

A SYSTEMATIC REVISION OF *JUNCUS* (JUNCACEAE) IN THE SINO-HIMALAYAN REGION

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The genus *Juncus* consists of about 310 species (Mabberley 2008) and have a very wide geographical range, extending through out the globe from the equator to the polar regions, and providing examples of the occurrence in both hemispheres of the same species (Don 1840). In the tropics the genus is absent in the lowland but present at higher elevations, usually above 2000 m (Balslev 1996). It occupies many habitats from coastal to mountain marshy places or bogs.

In the Sino-Himalaya, the species of *Juncus* are found widely in the alpine and subalpine regions and are sometimes dominant. Economically it is also an important pasture plant where grazing animals feed. *Juncus* is one of the genera much diversified in the alpine and subalpine of the Sino-Himalaya.

Juncus in this region has been studied by several taxonomists and more than 100 species have been reported (Don 1825, 1840, Buchenau 1867, 1885, 1890, 1906, Franchet 1887, Hooker 1894, Brown 1903, Rendle 1906, Camus 1910, Smith 1914, Samuelsson 1927, 1936, Satake 1968, 1971, Hara 1978, Lu & Zhang 1979, Miyamoto & Ohba 1993, 1995, 1997a, 1997b, Noltie 1994a, 1998, Wu 1994). A considerable number of the species have been described based on one or a few specimens. In spite of former taxonomic studies, some species of *Juncus* have not yet been successfully circumscribed for the lack of reliable diagnostic characters.

This paper provides a revision of the species of *Juncus* found in the Sino-Himalayan region.

Materials and Methods

This study was mainly based on several thousands of the herbarium specimens including types of the Sino-Himalayan species. Field trips were carried out in the Sino-Himalayan region throughout Pakistan, Nepal, Darjeeling, Bhutan, and China (Yunnan, Sichuan, and Xizang) from 1990 to 2002 and examined variation among and within populations.

Specimens of the following herbaria were examined: Harvard University Herbaria (A), Botanischer Garten und Botanisches Museum Berlin-Dahlem (B), Department of Botany, London Natural History Museum (BM), Central National Herbarium, Botanical Survey of India (CAL), Botany Department, Chengdu Institute of Biology, Chendgu (CDBI), Royal Botanic Garden, Edinburgh (E), East China Normal University, Shanghai (HSNU), Royal Botanic Gardens, Kew (K), National Herbarium and Plant Laboratories, Department of Plant Resources, Kathmandu (KATH), Kunming Institute of Botany, Chinese Academy of Sciences, Kunming (KUN), Herbarium, Department of Botany, Faculty of Science, Kyoto University (KYO), National Herbarium Netherlands, Leiden (L), V. L. Komarov Botanical Institute, Saint Petersburg (LE), Muséum National d'Histoire Naturelle, Paris

(P), Institute of Botany, Chinese Academy of Sciences, Beijing (PE), Herbarium, Botany Department, Swedish Museum of Natural History (S), Herbarium, Department of Botany, University Museum, University of Tokyo (TI), Botanical Museum, Uppsala University (UPS), Herbarium, Department of Botany, Naturhistorisches Museum, Wien (W), and Herbarium, Institute für Botanik, Universität Wien (WU).

Taxonomical History

Taxonomical study of *Juncus* in the Sino-Himalaya was begun in the early nineteenth century when Don (1825) described *Juncus concinnus* based on a specimen collected from Gossain Than (actually Gosainkund, north of Kathmandu) in Nepal by Wallich in 1818. Later he (1840) described four new species, *J. indicus*, *J. leucanthus*, *J. leucomelus*, and *J. membranaceus*, based on specimens collected in northern India by Royle. Buchenau (1867) described two new species, *J. thomsoni* and *J. minimus*, and he (1885) was the first botanist who summarized Himalayan *Juncus* based on specimens collected in Northwest Himalaya, Sikkim, and Assam by J. D. Hooker, J. Thomson, and C. B. Clarke. He recognized 25 species of *Juncus*, together with description of five new species, *J. bracteus*, *J. chrysocarpus*, *J. clarkei*, *J. leptospermus*, and *J. sphenostemon*. In 1890 Buchenau published a worldwide monograph of Juncaceae, in which several new species of the Sino-Himalayan *Juncus* were described. Hooker (1892) recognized 26 species of *Juncus* from the Himalayan region in his 'Flora of British India,' and later he (1894) described two new species, *J. nematocaulon* and *J. sikkimensis*. Professor Hiroshi Hara made expeditions to Nepal, Sikkim, and Bhutan in 1960s and 1970s. Collections of these expeditions were enumerated and published in three parts in 1966, 1971, and 1975. Satake studied the *Juncus*, and he described two new species, *J. albescens* and *J. tratangensis*, in the reports, and in another report (Satake 1968) described more two new species, *J. bhutanensis* and *J. leuteocarpus*. Hara published 20 papers from 1961 to 1978 entitled 'New or noteworthy flowering plants from Eastern Himalaya,' and in the one of the papers, he (1974) described a new species of *Juncus biglumoides* based on a specimen collected from Lamjung Himal in Nepal by J. D. A. Stainton and others. After Hara (1978) the number of species increased to 30 in 'An Enumeration of the Flowering Plants of Nepal' (Hara et al. 1978). Ohba and his associates inquired succeeding Himalayan plant research, and Miyamoto and Ohba (1993, 1995, 1997) described four new species, *J. ganeshii*, *J. harae*, *J. nepalicus*, and *J. sherei*, based on the specimens collected from Nepal. Noltie (1994a) made a detailed study on *Juncus* and described four new species, *J. bryophytes*, *J. glaucoturgidus*, *J. hydrophilus*, and *J. spumosus*, from Bhutan and adjacent regions, which were included in a contribution to the elucidation of the Flora of Bhutan (Noltie 1994b). After he also described two new species from the Himalayan region, *J. deosaicus* from Pakistan and *J. tobdeniorum* from Sikkim (Noltie 1998). Most recently Press et al. (2000) reported 38 species of *Juncus* from Nepal in 'Annotated Checklist of the Flowering Plants of Nepal.'

A great number of specimens of *Juncus* were collected from SW China, mainly Yunnan and Sichuan by French missionaries, such as David, Delavay, and Soulié, in the middle of nineteenth century. Succeedingly *Juncus* was collected from SW China by Forrest, Rock, Smith, Kingdon-Word, and Handel-Mazzetti. Franchet (1887) described *J. allioides* and *J. luzuliformis* based on David's collections. Camus (1910) treated Asian *Juncus*,

and he described five new species and three varieties, *J. amplifolius*, *J. amplifolius* var. *pumilus*, *J. clarkei* var. *marginatus*, *J. crassistylus*, *J. gracilicaulis*, *J. longistamineus*, *J. sikkimensis* var. *longiflorus*, and *J. yunnanensis* based on Delavay's and Soulié collections. Samuelsson (1927, 1936) described several new species based on their collections. Wu (1994) revised Chinese *Juncus*, and he described several new species based on specimens collected in Yunnan and Sichuan. Recently Miyamoto and Ohba (1997) described two new species, *J. gonggae* and *J. trachyphyllus*, from Mt. Gongga shan in Sichuan. Noltie (1998) described *J. fimbriatylodes*, an endemic species from Yunnan, China.

Recently *Juncus* was treated only in regional floras of Sino-Himalaya, for example, Jafri (1981), Lu and Zhang (1987), Noltie (1994b), Zhang and Lu (1994), Wu (1997), Akiyama et al. (1999, 2000), Miyamoto and Ohba (1999, 2002, 2008), Li (2000), Press et al. (2000), Wu and Clemants (2000), and Bao (2003).

Morphological Characters

The following morphological characters are used to distinguish the Sino-Himalayan species.

Rhizomes

Five types of rhizomes for branching pattern are found in *Juncus*. Their appearance is usually quite characteristic to a given species or group of species (Balslev 1996).

1. Branching-ascending rhizomes: rhizomes branch loosely with conspicuous internodes.
J. bufonius, *J. prismatocarpus*, and *J. wallichianus*.
2. Stoloniferous rhizomes: rhizomes creep horizontally with long internodes.
J. amplifolius, *J. benghalensis*, *J. chryosocarpus*, *J. concolor*, *J. crassistylus*, *J. ganeshii*, *J. grisebachii*, *J. himalensis*, *J. kingii*, *J. longistamineus*, *J. membranaceus*, *J. milashanensis*, *J. minimus*, *J. pseudocastaneus*, *J. rohtangensis*, and *J. sphacelatus*.
3. Densely branching rhizomes: rhizomes irregularly branch with short internodes.
J. longiflorus, *J. nepalicus*, *J. ochraceus*, *J. rostocarpus*, and *J. spumosus*.
4. Short creeping rhizomes: rhizomes creep horizontally, and culms arise in dense rows from the upper side of the rhizome.
J. articulatus, *J. biglumoides*, *J. brachystigma*, *J. bryophilus*, *J. cephalostigma*, *J. clarkei*, *J. concinnus*, *J. dongchauanensis*, *J. duthiei*, *J. effusus*, *J. fimbriatylodes*, *J. giganteus*, *J. glaucoturgidus*, *J. gonggae*, *J. gracilicaulis*, *J. harae*, *J. inflexus*, *J. khasiensis*, *J. leptospermus*, *J. luzuliformis*, *J. mustangensis*, *J. perpusillus*, *J. petrophilus*, *J. potaninii*, *J. przewalskii*, *J. setchuensis*, *J. sherei*, *J. sikkimensis*, *J. spectabilis*, *J. thomsonii*, *J. tobdeniorum*, *J. trachyphyllus*, *J. trichophyllus*, *J. triglumis*, and *J. uniflorus*.
5. Long creeping rhizomes: rhizomes differ from short creeping ones only in having conspicuous internodes.
J. allioides, *J. leucanthus*, and *J. modicus*.

Culms

The flowering stem is the culm. The culms are ascending and erect.

They are terete and the cross sections are rounded in *J. allioides* (Fig. 1-1), oval in *J. himalensis* (Fig. 1-2), pentaquetrous in *J. brachystigma* (Fig. 1-3), or laterally compressed in *J. prismatocarpus* (Fig. 1-4). The surface of culms is smooth as in *J. allioides* (Fig.

1-5), or with longitudinal striae as in *J. himalensis* (Fig. 1-6), or longitudinal ridges as in *J. brachystigma* (Fig. 1-7).

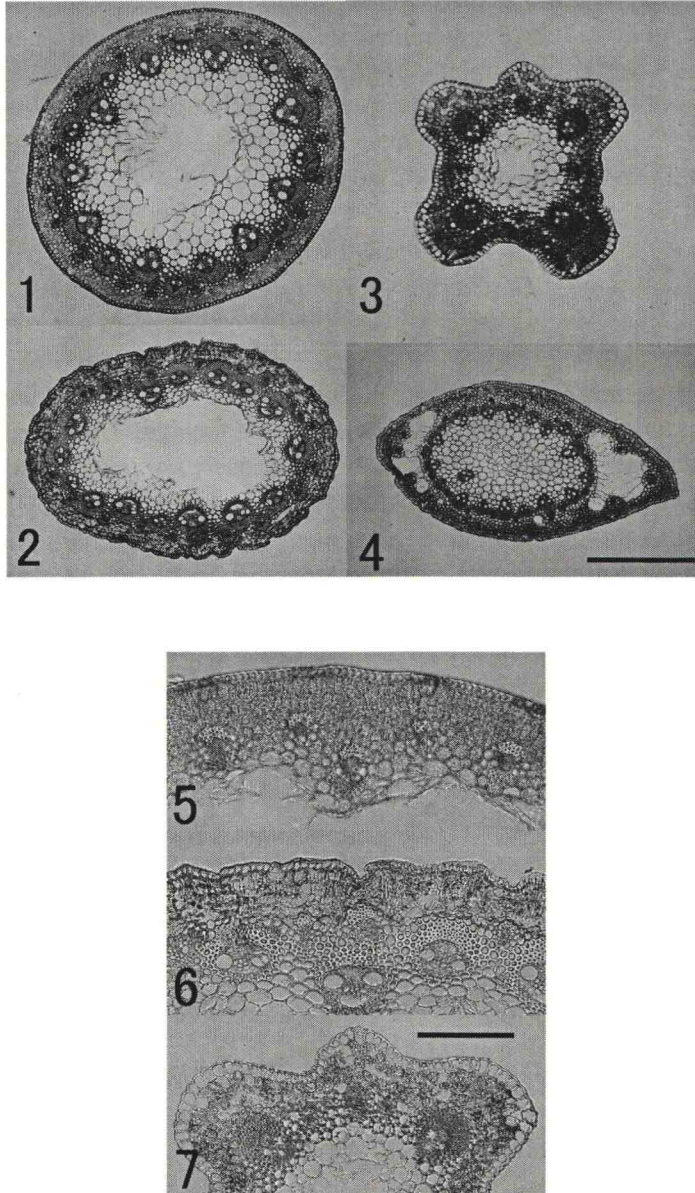


Fig. 1. Cross sections of middle part of culms. 1: *J. allioides*, 2: *J. himalensis*, 3: *J. brachystigma*, 4: *J. prismatocarpus*, 5: *J. allioides*, 6: *J. himalensis*, 7: *J. brachystigma*. Scale: upper 0.5 mm, lower 0.2 mm.

Blade

Four types of leaves are found in the cross section of the blades in Sino-Himalayan *Juncus*. The adaxial side of leaves or terete leaves, when present, have epidermis with large hyaline, so-called bulli-form cells (Fig. 2) (Duval-Jouve 1871).

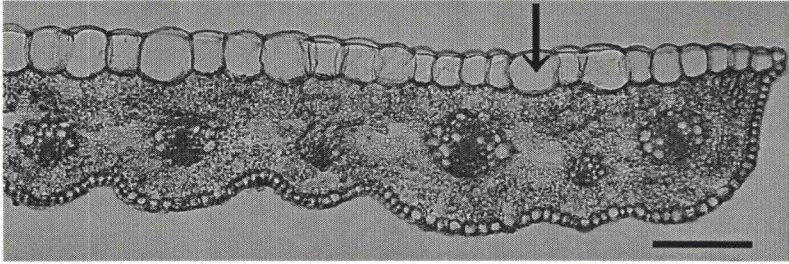


Fig. 2. Cross section of the leaf of *J. rostratus*. Arrow indicates bulli-form cell. Scale: 0.1 mm.

1. Flat blades: the cross section of the blades is flattened. The vascular bundles lie in a row under both surfaces respectively (Fig. 3-1).

J. amplifolius, *J. giganteus*, *J. gracilicaulis*, *J. hydrophilus*, *J. milashanensis*, and *J. minimus*; the bulli-form cells absent.

J. clarkei, *J. crassistylus*, *J. nepalicus*, *J. petrophilus*, *J. rostratus*, and *J. spumosus*; the bulli-form cells present on adaxial side.

2. Bifacial blades: the cross section of the blades is U-shaped. The vascular bundles lie in U-shaped (Fig. 3-2).

J. benghalensis, *J. biglumoides*, *J. brachystigma*, *J. bryophilus*, *J. bufonius*, *J. ganeshii*, *J. grisebachii*, *J. harae*, *J. himalensis*, *J. membranaceus*, *J. modicus*, *J. mustangensis*, *J. potaninii*, *J. sphacelatus*, and *J. triglumis*; the bulli-form cells absent on both side.

J. gonggae, *J. ochraceus*, and *J. trachyphyllus*; the bulli-form cells present on adaxial side.

J. chrysocarpus, *J. concinnus*, and *J. fimbriatylodes*; the bulli-form cells present on both sides.

3. Terete blades: the cross section of the blades is rounded or oval. The vascular bundles lie in a circle (Fig. 3-3–6).

J. allioides, *J. articulatus*, *J. cephalostigma*, *J. concolor*, *J. dongchuanensis*, *J. duthiei*, *J. glaucoturgidus*, *J. khasiensis*, *J. kingii*, *J. leptospermus*, *J. leucanthus*, *J. longiflorus*, *J. longistamineus*, *J. luzuliformis*, *J. perpusillus*, *J. przewalskii*, *J. pseudocastaneus*, *J. rohtangensis*, *J. sherei*, *J. sikkimensis*, *J. thomsonii*, *J. trichophyllus*, *J. uniflorus*, and *J. wallichianus*; the bulli-form cells absent. The surface of leaves is smooth (Fig. 3-3), or with longitudinal striae (Fig. 3-4) or longitudinal ridges (Fig. 3-5–6).

Juncus sherei has leaves with a single groove both on adaxial and abaxial sides, respectively (Fig. 3-4), *J. brachystigma* with conspicuous longitudinal ridges (Fig. 3-5), and *J. khasiensis* X-shaped (Fig. 3-6).

4. Compressed blades: the cross section of the blades is oblong to linear-oblong with compressedly sharp edges. The vascular bundles lie in oval-shaped (Fig. 3-7).

J. prismatocarpus; the bulli-form cells absent.

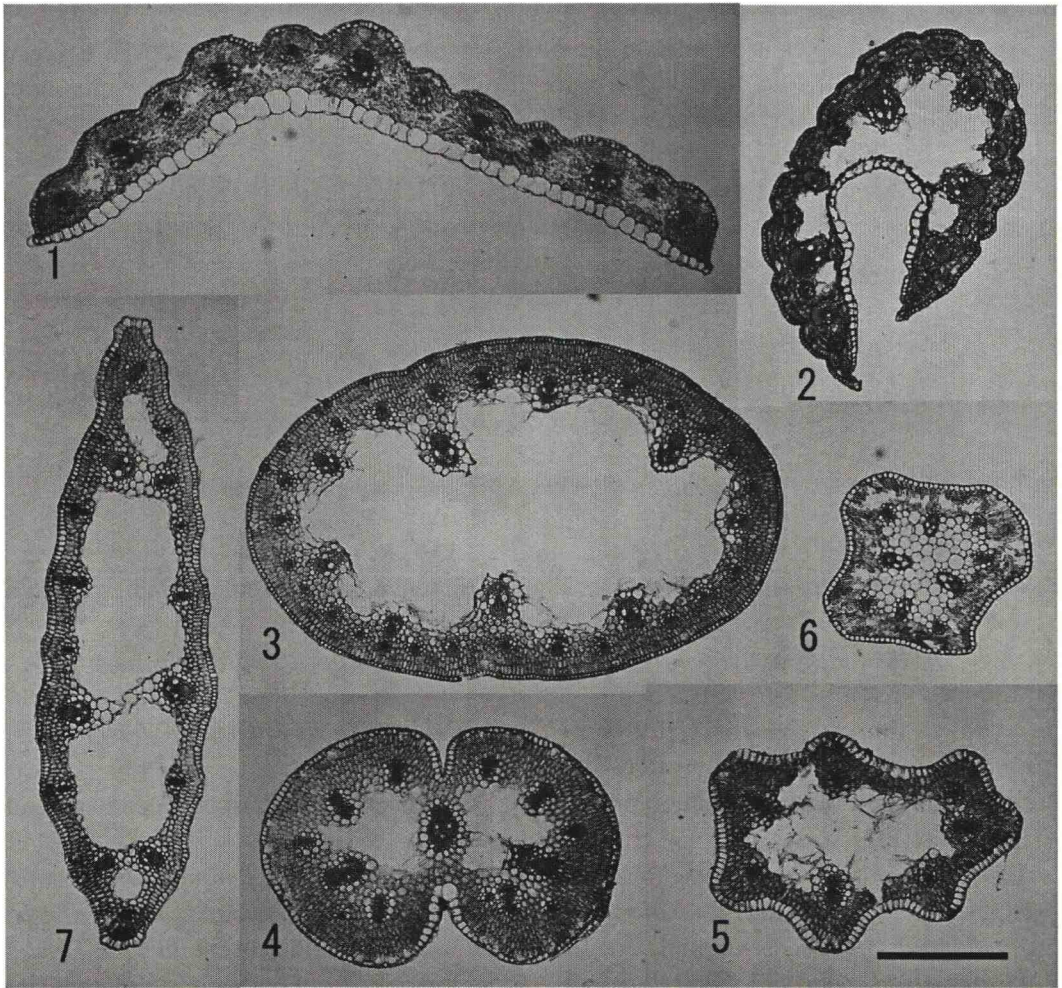


Fig. 3. Cross sections of basal leaves. 1: Flat blade of *J. rostricarpus*, 2: Bifacial blade of *J. benghalensis*, 3: Terete blade of *J. allioides*, 4: Terete blade of *J. sherei* with a single groove each on adaxial and abaxial side. 5: Terete blade of *J. brachystigma* with longitudinal conspicuous ridges. 6: Terete blade of (X-shape) *J. khasiensis*. 7: Compressed blade of *J. prismatocarpus*. Scale: 0.2 mm.

Cataphylls

Juncus has sheathing leaves at base of culms which blade is degenerated. Such sheathing leaves are called cataphylls by Buchenau (1875, 1890, 1906).

Juncus effusus, *J. inflexus*, *J. setchuensis*, and *J. tobdeniorum* have only cataphylls.

Inflorescences

The inflorescences of *Juncus* are terminal on the culm and generally many-flowered. But *J. bryophilus*, *J. harae*, *J. longistamineus*, *J. potaninii*, *J. rohtangensis*, and *J. uniflorus* of the Sino-Himalayan *Juncus* have 1 or 2 flowers in the inflorescences.

Juncus has two types of the inflorescences. One is cymose and occurs in *J. bufonius*, *J. effusus*, *J. inflexus*, *J. luzuliformis*, *J. setchuensis*, and *J. tobdeniorum*. Another is racemose and occurs in other species.

Lowest bract

In *Juncus* there is considerable and taxonomically important variation in the lowest bract (Balslev 1996). The lowest bract is longer or shorter than, or as long as the inflorescence. *Juncus amplifolius*, *J. articulatus*, *J. benghalensis*, *J. brachystigma*, *J. bryophilus*, *J. bufonius*, *J. clarkei*, *J. concinnus*, *J. crassistylus*, *J. dongchuanensis*, *J. duthiei*, *J. fimbriatylodes*, *J. ganeshii*, *J. giganteus*, *J. gracilicaulis*, *J. grisebachii*, *J. harae*, *J. himalensis*, *J. hydrophilus*, *J. khasiensis*, *J. kingii*, *J. leptospermus*, *J. longiflorus*, *J. milashanensis*, *J. minimus*, *J. mustangensis*, *J. nepalicus*, *J. ochraceus*, *J. petrophilus*, *J. prismatocarpus*, *J. pseudocastaneus*, *J. rohtangensis*, *J. rostocarpus*, *J. sherei*, *J. sikkimensis*, *J. spacelatus*, *J. spumosus*, and *J. wallichianus* have the lowest bract similar to basal leaves or cauline leaves. *Juncus biglumoides*, *J. effusus*, *J. harae*, *J. inflexus*, *J. luzuliformis*, *J. setchuensis*, and *J. tobdeniorum* have the lowest bract like a culm. *Juncus benghalensis*, *J. brachystigma*, and other species of the Sino-Himalayan species have the scarious lowest bract like other floral bract.

Floral bract

The floral bract is broadly ovate, lanceolate to linear or filiform. *Juncus amplifolius*, *J. articulatus*, *J. bufonius*, *J. clarkei*, *J. concinnus*, *J. crassistylus*, *J. dongchuanensis*, *J. effusus*, *J. fimbriatylodes*, *J. ganeshii*, *J. giganteus*, *J. gracilicaulis*, *J. grisebachii*, *J. himalensis*, *J. inflexus*, *J. leptospermus*, *J. milashanensis*, *J. ochraceus*, *J. potaninii*, *J. prismatocarpus*, *J. pseudocastaneus*, *J. rostocarpus*, *J. setchuensis*, *J. sikkimensis*, *J. sphacelatus*, *J. spumosus*, *J. trachyphyllus*, and *J. wallichianus* have sheathing bracts on peduncle.

Bracteoles

Bracteoles are foliar structures, inserted on the pedicel just below the flower. In the Sino-Himalayan *Juncus* the bracteoles present in *J. bufonius*, *J. effusus*, *J. inflexus*, *J. setchuensis*, and *J. tobdeniorum* with the cymose inflorescence.

Perianth

The perianth is composed of six free tepals in two whorls. They are scarious and ovate, lanceolate to oblong.

Stamens

Usually six stamens occur in two whorls and alternate to tepals. The inner stamens are absent in six species, *J. effusus*, *J. leptospermus*, *J. prismatocarpus*, *J. setchuensis*, *J. tobdeniorum*, and *J. wallichianus*. The length of stamens is shorter or longer than, or as long as tepals. The filaments are free and filiform or linear. The anthers are linear to oblong and attached the filaments at base. The relative length of the filament and the anther is one of taxonomically significant characters. Because the length of stamens in young flower are variable, it is necessary to measure mature flowers for comparison.

Pistil

The pistil consists of three distinct stigmas, one style, and one ovary consisting of three united carpels. The ovary is oblong-trigonous and 1- or 3-locular, or 3-septate. The length of stigma and style is one of taxonomically significant characters.

Capsule

The capsule is obovoid or ovoid, and obtuse, acute, mucronate, cuspidate or aristate at apical part. The cross section of the capsule is rounded, trigonous or three-keeled.

Seeds

The seeds are ovoid, obovoid, or ellipsoid; appendage of hyaline outer seed coat on both sides are absent or present.

Taxonomic Treatment of Sino-Himalayan *Juncus*

Genus **Juncus** L., Sp. Pl. 325 (1753). Kunth, Enum. Pl. 3: 315–362 (1841). Buchenau, Monogr. Junca. in Bot. Jahrb. Syst. 12: 167–461 (1890); Juncaceae. In: Engler, A. (ed.), Das Pflanzenreich (iv. 36) 25: 98–226 (1906).

Key to Species of Sino-Himalayan *Juncus*

1. A pair of bracteoles present on pedicel just below flower
 2. Inflorescence terminal; lowest bract similar to basal or cauline leaf; basal and cauline leaves with blade; annual 8. *J. bufonius*
 2. Inflorescences lateral; lowest bract like culm; only cataphylls on basal culms, without leaves with blade; perennial
 3. Stamens 6 29. *J. inflexus*
 3. Stamens 3
 4. Pith spongy, interrupted 58. *J. tobdeniorum*
 4. Pith spongy, continuous
 5. Culms striations 20–50; capsule perfectly 3-locular 18. *J. effusus*
 5. Culms striations 15–30; capsule imperfectly 3-locular 52. *J. setchuensis*
1. A pair of bracteoles absent
 2. Sheathing floral bract present on peduncle; inflorescence usually with several flower heads (except for *J. khasiensis* and *J. potaninii* with one or two flower heads)
 3. Cross section of capsule 3-keeled; style very short, 0.1–0.5 mm long
 4. Leaves strongly compressed 47. *J. prismatocarpus*
 4. Leaves terete
 5. Stamens 6 3. *J. articulatus*
 5. Stamens 3
 6. Tepals 3–4 mm long 63. *J. wallichianus*
 6. Tepals 2.5–3.5 mm long 32. *J. leptospermus*
 3. Cross section of capsule rounded to trigonous; style 1–4 mm long (except for *J. potaninii* 0.2–0.4 mm long)
 4. Stamens longer than tepals
 5. Leaves grass leaf-like; cross section of blade flattened
 6. Anthers not exerted; stamens slightly longer than tepals 11. *J. clarkei*
 6. Anthers distinctly exerted; stamens longer than tepals
 7. Filaments 3 times as long as anthers 28. *J. hydrophilus*
 7. Filaments 4–5 times as long as anthers
 8. Outer tepals slightly longer than inner ones; style as long as stigmas 56. *J. spumosus*
 8. Outer tepals shorter than inner ones; style twice as long as stigmas 24. *J. gracilicaulis*
 5. Leaves terete; cross section of blade rounded, oval, U-shaped, or X-shaped
 6. Basal leaf absent; proliferous 16. *J. dongchuanensis*
 6. Basal leaf present; non-proliferous
 7. Filaments twice as long as anthers; rhizome stoloniferous 25. *J. grisebachii*
 7. Filaments 3–6 times as long as anthers; rhizome short creeping

- 8. Cross section of blade X-shaped 30. *J. khasiensis*
 - 8. Cross section of blade U-shaped
 - 9. Outer tepals longer than inner ones; flower head with 7–12 flowers 12. *J. concinnus*
 - 9. Outer tepals as long as inner ones; flower head with 1 or 2 flowers 46. *J. potaninii*
 - 4. Stamens shorter than tepals
 - 5. Leaves grass leaf-like; cross section of leaf blade flattened
 - 6. Leaf blade with denticulate margin 14. *J. crassistylus*
 - 6. Leaf blade with entire margin
 - 7. Style longer than stigmas; culm with several longitudinal striae; cross section oval 51. *J. rostocarpus*
 - 7. Style shorter than stigmas; culm without longitudinal striae; cross section rounded
 - 8. Outer tepals longer than inner ones 21. *J. giganteus*
 - 8. Outer tepals as long as inner ones 2. *J. amplifolius*
 - 5. Leaves terete; cross section of leaf blade rounded, oval, U-shaped
 - 6. Flower heads with sterile flowers 16. *J. dongchuanensis*
 - 7. Basal leaves present; surface of culms with several longitudinal striae 43. *J. ochraceus*
 - 7. Basal leaves absent; surface of culms smooth 19. *J. fimbriatylodes*
 - 6. Flower heads without sterile flowers
 - 7. Anthers shorter than filaments
 - 8. Filaments 1.5–2 times as long as anthers 20. *J. ganeshii*
 - 8. Filaments 3 times as long as anthers
 - 9. Stamens almost as long as tepals; auricles rounded 27. *J. himalensis*
 - 9. Stamens shorter than tepals; auricles elongated 55. *J. sphacelatus*
 - 7. Anthers longer than filaments
 - 8. Rhizomes creeping with stolons 49. *J. pseudocastaneus*
 - 8. Rhizomes densely branched or short creeping without stolons
 - 9. Cross section of culms U-shaped 15. *J. deosaicus*
 - 9. Cross section of culms rounded 54. *J. sikkimensis*
2. Sheathing floral bract absent on peduncle; inflorescence with 1 or 2 flower heads except for *J. luzuliformis*
3. Stamens shorter than tepals or slightly exerted
 - 4. Leaves grass leaf-like; cross section of leaf blade flattened
 - 5. Anthers longer than filaments 38. *J. milashanensis*
 - 5. Anthers shorter than filaments
 - 6. Filaments 5 times as long as anthers; style very short, 0.5–0.7 mm long; apex of capsule obtuse 39. *J. minimus*
 - 6. Filaments 3 times as long as anthers; style 1.5–2 mm long; apex of capsule acute 42. *J. nepalicus*
 - 4. Leaves terete; cross section of leaf blade rounded, oval, U-shaped, or X-shaped

5. Anthers shorter than filaments
6. Stamens as long as or slightly longer than tepals; surface of culms with longitudinal ridges or striae
7. Inflorescences lateral; lowest bract culm-like 5. *J. biglumoides*
7. Inflorescence terminal; lowest bract similar to cauline leaf
..... 36. *J. luzuliformis*
6. Stamens shorter than tepals; surface of culms with a single groove or without groove
7. Filaments 3 times longer than anthers; tepals chestnut-brown, shining
..... 17. *J. duthiei*
7. Filaments 2–2.5 times as long as anthers; tepals brown ... 7. *J. bryophilus*
5. Anthers longer than filaments
6. Basal leaves 2 or 3; lowest bract as long as or just exceeding inflorescence, lanceolate 62. *J. uniflorus*
6. Basal leaf 1 (rarely 2); lowest bract longer than inflorescence, linear-lanceolate or filiform
7. Inflorescence proliferous 26. *J. harae*
7. Inflorescence non-proliferous
8. Anthers twice as long as filaments 26. *J. harae*
8. Anthers 4 times as long as filaments
9. Rhizomes stoloniferous or short creeping 50. *J. rohtangensis*
9. Rhizomes densely branched, plants caespitose 34. *J. longiflorus*
3. Stamens longer than tepals, distinctly exerted
4. Cross section of leaf blade U-shaped or flattened
5. Cross section of culm with several longitudinal striae or ridges
6. Filaments slightly shorter than anthers 10. *J. chrysocarpus*
6. Filaments 3–4 times as long as anthers
7. Stigmas very short, 0.1–0.2 mm long 6. *J. brachystigma*
7. Stigmas distinct, 0.4–0.5 mm long 23. *J. gonggae*
5. Cross section of culm without striae or ridges
6. Rhizomes stoloniferous
7. Filaments 1.5–2 times as long as anthers 4. *J. benghalensis*
7. Filaments 3 times as long as anthers 37. *J. membranaceus*
6. Rhizomes not stoloniferous
7. Cross section of leaf blade U-shaped 59. *J. trachyphyllus*
7. Cross section of leaf blade flattened 45. *J. petrophilus*
4. Cross section of leaf blade rounded or oval
5. Leaves and culms glaucous, surface scabrid 22. *J. glaucoturgidus*
5. Leaves and culms not glaucous, surface smooth
6. Culm surface with several longitudinal striae or ridge
7. Flower heads with 1 or 2 flowers 35. *J. longistamineus*
7. Flower heads with more than 5 flowers
8. Basal leaf absent; stigmas 0.5–0.7 mm long 40. *J. modicus*
8. Basal leaf present; stigmas 0.1–0.2 mm long, capitate
..... 9. *J. cephalostigma*

6. Culm surface without longitudinal striae
 7. Basal leaf absent
 8. Rhizomes stoloniferous, cataphylls straw colored 13. *J. concolor*
 8. Rhizomes very short, cataphylls shining, chestnut-brown
..... 33. *J. leucanthus*
 7. Basal leaves present
 8. Cauline leaves usually present
 9. Bulbils present at sheath of cauline leaves 60. *J. trichophyllus*
 9. Bulbils absent
 10. Lowest bract similar to cauline leaf or basal leaf, terete, longer than inflorescence 53. *J. sherei*
 10. Lowest bract scarious, flattened, slightly longer than or as long as inflorescence
 11. Auricles of cauline leaf truncate or absent 48. *J. przewalskii*
 8. Cauline leaf always absent
 9. Lowest bract similar to basal leaf, terete, longer than inflorescence
 10. Rhizomes stoloniferous 31. *J. kingii*
 10. Rhizomes not stoloniferous
 11. Basal leaves with a single groove on adaxial and abaxial surfaces
..... 53. *J. sherei*
 11. Basal leaves with a single groove on adaxial surface
..... 41. *J. mustangensis*
 9. Lowest bract scarious, flattened, slightly longer than inflorescence
 10. Others 4 times as long as filaments 61. *J. triglumis*
 10. Others 2–3 times as long as filaments
 11. Seed appendage less than 0.1 mm long 44. *J. perpusillus*
 11. Seed appendage 0.6–0.7 mm long 1. *J. allioides*
 11. Seed appendage 0.8–1.1 mm long 57. *J. thomsonii*

1. *Juncus allioides* Franch. in Nouv. Arch. Mus. Hist. Nat., ser. 2, **10**: 99 (1887). Buchenau in Bot. Jahrb. Syst. **12**: 399 (1890); in Bot. Jahrb. Syst. **29**: 238 (1900); in Bot. Jahrb. Syst. **36** (Bibl. 82): 19 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 229, f. 106 (1906). Brown in J. Linn. Soc., Bot. **36**: 162 (1903). Camus in Notul. Syst. (Paris) **1**(10): 278 (1910). Samuelsson in Acta Horti. Gothob. **3**: 69 (1927). Egorova in Akad. Nauk. SSSR Bot. Inst. Komarov, Rast. Tsentral. Azii, Fasc. **3**: 95, t. 8, f. 8 (1967). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Wu et al., Index Fl. Yunnan. **2**: 2081 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 515, f. 287 (1987). Noltie, Fl. Bhutan **3**(1): 262, f. 25a–d (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2421 (1994). Wu in Acta Phytotax. Sin. **32**: 452 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 177, f. 41, 1–3 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 180 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 102 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 236 (2000); in J. Jap. Bot. **78**: 153 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 51 (2000). Li et al., Fl. Gaoligong Mts.: 1119 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 148 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 89, f. 65 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 539, f. 111, 1–4 (2003).

[Colour plate 1a, b; Plate 1; Fig. 4]

Types: China; Tibet oriental, Provice de Moupin (M. l'Abbé David s. n., Jun. 1869, P-holotype, W-isotype).

Juncus macranthus Buchenau in Bot. Jahrb. Syst. **12**: 398 (1890); in Bot. Jahrb. Syst. **29**: 238 (1900). Types: China; Prov. Kansu [Gansu] orientali (G. N. Potanin s. n., 11 Jul. 1885, LE, W-syntypes); loc. cit., Tschagola (G. N. Potanin s. n., 11 Jul. 1885, W-syntype); loc. cit., Trajectu 8890 ped alt inter vicos Mör-pin et U-pin (G. N. Potanin s. n., 4 Jul. 1885, W-syntype).

Juncus spectabilis Rendle in J. Bot. Lond. **44**: 46 (1906). Buchenau in Engler, Pflanzenr. (iv. 36) **25**: 265 (1906). Noltie in Edinburgh J. Bot. **51**: 131 (1994). Types: Tibet; Gyangtse (H. J. Walton 69, Jul.–Sept. 1904, BM-holotype, CAL, K-isotypes).

Juncus yunnanensis A. Camus in Notul. Syst. (Paris) **1**(10): 275, f. 19, 13–16 (1910). Wu in Acta Phytotax. Sin. **32**: 459 (1994); Fl. Reipubl. Popul. Sin. **13**: 199, f. 47, 7–10 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 56 (2000). Type: China; Yunnan, marais au pied du Tsang-chan, au-dessus de Tali, 2200 m (P. J. M. Delavay 2046, 20 Apr. 1886, P-lectotype, designated here).

Juncus membranaceus auct. non Royle ex D. Don: Bao in Wu and Wu, Fl. Yunnanica **15**: 549 (2003).

Perennial, loosely caespitose, 8–50 cm tall. Rhizomes horizontally long creeping or short creeping, 0.8–1.5 mm in diam. Culms erect, grass-green, terete, 0.6–2.2 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 1–3 to each culm, light brown to stramineous, 1–5 cm long. Leaves grass-green, terete, cross section of blade oval, auricles rounded; basal leaves 1 or 2 to each culm, 4–30 cm long including sheath, 0.5–1.8 mm in diam., sheath 2–5 cm long; cauline leaves 1 or 2 to each culm or rarely absent, terete, shorter than culm, 4–21 cm long including sheath, 0.2–1.5 mm in diam., sheath 3–6 cm long. Inflorescence terminal; flower head single, cream-white, subglobose to hemispherical, 1.5–2 cm in diam., flowers 10–20. Lowest bract scarious, brown to light brown, lanceolate to ovate-lanceolate, 0.8–1.8 cm long, 3–5 mm wide, as long as inflorescence; floral bract lanceolate, 2–8 mm long, 1.5–3.5 mm wide, scarious; sheathing bract absent. Flowers 0.8–1 cm long, 2–3 mm wide, pedicel 1.5–4 mm long. Tepals cream-white, oblong-lanceolate to oblong, outer ones and inner ones equal in length, 5–6.5 mm long, 1.2–1.8 mm wide. Stamens 6, longer than tepals, 7.5–9 mm long; filaments 5.7–6 mm long, 2–3 times as long as anthers; anthers yellow, linear-elliptic, 1.8–3 mm long. Pistil 5–8 mm long, 1–1.5 mm wide; stigmas 1–1.3 mm long; style 1.8–2.2 mm long. Capsule brown, oblong, longer than tepals, 5–6 mm long, 2.0–2.2 mm wide, mucronate, cross section trigonous. Seeds ellipsoid, 0.6–0.7 mm long, appendage 0.5–0.6 mm long.

Distr. India (Punjab, Kumaon), Nepal, Sikkim, Bhutan, China (Xizang, Qinghai, Yunnan, Sichuan, Shaanxi, Hubei).

Juncus allioides is a widespread and common species in the Sino-Himalaya. Its altitudinal range is wider than those of most other Sino-Himalayan *Juncus* species. It grows on marshy places along bogs or streams as high up as 4800 m in Nepal and as low as 2000 m in China. The cauline leaf of *J. allioides* is present or sometimes absent. The character of present or absent of cauline leaf was used as a diagnostic character in several species of *Juncus*. However, in *J. allioides*, this character shows wide range of variation

among populations. *Juncus spectabilis* Rendle and *J. yunnanensis* A. Camus, which are characterized by the lack of cauline leaf, described from Southwest China, are also conspecific with *J. allioides*.

2. *Juncus amplifolius* A. Camus in Notul. Syst. (Paris) **1**(10): 281, f. 19, 7–12 (1910). Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1230 (1936). Wu et al., Index Fl. Yunnan. **2**: 2081 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 523, f. 293 (1987). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2423 (1994). Wu in Acta Phytotax. Sin. **32**: 465 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 224, f. 52, 1–4 (1997). Noltie in Edinburgh J. Bot. **51**: 139 (1994); Fl. Bhutan **3**(1): 261 (1994). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 180 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 102 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 62 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 115 (2002).

[Colour plate 8a; Plate 2; Fig. 5]

Type: China; Tibet oriental, Yunnan, Tsé-kou, montagne de Patong et mont de Tsen-tchrou (J. A. Soulié 1105, 20 Sept. 1895, P-holotype).

Juncus crassistylus auct. non A. Camus: Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 180 (1999).

Perennial, 10–50 cm tall. Rhizomes stoloniferous, horizontally long creeping, 0.9–2.1 mm in diam. Culms erect, grass-green, terete, 0.6–2.2 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 2 or 3 to each culm, brown to stramineous, 1–5 cm long. Leaves grass-green, grass leaf-like, blade margin entire, multi-grooved on abaxial side, cross section of blade flattened, auricles absent; basal and subbasal leaves 1 or 2 to each culm, 3–18 cm long including sheath, 3–8 mm wide, sheath 1–8 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 3–16 cm long including sheath, 1.5–7 mm wide, sheath 1–5 cm long. Inflorescence terminal, branched; flower heads 2–5, brown, 0.8–2.5 cm in diam., flowers 2–20, peduncle 0.3–5 cm long. Lowest bract grass leaf-like, linear, 1.5–10 cm long including sheath, 0.8–3.0 mm wide, as long as inflorescence, with several ridges on abaxial side, cross section flattened, sheath 0.3–1.5 cm; floral bract lanceolate to ovate-lanceolate, 3–6 mm long, 1–2 mm wide, scarious; sheathing bract on peduncle membranaceous, lanceolate, 0.5–1.5 cm long. Flowers 0.8–1.4 cm long, 2–3 mm wide, pedicel 1–2 mm long. Tepals brown, lanceolate, outer ones slightly longer than inner ones, 5–7 mm long, 1.3–1.8 mm wide, inner ones 4.7–6.8 mm long, 1.3–1.8 mm wide, with a hooked appendage at apex. Stamens 6, longer than tepals, 4.5–4.9 mm long; filaments 2.0–2.2 mm long; anthers linear-elliptic, slightly longer than filaments, 2.5–2.7 mm long. Pistil 0.8–1.3 mm long, 1.5–1.8 mm wide; stigmas 4–7 mm long. Capsule brown, oblong, longer than tepals, 6–8 mm long, 2.5–3 mm wide, mucronate, cross section rounded. Seeds ovoid, 0.6–0.8 mm long, appendage 1.5–1.6 mm long.

Distr. China (Gansu, Yunnan, Sichuan, Shaanxi).

Juncus amplifolius is characterized in having a hooked appendage at apex of the outer tepals but this character was not noted by Camus (1910). This species is similar to *J. crassistylus* A. Camus and *J. milashanensis* A. M. Lu & Z. Y. Zhang but *J. amplifolius* has multi-grooved and flattened leaves; *J. crassistylus* has short stigma lobes (0.5–0.7 mm

long) and *J. milashanensis* has anthers twice as long as the filaments.

Juncus amplifolius grows on exposed screes or streamsides from elevations of 3500 m in *Abies* forests zone to 4500 m in alpine zone.

3. *Juncus articulatus* L., Sp. Pl.: 327 (1753). Egorova in Akad. Nauk. SSSR Bot. Inst. Komarov, Rast. Tsentral. Azii, Fasc. **3**: 100 (1967). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Jafri in Fl. Pakistan **138**: 15, f. 3 a–e (1981). Lu and Zhang in Wu, Fl. Xizang. **5**: 508, f. 281 (1987). Noltie, Fl. Bhutan **3**(1): 255 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2418 (1994). Wu in Acta Phytotax. Sin. **32**: 452 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 184, f. 42, 8–10 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 180 (1999); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 53 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 247, f. 109 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 542 (2003).

[Colour plate 1e; Plate 3; Fig. 6]

Juncus lampocarpus Buchenau in Bot. Jahrb. Syst. **6**: 200 (1885), pro part.

Perennial, ascending, 2–40 cm tall. Rhizomes horizontally short creeping, 1.6–3 mm in diam. Culms erect or ascending, grass-green, 0.5–1.8 mm in diam., smooth, cross section oval. Leaves grass-green, terete, cross section of blade oval, auricles rounded; basal and subbasal leaves 1 or 2 to each culm, 4–10 cm long including sheath, 0.4–0.8 mm in diam., sheath 1–4 cm long; cauline leaves 1–3 to each culm, shorter than culm, 6–11 cm long including sheath, 0.6–1 mm in diam., sheath 1.5–4.5 cm long. Inflorescence terminal, loosely branched; flower heads many, grass-green, 2–3.5 mm in diam., flowers 2–6, sheath 0.5–1.5 cm. Lowest bract grass-green, linear, shorter than inflorescence, 1.5–5 cm long; floral bract ovate to ovate-lanceolate, shorter than inflorescence, 2–3 mm long, 0.8–1.2 mm wide, scarious; sheathing bract on peduncle lanceolate to obovate, 0.8–1.5 cm long, membranaceous. Flowers 3–4 mm long, 1.0–1.3 mm wide. Tepals grass-green to light brown, lanceolate to ovate-lanceolate, outer ones slightly longer than inner ones, 2.0–2.8 mm long, 0.5–0.8 mm wide. Stamens 6, shorter than tepals, 1.2–1.4 mm long; filaments 0.6–0.7 mm long; anthers yellow, linear-elliptic, 0.6–0.7 mm long, as long as filaments. Pistil 1.8–2.0 mm long; stigmas 0.8–1.0 mm long; style 0.1–0.15 mm long. Capsule light brown, oblong, slightly longer than tepals, 3.8–4 mm long, 1.0–1.2 mm wide, acute, cross section 3-keeled. Seeds obovoid, 0.4–0.5 mm long, appendage absent.

Distr. Afghanistan, Pakistan, Kashmir, India (Punjab), Nepal, Bhutan, China (Xizang, Gansu, Yunnan, Sichuan, Shaanxi, Hubei).

Juncus articulatus is similar to *J. leptospermus* Buchenau and *J. wallichianus* Laharpe but differs in having six stamens. This species grows in exposed marshy places or streamsides from elevations of 1200 to 3200 m.

4. *Juncus benghalensis* Kunth, Enum. Pl. **3**: 360 (1841). Buchenau in Bot. Jahrb. Syst. **6**: 222 (1885); in Bot. Jahrb. Syst. **12**: 400 (1890). Samuelsson in Hand. Mazz., Symb. Sin. **7**: 1235 (1936). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Wu et al., Index Fl. Yunnan. **2**: 2081 (1984). Jafri in Fl. Pakistan **138**: 5, f. 2 e–g (1981). Noltie, Fl. Bhutan **3**(1): 267, f. 25g–h (1994). Wu in Acta Phytotax. Sin. **32**: 460 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 208, f. 49, 7–8 (1997). Miyamoto in Ohba and Ikeda, Fl. Ganesh Him.: 66

(1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 180 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 102 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 236 (2000); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 58 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 101, f. 65 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 549 (2003).

[Colour plate 1f; Plate 4; Fig. 7]

Types: Bengalia inferior (Wallich 3480a, K-holotype, W-isotype).

Juncus leucomelus Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 319 (1840). Buchenau in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 211 (1885); in Bot. Jahrb. Syst. **12**: 319 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 225 (1906). Hook. f., Fl. Brit. Ind. **6**: 397 (1892). Camus in Notul. Syst. (Paris) **1**(10): 275 (1910). Samuelsson in Acta Horti Gothob. **3**: 69 (1927). Satake in Hara, Fl. E. Himal. **1**: 403 (1966); Fl. E. Himal. **2**: 163 (1971); in J. Jap. Bot. **43**: 382 (1968). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. **3**: 95, t. 8, f. 5 (1967). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Jafri in Fl. Pakistan **138**: 7, f. 1d (1981). Wu et al., Index Fl. Yunnan. **2**: 2083 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 510, f. 283 (1987). Noltie in Edinburgh J. Bot. **51**: 130 (1994); Fl. Bhutan **3**(1): 266 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2419 (1994). Wu in Acta Phytotax. Sin. **32**: 459 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 199, f. 47, 7–10 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 56 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 99 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 547 (2003). Types: N. W. India; Kunawar ad Soongnum (Royle s. n., LIV-holo, not seen, K, W-isotypes).

Juncus bracteatus Buchenau in Bot. Jahrb. Syst. **6**: 220 (1885); in Bot. Jahrb. Syst. **12**: 397 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 228 (1906). Hook. f., Fl. Brit. Ind. **6**: 397 (1892). Lu and Zhang in Wu, Fl. Xizang. **5**: 514 (1987). Wu in Acta Phytotax. Sin. **32**: 460 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 208, f. 49, 1–2 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 58 (2000). Bao in Wu and Wu, Fl. Yunnanica **15**: 549 (2003). Types: Sikkim, 12000 ft. (J. D. Hooker s. n., BM, S, UPS, W-syntypes).

Juncus sphenostemon Buchenau in Bot. Jahrb. Syst. **6**: 223, t. 3, f. 1–6 (1885); in Bot. Jahrb. Syst. **12**: 401 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 230, f. 107 (1906). Camus in Notul. Syst. (Paris) **1**(10): 278 (1910). Satake in Hara, Fl. E. Himal. **1**: 403 (1966); Fl. E. Himal. **2**: 164 (1971); in Ohashi, Fl. E. Himal. **3**: 131 (1975). Types: North West Himalaya; Laka, Dhurmsala, 11000 ft. (C. B. Clarke 23983, 24617, 17 Oct. 1874, K, W-syntypes). Kashmir; Palgam, 13000 ft. (C. B. Clarke 31059, 4 Sept. 1875, K, W-syntypes).

Juncus bhutanensis Satake in J. Jap. Bot. **43**: 382, f. 1–2 (1968); in Ohashi, Fl. E. Himal. **3**: 130 (1975). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Type: Bhutan; Barshong–Nala, 3100–3500 m (H. Kanai et al. 6021, 25 May 1967, TI-holotype).

Juncus upendrii Goel in Himalayan Research and Development **7**: 68, f. 1 (1988). Types: India; Uttar Pradesh (Kumaon), Pithoragarh district, Rungling forest (C. M. Arora 56823A, 8 Oct. 1975, CAL-holotype, BSD-isotype, not seen).

Perennial, loosely caespitose, 5.5–25 cm tall. Rhizomes stoloniferous, horizontally

short creeping, 0.2–0.3 mm in diam. Culms erect, grass-green, terete, 0.2–0.4 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 1 or 2, or absent, grass green, stramineous, 1–1.5 cm long. Leaves terete, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded; basal and subbasal leaves 1 or 2 to each culm, 2.5–12 cm long including sheath, 0.3–0.6 mm in diam., sheath 0.8–3 cm long; cauline leaves 1 or 2 to each culm or absent, 2–11 cm long including sheath, 0.3–0.5 mm in diam., sheath shorter or longer than culm, 0.8–2.5 cm long. Inflorescence with a single flower head, cream-white, hemispherical, 0.8–1.5 cm in diam., flowers 2–13. Lowest bract grass-green to brown, terete to scarious, linear to linear-lanceolate, 0.5–6 cm long; floral bract lanceolate, 2–6 mm long, 0.6–1.2 mm wide, scarious; sheathing bract absent. Flowers 7–8 mm long, 3–4 mm wide, pedicel 0.6–1.2 mm long. Tepals cream-white, oblong-lanceolate to lanceolate, outer ones and inner ones equal in length, 4–6 mm long, 0.8–1.5 mm wide. Stamens 6, longer than tepals, 6.5–9 mm long; filaments 4.8–6.5 mm long, 2.5–2.8 times as long as anthers; anthers yellow, linear-elliptic, 1.7–2.5 mm long. Pistil 6–7.5 mm long, 0.8–1 mm wide; stigmas 0.6–1.0 mm long; style 1.8–2.2 mm long. Capsule chestnut-brown, obovoid, longer than tepals, 4–6 mm long, 1.8–2.0 mm wide, cuspidate, cross section rounded. Seeds ellipsoid, 0.6–0.7 mm long, appendage 0.1 mm long.

Distr. Pakistan, Kashmir, India (Himachal Pradesh, Uttar Pradesh), Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan).

Present or absent of the cauline leaf of *Juncus benghalensis* is variable. The form in having the cauline leaf was found on mossy banks in *Abies* forests in subalpine region around 3000 m, while the form in lacking the cauline leaf was found on grassland slopes in Alpine region above ca. 3500 m. *Juncus leucomelus*, described on a specimen collected by D. Don in 1840 from NW India, was characterized in lacking the cauline leaf, however, it is difficult to separate it from *J. benghalensis*.

5. *Juncus biglumoides* H. Hara in J. Jap. Bot. **49**: 201 (1974). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 102 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Miyamoto and Ohba in J. Jap. Bot. **77**: 25, f. 1 (2002). Kirschner et al., Juncaceae 2, Fl. World **7**: 109 (2002).

[Colour plate 1g, h; Plate 5; Fig. 8]

Types: Nepal; Lamjung Himal, Rambrong, 12000 ft. (Stainton, Sykes & Williams 6029, 29 Jun. 1954, BM-holotype, A, TI-isotypes).

Juncus kangpuensis K. F. Wu in Acta Phytotax. Sin. **32**: 443, f. 1, 1–5 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 163, f. 36, 1–5 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 49 (2000). Types: China; Yunnan, Weixi, Kangpu, 3500 m (C. W. Wang 64511, 22 Jul. 1935, PE-holotype, A, KUN, HSNU-isotypes).

Juncus biglumis non L.: Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1238 (1936).

Perennial, loosely caespitose, 10–20 cm tall. Rhizomes horizontally short creeping, 0.7–1 mm in diam. Culms erect, grass-green, terete, 0.3–0.7 mm in diam., with several longitudinal ridges, cross section compressed oval. Cataphylls 1 or 2 to each culm, light brown to brown, 0.5–1.2 mm long. Leaves terete, with ridges, cross section of blade oval, auricles rounded, sheath light brown to stramineous at base; basal leaves 1–3 to each culm, 3–9 cm long including sheath, 0.7–1.2 mm in diam., sheath 2–3 cm long; cauline

leaves absent. Inflorescences pseudolateral, flower head single, brown to chestnut-brown, 0.5–1.1 mm in diam., flowers 1–3, peduncle absent. Lowest bract culm-like, appearing as a continuation of culm, grass-green, 1–3 cm long, 0.8–1.1 mm in diam. cross section oval, with several striae; floral bract lanceolate to ovate, 2–3 mm long, 0.5–0.8 mm wide, scarious; sheathing bract absent. Flowers 3–7 mm long, 2–3 mm wide, flower sessile if solitary, pedicel 0.3–0.4 mm long. Tepals chestnut-brown, shining, lanceolate, outer ones shorter than inner ones, 2.5–2.8 mm long, 0.75–0.85 mm wide, inner ones 3.0–3.5 mm long, 0.9–1.1 mm wide. Stamens 6, as long as inner tepals and slightly longer than outer tepals, 3.2–3.5 mm long; filaments 1.7–2.2 mm long, 2.5 times as long as anthers; anthers leather-yellow, ellipsoid, 0.8–1.0 mm long. Pistil 4–5 mm long, 0.8–1 mm wide; stigmas white, 1.2–1.4 mm long; style 1.8–2 mm long. Capsule chestnut-brown, ovoid, longer than tepals, 3.5–5 mm long, 1.5–2 mm wide, mucronate, cross section trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendage absent.

Distr. Nepal, China (Yunnan).

Juncus biglumoides is similar to *J. bryophilus* Noltie and *J. harae* Miyam. & H. Ohba but differs in having the stamens as long as or slightly longer than the tepals. This species is grown on exposed grassland slopes and damp places by streams from elevations of 3500 to 4200 m. Very few specimens are found in the herbaria and probably this species is rare. *Juncus kangpuensis* K. F. Wu, described on two specimens collected in Weixi in Yunnan, China, is conspecific with *J. biglumoides*.

6. *Juncus brachystigma* Sam. in Hand.-Mazz., Symb. Sin. 7: 1236 (1936). Hara et al., Enum. Flow. Pl. Nepal 1: 84 (1978). Wu et al., Index Fl. Yunnan. 2: 2081 (1984). Lu and Zhang in Wu, Fl. Xizang.: 509 (1987). Noltie, Fl. Bhutan 3(1): 268, f. 25i–j (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2419 (1994). Wu in Acta Phytotax. Sin. 32: 460 (1994); Fl. Reipubl. Popul. Sin. 13(3): 202, f. 47, 3–6 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 66 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 180 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 26: 103 (2000); in J. Jap. Bot. 78: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China 24: 56 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 95, f. 65 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 548 (2003). [Colour plate 2a; Plate 6; Fig. 9]

Types: China; Yunnan, in montis Yülung-schan prope urbem Lidjiang pratis pinguibus lapidosis regionis frigide temperatae Ndwolo, 3600 m (H. F. Handel-Mazzetti, 4259, 20 Jul. 1914, WU-lectotype, designated by J. Kirschner in 2002, S, K, TI, W-isolectotypes).

Juncus biglumis non L.: Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2418 (1994). Bao in Wu, Fl. Yunnanica 15: 551, f. 114, 8–12 (2003).

Perennial, caespitose, 3–16 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.3–0.7 mm in diam., with several longitudinal ridges, cross section rounded. Cataphylls inconspicuous or 1 or 2 to each culm, chestnut-brown, 0.3–1.5 cm long, fibrillose. Leaves terete to flattened, with a groove on adaxial side, cross section of blade U-shaped with longitudinal ridges, auricles grass-green, very short; basal leaves 1 or 2 to each culm, 1.2–7 cm long including sheath, 0.3–0.7 mm in diam., sheath 0.5–1.5 cm long; cauline leaves absent. Inflorescence with a single flower head, cream-white, hemispherical, 0.8–1.3 cm in diam., flowers 6–12. Lowest bract usually grass-green,

sometimes light brown, linear to lanceolate, 0.4–4 cm long, terete to scarious; floral bract grass-green to light brown, lanceolate to ovate-lanceolate, 2.5–6 mm long, 1.0–2.5 mm wide, scarious; sheathing bract absent. Flowers 4–6 mm long, 1.5–2.5 mm wide, pedicel 0.5–1.2 mm long. Tepals cream-white, oblong to lanceolate, outer ones and inner ones equal in length or outer ones slightly shorter than inner ones, 3–5 mm long, 0.7–1.0 mm wide. Stamens 6, longer than tepals, 4–6 mm long; filaments 3.2–4.8 mm long, 4 times as long as anthers; anthers yellow, linear-elliptic, 0.8–1.2 mm long. Pistil 4–5 mm long, 0.8–1.3 mm wide; stigmas 0.2–0.3 mm long; style 1.3–1.5 mm long. Capsule chestnut-brown, ovoid, 4–5 mm long, 1.5–1.8 mm wide, cuspidate, cross section trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendage 0.2–0.3 mm long.

Distr. India (Kumaon), Nepal, Sikkim, Bhutan, China (Xizang, Gansu, Yunnan, Sichuan).

Juncus brachystigma grows on mossy rocks or screes between shrubs from elevations of 2900 to 4600 m. This species is similar to *J. benghalensis* Kunth and *J. sherei* Miyam. & H. Ohba. These species have been confused but this species differs in having very short stigma (0.2–0.3 mm long) and longitudinal conspicuous ridges on the culms and the leaves.

7. *Juncus bryophilus* Noltie in *Edinburgh J. Bot.* **51**: 137, f. 1F–K (1994); *Fl. Bhutan* **3**(1): 271 (1994). Miyamoto and Ohba in *J. Jap. Bot.* **77**: 25, f. 2 (2002). Kirschner et al., *Juncaceae 2, Fl. World* **7**: 112, f. 66 (2002). [Colour plate 2d; Plate 7; Fig. 10]

Type: Bhutan; Upper Mo Chu District, ridge above Laya, 28°07'N 89°44'E, 4450 m (I. W. J. Sinclari & D. G. Long 5217b, 21 Sept. 1984, E-holotype, photo).

Perennial, caespitose, 2–9 cm tall. Rhizomes horizontally short creeping. Culms grass-green, 0.3–0.5 mm in diam., terete, with a longitudinal groove, cross section rounded. Cataphyll 1 to each culm, light brown to stramineous, 2–5 mm long, fibrillose. Leaves grass-green, terete, cross section of blade oval, auricles grass-green, rounded; basal leaf 1 or sometimes absent, 0.5–4.0 cm long including sheath, 0.4–0.5 mm in diam., sheath 2–3 mm long; cauline leaves absent. Inflorescences pseudolateral, flower head solitary, brown, flowers 1 or 2(or 3). Lowest bract grass-green, culm-like, appearing as a continuation of culm, terete, 0.6–0.8 mm in diam.; floral bract lanceolate, 2–3 mm long, 0.6–0.8 mm wide, scarious; sheathing bract absent. Flowers 5–6 mm long, 2–2.5 mm wide, sessile if solitary, pedicel 0.4–0.5 mm long. Tepals brown, lanceolate, outer ones slightly longer than inner ones, 3.2–3.7 mm long, 0.9–1.0 mm wide, inner tepals 3.0–3.5 mm long, 0.7–1.0 mm wide. Stamens 6, shorter than tepals, 2.2–2.5 mm long; filaments 1.4–1.6 mm long, 2.3 times as long as anthers; anthers leather-yellow, ellipsoid, 0.6–0.7 mm long. Pistil 4–5 mm long, 1.2–1.4 mm wide; stigmas 1.2–1.4 mm long; style 0.3–0.4 mm long. Capsule brown, ovoid, slightly longer than tepals, 3.5–4.0 mm long, 1.2–1.6 mm wide, mucronate, cross section trigonous. Seeds oblong, 0.8–1.0 mm long, appendage absent.

Distr. Nepal, Sikkim, Bhutan.

Juncus bryophilus grows on mossy rocks from elevations of 3650 to 4050 m and is similar to *J. harae* Miyam. & H. Ohba and *J. uniflorus* W. W. Sm. but differs in having the filaments longer than the anthers. This species is distributed disjunctively in central Nepal, Sikkim, and Bhutan.

8. *Juncus bufonius* L., Sp. Pl.: 328 (1753). Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 324 (1840). Buchenau in Bot. Jahrb. Syst. **1**: 106 (1880); in Bot. Jahrb. Syst. **6**: 198 (1885); in Bot. Jahrb. Syst. **12**: 174 (1890); in Bot. Jahrb. Syst. **36** (Beibl. 82): 17 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 105 (1906). Hook. f., Fl. Brit. Ind. **6**: 392 (1892). Brown in J. Linn. Soc., Bot. **36**: 162 (1903). Samuelsson in Acta Horti Gothob. **3**: 66 (1927); in Hand. Mazz., Symb. Sin. **7**: 1229 (1936). Krecetovicz and Goncarpv in Komarov, Fl. URSS. **3**: 517 (1935). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral Azii, Fasc. **3**: 93 (1967). Satake in Hara, Fl. E. Himal **2**: 163 (1971). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Jafri in Fl. Pakistan **138**: 4, f. 1a–c (1981). Wu et al., Index Fl. Yunnan. **2**: 2081 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 503, f. 277 (1987). Noltie, Fl. Bhutan **3**(1): 252, f. 24o (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2417 (1994). Wu in Acta Phytotax. Sin. **32**: 451 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 172, f. 39, 8–11 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 181 (1999); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 51 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 3, Fl. World **8**: 9, f. 119 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 537, f. 109, 1–7 (2003).

[Colour plate 2e; Plate 8; Fig. 11]

Type: In Europae (Van Royen, L904145-433, not seen).

Juncus alutaiensis K. F. Wu in Acta Phytotax. Sin. **32**: 450, f. 3, 5–8 (1994). Wu and Clemants in Wu and Raven, Fl. China **24**: 50 (2000). Type: China; Xinjian, Altay, 600 m (XJAA-72-2302, 19 Sept. 1972, HSNU-holotype).

Annual, caespitose, 5–22 cm tall. Rhizomes very short creeping. Culms ascending, grass-green, terete, 0.2–0.8 mm thick, with several longitudinal striae, cross section rounded. Cataphyll 1 or absent to each culm, loosely embracing at base of culm, stramineous or brown, 0.5–1 cm long. Leaves terete to somewhat flattened, cross section of blade oval, auricles very short, sheath light brown at base; basal leaves 1 or 2 to each culm or absent, 2–5 cm long including sheath, 0.2–1.5 mm wide, sheath 0.5–1.5 cm long; cauline leaf solitary to each culm or absent, 2–10 cm long including sheath, 0.2–0.8 mm wide, sheath shorter or longer than culm, 0.5–1.5 cm long. Inflorescence terminal, loosely branched, flower heads many, grass-green, 3–7 mm in diam., flowers 2–4, peduncle 0.5–4 cm long. Lowest bract grass-green, linear, 2.5–9 cm long, cross section U-shaped. Bracteoles 2, pale brown, broadly ovate, 0.5–0.8 mm long, membranaceous; sheathing bract on peduncle pale brown, lanceolate, 0.4–1.0 cm long, membranaceous. Flowers 3.5–5 mm long, 1–1.7 mm wide, pedicel 0.3–0.5 mm long. Tepals light brown, linear-lanceolate, outer ones longer than inner ones, 3.5–4.5 mm long, 0.6–0.8 mm wide. Stamens 6, shorter than tepals, 1.2–1.5 mm long; filaments 0.6–0.9 mm long, 1.5–2 times as long as anthers; anthers yellow, linear-elliptic, 0.4–0.6 mm long. Pistil 2.8–3 mm long, 1.0–1.2 mm wide; stigmas 0.4–0.5 mm long; style 0.1–0.15 mm long. Capsule light brown, obovoid, as long as tepals, 3.5–4 mm long, 1.5–2.0 mm wide. Seeds ellipsoid, 0.3–0.4 mm long, appendage absent.

Distr. Afghanistan, Pakistan, Kashmir, India (Punjab, Himachal Pradesh, UttarPradesh), Nepal, Sikkim, Bhutan, Assam, China (Xizang, Gansu, Yunnan, Sichuan, Shaanxi, Shanxi).

Juncus bufonius grows in exposed marshy places from elevations of 1500 to 4500 m.

This species is cosmopolitan, however, occurs rarely in the Sino-Himalayan region.

9. *Juncus cephalostigma* Sam. in Hand.-Mazz., Symb. Sin. 7: 1233 (1936). Hara et al., Enum. Flow. Pl. Nepal 1: 84 (1978). Wu et al., Index Fl. Yunnan. 2: 2082 (1984). Lu and Zhang in Wu, Fl. Xizang. 5: 517 (1987). Noltie, Fl. Bhutan 3(1): 265 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2420 (1994). Wu in Acta Phytotax. Sin. 32: 460 (1994); Fl. Reipubl. Popul. Sin. 13(3): 209, f. 50, 4–5 (1997). Wu and Clemants in Wu and Raven, Fl. China 24: 58 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Miyamoto in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 236 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 94 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 550 (2003).

[Colour plate 2f; Plate 9; Fig. 12]

Types: Tibet; Tseku am Mekong (Monbeig 43, S-holotype, K-isotype).

Juncus cephalostigma Sam. var. *dingjieensis* K. F. Wu in Acta Phytotax. Sin. 32: 460 (1994); Fl. Reipubl. Popul. Sin. 13(3): 209 (1997). Wu and Clemants in Wu and Raven, Fl. China 24: 58 (2000). Types: Xizang [Tibet]; Dinggye, 3650 m (Qing-Xin expedition team 5484, PE-holotype, HSNU, KUN-isotypes).

Perennial, caespitose, 4.5–15 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.2–0.4 mm in diam., with several longitudinal ridges, cross section oval to rounded. Cataphylls 1 or 2 to each culm, brown, shining. Leaves terete, with a groove on adaxial side, cross section of blade oval to somewhat U-shaped, auricles grass-green, rounded on basal leaves; basal leaves 1 or 2 to each culm, 2–8 cm long including sheath, 0.3–0.4 mm in diam., sheath 0.8–2.5 cm long; cauline leaf solitary to each culm, shorter than culm, blade 0.8–2 cm long, 0.1–0.15 mm in diam., bristle, sheathing part absent. Inflorescence with a single flower head, cream-white, 0.4–1.5 cm in diam., flowers 2–10. Lowest bract chestnut-brown, lanceolate to ovate-lanceolate, 2.5–6 mm long, scarious; floral bract light brown to chestnut-brown, lanceolate, 2–5 mm long, 0.5–1 mm wide, scarious; sheathing bract absent. Flowers 5–8 mm long, 2–2.5 mm wide, pedicel 0.5–1 mm long. Tepals cream-white, oblong-lanceolate, outer ones and inner ones equal in length, 2.5–3.5 mm long, 0.5–1 mm wide. Stamens 6, shorter than tepals, 1.2–1.5 mm long; filaments 2.5–5 mm long, 2.5–3 times as long as anthers; anthers yellow, linear-elliptic, 0.8–2 mm long. Pistil cream-white, 3.5–5 mm long, 0.8–1 mm wide; stigmas 0.1–0.2 mm long; style cream-white, 1–2 mm long. Capsule brown, oblong, as long as tepals, 3–4.5 mm long, 1.4–1.6 mm wide. Seeds ellipsoid, 0.5–0.6 mm long, appendage very short.

Distr. Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan).

Juncus cephalostigma grows on grassland slopes in alpine region from elevations of 3500 to 4400 m. This species is similar to *J. leucanthus* Royle ex D. Don and *J. przewalskii* Buchenau but differs in having very short stigma lobes and culms with several longitudinal striae on surface.

10. *Juncus chrysocarpus* Buchenau in Bot. Jahrb. Syst. 6: 201 (1885); in Bot. Jahrb. Syst. 12: 266 (1890); in Bot. Jahrb. Syst. 12: 237 (1890). Hook. f., Fl. Brit. Ind. 6: 394 (1892). Hara et al., Enum. Flow. Pl. Nepal 1: 84 (1978). Lu and Zhang in Wu, Fl. Xizang. 5: 518 (1987). Noltie, Fl. Bhutan 3(1): 258 (1994). Zhang and Lu in Wang et al., Vasc. Pl.

Hengduan Mts. **2**: 2421 (1994). Wu in Acta Phytotax. Sin. **32**: 452 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 179 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 67 (1999). Wu and Clemants in Wu and Raven, Fl. China **24**: 52 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 82 (2002).

[Colour plate 2b; Plate 10; Fig. 13]

Types: Sikkim; Isumbo, 11000 ft. (C. B. Clarke 25552, 24 Oct. 1875, W-syntype); loc. cit., Yakla, 10000 ft. (C. B. Clarke 10259, 20 Oct. 1869, W-syntype); loc. cit., Jongri, 12000 ft. (C. B. Clarke 25963, 15 Oct. 1885, W, UPS-syntypes).

Perennial, loosely caespitose, 12–30 cm tall. Rhizomes stoloniferous, horizontally short creeping, 0.3–0.5 mm in diam. Culms erect, grass-green, terete, 0.3–1.3 mm thick, with several longitudinal inconspicuous striae, cross section rounded. Cataphyll solitary or inconspicuous, light brown to stramineous, 0.5–2 cm long. Leaves terete, with a groove on adaxial side, cross section of blade U-shaped, bulli-form cells on both sides, auricles grass-green, rounded, septa conspicuous when dried; basal and subbasal leaves 1 or 2 to each culm, 8–20 cm long including sheath, 0.3–0.7 mm in diam., sheath 1–5 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 4–20 cm long including sheath, 0.3–0.8 mm in diam., sheath 1.5–4 cm long. Inflorescence with a single or rarely 2 flower heads, cream-white, hemispherical, 0.3–1.6 cm in diam., flowers 2–16. Lowest bract grass-green or pale brown, lanceolate to linear, 0.5–5 cm long, terete or scarious; floral bract lanceolate to linear-lanceolate, 0.4–1 cm long, 0.8–2.0 mm wide, scarious; sheathing bract absent. Flowers 7–8 mm long, 2–3 mm wide, pedicel 0.5–2.0 mm long. Tepals cream-white, oblong-lanceolate, outer ones slightly shorter than inner ones, inner ones 4–7 mm long, 1.0–1.3 mm wide. Stamens 6, longer than tepals, 5–8 mm long; filaments 3.2–4.5 mm long, 1.2–1.7 times as long as anthers; anthers yellow, linear-elliptic, 1.8–3.5 mm long. Pistil 4–6 mm long, 0.7–1.7 mm wide; stigmas 0.7–1.3 mm long; style 1.5–3 mm long. Capsule yellow-brown, oblong, slightly shorter than tepals, 5–6 mm long, 2.0–2.5 mm wide, cross section rounded. Seeds ellipsoid, 0.5–0.6 mm long, appendage 0.8–1.0 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Xizang).

Juncus chrysocarpus grows on mossy banks and tree trunks from elevations of 2700 to 4000 m. This species is similar to *J. benghalensis* Kunth but differs in having septate leaves and culms with several longitudinal striae on surface.

11. *Juncus clarkei* Buchenau in Bot. Jahrb. Syst. **6**: 210 (1885); in Bot. Jahrb. Syst. **12**: 413 (1890); in Engler, Pflanzenz. (iv. 36) **25**: 236 (1906). Hook. f., Fl. Brit. Ind. **6**: 400 (1892). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 524 (1987). Noltie, Fl. Bhutan **3**(1): 260 (1994). Wu in Acta Phytotax. Sin. **32**: 463 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 222, f. 52, 12–14 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 67 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 181 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 103 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 236 (2000); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 61 (2000). Li et al., Fl. Gaoligong Mts.: 1120 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 83 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 556 (2003). [Colour plate 2c; Plate 11; Fig. 14]

Types: Sikkim; 11000–14000 ft. (J. D. Hooker, s. n., K, W-syntypes); loc. cit., Singale

la, 11000 ft. (C. B. Clarke 12711, 8 Oct. 1870, W-syntype); loc. cit., Jongri, 12000 ft. (C. B. Clarke 25959, 15 Oct. 1875, K, W-syntypes); loc. cit. Jonglo, Darjeeling, 10000 ft. (C. B. Clarke 27604, 12 Sept. 1875, W-syntype); loc. cit., Yakla, 10000 ft. (C. B. Clarke 9854, 15 Oct. 1869, W-syntype); loc. cit., 13000 ft. (C. B. Clarke 9621, 16 Oct. 1896, W-syntype); loc. cit., 12000 ft. (C. B. Clarke 9994bis, 17 Oct. 1869, W-syntype); loc. cit., 10000 ft. (C. B. Clarke 10222, 20 Oct. 1869, W-syntype); loc. cit., Isumbo, 12000 ft. (C. B. Clarke 25565, 24 Oct. 1875, K, W-syntypes).

Juncus clarkei Buchenau var. *marginatus* A. Camus in Notul. Syst. (Paris) **1**(10): 278 (1910). Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1230 (1936). Wu in Acta Phytotax. Sin. **32**: 463 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 223 (1997). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Wu and Clemants in Wu and Raven, Fl. China **24**: 62 (2000). Type: China; Yunnan, Tsang-chan, 3500 m (P. J. M. Delavay 2656, 20 Aug. 1887, P-holotype).

Juncus albescens Satake in Hara, Fl. E. Himal. **2**: 161, f. 13 (1971), nom. illegit., non (Lange) Fernald in Rhodora **26**: 202 (1925). Press et al., Ann. Check. Fl. Pl. Nepal: 148 (2000). Bao in Wu and Wu, Fl. Yunnanica **15**: 539, f. 112, 6–11 (2003). Type: Bhutan; Laya-Laum Thang, 3850–4100 m (H. Kanai et al. 11847, 18 May 1967, TI-holotype).

Juncus yoshisukei Goel in J. Econ. Taxon. Bot. **7**: 208 (1985), nom. nov. Type: Bhutan; Laya-Laum Thang, 3850–4100 m (H. Kanai et al. 11847, 18 May 1967, TI-holotype).

Juncus yuii S. Y. Bao in Wu and Wu, Fl. Yunnanica **15**: 804, f. 115, 1–5 (2003). Type: China; Gongshan Xian, Sewalongba, 3400 m (T. T. Yü 22533, 27 Aug. 1938, KUN-holotype).

Perennial, loosely caespitose, 13–50 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.3–1.3 mm thick, with several longitudinal striae, cross section oval to rounded. Cataphylls 1(or 2) to each culm or absent, loosely embracing at base of culm, stramineous, 0.5–1 cm long. Leaves grass leaf-like, blade margin entire, cross section of blade flattened, auricles absent, sheath stramineous at base; basal and subbasal leaves 1–3 to each culm, 7–25 cm long including sheath, 1.5–6 mm wide, sheath 2–10 cm long; cauline leaves 1 or 2 to each culm, 5–30 cm long including sheath, 1.3–5 mm wide, sheath 1–6 cm long, usually longer than culm. Inflorescence terminal, branched, flower heads 2–5, pale stramineous, hemispherical, 0.4–2 cm in diam., flowers 2–15, peduncle 0.5–4 cm long. Lowest bract grass leaf-like, linear, longer than inflorescence, 3–20 cm long, apical part grass-green, basal reddish brown; floral bract lanceolate to ovate-lanceolate, 2.5–8 cm long, 1–2.8 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 0.3–2 cm long, membranaceous. Flowers 5–8 mm long, 2.5–3 mm wide, pedicel 0.5–3 mm long. Tepals pale stramineous, linear-lanceolate, outer ones and inner ones equal in length, 4–5 mm long, 0.9–1.1 mm wide. Stamens 6, longer than tepals, 4.5–9 mm long; filaments 2.9–7 mm long, 2–3 times as long as anthers; anthers yellow, linear-ellipsoid, 1.6–2 mm long. Pistil 5–9 mm long, 1.0–1.2 mm wide; stigmas 0.3–1 mm long; style 1–2 mm long.

Capsule light brown, oblong, longer than tepals, 6–8 mm long, 1.3–1.5 mm wide, acute, cross section rounded. Seeds ellipsoid, 0.8–1 mm long, appendage 0.5–0.8 mm long.

Distr. Nepal, Sikkim, Bhutan, Assam, Myanmar, China (Xizang, Yunnan, Sichuan).

Juncus clarkei grows on mossy or damp rocks from elevations of 2900 to 4000 m. This species is similar to *J. crassistylus* A. Camus but differs in having the stamens longer than

the tepals.

12. *Juncus concinnus* D. Don, Prodr. Fl. Nepal.: 44 (1825); in Trans. Linn. Soc. London **18**(3): 321 (1840); Hook. f., Fl. Brit. Ind. **6**: 399 (1892). Buchenau in Bot. Jahrb. Syst. **1**: 112 (1880); in Bot. Jahrb. Syst. **6**: 215 (1885); in Bot. Jahrb. Syst. **12**: 406 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 235 (1906). Samuelsson in Had.-Mazz., Symb. Sin. **7**: 1235 (1936). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Jafri in Fl. Pakistan **138**: 11, f. 6, c–g (1981). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 525, f. 294 (1987). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 72 (1992). Noltie, Fl. Bhutan **3**(1): 258 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2424 (1994). Wu in Acta Phytotax. Sin. **32**: 462 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 219, f. 52, 5–7 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 67 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 181 (1999); Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 103 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 237 (2000); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 61 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 80 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 554, f. 115, 6–11 (2003).

[Colour plate 3a; Plate 12; Fig. 15]

Type: Nepal; Gosaing Stan [Gosainkund] (Wallich s. n., Jul. 1818, BM-lectotype, designated by J. Kirschner in 2002).

Juncus elegans Royle ex Sam. in Hand.-Mazz., Symb. Sin. **7**: 1232 (1936). Type: India; Uttar Pradesh (Mussoorie s. n., LIV-lectotype, designated by J. Kirschner in 2002).

Juncus leuteocarpus Satake in J. Jap. Bot. **43**: 384, f. 3–4 (1968). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Type: Bhutan; Charikhachor–Chendebi–Rukubi–Longtepanang, 2250–2950 m (H. Kanai et al. 8478, 21 Apr. 1967, TI-holotype).

Juncus glomeratus K. F. Wu in Acta Phytotax. Sin. **32**: 462, f. 6, 1–5 (1994), nom. Illegit., non Thunb., Fl. Jap.: 145 (1784).

Juncus meiguensis K. F. Wu in Acta Phytotax. Sin. **32**: 463, f. 6, 6–7 (1994); Fl. Reipubl. Popul. Sin. **1**: 222, f. 53, 6–7 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 61 (2000). Types: China; Sichuan, Meigu (Sichuan expedition team 1954, 23 Aug. 1959, CDBI-holotype, not seen, KUN, PE-isotypes).

Juncus lanpinguensis V. Novikov in Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol. **103**(4): 71 (1997). Types: China; Yunnan, Lanping, 3000 m (H. T. Tsai 53760, 17 Aug. 1933, PE-holotype, A, HSNU, KUN-isotypes).

Juncus khasiensis auct. non Buchenau: Zhang & Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2424 (1994).

Perennial, caespitose, 10–35 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, 0.5–0.8 mm in diam., with several longitudinal ridges. Cataphylls 1 or 2 to each culm or absent, 0.5–2 cm long, stramineous. Leaves terete to somewhat flattened, with a groove on adaxial side, cross section of blade U-shaped with bulli-form cells, auricles grass-green, acute; basal leaves 1 or 2 to each culm, 6–20 cm long including sheath, 0.4–0.8 mm in diam., sheath 1–4 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 4–15 cm long including sheath, 0.3–0.6 mm in diam., sheath 1–4 cm long. Inflorescence terminal, branched; flower heads 2–8, cream-white, hemispherical,

5–8 mm in diam., flowers 4–10, peduncle 0.5–3 cm long. Lowest bract grass-green, linear, longer than inflorescence, sometimes as long as inflorescence, 2–15 cm long, cross section U-shaped to flattened with bulli-form cells; floral bract pale stramineous or light brown, lanceolate, 3–6 mm long, 1–1.2 mm wide; sheathing bract on peduncle pale stramineous, lanceolate, 0.25–1.9 cm long, membranaceous. Flowers 4–6 mm long, 2–2.5 mm wide, pedicel 0.3–0.8 mm long. Tepals cream-white, lanceolate, outer ones slightly shorter than inner ones, inner ones 2.5–3.2 mm long, 0.6–0.8 mm wide. Stamens 6, longer than tepals, 5–7 mm long; filaments 4.2–6.0 mm long, 6 times as long as anthers; anthers yellow, linear-ellipsoid, 0.8–1 mm long. Pistil cream-white, 4–5 mm long, 0.5–0.7 mm wide; stigmas 0.6–0.8 mm long; style 1.0–1.5 mm long. Capsule brown, oblong, slightly longer than tepals, 4–4.2 mm long, 1.3–1.5 mm wide, cuspidate, cross section rounded. Seeds ellipsoid, 0.5–0.7 mm long, appendage 0.2 mm long.

Distr. India (Punjab, Himachal Pradesh, Uttar Pradesh, Kumaon), Nepal, Sikkim, Bhutan, Assam, Myanmar, China (Xizang, Yunnan, Sichuan).

Juncus concinnus was first described as a species based on a specimen collected from Nepal by Don (1825). This species is morphologically variable, and it has been treated as a single species in Bhutan (Satake 1968), as two species in China (Wu 1994). I have not find any reason to divide it into either microspecies or varieties but further work is required. It is similar to *J. gracilicaulis* A. Camus and *J. petrophilus* Miyam. but differs in having the U-shaped cross section of the leaf blade with bulli-form cells on both sides. It grows on mossy banks and tree trunks, sometimes grassland slopes from elevations of 1000 to 3750 m.

13. *Juncus concolor* Sam. in Had.-Mazz., Symb. Sin. 7: 1232 (1936). Wu et al., Index Fl. Yunnan. 2: 2082 (1984). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2421 (1994). Wu in Acta Phytotax. Sin. 32: 461 (1994); Fl. Reipubl. Popul. Sin. 13: 211 (1997). Miyamoto in J. Jap. Bot. 74: 72, f. 1 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 181 (1999). Wu and Clemants in Wu and Raven, Fl. China 24: 59 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 102, f. 68 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 550 (2003). [Colour plate 3b; Plate 13; Fig. 16]

Types: China; Yunnan, Prope urbem Yungbei, in regionis calide temperate et Semperatae pinebis inter vic. Dschaoping et Boloti, 2600–3000 m (J. F. Handel-Mazzetti 3359, 30 Jun. 1914, S-holotype, W-isotype).

Perennial, loosely caespitose, 10–38 cm tall. Rhizomes horizontally short creeping, 0.3–0.7 mm in diam. Culms erect, grass-green, terete, without longitudinal striae, cross section rounded. Cataphylls 3–6 to each culm, stramineous. 1.6–4.0 cm long, apex acuminate. Leaves grass-green, terete, cross section of blade rounded, auricles grass-green, very short; basal leaf absent or sometimes solitary; cauline leaf solitary, linear, longer than or sometimes as long as inflorescence, 10–24 cm long including sheath, 1.0–1.5 mm in diam., sheath 1.0–3.0 cm long. Inflorescence with a single flower head, cream-white, hemispherical, 1.0–2.0 cm in diam., flowers 5–20. Lowest bract light brown, lanceolate, shorter than inflorescence, 7–9 mm long, 3.4–4.3 mm wide; floral bract pale brown, lanceolate, 3.0–9.0 mm long, 0.7–4.3 mm wide, scarious; sheathing bract absent. Flowers 6.5–9.5 mm long, 2.0–2.5 mm wide, pedicel 0.8–2.4 mm long. Tepals ivory-

white, lanceolate, outer ones and inner ones equal in length, 4.8–5.5 mm long, 1.2–1.5 mm wide. Stamens 6, ivory-white, longer than tepals, 7.3–8.7 mm long; filaments 4.8–6.0 mm long, 2–3 times as long as anthers; anthers linear-elliptic, 2.5–2.8 mm long. Pistil ivory-white, 2.9–3.4 mm long, 1.2–1.8 mm wide; stigmas 0.6–0.9 mm long; style 2.3–3.5 mm long. Capsule obovoid, 2.5–4.0 mm long, 1.0–1.4 mm wide, cross section trigonous. Seeds unknown.

Distr. Myanmar, China (Yunnan).

Juncus concolor was known from only the type specimen collected in the west side of Mt. Cangshan, Yunnan Province by Handel-Mazzetti in 1914. We collected this species on grassy slope at 3800–3820 m near the type locality.

Juncus concolor is similar to *J. allioides* Franch., *J. cephalostigma* Sm., *J. glaucoturgidus* Noltie, *J. leucanthus* Royle ex D. Don, and *J. trachyphyllus* Miyam. & H. Ohba but differs apparently in having stoloniferous rhizomes, straw-colored basal sheath and the lack of basal leaf.

14. *Juncus crassistylus* A. Camus in Notul. Syst. (Paris) **1**(10): 278, f. 19, 1–6 (1910). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2423 (1994). Wu in Acta Phytotax. Sin. **32**: 465 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 227, f. 55, 1–4 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 103 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 63 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 148 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 84 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 558 (2003). [Colour plate 3d; Plate 14; Fig. 17]

Type: China; Yunnan, Tsang-chan, parmiles bambous, 3500 m (P. J. M. Delavay 2656, 20 Aug. 1887, P-lectotype, designated here).

Juncus megalophyllus S. Y. Bao in Wu and Wu, Fl. Yunnanica **15**: 558, f. 116, 1–8 (2003). Type: China; Yunnan, Lushi Xian, Pianma, 3100–3500 m (Jujiang Expedition 1832, 4 Aug. 1978, KUN-holotype).

Perennial, loosely caespitose, 30–60 cm tall. Rhizomes stoloniferous, horizontally creeping, robust, 2–3 mm in diam. Culms erect, grass-green, terete, 2–5 mm in diam., with several longitudinal striae, cross section oval. Cataphylls 1 or 2 to each culm, loosely embracing at base of culm, light brown to stramineous. Leaves grass leaf-like, blade margin denticulate, with several ridges on abaxial side, cross section of blade flattened, auricles absent; basal and subbasal leaves 2 or 3 to each culm, 3–10 cm long including sheath, 1–1.5 cm wide, sheath 2–5 cm long; cauline leaves 1 or 2 to each culm, 10–30 cm long including sheath, 1–2 cm wide, sheath longer than culm, 2–5 cm long. Inflorescence terminal, branched, flower heads 3–8, yellowish white, hemispherical, 1–2 cm in diam., flowers 5–20, peduncle 1–6 cm long. Lowest bract longer than inflorescence, grass-green, grass leaf-like, linear-lanceolate, 10–15 cm long, 3–6 mm wide, with several ridges on abaxial side, cross section flattened; flora bracts lanceolate to ovate-lanceolate, 3–15 mm long, 1.5–4 mm wide, scarious; sheathing bract on peduncle lanceolate, 5–8 mm long, membranaceous. Flowers 6–8 mm long, 2–3 mm wide, pedicel 1.5–6.0 mm long. Tepals yellowish white, lanceolate, outer ones slightly shorter than inner ones, 3.0–4.0 mm long, 0.8–2.4 mm wide, inner ones 3.5–5.0 mm long, 0.8–2.5 mm wide. Stamens 6, shorter than tepals, 2.6–3.3 mm long; filaments 1.2–1.5 mm long; anthers linear-elliptic, slightly

longer than filaments, 1.4–1.8 mm long. Pistil 4.2–5.0 mm long, 0.8–1.0 mm wide; stigmas 0.5–0.7 mm long; style ovoid-trigonal, 1.3–1.5 mm long. Capsule brown to light brown, ovoid, slightly longer than tepals, 6–8 mm long, 2–2.5 mm wide, cuspidate, cross section rounded. Seeds ovoid, 0.6–0.8 mm long, appendage 1 mm long.

Distr. Myanmar, China (Yunnan, Sichuan).

Juncus crassistylus is similar to *J. clarkei* Buchenau and *J. amplifolius* A. Camus in having grass leaf-like leaves but it differs from the latter two species in having the leaf blade with denticulate margin. It grows in exposed places along streams and roads from elevations of 2100 to 4000 m, and is distributed disjunctively in Myanmar and China. The specimens of this species are found very scarcely in the herbaria and this species is probably rare.

15. *Juncus deosaicus* Noltie in *Edinburgh J. Bot.* **55**: 41, f. 1C, 2K–M (1998). Kirschner et al., *Juncaceae 2, Fl. World 7*: 123, f. 63, 64 (2002). [Fig. 18]

Types: Pakistan (Northern Area); Deosai Plains, 0–9 Km beyond top of Satpara Valley, 35°06'N, 75°33'E, 3900 m (S. Z. Hussain, Lowe, Muqarrad & Springate 940659, 19 Aug. 1994, E-holotype, photo, CAL-isotype).

Perennial, loosely caespitose, 15–22 cm tall. Rhizomes short creeping, c. 1.2 mm in diam. Culms erect, grass-green, terete. Cataphylls reddish brown, short. Leaves grass-green, as long as culms, 0.7 mm wide, apex acute; cauline leaves 1 or 2, upper cauline leaf with conspicuous reddish brown sheath, blade sometimes exceeding inflorescences; auricles scarcely produced. Inflorescence with a single flower head, flowers 3–5. Lower bract erect, leaf-like, longer than inflorescence, 2–9 cm long, slender, base reddish brown, membranaceous; floral bract brown, lanceolate, scarious. Tepals dark reddish brown, greenish white at base, extreme apex hyaline; outer ones narrowly lanceolate, 5.3–5.5 mm long, 0.7–1.1 mm wide, apex acuminate, concave, keeled; inner ones oblong-lanceolate, 4.5–5 mm long, 1–1.2 mm wide, apex acuminate. Stamens 6, filaments shorter than anthers, 1.2–1.5 mm long; anthers cream, 2.5–2.9 mm. Pistil narrowly ovoid, 2–2.5 mm long, gradually tapering into style; stigmas erect, pale brown, 4–4.3 mm long; style 2 mm long.

Distr. Pakistan.

This species is closest to *J. himalensis* Klotzsch. It also superficially resembles *J. amplifolius* A. Camus, from which it differs greatly in its leaf morphology (Noltie 1998).

16. *Juncus dongchuanensis* K. F. Wu in *Acta Phytotax. Sin.* **32**: 457, f. 5, 4–5 (1994); *Fl. Reipubl. Popul. Sin.* **13**: 195, f. 40, 6–7 (1997). Miyamoto in *J. Jap. Bot.* **74**: 74, f. 2 (1999); in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **25**: 181 (1999); in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **26**: 103 (2000). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 55 (2000). Kirschner et al., *Juncaceae 2, Fl. World 7*: 134, f. 78 (2002). Bao in Wu and Wu, *Fl. Yunnanica* **15**: 545 (2003). [Colour plate 3g, h; Plate 15; Fig. 19]

Type: China; Yunnan, Dongchuan, 2500–2700 m (Exped. Boreali-orientali-Yunnan team 500, 12 Aug. 1964, KUN-holotype).

Juncus miyiensis K. Y. Wu in *Acta Phytotax. Sin.* **32**: 456, f. 5, 1–3 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 195 (1997). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 55 (2000). Types: China; Sichuan, Miyi, 3200 m (S. Y. Chen, Z. He & M. F. Zhong 10914,

26 Jul. 1958., NAS-holotype, not seen, HSNU-isotype).

Perennial, caespitose, 10–30 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.6–0.8 mm in diam., with several longitudinal ridges, cross section rounded. Cataphylls 3–6 to each culm, yellowish brown to stramineous, shining, 0.3–3 cm long. Leaves terete, cross section of blade oval, with several longitudinal striae, auricles grass-green, rounded; basal leaf absent; cauline leaf solitary, linear, shorter than culm, 10–28 cm long including sheath, 0.7–2.0 mm wide, sheath 1–4 cm long. Inflorescence terminal, branched, flower heads 2–4, grass-green, globose, 5–10 mm in diam. flowers several, peduncle 0.5–5.0 cm long. Lowest bract linear-lanceolate, shorter than inflorescence, 1.0–3.0 cm long, 1.5–2.0 mm wide; floral bract linear-lanceolate, 0.2–3.0 cm long, 0.6–2.0 mm wide; sheathing bract on peduncle lanceolate, 1.5–2.0 mm long, membranaceous. Flowers normal or viviparous, mixed with in the same inflorescence. Ordinal flowers 6–8 mm long, 2.2–2.5 mm wide, pedicel 0.5–1.2 mm long. Tepals grass-green, ovate-lanceolate to lanceolate, outer ones slightly shorter than inner ones, 4.3–4.6 mm long, 0.8–1.4 mm wide, inner one 5.5–6.8 mm long, 0.9–1.3 mm wide. Stamens 6, longer than tepals, outer ones longer than inner ones, 11–12 mm long, inner ones, 8–10 mm long; filaments 5.6–8.0 mm long, 2.5 times as long as anthers; anthers linear-elliptic, 5.6–8.0 mm long. Pistil. 2.4–2.8 mm long, 1.5–1.9 mm wide; stigmas 0.7–0.8 mm long; styles 1.8–2.0 mm long. Capsule ovoid, acuminate, cross section trigonous, 5.0–6.0 mm long, 2–2.5 mm wide. Seeds unknown. Viviparous flowers grass-green, 3.5–6.0 mm long, 0.7–1.5 mm wide, stamens and pistils absent.

Distr. China (Yunnan).

Juncus dongchuanensis is similar to *J. concinnus* D. Don but differs in having shining yellowish brown basal sheath and the filaments 2.5 times as long as the anthers, and lack of basal leaf. It grows on banks and rocks along paths from elevations of 2600 to 3460 m and is ecologically similar to *J. fimbristylloides* Noltie. This species is distributed only in Yunnan Province.

17. *Juncus duthiei* (C. B. Clarke) Noltie in *Edinburgh J. Bot.* **51**: 134 (1994); *Fl. Bhutan* **3**(1): 269, f. 25k (1994). Press et al., *Ann. Check Fl. Pl. Nepal*: 149 (2000). Miyamoto and Ohba in *J. Jap. Bot.* **77**: 27, f. 3 (2002). Kirschner et al., *Juncaceae 2, Fl. World* **7**: 110, f. 65 (2002). [Colour plate 3e; Plate 16; Fig. 20]

Type: India; Uttar Pradesh, Rhudughera, Tihri Garhwal, 15000–16000 ft. (J. F. Duthie 132, 20 Jul. 1882, K-holotype).

Microschoenus duthiei C. B. Clarke in Hooker, *Fl. Brit. Ind.* **6**: 675 (1894).

Perennial, caespitose, 0.7–5 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.5–0.7 mm in diam., cross section rounded. Cataphylls 1 or 2 to each culm, brown to light brown, 3–8 mm long. Leaves grass-green, terete, auricles very short, basal leaf solitary to each culm, grass-green, 1–6 cm long including sheath, 0.4–0.7 mm in diam.; sheath 3–5 mm long; cauline leaves absent. Inflorescences pseudolateral, flower head solitary, 0.3–2.3 cm long, 0.5–0.8 mm wide, flowers 1–3. Lowest bract longer than inflorescence, grass-green, 0.8–2.3 cm long, 0.6–0.8 mm wide; floral bract lanceolate, 3–8 mm long, 0.8–2 mm wide, scarious; sheathing bract absent. Flowers 5–7 mm long, 1.5–2.0 mm wide; pedicel 0.6–3.5 mm long. Tepals ovate-lanceolate, outer ones chestnut-brown, slightly longer than inner ones, 2.8–3.0 mm long, 0.9–1.3 mm wide, cuspidate.

Stamens 6, shorter than tepals, 2.0–2.3 mm long; filaments 1.5–1.7 mm long, 3.5 times as long as anthers; anthers leather-yellow, ellipsoid, 0.4–0.5 mm long. Pistil 3.8–4.2 mm long, 1.2–1.3 mm wide; stigmas 1.2–1.4 mm long; style 0.2–0.3 mm long. Capsule obovoid, 3.5–4 mm long, mucronate, cross section rounded. Seeds oblong, 0.77–0.83 mm long, appendages very short, 0.1 mm long.

Distr. India (Uttar Pradesh), Nepal.

Juncus duthiei was originally described in the monotypic genus *Microschoenus*, Cyperaceae (Clarke 1894), and moved to *Juncus* by Noltie (1994a). Noltie (1994a) noted that this species has the anthers longer than the filaments, a long style (1.5–4.0 mm long), and the red stigma. However, I checked the type specimen and samples collected in central Nepal and found the anthers to be shorter than the filaments, the style very short (0.2–0.3 mm long), and the stigma pale yellow. I examined the specimens cited by Noltie (1994a) as *J. duthiei* and found that he identified them as *J. rohtangensis* Goel & Aswal.

This species is most similar to *J. bryophilus* Noltie but differs in having the filaments three times longer than the anthers and the chestnut-brown perianth. It was collected on scree slopes at 4920 m in Nepal.

18. *Juncus effusus* L., Sp. Pl.: 326 (1753). Buchenau in Bot. Jahrb. Syst. **1**: 107 (1880); in Bot. Jahrb. Syst. **6**: 199 (1885); in Bot. Jahrb. Syst. **29**: 238 (1900); in Engler, Pflanzenr. (iv. 36) **25**: 135 (1906). Brown in J. Linn. Soc. Bot. **36**: 163 (1903). Samuelsson in Had.-Mazz., Symb. Sin. **7**: 1229 (1936); in Acta Horti Gothob. **3**: 67 (1927). Krecetovicz and Goncarpv in Komarov, Fl. URSS. **3**: 548, pl. 29, f. 8 (1935). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Noltie, Fl. Bhutan **3**(1): 253 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2417 (1994). Wu in Acta Phytotax. Sin. **32**: 443 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 160, f. 35, 5–8 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 48 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae **3**, Fl. World **8**: 88, f. 137 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 534, f. 109, 8–14 (2003). [Colour plate 4f; Plate 17; Fig. 21]

Type: Herb. Linn. (LINN449.6, not seen).

Perennial, densely caespitose, 50–100 cm tall. Rhizomes horizontally short creeping, internodes very short, 2.5–4 mm in diam., covered with brown scales, culms arising in densely crowded rows. Culms erect, grass-green, terete, 1–2.5 mm in diam., with several longitudinal striae, pith continuous, spongy, aerenchymatous with asteriform cells. Cataphylls 2 or 3 to each culm, closely embracing at base of culm, brown at base, stramineous upward, 1–13 cm long. Leaves only cataphylls sheathing culm. Inflorescences pseudolateral, loosely branched, flowers many. Lowest bract appearing as a continuation of culm, 7–15 cm long. Bracteoles 2, ovate to ovate-lanceolate, 0.4–0.5 mm long. Flowers 1.5–2 mm long, 1–1.5 mm wide. Tepals light brown, lanceolate, outer ones longer than inner ones, 1.8–2 mm long, 0.5–0.7 mm wide. Stamens 3, opposite to outer tepals, shorter than tepals, 1.2–1.5 mm long; filaments 0.8–1 mm long, 3 times as long as anthers; anthers yellow, linear-elliptic, 0.4–0.5 mm long. Pistil 1.8–2 mm long, 1–1.2 mm wide; stigmas 0.4–0.5 mm long; style very short, 0.05–0.1 mm long. Capsule ellipsoid, brown, obtuse, longer than tepals, 2.3–2.5 mm long, 1.8–2.0 mm wide, mucronate,

3-loculed, cross section trigonous. Seeds brown, ovoid, 0.4–0.5 mm long, appendages very short.

Distr. Nepal, Bhutan, Assam, Myanmar, China (Xizang, Yunnan, Sichuan).

Juncus effusus is a cosmopolitan species and very little common in Sino-Himalaya. This species is similar to *J. setchuensis* Buchenau but differs in having aerenchymatous pith with asteriform cells. It grows in exposed wet places along roads or ditches from elevations of 1350 to 2600 m.

19. *Juncus fimbristyloides* Noltie in *Edinburgh J. Bot.* **55**: 39, f. 1B, 2E–J (1998). Miyamoto in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **26**: 104 (2000). Kirschner et al., *Juncaceae 3, Fl. World 7*: 86, f. 63–64 (2002). [Colour plate 3f; Plate 18; Fig. 22]

Types: China; Yunnan, Lijiang Prefecture, Yulong Shan ridge, N of Camellia Temple, 3400 m (CLD 1122, 11 Oct. 1990, E-holotype, not seen, PE, TI-isotypes).

Perennial, caespitose, 15–30 cm tall. Rhizomes horizontally short creeping. Culms ascending, grass-green, terete, 0.3–0.6 mm in diam., cross section rounded. Cataphyll 1 to each culm, brown, 0.8–5 cm long, mucronate. Leaves terete, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded to obtuse; basal leaf absent; cauline leaf 1 to each culm, linear, shorter than culm, 7–13 cm long including sheath, 0.3–0.4 mm in diam., sheath 1.5–2.5 cm long. Inflorescence terminal, loosely branched, flower heads many, flowers many, almost sterile, sterile flowers composed of several sterile bracts, peduncle 0.5–5 cm long; sterile bracts golden-brown, ovate, 2–3 mm long, 1–1.4 mm wide. Lowest bract grass-green, filiform, terete, shorter than inflorescence, 1.5–3 cm long; floral bract brown, lanceolate, 1.5–2 mm long, 0.6–0.8 mm wide, scarious; sheathing bracts on peduncle pale brown, lanceolate, 5–8 mm long, membranaceous. Normal flower absent as far as examined. Sterile flowers composed of narrowly lanceolate scales, apical part with bristles.

Distr. China (Yunnan).

Juncus fimbristyloides is similar to *J. ochraceous* Buchenau but differs in having bristle scales in sterile flowers, bulli-form cells on the surface of the leaf, and no basal leaf. It was collected from only two localities in Yunnan Province and grows on damped mossy rocks at 3400 m and 2900 m.

20. *Juncus ganeshii* Miyam. & H. Ohba in *J. Jap. Bot.* **69**: 245, f. 1 (1995); in Ohba and Ikeda, *Contr. Fl. Ganesh Him.*: 67 (1999). Press et al., *Ann. Check. Fl. Pl. Nepal*: 149 (2000). Kirschner et al., *Juncaceae 2, Fl. World 7*: 125, f. 75 (2002).

[Colour plate 4f; Plate 19; Fig. 23]

Type: Nepal; Bagmati Zone, Rasuwa Distr., Jaisuli Kund–Paldol Base Camp, 4440 m (F. Miyamoto, K. R. Rajbhandari, S. Akiyama, M. Amano, H. Ikeda & H. Tsukaya 9410148, 2 Aug. 1994, TI-holotype).

Perennial, loosely caespitose, 6–20 cm tall. Rhizomes stoloniferous, horizontally short creeping, 0.4–0.8 mm in diam. Culms erect, grass-green, basal part yellowish green, terete, 0.5–0.8 mm in diam., smooth, cross section rounded. Cataphylls 1 or 2 to each culm, light brown, 1–4 cm long. Leaves grass-green, terete, sheathing at base, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded; basal leaves 1 or 2 to each culm, 3–8 cm long including sheath, 0.4–0.6 mm wide, sheath 1.5–4 cm

long; cauline leaf solitary to each culm, linear, shorter than culm, 3.5–7 cm long including sheath, 0.3–0.5 mm wide, sheath 1.5–3.5 cm long. Inflorescence with 1 or 2(or 3) flower heads, chestnut-brown, 0.5–1 cm wide, flowers 2–8, peduncle 0.3–3 cm long. Lowest bract longer than or sometimes as long as inflorescence, grass-green, linear-lanceolate, terete, 1–4 cm long, 1.5–3.0 mm wide, margin reddish brown; floral bract lanceolate, 4–6 mm long, 1.5–2 mm wide, scarious; sheathing bract on peduncle lanceolate, 4–7 mm long, membranaceous. Flowers 5–6 mm long, 1.0–1.5 mm wide, pedicel 1–3 mm long. Tepals chestnut-brown, lanceolate, outer ones slightly longer than inner ones, 5–6 mm long, 1.0–1.6 mm wide, inner ones 4.5–6.0 mm long, 0.9–1.2 mm wide. Stamens 6, shorter than tepals, outer ones 3.3–5.0 mm long, inner ones 3.0–5.0 mm long; filaments 1.9–2.8 mm long, 1.3 times as long as anthers; anthers yellow, linear-ellipsoid, 1.4–2.2 mm long. Pistil 0.6–1 cm long, 2.5–3 mm wide; stigmas 2–2.5 mm long; style 1.8–2 mm long. Capsule ovoid, 3–4 mm long, 1–1.5 mm wide, cross section rounded. Seeds not seen.

Distr. Pakistan, Kashmir, Nepal.

Juncus ganeshii is most similar to *J. himalensis* Klotzsch but differs in having the filaments 1.3 times as long as the anthers and the stamens shorter than the tepals. *Juncus himalensis* has the filaments twice to three times as long as the anthers and the stamens slightly shorter than or as long as the tepals. *Juncus ganeshii* is similar to the small plants of *J. sphacelatus* Decne. but the latter has elongated leaf auricles. *Juncus ganeshii* grows in marshy places of bogs from elevations of 2700 to 4440 m.

21. *Juncus giganteus* Sam. in Acta Horti Gothob. **3**: 70 (1927). Wu in Acta Phytotax. Sin. **32**: 465 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 225, f. 54, 1–3 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 63 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 119 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 539, f. 111, 1–4 (2003).

[Plate 20; Fig. 24]

Types: China; Szech'uan [Sichuan], Huang-chen-kuan, ca. 3200 m (H. Smith 4002, 19 Aug. 1922, UPS-holotype, S-isotype).

Juncus exploratorum Walker in Contr. U. S. Natn. Herb. **28**: 600, f. 144 (1941). Types: China, Kansu [Gansu], Garagannar, south of old Taochow, 3600–4200 m (R. C. Ching 912, 26–31 Aug. 1923, US-holotype, not seen, A-isotype).

Juncus tibeticus E. M. Egorova in Akad. Nauk. SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. **3**: 96, t. 8, f. 3 (1967). Wu in Acta Phytotax. Sin. **32**: 465 (1994); Fl. Reipubl. Popul. Sin. **13**: 229 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 63 (2000). Type: China; Kansu [Gansu], fl. Tetung (Przewalski 352, 28 Jun.–9 Jul. 1872, LE-holotype).

Perennial, loosely caespitose, 40–60 cm tall. Rhizomes stoloniferous, horizontally short creeping, 0.9–1.2 mm in diam. Culms erect, grass-green, terete, 5–6 mm in diam., cross section rounded. Cataphylls inconspicuous. Leaves grass leaf-like, blade margin entire, cross section of blade flattened, auricles absent; basal leaves 2–4 to each culm, 10–25 cm long including sheath, 5–8 mm wide, sheath 3–5 cm long; cauline leaves 2 or 3 to each culm, 20–30 cm long including sheath, 4–6 mm wide, sheath 4–6 cm long. Inflorescence terminal, branched, flower heads 3–5, brown, 0.8–1.3 mm in diam., flowers 5–10, peduncle 1–6 cm long. Lowest bract grass-green, grass leaf-like, linear-lanceolate,

longer than inflorescence, 5–7 cm long, 3–5 mm wide, flattened; floral bract lanceolate to ovate-lanceolate, 3–7 mm long, 1–1.5 mm wide; sheathing bract on peduncle lanceolate, 0.6–0.8 cm long, membranaceous. Flowers 6–8 mm long, 1.5–2.0 mm wide, pedicel 0.5–1.0 mm long. Tepals brown, lanceolate, outer ones slightly longer than inner ones, 5–7 mm long, 1.0–1.4 mm wide, inner ones 4.8–5.2 mm long, 0.9–1.2 mm wide. Stamens 6, shorter than tepals, 4–5 mm long; filaments 2.3–3.0 mm long, 1–1.5 times as long as anthers; anthers linear ellipsoid, 1.7–2.0 mm long. Pistil 7–8 mm long, 1.5–2.0 mm wide; stigmas 1.6–1.8 mm long; style 0.5–0.8 mm long. Capsule dark brown, oblong, longer than tepals, 6–8 mm long, 2–3 mm wide, acuminate. Seeds ellipsoid, 3 mm long, cross section rounded, appendages 1.1 mm long.

Distr. China (Qinghai, Gansu, Sichuan).

Juncus giganteus is similar to *J. ganeshii* Miyam. & H. Ohba, *J. himalensis* Klotzsch, and *J. sphacelatus* Decne. but differs in having grass leaf-like leaves. Also this species is similar to *J. amplifolius* A. Camus but differs in having the shorter stigmas (1.6–1.8 mm long) and style (0.5–0.8 mm long) than those of *J. amplifolius* (stigmas 4–7 mm long and style 1.5–2 mm long). It grows on grassland slopes from elevations of 3800 to 4300 m.

22. *Juncus glaucoturgidus* Noltie in Edinburgh J. Bot. **51**: 132, f. 1A–E (1994); Fl. Bhutan **3**(1): 264 (1994). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 67 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 90, f. 66 (2002). [Colour plate 4a; Plate 21; Fig. 25]

Types: Sikkim; Samiti Lake (Bungmoteng Chho), 27°33'33"N, 88°11'25"E, 4300 m (D. G. Long, R. J. D. McBeath, H. J. Noltie, & M. F. Watson ESİK 572, 21 Jul. 1992, E-holotype, photo, K-isotype).

