THE FAMILY EUPHORBIACEAE S. L. IN NEPAL
A CHECKLIST AND TAXONOMICAL NOTES

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Euphorbiaceae s. l. is characterized by often minute, unisexual flowers and superior ovaries with 1 or 2 ovules per cymule, and some of the members are of great economic importance (Webster 1987, 1994a, Govaerts et al. 2000, Radcliffe-Smith 2001). The family distributes nearly world wide, although predominantly in tropical and subtropical areas (Webster 1987, 1994a, Govaerts et al. 2000). According to Radcliffe-Smith (2001) this is the sixth largest family of angiosperms. Govaerts et al. (2000) recorded 322 genera and 8910 species in the family.

Webster (1975, 1994b) had outlined and extended a system of classification of the family and now most workers accept his system. However, molecular evidences (Chase et al. 1993, Tokuoka & Tobe 1999, Savolainen et al. 2000) together with some morphological evidences (e. g. Tokuoka & Tobe 1999) have suggested Euphorbiaceae s. l. are heterogeneous and polyphyletic. Angiosperm Phylogeny Group (1998) and Savolainen et al. (2000) proposed Phyllanthaceae, Pseudanthaceae, and Putranjivaceae for Phyllanthoideae (excl. Drypeteae), Oldfieldioideae, and Drypeteae in the system of Webster (1994b) respectively. Although the advanced system of Euphorbiaceae s. l. proved by phylogenetic classification will be proposed and become widely accepted in the future, in this checklist "Euphorbiaceae" is used in the broad and traditional sense in accordance with the precedent works.

History

The first botanical collection of Nepal was made by F. Buchanan sent by the Honourable East India Company from Makwanpur to Kathmandu from March 1802 to March 1803 (Rajbhandari 1976, 2002, Stearn 1978). A set of these collections had formed the basis of Don's *Prodromus Florae Nepalensis* (1825), in which the first six species of Nepalese Euphorbiaceae, *Euphorbia dracunculoides* Lam. (as *E. angustifolia*) (Plate 78), *E. fusiformis* Buch.-Ham. ex D. Don (Plate 74), *E. prolifera* Buch.-Ham. ex D. Don (Plate 75), *Chamaesyce parviflora* (L.) Soják (as *E. tenuis*) (Plate 81), *Phyllanthus parvifolius* Buch.-Ham. ex D. Don (as '*parvifolia*') (Plate 63), and *Aporosa octandra* (Buch.-Ham. ex D. Don) A. R. Vickery (as *Myrica octandra*, Myricaceae) (Plate 70) were recorded (Press & Shrestha 2000). The type specimens of these species are held at the Natural History Museum, London (BM) (Press & Shrestha 2000).

Wallich (1828–1849) proposed numerous new names of Nepalese Euphorbiaceae based on Buchanan's collections and his own collections in the expedition to Kathmandu valley and Trisuli valley made from December 1820 to November 1821 (Burkill 1910), but without description. Among these invalid names Müller Argoviensis (1863) validated two names, *Phyllanthus juniperinus* Wall. ex Müll. Arg. (Plate 64) and *Phyllanthus glaucus* Wall. ex Müll. Arg. (Plate 65). Müller Argoviensis (1863, 1865) and Boissier (1862)

described four new species from Nepal, *Glochidion acuminatum* Müll. Arg. (Plate 68), *Phyllanthus nepalensis* Müll. Arg. (Plate 67), *Mallotus nepalensis* Müll. Arg. (Plate 71), and *Euphorbia nepalensis* Boiss. (Plate 76), based on Wallich's collections. Hooker and his collaborators had reviewed the results of these explorations and publications, and compiled them in *Flora of British India* in which 21 species of Euphorbiaceae from Nepal were recorded (Hooker 1886–1888) (Table 1).

Burkill traced almost the same route at the same season of Wallich's expedition and recorded 13 species in 8 genera of Euphorbiaceae (Burkill 1910).

Through some major botanical expeditions organized by the British Museum (Natural History) and University of Tokyo after 1949, numerous Nepalese specimens had been provided to British, Scottish and Japanese herbaria as well as plant collecting activities by the Department of Plant Resources, Nepal (Stearn 1978, 1981, Ohba 2002, Rajbhandari 2002). Hurusawa & Tanaka's enumeration (1966) based on specimens in TI has greatly contributed to the progress of the knowledge on diversity of Euphorbiaceae in eastern Nepal, though many misidentifications and nomenclatural mistakes were pointed by various authors. A regional flora of Kathmandu valley was edited by Malla et al. (1986) with reference to the Herbarium, Department of Plant Resources, Nepal (KATH) in which 17 species in 11 genera of Euphorbiaceae were included with keys to species, synonymy, and descriptions. Short & Vickery (1982) completed the first full list of Nepalese Euphorbiaceae mostly based on the specimens kept in BM, and enumerated 28 genera with 83 species (and *Bischofia javanica* as Staphyleaceae). Kurosawa (1998) provided keys to genera and species with miscellaneous taxonomic notes based on studies in Japanese herbaria, the University Museum, University of Tokyo (TI) and Biological Institute, Faculty of Science, Tohoku University (TUS), with reference to literatures.

Aims of the Checklist

Recent progress in understanding the taxonomy for Euphorbiaceae is remarkable. Three floristic works including many new taxonomic treatment in adjacent countries (Sikkim and Bhutan by Long 1987; China by Li 1994, Kiu et al. 1996, and Ma & Tseng 1997; Sri Lanka by Philcox 1997) and numerous regional or world revisions and checklists of genera (*Antidesma* by Hoffmann 2000; *Aporosa* by Chakrabarty & Gangopadhyay 1993, Schot 1995; *Baccaurea* by van Welzen et al. 2000, Haegens 2000; *Balakata* by Esser 1999; *Baliospermum* by Chakrabarty & Balakrishnan 1990; *Breynia* by van Welzen et al. 2000; *Bridelia* by Dressler 1996b, van Welzen et al. 2000; *Croton* by Chakrabarty & Balakrishnan 1992; *Chrozophora* by van Welzen 1999; *Excoecaria* by Chakrabarty & Gangopadhyay 1994; *Falconeria* by Esser 1999; *Flueggea* by Webster 1984; *Glochidion* by Chakrabarty & Gangopadhyay 1995, van Welzen et al. 2000; *Mallotus* by van Welzen et al. 2000; *Putranjiva* as *Drypetes* by Chakrabarty et al. 1997; *Triadica* by Esser 1999; *Vernicia* by Stuppy et al. 1999) had been published, and a checklist for the family as a whole had been completed by Govaerts et al. (2000) in a series of worldwide checklists by the Royal Botanic Gardens, Kew. Short & Vickery's enumeration (1982) requires revising to the recent progress with reference. Descriptions as well as detailed distributions and ecological data of most of Nepalese Euphorbiaceae have not be available. The checklist presented here aims at revising taxonomic treatments and showing present knowledge about the Euphorbiaceae of Nepal through studies on herbarium specimens and literatures.

TABLE 1. The records of Nepalese Euphorbiaceae in Hooker (1886–1888) and their cited specimens. Data in brackets are those available from the label of specimens

Name in Hooker (1886–1888) (page)	Treatment in present study	Cited specimens in Hooker (1886–1888)
Euphorbia fusiformis Ham. (257)	*Euphorbia fusiformis*	*Hamilton*
E. wallichii Hook. f. (258)	*E. wallichii*	*Wallich, List no. 7696A*, at Gossainthan [in 1821] (K-WALL*).
E. stracheyi Boiss. (259)	*E. stracheyi*	*Wallich, List no. 7685*, [in 1821] (K-WALL*).
E. longifolia Don (261)	*E. pseudosikkimensis*	*Hamilton*; *Wallich, List no. 7694A*, at Thoukote [18 May 1821] (K-WALL*).
E. prolifera Ham. (264)	*E. prolifera*	*Wallich, List no. 7698A*, [in 1821] (K!, Plate 14, K-WALL*).
E. angustifolia Ham (265, as doubtful species)	*E. dracunculoides*	*Hamilton*, at Norcotera.
E. tenuis Ham. (266, as doubtful species)	*Chamaesyce parvifolia*	*Hamilton*, at Bassaria.
Andrachne cordifolia Muell. Arg. (283)	*Leptopus cordifolius*	*Wallich, List no. 7913B* (K-WALL*).
Phyllanthus glaucus Wall. (288)	*Phyllanthus glaucus*	*Wallich, List no. 7918A* p.p.[May 1821] (K-WALL!); 7927A, [April 1821 & 15 Dec. 1820] (K!, K-WALL!, Plate 65)
P. parvifolius Ham. (294)	*P. parvifolius*	*Wallich, List no. 7901B* (K-WALL!)
Glochidion lanceolarium Dalz. (308)	*Glochidion lanceolarium*	*Wallich, List no. 7855E*, [24 March 1821] (K-WALL!).
G. velutinum Wight (322)	*G. heyneanum*	*Wallich, List no. 7852*, [May 1821] (K-WALL!, Plate 67).
G. acuminatum Muell. Arg. (323)	*G. triandrum*	*Wallich, List no. 7885* (K!, K-WALL!, Plate 68).
Breynia patens Benth (329)	*Breynia retusa*	*Wallich, List no. 7911D* [May 1821 & April 1821] (K-WALL*).
Sauropus compressus Müll. Arg. (336)	*Sauropus quadrangularis*	*Hamilton*
Antidesma bunius Spreng (358)	*Antidesma bunius*	?
Acalypha brachystachya Hornem. (416)	*Acalypha supera*	?
Alchornea mollis Müll. Arg. (420)	*Alchornea mollis*	*Wallich, List no. 7825*, [May 1821] (K-WALL!).
Mallotus nepalensis Müll. Arg. (428)	*Mallotus nepalensis*	*Wallich, List no. 7824*, [in 1821] (K!, K-WALL!, Plate 71).
Baliospermum corymbiferum Hook. f. (463)	*Baliospermum corymbiferum*	no cited specimens
Excoecaria acerifolia F. Didrichs. (473)	*Excoecaria acerifolia*	*Wallich, List no. 7969*, [in 1821] (K-WALL!).

* IDC microfiches in TI were seen.

Materials and Methods

Herbarium studies were conducted in E, KYO, TI and TUS from 2000 to 2003, although I could not examine numerous Nepalese specimens not yet mounted in TI. The specimens kept in four other herbaria, BM, K, K-WALL and KATH, were also observed in the same period, but rather partially and insufficiently. IDC microfiches in TI were seen for the type specimens in G-DC and some important specimens in K-WALL. My field observations in Chitwan, Arun-Iswa Khola, and Mustang (Suzuki & Yoda 1996, Noshiro 1998, Noshiro & Amano 2002) are also reflected for descriptions of habitat and ecology.

Explanation of Checklist

Classification and arrangement. Intrafamilial classification and generic circumscription and arrangement follow Radcliffe-Smith (2001).

Acceptance of species and infraspecific taxa. The phylogenetic species concept (Nixon & Wheeler 1990, Luckow 1995) is employed here, i. e. species are the smallest diagnosable aggregation. Species generally taken here are as groups of individuals that consistently differ in qualitative morphological characters, or quantitative morphological characters that have no overlap in values. The rank of subspecies is applied to geographically complementary taxa that differ in reasonably reliable characters but without clear intervals as in the case of *Flueggea virosa* subsp. *himalaica*.

Taxa recorded in literatures but not examined specimens during this study, whether it is reliable or not, are listed in *Excluded Taxa* at the end of the checklist and included in keys with "excl."

Keys. Keys are generally made with reference to Nepalese materials cited in Appendix, except in the case of excluded taxa indicated by "excl."

Synonym lists. Synonyms are listed chronologically if heterotypic, with any homotypic synonyms following in a given lead. Synonyms of which I have not observed the type materials are also listed referring to Govaerts et al. (2000) or, in some case of Wallich's names, to Hooker (1986–1988), Short & Vickery (1982), and Govaerts et al. (2000). Synonyms in brackets are those of invalid, i. e. nom. nud., nom. rejic., etc., according to the International Code of Botanical Nomenclature (Greuter et al. 2000). Data of the type materials in brackets are those available from the label of specimens. Abbreviations of authors of scientific names, books, journals, and herbaria follow "Authors of Plant Names" (Brummitt & Powell 1992), "Taxonomic Literature" (Stafleu & Cowan 1976–1988), "Botanico-Periodicum-Huntianum/Supplementum" (Bridson 1991), and "Index Herbariorum. Part I. The Herbaria of the World (Regnum Veg. vol. 120)" (Holmgren et al. 1990), respectively.

Descriptions. All descriptions are based on herbarium collections from Nepal cited in Appendix. Descriptions of most of foreign taxa are omitted as well as the taxa treated in another papers in press or in preparation. Terminology follows generally Radford et al. (1974) and Harris & Harris (1994).

Distributions. World distribution of each taxon is based on assessments of literature. The names of geographical ranges in the world generally follow Hollis & Brummit (1992), but do not follow in some cases (e. g. Sikkim is separated from Bhutan and is treated as a part of India). The categories of the elements are modified from those of Grierson & Long (1983).

1. *Himalayan-Chinese-Japanese element* (Grierson & Long 1983). This element is subdivided into following 4 categories here.

1a. Taxa distributed from Kashmir or western Nepal to eastern Nepal, Sikkim, Bhutan, Assam or southeastern Tibet. It is tentatively called as '*Pan-Himalayan element*' here.

1b. Taxa distributed from Kashmir to Nepal. It is tentatively called as '*NW Himalayan element*' here.