Perennial, caespitose, 10–25 cm tall. Rhizomes horizontally short creeping. Culms erect, glaucescent green, terete, 0.7–1.2 mm in diam. Cataphylls 3–6 to each culm, stramineous to light brown, 0.5–5 cm long. Leaves glaucescent green, terete, cross section of blade rounded to oval, auricles rounded; basal leaf 1 to each culm, 7–12 cm long including sheath, 0.8–1.2 mm wide, sheath 3–5 cm long; cauline leaves 1 or 2 to each culm, 2–5 cm including sheath, 0.15–0.4 mm wide, sheath 1.5–4 cm long, auricles rounded, shorter than culm. Inflorescence with a single flower head, hemispherical, 1–2.5 cm in diam., flowers 10–15, cream-white. Lowest bract light brown to chestnut-brown, lanceolate to ovate-lanceolate, slightly longer than inflorescence, 0.8–1.5 cm long, scarious; floral bract lanceolate, 0.7–1.4 cm long, 2.5–4.0 mm wide, scarious; sheathing bract absent. Flowers 0.7–1.3 cm long, 2.5–3.5 mm wide, pedicel 1–5 mm long. Tepals cream-white, lanceolate to linear-lanceolate, outer ones and inner ones equal in length, 4–6.5 mm long, 1–1.8 mm wide. Stamens 6, longer than tepals, 4.5–7.5 mm long; filaments 3–5 mm long, twice as long as anthers; anthers yellow, linear-ellipsoid, 1.5–2.5 mm long. Stigmas 0.8–1 mm long; style 1.5–2.5 mm long. Capsule brown, oblong, as long as tepals, 5–6 mm long, 2.5–2.7 mm wide, cross section trigonous. Seeds ellipsoid, 0.6–0.7 mm long, appendages very short, 0.05 mm long.

Distr. Nepal, Bhutan, China (Sichuan).

Juncus glaucoturgidus is similar to *J. allioides* Franch. and *J. trachyphyllus* Miyam. & H. Ohba but differs from the former in having glaucous leaves, scabrid culms, and

glaucous green leaf blade, and from the latter in having the rounded to oval cross section of leaf blade. *Juncus trachyphyllus* has the U-shaped cross section of leaf blade. *Juncus glaucoturgidus* grows on scree slopes among *Rhododendron* shrubs from elevations of 3750 to 4800 m.

23. *Juncus gonggae* Miyam. & H. Ohba in J. Jap. Bot. **72**: 162, f. 1 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999). Kirschner et al., Juncaceae 2, Fl. World **7**: 106, f. 70 (2002). [Colour plate 4b; Plate 22; Fig. 26]

Types: China; Sichuan, Daocheng District, Mt. Gonggashan, 4300 m (S. Wu et al. 1551, 25 Aug. 1996, KUN-holotype, TI-isotype).

Perennial, caespitose, 4–20 cm tall. Rhizomes horizontally short creeping. Culms ascending or erect, terete, 0.35–0.5 mm in diam., with several longitudinal striae. Cataphylls 2 or 3 to each culm, stramineous, 0.5–2 cm long. Leaves grass-green, terete, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded; basal leaves 1 or 2 to each culm, 1.5–10 cm long including sheath, 0.3–0.5 mm wide, sheath 0.5–2 cm long; cauline leaf almost absent, if present solitary, linear, 3–5 cm long including sheath, 0.25–0.35 mm wide, sheath 5–8 mm long. Inflorescence with a single flower head, hemispherical, 0.5–1.2 cm in diam., flowers 3–8, cream-white. Lowest bract light brown, linear-lanceolate, longer than or sometimes as long as inflorescence, 0.4–1.0 cm long, 0.5–1.0 mm wide; floral bract light brown, lanceolate, 1.5–2.0 mm long, 0.5–0.8 mm wide, scarious. Flowers viviparous or normal, sometimes both mixed in an inflorescence. Normal flowers 5–7 mm long, 5–8 mm wide, pedicel 0.4–0.6 mm long. Tepals white, lanceolate, outer ones slightly longer than inner ones, 3.0–3.5 mm long, 0.8–1.1 mm wide. Stamens 6, longer than tepals, 4.5–5.5 mm long; filaments 3.5–4.2 mm long, 3 times as long as anthers; anthers white, linear, 1–1.3 mm long. Pistil 3.8–4.5 mm long, 1.1–1.3 mm wide; stigmas 0.5–0.7 mm long; style 0.4–0.8 mm long. Capsule ovoid, 2.9–3.0 mm long, 1.0–1.2 mm wide, cuspidate, cross section trigonous. Viviparous flowers 3–5 mm long, 3.5–5.0 mm wide; stamens and pistil usually reduced, inner tepals changed into propagules, 3.0–4.5 mm long. Seeds ellipsoid, 0.5–0.6 mm long, appendages very short, 0.05 mm long.

Distr. China (Yunnan, Sichuan).

Juncus gonggae is similar to *J. modicus* N. E. Brown but differs in having the short anthers and the grooved leaves. This species is often proliferous. In subgenus Alpini, proliferation has been known in *J. trichophyllus* W. W. Sm., *J. harae* Miyam. & H. Ohba, and *J. dongchuanensis* K. F. Wu. *Juncus trichophyllus* differs from *J. gonggae* in having axillary bulbils on cauline leaves. The normal flowered form of *J. gonggae* was found on mossy rocks with *J. concinnus* D. Don in *Abies* and *Larix* forests from elevations of 3600 to 4300 m. The proliferous form of *J. gonggae* was found only in exposed screes with *J. trachyphyllus* at the margin of *Rhododendron* shrubs.

24. *Juncus gracilicaulis* A. Camus in Notul. Syst. (Paris) **1**(10): 279, f. 19, 17–22 (1910). Noltie, Fl. Bhutan **3**(1): 259 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2424 (1994). Wu in Acta Phytotax. Sin. **32**: 463 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 223, f. 54, 4–5 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 181 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000). Wu

and Clemants in Wu and Raven, Fl. China **24**: 62 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 81 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 556 (2003).

[Colour plate 4d; Plate 23; Fig. 27]

Type: China; Yunnan, rochers humides dans les boid de San-tcha-ho (P. J. M. Delavay 3943, 4 Sept. 1889, P-lectotype, designated here).

Perennial, caespitose, 12–20 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.4–0.8 mm in diam., with several longitudinal ridges. Cataphylls 1 or 2 to each culm, stramineous, 1–2 cm long. Leaves grass leaf-like, with several ridges on both sides, cross section of blade flattened, auricles absent; basal and subbasal leaves 1 or 2 to each culm, 5–10 cm long including sheath, 4–6 mm wide, sheath 2–4 cm long; cauline leaf 1 to each culm, 5–12 cm long including sheath, 3–5 mm wide, sheath 2–3 cm long, shorter or longer than culm. Inflorescence terminal, branched, flower heads 2–4, hemispherical, 0.8–1.3 cm in diam., flowers 3–8, ivory-white, peduncle 0.4–4 cm long. Lowest bract grass leaf-like, grass-green, linear-lanceolate, longer than inflorescence, 3–5 cm long, 2–4 mm wide, with several ridges on both sides, cross section flattened; flora bract lanceolate to ovate-lanceolate, 3–6 mm long, 1–3 mm wide; sheathing bract on peduncle lanceolate, 0.2–0.3 mm long, membranaceous. Flowers ivory-white, 6–8 mm long, 1.2–1.5 mm wide, pedicel 0.5–1.0 mm long. Tepals white, lanceolate, outer ones slightly shorter than inner ones, 1.8–2.3 mm long, 0.6–0.8 mm wide; inner ones 2.0–2.8 mm long, 0.6–0.8 mm wide. Stamens 6, longer than tepals, 7–9 mm long; filaments 5.2–6.9 mm long, 6 times as long as anthers; anthers ellipsoid, 0.8–1.1 mm long. Pistil ivory-white, 3–3.5 mm long, 0.6–0.8 mm wide; stigmas 0.5–0.6 mm long; style 1.0–1.3 mm long. Capsule brown, ovoid, 4–6 mm long, 1.5–2 mm wide, rostrate, cross section rounded. Seeds ellipsoid, 0.6–0.8 mm long, appendages 0.4–0.5 mm long.

Distr. India (Punjab), Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan).

Juncus gracilicaulis is characterized by having the grass leaf-like leaves and most similar to *J. concinnus* D. Don, but *J. gracilicaulis* has the U-shaped cross section of blades with the bulli-form cells on both surfaces. It grows on mossy rocks from elevations of 2700 to 4500 m.

25. *Juncus grisebachii* Buchenau in Bot. Jahrb. Syst. **1**: 109 (1880); in Bot. Jahrb. Syst. **6**: 202 (1885); in Bot. Jahrb. Syst. **12**: 265 (1890); in Bot. Jahrb. Syst. **29**: 236, t. 111 (1900). Hook. f., Fl. Brit. Ind. **6**: 394 (1892). Satake in Hara, Fl. E. Himal.: 402 (1966). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Lu and Zhang in Wu, Fl. Xizang. **5**: 525 (1987). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 72 (1992). Noltie, Fl. Bhutan **3**(1): 257 (1994). Wu in Acta Phytotax. Sin. **32**: 452 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 180 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 52 (2000). Miyamoto in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 237 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 82 (2002). [Colour plate 4c; Plate 24; Fig. 28]

Types: Sikkim; 10000–14000 ft. (J. D. Hooker s. n., K, S, W-syntypes).

Juncus phaeocarpus A. M. Lu & Z. Y. Zhang in Acta Phytotax. Sin. **17**: 126, f. 2-1, 5 (1979); in Wu, Fl. Xizang. **5**: 522, f. 290 (1987). Wu in Acta Phytotax. Sin. **32**: 451 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 181, f. 41, 7–10 (1997). Types: Tibet; NeLaMu,

Chang Mu, 3550 m (Y. T. Chang & K. Y. Ling 3285, 11 May 1966, PE-holotype, HSNU-isotype).

Perennial, loosely caespitose, 30–100 cm tall. Rhizomes stoloniferous, horizontally short creeping, 0.5–0.8 mm in diam. Culms erect, grass-green, terete, 1–3 mm in diam., with several longitudinal ridges, cross section rounded. Cataphylls 1 or 2 to each culm, light brown to brown, 1–6 cm long. Leaves light brown to brown, terete, sheathing at base, cross section of blade U-shaped, auricles acute; basal leaves 1 or 2 to each culm or absent, 5–30 cm long including sheath, 0.6–1.6 mm in diam., sheath 2–10 cm long; cauline leaves 2 or 3 to each culm, 10–30 cm long, 0.8–1.3 mm in diam., sheath 3–10 cm long, shorter than culm. Inflorescence terminal, branched, flower heads 1–5, hemispherical, 0.7–1.8 cm in diam., flowers 5–20, cream-white, peduncle 1–4 cm long. Lowest bract grass-green, linear-lanceolate, longer than or sometimes as long as inflorescence, terete, 5–20 cm long; floral bract light brown, lanceolate to ovate-lanceolate, 5–9 mm long, 1.5–2 mm wide, scarious; sheathing bract on peduncle light brown, lanceolate, 0.5–1.5 cm long, membranaceous. Flowers 8–11 mm long, 2–2.5 mm wide, pedicel 1–1.5 mm long. Tepals cream-white, lanceolate, outer ones slightly shorter than inner ones, 4.5–6 mm long, 1.2–1.5 mm wide. Stamens 6, longer than tepals, 6–7.5 mm long; filaments 3.6–4.9 mm long, 1.5 times as long as anthers; anthers yellow, linear-ellipsoid, 2.4–2.6 mm long. Pistil 5.5–7 mm long, 1–1.2 mm wide; stigmas 1–1.5 mm long; style 2–3 mm long. Capsule brown, oblong, as long as tepals, 5–6 mm long, 1.5–1.8 mm wide, mucronate, cross section rounded to trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendages 1.5–1.8 mm long.

Distr. India, Nepal, Sikkim, Bhutan, Assam, China (Xizang, Yunnan).

Juncus grisebachii is characterized by having the lowest bract three times as long as the inflorescence and the stoloniferous rhizomes, and similar to *J. concinnus* D. Don and *J. chrysocarpus* Buchenau, but differs in having the filaments 1.5 times as long as the anthers and no bulli-form cells on the leaves. It grows on grassland slopes from elevations of 2400 to 4000 m.

26. *Juncus harae* Miyam. & H. Ohba in J. Jap. Bot. **68**: 27, f. 1 (1993). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 67 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 237 (2000). Miyamoto and Ohba in J. Jap. Bot. **77**: 29, f. 4 (2002). Kirschner et al., Juncaceae 2, Fl. World **7**: 110 (2002). [Colour plate 4e; Plates 25 & 26; Fig. 29]

Type: Nepal; Koshi Zone, Sankhuwa Sabha Distr., Sano Pokhari–Khongma, 3850 m (M. Minaki et al. 9020853, 12 Aug. 1990, TI-holotype).

Perennial, caespitose, 3–25 cm tall. Rhizomes horizontally short creeping. Culms ascending, slender, compressed terete, 0.3–0.5 mm in diam., with several longitudinal ridges, cross section compressed oval. Cataphyll 1 to each culm, stramineous, 1.0–1.5 mm long. Leaves grass-green, with several grooves, cross section of blade compressed oval, auricles rounded; basal leaf absent on culm with viviparous flowers, or 1 to each culm with normal flowers, 3–10 cm long including sheath, 0.2–0.4 mm wide, sheath 1.5–4 cm long; cauline leaves absent. Inflorescences with normal flowers pseudolateral, flowers 1 or 2, brown, or inflorescences with 3–7 viviparous flowers. Lowest bract grass-green, longer than inflorescence, 0.5–3.0 cm long, 0.2–0.3 mm wide; floral bract brown,

ovate, 1.5–2 mm long, 1–1.5 mm wide. Flowers normal or viviparous, sometimes mixed. Normal flowers 5–8 mm long, 1.2–1.5 mm wide; pedicel 0.3–0.5 mm long. Tepals brown, ovate-lanceolate, outer ones and inner ones equal in length, 2.8–4 mm long, 1.0–1.3 mm wide. Stamens 6, shorter than tepals, 2.5–2.8 mm long; filaments shorter than anthers, 0.8–0.9 mm long; anthers leather-yellow, linear-ellipsoid, 1.6–1.8 mm long. Pistil 5–8 mm long, 1–1.5 mm wide; stigmas pale yellow, 2.8–3.0 mm long; style 1.5–2.0 mm long. Capsule ovoid, 2.8–3.0 mm long, 1.8–2.2 mm wide, cross section trigonous. Seeds 0.3–0.32 mm long, appendages very short, 0.05 mm long. Viviparous flowers 2.5–3.8 mm long, one inner tepal part transformed into a propagule, inner tepals lanceolate, 1.8–2.5 mm long, 0.5–0.6 mm wide, aristate; stamens and pistil reduced.

Distr. Nepal, Bhutan, China (Yunnan).

Juncus harae has both flower forms, normal and viviparous, and the former form is similar to *J. biglumoides* H. Hara and *J. rohtangensis* Goel & Aswal, but it is clearly distinguished from *J. biglumoides* by the equal length tepals and the anthers longer than the filaments, and from *J. rohtangensis* by the filaments twice as long as the anthers and a pale yellow stigma. This species is found on mossy rock cliffs from elevations of 3700 to 4100 m.

27. *Juncus himalensis* Klotzsch and Garcke, Bot. Reise Pr. Waldemar: 60, t. 97 (1862). Buchenau in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 227 (1885); in Bot. Jahrb. Syst. **12**: 405 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 234 (1906). Hook. f., Fl. Brit. Ind. **6**: 398 (1892). Brown in J. Linn. Soc., Bot. **36**: 164 (1903). Camus in Notul. Syst. (Paris) **1**(10): 283 (1910). Krecetovicz and Goncarpv in Komarov, Fl. URSS. **3**: 525 (1935). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 522, f. 291 (1987). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 72 (1992). Noltie, Fl. Bhutan **3**(1): 255 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2423 (1994). Wu in Acta Phytotax. Sin. **32**: 465 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 229, f. 56, 1–4 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 238 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 63 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 123 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 560 (2003). [Colour plate 4g; Plate 27; Fig. 30]

Types: Himalayas (Hoffmeister s. n., B, destroyed, W-syntype).

Juncus schlagintweitii Buchenau in Nachr. Königl. Ges. Wiss. Göttingen Geschäftl. Mitt. **13**: 255 (1869); in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 229 (1885). Types: Tibet; Prov. Dras, Matai up to the Tsoji Pass (A. & H. Schlagintweit 6668, 14 Oct. 1868, W-syntype). India; Garhwal (A. & H. Schlagintweit 9708, 6 Oct. 1855, W-syntype, not seen).

Juncus himalensis Klotzsch var. *schlagintweitii* Buchenau in Bot. Jahrb. Syst. **12**: 406 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 235 (1906). Samuelsson in Acta Horti Gothob. **3**: 71 (1927); in Hand.-Mazz., Symb. Sin. **7**: 1230 (1936). Wu et al., Index Fl. Yunnan. **2**: 2083 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 522 (1987).

Juncus sphacelatus Decne. var. *himalensis* (Klotzsch) Jafri in Fl. Pakistan **138**: 12, f. 2, A–D (1981).

Perennial, loosely caespitose, 15–70 cm tall. Rhizomes stoloniferous, horizontally, short creeping, 0.6–1.8 mm in diam. Culms erect, grass-green, terete, 1.2–2.0 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 2 or 3 to each culm, loosely embracing at base of culm, light brown to stramineous, 0.5–3 cm long. Leaves light brown to grass-green, terete to somewhat flattened, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded, sheathing at base; basal and subbasal leaves 1–3 to each culm, 8–45 cm long including sheath, 0.4–0.8 mm in diam., sheath 1–10 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 4–25 cm long including sheath, 0.4–0.8 mm in diam., sheath 2–5 cm long. Inflorescence terminal, branched, flower heads 2–10, 4–15 mm in diam., flowers 2–10, chestnut-brown, peduncle 0.5–5 cm long. Lowest bract grass-green, linear, longer than or sometimes as long as inflorescence, 5–20 cm long, margin reddish brown to grass-green, cross section U-shaped; floral bract lanceolate, 0.5–1.1 cm long, 1.3–2.5 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 0.5–1.5 cm long, membranaceous. Flowers 6–11 mm long, 2–4.5 mm wide, pedicel 1–5 mm long. Tepals chestnut-brown to light brown, lanceolate, outer ones slightly longer than inner ones or equal in length, 4–8 mm long, 1–2 mm wide. Stamens 6, shorter than tepals, 3.5–8.0 mm long; filaments 2.8–6.0 mm long, 2–3 times as long as anthers; anthers yellow, linear-ellipsoid, 0.7–2 mm long. Pistil 4–5 mm long, 1.2–1.6 mm wide; stigmas 1.4–2.5 mm long; style 1.0–1.5 mm long. Capsule chestnut-brown to brown, oblong, longer than tepals, 6–8 mm long, 2–3 mm wide, mucronate, cross section trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendages 1.5–1.8 mm long.

Distr. Pakistan, Kashmir, India (Punjab, Himachal Pradesh, Uttar Pradesh, Kumaon), Nepal, Sikkim, Bhutan, China (Xizang, Gansu, Yunnan, Sichuan, Shanxi).

Juncus himalensis is similar to *J. ganeshii* Miyam. & H. Ohba, *J. pseudocastaneus* Sam., *J. sikkimensis* Hook. f., and *J. sphacelatus* Decne. These species are characterized by having the composite flower heads, cylindrical leaves, chestnut-colored flowers, and stamens shorter than tepals. *Juncus himalensis* has filaments three times as long as anthers and the tepals lanceolate and grows in exposed marshy places from subalpine to alpine with other species, such as *J. sphacelatus* Decne., and *J. thomsonii* Buchenau. This species is widely distributed in the Sino-Himalaya from Pakistan in West Himalaya to Shanxi in SW China through Tibet from elevations of 1750–4000 m.

28. *Juncus hydrophilus* Noltie in Edinburgh J. Bot. **51**: 138, f. 2I–O (1994); Fl. Bhutan **3**(1): 260 (1994). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 84, f. 62 (2002). [Fig. 31]

Types: Sikkim; West District, Prek Chhu Bridge below Bakhim, 27°25'N, 88°11'E, 2300 m (D. G. Long, R. J. D. McBeath, H. J. Noltie, & M. F. Watson 771, 27 Jul. 1992, E-holotype, photo, K-isotype).

Perennial, loosely caespitose, 32–40 cm tall. Rhizomes stoloniferous, horizontally short creeping, 1 mm in diam. Culms erect, terete, grass-green. Cataphyll 1 to each culm, 0.7–4 cm long. Leaves grass-green; basal leaves lacking; cauline leaves 3 or 4, grass leaf-like, flattened, longest one 14–17 cm long, 2–3 mm wide; sheath reddish brown, 2.5–

4.0 cm long, without auricle. Inflorescence terminal, branched, flower heads 1–5, 1.5 cm in diam., flowers 4–9, cream-white. Lower bract shorter than inflorescence, bristle-like; floral bract lanceolate, scarious. Tepals unequal, cream, outer ones narrowly lanceolate, 3.5–5.0 mm long, 0.8–1.4 mm wide, acute at apex, keeled, inner ones 4.0–5.3 mm long, 0.9–1.0 mm wide. Stamens 6, longer than tepals; anthers pale yellow, narrowly oblong, 1.4–2.5 mm long. Pistil 5.0–6.5 mm long including style, 1.0–1.5 mm wide; stigmas 0.5–1.0 mm; style 1.5 mm long. Capsule stramineous, shining, very narrowly ovoid, 5–6 mm long, 1.8–2 mm wide. Seeds unknown.

Distr. Nepal, Sikkim, Bhutan.

29. *Juncus inflexus* L., Sp. Pl.: 326 (1753). Krecetovicz and Goncarpv in Komarov, Fl. URSS. **3**: 546, t. 29, f. 10 (1935). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Jafri in Fl. Pakistan **138**: 22, f. 22, f. 5f–i (1981). Wu et al., Index Fl. Yunnan. **2**: 2082 (1984). Noltie, Fl. Bhutan **3**(1): 252, f. 24p–q (1994). Wu in Acta Phytotax. Sin. **32**: 442 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 157, f. 35, 1–4 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 238 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 48 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 3, Fl. World **8**: 103, f. 139 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 535 (2003).

[Colour plate 5f; Plate 28; Fig. 32]

Types: Europa australi (UPS, not seen).

Juncus glaucus Ehrh. [Beitr. **6**: 83 (1791), nom. nud.] ex Sibth, Fl. Oxon: 113 (1794). Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 324 (1840). Buchenau in Bot. Jahrb. Syst. **1**: 107 (1880); in Bot. Jahrb. Syst. **6**: 199 (1885); in Bot. Jahrb. Syst. **12**: 243 (1890); in Bot. Jahrb. Syst. **36** (Beibl. 82): 18 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 132 (1906). Hook. f., Fl. Brit. Ind. **6**: 393 (1892). Brown in J. Linn. Soc., Bot. **36**: 164 (1903). Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1229 (1936). Satake in Hara, Fl. E. Himal. **2**: 162 (1971). Type: Germany; Hannoverae (F. Ehrhart, LINN-SMITH, not seen).

Juncus glaucus Ehrh. var. *leptocarpus* Buchenau in Bot. Jahrb. Syst. **6**: 20 (1885); in Bot. Jahrb. Syst. **12**: 244 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 134 (1906). Samuelsson in Acta Horti Gothob. **3**: 67 (1927). Type: Nepal (Hügel 475, W-holotype).

Juncus inflexus var. *leptocarpus* (Buchenau) Z. Y. Zhang in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2417 (1994).

Juncus inflexus L. subsp. *austro-occidentalis* K. F. Wu in Fl. Reipubl. Popul. Sin. **13**(3): 261 (1997). Types: China; Sichuan, Shimian (C. C. Hsieh 42386, SZ-holotype, not seen, HSNU, PE-isotypes).

Juncus jinpingensis S. Y. Bao in Wu and Wu, Fl. Yunnanica **15**: 804, f. 110, 1–6 (2003). Type: China; Yunnan, Jinping Xian, 1800 m (Sino-Russian Expeditio 1258, 11 May 1956, KUN-holotype).

Perennial, densely caespitose, 50–120 cm tall. Rhizomes horizontally short creeping, 4–7 mm in diam., covered with castaneus scales, internodes very short, culms arising in densely crowded rows. Culms erect, grass-green, terete, 1–3 mm thick, with several longitudinal ridges, pith interrupted spongy, cross section rounded. Cataphylls 2 or 3 to each culm, closely embracing at base of culm, stramineous or light brown apically,

chestnut-brown at base, 1–18 cm long. Leaves cataphylls only, sheathing to culm. Inflorescences pseudolateral, loosely branched, flowers many. Lowest bract appearing as a continuation of culm, 8–30 cm long. Bracteoles 2, ovate to ovate-lanceolate, 0.5–0.8 mm long. Flowers 1.5–2 mm long, 1–1.5 mm wide. Tepals light brown, lanceolate, outer ones longer than inner ones, 1.5–2 mm long, 0.5–0.7 mm wide. Stamens 6, shorter than tepals, 0.5–0.8 mm long; filaments 0.25–0.4 mm long; anthers yellow, linear-ellipsoid, equaling filaments, 0.25–0.4 mm long. Pistil 2–3 mm long, 0.8–1.1 mm wide; stigmas 0.2–0.3 mm long; style 0.1–0.12 mm long. Capsule brown, ellipsoid, longer than tepals, 2–3 mm long, 1.2–1.5 mm wide, acute, mucronate, cross section rounded to trigonous, 3-septate. Seeds brown, ovoid, 0.4–0.5 mm long, appendages very short.

Distr. Pakistan, India (Punjab, Kumaon), Nepal, Sikkim. Bhutan, Assam, Myanmar, China (Yunnan, Sichuan, Shanxi).

Juncus inflexus is distributed widely in North Africa, Europe, West Asia, and Sino-Himalaya. This species is characterized by having six stamens and interrupted spongy pith. It grows on wet banks along streams or roads and in flood plains from elevations of 1400 to 3000 m. I have not found *J. inflexus* sympatrically with *J. effusus* L. and *J. setchuensis* Buchenau.

30. *Juncus khasiensis* Buchenau in Bot. Jahrb. Syst. **12**: 407 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 235 (1906). Hook. f., Fl. Brit. Ind. **6**: 399 (1892). Brown in J. Linn. Soc., Bot. **36**: 164 (1903). Satake in J. Jap. Bot. **43**: 382 (1968). Lu and Zhang in Wu, Fl. Xizang. **5**: 526 (1987). Noltie, Fl. Bhutan **3**(1): 260 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2424 (1994). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 238 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 89, f. 65 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 539, f. 111, 1–4 (2003).

[Colour plate 5g; Plate 29; Fig. 33]

Types: India; Assam, Khasia, 5000 ft. (C. B. Clarke 45453, Sept. 1885, 1886, W-syntype); loc. cit., Maokadokadok, 5000 ft. (C. B. Clarke 40457, 12 Sept. 1885, K-syntype); loc. cit., Sailankote, 5000 ft. (C. B. Clarke s. n., 22 Oct. 1886, W-syntype); loc. cit., 5500 ft. (C. B. Clarke 45656A, 25 Sept. 1886, K-syntype); loc. cit., 5000–6000 ft. (J. D. Hooker & T. Thomson s. n., K, W-syntypes).

Juncus nematocaulon Hook. f., [Fl. Brit. Ind. **6**: 400 (1892), nom. nud.] Icon. Pl. **23**: t. 2234 (1894). Buchenau in Engler, Pflanzenr. (iv. 36) **25**: 236 (1906). Types: India; Assam, Naga Hill, 9900 ft. (C. B. Clarke 41274, 25 Oct. 1885, K-holotype, W-isotype).

Perennial, loosely caespitose, 7–20 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.4–0.5 mm in diam., with longitudinal striae, cross section tetragonous to oval. Cataphylls 1 or 2 to each culm, embracing at base of culm, brown to stramineous, 0.5–2 cm long. Leaves terete, cross section of blade X-shaped, auricles very short; basal or subbasal leaf one to each culm, longer than or sometimes shorter than culm, 4–25 cm long including sheath, sheath 1–4 cm long, 0.3–0.4 mm in diam.; cauline leaves absent. Inflorescence with 1 or 2 flower heads, hemispherical, 4–12 mm in diam., flowers 2–10, cream-white, peduncle 0.5–1.5 cm long. Lowest bract shorter than inflorescence, linear-lanceolate, 0.5–1.5 cm long, scarious; floral bracts lanceolate,

3–5 mm long, 1.3–2 mm wide; sheathing bract on peduncle brown, lanceolate, 3–5 mm long, membranaceous. Flowers 6–8 mm long, 2.5–3 mm wide, pedicel 0.5–0.8 mm long. Tepals cream-white, lanceolate, outer ones and inner ones equal in length, 3.5–5 mm long, 1–1.2 mm wide. Stamens 6, longer than tepals, 5.5–6 mm long; filaments 4.2–4.5 mm long, 3 times as long as anthers; anthers yellow, linear-ellipsoid, 1.3–1.5 mm long. Pistil 3–4 mm long, 0.5–0.9 mm wide; stigmas 0.6–0.7 mm long; style 1.2–1.5 mm long. Capsule light brown to stramineous, oblong, longer than tepals, 6–7 mm long, 2–2.2 mm wide, cross section rounded to trigonous. Seeds ellipsoid, 0.5–0.6 mm long, appendages 0.4–0.5 mm long.

Distr. Nepal, Sikkim, Bhutan, Assam, China (Yunnan), Thailand.

Juncus khasiensis is characterized by having the X-shaped cross section of leaf blade and culm, and similar to *J. concinnus* D. Don but differs in having the cauline leaves and bulliform cells. It grows on mossy banks or tree trunks from elevations of 1500 to 4500 m. This species was recorded for the first time from Thailand (J. F. Maxwell 94-1016, 10 Sept. 1994, A).

31. *Juncus kingii* Rendle in J. Bot. **44**: 45 (1906). Buchenau in Engler, Pflanzenr. (iv. 36) **25**: 265 (1906). Camus in Notul. Syst. (Paris) **1**(10): 275 (1910). Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1237 (1936). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Wu et al., Index Fl. Yunnan. **2**: 2083 (1984). Lu and Zhang in Wu, Fl. Xizang. **5**: 511 (1987). Noltie, Fl. Bhutan **3**(1): 266 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2419 (1994). Wu in Acta Phytotax. Sin. **32**: 459 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 200, f. 47, 1–2 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 238 (2000); in J. Jap. Bot. **78**: 154 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 56 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 95 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 547 (2003). [Colour plate 5e; Plate 30; Fig. 34]

Types: Tibet; Kang-me, two days north of Phari (King's Coll. s. n., 3 Aug. 1882, BM-lectotype, designated by Kirschner in 2002, K-isolectotype).

Juncus longibracteatus A. M. Lu & Z. Y. Zhang in Acta Phytotax. Sin. **17**: 126, f. 5–8 (1979); in Wu, Fl. Xizang. **5**: 513, f. 284 (1987). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2419 (1994). Type: Tibet; Gyi-Lung, 4150 m (Qing-Zang Exped., Veget. Group Q113-1, PE-holotype).

Perennial, loosely caespitose, 10–40 cm tall. Rhizomes stoloniferous, horizontally short creeping, 0.5–0.8 mm in diam. Culms erect, grass-green, terete, 0.6–1.3 mm in diam., smooth, cross section rounded. Cataphylls inconspicuous, 1–6 to each culm, stramineous, 0.5–4 cm long. Leaves grass-green, terete, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded; basal leaf one to each culm, 6–25 cm long including sheath, 0.7–1.5 mm in diam., sheath 1.5–8 cm long; cauline leaves absent. Inflorescence with a single flower head, subglobose, 1.3–2.3 cm in diam., flowers 10–35, cream-white. Lowest bract grass-green, terete, linear, longer than inflorescence, 1.5–5(–10) cm long, cross section rounded; floral bract lanceolate to linear-lanceolate, 0.5–1.5 cm long, 1–2.0 mm wide, scarious; sheathing bract absent. Flowers 7–10 mm long, 2–3 mm wide, pedicel

0.5–1 mm long. Tepals cream-white, lanceolate to linear-lanceolate, outer ones and inner ones equal in length, 4–6 mm long, 1–1.2 mm wide. Stamens 6, longer than tepals, 7–9 mm long; filaments 5–6.5 mm long, 2.5 times as long as anthers; anthers yellow, linear-ellipsoid, 2–2.5 mm long. Pistil 6–8 mm long, 1–1.5 mm wide; stigmas 1.5–1.8 mm long; style 2.3–2.5 mm long. Capsule chestnut-brown, oblong, as long as tepals, 4.8–5 mm long, cuspidate, cross section trigonous. Seeds ellipsoid, 0.6–0.7 mm long, appendages 0.1 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan).

Juncus kingii is characterized by the lowest bract longer than the inflorescence and the lack of the cauline leaf. Absence or presence of the cauline leaf is variable in *J. allioides* Franch. and *J. benghalensis* Kunth, however, this character in *J. kingii* is stable. *Juncus kingii* is similar to *J. allioides* but differs in having the stoloniferous rhizomes and the cylindrical lowest bract. It grows on grassland slopes from elevations of 2545 to 5000 m.

32. *Juncus leptospermus* Buchenau in Bot. Jahrb. Syst. **6**: 203 (1885); in Bot. Jahrb. Syst. **12**: 339 (1890); in Bot. Jahrb. Syst. **36** (Beibl. 82): 19 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 197, f. 95 (1906). Hook. f., Fl. Brit. Ind. **6**: 396 (1892). Camus in Notul. Syst. (Paris) **1**(10): 275 (1910). Wu et al., Index Fl. Yunnan. **2**: 2083 (1984). Noltie, Fl. Bhutan **3**(1): 255 (1994). Wu in Acta Phytotax. Sin. **32**: 453 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 186, f. 43, 3–4 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 238 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 53 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 227 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 543, f. 117, 1–5 (2003).

[Colour plate 5a; Plate 31; Fig. 35]

Types: India; Assam, Khasia, 4000–6000 ft. (J. D. Hooker & T. Thomson s. n., K-syntype); East Bengal (Griffith 5459, W, L, P-syntypes).

Perennial, ascending, 20–40 cm tall. Rhizomes horizontally short creeping. Culms erect or ascending, 0.7–1.5 mm in diam. Leaves grass-green, terete, cross section of blade rounded to oval, auricles rounded; basal leaves 1 or 2 to each culm, sometimes absent, 4–8 cm long including sheath, 0.4–0.75 mm wide, sheath 1–3 cm long; cauline leaves 1–4 to each culm, shorter than culm, 5–13 cm long including sheath, sheath 2–4 cm long, 0.5–0.65 mm wide. Inflorescence terminal, loosely branched, flower heads many, 3–5 mm in diam., flowers 2–6, grass-green. Lowest bract grass-green, linear, shorter than inflorescence, 2–5 cm long; floral bract ovate to lanceolate, 1–2 mm long, 0.4–0.8 mm wide, scarious; sheathing bract on peduncle lanceolate to obovate, 5–10 mm long, membranaceous. Flowers 3–4 mm long, 1.0–1.5 mm wide. Tepals grass-green to brown, lanceolate to linear-lanceolate, outer ones sometimes slightly longer than inner ones or equal in length, 2.5–3.5 mm long, 0.6–0.8 mm wide. Stamens 3, shorter than tepals, 2.0–2.5 mm long; filaments longer than anthers, 1.6–2 mm long; anthers yellow, linear-ellipsoid, 0.4–0.5 mm long. Stigmas 0.2–0.3 mm long; style 0.1–0.15 mm long. Capsule brown, oblong, slightly longer than tepals, 2.8–3 mm long, 0.8–1 mm wide, cross section 3-keeled, appendages very short.

Distr. India (Himachal Pradesh), Nepal, Bhutan, Assam, China (Xizang, Yunnan).

Juncus leptospermus is similar to *J. articulatus* L. and *J. wallichianus* Laharpe but

differs from *J. articulatus* in having three stamens and from *J. wallichianus* in having the shorter tepals (2.5–3.5 mm long) than those of *J. wallichianus* (3–4 mm long). It grows in marshy places in the upper elevation of 2100 m.

33. *Juncus leucanthus* Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 318 (1840). Buchenau in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 218 (1885); in Bot. Jahrb. Syst. **12**: 395 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 228 (1906). Hook. f., Fl. Brit. Ind. **6**: 397 (1892). Camus in Notul. Syst. (Paris) **1**(10): 278 (1910). Satake in Hara, Fl. E. Himal.: 403 (1966); in Fl. E. Himal. **2**: 163 (1971); in Ohashi, Fl. E. Himal. **3**: 130 (1975); in J. Jap. Bot. **43**: 382 (1968). Hara et al., Enum. Flow. Pl. Nepal **1**: 84 (1978). Lu and Zhang in Wu, Fl. Xizang. **5**: 514, f. 286 (1987). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 72 (1992). Noltie, Fl. Bhutan **3**(1): 264, f. 25e (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2420 (1994). Wu in Acta Phytotax. Sin. **32**: 461 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 212, f. 50, 1–3 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 182 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 239 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 59 (2000). Li et al., Fl. Gaoligong Mts.: 1121 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 92, f. 65E (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 551 (2003). [Colour plate 5b; Plate 32; Fig. 36]

Types: N. W. India (J. F. Royle s. n., LIV-lectotype, designated by J. Kirschner in 2002, not seen, K, LE, W-isolectotypes).

Juncus leucanthus Royle ex D. Don var. *alpinus* Buchenau in Bot. Jahrb. Syst. **12**: 396 (1890). Types: Sikkim; Jongri, 13000 ft. (C. B. Clarke 2617, 15 Oct. 1875, K-holotype, W-isotype).

Juncus tanguticus Sam. in Hand.-Mazz., Symb. Sin. **7**: 1233 (1936). Wu in Acta Phytotax. Sin. **32**: 461 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 213, f. 50, 8–11 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 59 (2000). Types: China; Shenxi [Shaanxi], Hwan-tsn-shan (G. Gairaldi 7242, 10 Jul. 1900, B-holotype, destroyed, S-isotype).

Juncus leucomelus auct. non Royle ex D. Don: Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 72 (1992).

Juncus membranaceus auct. non Royle ex D. Don: Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992).

Perennial, caespitose, 10–30 cm tall. Rhizomes horizontally short or long creeping. Culms erect, grass-green, terete, 0.4–0.7 mm in diam., smooth, cross section rounded. Cataphylls 2 or 3 to each culm, chestnut-brown, shining, 1–4 cm long, aristate. Leaves grass-green, terete, cross section of blade rounded to oval; basal leaf usually absent; cauline leaves usually 2 to each culm, shorter than culm; lower cauline leaves 4–10 cm long including sheath, 0.5–0.8 mm wide, sheath 1–4 cm long, auricles rounded, upper ones 3–5 cm long including sheath, 0.3–0.4 mm wide, sheath 1–2 cm long, auricles very short. Inflorescence with a single flower head, hemispherical, 0.5–2 cm in diam., flowers 5–15, cream-white. Lowest bract chestnut-brown, lanceolate to ovate-lanceolate, as long as inflorescence, 0.4–1.0 cm long, scarious; floral bract chestnut-brown, lanceolate, 3–8 mm long, 2–3 mm wide, scarious; sheathing bract absent. Flowers 6–10 mm long, 2–2.5 mm wide, pedicel 0.8–1.5 mm long. Tepals cream-white, lanceolate to oblong-lanceolate,

outer ones and inner ones equal in length, 3–4.5 mm long, 0.8–1.2 mm wide. Stamens 6, longer than tepals, 6–9 mm long; filaments chestnut-brown, 4–6 mm long, twice as long as anthers: anthers yellow, linear-ellipsoid, 2–3 mm long. Pistil 3–4 mm long, 0.8–1 mm wide; stigmas 0.5–1 mm long; style 1.5–3 mm long. Capsule chestnut-brown, oblong, as long as tepals, 4.5–5 mm long, 1.3–1.5 mm wide, cross section trigonous. Seeds ellipsoid, 0.7–0.8 mm long, appendages very short, 0.1 mm long.

Distr.: India (Punjab), Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan, Shaanxi).

Juncus leucanthus is similar to *J. allioides* Franch. and *J. cephalostigma* Sam. but differs from *J. allioides* in having chestnut-brown, shiny cataphylls and from *J. cephalostigma* in having the auricles on the cauline leaf. *Juncus cephalostigma* has no auricle on the cauline leaf. It grows on grassland or scree slopes from elevations of 2000 to 4500 m.

34. *Juncus longiflorus* (A. Camus) Noltie in Edinburgh J. Bot. **51**: 134 (1994). Miyamoto and Ohba in J. Jap. Bot. **74**: 76, f. 3 (1999); in J. Jap. Bot. **77**: 34 (2001). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 183 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 104 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 60 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 126, f. 76 (2002).

[Colour plate 5c, d; Plate 33; Fig. 37]

Juncus sikkimensis Hook. f. var. *longiflorus* A. Camus in Notul. Syst. (Paris) **1**(10): 283, f. 19, 23 (1910). Bao in Wu and Wu, Fl. Yunnanica **15**: 557 (2003).

Type: China; Yunnan, lieux humides oupeu ombragés du Tsang-chan (Cang shan), 4000 m (P. J. M. Delavay 2806, 27 Jul. 1887, P-lectotype, designated by H. Noltie in 1994a).

Juncus sikkimensis Sam. in Hand.-Mazz., Symb. Sin. **7**: 1232 (1936), pro parte.

Juncus sikkimensis Hook. f. var. *helvolus* K. F. Wu in Acta Phytotax. Sin. **32**: 461 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 217 (1997). Bao in Wu and Wu, Fl. Yunnanica **15**: 558 (2003). Types: China; Yunnan, Deqin, 3800 m (K. M. Feng 6594, 13 Aug. 1940, PE-holotype, KUN-isotype).

Juncus fugongensis S. Y. Bao in Wu and Wu, Fl. Yunnanica **15**: 805, f. 112, 1–5 (2003). Type: China; Yunnan, Bijiang, Biluoxueshan, 3500–3700 m (Nujiandiaochoadui 0882, 18 Jun. 1978, KUN-holotype).

Perennial, densely caespitose, 20–50 cm tall. Rhizomes densely short branched and clustered. Culms ascending, densely tufted, grass-green, terete, 0.5–0.8 mm in diam., smooth, cross section rounded. Cataphylls 3–6 to each culm, shining yellowish brown, 3.0–4.0 cm long, acute. Leaves grass-green, terete, cross section of blade oval, auricles rounded; basal or subbasal leaf one to each culm, shorter than culm, 10–30 cm long including sheath, 0.4–0.7 mm in diam., sheath 3–4 cm long; leaves on sterile shoots with a blade, 25–70 cm long, 0.3–0.6 mm in diam., sheath same as long as basal one. Inflorescence terminal, flower head solitary, flowers 3–5, chestnut-brown. Lowest bract chestnut-brown, linear-lanceolate, longer than inflorescence, 2.5–3.7 cm long, 5.0–9.0 mm wide; flora bract lanceolate to linear-lanceolate, 1.3–2.0 cm long, 4–6 mm wide, scarious; sheathing bract absent. Flowers 8–15 mm long, 2.2–3.5 mm wide, pedicel 0.5–5.0 mm long. Tepals chestnut-brown, lanceolate, outer ones longer than inner ones, 5.5–

9.4 mm long, 1.5–1.8 mm wide, inner ones 5.0–8.0 mm long, 1.1–1.6 mm wide. Stamens 6, shorter than tepals, outer ones 2.8–3.2 mm long, inner ones 2.6–3.0 mm long; filaments 0.8–1.0 mm long, shorter than anthers; anthers leather-yellow, linear-ellipsoid, 1.6–2.0 mm long. Pistil 6.0–8.5 mm long, 1–1.4 mm wide; stigmas 3.3–4.5 mm long; styles 3.0–4.0 mm long. Capsule brown, obovoid, slightly shorter than tepals, 7–8 mm long, 2.0–2.5 mm wide, cross section trigonous. Seeds ellipsoid, 0.7–0.8 mm long, appendages 0.3–0.4 mm long.

Distr. China (Xizang, Yunnan).

Juncus longiflorus, characterized by the culms densely tufted, is similar to *J. rohtangensis* Goel & Aswal and *J. sikkimensis* Hook. f. but differs in having the leaves on sterile shoots which are longer than or sometimes same as long as the inflorescence, the shining yellowish brown basal sheaths, and no sheath-like bract. This is often misidentified as most similar *J. sikkimensis*, especially for fragmental or incomplete specimens. *Juncus sikkimensis* var. *helvolus* K. F. Wu was described based on a specimen collected in Deqin, but it is identical with *J. longiflorus*.

Juncus longiflorus grows in grassland on exposed slopes near ridges from elevations of 3400 to 4400 m, while *J. pseudocastaneus* (Lingelsh.) Sam. and *J. sikkimensis* grow in bogs or humid places by creeks.

35. *Juncus longistamineus* A. Camus in Notul. Syst. (Paris) 1(10): 277, f. 19, 24–26 (1910). Samuelsson in Hand.-Mazz., Symb. Sin. 7: 1235 (1936). Wu et al., Index Fl. Yunnan. 2: 2083 (1984). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2420 (1994). Wu in Acta Phytotax. Sin. 32: 460 (1994); Fl. Reipubl. Popul. Sin. 13(3): 204, f. 48, 1–3 (1997). Wu and Clemants in Wu and Raven, Fl. China 24: 57 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 133 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 548 (2003). [Plate 34; Fig. 38]

Type: China; Tibet oriental [Yunnan], Tsékou, mont de Tsen-tchrou, sur les rochers (J. A. Soulié 1113, 20 Sept. 1895, P-lectotype, designated by F. Miyamoto in Kirschner et al., Juncaceae 2, Fl. World 7: 133, 2002).

Perennial, caespitose, 10–13 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.3–0.5 mm in diam., with several longitudinal striae, cross section compressed oval. Cataphylls 1 or 2 to each culm, light brown to stramineous, 3–5 mm long. Leaves grass-green, compranately terete, with several longitudinal striae, cross section of blade oval, auricles rounded; basal leaves 1 or 2 to each culm, 5–10 cm long including sheath, 0.6–0.7 mm wide, sheath 1–4 cm long; cauline leaves absent. Inflorescence with a single flower head, 4–7 mm in diam., flowers 1 or 2, ivory-white. Lowest bract linear-lanceolate, shorter than inflorescence, 5–7 mm long; floral bract pale brown, lanceolate, 3–6 mm long, 0.7–1 mm wide; sheathing bract absent. Flowers 8–12 mm long, 3–5 mm wide, pedicel 0.5–0.8 mm long. Tepals ivory-white, linear-lanceolate, outer ones slightly shorter than inner ones or equal in length, 4–5 mm long, 0.7–0.8 mm wide. Stamens 6, longer than tepals, 6–7 mm long; filaments 4–4.5 mm long, twice as long as anthers; anthers white, linear-ellipsoid, 2–2.5 mm long. Pistil ivory-white, 4–5.5 mm long, 1.2–1.5 mm wide; stigmas 0.8–1 mm long; style 1–1.2 mm long. Capsule light brown, oblong, 5–5.5 mm long, 1.5–2 mm wide, mucronate, cross section trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendages 0.4 mm long.

Distr. China (Yunnan).

Juncus longistamineus is similar to *J. potaninii* Buchenau but differs in having the long style (1–1.2 mm long) and the filaments twice as long as the anthers. *Juncus potaninii* has the short style (0.2–0.4 mm long) and the filaments 3 to 4 times as long as the anthers. This species is restricted in Yunnan Province in China from elevations of 3600 to 3900 m.

36. *Juncus luzuliformis* Franch., Nouv. Arch. Mus. Hist. Nat., ser. 2, **10**: 99 (1887). Buchenau in Bot. Jahrb. Syst. **12**: 204 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 227 (1906). Brown in J. Linn. Soc., Bot. **36**: 164 (1903). Camus in Notul. Syst. (Paris) **1**(10): 277 (1910). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 183 (1999). Wu and Clemants in Wu and Raven, Fl. China **24**: 57 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 133, f. 69 (2002). [Plate 35; Fig. 39]

Types: Tibet oriental; Provce de Moupine (M. l'Abbé David s. n., Aug. 1869, P-holotype, W-isotype).

Perennial, caespitose, 5–20 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.2–0.3 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 1 to 2 to each culm, light brown to stramineous, shining, 1.5–2 cm long. Leaves grass-green, compressedly terete, cross section oval to rounded, auricles rounded; basal leaves 1 or 2 to each culm, sometimes longer than culm, 10–25 cm long including sheath, 0.6–0.85 mm wide; sheath 1–1.5 cm long; cauline leaf one to each culm, shorter than culm, 1.5–3 cm long including sheath, 0.5–0.6 mm wide, sheath 1–1.5 mm long. Inflorescence cymose, lateral branches 1–3, flower solitary to each branch, yellowish white. Lowest bract shorter than inflorescence, 1–1.5 mm long, bristle; floral bract ovate-lanceolate to ovate, 1–2 mm long, 0.6–1.3 mm wide; sheathing bract absent. Flowers yellowish white, 6–7.5 mm long, 2–2.5 mm wide, sessile. Tepals yellowish white, narrowly lanceolate to lanceolate, outer ones and inner ones equal in length, 3.5–5 mm long, 0.8–1 mm wide. Stamens 6, slightly longer than or as long as tepals, 4–5 mm long; filaments 2.6–3.2 mm long, 1.5–1.8 times as long as anthers: anthers white, linear-ellipsoid, 1.4–1.8 mm long. Pistil yellowish white, 4.5–5.5 mm long, 1–1.3 mm wide; stigmas 0.5–0.7 mm long; style 2–2.5 mm long. Capsule brown, ovoid, slightly longer than tepals, 4.5–5 mm long, 1.5–1.8 mm wide, rostrate, cross section trigonous. Seeds ellipsoid, 0.5–0.6 mm long, appendages 0.2 mm long.

Distr. China (Xizang, Yunnan, Sichuan, Shaanxi, Hubei).

Juncus luzuliformis is similar to *J. potaninii* Buchenau but differs in having the cymose and the stamens same as long as tepals. It grows on mossy rocks afrom elevations of 1750 to 3450 m. *Juncus potaninii* has the terminal inflorescence sometimes branched and the stamens longer than the tepals.

37. *Juncus membranaceus* Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 320 (1840). Buchenau in Bot. Jahrb. Syst. **6**: 220 (1885); in Bot. Jahrb. Syst. **12**: 397 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 229 (1906). Hook. f., Fl. Brit. Ind. **6**: 397 (1892). Satake in Hara, Fl. E. Himal.: 403 (1966). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. **3**: 95 (1967). Hara et al., Enum. Flow. Pl. Nepal **1**: 85 (1978). Jafri in Fl. Pakistan **138**: 10, f. 6a–b2 (1981). Lu and Zhang in Wu, Fl. Xizang. **5**: 514

(1987). Zhang and Lu in Wang et al., *Vasc. Pl. Hengduan Mts.* **2**: 2422 (1994). Wu in *Acta Phytotax. Sin.* **32**: 460 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 206 (1997). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 58 (2000). Press et al., *Ann. Check. Fl. Pl. Nepal*: 150 (2000). Kirschner et al., *Juncaceae 2, Fl. World* **7**: 89 (2002). Bao in Wu and Wu, *Fl. Yunnanica* **15**: 549 (2003). [Colour plate 6a; Plate 36; Fig. 40]

Types: N. W. India (Royle s. n., LIV-holotype, not seen, W-isotype).

Juncus hoffmeisteri Klotzsch in Klotzsch and Garcke, *Bot. Ergebn. Reise Waldemar*: 60 (1862). Type: Himalaya (Hoffmeister, B, destroyed); Klotzsch and Garcke, *Bot. Ergebn. Reise Waldemar*: Plate 98 (1862).

Juncus concinnus Royle ex D. Don var. *turbidus* Buchenau in *Nachr. Königl. Ges. Wiss. Göttingen Geschäftl. Mitt.* **13**: 252 (1869); in *Bot. Jahrb. Syst.* **12**: 407 (1890); in Engler, *Pflanzenr.* (iv. 36) **25**: 235 (1906). Types: Tibet, Prov. Tsans Kar, Sulle to Padum (Schlaginweit 6700, 22–24 Jun. 1856, B, destroyed, W-syntype).

Perennial, loosely caespitose, 15–35 cm tall. Rhizomes stoloniferous, horizontally, 0.4–0.5 mm in diam. Culms erect, grass-green, terete, 0.8–1.2 mm in diam., with several longitudinal striae, cross section rounded to oval. Cataphyll inconspicuous, one or absent, light brown to stramineous, 1–2 cm long. Leaves grass-green, terete, with a groove on adaxial side, cross section of blade U-shaped, auricles rounded; basal and subbasal leaves 1 or 2 to each culm, 3–12 cm long including sheath, 0.4–0.7 mm in diam., sheath 1–5 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 4–9 cm long including sheath, 0.3–0.5 mm in diam., sheath 1.5–4 cm long. Inflorescence with a single flower head, hemispherical, 1–2 cm in diam., flowers 6–12, cream-white. Lowest bract light brown, lanceolate to ovate-lanceolate, as long as inflorescence, 0.8–1.2 cm long, scarious; floral bract lanceolate, 5–8 mm long, 1.5–2.0 mm wide, scarious; sheathing bract absent. Flowers 8–10 mm long, 2–2.5 mm wide, pedicel 2–2.5 mm long. Tepals cream-white, oblong-lanceolate, outer ones slightly shorter than inner ones or equal in length, 4–5 mm long, 1.2–1.5 mm wide. Stamens 6, longer than tepals, 6–7 mm long; filaments 4.5–5.3 mm long, 3 times as long as anthers: anthers yellow, linear-ellipsoid, 1.5–1.7 mm long. Pistil 4–5 mm long, 0.8–1 mm wide; stigmas 1.3–1.5 mm long; style 0.1–0.2 mm long. Capsule chestnut-brown to brown, oblong, longer than tepals, 5.5–6.5 mm long, 2.5–2.7 mm wide, mucronate, cross section rounded. Seeds ellipsoid, 0.5–0.6 mm long, appendages 1.4–1.6 mm long.

Distr. Afghanistan, Pakistan, Karakoram, Kashmir, India (Punjab, Uttar Pradesh, Kumaon), Nepal, China (Xizang).

Juncus membranaceus is similar to *J. allioides* Franch. but differs in having the stoloniferous rhizomes and the short style 0.1–0.2 mm long. It grows in glasslands along streams from elevations of 2400 to 4000 m. This species is distributed mainly in West Himalaya.

38. *Juncus milashanensis* A. M. Lu & Z. Y. Zhang in *Acta Phytotax. Sin.* **17**: 127, f. 2, 6–10 (1979); in Wu, *Fl. Xizang* **5**: 520, f. 290 (1987). Zhang and Lu in Wang et al., *Vasc. Pl. Hengduan Mts.* **2**: 2422 (1994). Wu in *Acta Phytotax. Sin.* **32**: 462 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 217 (1997). Miyamoto in *J. Jap. Bot.* **74**: 78, f. 4 (1999); in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **25**: 183 (1999); in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **26**: 105 (2000). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 61

(2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 115, f. 73 (2002). [Colour plate 6b; Plate 37; Fig. 41]

Type: Tibet; Mi-La Shan, 5200 m (Y. T. Chang & K. Y. Long 2734, 16 Sept. 1965, PE-holotype).

Perennial, loosely caespitose, 5–25 cm tall. Rhizomes long creeping with scale-like leaves, sometimes densely branched and clustered, 1.0–2.0 mm in diam. Culms erect or oblique, terete, 1–3 mm in diam., with several longitudinal ridges, cross section rounded. Cataphylls 3 or 4 to each culm, loosely embracing at base of culm, brown, 1–3 cm long, sometimes with fimbriate old leaves at base. Leaves grass leaf-like, blade margin entire, cross section of blade flattened, with several longitudinal striae on abaxial side, auricles absent; basal leaves 2 or 3 to each culm, 1.0–6.0 cm long including sheath, 0.8–3.0 mm wide, sheath 0.5–3.0 cm long; cauline leaves absent or one to each culm, shorter than culm, 1.0–4.0 cm long including sheath, 2.0–3.0 mm wide, sheath 0.5–1 cm long. Inflorescence with 1 or 2 (or 3) flower heads, 0.8–2.0 cm in diam., flowers 4–10, chestnut-brown, peduncle 0.5–1.5 cm long. Lowest bract grass leaf-like, grass-green with chestnut-brown base, linear-lanceolate, longer than or sometimes same as long as inflorescence, 1.0–4.5 cm long, 2.3–4.0 mm wide, flattened, with many grooves on abaxial side; floral bract linear-lanceolate to lanceolate, 0.5–4.5 cm long, 2.0–4.0 mm wide; sheathing bract on peduncle lanceolate, 0.5–1.0 cm long, membranaceous. Flowers 10–15 mm long, 2.5–3.5 mm wide, pedicel 0.6–4.5 mm long. Tepals chestnut-brown, ovate-lanceolate, outer ones slightly shorter than inner ones, 4.5–7.7 mm long, 0.8–1.3 mm wide, inner ones 5.0–8.0 mm long, 0.9–1.4 mm wide. Stamens 6, shorter than tepals, 2.7–4.5 mm long; filaments 0.9–1.5 mm long; anthers leather-yellow, linear-ellipsoid, 1.8–3.0 mm long, twice longer than filaments. Pistil 4.5–6.2 mm long, 0.8–1.2 mm wide; stigmas red, 3.0–4.0 mm long; style 1.5–2.2 mm long. Capsule ovoid, slightly longer than tepals, 6–7 mm long, 2–2.5 mm wide, cuspidate, cross section trigonous. Seeds ellipsoid, 0.5–0.6 mm long, appendages 0.2–0.3 mm long.

Distr. China (Xizang, Yunnan, Sichuan).

Juncus milashanensis is similar to *J. amplifolius* A. Camus, *J. nepalicus* Miyam. & H. Ohba, and *J. pseudocastaneus* (Lingelsh.) Sam., and these species have often been confused. *Juncus milashanensis* differs from those in having the flattened, abaxially multi-grooved, grass leaf-like leaves, the anthers longer than the filaments, and the red-coloured stigmas. *Juncus milashanensis* grows on open scree slopes from elevations of 4550 to 4800 m. Lu and Zhang (1979) described this species having erect rhizomes, but actually the rhizomes are creeping.

Although this species has been reported only from Tibet, I found it around Wuming Shan and Gongga Shan in Sichuan province. Zhang and Lu (1994) listed *J. milashanensis* in Yunnan province with reference to a specimen collected in Yangbi (Zhang & Lu 1206), but this specimen is identical with *J. concinnus* D. Don.

39. *Juncus minimus* Buchenau in Bot. Zeitung (Berlin) **25**: 145 (1867); in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 209 (1885); in Bot. Jahrb. Syst. **12**: 412 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 232, f. 109 (1906). Hook. f., Fl. Brit. Ind. **6**: 400 (1892). Samuelsson in Hand.-Mazz., Symb. Sin. **7**: 1230 (1936). Hara et al., Enum. Flow. Pl. Nepal **1**: 85 (1978). Wu et al., Index Fl. Yunnan. **2**: 2083 (1984). Lu and Zhang in Wu, Fl.

Xizang. **5**: 517, f. 288 (1987). Miyamoto and Ohba in Ohba and Akiyama, *Alp. Fl. Jaljale Him.*: 73 (1992). Noltie, *Fl. Bhutan* **3**(1): 261 (1994). Zhang and Lu in Wang et al., *Vasc. Pl. Hengduan Mts.* **2**: 2419 (1994). Wu in *Acta Phytotax. Sin.* **32**: 461 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 216, f. 51, 5–7 (1997). Miyamoto in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **25**: 183 (1999); in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **26**: 105 (2000). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 60 (2000). Li et al., *Fl. Gaoligong Mts.*: 1122 (2000). Press et al., *Ann. Check. Fl. Pl. Nepal*: 150 (2000). Kirschner et al., *Juncaceae 2, Fl. World* **7**: 116, f. 69E–F (2002). Bao in Wu and Wu, *Fl. Yunnanica* **15**: 553 (2003). [Colour plate 6d; Plate 38; Fig. 42]

Types: Sikkim; 16000–18000 ft. (J. D. Hooker s. n., K, W-syntypes).

Juncus unifolius A. M. Lu & Z. Y. Zhang in *Acta Phytotax. Sin.* **17**: 125, f. 1–4 (1979). Wu in *Acta Phytotax. Sin.* **32**: 461 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 215, f. 51, 8–10 (1997). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 60 (2000). Type: Tibet; Za-Yul, 4250 m (F. W. Chang & D. Cheng 1525, 13 Aug. 1973, PE-holotype).

Perennial, densely caespitose, 2–8 cm tall. Rhizomes densely short branched and clustered. Culms erect, grass-green, terete, 0.2–0.6 mm in diam., with several longitudinal deep striae, cross section compressedly oval. Cataphylls inconspicuous. Leaves grass leaf-like, blade margin entire, cross section of blade flattened, auricle absent; basal and subbasal leaves 1–3 to each culm, 1–5 cm long including sheath, 1.5–5.5 mm wide; sheath 0.5–2 cm long; cauline leaf one to each culm or absent, 2.5–4 cm long including sheath, 2–3 mm wide, sheath 0.8–1 cm long. Inflorescence with a single flower head, hemispherical, 0.4–1.2 cm in diam., flowers 1–7, brown. Lowest bract grass leaf-like, grass-green, linear-lanceolate, longer than or sometimes as long as inflorescence, 0.5–1.5 cm long; floral bract linear-lanceolate to lanceolate, 4–8 mm long, 1.2–1.8 mm wide, scarious; sheathing bract absent. Flowers 4–8 mm long, 3–4 mm wide, pedicel 0.5–2.5 mm long. Tepals brown to light brown, lanceolate, outer ones slightly shorter than inner ones or equal in length, 4–6 mm long, 0.6–0.8 mm wide. Stamens 6, as long as tepals, 3–3.5 mm long; filaments 2.5–3.0 mm long, 5 times as long as anthers; anthers cream-white, ellipsoid, 0.4–0.6 mm long. Pistil 3–4 mm long, 1–1.5 mm wide; stigmas 1.2–1.5 mm long; style 0.5–0.7 mm long. Capsule chestnut-brown, obovoid, as long as tepals, 4–5 mm long, 1.8–2 mm wide, mucronate, cross section trigonous. Seeds ellipsoid, 0.4–0.5 mm long, appendages 0.3–0.5 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Xizang, Yunnan).

Juncus minimus is similar to *J. nepalicus* Miyam. & H. Ohba but differs in having the filaments five times as long as the anthers, short style (0.5–0.7 mm long), and mucronate capsule. *Juncus nepalicus* has the filaments three times as long as the anthers, the 1.5–2 mm long style, and the cuspidate capsule. It grows on exposed scree slopes from elevations of 4200 to 5090 m.

40. *Juncus modicus* N. E. Br. in *J. Linn. Soc., Bot.* **34**: 165 (1903). Buchenau in *Bot. Jahrb. Syst.* **36** (Beibl. 82): 19 (1905); in Engler, *Pflanzenr.* (iv. 36) **25**: 231 (1906). Camus in *Notul. Syst. (Paris)* **1**(10): 278 (1910). Zhang and Lu in Wang et al., *Vasc. Pl. Hengduan Mts.* **2**: 2421 (1994). Wu in *Acta Phytotax. Sin.* **32**: 460 (1994); *Fl. Reipubl. Popul. Sin.* **13**(3): 209, f. 50, 6–7 (1997). Miyamoto in Akiyama et al., *Bull. Natn. Sci. Mus., Tokyo, B*, **25**: 183 (1999). Wu and Clemants in Wu and Raven, *Fl. China* **24**: 59

(2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 109 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 550 (2003).

[Colour plate 6e; Plate 39; Fig. 43]

Types: China; Hupeh [Hubei], Fang, 8000–9000 ft. (A. Henry 6854, K, P-syntypes); loc. cit. (A. Henry 6868A, K, W-syntypes).

Perennial, caespitose, 10–40 cm tall. Rhizomes horizontally short or long creeping. Culms erect, grass-green, terete, 0.3–0.6 mm in diam., with several longitudinal ridges, cross section of blade oval. Cataphylls 1 or 2 to each culm, chestnut-brown, shining, 1–3 cm long. Leaves terete, with several longitudinal ridges, cross section compressedly oval, auricles rounded, elongated; basal leaf absent; lower cauline leaf one to each culm, 5–10 cm long including sheath, 0.4–0.7 mm wide, sheath 1–3 cm long; upper cauline leaf one to each culm, shorter than culm, 1.5–5 cm long including sheath, 0.3–0.5 mm wide, sheath 1–2 cm long. Leaves in sterile shoots longer than or as long as culm, 10–40 cm long. Inflorescence with a single flower head, hemispherical, 0.8–1.4 mm in diam., flowers 4–10, ivory-white. Lowest bract pale brown, lanceolate to ovate-lanceolate, as long as inflorescence, 0.5–0.8 mm long, scarious; floral bract lanceolate to ovate, 0.4–0.6 mm long, 0.1–0.2 mm wide, scarious; sheathing bract absent. Flowers 6–10 mm long, 0.8–1.5 mm wide, pedicel 2–3 mm long. Tepals yellowish white, lanceolate, outer ones slightly shorter than inner ones, 3–4 mm long, 0.8–1.1 mm wide. Stamens 6, longer than tepals, 6–8 mm long; filaments 4–5.7 mm long, twice as long as anthers: anthers white, linear-ellipsoid, 2–2.3 mm long. Pistil 4–5 mm long, 1.2–1.5 mm wide; stigmas 0.5–0.7 mm long; style 1.1–1.5 mm long. Capsule obovoid, slightly longer than tepals, 4.5–5.5 mm long, 1.6–1.8 mm wide, cuspidate, cross section trigonous. Seeds oblong, 0.7–0.8 mm long, appendages very short, 0.05–0.1 mm long.

Distr. China (Gansu, Yunnan, Sichuan, Guizhou, Hubei).

Juncus modicus is similar to *J. leucanthus* Royle ex D. Don but differs in having the cross section of culm with several longitudinal striae, the leaves in sterile shoots longer than or as long as the culm, and the elongated auricles. It grows on mossy banks on edges of *Picea* and *Abies* from elevations of 2100 to 3800 m.

41. *Juncus mustangensis* Miyam. & H. Ohba in J. Jap. Bot. 78: 154, f. 1 (2003).

[Plate 40; Fig. 44]

Types: Nepal; Dhaulagiri Zone, Mustang District, between Sangda Pass and Phalyak, 28°51' 40"N, 83°44'41"E, 3870 m (F. Miyamoto, N. Kurosaki, S. Akiyama, H. Ikeda, M. Tsusaka & M. N. Subedi 20210100, 13 Aug. 2002, TI-holotype, KATH-isotype).

Perennial, caespitose, 7–20 cm tall. Rhizomes horizontally very short creeping, 0.4–0.7 mm in diam. Culms erect, grass-green, terete, 0.3–0.8 mm in diam., smooth, cross section rounded. Cataphylls inconspicuous. Leaves grass-green, terete, with an adaxial groove, cross section of blade U-shaped, auricles absent; basal leaves 1 or 2 (or 3) per culm, 4–8 cm long including sheath, 0.7–1.5 mm in diam., sheath 0.5–3 cm long; cauline leaves absent. Inflorescence with a single flower head, subglobose, 1–1.8 cm in diam., flowers 7–14, creamy white. Lowest bract grass-green, terete, linear, longer than inflorescence, 1–1.8 cm long, cross section rounded; floral bracts lanceolate to linear-lanceolate, 2–5 mm long, 1–1.5 mm wide, scarious; sheathing bract absent. Flowers 0.6–0.9 cm long, pedicellate, 1.5–2 mm wide, pedicel 0.5–1 mm long. Tepals cream-white, lanceolate to

linear-lanceolate, outer ones slightly longer than inner ones, 3.5–5 mm long, 0.8–1 mm wide. Stamens 6, longer than tepals, 5–8 mm long; filaments 3–5 mm long, twice as long as anthers; anthers yellow, linear-elliptic, 1.5–2.5 mm long. Pistil 5.5–7 mm long, 1–1.5 mm wide; stigma 0.8–1 mm long; style 1.5–2 mm long. Capsule chestnut-brown, oblong, as long as tepals, 4–5 mm long, 2–2.5 mm wide, cuspidate, cross section trigonous. Seeds unknown.

Distr. Nepal.

Juncus mustangensis is characterized by the short creeping rhizomes, the absence of auricles and cauline leaves, and basal leaves with a single adaxial groove. It is similar to *J. benghalensis* Kunth and *J. sherei* Miyam. & H. Ohba, but *J. benghalensis* has stoloniferous rhizomes and leaves with rounded auricles, and *J. sherei* has the basal leaves with a single groove on both adaxial and abaxial surfaces. *Juncus mustangensis* is also similar to *J. kingii* Rendle, which has the stoloniferous rhizomes and the basal leaves without groove.

Juncus mustangensis was collected in moist cliffs along the gorge between Sangda Pass and Phalyak on the west side of Kali Gandaki River.

42. *Juncus nepalicus* Miyam. & H. Ohba in J. Jap. Bot. **68**: 28, f. 2 (1993). Noltie in Edinburgh J. Bot. **51**: 139 (1994); Fl. Bhutan **3**(1): 262 (1994). Wu and Clemants in Wu and Raven, Fl. China **24**: 62 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 116 (2002).

[Colour plate 6c; Plate 41; Fig. 45]

Type: Nepal; Koshi Zone, Sankhuwa Sabha Distr., around Cha Ding Kharka, 4400 m (M. Minaki et al. 9020690, 7 Aug. 1990, TI-holotype).

Perennial, densely caespitose, 5–20 cm tall. Rhizomes densely short branched and clustered. Culms ascending, grass-green, compressed terete, 0.4–0.7 mm in diam., with several longitudinal ridges, cross section oval. Cataphylls 1 or 2 to each culm, loosely embracing at base of culm, brown, 3–5 mm long. Leaves grass leaf-like, blade margin entire, with several ridges on abaxial side, cross section of blade flattened, auricles absent; basal and subbasal leaves 2–4 to each culm, 2–12 cm long including sheath, 1.5–3 mm wide, sheath 0.5–1 cm long; cauline leaf absent or one to each culm, linear-lanceolate, shorter than culm, 3–6 cm long including sheath, 0.8–1.5 mm wide, sheath 1.5–3 cm long. Inflorescence with 1 or 2 flower heads, 0.5–1 cm in diam., flowers 3–6, chestnut-brown, peduncle 0.1–1 cm long. Lowest bract brown, lanceolate, as long as or sometimes slightly longer than inflorescence, 0.5–1.5 mm long, 1–2 mm wide; floral bract lanceolate to ovate, 2–6 mm long, 0.8–1.3 mm wide, scarious; sheathing bract absent. Flowers 6–8 mm long, 1.8–2.2 mm wide, pedicel 1–2 mm long. Tepals chestnut-brown, ovate-lanceolate, outer ones slightly shorter than inner ones, 2.8–3.8 mm long, 0.8–1.0 mm long, inner ones 3.5–4.5 mm long, 1.0–1.2 mm wide. Stamens 6, shorter than tepals, 2.5–3.5 mm long; filaments brown, 2.0–2.2 mm long, twice as long as anthers: anthers ivory-yellow, linear-ellipsoid, 1.0–1.2 mm long. Pistil 7–8 mm long, 1.6–1.8 mm wide; stigmas reddish, 2.5–4 mm long; style 1.5–2 mm long. Capsule brown, oblong, mucronate, cross section trigonous. Seeds ellipsoid, 0.5–0.6 mm long, appendages 0.6 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Yunnan).

Juncus nepalicus is similar to *J. milashanensis* A. M. Lu & Z. Y. Zhang and *J. minimus*

Buchenau but differs from *J. milashanensis* in having the tepals unequal in length and the anthers with half-length of the filaments, and from *J. minimus* in having the bulliform cells on the adaxial side of leaves and the cuspidate capsule. It grows on exposed slopes among *Rhododendron* shrubs from elevations of 3300 to 4400 m.

43. *Juncus ochraceus* Buchenau in Abh. Naturwiss. Vereine Bremen **3**: 292 (1872); in Bot. Jahrb. Syst. **1**: 112 (1880); in Bot. Jahrb. Syst. **6**: 207 (1885); in Bot. Jahrb. Syst. **12**: 415 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 240 (1906). Hook. f., Fl. Brit. Ind. **6**: 394 (1892). Camus in Notul. Syst. (Paris) **1**(10): 283 (1910). Satake in Hara, Fl. E. Himal.: 403: (1966); Fl. E. Himal. **2**: 163 (1971). Hara et al., Enum. Flow. Nepal **1**: 85 (1978). Noltie in Edinburgh J. Bot. **51**: 141 (1994); Fl. Bhutan **3**(1): 253, f. 24r-t (1994). Wu in Acta Phytotax. Sin. **32**: 452 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 176, f. 56, 5-7 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 51 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 86 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 545 (2003).

[Colour plate 6f; Plate 42; Fig. 46]

Types: Sikkim; 12000 ft. (J. D. Hooker s. n., K-holotype, W, P-isotypes).

Juncus tratangensis Satake in Hara, Fl. E. Himal.: **2**: 164, f. 14 (1971). Type: Bhutan; Tongsa-Tratang-Uto La Road, 2200-2950 m (H. Kanai et al. 5952, 17 Apr. 1967, TI-holotype).

Perennial, caespitose, 15-45 cm tall. Rhizomes densely branched. Culms erect, grass-green, terete, 0.6-1.3 mm in diam., with several longitudinal striae, cross section rounded. Cataphyll one to each culm, loosely embracing at base of culm, grass-green at apex, light brown at base, 0.5-4 cm long. Leaves terete, with a groove on adaxial side, cross section of blade U-shaped with several striae, auricles rounded to obtuse; basal leaves 1 or 2 to each culm, 5-15 cm long including sheath, 0.4-0.7 mm wide, sheath 2-7 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 5-15 cm long including sheath, 0.4-0.6 mm wide, sheath 2-4 cm long. Inflorescence terminal, loosely branching, flower heads many, flowers many; almost inflorescences with sterile flowers and normal flower heads with 1 or 2 flowers, peduncle 0.5-8 cm long. Lowest bract grass-green, filiform, terete, shorter than inflorescence, 3-8 cm long; floral bract lanceolate, 3-4 mm long, 0.6-0.8 mm wide, scarious; sheathing bract on peduncle pale brown, lanceolate, 0.3-1.4 cm long, membranaceous. Flowers normal or viviparous, mixed in an inflorescence. Normal flowers 6-8 mm long, 3-4 mm wide, pedicel 0.5-0.8 mm long. Tepals gold-brown, lanceolate, outer ones and inner ones equal in length, 3.5-4 mm long, 0.8-1 mm wide. Stamens 6, shorter than or sometimes as long as tepals, 2.6-3.8 mm long; filaments 1.2-1.5 mm long; anthers yellow, linear-elliptic, slightly longer than filaments, 1.4-2.8 mm long. Pistil 4-6 mm long, 1-1.5 mm wide; stigmas 2.0-2.3 mm long; style 1.3-1.5 mm long. Capsule pale brown, obovoid, as long as tepals, 3.5-4 mm long, 2-2.2 mm wide, obtuse, mucronate, cross section 3-keeled. Seeds unknown. Viviparous flowers composed of several sterile bracts, 4-5 mm long, 0.5-0.6 mm wide; stamens and pistil reduced; sterile bracts golden-brown, linear-lanceolate.

Distr. Kashmir, Nepal, Sikkim, Bhutan, Assam, Arunachal Pradesh, China (Xizang, Yunnan, Sichuan).

Juncus ochraceus is similar to *J. fimbristylodes* Noltie but differs in having the culms with several longitudinal striae and no bulli-form cells on leaf surface. It grows on exposed road sides or bare soil slopes from elevations of 1500 to 3000 m.

44. *Juncus perpusillus* Sam. in Hand-Mazz., Symb. Sin. 7: 1237 (1936). Noltie in Edinburgh J. Bot. **51**: 130 (1994); Fl. Bhutan **3**(1): 268 (1994). Wu in Acta Phytotax. Sin. **32**: 460 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 202, f. 46, 12–14 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 68 (1992); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 239 (2000); in J. Jap. Bot. **78**: 156 (2003). Wu and Clemants in Wu and Raven, Fl. China **24**: 57 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 101 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 551 (2003).

[Colour plate 7a; Plate 43; Fig. 47]

Types: China; Sichuan, Taofu (Dawo) Distr., Haitzeshan, 4400–4600 m (H. Smith 11684, 31 Aug. 1934, S-holotype, BM, S-isotypes).

Perennial, caespitose, 1–15 cm tall. Rhizomes horizontally short creeping, culms arising in dense rows. Culms erect, terete, 0.25–0.6 mm in diam., cross section compressed oval. Cataphyll one or inconspicuous, loosely embracing at base of culm, light brown, 0.3–1 cm long. Leaves filiform, terete, cross section of blade rounded, auricles rounded; basal leaves 1 or 2 to each culm, 0.8–4.5 cm long including sheath, sheath 0.3–2.5 cm long; cauline leaves absent. Inflorescence with a single flower head, hemispherical, 0.4–1 cm diam., flowers 2–12, chestnut-brown. Lowest bract brown to chestnut-brown, ovate-lanceolate, shorter than inflorescence, scarious; floral bract lanceolate to ovate, 2–4 mm long, 0.7–2 mm wide, scarious. Flowers 4–6 mm long, 1–1.5 mm wide, pedicel 0.3–0.5 mm long. Tepals brown to chestnut-brown, lanceolate, outer ones and inner ones equal in length, 3–4 mm long, 0.7–1.0 mm wide. Stamens 6, longer than tepals, 4–8 mm long; filaments chestnut-brown, 3 times as long as anthers, 3–4.5 mm long; anthers cream-yellow, linear-ellipsoid, 1–1.4 mm long. Pistil 3–4 mm long, 0.8–1 mm wide; stigmas brown to chestnut-brown, 0.3–1.3 mm long; style brown to chestnut-brown, 1–1.2 mm long. Capsule chestnut-brown, oblong, slightly longer than tepals, 4–6 mm long, 1.2–1.5 mm wide, mucronate, cross section trigonous. Seeds oblong, 0.5–0.6 mm long, appendages very short, 0.05 mm long.

Distr. Kashmir, India (Uttar Pradesh, Kumaon), Nepal, Sikkim, China (Gansu, Yunnan, Sichuan).

Juncus perpusillus is similar to *J. thomsonii* Buchenau but differs in having the filaments three times as long as the anthers. It grows on wet grass land slopes along streams or bogs, sometimes with *J. thomsonii*, from elevations of 3400 to 4660 m. This species is one of the smallest plants (1 cm tall) of the Sino-Himalayan *Juncus*.

45. *Juncus petrophilus* Miyam., sp. nov. [Colour plate 7c; Plate 44; Fig. 48]

Types: China; Yunnan province, Dali, Mt. Dancang Shan, 3600 m (F. Miyamoto 10520, 11 Jul. 2000, KUN-holotype, TI-isotype).

Juncus benghalensis Kunth, *J. concinno* D. Don, et *J. sherei* Miyam. & H. Ohba, sed foliis complanato et filamentis 1.3–1.5-plo longiores quam antheris differt.

Perennial, caespitose, 5–15 cm tall. Rhizomes horizontally short creeping. Culms erect,

grass-green, terete, smooth, cross section rounded. Cataphyll one to each culm, sedge-green, 0.3–1.5 cm long. Leaves grass leaf-like, grass-green, margin entire, cross section of blade flattened, auricles very short; basal leaves 1 or 2 to each culm, 2–8 cm long including sheath, 1–1.7 mm wide, sheath 0.5–2 cm long; cauline leaf one to each culm, linear, shorter than culm, 1–6 cm long including sheath, 0.8–1.6 mm wide, sheath 0.3–1.5 cm long. Inflorescence with a single flower head, hemispherical 5–9 mm in diam., flowers 3–7, ivory-white. Lowest bract linear-lanceolate to lanceolate, shorter than or slightly longer than inflorescence, 2.5–8(–10) mm long; floral bract white, sometimes partly brown, lanceolate to ovate-lanceolate, 2–6 mm long, 0.8–2 mm wide, scarious. Flowers 4.5–5 mm long, 1–1.6 mm wide, pedicel 0.3–0.5 mm long. Tepals white, oblong-lanceolate, outer ones slightly longer than inner ones or equal in length, 2–3.2 mm long, 0.6–0.8 mm wide; inner ones 2.5–3.3 mm long, 0.7–1 mm wide. Stamens 6, slightly longer than tepals, 3.6–4.5 mm long; filaments 2–2.6 mm long, 1.3–1.5 times as long as anthers; anthers cream-yellow, narrowly oblong, 1.6–1.9 mm long. Pistil white, 4–4.5 mm long, 0.8–1 mm wide; stigmas 0.4–0.5 mm long; style 1.6–1.8 mm long. Capsule white, ovoid, 2–2.2 mm long, 0.9–1.1 mm wide, cross section trigonous. Seeds unknown.

Distr. China (Yunnan).

Juncus petrophilus is similar to *J. benghalensis* Kunth, *J. concinnus* D. Don, and *J. sherei* Miyam. & H. Ohba but differs in having the flattened basal leaves with bulliform cells on abaxial side and the filaments 1.3–1.5 times as long as the anthers. *Juncus concinnus* has sometimes flattened basal leaves but differ from *J. petrophilus* by the filaments 3–4 times as long as the anthers and the inner tepals longer than the outer ones. *Juncus petrophilus* grows on mossy rocks along paths in *Abies* forests with *J. benghalensis* and *J. concinnus* in Mt. Dancang Shan in Yunnan province, China at 3600 m.

46. *Juncus potaninii* Buchenau in Bot. Jahrb. Syst. **12**: 394 (1890); in Bot. Jahrb. Syst. **29**: 238 (1896). Brown in J. Linn. Soc., Bot. **36**: 165 (1903). Samuelsson in Acta Horti Gothob. **3**: 69 (1927). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. **3**: 95 (1967). Lu and Zhang in Wu, Fl. Xizang. **5**: 514, f. 285 (1987). Zang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2420 (1994). Wu in Acta Phytotax. Sin. **32**: 460 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 206, f. 49, 9–11 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **25**: 183 (1999). Wu and Clemants in Wu and Raven, Fl. China **24**: 57 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 130 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 548, f. 111, 5–9 (2003).

[Colour plate 7g; Plate 45; Fig. 49]

Types: China; Prov. Szechuan [Sichuan], Kseruzo (G. N. Potanin s. n., 6 Aug. 1885, W-syntype); Prov. Kansu [Gansu], Dshoubunon (G. N. Potanin s. n., 10 Aug. 1885, W-syntype).

Juncus modestus Buchenau in Bot. Jahrb. Syst. **12**: 203 (1890). Brown in J. Linn. Soc., Bot. **36**: 164 (1903). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2420 (1994). Wu in Acta Phytotax. Sin. **32**: 460 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 204, f. 48, 4–5 (1997). Types: China; Prov. Szetschuan [Sichuan], septentrionali, Valle flum. Heiho supra vicum Hunneiku (G. N. Potanin s. n., 2 Jul. 1885, LE-holotype, W-isotype).

Juncus luzuliformis Franch. var. *modestus* (Buchenau) Buchenau in Bot. Jahrb. Syst.

36 (Beibl. 82): 15 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 228, f. 105 (1906). Camus in Notul. Syst. (Paris) **1**(10): 277 (1910).

Juncus luzuliformis Franch. var. *potaninii* (Buchenau) Buchenau in Bot. Jahrb. Syst. **36** (Beibl. 82): 15 (1905); in Engler, Pflanzenr. (iv. 36) **25**: 228, f. 106 (1906).

Juncus perparvus K. F. Wu in Acta Phytotax. Sin. **32**: 448, f. 3, 1–4 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 170, f. 38, 1–4 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 50 (2000). Bao in Wu and Wu, Fl. Yunnanica **15**: 537 (2003). Types: China; Qinghai, Huangyuan, Fengjie Shan (P. C. Tsoog 8847, 10 Jul. 1958, PE-holotype, HSNU, KUN-isotypes).

Perennial, slender, caespitose, 5–12 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.2–0.3 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls inconspicuous or 1 or 2 to each culm, stramineous to light brown, 0.5–1 cm long. Leaves grass-green, filiform, terete, cross section of blade U-shaped, auricles very short; basal and subbasal leaves 1 or 2 to each culm, 2–9 cm long including sheath; sheath 0.5–2 cm long, 0.1–0.2 mm wide; cauline leaf one to each culm, filiform, shorter than culm, 1–3 cm long including sheath, sheath 0.5–1.2 mm long. Inflorescence terminal, flower heads 1 or 2, 1.5–5 mm in diam., flowers 1 or 2, yellowish white, peduncle of lateral head 0.5–1 cm long. Lowest bract pale brown, shorter than or as long as inflorescence, 2.5–4 mm long, 0.4–1 mm wide; floral bract lanceolate, 1.5–2.5 mm long, 0.6–1.2 mm wide, scarious; sheathing bract on peduncle lanceolate, 1.5–2 mm long, membranaceous. Flowers 3.5–4 mm long, 2–2.5 mm wide, sessile. Tepals yellowish white, narrowly lanceolate, outer ones and inner ones equal in length, 2.5–3.2 mm long, 0.5–0.9 mm wide. Stamens 6, longer than tepals, 3.5–3.8 mm long; filaments 2.7–3.0 mm long, 3–4 times as long as anthers; anthers white, linear-ellipsoid, 0.6–0.8 mm long. Pistil 4–5 mm long, 1–1.5 mm wide; stigmas 0.3–0.5 mm long; style 0.2–0.4 mm long. Capsule brown, oblong, as long as tepals, 3.5–4 mm long, 1.5–1.7 mm wide, cross section rounded. Seed ellipsoid, 0.4–0.5 mm long, 0.15–0.2 mm wide, appendages very short, 0.1–0.2 mm long.

Distr. China (Xizang, Qinghai, Gansu, Yunnan, Sichuan, Shaanxi, Hubei).

Juncus potaninii is similar to *J. longistamineus* A. Camus but differs in having the filaments three to four times as long as the anthers and the short style (0.2–0.4 mm long). It grows on mossy rocks in *Abies* forests from elevations of 2300 to 4400 m.

47. *Juncus prismatocarpus* T. Br., Prod.: 259 (1810). Buchenau in Bot. Jahrb. Syst. **6**: 204 (1885). in Bot. Jahrb. Syst. **12**: 310 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 180 (1906). Hook. f., Fl. Brit. Ind. **6**: 395 (1892). Brown in J. Linn. Soc., Bot. **36**: 165 (1903). Samuelsson in Hand-Mazz., Symb. Sin. **7**: 1229 (1936). Jafri in Fl. Pakistan **138**: 18 (1981). Noltie, Fl. Bhutan **3**(1): 254, f. 24u–v (1994). Wu in Acta Phytotax. Sin. **32**: 455 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 192, f. 45, 7–10 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 239 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 54 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 148, f. 82A–C (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 544 (2003).

[Colour plate 7f; Plate 46; Fig. 50]

Type: Australia; [NSW, Port Jackson area] (R. Brown 5784, BM-holotype).

Juncus leschenaultia J. Gay in Laharpe, Mém. Soc. Hist. Nat. Paris. 3: 137 (1827). Buchenau in Bot. Jahrb. Syst. 1: 111 (1880). Krecetovicz and Goncarpv in Komarov, Fl. URSS 3: 540, t. 30, f. 2 (1935). Satake in Hara, Fl. E. Himal.: 403 (1966); Fl. E. Himal. 2: 162 (1971). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. 3: 101 (1967). Hara et al., Enum. Flow. Pl. Nepal 1: 84 (1978). Wu et al., Index Fl. Yunnan. 2: 2083 (1984). Lu and Zhang in Wu, Fl. Xizang. 5: 508, f. 280 (1987). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2417 (1994). Press et al., Ann. Check. Fl. Pl. Nepal: 149 (2000). Type: India; Mountitus Nelly Gerry (*Leschenaultia* s. n., K-holotype).

Juncus sinensis J. Gay in Laharpe, Mém. Soc. Hist. Nat. Paris 3: 137 (1827). Buchenau in Bot. Jahrb. Syst. 1: 108 (1880); in Bot. Jahrb. Syst. 6: 203 (1885). Types: China (G. Staunton s. n., P, W-syntypes). Japon (C. P. Thunberg s. n., G-DEL-syntype, not seen).

Juncus prismatocarpus R. Br. var. *leschenaultia* (J. Gay) Buchenau in Bot. Jahrb. Syst. 6: 311 (1885); in Bot. Jahrb. Syst. 12: 311 (1890); in Bot. Jahrb. Syst. 29: 238 (1900); in Engler, Pflanzenr. (iv. 36) 25: 180 (1906).

Perennial, ascending, 10–30 cm tall. Rhizomes branched-ascending. Culms erect or ascending, compranate, 0.7–1.5 mm in diam., margin narrowly two-winged. Leaves grass-green, terete, cross section of blade compressedly oval, margin narrowly two-winged, auricles rounded; basal leaves 1 or 2, sometimes absent, 3–10 cm long including sheath, 2–3 mm wide, sheath 1–4 cm long; cauline leaves 1–3, shorter than culm, 3–15 cm long including sheath, 1–2 mm wide, sheath 1–4 cm long, auricles obtuse. Inflorescence terminal, loosely branched, flower heads many, 5–10 mm in diam., flowers 2–15, grass-green. Lowest bract grass-green, linear, shorter than inflorescence, 2–10 cm long; floral bract ovate to ovate-lanceolate, 0.5–2.5 mm long, 0.4–2.0 mm wide, scarious; sheathing bract on peduncle lanceolate to obovate, 3–7 mm long, membranaceous. Flowers 3–5 mm long, 0.8–1.0 mm wide. Tepals grass-green, lanceolate to linear-lanceolate, outer ones slightly longer than inner ones or equal in length, 2.3–4.5 mm long, 0.4–0.8 mm wide. Stamens 3, shorter than tepals, 1–2.5 mm long; filaments 0.7–1.8 mm long, longer than anthers; anthers yellow, linear-elliptic, 0.3–0.7 mm long. Pistil 1.5–3 mm long, 1–1.2 mm wide; stigmas 0.2–1 mm long; style 0.1–0.3 mm long. Capsule brown, oblong, slightly longer than or as long as tepals, 3–4 mm long, 1–1.2 mm wide, cross section 3-keeled. Seeds obovoid, 0.4–0.5 mm long, appendages absent.

Distr. India, Nepal, Sikkim, Bhutan, Assam, China (Yunnan & Sichuan).

Although *Juncus prismatocarpus* is similar to *J. wallichianus* Laharpe, *J. prismatocarpus* is characterized by laterally compressed culms and leaves. This species is distributed widely in Asia and grows in marshy places or near paddy fields at lower altitudes of below 2800 m.

48. *Juncus przewalskii* Buchenau in Bot. Jahrb. Syst. 12: 401 (1890); in Bot. Jahrb. Syst. 36 (Beibl. 82): 19 (1905); in Engler, Pflanzenr. (iv. 36) 25: 231, f. 108 (1906). Brown in J. Linn. Soc., Bot. 36: 166 (1903). Samuelsson in Acta Horti Gothob. 3: 69 (1927). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. 3: 96, t. 8, f. 4 (1967). Wu et al., Index Fl. Yunnan. 2: 2083 (1984). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2421 (1994). Wu in Acta Phytotax. Sin. 32: 461 (1994); Fl. Reipubl. Popul. Sin. 13(3): 213, f. 51, 1–2 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci.

Mus., Tokyo, B, **25**: 183 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 59 (2000). Li et al., Fl. Gaoligong Mts.: 1122 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 102, f. 69C–D (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 553 (2003).

[Colour plate 7b; Plate 47; Fig. 51]

Types: China; Kansu [Gansu], Terra Tangutorum, regio alpina secus fl. Tetung (N. M. Przewalskii s.n., Jul. 1872, LE-holotype, W, S-syntypes).

Juncus przewalskii Buchenau var. *discolor* Sam. in Hand.-Mazz., Symb. Sin. **7**: 1234 (1936). Wu et al., Index Fl. Yunnan. **2**: 2084 (1984). Wu in Acta Phytotax. Sin. **32**: 461 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 215 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 60 (2000). Types: China; Yunnan, Yangtze watershed, Prefectural District of Likiang, eastern slopes of Likiang Snow Range (J. F. Rock 4953, May–Oct. 1922, S-holotype, not seen, B-isotype).

Juncus kandingensis K. F. Wu in Acta Phytotax. Sin. **32**: 460, f. 4, 9–10 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 211, f. 44, 9–10 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 59 (2000). Types: China; Sichuan, Kangdin, 3400 m (Z. S. Liu 964, PE-holotype, HSNU-isotype).

Juncus przewalskii Buchenau var. *multiflorus* S. Y. Bao in Wu, Fl. Yunnanica **15**: 804 (2003). Type: China; Yunnan, Haba shan, 4500 m (Zhongdian research team 2062, 16 Sept. 1962, KUN-holotype).

Perennial, caespitose, 3–25 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.2–0.5 mm in diam., with smooth, cross section rounded. Cataphylls 2 or 3 to each culm, light brown to brown, 1–3 cm long. Leaves grass-green, terete, cross section of blade rounded; basal leaves 1–3 to each culm, 3–9 cm long including sheath, 0.4–1 mm in diam., sheath 1.5–4 cm long, auricles absent or truncate; cauline leaf solitary, dark brown, linear, shorter than culm, 2–5 cm long, sheath part absent, auricles absent. Inflorescence with a single flower head, hemispherical, 0.5–2 cm in diam., flowers 8–20, chestnut-brown or rarely cream-white. Lowest bract brown to dark brown, ovate-lanceolate to ovate, shorter than or as long as inflorescence, 0.7–1 cm long, 3–6 mm wide, scarious; floral bract 3–8 mm long, 2–3 mm wide, scarious; sheathing bract absent. Flowers 5–10 mm long, 2–4 mm wide, pedicel 0.5–2 mm long. Tepals shining brown or ivory-white, lanceolate, outer ones slightly longer than inner ones, 3–6.5 mm long, 1–1.8 mm wide. Stamens 6, longer than tepals, 5–7 mm long; filaments 3.7–6 mm long, 2.3–2.6 times as long as anthers: anthers white, linear-ellipsoid, 1.3–2.6 mm long. Pistil brown or ivory-white, 6–7 mm long, 1.2–1.5 mm wide; stigmas 0.5–0.8 mm long; style 2–3 mm long. Capsule brown, obovoid, shorter than tepals, 3–4.5 mm long, 1.5–2 mm wide, mucronate, cross section rounded. Seeds ellipsoid, 0.4–0.7 mm long, appendages 0.2–0.3 mm long.

Distr. China (Xizang, Gansu, Yunnan, Sichuan, Shaanxi).

Juncus przewalskii is similar to *J. allioides* Franch., *J. cephalostigma* Sam., and *J. leucanthus* Royle & D. Don but differs from *J. allioides* and *J. leucanthus* in having the truncate auricles or no auricle, and the cauline leaf without sheathing part, and from *J. cephalostigma* in having the stigmas (0.5–0.8 mm long) longer than those of *J. cephalostigma* (0.1–0.2 mm long). This species is characterized by dark brown cauline leaf. It grows in grassland or on scree slopes from elevations of 2800 to 4870 m. *Juncus*

kandingensis K. F. Wu, which was described based on a specimen collected in Kangdin, Sichuan (Z. S. Liu 964, PE-holotype) by K. F. Wu, is dwarf form of *J. przewalskii*.

49. *Juncus pseudocastaneus* (Lingelsh.) Sam. in Hand.-Mazz., Symb. Sin. 7: 1230 (1936). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Wu et al., Index Fl. Yunnan. 2: 2084 (1984). Lu and Zhang in Fl. Xizang. 5: 518 (1987). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2422 (1994). Wu in Acta Phytotax. Sin. 32: 452 (1994); Fl. Reipubl. Popul. Sin. 13(3): 180, f. 41, 4–6 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 183 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 239 (2000). Bao in Wu and Wu, Fl. Yunnanica 15: 539 (2003).

[Colour plate 7e; Plate 48; Fig. 52]

Juncus sikkimensis Hook. f. var. *pseudocastaneus* Lingelsh. in Limpricht, Repert. Spec. Nov. Regnii Veg. Beih. 12: 316 (1922). Samuelsson in Acta Hort. Gothob. 3: 71 (1927).

Types: Tibet; Tatsienlu, Dawo, Gata, auf der Pasalm Hai tse schan am Dshara, 4360 m (Limpricht 1869, 2 Jul. 1914, WRS�-holotype, K. WU-isotypes).

Perennial, loosely caespitose, 9–47 cm tall. Rhizomes stoloniferous, horizontally creeping, 0.4–0.6 mm thick. Culms erect, grass-green, terete, 0.6–1.3 mm thick, smooth, cross section rounded. Cataphylls 1 or 2 to each culm, loosely embracing at base of culm, brown, shining, 1–5 cm long. Leaves terete, cross section of blade rounded, auricles rounded, sheathing at base light brown to stramineous; basal leaves 2–4 to each culm, 7–21 cm long including sheath, 1–1.5 mm wide, sheath 2.5–8 cm long; cauline leaves absent. Inflorescence terminal, pseudolateral, flower heads 1 or 2, 0.6–1.7 cm in diam., flowers 2–5, chestnut-brown, peduncle 0.3–3 cm long. Lowest bract grass-green, linear, apical part terete, basal part flattened, longer than inflorescence, 2–4 cm long, margin chestnut-brown; floral bract lanceolate to ovate-lanceolate, 5–8 mm long, 2–2.5 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 1–1.5 cm long, membranaceous. Flowers chestnut-brown, 12–17 mm long, 2.8–4 mm wide, pedicel 1–3.5 mm long. Tepals chestnut-brown, linear-lanceolate, outer ones slightly longer than inner ones, 5.5–7 mm long, 1.2–2.2 mm wide. Stamens 6, shorter than tepals, 3.6–5 mm long; filaments 1.3–1.5 mm long, shorter than anthers; anthers orange-yellow, linear-ellipsoid, 2.3–3.5 mm long. Pistil 0.9–1.4 cm long, 1–1.2 mm wide; stigmas 4–8 mm long; style 3–4 mm long. Capsule chestnut-brown, oblong, slightly longer than tepals, 7–9 mm long, 2–2. mm wide, cuspidate, cross section rounded. Seeds ellipsoid, 0.6–0.7 mm long, appendages 0.6–0.8 mm long.

Distr. Nepal, Sikkim, Bhutan, Assam, China (Xizang, Qinghai, Yunnan, Sichuan).

Juncus pseudocastaneus was described as *J. sikkimensis* var. *pseudocastaneus* Lingelsh. and in a recent taxonomical treatment (Wu & Clemants 2000) it is regarded as a synonym of *J. sikkimensis* Hook. f. However, I considered it to be an independent species because *J. pseudocastaneus* is characterized by stoloniferous creeping rhizomes, 2–4 basal leaves to each culm, and the rounded auricles. It grows in marshy places by streams or bogs from elevations of 3500 to 4920 m.

50. *Juncus rohtangensis* Goel & Aswal in Indian J. Forest. 10: 262, f. 1–8 (1987). Miyamoto in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 239 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 111, f. 69C–D (2002). Miyamoto and Ohba in J. Jap. Bot.

77: 31, f. 5 (2002); in J. Jap. Bot. 78: 156 (2003). [Colour plate 7d; Plate 49; Fig. 53]

Types: India; Himachal Pradesh, Lahaul Spiti Distr., Lahaul Valley, Rohtang Pass, 4000 m (B. S. Aswal 10554E, 27 Jul. 1979, CDRI-holotype, not seen, CAL-isotype).

Juncus sikkimensis var. *monocephalus* Hook. f., [Fl. Brit. Ind. 6: 399 (1892), nom. nud.] Icon. Pl. 23: t. 2235 (1894). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Wu et al., Index Fl. Yunnan. 2: 2084 (1984). Types: Sikkim; Lachen, 11000–12000 ft. (Hooker s. n., 20 Jun. 1849, K-holotype, A, B-isotypes).

Juncus duthiei (C. B. Clarke) Noltie in Edinburgh J. Bot. 51: 134 (1994), pro part.

Juncus nigroviolaceus K. F. Wu in Acta Phytotax. Sin. 32: 448, f. 2, 10–12 (1994). Wu, Fl. Reipubl. Popul. Sin. 13(3): 169 (1879). Wu and Clemants in Wu and Raven, Fl. China 24: 50 (2000). Types: China; Xizang, Cona, 4300 m (C. Y. Wu & C. K. Chen 75-612, 18 Jul. 1975, HNWP-holotype, not seen, KUN-isotype).

Juncus uniflorus auct. non W. W. Sm.: Miyamoto and H. Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992), pro part. Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999).

Perennial, loosely caespitose, 1–28 cm tall. Rhizomes stoloniferous, horizontally creeping, 0.6–1.8 mm thick. Culms erect, grass-green, terete, 0.3–0.8 mm in diam., with several longitudinal striae. Cataphylls 1 or 2 to each culm, embracing at base of culm, pale brown to stramineous, 0.5–2 cm long. Leaves grass-green, terete, cross section of blade oval, auricles rounded; basal leaf usually one to each culm, 0.8–9 cm long including sheath, 0.4–0.75 mm wide, sheath 2–10 mm long; leaves on sterile shoots 1–18 cm long including sheath, 0.25–0.70 mm wide, sheath 2–10 mm long; cauline leaves absent. Inflorescence solitary, pseudolateral, 0.2–2.8 cm long, 0.4–0.8 mm wide, flowers 1–3. Lowest bract grass-green, longer than inflorescence, 0.4–2.8 cm long, 1–2 mm wide; floral bract lanceolate, 0.1–1 cm long, 0.5–1.2 mm wide; sheathing bract absent. Flowers 0.3–1.4 cm long, 1.2–2.5 mm wide, sessile if solitary, pedicel 0.6–2.5 mm long. Tepals chestnut-brown, ovate-lanceolate, outer ones and inner ones equal in length, 1.8–3.9 mm long, 0.5–1.2 mm wide. Stamens 6, shorter than tepals, 1.0–3.1 mm long; filaments 0.17–0.5 mm long, shorter than anthers; anthers leather-yellow, linear-ellipsoid, 0.83–2.6 mm long. Pistil 0.5–1.5 cm long, 0.4–0.7 mm wide; stigmas red, 0.9–4.0 mm; style 0.8–4.0 mm long. Capsule ovoid, 3–4.5 mm long, 1.5–2.0 mm wide, mucronate, cross section rounded. Seeds ellipsoid, 0.5–0.9 mm long, appendages very short, 0.05–0.1 mm long.

Distr. India (Himachal Pradesh), Nepal, Sikkim, Bhutan, China (Xizang).

Juncus rohtangensis is very variable in the size. Dwarf individuals are similar to *J. uniflorus* W. W. Sm. but differ in having the anthers five times longer than the filaments, the lowest grass-green bract exceeding the flowers, and the chestnut-brown tepals. Larger ones are similar to *J. sikkimensis* Hook. f. and *J. pseudocastaneus* Sam. but differ in lacking the sheath-like bracts on the peduncle. *Juncus sikkimensis* var. *monocephalus* Hook. f. described from Sikkim is conspecific with *J. rohtangensis*. It grows on alpine scree slopes and along streams above 3500 m.

51. *Juncus rostocarpus* Miyam., nom. nov. [Colour plate 1c, d; Plate 50, Fig. 54]

Juncus amplifolius A. Camus var. *pumilus* A. Camus in Notul. Syst. (Paris) 1(10): 282 (1910). Samuelsson in Acta Horti Gothob. 3: 70 (1927). Wu in Acta Phytotax. Sin. 32: 465 (1994); Fl. Reipubl. Popul. Sin. 13(3): 225 (1997).

Types: China; Yunnan, ravins sur le Tsang-chan, 3500 m (P. J. M. Delavay 2412, 26 Jun. 1886, P-lectotype, designated here). Tibet, Tatsien-lou (J. A. Soulié 1154, Jul. 1894, P-syntype).

Perennial, densely caespitose, 20–40 cm tall. Rhizomes densely short branched and clustered. Culms ascending, grass-green, terete, 0.7–1.2 mm thick, with several longitudinal ridges, cross section compressed oval. Cataphylls 2 or 3 to each culm or absent, loosely embracing at base of culm, light brown to stramineous, 2–3 cm long. Leaves grass leaf-like, blade margin entire, sheathing at base light brown to reddish, cross section of blade flattened, with several ridges on abaxial side, auricles absent; basal and subbasal leaves 2 or 3 to each culm, 8–14 cm long including sheath, 2–3 mm wide, sheath 2–5 cm long; cauline leaves 1 or 2 to each culm, shorter than culm, 5–10 cm long including sheath, 2–3 mm wide, sheath 2.5–5 cm long. Inflorescence terminal, branched, flower heads 3–6, 0.5–1.5 cm in diam., flowers 2–8, chestnut-brown, peduncle 0.4–5 cm long. Lowest bract grass-green, leaf-like, linear, slightly longer than or as long as inflorescence, 2–5 cm long, with several ridges on abaxial side, cross section flattened; floral bract lanceolate to ovate, 1.5–4 mm long, 1–1.5 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 0.5–1 cm long, membranaceous. Flowers 11–15 mm long, 2–2.5 mm wide, pedicel 1–1.5 mm long. Tepals chestnut-brown, lanceolate to linear-lanceolate, outer ones slightly shorter than inner ones, 4–6 mm long, 0.8–1.2 mm wide. Stamens 6, slightly shorter than tepals, 3–5.5 mm long; filaments 1.4–2.6 mm long, slightly shorter than or as long as anthers; anthers yellow, linear-ellipsoid, 1.5–2.8 mm long. Pistil 0.8–1 cm long, 1–1.2 mm wide; stigmas 2.5–4 mm long; style 2.5–4 mm long. Capsule chestnut-brown to brown, oblong, longer than tepals, 6–7 mm long, 2.5–3 mm wide, cuspidate, cross section rounded. Seeds ellipsoid, 0.5–0.6 mm long, appendages 1.5–1.8 mm long.

Distr. Nepal, Sikkim, Bhutan, Myanmar, China (Xizang, Yunnan).

Juncus rostratus is a new name for *J. amplifolius* A. Camus var. *pumilus* A. Camus. Camus (1910) described this based on two specimens collected from Kanding in Sichuan and Tali in Yunnan as a variety of *J. amplifolius*. *Juncus rostratus* is most similar to *J. amplifolius* and *J. nepalicus* Miyam. & H. Ohba but differs from *J. amplifolius* in having the densely branched, nonstoloniferous rhizomes, the long style as long as the stigmas, and the red stigmas in flowering, and from *J. nepalicus* in having the filaments same as long as the anthers. It grows on exposed slopes on edges of *Abies* forests from elevations of 3100 to 3850 m.

52. *Juncus setchuensis* Buchenau in Bot. Jahrb. Syst. **29**: 238 (1900); in Bot. Jahrb. Syst. **36** (Beibl. 82): 17 (1905). Brown in J. Linn. Soc., Bot. **36**: 166 (1903). Samuelsson in Acta Horti Gothob. **3**: 68 (1927); in Hand.-Mazz., Symb. Sin. **7**: 1229 (1936). Wu et al., Index Fl. Yunnan. **2**: 2084 (1984). Lu and Zhang in Fl. Xizang. **5**: 506, f. 279 (1987). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. **2**: 2417 (1994). Wu in Acta Phytotax. Sin. **32**: 443 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 160, f. 35, 9–12 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000). Wu and Clemants in Wu and Raven, Fl. China **24**: 48 (2000). Li et al., Fl. Gaoligong Mts.: 1123 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 100 (2002). Bao in Wu and Wu, Fl. Yunnanica **15**: 535, f. 110, 7–13 (2003).

[Plate 51; Fig. 55]

Type: China; Setchuen [Sichuan], Nanchuan, Shihtru Kon, Chinfu Shan (C. Bock & A. von Rosthorn 78, 7 Jul. 1891, O-holotype, photo).

Juncus dulongjiangensis V. Novikov in Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol. **103**(4): 69 (1998). Type: China; Yunnan, Gonshan, Dulongjian, 2800 m (Dulongjian expedition team 753, 22 Nov. 1990, KUN-holotype).

Perennial, densely caespitose, 30–60 cm tall. Rhizomes horizontally short creeping, culms arising in densely crowded rows. Culms erect, grass-green, terete, 0.8–1.5 mm in diam., with several longitudinal ridges, pith continuous. Cataphylls 2 or 3 to each culm, closely embracing at base of culm, brown at base, stramineous upward, 1–8 cm long. Leaves only cataphylls sheathing culm. Inflorescence pseudolateral, loosely branched, flowers many. Lowest bract appearing as a continuation of culm, 6–16 cm long. Bracteoles 2, ovate to ovate-lanceolate, 0.5–0.8 mm long. Flowers 3–3.5 mm long, 1.2–1.5 mm wide. Tepals light brown, lanceolate, outer ones longer than inner ones, 2.5–3 mm long, 0.8–1.2 mm wide. Stamens 3, shorter than tepals, 2.2–2.5 mm long; filaments 1.6–1.7 mm long, twice as long as anthers; anthers yellow, linear-ellipsoid, 0.6–0.8 mm long. Pistil 2–3 mm long, 1–1.2 mm wide; stigmas 0.6–0.8 mm long; style 0.2–0.3 mm long. Capsule brown, obovoid, as long as tepals, 2.7–3 mm long, 2.2–2.5 mm wide, obtuse, mucronate, cross section rounded-trigonous, 3-septate. Seeds brown, ovoid, 0.4–0.5 mm long, appendages absent.

Distr. Sikkim, China (Xizang, Yunnan, Sichuan, Ghuizhou, Hubei).

Juncus setchuensis is widely distributed in East Asia from Sikkim to Japan. It grows in exposed wet places along roads or ditches from elevations of 400 to 2950 m in the Sino-Himalaya. This species is similar to *J. effuses* L. but differs in having the culms with several longitudinal ridges and the obovoid capsule.

53. *Juncus sherei* Miyam. & H. Ohba in J. Jap. Bot. **72**: 293, f. 1 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 105 (2000); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 240 (2000). Press et al., Ann. Check Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 104 (2002). [Colour plate 8b; Plate 52; Fig. 56]

Type: Nepal; Sagarmatha Zone, Solukhumbu Distr., Gnaula–Pike, 3300 m (F. Miyamoto et al. 9580049, 22 Jul. 1995, TI-holotype).

Perennial, caespitose, 6–19 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green terete, 0.3–0.5 mm thick, smooth, cross section rounded. Cataphylls 1 or 2 to each culm, stramineous, 5–25 mm long. Leaves terete, grooved on both sides, cross section oval, auricles rounded; basal leaves 1 or 2 to each culm, 2–15 cm long including sheath, 0.15–0.4 mm wide, sheath 2–4 cm long; cauline leaves absent, sometimes present, solitary linear, shorter than inflorescence, 1.5–3.0 cm long. Inflorescence with a single flower head, hemispherical, 0.7–1.5 cm in diam., flowers 5–15, cream-white. Lowest bract brownish green, acicular-lanceolate, longer than inflorescence, 0.5–1.5 cm long, 1–2 mm wide; floral bract brown, lanceolate, 2–4 mm long, 0.5–2 mm wide, scarious; sheathing bract absent. Flowers 4–8 mm long, 6–12 mm wide, pedicel 0.3–0.5 mm long. Tepals ivory-white, lanceolate, outer ones and inner ones equal in length, 3–6 mm long, 1–1.7 mm wide. Stamens 6, longer than tepals, 5.8–8.8 mm long; filaments 4–6.1 mm long, twice as long as anthers; anthers white, linear-ellipsoid, 1.8–2.5 mm long. Pistil 3–

5 mm long, 0.8–1 mm wide; stigmas 0.6–0.8 mm long; style 1.3–1.8 mm long. Capsule obovoid, 3–4 mm long, 1–1.5 mm wide, cuspidate, cross section trigonous. Seeds ellipsoid, 0.5–0.7 mm long, appendages very short, 0.05 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Yunnan).

Juncus sherei is similar to *J. benghalensis* Kunth but differs in having the leaves with a single groove on both sides, the shorter anthers (1.8–2.5 mm long), and no stolons. The leaves of *J. benghalensis* has a single groove on the adaxial side only. *Juncus gonggae* Miyam. & H. Ohba and *J. brachystigma* Sam. differ from *J. sherei* in having the many-grooved culms and leaves. The presence and absence, and the number of grooves on culms and leaves are considered to be constant and stable in *Juncus*. *Juncus sherei* was found on mossy rocks in *Rhododendron* forests with *J. benghalensis* or sometimes on exposed grassland slopes from elevations of 3000 to 4500 m.