1c. Taxa distributed from eastern Nepal to Sikkim, Bhutan, Assam and southeastern Tibet. It is tentatively called as '*E Himalayan element*' here.

1d. *Endemic*: taxa at present known only from Nepal Himalaya.

2. *Tibetan element* (Grierson & Long 1983): taxa distributed from Nepal to Tibet.

3. *Deccan element* (Grierson & Long 1983): taxa distributed from Nepal to Peninsular India and Sri Lanka.

4. *SE Asian-Malaysian element* (Grierson & Long 1983): taxa distributed from Nepal and India to many parts of tropical or subtropical SE Asia.

5. Taxa widely distributed from Peninsular India and Sri Lanka to SE Asia. It is tentatively called as '*Deccan-Malaysian element*' here.

6. *Pan old tropic* or *Pan-tropic*.

These are descriptive and do not imply any migration or origin of the taxon concerned as emphasized in Grierson & Long (1983). *Distribution in Nepal* and distribution maps of each taxon are based on herbarium specimens cited in Appendix. For geographical subdivision I have adopted the administrative division in which Nepal is divided into 5 development regions, i. e. Far Western, Mid Western, Western, Central, and Eastern, subdivided into 14 zones and 75 districts.

Habitat & ecology. Habitat and ecology is based on labels of herbarium specimens with reference to literatures and my limited field observations in Nepal.

Vernacular names and Uses. Vernacular name and use of plants are based on literatures.

Distribution map. Horizontal and altitudinal distribution maps are presented for each taxon based on label data in herbarium specimens. In some cases, latitude, longitude, and altitude for collecting sites were decided with the help of a locality database prepared by Dr. K. Yonekura.

Synopsis of Nepalese Euphorbiaceae

In the present checklist 96 species in 34 genera are accepted for Nepalese Euphorbiaceae (Table 2). Among them *Chamaesyce hispida* (Boiss.) V. S. Raju & P. N. Rao (Plate 80), *Euphorbia cashmeriana* Royle (Plate 79), *Glochidion daltonii* (Müll. Arg.) Kurz (Plate 69), and *Phyllanthus leschenaultii* Müll. Arg. (Plate 66) are firstly recorded from Nepal. Numerous taxa are revised in their taxonomical treatments either from the previous Nepalese enumeration (Short & Vickery 1982) or from a world checklist (Govaerts et al. 2000).

The number of native species of Euphorbiaceae is largest in Eastern development region. This situation reflects that the number of species of subfamily Phyllanthoideae (excl. Drypeteae), Acalyphoideae, and Crotonoideae tend to decrease in western regions (Table 3).

About a half of the native species are distributed from Malaysia (Deccan-Malaysian element and SE Asian-Malaysian element) (Table 4). Relatively few number of species are share with Kashmir or Tibet (Pan-Himalayan element, NW Himalayan element, and Tibetan element). Only three species are endemic to Nepal. At present, no taxon of Nepalese Euphorbiaceae falls under the Euro-Siberian element and Arctic-alpine element of Grierson & Long (1983).

TABLE 2. Number of accepted native and naturalized species in each genus of Nepalese Euphorbiaceae

Genera	Native species	Naturalized species	Genera	Native species	Naturalized species
I. Phyllanthoideae					
1. Bridelia	5	0	19. Mallotus	7	0
2. Leptopus	1	0	20. Trewia	1	0
3. Flueggea	1	0	21. Acalypha	1	0
4. Phyllanthus	15	2	22. Tragia	1	0
5. Sauropus	2	0	III. Crotonoideae		
6. Breynia	2	0	23. Manihot	0	1
7. Glochidion	7	0	24. Jatropha	0	2
8. Putranjiva	1	0	25. Ostodes	1	0
9. Baccaurea	1	0	26. Baliospermum	2	0
10. Aporusa	1	0	27. Croton	4	1
11. Antidesma	4	0	28. Vernicia	0	1
12. Bischofia	1	0	IV. Euphorbioideae		
II. Acalyphoideae			29. Excoecaria	1	0
13. Chrozophora	1	0	30. Falconeria	1	0
14. Alchornea	1	0	31. Triadica	1	0
15. Ricinus	0	1	32. Balakata	1	0
16. Mercurialis	1	0	33. Euphorbia	12	2
17. Cleidion	1	0	34. Chamaesyce	4	1
18. Macaranga	3	0			
			Total	**85**	**11**

TABLE 3. Number of native Euphorbiaceous species in each development region of Nepal

	Far Western	Mid Western	Western	Central	Eastern	**Total**
Phyllanthoideae						
excl. Drypeteae	10	13	24	28	35	**40**
Drypeteae (*Putranjiva*)	1	0	0	0	0	**1**
Acalyphoideae	3	3	7	10	16	**17**
Crotonoideae	0	1	2	3	6	**7**
Euphorbioideae	8	14	13	14	10	**20**
Total	**22**	**31**	**46**	**55**	**67**	**85**

TABLE 4. Number of native Euphorbiaceous species in each geographical element

	Pan-Himalayan element	NW Himalayan element	E Himalayan element	Endemic	Tibetan element	Deccan element	SE Asian-Malayasian element	Deccan-Malayasian element	Pan old tropic or Pan tropic	unknown
Phyllanthoideae										
excl. Drypeteae	4	0	5	1	0	3	13	13	1	0
Drypeteae (*Putranjiva*)	0	0	0	0	0	0	0	1	0	0
Acalyphoideae	0	0	6	1	0	1	1	6	1	1
Crotonoideae	0	0	1	1	0	0	1	4	0	0
Euphorbioideae	4	4	3	0	2	0	2	3	2	0
Total	**8**	**4**	**15**	**3**	**2**	**4**	**17**	**27**	**4**	**1**

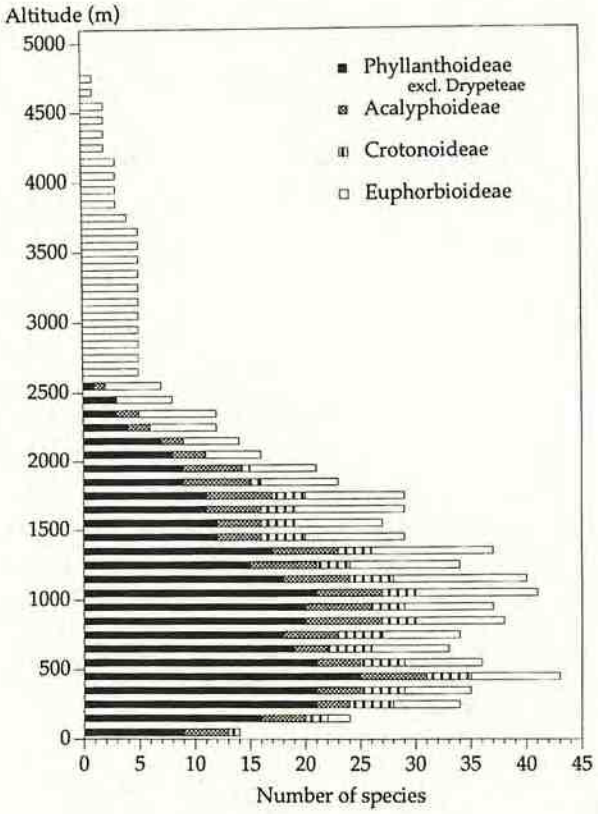

Fig. 1. Altitudinal changes in number of species in each subfamily of Nepalese Euphorbiaceae.

Subfamily Crotonoideae is restricted below ca. 2000 m, and Phyllanthoideae and Acalyphoideae are distributed up to ca. 2500 m in altitude (Fig 1). Only four species of *Euphorbia* section Holophyllum, *E. wallichii* Hook. f., *E. luteoviridis* D. G. Long, *E. himalayensis* (Klotzsch) Boiss., and *E. stracheyi* Boiss., have been collected above 3800 m. The last species is found up to 4700 m.

SE Asian-Malaysian element and Deccan-Malaysian element are remarkable in lower altitude, while Tibetan element and NW Himalayan element are restricted to higher altitude (Fig. 2). Most of naturalized species are found up to 2000 m altitude. In Euphorbiaceae s. s. (Acalyphoideae + Crotonoideae + Euphorbioideae) E Himalayan element are dominated in medium altitude, from 1900 m to 2600 m. Three endemic species are restricted to medium altitude of Western and Central development regions.

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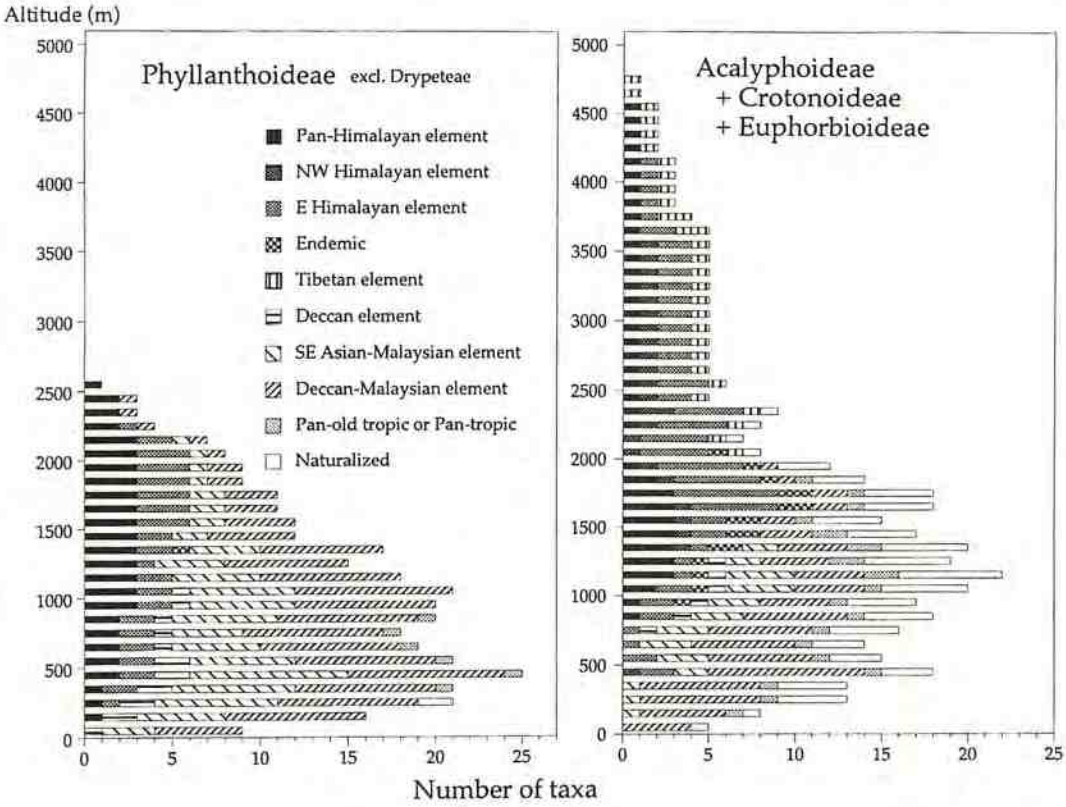

Fig. 2. Altitudinal changes in number of species of each geographical element in Phyllanthoideae excluding Drypeteae (Phyllanthaceae) and Acalyphoideae+Crotonoideae+Euphorbioideae (Euphorbiaceae s. l.) in Nepal. See text for categories of the elements.

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EUPHORBIACEAE

Euphorbiaceae A. L. de Jussieu, Gen. Pl.: 384 (1789). — Type genus: *Euphorbia* L.

KEY TO THE SUBFAMILIES

1. Locules of ovary each with 2 ovules; fruits with 1 or 2 seeds per locules; hairs simple; leaves and inflorescences without glands (except in *Aporosa*); milky latex absent ..... I. PHYLLANTHOIDEAE
1. Locules of ovary each with 1 ovule; fruits with 1 seed per locule; hairs simple, stellate or lepidote; leaves or inflorescences with glands; milky latex present or absent
   2. Milky latex absent ..... II. ACALYPHOIDEAE
   2. Milky latex present
      3. Hairs simple, stellate or lepidote; leaves lobate or elobate; petals present or absent; stamens 5 or more ..... III. CROTONOIDEAE
      3. Hairs simple; leaves elobate; petals absent, stamens 1–3 ..... IV. EUPHORBIOIDEAE

KEY TO THE GENERA OF PHYLLANTHOIDEAE

A. Pistillate flowers in axillary or terminal inflorescences, ovary 1–3(–5)-locular, styles 2 or 3(–5); fruits capsular, drupaceous or baccate, 1–3(–5)-locular, 1–6(–10)-seeded
   B. Leaves simple; flowers in spikes, racemes or clusters
      C. Fruits with 2 seeds per locule; flowers in axillary clusters; peduncle less than 1 cm long
         D. Petals present
            E. Fruits drupaceous, sessile or shortly pedicellate; petiole less than 1 cm ..... **1. Bridelia**
            E. Fruits capsular, long pedicellate; petiole 1–2 cm ..... **2. Leptopus**
         D. Petals absent
            E. Pistillode present in staminate flowers; fruits white ..... **3. Flueggea**
            E. Pistillode absent; fruits red, brown, black or yellowish green
               F. Sepals free
                  G. Floral disc present; seeds dry, brown or yellowish brown ..... **4. Phyllanthus**
                  G. Floral disc absent; seeds with fleshy seed-coat, usually vermilion ..... **7. Glochidion**
               F. Sepals connate at least at base, often conspicuous in fruits
                  G. Styles free; calyx of staminate flowers discoid ..... **5. Sauropus**
                  G. Styles connate into a column; calyx of staminate flowers turbinate ..... **6. Breynia**
      C. Fruits with 1 seed per locule; flowers in the terminal or axillary spikes or racemes; peduncle more than 1 cm at least in staminate spikes or racemes
         D. Ovary 2- or 3-locular
            E. Petioles 1.5–5 cm long, eglandular; spikes often cauliflorious; pistillate spikes 10–19 cm ..... **9. Baccaurea**
            E. Petioles 1–1.5 cm long, 2-glandular at apex; spikes axillary; pistillate spikes

less than 0.5 cm ..... **10. Aporosa**
D. Ovary 1-locular; petioles 0.3–0.6 cm long ..... **11. Antidesma**
B. Leaves trifoliate; inflorescences panicles ..... **12. Bischofia**
A. Pistillate flowers solitary at axil, ovary 2- or 3-locular, styles 2 or 3; fruits drupaceous, 1-locular and 1-seeded by abortion ..... **8. Putranjiva**