54. *Juncus sikkimensis* Hook. f., [Fl. Brit. Ind. 6: 399 (1892), nom. nud.] Icon. Pl. 23: t. 2235 (1894). Buchenau in Engler, Pflanzenr. (iv. 36) 25: 234 (1906). Camus in Notul. Syst. (Paris) 1(10): 283 (1910). Samuelsson in Acta Horti Gothob. 3: 71 (1927); in Hand.-Mazz., Symb. Sin. 7: 1232 (1936). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Wu et al., Index Fl. Yunnan. 2: 2084 (1984). Lu and Zhang in Fl. Xizang. 5: 522, f. 292 (1987). Noltie in Edinburgh J. Bot. 51: 134 (1994); Fl. Bhutan 3(1): 256 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2422 (1994). Wu in Acta Phytotax. Sin. 32: 461 (1994); Fl. Reipubl. Popul. Sin. 13(3): 217, f. 52, 8–11(1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999). Wu and Clemants in Wu and Raven, Fl. China 24: 60 (2000). Li et al., Fl. Gaoligong Mts.: 1123 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 126 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 557 (2003). [Colour plate 8f; Plate 53; Fig. 57]

Types: Sikkim; 12000–14000 ft. (J. D. Hooker s. n., K-holotype, W-isotype).

Perennial, loosely caespitose, 20–35 cm tall. Rhizomes horizontally short creeping, 2–3 mm in diam. Culms erect, grass-green, terete, 0.6–1 mm in diam., smooth, cross section rounded. Cataphylls 3–5 to each culm, embracing at base of culm, reddish brown, shining, 1–4 cm long. Leaves terete, with a groove on both sides, cross section of blade oval, auricles very short, sheathing at base light brown; basal leaves absent, subbasal leaf one to each culm, 11–17 cm long including sheath, 0.5–0.9 mm wide, sheath 2.5–7 cm long; cauline leaves absent. Inflorescence terminal, pseudolateral, flower heads 1 or 2, 0.8–1.3 cm in diam., flowers 3–7, blackish brown, shining, peduncle 0.3–3 cm long. Lowest bract chestnut-brown, linear, apical part terete, basal part flattened, as long as inflorescence, 2.5–4 cm long; floral bract linear-lanceolate to oblong-lanceolate, 5–15 mm long, 1–2 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 5–7 mm long, membranaceous. Flowers blackish brown, 8–9 mm long, 2–3 mm wide, pedicel 0.5–2 mm long. Tepals blackish brown, linear-lanceolate, outer ones slightly longer than inner ones, 4.5–5 mm long, 1–1.2 mm wide. Stamens 6, shorter than tepals, 2.3–3 mm long; filaments 0.8–1 mm long; anthers orange-yellow, linear-ellipsoid, 1.5–2 mm long, twice longer than filaments. Pistil 6–7 mm long, 1–1.2 mm wide; stigmas 2–3 mm long; style 2–2.5 mm long. Capsule chestnut-brown, oblong, slightly shorter than tepals, 5.5–6 mm long, 1.5–1.8 mm wide, cuspidate, cross section trigonous. Seeds unknown.

Distr. Nepal, Sikkim, Bhutan, China (Xizang, Yunnan).

Juncus sikkimensis is similar to *J. pseudocastaneus* (Lingelsh.) Sam. but differs in having the short creeping rhizomes, the leaves with a groove on both sides, and the truncate auricles. It grows in marshy places along streams or bogs from elevations of 3000 to 4500 m.

55. *Juncus sphacelatus* Decne. in Jacquem., Voy. Inde 4: 172, t. 172 (1835). Buchenau in Bot. Jahrb. Syst. 1: 111 (1880); in Bot. Jahrb. Syst. 6: 225 (1885); in Bot. Jahrb. Syst. 12: 404 (1890); in Engler, Pflanzenr. (iv. 36) 25: 233, f. 110 (1906). Hook. f., Fl. Brit. Ind. 6: 398 (1892). Samuelsson in Acta Horti Gothob. 3: 71 (1927); in Hand.-Mazz., Symb. Sin. 7: 1230 (1936). Satake in Hara, Fl. E. Himal.: 403 (1966); in Ohashi, Fl. E. Himal. 3: 131 (1975). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. 3: 96 (1967). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Jafri in Fl. Pakistan 138: 12 (1981). Wu et al., Index Fl. Yunnan. 2: 2084 (1984). Lu and Zhang in Fl. Xizang. 5: 519, f. 289 (1987). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992). Noltie, Fl. Bhutan 3(1): 255, f. 24w-x (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2423 (1994). Wu in Acta Phytotax. Sin. 32: 466 (1994); Fl. Reipubl. Popul. Sin. 13(3): 231, f. 56, 8-11 (1997). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 183 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 240 (2000); in J. Jap. Bot. 78: 156 (2003). Wu and Clemants in Wu and Raven, Fl. China 24: 64 (2000). Li et al., Fl. Gaoligong Mts.: 1123 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 124 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 561 (2003). [Colour plate 8c; Plate 54; Fig. 58]

Types: India (V. Jacquemont s. n., P, K-syntypes).

Perennial, loosely caespitose, 6-62 cm tall. Rhizomes stoloniferous, horizontally creeping. Culms erect, grass-green, terete, 0.6-2.5 mm thick, with several longitudinal striae, cross section oval. Cataphylls 1 or 2 to each culm, loosely embracing at base of culm, stramineous, 0.8-5 cm long. Leaves terete, with a groove on adaxial side, cross section of blade U-shaped, sheathing at base light brown to stramineous, auricles rounded, elongate; basal and subbasal leaves 1 or 2 to each culm, 2-32 cm long including sheath, 0.6-0.8 mm wide, sheath 0.5-20 cm long; cauline leaves absent. Inflorescence terminal, branched, flower heads 1-3(-4), 0.15-1.5 cm in diam., flowers 1-8, chestnut-brown to brown, peduncle 0.1-6.5 cm long. Lowest bract grass-green, linear, apical part terete, basal part flattened, longer than inflorescence, 1.3-14 cm long, margin chestnut-brown; floral bract lanceolate to ovate, 5-8 mm long, 0.9-1.2 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 1-1.5 cm long, membranaceous. Flowers chestnut-brown, 12-16 mm long, 2-2.5 mm wide, pedicel 2.5-5 mm long. Tepals chestnut-brown, linear-lanceolate, outer ones longer than inner ones, 6.5-9 mm long, 0.8-1.3 mm wide. Stamens 6, shorter than tepals, 3.5-5 mm long; filaments 2.7-3.8 mm long, 3 times as long as anthers; anthers yellow, linear-ellipsoid, 0.8-1.2 mm long. Pistil 6-9 mm long, 1-1.3 mm wide; stigmas 2-3 mm long; style 0.5-1 mm long. Capsule chestnut-brown, obovoid, longer than tepals, 0.8-1 cm long, 1.9-2.5 mm wide, mucronate, cross section rounded. Seeds ellipsoid, 0.6-0.8 mm long, appendages 1-1.5 mm long.

Distr. India (Punjab, Himachal Pradesh, Uttar Pradesh, Kumaon), Nepal, Sikkim, Bhutan, China (Xizang, Yunnan, Sichuan, Shaanxi).

Juncus spacelatus is similar to *J. himalensis* Klotzsch but differs in having the elongate auricles and the linear-lanceolate tepals much longer than the stamens. It grows in marshy places along streams or bogs from elevations of 3700 to 4600 m.

56. *Juncus spumosus* Noltie in Edinburgh J. Bot. **51**: 139, f. 2A–H (1994); Fl. Bhutan **3**(1): 261 (1994). Wu and Clemants in Wu and Raven, Fl. China **24**: 62 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 126, f. 62A–H (2002).

[Colour plate 8d, e; Plate 55; Fig. 59]

Types: Bhutan; Tongsa Distr. west side of Yuto La, 3350 m (H. J. Noltie 122, 8 Aug. 1991, E-holotype, photo, K-isotype).

Juncus biluoshanensis K. F. Wu in Acta Phytotax. Sin. **32**: 463, f. 6, 8–11 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 223, f. 53, 8–11 (1997). Miyamoto in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, **26**: 102 (2000). Bao in Wu and Wu, Fl. Yunnanica **15**: 557 (2003). Type: China; Yunnan, Bijiang, Biluo snowy mountain, 3900 m (S. K. Wu 8703, 10 Sept. 1964, KUN-holotype).

Perennial, densely caespitose, 20–90 cm tall. Rhizomes densely short branched and clustered. Culms ascending, grass-green, terete, 2–2.8 mm in diam., with several longitudinal striae, cross section rounded. Cataphylls 1 or 2 to each culm, loosely embracing at base of culm, brown to reddish brown, 2–3 cm long. Leaves grass leaf-like, blade margin entire, sheathing at base light brown to reddish, cross section of blade flattened, with several ridges on abaxial side, auricles absent; basal and subbasal leaves 2 or 3 to each culm, 5–27 cm long including sheath, 5–8 mm wide, sheath 2–5 cm long; cauline leaves 1–3 to each culm, shorter than culm, 5–20 cm long including sheath, 3–5 mm wide, sheath 2–5 cm long. Inflorescence terminal, branched, hemispherical, flower heads 10–30, 0.5–1 cm in diam., flowers 2–8, chestnut-brown, peduncle 0.5–6 cm long. Lowest bract grass leaf-like, grass-green, linear, slightly longer than or as long as inflorescence, 5–14 cm long, with several ridges on abaxial side, cross section flattened; floral bract lanceolate to ovate, 1.8–2 mm long, 0.6–0.8 mm wide, scarious; sheathing bract on peduncle brown, lanceolate, 1–2 cm long, membranaceous. Flowers cream-white, 5–6 mm long, 1.8–2 mm wide, pedicel 0.8–1 mm long. Tepals light brown, ovate to oblong, outer ones slightly longer than inner ones, 3–3.5 mm long, 0.8–1.3 mm wide. Stamens 6, longer than tepals, 4.5–5 mm long; filaments 3.8–4.1 mm long, 5 times as long as anthers; anthers yellow, linear-ellipsoid, 0.7–0.9 mm long. Pistil 4.5–5.5 mm long, 1.2–1.8 mm wide; stigmas 0.5–0.8 mm long; style 0.3–0.5 mm long. Capsule brown, ovoid, longer than tepals, 5–6 mm long, 2.0–2.2 mm wide, acute, cross section rounded. Seeds ellipsoid, 0.5–0.6 mm long, appendages 1–1.4 mm long.

Distr. Bhutan, China (Yunnan).

Juncus spumosus is similar to *J. amplifolius* A. Camus and *J. rostratus* Miyam. but differs in having the bulliform cells on the abaxial side of leaves, the filaments five times as long as the anthers, the shorter stigmas (0.5–0.8 mm long), and the shorter style (0.3–0.5 mm long); *J. amplifolius* (stigmas 4–7 mm long, style 1.5–2 mm long) and *J. rostratus* (stigmas 2.5–4 mm long, style 2.5–4 mm long). It grows on exposed scree slopes along road sides from elevations of 2600 to 3900 m.

57. *Juncus thomsonii* Buchenau in Bot. Zeitung (Berlin) **25**: 148 (1867); in Bot. Jahrb.

Syst. 6: 214 (1885); in Bot. Jahrb. Syst. 12: 390 (1890); in Engler, Pflanzenr. (iv. 36) 25: 224 (1906). Brown in J. Linn. Soc., Bot. 36: 166 (1903). Samuelsson in Acta Horti Gothob. 3: 69 (1927); in Hand.-Mazz., Symb. Sin. 7: 1237 (1936). Krecetovicz and Goncarpv in Komarov, Fl. USSR 3: 523, t. 30, f. 7 (1935). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. 3: 96, t. 8, f. 6 (1967). Satake in J. Jap. Bot. 43: 382 (1968); in Ohashi, Fl. E. Himal. 3: 131 (1975). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Jafri in Fl. Pakistan 138: 8, f. 1e–g (1981). Wu et al., Index Fl. Yunnan. 2: 2084 (1984). Lu and Zhang in Fl. Xizang. 5: 508, f. 282 (1987). Noltie, Fl. Bhutan 3(1): 268 (1994). Wu in Acta Phytotax. Sin. 32: 459 (1994); Fl. Reipubl. Popul. Sin. 13(3): 198, f. 46, 5–7 (1997). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2418 (1994). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 183 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 240 (2000); in J. Jap. Bot. 78: 156 (2003). Wu and Clemants in Wu and Raven, Fl. China 24: 56 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 96 (2002). Bao in Wu and Wu, Fl. Yunnanica 15: 545 (2003). [Colour plate 9a; Plate 56; Fig. 60]

Juncus leucomelus Royle var. *thomsonii* (Buchenau) Buchenau in Nachr. Königl. Ges. Wiss. Göttingen Geschäftl. Mitt. 13: 250 (1869).

Type: Himalaya Bor. Occ.; 10000–15000 ft. (T. Thomson s. n., W-syntype).

Juncus thomsonii var. *fulvus* K. F. Wu in Acta Phytotax. Sin. 32: 459 (1994); Fl. Reipubl. Popul. Sin. 13(3): 199 (1997). Type: Tibet; Tumengela coal mine, 5000 m (J. X. Yang 1917, 8 Jul. 1963, KUN-holotype).

Perennial, caespitose, 5–30 cm tall. Rhizomes short creeping. Culms erect, terete, 0.3–0.9 mm in diam., with several shallow grooves, cross section rounded. Cataphylls 1 or 2 to each culm or absent, light brown to brown, 5–8 mm long. Leaves terete, cross section of blade rounded, auricles rounded; basal leaves 2 or 3 to each culm, 2–8 cm long including sheath, 0.2–0.4 mm wide, sheath 1–6 cm long; cauline leaves absent. Inflorescence with a single flower head, hemispherical, 0.5–1.2 mm in diam., flowers cream-white, 3–10. Lowest bract brown to chestnut-brown, lanceolate to ovate-lanceolate, shorter than inflorescence, 3–8 mm long, 2–5 mm wide, scarious; floral bract lanceolate to ovate, 2–7 mm long, 1.5–4 mm wide, scarious; sheathing bract absent. Flowers 5–8 mm long, 0.5–1.5 mm wide, pedicel 0.5–2 mm long. Tepals ivory-white, elliptic-lanceolate, outer ones slightly longer than inner ones, 2–3 mm long, 0.7–0.9 mm wide. Stamens 6, longer than tepals, 4–6 mm long; filaments 3–4.2 mm long, 2–2.3 times as long as anthers; anthers white, linear-ellipsoid, 1.5–1.8 mm long. Pistil 3–5 mm long, 0.7–1 mm wide; stigmas 1–1.5 mm long; style white, 0.5–0.8 mm long. Capsule chestnut-brown, obovoid, 5–7 mm long, 2–2.5 mm wide, mucronate, cross section trigonous. Seeds 0.6–0.8 mm long, 0.2–0.3 mm wide, appendages 0.8–1.1 mm long.

Distr. Pakistan, Kashmir, India (Punjab, Himachal Pradesh, Kumaon), Nepal, Sikkim, Bhutan, China (Xizang, Qinghai, Gansu, Yunnan, Sichuan, Shaanxi).

Juncus thomsonii is similar to *J. perpusillus* Sam. but differs in having the anthers (1.5–1.8 mm long) half of the filaments in length; *J. perpusillus* (the anthers 1–1.4 mm long). It grows in marshy places of bogs or along rivers from elevations of 3000 to 4920 m.

58. *Juncus tobdeniorum* Noltie in Edinburgh J. Bot. 55: 42, f. 1A, 2A–D (1998).

Kirschner et al., Juncaceae 3, Fl. World 8: 102 (2002).

[Plate 57; Fig. 61]

Types: Sikkim; North District, Yakche, N. of Lachung, 27°43'17"N, 88°45'02"E, 3105 m (D. G. Long & H. J. Noltie 209, 14 Jul. 1996, E-holotype, photo, CAL, PE, TI-isotypes).

Perennial, densely caespitose, 16–23 cm tall. Rhizomes horizontally short creeping, culms arising in densely crowded rows. Culms erect, grass-green, terete, 0.5–0.8 mm in diam., with several longitudinal ridges, pith interrupted spongy. Cataphylls 2 or 3 to each culm, closely embracing at base of culm, stramineous apically, brown at base, 0.3–4 cm long. Leaves only cataphylls sheathing culm. Inflorescence pseudolateral, loosely branched, flowers 3–25. Lowest bract appearing as a continuation of culm, 3–7 cm long. Bracteoles 2, ovate to ovate-lanceolate, 0.4–1 mm long. Flowers 2–2.8 mm long, 1–1.3 mm wide. Tepals light brown, lanceolate to linear-lanceolate, outer ones as long as inner ones, 2–2.3 mm long, 0.5–0.7 mm wide. Stamens 3, shorter than tepals, 1–1.2 mm long; filaments 0.7–0.8 mm long, twice as long as anthers; anthers yellow, linear-ellipsoid, 0.3–0.4 mm long. Pistil 1.2–1.5 mm long, 0.5–0.8 mm wide; stigmas 0.2–0.3 mm long; style 0.1–0.2 mm long. Capsule brown, obovoid, shorter than tepals, 1.2–1.5 mm long, 0.7–0.8 mm wide, cross section trigonous, 3-septate. Seeds brown, ovoid, 0.4–0.5 mm long, appendages absent.

Distr. Sikkim.

Juncus tobdeniorum is most similar to *J. setchuensis* Buchenau but differs in having the culms with the interrupted spongy pith and the short stigma (0.2–0.3 mm long).

59. *Juncus trachyphyllus* Miyam. & H. Ohba in J. Jap. Bot. 72: 164, f. 2 (1999); in Akiyama et al., Bull. Natn. Sci. Mus., Tokyo, B, 25: 183 (1999); in J. Jap. Bot. 78: 154 (2003). Kirschner et al., Juncaceae 2, Fl. World 7: 106, f. 71A–M (2002).

[Colour plate 9c; Plate 58; Fig. 62]

Types: China; Sichuan, Docheng District, Mt. Gonggashan, 4300 m (S. Wu et al. 1540, 21 Aug. 1996, KUN-holotype, TI-isotype).

Perennial, caespitose, 7–20 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.4–0.8 mm in diam., scabrous, cross section oval. Cataphylls 2–4 to each culm, stramineous, 1.0–3.5 cm long. Leaves grass leaf-like, cross section of blade U-shaped, auricles very short; basal leaves 1 or 2 to each culm, 4–10 cm long including sheath, 0.4–1 mm wide, sheath grass-green, 1.5–4 cm long; cauline leaf one to each culm, terete, linear, shorter than inflorescence, 1.5–7.0 cm long, with several grooves. Inflorescence with a single flower head, rarely 2, hemispherical, 0.8–1.8 cm in diam., flowers 5–15, ivory-white, peduncle of lateral head 1.0–1.5 cm long. Lowest bract linear-lanceolate, longer than or as long as inflorescence, 0.8–1.2 cm long, 2.0–3.5 mm wide; floral bract light brown, lanceolate-ovate, 4–7 mm long, 1.5–3.0 mm wide, scarious; sheathing bract on peduncle lanceolate, 3–4 mm long, membranaceous. Flowers 7–10 mm long, 0.8–1.5 mm wide, pedicel 0.8–1.0 mm long. Tepals white, lanceolate, outer ones slightly shorter than inner ones, 4–5 mm long, 0.9–1.0 mm wide, inner ones 4.5–5.5 mm long, 1.0–1.4 mm wide. Stamens 6, longer than tepals, 9–10 mm long; filaments 6.5–7.2 mm long, 2.6 times as long as anthers; anthers white, linear, 2.5–2.8 mm long. Pistil 7–8 mm long, 1.5–2 mm wide; stigmas 0.6–0.8 mm long; style 2.0–2.5 mm long. Capsule ovoid, 4.4–4.8 mm long, 1.2–1.5 mm wide, mucronate, cross section trigonous. Seeds

ellipsoid, 1.5–1.8 mm long, appendages very short, 0.05 mm long.

Distr. China (Sichuan).

Juncus trachyphyllus is similar to *J. allioides* Franch. and *J. glaucoturgidus* Noltie but differs in having the grooved basal leaves, the U-shaped cross section of the leaf blade, the scabrid leaves, and the scabrid culms. It grows on exposed scree slopes with *J. kingii* Rendle and *J. gonggae* Miyam. & H. Ohba from elevations of 3900 to 4300 m. *Juncus trachyphyllus* is found only at the foot of the Mt. Gongga shan in Sichuan, China.

60. *Juncus trichophyllus* W. W. Sm. in Rec. Bot. Surv. India **6**: 103 (1914). Noltie in Edinburgh J. Bot. **51**: 131 (1994); Fl. Bhutan **3**(1): 266, f. 25f (1994). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 241 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 96 (2002). [Colour plate 9b; Plate 59; Fig. 63]

Types: Sikkim, Changu, 13000 ft. (W. W. Smith 3502, 16 Jul. 1910, CAL, K-syntypes); without precise locality (King's Coll. s. n., in 1889, CAL, K-syntypes).

Perennial, caespitose, 3–11 cm tall. Rhizomes horizontally short creeping. Culms erect, terete, 0.25–0.35 mm in diam., smooth, cross section rounded. Cataphylls 1 or 2 to each culm, brown, 3–6 mm long. Leaves grass-green, terete, cross section of blade rounded, auricles rounded; basal leaf absent or one to each culm, 0.5–1 cm long; cauline leaves 2 or 3 to each culm, linear, 2–5 mm long, with bulbils, auricles oblique-truncate, shorter than culm. Inflorescence with a single flower head, hemispherical, 0.6–1 cm in diam., flowers 3–8, yellowish white. Lowest bract brown, ovate-lanceolate, shorter than inflorescence, 3–5 mm long, 1–1.5 mm wide, scarious; floral bract pale brown, lanceolate, 3–4 mm long, 0.8–1 mm wide, scarious; sheathing bract absent. Flowers 4–6 mm long, 0.7–0.9 mm wide, pedicel 0.8–1.3 mm long. Tepals ivory-white, ovate-lanceolate to ovate, outer ones and inner ones equal in length, 2–2.5 mm long, 0.7–0.9 mm wide. Stamens 6, longer than tepals, 2.1–3.2 mm long; filaments 1.7–2.2 mm long, twice as long as anthers: anthers white, linear-ellipsoid, 0.8–1 mm long. Pistil white, 2–3 mm long, 0.7–1 mm wide; stigmas 0.2–0.3 mm long; style 0.6–0.8 mm long. Capsule brown, obovoid, 2.5–3 mm long, 1.3–1.5 mm wide, cuspidate, cross section trigonous. Seeds unknown.

Distr. Nepal, Sikkim, Bhutan.

Juncus trichophyllus is characterized by the axillary bulbils on the cauline leaves and similar to *J. brachystigma* Sam. in the floral morphology, but *J. brachystigma* has the culm and leaf surface with several longitudinal ridges and no cauline leaf. *Juncus trichophyllus* is restricted in Nepal, Sikkim, and Bhutan. It grows on mossy rocks from elevations of 3650 to 4300 m.

61. *Juncus triglumis* L., Sp. Pl.: 328 (1753). Buchenau in Bot. Jahrb. Syst. **1**: 111 (1880); in Bot. Jahrb. Syst. **6**: 213 (1885); in Bot. Jahrb. Syst. **12**: 388 (1890); in Engler, Pflanzenr. (iv. 36) **25**: 224 (1906). Hook. f., Fl. Brit. Ind. **6**: 396 (1892). Samuelsson in Acta Horti Gothob. **3**: 69 (1927). Krecetovicz and Goncarpv in Komarov, Fl. USSR **3**: 522, t. 30, f. 13 (1935). Satake in Hara, Fl. E. Himal.: 404 (1966); in Hara, Fl. E. Himal. **2**: 164 (1970). Egorova in Akad. Nauk SSSR Bot. Inst. Komarova, Rast. Tsentral. Azii, Fasc. **3**: 97, t. 8, f. 7 (1967). Hara et al., Enum. Flow. Pl. Nepal **1**: 85 (1978). Jafri in Fl. Pakistan **138**: 6 (1981). Lu and Zhang in Fl. Xizang. **5**: 508 (1987). Miyamoto and Ohba

in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992). Noltie, Fl. Bhutan 3(1): 269 (1994). Zhang and Lu in Wang et al., Vasc. Pl. Hengduan Mts. 2: 2418 (1994). Wu in Acta Phytotax. Sin. 32: 459 (1994); Fl. Reipubl. Popul. Sin. 13(3): 196, f. 46, 1–4 (1997). Wu and Clemants in Wu and Raven, Fl. China 24: 55 (2000). Miyamoto in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 241 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World 7: 97, f. 67 (2002).

[Colour plate 9d; Plate 60; Fig. 64]

Types: In alpinis Lapponiensis [Sweden; Lappland] (LINN-LAPP-syntype); Tauro Rastadiensis [Austria; Dadstadter Tauern] (LINN-LAPP-syntype).

Juncus hancockii Hance in J. Bot. 16: 111 (1878). Type: China; Shanxi, Siao Wu-tai-shan (W. Hancock 20118, BM-holotype).

Juncus potaninii Buchenau: Miyamoto & Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992).

Perennial, caespitose, 4–7 cm tall. Rhizomes horizontally short creeping, culms arising in dense rows. Culms erect, grass-green, terete, 0.4–0.6 mm in diam., smooth, cross section rounded. Cataphyll one to each culm or inconspicuous, loosely embracing at base of culm, light brown to brown, 0.5–1.5 cm long. Leaves terete, filiform, with a groove on adaxial side, cross section of blade compressed U-shaped, auricles rounded; basal and subbasal leaves 1 or 2 to each culm, 3–8 cm long including sheath, sheath 1–4 cm long; cauline leaves absent. Inflorescence with a single flower head, hemispherical, 3.5–8 mm in diam., flowers 2–6, chestnut-brown. Lowest bract brown, ovate-lanceolate, as long as inflorescence, 3–5 mm long, 1.5–1.8 mm wide, scarious; floral bract lanceolate to ovate, 2.5–4 mm long, 1.3–1.5 mm wide, scarious. Flowers 5.5–6.5 mm long, 1.8–2.0 mm wide, pedicel 0.8–1 mm long. Tepals brown to chestnut-brown, lanceolate, outer ones and inner ones equal in length, 3–4 mm long, 0.8–1.4 mm wide. Stamens 6, longer than tepals, 3.5–5.5 mm long; filaments chestnut-brown, 3–4.4 mm long, 4–5 times as long as anthers; anthers cream-yellow, linear-ellipsoid, 0.5–1.1 mm long. Pistil brown to chestnut-brown, 5–7 mm long, 1–1.3 mm wide; stigmas 0.5–0.8 mm long; style 0.5–0.8 mm long. Capsule chestnut-brown, oblong, 4–5 mm long, 1.8–2 mm wide, mucronate, cross section trigonous. Seeds oblong, 0.7–0.8 mm long, appendages 0.5–0.8 mm long.

Distr. Nepal, Sikkim, Bhutan, China (Xizang, Hubei).

Juncus triglumis is similar to *J. thomsonii* Buchenau but differs in having the compressedly oval leaves, the U-shaped cross section of the leaf blade, and the shorter stigmas (0.5–0.8 mm long); *J. thomsonii* (stigmas 1–1.5 mm long). It grows in marshy places of bogs or along streams from elevations of 2400 to 4660 m. *Juncus triglumis* is widely distributed in the northern hemisphere and one of the common species in the alpine region of Nepal. However, in eastern Sino-Himalaya it is rather rare.

62. *Juncus uniflorus* W. W. Sm. in Rec. Bot. Surv. India 6: 104 (1914). Hara et al., Enum. Flow. Pl. Nepal 1: 85 (1978). Noltie in Edinburgh J. Bot. 51: 136 (1994); Fl. Bhutan 3(1): 270, f. 251 (1994). Miyamoto in Ohba and Ikeda, Contr. Fl. Ganesh Him.: 69 (1999); in Ohba and Ikeda, Fl. Hinku and Hunku, E. Nepal: 241 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Miyamoto and Ohba in J. Jap. Bot. 77: 33, f. 6 (2002). Kirschner et al., Juncaceae 2, Fl. World 7: 111, f. 65 (2002). [Colour plate 9e; Plate 61; Fig. 65]

Types: Sikkim; Se-moo-do-ne, about 2500 ft. below the Jelep La (i. e., about 12000ft.)

(G. King's Coll. s. n., 22 Jun. 1882, K-lectotype, designate by H. Noltie in 1994a, CAL-isolectotype); Chakung Chu, 13000 ft. (W. W. Smith 3854, 26 Jul. 1910, K-syntype).

Perennial, caespitose, 1–3 cm tall. Rhizomes horizontally short creeping. Culms erect, grass-green, terete, 0.2–0.3 mm in diam., smooth, cross section rounded. Cataphylls 1 or 2 to each culm, light brown, 2–5 mm long. Leaves terete, grass-green, auricles very short; basal leaves 2 or 3 to each culm, 0.8–2.5 cm long including sheath, 0.25–0.32 mm wide, sheath 2–5 mm; cauline leaves absent; leaves on sterile shoots 1–4 cm long, 0.25–0.35 mm wide. Inflorescence solitary, pseudolateral, 3.0–5.5 mm long, 1.3–2.2 mm wide, flower solitary or sometimes 2, bracts 2, as long as or just exceeding flower; sheathing bract absent; lowest bract brown, slightly longer than inflorescence, 2.5–4.5 mm long, 0.4–0.8 mm wide. Flowers 3–5.5 mm long, 1.0–1.5 mm wide, sessile. Tepals brown, lanceolate, outer ones shorter than inner ones, 1.8–3.0 mm long, 0.4–0.6 mm wide. Stamens 6, shorter than tepals, 1.0–1.7 mm long; filaments 0.24–0.70 mm long; anthers leather-yellow, linear-ellipsoid, 0.36–1.0 mm long, 1.5 times as long as filaments. Pistil 2.8–5.2 mm long, 0.8–1.5 mm wide; stigmas 0.8–1.2 mm long; style 0.8–1.0 mm long. Seeds ellipsoid, 0.5–0.6 mm long, appendages very short.

Distr. Nepal, Sikkim, China (Xizang).

Juncus uniflorus is one of the smallest species of *Juncus* in the Sino-Himalayan region. It is similar to *J. rohtangensis* Goel & Aswal but differs in having two or three basal leaves, the brown tepals, and the anthers 1.5 to 2 times as long as the filaments. It grows in marshy places from elevations of 4150 to 4600 m.

63. *Juncus wallichianus* Laharpe in Mém. Soc. Hist. Nat. Paris. **3**: 139 (1827). Buchenau in Bot. Jahrb. Syst. **1**: 111 (1880). Satake in Hara, Fl. E. Himal.: 404 (1966); in Hara, Fl. E. Himal. **2**: 169 (1970). Hara et al., Enum. Flow. Pl. Nepal **1**: 85 (1978). Miyamoto and Ohba in Ohba and Akiyama, Alp. Fl. Jaljale Him.: 73 (1992). Noltie, Fl. Bhutan **3**(1): 254 (1994). Wu in Acta Phytotax. Sin. **32**: 453 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 188, f. 43, 5–6 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 54 (2000). Li et al., F. Gaoligong Mts.: 1123 (2000). Press et al., Ann. Check. Fl. Pl. Nepal: 150 (2000). Kirschner et al., Juncaceae 2, Fl. World **7**: 225, f. 90D–E (2002).

[Colour plate 9f; Plate 62; Fig. 66]

Types: Nepal (Wallich s. n., K-holotype, G, W-isotypes).

Juncus indicus Royle ex D. Don in Trans. Linn. Soc. London **18**(3): 323 (1840). Types: Nepal; Katmandu [Kathmandu] (Wallich 8999, in 1821, K-holotype, W-isotype).

Juncus monticola Steud. in Syn. Pl. Glumac. **2**: 301 (1855). Satake in Hara, Fl. E. Himal.: 403 (1966); in Hara, Fl. E. Himal. **2**: 163 (1971); in Ohashi, Fl. E. Himal. **3**: 130 (1975). Types: India; M. Nilagiri (R. F. Hohenacker 951, P-lectotype, designated by Wilson & Johnson in 2001, BM, S, UPS-isolectotypes).

Juncus auritus F. K. Wu in Acta Phytotax. Sin. **32**: 453, f. 4, 5–8 (1994); Fl. Reipubl. Popul. Sin. **13**(3): 189, f. 44, 5–8 (1997). Wu and Clemants in Wu and Raven, Fl. China **24**: 54 (2000). Types: China; Yunnan (C. W. Wang 63454, in 1935, HSNU-holotype, KUN-isotype).

Juncus sphaerocephalus K. F. Wu in Acta Phytotax. Sin. **32**: 453, f. 4, 1–4 (1994). Bao in Wu and Wu, Fl. Yunnanica **15**: 542 (2003). Types: China; Yunnan, Shithze Shan, 1200 m (C. W. Wang & Y. Liu 84257, 9 Oct. 1939, PE-holotype, KUN-isotype).

Juncus yanshanuensis Novikov in Obshch. Isp. Prir., Otd. Biol. **103**(4): 70 (1998).

Perennial, ascending, 10–30 cm tall. Rhizomes branched-ascending, erect or ascending, 0.6–1.2 mm in diam., cross section rounded. Leaves grass-green, terete, cross section of blade rounded to oval, auricles rounded; basal leaves 1 or 2 to each culm, sometimes absent, 2–6 cm long including sheath, sheath 1–3 cm long, 0.4–0.8 mm wide; cauline leaves 1–3 to each culm, shorter than culm, 5–10 cm long including sheath, sheath 1–2.5 cm long, 0.5–0.8 mm wide. Inflorescence terminal, loosely branched, flower heads many, 4–8 mm in diam., flowers 2–20, grass-green. Lowest bract grass-green, linear, shorter than inflorescence, 2–6 cm long; floral bract ovate to lanceolate, 1.5–2.0 mm long, 0.6–0.8 mm wide, scarious; sheathing bract on peduncle lanceolate to obovate, 5–10 mm long, membranaceous. Flowers 3–4 mm long, 0.8–1.0 mm wide. Tepals grass-green to light brown, lanceolate to linear-lanceolate, outer ones slightly longer than inner ones or equal in length, 3–4 mm long, 0.7–0.8 mm wide. Stamens 3, shorter than tepals, 2–2.5 mm long; filaments 1.6–2 mm long, longer than anthers; anthers yellow, linear-ellipsoid, 0.4–0.5 mm long. Stigmas 0.2–0.3 mm long; style 0.1–0.2 mm long. Capsule brown, oblong, slightly longer than tepals, 3.5–4.5 mm long, 1–1.2 mm wide, cross section 3-keeled. Seeds obovoid, 0.4–0.5 mm long, appendages very short.

Distr. Nepal, Sikkim, Bhutan, Assam, Myanmar, China (Xizang, Yunnan).

Juncus wallichianus is found only at low altitude, below 2000 m in marshy places in the Sino-Himalaya. This species is similar to *J. leptospermus* Buchenau but differs in having the slightly compressed oblong cross section of the leaf blade and the longer tepals.

Summary

The species of *Juncus* (Juncaceae) in the Sino-Himalayan region are revised. Sixty-three species are recognized. One new species, *Juncus petrophilus* Miyam., is described. *Juncus rostocarpus* Miyam. is a new name for *J. amplifolius* var. *pumilus* A. Camus.

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Appendix: Specimens Examined

I. *Juncus allioides* Franch.

PUNJAB: Kulu-Lahaul, above Manali, 11000 ft. (J. R. Drummond 23168, 16 Jul. 1888, K); Mussoorii, Kidar Kantha, 15000 ft. (J. R. Drummond 22794, 10 Jun. 1904, K); Kunawar (J. R. Drummond 22433, 22434, 1885, K).

KUMAON: Palang, 11000 ft. (J. F. Duthie 6053a, 20 Jul. 1886, K); without precise locality (Wallich 9002B, 1872, K).

NORTH WEST INDIA: Tihri-Garhwal, Rudugaira Gad, 15000 ft. (P. P. Huggins 237, Sept. 1950, BM); loc. cit., Rhudughara, 10000-11000 ft. (J. F. Duthie 152, Jul. 1888, CAL).

NEPAL: Bhurchula Leke, near Jumla, 12500 ft. (O. Polunin et al. 4505a, 10 Jul. 1952, BM); Central Nepal, Thorong La, E. of Muktinath, 14500 ft. (G. Mische 645, 9 Sept. 1977, BM); Taglung, S. of Tukucha, Kali Gandaki, 12000 ft. (J. D. A. Stainton et al. 1750, 7 Nov. 1954, A); Namdo, N. of Mustang, 16500 ft. (J. D. A. Stainton et al. 2335, 9 Aug. 1954, A, BM, CL); Gandaki Zone, Manang distr., Bimtang, 28°38'04"N, 84°28'20"E, 4325 m (M. Suzuki et al. 9460279, 10 Aug. 1994, TI); Jargeng Khola, 15000-16000 ft. (D. G. Lowndes 1349, 7 Aug. 1950, BM); Taglung, Kali Gandaki, 12000 ft. (J. D. A. Stainton & L. H. J. Williams 1750, 11 Jul. 1954, BM); Tukucha, Kaki Gandaki, 10500 ft. (J. D. A. Stainton & L. H. J. Williams 1880a, 18 Jul. 1954, BM); Pangsing, 14000 ft. (C. L. Dhwoj 113, 1929, BM); Rasuwa, around Tinbu Kharka, 3800 m (F. Miyamoto et al. 9410078, 27 Jul. 1994, TI); loc. cit., Gosain Kund - Bhairab Kund, 4200 m (M. Sato 9534046, 27 Jul. 1995, TI); near mining camp Lari, 28°14'N, 85°12'E, 4300 m (J. H. Haas 2502, 23 Aug. 1974, BM); Lamche Danda, 27°26'N, 86°27'E, 3100 m (J. F. Dobremez 248, 25 Jun. 1970, BM); Near Lapsang, Simula Khola, 4250 m (C. G. Wilson et al. 758, 19 Sept. 1989, KATH); loc. cit., 27°34'N, 87°59'E, 4330 m (C. G. Wilson et al. 762, 19 Sept. 1989, KATH); Kosi zone, Sankhuwa Sabha district, Younglay, Barun Khola (24 km N. W. Num), 27°44'N, 87°12'E, 3660 m (H. B. Emery CH37, 9 Jul. 1974, K); loc. cit., Ribuk, Barun Khola (24 km N. W. Num), 27°45'N, 87°11'E, 3812 m (H. B. Emery CH8B, 9 Jul. 1974, K); Ghunsa to Kambachen, 27°02'N, 87°58'E (S. Crawford et al. KEKE473, 9 Sept. 1989, K); near Lapsang, Simbua Khola, 27°04'N, 87°59'E, 4250 m (S. Crawford et al. KEKE758, 19 Sept. 1989, K); loc. cit., 4330 m (S. Crawford et al. KEKE762, 19 Sept. 1989, K); Chairam, 27°33'N, 87°58'E, 12500 ft. (L. H. J. Williams 862, 23 Jun. 1969, BM, KATH, TI); Ghunsa to Kambachen, 3720 m (C. G. Wilson et al. 473, 9 Sept. 1989, KATH); Solukhumbu, Khare - Tangna, 4100 m (F. Miyamoto et al. 9580361, 20 Aug. 1995, KATH, TI); loc. cit., Saure Kharka - Tangna, 3900 m (F. Miyamoto et al. 9580212, 5 Aug. 1995, KATH, TI); loc. cit., Saure Kharka - Tangna, 4000 m (F. Miyamoto et al. 9580202, 5 Aug. 1995, KATH, TI); loc. cit., Tangna - Sabsitsho - Dik Kharka, 4200 m (F. Miyamoto et al. 9580221, 6 Aug. 1995, KATH, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4660 m (F. Miyamoto et al. 9580265, 11 Aug. 1995, KATH, TI); loc. cit., Dik Kharka - Khare, 4200 m (F. Miyamoto et al. 9592223, 17 Aug. 1995, TI); loc. cit., Tangna - Sabsitsho - Dik Kharka, 4280 m (F. Miyamoto et al. 9596233, 6 Aug. 1995, TI); loc. cit., Jar Kharka - Panch Pokari - Mojong Khola - Thasing Dingma, 4200 m (F. Miyamoto et al. 9580172, 3 Aug. 1995, TI); Changyam Khola, 13500 ft. (P. C. Gardner 759/759A, 14 Jun. 1953, BM); Michet, 13500-15000 ft. (C. Wigram 23, 3 Feb. 1924, K); Nimasey, 12000-13000 ft. (C. L. Dhwoj 312, 1930, BM); N. Phgune Dhuri, 13000 ft. (J. D. A. Stainton et al. 3412a, 7 Jul. 1954, BM); Tak Tor, 12000-13000 ft. (C. L. Dhwoj 048A, 1930, BM).

SIKKIM: Lachen, 14000 ft. (J. D. Hooker s.n., 15 Jul. 1849, K); loc. cit., 13000 ft. (G. King's collector, s.n., Jul. 1888, CAL); Dzongri, 27°28'31"N, 88°09'38"E, 4000 m (ESIK 428, 433, 16 Jul. 1992, E, TI); West district, Below Lam Pokhri, 27°29'N, 88°12'E, 4090 m, (ESIK 525, 19 Jul. 1992, E, TI); Jongri (H. Hara et al. s.n., 23 May 1960 TI); East district, Tsomgo Chho, 27°22'14"N, 88°45'52"E, 3720 m (D. G. Long & H. J. Noltie 60, 8 Jul. 1996, E, TI); North district, N. W. slopes above Seku chho, Moraine ridge, 27°55'08"N,

88°40'40"E, 4830 m (D. G. Long & H. J. Noltie 417, 23 Jul. 1996, E, TI); By Rathong river en route from Dharrahli pass to Bilibari camp site, 4000 m (B. N. Starling et al. AGSES 223, 30 Jun. 1983, K); Darjeeling, Sandakphu, West, 3633 m (B. Safui 1684, 16 Sept. 1962, CAL); Chamnago, 12000 ft. (W. W. Smith 3642, 22 Jul. 1910, CAL); Chang, 14000 ft. (Ribu & Rhomoo 5703, 25 Nov. 1911, B); Tsomgo Lake, 12000ft. (Cutting & Vernay 22, 3 Aug. 1935, K); without precise locality, 11000–14000 ft. (J. D. Hooker s.n., 30 Aug. 1849, K).

BHUTAN: Upper Mo Chu district, E. bank of Tharizam Chu, 28°01'N, 89°35'E, 4080 m (I. W. J. Sinclair & D. G. Long 5319, 25 Sept. 1984, K); Dotena Limpa, 10000 ft. (R. E. Cooper et al. 2481, 30 Jul. 1914, BM); Jiutang, upper Trongsa Cew valley, 12500 ft. (F. Ludow et al. 19445, 17 Jul. 1949, BM); Waitang, Tsampa, 13500 ft. (F. Ludlow et al. 19236, 24 Jun. 1949, BM); Wangdi Phodrang district, Maorothang - Tintatso, 27°39'N, 90°31'E, 3900 m (F. Miyamoto 9361567, 20 Sept. 1993, TI); loc. cit., 3800 m (F. Miyamoto 9361570, 20 Sept. 1993, TI); loc. cit., Tintatso, 27°42'N, 90°31'E, 3900 m (F. Miyamoto 9361575, 20 Sept. 1993, TI); loc. cit., Tsonsothang, 27°49'N, 90°24'E, 4100 m (F. Miyamoto 9361635, 22 Sept. 1993, TI); Tamp La, 27°43'N, 90°31'E, 4400 m (F. Miyamoto 9361693, 25 Sept. 1993, TI); loc. cit., Tintatso, 27°42'N, 90°31'E, 4150 m (F. Miyamoto 9361745, 27 Sept. 1993, TI).

XIZANG (TIBET): Nyalam, 3100 m (Qing-Zang expedition team 5903, 25 Jun. 1975, KUN); loc. cit., 3850 m (S. K. Wu et al. 75-443, 22 Jun. 1975, KUN); Yatung, 27°51'N, 88°35'E (H. E. Hobson 2, 1897, K); Chumbi & Phari (Dungboo s.n., Jul. 1879, CAL); Lhasa district (collector unknown 20264, Jun.–Jul. 1947, K); Nyingchi, 4500 m (Qing-Zang expedition team 74-5358, 26 Sept. 1974, KUN); Mainling (Qing-Zang expedition team 74-5326, 21 Sept. 1974, KUN); Baxoi Xian, Rawu - Baxoi, 4180 m (S. Akiyama et al. 105181, 4 Aug. 2000, KUN, TI); Zogang, 4000 m (Qing-Zang expedition team 12139, KUN); Lusha, Tsangpo valley, 29°27'N, 94°35'E, 9500 ft. (F. Ludlow et al. 4852, 17 Jun. 1938, A, CAL); Karwa valley, 12000 ft. (collector unknown 211, K); Ronaphar valley, 1300 ft. (M. R. W. G. Hingston 35, 1 Jul. 1924, K); Tongolo [Tungo la] (R. P. Soulié 720, 1893, CAL, K, P); loc. cit. (R. P. Soulié 931, 1893, K, P); loc. cit. (R. P. Soulié 961, 1893, A, K); above Yangu, Yersta valley, 13500 ft. (F. E. Younghusband T20, 7 Jul. 1903, K, CAL); without precise locality (N. M. Przewalski s.n., 1884, S).

QINGHAI: Yushu 3850 m (Tibet expedition team 1245, 1 Aug. 1972, PE).

GANSU: Gargannar, S. of Old Taochow, 3600–4200 m (R. C. Ching 917, 28–31 Aug. 1923, A); Lingan Hsien, 3000 m (P. Wang 55110, 20 Jul. 1936, KUN, PE); without precise locality (N. M. Przewalski s.n., 17–29 Jun. 1980, S); without precise locality, 3800 m (K. T. Fu 1353, 22 Jul. 1937, PE).

YUNNAN: Wei-si Hsien, 3500 m (C. W. Wang 63865, Jun. 1935, A, PE); loc. cit., 3000 m (C. W. Wang 67676, Aug.–Sept. 1935, A, PE); loc. cit., 3000 m (C. W. Wang 67820, Aug.–Sept. 1935, A, PE); loc. cit., Yeh-Chih, 3600 m (C. W. Wang 68409, Aug. 1935, A, PE); loc. cit., Kang-pu, 3500 m (C. W. Wang 64640, Jul. 1935, A, KUN, PE); loc. cit., 2000 m (C. W. Wang 64689, Jul. 1935, A, PE); Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68753, Aug. 1935, A); A-tun-tze, 3000 m (C. W. Wang 64806, Jul.–Aug. 1935, A); loc. cit., 3000 m (C. W. Wang 64801, Jul.–Aug. 1935, PE); Atuntze, Paimashan, Mune, 4020 m (T. T. Yü 9233, 27 Jul. 1937, PE); Deqe, Sanchan He, 3040 m (H. Ohba et al., 1404, 3 Aug. 1996, KUN, TI); loc. cit., Sibao, 2800 m (H. Ohba et al., 1425, 4 Aug. 1996, KUN, TI); loc. cit., Dacao Chang, 3200 m (H. Ohba et al., 1437, 6 Aug. 1996, KUN, TI); Zhongdian Xian, Hong Shan, 4160 m (S. K. Wu et al. 103042, 31 Jul.–4 Aug. 1999, KUN, TI); loc. cit., Tianchi, 27°39'N, 99°38'E, 3900 m (S. Akiyama et al. 420, 8 Jul. 2000, KUN, TI); loc. cit., Shudu Hu, a lake near Zhongdian, 27°55'N, 99°56'E, 3400 m (S. Akiyama et al. 424, 9 Jul. 2000, KUN, TI); Yanbi Xian, W. side of Diancang Shan, 25°50'N, 99°59'E, 3000 m (B. Bartholomew & D. E. Boufford 637, 30 Jun. 1984, A); Chungtien, Kongsinshu, 3300 m (T. T. Yü 11830, 28 Jun. 1937, PE); loc. cit., Tehgoh, 3200 m (T. T. Yü 12364, 24 Jul. 1937, A, PE); Shunning, Holungtan, 3000 m (T. T. Yü 16206, 10 Jun. 1937, PE); Dali Xian, Diancang Shan, 25°53'N, 100°01'E, 2900–3200 m (B. Bartholomew & D. E. Boufford 1173, 19 Jul. 1984, A); Tali range, 8000–10000 ft. (G. Forrest 4899, Jun.–Jul. 1909, CAL); Gue-sai-gue, Tsa-wa-rung, 3200 m (C. W.

Wang 65777, Aug. 1935, A, PE); Lijiang, Lijiang - Ganhaizi, 2750-2800 m (H. Ohba et al. 380, 15 Sept. 1987); Lijiang Xian, Laojun Shan, Longqun Lodge - Jiushijiu Longtan, 4000 m (S. K. Wu et al. 103159, 8 Sept. 1999, KUN, TI); Li-kiang Hsien, 2900 m (C. W. Wang 70811, Jul. 1935, PE); loc. cit., 3000 m (C. W. Wang 71026, Jul. 1935, A, PE); loc. cit., 2300 m (C. W. Wang 70524, Jun. 1935, A, PE); Prope urbem Lidjiang, imprimis in monte Yulung-schan (F. Handel-Mazzetti 4074, 1914-1918, S); Bangtze watershed, Prefectural district of Likiang (J. F. Rock 4765, May-Oct. 1922, A, S); Eastern slopes Likiang (J. F. Rock 11496, 10 Sept. 1923, KUN); Upper Kiukiang valley, Lungtsahmuru, 3800 m (T. T. Yü 19836, 9 Aug. 1938, A, PE); Konkaling, Konkatién, 3900 m (T. T. Yü 13053, 30 Aug. 1937, A, PE); Kulung, Metikonga, Lamashi, 3600 m (T. T. Yü 6863, 6 Jul. 1937, A, PE); Pin-chuan, 3000 m (C. W. Wang 52963, 18 Jul. 1933, PE); Taucheng Hsien, Mowu, 3950 m (T. T. Yü 12874, 23 Aug. 1937, A, PE); without precise locality (G. Forrest 14722, 1917-1919, K); without precise locality, 10000 ft. (G. Forrest 2364, Jun. 1904, K); without precise locality (Monati & Maire 3427, A).

SICHUAN: Taofu district, Haitzeshan, in ripa glareosa rivuli., 3800 m (H. Smith 11728, 28 Aug. 1934, KYO, PE); Kangding (Huang et al. 914 12, Jul. 1930, PE); Tachienlu, 9000-13500 ft. (A. E. Pratt 398, 1890, CAL); Ta Tsien lou (R. P. Soulié 887, 1893, CAL); Bao-Hsien (Moupin), Liang-ho-kuo, 11900 ft. (S. Y. Hu 395, Jul.-Aug. 1939, A, K); Mountains between the Litang and Shou-Chu rivers, between Wa-Erh-Dje and Garu, 4450 m (J. F. Rock 16770, Jul.-Aug. 1928, A); Xiangcheng - Daocheng, around Wuming Shan, 3600 m (S. K. Wu et al., 425, 29 Jul. 1997, KUN, TI); around Wuming shan 4600 m (S. K. Wu et al. 1038, 28 Jul. 1997, KUN, TI); Daocheng, Haizi, 4400 m (S. K. Wu et al., 1520, 17 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, Beiyu, 4650 m (S. K. Wu et al., 1547, 22 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, 4450 m (S. K. Wu et al., 446, 4 Aug. 1997, KUN, TI); loc. cit., 4020 m (S. K. Wu et al., 462, 7 Aug. 1997, KUN, TI); Yanyuan, 3900-4000 m (Qing-Zang expedition team 12264, 22 Jul. 1983, KUN); Tatsienlu (McLaren AC65, Jun. 1938, KYO); Muli, 3300 m (Qing-Zang expedition team 13012, 19 Aug. 1983, KUN); Mu-li, Wa-chin, 3300 m (T. T. Yü 6153, 12 Jun. 1937, A, PE); Sungpan, Gebirgeum (H. Wrigold s.n., Jun.-Aug. 1914, S); Sungpan Hsien, (W. P. Fang 4056, 8 Aug. 1928, A, K); Qinglongzui near the side of Longwangmiao, along the Longxi river, 1750 m (D. E. Boufford & B. Bartholomew 24622, 5 Sept. 1988, A); Xiaojin, Rilong - a pass of Balang Shan - Rilong, 3600 m (H. Ikeda et al., 100806, 29 Aug. 1998, KUN, TI); loc. cit., Ganhaizi - Dashuiba - Ganhaizi, 3530 m (H. Ikeda et al., 100826, 31 Aug. 1998, KUN, TI); loc. cit., Ganhaizi - southwestern slope of Mt. Siguniang - Ganhaizi, 3800 m (H. Ikeda et al., 100847, 1 Sept. 1998, KUN, TI); Mt. Omei (E. H. Wilson 5302, A, K); loc. cit., 3100 m (W. P. Fang 12983, 5 Aug. 1938, A, PE); loc. cit., 2150 m (T. C. Peng 121, 1 Aug. 1938, A); loc. cit., 10000-11000 ft. (W. P. Fang 2946, 14 Aug. 1928, A, PE); Omei shan (T. N. Liou 10302, 18 Oct. 1938, PE); loc. cit. (T. N. Liou & C. Wang 1230, 4 Oct. 1939, PE); Dongrergo, rufra Thrangbung-ssu, 4000 m (H. Smith 3114, 23, Jul. 1922, S); Lieng ho kou, 12000 ft. (T. K. Wang & T. S. Wen 615, Aug. 1936, A); Pao-hsin Hsein, Mupin, Tzu-pu Soong (collector unknown 2, 1954, PE); without precise locality (A. Henry 8916, Feb. 1890, K); without precise locality (R. P. Soulié 827, 1893, K); without precise locality, 3200 m (C. Y. Chiao & C. S. Fan 748, 12 Aug. 1938, A); without precise locality, 3000 m (C. Y. Chiao & C. S. Fan 839, 23 Aug. 1938, A).

SHAANXI: Mt. Thae-pei-san (G. Giraldi 2055, 1897, B); Taipai shan, Vicinity of Pinganszu (T. N. Liou & P. C. Tsoong 2466, 19 Jul. 1938, PE); Taibai Shan (Ren et al. 142, 30 Sept. 1955, PE);

HUBEI: without precise locality (E. H. Wilson 2347, K); Hsignshan (A. Henry 6927, Mar. 1889, A, K).

WESTERN CHINA: without precise locality (E. H. Wilson 4545, Jul. 1903, A, K).

2. *Juncus amplifolius* A. Camus

GANSU: Minshan, 4100 m (T. P. Wang 7572, 23 Aug. 1937, PE).

YUNNAN: Tse-kou (R. P. Soulié 1105, S); Soo-roo-la, Cham-pu-tung, 3000 m (C. W. Wang 66704, Sept.

1935, A, PE).

SICHUAN: Taofu (Dawo) district, Taining (Ngata), montes orientales, 4500 m (H. Smith 11929, 7 Sept. 1934, S, UPS); Kangting (Tachienlu) district, West range, 4200–4400 m (H. Smith 11365, 20 Aug. 1934, BM, S, UPS); loc. cit., Tapaoshan, in prato alpino, 4400 m (H. Smith 11485, 20 Aug. 1934, BM, KYO, PE, S, UPS); loc. cit., Chungo valley, Mt. Yara, N. E. slopes, 4100 m (H. Smith 11112, 18 Aug. 1934, KYO, S, UPS); Tachenlu, 9000–13500 ft. (A. E. Pratt 844, BM, CAL); Li-fan Hsien, Mt. Hung-ch'iao, 3800 m (F. T. Wang 21547, 29 Jun. 1930, S); Xiaojin, Rilong - a pass of Balang Shan - Rilong, 4000 m (H. Ikeda et al., 100803, 29 Aug. 1998, KUN, TI); loc. cit., Ganhaizi - Dashuiba - Ganhaizi, 3530 m (H. Ikeda et al., 100823, 31 Aug. 1998, KUN, TI); loc. cit., Ganhaizi - southwestern slope of Mt. Siguniang - Ganhaizi, 4450 m (H. Ikeda et al., 100838, 100840, 1 Sept. 1998, KUN, TI); Sungpan (F. Hander-Mazzetti s.n., Jun.–Aug. 1914, S); Hsioeh-Shan, San-cha-tsu, 4400 m (H. Smith 3400, 10 Aug. 1922, S, UPS); loc. cit., 4300 m (H. Smith 3841, 19 Jul. 1922, S, UPS); Tahsiangling, 2700–2900 m (H. Smith 10171, 26 Jun. 1934, BM, S, UPS); Win-Chuan, Tsao-puh, 10000 ft. (S. Y. Hu 2597, Aug. 1942, A); without precise locality (J. W. & C. J. Gregory s.n., 1922, BM).

SHAANXI: Ta-pei-shan, 3000–3200 m (G. Fenzel 803, 28 Aug.–5 Sept. 1934, S); Taipaishan, On way from Fangyangszu to Eryaihai, 3200–3800 m (T. N. Liou & P. C. Tsoong 894, 14 Sept. 1937, PE); loc. cit., Pashientai, 3900 m (T. N. Liou & P. C. Tsoong 972, 15 Sept. 1937, PE); loc. cit., Paomaliang (T. N. Liou & P. C. Tsoong 2908, 29 Jul. 1938, PE); Taibai Shan, 3750 m (Fu 8508, 8 Aug. 1956, KUN).

NORTH CENTRAL CHINA: Mt. Miao-Wang-shan (R. F. Hugh s.n., Jul. 1899, BM); Mt. Ngo-shan (Sas-y-san), (R. F. Hugh s.n., Sept. 1899, BM).

3. *Juncus articulatus* L.

AFGHANISTAN: Kandahar Algardof (S. Kitamura s.n., 7 Jun. 1955, KYO); Nuristan Voma to Chatrass (S. Kitamura s.n., 1 Aug. 1955, KYO); Nuristan, Chatrass-Kushmaicot (S. Kitamura s.n., 2 Aug. 1955, KYO); Tshkashim, Wakhan (R. Yosii 876, 876, 880, 884, 885, 887, 893, 29–31 Aug. 1960, KYO); Borak, Badakhshan (R. Yosii 983, 1001, 1002, 4 Sept. 1960, KYO); loc. cit. (R. Yosii 300, 7 Jul. 1960, KYO); Mt. Noshang, Qasideh village (R. Yosii 414, 16–17 Jul. 1960, KYO); Pugman, near Kobur (S. Kitamura s.n., 15 Jul. 1955, KYO); Pulikhumri (S. Kitamura s.n., 3 Jul. 1955, KYO); Taiwora (S. Kitamura s.n., 8 Sept. 1955, KYO); loc. cit. (T. Umesao s.n., 8 Sept. 1955, KYO).

PAKISTAN: Hindukushi, Pingal to Pahimal, 2500 m (K. Honda 242, 31 Jul. 1957, KYO); loc. cit., Hilter, 2300 m (K. Ogino 518, 7 Aug. 1957, KYO); between 35°55'N, 71°18'E and 36°06'N, 71°48'E, 7100 ft. (S. A. B. Lyoon 806, 6 Jun. 1958, A); Harchin (S. M. Toppin 652, Sept. 1908, K); Siran, Hazara (R. R. Stewart s.n., 13 Apr. 1959, K); Hazara district (H. Deane s.n., K); Gabral, 7500 ft. (M. Shah et al. 392, 4 Sept. 1975, A); Kshkoman valley, Pakor to Imit (K. Honda s.n., 16 Sept. 1956, KYO); near Madian. Swat State (R. J. Rodin 5527, 15 Aug. 1952, K); Urrak to Hanna, 6000 ft. (Dar & Arif 575, A).

KASHMIR: near Rawalpindi, 1700 ft. (R. R. Stewart 13815, Apr. 1934, A); Riwayat near Rawalpindi, 1800 ft. (R. R. Stewart 17277A, 25 Apr. 1939, A); Uri Cashm, 4000 ft. (A. Meebold 210, Jun. 1905, CAL); Tangmarg, 6000 m (O. Polunin 56/339, 16 Aug. 1956, B); Barsil, 10500 ft. (C. B. Clarke 29618, 26 Jul. 1876, K); Llos, Auckar Lake near Srinagar (R. R. Stewart 8100, 29 Jul. 1925, K); Sciud valley, near Srinagar, 9000 ft. (R. R. Stewart 9912, 20 Aug. 1928, K); Dras, Ladak, 10000 ft. (R. R. Stewart 10027, Aug. 1928, K); Mulbekh, Kadakh (W. N. Koelz 6181, 28–29 Jul. 1933, A); Leh, Ladak, 10500 ft. (W. N. Koelz 2595b, 12 Aug. 1931, S); loc. cit., 10500 ft. (W. N. Koelz 2595, 12 Aug. 1931, K); Gilgit, 4770 ft. (O. Polunin 6023, 13 Jul. 1960, BM); loc. cit., 4900 ft. (R. R. Stewart 26296, 28 Jul. 1954, K); Gurus, 8000 ft. (C. B. Clarke 29497, 22 Jul. 1876, CAL); Qurais, 8700 ft. (B. B. Osmaston 3S, 29 Jul. 1928, K); Ramoo 6000 ft. (C. B. Clarke 28491, 10 Jul. 1876, CAL); Sind valley (C. B. Clarke 24189, Sept. 1874, CAL); Shrigar, 7000 ft. (C. B. Clarke 300071, 5 Aug. 1876, K); Sumlal Cashm, 5000 ft. (A. Meebold 208, Jun. 1905, CAL); without precise locality, 9500 ft. (R. R.

Stewart 18873, 19 Aug. 1939, A).

PUNJAB: Dilasini - Bajaura (J. R. Drummond 23162, 26 May 1888, K); Bucuber Raoevi below Kasauli (J. R. Drummond 5001, K); Bassahir, Kunawar (J. R. Drummond 26521, 1885, K); Ghora Gob, Murree Hills, 6000 ft. (R. R. Stewart 12847, 1928, S); Murree, 7000 ft. (R. R. Stewart 9592, 31 May 1928, K, S) loc. cit., 8000 ft. (Jafri & Ali 3032, 15 Jun. 1959, K); near Manikaru (J. R. Drummond 23161, 20 May 1888, K).

NORTH WEST HIMALAYA: Billu, 6000 ft. (Brandis 3339, Sept. 1964, CAL); Sanawarg, 9000 ft. (R. R. Stewart 9912, 20 Aug. 1928, S).

NEPAL: Sialgarhi, 9500 ft. (O. Polunin et al. 104, 11 Jul. 1952, A); Kunri, Jumla district (H. Tabata et al. 3254, 6 Sept. 1976, KATH); Pura, Muktinath, 12000 ft. (J. D. A. Stainton et al. 2031, 27 Jul. 1954, A); Dhaulagiri zone, Mustang district, Phalyak - Sangda Pass - Pongio Kharka (a kharka between Sangda Pass and Sangda village), 28°49'0.7"N, 83°44'28.1"E, 3340 m (F. Miyamoto et al. 20210008, 9 Aug. 2002, TI); Dhaulagiri zone, Mustang district, Ghami - Ghar Gompa, 29°04'34"N, 83°52'53.8"E, 3690 m (F. Miyamoto et al. 20210123, 18 Aug. 2002, TI); Gandaki Zone, Gorkha distr., Lhogaon, 28°34'25"N, 84°42'05"E-28°33'09"N, 84°39'19"E, 3175 m (M. Suzuki et al. 9460217, 5 Aug. 1994, TI).

BHUTAN: Paro, 2286 m (R. Bedi 698, 18 Aug. 1971, K).

ASSAM: Khasia (Griffith s.n., K); loc. cit., 4000-6000 ft. (J. D. Hooker & T. Thomson s.n., 14 Sept. 1850, K, KYO); loc. cit., Soyung, 5000 ft. (C. B. Clarke 45402A, 16 Sept. 1886, K).

XIZANG (TIBET): Zhigung, 2350 m (S. K. Wu 5268, 30 Aug. 1976, KUN).

GANSU: Min Hsien, 2500 m (T. P. Wang 4958, 9 Jul. 1936, KUN, PE); Tienshui Hsien, 1300 m (T. P. Wang W4324, 14 Jun. 1936, A, PE).

YUNNAN: Deqen, 2651 m (Qing-Aang expedition team 2912, 19 Jul. 1981, KUN); A-tun-tze, 3400 m (C. W. Wang 69208, Sept. 1935, A, KUN, PE); Wei-si Hsien, 2800 m (H. T. Tsai 59861, 18 Oct. 1934, PE).

SICHUAN: Taofu (Dawo) district, Taofu, 2900 m (H. Smith 12182, 17 Sept. 1934, S); loc. cit., Lhamo Mondeh La, 3700 m (H. Smith 12418, 23 Sept. 1934, PE, S); Djer-mai, Tsa-wa-rung, 3200 m (C. W. Wang 65695, Aug. 1935, A, PE); Dzer-nar, Tsa-wa-rung, 3000 m (C. W. Wang 66300, Sept. 1935, A, PE); Kangting (Tachienlu) district, Chungo valley, 3000 m (H. Smith 11152, 17 Aug. 1934, PE, S); Muli (Qing-Zang expedition team 1347, 20 Aug. 1983, KUN).

SHANXI: Yun-cheng, 500 m (H. Smith 6009, 1 Jul. 1924, PE).

4. *Juncus benghalensis* Kunth

PAKISTAN: Kagan valley, Hazara, 12400 ft. (Inayat 20240, 20 Jul. 1896, CAL); Richwori, Shuikiyari, Hazara (Inayat s.n., 10 Jun. 1899, CAL); Suran valley, Hazara (Inayat 20239a, 27 Jun. 1896, CAL); Hazara (Inayat 22630, 24. Jul. 1897, CAL).

KASHMIR: Gulmarg Rakh, 10000 ft. (R. R. Stewart 8667, 26 Jul. 1926, K, S); Pir Panjal (J. F. Duthie 25771, 10 Aug. 1901, K); Masjid Gali, Gurais region, 13000 ft. (R. R. Stewart 18360, 12 Aug. 1936, A); Pohlgam, 12000 ft. (R. R. Stewart 9035, 10 Aug. 1927, S); Sekiwas, 12000 ft. (R. R. Stewart 12435, 19 Sept. 1931, K); Sonamarg, 10000 ft. (R. R. Stewart 9842, 3 Aug. 1928, S); Sorus above Pahlagane, 10000-12000 ft. (R. R. Stewart 21594, 6 Aug. 1945, K).

HIMACHAL PRADESH: Lahul Khokhsar, 10500 ft. (N. L. Bor. 16612, 3 Aug. 1941, K).

NORTH WEST INDA: without precise locality (K. Biswas 3550, A); without precise locality (Royle s.n., CAL).

NEPAL: Lara, 11000 ft. (C. B. Clarke 24598, 7 Oct. 1874, BM); Jumla, Bajari Binu - Visht Dah, Giri Khora, 4460 m (M. Minaki et al. 9109121, 23 Sep. 1991, TI); Larjung, S. of Tukucha, Kali Gandaki, 11500 ft. (J. D. A. Stainton et al. 1942, 13 Jul. 1954, A, CAL); Mustang, around Ommang (T. Hoshino et al. 9662106, 1 Aug. 1996, TI); Dhaulagiri zone, Mustang district, Around Sangda Pass, 28°52'29.5"N, 83°43'9.4"E, 4700 m (F.

Miyamoto et al. 20210077, 12 Aug. 2002, TI); Rasuwa, around Base Camp, 4990 m (H. Takayama et al. 9220323, 21 Jul. 1992, TI); loc. cit., a Kharka - Pati Kharka, 3700 m (F. Miyamoto et al. 9410185, 4 Aug. 1994, TI); loc. cit., Yure Kharka - Tinbu Kharka, 3430 m (F. Miyamoto et al. 9410042, 26 Jul. 1994, TI); loc. cit., around Tinbu Kharka, 3800 m (F. Miyamoto et al. 9410084, 27 Jul. 1994, TI); loc. cit., Tulo Bhera Kharka - Jaisuli Kund, 4200 m (F. Miyamoto et al. 9410120, 30 Jul. 1994, TI); Ramechhap around Neju, 3500 m (H. Ohba et al. 8530623, 31 Jul. 1985, TI); Kalinchok, 11000 ft. (Banerjee et al. 2819a, 15 Sept. 1964, KATH); Solukhumbu, Gnaula - Pike, 3400 m (F. Miyamoto et al. 9580050, 22 Jul. 1995, KATH, TI); loc. cit., Pike - Tasman Bhangjang - Pike Khop, 3700 m (F. Miyamoto et al. 9580071, 9580072, 24 Jul. 1995, KATH, TI); loc. cit., Chhatarwa - a pass - Kurke, 3900 m (F. Miyamoto et al. 9580473, 29 Aug. 1995, KATH, TI); loc. cit., Thasing Dingma - Chhatarwa, 3600 m (F. Miyamoto et al. 9580468, 28 Aug. 1995, KATH, TI); loc. cit., Chalem Kharka - Jar Kharka, 4000 m (F. Miyamoto et al. 9580152, 1 Aug. 1995, KATH, TI); loc. cit., Chalem Kharka - Jar Kharka, 4200 m (F. Miyamoto et al. 9580157, 1 Aug. 1995, KATH, TI); loc. cit., Samakang Kharka - Dudh Kund, 3700 m (F. Miyamoto et al. 9580416, 24 Aug. 1995, KATH, TI); loc. cit., Thasing Dingma - Sanu Khola - Saure Kharka, 3700 m (F. Miyamoto et al. 9580501, 4 Aug. 1995, KATH, TI); loc. cit., around Khare, 4800 m (F. Miyamoto et al. 9580256, 8 Aug. 1995, KATH, TI); loc. cit., Chhomalung Base Camp - Rato Odara, 4800 m (F. Miyamoto et al. 9580345, 18 Aug. 1995, KATH, TI); Sankhuwasawa, around Cha Ding Kharka and Shipton Pass, 4430 m (M. Minaki et al. 9020682, 9 Aug. 1990, TI); loc. cit., 3700 m (M. Minaki et al. 9020804, 9020805, 10 Aug. 1990, TI); loc. cit., Bhainsi Charka - Danda Kharka - Unshisa Kharka - Khongma, 3300 m (M. Minaki et al. 9020560, 9020563, 4 Aug. 1990, TI); loc. cit., 3000 m (M. Minaki et al. 9020624, 4 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3900 m (M. Minaki et al. 9020642, 9020654, 5 Aug. 1990, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 4000 m (M. Minaki et al. 9020870, 12 Aug. 1990, TI); loc. cit., Ta Dasa - Ne Kharka (Nehe Kharka) - Yangri Kharka - Phemathang Kharka (Tematan Kharka), 3380 m (M. Suzuki et al. 8850688, 28 Jul. 1988, TI); loc. cit., Hati Sar - Mangalbare - Lam Pokhari - Minchin Dhap (H. Hara et al. s.n., 28 Oct. 1963, TI); loc. cit., Chhippon (Chhippon Pokhari) - Gidde (Gidde Kharka) (H. Ohba et al. 9153156, 19 Jul. 1991, TI); Kosi zone, Sankhuwa Sabha district, Younglay, Barun Khola (23 km N. W. Num), 27°44'N, 87°12'E, 3721 m (H. B. Emery CH26, 9 Jul. 1974, K); loc. cit., Younglay, Barun Khola (23 km N. W. Num), 27°45'N, 87°11'E, 3812 m (H. B. Emery CH38A, 9 Jul. 1974, K); Nehe Kharka, S side of Barun Khola, 27°45'N, 87°10'E, 3730 m (D. G. Long et al. 431, 30 Sept. 1991, KATH); Environs of Ghunsa, 27°40'N, 87°57' (C. G. Wilson et al. 430a, 8 Sept. 1989, KATH); Below Tamo La, 27°35'N, 87°57'E, 4050 m (C. G. Wilson et al. 717, 16 Sept. 1989, KATH); E Dhankuta, Bilbatay Bhanjang - Tutay - Tinjuray - Hati Sar (H. Hara et al. 6300867, 27 Oct. 1963, TI); loc. cit., Taplejung, Baroya Khimty - Thakma Khola (H. Hara et al. s.n., 12 Nov. 1963, TI); loc. cit., Bilbatay, Bhanjang - Tinjuray - Hati Sar (H. Hara et al. 6300867, 27 Oct. 1963, KYO); loc. cit., Taplejung, Walunchung Gola - Zongi (H. Kanai et al. 6300986, 11 Nov. 1963, TI); Sindhupalchok, Thale - Thale Bisauna, 2200 m (H. Kanai & T. B. Shrestha 672794, 10 Sept. 1970, TI); loc. cit., Lukthang - Kalingchok - Kuri, 3400 m (H. Kanai et al. s.n., 12 Nov. 1963, TI); Environs of Ghunsa, 27°40'N, 87°57'E, 3430 m (S. Crawford et al. KEKE435, 3 Sept. 1989, K); near Dojam Khola, Suli Gola, 14000 ft. (O. Polunin et al. 2276, 21 Jun. 1952, CAL).

SIKKIM: Jongri, 13000 ft. (C. B. Clarke 25748, 15 Oct. 1875, BM); Ling-tir, Dcujbo (collector unknown s.n., 25 Aug. 1878, K); Singalila, Phalut, 3600 m (H. Hara et al. s.n., 17 Jul. 1967, TI); Singalila, Sandakphu, 3800–3970 m (H. Hara et al. s.n., 14 & 15 Jul. 1969, TI); Tsomgo Lake, 12000 ft. (Cutting & Vernay 22, 3 Aug. 1935, K); Tsomgo Lake, 12000 ft. (Cutting & Vernay 23, 3 Aug. 1935, K); Zewu valley, 10000 ft. (Smith & Cave 1065, 9 Jul. 1909, CAL); loc. cit., 10800 ft. (Smith & Cave 1162, 10 Jul. 1909, CAL); North district, Yumthang, Lachung Chhu, 27°48'08"N, 88°42'22"E, 3600 m (D. G. Long & H. J. Noltie 161, 13 Jul. 1996, E, TI); without precise locality (G. King 4918, 8 Jul. 1877, K); without precise locality, 12000–15000 ft. (J. D.

Hooker s.n., Sept. 1849, K); without precise locality, 12000 ft. (J. D. Hooker s.n., 20 Jun. 1849, K); without precise locality, 12000 ft. (J. D. Hooker s.n., Aug. 1936, CAL, K, L, S, UPS); without precise locality (Prain 291, 12 Aug. 1903, CAL).

BHUTAN: Wandu Phodrang district, Tsonsothang, 27°49'N, 90°24'E, 3900 m (F. Miyamoto 9361644, 22 Sept. 1993, TI); loc. cit., Marrothang - Tintatso, 27°39'N, 90°31'E, 4000 m (F. Miyamoto 9361569, 20 Sept. 1993, TI); E. slope of Thrumse La, W. of Sengor, 27°24'N, 91°00'E (A. J. C. Grierson & D. G. Long 2571, 7 Jul. 1979, E, TI); Chi la pass, 12500ft. (G. S. Gupta 613, 20 Aug. 1964, CAL).

HIMALAYA: Himal. Bor. Occ., without precise locality, 4000–10000 ft. (T. Thomson s.n., L); without precise locality (Falconer 1184, L).

XIZANG (TIBET): Nyalam Xian, Nyalam - Zhangmu, 28°05'N, 85°59'E, 3470 m (S. Akiyama et al. 106302, 21 Aug. 2001, KUN, TI); Nage, 3250 m (Tibet expedition team 74-3804, 31 Jul. 1974, KUN); Natu La to Champitang, 14000–12000 ft. (F. S. Chapman 706, 1 Aug. 1936, K); Northern foot of Tari Pass via Mud to southern foot of Parang (collector unknown s.n., 12–17 Jun. 1856, L); Nyingchi Xian, Sezhaishan, 4500 m (S. Akiyama et al. 105212, 17 Aug. 2000, KUN, TI); Deyan La, Kongbo, 13000 ft. (F. Ludlow et al. 14325, 11 Aug. 1947, BM, CAL, UPS); Champang, 12000ft. (F. S. Chapman 453, 1, Aug. 1936, K); without precise locality (Stoices s.n., CAL); without precise locality (Stoliczka s.n., CAL).

YUNNAN: Gongshan Xian, S. W. of Gongshan, 2600 m (S. K. Wu et al. 103190, 103192, 20 Sept. 1999, KUN, TI); Che-tse-lo, 4000 m (H. T. Tsai 58209, 27 Aug. 1934, PE, KUN); Tsekou (R. P. Soulié s.n., 18 Jul. 1895, K); Deqe, around Daxue Shan, 4300 (S. K. Wu et al. 1593, 27 Aug. 1996, KUN, TI); Eokerla, A-tun-tze, 3000 m (C. W. Wang 64899, 3-5 Aug. 1935, A); Wei-si Hsien, Yeh-chih, 3600 m (C. W. Wang 68552, Aug. 1935, PE, KUN); Chengkang, 3500 m (T. T. Yü 16932, 24 Jul. 1938, KUN); Chungtien (K. M. Feng 1555, 7 Jul. 1939, PE); Ta-li Hsien, 4000 m (H. T. Tsai 53986, 31 Jul. 1933, PE); Yangbi, around Cangshan, 3760 m (S. K. Wu et al. 471, 17 Aug. 1997, KUN, TI); Zhongdian Xian, Hong Shan, 4300 m (S. K. Wu et al. 103028, 31 Jul.-4 Aug. 1999, KUN, TI); loc. cit., Tianchi, near Zhongdian, 3900 m (S. Akiyama et al. 418, 8 Jul. 2000, KUN, TI); loc. cit., Ha ba Xueshan, Haba Hai, 4400 m (S. K. Wu et al. 103081, 8–11 Aug. 1999, KUN, TI); Dali Shi, Diancang Shan, Zhonghe Peak, 3800 m (S. K. Wu et al. 103148, 6 Sept. 1999, KUN, TI); Eastern slopes of Likiang Snow range, Yangtze watershed (J. F. Rock 10701, 10 Sept. 1923, B); Chi-na-tung, Tsa-wa-rung, 2800 m (C. W. Wang 65372, Aug. 1935, A, PE); Chi-na-tung, Tsa-wa-rung, 2800 m (C. W. Wang 65723, Aug. 1935, PE); Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68764, Aug. 1935, A); Shi-gi-tung, Champu-tung (C. W. Wang 67230, Oct. 1935, KUN, PE); loc. cit., 3000 m (C. W. Wang 67193, Oct. 1935, PE); Boggy, stony pasture on the eastern flank of the Tali Range, 25°40'N, 8000–10000 ft. (G. Forrest 4906, Jun. 1906, B); Tsekou, Sila (R. P. Soulié 1152, 18 Jul. 1895, S).

SICHUAN: Kangting (Tachienlu) district, Tapaoshan, 4200 m (H. Smith 11312, 20 Aug. 1934, PE, S, UPS); Kangting (Tachienlu) district, Chung valley, Mt. Yara, N. E. slopes, 3900 m (H. Smith 11162, 18 Aug. 1934, KYO, S, UPS); Hi-ma-la, Tsa-wa-rung, 3700 m (C. W. Wang 65620, Aug. 1935, A, PE); Daocheng, around Gongga Shan, Beiyu, 4400 m (S. K. Wu et al. 1553, 22 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, 4370 m (S. K. Wu et al. 466, 8 Aug. 1997, KUN, TI); Xiaojin, Ganhaizi - Dashuiba - Ganhaizi, 3600 m (H. Ikeda et al. 100819, Aug. 31 1998, KUN, TI); loc. cit., 3500 m (H. Ikeda et al. 100821, 31 Aug. 1998, KUN, TI); loc. cit., around Gongga Shan, 4600 m (S. K. Wu et al. 1142, 4 Aug. 1997, KUN, TI).

5. *Juncus biglumoides* H. Hara

YUNNAN: Weixi, Kangpu, 3500 m (C. W. Wang 64538, 22 Jul. 1935, KUN-paratype of *J. kangpuensis*); Zhongdian, Around Mt. Hongshan, 4200 m (S. K. Wu et al. 103044, 2 Aug. 1999, KUN, TI); loc. cit., Tianchi, 27°39'N, 99°38'E, 3900 m (S. Akiyama et al. 414, 8 Jul. 2000, KUN, TI); In tergi inter vicis Haba et Dugwan-twun ad austro-orient., pagi Dschungdien regione, 3850 m (F. Handel-Mazzetti 6902, 22 Jun. 1915, S).

6. *Juncus brachistigma* Sam.

KUMAON: Palang, 11000 ft. (J. F. Duthie 6050, 20 Jul. 1886, BM).

NEPAL: near Dojam Khola, Suli Gola, 14000 ft. (O. Polunin et al. 2276, 21 Jun. 1952, A, BM); Tukucha, Kali Gandaki, 12000 ft. (J. D. A. Stainton et al. 1170a, 15 Jun. 1954, BM); Lamjung, 13500 ft. (J. D. A. Stainton et al. 6160, 5 Jul. 1954, BM); Sabze Khola, 13500 ft. (D. G. Lowndes 1208, 19 Jul. 1950, BM); on route Chilime Khola, 15000 ft. (O. Polunin 1327, 26–28 Jul. 1949, BM); Rasuwa, Yure Kharka - Tinbu Kharka, 3700 m (F. Miyamoto et al. 9410053, 26 Jul. 1994, TI); loc. cit., Tulo Bhera Kharka - Jaisuli Kund, 4200 m (F. Miyamoto et al. 9410121, 9410810, 30 Jul. 1994, TI); loc. cit., Paldol Base Camp - a Kharka, 4400 m (F. Miyamoto et al. 9410165, 3 Aug. 1994, TI); near Gunsu, 3800 m (K. Nishioka 283, 12 Jun. 1962, KYO).

SIKKIM: North district, S. E. side of Lasha Chhu, Velow Sebu La, Dampmoraine slope, 27°56'13"N, 88°38'30"E, 4700 m (D. G. Long & H. J. Noltie 380, 21 Jul. 1996, E, TI); Na-tut a mountain, (G. King's collector, s.n., 28 Aug. 1882, CAL, K); Rookah, 10000 ft. (G. King's collector, s.n. 1885, K); Chwnago, 12000–13000 ft. (W. W. Smith 3808, 26 Jul. 1910, CAL); Dikuchu, 13000 ft. (W. W. Smith 3752, 23 Jul. 1910, CAL); Kangpnpehuthang, 16000 ft. (Ribu & Rhomoo 5229, 6 Sept. 1911, K); without precise locality (J. D. Hooker s.n., K); without precise locality (G. King's collector, s.n., 1882, CAL).

BHUTAN: Shingbe, Me la, 11000 ft. (F. Ludlow et al. 20325a, 6 Jun. 1949, BM); loc. cit., 12000 ft. (F. Ludlow et al. 20695, 4 Jun. 1949, BM).

EAST HIMALAYA: Chulong, 15000 ft. (R. Lepcha 216, 12 Sept. 1912, A, E).

XIZANG (TIBET): Nyalam, 3350 m (Zhang & Lang 3593, 20 May 1966, KUN); Phile la, 14000 ft. (R. E. Cooper 1784, 23 Jul. 1914, BM); Kongbo Province, Molom Nepar, 4000 m (F. Ludlow et al. 62666, BM).

GANSU: Lien hoa shan in swanmpy meadow between Taochow and Titao, 11500 ft. (J. F. Rock 12715, 20 Jul. 1925, A).

YUNNAN: Chungtien Plateau (K. M. Feng 1555, 7 Jul. 1939, A); Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68858, Aug. 1935, KUN, PE); Weihsi, Tungchuling, Sungyenka, 4000 m (T. T. Yü 8943, 12 Jul. 1937, A, PE); Wei-si Hsien, Yeh-Chih, 3600 m (C. W. Wang 68346, Aug. 1935, A, PE); In montis Yülung-schan prope urbem Lidjiang (Likiang) regione alpina, in glareis, und unter dem kleinen Gletscher ober der Schlucht Loku, 3625 m (F. Handel-Mazzetti 6815, 18 Jun. 1915, S); In regionis temperatae supra vicum Nguluko ad urbem Lidjiang, 3100–3400 m (F. Handel-Mazzetti 6695, 10 Jun. 1915, S); Li-kiang Hsien, 2900 m (C. W. Wang 70811a, Jul. 1935, A); loc. cit., 3000 m (C. W. Wang 71677, Jul. 1935, PE); Likiang Snow Range (R. C. Ching 30332, 7 Jul. 1939, A); Gongshan (Qing-Zang expedition team 7789, 30 Jun. 1982, KUN); Zhongdian, Chungtien, Lichiashica, 3600 m (T. T. Yü 11661, 17 Jun. 1937, A, KUN, PE); Zhongdian, 4000 m (Qing-Zang expedition team 1301, 21 Jun. 1981, KUN); Zhongdian Xian, Hong Shan, 3700 m (S. K. Wu et al. 103027, 31 Jul.–4 Aug. 1999, KUN, TI); loc. cit., Haba Xueshan, Haba Hai, 4000 m (S. K. Wu et al. 103087, 11 Aug. 1999, KUN, TI); Yangbi, around Cangshan, 3750 m (S. K. Wu et al. 479, 18 Aug. 1997, KUN, TI).

SICHUAN: Daocheng, around Gongga Shan, Beiyu, 4600 m (S. K. Wu et al. 1548, 22 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, 4600m (S. K. Wu et al. 455, 5 Aug. 1997, KUN, TI); without precise locality, 27°30'N, 11000 ft. (G. Forrest 6298, Aug. 1910, BM, K); Muli, Sao-siang-liang-tze, 3600 m (T. T. Yü 7771, 17 Aug. 1937, KUN).

7. *Juncus bryophilus* Noltie

NEPAL: Bagmati zone, Rasuwa district, a Kharka - Pati Kharka, 28°15'N, 85°10'E, 3650 m (F. Miyamoto et al. 9410195, 4 Aug. 1994, TI).

SIKKIM: Dzongri, 4000 m (ESIK 698, 25 Jul. 1992, E, TI-paratype of *J. bryophilus*).

BHUTAN: Wangdi Phodrang district, Maorothang - Tintatso, 27°39'N, 90°31'E, 3700 m (F. Miyamoto 9361571, 20 Sept. 1993, TI).

8. *Juncus bufonius* L.

AFGHANISTAN: Hindukush, Gupis, 2170 m (K. Ogino 586, 1 Aug. 1957, KYO).

PAKISTAN: Borit Jil, Hunza valley, Mourirars, 2500 m (F. A. Perrott 15, 31 Aug. 1980, K); Karakoram, Oltali Chish, 2400 m (S. Nakao s.n., 10 Jun. 1955, KYO).

KASHMIR: Gilgit (G. M. Giles s.n., 1885, CAL); Srinagar, 5000 ft. (Meebold 206, Jun. 1905, CAL); loc. cit., 7700 ft. (C. B. Clarke 30075, 5 Aug. 1876, CAL); Skard, 7650 ft. (C. B. Clarke 30034, 4 Apr. 1876 CAL); Dehara Sun, Kailong-Ka-Gor, Lahaul (N. L. Boris 22, 3 Jul. 1938, K); Kadak, 3700 m (U. C. Bhattacharyya 41062, 8 Sept. 1970, CAL); Taugwarg, 7200 ft. (R. R. Stewart 8822A, 26 Jul., K); Tilail (J. F. Duthie 13940, 31 Aug. 1893, CAL).

PUNJAB: Karnal Jungle (J. R. Drummond 26525, 27 May 1886, K); Maisi (O. P. Misra 47008, 16 Apr. 1972, CAL); Nasrela (O. P. Misra 47053, 17 Apr. 1972, CAL); without precise locality, 1000–3000 ft. (T. Thomson s.n., Mar. 1846, K); without precise locality (J. R. Drummond 1748, Mar. 1885, K); without precise locality (J. R. Drummond 2339, 10 Feb. 1886, K); without precise locality (J. R. Drummond 26523, 24024, 26530, 26536, 26552, 1886, K).

HIMACHAL PRADESH: Gilgit (G. M. Giles 270, Mar. 1886, CAL); Lahul, Sissn (N. L. Bor 16503, 28 Jul. 1941, K); Lahul, Chola dara, 3900 m (U. C. Bhattacharyya 48779, 21 Jul. 1972, CAL).

UTTAR PRADESH: Spiti, Gette, 4300 m (U. C. Bhattacharyya 49266, 3 Aug. 1972, CAL); Garhwal, Trijuginarayan, 2000 m (B. D. Naithani 48012, 26 May 1972, CAL); near Chour, Kumaon (J. E. Winterbottom 8, CAL); Sarjoo river (O. P. Misra 7795, 2 Sept. 1965, CAL).

NORTH WEST HIMALAYA: Daspa valley, 2000 ft. (Brandis 3341, Sept. 1864, CAL); Langha, 8500 ft. (Brandis 3340, 25 Sept. 1864, CAL).

NEPAL: Between Chahar and Muktinath, 11000 ft. (H. Tabata et al. 6272, 11 Oct. 1976, KATH); Dhaulagiri zone, Mustang district, Ghami - Ghar Gompa, 29°04'34"N, 83°52'53.8"E, 3690 m (F. Miyamoto et al. 20210118, 18 Aug. 2002, TI); Kambachen, 27°44'N, 87°59'E, 4100 m (S. Crawford et al. KEKE602, 12 Sept. 1989, K, KATH).

SIKKIM: North district, E. bank of Lachung Chhu, just above Lachung, 27°41'37"N, 88°45'10"E, 2730 m (D. G. Long & H. J. Noltie s.n., 15 Jul. 1996, E, TI); Gingong, 15000 ft. (Ribu & Rhomoo 2876, Sept.–Oct. 1909, CAL); Grangong, 15000 ft. (R. Lepcha 2876, 2 Nov. 1909, CAL); without precise locality, 9000 ft. (J. D. Hook s.n., CAL, K).

BHUTAN: Thimphu - Wangdu Phodrang, 1450–3200 m (H. Kanai et al. 4493, 9 Apr. 1967, TI); without precise locality (Griffith 2659, Aug. 1837, K).

ASSAM: Talap (G. A. Gummie 189, 23 Mar. 1894, CAL); Pobomkh (I. H. Brukill 38234, 11 Mar. 1912, CAL).

HIMALAYA: Range (S. Kurz s.n., CAL); Himal Bor Occ., without precise locality, 6000–13000 ft. (T. Thomson s.n., CAL, K); without precise locality, 1000–3000ft. (T. Thomson s.n., CAL).

XIZANG (TIBET): Gyangtse (C. H. J. Walton 99, Jul.–Sept. 1904, B, CAL, K); Gongbo'gyamda Xian, Basum Lake, 3550 m (S. Akiyama et al. 105199, 15 Aug. 2000, KUN, TI); Mainling, 3070 m (Qing-Zhang expedition team 750908, 28 Jul. 1975, KUN); Kongbo Province, near Puchu, 29°27'N, 94°15'E, 9800 ft. (F. Ludlow et al. 6116, 11 Aug. 1938, BM); loc. cit., near Lamdo, Tsangpo valley, 29°23'N, 94°22'E, 9800 ft. (F. Ludlow et al. 4567, 30 May 1938, BM); Markam (S. K. Wu 4477, 11 Aug. 1976, KUN); Ladak, Gia to Upshi (collector unknown 1428, 27 Jun. 1856, A).

GANSU: In via Min-Schemo-Weitseba-Li-Tienschui (G. Fenzel 2728, 20–29 Aug. 1935, A); near Pingfan, 2350–2800 m (R. C. Ching 467, 12–20 Jul. 1923, A).

YUNNAN: Atuntze, 2700 m (C. W. Wang 70227, Sept. 1935, A, KUN); Lijiang, Heilongtan (Hen et al. 618, 28 May 1986, KUN).

SICHUAN: Chiefly near Tachienlu, 9000–13500 ft. (A. E. Pratt 390, BM); Daocheng, 3000 m (Qing-Zhang expedition team 4318, 25 Aug. 1981, KUN); Tachienlu, 9000–13500 ft. (A. E. Pratt 390, Dec. 1890, CAL); Xiaojin, Rilong - a pass of Balang Shan - Rilong, 2880 m (H. Ikeda et al. 100802, 29 Aug. 1998, KUN, TI); Chengtu (C. W. Wang 12309, 4 May 1938, A); loc. cit. (W. P. Fang 13326, 11 Apr. 1939, A); Feng-ab-Hsien, 500 m (K. S. Hao 160, 11 May 1930, S); Shunching, 320 m (K. S. Hao 164, 10 May 1930, S); Mt. Uo-mi-san (R. F. Hugh s.n., Sept. 1899, BM).

SHAANXI: Hsia-Hsien, Pei-shui-ho (H. Smith s.n., 9 Jul. 1924, S).

SHANXI: Kolan Hsien, 4300 m (T. Tang 471, 31 Apr. 1929, S); Makiapou (N. E. Licent 491, 25 Jul. 1914, BM); Puhaiian, Kohchengeien (T. P. Wang 3778, 30 Sept. 1935, S); Siao-y Hsien, Shengtingshen (T. P. Wang 3268, 25 Aug. 1935, S).

9. *Juncus cephalostigma* Sam.

NEPAL: Sankhuwasawa, Pike - Pike Peak - Pike, 3820 m (F. Miyamoto et al. 9580061, 23 Jul. 1995, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalangi Base Camp, 4500 m (F. Miyamoto et al. 9580275, 11 Aug. 1995, TI); Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 4620 m (M. Minaki et al. 9020686, 12 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3670 m (M. Minaki et al. 9020655, 5 Aug. 1990, TI); loc. cit., 3870 m (M. Minaki et al. 9020638, 5 Aug. 1990, TI); loc. cit., 3750 m (M. Minaki et al. 9020652, 5 Aug. 1990, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 4100 m (M. Minaki et al. 9020882, 12 Aug. 1990, TI); loc. cit., 3900 m (M. Minaki et al. 9020860, 12 Aug. 1990, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 4400 m (M. Minaki et al. 9020683, 10 Aug. 1990, TI); loc. cit., Kongma - Sano Pokhari - Siptong Pass - Thulo Pokhari - Cha Ding Kharka, 3570m (M. Minaki et al. 9020653, 5 Aug. 1990, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass - Sano Pokhari - Khongma, 3900 m (M. Minaki et al. 9020862, 12 Aug. 1990, TI); Kosi zone, Sankhuwa sabha district, Dap, Kasua Khola (18 km N. Num), 27°43'N, 87°16'E, 3812 m (H. B. Emery CH06, 28 Jun. 1974, K).

SIKKIM: East district, Tsomgo Chho, 27°22'14"N, 88°45'52"E, 3720 m (D. G. Long & H. J. Noltie 62, 8 Jul. 1996, E, TI); Chauju [Tsomgo] (Chatterjee 231, 14 Jul. 1906, CAL); Jelap Ia, 14500 ft. (collector unknown 54, 20 Sept. 1926, CAL); Maglatha W Imgi (G. King s.n., Jun. 1887, K); Rshinangi, 13000 ft. (Ribu & Rhomoo 4516, 26 Oct. 1910, CAL); Laghep, 11000 ft. (P. E. Cooper 14, 26 Jun. 1913, KATH); without precise locality, 12000–15000 ft. (J. D. Hooker s.n., 1849, K); without precise locality, 12000 ft. (J. D. Hooker s.n., 20, Jun. 1849, K with *J. benghalensis*); without precise locality, 12000 ft. (J. D. Hooker s.n., S).

BHUTAN: E. slope of Thrumse La, W. of Sengor, 27°24'N, 91°00'E, 3640 m (A. J. C. Grierson & D. G. Long 2572, 7 Jul. 1979, A, K).

EAST HIMALAYA: [Sikkim] Gnathong, 13000 ft. (C. H. Cave s.n., 20 Sept. 1916, A, E); [Nepal] Sherbathang, 11000 ft. (C. H. Cave s.n., 24 Oct. 1916, A, E).

XIZANG (TIBET): Tsekou, (R. P. Soulié s.n., 18 Jul. 1895, BM); Baxoi Xian, Demu La, 4870 m (S. Akiyama et al. 105089-bis, 26 Jul. 2000, KUN, TI).

YUNNAN: Mekong-Salwin Divide, Sila, 3700 m (T. T. Yü 22229, 8 Aug. 1938, A, KUN, PE); Gongshan, 3600–3500 m (Qing-Zang expedition team 8489, 14 Jul. 1982, KUN); loc. cit., 3500 m (Qing-Zang expedition team 8536, 24 Jul. 1982, KUN); Fugong (Lin 791986, 1 Aug. 1979, KUN); Weihsi, Tungchuling, Nankukung, 3900 m (T. T. Yü 8842, 11 Jul. 1937, PE).

SICHUAN: Tatsienlu (MacLaren AC 134, Jul. 1938, KYO).

10. *Juncus chrysocarpus* Buchenau

NEPAL: Rasuwa, Sunchet Kharka - Kangait Kharka - Gopchet Kharka - a pass - Lipchet Kharka, 2800 m (F. Miyamoto et al. 9410309, 15 Aug. 1994, TI); loc. cit., Lipchet Kharka - Makgan Kharka - Guinsi (near Balche), 3320m (F. Miyamoto et al. 9410324, 16 Aug. 1994, TI); Rorested ridge between Basantpur (N. of Chitre) and Door Pani, 27°07'N, 87°24'E, 2720 m (S. Crawford et al. KEKE51, 28 Aug. 1989, K); Ghunsa Khola, Amjilassa to KYapra, 27°37'N, 87°53'E, 2700 m (S. Crawford et al. KEKE300, 6 Sept. 1989, K); Between Ghunsa and Tamo La. 27°38'N, 87°57'E, 3730 m (S. Crawford et al. KEKE675, 15, Sept. 1989, K); Forested ridge between Basantapur and Door Pani, 27°07'N, 87°24'E, 2720 m (C. G. Wilson et al. 51, 28 Aug. 1989, KATH); above Door Pani, 27°10'N, 87°26'E, 2900 m (C. G. Wilson 1248, 5 Oct. 1989, KATH); Taplejung district, Forested ridge at Manebhanjang, N end of Milke Danda Ridge, 27°27'N, 87°28'E, 3350 m (D. G. Long et al. 960, 22 Oct. 1991, KATH); Environs of Ghunsa, 27°40'N, 87°57'E, 3570 m (C. G. Wilson 433, 8 Sept. 1989, KATH); Ghunsa and Tamo La, 27°37'N, 87°57'E, 3730 m (C. G. Wilson et al. 675, 15 Sept. 1989, KATH).

SIKKIM: Jongri, 12000 ft. (C. B. Clarke 25891, 25893, 25976, 15 Oct. 1875, K); loc. cit., 13000 ft. (C. B. Clarke 26149, Oct. 1875, K); Guantong, 11000 ft. (G. A. Gammie 993, 23 Aug. 1892, CAL); Darjeeling, Phallut to Singla, 11000-12000 ft. (I. H. Burkill 25291, 20 Oct. 1904, CAL); Islumbo, 12000 ft. (C. B. Clarke 25572, 24 Oct. 1875, K); loc. cit., 11000 ft. (C. B. Clarke 25592, 24 Oct. 1875, CAL); Phallaling, 12000 ft. (C. B. Clarke 25699, 25 Oct. 1875, CAL); without precise locality, 12000 ft. (C. B. Clarke 25562, 24 Oct. 1875, K); without precise locality, 10000-12000 ft. (J. D. Hooker s.n., A, K); without precise locality (S. Kurz s.n., 17 Oct. 1868, CAL).

BHUTAN: Wangdi Phodrang district, Lipchet Kharka - Makgan Kharka, 28°03'N, 85°07'E, 3320 m (F. Miyamoto 9410324, 16 Aug. 1994, TI); loc. cit., Tsonsothang - Tampetso, 27°37'N, 90°31'E, 4000 m (F. Miyamoto 9361678, 24 Sept. 1993, TI); loc. cit., Marothang, 27°39'N, 90°31'E, 3500 m (F. Miyamoto 9361755, 28 Sept. 1993, TI); loc. cit., Nika chuu - Bhaja, 27°37'N, 90°32'E, 3200 m (F. Miyamoto 9361527, 18 Sept. 1993, TI); without precise locality (Griffith s.n., K).

EAST HIMALAYA: without precise locality (Griffith 5454/1, CAL).

XIZANG (TIBET): Cona, 3250 m (Qing-Zang expedition team 74-3804, 31 Jul. 1974, KUN); without precise locality (collector unknown 1176, 1882, K).

11. *Juncus clarkei* Buchenau

NEPAL: Tukucha, Kali Gandaki, 10500 ft. (J. D. A. Stainton et al. 1114, 14 Jun. 1954, CAL); Rasuwa, Gopte - Thale Patil, 3400 m (H. Hara et al. 721968, 26 Aug. 1972, TI); loc. cit., Pabil Kharka - a pass - a Kharka, 3800 m (F. Miyamoto et al. 9410229, 7 Aug. 1994, KATH, TI); loc. cit., Chyauche Kharka - a bridge - Lingju, 3400 m (F. Miyamoto et al. 9410269, 12 Aug. 1994, KATH, TI); loc. cit., Lipchet Kharka - Makgan Kharka - Guinsi (near Balche), 3400 m (F. Miyamoto et al. 9410318, 16 Aug. 1994, KATH, TI); Solukhumbu, Thasing Dingma - Chhatarwa, 3600 m (F. Miyamoto et al. 9580470, 28 Aug. 1995, KATH, TI); loc. cit., Junbesi - Tagtor - a pass - Lanjura Pass - Goyom - Dakchu - Sete - Kensa, 3400 m (F. Miyamoto et al. 9580496, 2 Sept. 1995, KATH, TI); loc. cit., Najing Ding - Chalem Kharka, 3000 m (F. Miyamoto et al. 9580137, 31 Jul. 1995, KATH, TI); Sankuwa Shaba district, Bhinsi Kharka - Danda Kharka - Unshisa Kharka - Khongma, 3000 m (M. Minaki et al. 9020559, 4 Aug. 1990, TI); loc. cit., Singoa Kharka - Pahakhola (H. Ohba et al. 9153450, 11 Aug. 1991, TI); loc. cit., Lamo Pokhari, 2900 m (H. Kanai et al. 720281, 9 Jun. 1972, TI); loc. cit., Pemathang kharka, S side of Barun Khola, 27°44', 87°12', 3505 m (D. G. Long et al. 395, 28 Sept. 1991, KATH); Ridge N. E. of Gupha Pokhali, 27°18', 87°33', 2800 m (C. G. Wilson et al. 108, 30 Aug. 1989, KATH); Ghunsa Khola, Amjilassa to Kyapra, 27°37', 87°53', 2700 m (C. G. Wilson et al. 300, 6 Sept. 1989, KATH); Simbua Khalka, below Tseram, 27°31', 87°56', 3400 m (C. G. Wilson et al. 820, 21 Sept. 1989, KATH); J. F. Rock Shelter I - J. F. Rock Shelter II, 3250 m (H. Kanai & S. B. Malla 674774, 24 Aug. 1969, TI).

SIKKIM: Lachen, 11000 ft. (J. D. Hooker s.n., 12 Jun. 1849, K); Jongri, 12000 ft. (C. B. Clarke 25959, 15 Oct. 1875, K); Darjeeling, 10000 ft. (C. B. Clarke 27604, 12 Sept. 1875, K, CAL-paratype of *J. clakeii*); Singalela, 11000 ft. (collector unknown, 1603 a, b, c, 4 Sept. 1876, K); Cheugtang, 6000 ft. (Smith & Cave 895, 7 Jul. 1909, CAL); Chooabanja (G. King s.n., Aug-Sept. 1887, CAL); Glumbo, 12000 ft. (C. B. Clarke 25565, 24 Oct. 1887, S, K); Phadouchen, 11000 ft. (W. W. Smith 4419, 20 Aug. 1910, CAL); Tongloo, 10000ft. (S. Kurz s.n., CAL); Tonglos, (T. Anderson 1335, 1862, CAL); Yakla, 13000 ft. (C. B. Clarke 9621, 16 Oct. 1869, CAL); Waya (Ribu 317, Oct. 1908, CAL, K); without precise locality 12000 ft. (G. King s.n., Aug. 1888, CAL); without precise locality 11000–14000 ft. (J. D. Hooker s.n., 6 Jun. 1849, A, K, L, CAL); without precise locality (S. Kurz s.n., 15 Oct. 1868, CAL).

BHUTAN: Wangdi Phodrang district, Bhaja - Nika chhu, 27°35'N, 90°30'E, 3200 m (F. Miyamoto 9361757, 28 Sept. 1993, TI).

ASSAM: Jakpho, Naga Hill, 9900 ft. (C. B. Clarke 41352, 25 Oct. 1885, K, CAL); loc. cit., 9800 ft. (N. L. Bor 6403, 27 Sept. 1935, K).

MYANMAR: North Triangle, Tama Bun, 9000 ft. (F. Kingdon-Ward 21441, 11 Oct. 1953, A, BM); loc. cit., 10300 ft. (F. Kingdon-Ward 21455, 12 Oct. 1953, A); N. E. Upper Burma, 11000 ft. (G. Yorrest 24877, Aug. 1924, K).

XIZANG (TIBET): Chumbi, Knug boo (G. King 150, 7 Jul. 1884, CAL, K).

YUNNAN: Tsekou (P. T. Manberg s.n., Jun. 1905, K); Pi-lo-shan, Che-tse-lo, 4000 m (H. T. Tsai 58605, 14 Sept. 1934, A, PE); Che-tse-lo, 3000–4000m (H. T. Tsai 54128, 4 Sept. 1933, A, KUN, PE); loc. cit., 4000 m (H. T. Tsai 58161, 24 Aug. 1934, A, PE); A-tun-tze, 3000 m (C. W. Wang 64863, Jul.–Aug. 1935, KUN); loc. cit. (C. W. Wang 64888, Jul-Aug. 1935, A, PE, KUN); Atuntze, Kangsatung, 3900 m (T. T. Yü 9817, 24 Aug. 1937, PE); Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68817, 68834, Aug. 1935, A, PE, KUN); In montium, inter fluvios Landsang-djiang (Mekong) et Lu-djiang (Salween), 28°09'N, 3800–3950 m (F. Handel-Mazzetti 9705, 6 Aug. 1916, S, W, WU); Mekong-Salwin Divide, Sewalongba, 3000 m (T. T. Yü 22533, 27 Aug. 1938, KUN, PE); Wei-si Hsien, Yeh-Chih, 3600 m (C. W. Wang 68420, Aug. 1935, PE); loc. cit., 3600 m (C. W. Wang 68548, Aug. 1935, A, PE, KUN); Inter pagum Dschungdien (Chungtien) et vicum Djitsung, 3900–4100 m (F. Handel-Mazzetti 7821, 25 Aug. 1915, S, W, WU); Lushui Xian, Pianma - Pianma Pass - Lushui, 3000 m (S. K. Wu et al. 103169, 13 Sept. 1999, KUN, TI); Gongshan, 3000 m (Qing-Zang expedition team 8592, 25 Jul. 1982, KUN); Gongshan Xian, Dulongjiang - Gongshan, 3000 m (S. K. Wu et al. 103187, 18 & 19 Sept. 1999, KUN, TI); loc. cit., S. W. of Gongshan, Gaoligong Shan, 2615 m (S. K. Wu et al. 103189, 20 Sept. 1999, KUN, TI); Wen-shan Hsien, Loa-jiun-shan (K. M. Feng 11181, 13 Aug. 1947, KUN); Tali Range (G. Forrest 28156, Jul. 1929, S); Tsangshan Range, W. of Talifu, 13000 ft. (J. F. Rock 6342, Aug. 1922, A, KUN); Dali, Cangshan, 3440 m (S. K. Wu et al. 1608, 1 Sept. 1996, KUN, TI); Yangbi, a Fruit Garden-Cangshan, 3800 m (S. K. Wu et al. 468, 16 Aug. 1997, KUN, TI); Dali Shi, Diancang Shan, Zhonghe Temple - Ximatang, 3400 m (S. K. Wu et al. 103134, 5 Sept. 1999, KUN, TI); loc. cit., Zhonghe Peak, 3500 m (S. K. Wu et al. 103146, 6 Sept. 1999, KUN, TI); Lijiang Xian, Laojun Shan, Longqun Lodge - Jiushijiu Longtan, 3900 m (S. K. Wu et al. 103160, 8 Sept. 1999, KUN, TI); Lung-pan-la Champu-tung, 3120 m (C. W. Wang 67273, Oct. 1935, A, KUN, PE); Upper Kiukiang valley, Lungtsahmuru, 3800 m (T. T. Yü 19838, 9 Aug. 1938, A, PE, KUN); Sooroo, Cham-pu-tung, 3000 m (C. W. Wang 66703, Sept. 1935, A, PE); Taron-Taru Divide, Tangtehwang, 2100 m (T. T. Yü 20005, 27 Aug. 1938, A); loc. cit. (T. T. Yü s.n., 27 Aug 1938, KUN); without precise locality (G. Forrest 29817, 1930-1931, S).

SICHUAN: Yanyuan, 3800 m (Qing-Zang expedition team 12755, 9 Aug. 1983, KUN).

12. *Juncus concinnus* D. Don

INDIA: N. Bihar, near Nepal Border (B. B. Mundkur 45, Sept. 1942, A).

PUNJAB: Kulu valley between Kothi and Rahla, 2700 m (R. A. M. Geesteranus 14071, 22 Aug. 1964, L); Kumawar (J. R. Drummond 22252, K).

HIMACHAL PRADESH: Dalhousie, 6000 ft. (C. B. Clarke 22493, 15 Sept. 1874, CAL); Dhurmsala, 10000 ft. (C. B. Clarke 22596, 17 Oct. 1874, CAL); loc. cit. (C. B. Clarke s.n., 17 Oct. 1874, L); Mdia, Simla, 2200 m (R. A. Maas Geesteranus 14056, 15 Aug. 1964, L); Narkavoa (Stoliczka s.n., CAL).

UTTAR PRADESH: Jaunsar. United Provinces, Deoban at 8500 ft. (C. E. Parkinson 7141, 25 Jun. 1936, S); Nainital, 6000 ft. (Meebold 215, Oct. 1905, CAL).

KUMAON: Bhaichan, 2000 m (C. M. Arora 49622, 6 Aug. 1972, CAL); Dafia - Dhoora, 2600 m (C. M. Arora 50067, 28 Aug. 1973, CAL); Nasini Tal, 6500 ft. (R. Strachey & J. E. Winterbottom 10, CAL); Nawi Lal, 7000 ft. (R. Strachey & J. E. Winterbottom 10, A); near Sasa, 8000–9000 ft. (J. F. Duthie 6054, 12 Jul. 1886, K); Jagesar, 7000 ft. (R. Strachey & J. E. Winterbottom 10, K).

NORTH WEST HIMALAYA: Kulel, 3000 ft. (G. A. Gammie 18174, 22 Aug. 1896, K); Landow, Mussoorie, 7000 ft. (R. R. Stewart 12846, 21 Aug. 1936, S); Jableukhet ridges, 7000 ft. (R. R. Stewart 14367, 16 Aug. 1934, A).

NEPAL: Thogwmdanda, 3200 m (collector unknown 712, 27 Aug. 1972, KATH); Jumla, 2300 m (M. P. Nanandher & B. P. Joshi 6817, 6 Aug. 1981, KATH); Surkhet, Katukuwa - Sidhapaila - Ranimatta, 1925 m (M. Suzuki et al. 9193018, 30 Jul. 1991, TI); near Phagune Dhuri, 13000 ft. (J. D. A. Stainton et al. 3421, 7 Jul. 1954, A, BM); Myagdi, Chitre (T. Hoshino et al. 9662041, 27 Jul. 1996, TI); Tukcha, Kali Gandaki, 10000 ft. (J. D. A. Stainton et al. 7482, 26 Aug. 1954, A, BM); Kali Gandaki, N. Dhumpu, 7800 ft. (G. Miede 82, 12 Jul. 1977, BM); near Lumsum, 7500 ft. (J. D. A. Stainton et al. 3516, 17 Jul. 1954, A, BM); Samargaon, N. of Tukucha, 15500 ft. (J. D. A. Stainton et al. 7295, 15 Aug. 1954, CAL); S. of Annapurna, above Siklis, 28°07'N, 84°06'E, 2650 m (G. Troth 940, 28 Aug. 1976, BM); Gandaki Zone, Manang distr., around Bimtang, 28°38'04"N, 84°28'20"E, 3520 m (M. Suzuki et al. 9470370, 9470374, 11 Aug. 1994, TI); loc. cit. 3535 m (M. Suzuki et al. 9060280, 11 Aug. 1994, TI); Bimtang, 3350 m (M. Suzuki et al. 9485391, 12 Aug. 1994, TI); Gandaki Zone, Gorkha distr., Lungdang Gompa, 28°28'10"N, 85°03'07"E, 2840 m (M. Suzuki et al. 9460113, 28 Jul. 1994, TI); loc. cit., Lokpa, 28°24'35"N, 84°53'40"E - 28°26'49"N, 84°55'56"E, 1940 m (M. Suzuki et al. 9485153, 25 Jul. 1994, TI); near Lumsum, 7500 ft. (J. D. A. Stainton et al. 3516, 17 Jul. 1954, CAL); Shiar Khola, W. of Chumje, 9500 ft. (P. C. Gardner 924, 27 Jun. 1953, BM); Langtang, 11500–12500 ft. (O. Polunin 481, 21 Jun. 1949, BM); Syarpagoan - Langtang, 9500 ft. (O. Polunin 1360, 31 Jul. 1949, BM); Langtang village area, 11500 ft. (O. Polunin 1548, 1 Aug. 1949, BM); Kyangijin, 11500–12000 ft. (A. Richards 58, 8 Aug. 1969, BM); Bagmati zone, Rasuwa district, just east of village of Bharku, 1828 m (H. van T. & S. N. Irene 150, 3 Aug. 1985, A); Bagmati zone, Lalitpur district, top of Mt. Pulchoki, 10 miles S. E. of Kathmandu, 2700 m (D. H. Nicolson 2255, 3 Sept. 1966, BM, KATH); Rasuwa, Borlang - Pati Bhanjyang - Tanguni - Chipling - Latsu - Ingyur (H. Kanai & S. B. Malla 674587, 21 Aug. 1969, TI); loc. cit., Gram - Thale - Dunche, 1900 m (H. Hara et al. 721733, 21 Aug. 1972, TI); loc. cit., Yure Kharka - Tinbu Kharka, 3750 m (F. Miyamoto et al. 9410056, 26 Jul. 1994, TI); loc. cit., Pati Kharka - cross a river - a Kharka (near Pabil Kharka), 3000 m (F. Miyamoto et al. 9410217, 5 Aug. 1994, TI); loc. cit., a Kharka - Pabil Kharka, 2920 m (F. Miyamoto et al. 9410219, 6 Aug. 1994, TI); loc. cit., Chyauche Kharka - a bridge - Lingju, 3400 m (F. Miyamoto et al. 9410284, 12 Aug. 1994, TI); loc. cit., Sunchet Kharka - Kangait Kharka - Gopchet Kharka - a pass - Lipchet Kharka, 2800 m (F. Miyamoto et al. 9410308, 15 Aug. 1994, TI); loc. cit., Lama Lodge - Chumna Lodge - Ghora Tabela - Thangshab - Langtang, 3300 m (H. Takayama et al. 9220115, 12 Jul. 1992, TI); Daman, 7620 ft. (Rajbhandari & Upadhyay 2230, 16 Aug. 1964, KATH); Daman, 27°45', 85°05', 2400 m (J. F. Dobremez 809, 14 Aug. 1971, KATH); Sherpagaon, 7000–8000 ft. (A. Richards 53, 5 Aug. 1969, BM); Rolwaling, 27°41', 86°15', 11500 ft. (D. McCosh 159, 31 May 1964, BM, KATH); Numbur, Rolwaling Himal., 2800 m (K. Yoda s.n., 3 Jun. 1963, KYO); loc. cit., 2900 m (K. Yoda s.n., 3 Jun. 1963, KYO); Ramechhap, Shivalaya -

Khasrubus - Deorali (H. Ohba et al. 8570099, 5 Jul. 1985, TI); loc. cit., Thare Og - Gyajo La - Neju (Njashung Dingma) (H. Ohba et al. 8570910, 30, Jul. 1985, TI); loc. cit., Bhandar - Deorali - Khasrubus - Shivalaya (H. Ohba et al. 8530786, 6 Aug. 1985, TI); loc. cit., Deorali - Thodung - Serdingma (H. Ohba et al. 8570190, 6 Jul. 1985, TI); loc. cit., Sibalaya - Manidara - Merudara - Sanmadara - Kösurobas - Mohobill - Gatekhora - Deorali - Bandar, 1900 m (F. Miyamoto et al. 9592036, 19 Jul. 1995, TI); loc. cit., 1870 m (F. Miyamoto et al. 9596028, 19 Jul. 1995, TI); loc. cit., Takisindu - Junbesi, 2500 m (F. Miyamoto et al. 9580493, 1 Sept. 1995, TI); Dorzhong to Chhumdung, 3400 m (S. Nakao s.n., 12 Jun. 1953, KYO); Taplejung, Topke Gola - Shewaden (H. Kanai et al. s.n., 28 Jun. 1972, TI); Taplejung district, from Chini to Nup, 3000 m (H. Tabata et al. 11713, 19 Jul. 1978, KYO); Solukhumbu, Pike Khop - Leding - Tama Khani - Beni - Fera, 2600 m (F. Miyamoto et al. 9580074, 25 Jul. 1995, TI); Chauki, 27°11'N, 87°29'E, 2500 m (J. F. Dobremea 1515, 17 Aug. 1972, BM); Sankhuwasawa, Thudam, 3400 m (H. Kanai et al. 720740, 25 Jun. 1972, TI); Milke Danda, 27°15'N, 87°30'E, 8500 ft. (L. H. J. Willams & J. D. A. Stainton 8433, 10 Sept. 1967, K); Kaski, Tirkhedhunga - Ulleri - Banthanti - Ghorepani, 2480 m (M. Mikage et al. 9552183, 16 Sept. 1995, TI); Dhankuta, Tute - Tinjure Phedi (H. Ohba et al. 9153067, 14 Jul. 1991, TI); near Ghunsa, 3500 m (K. Nishioka 36, 16 Jun. 1962, KYO); near Wallun, 3400 m (K. Nishioka 124, 16 Jul. 1962, KYO); Jangla Banjang, 1000 m (S. Elnarsson et al. 771, 16 Jun. 1973, BM); Phagune Dhuri, 13000 ft. (J. D. A. Stainto et al. 3421, 7 Jul. 1954, BM); Mahani gaon (O. Polunin et al. 311, 26 Jul. 1952, BM); Mupong, 9000–10000 ft. (C. L. Dhwoj 396, 1930, BM); On path from Chomro to Gandrung, 7000 ft. (C. Barclay 2411, 30 May 1971, K); Sindnuwa, Dhankuta district, 2100 m (N. P. Manandhar 129, 2 Aug. 1976, KATH); Environs of Ghunsa, 27°40', 87°57', 3430 m (C. G. Wilosn et al. 435, 8 Sept. 1989, KATH); Kyapra to Pheri, Ghunsa, 27°38', 87°55', 3380 m (C. G. Wilosn et al. 1246, 5 Oct. 1989, KATH); Shidna N of Dhankuta, 27°03', 87°24', 2650 m (C. B. Wilosn et al. 347a, 7 Sept. 1989, KATH); above Door Pani, 27°10', 87°26', 2900 m (C. G. Wilosn et al. 435, 8 Sept. 1989, KATH); Rikheswone, 8000 ft. (S. B. Malla & K. R. Rajbhandari 62, 27 Aug. 1960, CAL, KATH); without precise locality (J. Scully 122, CAL); Near Kutungchhang, 7500 ft. (T. B. Shrestha & P. R. Shakya 3715, 7 Sept. 1965, KATH); without precise locality, 4050–4100 m (O. Namikawa 569, 2 Sept. 1958, KYO).

SIKKIM: Lachen, 14000 ft. (J. D. Hooker s.n., 15 Jul. 1849, K); North district, Lasha Chhu valley, N. E. of Thanggu, 27°53'39"N, 88°32'44"E, 3980 m (D. G. Long & H. J. Noltie 317, 18 Jul. 1996, E, TI); Chawuago, 12000–13000 ft. (W. W. Smith 3810, 26 Jul. 1910, CAL); Zewu valley, 13000 ft. (Smith & Cave 2807, 20 Jul. 1909, CAL); without precise locality, 8000–10000 ft. (J. D. Hooker s.n., L).

BHUTAN: Laya, Upper Mo Chu, 12000 ft. (F. Ludlow et al. 16434, 6 Jun. 1949, A, BM, CAL); Denchung, Khoma Chu, 7000 ft. (F. Ludlow et al. 20875, 13 Jul. 1949, A, BM); Dochula, 3100 m (G. S. Gupta 1747, 28 Aug. 1965, CAL); Thimphu district, Dotena, Thimphu Chu, 27°35'N, 89°38'E, 2550 m (I. W. J. Sinclair & D. G. Long, 5023, 15 Sept. 1984, K); Thimpu, 9500 ft. (S. B. Lyon 5096, 17 Sept. 1967, BM); Upper MO Chu district, Gasa Dzong, 27°57'N, 89°46'E, 2800 m (I. W. J. Sinclair & D. G. Long 5023, 15 Sept. 1984, K); Sengor, N. W. of Mongar, 27°22'N, 91°01'E, 3000 m (A. J. C. Grierson & D. G. Long 2519, 6 Jul. 1979, K); Ura ha, 11000 ft. (S. B. Lyon 15106A, 28 Jun. 1969, BM); Chi la, 4000–4300 m (G. S. Gupta 613, 20 Aug. 1963, CAL).

ASSAM: Khasia, 5000–6000 ft. (J. D. Hooker & T. Thomson s.n., L); Tha Chu (F. Kingdon-Ward 19653, 16 Jul. 1950, BM); Jakpho, Naga Hill, 9900 ft. (C. B. Clarke 41276, 25 Oct. 1885, CAL).

HIMALAYA: Him. Bor. Occ., 10000–14000 ft. (T. Thomson s.n., L); without precise locality, 6000–10000 ft. (T. Thomson s.n., L, CAL); without precise locality, 4000–10000 ft. (T. Thomson s.n., L); without precise locality (Falconer 1184, L).

MYANMAR: West central Myanmar, Mt. Victoria, 7000 ft. (F. Kingdon-ward 22617, 2 Sept. 1956, BM).

XIZANG (TIBET): Nyalam Xian, Zhangmu, 27°59'N, 85°58'E, 2700 m (S. Akiyama et al. 106261, 16 Aug. 2001, KUN, TI); Chumbi, Rwdung (Dungboo s.n., 28 Jun. 1878, B, CAL); Chumbi & Phari (Meebold

4919, Oct. 1907, CAL); Rung-me, N. of Phari (G. King s.n., Aug. 1882, CAL); Mainling, 3150 m (Qing-Zang expedition team 74-5336, 21 Sept. 1974, KUN); Gongbo'gyamda Xian, Basum Lake, 3550 m (S. Akiyama et al. 105203, 15 Aug. 2000, KUN, TI); Nyingch, 2800 m (Yang 2349, 18 Sept. 1963, KUN); Mira La, Nyang Chu, 29°28'N, 94°12'E, 11000–12000 ft. (F. Ludlow et al. 6031, 12 Aug. 1938, A); Zayu, 3500 m (Qing-Zang expedition team 10520, 18 Sept. 1981, KUN); loc. cit., 3700 m (Tibet expedition team 10811, 27 Sept. 1982, KUN); Lang (G. King 1808, 5 Aug. 1882, K); Rookah, 10000 ft. (G. King s.n., 1885, K); San-duan-tung from Chumbi (G. King s.n., 5 Aug. 1882, CAL).

YUNNAN: In pluviisilvis mixtis temperatis supra vicum Bahan (Pehalo) ad fluvium Lu-djiang (Salween), Tong-Tchouan, 27°58'N, 2700 m (F. Handel-Mazzetti 9054, 24 Jun. 1916, S, W); Boggy pasture on the western flank of the Shewli Salwin divide, 25°20'N, 9000–10000 ft. (G. Forrest 8934, Aug. 1912, K); loc. cit., 9000 ft. (G. Forrest 8951, Aug. 1912, K); Yangtze watershed, in the Prefectural district of Likiang, eastern slopes of Likiang Snow Range, 12000–13000 ft. (J. F. Rock 4873, 12-29 May 1922, A); Mt. Wuaha, Yung-ning Territory, 11000 ft. (J. F. Rock 24212, May 1922, A, K-paratype of *J. glomeratus*); Zhongdian (S. Y. Hu & Y. C. Kong Y167, 8 Jul. 1999, A); Chengkang, Snow Range, 3100 m (T. T. Yü 17214, 6 Aug. 1938, A, KUN, PE); Haba Xueshan, 2900 m (Zhongdian expedition team 2101, 17 Sept. 1962, KUN); Chi-na-tung, Tsa-wa-rung, 2800 m (C. W. Wang 65226, Aug. 1935, A, KUN, PE); Wei-si Hsien, 3500 m (C. W. Wang 63806, Jun. 1935, A); loc. cit., 3500 m (C. W. Wang 63885, Jun. 1935, A, PE); loc. cit., 2800 m (H. T. Tsai 57990, 21 Sept. 1934, A, PE); loc. cit., Yeh-Chih, 3600 m (C. W. Wang 68339, Aug. 1935, PE); loc. cit., 3200 m (C. W. Wang 68067, Aug. 1935, A); loc. cit., 3600 m (C. W. Wang 68326, Aug. 1935, A); Chih-tse-lo, 2500 m (H. T. Tsai 54162, 7 Sept. 1933, A, PE); Chu-hsiung, To-Tsu, 1980 m (M. K. Li 143, 23 Sept. 1939, PE); Chi-na-tung, Tsa-wa-rung, 3000 m (C. W. Wang 65358, Aug. 1935, A, PE); Pin-chuan Hsien, 3000 m (H. T. Tsai 52963, 18 Jul. 1933, A, PE); Atuntze, Kangtsatung, Chienlungna, 3250 m (T. T. Yü 9963, 29 Aug. 1937, PE); Atuntze, Paimashan, Kuchianung, 3400 m (T. T. Yü 9460, 9 Aug. 1937, PE); Atun-tze, 3000 m (C. W. Wang 64799, Jul.-Aug. 1935, A); loc. cit., 2700 m (C. W. Wang 69938, Sept. 1935, PE); loc. cit., 2700 m (C. W. Wang 69933, Sept. 1935, A); Deqen (Qing-Zang expedition team 2653, 11 Jul. 1981, KUN); Zhongdian, Biutahai, 3440 m (Qing-Zang expedition team 1619, 23 Jun. 1951, KUN); Zhongdian, Haba Shan, 3600 m (Zhongdian expedition team 1309, 25 Aug. 1962, PE-paratype of *J. glomeratus*); Zhongdian Xian, Tianchi, 27°39'N, 99°38'E, 3900 m (S. Akiyama et al. 419, 8 Jul. 2000, KUN, TI); loc. cit., Shudu Hu, a lake near Zhongdian, 27°55'N, 99°56'E, 3400 m (S. Akiyama et al. 426, 9 Jul. 2000, KUN, TI); Y. Chungtien, Pica, 3100 m (T. T. Yü 12010, 7 Jul. 1937, PE); Kiukiang valley, Narktai to Bleeton, 2350 m (T. T. Yü 19597, 3 Aug. 1937, PE); Song-Ming, Ta-Po-chiao, 2300 m (Y. P. Chang 151, 14 Oct. 1940, PE); Yangbi Xian, W. side of Diancang Shan mountain range, En route from Xueshanhe to Dapingzi, 25°43'N, 100°02'E, 2600-3000 m (B. Bartholomew & D. E. Boufford 216, 17 Jun. 1984, A); loc. cit., Vicinity of Dajiping, 25°50'N, 99°59'E, 2600-3100 m (B. Bartholomew & D. E. Boufford 670, 1 Jul. 1984, A); Yangbi county, Zhongsan, 2500 m (K. Iwatsuki et al. 480, 23 Aug. 1984, KUN, TI); loc. cit., 2400 m (K. Iwatsuki et al. 232, 23 Aug. 1984, KUN, TI); Yangbi county, Sanchaho on the western slope of Dianchang Shan, 2350-2600 m (M. Kato et al. 303, 21 Jul. 1988, KUN, TI); Tai-li Hsien, Tien-ts'ang Shan (K. K. Tsoong 2282, 3 Sept. 1908, S); Tali range (G. Forrest 28162, Jul. 1929, S); loc. cit., 9000-10000 ft. (G. Forrest 4911, 1909, CAL); Ta-li Hsien, 2800 m (H. T. Tsai 53821, 26 Jul. 1933, A, PE); Dali Xian, E. side of Diancang Shan mountain range, Vicinity of Yinglofeng, 25°42'N, 100°07'E, 2900–3050 m (B. Bartholomew & D. E. Boufford 940, 10 Jul. 1984, A); Dali Xian, Diancang Shan mountain range, Xiaohuadianba in the vicinity of Huadianba medicinal herb farm, 25°53'N, 100°01'E, 3200 m (B. Bartholomew & D. E. Boufford 1183, 19 Jul. 1984, A); Dali, Cangshan, 3410 m (S. K. Wu et al. 1611bis, 1 Sept. 1996, KUN, TI); loc. cit., 3300 m (S. K. Wu et al. 1613, 1 Sept. 1996, KUN, TI); Dali Bizu Zizhizhou, Huandianba, 2900–3100 m (K. Iwatsuki et al. 1482, 29 Aug. 1984, KUN, TI); Dali Shi, Diancang Shan, 3300 m (S. Akiyama et al. 403, 5 Jul. 2001, KUN, TI); Lichiang, 3600 m (C. Schneider 2069,

30 Jul. 1914, K); Li-kiang Hsian, 2500 m (C. W. Wang 70862, Jul. 1935, A, PE); loc. cit., 2500 m (C. W. Wang 70893, Jul. 1935, A, PE); loc. cit., 2800 m (C. W. Wang 71379, Jul. 1935, PE); loc. cit., 2800 m (C. W. Wang 71679, Jul. 1935, A, PE); loc. cit., 2300 m (C. W. Wang 70951, Jul. 1935, PE); Likiang snow range (R. C. Ching 30293, 28 Jun. 1939, A); Lijiang, Ganhaizi, 3080 m (S. K. Wu et al. 1439, 9 Aug. 1996, KUN, TI); loc. cit., Baishui, 3000–3150 m (K. Iwatsuki et al. 1161, 2 Oct. 1987); loc. cit., Longpan, 1950–2250 m (H. Ohba et al. 142, 10 Sept. 1987, KUN, TI); loc. cit., Nguluko, 2800 m (T. T. Yü 15263, 5 Jul. 1937, PE); N.W. Likiang Snow range on Yangtze (R. C. Ching 20746, 9 Jun. 1939, A); Upper Kiukiang valley, Narktai, 2350 m (T. T. Yü 19597, 3 Aug. 1938, A); Septentrional central (Maire 6865, 1909-1911, S); Tong-Tchouan (Maire s.n., 1909-1911, S).

SICHUAN: Taofu (Dawo) district, montes orientales, Lhamo Mondeh La, 3500 m (H. Smith 12306, 21 Sept. 1934, KYO, PE, S); Sacred Mt. Kar-war-kar-boo, Tsa-wa-rung, 3400 m (C. W. Wang 66263, Sept. 1335, A, PE); Litang, 3900 m (Sichuan expedition team 3677, 3 Aug. 1973, KUN); Mu-li, Lea-lang-kang-din, 2400 m (T. T. Yü 7471, 30 Jul. 1937, A, PE); Muli, 3200 m (Tibet expedition team 14004, 13 Sept. 1983, KUN); loc. cit., 2500-3350 m (S. K. Wu 3235, 25 Sept. 1959, KUN); Xiangcheng - Daocheng, around Wuming Shan, 4000 m (S. K. Wu et al. 428, 29 Jul. 1997, KUN, TI); Daocheng, 3250 m (Qing-Zang expedition team 4298, 25 Aug. 1981, KUN); loc. cit., 4200 m (Qing-Zang expedition team 5894, 31 Aug. 1981, KUN); loc. cit., Daocheng - Gongling, 3740 m (S. K. Wu et al. 1531, 19 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, Beiyu, 4200 m (S. K. Wu et al. 1554, 22 Aug. 1996, KUN, TI); loc. cit., Gongga Zhonggu - Riwa Xiang - Gongling - Daocheng, 3700 m (S. K. Wu et al. 1577, 25 Aug. 1996, KUN, TI); loc. cit., around Gongga Zhonggu, 3880 m (S. K. Wu et al. 435, 3 Aug. 1997, KUN, TI); Tahsiangling, W. side, 2600 m (H. Smith 10207, 26 Jun. 1934, KYO, S); Xiaojin, Ganhaizi - southwestern slope of Mt. Siguniang - Ganhaizi, 3800 m (H. Ikeda et al. 100839, 1 Sept. 1998, KUN, TI); loc. cit., 3700 m (H. Ikeda et al. 100841, 1 Sept. 1998, KUN, TI); Yanyuan, 3200 m (Qing-Zang expedition team 12036, 12175, 12872, 20 Jul. 1983, KUN).

13. *Juncus concolor* Sam.

INDIA AND BURMA: Sirhoi, 8000–8500 ft. (F. Kingdon-Ward 17839, 21 Jul. 1948, A).

YUNNAN: Chengkang, Snow Range, 3400 m (T. T. Yü 16961, 24 Jul. 1938, A, PE); loc. cit., 3420 m (T. T. Yü 17194, 4 Aug. 1938, A, PE); Yangbi, around Cangshan, Yangbi side, 3800 m (S. K. Wu et al. 475, 17 Aug. 1997, KUN, TI); loc. cit., 3820 m (S. K. Wu et al. 476, 17 Aug. 1997, KUN, TI).

14. *Juncus crassistylus* A. Camus

MYANMAR: Open moist pasture on the summit of the Sansi gorge, Upper Burmah, 25°25'N, 9500 ft. (G. Forrest 9116, Sept. 1912, K); N. E. upper Buruma (G. Forrest 25042, Sept. 1924, K); Nmai Hka-Salwin divide (G. Forrest 25072, Sept. 1924, BM).

YUNNAN: Western flank of the Shweli-Salwin divide, 10000–11000 ft. (G. Forrest 9026, Aug. 1912, K, PE, S); Che-tse-lo, 4000 m (H. T. Tsai 58016, 18 Aug. 1934, A, K, KUN, PE); loc. cit., 4000 m (H. T. Tsai 58063, 18 Aug. 1934, A, PE); loc. cit., 4000 m (H. T. Tsai 58253, 27 Aug. 1934, A, PE); loc. cit., 4000 m (H. T. Tsai 58639, 15 Aug. 1934, A, PE); Lushui Xian, Pianma - Pianma Pass - Lushui, 3200 m (S. K. Wu et al. 103173, 13 Sept. 1999, KUN, TI); Tali range, 25°40'N, 100°05'E, 7000 ft. (G. Forrest 28009, Aug. 1929, BM, S); Dali Xian, E. side of Diancang Shan mountain range, Vicinity of Yinglofeng, 3000 m (B. Bartholomew et al. 859, 8 Jul. 1984, A); Dali Shi, Diancang Shan, Zhonghe Peak, 3700 m (S. K. Wu et al. 103153, 6 Sept. 1999, KUN, TI); loc. cit., 3300 m (S. K. Wu et al. 103144, 6 Sept. 1999, KUN, TI); loc. cit., Zhonghe Temple - Ximatang, 3200 m (S. K. Wu et al. 103138, 5 Sept. 1999, KUN, TI); Parmi les bambous, Tsang Chang, 3500 m (P. J. M. Delavey 2641, 20 Aug. 1887, BM, CAL, K, P); without precise locality (G. Forrest 12882, 1917-1919, BM); without precise locality (G. Forrest 15882, K).

SICHUAN: Between Taining (Ngata) and Taofu (Dawo), 3800 m (H. Smith 12074, 12 Sept. 1934, BM).

16. *Juncus dongchuanensis* K. F. Wu

YUNNAN: Tali fu, 3000–3400 m (Schneider 2498, Aug. 1914, A, K); Huize, Dahihenshan, 3350m (Dongchuandui 63-122, 27 Sep. 1963, KUN); Dongchuan, 2700 m (S. B. Lan 585, 20 Sept. 1985, PE); Ta-li Hsien, 2600 m (H. T. Tsai 53917, 29 Jul. 1933, A, KUN); Dali, Cangshan, 25°40'N, 100°07'E, 3410 m (S. K. Wu et al. 1611, 1 Sep. 1996, KUN, TI); Dali Shi, Diancang Shan, Zhonghe Temple, 3200 m (S. K. Wu et al. 103136, 5 Sept. 1999, KUN, TI); loc. cit., Zhonghe Peak, 3300 m (S. K. Wu et al. 103151, 6 Sept. 1999, KUN, TI); Tsang shan, 3460 m (collector unknown CLD-90 1246, 15 Oct. 1990, K); Binchuan Xian, Jizu Shan, Jinding Temple - Zhusheng Temple, 2900 m (S. K. Wu et al. 103198, 25 Sept. 1999, KUN, TI); without precise locality (P. J. M. Delavey 6660, 6556, Aug. 1895, P); without precise locality (P. J. M. Delavey 3165, 20 Aug. 1887, P).

17. *Juncus duthiei* (C. B. Clarke) Noltie

NEPAL: Bagmati zone, Rasuwa district, around base camp, 28°13'09"N, 85°37'17"E, 4920 m (H. Takayama et al. 9220322, 21 Jul. 1992, TI).

XIZANG (TIBET): without precise, 15000 ft. (collector unknown, K).

18. *Juncus effuses* L.

NEPAL: Jumbesi, 2700 m (K. Yoda s.n., 5 May 1963, KYO).

BHUTAN: Timphu (2250 m) - Dochu La (3050 m) (H. Kanai et al. 658, 30 May 1967, KYO).

ASSAM: Tsera Rin, Khasiyas, 4500 ft. (C. B. Clarke 7321, 1 Jun. 1868, K); Laitlynkot, Khasi Hills, 6000 ft. (W. N. Koelz 23243, 16 Jul. 1949, L); Cherrapunjee, Khasi Hills, 4000 ft. (T. R. Chand 5500, 28 Apr. 1952, L); Shillong, Khasi Hills, 5500 ft. (T. R. Chand 7547, 15 Apr. 1954, L); Khasia, 5000 ft. (J. D. Hooker s.n., K); East Bengal (Griffith 5456, K).

MYANMAR: Kambaiti (73 km E. of Myitkyina), 2100 m (R. Malaise 45, 1 May 1934, S); loc. cit., 2100 m (R. Malaise 18, 7 Jun. 1934, S); loc. cit., 2100 m (R. Malaise 121, 1934, S).

XIZANG (TIBET): Long (M. F. E. Younghusband s.n., 29 Jun. 1903, B).

YUNNAN: Lushui Xian, Pianma - Pianma Pass - Lushui, 2600 m (S. K. Wu et al. 103176, 103178, 13 Sept. 1999, KUN, TI); Wei-se Hsien, 2300 m (H. T. Tsai 63081, 8 Nov. 1934, A); Shunning, 1950 m (T. T. Yü 16049, A); Dali Xian, E. side of Diancang Shan, vicinity of Butterfly Springs. 25°55'N, 100°05'E, 2050 m (B. Bartholomew & D. E. Boufford 744, 6 Jul. 1984, A); loc. cit., 25°38'N, 100°10'E, 2200–2350 m (B. Bartholomew & D. E. Boufford 805, 7 Jul. 1984, A); Dali Shi, Diancang Shan, Zhonghe Temple - Ximatang, 2900 m (S. K. Wu et al. 103129, 5 Sept. 1999, KUN, TI); Tali-Hsien, 2600 m (C. W. Wang 63124, May 1935, KUN); Fo-Hai, 1520 m (C. W. Wang 74032, May 1936, A); Jinghong Xian, 1700 m (T. Zhanhuo 92-291, 5 Jun. 1992, A); Kun-Ming, 2200 m (C. W. Wang 63059, Apr. 1935, A); Kien-shuei Hsien, 1900 m (H. T. Tsai 53109, 11 Apr. 1933, A); Lan-Tsang Hsien, 1500 m (C. W. Wang 76598, May 1936, A); O-shan Hsien, 1650 m (H. T. Tsai 55784, 9 Jun. 1933, A); O-pien Hsien, 1700 m (T. T. Yü 728, A); Shung-Kiang Hsien, 1480 m (C. W. Wang 73066, Apr. 1936, A); Tsang-Yuan, 1600 m (C. W. Wang 73253, Apr. 1936, A).

SICHUAN: Mt. Omei (H. C. Chow 12124, 13 Apr. 1940, A); loc. cit. (W. P. Fang s.n., A); Ping-wu Hsien, Mo-tien Ling, 2500 m (F. T. Wang 22503, S); Juxta urbem Ningyuen secus rivos regionis subtropicae, 1650 m (F. Handel-Mazzetti 1284, 13 Jun. 1914, S); Nin-ijuan-fer, 1650 m (H. Smith 1735, 15 May 1922, S); Opien Hsien (C. L. Sun 950, 10 Aug. 1939, A).

19. *Juncus fimbriatylodes* Noltie

YUNNAN: Binchuan Xian, Jizu Shan, Jinding Temple - Zhusheng Temple, 2900 m (S. K. Wu et al. 103196,

25 Sept. 1999, KUN, TI).

20. *Juncus ganeshii* Miyam. & H. Ohba

PAKISTAN: Chitral, Lohigal An, N. E. of Drosh, 13000 ft. (J. D. A. Stainton 3131, 14 Aug. 1958, A, BM); Chitral, Lutko, between 35°55'N, 71°18'E and 36°06'N, 71°48'E, 9000 ft. (S. A. B. Lyon 787, 3 Jun. 1958, A, BM).

KASHMIR: above Rattu, Astor valley, 9500 ft. (R. R. Stewart & I. D. Stewart 18775, 19 Aug. 1939, A); Buzil, 10000 ft. (W. N. Koelz 9423, 5 Aug. 1936, A); To Gadsar, beyond Gangabal, 11000–12000 ft. (R. R. Stewart 18302, 11 Aug. 1939, A); Bwji La, Deosai side, 14000–15000 ft. (R. R. Stewart 20109, 31 Jul. 1940, A); Char, Zanskar (W. N. Koelz 5690, 5693, 16–17 Jul. 1933, A); Pense La, Zanskar district, 13700 ft. (M. Grace et al. s.n. 29 Jul. 1981, K).

21. *Juncus giganteus* Sam.

QINGHAI: Dari Xian, Huleanma, Jianshe Xiang, S. side of the Huang He and S. W. of confluence with the Sari He (Dar Qu), 33°45'42"N, 99°23'32"E, 4000 m (T. N. Ho et al. 1102, 11 Aug. 1993, A).

GANSU: Tao River basin: Alpine meadows of Mt. Kwang Kei, W. Tebbu land, Minshan range (J. F. Rock 13742, Oct. 1925, A, K); Gargannar, S. of Old Taochow, 3600–4200 m (R. C. Ching 912, Oct. 1925, K); without precise locality (P. Licsut 4510, 28 Jul. 1918, S).

SICHUAN: Between Taining (Ngata) and Taofu (Dawo), S. W. of Sunglingku, 3800 m (H. Smith 12074, 12 Sept. 1934, S, UPS); Taofu (Dawo) district, Mt. Yara, N. W. valley, 4100 m (H. Smith 11609, 29 Aug. 1934, S, KYO, UPS); Hsioeh-shan, 4300 m (H. Smith 3878, 19 Jul. 1922, UPS); loc. cit., 4200–4300 m (H. Smith 3737, 24 Jul. 1922, S, UPS).

22. *Juncus glaucoturgidus* Noltie

NEPAL: Kyangin Kharka areas, 12000–14000 ft. (S. B. Malla s.n., 18 Jul. 1967, BM-paratype of *J. glaucoturgidus*); Rasuwa, Yure Kharka - Tinbu Kharka, 3750 m (F. Miyamoto et al. 9410055, 26 Jul. 1994, TI); loc. cit., around Tinbu Kharka, 3820 m (F. Miyamoto et al. 9410079, 27 Jul. 1994, TI); loc. cit., Base Camp - Yala Kharka - Yathang - Langtang Khola, 4800 m (H. Takayama et al. 9220279, 19 Jul. 1992, TI); loc. cit., 4300 m (H. Takayama et al. 9220280, 19 Jul. 1992, TI); loc. cit., Kyangjin Kharka - Tarche Pisa - Tashigang - Yala Kharka, 4000 m (H. Takayama et al. 9220171, 14 Jul. 1992, TI); loc. cit., Kyangjin Kharka - Tarche Pisa - Tashigang - Yala Kharka, 4230 m (H. Takayama et al. 9220172, 14 Jul. 1992, TI); Solukhumbu, Beni Kharka (Dambuk) - Dikitscho - below DudhKund, 4300 m (H. Ohba et al. 8572028, 26 Aug. 1985, TI).

BHUTAN: Kantanang, Tsampa, 13000 ft. (F. Ludlow & G. Serriff 19042, 3 Jun. 1949, BM-paratype of *J. glaucoturgidus*).

SICHUAN: Daocheng, around Gongga Zhonggu, 3790 m (S. K. Wu et al. 443, 3 Aug. 1997, KUN, TI); loc. cit., around Gongga Shan, 4400 m (S. K. Wu et al. 445, 4 Aug. 1997, KUN, TI).

23. *Juncus gonggae* Miyam. & H. Ohba

YUNNAN: Dali shi, Diancang Shan, 3500 m (S. Akiyama et al. 409, 5 Jul. 2001, KUN, TI).

24. *Juncus gracilicaulis* A. Camus

PUNJAB: Rohtang Pass, 4000 m (N. P. Suigh 22949, 30 Jul. 1962, CAL).

NEPAL: Lamo Pokhari, 2900 m (H. Kanai et al. 720281, 9 Jun. 1972, TI); Kyapra to Pheri, Ghunsa Khola, 27°38'N, 87°55'E, 3370 m (C. G. Wilson et al. 346, 7 Sept. 1989, KATH).

SIKKIM: without precise locality (G. King 4505, 1879, K).

BHUTAN: Gasa - Pari La - Chamsa (H. Hara et al. 12682, 14 May 1967, TI); Lachen (J. D. Hooker s.n., 9

Jun. 1849, K); without precise locality, 8000–10000 ft. (J. D. Hooker s.n., S).

CHINA. XIZANG (TIBET): Zayu (Qing-Zang expedition team 10330, 11 Sept. 1982, KUN); loc.cit., 3700 m (Qing-Zang expedition team 10811, 27 Sept. 1982, KUN).

YUNNAN: Deqin Xian, Meili Xueshan, Suola, 3700 m (S. K. Wu et al. 193125, 20–23 Aug. 1999, KUN, TI); Lijiang Xian, Laojun Shan, Longqun Lodge - Jiushijiu Longtan, 3700 m (S. K. Wu et al. 193162, 8 Sept. 1999, KUN, TI); Dali (H. C. Wang 859, Jun. 1941, PE); Mt. Wuaha, Yung-ning Territory, 11000 ft. (J. F. Rock 24212, May 1932, B); Zhongdian, Haba shan, 27°22'28"N, 100°05'50"E, 3717 m (Alpine Garden Society expedition ACE 329, 16 Jun. 1994, K).

SICHUAN: Daocheng, Haizi, 4050 m (S. K. Wu et al. 1512, 17 Aug. 1996, KUN, TI); Xiangcheng - Daocheng, around Wuming Shan, 4520 m (S. K. Wu et al. 431, 29 Jul. 1997, KUN, TI); Tahsiangling, W. side, 2700 m (H. Smith 10208, 26 Jun. 1934, UPS).

25. *Juncus grisebachii* Buchenau

INDIA: without precise locality (K. Biswas 3601, A); West Bengal, Sandakphu, 12300 ft. (K. Biswas 5741, 8 Oct. 1941, CAL).

NEPAL: Rasuwa, Gopte - Thale Patil, 3400 m (H. Hara et al. 721967, 26 Aug. 1972, TI); Rasuwa, Gopte - Thale Patil (H. Hara et al. s.n., 26 Aug. 1972, TI); Dawan, 27°41'N, 85°05'E, 2490 m (J. F. Dobremez 809, 14 Aug. 1971, BM); Langtang valley, 13000 ft. (A. D. Schilling 465, 2 Aug. 1965, K); E. Tharke - Chyang, towards Ganja la, 28°00'N, 85°33'E, 3300 m (J. H. Hass 2700, 8 Sept. 1974, BM); Yangyr - Danda, 28°02'N, 85°34'E, 3800 m (J. H. Hass 2753, 15 Sept. 1974, BM); Sindhupalchok, Tingoang - Khosori Khabre, 3000 m (H. Kanai & T. B. Shrestha 676106, 12 Sept. 1970, TI); Dobate - Hile Dhap - Mane - Thale Patil - J. F. Rock Shelter I - J. F. Rock Shelter II, 3450 m (H. Kanai & S. B. Malla 674757, 24 Aug. 1969, TI); Kalinchok, 11000 ft. (Banerjee et al. 2819b, 15 Sept. 1964, KATH); Khokim, 27°23'N, 87°29'E, 3100 m (J. F. Dobremez 1583, 19 Aug. 1972, BM); Sankhuwasabha district, E bank of Upper Saldim Khola, below bridge NW of Hatiya, 27°44'N, 87°18'E, 2785 m (D. G. Long et al. 717, 12 Oct. 1991, KATH); loc. cit., N bank of Barun Khola, below Pemathang Kharka, 27°44'N, 87°12'E, 3360 m (D. G. Long et al. 589, 8 Oct. 1991, KATH); Sankhuwasawa, Banduke - Jomle (H. Ohba et al. 9153310, 4 Aug. 1991, TI); loc. cit., Banduke - Jomle, 4000 m (H. Ohba et al. 9110284, 4 Aug. 1991, TI); loc. cit., Singoa Kharka - Pahakhola, 3800 m (H. Ohba et al. 9110458, 11 Aug. 1991, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 3800 m (M. Minaki et al. 9020787, 10 Aug. 1990, TI); loc. cit., Beni Kharka - Sarkari Pati, 3600 m (H. Ohba et al. 8572141, 2 Sept. 1985, TI); loc. cit., Loding - Pikebuk - Pike Bhanjyang, 3500 m (H. Ohba et al. 8572335, 5 Sept. 1985, TI); loc. cit., Singoa Kharka - Pahakhola, 3900 m (H. Ohba et al. 9120379, 11 Aug. 1991, TI); loc. cit., Samakang Kharka - Dudh Kund, 3500 m (F. Miyamoto et al. 9580419, 24 Aug. 1995, TI); loc. cit., Tangna - Samakang Kharka, 3600 m (F. Miyamoto et al. 9580400, 23 Aug. 1995, TI); loc. cit., Thasing Dingma - Chhatarwa, 3900 m (F. Miyamoto et al. 9580467, 28 Aug. 1995, TI); loc. cit., Chalem Kharka - Jar Kharka, 3500 m (F. Miyamoto et al. 9580156, 1 Aug. 1995, TI); Guide Himal., 27°24'N, 87°06'E, 3700 m (J. F. Dobremez 1742, 29 Aug. 1972, BM); Arun valley, Wabak Khola, E. of Num, 13000 ft. (J. D. A. Stainton 1339, 12 Aug. 1956, A, BM); Arun valley, Num, 10000 ft. (J. D. A. Stainton 1680, 19 Sept. 1956, BM, L); Pangsing, 14000 ft. (C. L. Dhwoj 113a, 1929, BM); Bhararate Himal, Barun valley, 3500 m (T. Wraber 376, 4 Oct. 1972, BM); Lamjoora, 17000ft. (C. L. Dhwoj 251, 1930, A, BM); Simigaon, 2850 m (A. Zimmermann 1323, 15 Sept. 1954, BM); Amjilassa to Kyapra, 27°37'N, 87°53'E, 2450 m (C. G. Wilson et al. 299, 6 Sept. 1989, KATH); Kyapana to Pheri, Ghunsa Khola, 27°38'N, 87°55'E, 3370 m (C. G. Wilson et al. 346, 7 Sept. 1989, KATH).

SIKKIM: Lachen, 8000 ft. (K. Biswas s.n., 22 May 1945, A); loc. cit. (C. H. Cave 81, 31 Aug. 1947, K); loc. cit., 8000–9000 ft. (N. C. Mjumdar 468, 12 Sept. 1968, CAL); above Changu, 13000 ft. (J. Pradhan s.n., 8

Aug. 1943, K); Darjeeling, 12000 ft. (J. S. Gamble 9514, Jul. 1881, K); loc. cit., 11000–12000 ft. (I. H. Burkill 25244, 19 Oct. 1904, CAL); loc. cit., 11000 ft. (I. H. Burkill 25368, 22 Oct. 1904, CAL); Jongri, 13000 ft. (C. B. Clarke 26008, 26119, 26223, 26228, 15 Oct. 1875, K); Chamnago, 13000 ft. (R. E. Cooper et al. 870, 11 Sept. 1913, BM); loc. cit. (W. W. Smith 3704, 23 Jul. 1910, CAL); Domang (J. Pradhan s.n. 10 Aug. 1943, K); Guatong, 13000 ft. (W. W. Smith 4356, 17 Aug. 1910, CAL); Islumbo, 11000 ft. (C. B. Clarke 25628, 24 Oct. 1875, CAL); Kali (G. King s.n., Aug.–Sept. 1887, BM); Tongloo, 10000 ft. (S. Kurz s.n., CAL); loc. cit. (T. Anderson 1336, 3 Aug. 1862, CAL); Phedang campsite, 11300 ft. (B. N. Stirling et al. A.G.S.E.S.386, 1983, K); Rechi La, 10000 ft. (H. H. Haines 2024, Sept. 1904, K); above Changu, 13000 ft. (Ribu & Rhomoo 4591, 26 Oct. 1910, CAL); Tongri (T. Anderson 1336, 8 Oct. 1962, A); Tongla, Darjeeling, 10000 ft. (J. S. Gamble 8427, Sept. 1880, CAL, K); loc. cit., 10000 ft. (C. B. Clarke 27586, 12 Sept. 1875, K, CAL); Yanjma, 13000 ft. (J. D. Hooker s.n., K); Youmtong, 11000 ft. (G. A. Gammie 990, 23 Aug. 1899, CAL); loc. cit., 12000 ft. (G. A. Gammie 1004, 24 Aug. 1892, CAL); Chamnago, 13000 ft. (R. E. Cooper 870, 11 Sept. 1913, KATH); without precise locality, 12000 ft. (J. D. Hooker s.n., Sept. 1849, K); without precise locality (S. Kurz s.n., 14 Oct. 1868, CAL); without precise locality, 14000 ft. (G. King 1004, Sept. 1888, CAL); without precise locality (G. King s.n., Sept. 1888, CAL); without precise locality, 13000 ft. (W. W. Smith 4163, 11 Aug. 1910, CAL); without precise locality, 10000–14000 ft. (J. D. Hooker s.n., A); without precise locality, 10000–14000 ft. (J. D. Hooker s.n., K, L).

BHUTAN: Upper Mo Chu district, near Chusom, N. of Kohina, 28°02'N, 89°47'E (I. W. J. Sinclair & D. G. Long 5087, 17 Sept. 1984, K); loc. cit., S. side of Pari La, between Gasa and Kohina, 27°58'N, 89°48'E (I. W. J. Sinclair & D. G. Long 5057, 16 Sept. 1984, K); Paro valley, 2400 m (N. P. Balakrishnan 1337, 24 Aug. 1963, CAL); Tongsa district, summit of Pele La, E. side, 27°32'N, 90°11'E (I. W. J. Sinclair & D. G. Long 5679, 12 Oct. 1984, K); Wangdi Phodrang district, Nika chhu - Bhaja, 27°31'N, 90°25'E, 2630 m (F. Miyamoto 9361514, 18 Sept. 1993, TI); loc. cit., Bhaja - Nika chhu, 27°36'N, 90°24'E, 2800 m (F. Miyamoto 9361759, 28 Sept. 1993, TI); valley above Gyetsa, W. of Bumtang, 27°31'N, 90°37'E (A. J. C. Grierson & D. G. Long 2606, 9 Jul. 1979, K); E. slope below Yuto La, E. of Tongsa, 27°31'N, 90°37'E (A. J. C. Grierson & D. G. Long 1734, 8 Jun. 1979, K); Chi la, on way to pass, 11000 ft. (G. S. Gupta 733, 24 Aug. 1963, CAL); Ehra Punthang, 10000 ft (R. E. Cooper et al. 4750, 31 Aug. 1915, BM); Ohra, 10000 ft. (R. E. Cooper et al. 4150, 31 Aug. 1915, B); Yakla, 13000 ft. (C. B. Clarke 9615, 16 Oct. 1886, CAL).

ASSAM: near Orban La, 8000–9000 ft. (F. Kingdon-Ward 14274, 24 Sept. 1938, BM).

EAST HIMALAYA: Kanglasa, 10000 ft. (C. H. Cave s.n., 24 Oct. 1916 A, E); Gowsar, 12000 ft. (C. H. Cave s.n., 20 Sept. 1916, A, E); without precise locality (Griffith 54457, CAL).

HIMALAYA: Yakla, 10000 ft. (C. B. Clarke 10053, 17 Oct. 1869, CAL); loc. cit., 10000 ft. (C. B. Clarke 10265, 20 Oct. 1869, CAL); loc. cit., 10000 ft. (C. B. Clarke s.n., 15 Oct. 1869, L); Himal Bor. Occ., 10000–14000 ft. (T. Thomson s. n., BM).

XIZANG (TIBET): Chumbi & Phari (Dungboo s.n., Aug. 1879, B, CAL, K); Yadong, 2900 m (Qing-Zang expedition team 74-2163, 10 Sept. 1974, KUN); Cona, 2700 m (Qing-Zang expedition team 74-2295, 11 Sept. 1974, KUN); Shoka, Tsangpo valley, 29°14'N, 94°09'E, 9800 ft. (F. Ludlow et al. 7151, 28 Sept. 1938, BM).

YUNNAN: without precise locality (R. P. Maire 3964, Aug. 1910, B).

26. *Juncus harae* Miyam. & H. Ohba

NEPAL: Bagmati zone, Rasuwa district, Yure Kharka - Tinbu Kharka, 28°10'N, 85°13'E, 3700 m (F. Miyamoto et al. 9410057, 26 Jul. 1994, TI); Koshi zone, Sankhuwa Sabha district, Khongma - ChaDing Kharka, 87°10'E, 27°40'N, 3570 m (M. Minaki et al. 9020629, 5 Aug. 1990, TI); Sagarmatha zone, Solukhumbu district, Gnaula - Pike, 27°33'N, 86°27'E, 3600 m (F. Miyamoto et al. 9580051, 22 Jul. 1995 TI).

BHUTAN: Wangdi Phodrang district, Tampetso - Tsonsothang, 27°48'N, 90°29'E, 3900 m (F. Miyamoto

9361642, 22 Sept. 1993, TI); loc. cit., Tsonsothang - Tampetso, 27°46'N, 90°31'E, 4000 m (F. Miyamoto 9361680, 24 Sept. 1993, TI).

YUNNAN: Zhongdian, Around Beihai (Mt. Haba Xueshan), 4100 m (S. K. Wu et al. 103082, 9 Aug. 1999, KUN, TI).

27. *Juncus himalensis* Klotzsch

PAKISTAN: Ziarat, 9000 ft. (S. L. Harriss 16723, 14 Jun. 1895, CAL); Lohigal An. N. E. of Drosh, 13000 ft. (J. D. A. Stainton 3131, 14 Aug. 1958, CAL); Lutko, Chitral, 9000 ft. (A. A. B. Lyan 787, 3 Jun. 1958, CAL); Chitral, Barum Gol, Between Och Anzog and Camp 2 by south Barum Glacier, 3800 m (P. Wendelbo s.n., 12 Jul. 1950, K, S); Chitral, Barum Gol, Och Anzog, 3600 m (P. Wendelbo s.n., 19 Jul. 1950, K, S); Chitral, 1000 ft. (S. L. Harriss 16722, 15 Jun. 1895, CAL); Bibiyali, vila, Kagn, Hzara (Inayat s.n., 22 Jul. 1899, CAL); Bhapran, Kagan (Inayat s.n., 26 Jul. 1899, CAL); Kagan valley, 9500 ft. (Inayat 20242a, 22 Jul. 1896, CAL); Gilgit (G. M. Giles s.n., 1885, CAL); Raji bhogi, Nila Kagan (Inayat 22631, 24 Jul. 1897, CAL); Swat Himalaya, Diwanganr to Pichar, 3600 m (K. Ogino 169, 23 Jul. 1957, KYO); Titri, Saranranqe (Inayat s.n., 23 Aug. 1899, CAL); (C4) Dishei to (C5) N. slope of Tikatoki, 3100 m (K. Honda 118, 22 Jul. 1957, KYO).

KASHMIR: Gulmarg Rakh, 10000 ft. (R. R. Stewart 8673, 26 Jul. 1926, K); Naltau valley, Gilgit, 12000-13000 ft. (R. R. Stewart 26297, 19 Jul. 1954, K); Khillanmarg, above Gulmarg, 10500 ft. (R. R. Stewart 10522, 21 Aug. 1929, S); Gilgit district, Nallar valley, 10000-11000 ft. (J. F. Duthie 12382, 4 Aug. 1892, K); Buzil, 10000 ft. (W. N. Koelz 9423, 5 Aug. 1936, K); Liddarwat, 11000 ft. (O. Polunin 56/500, 25 Aug. 1956, B); Sonamang, 10000-12000 ft. (R. R. Stewart 9771, 23 Jul. 1928, S); Pahlgam, 10000 ft. (R. R. Stewart 7915, 18 Jul. 1925, K); loc. cit., 9000 ft. (R. R. Stewart 5965, 6 Sept. 1920, S); loc. cit., 10000 ft. (R. R. Stewart 7942, 13-14 Jul. 1925, S); loc. cit., 9000 ft. (R. R. Stewart 8018, 22 Jul. 1925, S); Shigar valley, 10000 ft. (B. B. Osmaston 8S, 18 Jul. 1928, K); Karakorum, 13500 ft. (C. B. Clarke 30341, 10 Aug. 1876, K); Braryer Wardnan, 8000 ft. (A. Meebold 214, Jun. 1905, CAL); Kunrlwan, 8000 ft. (C. B. Clarke 29347, 21 Jul. 1876, K); Laka, 11000 ft. (C. B. Clarke 23850, 17 Oct. 1874, CAL); Lidder valley, 1100 m (R. R. Stewart 21808a, 28 Aug. 1945, K); Nittar valley, 10000-11000 ft. (J. F. Duthie 12382, 4 Aug. 1892, K); Pahapgam Talinlake, 3800 m (T. A. Rao 9663, 24 Jun. 1959, CAL); Pir Pinjul, 11000 ft. (C. B. Clarke 28766, 6 Jul. 1876, K); Prljam, 9000 ft. (C. B. Clarke, 31091, 5 Sept. 1876, K); Sauamarg, Scuid valley, 10000 ft. (R. R. Stewart 9851A, 3 Aug. 1928, K); without precise locality, 8000 ft. (C. B. Clarke 29347, 21 Jul. 1876, CAL); without precise locality, 12000-13000 ft. (J. F. Duthie 13399, 1 Aug. 1893, CAL); without precise locality (J. F. Duthie 13465, 3 Aug. 1893, CAL); without precise locality (T. A. Rao 257, CAL); without precise locality (T. A. Rao 726, CAL); without precise locality (W. N. Koelz 3002, 19 Sept. 1931, S).

INDIA: Between Alwas and Sach Pass, 12000-14000 ft. (G. A. Gammie 18371, 30 Aug. 1896, K).

PUNJAB: Laosar, Spiti, Kangra (W. N. Koelz 7033, 2-3 Sept. 1933, A); Lahul (collector unknown s.n., Mar. 1865, K); Kulu-Lahaul, Marsh above Manali, 9000-10000 ft. (J. R. Drummond 23164, 16 Jul. 1788, K); Kulu-Lahaul, Duhar, (J. R. Drummond 23171, 7 Jul. 1888, K); Boiling Nullah, Lahul, 14000 ft. (W. N. Koelz 1263, 29 Aug. 1930, S); Kado La, 11000 ft. (R. E. Cooper 5472, 21 Aug. 1916, B); Kunawar (J. R. Drummond 26520, 1886, K).

KUMAON: Below Udyar, 2900 m (C. M. Arora 49747, 8 Aug. 1972, CAL); Chipla, 4500 m (C. M. Arora 49887, Aug. 1972, CAL); Mulapa Gdh, Darma, 12000-13000 ft. (J. F. Duthie 6052, 5 Aug. 1886, CAL); Tola, 11500 ft. (R. Strachey & J. E. Winterbottom 5, K); without precise locality, 12000-13000 ft. (J. F. Duthie 6052, 1887, K); without precise locality (collector unknown 1849, K); without precise locality (collector unknown s.n., K).

HIMACHAL PRADESH: Lahaul, Bara-lacha (N. L. Bor 158, 18 Aug. 1938, K); loc. cit., Pofaus, 11000 ft. (N. L. Bor 9485, 16 Jul. 1938, K); loc. cit., Rotang, 13000 ft. (N. L. Bor. 12142, 2 Jul. 1938, K); loc. cit., 13800

ft. (N. L. Bor. 16895, 21 Jul. 1938, K); loc. cit., Biling Lumpa, 11000 ft. (N. L. Bor. 12678-12680, 12 Jun. 1941, K); Rohtang Pass, 13140 ft. (M. Nath s.n., 8 Sept. 1935, CAL); Bara Shizin Glacier, Lahul & Spiti district, 13500 ft. (J. M. Hoghes 42, Jul. 1981, K); Sonapani Glacier, Lahul & Spiti district, 13200 ft. (J. M. Hoghes 80, 29 Jul. 1981, K).

UTTRA PRADESH: Tihri-Garhwal, 10000–11000 ft. (J. F. Duthie 150, 19 Jul. 1883, CAL); Garhwal, Kedamath Glacier valley (M. A. Rau 8704, 27 Sept. 1958, CAL).

NEPAL: Rara, 2900 m (M. P. Manandhar & D. P. Joshi 8014, 10 Aug. 1981, KATH); Chakhure Lekh (N. P. Manandhar & D. P. Joshi 6587, 3 Aug. 1981, KATH); Maharigaon, 3 miles N. E. (O. Plounin et al. 130, 13 Jul. 1952, CAL); loc. cit., 11000 ft. (O. Plounin et al. 178, 15 Jul. 1952, CAL); Thakurji Lekh, S. of Jumla, 12000 ft. (O. Plounin et al. 4737, 17 Jul. 1952, CAL); near Balangra Pass, 12000 ft. (O. Plounin et al. 2626, 28 Jul. 1952, S, CAL); near Tarakot, Bheri river, 10500 ft. (O. Plounin et al. 2385, 6 Jul. 1952, CAL); Rambrong, Lamjung Himal., 14000 ft. (J. D. A. Stainton & L. H. J. Williams 6157, 5 Jul. 1954, L); Central Nepal, P29 East Peak, 4500 m (T. Namba 1022003, 22 Oct. 1963, KYO); Gandaki Zone, Gorkha distr., Thangmanang Kharka, 28°34'25"N, 84°42'05"E–28°33'09"N, 84°39'19"E, 3750m (M. Suzuki et al. 9460234, 5 Aug. 1994, TI); Gandaki Zone, Gorkha distr., Thangmanang Kharka, 28°33'09"N, 84°39'19"E, 4160m (M. Suzuki et al. 9470345a, 6 Aug. 1994, TI); Rasuwa, Parbati Kund (near Gatlang) - Yure Kharka, 3000 m (F. Miyamoto et al. 9410034, 25 Jul. 1994, TI); loc. cit., Tinbu Kharka - Sano Bhera Kharka - Tulo Bhera Kharka, 3850 m (F. Miyamoto et al. 9410086, 28 Jul. 1994, TI); loc. cit., Paldol Base Camp - a Kharka, 4100 m (F. Miyamoto et al. 9410173, 3 Aug. 1994, TI); loc. cit., Ganesh Base Camp - a pass - cross a river - a Kharka, 4180 m (F. Miyamoto et al. 9410253, 10 Aug. 1994, TI); loc. cit., Base Camp - Yala Kharka - Kyangjin Kharka - Langtang, 3700 m (H. Takayama et al. 9220348, 22 Jul. 1992, TI); loc. cit., Langtang Khola - Pirgona - Pyung - a pass - Base Camp, 4020 m (H. Takayama et al. 9220292, 9220307, 20 Jul. 1992, TI); loc. cit., Base Camp - Yala Kharka - Kyangjin Kharka - Langtang, 4290 m (H. Takayama et al. 9220349, 22 Jul. 1992, TI); loc. cit., Bhairabkund (M. Sato 9534024, 27 Jul. 1995, TI); Langtang valley, 13000 ft. (Schilling et al. 465, 27 Jun. 1965, KATH); Ganesh Himal, Shiari Khola, 13000 ft. (P. C. Gardner 1303, 15 Jul. 1953, KATH); Thami, Khumbu, 14250 ft. (A. D. Schilling 992, 31 Jul. 1966, K); Sankhuwasawa, Lama Chungbu - Samdan - Slesa - Lama Chungbu - Thudam (H. Kanai et al. s.n., 24 Jun. 1972, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 3950 m (M. Minaki et al. 9020886, 12 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3570 m (M. Minaki et al. 9020630, 5 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3820 m (M. Minaki et al. 9020628, 5 Aug. 1990, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 4000 m (M. Minaki et al. 9020856, 12 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3900 m (M. Minaki et al. 9020651, 5 Aug. 1990, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 4100 m (M. Minaki et al. 9020711, 8 Aug. 1990, TI); loc. cit., Khokling (Khokling Kharka) - Jaljale (Jaljale Himal) (H. Ohba et al. 9153196, 21 Jul. 1991, TI); loc. cit., Jaljale (Jaljale Himal) - Tin Pokhari (H. Ohba et al. 9120149, 22 Jul. 1991, TI); loc. cit., Thasing Dingma - Sanu Khola - Saure Kharka, 3700 m (F. Miyamoto et al. 9580195, 4 Aug. 1995, TI); loc. cit. Samakang Kharka - Dudh Kund, 3700 m (F. Miyamoto et al. 9580409, 24 Aug. 1995, TI); loc. cit. Tangna - Samakang Kharka, 3850 m (F. Miyamoto et al. 9580387, 23 Aug. 1995, TI); Sankhuwasabha district, Upper valley of tributary of Barun Khola, NE of Pemathang Kharka, 27°45'N, 87°13'E, 4100 m (D. G. Long et al. 618, 9 Oct. 1991, KATH); loc. cit., Ridge between Kauma and Shipton La, 27°39'N, 87°13'E, 3790 m (D. G. Long et al. 305, 26 Sept. 1991, KATH); Arun valley, Barun Khola, N. of Num, 11000 ft. (J. D. A. Stainton 567, 8 Jun. 1956, A, BM, CAL); Tamur valley, Mewa Khola, Topke Gola, 12500 ft. (J. D. A. Stainton 929, 11 Jul. 1956, A, BM); loc. cit., from Jongbuk to Thudam pass, 3505 m (H. Tabata et al. 11405, 11 Jul. 1978, KYO); Taplejung district,

From Walungchunggola to Chini, 2650–2800 m (H. Tabata et al. 11668, 18 Jul. 1978, KYO); loc. cit., from Nup to Yangma, 3880–4010 m (H. Tabata et al. 11750, 20 Jul. 1978, KYO); Environs of Ghunsa, 27°40'N, 87°57'E, 3425 m (C. G. Wilson et al. 436, 8 Sept. 1989, KATH); Yangma, 4500 m (S. Nakao 74, 6 Jul. 1962, KYO); Yamatari glacier, 3900 m (S. Nakao & K. Nishioka s.n., 16 Jun. 1962, KYO); In the forest of *Pinus griffitti*, 3600 m (O. Namikawa 305, 322, 334, 30 Sept. 1958, KYO).

SIKKIM: Lachen, 10000–12000 ft. (J. D. Hooker s.n., 30 Aug. 1849, K); Gamothang (H. Hara et al. 512, 27 May 1960, KYO); By Rathong river en route from Dharahli pass to Biklbari campsite, 4000 m (B. N. Starling et al. A.G.S.E.S.225, 30 Jun. 1983, K); W. Jongri (G. King s.n., Aug. 1887, CAL); Zewu valley, 12800 ft. (Smith & Cave 1397, 14 Jul. 1909, CAL); loc. cit., 11000 ft. (W. W. Smith 1180, 11 Jul. 1910, CAL); loc. cit., 12800 ft. (W. W. Smith 1397, 14 Jul. 1910, CAL); loc. cit., 10000 ft. (W. W. Smith 1148, 10 Aug. 1910, CAL); Chola valley, 12000 ft. (W. W. Smith 3606, 21 Jul. 1910, CAL); Chakung Chu, 14000 ft. (W. W. Smith 3857, 26 Jul. 1910, CAL); Changa, 11000 ft. (W. W. Smith 3057, 5 Jul. 1910, CAL); loc. cit., 13000 ft. (W. W. Smith 3581, 16 Jul. 1910, CAL); Chawuago, 12000–13000 ft. (W. W. Smith 3623, 23 Jul. 1910, CAL); loc. cit., 11000 ft. (W. W. Smith 3703, 23 Jul. 1910, CAL); Llonak, 12000 ft. (Smith & Cave 1758, 26 Jul. 1909, CAL); without precise locality, 10000–14000 ft. (J. D. Hooker 29, L); without precise locality, 10000–14000 ft. (J. D. Hooker s.n., A, CAL); without precise locality, 10000–12000 ft. (J. D. Hooker s.n., K); without precise locality, 11500 ft. (J. D. Hooker s.n., 7 Jul. 1849, K); without precise locality, 12000 ft. (J. D. Hooker s.n., 5 Sept. 1849, K); without precise locality, 9000–10000 ft. (J. D. Hooker s.n., 6 Jul. 1849, K); without precise locality (Prain 324, 12 Aug. 1903, CAL); without precise locality, 11000 ft. (Smith & Cave 1180, 11 Jul. 1909, B); without precise locality, 12000 ft. (Smith & Cave 1758, 26 Jul. 1909, B).

BHUTAN: Upper Mo Chu district, E. bank of Thrizam Chu, 28°01'N, 89°35'E, 4080 m (I. W. J. Sinclair & D. G. Long 5320, 25 Sept. 1984, K); Wangdi Phodrang district, Tampetso - Tsonsothang, 27°49'N, 90°24'E, 3900 m (F. Miyamoto 9361629-9361631, 22 Sept. 1993, TI); loc. cit., Tsonsothang, 27°49'N, 90°24'E, 4100 m (F. Miyamoto 9361647, 22 Sept. 1993, TI).

HIMALAYA: Himal. Bor. Occ. (Falconer 1185, L); without precise locality, 10000–14000 ft. (T. Thomson s.n., A, CAL); without precise locality, 10000-14000 ft. (T. Thomson s.n., 5 Aug. 1849, K); above Pauji, Kunawar, 10000–14000 ft. (T. Thomson s.n., 18 Aug. 1849, K); without precise locality, 9500 ft. (J. F. Duthie 20242a, 22 Jul. 1896, K); without precise locality (J. F. Duthie s.n., 23 Aug. 1899, K); without precise locality, 10000 ft. (J. F. Duthie s.n., 31 Aug. 1899, K); without precise locality, 13000 ft. (J. S. Gamble 24266, 3 Jun. 1893, K); without precise locality (G. King s.n., Aug. 1889, K); without precise locality, 10000–14000 ft. (Wallich 9001B, K).

XIZANG (TIBET): Nyalam, 3850 m (Qing-Zang expedition team 5814, 23 Jun. 1975, KUN); loc. cit., 3850 m (S. K. Wu et al. 75-444, 22 Jun. 1975, KUN); Dengqen, 4000 m (S. K. Wu 4910, 21 Aug. 1976, KUN); Yadong, 2900 m (Qing-Zang expedition team 74-2445, 13 Sept. 1974, KUN); Province Dras, Dras to Matai (collector unknown 6472, 12 and 13 1856, S); Chumbi (G. King s.n., 5 Aug. 1882, K); Chumbi & Phari (Dungboo s.n., 2 Jul. 1878, B, CAL, K); Thieppa, 13000 ft. (G. King s.n., Aug. 1885, K); Ga-Ling between Chumlei and Pahari (G. King s.n., 7 Jul. 1882, B); Deyang La, Kongbo, 14000 ft. (F. Ludlow et al. 14322, 11 Aug. 1947, A); Kongbo Province, Shoka, Tsangpo valley, 29°14'N, 94°09'E, 9800 ft. (collector unknown 4548, 29 May 1938, BM); Mainling, 3250 m (Qing-Zang expedition team 74-5325, 21 Sept. 1974, KUN); Tang, 13500–14500 ft. (M. F. F. Younghusband T18, 14 Jul. 1903, K, CAL); Gongbo'gyamda Xian, Basum Lake, 3550 m (S. Akiyama et al. 105199, 15 Aug. 2000, KUN, TI); Zagon, 4000 m (Qing-Zang expedition team 12138, 1 Jul. 1976, KUN); Dras (collector unknown 6453, 12–13 Oct. 1856, A); Nangaske, Gam Dok Cho, 15000 ft. (C. H. J. Walton T19, Jul. 1904, CAL); Ga-ling, (G. King s.n., 7 Jul. 1882, CAL); Sang-dang-tung (G. King s.n., 5 Aug. 1882, CAL); without precise locality (Stoliczka s.n., CAL).

GANSU: Kintan Hsien, 2990 m (T. P. Wang W5109, 20 Jul. 1936, KUN).

YUNNAN: A-tun-tze, 3500 m (C. W. Wang 64848, Jul.–Aug. 1935, A, KUN, PE); loc. cit., 2700 m (C. W. Wang 69938, Sept. 1935, KUN); loc. cit., Huann-fu-ping, 3700 m (C. W. Wang 68752, Aug. 1935, A, PE, KUN); Atuntze, Yangtsatung, 3900 m (T. T. Yü 9824, 24 Aug. 1937, PE); loc. cit., Kungpu, Piyenla, 3200 m (T. T. Yü 10024, 31 Aug. 1937, A, PE); Wei-si Hsien, Yeh-Chih, 3600 m (C. W. Wang 68446, Aug. 1935, PE); loc. cit. (C. W. Wang 68515, Aug. 1935, A, KUN, PE); loc. cit., 3000 m (C. W. Wang 64090, Jun. 1935, A, KUN, PE); Deqen, 3700 m (Qing-Zang expedition team 1192, 11 Jul. 1981, KUN); In regione frigide temperata jugi Si-la inter fluvios Landsang-djiang (Mekong) et Lu-djiang (Salween), 3600 m (F. Handel-Mazzetti 8439, 29 Sept. 1915, S); Yangtze watershed, in the Prefectural district of Likiang, eastern slopes of Likiang snow range, 16000 ft. (J. F. Rock 5299, 12–29 May 1922, A); Prope urbem Lidjiang, imprimis in monte Yulung-schan. (F. Handel-Mazzetti 4073, Jun.–Sept. 1914–1916, S); Lijiang Xian, Laojun Shan, Longqun Lodge - Jiushijiu Longtan, 3700 m (S. K. Wu et al. 103157, 8 Sept. 1999, KUN, TI); Muli, Wachin, Jin-chang, 4000 m (T. T. Yü 14598, 22 Oct. 1937, A); Chi-na-tung, Tsa-wa-rung, 3500 m (C. W. Wang 65378, Aug. 1935, A, PE); Shi-gi-tung, Champu-tung, 2170 m (C. W. Wang 67180, Oct. 1935 A, PE, KUN); loc. cit., 3000 m (C. W. Wang 67290, Oct. 1935, A, PE).

SICHUAN: Taofu (Dawo) district, valley W. of Mt. Yara, 3700 m (H. Smith 11726, 1 Sept. 1934, S, UPS); Kangting (Tachienlu), 2700 m (H. Smith 10518, 17 Jul. 1934, KYO, S); Liang-ho-kuo, 11900 ft. (S. Y. Hu 1403A, Jul.–Aug. 1939, A); loc. cit., 12000 ft. (C. W. Wang & T. S. Wen 630, Aug. 1938, A); Litang (Sichuan vegetation expedition team 3713, 5 Aug. 1973, KUN); Daocheng, Haizi, 4350 m (S. K. Wu et al. 1524, 18 Aug. 1996, KUN, TI); loc. cit., Daocheng - Daxue Shan Yakou, 3610 m (S. K. Wu et al. 405, 26 Jul. 1997, KUN, TI); Muli, Wachin, Jin-chang, 4000 m (T. T. Yü 14598, 22 Oct. 1937, BM); Muli, 3300–3400 m (Qing-Zang expedition team 13013, 19 Aug. 1983, KUN); Kangting (Tachienlu), 2700 m (H. Smith 10518, 17 Jul. 1934, PE); Tachienlu, 9000–13500 ft. (A. E. Pratt 96, CAL); Chiefly near Tachienlu, 9000–13500 ft. (A. E. Pratt 86, A); Omei Hsien, Mt. Omei (W. P. Fago 17336, 14 Jul. 1941, PE); loc. cit. (L. Y. Tai, T297, 14 Aug. 1940, A); loc. cit., 8500–9000 ft. (W. P. Fang 2854, 1928, A); loc. cit., 3135 m (W. P. Fang 17736, 14 Jul. 1941, A); Omeishan (T. N. Liou 10312, 18 Oct. 1938, PE); loc. cit. (T. N. Liou & C. Wang 1229, 4 Oct. 1939, PE); Dujiangyan Municipality, Qinglongzui near the side of Longwangmiao, along the Longxi River, 1750 m (D. E. Boufford & B. Bartholomew 24632, 5 Sept. 1988, A); Mou Hsien (Mou-chow), Kuanyin Shan, 2600 m (F. T. Wang 22038, 31 Jul. 1930, S); inter Baorst Tha (H. Smith 4898, 20 Oct. 1922, S); without precise locality, 3100 m (C. Y. Chiao & C. S. Fan 819, 22 Aug. 1938, A); without precise locality, 11000 ft. (S. Y. Hu 2569, Aug. 1942, A).

SHANXI: Hsiaowutai shan, 3000 m (C. W. Wang 62104, 6 Aug. 1934, PE).

WESTERN CHINA: without precise locality (E. H. Wilson 4544, Jul. 1903, A, K).

28. *Juncus hydrophilus* Noltie

NEPAL: N. W. of Saltie, along trail to Pangsing Bhanjyang, 2760 m (D. Haas 2547, 25 Aug. 1974, BM-paratype of *J. hydrophilus*).

BHUTAN: Dotena, 2730 m (H. J. Noltie 13, 20 Jul. 1991, E, TI-paratype of *J. hydrophilus*).

29. *Juncus inflexus* L.

PAKISTAN: Kurram, Inter Amal Kot et Sadda, 33°43'N, 70°25'E, 1400 m (K. H. Rechinger 30978, 8–11 Oct. 1856, B); Muzaffwabad, Axodkashnice, Rawalpindi (J. Mohd. 8013, 12 Sept. 1967, K); Chashma shahi (V. N. Kaul 60, 22 Jul. 1964, CAL); Shoghot, N. of Chitral, 6000 ft. (J. D. A. Stainton 2750, 25 Jun. 1958, CAL); Chitral (S. L. Harriss 16727, 6 Jun. 1895, CAL); loc. cit., Mastut, 7500 ft. (J. D. A. Stainton 2480, 19 May 1958, BM); Swat Himalaya, Kalam to Paloza, 2390 m (K. Honda 44 18 Jul. 1957, KYO); loc. cit., Lutko valley, N. W. of Chitral, 7000 ft. (J. D. A. Stainton 3253, 14 Sept. 1958, BM) Bhouja, Kagan, Hazara (Inayat

s.n., 1 Aug. 1899, CAL); Gilgit (G. M. Giles s.n., 1885, CAL); Wna, 4000–5000ft. Waziristan (Harsukh 15668, 5 May 1895, CAL).

INDIA. PUNJAB: Simla (J. R. Drummond 22253, 1886, K); loc. cit. (J. R. Drummond 20928–20930, 1887, K); without precise locality (J. R. Drummond 26524, K).

UTTAR PRADESH: Mukba road, Tihri-Garhwal (J. F. Duthie 155, CAL).

KUMAON: near Ranikhet, 5000–6000 ft. (J. F. Duthie 6057, 3 Jun. 1886, CAL); on the southern slopes of the Tari Pass (collector unknown 9931, 9 Jun. 1856, S); Monali, 6600 ft. (N. L. Bor 11814, 28 Jun. 1938, K); loc. cit., 7400 ft. (R. Strachey & J. E. Winterbottom 6, K); loc. cit. (T. Thomson 1030, May 1845, K); loc. cit., near Chour, 8700 ft. (J. E. Winterbottom 6, 9 May 1840, CAL); loc. cit., Inucus (T. Thomson 1030, May 1843, BM); Konain, Jaunsar, United Province, 7500 ft. (G. E. Parkinson 7136, 23 Jun. 1936, S).

NORTH WEST HIMALAYA: Beyond Theog (or Iheog) (J. S. Gamble 6580A, 8 Sept. 1878, K).

NEPAL: Rara, Mugu district, 2900 m (N. P. Manandhar 7058, 7066, 10 Aug. 1981, KATH); Maharigaon, 10500 ft. (O. Polunin et al. 324, 27 Jul. 1952, CAL); Between Yangzo and Ghunsa, 2850 m (K. Nishioka 1051, 24 Sept. 1962, KYO); above Chepuwa, 10000 ft. (Banerjee et al. 3450, 12 May 1965, K, KATH); Rasuwa, Syabru Bensi - Parbati Kund (near Gatlang), 2200 m (F. Miyamoto et al. 9410018, 24 Jul. 1994, TI); loc. cit., Syabru - a river - Langtang Khola - Lama Lodge, 2180 m (H. Takayama et al. 9220081, 11 Jul. 1992, TI); loc. cit., Lama Lodge - Langtang Khola - a river - Syabru, 2500 m (H. Takayama et al. 9220402, 24 Jul. 1992, TI); Dolakha, Jiri - Bkal - Ratmate - Maligaon - Shivalaya (H. Ohba et al. 8571659, 16 Aug. 1985, TI); Sankhuwasawa, Hatia Gola - Dighedenra - Taram Bhanjyang - Honkon (H. Ohashi et al. 770449, 5 Aug. 1977, TI); loc. cit., Takisindu - Junbesi, 2800 m (F. Miyamoto et al. 9580502, 1 Sept. 1995, TI); loc. cit., from Chamtang to Ritak, 2015 m (H. Tabata et al. 11285, 9 Jul. 1978, KYO); Tamur valley, Mewa Khola, S. E. of Topke Gola, 8000 ft. (J. D. A. Stainton 333, 17 May 1956, CAL).

SIKKIM: Lachen to Chungthang, 8000 ft. (K. Biswas 6903, 22 May 1845, CAL); Lachung, 9000 ft. (G. A. Gammie 671, 7 Aug. 1892, CAL); Tiger Hill, 8900 ft. (D. Chatterjee 263, 20 Jul. 1856, CAL); Yoksam, 1700 m (H. Hara et al. 328, 16 May 1960, KYO); Chungthang to Lechen, 5000–6000 ft. (K. Biswas 6689, 16 May 1845, CAL); Chang thang, 5000 ft. (G. King s.n., May 1885, CAL); Dikchu valley, 9000–10000 ft. (W. W. Smith 3822, 26 Jul. 1910, CAL); Dubdi forest, Yuksum, 6200 ft. (S. N. Mitra 9519, 27 May 1954, CAL); Legek Panthing (C. B. Clarke 46438, May 1885, BM); Loo-li-la (G. King 607, 28 May 1884, CAL); Lunlang, 6000 ft. (R. Lepcha 2385, 20 Jun. 1909, CAL); Panthng (C. B. Clarke 46438B, May 1885, CAL); Zemu valley, 9000 ft. (Smith & Cave 2809, 20 Jul. 1909, CAL); Yong, 5000 ft. (M. F. E. Younghusband s.n., 29 Jun. 1903, CAL); without precise locality, 6000–10000 ft. (J. D. Hooker s.n., 3 Aug. 1849, BM, CAL, K, L, S); without precise locality, 9000–10000 m (J. D. Hooker s.n., 4 Jul. 1849, K).

BHUTAN: Tashiling (2100 m) - Neylong (2200 m) - Charikhachor (2250 m) (H. Hara et al. 8277, 20 Apr. 1967, KYO, TI); Tongsa, 27°30'N, 90°30'E (A. J. C. Grierson & D. G. Long 1287, 24 May 1979, K); loc. cit., 8500 ft. (F. Ludlow et al. 17010, 4 Aug. 1949, BM); Sherpang, 7000 ft. (F. Ludlow et al. 20211, 30 Apr. 1949, BM).

ASSAM: Khasia, Lailanhote, 5500 ft. (C. B. Clarke 45656, 25 Sept. 1886, B); loc. cit., 5000 ft. (J. D. Hooker & T. Thomson s.n., L); loc. cit., 5000 ft. (J. D. Hooker s.n., BM, CAL); Eastern Circle, Shillong, Nyukmadong, 2600 m, (R. S. Rao 7606, 19 May 1957, CAL); Shillong, 5000 ft. (C. B. Clarke 38227, 1 Jun. 1885, CAL).

HIMALAYA: Himal Bor. Occ., without precise locality, 6000–9000 ft. (T. Thomson s.n., 6 Jun. 1849, BM, CAL, K, L); Himal Bor. Occ., without precise locality (T. Thomson s.n., K).

MYANMAR: Haka, 6000 ft. (F. G. Dickason 7531, Apr. 1938, A); N. Triangle (Hkinlum), 4000 ft. (F. Kingdon-Ward 20811, 12 May 1953, A).

XIZANG (TIBET): Chumbi, Loo-li-la (G. King 607, 28 May 1884, B); Kongbo Province, Tse to Chamna, Tsangpo valley, 29°25'N, 94°26'E, 9000 ft. (F. Ludlow et al. 4656, 5 Jun. 1938, BM); Kadrang on the northern

foot of the Laotse Pass (collector unknown catalogue no. 2176, 10–17 Aug. 1886, B); Milbe to Dras (collector unknown catalogue no. 4984, 8–11 Oct. 1856, B); near the spring between Pullakand, Chongil Dane Astse (collector unknown catalogue no. 6773, 6 Aug. 1856, B); Yugu to Leh, right side of the Indus valley, Ladak (collector unknown catalogue no. 1973, 1–31 Aug. 1856, L).

YUNNAN: Gongshan, 2600–3500 m (Lin 790937, 16 Jul. 1979, KUN); Prope urbem Lidjiang, imprimis in monte Yulung-schan. (F. Handel-Mazzetti 4075, Jun.–Sept. 1914–1916, S); Chengkang, 2580 m (T. T. Yü 16991, 26 Jul. 1938, KUN); Tali Hsien, 1500 m (C. W. Wang 63370, May 1935, PE, KUN); loc. cit., 2400 m (H. T. Tsai 53892, 28 Jul. 1933, PE); loc. cit., 2400 m (H. T. Tsai 53904, 29 Jul. 1933, PE); Dali Shi, Diancang Shan, 2300 m (S. Akiyama et al. 402, 5 Jul. 2001, KUN, TI); Likiang Hsien, 2800 m (C. W. Wang 71439, Jul. 1935, KUN, PE); loc. cit., 2000 m (C. W. Wang 65046, Jun. 1935 KUN); Kun Ming, 2300 m (C. W. Wang 62962, Apr. 1935, KUN); Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-djiang (Irrawadi orient. super.), in pluviisilivis mixtis temperatis vallis Tjiontson-lumba infra Tschamutong, 2950 m (F. Handel-Mazzetti 9174, 29 Jun. 1916, S); Y. Si-chou Hsien (C. W. Wang 85505, 9 Dec. 1939, KUN).

SICHUAN: Mou Hsien, road leading to the city, 1750 m (F. T. Wang 21808, 25 Jul. 1930, S); Nin-yuan-sun, 1650 m (H. Smith 1736, 15 May 1922, S); without precise locality (J. W. & C. J. Gregory s.n., 19 Aug. 1922, BM).

SHANXI: austr. inter Kao-lo-ghan et Ch-wo-Hsien, 1000 m (H. Smith 6628, 30 Jul. 1924, S).

30. *Juncus khasiensis* Buchenau

NEPAL: near Balangra Pass, 12800 ft. (O. Polunin et al. 2542, 22 Jul. 1952, L, UPS); Rasuwa, Chyauche Kharka - a bridge - Lingju, 3100 m (F. Miyamoto et al. 9410268, 12 Aug. 1994, TI); loc. cit., 3400 m (F. Miyamoto et al. 9410283, 12 Aug. 1994, TI); loc. cit., Lingju - Tibling, 2100 m (F. Miyamoto et al. 9410289, 13 Aug. 1994, TI); loc. cit., Sunchet Kharka - Kangait Kharka - Gopchet Kharka - a pass - Lipchet Kharka, 3000 m (F. Miyamoto et al. 9410317, 15 Aug. 1994, TI); loc. cit., Lipchet Kharka - Makgan Kharka - Guinsi (near Balche), 3400 m (F. Miyamoto et al. 9410319, 16 Aug. 1994, TI); loc. cit., 2800 m (F. Miyamoto et al. 9410322, 16 Aug. 1994, TI); E. of Dobato, 3200 m (J. H. Haas, 2148, 9 Aug. 1974, BM); Khokim, 27°23'N, 87°29'E, 3100 m (J. F. Dobremez, 1584, 19 Aug. 1972, BM); Sankhuwasawa, Chhippon (Chhippon Pokhari) - Gidde (Gidde Kharka) (H. Ohba et al. 9120110, 19 Jul. 1991, TI); loc. cit., Junbesi - Tagtor - a pass - Lanjura Pass - Goyom - Dakchu - Sete - Kensa, 3200 m (F. Miyamoto et al. 9592569, 2 Sept. 1995, TI); loc. cit., Najing Ding - Chalem Kharka, 3100 m (F. Miyamoto et al. 9580138, 31 Jul. 1995, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4500 m (F. Miyamoto et al. 9580494, 11 Aug. 1995, TI); Sankhuwasabha district, Pemathang Kharka, S side of Barun Khola, 27°44'N, 87°12'E, 3410 m (D. G. Long et al. 391, 29 Sept. 1991, KATH); Ridge N. E. of Gupha Pokhari, 27°18'N, 87°33'E, 2870 m (C. G. Wilson et al. 109, 30 Aug. 1989, KATH); above Door Pani, 27°10'N, 87°26'E, 2870 m (C. G. Wilson et al. 11247, 10 Oct. 1989, KATH); Tinjure Danda ridge above Door Pani, 27°10'N, 87°25'E, 2960 m (C. G. Wilson et al. 68, 29 Aug. 1989, KATH).

SIKKIM: East district, Between Gangtok and Phusum (Karponang), 27°21'N, 88°39'E, 2680 m (D. G. Long & H. J. Noltie 80, 8 Jul. 1996, E, TI); East district, Below Kyangosla, 27°22'N, 88°42'E, 3120 m (D. G. Long & H. J. Noltie 77, 8 Jul. 1996, E, TI); Karponong, 7500 ft. (D. Catterjee 150, 12 Jul. 1856, CAL); without precise locality (S. Kurz s.n., 17–16 Oct. 1868, CAL).

BHUTAN: Wangdi Phodrang district, Bhaja-Nika chhu, 27°35'N, 90°24'E, 3200 m (F. Miyamoto 9361758, 28 Sept. 1993, TI).

ASSAM: Khasia, Maokadokadik 5000 ft. (C. B. Clarke 40457, 12 Sept. 1885, CAL, K); loc. cit., Lailankote, 5500 ft. (C. B. Clarke 45656A, 25 Sept. 1886, BM, K, S); loc. cit., 5000–6000 ft. (J. D. Hooker & T. Thomson s.n., K, S).

YUNNAN: Fugong, 3500 m (Lin 792041, 1 Aug. 1979, KUN); Yangbi, a Fruit Garden - Cangshan, 3550 m (S. K. Wu et al. 469, 16 Aug. 1997, KUN, TI).

THAILAND: Doi intanon National Park, Giwe Mae Ban meadow, 2275 m (J. F. Maxwell 94-1016, 10 Sept. 1994, A).

31. *Juncus kingii* Rendle

NÉPAL: Bajura district, Porakya pass, 2545 m (H. Tabata et al. 2620, 19 Aug. 1976, KYO); near Balangra Pass, 12800 ft. (O. Polunin et al. 2542, 22 Jul. 1952, A, BM, CAL); Dolpo, W. side Khung Khola, 5000 m (Aney-Nilson & Phillips 674, 19 Aug. 1973, K); Jargeng Khola, 15000–16000 ft. (D. G. Lowndes 1349a, 7 Aug. 1950, BM); Jumla, Hanka - pass - the 2nd highest peak - digging point - Bajari Binu, 4690 m (M. Minaki et al. 9106051, 20 Sept. 1991, TI); Tukucha, Kari Gandaki, 10500 ft. (J. D. A. Stainton & L. H. J. Williams 1880, 18 Jul. 1954, BM); Kyangin, 11500–12000 ft. (A. Richards 63, 8 Aug. 1969, BM); Gandaki Zone, Manang distr., Yak Kharka - Chri Lattar-Thorong Phedi, 28°43'24"N, 83°58'20"E–28°46'46"N, 83°58'16"E, 4020 m (M. Suzuki et al. 9460391, 18 Aug. 1994, TI); Langsisa Kharka (O. Polunin 1924, Sept. 1924, BM); Rasuwa, a Kharka - Pati Kharka, 3700 m (F. Miyamoto et al. 9410184, 4 Aug. 1994, TI); loc. cit., Bhairab Kund 4200m (M. Sato 9534063, 27 Jul. 1995, TI); loc. cit. (M. Sato 9534130, 9534144, 9534164, 9534169, 9534171, 28 Jul. 1995, TI); loc. cit., Gosain Kund - Bhairab Kund (M. Sato 9534195, 28 Jul. 1995, TI); loc. cit., Yure Kharka - Tinbu Kharka 3750 m (F. Miyamoto et al. 9410054, 26 Jul. 1994, TI); loc. cit., Base Camp - Yala Kharka - Yathang - Langtang Khola, 4800 m (H. Takayama et al. 9220282, 19 Jul. 1992, TI); Solukhumbu, Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4600 m (F. Miyamoto et al. 9580289, 11 Aug. 1995, TI); loc. cit., Pike - Tasman Bhangjang - Pike Khop, 3660 m (F. Miyamoto et al. 9580069, 24 Jul. 1995, TI); loc. cit., Samakang Kharka - Dudh Kund, 3700 m (F. Miyamoto et al. 9580420, 24 Aug. 1995, TI); loc. cit., Saure Kharka - Tangna, 4000 m (F. Miyamoto et al. 9580213, 5 Aug. 1995, TI); Khumbakarna Himal., Lower Barun valley, 4850 m (T. Wraber 34588, 25 Sept. 1972, BM); Taplejung district, from Nupo to Yangma, 3880–4010 m (H. Tabata et al. 11783, 20 Jul. 1978, KYO); Nea Lapsang, Simbua Khola, 27°34'N, 87°59'E, 4330 m (S. Crawford et al. KEKE764, 19 Sept. 1989, K); Kambchen, 27°44'N, 87°59'E, 4100 m (C. G. Wilson et al. 603, 12 Sept. 1989, KATH); Dojam Khola, 16000 ft. (O. Polunin et al. 1485, 5 Jul. 1952, BM); Tchaftang, Clugu, 15000 ft. (O. Polunin et al. 5385, 22 Aug. 1952, BM).

SIKKIM: Lachen, 14000 ft. (J. D. Hooker s.n., 15 Jul. 1849, K); North district, Softhanggu, Degraded slope (formerly fin forest) with *Spiraea/Rosa* scrub, 27°52'28"N, 88°32'31"E, 3760 m (D. G. Long & H. J. Noltie 283, E, TI); without precise locality, 11000–14000 ft. (J. D. Hooker s.n., B).

BHUTAN: Upper Mo Chu district, E. bank of Tharizam Chu, 28°01'N, 89°35'E, 4120 m (I. W. J. Sinclair & D. G. Long 5294, 24 Sept. 1984, K).

XIZANG (TIBET): Nyingchi, 4300 m (Qing-Zang expedition team 751049, 2 Aug. 1975, KUN-paratype of *J. longibracteatus*); Batang (R. P. Soulié 3474, 1903, P).

YUNNAN: Deqen, Baimashue Shan, 4500 m (Qing-Zang expedition team 2393, 13 Jul. 1981, KUN); loc. cit., Tianchi, 3600 m (S. K. Wu et al. 1479, 12 Aug. 1996, KUN, TI); loc. cit., around Daxue Shan, 4300 m (S. K. Wu et al. 1592, 27 Aug. 1996, KUN, TI); Wei-si Hsien, Yeh-Chih, 3600 m (C. W. Wang 68323, Aug. 1935, PE); E. slopes of Mount Dyinaloko, N. peak of the Likiang Snow Range, 13000 ft. (J. F. Rock 10381, Aug. 1923, A); without precise locality (C. Schneider 3750, 1914, A); without precise locality (C. Schneider 3771, 1914, A).

SICHUAN: Gue-sai-gue, Tsa-wa-rung, 3200 m (C. W. Wang 65777, Aug. 1935, KUN); Daocheng, Bowa Shan, 4360 m (S. K. Wu et al., 1505, 16 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, Beiyu, 4300 m (S. K. Wu et al., 1555, 22 Aug. 1996, KUN, TI); loc. cit., Gongga Zhonggu - Riwa Xiang - Gongling -

Daocheng, 4000 m (S. K. Wu et al., 1580 25 Aug. 1996, KUN, TI); loc. cit., around Gongga Zhonggu, 3880 m (S. K. Wu et al. 444, 3 Aug. 1997, KUN, TI); loc. cit., around Gongga Shan, 4300 m (S. K. Wu et al. 457 6 Aug. 1997, KUN, TI); Tachienlu, 9000–13500 ft. (A. E. Pratt 398, K); Xiaojin, Ganhaizi - S. W. slope of Mt. Siguniang - Ganhaizi, 3800 m (H. Ikeda et al. 100846, 1 Sept. 1998, KUN, TI).

32. *Juncus leptospermus* Buchenau

INDIA. HIMACHAL PRADESH: Siarun, Lahul (N. L. Bor 10300, 8 Jul. 1941, CAL).

NEPAL: near Gurjakhani, 8500 ft. (J. D. A. Satinton et al. 3681, 30 Jul. 1954, A, BM, CAL); Rasuwa, Syabru Bensi - Parbati Kund (near Gatlang), 2300 m (F. Miyamoto et al. 9410012, 24 Jul. 1994, TI); loc. cit., 2200 m (F. Miyamoto et al. 9410019, 24 Jul. 1994, TI); loc. cit., Lingju - Tibling, 2100 m (F. Miyamoto et al. 9410298, 13 Aug. 1994, TI); loc. cit., Lipchet Kharka - Makgan Kharka - Guinsi (near Balche), 2400 m (F. Miyamoto et al. 9410323, 16 Aug. 1994, TI); loc. cit., Lama Lodge - Chumna Lodge - Ghora Tabela - Thangshab - Langtang, 3000 m (H. Takayama et al. 9220106, 12 Jul. 1992, TI); Ramechhap, Patkare - Bhandar (H. Ohba et al. 8571333, 5 Aug. 1985, TI); Solukhumbu, Pike Khop - Leding - Tama Khani - Beni - Fera, 2440 m (F. Miyamoto et al. 9592104, 25 Jul. 1995, TI).

BHUTAN: Paro district, Takshang, 27°28'N, 89°21'E, 2500 m (F. Miyamoto 9361505, 16 Sept. 1993, TI); Wangdi Phodrang district, Nika chhu-Bhaja, 27°31'N, 90°25'E, 2630 m (F. Miyamoto 9361517, 18 Sept. 1993, TI).

ASSAM: Khasia Hills, Umjao river, 5000 ft. (Burkill & Banerjee 35209, 4 Jun. 1911, CAL); Cherrapunji, Eastern Circle, Shillong (G. K. Deka 19210, 20 Sept. 1959, CAL).

XIZANG (TIBET): Yadong, 2940 m (Tibet expedition team 74-2442, 13 Sept. 1974, KUN).

YUNNAN: Wei-se Hsien, 2800 m (H. T. Tsai 59861, 18 Oct. 1934, A); Dali Shi, Diancang Shan, Zhonghe Temple - Ximatang, 2600 m (S. K. Wu et al. 103130, 5 Sept. 1999, KUN, TI); without precise locality, 3600 m (C. Schneider 2363, 4 Sept. 1914, A).

33. *Juncus leucanthus* Royle ex D. Don

PUNJAB: Mussoorie, Kidar Kantha, 12000 ft. (J. R. Drummond 22795, Jun. 1904, K).

NEPAL: Rambrong, Lumjung Himal., 13000 ft. (J. D. A. Stainton et al. 6124, 4 Jul. 1955, A, BM, CAL); Rasuwa, around Jaisuli Kund, 4250 m (F. Miyamoto et al. 9410133, 31 Jul. 1994, TI); loc. cit., Paldol Base Camp - a Kharka, 4300 m (F. Miyamoto et al. 9410162, 3 Aug. 1994, TI); loc. cit., Tulo Bhera Kharka - Jaisuli Kund, 4200 m (F. Miyamoto et al. 9410800, 30 Jul. 1994, TI); loc. cit., Gosainkund - Surjakund - Gopte, 4200 m (H. Hara et al. 721921, 25 Aug. 1972, TI); loc. cit., Mul Kharka, 3880 m (H. Kanai & P. R. Shakya 672245, 3 Jul. 1970, TI); Gosainkund (4200 m) - Surjakund (4400 m) - Gopte (3500 m) (H. Kanai et al. s.n., 25 Aug. 1972, TI); loc. cit., Gadje (3920 m) - Surja Kund (4450m) - Gosainkund (4260 m) (S. B. Malla & H. Kanai 674893, 26 Aug. 1969, TI); loc. cit., Lama Chungbu - Samdan - Slesa - Lama Chungbu - Thudam, 4500 m (H. Kanai et al. 720724, 24 Jun. 1972, TI); loc. cit., Langtang Khola - Pirgona - Pyung - a pass - Base Camp (H. Takayama et al. 9220293, 20 Jul. 1992, TI); loc. cit., Base Camp - Yala Kharka - Kyangjin Kharka - Langtang (H. Takayama et al. 9220356, 22 Jul. 1992, TI); loc. cit., Kyangjin Kharka - Tarche Pisa - Tashigang - Yala Kharka (H. Takayama et al. 9220176, 14 Jul. 1992, TI); loc. cit., around Base Camp (H. Takayama et al. 9220320, 21 Jul. 1992, TI); loc. cit., Base Camp - Yala Kharka - Yathang - Langtang Khola (H. Takayama et al. 9220285, 19 Jul. 1992, TI); loc. cit., Langtang Khola - Pirgona - Pyung - a pass - Base Camp (H. Takayama et al. 9220313, 20 Jul. 1992, TI); Mul Kharka, Chilime Khola, 3800–4100 m (H. Kanai & P. R. Shakya 672245, 3 Jul. 1970, TI); Sankhuwasawa, Suke - Kokim Pokhari - Hati Surde - Hile Chok (H. Kanai et al. s.n., 11 Jun. 1972, TI); Ramechhap, Serdingma - Dubikharka (H. Ohba et al. 8570302, 8530148, 7 Jul. 1985, TI); loc. cit., around Neju (H. Ohba et al. 8530648, Aug. 1985, TI); loc. cit., around Thare Og (H. Ohba et al. 8570853, 26

Jul. 1985, TI); Solu Khumbu district, from Gohim to Junbesi, 3090-3410 m (H. Tabata et al. 10351, 4 Jun. 1978, KYO); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 3800 m (F. Miyamoto et al. 9580274, 11 Aug. 1995, KATH, TI); loc. cit., Pike - Tasman Bhangjang - Pike Khop, 3800 m (F. Miyamoto et al. 9580070, 24 Jul. 1995, KATH, TI); loc. cit., Samakang Kharka - Dudh Kund, 3700 m (F. Miyamoto et al. 9580421, 24 Aug. 1995, TI); loc. cit., Tangna - Samakang Kharka, 3900 m (F. Miyamoto et al. 9580388, 23 Aug. 1995, KATH, TI); loc. cit., Chalem Kharka - Jar Kharka, 4200 m (F. Miyamoto et al. 9580149, 1 Aug. 1995, KATH, TI); loc. cit., Jar Kharka - a pass - Panch Pokari - Jar Kharka, 4400 m (F. Miyamoto et al. 9580166, 2 Aug. 1995, KATH, TI); Sankhuwasawa, Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka (M. Minaki et al. 9020635, 5 Aug. 1990, TI); loc. cit., Taplejung, Saju Pokhari - 4400m - Topke Gola (H. Kanai et al. s.n., 16 Jun. 1972, TI); loc. cit., Jomle - Goja (Goja Kharka) (H. Ohba et al. 9120228, 5 Aug. 1991, TI); loc. cit., Singoa Kharka - Pahakhola (H. Ohba et al. 9120396, 11 Aug. 1991, TI); loc. cit., around Cha Ding Kharka and Shipton Pass (M. Minaki et al. 9020680, 9020714, 9020720, 9020738, 9020747, 9020751, 8 Aug. 1990, TI); loc. cit. (M. Minaki et al. 9020678, 7 Aug. 1990, TI); loc. cit. (M. Minaki et al. 9020684, 11 Aug. 1990, TI); loc. cit. (M. Minaki et al. 9020748, 9 Aug. 1990, TI); loc. cit. (M. Minaki et al. 9020795, 10 Aug. 1990, TI); loc. cit., Khongma - Unshisa Kharka - Danda Kharka - Bhainsi Kharka - Uttise Kharka - Tashi Gaun (M. Minaki et al. 9020687, 13 Aug. 1990, TI); loc. cit., Sedua - Vedghari - Arun Khola - Dhadkhet - Num (M. Minaki et al. 9020694, 15 Aug. 1990, TI); loc. cit., Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma (M. Minaki et al. 9020861, 9020863, 12 Aug. 1990, TI); loc. cit., Jaljale (Jaljale Himal), Khongma - Tin Pokhari (H. Ohba et al. 9120146, 22 Jul. 1991, TI); Tamo La - Simion La, 27°37'N, 87°57'E, 4025 m (C. G. Wilson et al. 677, 15 Sept. 1989, KATH); Near Lapsang, Simbua Khola, 27°34'N, 87°59'E, 4330 m (C. G. Wilson et al. 763, 19 Sept. 1989, KATH).

SIKKIM: Aluthang to Jongri, 13900 ft. (S. N. Mitra 9502, 4 Jun. 1954, CAL); Jongri, 13000 ft. (C. B. Clarke 26146, 26149, 15 Oct. 1875, K); North district, S. E. side of Lasha Chhu, below Sebu La, 27°56'13"N, 88°38'30"E, 4560 m (D. G. Long & H. J. Noltie 376, 21 Jul. 1996, E, TI); East district, Tsomgo Chho, 27°22'14"N, 88°45'52"E, 3720 m (D. G. Long & H. J. Noltie 58, 8 Jul. 1996, E, TI); Chuga, 12000-13000 ft. (W. W. Smith 3155, 7 Jul. 1910, CAL); Maglatha W Imgi (G. King s.n., Jun. 1887, K); Phedang to Dzongri, 4000 m (B. N. Starling et al. A.G.S.E.S.39, 21 Jun. 1983, K); Se-mo-go-ne, 2500 ft. (G. King s.n., 23 Jun. 1882, B); Sindukphoo, 12000 ft. (C. B. Clarke 3498, 5 Jun. 1884, CAL); Tosar Chakung Chu, 14000 ft. (Ribu & Rhomoo 4489, 26 Oct. 1910, CAL); without precise locality (G. King 4918, 8 Jul. 1877, K); without precise locality, 12000-15000 ft. (J. D. Hooker 11 Sept. 1849, K, S); without precise locality, 12000 ft. (J. D. Hooker s.n., 20 Jun. 1849, K); without precise locality (Prain 113, 12 Aug. 1903, CAL); without precise locality 12000 ft. (J. D. Hooker s.n., L, S).

BHUTAN: Laya (3650 m) - Laum Thang (3900 m) (H. Hara et al. 11981, 18 May 1967, KYO); Sele La, 2900 m (S. Nakao 759, 26 Jul. 1958, KYO); Upper Mo Chu district, Moraine above Timuzam, W. of Laya, 28°05'N, 89°40'E, 4150 m (I. W. J. Sinclair & D. G. Long 5254, 23 Sept. 1984, K); Barshong 3500 m - Nala 3100 m (H. Kanai et al. 6201, 25 May 1967, TI).

HIMALAYA: Himal. Bor. Occ., without precise locality, 4000-10000 ft. (T. Thomson s.n., L).

XIZANG (TIBET): N. of Pagri, Kang Me (G. King's collector s.n., 8 Aug. 1882, BM).

YUNNAN: Dokerla, A-tun-tze, 3000 m (C. W. Wang 64899, 3-5 Aug. 1935, PE); Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68736, 68742, 68753, Aug. 1935, PE); Atuntze, Chitoyangou, 4200 m (T. T. Yü 9743, 9749, 22 Aug. 1937, PE); Dokeria, A-tun-tze, 3000 m (C. W. Wang 64899, 3-5 Aug. 1935, PE); Che-tse-lo, 4000 m (H. T. Tsai 58228, 27 Aug. 1934, PE); loc. cit. (T. T. Yü 58226, 27 Aug. 1934, PE); Deqe, around Daxue Shan, 4470 m (S. K. Wu et al. 1583, 27 Aug. 1996, KUN, TI); Kang-pu, Wei-si Hsien, 2000 m (C. W. Wang 64689, Jul. 1935, PE); Chengkang, Snow lange, 3400 m (T. T. Yü 16961, 24 Jul. 1938, PE); Tsang-

chan, au-dessus de Tali, 3500 m (P. J. M. Delavey 369, 4 Jul. 1882, P); Mu-li, Lu-lu, 3500 m (T. T. Yü 7130, 9 Jul. 1937, PE); Yangbi, around Cangshan, 3750 m (S. K. Wu et al. 482, 18 Aug. 1997, KUN, TI); Zhongdian Xian, Hong Shan, 28°06'N, 99°54'E, 4300 m (S. K. Wu et al. 103026, 31 Jul. – 4 Aug. 1999, KUN, TI); Dali shi, Diancang Shan, Zhonghe Peak, 25°42'N, 100°10'E, 3900m (S. K. Wu et al. 103152, 6 Sept. 1999, KUN, TI);

SICHUAN: Kangting (Tachienlu) district, Yulingkong, Gomba La, 3700 m (H. Smith 10724, 22 Jul. 1934, KYO, S); Daocheng, Bowa Shan, 4400 m (S. K. Wu et al. 1510 16 Aug. 1996, KUN, TI); Ping-wu Hsien, Mo-t'ien Ling, 2300 m (Salween), 28°04'N, 3600–3450 m (F. T. Wang 22492, 1 Sept. 1930, S).

SHAANXI: Taipei-schan (G. Giraldi 2054, Aug. 1894, B); loc. cit. (G. Giraldi 2026, Sept. 1897, B); loc. cit. (G. Giraldi 6725, 6726, 6746, 1 Oct. 1901, B); Miaowang-schan bei Paotji (G. Giraldi 6727, 1 Oct. 1901, B); Hwangtoui-schan (G. Giraldi 6743, 1 Oct. 1901, B); loc. cit. (G. Giraldi 7242, 1 Oct. 1901, B).

34. *Juncus longiflorus* (A. Camus) Noltie

XIZANG (TIBET): Tsekou (R. P. Soulié 2754, 18 Jul. 1895, P); without precise locality (R. P. Soulié 1154, 17 Jul. 1895, S).

YUNNAN: Gongshan Xian, Kongmu, Dadui, 3500–3880 m (Lin & Den 791033, 17 Jul. 1979, KUN); loc. cit., Yako, Dulonjian (Lin & Den 790550, 1979, KUN); loc. cit., Changputong, 3700–3800 m (Feng 7878, 20 Sep. 1940, KUN); Gong Shan, 3800 m (T. T. Yü 22807, 17 Oct. 1938, PE); In regione alpina jugi Sila inter fluvios Landsang-djiang (Mekong) et Lu-djiang (Salween), 4400 m (F. Handel-Mazzetti 8433, 29 Sept. 1915, P, S, W); Mekong-Salwin Divide Sila, 3800 m (T. T. Yü 22257, 9 Aug. 1938, A, PE); Gong Shan, 3800 m (T. T. Yü 22807, 17 Oct. 1938, PE); coteaux prs de l'arête du Tsang-chan, 4000 m (P. J. M. Delavey 4065, 30 Aug. 1889, S); Deqin, 3400 m (H. T. Tsai 53953, 30 Jul. 1933, PE); Che-tse-lo, 4000 m (H. T. Tsai 58054, 18 Aug. 1934, A, PE); loc. cit. (H. T. Tsai 58222, 27 Aug. 1934, A, PE); loc. cit., Pi-lo-shan, 4000 m (H. T. Tsai 58621, 15 Sept. 1934, A, PE); Tali Hsien, 4000 m (H. T. Tsai, 53987, 31 Jul. 1933, KUN, PE); Dali Xian, alpine meadow near the summit of Diancang Shan mountain range in the vicinity of Yinglofeng Peak, directly W. of Dali city, 3900 m (B. Bartholomew et al. 1035, 11–12 Jul. 1984, KUN); Boggy pasture on the eastern flank of the Tali Range, 25°40'N, 9000–10000 ft. (G. Forrest 4894, Jun. 1906, B, P); Dali, 3400 m (C. W. Wang 63260, May 1935, KUN); loc. cit., Cangshan, Zhonghefen (Zhongdian expedition team 63-3801, 2 Aug. 1963, KUN); loc. cit., 25°40'N, 100°07'E, 3680 m (S. K. Wu et al. 1604, 1 Sep. 1996, KUN, TI); loc. cit., 3800 m (S. K. Wu et al. 1605, KUN, TI); loc. cit., 3900 m (S. K. Wu et al. 1607, KUN, TI); loc. cit., Zhonghe Peak, 3600 m (S. K. Wu et al. 103145, 6 Sept. 1999, KUN, TI); loc. cit., 3700 m (S. K. Wu et al. 103147, 6 Sept. 1999, KUN, TI); Dali shi, Diancang Shan, 3400 m (S. Akiyama et al. 411, 5 Jul. 2001, KUN, TI); Dali, Cangshan Mt. 25°40'N, 100°45'E, 3290 m (Alpine Garden Society expedition ACE 926, 5 Jul. 1994, K); Dali Xian, alpine meadow near the summit of Diancang Shan mountain range in the vicinity of Yinglofeng Peak, directly W. of Dali city, 3900 m (B. Bartholomew et al. 1035, 11–12 Jul. 1984, PE); Yangbi, around Cangshan, 3850 m (S. K. Wu et al. 477, 17 Aug. 1997, KUN, TI); Yanbgi Xian, W. side of Diancang Shan mountain range. Vicinity of Baiyungeng Peak above Malutang, 3500–3600 m (B. Bartholomew et al. 585, 26 Jun. 1984, KUN, PE).

35. *Juncus longistamineus* A. Camus

YUNNAN: Wei-si Hsien, Yeh-Chih, 3600 m (C. W. Wang 68459, Aug. 1935, KUN, PE); Atuntze, Yangtsatung, 3900 m (T. T. Yü 9815, 24 Aug. 1937, KUN, PE); without precise locality (G. Forrest 18302, 1917–1919, BM).

36. *Juncus luzuliformis* Franch.

YUNNAN: Fugong (Lin 792041, 1 Aug. 1979, KUN).

SICHUAN: Kangting (Tachienlu) district, Cheto La, 3400 m (Salween), 28°04'N, 3600-3450 m (H. Smith 11075, 2 Aug. 1934, PE, S, UPS); Hua Niu Ping, Han Yuen Hsien, 2800 m (C. Y. Chiao 1857, 19 Aug. 1939, A); Bao-Hsien, Tu-pa-kou-Ta-chong-pun, 8850 ft. (S. Y. Hu 1281, Jul.-Aug. 1939, A, K); near Yu Ya Ling, 2600 m (C. Y. Chiao 1762, 10 Aug. 1939, A); Tachienlu, 9000-13500 ft. (A. E. Pratt 162, Dec. 1890, CAL); Ta-tsien-Lou, Principauté Kia La (R. P. Soulié 119, 1 Aug. 1893, P); Xiaojin, Rilong-a pass of Balang Shan - Wenchuan: Wolong, 2500 m (H. Ikeda et al. 100856, 6 Sept. 1998, KUN, TI); Dujiangyan Municipality, Qinglongzui near the side of Longwangmiao, along the Longxi River, 1750 m (D. E. Boufford & B. Bartholomew 24615, 5 Sept. 1988, A); Sungpan Hsien (W. P. Fang 4170, 11 Aug. 1928, PE, A); Mt. Omi (E. H. Wilson 5201, Sept. 1904, BM); loc. cit., 1800 m (T. C. Lee 3787, 10 Oct. 1940, PE); loc. cit., (H. C. Chow 12487, 23 Jul. 1940, A); loc. cit., 1800 m (H. C. Chow 8328, 9 Sept. 1938, A); loc. cit., 1800 m (L. Y. Tai 77, 3 Aug. 1940, A); loc. cit. (L. Y. Tai T236, 15 Aug. 1940, A); loc. cit. (L. Y. Tai T319, 17 Aug. 1940, A); loc. cit. (S. C. Sun & K. Chang 1146, 16 Aug. 1939, A); loc. cit. (S. C. Sun and K. Chang 1117, 7 Aug. 1939, A); loc. cit. (T. C. Lee 3498, 10 Sept. 1940, A); loc. cit., 3000 m (C. Y. Chiao & C. S. Fan 749, 12 Aug. 1938, A); loc. cit., 3000 m (C. Y. Chiao & C. S. Fan 834, 23 Aug. 1938, A); loc. cit., 1900 m (C. Y. Chiao & C. S. Fan 544, 29 Aug. 1938, A); loc. cit., 1770 m (Y. S. Liu 1159, Aug. 1937, A); Omei shan (T. N. Liou 1095, 30 Sept. 1939, PE); loc. cit. (T. N. Liou 10246, 18 Oct. 1938, PE); loc. cit. (T. N. Liou 10448, 20 Oct. 1938, PE); Tchen-keou-tin district (R. P. Farges 28, K, P); without precise locality (T. N. Liou 12626, 24 Oct. 1938, PE).

SHAANXI: Taipaishan, Ravine to the S. of Fangyangszu, 3000 m (T. N. Liou & P. C. Tsoong 1181, 23 Sept. 1937, PE); loc. cit. (T. N. Liou & P. C. Tsoong 1322, 28 Sept. 1937, PE).

HUBEI: Shennongjia Forest district, 31°30'N, 110°30'E, 2760 m (B. Bartholomew et al. 42, 26 Aug. 1980, A).

HUPEH: without precise locality (A. Henry 6846, 1885-1888, K); without precise locality (A. Henry 6868, 1885-1888, BM, CAL, K).

WESTERN CHINA: without precise locality, 11000 ft. (E. H. Wilson 4546, A, K); without precise locality (E. H. Wilson 5301, K).

37. *Juncus membranceus* Royle ex D. Don

AFGHANISTAN: Hindukush, between Dalti and Nazbardel, 2600 m (K. Ogino 452, 9 Aug. 1957, KYO); loc. cit., 2650 m (K. Ogino 453, 9 Aug. 1957, KYO).

PAKISTAN: Chitral, Gangailat Gol, Kafiristan, 9000 ft. (J. D. A. Stainton 2710, 18 Jun. 1958, BM); loc. cit., Madaklasht, N. E. of Drosh, 12000 ft. (J. D. A. Stainton 3116, 14 Aug. 1958, BM); loc. cit., Luger, 8400 ft. (Harriss 16721, 18 Jun. 1895, BM); loc. cit., Gangalwat Gol (Kafiristan) S. W. of Chitral, 9000 ft. (J. D. A. Stainton 2710, 18 Jun. 1958, A, UPS); loc. cit., Laspur (Harchin), 36°02' N, 72°27' E, 9000 ft. (S. A. B. Lyon 30, 15 Jul. 1957 A, BM, UPS); loc. cit., Madaklasht, N. E. of Drosh, 12000 ft. (J. D. A. Stainton 3116, 14 Aug. 1958, UPS); Kagan valley between Dalakot (34°35'N, 73°20'E) and Babusar Pass (35°10'N, 74°2'E) (J. Abel 181, Jul.-Sept. 1954, BM); Darkot, 10200 ft. (S. A. B. Lyon 8088, 18 Jun. 1976, K); near Burawai, Kagan valley, 33°70'N, 73°80'E, 10000 ft. (C. Wright 65, 16 Aug. 1975, BM); Kagan valley, 12000 ft. (Inayat 20237, 21 Jul. 1896, CAL); loc. cit., Hazara, 9000 ft. (Inayat 20238, 22 Jul. 1896, CAL); Saiful Hable, Kaghan valley, 10500 ft. (Muqarrabshab & Jamghed 150, 5 Aug. 1987, BM); Kan Koli, Kagan, Hazara (Inayat s.n., 27 Jul. 1899, CAL); Dara Kullu, Shuikujari, Hazara, 10400 ft., (Inayat s.n., 11 Jun. 1899, CAL); Dhafran, Kagan, Hazara (Inayat s.n., 26 Jul. 1899, CAL); Suger, 8400 ft. Hazara (S. L. Harriss 16721, 18 Jun. 1895, CAL); Narau, Kagu, 8400 ft., Hazara (Inayat s.n., 20 Jun. 1899, CAL); Baltistan, Katzarah, 2420 m (S. Takatsuki et al. 9360001, 30 Jun. 1993, TI); near Kalam, 25 miels above Bahrein, 6000-7000 ft. (R. J. Rodin s.n., 19 Aug. 1952, K); Barum Gol, Zapotili, 3500 m (P. Wendelbo s.n., 20 Jul. 1950, BM, K); Diamar, Northern areas (M. A. Khan & M. Afzal 937, 26 Jun. 1977, W); Sat Himalaya, Mahidan(C3) - Dishei(C4), 2800 m (K. Honda 96,

21 Jul. 1957, KYO); Sat Himalaya, Mahidan(C3) - Dishei(C4), 2950 m (K. Honda 105, 21 Jul. 1957, KYO); Swat State, Ushu, 9000 ft. (R. R. Stewart & A. Rahman 25316, 27 Jul. 1953, BM).