KEY TO THE GENERA OF ACALYPHOIDEAE

A. Erect tree, shrub, or herb
B. Petals present ..... **13. Chrozophora**
B. Petals absent
C. Leaves with stipels at the top of petiole ..... **14. Alchornea**
C. Leaves without stipel
D. Leaves peltate, deeply 5–10-lobed; filaments connate into fascicles ..... **15. Ricinus**
D. Leaves peltate or not peltate, unlobed or shallowly 3-lobed; filaments free
E. Leaves opposite
F. Herbs; fruits capsular, dehiscent; seeds carunculate ..... **16. Mercurialis**
F. Trees; fruits fleshy, indehiscent; seeds ecarunculate ..... **20. Trewia**
E. Leaves alternatet
F. Leaves entire; pistillate flowers long-pedicellate, solitary in leaf axil ..... **17. Cleidion**
F. Leaves toothed; pistillate flowers pedicellate or sessile, on panicles, spikes, racemes, thyrses
G. Dioecious; inflorescences unisexual; bracts of pistillate flowers inconspicuous, scaly; seeds ecarunculate
H. Indumentum simple; leaves not granulose-glandular ..... **18. Macaranga**
H. Indumentum stellate or lepidote; leaves granulose-glandular ..... **19. Mallotus**
G. Monoecious; inflorescences usually bisexual; bracts of pistillate flowers conspicuous, foliaceous; seeds carunculate ..... **21. Acalypha**
A. Twinging herbs ..... **22. Tragia**

KEY TO THE GENERA OF CROTONOIDEAE

A. Leaves palmately 3–7-lobed, lobes entire; seeds carunculate
B. Petals present ..... **23. Manihot**
B. Petals absent ..... **24. Jatropha**
A. Leaves unlobed or 3-lobed, margin serate, serrulate or crenate; seeds carunculate or ecarunculate
B. Inflorescences cauliflorious; seeds ecarunculate ..... **25. Ostodes**
B. Inflorescences terminal or axillary; seeds carunculate or ecarunculate
C. Leaves simple; petals abscent or, if present, inconspicuous, 0–3.5 mm long; fruits 0.4–2 cm in diam.; seeds carunculate
D. Indumentum simple; petals abscent ..... **26. Baliospermum**
D. Indumentum stellate or lepidote; petals present at least in staminate flowers .....

.....**27. Croton**

C. Leaves simple or 3-lobed; petals conspicuous, 20–35 mm long; fruits 4–6 cm in diam. (not seen in Nepalese *Vernicia*); seeds ecarunculate (not seen in Nepalese *Vernicia*) ..... **28. Vernicia**

KEY TO THE GENERA OF EUPHORBIOIDEAE

A. Inflorescences elongated thyrses
  B. Dioecious; leaves without glands on petiole apex or blade base; stamens 3 ..... **29. Excoecaria**
  B. Monoecious; leaves with glands on petiole apex or blade base; stamens 2 or 3
    C. Leaves serrulate; inflorescences unisexual ..... **30. Falconeria**
    C. Leaves entire; inflorescences bisexual
      D. Fruits capsular, dehiscent, 3-seeded; seeds with whitish sarcotesta **31. Triadica**
      D. Fruits fleshy, indehiscent, 1- or 2-seeded; seeds without sarcotesta ..... **32. Balakata**

A. Inflorescences pseudanthia (cyathia), one ovary and several stamens in cup-like gland-fringed involucre
  B. Involucres radially symmetrical, glands not enclosed; styles free or connate at base
    C. Involucral glands without petal-like appendages; cauline leaves alternate, floral leaves whorled or opposite ..... **33. Euphorbia**
    C. Involucral glands with petal-like appendages; leaves opposite ..... **34. Chamaesyce**
  B. Involucres bilaterally symmetrical, glands enclosed within the spur; styles connate into a column ..... excl. *Pedilanthus*

Subfamily I. PHYLLANTHOIDEAE Asch.

Phyllanthoideae Asch., Fl. Prov. Brandenburg 1: 59 (1864). — Phyllanthaceae Klotzsch & Garcke, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 246 (1859). — Type: *Phyllanthus* L.

1. Bridelia Willd.

Bridelia Willd., Sp. Pl. 4: 978 (1806), "*Briedelia*"; corr. Spreng., Anleit. Kenntn. Gew. ed. 2, 2: 887 (1818). — Lectotype species designated by Webster (1994b): *Bridelia scandens* (Roxb.) Willd.; See Dressler (1996a) for orthography of the name.

Key to the species
(See also Table 5)

A. Leaf blades 3–10.5 by 1.3–3.5 cm, secondary veins 7–12, petiole 2–5 mm long; drupes globose, 4–6 by 4–6 mm, sessile ..... **1. B. tomentosa** Blume

A. Leaf blades 6.5–20.5 by 3–11 cm, secondary veins 8–23, petiole 4–13 mm long; drupes globose, ellipsoid, or obovoid, 5–12 by 4–9 mm, pedicel 0–2.5 mm
  B. Scranbling shrubs or small trees; pistillate sepals 4–6 by 2–3 mm; drupes 9–12 mm long, 5–9 mm in diam. ..... **2. B. stipularis** (L.) Blume
  B. Shrubs, small trees or trees; pistillate sepals 1–2 by 0.8–1.5 mm
    C. Leaf apex acute or acuminate; secondary veins 8–10 pairs; drupes ellipsoid, 10–12

mm long, 6–7 mm in diam. ..... **3. B. pubescens** Blume

C. Leaf apex acute, obtuse or rounded; secondary veins 12–23 pairs; drupes globose or ellipsoid, 5–7 mm long, 4–7 mm in diam.

D. Twigs tomentose or pilose; petioles tomentose; leaf lower surfaces pubescent or tomentose throughout; pistillate pedicels 1–1.5 mm long; staminate pedicels ca. 1 mm long; drupes globose ..... **4. B. retusa** (L.) A. Juss.