KARAKORAM: Upper end of Hushe valley, Ghondakoro Glacier basin at the foot of the Mt. Masherbrum, 11000 ft. (G. L. Webster & E. Nasir 6261, 23 Jul. 1955, A, K, S, W); Upper end of Field, S. of the village of Hushe, 10000 ft. (G. L. Webster & E. Nasir 5942, 3 Jul. 1955, A); Hispar Village area, Nagar State, 10600 ft. (O. Polunin 6352, 20 Aug. 1960, B, BM); Hispar valley, 9000–10000 ft. (R. S. Russell 1165, 15 Jul. 1939, BM); Nagar state, Minadin glacier, 11500 ft. (Meqan 93, 21 Aug. 1961, BM); Oltali Chish, 2400 m (S. Nakao s.n., 10 Jun. 1955, KYO); near Asiolo, 3200 m (S. Nakao s.n., 29 Jun. 1955, KYO); Kero Lugma Glacier, left bank, Oblation valley, 12000–13000 ft. (R. S. Russell 1303, Jul. 1939, BM); Solu Glacier, R. Bank, Oblation valley, 11500 ft. (R. S. Russell 1721, 26 Aug. 1939, BM).

KASHMIR: Hunza und Nagar-Gebiet, Boladas, Tumpel im Gletschervorland, 2700 m (H. K. Paffen 168, W); Shardi, Kishenganga valley, 6000 ft. (R. R. Stewart 17758, 20–21 Jul. 1939, A); Gilgit, Mang Gah, 10000 ft. (J. W. Thornley 10, 21 Jul. 1950, BM); Gilgit, Gstor valley (G. M. Giles 655, K); Gilgit, Naltar, 113000 ft. (R. R. Stewart 26298, 19 Jul. 1954, K); Sonamang, 10000 ft. (R. R. Stewart 9861A, 9 Aug. 1928, CAL); Burzil Pass, Gilgit road, 13000 ft. (R. R. Stewart 19030, 27 Aug. 1939, A); Mahalish, S. of Haramukh (F. Ludlow & G. Sherriff 7839, 28 Jul. 1940, BM); Rana valley, 36°20'N, 75°50'E, 12000 ft. (Laijets & Deadoh TEL1258, 30 Jul. 1967, BM); Baltistan, Koghani, 8000 ft. (F. Ludlow 349, BM); Baltistan, Turmih Nallah, 9000 ft. (F. Ludlow 305, BM); Baltistan, 10000–11000 ft. (J. F. Duthie 12110, 18 Jul. 1892, BM); above Pahlgam, 10000 ft. mutong, 2950 m (R. R. Stewart 7945a, 13–14 Jul. 1925, S); Sonawary, 9000 ft. (H. H. Rich 1284, 15 Jul. 1919, K); Dras, W. Lcber, 10000 ft. (G. A. Gammie s.n., 1 Aug. 1891, K); Kutti valley, 14000 ft. (J. F. Duthie 3441, 7 Sept. 1884, CAL); Margan, 8000–9000 ft. (A. Meebold 212, Jun. 1905, CAL); Rotang Pass, 13140 ft. (M. Nath s.n., 28 Jul. 1935, CAL); Shish Nag, 12000 ft. (R. R. Stewart 12844, 1 Sept. 1925, UPS); Snon valley, 11500 ft. (B. B. Osmaston 183, 4 Jul. 1928, K); Bang La, 9000 ft. (C. B. Clarke 24 Jul. 1876, L); Knzlodan, 7500 ft. (C. B. Clarke 29390, 21 Jul. 1875, W); Masjid Gali, 11000–12000 ft. (R. R. Stewart & I. D. Stewart 18447, 12 Aug. 1939, A); Thajiwas, 10000 ft. (N. K. B. Robson 2030, 7 Jun. 1971, BM); without precise locality (Stoliczka s.n., W); without precise locality, 9000–10000 ft. (R. R. Stewart 9764, 23 Jul. 1928, UPS); without precise locality, 12000–13000 ft. (J. F. Duthie 13230, 25 Jul. 1893, CAL); without precise locality, 13000–14000 ft. (J. F. Duthie 13281, 27 Jul. 1893, CAL); without precise locality, 7500 ft. (C. B. Clarke 29390, 21 Jul. 1876, CAL); without precise locality, 9000 ft. (C. B. Clarke 29552, 24 Jul. 1876, CAL); without precise locality, 10000 ft. (C. B. Clarke 28687, 9 Jul. 1876, W); without precise locality, 11000 ft. (C. B. Clarke 28371, 6 Jul. 1876, W).

PUNJAB: Kulu-Lahaul (J. R. Drummond 23190, 8 Jul. 1888, K); Lahul, Sisu, 10000 ft. (W. N. Koelz 670, 25 Jul. 1930, S); Lahul, Kyelang, 10500 ft. (W. N. Koelz 8539, 27 Jun. 1936, A); Lahul, Sisu, Kangra, 10000 ft. (W. N. Koelz 5101, 1–2 Jul. 1933, A); Lahul, Yramphoo, 3400 m (U. C. Battacharyya 48757, 19 Jul. 1972, CAL); Pin valley, Spiti, Kangra (W. N. Koelz 7198, 18–21 Sept. 1933, A); Spiti, Losar, 4100 m (U. C. Battacharyya 48900, 26 Jul. 1972, CAL).

UTTAR PRADESH: Tehri-Garhwal (J. F. Duthie 151, 19 Jun. 1883, K); loc. cit., Domdor valley, 11000–12000 ft. (J. F. Duthie 151, 26 Jun. 1883, BM); loc. cit., Rudugaira Gad, 130000 ft. (P. P. Huggins 255, 28 Sept. 1952, BM).

KUMAON: Tolu, 11500 ft. (R. Strachey & J. E. Winterbottom 12, A, BM, K); Kutti valley in Byoins, 14000 ft. (J. F. Duthie 3441, 7 Sept. 8994, K, BM).

WESTERN HIMALAYA: without precise locality (J. F. Duthie s.n., 17 Jul. 1899, K).

NEPAL: Opposte Budhi, Village, 10000–11000 ft. (J. F. Duthie 6053, 18 Jul. 1886, BM, CAL); Kali Gandaki, 13100 ft. (G. Miehe 284, 21 Jul. 1977, BM); Cha Lungpa (G. Miehe 385, 29 Jul. 1977, BM)

HIMALAYA: Himal Bor. Occ., without precise locality, 10000–14000 ft. (T. Thomson s.n., A, CAL, K);

without precise locality, 6000–10000 ft. (T. Thomson s.n., BM, K, L, UPS); without precise locality, 10000–15000 ft. (T. Thomson s.n., BM).

XIZANG (TIBET): E. of Suroo in Zanskar (Stoliczka s.n., CAL); Between Chokutenz and Gandar Chish, 9000–13000 ft. (W. M. Cnway 185, 1892, CAL); Spiti (collector unknown s.n., 12–17 Jun. 1856, BM); Balti (collector unknown s.n., 13–15 Jul. 1856, BM).

38. *Juncus milashanensis* A. M. Lu & Z. Y. Zhang

XIZANG (TIBET): Lhasa, 4800–5000 m (Y. T. Chang & K. Y. Long 2413, 1 Sept. 1965, KUN-paratype of *J. milashanensis*).

YUNNAN: Deqin Xian, Meili Xueshan, Suola, 4600 m (S. K. Wu et al. 103115, 20–23 Aug. 1999, KUN, TI).

SICHUAN: Daocheng, around Wuming Shan, 4680 m (S. K. Wu et al. 410, 27 Jul. 1997, KUN, TI); loc. cit., around Gongga Shan, alt. 4550 m (S. K. Wu et al. 450, 4 Aug. 1997, KUN, TI).

39. *Juncus minimus* Buchenau

NEPAL: Ganga La Pass, 13500 ft. (O. Polunin 237, 9–10 Jun. 1949, BM); Taplejung, Bomrang (Bomrang Kharka) - Pamphule Deurali - Singoa Kharka, 4500 m (H. Ohba et al. 9120351, 10 Aug. 1991, TI).

SIKKIM: North district, E. side of Selu La, Fine, 27°55'N, 88°39'E, 5090 m (D. G. Long & H. J. Noltie 395, 22 Jul. 1996, E, TI); Zemu valley, 12800 ft. (Smith & Cave 1396, 14 Jul. 1909, K, CAL); Gumtso 15000 ft. (Smith & Cave 1441, 14 Jul. 1909, CAL); without precise locality, 16000–18000 ft. (J. D. Hooker s.n., A, BM, CAL, K).

BHUTAN: Wangdi Phodrang district, Tintaso-Tampe La, 27°43'N, 90°31'E, 4400 m (F. Miyamoto 9361616, 21 Sept. 1993, TI); loc. cit. (F. Miyamoto 9361617, 22 Sept. 1993, TI).

ASSAM: Jakpho, 3100 m (C. B. Clarke, K).

XIZANG (TIBET): Mira La, 29°30'N, 94°10'E, 14000 ft. (F. Ludlow et al. 6138, 13 Aug. 1938, BM); Doshong La, 29°29'N, 94°59'E, 13000 ft. (F. Ludlow et al. 5252, 14 Jul. 1938, BM); Nyingchi Xian, Sezhaishan Shan, 4500 m (S. Akiyama et al. 105214, 17 Aug. 2000, KUN, TI); Zayu, 4200 m (Tibet research team 10714, 26 Sept. 1982, KUN).

YUNNAN: In montium inter fluvios Landsang-djiang (Mekong) et Lu-djiang (Salween) 28°09'N, 4450 m (F. Handel-Mazzetti 9744, 7 Aug. 1916, S); Deqe, around Daxue Shan, 4550 m (S. K. Wu et al. 1595, 28 Aug. 1996, KUN, TI); Deqin Xian, Meili Xueshan, Suola, 4500 m (S. K. Wu et al. 103112, 20–23 Aug. 1999, KUN, TI); Zhongdian Xian, Hong Shan, 4600 m (S. K. Wu et al. 103031, 31 Jul.–4 Aug. 1999, KUN, TI).

SICHUAN: Kangting (Tachienlu) district, Chungo valley, Mt. Yara, N. E. slopes, 3900 m (H. Smith 11158, 18 Aug. 1934, S); loc. cit., Tapaoshan, N. side, 4600 m (H. Smith 11426, 22 Aug. 1934, PE, PE, S).

40. *Juncus modicus* N. E. Br.

GANSU: without precise locality (W. Y. Hsia 7092, PE)

YUNNAN: Yangtze watershed, Prefectural district of Likiang, eastern slopes of Likiang Snow Range, 10000–11000 ft. (J. F. Rock 5977, 1922, S, W); Dali, Cangshan, 3700 m (S. K. Wu et al. 1610, 2 Sept. 1996, KUN, TI); Dali shi, Diancang Shan, Zhonghe Peak, 25°42'N, 100°10'E, 3700m (S. K. Wu et al. 103150, 6 Sept. 1999, KUN, TI); Dali shi, Diancang Shan, Zhonghe Temple-Ximatang, 25°41'N, 100°09'E, 3800m (S. K. Wu et al. 103137, 103139, 5 Sept. 1999, KUN, TI); Dali shi, Diancang Shan, 3600 m (S. Akiyama et al. 410, 5 Jul. 2001, KUN, TI); Yangbi, around Cangshan, 3800 m (S. K. Wu et al. 472, 17 Aug. 1997, KUN, TI).

SICHUAN: Tchen-Keou-Tin district (R. P. Fargens s.n., BM); Xiaojin, Ganhaizi-Dashuiba-Ganhaizi, 3530 m (H. Ikeda et al. 100834, 31 Aug. 1998, KUN, TI); Dujiangyan Municipality, L Qinglongzui near the side of Longwangmiao, along the Ongxi river, 2020 m (D. E. Boufford & B. Bartholomew 24790, 10 Sept. 1988, A).

SHAANXI: septentr., Gipfel du Thai-pei-shan (G. Giraldi 6413, 6414, 10–20 Aug. 1901, B); septentr., Kuan-Aou-San (G. Giraldi 2025, Jul. 1894, B); septentr., Tar-pa-shan (G. Giraldi 2028a, Aug. 1893, B); septentr., Thoce-Pei-San (G. Giraldi 2055, Jul. 1897, B); Taipaishan, On way from Pinganszu to Fangyangszu (T. N. Liou & P. C. Tsoong 806, 11 Sept. 1937, PE); loc. cit., 3580-3700 m (T. N. Liou & P. C. Tsoong 932, 11 Sept. 1937, PE); Taipaishan, Vicinity of Pinganszu (T. N. Liou & P. C. Tsoong 732, 8 Sept. 1937, PE).

GUIZHOU: Hsing Shan, 2100 m (N. Steward et al. 650, 10 May 1931, S).

HUBEI: Shennongjia Forest district, 31°30'N, 110°30'E, 2780 m (B. Bartholomew et al. 118b, 26 Aug. 1980, A); without precise locality (E. H. Wilson 2347a, Aug. 1901, K, S).

WESTERN CHINA: without precise locality (E. H. Wilson 4542, Jul. 1903, A, BM, K).

42. *Juncus nepalicus* Miyam. & H. Ohba

NEPAL: Sankhuwasawa, around Cha Ding Kharka and Shipton Pass 4400 m (M. Minaki et al. 9020690, 7 Aug. 1990, TI); loc. cit., 4100 m (M. Minaki et al. 9020753, 9 Aug. 1990, TI).

SIKKIM: North district, Glacial valley above Yakche, N of Lachung, 27°43'09"N, 88°44'47"E, 3180 m (D. G. Long & H. J. Noltie 222, 15 Jul. 1996, E, TI); Lachen valley, 10000 ft. (J. D. Hooker s.n., 6 Jun. 1849, K); Eumtso 15000 ft. (Smith & Cave 1441, 14 Jul. 1909, K); without precise locality, 10000–12000 ft. (J. D. Hooker s.n., K).

BHUTAN: Thimphu (2250 m) - Dochu La (3050 m) (H. Kanai et al. 696, 30 May 1967, KYO); Wangdi Phodrang district, Tintaso-Tampe La, 27°43'N, 90°31'E, 4400 m (F. Miyamoto 9361618, 21 Sept. 1993, TI).

YUNNAN: Tehching (Atuntze), Miyetzium, 3350 m (T. T. Yü 8634, 18 Jun. 1937, A, KUN); Dokeria, A-tuntze, 3300 m (C. W. Wang 64942, 3–5 Aug. 1935, PE); Weihsi, Tungchuling, Mankukung, 4000 m (T. T. Yü 8934, 12 Jul. 1937, KUN, PE); loc. cit., 3900 m (T. T. Yü 8834, 11 Jul. 1937, A, KUN, PE).

43. *Juncus ochraceus* Buchenau

KASHMIR: Srinagar, 5000 ft. (A. Meebold 211, Jun. 1905, CAL).

NEPAL: Balangra Pass, 12000 ft. (O. Polunin et al. 1030, 28 May 1952, UPS); Dhawalagiri zone, Myagdi, Ghorepani - Chitre - Sikha - Ghara - Tatopani, 2190 m (M. Mikage et al. 9552228, 17 Sept. 1995, TI); Dhankuta, Murhay - Sinduwa - Chitray - Bilbatay Bhanjang (H. Hara et al. 6300885, 24 Oct. 1963, TI); Between Yangzo and Ghunsa, 2850 m (K. Nishioka 1052, 24 Sept. 1962, KYO); Sankhuwasawa, Minchin Dhap - Mul Pokhari (H. Hara et al. 6300862, 29 Oct. 1963, TI); Arun valley, Chyamtang, 8000 ft. (J. D. A. Stainton 1754, 20 Sept. 1956, A, BM, CAL); Thudam, 11500 ft. (L. W. Beer 10681, 2 Nov. 1971, BM); Taplejung, Baroya Khimty - Thakma Khola (H. Hara et al. 6300981, 12 Nov. 1963, TI); loc. cit., (H. Hara et al. 6300984, 12 Nov. 1963, TI); loc. cit. (H. Kanai et al. 6300965, 16 Nov. 1963, TI); below Siling Tzokupa - Siling Tzokpa (H. Hara et al. 6300970, 21 Nov. 1963, TI); Sankhuwasabha district, N Bank of Barun Khola, above Pemathang Kharka, 27°45'N, 87°11'E, 3490 m (D. G. Long et al. 586, 8 Oct. 1991, KATH); loc. cit., E bank of Upper Saldim Khola, below bridge, NW of Hatiya, 27°44'N, 87°18'E, 2785 m (D. G. Long 716, 12 Oct. 1991, KATH); Ghunsa Khola, Amjilassa to Kyapra, 27°37'N, 87°53'E, 2700 m (S. Crawford et al. KEKE298, 6 Sept. 1989, K, KATH); Kyapra to Pheri, Ghunsa Khola, 27°38'N, 87°55'E, 3330 m (S. Crawford et al. KEKE351, 7 Sept. 1989, K); without precise locality (M. L. Banerjee 2240, CAL).

SIKKIM: Darjieling 7000 ft. (C. B. Clarke 8889, 29 Aug. 1869, K, CAL); loc. cit., 8000 ft. (C. B. Clarke 13610, 8 Nov. 1870, K, CAL); loc. cit., 7000 ft. (C. B. Clarke 26277, 4 Nov. 1875, K, S, UPS); loc. cit., 7500 ft. (collector unknown s.n., 29 Sept. 1879, K); loc. cit., 7000 ft. (T. Anderson 1338, 27 Aug. 1862, A); On way up Tiger hill, 8000 ft. (K. Biswas 8641, 13 Nov. 1945, CAL); Lachung, 8500 ft. (G. A. Gammie 1064, 30 Aug. 1892, CAL); Lachen, 8000-9000 ft. (N. C. Majumdar & R. N. Banerjee 464, 12 Sept. 1968, CAL); Bansoi (on way to Lachen), 7500 ft. (R. N. Banerjee 432, 12 Sept. 1968, CAL); Amilal, 8000 ft. (G. King 4088, 2 Sept.

1877, CAL); Cinchal lake area, 8000 ft. (K. Biswas 8645, 13 Nov. 1945, CAL); Kwseueg, 5000 ft. (G. King's collector, 4035, 1887, CAL); Ruwahi Jhora, 6500 ft. (W. W. Smith 337, 1 Oct. 1808, CAL); Siuohal, 8000 ft. (T. Anderson 1338, Aug. 1862, CAL); Sureil, 6000 ft. (W. G. Craib 47, 13 Nov. 1908, CAL); loc. cit. (J. D. Drummond 20984, 1904, K); loc. cit., 8000 ft. (M. B. Raizada 19031, 15 Nov. 1944, A); loc. cit., 8000 ft. (J. S. Gamble 8449, Sept. 1880, K); loc. cit., 7000 ft. (J. S. Gamble 10534, Sept. 1882, CAL); loc. cit., 6500 ft. (J. S. Gamble s.n., Aug. 1872, K); loc. cit., 7000 ft. (J. S. Gamble 3174A, Oct. 1872, K); loc. cit., 7000 ft. (J. S. Gamble 3173A, Sept. 1872, K); loc. cit., 7000 ft. (J. S. Gamble s.n., K); Yoksun, 6000 ft. (J. S. Gamble 25237, 11 Oct. 1875, CAL, K); without precise locality, 6500 ft. (G. King's collector, s.n., 14 Sept. 1872, CAL, S); without precise locality, 6800 ft. (G. King's collector, s.n., 14 Sept. 1872, CAL); without precise locality (G. King's collector, s.n., 1878, CAL); without precise locality, 6000–9000 ft. (J. D. Hooker s.n., K, CAL); without precise locality (J. D. Hooker s.n., K); without precise locality (collector unknown 323, CAL); without precise locality (Griffith 5462, Aug. 1837, K, L, S, CAL); without precise locality (S. Kurz s.n., 7 Oct. 1868, CAL); without precise locality (S. Kurz s.n., 3 Oct. 1868, CAL); without precise locality (J. S. Gamble 3175A, 1873, K).

BHUTAN: Streamside above Taba, Thimphu, 27°30'N, 89°39'E (A. J. C. Grierson & D. G. Long 947, 11 May 1979, K); Thimphu Chu above Dotena (I. W. J. Sinclair & D. G. Long 4881, 5 Sept. 1984, K); Mishina - Dochu La - Thimphu (H. Hara et al. 10369, 28 Apr. 1967, BM, TI); Thimphu - Dochu La (H. Kanai et al. 696, 30 May 1967, BM, TI); 1 km S of Tongsa 27°30'N, 90°30'E (A. J. C. Grierson & D. G. Long 1097, 17 May 1979, K); Chimakushi, 7200 ft. (P. K. Hajra 500, 27 Sept. 1964, CAL); Putlibhir, 7300 ft. (G. D. Gupta 2109, 16 Sept. 1965, CAL).

ASSAM: Dichu valley between Lohit valley and Diphu pass into Bwuma (F. Kingdon Ward 19466, 14 May 1950, K); Charduar (Masters s.n., 1857, CAL); without precise locality (Simons s.n., L).

ARUNACHAL PRADESH: Camp C12, Eastern Circle, Shilong (J. Joseph 48800, 4 Jan. 1970, CAL); Sissini Camp, Kameng (G. Panigrahi 6065, 26 Mar. 1956, CAL); Takepokong to Sirang, 1900–2400 m (R. S. Rao 17856, 19 Nov. 1958, CAL).

XIZANG (TIBET): Medog, Hanmi, 2300 m (H. Sun et al. 836, 27 Oct. 1992, KUN); Bomi (S. K. Wu 5784, 11 Sept. 1976, KUN); Di Chu Gorge, 2600 m (F. Kindgon-Ward 19644, BM).

YUNNAN: Yunlong Xian, Ziben Shan, 2700 m (S. K. Wu et al. 103165, 10–11 Sept. 1999, KUN, TI); Lushui Xian, Pianma - Pianma Pass - Lushui, 2600 m (S. K. Wu et al. 103175, 13 Sept. 1999, KUN, TI); Gongshan Xian, Dulongjiang, 1700 m (S. K. Wu et al. 103180, 17 Sept. 1999, KUN, TI); loc. cit., S. W. of Gongshan, Gaoligong Shan, 2500 m (S. K. Wu et al. 103191, 20 Sept. 1999, KUN, TI); Tali Hsien, 1300 m (C. W. Wang 63448, 35 May 1935 A, KUN); Dzung-duei, Cham-pu-tung, 3000 m (C. W. Wang 67025, Oct. 1935, A, KUN); Shi-gi-tung, Champu-tung, 2500 m (C. W. Wang 67128, Oct. 1935, A, KUN); Chiu-Kiang, W. of Champutung, 2800 m (C. W. Wang 67331, Oct. 1935, A, KUN); Shang-pa Hsien, 2000 m (H. T. Tsai 56573, 21 Sept. 1933, A, KUN); loc. cit., 2000 m (H. T. Tsai 59071, 29 Oct. 1934, KUN).

SICHUAN: near Chang-lou-ping, 2200 m (C. W. Wang, 2070, 28 Aug. 1939, A); Tianjin, 2550 m (C. W. Wang 1932, 26 Aug. 1963, PE).

44. *Juncus perpusillus* Sam.

KASHMIR: Snsal Nala, Lidlar valley, 12000–13000 ft. (J. F. Duthie 13344, 30 Jul. 1893, CAL).

UTTARA PRADESH: Tihei-Garhwal, Bandarpuneh, 13000–4000 ft. (J. F. Duthie 478, 25 Aug. 1883, CAL).

KUMAON: without precise locality, 14500 ft. (R. Strachey & J. E. Winterbottom 13, A).

NEPAL: Rara Daha, 9800 ft. (O. Polunin et al. 4091, 15 May 1952, UPS); Tukucha, Kali Gandaki, 12000 ft. (J. D. A. Stainton & L. H. J. Williams 1170, 15 Jun. 1954, UPS); Nea Chlike Pahar, 13500 ft. (J. D. A. Stainton & L. H. J. Williams 3134, 15 Jun. 1954, UPS); Rasuwa, Tulo Bhera Kharka - Jaisuli Kund, 4200 m (F.

Miyamoto et al. 9410830, 30 Jul. 1994, TI); loc. cit., Paldol Base Camp - a Kharka, 4400 m (F. Miyamoto et al. 9410164, 3 Aug. 1994, TI); Sankhuwasawa, around Cha Ding Kharka and Shipton Pass, 4150 m (M. Minaki et al. 9020825, 9 Aug. 1990, TI); Solukhumbu, around Khare, 4800 m (F. Miyamoto et al. 9580257, 9 Aug. 1995, TI); loc. cit., Chhomalang Base Camp - Seto Pokhari, 4400 m (F. Miyamoto et al. 9580305, 12 Aug. 1995, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4660 m (F. Miyamoto et al. 9580264, 11 Aug. 1995, TI); loc. cit., around Tangna, 4000 m (F. Miyamoto et al. 9580401, 22 Aug. 1995, TI); Gokyo, 27°59'N, 86°41'E, 4600 m (J. F. Dobremez 409, 8 Jul. 1970, KATH).

SIKKIM: North district, S. E. side of Lasa Chhu, below Sebu La, Damp moraine slopes, 27°56'13"N, 88°38'30"E, 4700 m (D. G. Long & H. J. Noltie, 383, 21 Jul. 1996, E, TI).

CHINA. GANSU: without precise locality (E. Licent 4317, 13 Jul. 1918, UPS).

YUNNAN: Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 68858, Aug. 1935, A); Zhongdian Xian, Hong Shan, 4600 m (S. K. Wu et al. 103030, 31 Jul. -4 Aug. 1999, KUN, TI).

SICHUAN: Hi-ma-la, Tsa-wa-rung, 3400 m (C. W. Wang 65598, Aug. 1936, A); S. Mu-li, Shao-siang-liang-tze, 3600 m (T. T. Yü 7771, 17 Aug. 1937, PE).

46. *Juncus potaninii* Buchenau

XIZANG (TIBET): without precise locality (S. K. Wu 4947, 22 Aug. 1976, KUN).

QINGHAI: Yushu Xian: Xia-Baitang, 32°40'30"N, 97°17'40"E, 4200-4400 m (D. E. Boufford & T. S. Ying 27043, 5 Jul. 1995, A); Maqin Xian, along the Xihalong He, between Jungong and Maqin, 3450-3550 m (T. N. Ho et al. 360, 26 Jul. 1993, A).

GANSU: near Chuoni, 2700 m (T. P. Wang 5323, 24 Jul. 1936, PE); Lin long chan et Ma ho chan (P. Licent 4317, 13 Jul. 1918, S).

YUNNAN: Deqe, around Daxue Shan, 3800 m (S. K. Wu et al. 1600, 29 Aug. 1996, KUN, TI); Zhongdian, Haba Shan, Dishuiyan, 4100 m (Zhongdian expedition team 1739, 31 Aug. 1962, KUN-paratype of *J. parvus*).

SICHUAN: Kangting (Tachienlu) district, Tapaoshan, 3900 m (H. Smith 11554, 26 Aug. 1934, UPS); loc. cit., Cheto valley, 3110 m (H. Smith 11078, 2 Aug. 1932, BM, P, PE, S); Tachenlu, 9000-13500 ft. (A. E. Pratt 162, BM); Dongrergo (Hsioeh-pao-ting), 4200 m (H. Smith 3795, 20 Jul. 1922, BM, PE, S, UPS); Tsipula, 4400 m (H. Smith 4216, 26 Aug. 1922, S, UPS); Xiajin, Rilong - Ganhaizi, 3300 m (H. Ikeda et al. 100812, 30 Aug. 1998, KUN, TI); loc. cit., Rilong - a pass of Balang Shan - Rilong, 4100 m (H. Ikeda et al. 100811, 29 Aug. 1998, KUN, TI).

SHAANXI: Taipai Shan, 2100-2300 m (T. N. Liou & P. C. Tsoong 517, 1 Sept. 1937, PE).

HUBEI: without precise locality (A. Henry 6868, 1885-1888, BM).

WESTERN CHINA: Mt. Omi (E. H. Wilson 5201, Sept. 1904, BM).

47. *Juncus prismatocarpus* R. Br.

PUNJAB: Bhadwar, Kangra, 2000 ft. (W. N. Koelz 4382, 3 May 1933, A).

HIMACAL PRADESH: Chamba, Khajjar, 6500 ft. (W. N. Koelz 8819, 11 Jul. 1936, A).

UTTAR PRADESH: Ganges Balley between Dhunda and Barabit, 4000-5000 ft. Tihri-Garhwal (J. F. Duthie 154, 13 Jul. 1883, CAL); Kheri (Inayat 22831, 28 Apr. 1898, CAL); Yons valley, Jaunsar, 3000 ft. (G. A. Gamble s.n., May 1891, CAL).

NEPAL: Between Barigad and Galsera (H. Tabata 151, 27 Jun. 1976, KATH); Katmandu, 1400 m (S. Nakao s.n., 27 Aug. 1953, KYO); Gokarna, 4400 ft. (Pradhan & Thapa 4402, 27 Apr. 1966, CAL); loc. cit., 4500 ft. (Pradhan & Ramola 7702, K); Baglung, 3000 ft. (J. D. A. Stainton et al. 58, 20 Apr. 1952, A, BM, CAL); above Suikhet village, 6 miles N. W. Pokhara (C. Barclay & P. M. Synge 2201, 22 May 1971, K); Dolakha, Jiri

- Kune - Kattike - Those - Shivalaya, 1780 m (M. Suzuki et al. 8571663, 16 Aug. 1985, TI); Rolwaling Himal, Banepa, 1400 m (K. Yoda s.n., 19 Apr. 1963, KYO); Ramechhap, Shivalaya - Those - Kattike - Kune - Jiri, 1900 m (H. Ohba et al. 8572612, 12 Sept. 1985, TI); Dhankuta, Hile - Pakhribas - Gholi Kharka, 1480 m (M. Minaki et al. 9020011, 23 Jul. 1990, TI); Solukhumbu, Takisindu - Junbesi, 2800 m (F. Miyamoto et al. 9580491, 1 Sept. 1995, TI); loc. cit., Pike - Tasman Bhangiang - Pike Khop, 2630 m (F. Miyamoto et al. 9580063, 24 Jul. 1995, TI); loc. cit., Manebanjang - Danda Pangma - Sekaha - Chipe Gaun - Bhotebas - Gogane - Chichila, 1300 m (M. Minaki et al. 9020244, 28 Jul. 1990, TI); loc. cit., Hurhure - Mude - Num, 2020 m (M. Minaki et al. 9020342, 31 Jul. 1990, TI); Tamur River between Chirwa and Hellok, 27°29'N, 87°46'E, 1560 m (S. Crawford et al. KEKE206, 4 Sept. 1989, K); Between Barigad and Galsera, 1480 m (H. Tabata et al. 151, 27 Jun. 1976, KYO); Marma Ghabung Khola, near Qpokhara, 3000 ft. (J. D. A. Stainton et al. 2489, 16 Apr. 1954, A); Tamur River between Chhiruwa and Hellok, 27°29'N, 87°46'E, 1560 m (C. G. Wilson et al. 206, 4 Sept. 1989, KATH); without precise locality, 2000–5000 ft (T. Thomson s.n., 18 Apr. 1844, K).

SIKKIM: Mungher 4000 ft. (W. W. Smith s.n., 12 Apr. 1908, CAL); Tista, 1000 ft. (C. H. Cave s.n., 9 Jun. 1917, CAL); without precise locality, 8000–10000 ft. (J. D. Hooker s.n., K).

BHUTAN: Taba, Thimphu, 27°30'N, 89°38'E, 2350 m (A. J. C. Grierson & D. G. Long 917, 9 May 1979, K); Punakha district, 1 km below Chuzomsa, Tang Chu, 27°30'N, 89°58'E, 1420 m (A. J. C. Grierson & D. G. Long 4529, 20 Apr. 1982, A, K); Tongsa district, near Pertimi, 27°13'N, 90°41'E, 1400 m (A. J. C. Grierson & D. G. Long 4286, 3 Apr. 1982, K); without precise locality (Griffith 5459, K).

ASSAM: Khasya Hills (Griffith s.n., L); loc. cit. (H. G. Carter 773, Mar. 1918, CAL); Khasia, 4000–6000 ft. (J. D. Hooker & T. Thomson s.n., K); Khasia, Surarim to Cherrapunji, 4000–6000 ft. (S. C. Banerji 136, 31 May 1911, CAL); Mokochung, 4600 ft. (N. L. Bor 16677, 20 Sept. 1942, L); Naga Hills, 9900 ft. (C. B. Clarke 41274, 25 Oct. 1885, K, S); Agalhatti Mysane (A. Meebold 8343, 1908, K); Delrvghur, 3000 ft. (C. B. Clarke 37723, 4 Apr. 1885, CAL); Gabru (A. C. Chattejee s.n., May 1902, A); Gabru (A. C. Chattejee s.n., May 1902, A).

ARUNACHAL PRADISH: on way Hapoh to Zino (G. V. SubbaRao 24691, 2 Jun. 1961, CAL); Chardwar (R. S. Rao 5876, 23 Mar. 1957, CAL).

EAST BENGAL: without precise locality (Griffith 5459, L)

MYANMAR: North Triangle (Hkinlum), 3000–4000 ft. (F. Kingdon-Ward 20776, 4 May 1953, A).

XIZANG (TIBET): Champitang, 12000 ft. (F. S. Chapman 453, 1 Aug. 1936, K); Kham, Pass Chun-tschoa (G. N. Potanin s.n., 10 Aug. 1893, S).

YUNNAN: Shun-Ning Hsien, 2800 m (C. W. Wang, 71890, Feb. 1936, A, PE); Weixi, 1920 m (Tibet expedition team 850, 10 Jun. 1981, KUN); Ta-li Hsien, 2540 m (C. W. Wang 63523, May 1935, A); Fo-Hai, 1540 m (C. W. Wang 72949, May 1936, A); Fo-Hai, 1900 m (C. W. Wang 77354, Jul. 1936, A); Wen-shan Hsien, 1600 m (H. T. Tsai 51777, 12 Feb. 1933, A); Meng-soong, Dah-meng-lung, Che-li Hsien, 1850 m (C. W. Wang 78495, Sept. 1936, A); Ping-pien Hsien, 1400 m (H. T. Tsai 60224, 15 Jun. 1934, A); Tsang Yuan, 1200 m (C. W. Wang 73161, Apr. 1936, A).

SICHUAN: Kiating (H. C. Chow 9560, 10 Apr. 1939, A); Ta-tien-pa, Kiating (L. Y. Tai T865, 3 Jun. 1941, A); Mt. Omei (S. C. Sun & K. Chang 363, 22 Jun. 1939, A); Mt. Omei (S. C. Sun & K. Chang 548, 27 Jun. 1939, A); loc. cit., 2300 m (S. C. Sun & K. Chang 1217, 26 Aug. 1939, A); loc. cit. (W. P. Fang 12900, Jul.-Aug. 1938, A); loc. cit., 630 m (W. P. Fang 14493, 7 Jun. 1940, A); Ma-pin Hsien 1300 m (F. T. Wang 22714, 10 May 1931, PE).

HUBEI: without precise locality (A. Henry 2471, 1885–1888, BM); without precise locality (collector unknown s.n., BM).

48. *Juncus przewalskii* Buchenau

XIZANG (TIBET): Baxoi Xian, Demu La, 4870 m (S. Akiyama et al. 105089, 26 Jul. 2000, KUN, TI); Kham, Pass Chuntschao (G. N. Potanii s.n., 10 Aug. 1893, S).

GANSU: Dschoni (G. N. Potanii s.n., 1885, S-paratype of *J. tanguticus*); Lapuleng, 3800 m (C. W. Wang 5844, 20 Aug. 1936, KUN); Vicinity of Lapuleng, 3500 m (K. T. Fu 1464, 17 Aug. 1937, PE).

YUNNAN: Atun-tze, Huann-fu-ping, 3700 m (C. W. Wang 68742, Aug. 1935, A); loc. cit., 3600 m (C. W. Wang 68994, Aug. 1935, A, KUN, PE); loc. cit., 3700 m (C. W. Wang 68764, Aug. 1935, KUN, PE); loc. cit., Bai-mar-shan, 3400 m (C. W. Wang 69642, Sept. 1935, A, KUN, PE); loc. cit., 3000 m (C. W. Wang 69622, Sept. 1935, A, PE); loc. cit., Paimashan, Shelong, 4100 m (T. T. Yü 9165, 24, Jul. 1937, PE); loc. cit., Chitoyangou, 4200 m (T. T. Yü 9743, 22 Aug. 1937, KUN); Deqin, around Daxue Shan, 4300 m (S. K. Wu et al. 1601, 29 Aug. 1996, KUN, TI); Deqin Xian, Meili Xueshan, Suola, 4500 m (S. K. Wu et al. 103113, 20–23 Aug. 1999, KUN, TI); Che-tse-lo, 4000 m (H. T. Tsai 58226, 58228, 27 Aug. 1934, A); Chungtien Plateau (K. M. Feng 1559, 7 Jul. 1939, PE); loc. cit., Sianrentung, 3600 m (T. T. Yü 12199, 17 Jul. 1937, A, PE); loc. cit., Juatze, 3400 m (T. T. Yü 12740, 8 Aug. 1937, PE); Zhongdian Xian, Hong Shan, 4360 m (S. K. Wu et al. 103029, 31 Jul.–4 Aug. 1999, KUN, TI); loc. cit., 4600 m (S. K. Wu et al. 103032, 31 Jul.–4 Aug. 1999, KUN, TI); Haba shan, 3950 m (Zhongdian research team 1792, 31 Aug. 1962, KUN); loc. cit., 4250 m (Zhongdian research team 1754, 31 Aug. 1962, KUN); Lichiang range, 11000–12000 ft. (G. Forrest 2917, Sept. 1909, B, CAL); Eastern slopes of Mount Dyaloko, northern peak of the Likiang Snow Range, 14500 ft. (J. F. Rock 10376, Aug. 1923, BM, S); Li-kiang Hsien, 2900 m (C. W. Wang 70811, Jul. 1935, A, PE); Yangtze watershed, Prefectural district of Likiang, eastern slopes of Likiang snow range, 15000 ft. (J. F. Rock 5265, 3 Jul. 1926, A, B); loc. cit. (J. F. Rock 4953, 3 Jul. 1926, B, PE); without precise locality, 3600 m (C. Schneider 3582, 19 Aug. 1914, A).

SICHUAN: Kangting (Tachienlu) dist., Tapaoshan, West range, Tsipula, 4200 m (H. Smith 3051, 5 Aug. 1922 S, UPS); loc. cit., Tapaoshan, West range, 4400–4600 m (H. Smith 11204, 22 Aug. 1934, BM, S, UPS); loc. cit., 4200–4400 m (H. Smith 11198, 22 Aug. 1934, PE, S, UPS); Chi-na-tung, Tsa-wa-rung, 2800 m (C. W. Wang 65237, Aug. 1935, A); Hi-ma-la, Tsa-wa-rung, 3400 m (C. W. Wang 65598, Aug. 1935, PE); Kangdin, 3400 m (Zhen-shu Liu 964, 1934, PE); Daocheng, around Gongga Shan, Beiyu, 4200–4580 m (S. K. Wu et al. 1546, 22 Aug. 1996, KUN, TI); loc. cit., 4700 m (S. K. Wu et al. 451, 5 Aug. 1997, KUN, TI).

SHAANXI: Ta-pai-shan (G. Giraldi 6746, 10–20 Aug. 1895, S-paratype of *J. tanguticus*); loc. cit., (G. Giraldi 6726, Aug. 1899, S-paratype of *J. tanguticus*); Taipaishan, Pesiantai (T. N. Liou & P. C. Tsoong 975, 15 Sept. 1937, PE); Than-tsn-shan (G. Giraldi 7242, 10 Jul. 1900, S).

WEST CHINA: without precise locality (E. H. Wilson 4540, Jul. 1904, BM).

49. *Juncus pseudocastaneus* (Lingelsh.) Sam.

NEPAL: Maharigaon, 3 miles N. E., 14500 ft. (O. Polunin et al. 125, 13 Jul. 1952, A, BM, CAL, UPS); Lamjung Himal, 15000 ft. (J. D. A. Stainton et al. 6335, 13 Jul. 1954, A); Rasuwa, around Base Camp, 4920 m (H. Takayama et al. 9220316, 9220317, 21 Jul. 1992, TI); loc. cit., Yala Kharka, 4750 m (H. Takayama et al. 9220204, 15 Jul. 1992, TI); loc. cit., Yala Kharka - Base Camp, 4800 m (H. Takayama et al. 9220220, 16 Jul. 1992, TI); Solukhumbu, Panch Pokhari - Seto Pokhari, 4780 m (F. Miyamoto et al. 9580325, 16 Aug. 1995, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4600 m (F. Miyamoto et al. 9580284, 9580503, 11 Aug. 1995, KATH, TI); loc. cit., Dik Kharka - Khare, 4300 m (F. Miyamoto et al. 9580243, 7 Aug. 1995, TI); Sankhuwasawa, Slesa, 4500 m (H. Kanai et al. 720723, 24 Jun. 1972, TI).

SIKKIM: North district, S. E. side of Lasha Chhu, below Sebu La, stony stream sides and flushes, 27°56'13"N, 88°38'30"E, 4600 m (D. G. Long & H. J. Noltie 379, 21 Jul. 1996, E, TI); without precise locality (R. S. Rao 974, CAL); without precise locality, 12000–16000 ft. (J. D. Hooker s.n. K).

BHUTAN: Yakuna, 4224 m (Ramesh Bedi 69, 6 Aug. 1971, K); Wangdi Phodrang district, Chukarpo,

27°49'N, 90°23'E, 4300 m (F. Miyamoto 9361650, 23 Sept. 1993, TI); loc. cit., Tsonsothang, 27°49'N, 90°24'E, 4300 m (F. Miyamoto 9361684, 24 Sept. 1993, TI); loc. cit., Maorothang - Tintatso, 27°39'N, 90°31'E, 4000 m (F. Miyamoto 9361568, 20 Sept. 1993, TI).

ASSAM: without precise locality (R. S. Rao 974, CAL).

EAST HIMALAYA: Chumolari, 16000 ft. (R. Lepcha 493, 12 Sept. 1912, A).

XIZANG (TIBET): Yatung, 27°51'N, 88°35'E (H. E. Hobson, s.n., 1897, K); Zhongba, 5000 m (Qing-Zang expedition team 6733, 12 Aug. 1975, KUN); Hills S. of Lhasa, 15500 ft. (F. Ludlow & G. Sheriff 8796, 6 Jul. 1942, A, UPS); Maizhokunggar Xian, Mt. Milha Shan, 29°49'N, 92°20'E, 4910 m (S. Akiyama et al. 106202, 6 Aug. 2001, KUN, TI); Budi Tsepo La, Kongbo, 13000 ft. (F. Ludlow et al. 14429, 21 Aug. 1947, A); Sang La, 29°35'N, 94°43'E, 13500 ft. (F. Ludlow et al. 5049, 29 Jun. 1938, A, UPS); Gongbo gyamda, 4920 m (Qing-Zang expedition team 74-2024, 30 Aug. 1974, KUN); Markam Xian, Lawu Shan, 4400 m (S. Akiyama et al. 105023, 14 Jul. 2000, KUN, TI).

QINGHAI: Gande Xian, Gande shan, Shanggongma Xiang, on road from Dari to Gande, 4400 m (T. N. Ho et al. 910, 9 Aug. 1993, A).

YUNNAN: Dokerla, A-tun-tze, 3500 m (C. W. Wang 64922, 3-5 Aug. 1935, A, PE); Hi-ma-la, Tsa-wa-rung, 3700 m (C. W. Wang 65672, Aug. 1935, A, PE); without precise locality, 3600 m (C. Schneider 3033, 1914, A).

SICHUAN: Taofu (Dawo) district, Mt. Yara, N. W. valley, 4100 m (H. Smith 11600, 29 Aug. 1934, PE, S, UPS); Kangting (Tachienlu) district, Cheto 4300 ft. (H. Smith 11008, 3 Aug. 1934, PE, S, UPS); Daocheng, Gongga shan (Qing-Zang expedition team 5531, 29 Aug. 1981, KUN); loc. cit., around Gongga Shan, 4500 m (S. K. Wu et al. 449, 4 Aug. 1997, KUN, TI); Xiaojin, Rilong - a pass of Balang Shan - Rilong, 4100 m (H. Ikeda et al. 100804, 29 Aug. 1998, KUN, TI); Kangting (Tachienlu) dist., Tapaoshan, West range, Tsipula, 4200 m (H. Smith 3052, 5 Aug. 1922, UPS).

WESTERN CHINA: Bogs, 13000 ft. (S. H. Wilson 4540, Jul. 1904, A, S).

50. *Juncus rohtangensis* Goel & Aswal

NEPAL: above Sauwala Khola, 13000 ft. (J. D. A. Stainton et al. 3582, 22 Jul. 1954, A, BM, CAL, UPS); Mukutinath, 3962 m (J. D. A. Stainton & L. H. J. Williams 1451, 26 Jun. 1954, BM, UPS); Shiar Khola, W. of Chumje, 12500 ft. (Gardner 1016, 29 Jun. 1953, BM); 5 miles E. Timure, 13500 ft. (O. Polunin 801, 3 Jul. 1949, BM); Langtang valley, 15000 ft. (O. Polunin 626, Jun. 1949, BM); J. F. Rock shelter II- Gadge, 3220-3950 m (H. Kanai & S. B. Malla 674837, 25 Aug. 1969, KATH, TI); Mul Kharka, Chilime Khola, 3800-4100 m (H. Kanai & P. R. Shakya 676208, 672225, 3 Jul. 1970, KATH, TI); Lari, 28°14'N, 85°11'E, 4650 m (Yon 107, 7 Jul. 1974, BM); Bagmati zone, Rasuwa district, Ganesh Base Camp - a Kharka, 28°15'N, 85°06'E, 3860 m (F. Miyamoto et al. 9410250, 10 Aug. 1994 TI); loc. cit., around Jaisuli Kund, 28°11'N, 85°11'E, 4500 m (F. Miyamoto et al. 9410129, 31 Jul. 1994, TI); loc. cit., Tulo Bhera Kharka - Jaisuli Kund, 85°13'E, 28°12'N, 4300 m (F. Miyamoto et al. 9410118, 9410119, 30 Jul. 1994, TI); loc. cit., around Tinbu Kharka, 28°11'N, 85°13'E, 3750 m (F. Miyamoto et al. 9410080, 27 Jul. 1994, TI); loc. cit., Tinbu Kharka - Tulo Bhera Kharka, 28°12'N, 85°14'E, 4100 m (F. Miyamoto et al. 9410098, 28 Jul. 1994, TI); loc. cit., Kyangjin Kharka - Yala Kharka, 4580 m (H. Takayama et al. 9220175, 14 Jul. 1992, TI); loc. cit., Around Base Camp, 28°13'09"N, 85°37'17"E, 4920 m (H. Takayama et al. 9220319, 21 Jul. 1992, TI); loc. cit., Yala Kharka - Langtrang, 4700 m (H. Takayama et al. 9220359, 22 Jul. 1992, TI); Tharepati, N. of Kathmandu, 3200 m (Phillips 163, 27 Jun. 1973, K); Between Tomo La and Sinion La, 27°37'N, 85°57'E, 4000 m (S. Crawford et al. KEKE678, 15 Sept. 1989, K); Janakpur zone, Ramechhap district, Dubikharka - Baula Pokhari, 3720-4000 m (H. Ohba et al. 8570328, 9 Jul. 1985, TI); loc. cit., Chhu-Ningma - Jata Pokhari, 4040-4220 m (H. Ohba et al. 8570426, 12 Jul. 1985, TI); loc. cit., Jata Pokhari - a peak - a peak on northwest of Panch Pokhari - Jata Pokhari, 27°43'N,

86°25'E, 4220–4893 m (M. Suzuki et al. 8580308, 16 Jul. 1985, TI); loc. cit., Koshing Kharka - Thare Og, 4000–4150 m (H. Ohba et al. 8570732, 22 Jul. 1985, TI); Hong Khola, 27°30'N, 86°45'E, 14000 ft. (D. McCosh 353, 2 Jul. 1964, BM, TI); Koshi zone, Sankhuwa Sabha district, Khongma - Cha Ding Kharka, 27°40'N, 87°10'E, 4100 m (M. Minaki et al. 9020636, 5 Aug. 1990, TI); loc. cit., Around Cha Ding Kharka, 27°40'N, 87°10'E, 3400 m (M. Minaki et al. 9020746, 9020822, 9 Aug. 1990, TI); loc. cit., 4150 m (M. Minaki et al. 9020824, 9 Aug. 1990, TI); loc. cit., Jaljale Himal, around Banduke, 27°30'N, 87°30'E, 4150 m (H. Ohba et al. 9110215, 9110232, 9120193, 25 Jul.-3 Aug. 1991, TI); loc. cit., Makalu Base Camp, 27°48'N, 87°06'N, 4728 m (H. B. Emery CH25, 8 Jul. 1974, K); Bhalukhop, 13400 ft. (T. B. Shrestha et Joshi 292, 24 Jul. 1971, BM); Dhdkund, 6 miles E. of Timure, 15500 ft. (O. Polunin 810, 5 Jul. 1949, BM); Near Lapsang, Simua Khola, 27°34'N, 87°59'E, 4270 m (C. G. Wilson et al. 760, 19 Sept. 1989, KATH); Tomo La - Sinion La, 27°37'N, 87°57'E, 4000 m (C. G. Wilson et al. 678, 15 Sept. 1989, KATH); Bhlalukhop to Jumley, 12400 ft. (T. B. Shrestha & D. P. Joshi 292, 24 Jul. 1971, KATH).

SIKKIM: Chokisn nera Jongri (G. King s.n., Jun. 1887, CAL); East district, Tsomgo Chho, 27°22' 14"N, 88°45' 52"E, 3720 m (D. G. Long & H. J. Noltie 63, 8 Jul. 1996, E, TI); Choktse (G. King s.n., Jun. 1887, CAL, K); Dzongri, 4000 m (B. N. Starling et al. AGSES268, 2 Jul. 1983, K); Zumu valley (Smith & Cave 2808, 20 Jul. 1909, CAL); without precise locality (G. King s.n., B); without precise locality, 10000–12000 ft. (J. D. Hooker s.n., A).

BHUTAN: Kempfu, 14000 ft. (B. J. Gould 463, 14 Jun 1938 K); Chesha La, 14000 ft. (F. Ludlow et al. 16647, 27 Jun. 1949, BM); Wangdi Phodrang district, Maorothang - Tintatso, 27°39'N, 90°31'E, 4000 m (F. Miyamoto 9361566, 20 Sept. 1993, TI); loc. cit., Tintatso - Tampe La, 27°43'N, 90°31'N, 4200 m (F. Miyamoto 9361592, 21 Sept. 1993, TI); loc. cit., Tampe La, 27°44'N, 90°31'E, 4500 m (F. Miyamoto 9361607, 9361611, 9361612, 21 Sept. 1993, TI).

XIZANG (TIBET): N. Chumbi, 13000 ft. (L. A. Waddell 73, K); Chumbi, N. W. Chumbi, 14000 ft. (L. A. Waddell s.n. K); Doha, 13000 ft. (Bor & Ram 20510, 20 Jun. 1945, K); Cona, 4300 m (Wu & Chen 75-949, 18 Jul. 1975, KUN).

51. *Juncus rostrocarpus* Miyam.

NEPAL: Sankhuwasawa, Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3570 m (M. Minaki et al. 9020646, 13 Aug. 1990, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 3850 m (M. Minaki et al. 9020798, 10 Aug. 1990, TI); loc. cit., Khongma - Unshisa Kharka - Danda Kharka - Bhainsi Kharka - Uttise Kharka - Tashi Gaun, 3500 m (M. Minaki et al. 9020922, 5 Aug. 1990, TI); Arun valley, Chhoyang Khola, W. of Num, 12500 ft. (J. D. A. Stainton 727, 21 Jun. 1956, BM, UPS); 18 km N. of Num, Khogma La, 3965 m (H. B. Emery CH48, 10 Jul. 1974, K); Khongma La (18 Km N. Num), Sankhuwa Sabha District, Kosi zone, 27°43'N, 87°15'E, 3965 m (H. B. Emery CH47, 10 Jul. 1974 A, K)..

SIKKIM: North district, Glacial valley above Yakche, N. of Lachung, 27°43'09"N, 88°04'47"E, 3180 m (D. G. Long & H. J. Noltie 223, 15 Jul. 1996, E, TI).

BHUTAN: Tongsa district, Yuto La, 10700 ft (B. Lyon 3304, 3 Jun. 1966 BM).

MYANMAR: N. Triangle (Tama Bum), 10000 ft. (F. Kingdon-Ward 21017, 20 Jun. 1953, BM), Hpimaw Pass, 11000 ft. (C. E. Parkinson 10056, 7 Jun. 1929, K); Htoma Bum Range, Dist. Myitkyina, 10400 ft. (Tha Hen d Chitkoko 4123, 21 Jun. 1953, K).

XIZANG (TIBET): Tsanang La, near Paka, 29°13'N, 94° 24'E, 13000-14000 ft. (F. Ludlow et al. 5854, 17 Jul. 1938, BM, UPS); Kongbo Province, Lusha Chu, 29°20'N, 94°35'E, 12500 ft. (F. Ludlow et al. 4760, 10 Jun. 1938, BM, CAL, UPS); Doshong La, Kongbo, 13000 ft. (F. Ludlow et al. 14384, 17 Aug. 1947, CAL, UPS); Trulung, Po Tsangpo, Pome, 8000 ft. (F. Ludlow et al. 13050, 28 May 1947, BM, UPS); Lisum, Nunkhu

Phu Chu valley, near Tongkyuk. Pome, 11000 ft. (F. Ludlow et al. 13769, 26 May 1947, UPS); Tse Ga, Tsari, Capt. (F. Kingdon-Ward 11935, 1935, BM); E. Tibet and S.W. China (G. Forrest 4909, BM).

YUNNAN: Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-djiang (Irrawadi orient. super.), in pluviisilvis mixtis temperatis vallis Tjiontson-lumba infra Tschamutong, 3150 m (F. Handel-Mazzetti 9200, 1914-1918, S); Gongshan (Lin & Jiao 790491, 1979, KUN); Fugong (Qing-Zang expedition team 7014, 28 May 1982 KUN); Lushui Xian, Pianma - Pianma Pass - Lushui, 3200 m (S. K. Wu et al. 103171, 13 Sept. 1999, KUN, TI); Lushui, 3300-3400 m (Bijiang expedition team 1725, 3 Aug. 1978, KUN); Che-tse-lo, 4000 m (H. T. Tsai 58225, 27 Aug. 1934, PE); Ta-li Hsien, 3400 m (H. T. Tsai 53859, 27 Jul. 1933, A, PE); Dali Xian, E. side of Diancang Shan mountain range, 3100 m (B. Bartholomew et al. 854, 11 Jul. 1984, BM, KUN); Dali, Cangshan, 3410 m (S. K. Wu et al. 1603, 1 Sept. 1996, KUN, TI); loc. cit., 3770m (S. K. Wu et al. 1606, 1 Sept. 1996, KUN, TI); Dali Shi, Diancang Shan, Zhonghe Peak, 3200 m (S. K. Wu et al. 103143, 6 Sept. 1999, KUN, TI); loc. cit., 3300 m (S. Akiyama et al. 406, 5 Jul. 2001, KUN, TI); loc. cit., 3500 m (S. Akiyama et al. 412, 5 Jul. 2001, KUN, TI); Dali Xian, E. side of Diancang Shan, 3100 m, 25°42'N, 100°97'E (B. Bartholomew et al. 854, A); Ta-li Hsien (C. W. Wang 63236, May 1935, A, PE); Tehching, Miyetziium, 3350 m (T. T. Yü 8634, 18 Jun. 1937, PE); W of Huadianba Rarm. N end of Cangshan, 2900 m (Sino-British expedition 826, 19 May 1981, K); Longquan to Dali road, 3100 m (Sino-British expedition 619, 15 May 1981, K); Dali, Cangshan Mt., 25°40'N, 100°45'E, 3290 m (Alpine Garden Society expedition ACE 922, 5 Jul. 1994, K); loc. cit., 3521 m (Alpine Garden Society expedition ACE 930, 5 Jul. 1994, K).

52. *Juncus setchuensis* Buchenau

SIKKIM: without precise locality, 6000-10000ft. (J. D. Hooker s.n., K).

XIZANG (TIBET): Chumbi & Phari (Dungbo s.n., Jul. 1879, K, CAL).

YUNNAN: Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-djiang (Irrawadi orient. super.), in pluviisilvis mixtis temperatis vallis Tjiontson-lumba infra Tschamutong, 2950 m (F. Handel-Mazzetti 9147, 29 Jun. 1916, S); Kang-pu, Wei-si Hsien (C. W. Wang 64540, Jul. 1935, A); Wei-si-Hsien, 2300 m (C. W. Wang 63563, Jun. 1935, A); Fugong, 1900 m (Qing-Zang expedition team 6880, 29 May 1982, KUN); Gongshan Xian, S. W. of Gongshan, Gaoligong Shan, 2615 m (S. K. Wu et al. 103188, 20 Sept. 1999, KUN, TI).

SICHUAN: Bao Hsin, Lung-tung, 4000 ft. (S. H. Hu 1507, Jul.-Aug. 1939, A); 5 miles from Ya-an, 600 m (C. Y. Chiao 1169, 27 Jul. 1939, A); Moon Ting Shan, 15 km from city, 1100 m (C. Y. Chiao 1244, 30 Jul. 1939, A); Kuan Hsien, Ts'ing-cheng Shan (F. T. Wang 21781a, 20 Jul. 1930, S); Yin-hsiu-wan, 1800 m (H. Smith 2391, 22 Jun. 1926, BM); Shunching Hsien (K. S. Hao 166, 10 May 1930, S); Guan Xian, Logxi, 1100 m (Wang Zhong-tao et al. 870192, 28 Jul. 1987, BM); Guan Xian, Qishuping, 1350 m (Z. T. Wang et al. 870222, 29 Jul. 1987, KYO); without precise locality, 1000 m (C. Y. Chiao & C. S. Fan 186, 4 Aug. 1938, A); Dujiangyan Amunicipality, just E. of the town of Longxi along the flowing tributary of the Longxi River, 820 m (D. E. Boufford & B. Bartholomew 24673, 6 Sept. 1988, A); Ma-pien Hsien, 1300 m (F. T. Wang 22843, 10 May 1931, A); Yin-hsin-wan, 1800 m (H. Smith 2391 22 Jun. 1926, PE); Lifan, Mung-twin-ke, 7000 ft. (S. H. Hu 1879 Aug. 1931, A); Mt. Ormei (T. C. Peng 69, 26 Aug. 1938, A); loc. cit., 400 m (W. P. Fang 14327, 10 May 1940, A); loc. cit. (W. W. Ma 2284, 12 Jun. 1940, A).

GUIZHOU: Yinjiang Xian, Huguoshi, in the valley above Zhangjiaba on the W. side of the Fajing Shan mountain range, 850-1300 m (B. Bartholomew et al. 1554, 3 Sept. 1986, BM).

HUBEI: Shenlungkai (K. S. Chow 76025, BM).

53. *Juncus sherei* Miyam. & H. Ohba

NEPAL: near Phagune Dhuri, 13000 ft. (J. D. A. Stainton et al. 3412, 7 Jul. 1954, BM, CAL); Chilime and

Langtang valley, Oo Kharka - Nul Kharka, 3400–3800 m (H. Kanai & P. R. Shakya 676206, 1 Jul. 1970, KATH, TI); Bagmati zone, Rasuwa district, NW of Dobate, 3400 m (J. H. Hass 2162A, 10 Aug. 1974, BM); loc. cit., Paldol Base Camp - a kharka, 4300 m (F. Miyamoto et al. 9410163, 3 Aug. 1994, TI); loc. cit., Yure Kharka - Tinbu Kharka, 3700 m (F. Miyamoto et al. 9410053a, 26 Jul. 1994, TI); Solukhumbu, Gnaula - Pike, 3300 m (F. Miyamoto et al. 9580049, 22 Jul. 1995, TI); loc. cit., Thasing Dingma - Sanu Khola - Saure Kharka, 3700 m (F. Miyamoto et al. 9580194, 4 Aug. 1995, TI); loc. cit., Najing Ding - Chalem Kharka, 3100 m (F. Miyamoto et al. 9580140, 31 Jul. 1995, TI); loc. cit., Chalem Kharka - Jar Kharka, 4050 m (F. Miyamoto et al. 9580148, 1 Aug. 1995, TI); loc. cit., Chhatarwa - a pass - Kurke, 4100 m (F. Miyamoto et al. 9580472, 29 Aug. 1995, TI); loc. cit., Beni Kharka - Sarkari Pati, (H. Ohba et al. 8581282, 2 Sept. 1985, TI); Koshi zone, Sankhuwa Sabha district, Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka, 3800 m (M. Minaki et al. 9020641, 5 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari, 3800 m (M. Minaki et al. 9020686b, 7 Aug. 1990, TI); loc. cit., 4100 m (M. Minaki et al. 9020752b, 9 Aug. 1990, TI); Singum Gompa, 3000 m (H. Kanai s.n., 4 Jun. 1969, TI).

SIKKIM: Chamnag, 12000–13000 ft. (W. W. Smith 3809, 26 Jul. 1910, CAL); without precise locality, 10000–12000 ft. (W. W. Smith 3063, 5 Jul. 1910, CAL); without precise locality (G. King 4198, 8 Jul. 1877 CAL).

BHUTAN: Phajudin Limper (R. E. Cooper 3513, 4 Nov. 1914, BM).

YUNNAN: Gongshan Xian, S. W. of Gongshan, Gaoligong Shan, 2600 m (S. K. Wu et al. 103193, 20 Sept. 1999, KUN, TI); Zhongdian Xian, Haba Xueshan, Haba Hai, 4500 m (S. K. Wu et al. 103080, 8–11 Aug. 1999, KUN, TI).

54. *Juncus sikkimensis* Hook. f.

NEPAL: Dap, Kasua Khola (18 km N. Num): Lamjung Himal, 15000 ft. (J. D. A. Stainton et al. 6335, 13 Jul. 1954, UPS, CAL); Jumla, Bajari Binu - Visht Dah, Giri Khora, 4280 m (M. Minaki et al. 9106056, 21 Sept. 1991, TI); Gandaki Zone, Gorkha distr., Thangmanang Kharka, 28°33'09"N, 84°39'19"E, 4160m (M. Suzuki et al. 9470345b, 6 Aug. 1994, TI); Rasuwa, Paldol Base Camp - a Kharka, 4350 m (F. Miyamoto et al. 9410169, 3 Aug. 1994, TI); loc. cit., Ganesh Base Camp - a pass - cross a river - a Kharka, 4200 m (F. Miyamoto et al. 9410254, 10 Aug. 1994, TI); loc. cit., Mul Kharka, 4000 m (H. Kanai & P. R. Shakya 672319, 6 Jul. 1970, TI); loc. cit., 3900 m (H. Kanai & P. R. Shakya s.n., 3 Jul. 1970, TI); Kosi zone, Sankhuwasawa, around Cha Ding Kharka and Shipton Pass, 4500 m (M. Minaki et al. 9020774, 9 Aug. 1990, TI); loc. cit., 4200 m (M. Minaki et al. 9020758, 9 Aug. 1990, TI); loc. cit., 27°43'N, 87°16'E (H. B. Emery CH05, 28 Jun. 1974, K); Khongma La (18 Km N. Num), Sankhuwa Sabha District, Kosi zone, 27°43'N, 87°15'E, 3965 m (H. B. Emery CH47, 10 Jul. 1974 A, K).

SIKKIM: Zemu valley (Smith & Cave 1239, 11 Jul. 1909, CAL); loc. cit., 16000 ft. (Smith & Cave 1428, 14 Jul. 1909, CAL); Chola valley, 13000 ft. (W. W. Smith 3615, 20 Jul. 1910, CAL); Chakung Chu, 13000 ft. (W. W. Smith 3851, 26 Jul. 1910, CAL); Kapoop, 13000 ft. (W. W. Smith 3425, 13 Jul. 1910, CAL); Lumtso, 15000 ft. (Smith & Cave 1442, 14 Jul. 1909, CAL); Thanka, 16000 ft. (Ribu & Rhomoo 5802, 25 Nov. 1911, B); Tosa, 14000 ft. (W. W. Smith 4034, 2 Aug. 1910, CAL).

BHUTAN: Yakuna, 4224 m (R. Bedi 69, 8 Jun. 1971, K).

XIZANG (TIBET): Yatung, 27°51'N, 88°35'E (H. E. Hobson 1897, K); Chumbi & Phari (Dungboo s.n., Jul. 1879, B, K); Budi Tsepo Kongbo, 13000 ft. (F. Ludlow et al. 14429, 21 Aug. 1947, UPS); Medog, 4000–4400 m (Li & Cheng 1161, 8 Oct. 1982, PE); Zayu, 4100 m (Qing-Zang expedition team 10243, Sept. 1982, KUN).

YUNNAN: Dokeria, Atuntze, 3500 m (C. W. Wang 64922, 3–5 Aug. 1935, KUN); loc. cit., 3700–4000 m (Feng 6208, 1 Aug. 1940, KUN); without precise locality (C. Schneider 3033, Aug. 1914, K).

55. *Juncus sphacelatus* Decne.

PUNJAB: Spiti, Losar, 13000 ft. (Gill 1976, 8 Aug. 1933, K); Dibibokri Nal, Kulu district, 12700 ft. (T. Sicelpe 3398, 27 Jun. 1952, BM).

HIMACHAL PRADESH: Spiti, Losar, 4100 m (U.C. Bhattacharyya 49004, 26 Jul. 1972, CAL).

UTTRA PRADESH: Tehri-Garhwal, 8000-9000 ft. (J. F. Duthie 479, Jul 1883, K); loc. cit., Rudugaira Gad, 13200 ft. (P. P. Huggins 181, Sept. 1952, BM).

KUMAON: United Provinces (Wallich 9001b, BM, K); without precise locality (R. Strachey & J. E. Winterbottom 4, BM, K).

INDIA ORIENTALIS: without precise locality (Griffith 9820, BM).

NEPAL: Thakurji Lekh, S. of Jumla, 12000 ft. (O. Polnin et al. 4737, 17 Jul. 1952, UPS); Maharigaon, 3 miles N. E., 14500 ft. (O. Polunin et al. 125a, 13 Jul. 1952, BM); near Jangla Bhanjyang, 13500 ft. (O. Plounin et al. 2367, 3 Jul. 1952, A, BM, CAL, UPS); near Seng Khola, 14000 ft. (J. D. A. Stainton & L. H. J. Williams 3815, 10 Aug. 1954, A, BM, UPS); Khangsar, 16500 ft. (D. G. Lowndes 1264, 28 Jul. 1950, BM); above Dogadi Khola, 13500 ft. (J. D. A. Stainton & L. H. J. Williams 3214, 21 Jun. 1954, A, BM, CAL, UPS); Namdo, N. of Mustang, 17000 ft. (J. D. A. Stainton & L. H. J. Williams 2291, 8 Aug. 1954, A, CAL, UPS); loc. cit., 16500 ft. (J. D. A. Stainton & L. H. J. Williams 2313, 9 Aug. 1954, BM, UPS); Gandaki Zone, Gorkha distr., Thangmanang Kharka, 28°33'09"N, 84°39'19"E, 4160m (M. Suzuki et al. 9470345c, 6 Aug. 1994, TI); Kyangin Ghyang, 13500 ft. (O. Polunin 250, 9-10 Jun. 1949, BM); Upper Mailung Khola, 28°N14'E, 85°N13'E, 4300 m (J. H. Hass 2485, 22 Aug. 1974, BM); Rasuwa, Jaisuli Kund - Paldol Base Camp, 4320 m (F. Miyamoto et al. 9410147, 2 Aug. 1994, TI); loc. cit., Gadje - Surjakund - Gosainkund, 4450 m (H. Kanai & S. B. Malla 674892, 26 Aug. 1969, TI); S. of Gosainkund, 3900 m (J. H. Hass 2201, 11 Aug. 1974, BM); N. E. of Gosainkund, 4550 m (J. H. Hass 2281, 16 Aug. 1974, BM); Langtang Jang Glacier, 15000-15500 ft. (A. Richards 71, 9 Aug. 1969, BM); Rasuwa, Base Camp - Yala Kharka - Kyangjin Kharka - Langtang, 4800 m (H. Takayama et al. 9220347, 22 Jul. 1992, TI); loc. cit., Base Camp - Yala Kharka - Yathang - Langtang Khola, 4000 m (H. Takayama et al. 9220283, 19 Jul. 1992, TI); loc. cit., Kyangjin Kharka - Tarche Pisa - Tashigang - Yala kharka, 4580 m (H. Takayama et al. 9220163, 14 Jul. 1992, TI); Solukhumbu, Chhomalung Base Camp - Seto Pokhari, 4400 m (F. Miyamoto et al. 9580306, 12 Aug. 1995, KATH, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalung Base Camp, 4600 m (F. Miyamoto et al. 9580285, 11 Aug. 1995, KATH, TI); loc. cit., Tangna - Sabsitsho - Dik Kharka, 4300 m (F. Miyamoto et al. 9580234, 6 Aug. 1995, KATH, TI); loc. cit., around Dudh Kund, 4300 m (F. Miyamoto et al. 9580440, 26 Aug. 1995, KATH, TI); loc. cit., Dik Kharka - Khare, 4300 m (F. Miyamoto et al. 9580242, 7 Aug. 1995, KATH, TI); loc. cit., Panch Pokhari - Seto Pokhari, 4780 m (F. Miyamoto et al. 9580326, 16 Aug. 1995, KATH, TI); Ramechhap, Baula Pokhari - a peak - Chhu - Ningma, 4100 m (H. Ohba et al. 8570389, 11 Jul. 1985, TI); loc. cit., Botase kharka - a stream - Koshing Kharka, 4150 m (H. Ohba et al. 8570642, 21 Jul. 1985, TI); loc. cit., 4300 m (H. Ohba et al. 8580365, 21 Jul. 1985, TI); loc. cit., Jata Pokhari - Panch Pokhari - the ridge between Khimti Khola East and West - Jata Pokhari, 4220 m (H. Ohba et al. 8530326, 17 Jul. 1985, TI); loc. cit., Ramechhap, Jata Pokhari - Panch Pokhari - Botase Kharka, 4270 m (H. Ohba et al. 8541107, 20 Jul. 1985, TI); Khumbakarana Himal, Makalu, Upper Barun valley, 4900 m (T. Wraber 193, 15 Sept. 1972, BM); Kosi zone, Sankhuwa Sabha district, Ribuk, Barun Khola, 25 km N. W. Num, 27°45'N, 87°11'E, 3843 m (H. B. Emery CH20, 30 Jun. 1974, K); loc. cit., Lower Barun Glacier, near Mera, 27°48'N, 87°07'E, 4420 m (D. G. Long et al. 515, 3 Oct. 1991, KATH); Jaljale Pokhari, 27°28'N, 87°27'E, 4000 m (J. F. Dobremez 1667, 22 Aug. 1972, BM); Tamo La - Sinion La, 27°37'N, 87°57'E, 4060 m (C. G. Wilson et al. 673, 15 Sept. 1989, KATH); Sankhuwasabha district, Upper valley of tributary of Barun Khola, NE of Pemathang Kharka, 27°45'N, 87°13'E, 3970 m (D. G. Long et al. 609, 9 Oct. 1991, KATH); loc. cit., Jaljale Himal, ridge near Panch Pokhari lakes at head of Panch Pokhari Khola, 27°32'N, 87°28'E, 3880 m (D. G. Long et al. 907, 19 Oct. 1991, KATH);

Sankhuwasawa, Jomle - Goja (Goja Kharka), 4000 m (H. Ohba et al. 9120224, 5 Aug. 1991, TI); Sankhuwasabha district, Jaljale Himal, ridge near Panch Pokhari lakes at head of Panch Pokhari Khola, 27°32'N, 87°28'E, 3880 m (D. G. Long et al. 907, 19 Oct. 1991, KATH); Kambachen to Lhonak, 27°44'N, 88°01'E, 4690 m (C. G. Wilson et al. 532, 10 Sept. 1989, KATH); Yañgune Khola valley above Pholle, 4500 m (Curzon 35, 22 Sept. 1985, K); Maccherma, 27°54'N, 86°43'E, 4500 m (J. F. Dobremez 377, 7 Jul. 1970, BM); Cho Oyo (G. Miehe 1093, 25 Sept. 1982, BM); Thakurji Lekh, S. of Jumla, 12000 ft. (O. Polunin et al. 4737, 17 Jul. 1952, A, BM); without precise locality (Wallich 9001a, 1821, BM).

SIKKIM: Chouga, 12000–13000 ft. (W. W. Smith 4280, 13 Aug. 1910, CAL); Ghalloot, 13000 ft. (S. Kurz s.n., CAL); Jarigla, 8000–9000 ft. (J. F. Duthei 479, 27 Jul. 1883, CAL); Llouok, 14000 ft. (Smith & Cave 2071, 30 Jul. 1909, CAL); Darjeeling, Gamatang, 3800 m (H. Hara et al. s.n., 27 May 1960, KYO); without precise locality, 13000–15000 ft. (T. Anderson 1337, 9 Oct. 1862, CAL); without precise locality, 12000–16000 ft. (J. D. Hook s.n., A, BM, CAL, K, S).

BHUTAN: Upper Mo Chu district, N. side of shingche La, 28°04'N, 89°37'E, 4640 m (I. W. J. Sinclair & D. G. Long 5270, 23 Sept. 1984, K); Wangdi Phodrang district, Tampetso - Tsonsohang, 27°48'N, 90°24'E, 3900 m (F. Miyamoto 9361628, 22 Sept. 1993, TI); loc. cit., S. of Rinchenzo, 27°58'N, 90°21'E, 4920 m (F. Miyamoto 9361649, 23 Sept. 1993, TI); loc. cit., Chukarpo, 27°49'N, 90°23'E, 4300 m (F. Miyamoto 9361651, 23 Sept. 1993, TI); Waitang Tsampa, 13500 ft. (F. Ludlow et al. 19237, 24 Jun. 1949, BM, UPS).

XIZANG (TIBET): Chumbi & Phari (Dungboo s.n., Jul. 1879, B, CAL, K); Yadong, 4400 m (Qing-Zang expedition team 74-2734, 20 Sept. 1974, KUN); Dengqen (S. K. Wu 4910, 21 Aug. 1976, KUN); Baxoi Xian, Rawu - Vaxoi, 4180 m (S. Akiyama et al. 105180, 4 Aug. 2000, KUN, TI); Nangarke, 15000 ft. (C. H. J. Walton T19, Jul. 1904, K).

YUNNAN: Ad confines Tibeticas sub jugo Dokerla, 28°15'N, 4226 m (F. Handel-Mazzetti 8174, 18 Sept. 1916, S, W); Bai-ma-shan, A-tun-tze, 3400 m (C. W. Wang 69508, Sept. 1935, A, KUN, PE); loc. cit. (C. W. Wang 69572, Sept. 1935, A, PE); loc. cit., 3500 m (C. W. Wang 9573, Sept. 1935, KUN); Atuntze, Paimashan, sanyungpa, 4150 m (T. T. Yü 9273, 29 Jul. 1937, A, KUN, PE); Weihsi, Tungchuling, Tsidang, 4000 m (T. T. Yü 8982, 14 Jul. 1937, KUN, PE); Hi-ma-la, Tsa-wa-rung, 3700 m (C. W. Wang 65612, Sept. 1935, A, PE); Si Konkaling, Tsungu, 3900 m (T. T. Yü 13031, 30 Aug. 1937, A, KUN, PE).

SICHUAN: Kangting (Tachienlu) district, Tapaoshan, 4200 m (H. Smith 11313, 20 Aug. 1934, PE, S, USP); Daocheng, Gongga Shan (Qing-Zang expedition team 5587, 29 Aug. 1981, KUN); Daocheng: around Gongga Shan, 4500 m (S. K. Wu et al. 1562, 23 Aug. 1996, KUN, TI); In jugi Tschescha ad septentr. Pagi Yunnanensis Yunging in districtu monasterii Muli regione frigide temperata, 4101 m (F. Handel-Mazzetti 7249, 25 Jul. 1916, S, W); Muli, 4200 m (Qing-Zang expedition team 14784, 14 Sept. 1983, KUN); Hsoeh-shan, 4300 m (H. Smith 3737, 22 Jul. 1924, PE); Taofu (Dawo) district, Mt. Yara, N. W. glacier valley, 4100 m (H. Smith 11609, 29 Aug. 1934, PE); loc. cit., valley W. of Mt. Yara, 3700 m (H. Smith 11726, 1 Sept. 1934, PE); Xiaojin, Rilong - a pass of Balang Shan - Rilong, 4000 m (H. Ikeda et al. 100805, 29 Aug. 1998, KUN, TI); Fupien Hsien, 3400 m (T. T. Yü 2454, 8 Aug. 1933, PE).

SHAANXI: Ta-pai-shan (G. Giraldi 6746, 10–20 Aug. 1895, S).

56. *Juncus spumosa* Noltie

CHINA. YUNNAN: Lushui Xian, Pianma - Pianma Pass - Lushui, 2600 m (S. K. Wu et al. 103174, 102179, 13 Sept. 1999, KUN, TI).

57. *Juncus thomsonii* Buchenau

PAKISTAN: Lahul, Serchu, 14000 ft. (F. Schmid 491, 20 Jul. 1953, BM).

KASHMIR: Deosai Plains, 13000 ft. (C. B. Clarke 29824, 31 Jul. 1876, K, S); loc. cit., 13000 ft. (R. R.

Stewart 20060, 20096, 30 Jul. 1940, CAL); Deosai (W. N. Koelz 6465, 14 Aug. 1933, A); Upper end of Hushe valley, Ghondakoro Glacier basin at the foot of the Masherbrum, 13000 ft. (R. R. Stewart 20096, 30 Jul. 1940, A, CAL); Ladak Rangtse La, 13500 ft. (R. Meinertzhagen s.n., Jun. 1950, BM); Tsakzhun Tso, 15000 ft. (G. L. Webster & E. Nasir 6122, 14 Jul. 1955, A); Taklung La, 17000 ft. (W. N. Koelz 2480, 31 Jul. 1931, S); Tsultak, Ladak, 16000 ft. (W. N. Koelz 2396, 20 Jul. 1931, S).

PUNJAB: Maqin Xian, Heitu Shan, Dawu Xiang, at pass between Jungong and Maqin, 34°23'09"N, 100°23'33"E, 4220 m (W. N. Koelz 2100, 22 Jun. 1931, S).

HIMACHAL PRADESH: Rotang Pass (Kulu and Lahoul), 13140 ft. (U.C. Bhattacharyya 49179, 31 Jul. 1972, CAL); Spiti, Kunzum Base, 4400 m (M. Nath s.n., 9 Aug. 1935, CAL); Lahul, Sarehu, 13000 ft. (N. L. Bor 9251, 16 Jul. 1938, K); without precise locality, 10000-15000 ft. (U.C. Bhattacharyya 48973, 24 Jul. 1972, CAL).

KUMAON: Konkonor 10500 ft. (K. M. Liou 6265, 26 Jul. 1936, PE); Marto li, 9000 ft. (R. Strachey & J. E. Winterbottom 9, K); Shushal, 15400 ft. (T. R. Chand 711, 14 Jun. 1948, L).

WESTERN HIMALAYA: Lichiang valley, 27°10'N, 9000 ft. (R. Meinertzhagen s.n., 7 Jun. 1925, B)

NEPAL: 4 miles N. E. of Saipal, 17000 ft. (J. D. A. Stainton et al. 1170, 15 Jun. 1954, BM); Talphi, Pansae Dara, 9300 ft. (O. Polunin 259, 9-10 Jun. 1949, BM); loc. cit. (J. D. A. Stainton 372, 21 May 1956, BM, UPS); Balangra pass, 12000 ft. (O. Polunin et al. 942, 12 May 1952, A, BM, UPS, CAL); near Balangra Pass, 15500 ft. (O. Polunin et al. 1030, 28 May 1952, A, BM, UPS); near Kagbeni, 3500 m (O. Namikawa 431, 3 Oct. 1958, KYO); Muktinat, 28°49'N, 83°55'E, 3700 m (J. E. M. Arnold 278, 26 Aug. 1954, BM); Dhorpatan, 9200 ft. (S. Einarsson et al. 2887, 6 Aug. 1973, BM); Dhorpatan, 9200 ft. (P. C. Gardner 744, 745, 14 Jun. 1953, BM); Dhaulagiri zone, Mustang district, Syangboche - Ghami, 29°00'16"N, 83°50'48.8"E, 3680 m (F. Miyamoto et al. 20210112, 17 Aug. 2002, TI); S. W. on the Dhauligiri Range and E. of the main trail from Dhorpatan to Tarakot via Jangla Barjyang (J. L. Fox s.n., Mar-Jun. 1975, TI); near Chalike Pahar, 13000 ft. (J. D. A. Stainton et al. 2638, 27 Apr. 1954, A, BM); Kali Gandaki, S. E. Tini, 9000 ft. (D. McCosh 154, 29 May 1964, BM); Marsiandi valley, 11500 ft. (Bernard Yon s.n., 14 Jul. 1974, BM); Tukucha, Kaligandaki, 12000 ft. (J. D. A. Stainton 7096, 15 Jun. 1974, BM); Rasuwa, Tinbu Kharka - Sano Bhera Kharka - Tulo Bhera Kharka, 4100 m (F. Miyamoto et al. 9410096, 28 Jul. 1994, TI); loc. cit., Yala Kharka - Base Camp, 4800 m (H. Takayama et al. 9220219, 16 Jul. 1992, TI); loc. cit., Kyangjin Kharka - Tarche Pisa - Tashigang - Yala Kharka, 4230 m (H. Takayama et al. 9220177, 14 Jul. 1992, TI); loc. cit., 4220 m (H. Takayama et al. 9220174, 14 Jul. 1992, TI); loc. cit., around Base Camp, 4920 m (H. Takayama et al. 9220321, 21 Jul. 1992, TI); loc. cit., Base Camp - Yala Kharka - Kyangjin Kharka - Langtang, 4300 m (H. Takayama et al. 9220350, 22 Jul. 1992, TI); loc. cit., Langtang Khola - Pirogona - Pyung - a pass - Base Camp, 4300 m (H. Takayama et al. 9220309, 20 Jul. 1992, TI); loc. cit., 4020 m (H. Takayama et al. 9220308, 20 Jul. 1992, TI); loc. cit., 4030 m (H. Takayama et al. 9220312, 20 Jul. 1992, TI); Khanging Ghyang, 13500 ft. (L. H. J. Williams 862, 23 Jun. 1969, A, BM); Langtang valley, 13000 ft. (S. Nakao s.n., 17 May 1953, KYO); Rolwaling, 27°45'N, 86°15'E, 12000 ft. (D. G. Lowndes 1072, 27 Jun. 1950, BM); Ghunsa, 3600 m (H. Tabata et al. 11795, 20 Jul. 1978, KYO); Inukhu Khola, Naulekh, 27°38'N, 86°50'E, 13000 ft. (G. Mische 170, 15 Jul. 1977, BM); Solukhumbu, Saure Kharka - Tangna, 3900 m (F. Miyamoto et al. 9580201, 5 Aug. 1995, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4660 m (F. Miyamoto et al. 9580263, 11 Aug. 1995, TI); loc. cit., Seto Pokhari - Chhomalang Base Camp, 5000 m (F. Miyamoto et al. 9580332, 17 Aug. 1995, TI); loc. cit., Panch Pokhari - Seto Pokhari, 4780 m (F. Miyamoto et al. 9580327, 16 Aug. 1995, TI); Sankhuwasabha district, Barun Khola between Pemathang Kharka and Nehe Kharka, 27°44'N, 87°11'E, 3520 m (D. G. Long et al. 408, 29 Sept. 1991, KATH) Arun valley, Thudam E. of Chyamtang, 12500 ft. (T. Wraber 34493, 15 Sept. 1972, BM); Khumbakarna Himal, Makalu, Upper Barun valley, 4900 m (J. D. A. Stainton et al. 3134, 16 Jun. 1954, A, BM, CAL); Taplejung district, from Nup to Yangma, 3880-4010 m (J. D. A. Stainton & L. H. J. Williams

2638, 27 Apr. 1954, BM, UPS, CAL); Near Lapsang, Simbua Khola, 27°34'N, 87°57'E, 4330 m (C. G. Wilson et al. 761, 19 Sept. 1989, KATH); Between Tamo La and Sinicn La, 27°37'N, 87°57'E, 4100 m (C. G. Wilson 674, 15 Sept. 1989, KATH); Chairam, 27°33'N, 87°58'E, 12500 ft. (J. F. Dobremez 3042, 19 May 1954, BM); Kambachen, 27°44'N, 87°59'E, 4100 m (C. G. Wilson et al. 606, 12 Sept. 1989, KATH); Kambachen to Lhonak, 27°44'N, 88°01'E, 4690 m (C. G. Wilson et al. 533, 10 Sept. 1989, KATH); near Lapsang, Simbua Khola, 27°34'N, 87°59'E, 4330 m (C. Barclay & P. M. Synge 2610, 6 Jun. 1971, K); Basia Banjang, 4500 m (O. Polunin et al. 2574, 26 Jul. 1952, A, BM); Changyam Khola, 13500 ft. (D. C. Gardner 744, 745, 14 Jun. 1953, TI); loc. cit., 13500 ft. (O. Polunin et al. 2574, 26 Jul. 1952, UPS, CAL, L); Phopa (O. Namikawa 182, 16 Aug. 1958, KYO); Prov. De La, Frontiere N. O. alpage au-dessus de Gittidas, 4300 m (S. Crawford et al. KEKE761, 19 Sept. 1989, K); Trail to Tilicho, 13400 ft. (A. D. Schilling et al. 408, 25 Jun. 1965, K); Tsarkachuglang (K. Nishioka 461, 1 Jun. 1962, KYO).

SIKKIM: without precise locality, 34°19'N, 82°12'E, 16500 ft (Ribu & Rhomoo 5657, 25 Nov. 1911, B);

Thamootsa, W. Jongri (J. D. Hooker 1849, K); Jongri (G. King's collector, s.n., Jun. 1887, CAL); W. Jongri (G. King's collector, s.n., CAL); Along the Choktsering Chu, north of Jongri, 4000–4500 m (H. Hara et al. s.n., 25 May 1960, TI); Jongri - Olothang, 4300 m (H. Hara et al. s.n., 23 May 1960, TI); Nakuchu, 16000 ft. (G. King's collector, s.n., 1889, K); Ghora La, 16000 ft. (J. D. Hooker s.n., S); Khambajong (W. W. Smith 3648, 22 Jul. 1910, CAL); Beeroon, 11000 ft. (G. King's collector, s.n., Jun. 1887, CAL); Beeroon, 11000 ft. (G. King's collector, s.n., Jun. 1887, BM); Chamnago, 11000–12000 ft. (W. W. Smith 3270, Jun. 1910, CAL); Llovok 14500 ft. (S. Kurz s.n., CAL); Tha moo tsa (G. King's collector, s.n., May 1885, CAL); Tongri, 13500–15000 ft. (Smith & Cave 1911, 3 Aug. 1909, CAL); W. Chaugh, 12000 ft. (T. Anderson 1332, 8 Oct. 1862, CAL); Changa, 12000 ft. (R. E. Cooper 38, 28 Un. 1913, KATH); without precise locality (Ribu & Rhomoo 2753, Sept-Oct. 1909, CAL); without precise locality (S. Kurz s.n., CAL); without precise locality (G. King's collector, s.n., May 1885, B, CAL); without precise locality, 12000–15000 ft. (C. B. Clarke 25717, 27 Oct. 1875, CAL); without precise locality, 12000–15000 ft. (M. F. E. Younghusband 148, 26 Jul. 1903, CAL).

BHUTAN: Chabecha - Goy - Lingshi, 3600–3900 m (H. Kanai et al. 6687, 24 May 1967, TI); Seanchu Passa - Okhu La - Chabecha, 3600 m (H. Kanai et al. 7520, 21 May 1967, TI); Wangdi Phodrang district, Thintaso, 27°02'N, 90°31'E, 4000 m (F. Miyamoto 9361583, 20 Sept. 1993, TI); loc. cit., Tamp La, 27°44'N, 90°31'E, 4500 m (F. Miyamoto 9361613, 21 Sept. 1993, TI); loc. cit. (F. Miyamoto 9361695, 25 Sept. 1993, TI); loc. cit., 4300 m (F. Miyamoto 9361699, 25 Sept. 1993, TI); Waitang, Tsampa, 13500 ft. (F. Ludlow et al. 16300, 21 May 1949, BM); Byakar, Bumtang Chu, 27°33'N, 90°43'E, 2750 m (F. Ludlow et al. 16393, 28 May 1945, A, BM, CAL, UPS); Byakar, Bumtang Chu, small valley near Dzong, 27°33'N, 90°43'E, 2750 m (A. T. C. Grierson & D. G. Long 1762, 9 Jun. 1979); Barshong, Thimbu Chu, 11500 ft. (F. Ludlow et al. 19238, 24 Jun. 1949, BM).

EAST HIMALAYA: Lintan, 3000 m (Townaud 505, CAL).

HIMALAYA: Himal Bor. Occ., Sin long Chan (T. Thomson s.n., K)

XIZANG (TIBET): Nyalam, 3710 m (T. Thomson s.n., CAL); Yatung, 27°51'N, 88°35'E (F. Ludlow et al. 13790, 27 May 1947, A); Chumbi (C. S. Cuthing & A. S. Vernay 116A, 10 Sept. 1935, K); Khambajong (Dungboo s.n., 1879, K); S. of Lhasa, 12500 ft. (F. Ludlow et al. 13790, 27 May 1947, UPS); Cona, 4260 m (N. M. Przewalski s.n., 1884, K); Ba valley, 9900 ft. (J. E. Winterbottom 797, 13 Jul. 1847, K); Nunkhu Phu Chu valley, near Tongkyuk, 11500 ft. (L. R. Wager 215, 6 Jul. 1933, K); loc. cit., Nunkhu Phu Chu valley, near Tongkyuk, Pome, 11500 ft. (M. F. E. Younghusband 148, 26 Jul. 1903, CAL); loc. cit. (collector unknown s.n., 1–4 Jul. 1856, K); Markam Xian, Lawu Shan, 4400 m (S. Akiyama et al. 105025, 14 Jul. 2000, KUN, TI). Cholzhong, 15000 ft. (M. R. W. G. Hingston 228, 24 Jun. 1924, K); Dochen Lake camp, 15000 ft. (A. P. Chieffly 858, 31 Jul. 1896, K); Gautsa, 13000 ft. (B. J. Gould 2190, 24 Jun. 1939, K); Gnari Khorsum (F. Ludlow & G. Sherriff 8670, 6 Jun. 1942, B, L, UPS); loc. cit., 14800–15500 ft. (Zhang & Lang 4617, 1 Jul. 1966, KUN);

Kenaoots in Ronglo (R. P. Soulié 960, 1893, K); Kiblesans, 14000–15000 ft. (Stoliczka s.n., CAL); Kuma, 14000 ft. (Bor & Ram 20546, 21 Jun. 1945, K); Laugphu Chu, 12000 ft. (J. F. Rock 14248, Jun. 1926, A, K, S); Pangkong province, Panamik on the lake Tsomognalari to Durguk (collector unknown 6611, 17–26 Jul. 1856, A); Pangkong Lake, 14000 ft. (collector unknown s.n., 5–15 Sept. 1855, L); Ronaphar valley, 1200 ft. (F. Ludlow et al. 13790, 27 May 1947, CAL); Rupehu, 15000–18000 ft. (R. Strachey & J. E. Winterbottom 11, K); Tal des Alyk-norin-holy, 12100 ft. (H. E. Hobson s.n., K); Tongolo (H. Smith s.n., 7 Jul. 1901, S); Vallup, 15000 ft. (Qing-Zang expedition team 74-2744, 2 Oct. 1974, KUN); without precise locality, 10000–15000 ft. (Stoliczka s.n., CAL); without precise locality, 14000–16000 ft. (T. Thomson s.n., 11 Sept. 1847, K); without precise locality (Mt. Everest expedition team 44, 19 Jun. 1938, K).

QINGHAI: Maqin Xian, Muchang, Dawu Xiang, S. E. of Maqin, 34°20'03"N, 100°30'34"E, 3980 m (T. N. Ho et al. 655, 2 Aug. 1993, A); Wu-chuan Hsien, Pa-lan Shan, 3500 m (T. N. Ho et al. 796, 5 Aug. 1993, A).

GANSU: Suehloshan, Min Hsien, 3000 m (T. P. Wang 4787, 1 Jul. 1936, PE); Sin long Chan (A. E. Licent 4379, 14 Jul. 1918, K); Regio Tangut (T. Anderson s.n., 4 Jun. 1837, CAL); without precise locality (T. T. Yü 14599, 22 Oct. 1937, BM); without precise locality (G. N. Potani s.n., 1883, K).

YUNNAN: Huann-fu-ping, A-tun-tze, 3700 m (C. W. Wang 65237, Aug. 1935, PE); Tehching (Atuntze) Miyetzimu, 3350 m (N. M. Przewalski s.n., 1880, CAL); Tehching (Atuntze), Mitzimu, 3350 m (T. T. Yü 8019, 6 Apr. 1937, PE); Litiping between Likiang and Weihsi (C. W. Wang 68742, Aug. 1935, PE); Zhongdian Xian, Tianchi, near Zhongdian, 3900 m (S. Akiyama et al. 415, 8 Jul. 2000, KUN, TI); Muli, Wachin, Jin-chang, 4000 m (T. T. Yü 8633, 19 Jun. 1937, BM); Li-chiang, Snow range, 2700 m (T. T. Yü 7052, 6 Jul. 1937, A, PE); loc. cit. (R. C. Ching 20806, 24 Jun. 1939, A); without precise locality (T. T. Yü 8019, 6 Apr. 1937, PE).

SICHUAN: Taofu (Dawo) district, Haitzeshan, 3700 m (H. Smith 3051a, 5 Aug. 1922, UPS); Tsipula, 4200 m (H. Smith 11311, 20 Aug. 1934, S, UPS); Daocheng, 4300 m (F. Handel-Mazzetti 3055, 15 Jun. 1914, S); loc. cit., Bowa Shan, 4300 m (S. K. Wu et al. 1518, 17 Aug. 1996, KUN, TI); Wolo-ho inter Yenyuen et Yungning, 3300 m (F. Handel-Mazzetti 2832, 4 Jun. 1914, S); Mu-li, Ku-lu-dar-s, 3400 m (T. T. Yü 14599, 22 Oct. 1937, A); Chi-na-tung, Tsa-wa-rung, 2800 m (A. K. Bulley 2148, May 1906, K); Yenyuen, 28°10'N, 3150 m (F. Handel-Mazzetti 1762, 26 Apr. 1914, S); Yenyuen, 2600 m (F. Handel-Mazzetti 2559, 25 May 1914, S); Taofu (Dawo) district, Haitzeshan, 3700 m (H. Smith 11311, 20 Aug. 1934, KYO, PE); Kangting (Tachienlu) district, Tapaoshan, 4200 m (H. Smith 4292, 4 Sept. 1922, S, UPS); loc. cit., 4400 m (S. K. Wu et al. 1501, 16 Aug. 1996, KUN, TI); loc. cit., around Gongga Shan, 4500 m (S. K. Wu et al., 448, 4 Aug. 1997, KUN, TI); Xiaojin, Ganhaizi - Dashuiba - Ganhaizi, 3600 m (H. Ikeda et al. 100820, 31 Aug. 1998, KUN, TI); Sung-pan (E. Licent 4279:01:00, 14 Jul. 1918, UPS); loc. cit., 3100 m (F. T. Wangn 21186, 5 Jun. 1930, S); Daliang schan, Ningyuen, 2725 m (H. Smith 11351, 27 Aug. 1934, PE); inter Merge et Pankar, 4500 m (H. Smith 2209, 22 Jul. 1911, S, KYO, PE); Mellan Mergeoch, 4500 m (H. Smith 2209, 11 Jul. 1922, UPS); Phulloot, 11000 ft. (Tibet expedition team 5149, 23 Aug. 1981, KUN).

SHAANXI: Taipei schan (H. Smith 11351, 27 Aug. 1934, S, UPS).

58. *Juncus tobdeniorum* Noltie

NEPAL. Gai Kharka, Kasua Khola (16 km, N. Num), Sankhuwa Sahba District, Koshi zone, 27°42'N, 87°16'E, 3172 m (B. H. Emery BHE86, 9 Jul. 1974, K).

59. *Juncus trachyphyllus* Miyam. & H. Ohba

NEPAL. Dhaulagiri zone, Mustang district, North-west of Lo-Manthang, 29°14'50"N, 83°54'28"E, 4530 m (F. Miyamoto et al. 20210166, 21 Aug. 2002 TI).

CHINA. SICHUAN: Daocheng, around Gongga Shan, Zhong Niuan, 4260 m (S. K. Wu et al. 1540, 21 Aug.

1996, KUN, TI); loc. cit., Beiyu, 4200 m (S. K. Wu et al. 1552, 22 Aug. 1996, KUN, TI); loc. cit., Gongga Zhonggu - Riwa Xiang - Gongling - Daocheng, 3900 m (S. K. Wu et al. 1579, 25 Aug. 1996, KUN, TI-paratype of *J. trachyphyllus*); loc. cit., around Gongga Zhonggu, 3880 m (S. K. Wu et al. 443, 3 Aug. 1997, KUN, TI).

60. *Juncus trichophyllus* W. W. Sm.

NEPAL: Rasuwa, a Kharka - Pati Kharka, 3650 m (F. Miyamoto et al. 9410194, 4 Aug. 1994, TI); Solukhumbu, Chalem Kharka - Jar Kharka, 4200 m (F. Miyamoto et al. 9580155, 1 Aug. 1995, TI); loc. cit., Pike - Pike Peak - Pike, 3820 m (F. Miyamoto et al. 9580059, 23 Jul. 1995, TI); Koshi zone, Sankuwasawa district, Cha Ding Kharka - Tutu La - Thulo Pokhari - Siptong Pass (Keke La) - Sano Pokhari - Khongma, 3900 m (M. Minaki et al. 90208629, 13 Aug. 1990, TI); loc. cit., Tributary on N side of Barun Khola, opposite Shipton La, 27°45'N, 87°14'E, 4200 m (D. G. Long et al. 653, 10 Oct. 1991, KATH);

SIKKIM: without precise locality (G. King's collector, s.n., K).

BHUTAN: Wangdi Phodrang district, Tintatso, 27°42'N, 90°31'E, 4300 m (F. Miyamoto 9361739b, 27 Sept. 1993, TI).

61. *Juncus triglumis* L.

NEPAL: Ramechhap, Koshing Kharka - Thare Og, 4000 m (H. Ohba et al. 8570735, 22 Jul. 1985, TI); loc. cit., 4100 m (H. Ohba et al. 8530421, 22 Jul. 1985, TI); Sankhuwasawa, Khokling (Khokling Kharka) - Jaljale (Jaljale Himal) (H. Ohba et al. 9153180, 21 Jul. 1991, TI); loc. cit., around Banduke (H. Ohba et al. 9153291, 31 Jul. 1991, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 4100 m (M. Minaki et al. 9020712, 9020745, 9 Aug. 1990, TI); loc. cit., Khongma - Sano Pokhari - Siptong Pass (Keke La) - Thulo Pokhari - Tutu La - Cha Ding Kharka (M. Minaki et al. 9020637, 5 Aug. 1990, TI); loc. cit., Khokling (Khokling Kharka) - Jaljale (Jaljale Himal), 4000 m (H. Ohba et al. 9110148, 21 Jul. 1991, TI); loc. cit., Rato Odara - beside a river - a pass - a pass - Chhomalang Base Camp, 4660 m (F. Miyamoto et al. 9580266, 11 Aug. 1995, TI); loc. cit., Chalem Kharka - Jar Kharka, 4250 m (F. Miyamoto et al. 9580147, 1 Aug. 1995, TI); loc. cit., Gnaula - Pike, 3550 m (F. Miyamoto et al. 9580052, 22 Jul. 1995, TI); Ding Kharka, 3870 m (M. Minaki et al. 9020637, 90206807, 5 Aug. 1990, TI); Sankhuwasabha district, Tributary valley of Barun Khola, NE of Pemathang Kharka, 27°44'N, 87°13'E, 4000 m (D. G. Long et al. 596, 8 Oct. 1991, KATH).

SIKKIM: Jongri (G. King's collector, s.n., K); loc. cit., 13000 ft. (C. B. Clarke 26088, 15 Oct. 1875, K); East district, Tsomgo Chho, 27°22'14"N, 88°45'52"E, 3720 m (D. G. Long & H. J. Noltie 54, 8 Jul. 1996, E, TI); Chokung chu, 13000–14000 ft. (W. W. Smith 3853, 26 Jul. 1910, CAL); Chola, 12000–13000 ft. (W. W. Smith 3922, 28 Jul. 1910, CAL); Phaloot, 13000 ft. (S. Kurz s.n., CAL); Rarakorum, 13500 ft. (C. B. Clarke 30339, 10 Aug. 1876, K); Thenga, 14000 ft. (Lepeha 2844, 2 Nov. 1909, CAL); without precise locality, 12000–15000 ft. (J. D. Hooker s.n., Sept. 1849, K).

BHUTAN: Pajoding, above Thimphu, 27°29'N, 89°35'E, 3750 m (A. J. C. Grierson & D. G. Long 2783, 19 Jul. 1979, E, K); Wangdi Phodrang district, Tsonsothang, 27°48'N, 90°24'E, 3900 m (F. Miyamoto 9361639, 22 Sept. 1993, TI); loc. cit., 4300 m (F. Miyamoto 9361681, 24 Sept. 1993, TI); loc. cit., Tintatso-Tampe La, 27°43'N, 90°31'E, 4400 m (F. Miyamoto 9361620, 21 Sept. 1993, TI); loc. cit., Chukarpo, 27°49'N, 90°23'E, 4300 m (F. Miyamoto 9361654, 23 Sept. 1993, TI).

XIZANG (TIBET): Chumbi & Phari (Dungboo s.n., Jul. 1879, B, CAL); Cona, 4260 m (Tibet expedition team 74-2744, 2 Oct. 1974, KUN); Raj hoti, 15000 ft. (R. Strachey & J. E. Winterbottom 1, K).

HUBEI: Chili Prov., Hsiao-wu-tai-shan, 3200 m (H. Smith 1230, 22 Sept. 1921, UPS); Hsiao-wu-tai-shan (C. T. Li 2224, 8 Jul. 1933, PE); loc. cit., 2400 m (C. T. Li 61427, 30 Jun. 1934, PE); Wuhe shan, 2700 m (Shanxi expedition team 636, 22 Aug. 1953, KUN).

62. *Juncus uniflorus* W. W. Sm.

NEPAL: Solukhumbu, Chhomalung Base Camp - Rato Odara, 4600 m (F. Miyamoto et al. 9580347, 18 Aug. 1995, TI); loc. cit., Chhomalung Base Camp - Seto Pokhari, 4400 m (F. Miyamoto et al. 9580304, 12 Aug. 1995, TI); loc. cit., around Cha Ding Kharka and Shipton Pass, 4150 m (M. Minaki et al. 9020823, 9 Aug. 1990, TI); Arun-Tamur Watershed, S. of Topke Gola, 13000 ft. (J. D. A. Stainton 872, 7 Jul. 1956, KATH).

SIKKIM: above Changu, 12000 ft. (W. W. Smith 3202, 8 Jul. 1910, K); Sherad Mang (R. E. Cooper 307, 18 Jul. 1913, KATH, S); Hills N. of Changu, 13500 ft. (R. E. Cooper 73, 26 Jun. 1913, KATH); without precise locality (collector unknown 972, CAL); without precise locality (collector unknown 1020, CAL); without precise locality, 6000-10000 ft. (J. D. Hooker s.n., L).

BHUTAN: N. E. Bhutan, Shingbe, Me La, 12000 ft. (F. Ludlow et al. 20693, 3 Jun. 1949, A, BM, UPS); Pajoding, above Thimphu, 27°29'N, 89°35'E, 3750 m (A. J. C. Grierson & D. G. Long 2783, 19 Jul. 1973, K); Wangdi Phodrang district, Tsonsohang, 27°49'N, 90°24'E, 4100 m (F. Miyamoto 9361636, 22 Sept. 1993, TI).

XIZANG (TIBET): Lusha Chu, Kongbo province, 29°20'N, 94°35'E, 12500 ft. (F. Ludlow et al. 4766, 10 Jun. 1938, BM).

63. *Juncus wallichianus* Laharpe

NEPAL: Ingyur - Gul Bhanjyang (H. Kanai & S. B. Malla 676151, 22 Aug. 1969, TI); Kathmandu (Wallich 8999, 1821, K); loc. cit., Nagarkot, 2000 m (H. Kanai et al. 6725239, 6725285, 24 Jun. 1967, TI); Dhankuta, Hile - Mure - Sinduwa - Bhalukhop - Chitre (H. Kanai et al. s.n., 5 Jun. 1972, TI); Sankhuwasawa, Hati Sar - Mangalbare - Lam Pokhari - Minchin Dhap (H. Hara et al. s.n., 28 Oct. 1963, TI); loc. cit., Minchin Dhap - Mul Pokhari (H. Hara et al. s.n., 29 Oct. 1968, TI); loc. cit., Hati Sar - Mangalbare - Lam Pokhari - Minchin Dhap (H. Hara et al. 6300868, 28 Oct. 1963, TI); loc. cit., Sedua - Mane Gaun - Tashi Gaun, 1600 m (M. Minaki et al. 9020463, 9020477-9020479, 2 Aug. 1990, TI); loc. cit., Bhuje - Gupha Pokhari - Lamo Pokhari - Chauke (H. Kanai et al. s.n., 4 Jul. 1972, TI); Taplejung, Nessum - Puntapla - Gorza Gaon - Bhuje (H. Kanai et al. s.n., 3 Jul. 1972, TI).

SIKKIM: on the way up Tiger Hill, 8000 ft. (E. Biswas 8631, 3 Nov. 1848, CAL); Gangtok, 5600 ft. (E. Biswas 7054, 19 May 1847, CAL); Gopal Dora (E. Biswas 55941, 23 Oct. 1841, CAL); Mungboo, 3600 ft. (W. W. Smith 183, 26 Sept. 1908, CAL); Descent from Buje Danda to the Tamur River, 27°20'N, 87°35'E, 2000 m (S. Crawford et al. KEKE 130, 31 Aug. 1989, K), Lachung, 8610 ft. (J. Pradham s.n., 8 Aug. 1943, K).

BHUTAN: Paro valley, 2550m (N. P. Balakrishnan 1241, 18 Aug. 1963, CAL).

ASSAM: Khasia, 4000-6000 ft. (J. D. Hooker & T. Thomson s.n., K).

EAST HIMALAYA: Seuchal (E. Biswas 3663, 28 Oct. 1839, CAL); without precise locality (A. B. Chowdhary s.n., 30 Jun. 1960, CAL).

MYANMAR: Kalaw (F. G. Dickason 5351, May 1932, A).

XIZANG (TIBET): Nyanlam, 2500 m (Qing-Zang expedition team 6090, 29 Jun. 1975, KUN); loc. cit. (Zhang & Lang 4458, 3 Jun. 1966, KUN).

YUNNAN: Gongshan, Dulong jiang, 1450 m (Dulong Jiang expedition team 1485, 30 Dec. 1990, KUN); Wei-si Hsien, 2800 m (C. W. Wang 67632, Aug.-Sept. 1935, A); Ta-li Hsien, 2800 m (H. T. Tsai 53915, 29 Jul. 1933, A); loc. cit., 2540 m (C. W. Wang 63520, May 1935, A); loc. cit. (C. W. Wang 63535, May 1935, PE); Dali Shi, Diancang Shan, 2300 m (S. Akiyama et al. 401, 5 Jul. 2001, KUN, TI); Kunming, 2300 m (C. W. Wang 62974, Apr. 1935, A); Yan shan, Shih-tze-shan, 1200 m (C. W. Wang 84259, 9 Oct. 1939, PE); near Kao-Chiao, Hsi-shan, Kunming, 1900 m (T. N. Liou 13364, 9 Jun. 1945, PE); Ping-pin Hsien, 1400 m (H. T. Tsai 60029, 1 Jun. 1934, PE); loc. cit. (H. T. Tsai 60224, 15 Jun. 1934, PE); Shung-Kiang Hsien, 1480 m (C. W. Wang 73028, Apr. 1936, A); without precise locality (T. T. Yü 12439, A).

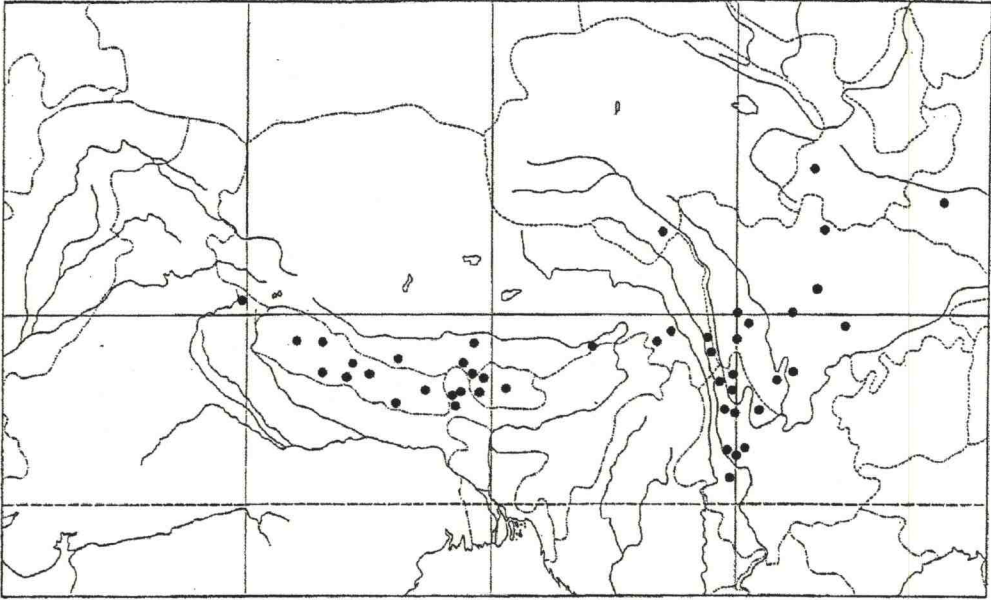


Fig. 4. Distribution map of *Juncus allioides* Franch.

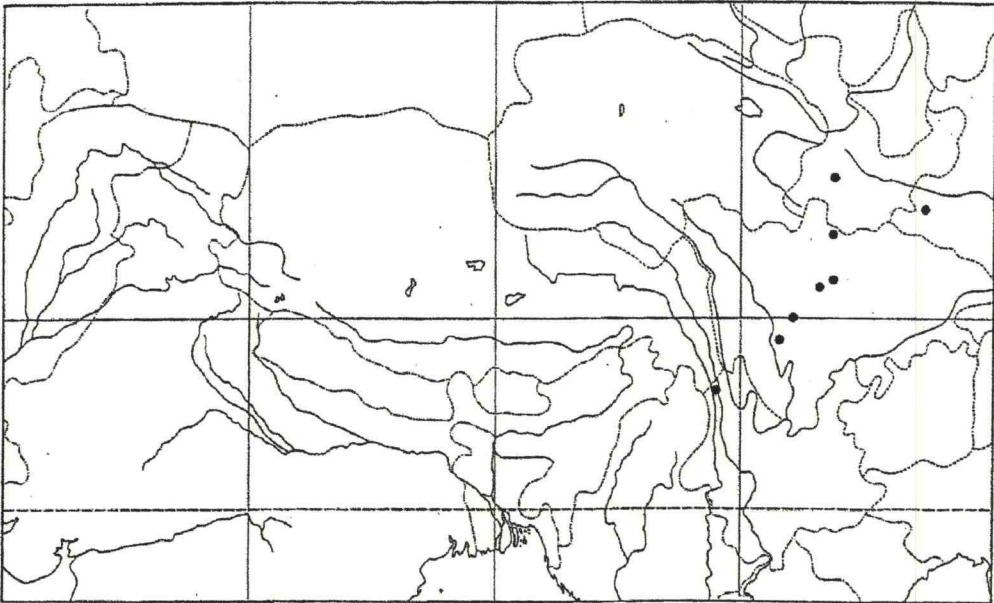


Fig. 5. Distribution map of *Juncus amplifolius* Miyam. & H. Ohba

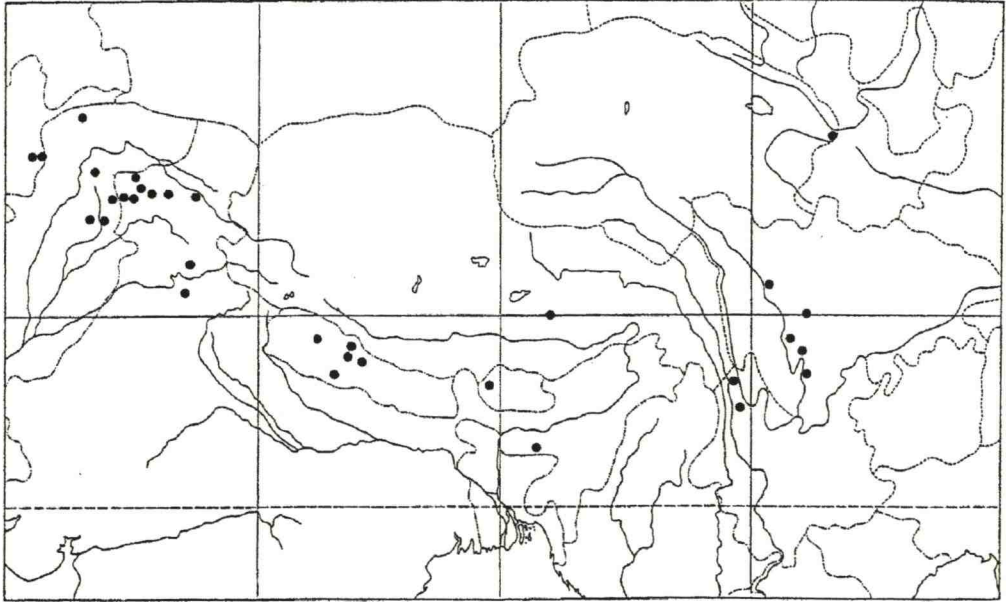


Fig. 6. Distribution map of *Juncus articulatus* L.

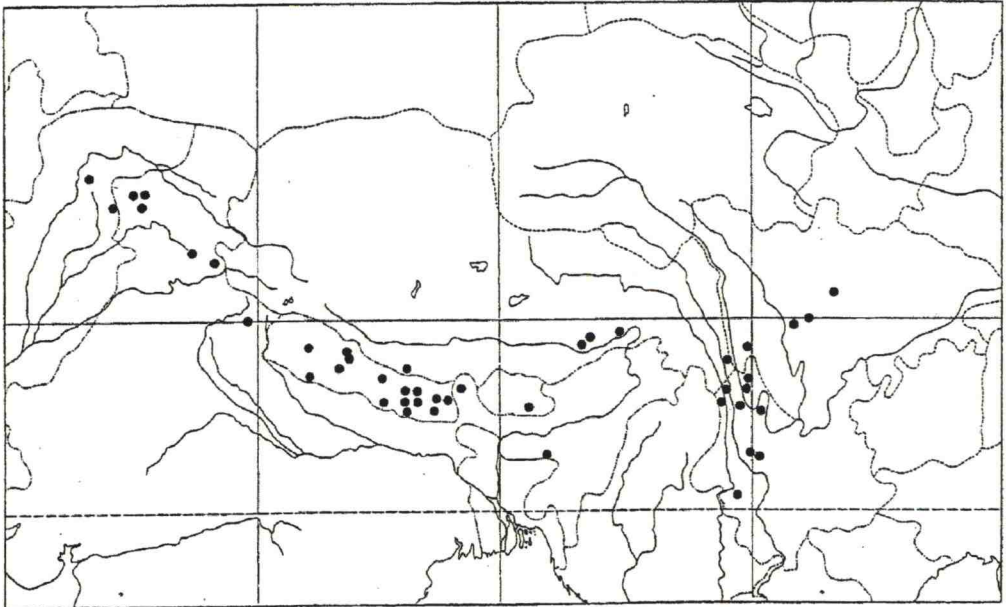


Fig. 7. Distribution map of *Juncus benghalensis* Kunth

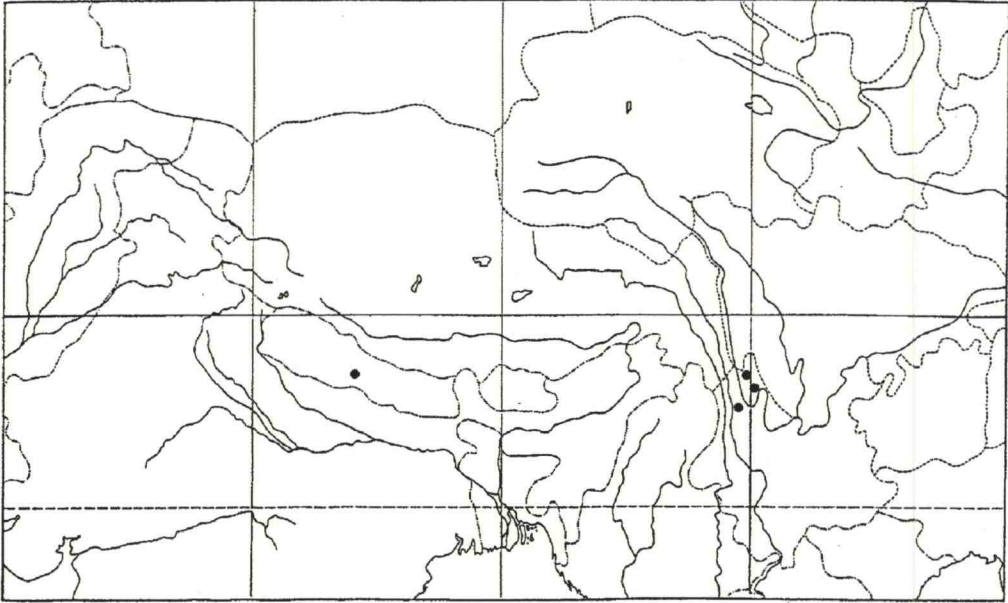


Fig. 8. Distribution map of *Juncus biglumoides* H. Hara.

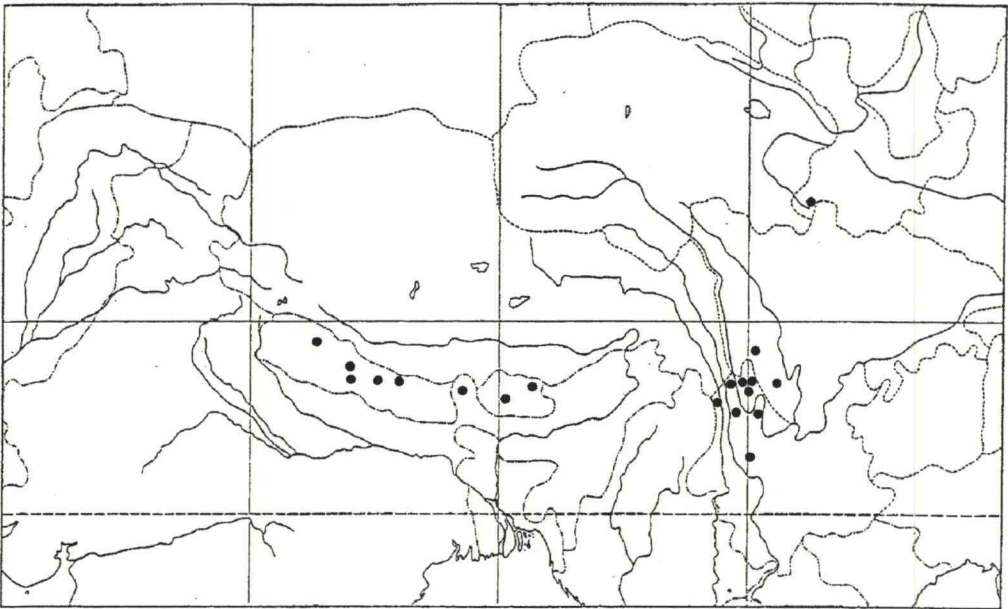


Fig. 9. Distribution map of *Juncus brachystigma* Sam.

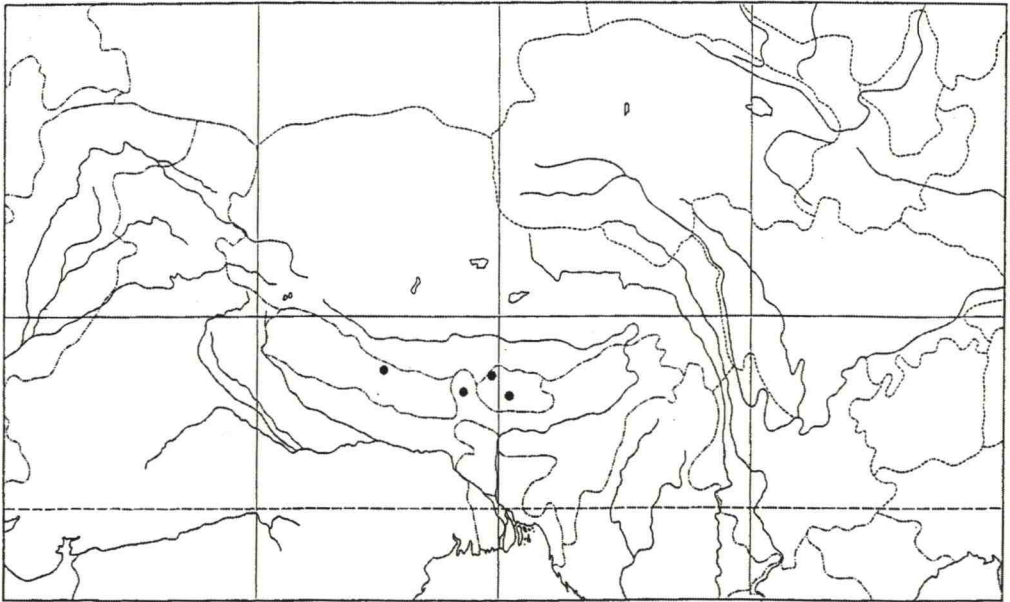


Fig. 10. Distribution map of *Juncus bryophilus* Noltie.

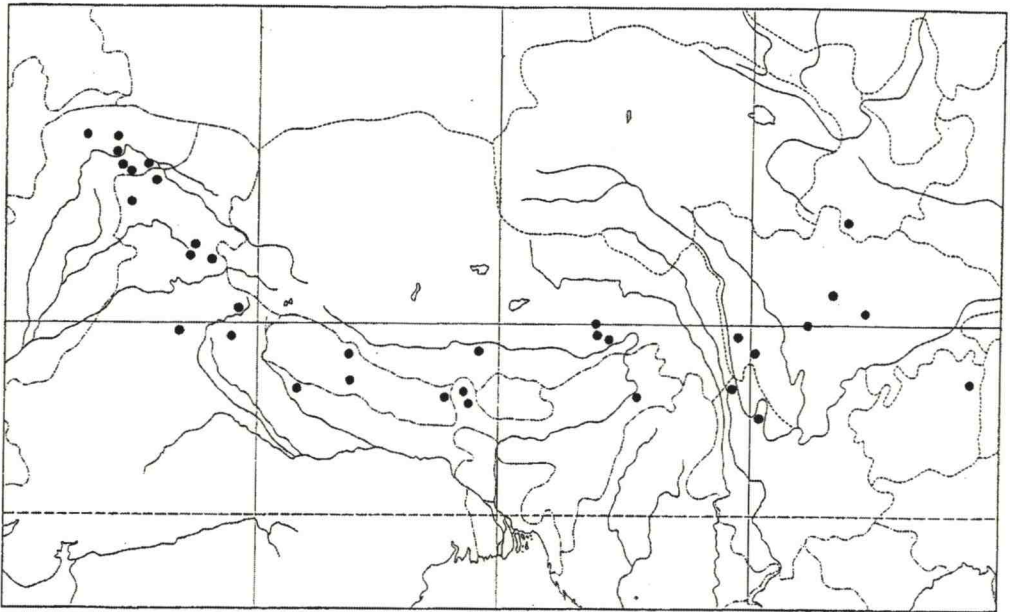


Fig. 11. Distribution map of *Juncus bufonius* L.

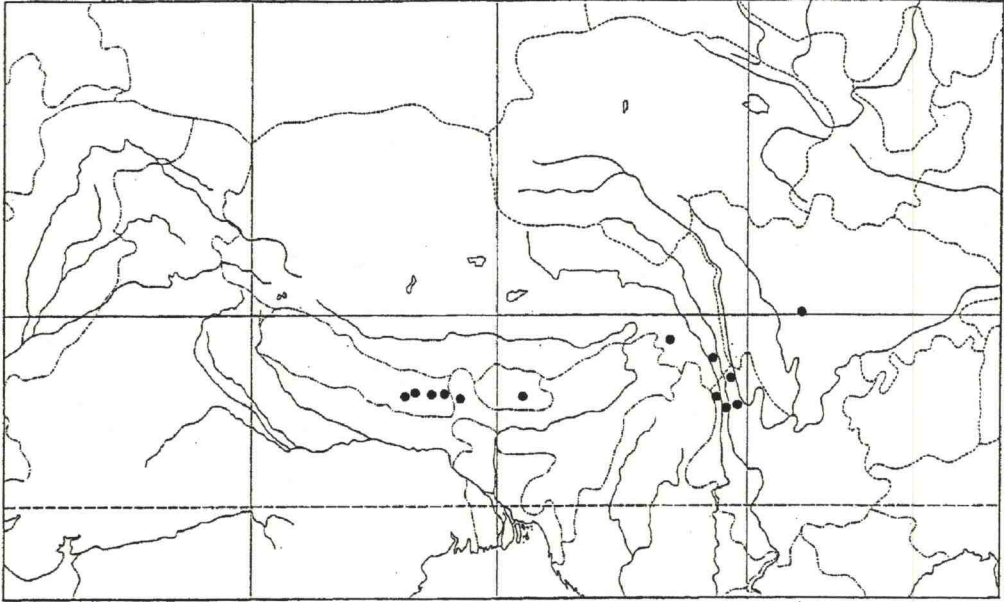


Fig. 12. Distribution map of *Juncus cephalostigma* Sam.

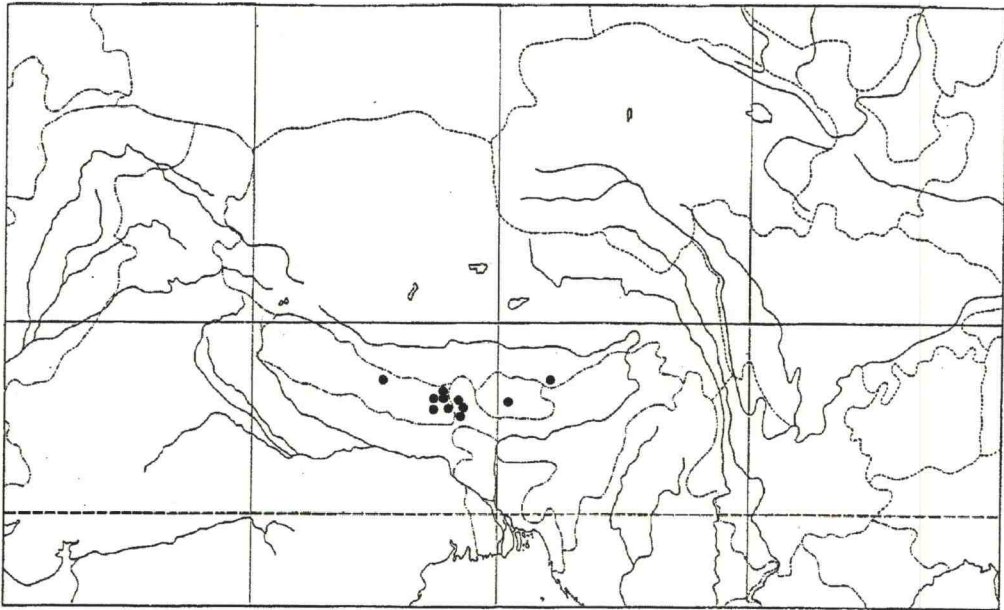


Fig. 13. Distribution map of *Juncus chrysocarpus* Buchenau

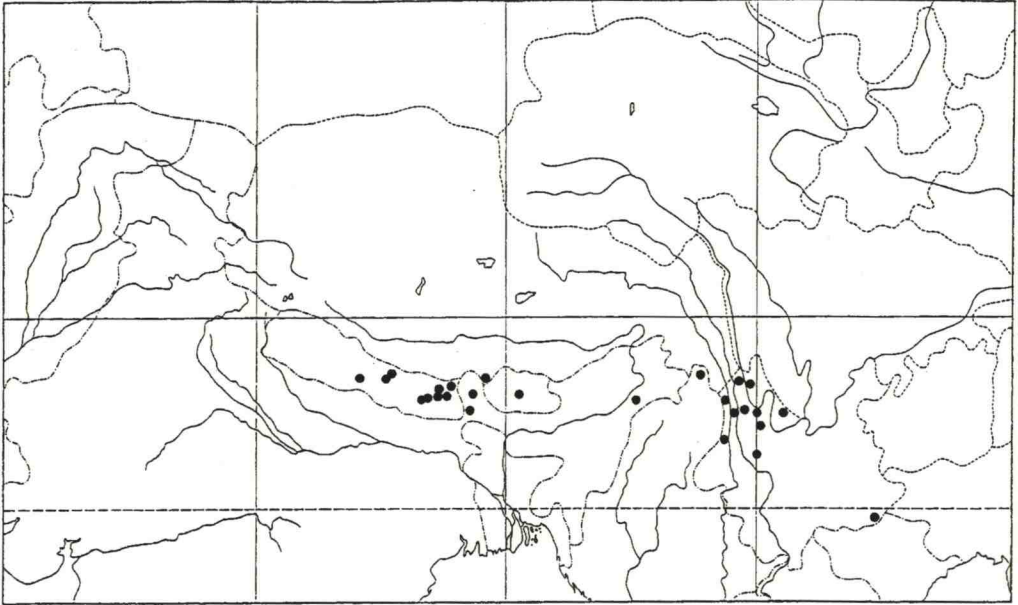


Fig. 14. Distribution map of *Juncus clarkei* Buchenau

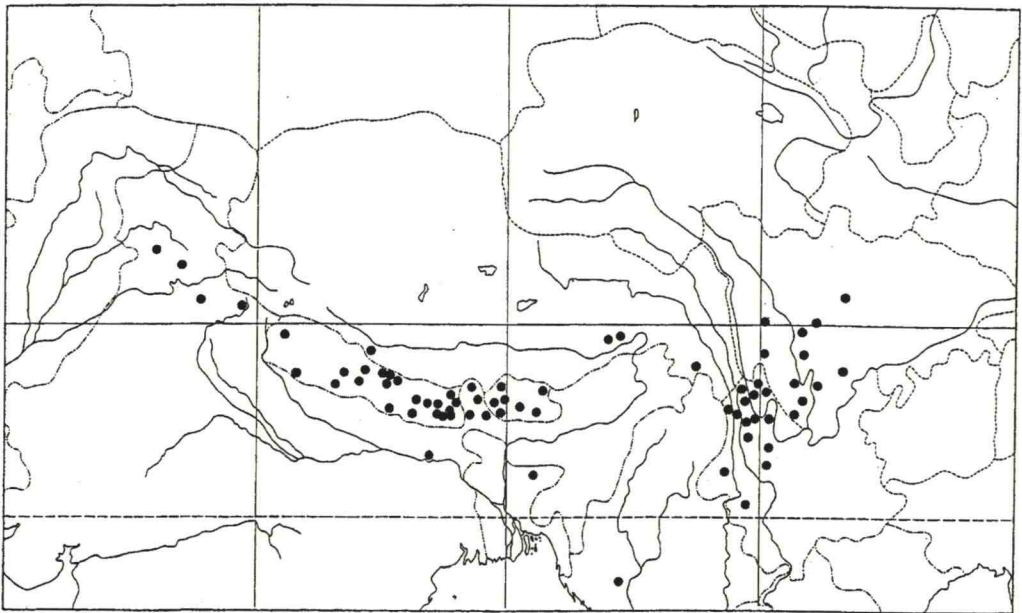


Fig. 15. Distribution map of *Juncus concinnus* D. Don

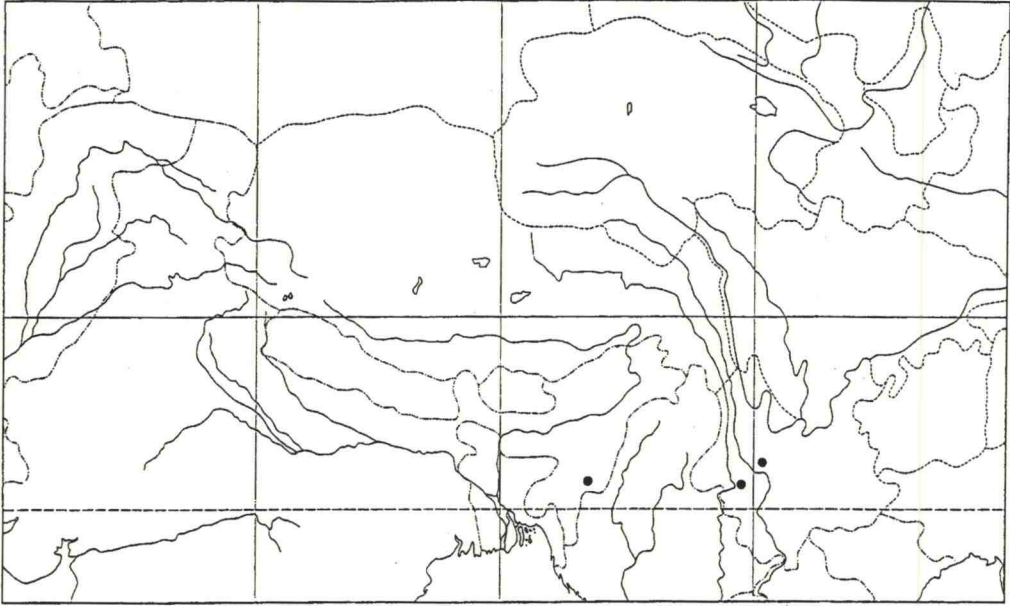


Fig. 16. Distribution map of *Juncus concolor* Sam.

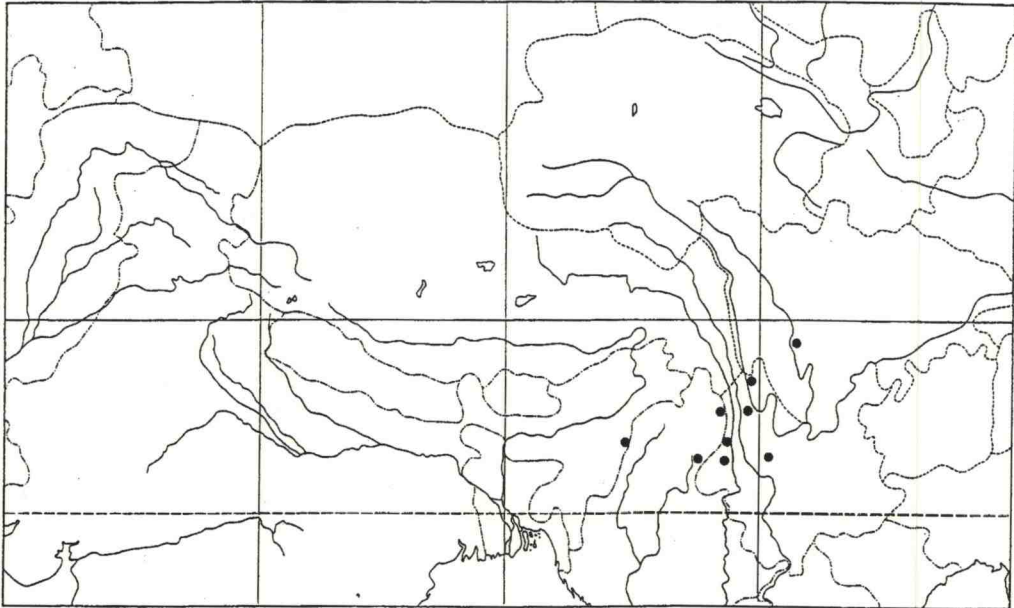


Fig. 17. Distribution map of *Juncus crassistylus* A. Camus

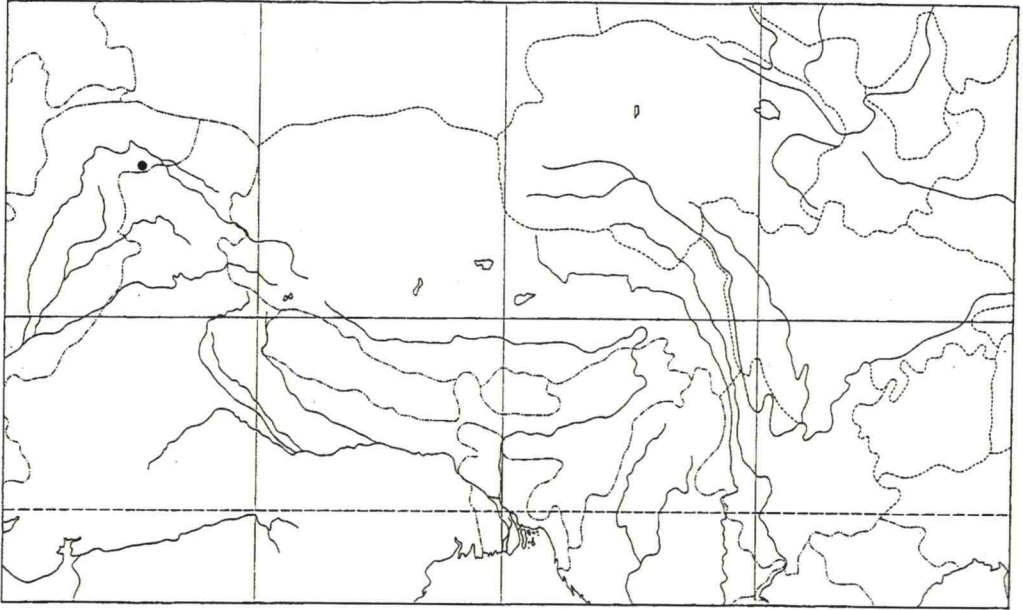


Fig. 18. Distribution map of *Juncus deosaiicus* Noltie

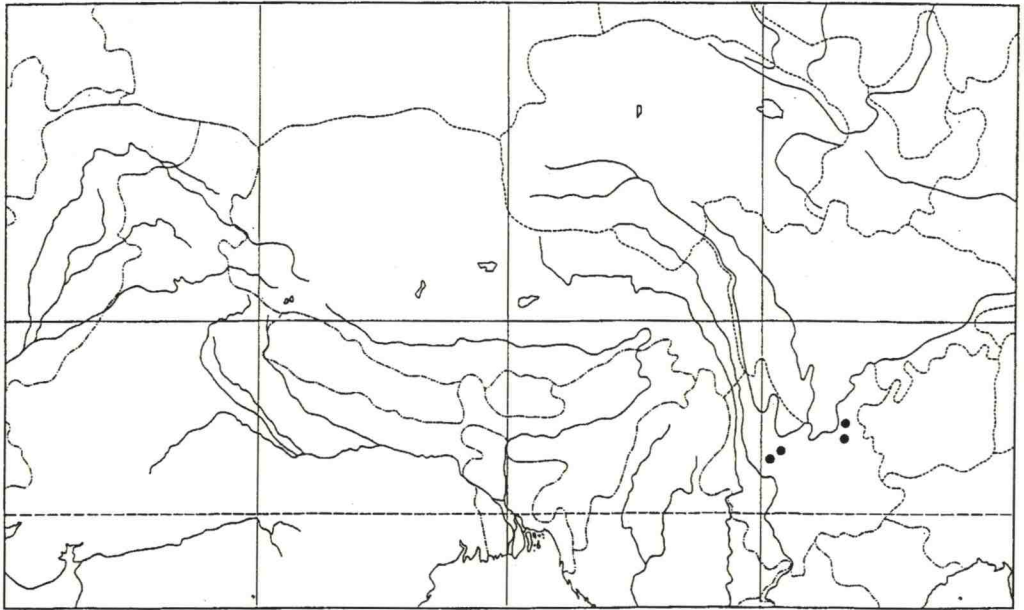


Fig. 19. Distribution map of *Juncus dongchuanensis* K. F. Wu.

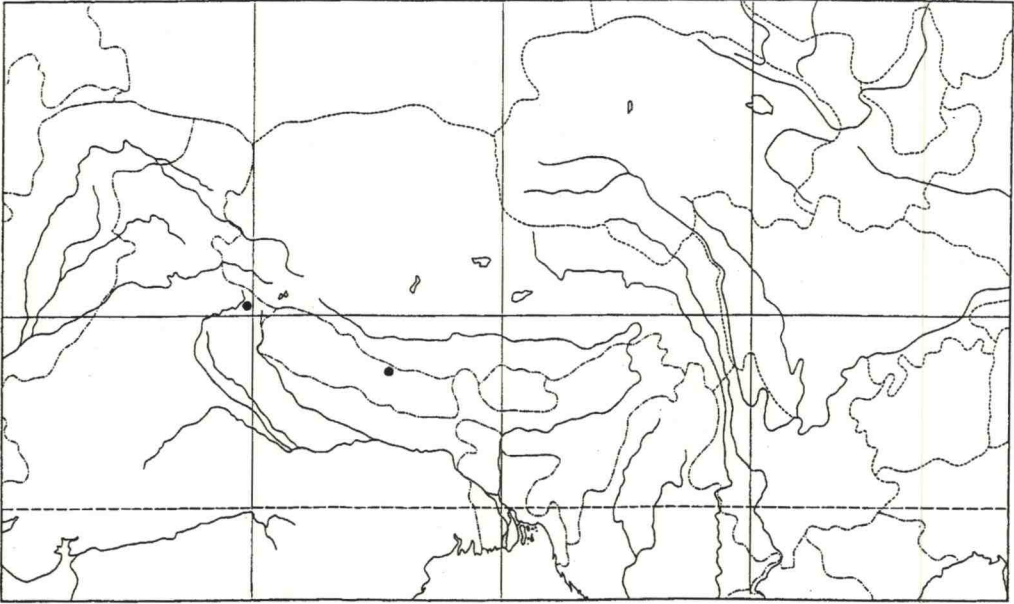


Fig. 20. Distribution map of *Juncus duthiei* (C. B. Clarke) Noltie

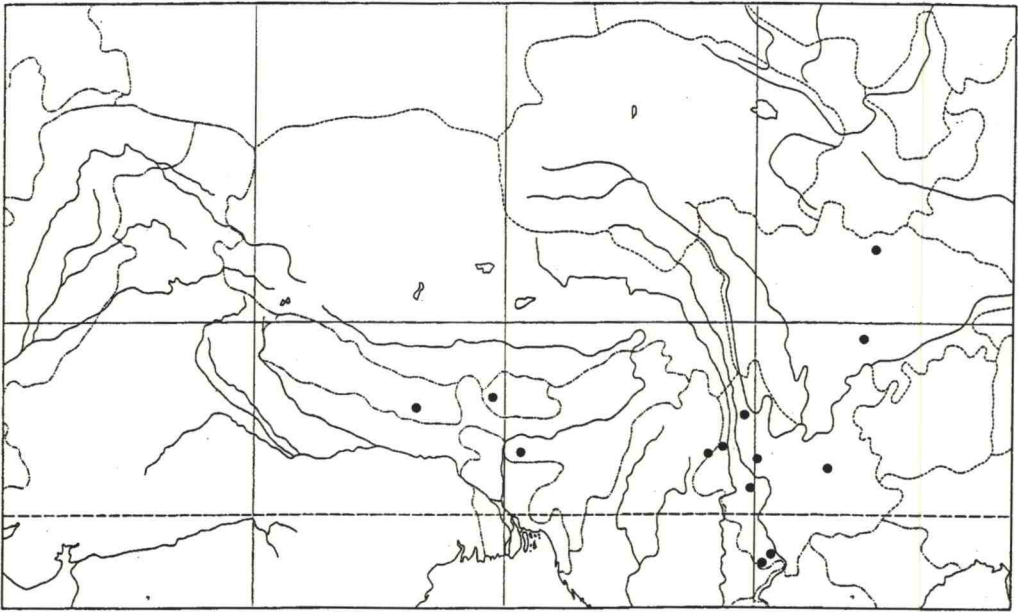


Fig. 21. Distribution map of *Juncus effuses* L.

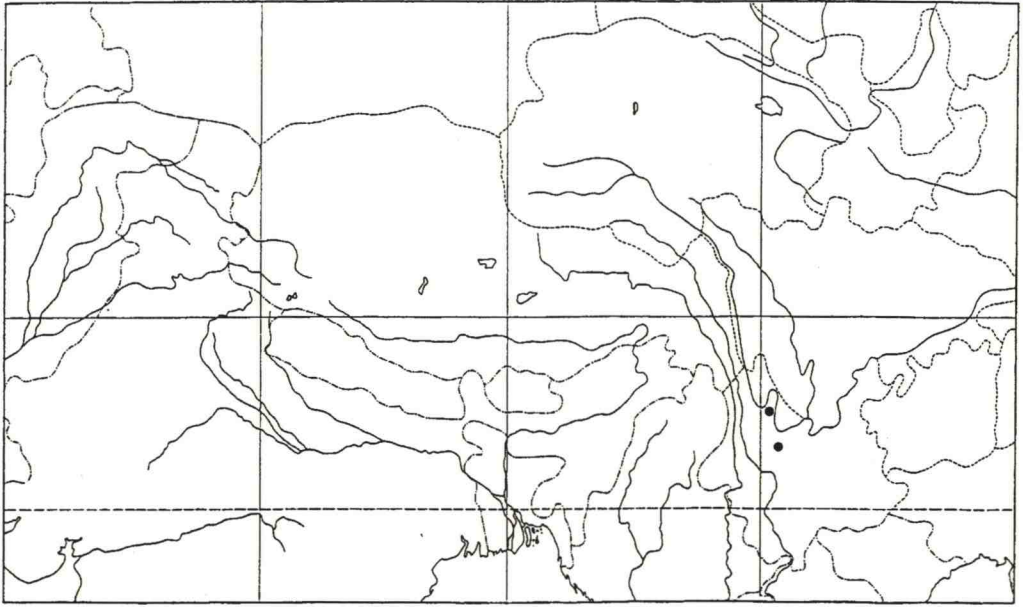


Fig. 22. Distribution map of *Juncus fimbriatylodes* Noltie

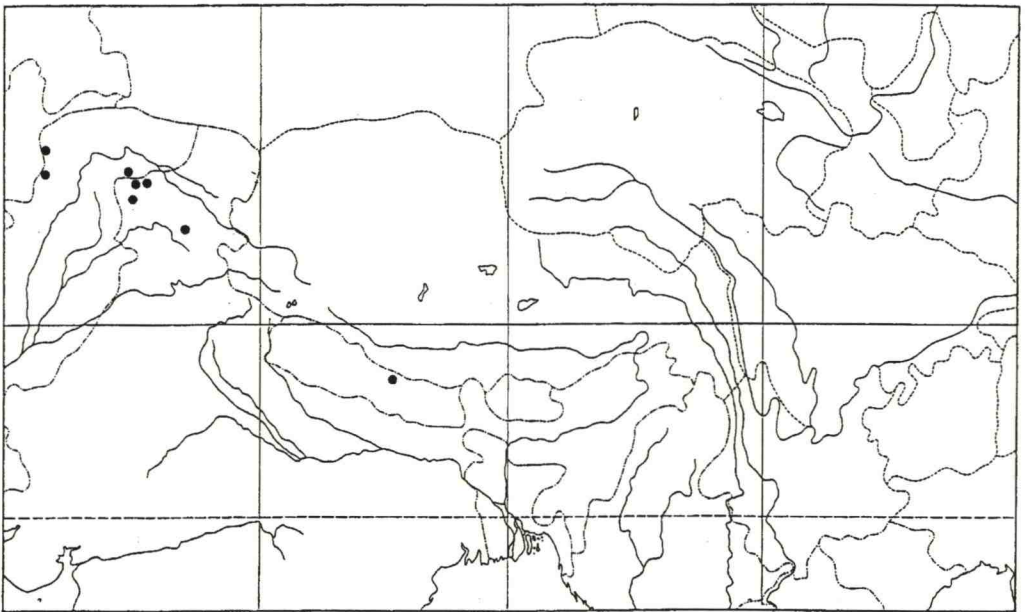


Fig. 23. Distribution map of *Juncus ganeshii* Miyam. et H. Ohba

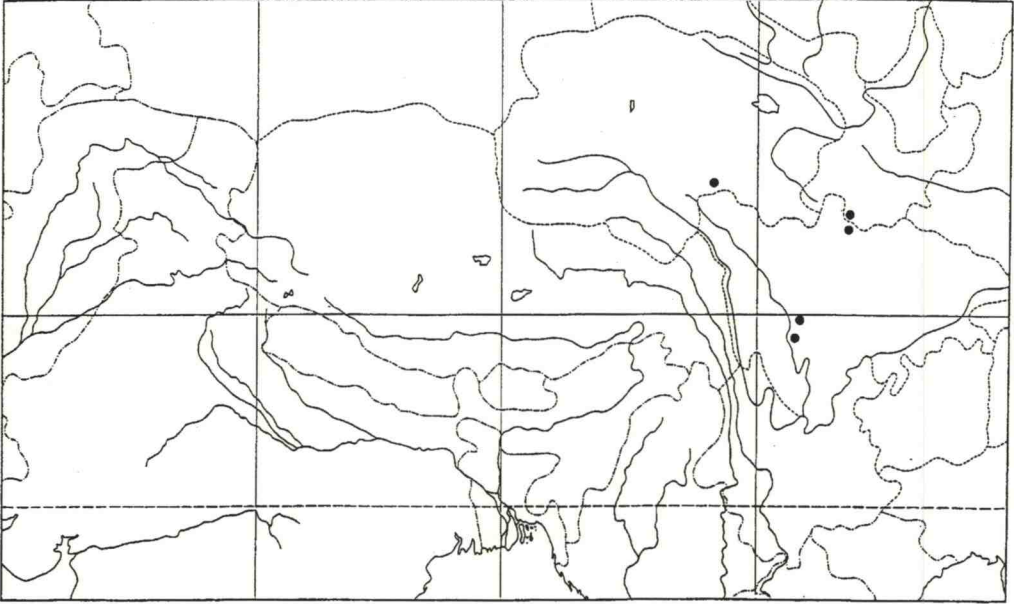


Fig. 24. Distribution map of *Juncus giganteus* Sam.

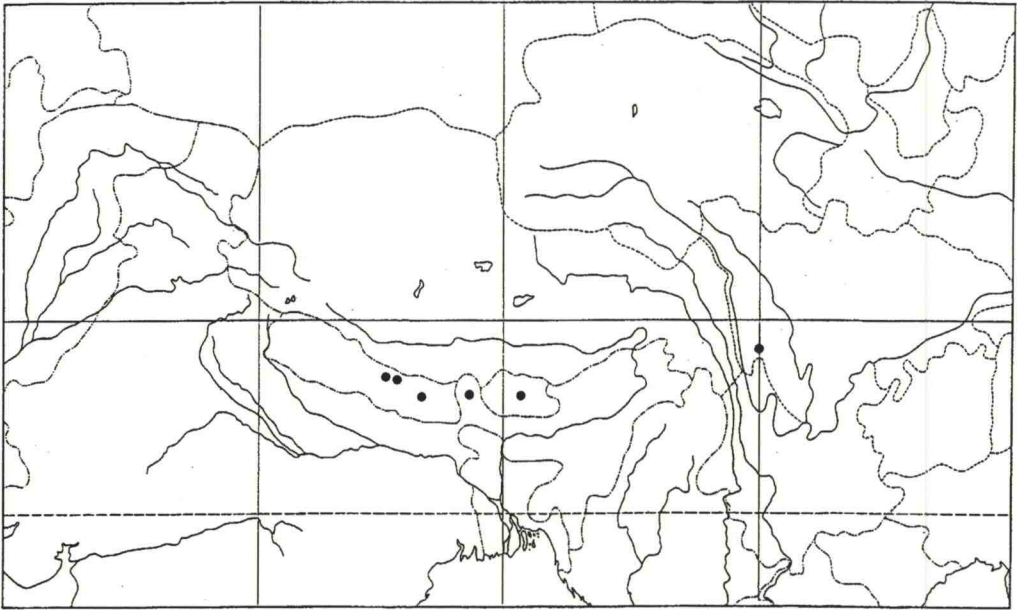


Fig. 25. Distribution map of *Juncus glaucoturgidus* Noltie

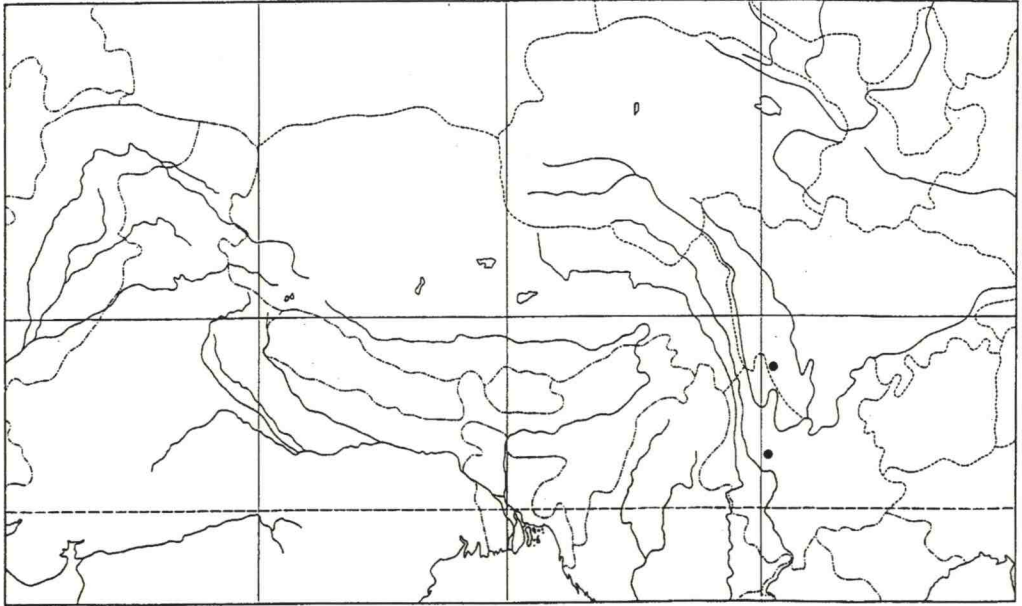


Fig. 26. Distribution map of *Juncus gonggae* Miyam. & H. Ohba

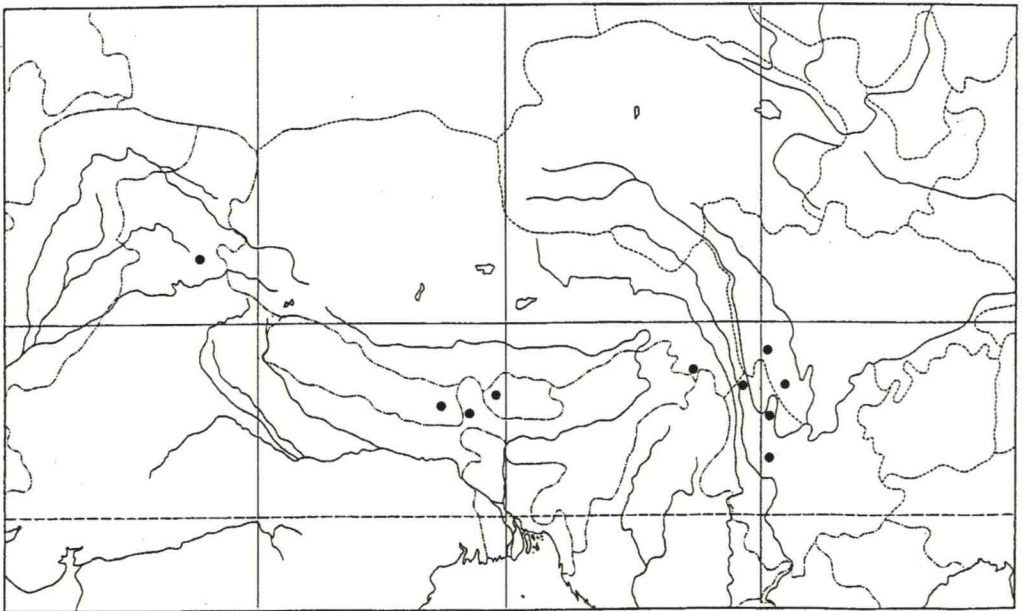


Fig. 27. Distribution map of *Juncus gracilicaulis* A. Camus

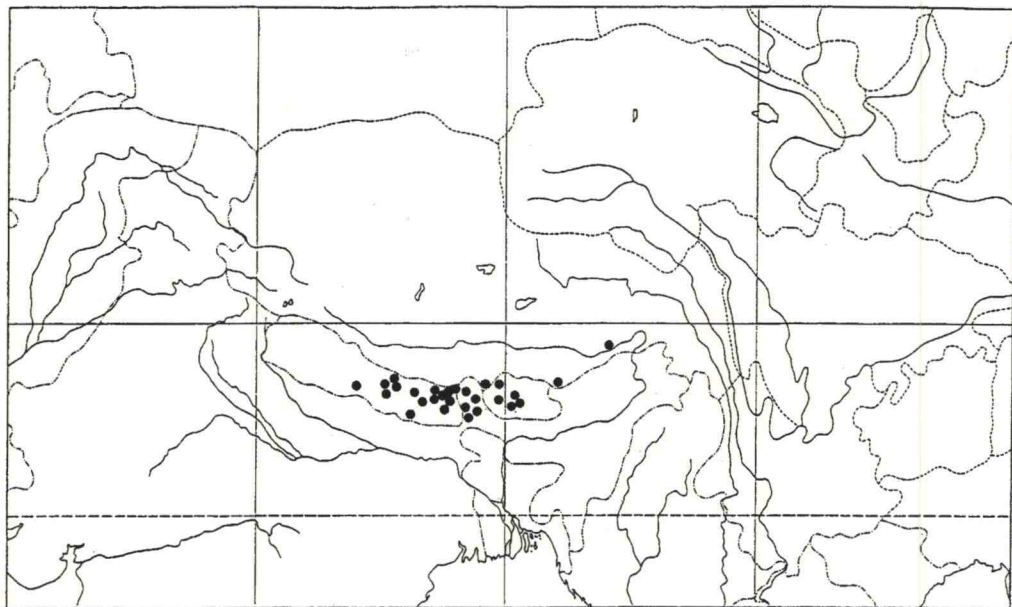


Fig. 28. Distribution map of *Juncus grisebachii* Buchenau

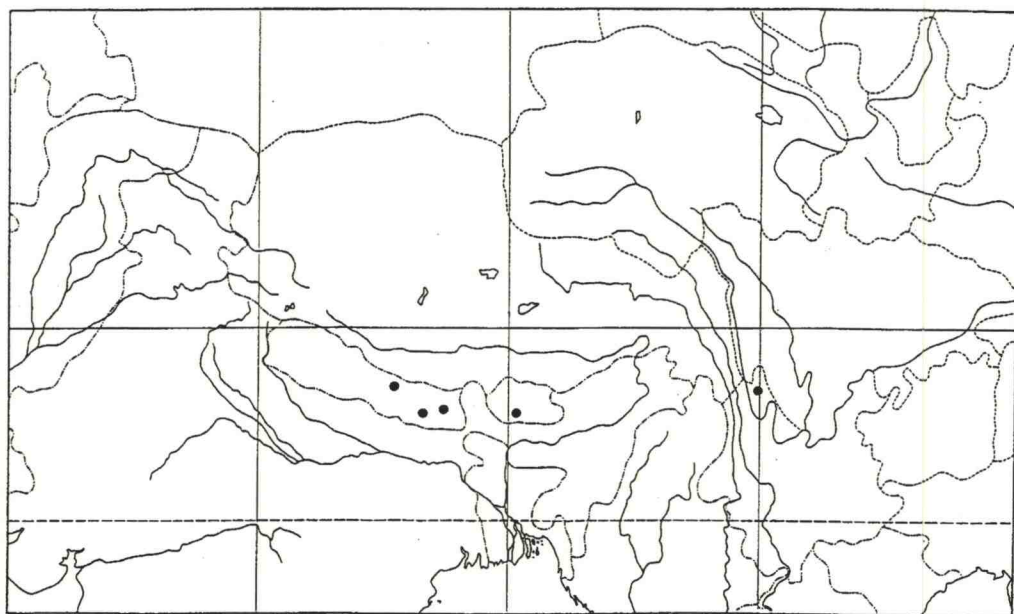


Fig. 29. Distribution map of *Juncus harae* Miyam. & H. Ohba.

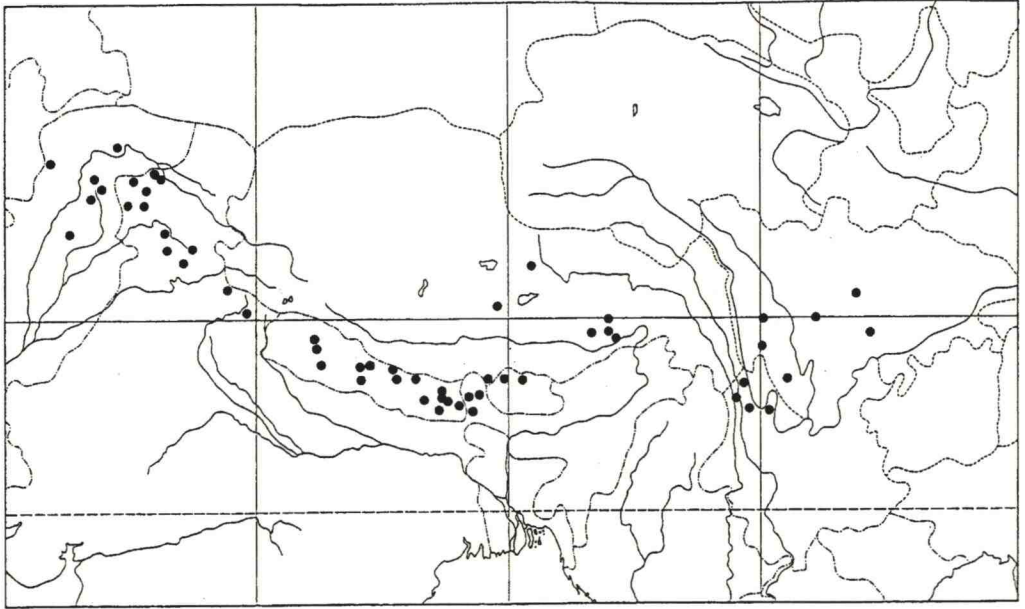


Fig. 30. Distribution map of *Juncus himalensis* Klotzsch

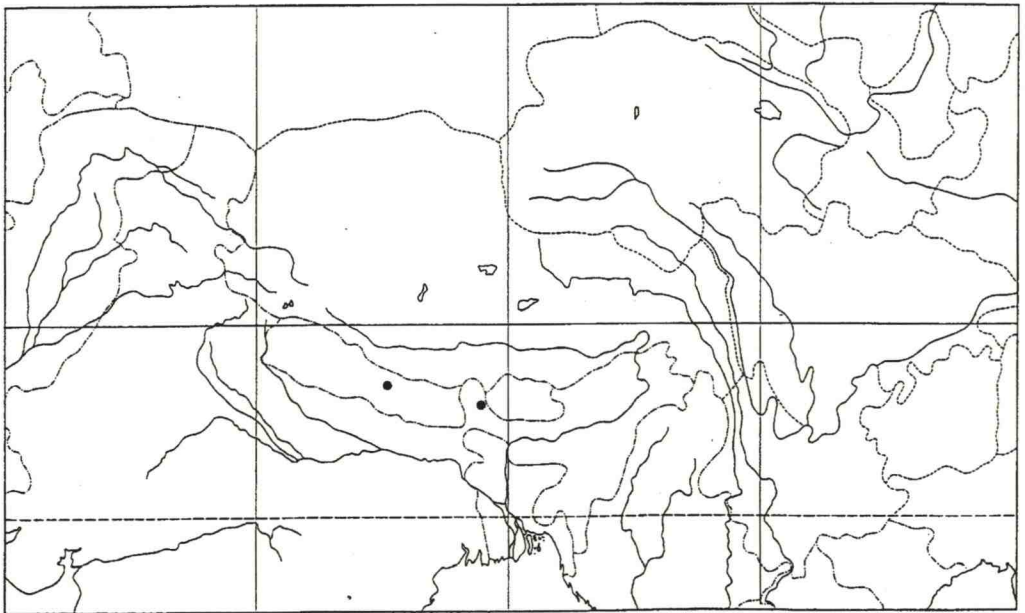


Fig. 31. Distribution map of *Juncus hydrophilus* Noltie

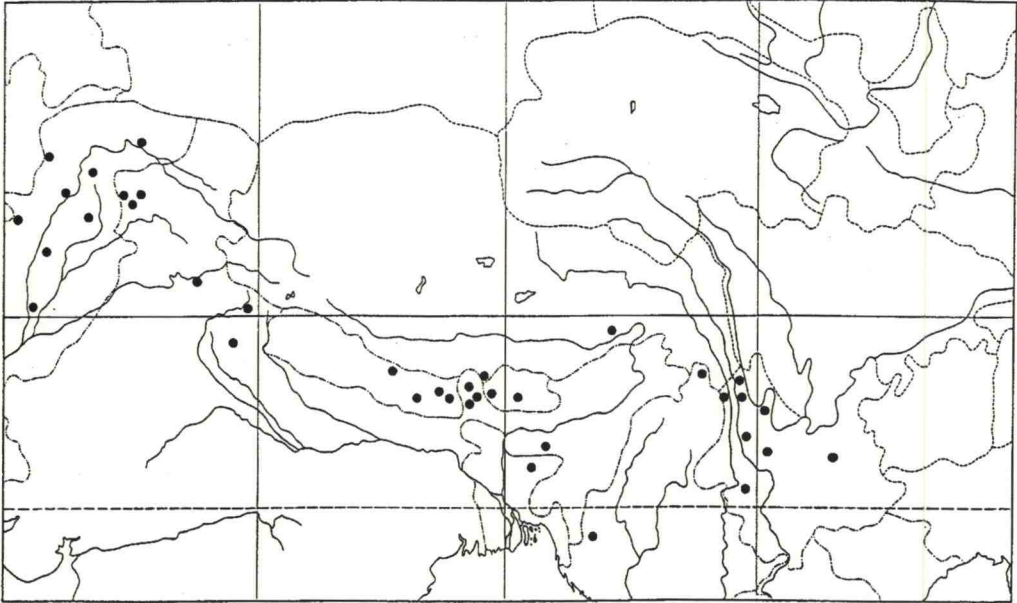


Fig. 32. Distribution map of *Juncus inflexus* L.

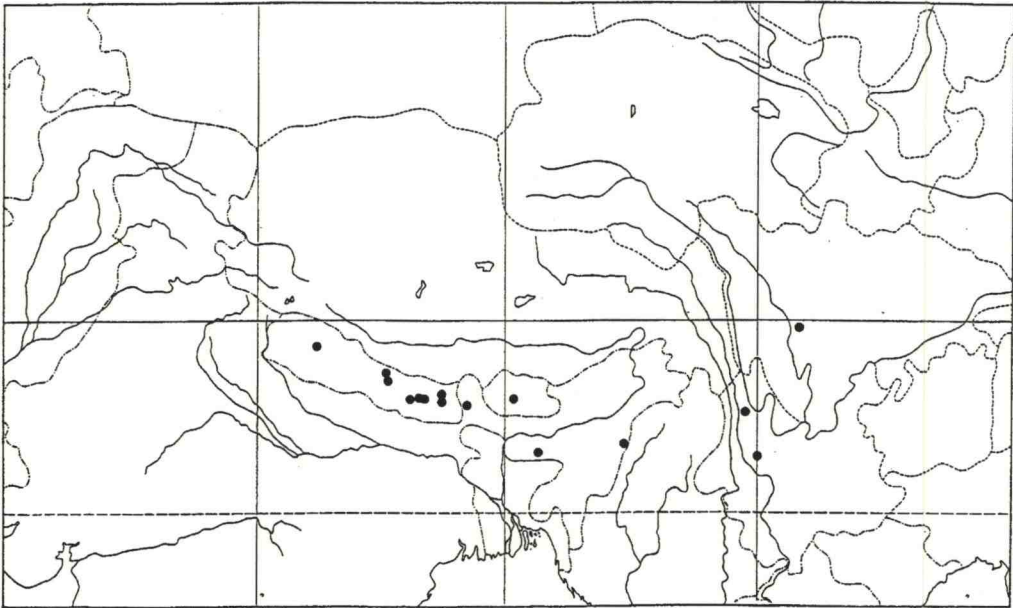


Fig. 33. Distribution map of *Juncus khasiensis* Buchenau

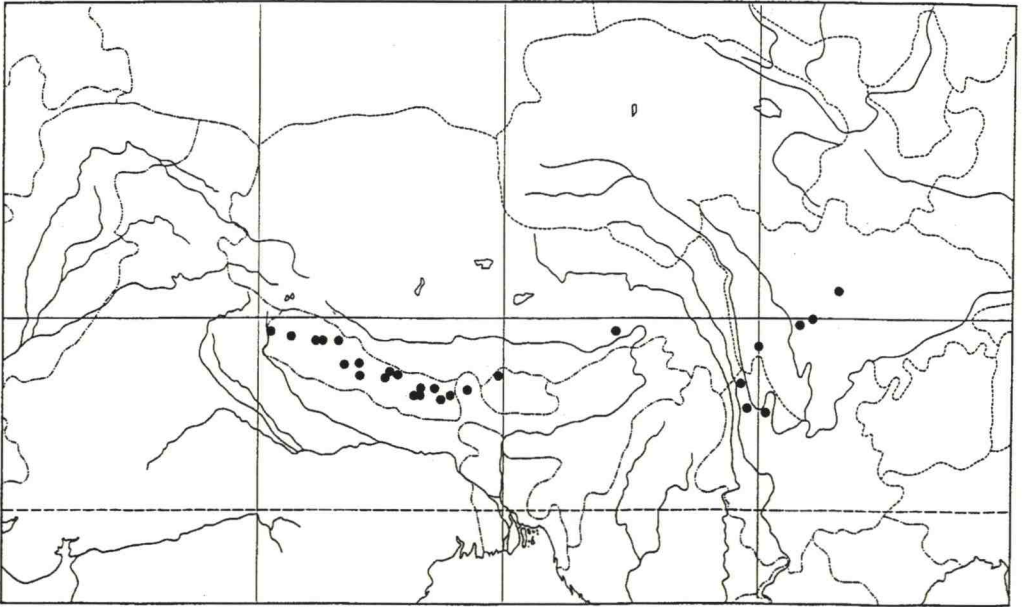


Fig. 34. Distribution map of *Juncus kingii* Rendle

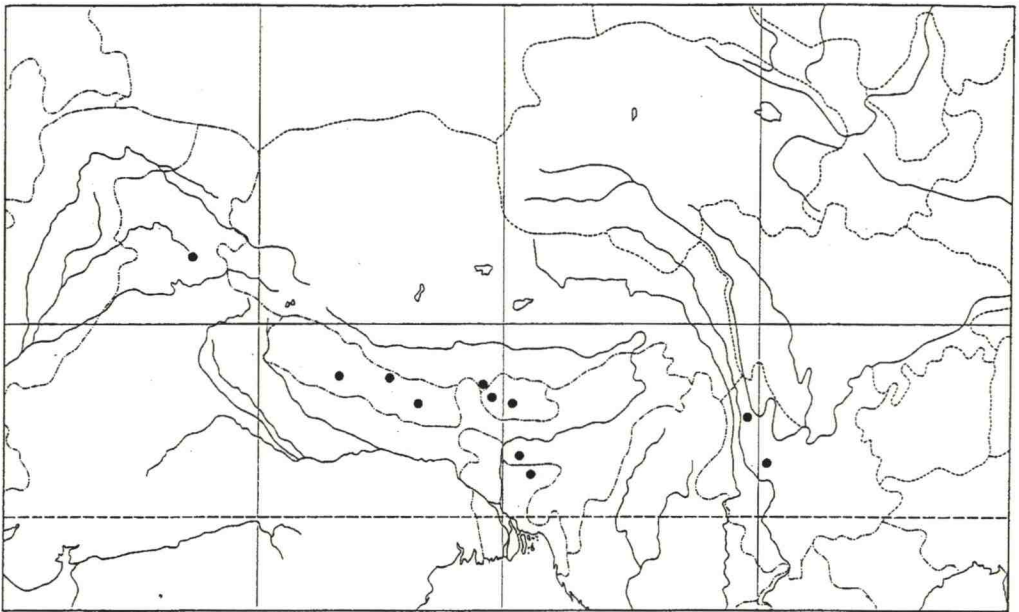


Fig. 35 Distribution map of *Juncus leptospermus* Buchenau

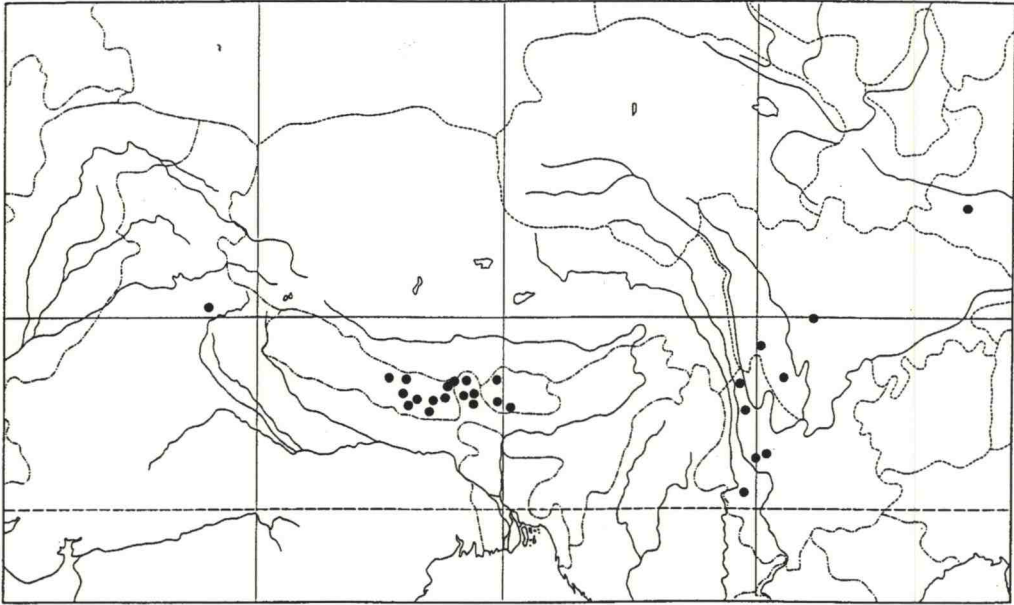


Fig. 36. Distribution map of *Juncus leucanthus* Royle ex D. Don

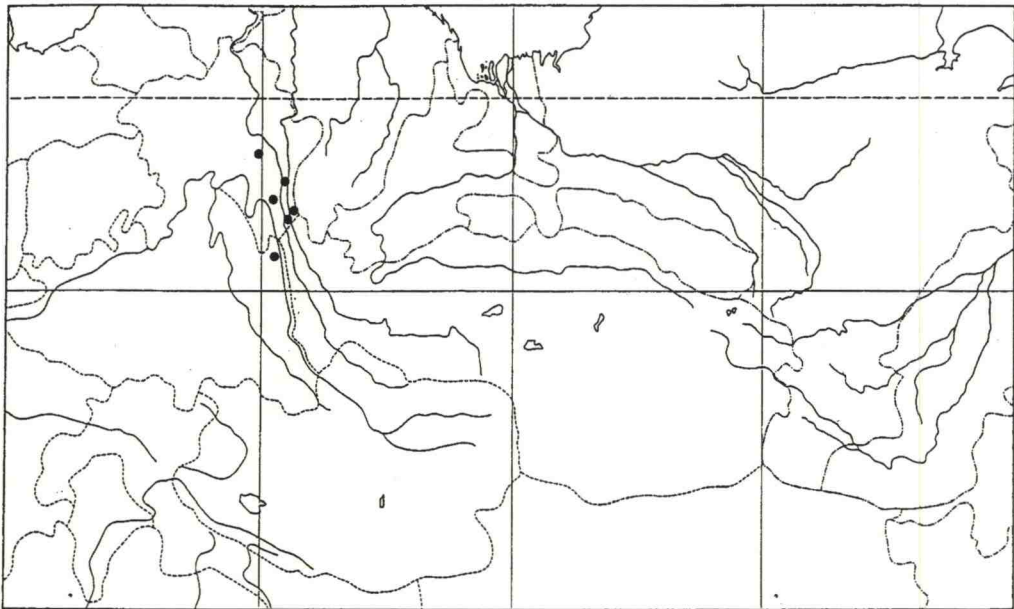


Fig. 37. Distribution map of *Juncus longiflorus* (A. Camus) Noltie

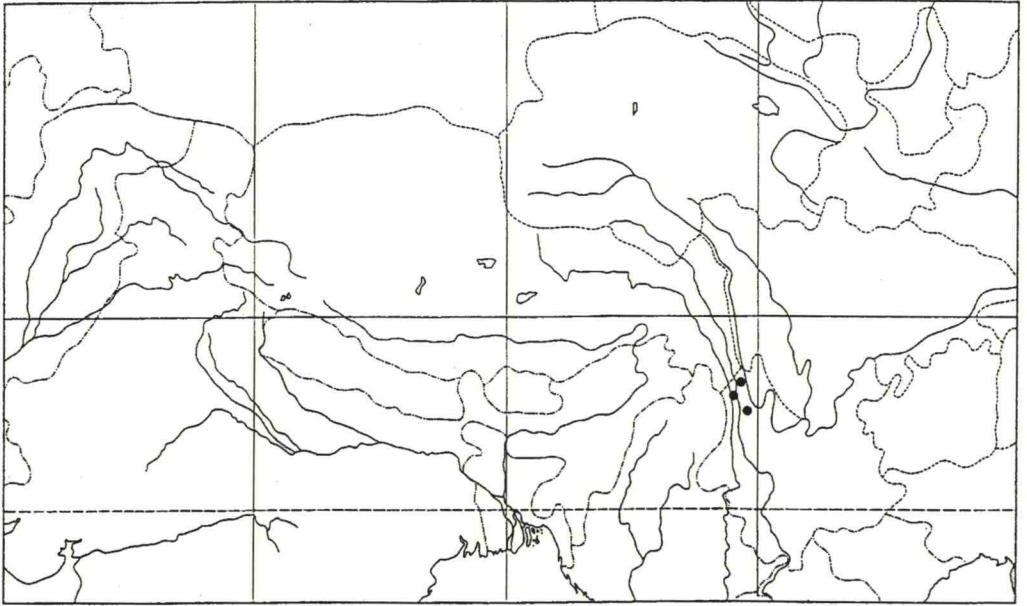


Fig. 38. Distribution map of *Juncus longistamineus* A. Camus

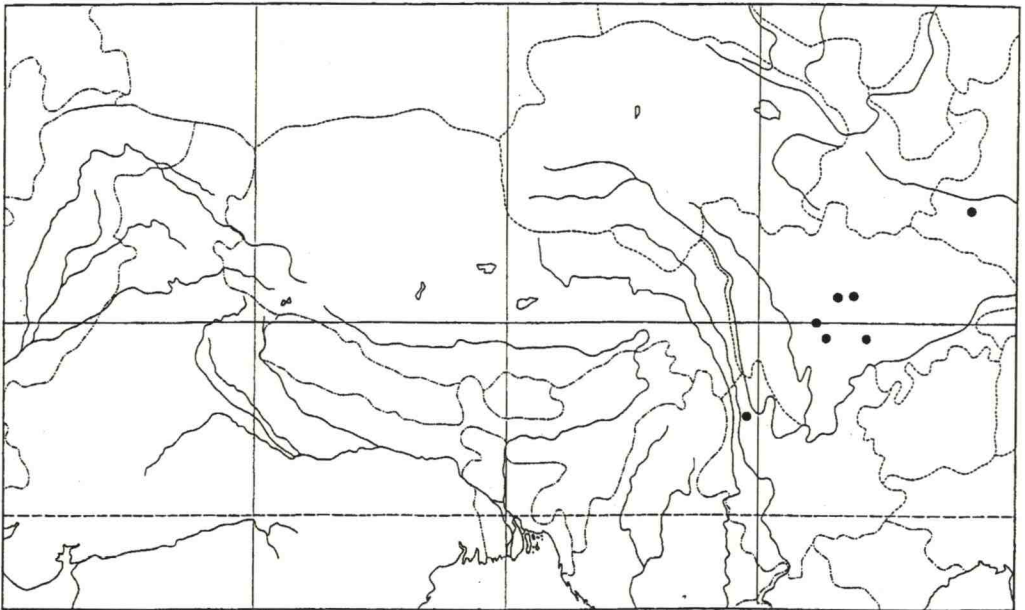


Fig. 39. Distribution map of *Juncus luzuliformis* Franch.

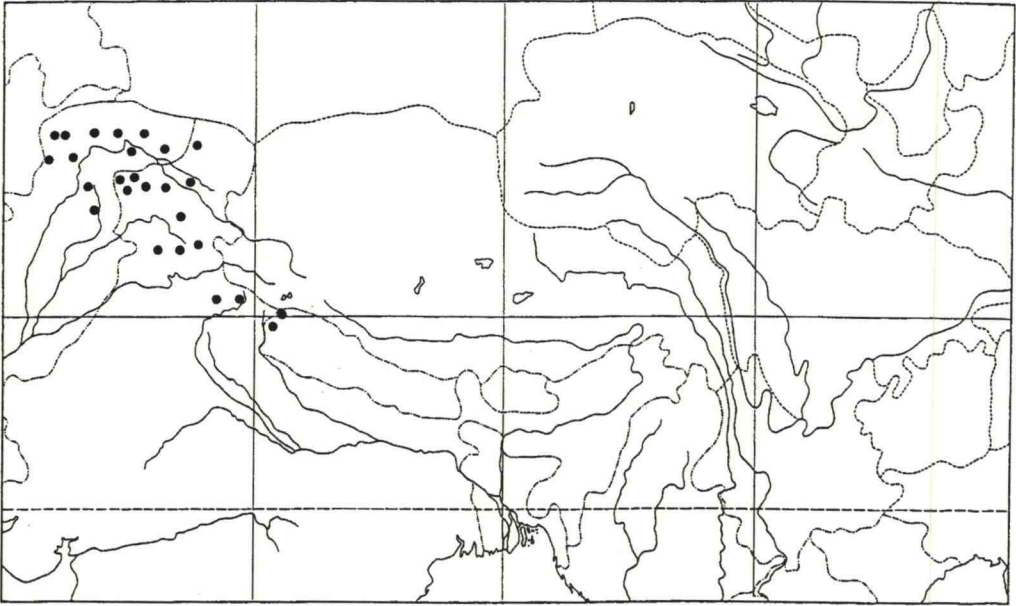


Fig. 40. Distribution map of *Juncus membranaceus* Royle ex D. Don

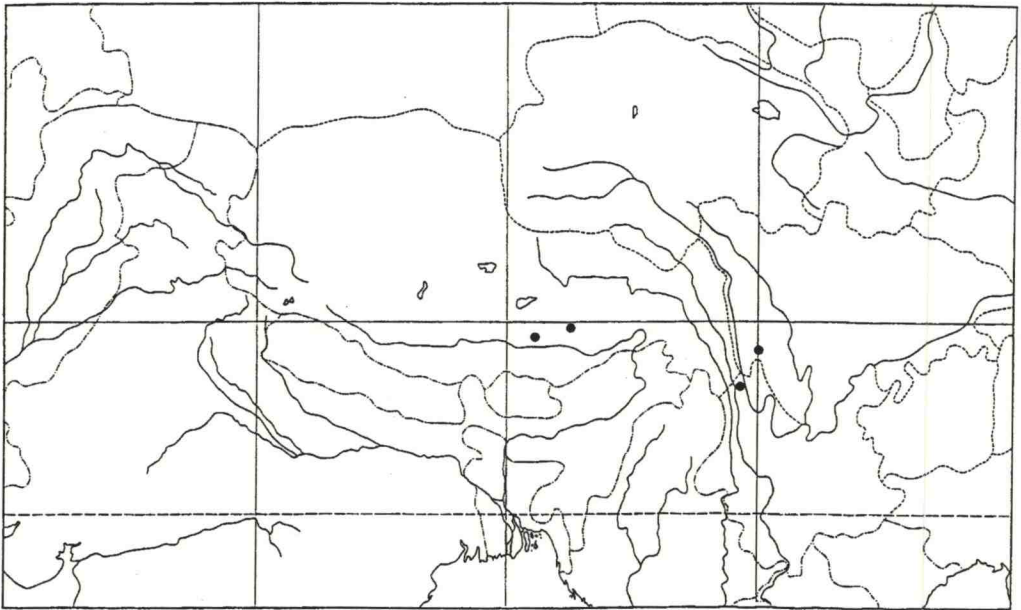


Fig. 41. Distribution map of *Juncus milashanensis* A. M. Lu & Z. Y. Zhang

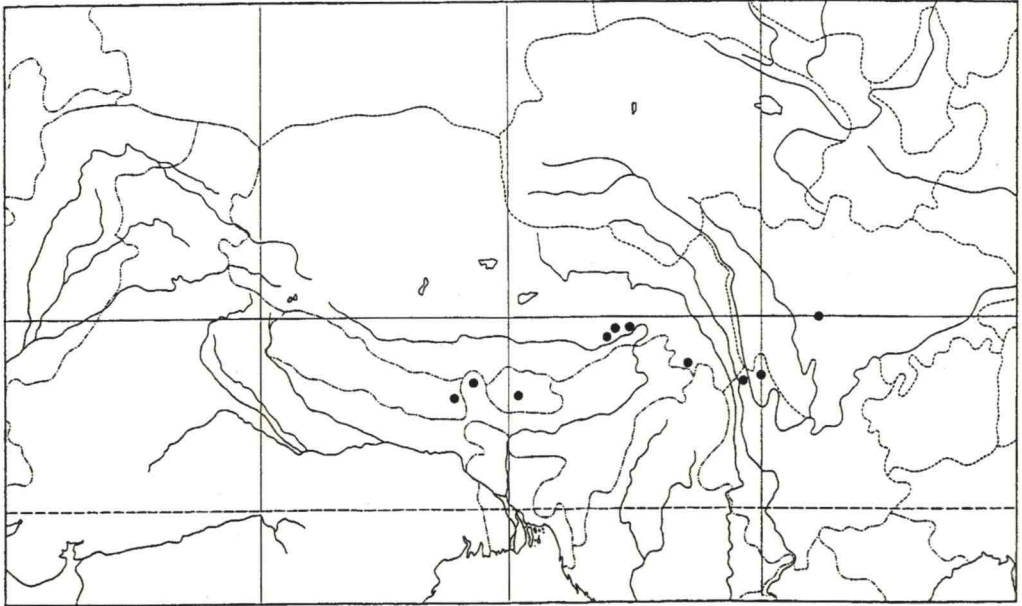


Fig. 42. Distribution map of *Juncus minimus* Buchenau

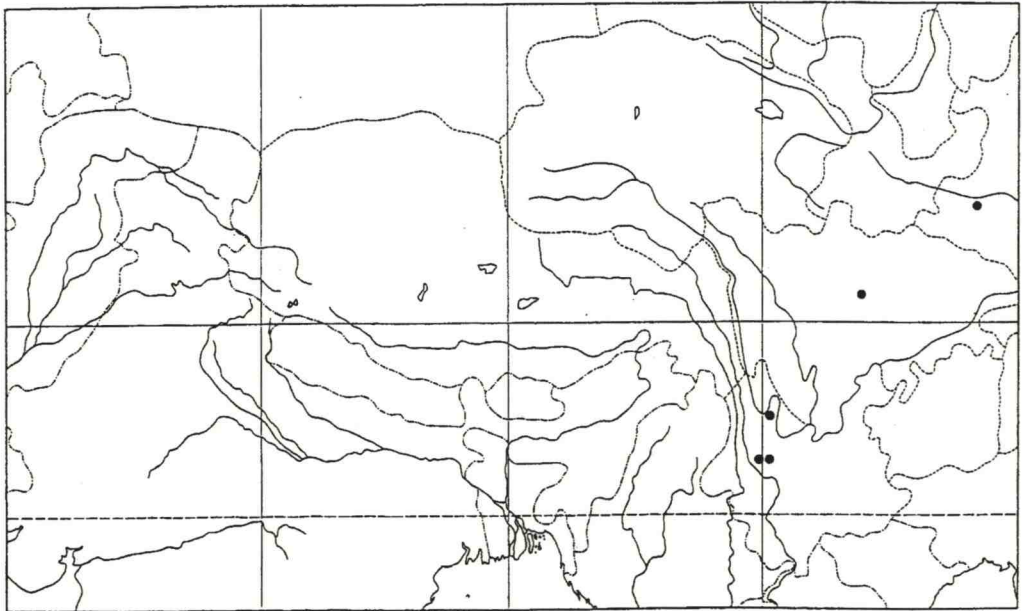


Fig. 43. Distribution map of *Juncus modicus* N. E. Br.

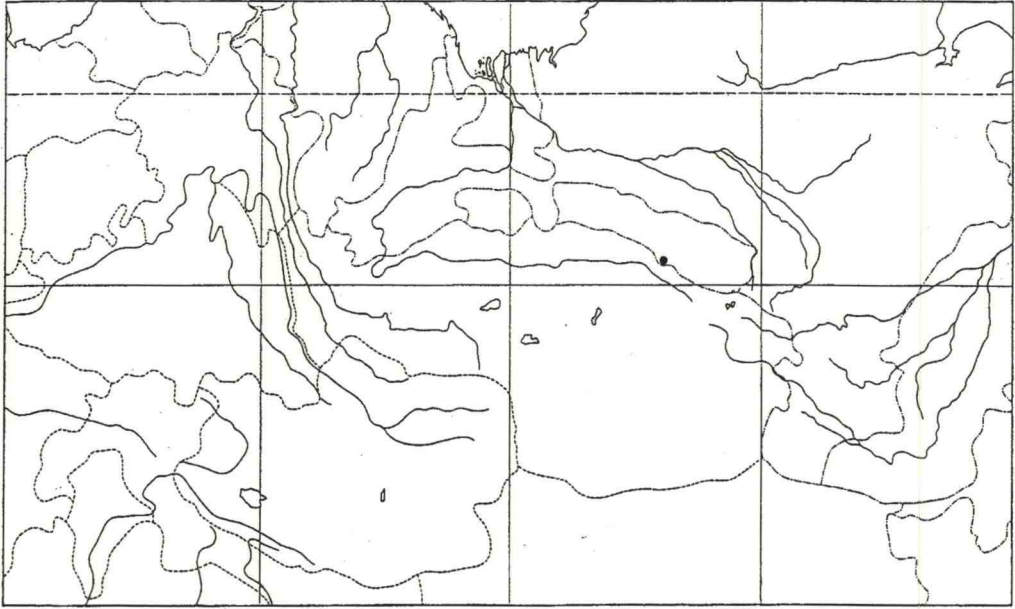


Fig. 44. Distribution map of *Juncus musatangensis* Miyam. et H. Ohba

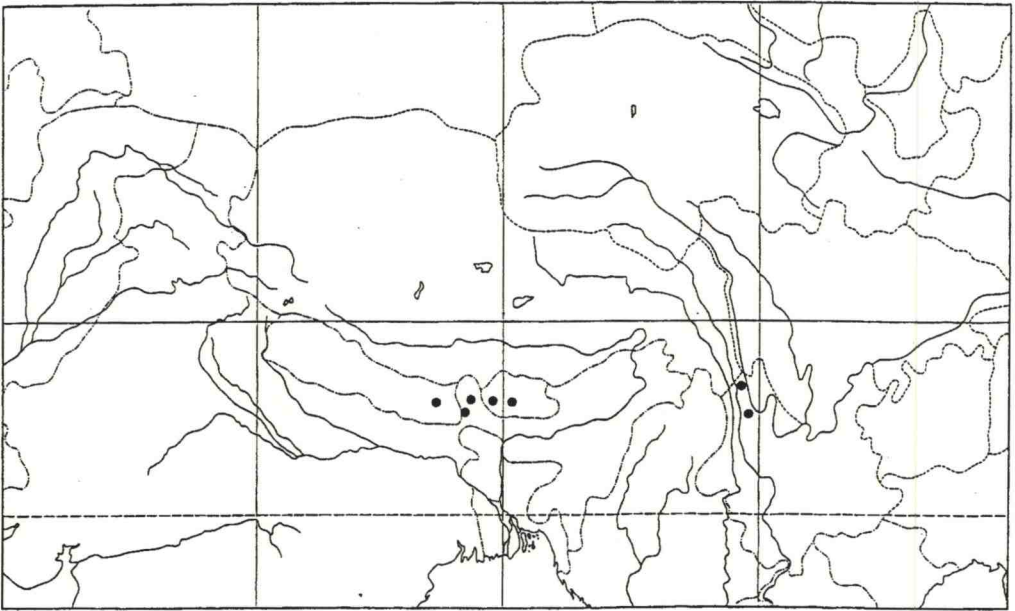


Fig. 45. Distribution map of *Juncus nepalicus* Miyam. et H. Ohba

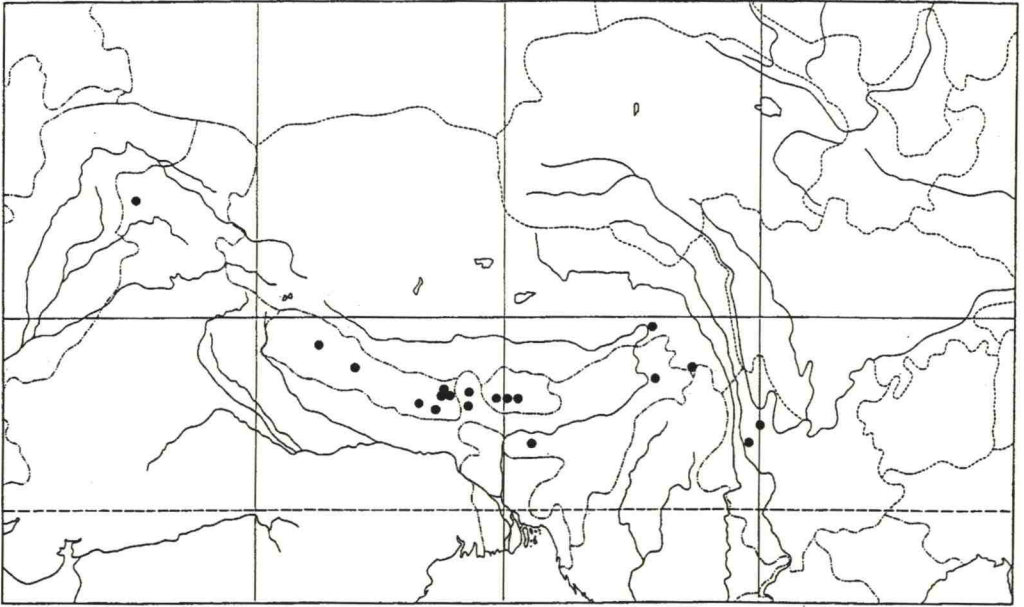


Fig. 46. Distribution map of *Juncus ochraceus* Buchenau

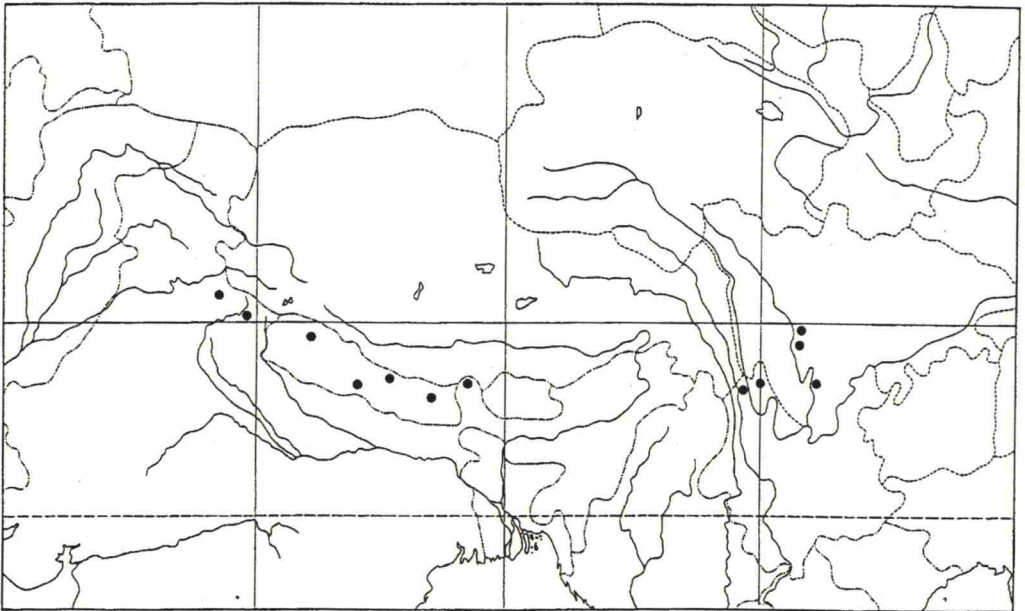


Fig. 47. Distribution map of *Juncus perpusillus* Sam.

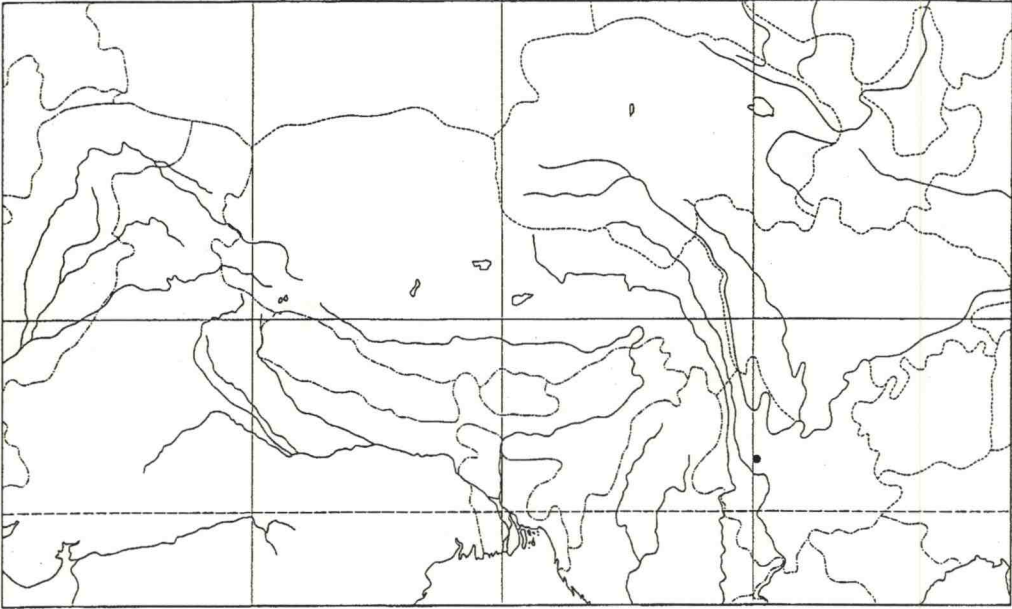


Fig. 48. Distribution map of *Juncus petrophilus* Miyam. & H. Ohba

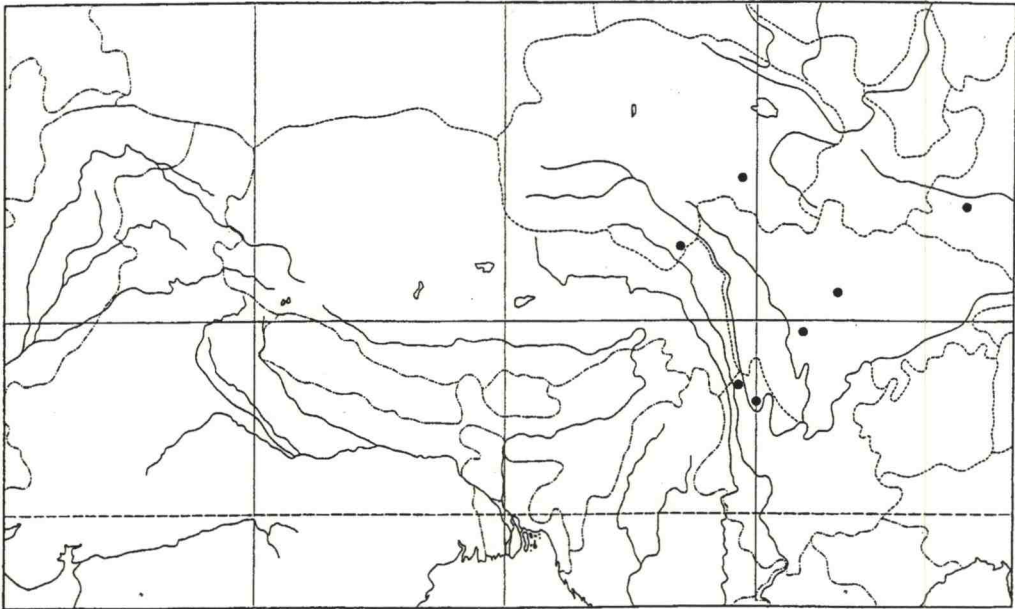


Fig. 49. Distribution map of *Juncus potanii* Buchenau

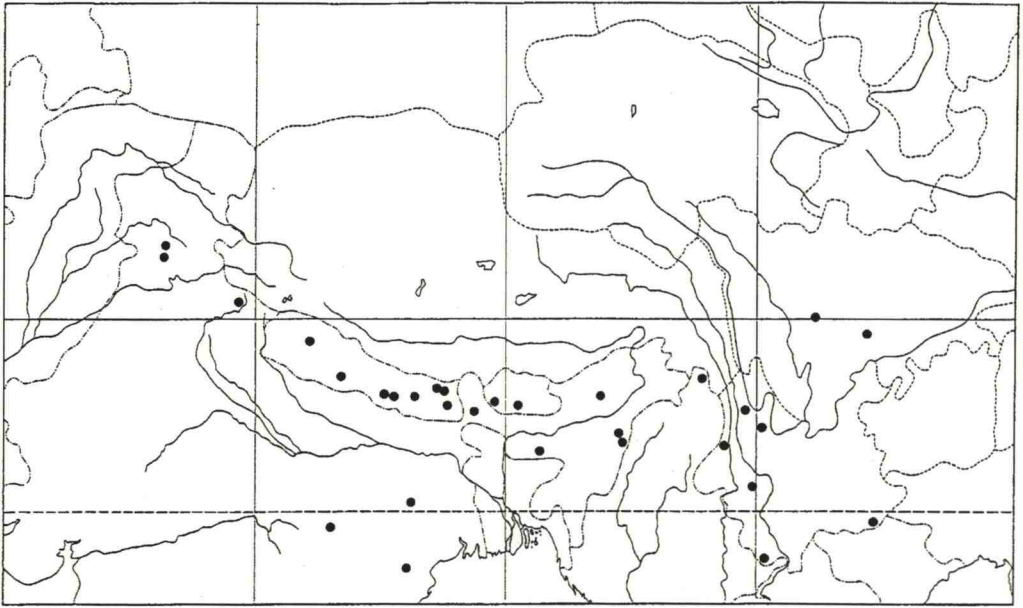


Fig. 50. Distribution map of *Juncus prismatocarpus* R. Br.

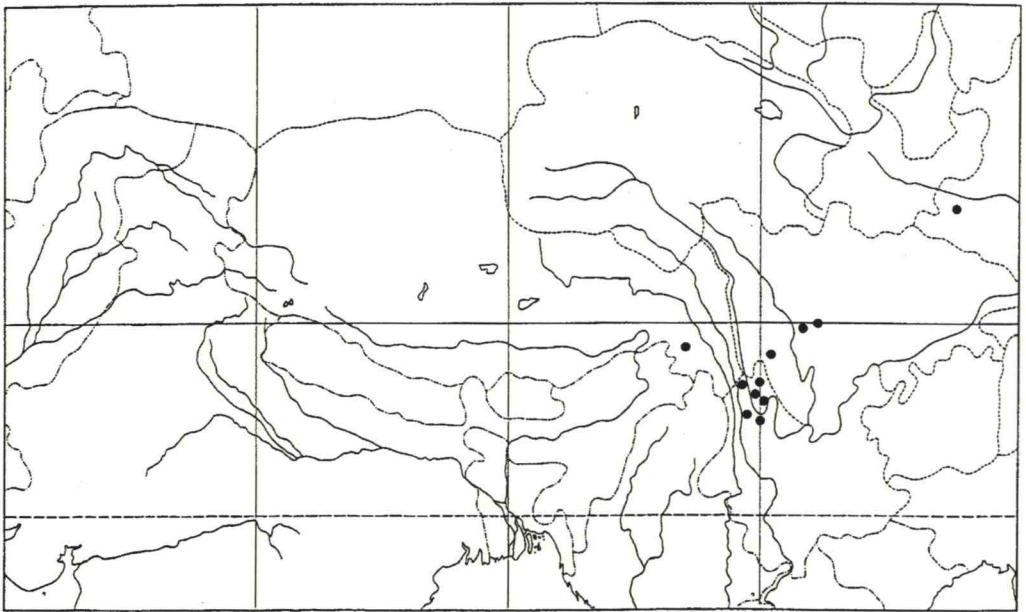


Fig. 51. Distribution map of *Juncus przewarskii* Buchenau

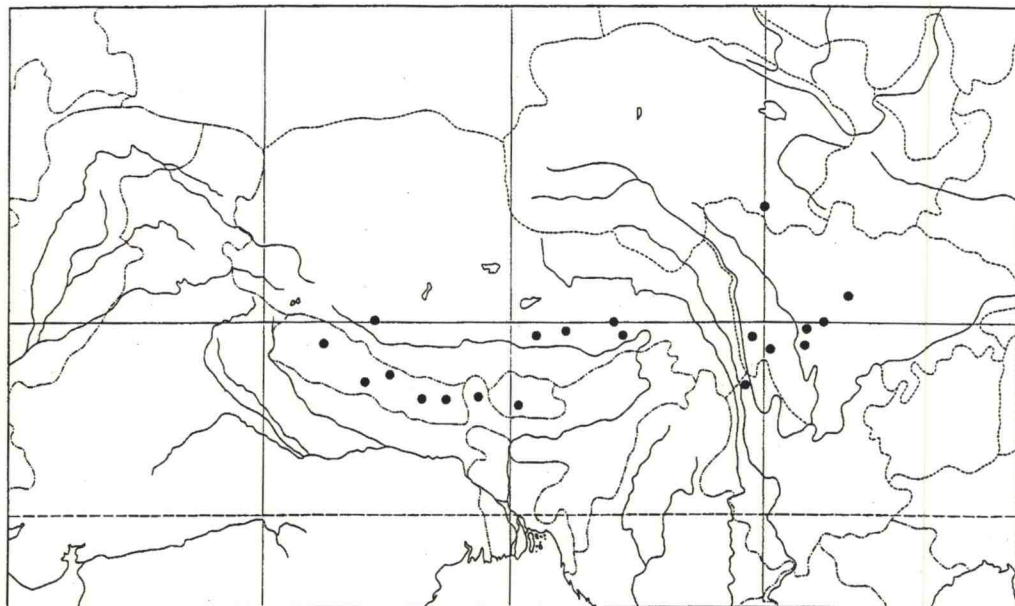


Fig. 52. Distribution map of *Juncus pseudocastaneus* Sam.

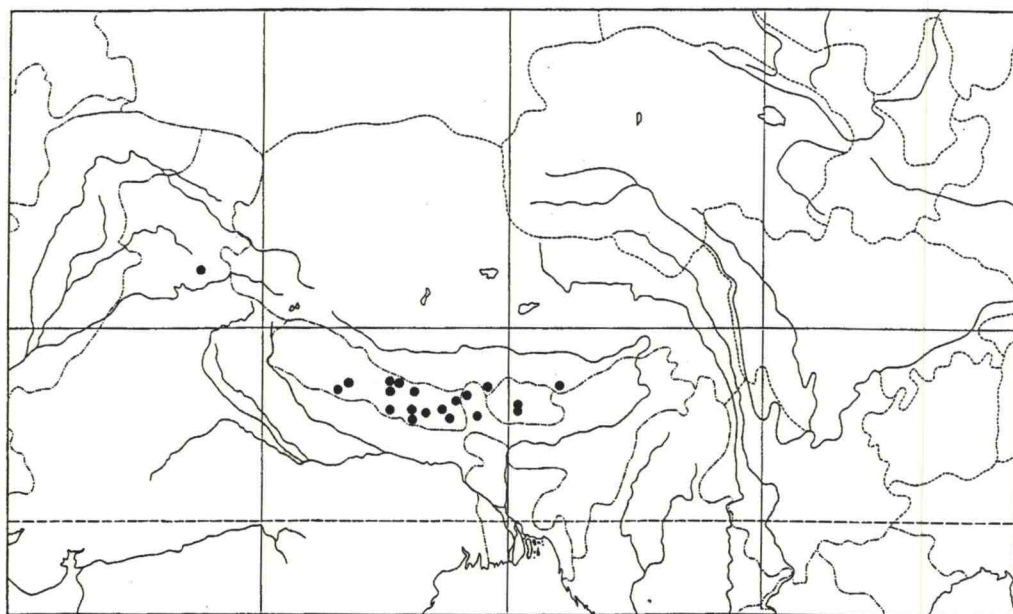


Fig. 53. Distribution map of *Juncus rohtangensis* Goel & Aswal.

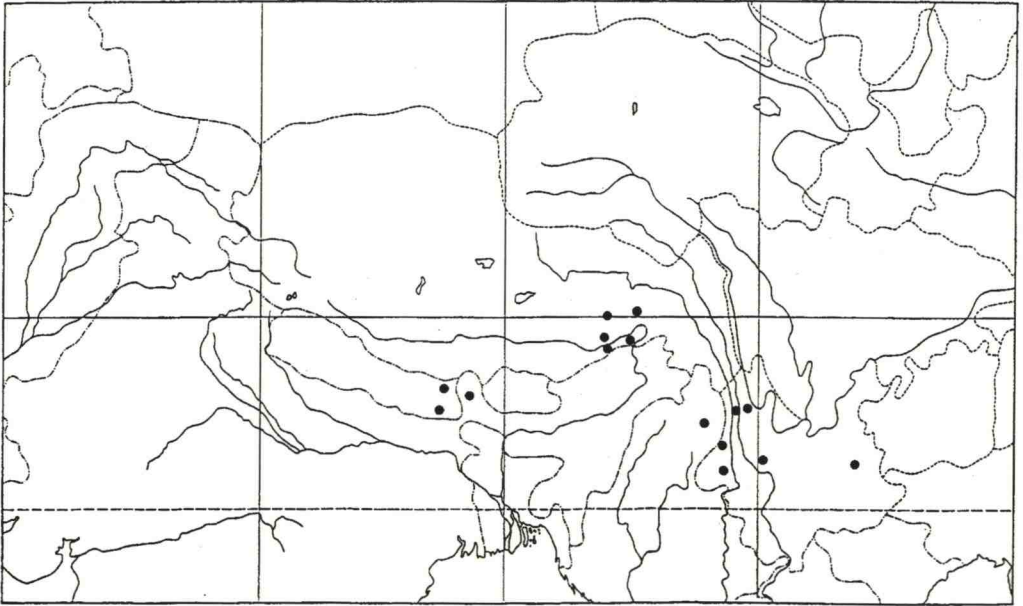


Fig. 54. Distribution map of *Juncus rostricarpus* Miyam. et H. Ohba

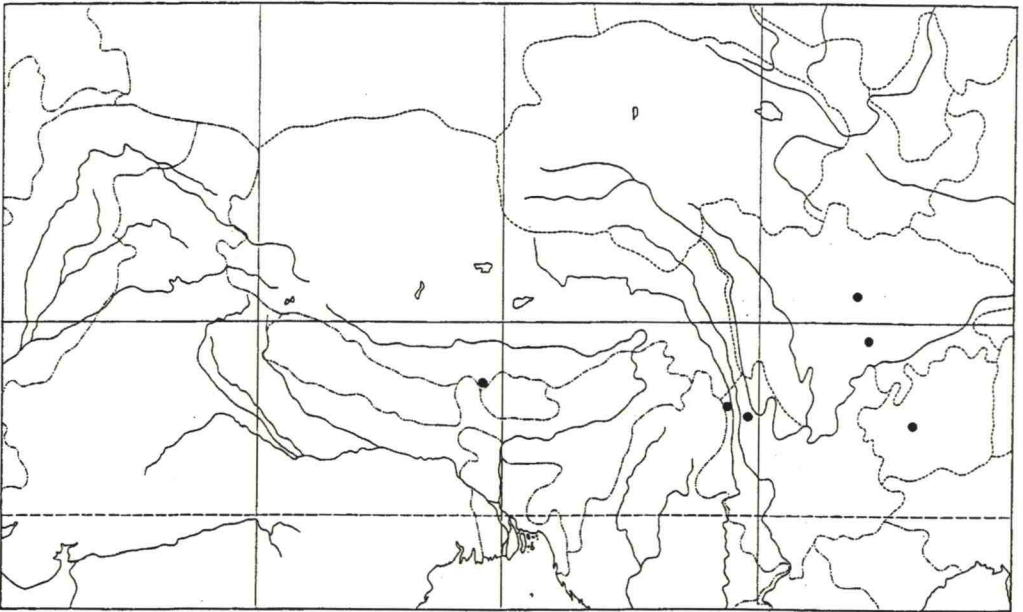


Fig. 55. Distribution map of *Juncus setchuensis* Buchenau

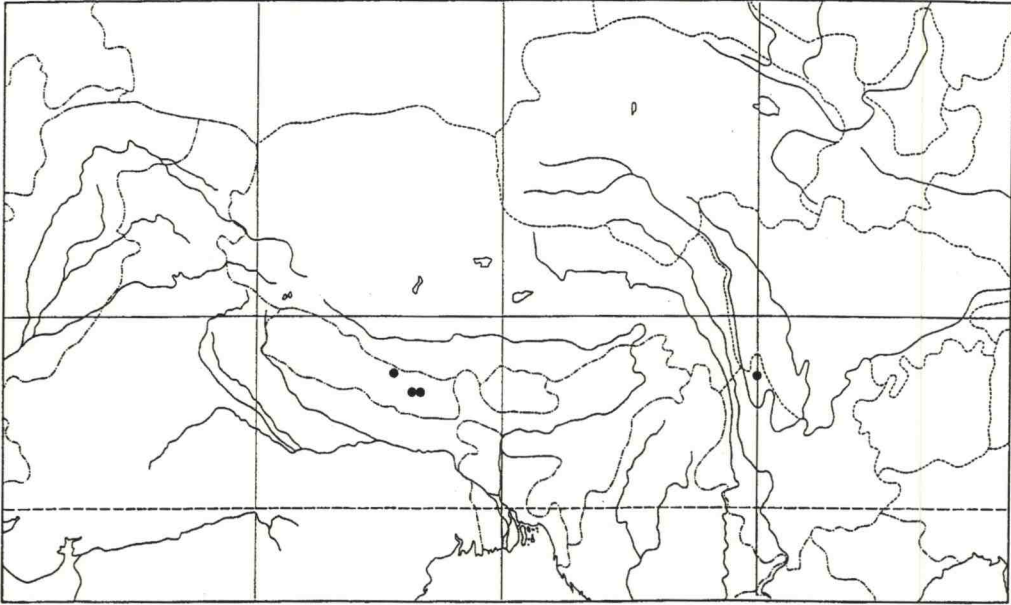


Fig. 56. Distribution map of *Juncus sherei* Miyam & H. Ohba

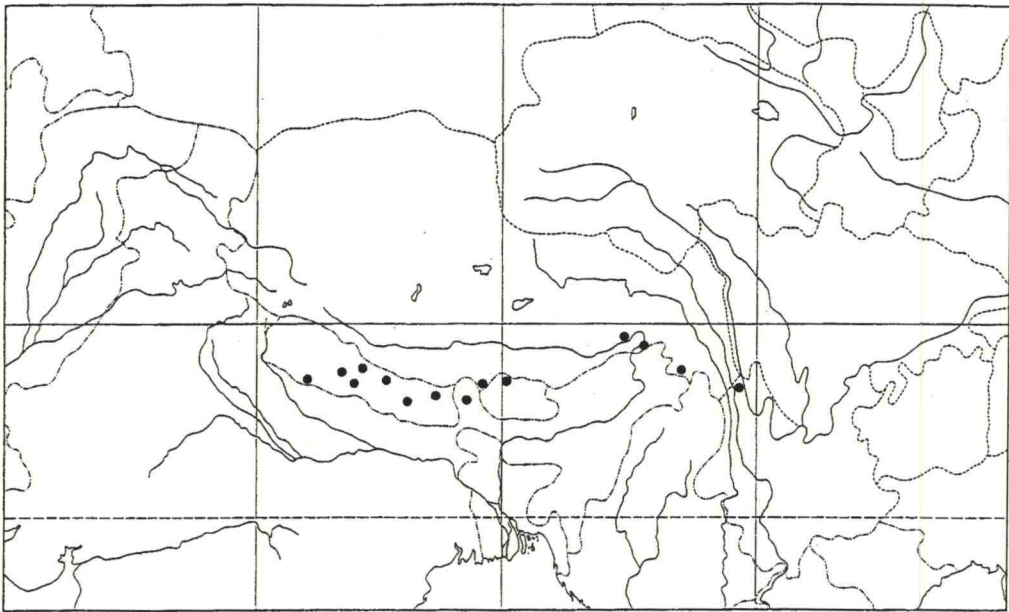


Fig. 57. Distribution map of *Juncus sikkimensis* Hook. f.

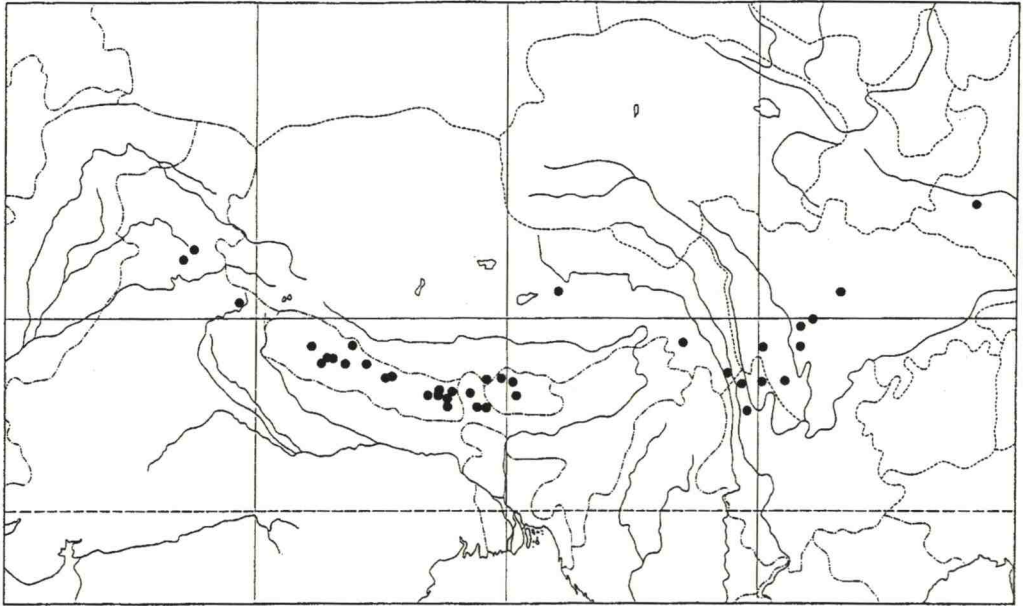


Fig. 58. Distribution map of *Juncus sphacelatus* Decne.