D. Twigs glabrous or pilose; petioles glabrous or pilose; leaf lower surfaces puberulent throughout and pubescent on veins; pistillate and staminate flowers sessile; drupes ellipsoid ..... **5. B. sikkimensis** Gehrm.

1. Bridelia tomentosa Blume — Fig. 3.

Bridelia tomentosa Blume, Bijdr.: 597 (1826); Wall., Numer. List: 273, no. 7874 (1847); Baill., Étude Euphorb.: 584 (1858); Müll. Arg. in DC., Prodr. 15(2): 501 (1866); Kurz, Forest Fl. Burma 2: 367 (1877); Hook. f., Fl. Brit. India 5: 271 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966); Airy Shaw, Kew Bull. 31: 382 (1976); Airy Shaw, Kew Bull. 35: 602 (1980); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 770 (1987); P. T. Li, Acta Phytotax. Sin. 26: 64 (1988); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 30, t. 8, f. 1–4 (1994); Dressler, Blumea 41: 297, f. 2 (1996); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 292 (2000); Dressler & van Welzen, Thai Forest Bull., Bot. 28: 67 (2000). — [*Bridelia tomentosa* Blume var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 501 (1866), nom. inval.] — *Amanoa tomentosa* (Blume) Baill., Adansonia 6: (1866). — Lectotype designated by Airy Shaw (1980): [*Blume s. n.*] (BO n. v.; iso BM, BR, L, NY (fide Dressler 1996) n. v.), Buitenzorg (Java, Bogor).

Bridelia lanceifolia Roxb., [Hort. Bengal.: 70 (1814), "*lanceofolia*", nom. nud.] Fl. Ind. ed. 1832, 3: 737 (1832), "*lanceaefolia*"; Wall., Numer. List: 273, no. 7884 (1847), "*lancifolia.*" — *Bridelia tomentosa* Blume var. *lanceifolia* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 502 (1866), "*lanceaefolia.*" — Lectotype designated by Dressler (1996b): [*Roxburgh s. n.*] (BM n. v.; iso K!) [without locality].

Bridelia loureirii Hook. & Arn., Bot. Beechey Voy.: 211 (1837), "*loureiri*", excl. syn. Lour. — Type: *Millett* (n. v.), China.

Bridelia tomentosa Blume var. *glabrescens* Benth., Hooker's J. Bot. Kew Gard. Misc. 6: 8 (1854). — Type: *Champion s. n.* (K? (fide Dressler 1996b) n. v.), Hongkong, East Point, Hedges.

Bridelia rhamnoides Griff., Not. Pl. Asiat. 4: 480 (1854). — Type: *Griffith s. n.*, Oct. 1834 (K!; CAL (fide Dressler 1996b) n. v.), in sylvis Mergue (Burma).

Bridelia urticoides Griff., Not. Pl. Asiat. 4: 481 (1854). — Type: *Griffith*, Dec. 1834 (CAL? (fide Dressler 1996b) n. v.), Mergue, ad littoram Ins. Madamaca (Burma).

Bridelia tomentosa Blume var. *trichadenia* Müll. Arg. in DC., Prodr. 15(2): 501 (1866). — Type: *Ferd. Muell. s. n.* [in 1863] (holo G-DC (IDC microfiche in TI) n. v.), in Nova Hollandia septentr., Arnhemsland.

Bridelia tomentosa Blume var. *chinensis* Müll. Arg. in DC., Prodr. 15(2): 501 (1866). — Type: *Park s. n.* (G-DC (IDC microfiche in TI) n. v.), China; [*J.*] *Motley 493*, [in 1857–1858] (K!), Borneo prope Bangarmassing.

Bridelia tomentosa Blume var. *rhamnoides* Müll. Arg. in DC., Prodr. 15(2): 502

TABLE 5. Comparison of characters of Nepalese *Bridelia* species

	B. tomentose	*B. stipularis*	*B. pubescens*	*B. retusa*	*B. sikkimensis*
Habit	shrub or small tree	scrambling shrub or small tree	small tree	shrub, small tree or tree	shrub or small tree
Twig hair	tomentose or glabrous	tomentose	pubescent or tomentose	tomentose	glabrous or pilose
lenticels	scattered	scattered	scattered	scattered	densely scattered
Petiole hair	tomentose or glabrous	densely tomentose	pubescent or tomentose	tomentose	glabrous or pilose
length	2–5 mm	4–10 mm	5–8 mm	6–13 mm	5–10 mm
Leaf blade shape	elliptic or narrowly ovate	elliptic or obovate	elliptic, ovate or lanceolate	elliptic	obovate, widely obovate or elliptic
apex	bluntly acute	acute or obtuse	acute or acuminate	acute or obtuse	acute, obtuse or rounded
secondary vein	7–12 pairs	11–16 pairs	8–10 pairs	13–23 pairs	12–16 pairs
upper surface	glabrous	pilose at least on veins	glabrous or pubescent along veins	glabrous or pilose on veins	glabrous
lower surface	tomentose	densely tomentose	pubescent	pubescent or tomentose	puberulent throughout and pubescent on veins
Pistillate flower sepal	1–1.6 × 0.5–1 mm	4–6 × 2–3 mm	1.5 × 1.5 mm	1.8–2 × 1–1.3 mm	1–1.5 × 0.8–1 mm
Fruits	globose	ellipsoid or obovoid	ellipsoid	globose	ellipsoid
size	4–6 × 4–6 mm	9–12××x 5–9 mm	10–12 × 6–7 mm	6.5–7 × 6–7 mm	5–6 × 4–5mm
seed	1- or 2-seeded	1- or 2-seeded	1-seeded	1- or 2-seeded	1-seeded
pedicel length	sessile	1–1.5 mm	1–2 mm	1.5–2.5 mm	sessile

(1866). — Type: *Hoffmannsegg s. n.* (B†, herb. Franquev. (P?), G-DC (fragm.) (IDC microfiche in TI) n. v.), insula Java.

Cleistanthus lanceolatus Müll. Arg. in DC., Prodr. 15(2): 507 (1866). — Type: *Teysm.*, [in 1765] (holo G-DC (IDC microfiche in TI) n. v.), in horto bog. cultus.

Bridelia tomentosa Blume var. *ovoidea* Benth., Fl. Austral. 6: 120 (1873). — Type: *Gulliver s. n.* (holo K!), Australia, Wood Island.

Bridelia phyllanthoides W. Fitzg., J. Roy. Soc. W. Australia 3: 163 (1918). — Type: *Fitzgerald 823* (NSW (fide Dressler 1996b) n. v.), W Australia, base of Mt. Broome.

Bridelia monoica sensu Merr., Philipp. J. Sci., C 13: 142 (1918), non (Lour.) Merr.

Bridelia glabrifolia Merr., Enum. Philipp. Fl. Pl. 2: 422 (1923). — *Bridelia tomentosa* Blume var. *glabrifolia* (Merr.) Airy Shaw, Kew Bull. 31: 383 (1976); Airy Shaw, Kew Bull. 35: 603 (1980). — Lectotype designated by Airy Shaw (1980): *Gaudichaud s. n.* (G-DC n. v.), Pilippines, Manila.