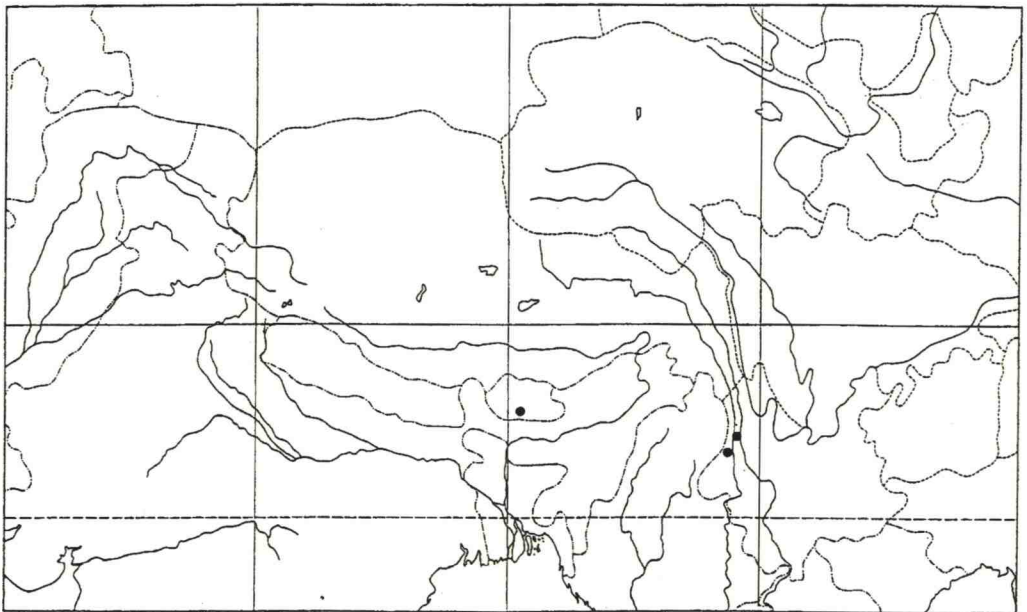


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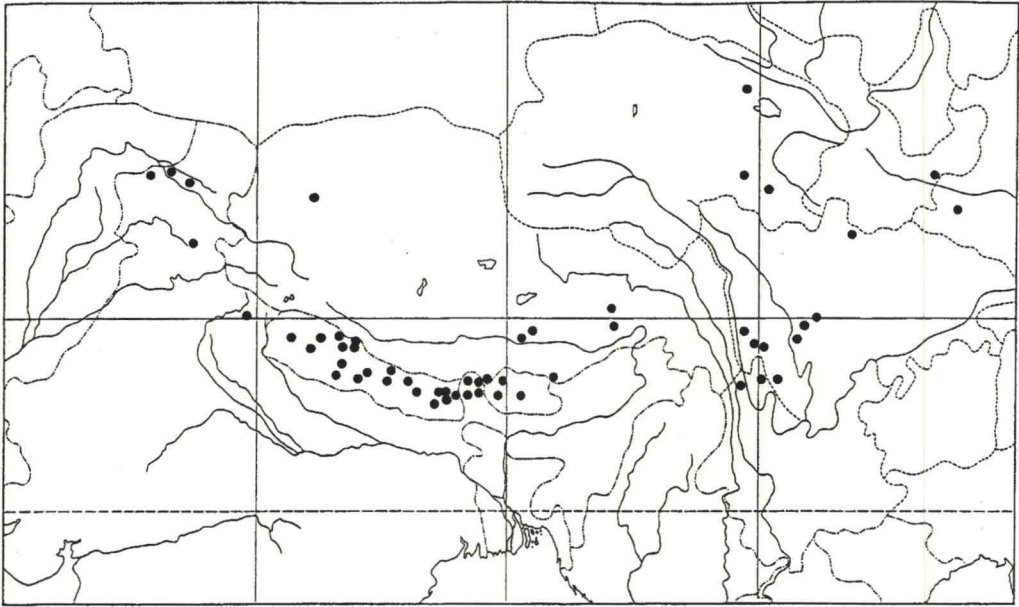


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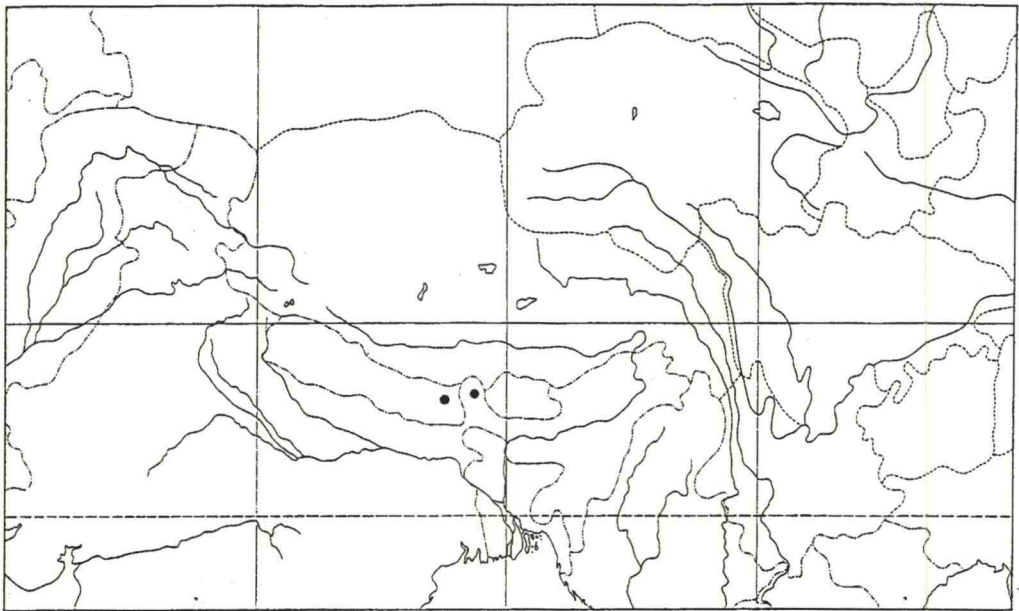


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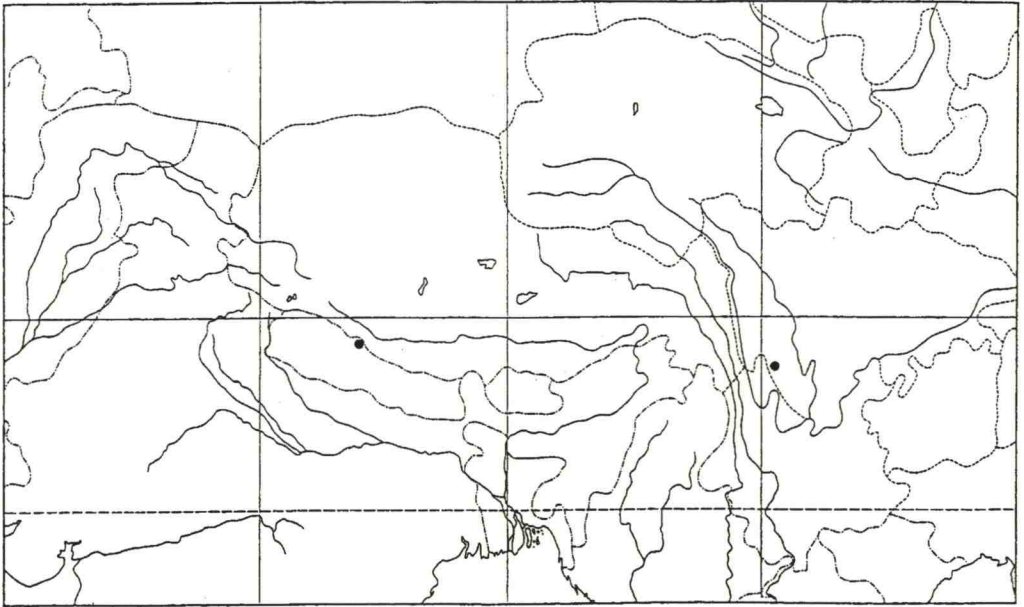


Fig. 62. Distribution map of *Juncus trachyphyllus* Miyam. & H. Ohba

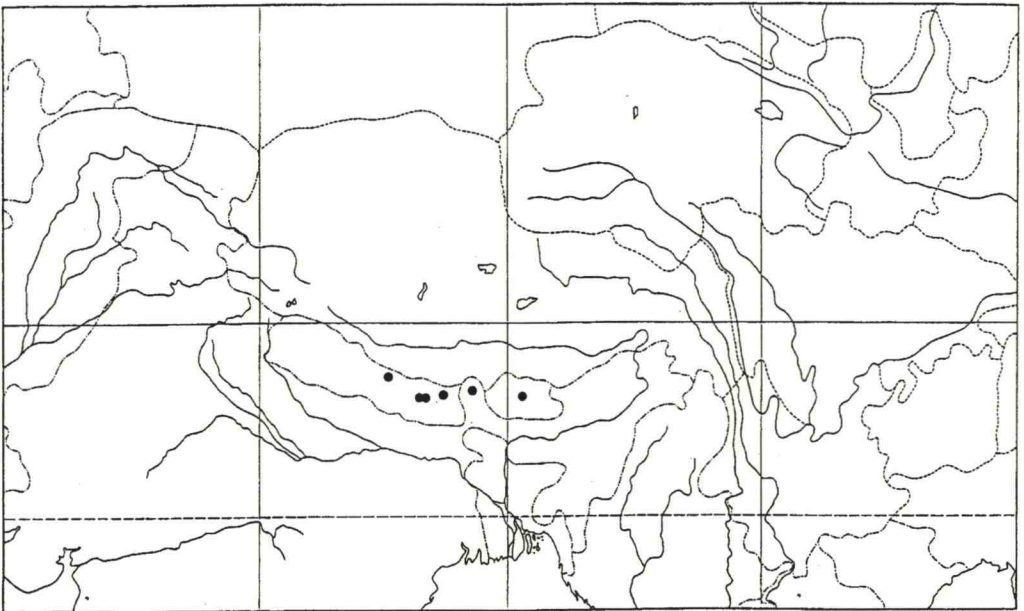


Fig. 63. Distribution map of *Juncus trichophyllus* W. W. Sm.

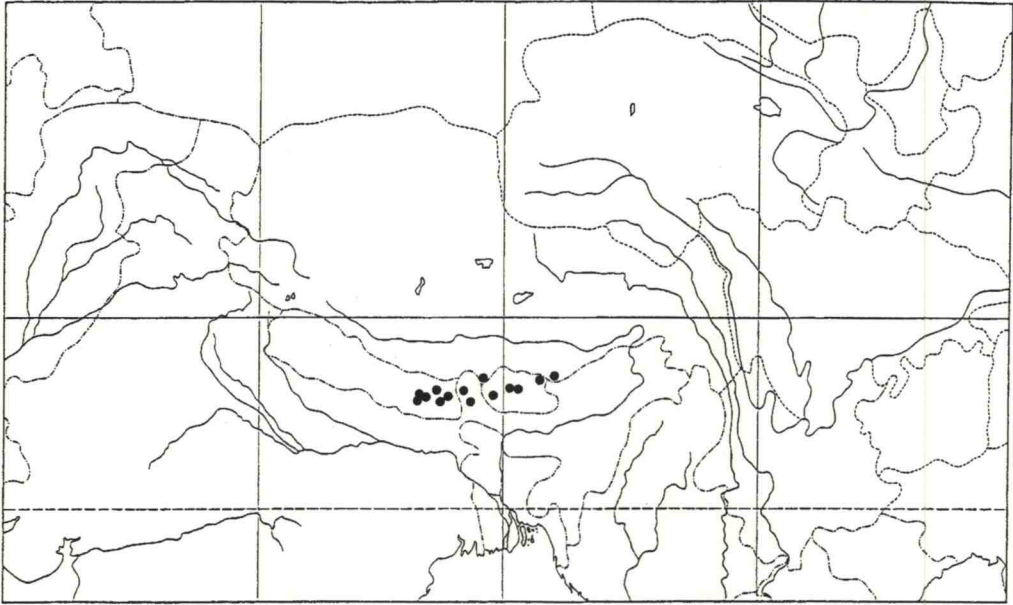


Fig. 64. Distribution map of *Juncus triglumis* L.

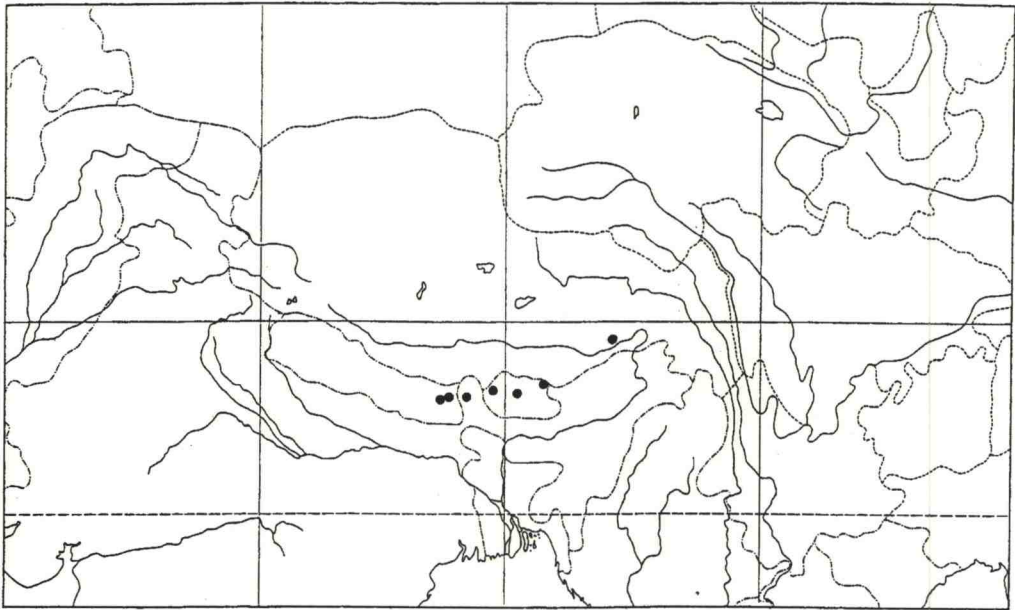


Fig. 65. Distribution map of *Juncus uniflorus* W. W. Sm.

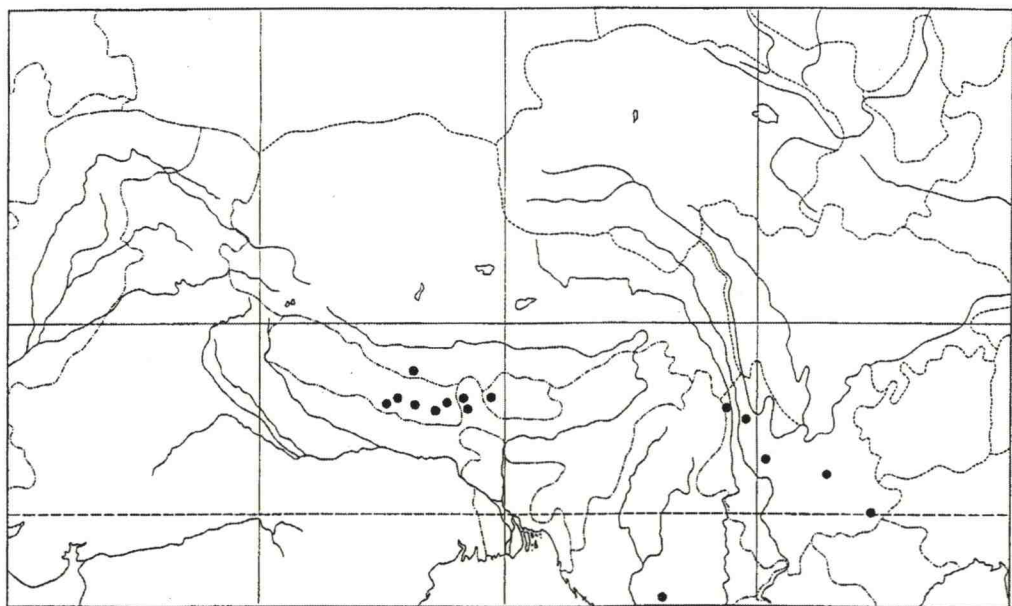


Fig. 66. Distribution map of *Juncus wallichianus* Laharpe

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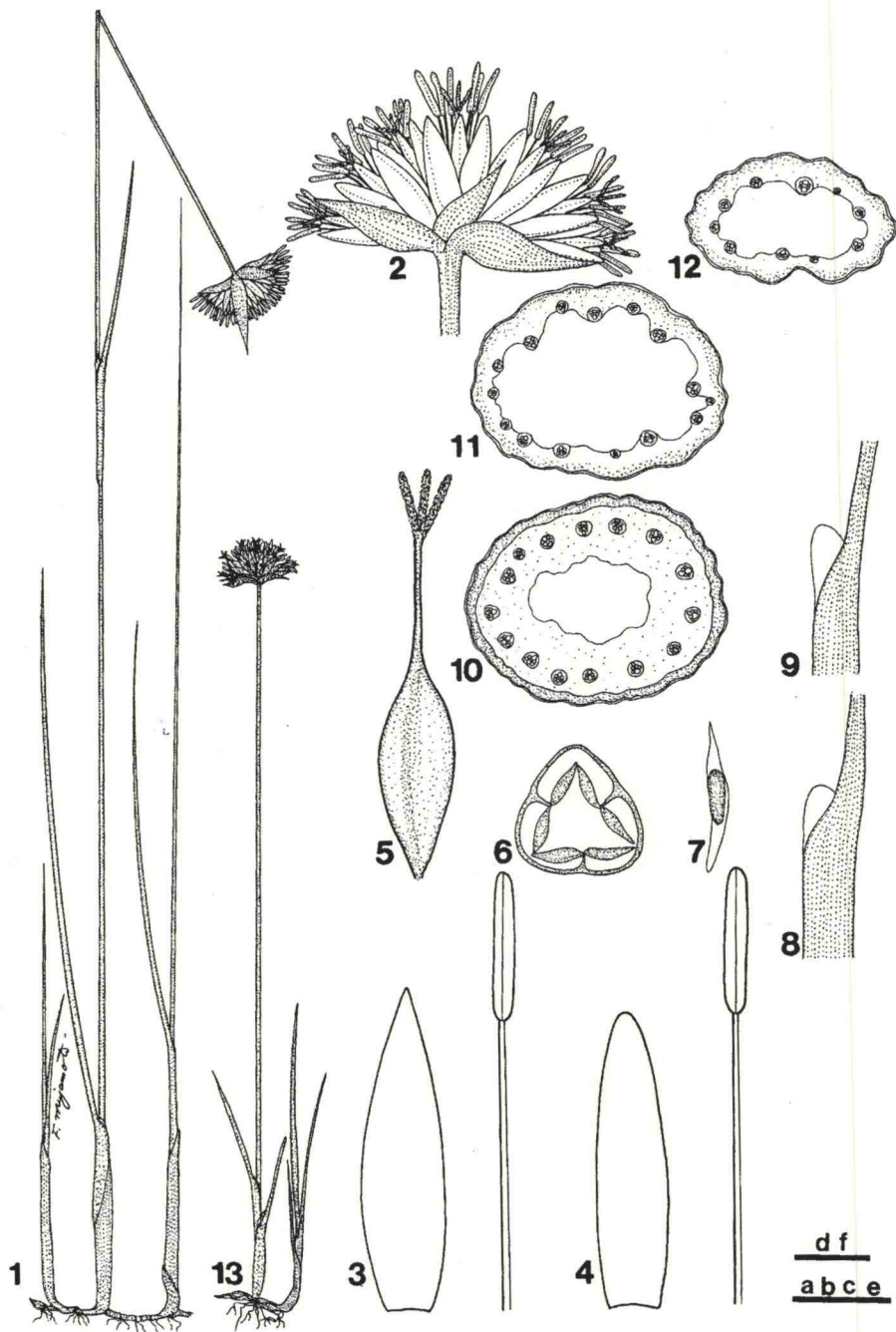


PLATE 1. *Juncus allioides* Franch.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Seed, 8. Auricle of basal leaf, 9. Auricle of cauline leaf, 10. Cross section of lower part of culm, 11. Cross section of basal leaf, 12. Cross section of cauline leaf, 13. Habit. Scales: a (2 cm) for 1 and 13; b (4 mm) for 2, 8 and 9; c (2 mm) for 3, 4 and 5; d (1 mm) for 6; e (1 mm) for 7; f (0.5 mm) for 10, 11 and 12.

Voucher specimen: 1-12, China; Sichuan, Xiaojin, Ganhaizi - Dashuiba - Ganhaizi, 3530 m (H. Ikeda et al. 100826, 31 Aug. 1998, KUN, TI). 13, Nepal; Bagmati zone, Rasuwa Distr., Langtrang Khola - Base camp (near Yala Kharka), 4030 m (F. Miyamoto 9220312, 20 Jul. 1992, TI).

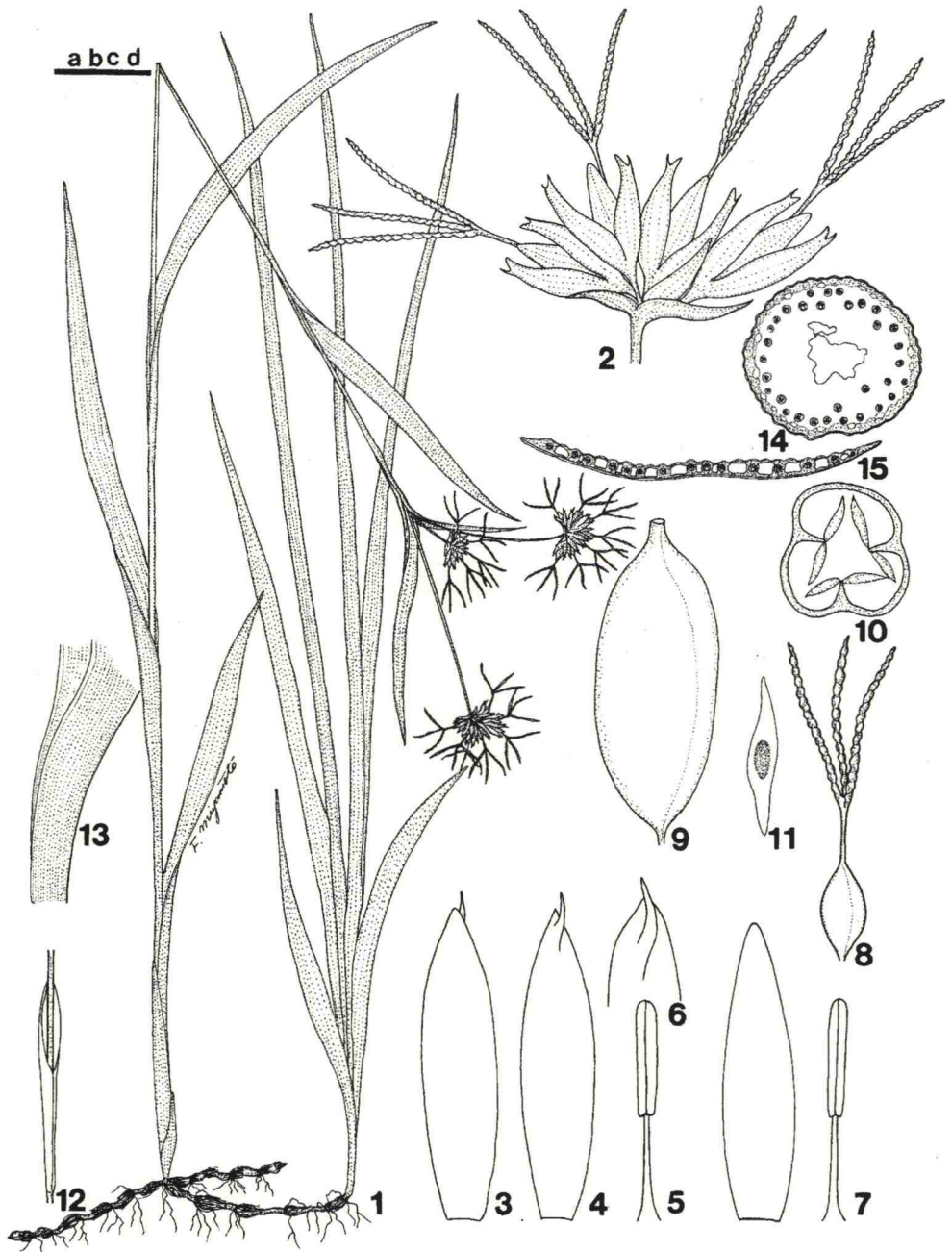


PLATE 2. *Juncus amplifolius* A. Camus

1. Habit, 2. Inflorescence, 3. Adaxial side of outer tepal, 4. Abaxial side of outer tepal, 5. Outer stamen, 6. A hooked appendage at apex of outer tepal, 7. Inner tepal and stamen, 8. Pistil, 9. Capsule, 10. Cross section of capsule, 11. Seed, 12. Sheathing bract on peduncle, 13. Leaf auricle of basal leaf, 14. Cross section of culm, 15. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 8, 12 and 13; c (2 mm) for 3, 4, 5, 7, 9, 10, 11 and 15; d (1 mm) for 6 and 14.

Voucher specimen: China; Sichuan, Xiaojin, Ganhaizi - southwestern slope of Mt. Siguniang - Ganhaizi, 4450 m (H. Ikeda et al. 100838, 1 Sept. 1998, TI)

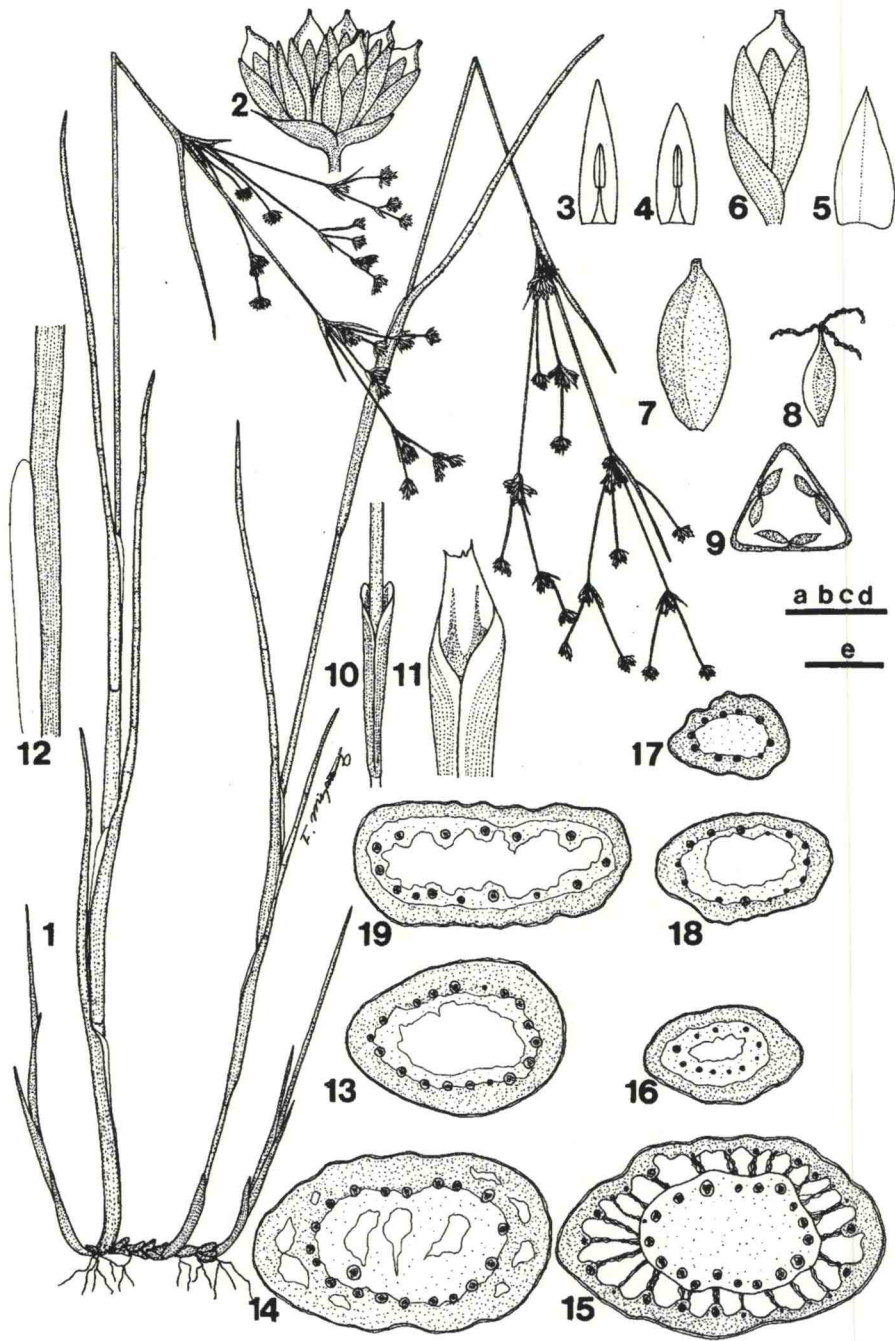


PLATE 3. *Juncus articulatus* L.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Bract, 6. Perianth and capsule, 7. capsule, 8. Pistil, 9. Cross section of capsule, 10. Sheathing bract on peduncle, 11. Apex of sheathing bract, 12. Auricle of basal leaf, 13. Cross section of upper part of culm, 14. Cross section of middle part of culm, 15. Cross section of lower part of culm, 16. Cross section of peduncle, 17. Cross section of lowest bract, 18. Cross section of upper part of cauline leaf, 19. Cross section of lower part of cauline leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 12; c (2 mm) for 3, 4, 5, 6, 7, 8 and 10; d (1 mm) for 9 and 11; e (0.5 mm) for 13, 14, 15, 16, 17, 18 and 19.

Voucher specimen: Pakistan; Baltistan, Skardu - Katzarah, 2400 m (S. Takatsuki et al. 9360001, 26 Jul. 1993, TI).



PLATE 4. *Juncus benghalensis* Kunth

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of cauline leaf basal leaf, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of lower part of lowest bract, 12. Cross section of upper part of lowest bract, 13. Cross section of lower part of basal leaf, 14. Cross section of upper part of basal leaf, 15. Cross section of lower part of cauline leaf, 16. Cross section of upper part of cauline leaf, 17. Habit. Scales: a (2 cm) for 1 and 17; b (4 mm) for 2 and 8; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7; e (0.5 mm) for 9, 10, 11, 12, 13, 14, 15 and 16.

Voucher specimen: 1-16, Nepal; Koshi zone, Sankhuwa Sabha Distr., Bhainsi Karka - Khongma, 3300 m (M. Minaki et al. 920560, 4 Aug. 1990, TI). 17, Bhutan; Wangdi Phodrang distr. Tampe La, 4400 m (F. Miyamoto 9361687, 25 Sept. 1993, TI).

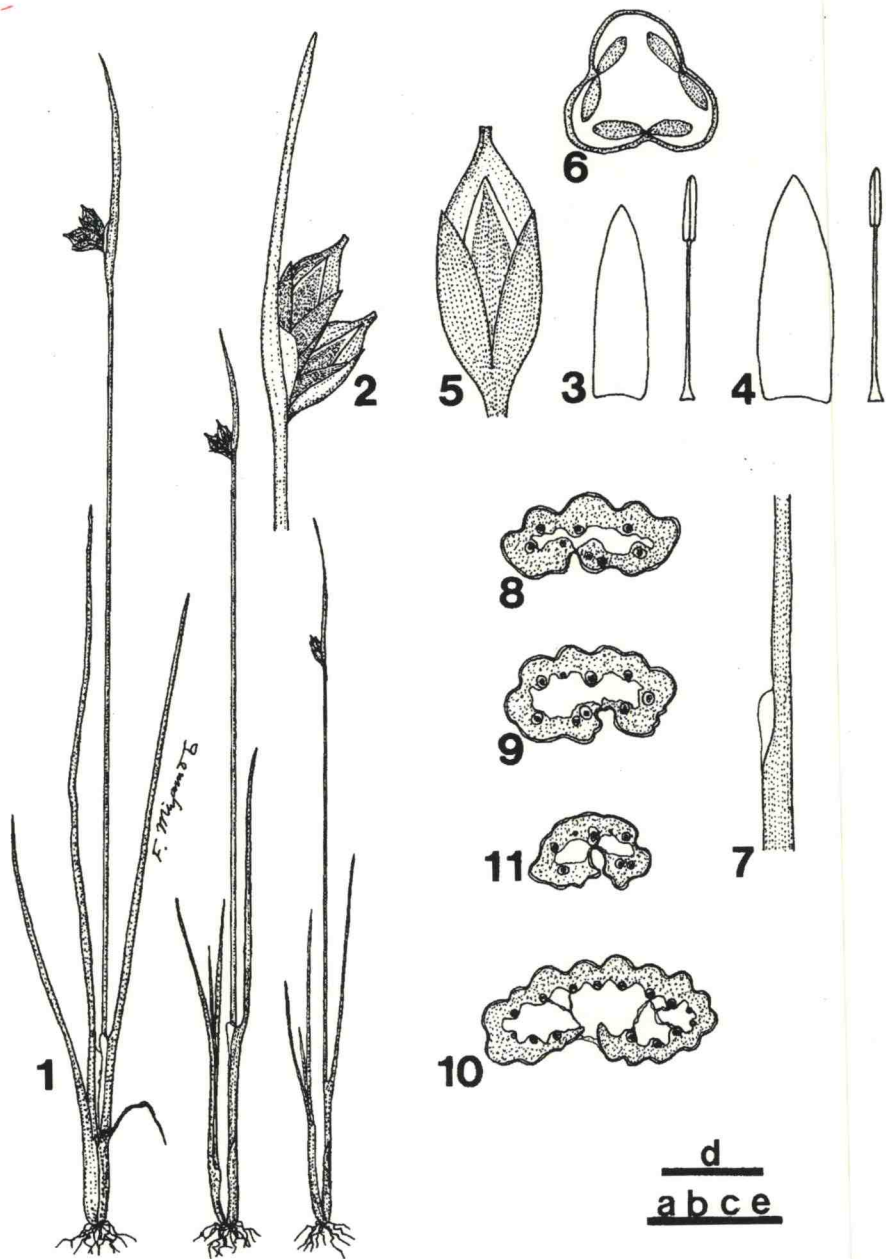


PLATE 5. *Juncus biglumoides* H. Hara

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and capsule, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of upper part of culm, 9. Cross section of lower part of culm, 10. Cross section of basal leaf, 11. Cross section of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2; c (2 mm) for 3, 4, 5 and 7; d (1 mm) for 6; e (0.5 mm) for 8, 9, 10 and 11. Voucher specimen: Nepal; Rambrong, Lamjung Himal, 12000 ft. (J. D. A. Stainton et al. 6029, 29 Jul. 1954, TI).

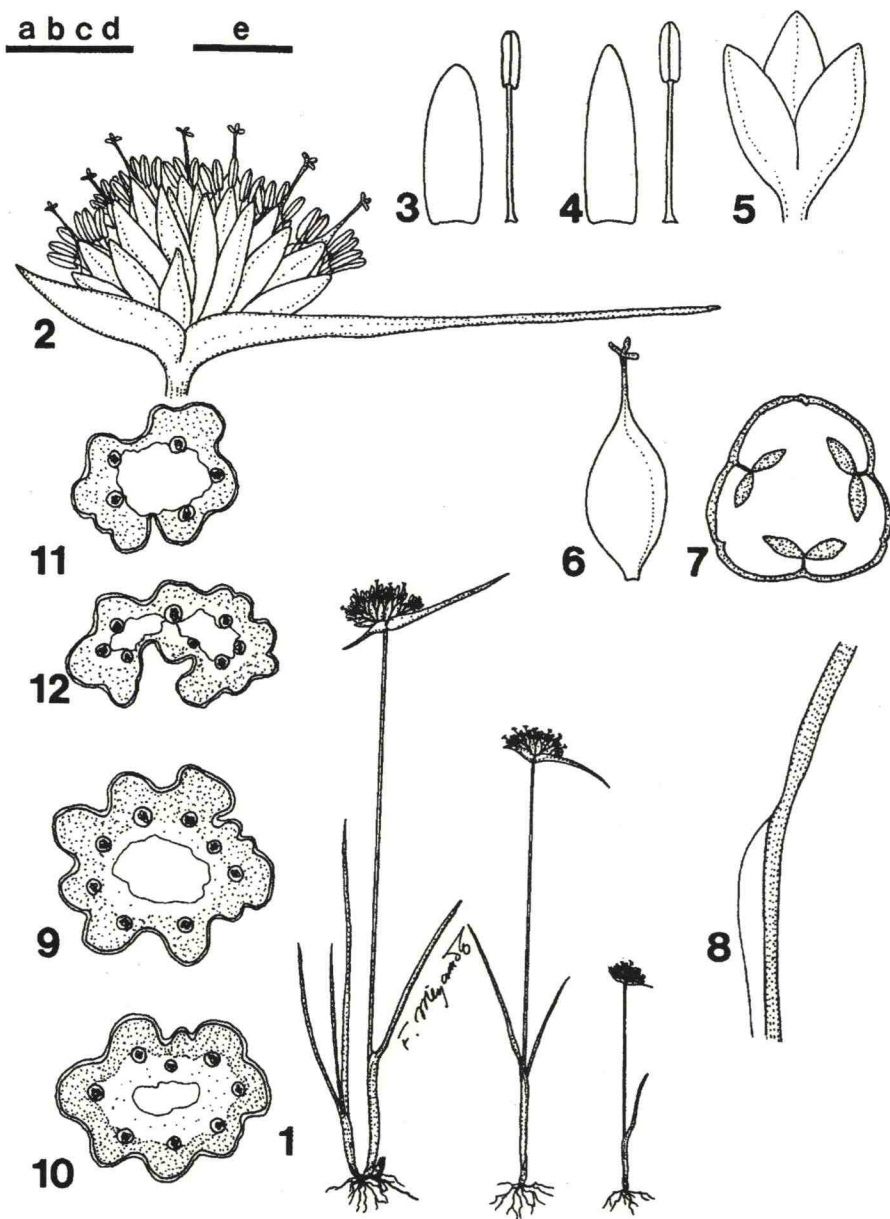


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1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of lowest bract, 12. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 8; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7; e (0.5 mm) for 9, 10, 11 and 12.

Voucher specimen: Bhutan; Wangdi Phodrang Distr., Tampe La, 4400 m (F. Miyamoto 9361692, 25 Sept. 1993, TI).

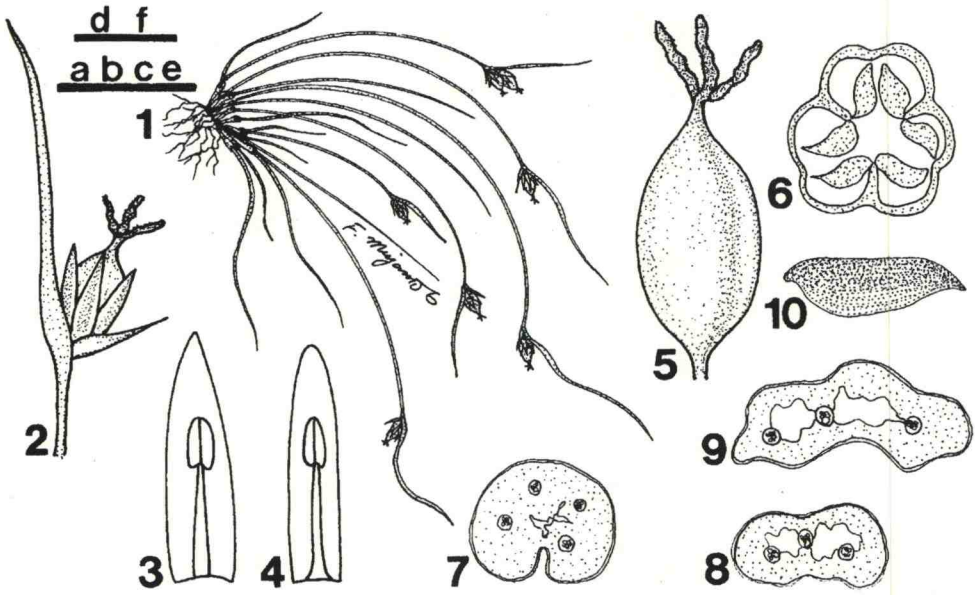


PLATE 7. *Juncus bryophilus* Noltie

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Cross section of middle part of culm, 8. Cross section of basal leaf, 9. Cross section of Lowest bract, 10. Seed. Scales: a (2 cm) for 1; b (4 mm) for 2; c (2 mm) for 3, 4 and 5; d (1 mm) for 6; e (0.5 mm) for 7, 8 and 9; f (0.5 mm) for 10.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., a Kharka - Pati Kharka, 3650 m (F. Miyamoto et al. 9410195, 4 Aug. 1994, TI).

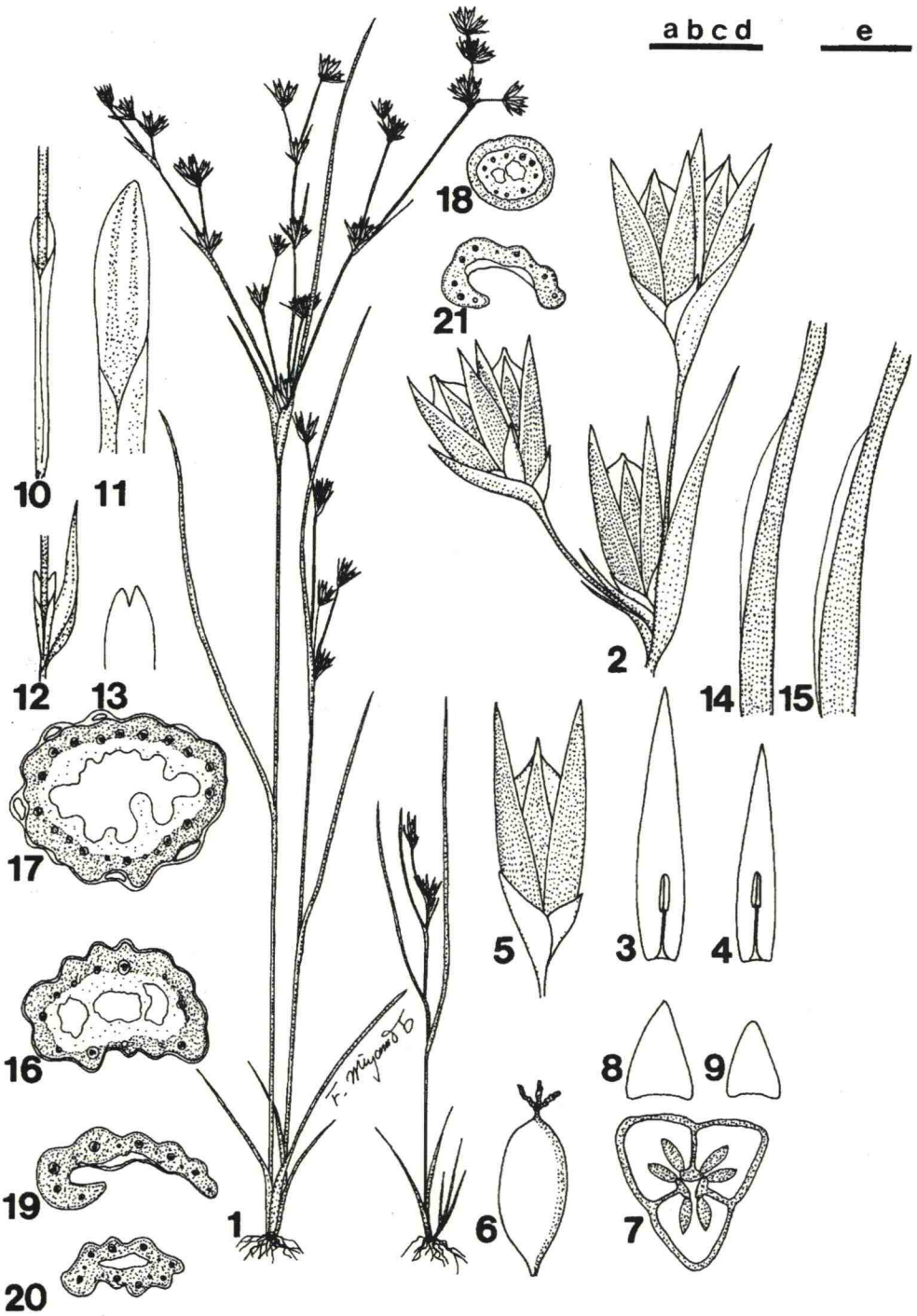


PLATE 8. *Juncus bufonius* L.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and capsule, 6. Pistil, 7. Cross section of capsule, 8. Outer bract, 9. Inner bract, 10, 12. Sheathing bract on peduncle, 11, 13. Apex of sheathing bract, 14. Auricle of cauline leaf, 15. Auricle of basal leaf, 16. Cross section of upper part of culm, 17. Cross section of lower part of culm, 18. Cross section of peduncle, 19. Cross section of cauline leaf, 20. Cross section of basal leaf, 21. Cross section of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2, 11, 13, 14 and 15; c (2 mm) for 3, 4, 5, 6, 8, 9, 10 and 11; d (1 mm) for 7; e (0.5 mm) for 16, 17, 18, 19, 20 and 21.

Voucher specimen: Bhutan; Thimphu - Wangdu Phodrang, 1450-3200 m (H. Kanai et al. 4493, 9 Apr. 1967, TI).

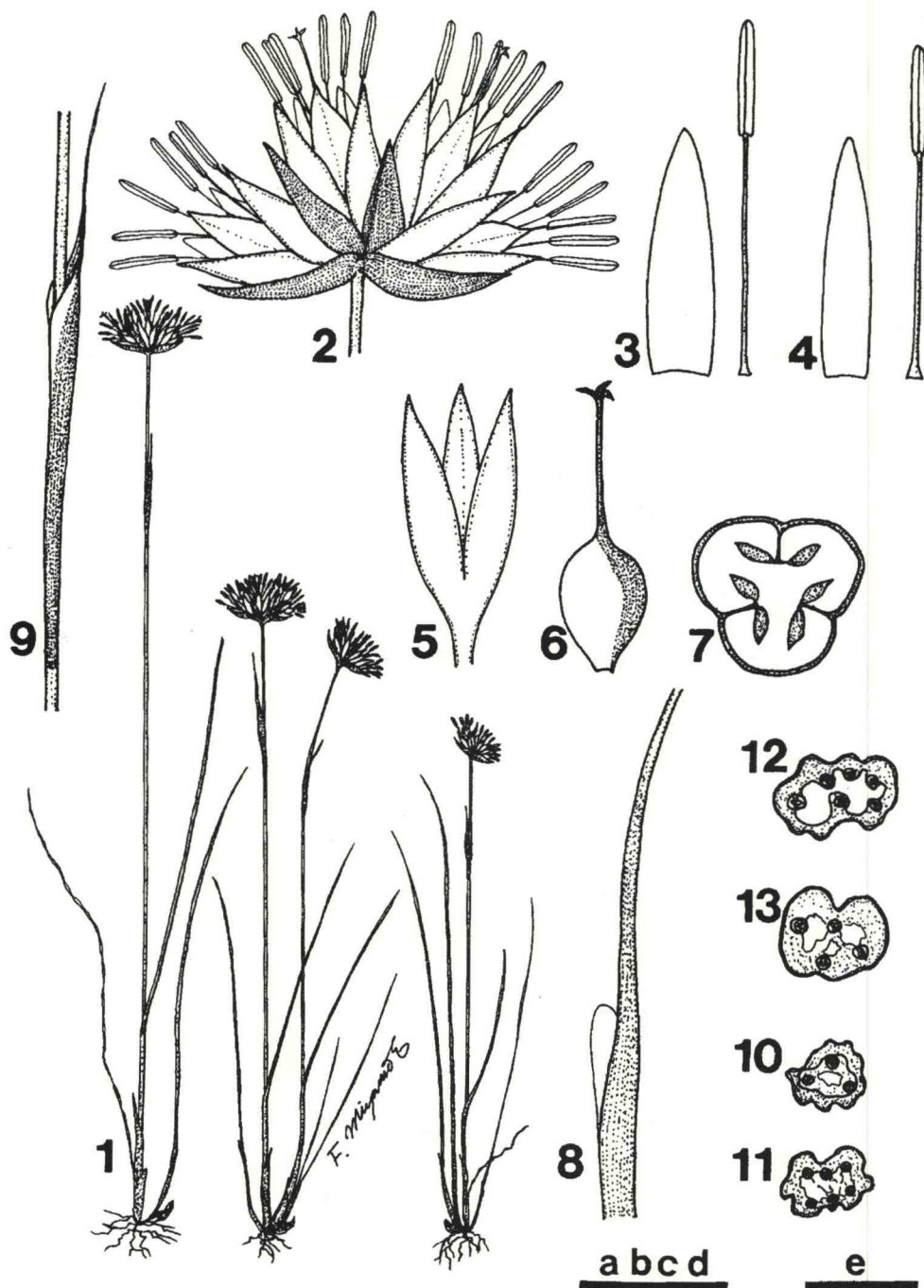


PLATE 9. *Juncus cephalostigma* Sam.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cauline leaf, 10. Cross section of part of culm, 11. Cross section of lower part of culm, 12. Cross section of upper part of basal leaf, 13. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 8; c (2 mm) for 3, 4, 5, 6 and 9 d (1 mm) for 7; e (0.5 mm) for 10, 11, 12 and 13.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, Surveying the whole area around Shipton Pass, 4400 m (M. Minaki et al. 9020683, 7 Aug. 1990, TI).

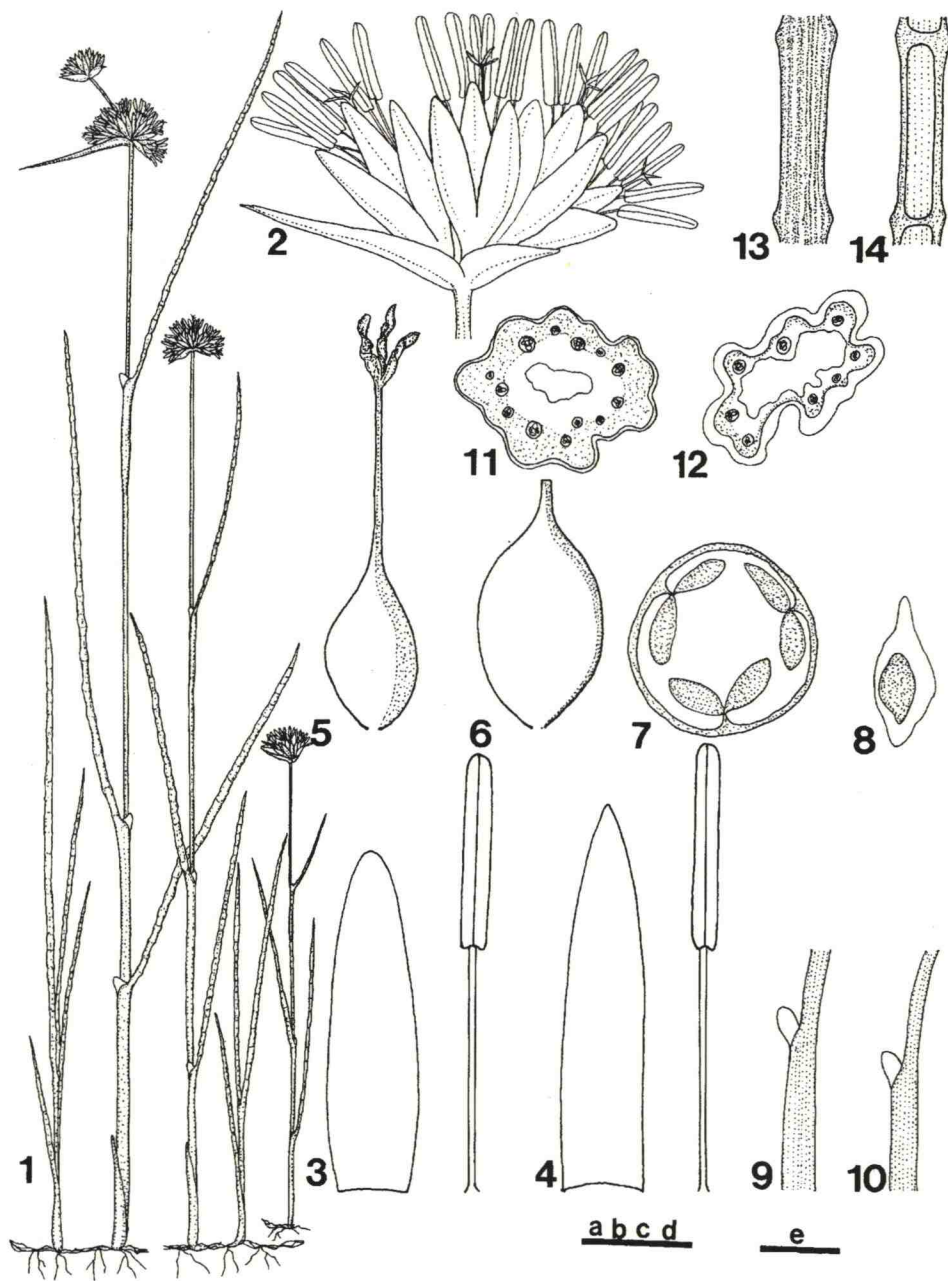


PLATE 10. *Juncus chrysocarpus* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Capsule, 7. Cross section of capsule, 8. Seed, 9. Auricle of basal leaf, 10. Auricle of cauline leaf, 11. Cross section of culm, 12. Cross section of basal leaf, 13. transverse septa of basal leaf, 14. Longitudinal section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9 and 10; c (2 mm) for 3, 4, 5, 6, 13 and 14; d (1 mm) for 7; e (0.5 mm) for 8, 11 and 12.

Voucher specimen: Nepal; Rasuwa, Lipchet Kharka - Makgan Kharka - Guinsi (near Balche), 3320m (F. Miyamoto et al. 9410324, 16 Aug. 1994, TI).



PLATE 11. *Juncus clarkei* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Auricle of cauline basal leaf, 9. Cross section of peduncle, 10. Cross section of culm, 11. Cross section of lowest bract, 12. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 8; c (2 mm) for 3, 4, 5 and 7; d (1 mm) for 6; e (0.5 mm) for 9, 10, 11 and 12. Voucher specimen: Bhutan; Wangdi Phodrang Distr., Bhja - Maorothang, 3350 m (F. Miyamoto 9361535, 19 Sept. 1993, TT).

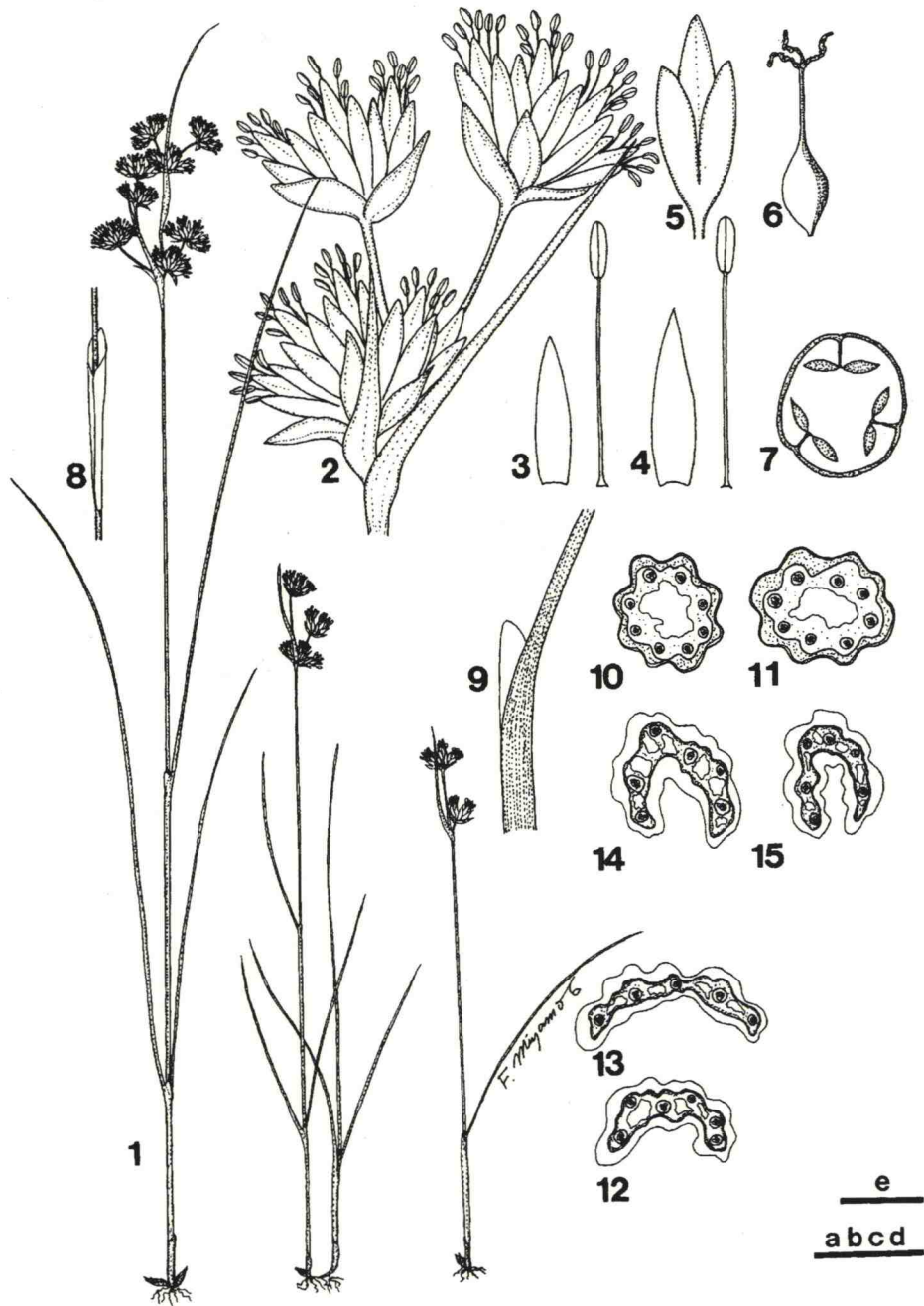


PLATE 12. *Juncus concinnus* D. Don

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. Auricle of cauline leaf, 10. Cross section of upper part of culm, 11. Cross section of lower part of culm, 12. Cross section of upper part of lowest bract, 13. Cross section of lower part of lowest bract, 14. Cross section of upper part of basal leaf, 15. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 9; c (2 mm) for 3, 4, 5, 6 and 8; d (1 mm) for 7; e (0.5 mm) for 10, 11, 12, 13, 14 and 15.

Voucher specimen: Nepal; Janakpur zone, Ramechhap Distr., Neju - Choarma, 3651-2760 m (H. Ohba et al. 8571114-bis, 2 Aug. 1985, TI).

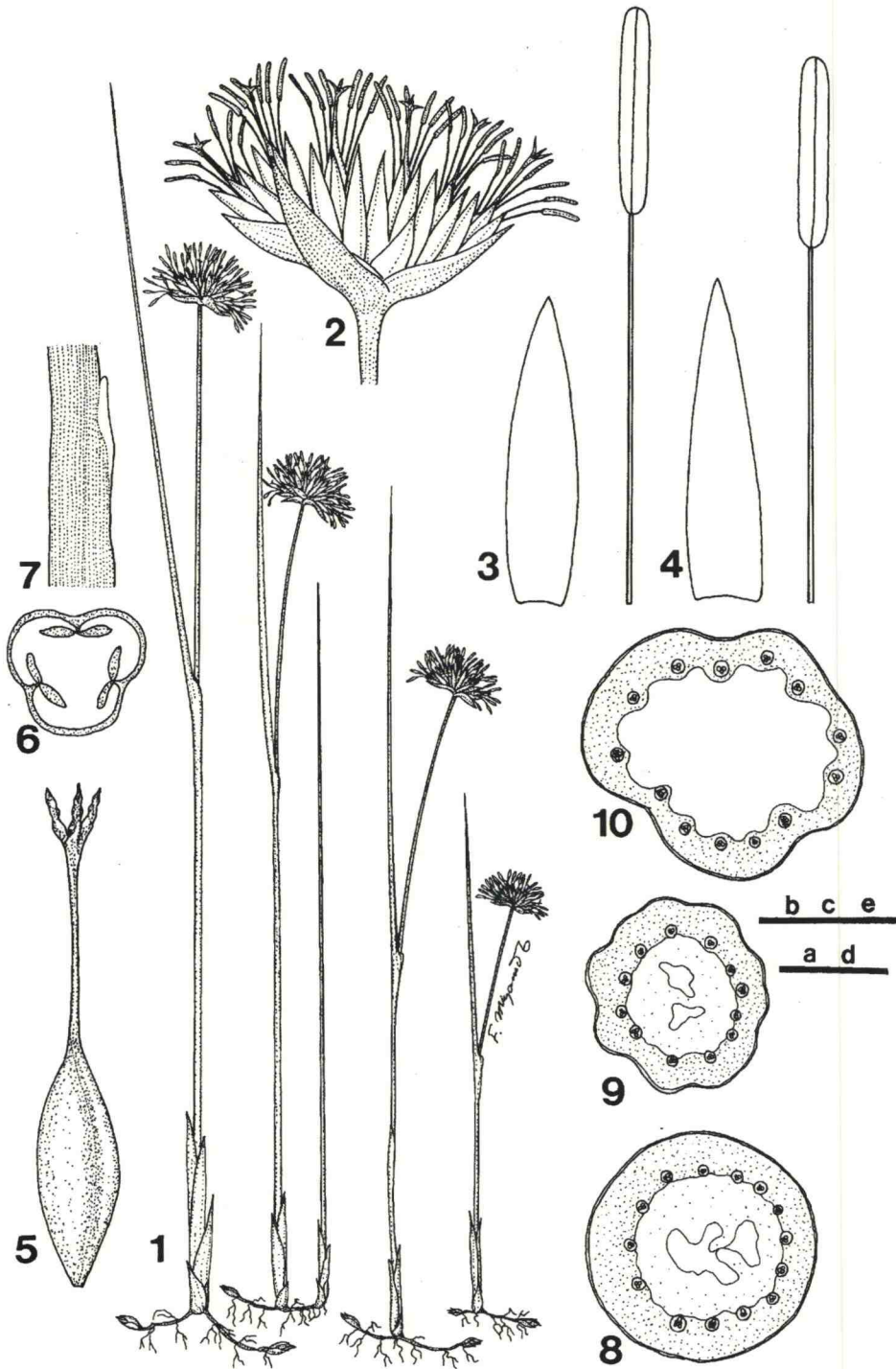


PLATE 13. *Juncus concolor* Sam.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Leaf auricle, 8. Cross section of lower part of culm, 9. Cross section of upper part of culm, 10. Cross section of cauline leaf. Scales: a (2cm) for 1; b (5mm) for 2 and 7; c (2.5 mm) for 3, 4, and 5; d (1mm) for 6; e (1.5 mm) for 8, 9, and 10.

Voucher specimen: China. Yunnan, Yangbi, around Cangshan, Yangbi side, 3800 m (S. K. Wu et al. 475, 17 Aug. 1997, TI).



PLATE 14. *Juncus crassistylus* A. Camus

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Auricle of basal leaf, 9. Cross section of culm, 10. Cross section of peduncle, 11. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 7 and 8; c (2 mm) for 3, 4, 5; d (1 mm) for 6; e (0.5 mm) for 9, 10 and 11.

Voucher specimen: China; Yunnan, Tsang-chan, parmiles bambous, 3500 m (P. J. M. Delavey 2656, 20 Aug. 1887, TI).



PLATE 15. *Juncus dongchuanensis* K. F. Wu.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Proliferous flower, 8. Leaf auricle, 9. Sheathing bract on peduncle, 10. Cross section of lower part of culm, 11. Cross section of cauline leaf. Scales: a (2cm) for 1; b (7.5 mm) for 2; c (5 mm) for 8 and 9, d: (2.5 mm) for 3, 4, 5, and 7; e (1mm) for 6, 10, and 11.

Voucher specimen: China; Yunnan, Dali, Cangshan, 3410 m (S. K. Wu et al. 1611, 1 Sep. 1996, TI).

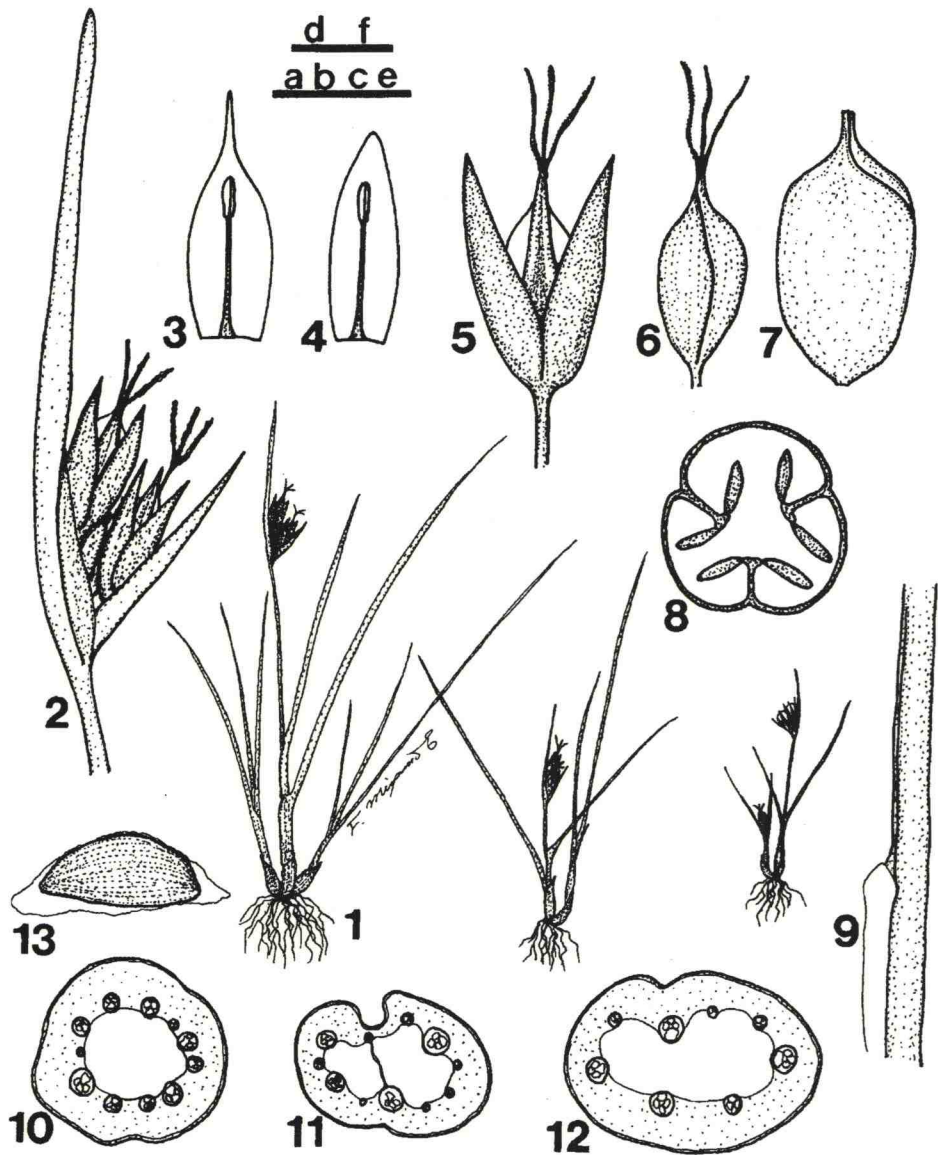


PLATE 16. *Juncus duthiei* (C. B. Clarke) Noltie
 1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Flower, 6. Pistil, 7. Capsule, 8. Cross section of capsule, 9. Auricle of basal leaf, 10. Cross section of culm, 11. Cross section of lowest bract, 12. Cross section of basal leaf, 13. Seed. Scales: a (2 cm) for 1; b (4 mm) for 2 and 9; c (2 mm) for 3, 4, 5, 6 and 7; d (1 mm) for 8; e (0.5 mm) for 10, 11 and 12; f (0.5 mm) for 13.
 Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Around Base Camp (near Yala Kharka), 4920 m (H. Takayama et al. 9220322, 21 Jul. 1992, TI-holotype).

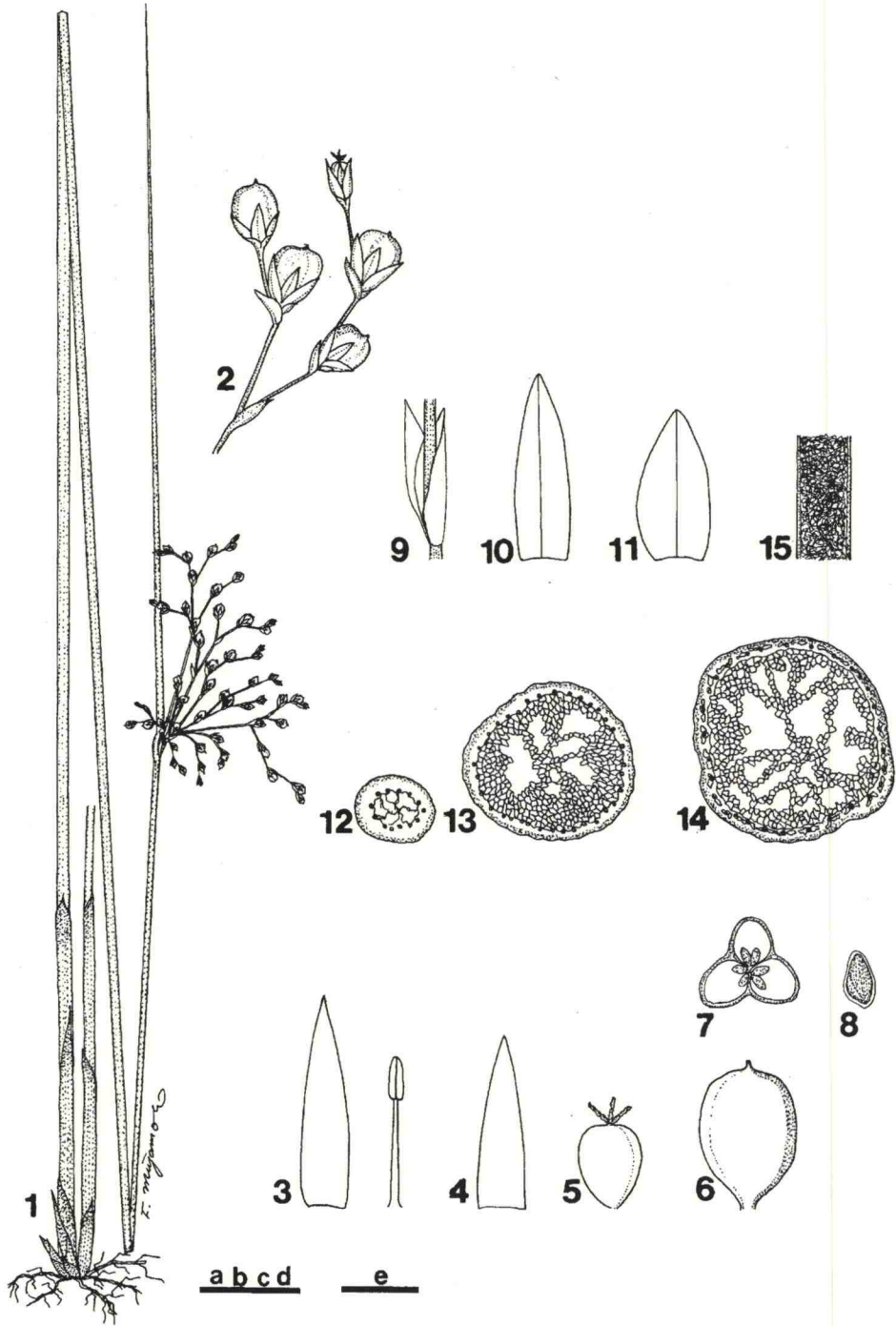


PLATE 17. *Juncus effusus* L.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal, 5. Pistil, 6. Capsule, 7. Cross section of capsule, 8. Seed, 9. Sheathing bract on peduncle, 10. Bract on peduncle, 11. Sheathing bract, 12. Cross section of peduncle, 13. Cross section of lowest bract, 14. Cross section of lower part of culm, 15. Longitudinal section of culm. Scales: a (2 cm) for 1; b (4 mm) for 2; c (1 mm) for 3, 4 and 8; d (2 mm) for 5, 6, 7 and 9; e (1 mm) for 10, 11, 12, 13, 14 and 15.

Voucher specimen: China; Yunnan, Lushui, Pianma - Pianma Pass - Lushui, 2600 m (S. K. Wu et al. 103178, 13 Sept. 1999, TI).

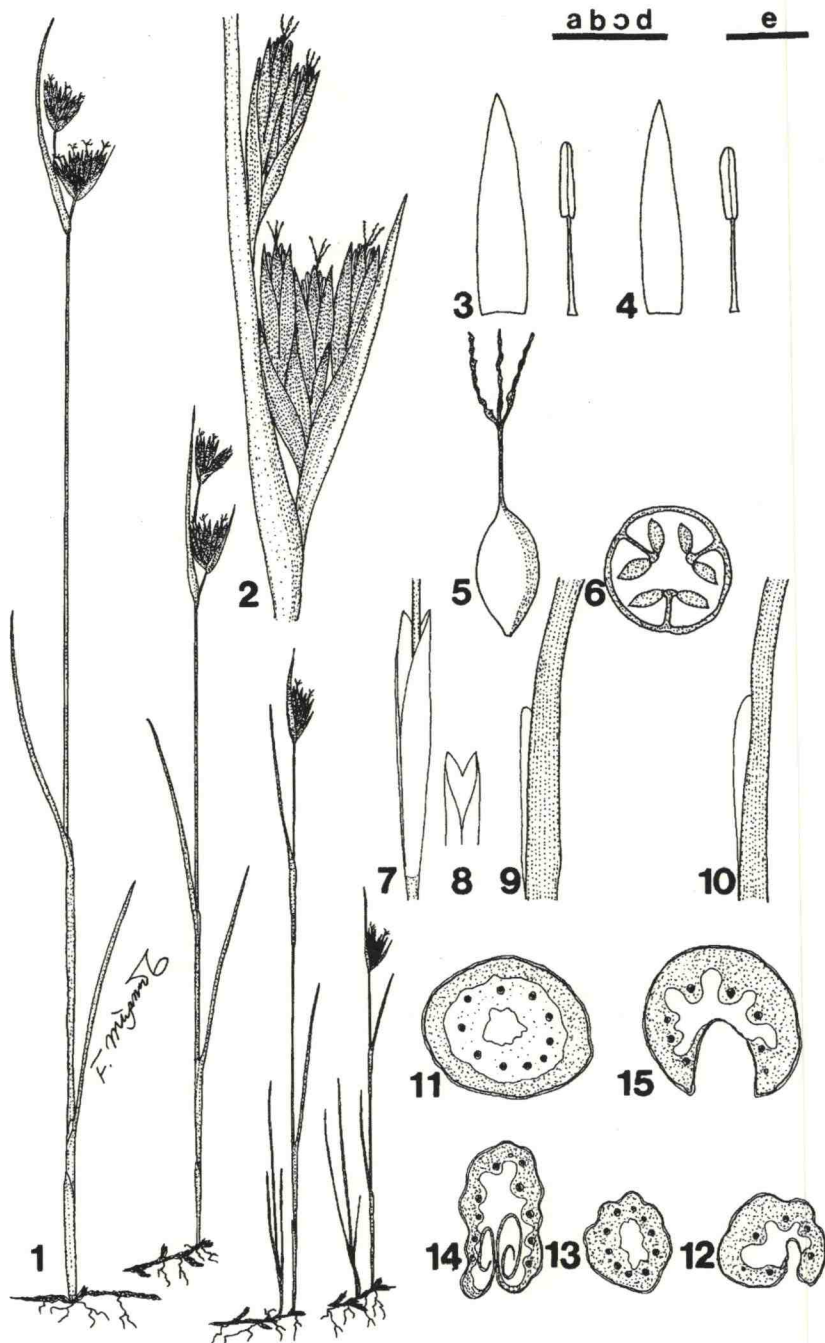


PLATE 19. *Juncus ganeshii* Miyam. & H. Ohba

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Apex of sheathing bract, 9. Auricle of cauline leaf, 10. Auricle of basal leaf, 11. Cross section of culm, 12. Cross section of lowest bract, 13. Cross section of upper part of cauline leaf, 14. Cross section of lower part of cauline leaf, 15. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9 and 10; c (2 mm) for 3, 4, 5, 7 and 8; d (1 mm) for 6; e (0.5 mm) for 11, 12, 13, 14 and 15.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Jaisuli Kund - Paldo Base Camp, 4440 m (F. Miyamoto et al. 9410148, 2 Aug. 1994, TI-holotype).



PLATE 20. *Juncus giganteus* Sam.
 1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and capsule, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Auricle of basal leaf, 9. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 7 and 8; c (2 mm) for 3, 4, 5; d (1 mm) for 6; e (0.5 mm) for 9. Voucher specimen: China; Szechuan, Hsioeh-shan, 4300 m (H. Smith 3878, 19 Jul. 1922, TI).



PLATE 21. *Juncus glaucoturgidus* Noltie

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricule of cauline leaf, 9. Auricule of basal leaf, 10. Cross section of upper part of culm, 11. Cross section of lower part of culm, 12. Cross section of cauline leaf, 13. Cross section of upper part of basal leaf, 14. Cross section of lower part of basal leaf, 15. Longitudinal section of basal leaf, 16. Leaf at dried. Scales: a (2 cm) for 1 and 16; b (4 mm) for 2, 8, 9 and 15; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7; e (0.5 mm) for 10, 11, 12, 13 and 14.

Voucher specimen: Nepal, Bagmati zone, Rasuwa Distr., Kyangin Kharka - Yala Kharka, 4230 m (H. Takayama et al. 92202172, 14 Jul. 1992, TI).

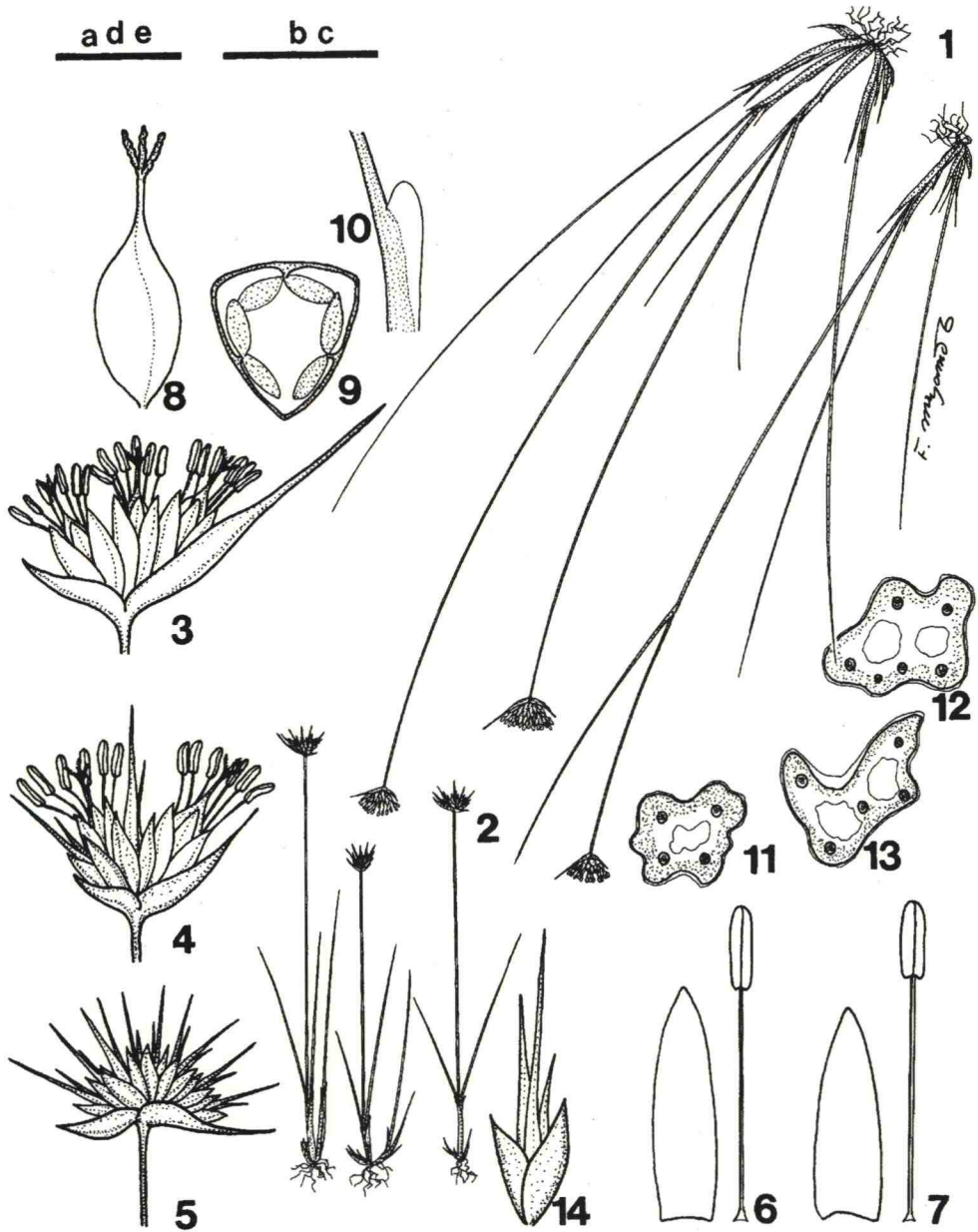


PLATE 22. *Juncus gonggae* Miyam. & H. Ohba

1. Habit, 2. Habit, 3. Normal inflorescence, 4. Normal and proliferous inflorescence, 5. Proliferous inflorescence, 6. Outer tepal and stamen, 7. Inner tepal and stamen, 8. Pistil, 9. Cross section of capsule, 10. Leaf auricle, 11. Cross section of upper part of culm, 12. Cross section of sterile leaf, 13. Cross section of basal leaf, 14. Proliferous flower. Scales: a (2 cm) for 1; b (5 mm) for 2, 3, 4 and 5; c (2.5 mm) for 6, 7, 8, 10 and 14; d (1 mm) for 9; e (0.5 mm) for 11, 12 and 13.

Voucher specimen: China; Sichuan, Daocheng, Mt. Gonggashan, 4300 m (S. K. Wu et al. 1551, 25 Aug. 1996, TI).

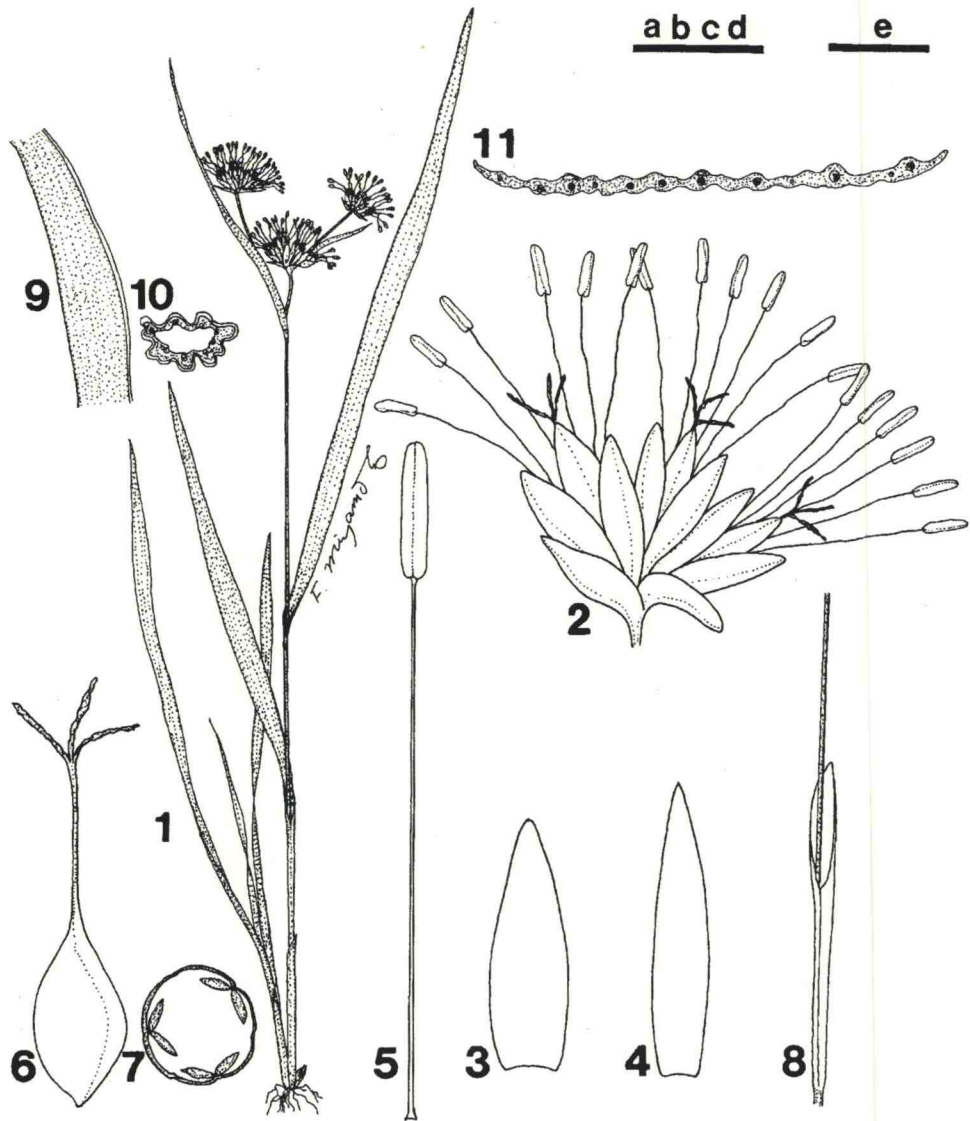


PLATE 23. *Juncus gracilicaulis* A. Camus

1. Habit, 2. Inflorescence, 3. Outer tepal, 4. Inner tepal, 5. Stamen, 6. Pistil, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. Auricle of basal leaf, 10. Cross section of culm, 11. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 9; c (2 mm) for 3, 4, 5 and 8; d (1 mm) for 6 and 7; e (0.5 mm) for 10 and 11.

Voucher specimen: China; San-tcha-ho (P. J. M. Delavey, s.n., 10 Aug. 1889, TT).

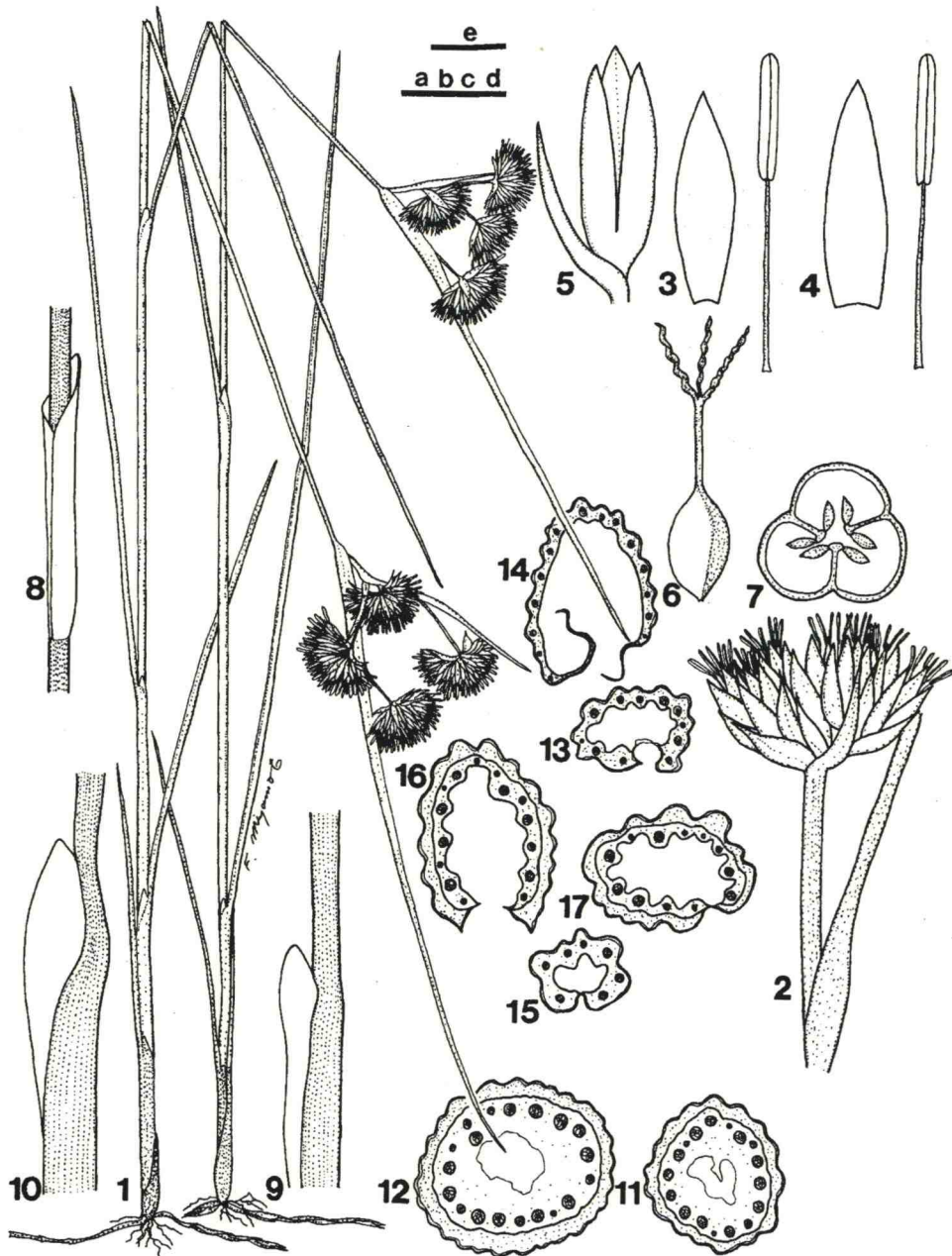


PLATE 24. *Juncus grisebachii* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. Auricle of cauline leaf, 10. Auricle of basal leaf, 11. Cross section of upper part of culm, 12. Cross section of lower part of culm, 13. Cross section of upper part of lowest bract, 14. Cross section of lower part of lowest bract, 15. Cross section of upper part of cauline leaf, 16. Cross section of middle part of cauline leaf, 17. Cross section of lower part of cauline leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9 and 10; c (2 mm) for 3, 4, 5, 6 and 8; d (1 mm) for 7; e (0.5 mm) for 11, 12, 13, 14, 15, 16 and 17.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Jaljale Himal, Singoa Kharka - Pakha Khola, 4140-2400 m (H. Ohba et al. 9120379, 11 Aug. 1991, TT).

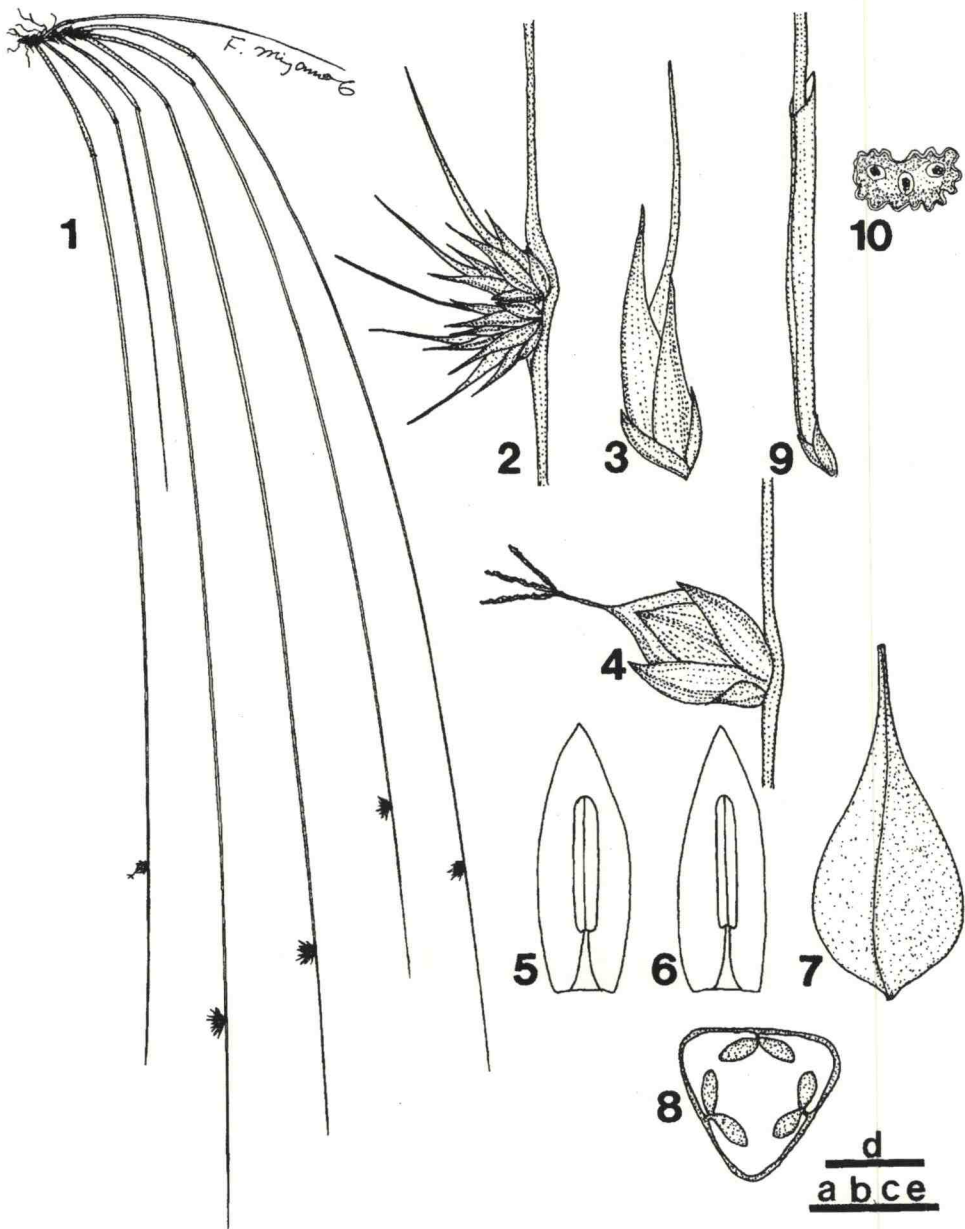


PLATE 25. *Juncus harae* Miyam. & H. Ohba.

1. Habit, 2. Proliferous inflorescence, 3. Proliferous flower, 4. Normal inflorescence, 5. Outer tepal and stamen, 6. Inner tepal and stamen, 7. Pistil, 8. Cross section of capsule, 9. Sheathing leaf, 10. Cross section of middle part of culm. Scales: a (2 cm) for 1; b (4 mm) for 2, 4 and 9; c (2 mm) for 3, 5, 6 and 7; d (1 mm) for 8; e (0.5 mm) for 10.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Sano Pokhari - Khongma, 3850 m (M. Minaki et al. 9020853, 12 Aug. 1990, TI).

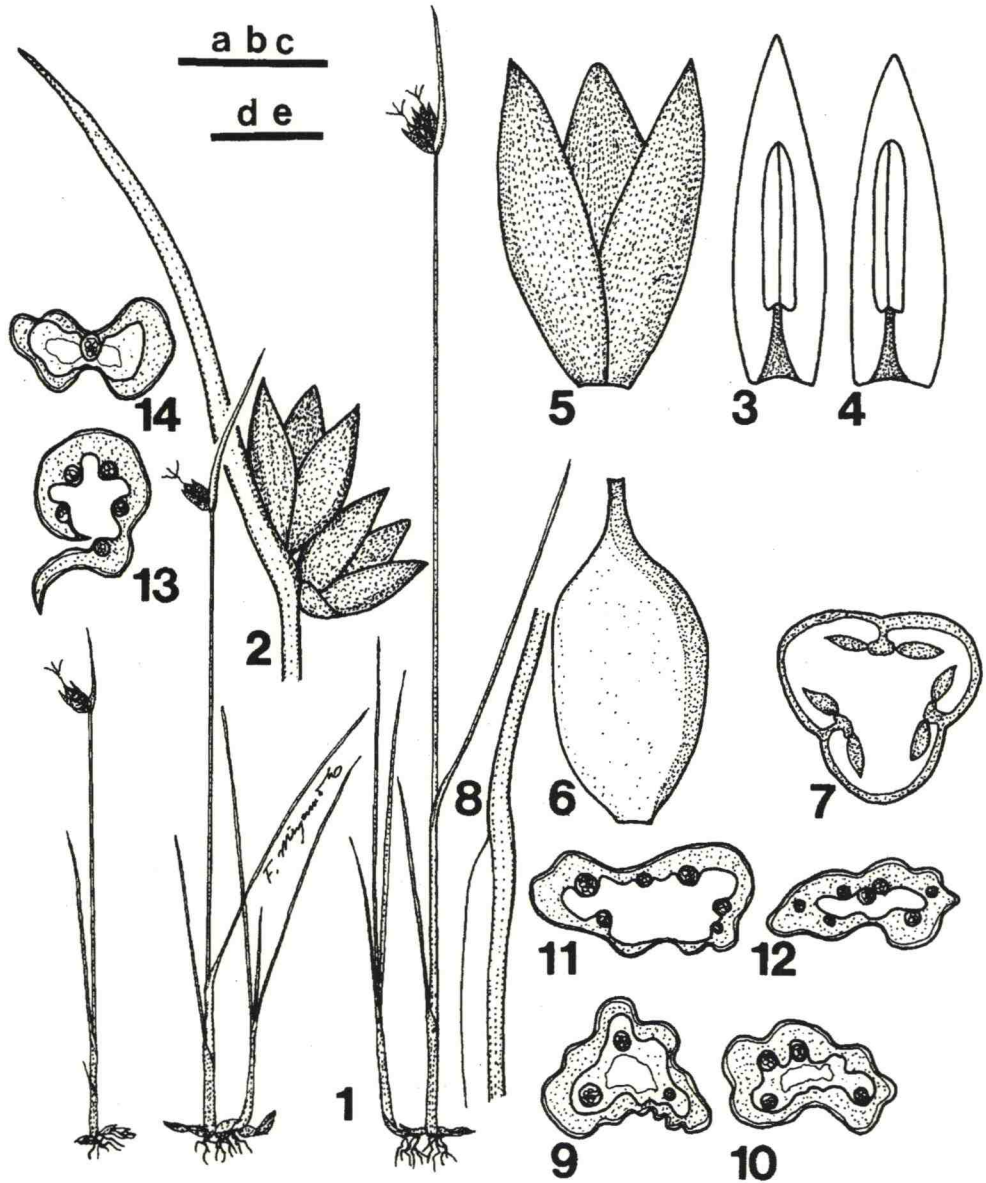


PLATE 26. *Juncus harae* Miyam. & H. Ohba

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of lower part of culm, 10. Cross section of upper part of culm, 11. Cross section of lower part of basal leaf, 12. Cross section of upper part of basal leaf, 13. Cross section of lower part of lowest bract, 14. Cross section of upper part of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2; c (2 mm) for 3, 4, 5, 6 and 8; d (1 mm) for 7; e (0.5 mm) for 9, 10, 11, 12, 13 and 14.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, Surveying the whole area around Shipton Pass, 4150 m (M. Minaki et al. 9020824, 9 Aug. 1990, TI).



PLATE 27. *Juncus himalensis* Klotzsch

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Outer bract, 9. Inner bract, 10, 11, 12, 13. Sheathing bract on peduncle, 14. Auricle of basal leaf, 15. Cross section of culm, 16. Cross section of upper part of basal leaf, 17. Cross section of lower part of basal leaf, 18. Cross section of upper part of cauline leaf, 19. Cross section of lower part of cauline leaf, 20. Cross section of upper part of lowest bract, 21. Cross section of lower part of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2 and 14; c (2 mm) for 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13; d (1 mm) for 7; e (0.5 mm) for 15, 16, 17, 18, 19, 20 and 21.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, 4100 m (M. Minaki et al. 920711, 8 Aug. 1990, TI).

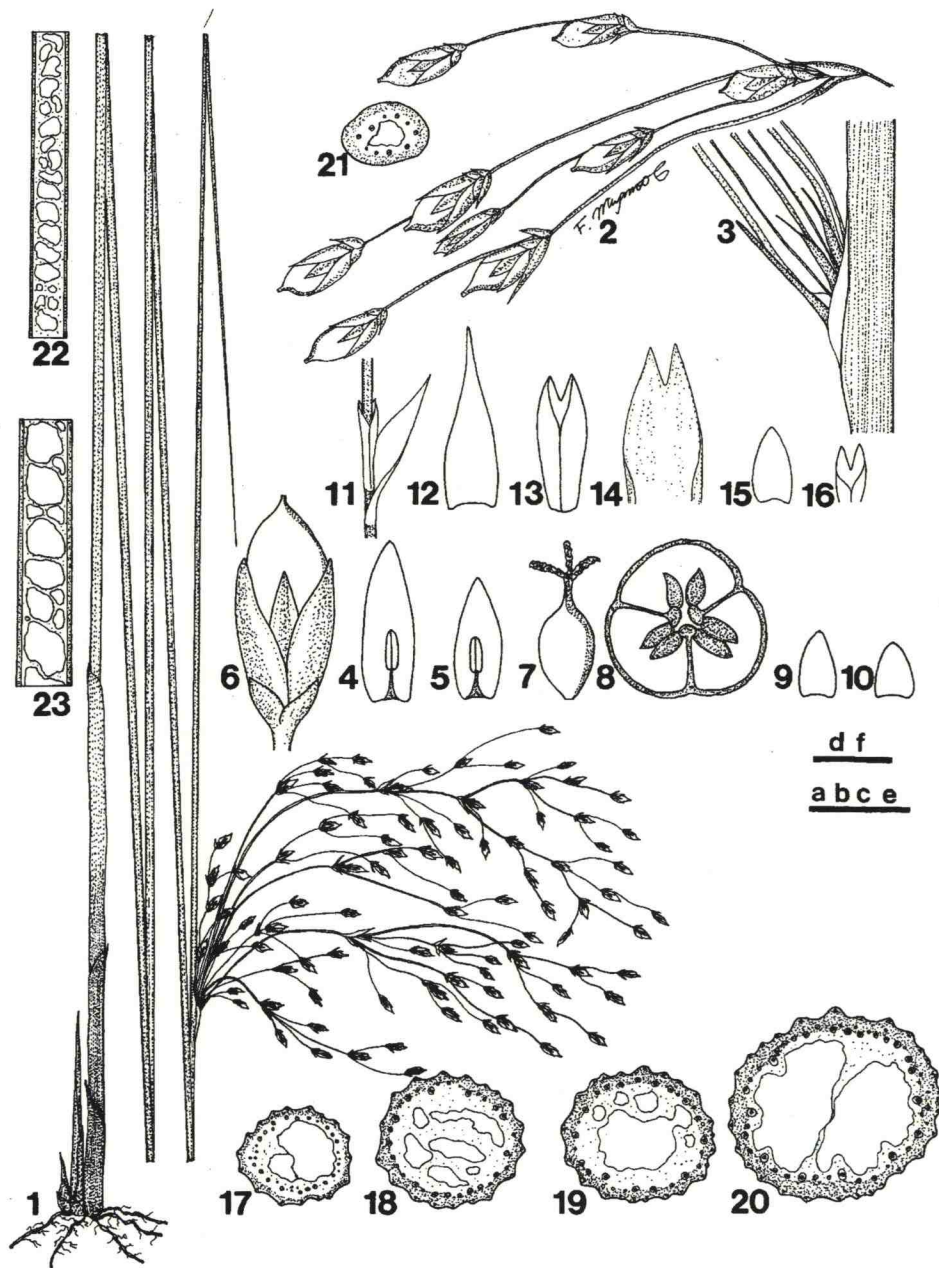


PLATE 28. *Juncus inflexus* L.

1. Habit, 2. Inflorescence, 3. Auricule of lowest bract, 4. Outer tepal and stamen, 5. Inner tepal and stamen, 6. Perianth and capsule, 7. Pistil, 8. Cross section of capsule, 9. Outer bracteole, 10. Inner bracteole, 11. Sheathing bract on peduncle, 12, 15. Bract, 13. Sheathing bract, 14, 16. Apex of sheathing bract, 17. Cross section of upper part of lowest bract, 18. Cross section of lower part of lowest bract, 19. Cross section of upper part of culm, 20. Cross section of lower part of culm, 21. Cross section of peduncle, 22. Longitudinal section of lowest bract, 23. Longitudinal section of culm. Scales: a (2 cm) for 1; b (4 mm) for 2, 3, 22 and 23; c (1 mm) for 4, 5, 6, 7, 9, 10, 12, 13, 15 and 16; d (0.5 mm) for 8, 14 and 21; e (2 mm) for 11; f (1 mm) for 17, 18, 19 and 20.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Lama Lodge - Syabru, 2500 m (H. Takayama et al. 9220402, 24 Jul. 1992, TI).

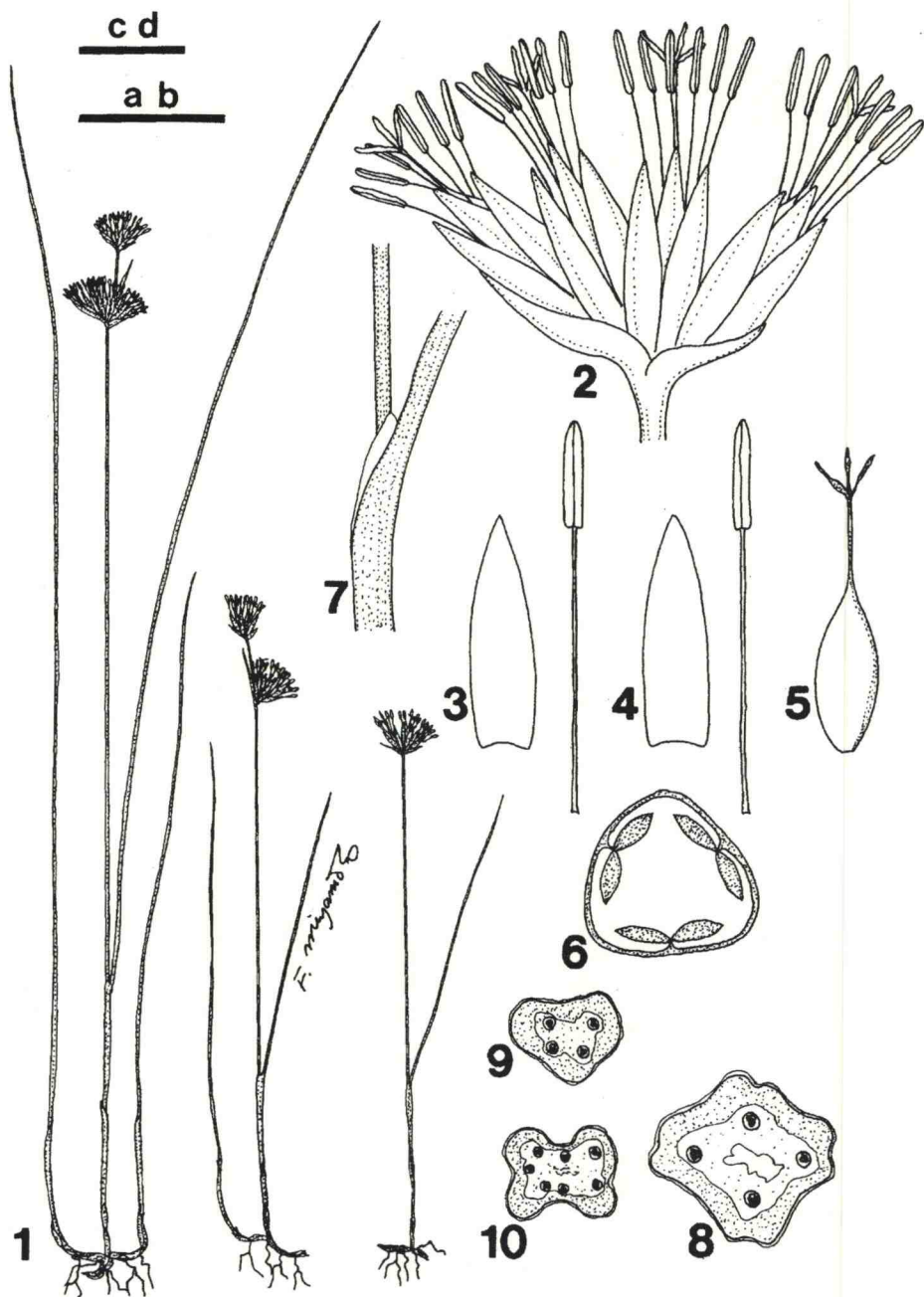


PLATE 29. *Juncus khasiensis* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of lower part of culm, 9. Cross section of upper part of culm, 10. Cross section of basal leaf. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4, 5 and 7; c (1 mm) for 6; d (0.5 mm) for 8, 9 and 10.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Lipchet Kharka - makgan Kharka - Guinsi, 2800 m (F. Miyamoto et al. 9410322, 16 Aug. 1994, TI).



PLATE 30. *Juncus kingii* Rendle

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Capsule, 8. Cross section of capsule, 9. Auricle of basal leaf, 10. Cross section of lower part of culm, 11. Cross section of upper part of basal leaf, 12. Cross section of lower part of basal leaf, 13. Cross section of upper part of basal leaf, 14. Cross section of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2 and 9; c (2 mm) for 3, 4, 5, 6 and 7; d (0.5 mm) for 8, 10, 11, 12, 13 and 14.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Base Camp - Yala Kharka - Langtrang Khola, 4800 m (F. Miyamoto, 9220282, 19 Jul. 1993, TI).

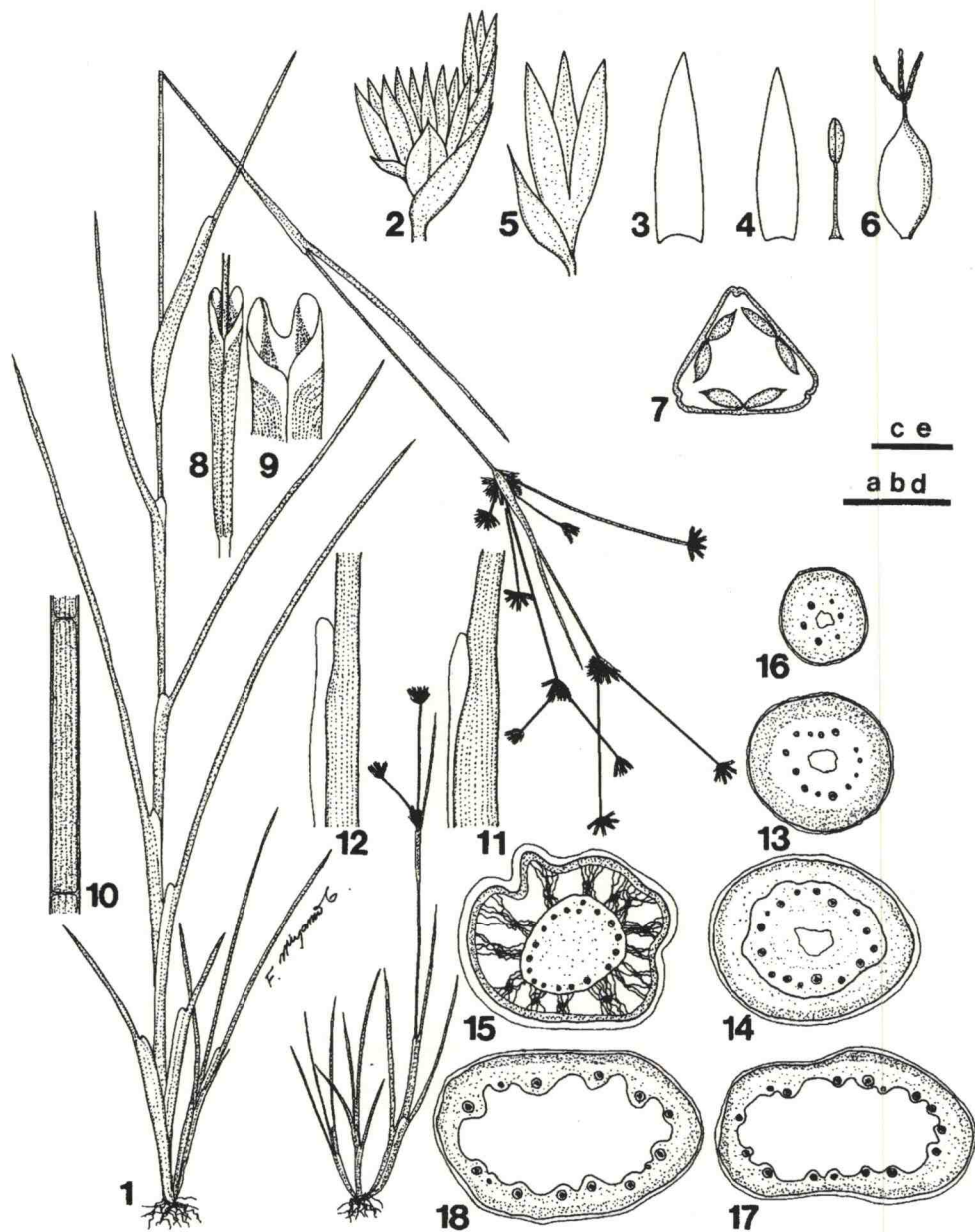


PLATE 31. *Juncus leptospermus* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. Apex of sheathing bract, 10. Longitudinal section of basal leaf, 11. Auricle of cauline leaf, 12. Auricle of basal leaf, 13. Cross section of peduncle, 14. Cross section of upper part of culm, 15. Cross section of lower part of culm, 16. Cross section of lowest bract, 17. Cross section of upper part of basal leaf, 18. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4, 5, 6 and 9; c (1 mm) for 7; d (4 mm) for 8 and 10; e (0.5 mm) for 11, 12, 13, 14, 15, 16, 17 and 18.

Voucher specimen: Nepal; Janakpur zone, Ramechhap Distr., Patkare - Bhandar, 2200-2300 m (H. Ohba et al. 8571333, 5 Aug. 1985, TI).

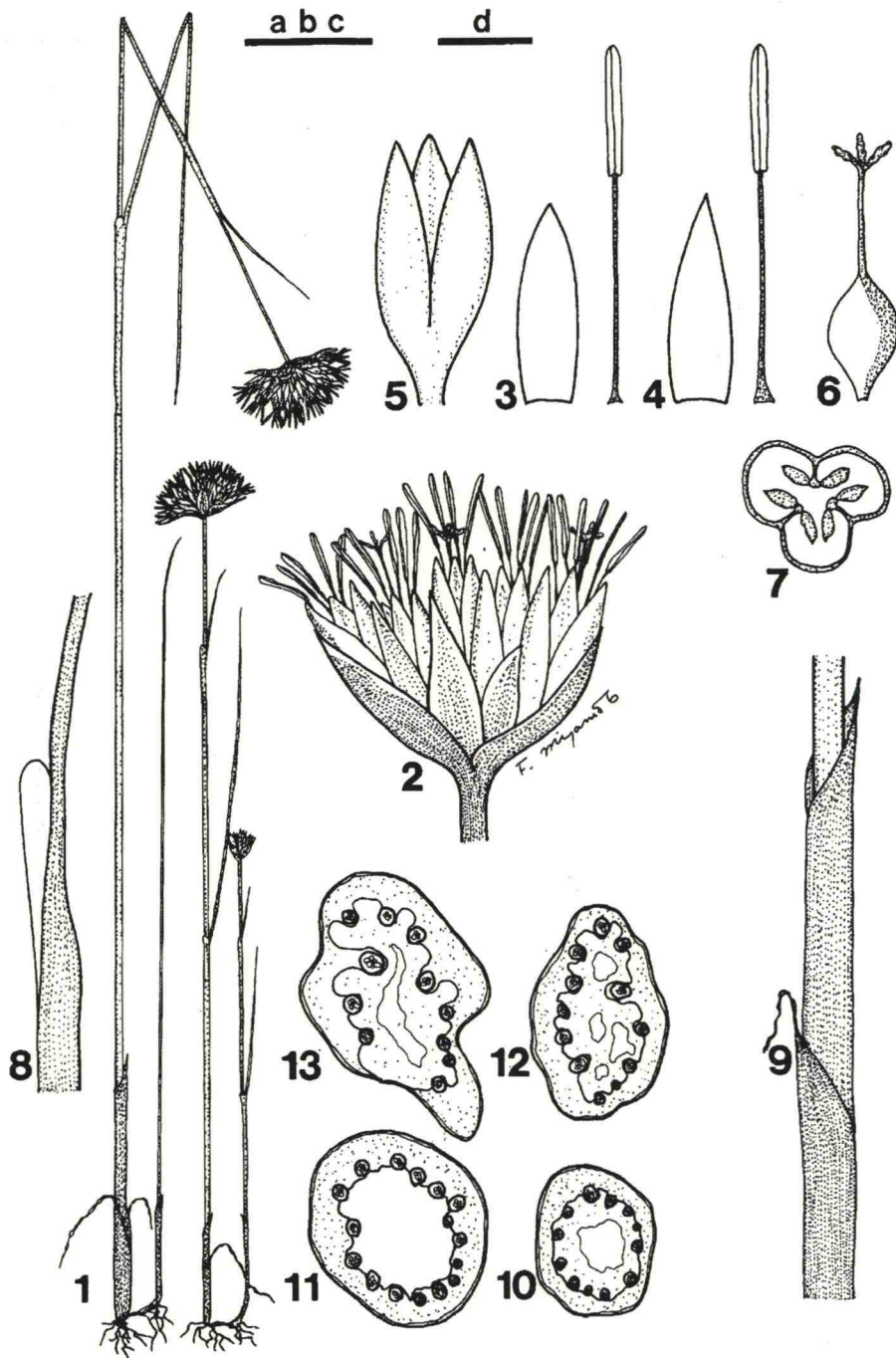


PLATE 32. *Juncus leucanthus* Royle ex D. Don
 1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Sheathing basal leaf, 10. Cross section of upper part of culm, 11. Cross section of lower part of culm, 12. Cross section of upper part of cauline leaf, 13. Cross section of lower part of cauline leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 8 and 9; c (2 mm) for 3, 4, 5 and 6; d (0.5 mm) for 7, 10, 11, 12 and 13.
 Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, Surveying the whole area around Shipton Pass, 4430 m (M. Minaki et al. 9020680, 7 Aug. 1990, TI).

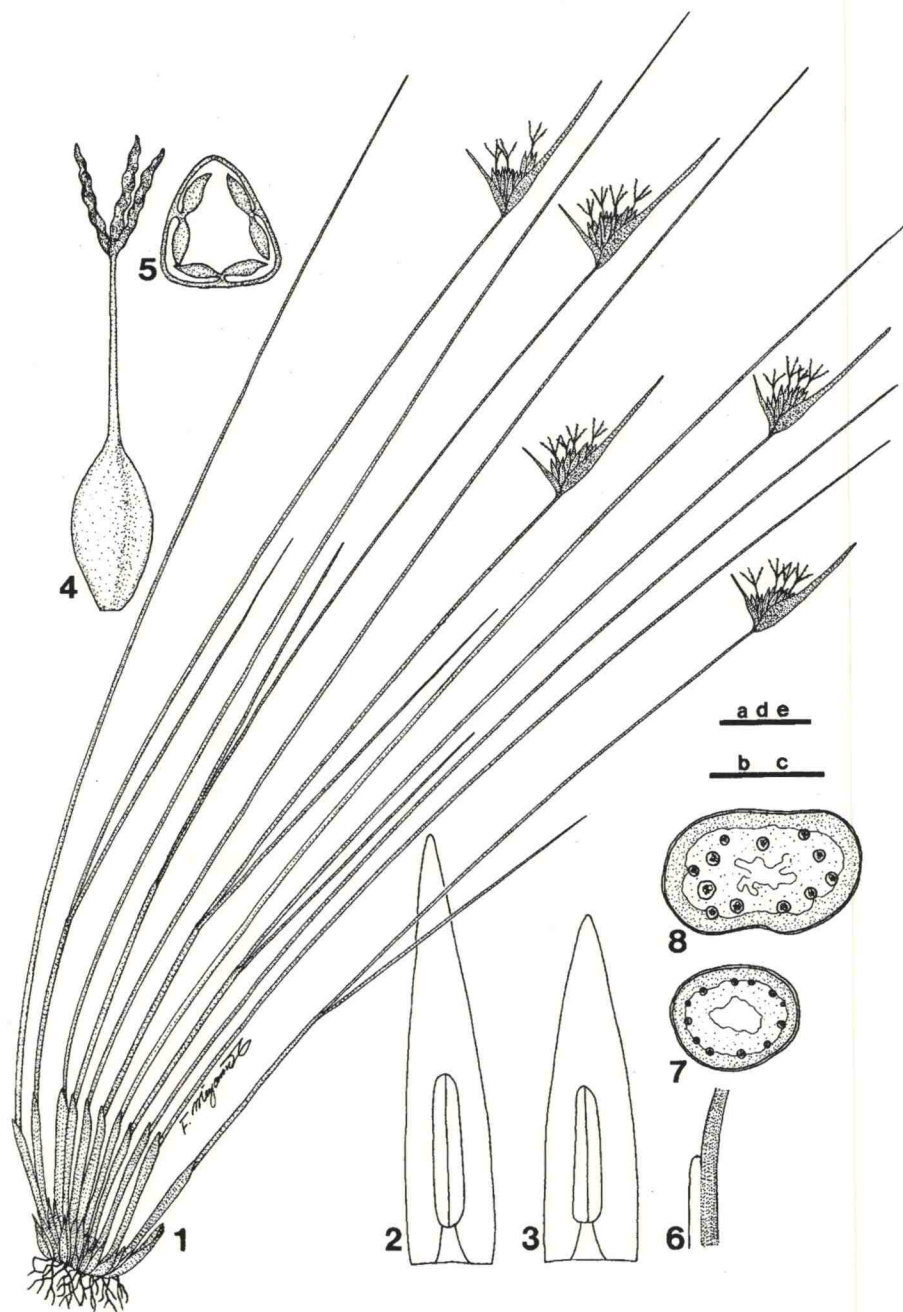


PLATE 33. *Juncus longiflorus* (A. Camus) Noltie

1. Habit, 2. Outer tepal and stamen, 3. Inner tepal and stamen, 4. Pistil, 5. Cross section of capsule, 6. Leaf auricle, 7. Cross section of lower part of culm, 8. Cross section of basal leaf. Scales: a (2 cm) for 1; b (2.5 mm) for 2, 3 and 4; c (1.6 mm) for 5; d (4 mm) for 6; e (0.6 mm) for 7 and 8.

Voucher specimen: China; Yunnan, Dali, Cangshan, 3630 m (S. K. Wu et al. 1604, 1 Sep. 1996, TI).

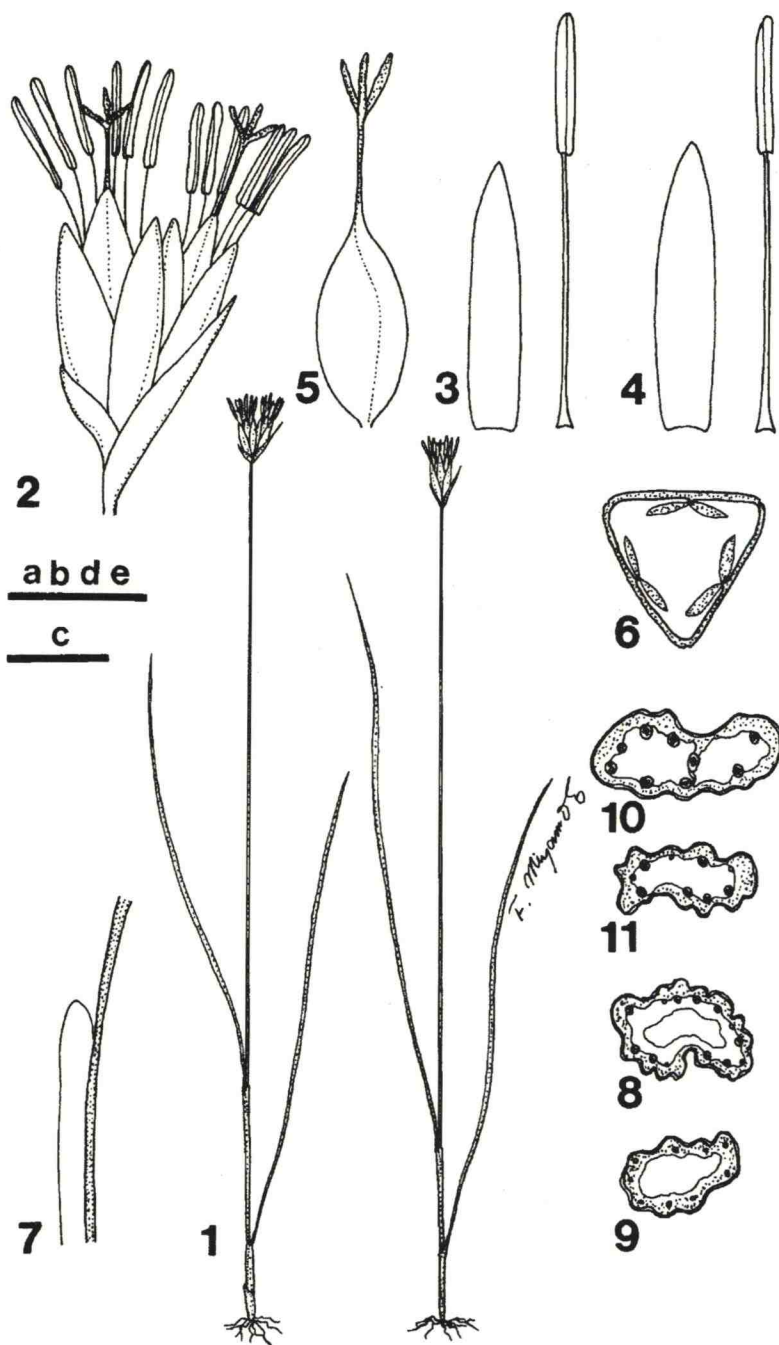


PLATE 34. *Juncus longistamineus* A. Camus

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of upper part of culm, 9. Cross section of lower part of culm, 10. Cross section of upper part of basal leaf, 11. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4 and 5; c (1 mm) for 6; d (1 mm) for 7; e (0.5 mm) for 8, 9, 10 and 11.

Voucher specimen: China; Yunnan, Y. Atuntze, Yangtsatung, 3900 m (T. T. Yü 9815, 24 Aug. 1937, KUN).

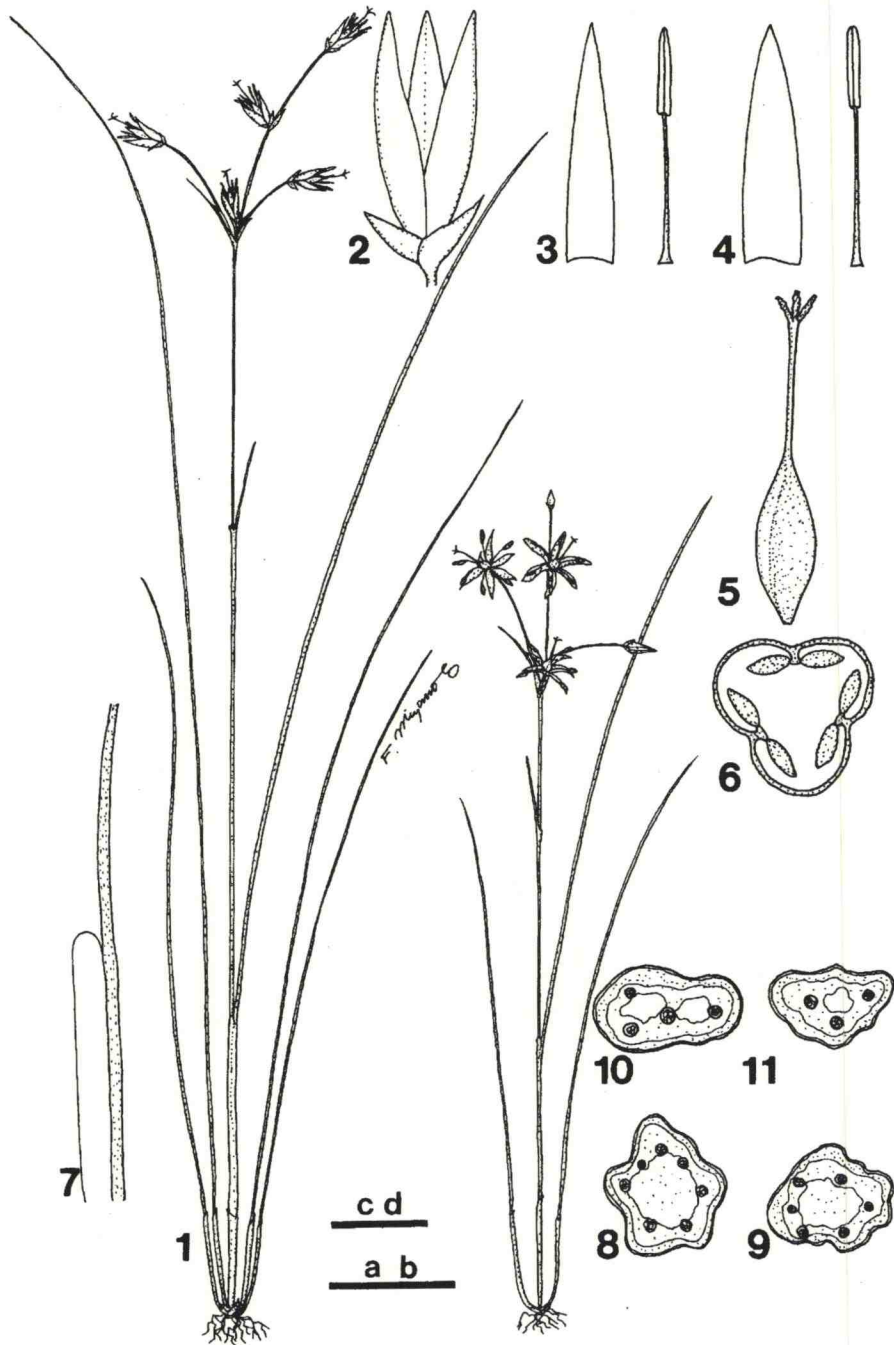


PLATE 35. *Juncus luzuliformis* Franch.

1. Habit, 2. Perianth, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of lower part of culm, 9. Cross section of upper part of culm, 10. Cross section of lower part of cauline leaf, 11. Cross section of upper part of cauline leaf. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4, 5 and 7; c (1 mm) for 6; d (0.5 mm) for 8, 9, 10 and 11.

Voucher specimen: China; Sichuan, Xiaojin, Rilong - a pass of Balang Shan - Wenchuan - Wolong, 2500 m (H. Ikeda et al., 100856, 6 Sept. 1998, TT).

abcd

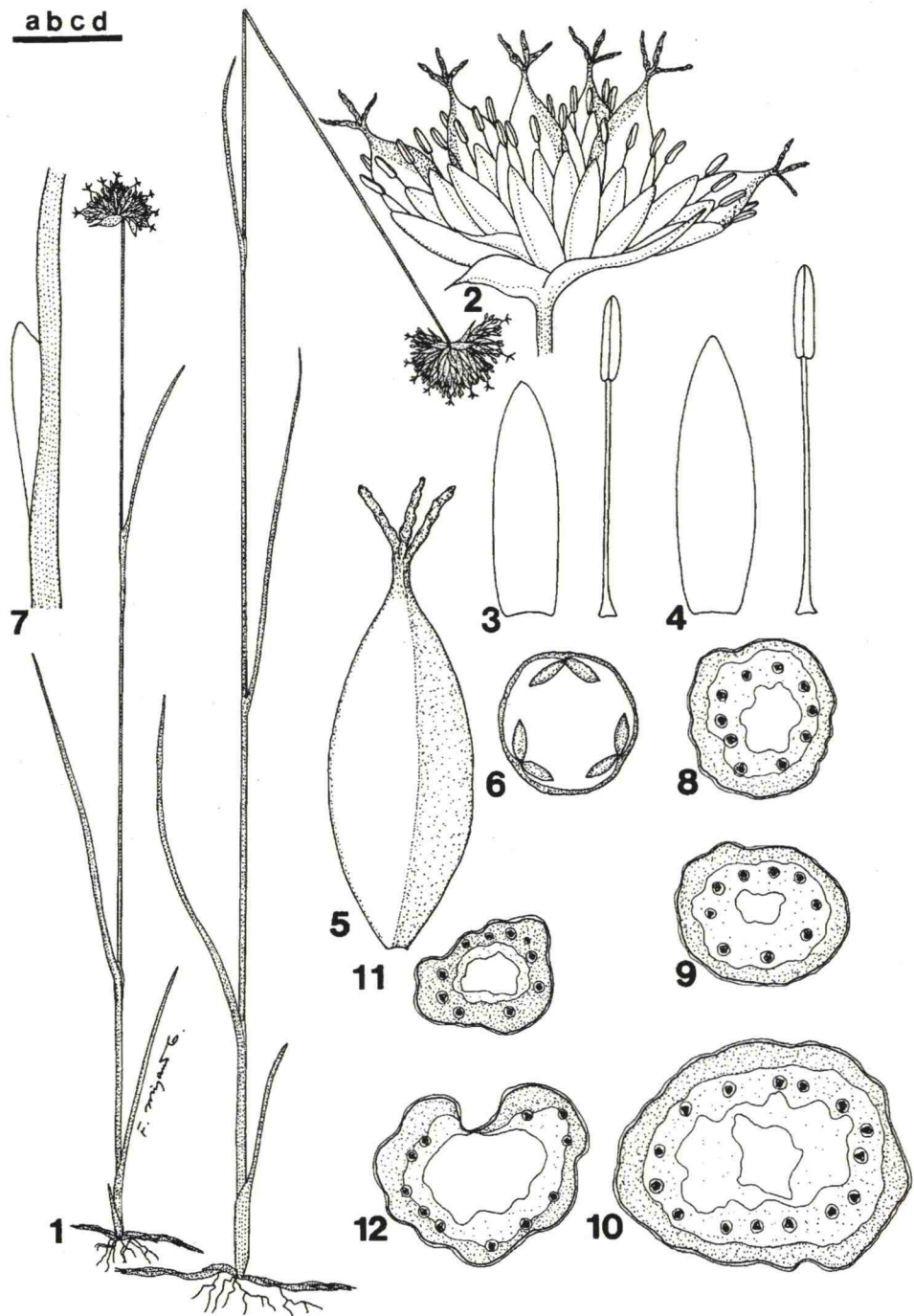


PLATE 36. *Juncus membranaceus* Royle ex D. Don

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of peduncle, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of lowest bract, 12. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 7; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 8, 9, 10, 11 and 12. Voucher specimen: Pakistan; Baltistan, Skardu - Katarah, 2400 m (S. Takatsukiet al. 9360003, 26 Jul. 1993, TI).

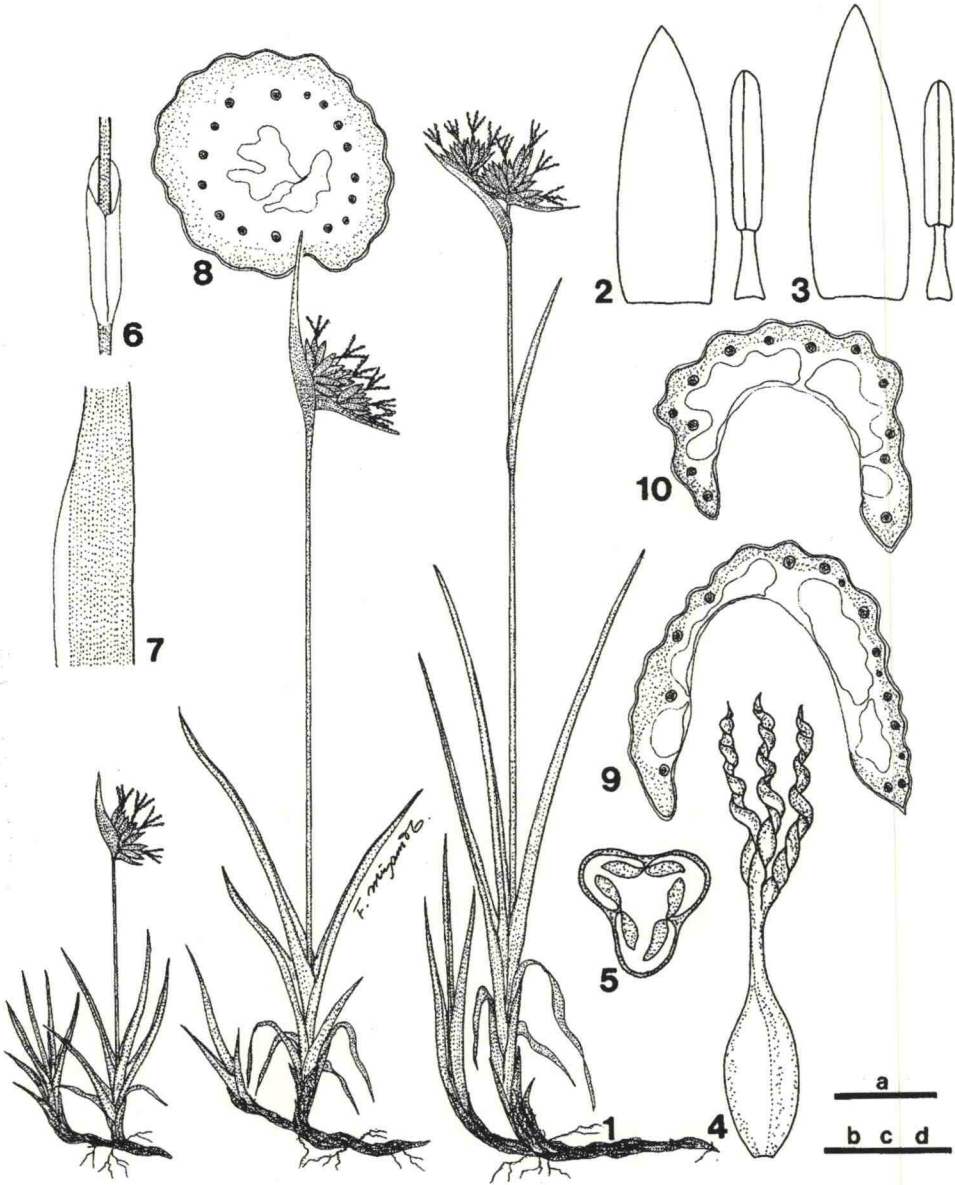


PLATE 37. *Juncus milashanensis* A. M. Lu & Z. Y. Zhang

1. Habit, 2. Outer tepal and stamen, 3. Inner tepal and stamen, 4. Pistil, 5. Cross section of capsule, 6. Leaf auricle, 7. Sheathing bract on peduncle, 8. Cross section of culm, 9. Cross section of basal leaf, 10. Cross section of cauline leaf. Scales: a (2cm) for 1; b (5mm) for 6 and 7; c (2.5 mm) for 2, 3, and 4; d (1.5mm) for 5, 8, 9, and 10.

Voucher specimen: China; Sichuan, Daocheng, around Wuming Shan, 4680 m (S. K. Wu et al. 410, 27 July 1997, TI).

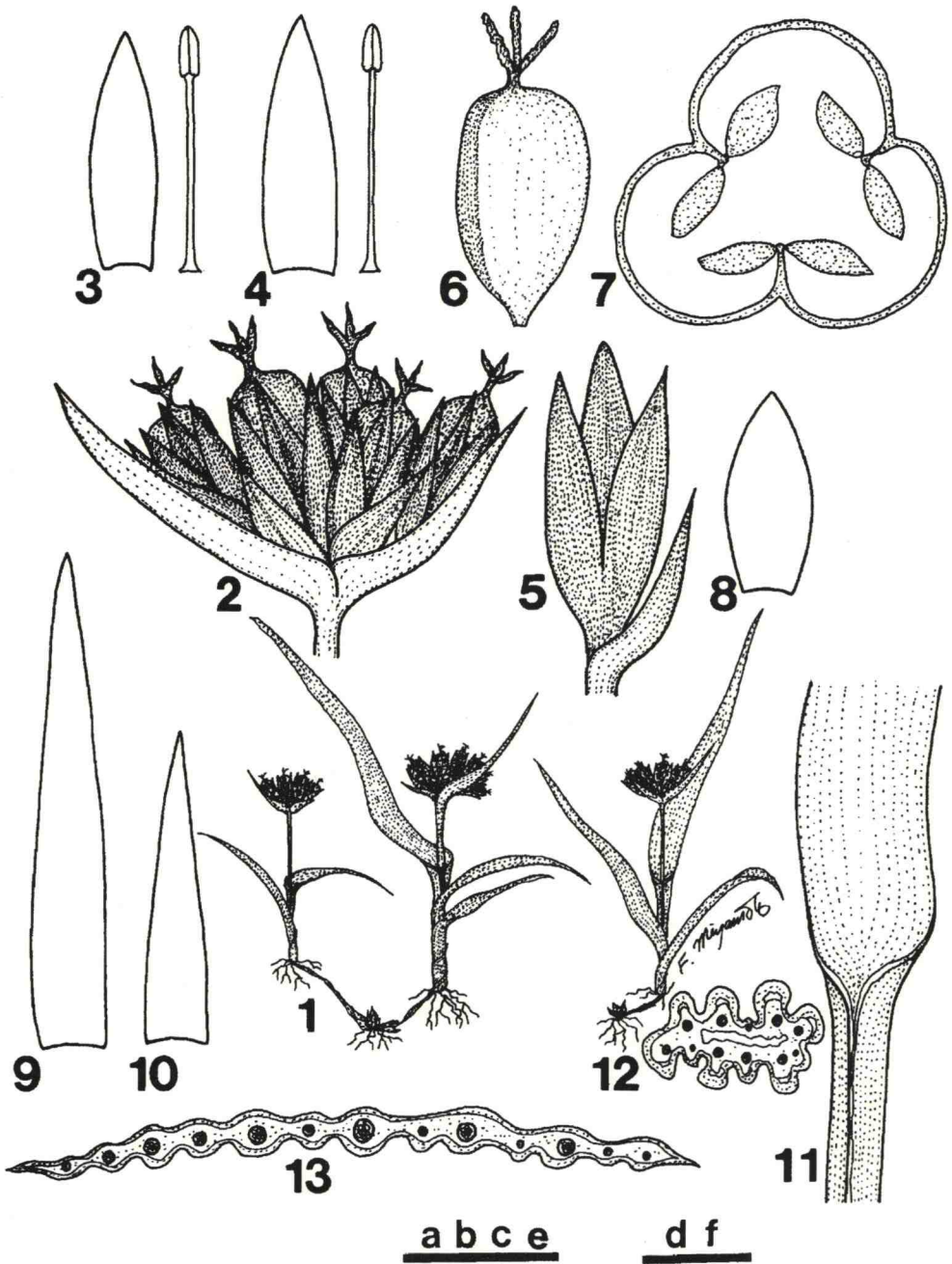


PLATE 38. *Juncus minimus* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8, 9, 10. Bract, 11. Auricle of basal leaf, 12. Cross section of culm 13. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9, 10 and 11; c (2 mm) for 3, 4, 5, 6 and 8; d (1 mm) for 7; e (0.5 mm) for 12; f (0.5 mm) for 13.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Jaljale Himal, Bomrang - Singoa Kharka, 4100 m (H. Ohba et al. 9120351, 10 Aug. 1991, TT).

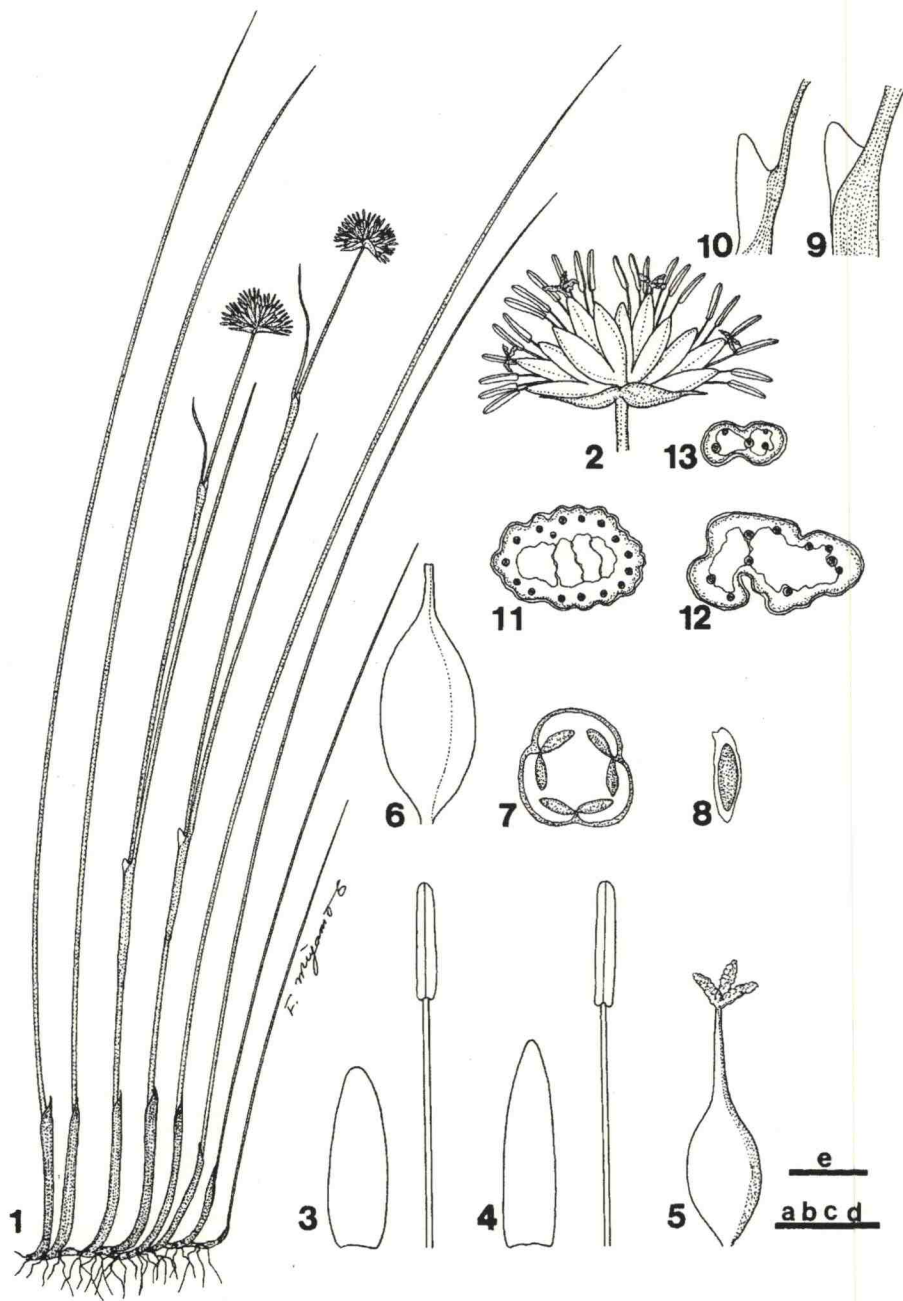


PLATE 39. *Juncus modicus* N. E. Br.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. pistil, 6. Capsule, 7. Cross section of capsule, 8. Seed, 9. Auricule of basal leaf, 10. Auricule of cauline leaf, 11. Cross section of culm, 12. Cross section of lower part of cauline leaf, 13. Cross section of upper part of cauline leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9 and 10; c (2 mm) for 3, 4, 5, 6 and 7; d (1 mm) for 8; e (0.5 mm) for 11, 12 and 13.

Voucher specimen: China; Yunnan, Dali, Cangshan, 3600 m (S. K. Wu et al. 1610, 1 Sept. 1996, TI).

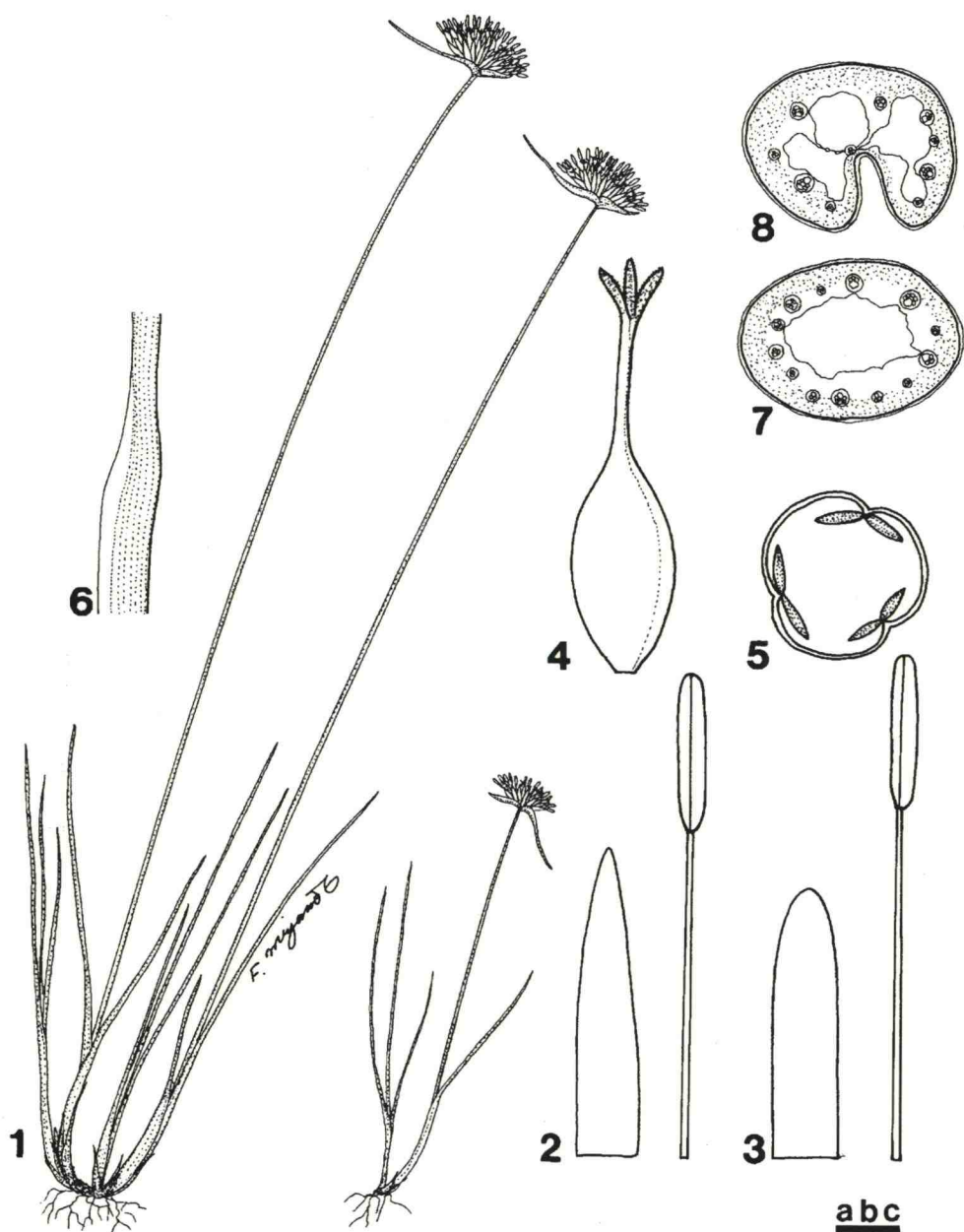


PLATE 40. *Juncus mustangensis* Miyam. & H. Ohba

1. Habit, 2. Outer tepal and stamen, 3. Inner tepal and stamen, 4. Pistil, 5. Cross section of capsule, 6. Auricle of basal leaf, 7. Cross section of flowering culm, 8. Cross section of basal leaf, Scales: a (1 cm) for 1. b (1 mm) for 2, 3, 4, 5 and 6. c (2 mm) for 7 and 8.

Voucher specimen: Nepal. Dhaulagiri zone, Mustang district, between Sangda Pass and Phalyak, 28°51'40"N, 83°44'41"E, 3870 m (F. Miyamoto, N. Kurosaki, S. Akiyama, H. Ikeda, M. Tsusaka & M. N. Subedi 20210100, 13 Aug. 2002, TI).

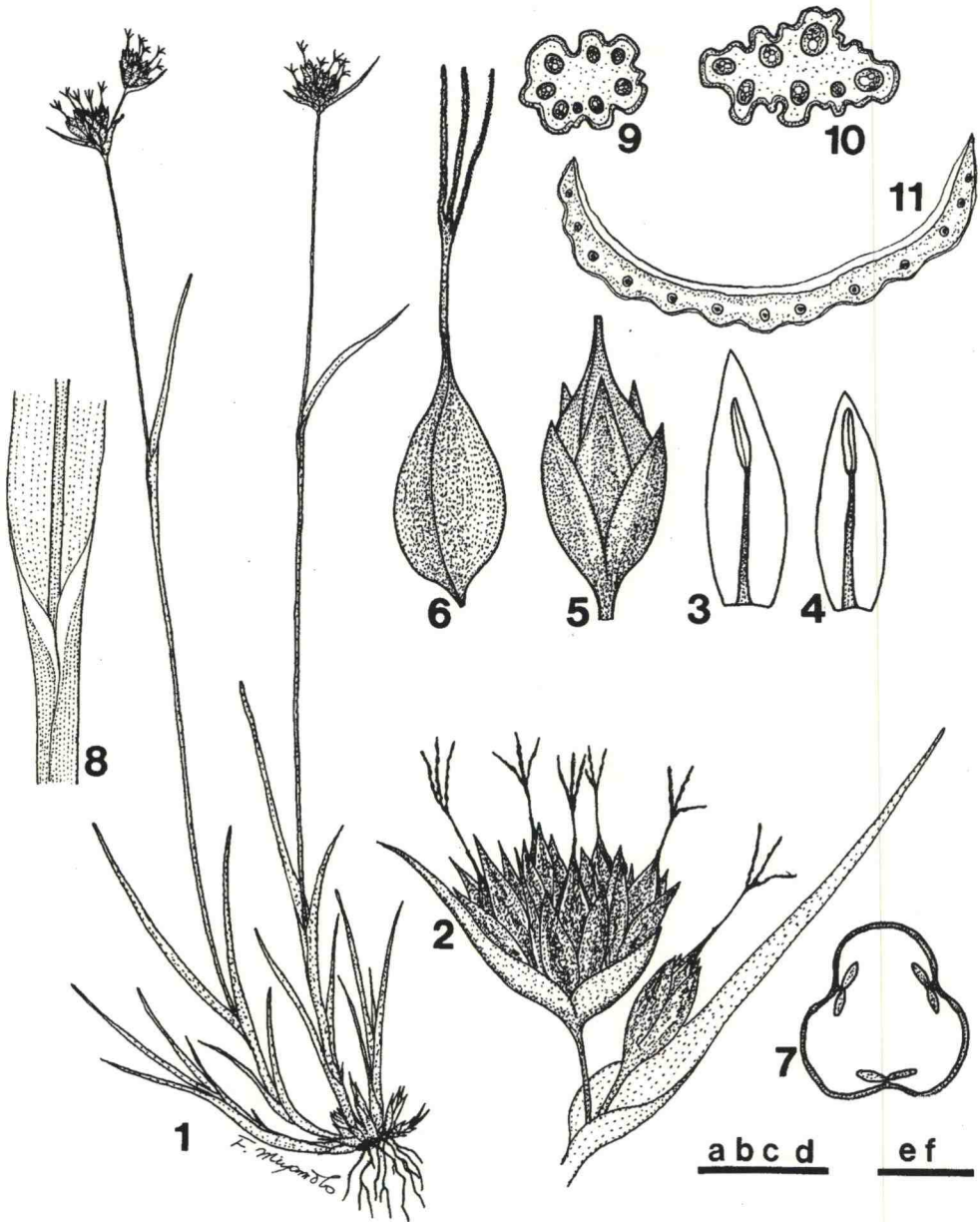


PLATE 41. *Juncus nepalicus* Miyam. & H. Ohba
 1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and capsule, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of basal leaf. Scales: a (2 cm) for 1; b (2 mm) for 2 and 5; c (1 mm) for 3, 4 and 6; d (4 mm) for 8; e (1 mm) for 7; f (0.5 mm) for 9, 10 and 11.
 Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, 4400 m (M. Minaki et al. 9020690, 7 Aug. 1990, TT).

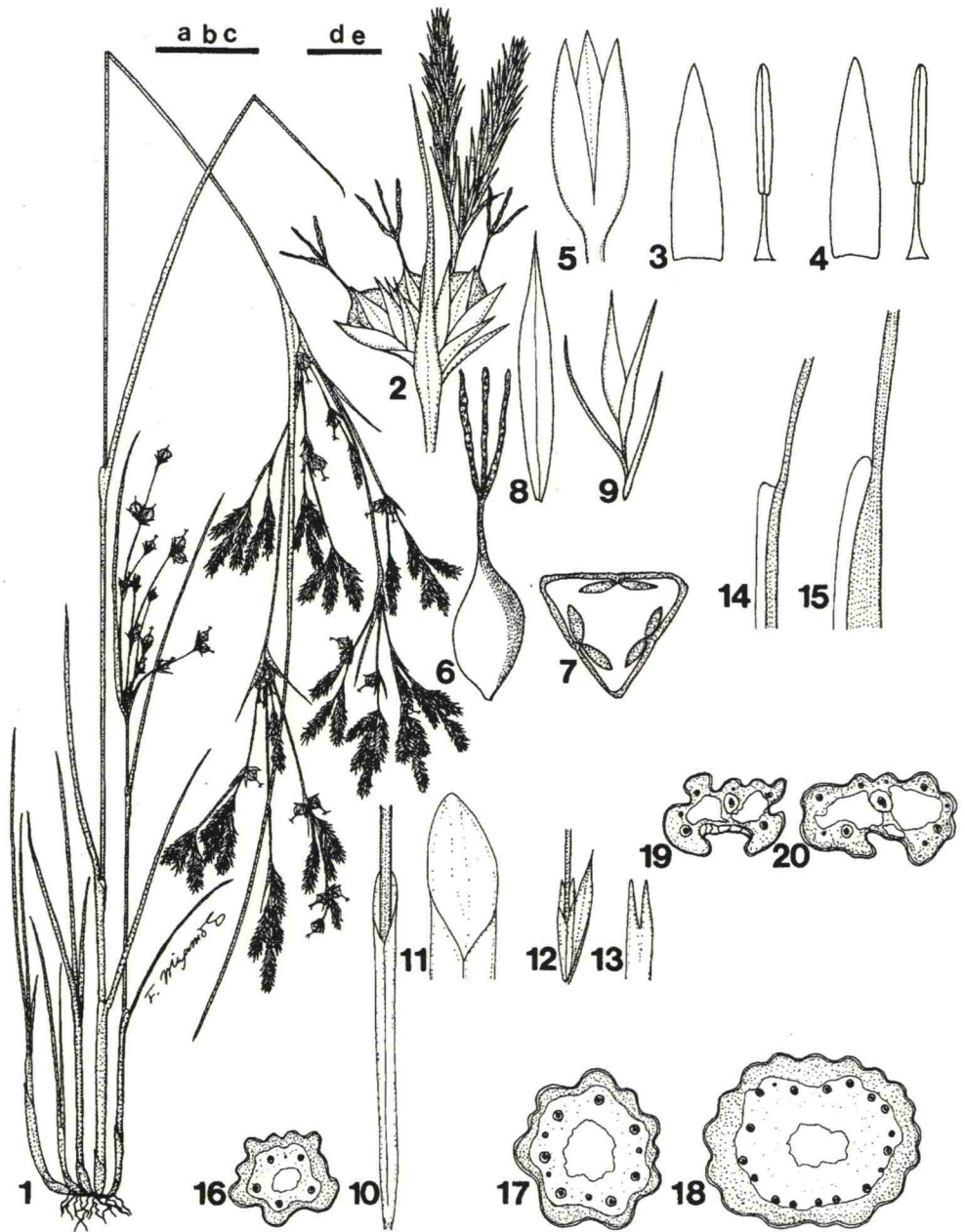


PLATE 42. *Juncus ochraceus* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Bract, 9. Sterile flower, 10, 12. Sheathing bract on peduncle, 11, 13. apex of sheathing bract, 14. Auricle of culm leaf, 15. Auricle of basal leaf, 16. Cross section of peduncle, 17. Cross section of upper part of culm, 18. Cross section of lower part of culm, 19. Cross section of lowest bract, 20. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 10; c (2 mm) for 3, 4, 5, 6 and 11; d (1 mm) for 7, 8, 9, 12, 13, 14 and 15; e (0.5 mm) for 16, 17, 18, 19 and 20.

Voucher specimen: Nepal; Taplejung, below Siling Tzokupa - Siling Tzokupa (H. Hara et al. 6300970, 29 Oct. 1963, TI).

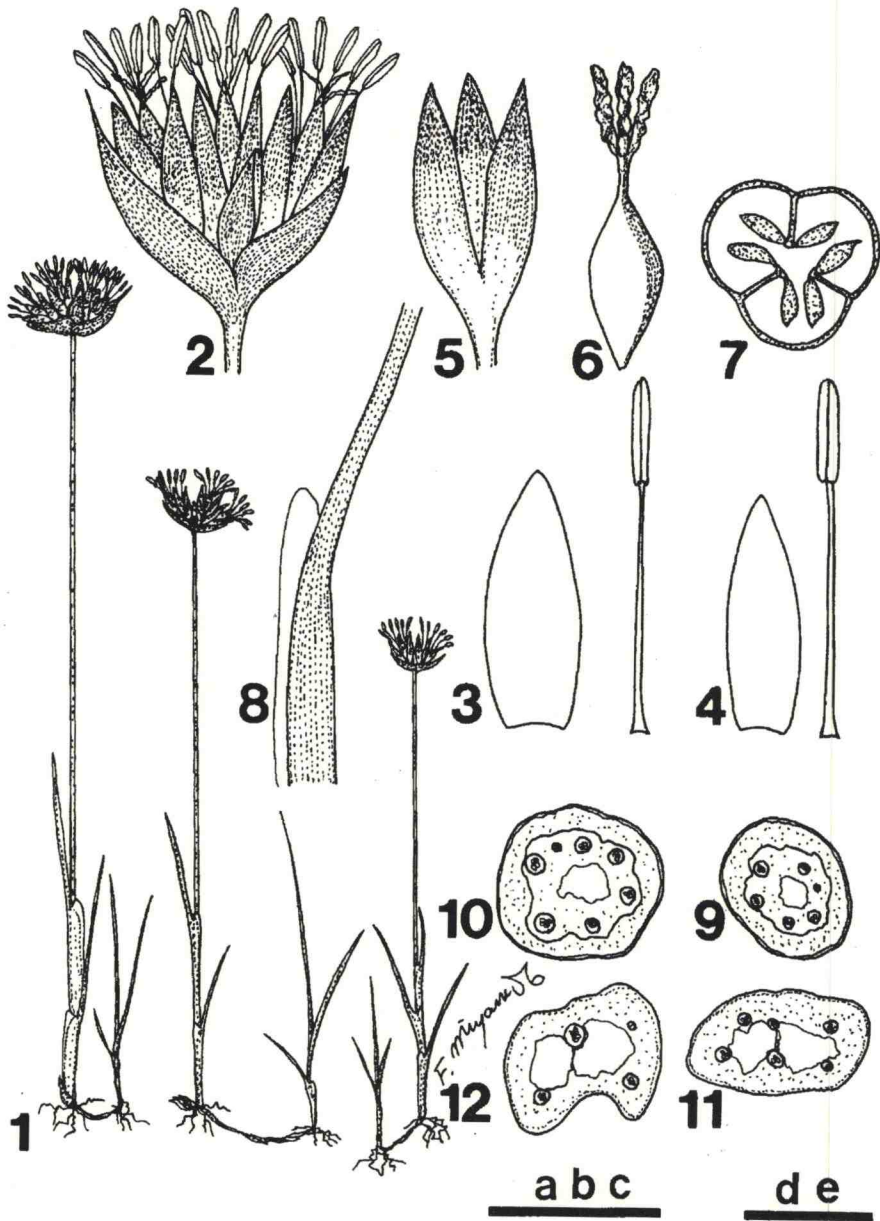


PLATE 43. *Juncus perpusillus* Sam.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of upper part of basal leaf, 12. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 8; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7; e (0.5 mm) for 9, 10, 11 and 12.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Yala Kharka - Langtrang, 4850 m (H. Takayama et al. 9220352 b, 22 Jul. 1992, TI).

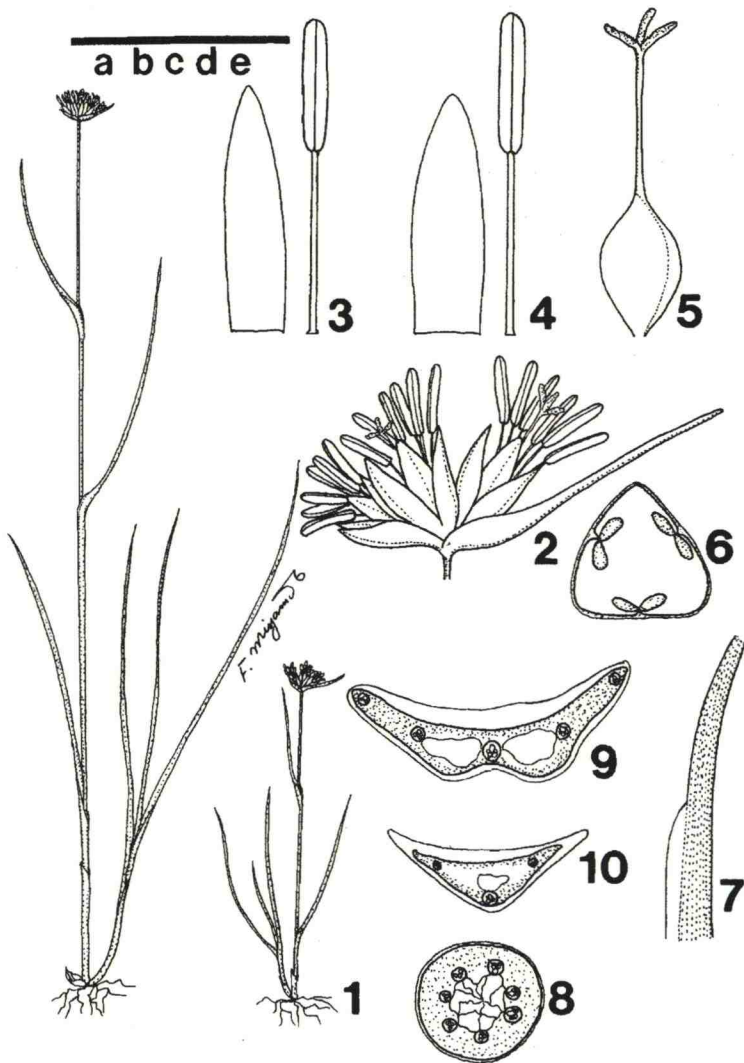


PLATE 44. *Juncus petrophilus* Miyam.

1. Habit of plants, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Leaf auricle of basal leaf, 8. Cross section of culm, 9. Cross section of basal leaf, 10. Cross section of cauline leaf. Scales: a (3 cm) for 1; b (6 mm) for 2 and 7; c (3 mm) for 3, 4 and 5; d (1.5 mm) for 6; e (1 mm) for 8, 9 and 10.

Voucher specimen: China; Yunnan, Dali, Mt. Dancang Shan, 3600 m (F. Miyamoto 105201, 1 Jul. 2000, TI).

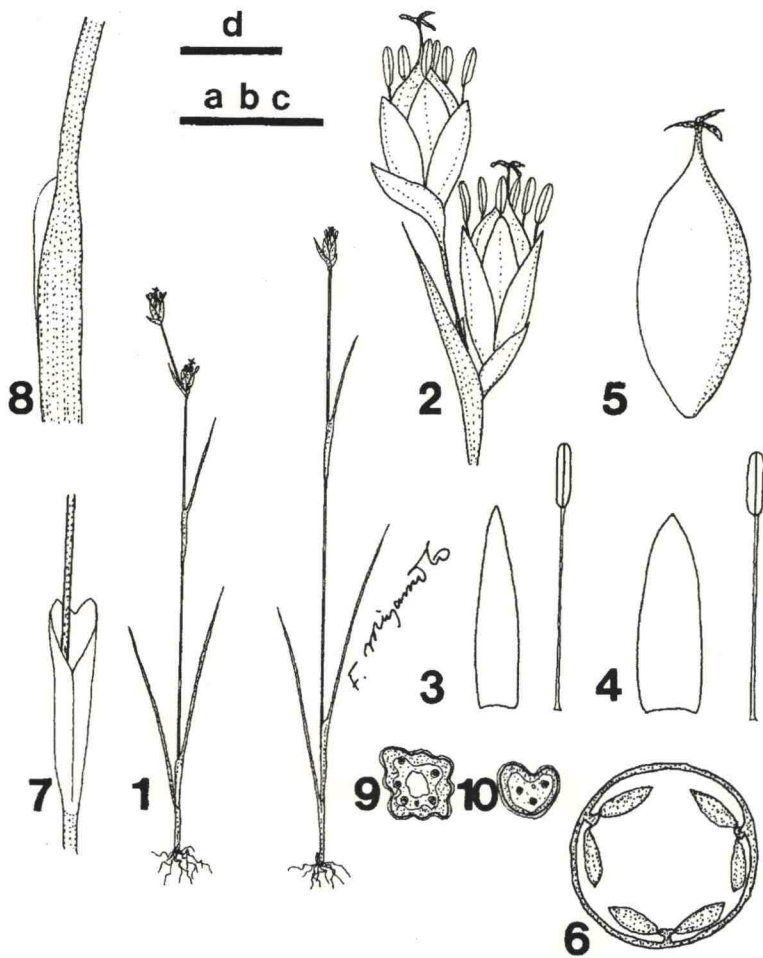


PLATE 45. *Juncus potaninii* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Auricle of basal leaf, 9. Cross section of culm, 10. Cross section basal leaf. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4 and 5; c (1 mm) for 6, 7 and 8; d (0.5 mm) for 9 and 10.

Voucher specimen: China; Sichuan, Xiajin, Rilong - Ganhaizi, 3300 m (H. Ikeda et al. 100812, 30 Aug. 1998, KUN, TI).

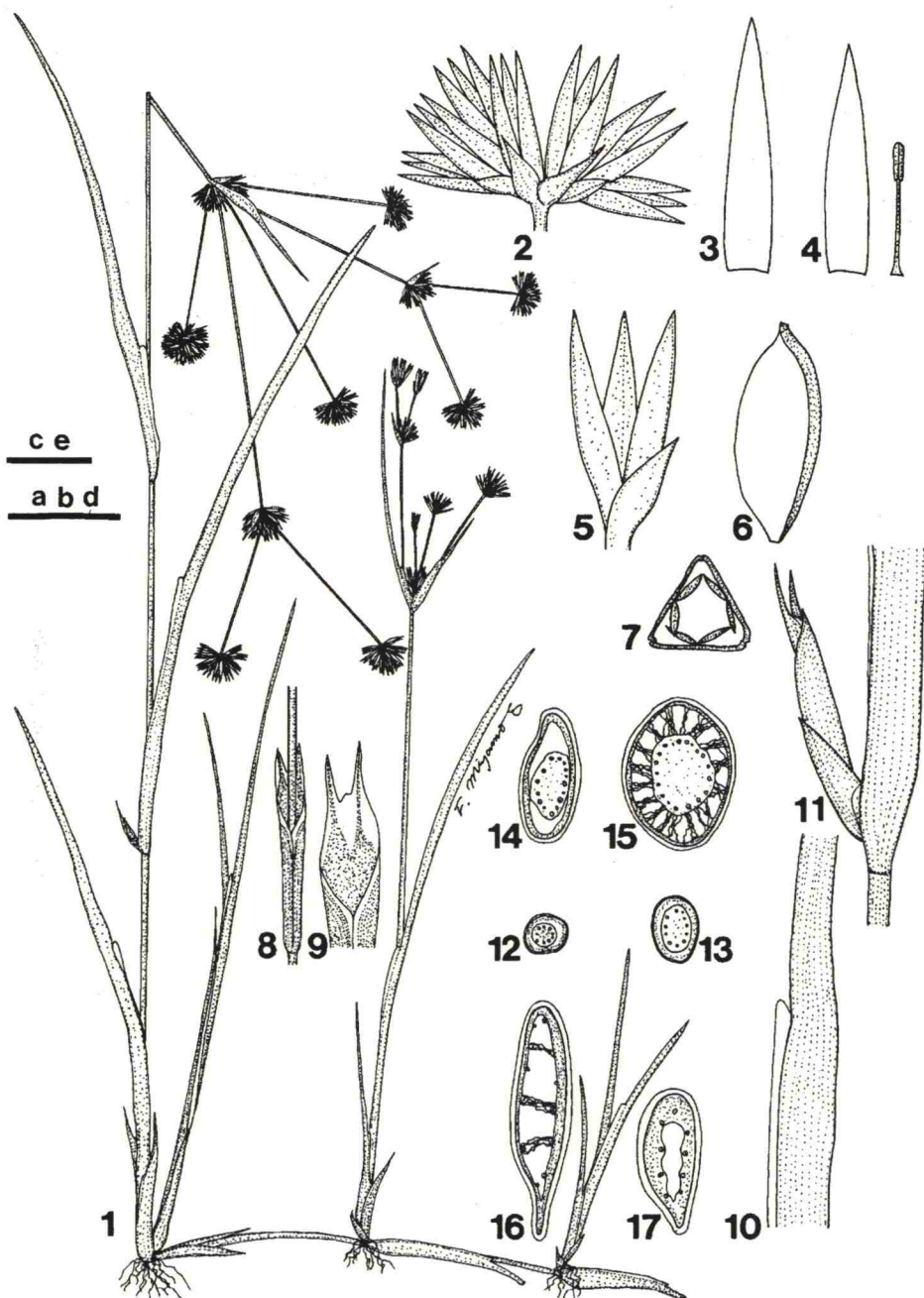


PLATE 46. *Juncus prismatocarpus* R. Br.

1. Habit, 2. Inflorescence, 3. Outer tepal, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. apex of sheathing bract, 10. Auricle of basal leaf, 11. Proliferous, 12. Cross section of upper part of peduncle, 13. Cross section of lower part of peduncle, 14. Cross section of upper part of culm, 15. Cross section of lower part of culm, 16. Cross section of cauline leaf, 17. Cross section of lowest bract. Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4, 5 and 9; c (1 mm) for 6, 7, 12, 13, 14 and 15; d (4 mm) for 8, 10 and 11; e (0.5 mm) for 16 and 17.

Voucher specimen: Nepal; Koshi zone, sankhuwa Sabha Distr., Manebanjang - Chichi la, 1300 m (M. Minaki et al. 9020244, 28 Jul. 1990, TI).

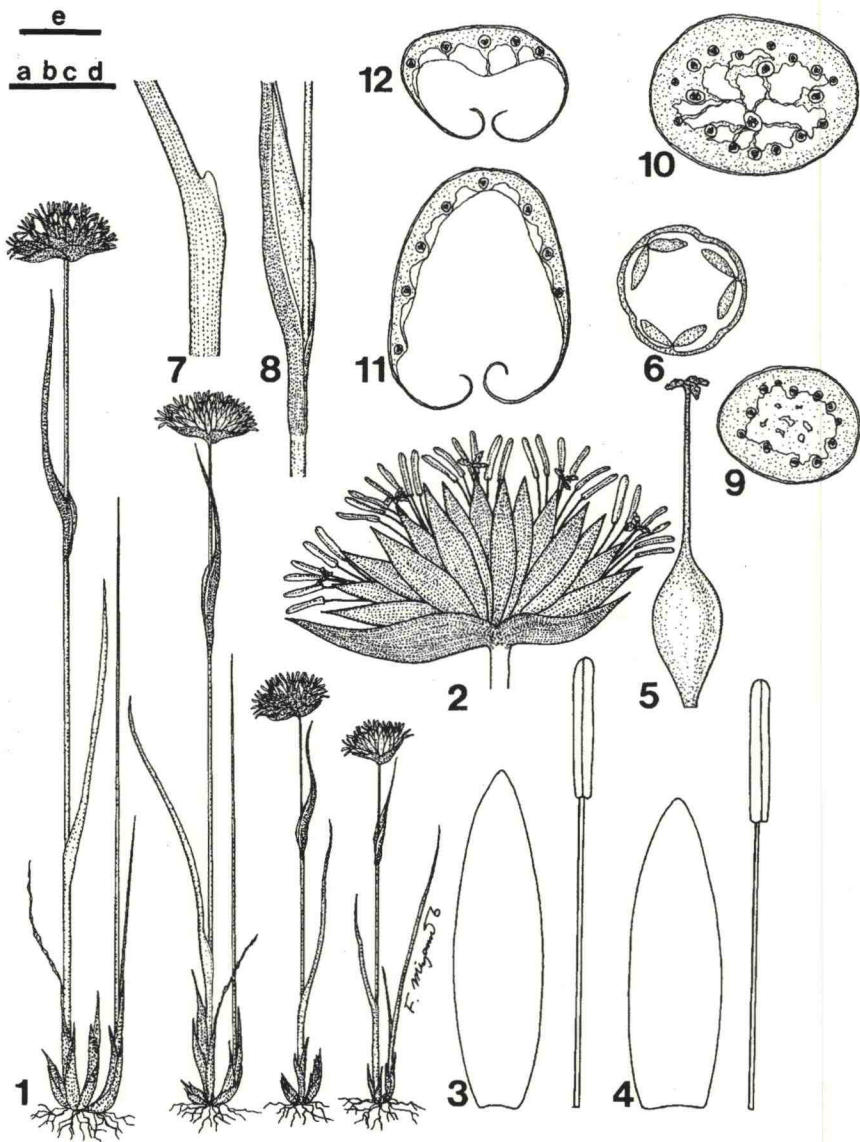


PLATE 47. *Juncus przewarskii* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cauline leaf, 9. Cross section of culm, 10. Cross section of basal leaf, 11. Cross section of upper part of cauline leaf, 12. Cross section of lower part of cauline leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 7 and 8; c (2 mm) for 3, 4 and 5; d (1 mm) for 6; e (1 mm) for 9, 10, 11 and 12.

Voucher specimen: China; Sichuan, Daocheng, around Gongga Shan, 4700 m (S. K. Wu et al. 451, 5 Aug. 1997, TI).

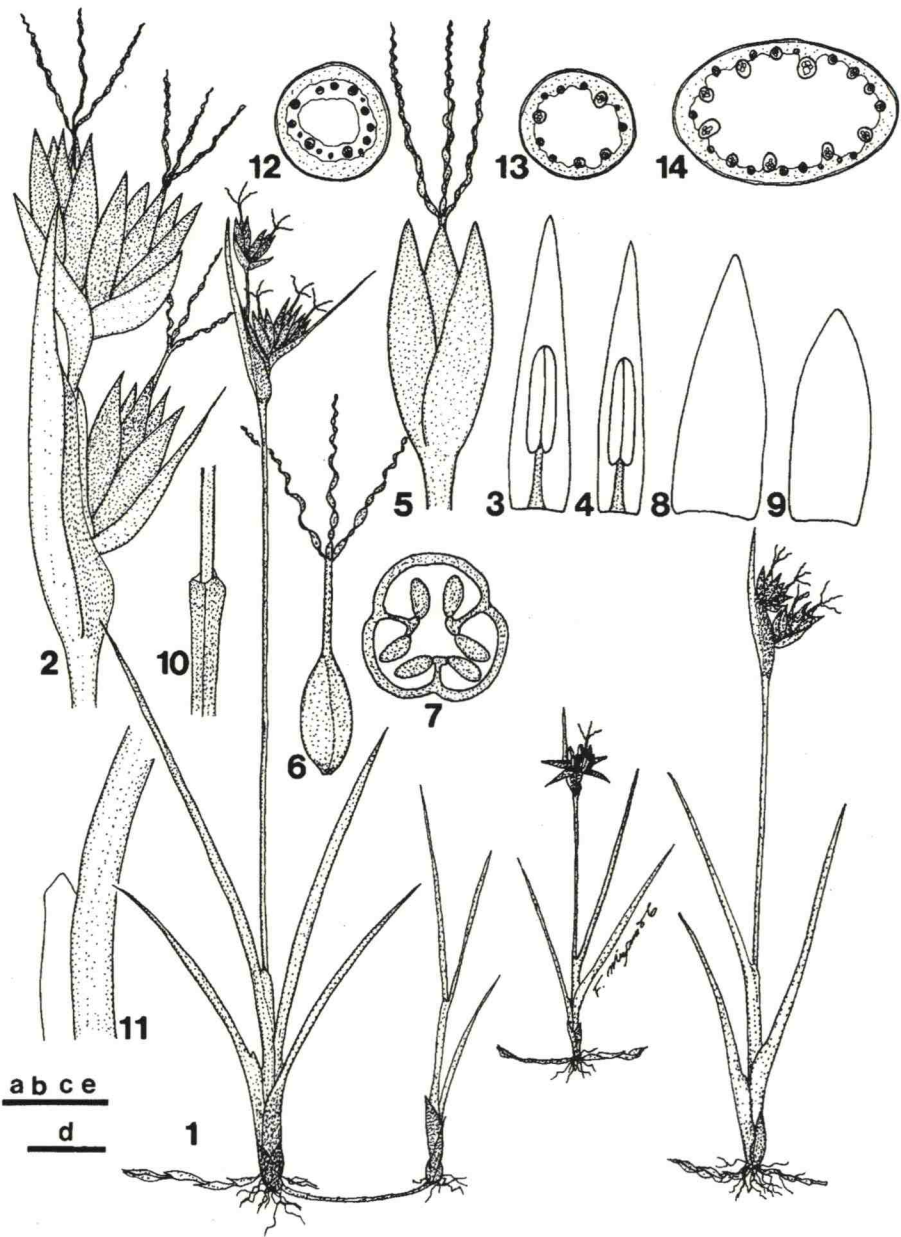


PLATE 48. *Juncus pseudocastaneus* Sam.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and stigmas, 6. Pistil, 7. Cross section of capsule, 8. Outer bract, 9. Inner bract, 10. Sheathing bract on peduncle, 11. Auricle of basal leaf, 12. Cross section of culm, 13. Cross section of lowest bract, 14. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 10 and 11; c (2 mm) for 3, 4, 5, 6, 8 and 9; d (1 mm) for 7; e (1 mm) for 12, 13 and 14.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, Surveying the whole area around Shipton Pass, 4200 m (M. Minaki et al. 9020758, 9 Aug. 1990, TI).

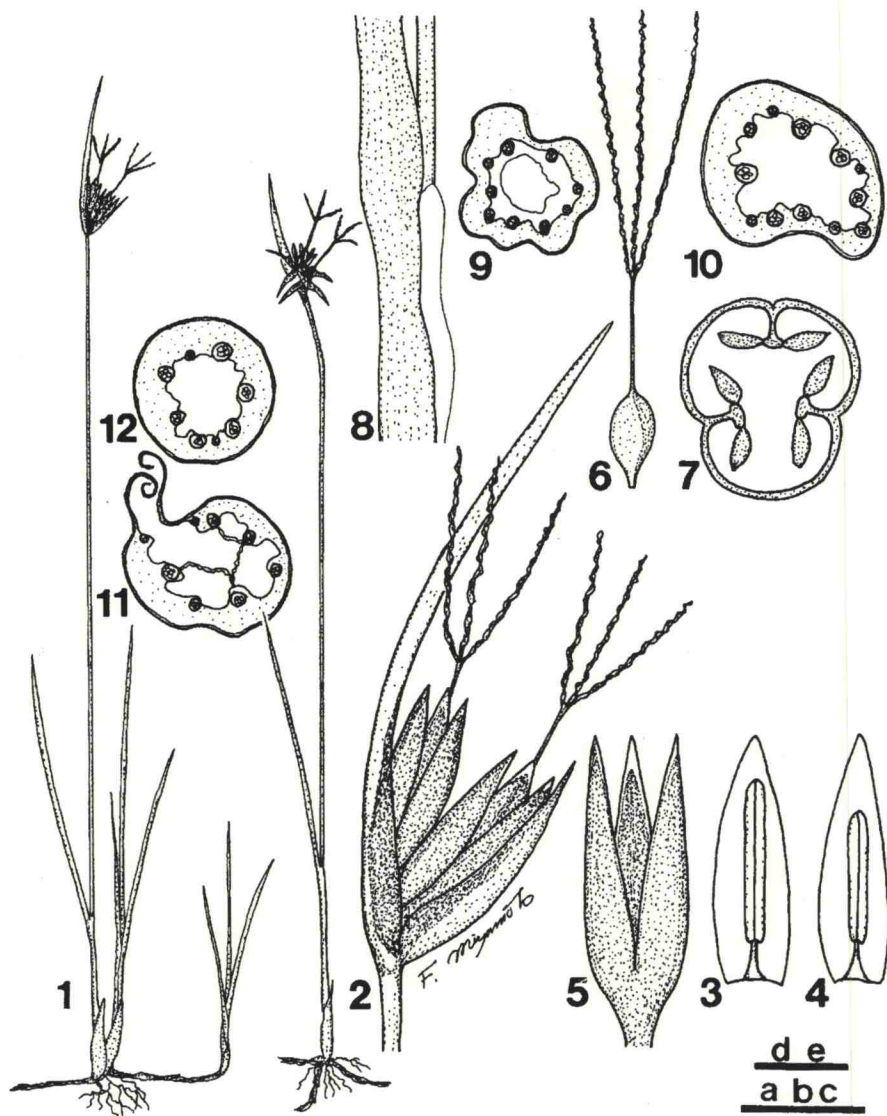


PLATE 49. *Juncus rohtangensis* Goel & Aswal.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of lower part of culm, 10. Cross section of upper part of culm, 11. Cross section of lowest bract, 12. Cross section of upper part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7, 9, 10, 11, 12; e (0.5 mm) for 8. Voucher specimens: Nepal; Bagmati zone, Rasuwa Distr., Kyangjin Kharka - Yala Kharka, 4580 m (H. Takayama et al. 9220175, 14 Jul. 1992, TI).

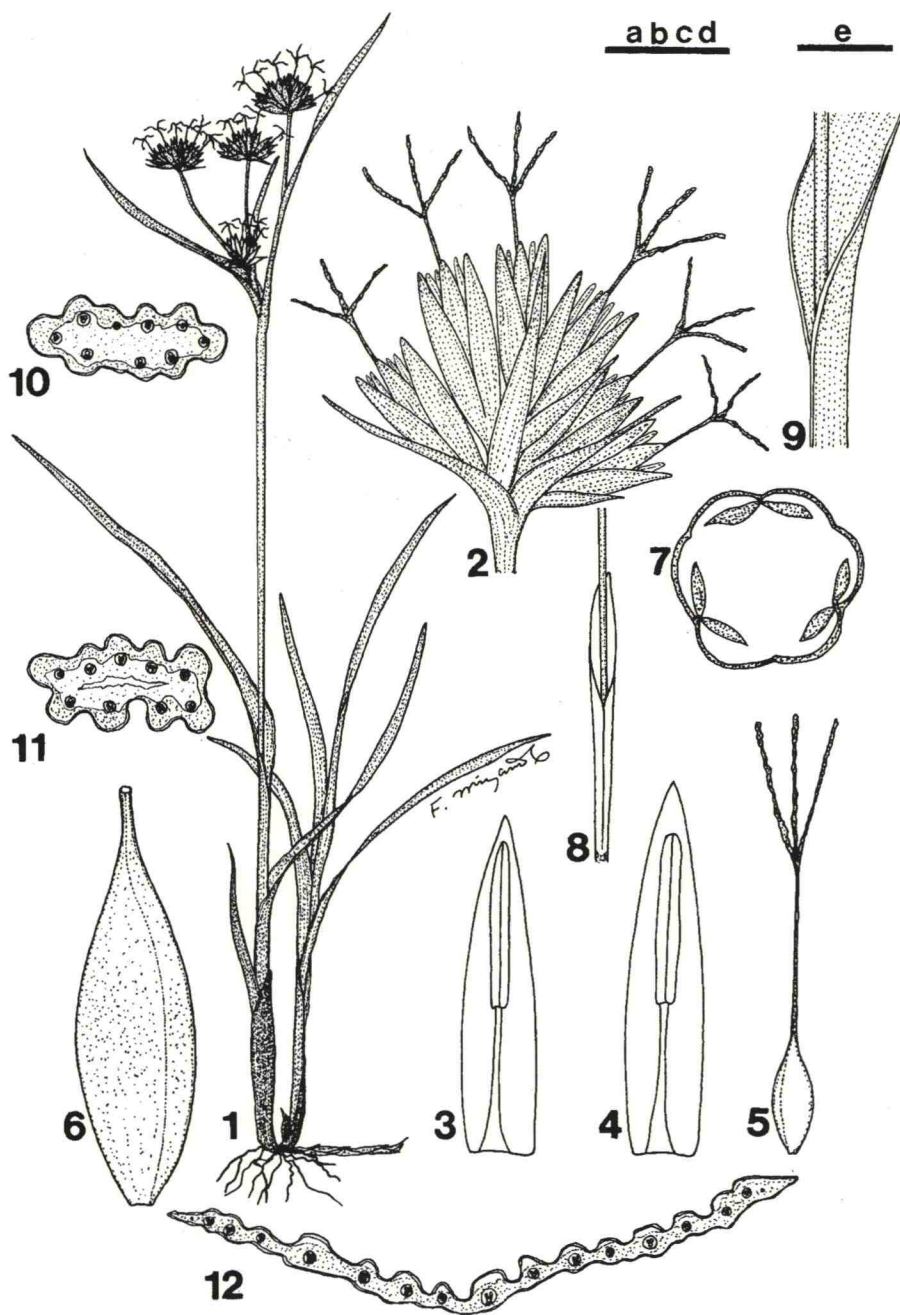


PLATE 50. *Juncus rostocarpus* Miyam.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. pistil, 6. Capsule, 7. Cross section of capsule, 8. Sheathing bract on peduncle, 9. Auricle of basal leaf, 10. Cross section of peduncle, 11. Cross section of culm, 12. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 9; c (2 mm) for 3, 4, 5, 6 and 8; d (1 mm) for 7; e (0.5 mm) for 10, 11 and 12.

Voucher specimen: Tibet; Tsekou (J. A. Soulié 1105, 20 Sept. 1895, TI).

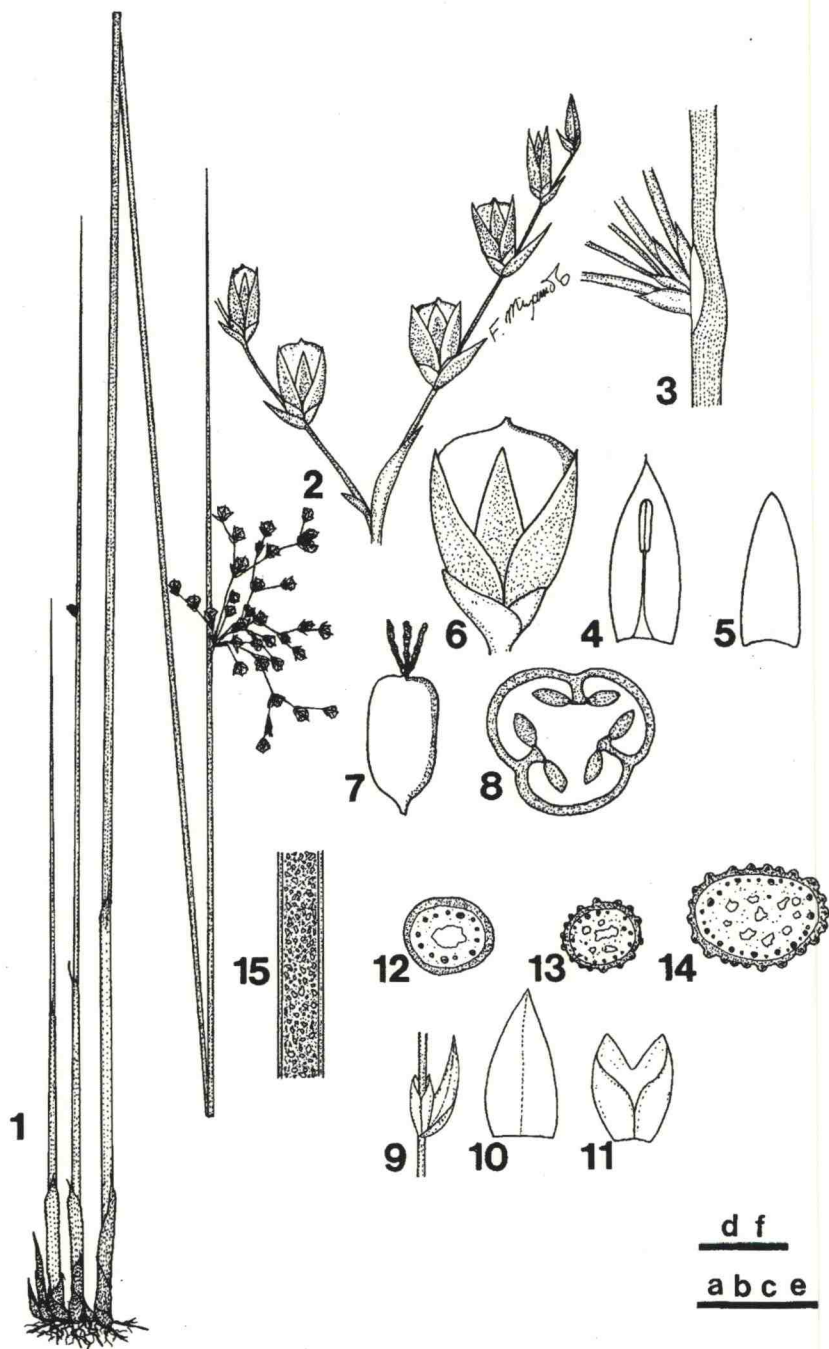


PLATE 51. *Juncus setchuensis* Buchenau

1. Habit, 2. Inflorescence, 3. Auricle of lowest bract, 4. Outer tepal and stamen, 5. Inner tepal, 6. Perianth and capsule, 7. Pistil, 8. Cross section of capsule, 9. Sheathing bract on peduncle, 10. Bract on peduncle, 11. Apex of sheathing bract, 12. Cross section of peduncle, 13. Cross section of upper part of culm, 14. Cross section of lower part of culm, 15. Longitudinal section of culm. Scales: a (2 cm) for 1; b (4 mm) for 2, 3, 9 and 15; c (2 mm) for 4, 5, 6 and 7; d (0.5 mm) for 8, 12 and 13; e (1 mm) for 10 and 11; f (1 mm) for 14. Voucher specimen: China; Yunnan, Gongshan Xian, SW of Gongshan, Gaoligong Shan, 2615 m (S. K. Wu et al. 103188, 20 Sept. 1999, TI).



PLATE 52. *Juncus sherei* Miyam & H. Ohba

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Auricle of basal leaf, 8. Cross section of culm, 9. Cross section of basal leaf, 10. Cross section of lowest bract. Scales: a (2 cm) for 1; b (5 mm) for 2; c (2.5 mm) for 3, 4, 5 and 7; d (1 mm) for 6; e (0.5 mm) for 8, 9 and 10.

Voucher specimen: Nepal; Sagarmatha zone, Solukhumbu District, Fnaula - Pike, 3300 m (F. Miyamoto et al. 9580049, 22 Jul. 1995, TI).

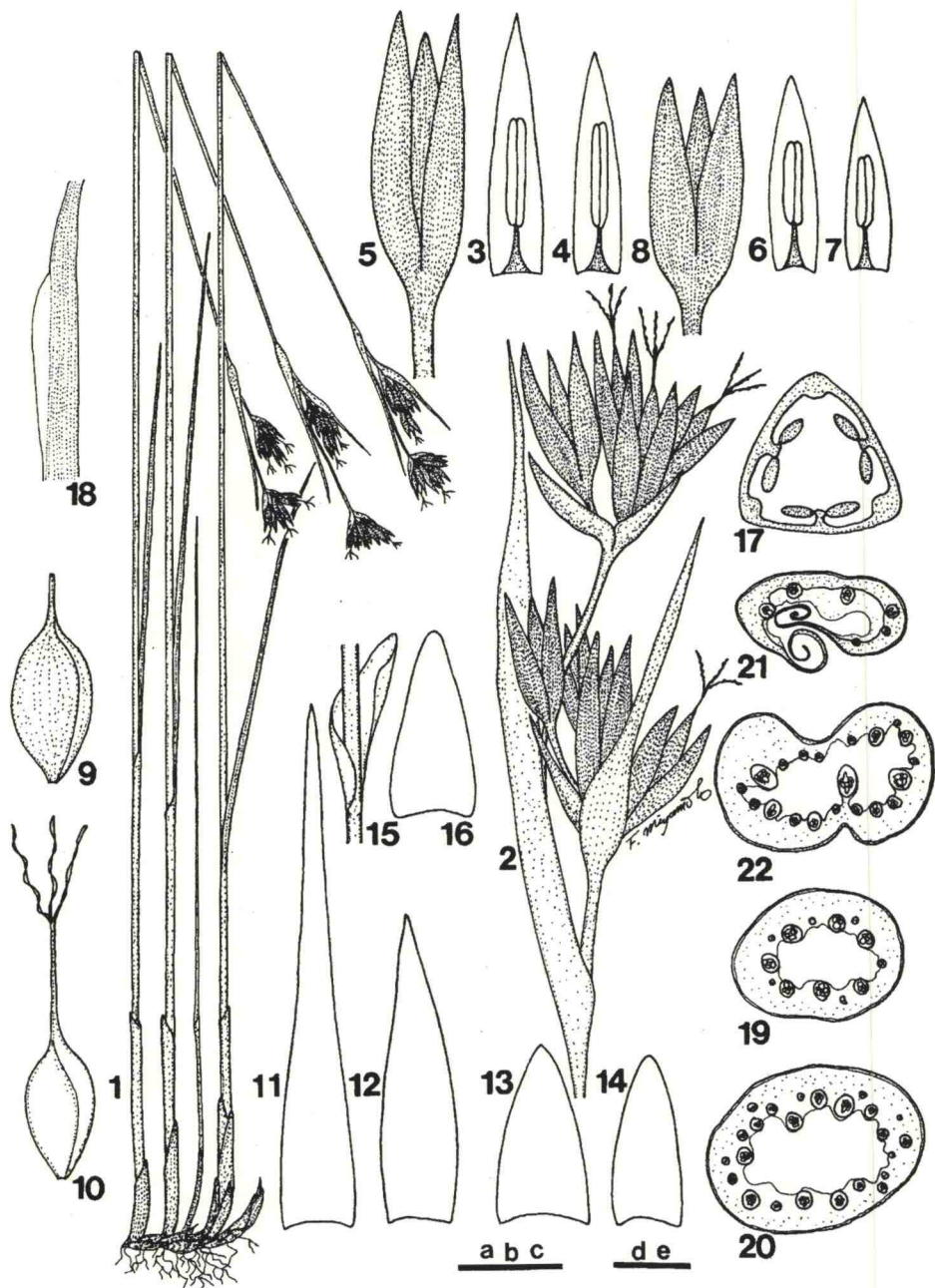


PLATE 53. *Juncus sikkimensis* Hook. f.

1. Habit, 2. Inflorescence, 3 and 6. Outer tepal and stamen, 4 and 7. Inner tepal and stamen, 5 and 8. Perianth, 9. Capsule, 10. Pistil, 11, 13. Outer bract, 12, 14. Inner bract, 15. Sheathing bract on peduncle, 16. Sheathing bract, 17. Cross section of capsule, 18. Auricle of basal leaf, 19. Cross section of upper part of culm, 20. Cross section of lower part of culm, 21. Cross section of lowest bract, 22. Cross section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2 and 18; c (2 mm) for 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16; d (1 mm) for 17; e (0.5 mm) for 19, 20, 21, 22.

Voucher specimen: Nepal; Bagmati zone, Rasuw Distr., Around Base Camp (near Yala Kharka), 4920 m (H. Takayama et al. 9220316, 21 Jul. 1992, TI).

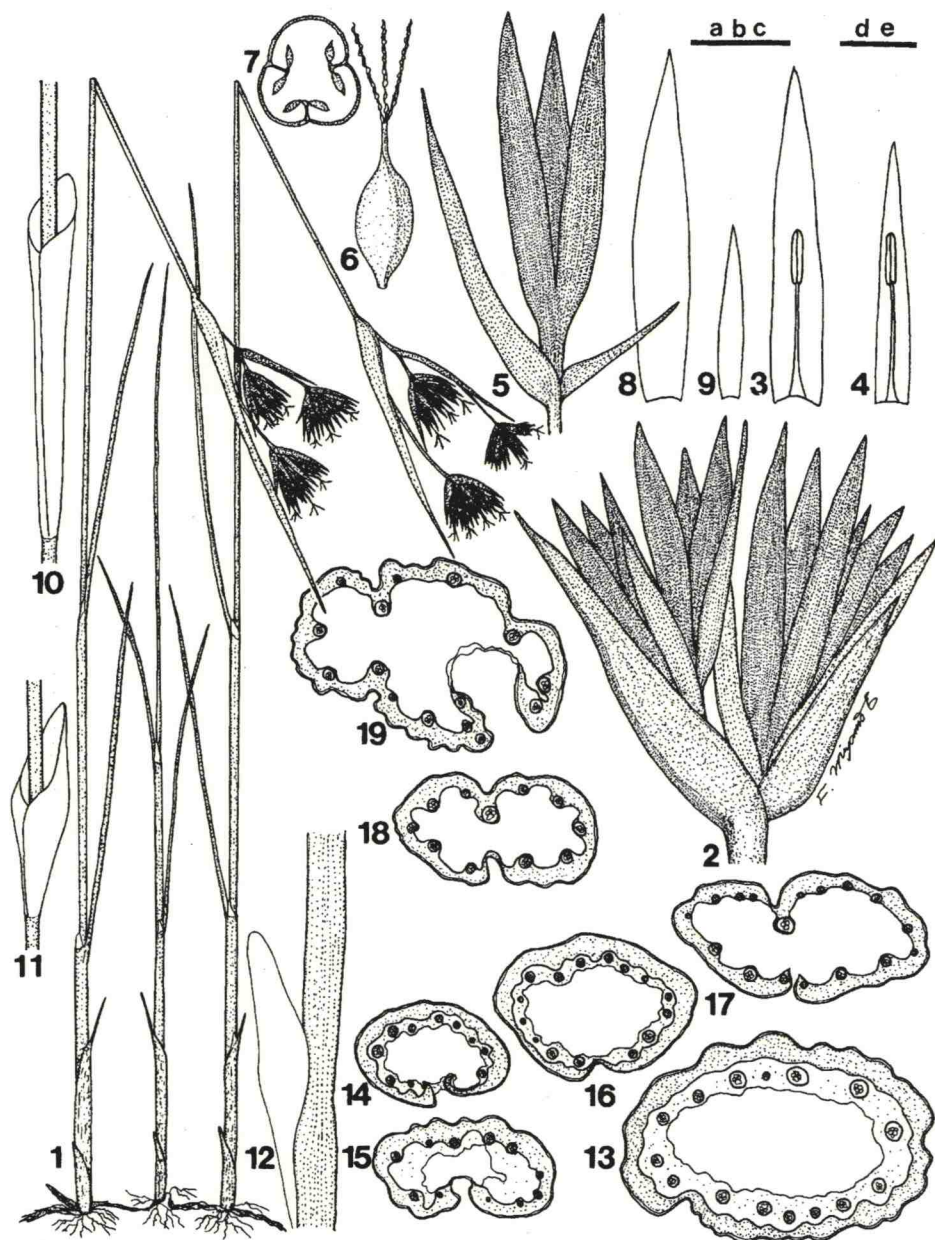


PLATE 54. *Juncus sphacelatus* Decne.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and bract, 6. Pistil, 7. Cross section of capsule, 8. Outer bract, 9. Inner bract, 10, 11. Sheathing bract on peduncle, 12. Auricle of basal leaf, 13. Cross section of culm, 14. Cross section of upper part of lowest bract, 15. Cross section of lower part of lowest bract, 16. Cross section of upper part of cauline leaf, 17. Cross section of lower part of cauline leaf, 18. Cross section of upper part of basal leaf, 19. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 10 and 11; c (2 mm) for 3, 4, 5, 6, 8, 9 and 12; d (1 mm) for 7; e (0.5 mm) for 13, 14, 15, 16, 17, 18 and 19.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Yala Kharka - Langtrang, 4800 m (H. Takayama et al. 9220347, 22 Jul. 1992, TI).



PLATE 55. *Juncus spumosos* Noltie

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Capsule, 7. Cross section of capsule, 8. Seed, 9. Sheathing bract on peduncle, 10. Auricle of basal leaf, 11. Cross section of culm, 12. Cross section of peduncle, 13. Cross section of basal leaf, 14. Cross section of lowest bract. Scales: a (2 cm) for 1; b (4 mm) for 2, 9 and 10; c (2 mm) for 4, 5, 6 and 8; d (1 mm) for 7; e (1 mm) for 11, 13 and 14; f (0.5 mm) for 12.

Voucher specimen: China; Yunnan, Lushui, Pianma - Pianma Pass - Lushui, 2600 m (S. K. Wu et al. 103174, 13 Sept. 1999, TI).

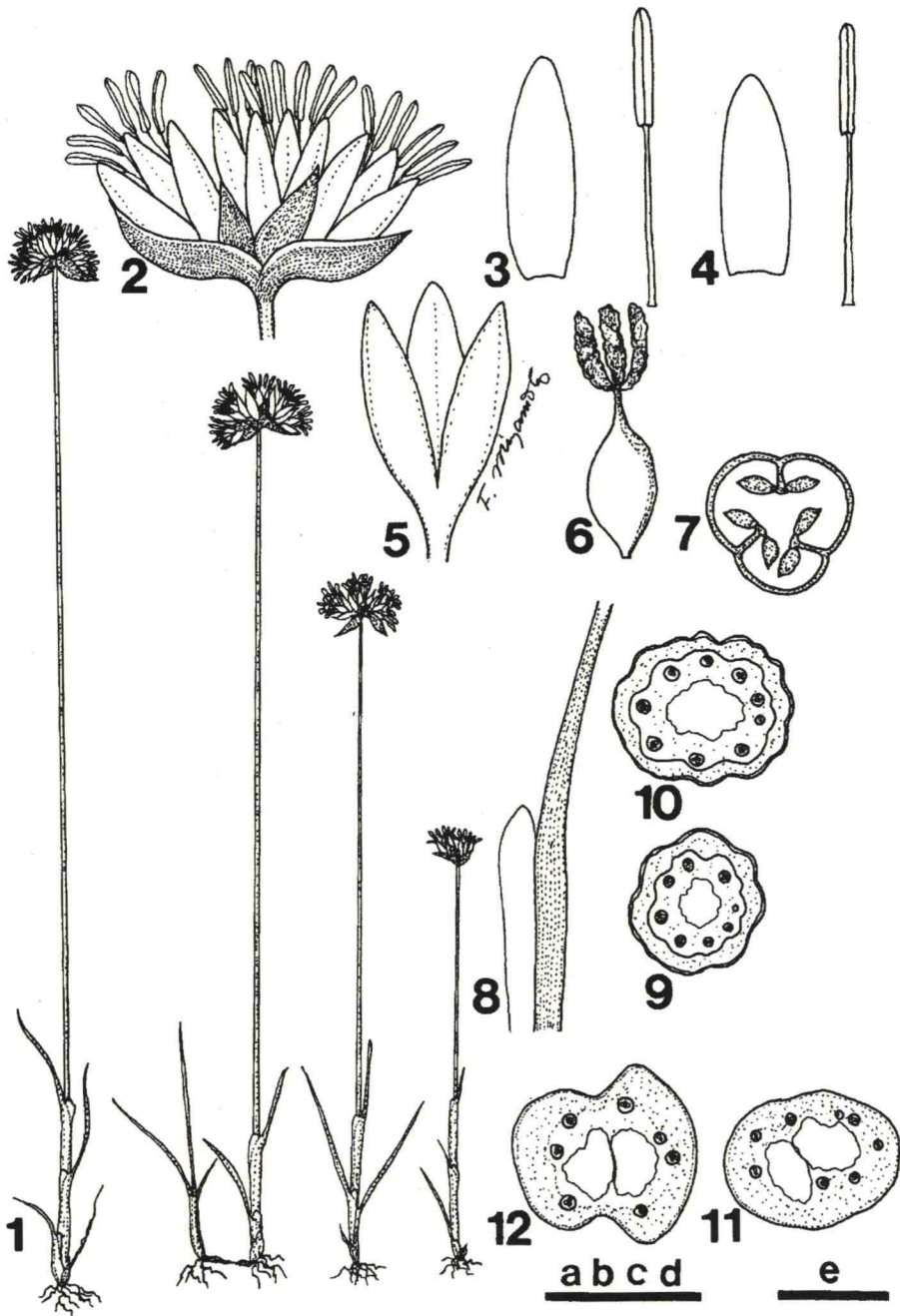


PLATE 56. *Juncus thomsonii* Buchenau

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9. Cross section of upper part of culm, 10. Cross section of lower part of culm, 11. Cross section of upper part of basal leaf, 12. Cross section of lower part of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 8; c (2 mm) for 3, 4, 5 and 6; d (1 mm) for 7; e (0.5 mm) for 9, 10, 11 and 12.

Voucher specimen: Nepal; Bagmati zone, Rasuwa Distr., Yala Kharka - Langtrang, 4850 m (H. Takayama et al. 9220352a, 22 Jul. 1992, TT).

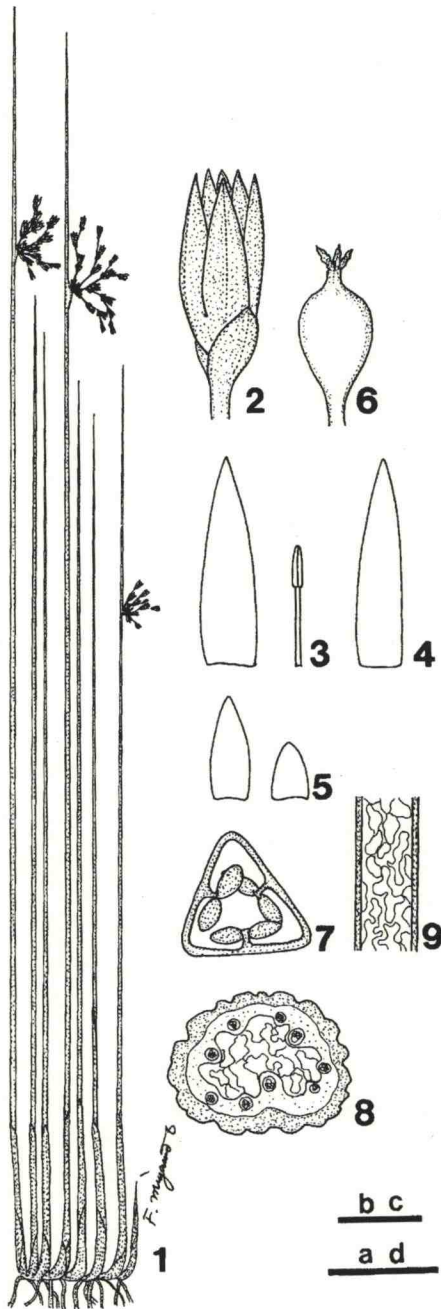


PLATE 57. *Juncus tobdeniorum* Noltie

1. Habit, 2. Perianth and bracteoles, 3. Outer tepal and stamen, 4. Inner tepal, 5. Bracteoles, 6. Pistil, 7. Cross section of capsule, 8. Cross section of culm, 9. Longitudinal section of culm.

Scales: a (2 cm) for 1; b (1 mm) for 2, 3, 4, 5, 6 and 9; c (0.5 mm) for 7; d (0.5 mm) for 8.

Voucher specimen: Sikkim; North District, Yakche, N. of Lachung, 3150 m (D. G. Long & H. J. Noltie 209, 14 Jul. 1996, TI).

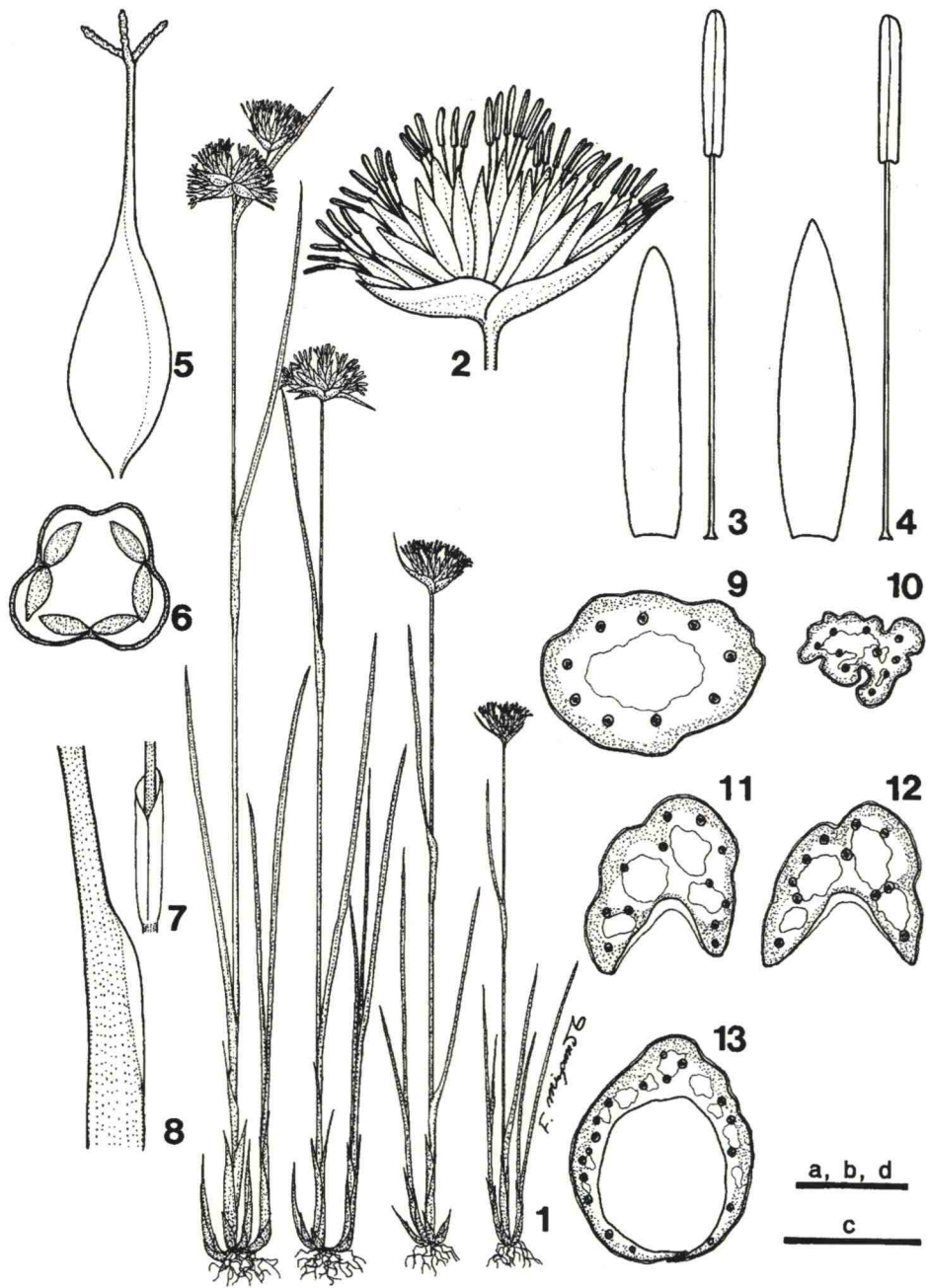


PLATE 58. *Juncus trachyphyllus* Miyam. & H. Ohba

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Cross section of capsule, 7. Sheathing bract on peduncle, 8. Auricle of basal leaf, 9. Cross section of lower part of culm, 10. Cross section of cauline leaf, 11. Cross section of upper part of basal leaf, 12. Cross section of lower part of basal leaf, 13. Cross section of lowest bract. Scales: a (2 cm) for 1; b (5 mm) for 2, 7 and 8; c (2.5 mm) for 3, 4 and 5; d (1 mm) for 6, 9, 10, 11, 12 and 13.

Voucher specimen: China; Sichuan, Daoching District, Mt. Gonggashan, 4300 m (Wu et al. 1540, 21 Aug. 1995, TI).

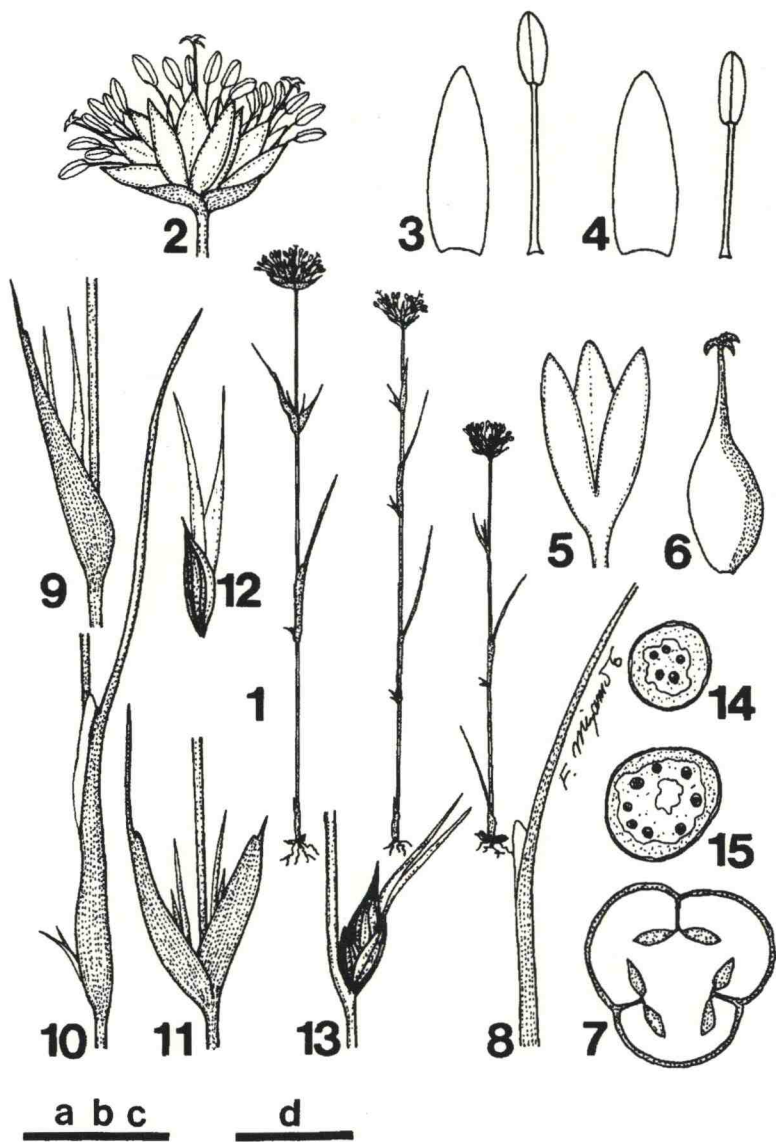


PLATE 59. *Juncus trichophyllus* W. W. Sm.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Auricle of basal leaf, 9, 10, 11. Cauline leaf with proliferous, 12, 13. Proliferous, 14. Cross section of upper part of culm, 15. Cross section of lower part of culm. Scales: a (2 cm) for 1; b (4 mm) for 2; c (2 mm) for 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13; d (1 mm) for 7, 14 and 15.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Cha Ding Kharka - Khongma, 3900 m (M. Minaki et al. 9020862a, 12 Aug. 1990, TI).

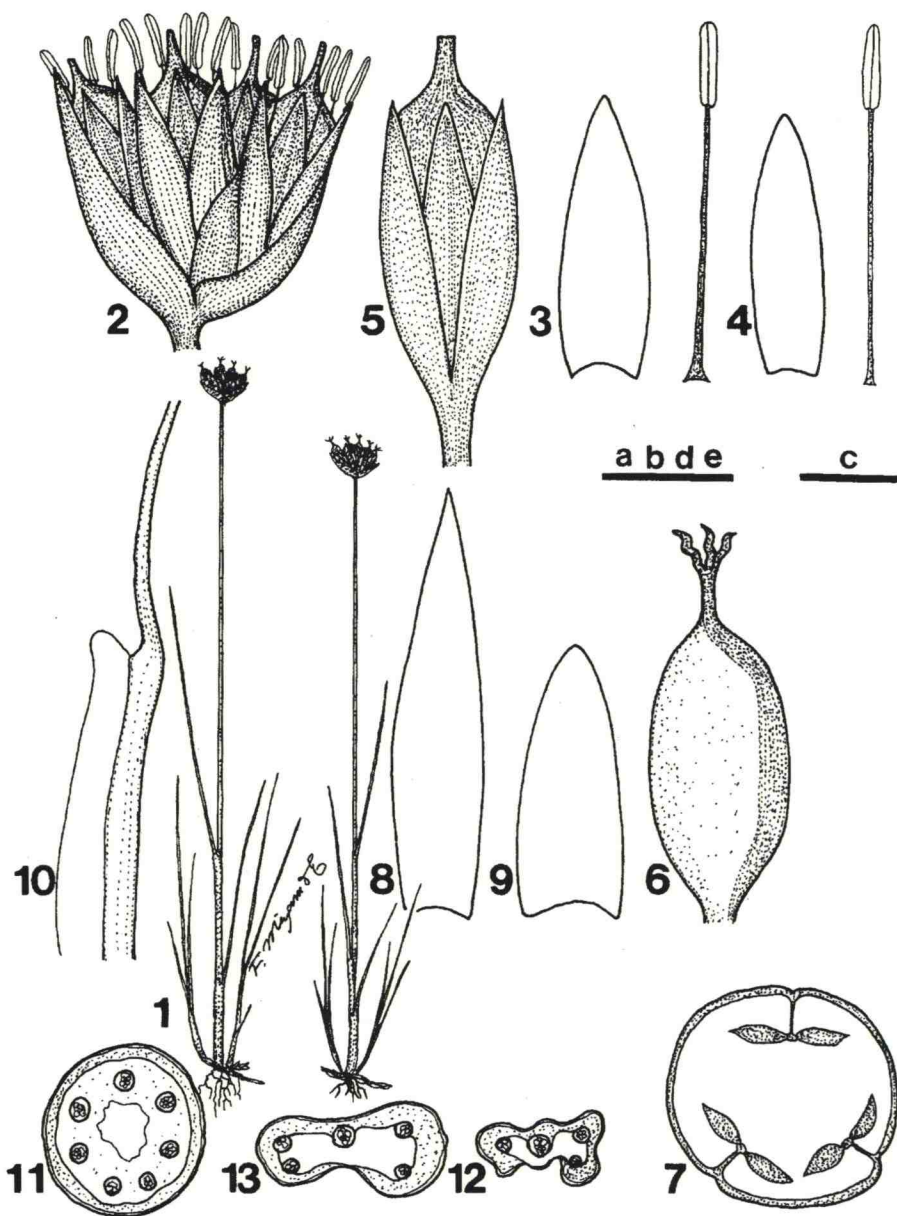


PLATE 60. *Juncus triglumis* L.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth and capsule, 6. Pistil, 7. Cross section of capsule, 8. Outer bract, 9. Inner bract, 10. Auricle of basal leaf, 11. Cross section of culm, 12. Cross section of upper part of basal leaf, 13. Cross section of lower part of basal leaf.). Scales: a (2 cm) for 1; b (2 mm) for 2, 3, 4, 5, 6, 8, and 9; c (1 mm) for 7; d (1 mm) for 10; e (0.5 mm) for 11, 12 and 13.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Around Cha Ding Kharka, 4100 m (M. Minaki et al. 9020745, 9 Aug. 1990, TT).

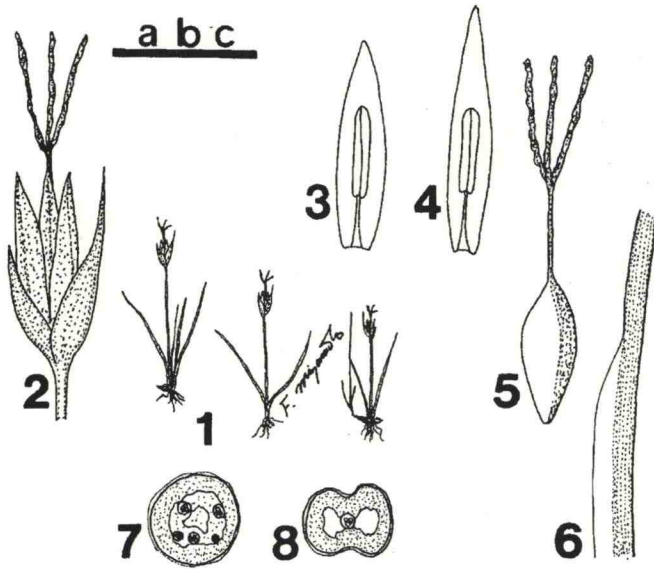


PLATE 61. *Juncus uniflorus* W. W. Sm.

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Pistil, 6. Auricle of basal leaf, 7. Cross section of lower part of culm, 8. Cross section of basal leaf. Scales. a (2 cm) for 1; b (4 mm) for 2, 3, 4, 5 and 6; c (2 mm) for 7 and 8.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Jaljale Himale, around Banduke, 4150 m (H. Ohba et al. 9110215, 25 Jul. - 3 Aug. 1991, TT).



PLATE 62. *Juncus wallichianus* Laharpe

1. Habit, 2. Inflorescence, 3. Outer tepal and stamen, 4. Inner tepal and stamen, 5. Perianth, 6. Pistil, 7. Cross section of capsule, 8. Proliferous flower, 9. Sheathing bract on peduncle and apex of sheathing bract, 10. Auricle of cauline leaf, 11. Cross section of upper part of culm, 12. Cross section of lower part of culm, 13. Cross section of upper part of peduncle, 14. Cross section of lower part of peduncle, 15. Cross section of upper part of cauline leaf, 16. Cross section of lower part of cauline leaf, 17. Cross section of basal leaf, 18. Upper part of basal leaf, 19. Longitudinal section of basal leaf. Scales: a (2 cm) for 1; b (4 mm) for 2, 9, 10 and 18; c (2 mm) for 3, 4, 5, 8 and 19; d (1 mm) for 6, 7, 11, 12, 13, 14, 15, 16 and 17.

Voucher specimen: Nepal; Koshi zone, Sankhuwa Sabha Distr., Sedua - Mane Gaun - Tashi Gaun, 1600 m (M. Minaki et al. 9020479, 2 Aug. 1990, TI).