Bridelia tomentosa Blume var. *eriantha* Airy Shaw, Kew Bull. 31: 384 (1976); Airy Shaw, Kew Bull. 35: 603 (1980). — Type: *Lozarides & Adams 145* (holo K n. v.), Northern Territory, about 6 miles N. of pine Creek Township.

Bridelia nayarii P. Basu, J. Econ. Taxon. Bot. 7: 634 (1985, publ. 1986). — Type: *N. G. Nair 909A*, 1 March 1974 (holo PBL n. v.; iso (*909B*) PBL n. v.), India, Car Nicobar Island, Malacca.

Shrub or small tree, 4.5 m high. *Twigs* slender, long and whiplike, tomentose or glabrous, with scattered lenticels. *Leaves* alternate; stipules early caducous; petiole 2–5 mm long, tomentose or glabrous; blade elliptic or narrowly ovate, 3–10.5 by 1.3–3.5 cm, thinly chartaceous, base obtuse, apex bluntly acute, margin entire, upper surface glabrous, lower surface tomentose, secondary veins prominent, 7–12 pairs. *Inflorescences* axillary glomerules. *Staminate flowers*: sepals 5, triangular, 1–1.5 by 0.7–1 mm, apex acute, margin entire, glabrous; petals 5, obovate, ca. 0.8 by 0.4 mm, apex rounded; staminal column ca. 1 mm long; free part of filaments 0.3–0.5 mm long; anthers ellipsoid, ca. 0.3 mm long. *Pistillate flowers* sessile; sepals 5 or 6, triangular, 1–1.6 by 0.5–1 mm, glabrous, persistent; petals 5 or 6, elliptic, ca. 0.6 by ca. 0.3 mm, base cuneate to spatulate, apex rounded, irregularly toothed; ovary globose, ca. 1 mm diam.; styles ca. 0.3 m long. *Infructescence* with up to 4 fruits. *Fruits* sessile; drupe globose, 4–6 mm diam., glabrous, smooth, 1 or 2 seeded.

Distribution — India (Bihar, Orissa, West Bengal, Sikkim, Assam, Andaman), Nepal, Bhutan, Burma, Thailand, Malaysia, Indonesia, New Guinea, N. Australia, Philippine, Cambodia, Laos, Vietnam, S. China, and Taiwan (Long 1987, Dressler 1996b, Govaerts et al. 2000). *SE Asian-Malaysian element.* In Nepal: Eastern.

Habitat & Ecology — Altitude 450 m. Flowers in September; fruits in December.

Notes — Airy Shaw (1976) and Dressler (1996b) pointed out that hairiness of this species varies and glabrous form is found all over the range of the species with intermediate forms. Some Nepalese specimens are lacking hairs on its twigs and petioles but they have more or less tomentose undersurface of leaves.

Govaerts et al. (2000) cited the author of *B. tomentosa* var. *rhamnoides* as "(Griff.) Müll. Arg." This variety is, however, considered to be published as a new variety with different type from *B. rhamnoides* Griff., because Müller Argoviensis (1866) did not cite any basionym.

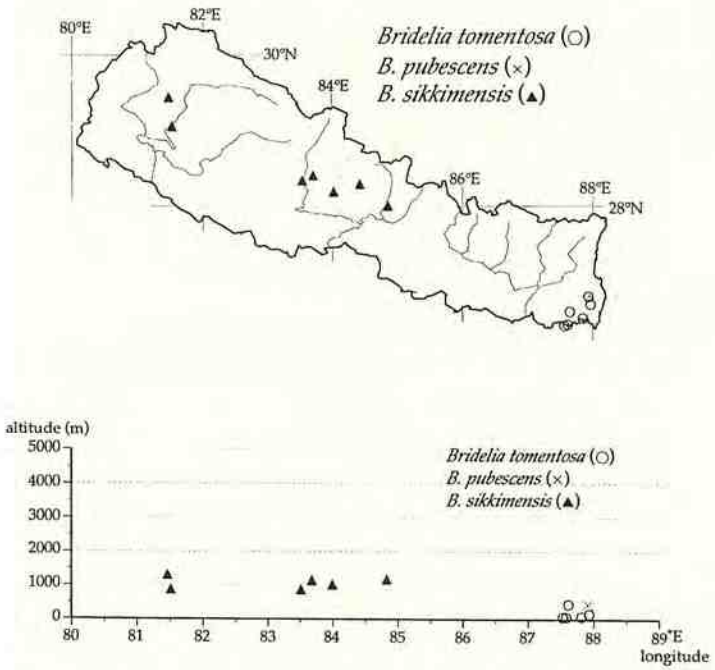

Fig. 3. Distribution of *Bridelia tomentosa* Blume, *B. pubescens* Blume, and *B. sikkimensis* Gehrm. in Nepal.

2. Bridelia stipularis (L.) Blume — Fig. 4.

Bridelia stipularis (L.) Blume, Bijdr.: 597 (1826); Baill., Étude Euphorb.: 584 (1858); Müll. Arg. in DC., Prodr. 15(2): 499 (1866); Kurz, Forest Fl. Burma 2: 369 (1877); Hook. f., Fl. Brit. India 5: 270 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 769 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 38, t. 8, f. 5–7 (1994); Dressler, Blumea 41: 293 (1996); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 292 (2000); Dressler & van Welzen, Thai Forest Bull., Bot. 28: 65 (2000). — *Clutia stipularis* L., Mant. Pl.: 127 (1767); Willd., Sp. Pl. 4: 883 (1806), "*Clutya.*" — [*Bridelia stipularis* (L.) Blume var. *typica* Gehrm., Bot. Jahrb. Syst. 41(95): 29 (1908), nom. inval.] — Lectotype designated by Dressler (1996b): *Herb. Linnaeus, No. 1206-13* (LINN n. v.) [India].

Clutia scandens Roxb., Pl. Coromandel 2: 39, t. 173 (1802); Santapau, J. Bomb. Nat. Hist. Soc. 50: 307 (1951); Siwakoti & Varma, Pl. Divers. E. Nepal: 321 (1999). — *Bridelia scandens* (Roxb.) Willd., Sp. Pl. 4: 979 (1806); Roxb., Fl. Ind. ed. 1832, 3: 736 (1832); Wall., Numer. List: 273, no. 7878, excl. E (1847); Baill., Étude Euphorb.: 584 (1858). — Lectotype designated by Dressler (1996b): *Roxburgh s. n.* (BR (fide Dressler 1996b) n. v.; iso K!, K-WALL (*7878A*)!, BM (fide Dressler 1996b) n. v.), [East India].

Bridelia zollingeri Miq., Fl. Ned. Ind. 1(2): 364 (1859). — Type: *Zollinger 878*, as "*8782*" (holo U (fide Dressler 1996b) n. v.; iso P (fide Dressler 1996b) n. v.), Java, in Bandong.

Bridelia dasycalyx Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 241 (1874); Kurz, Forest Fl. Burma 2: 369 (1887); Hook. f., Fl. Brit. India 5: 271 (1887). — [*Bridelia*

dasycalyx var. *genuina* Kurz, nom. inval.] — Lectotype designated by Dressler (1996b): *Kurz 1605* (K!; iso K!, BO (fide Dressler 1996b) n. v.), Burma, Ava, Prome, Pegu [Yomah, Phoungyen].

Bridelia dasycalyx Kurz var. *aridicola* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 241 (1874); Kurz, Forest Fl. Burma 2: 370 (1887). — Lectotype designated by Dressler (1996b): *Kurz 2475* (BO n. v.), Burma, Brome, Pegu.

Bridelia stipularis (L.) Blume var. *ciliata* Gehrm., Bot. Jahrb. Syst. 41(95): 29 (1908). — Type: not designated.

Bridelia stipularis (L.) Blume subsp. *philippinensis* Jabl. in Engl., Pflanzenr., IV, 147, VIII: 57 (1915). — Lectotype designated by Dressler (1996b): *FB* (*Ahern*) [*Ahern's collector*] *1884*, Oct. 1904 (US, n. v.; iso K!, BO, NY (fide Dressler 1996b) n. v.), the Philippines, Luzon, Prov. Rizal, Bosoboso.

Monoecious scrambling shrub or small tree, 6–15 m high, stem diameter ca. 20 cm. *Twigs* tomentose when young, with scattered lenticels. *Leaves* alternate; stipules triangular, 7–12 by 3–4 mm, apex acuminate, tomentose, early caducous; petiole 4–10 mm long, densely tomentose; blade elliptic or obovate, 6.5–20 by 3–11 cm, chartaceous, base obtuse, rounded or slightly emarginate, apex acute or obtuse, margin entire, secondary veins prominent, 11–16 pairs, upper surface pilose at least on veins, lower surface densely tomentose. *Inflorescences* glomerules, along the leafless or smaller leaved ends of twigs. *Staminate flowers*: pedicel ca. 1 mm long, glabrous; sepals 5, triangular, 2–3 by 1.3–2 mm, apex acuminate, margin entire, glabrous or pilose; petals 5, obovate, 1.2–1.7 by 0.8–1.8 mm, apex rounded; free part of filaments 1–1.7 mm; anthers ellipsoid, 0.5–0.9 mm long;

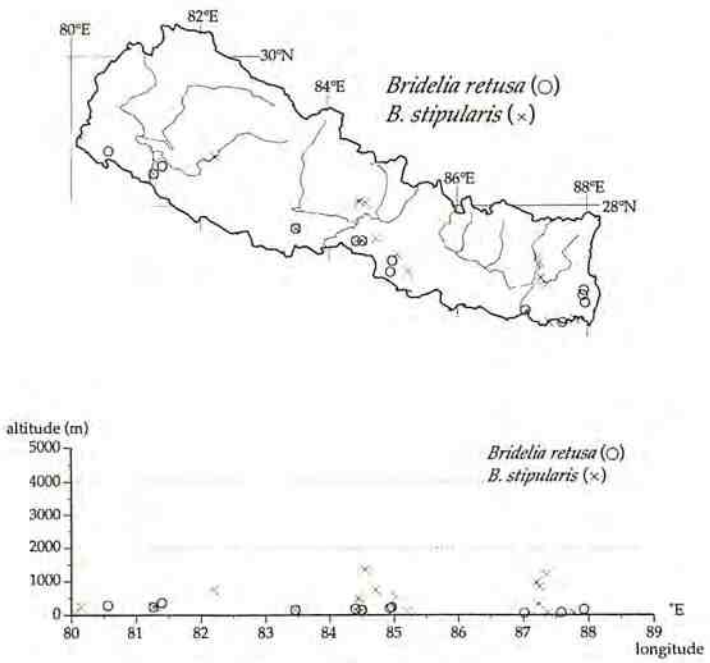

Fig. 4. Distribution of *Bridelia retusa* (L.) A. Juss.and *B. stipularis* (L.) Blume in Nepal.

staminal column 1–2.7 mm long; disc annular, ca. 3.5 mm diameter. *Pistillate flowers* subsessile; sepals 5, triangular, 4–6 by 2–3 mm, apex acute or acuminate, tomentose or pilose, persistent; petals elliptic, 2.5–3 by 1–1.5 mm, apex rounded. *Fruits*: pedicel 1–1.5 mm long; drupe ellipsoid or obovoid, 9–12 mm long, 5–9 mm in diam., glabrous, smooth, with remnants of style, 1- or 2-seeded.

Distribution — Sri Lanka, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Malaysia, Indonesia, Philippine, Cambodia, Vietnam, and S China (Dressler, 1996b). *SE Asian-Malaysian element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude up to 290 m. In forests or in *Saccharum* grassland. Rare in eastern plains (Siwakoti & Varma 1999, as *B. scandens*). Flowers in October; fruits from December to June.

3. Bridelia pubescens Kurz — Fig. 3.

Bridelia pubescens Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 241 (1874); Kurz, Forest Fl. Burma 2: 367 (1877); Hook. f., Fl. Brit. India 5: 270 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 770 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 36 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998). — Lectotype designated by Dressler (1996b): *Kurz 2474*, [10 Apr. 1871] (K!; iso K!, BM (fide Dressler 1996b) n. v.), Burma, Pegu, Yomah.

Bridelia nooteboomii Chakrab., J. Econ. Taxon. Bot. 5: 949 (1984). — Type: *Nooteboom 716*, Jan. 11, 1969 (holo PBL n. v.; iso L, PBL (fide Dressler 1996b) n. v.), Thailand, Northern Region, NW of Chiengmai, Doi Pui, 19°N, 98°30'E, 1300m.

Bridelia glauca auct. non Blume, Bijdr.: 597 (1826): Dressler, Blumea 41: 311 (1996) p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 287 (2000), p. p.; Dressler & van Welzen, Thai Forest Bull., Bot. 28: 63 (2000).

Small tree, 4.5–7.5 m high. *Twigs* pubescent or tomentose when young, with scattered lenticels. *Leaves* alternate; stipules early caducous; petiole 5–8 mm long, pubescent or tomentose; blade elliptic, ovate or lanceolate, 8.5–18 by 4–7.5 cm, chartaceous, base acute, apex acute or acuminate, margin entire, secondary veins prominent, 8–10 pairs, upper surface glabrous or pubescent along the main veins, lower surface pubescent. *Inflorescences* axillary glomerules. *Staminate flowers* not seen. *Pistillate flowers*: pedicel ca. 0.5 mm long, tomentose; sepals triangular, ca. 1.5 by ca. 1.5 mm, both surface pubescent; petals circular or widely elliptic, ca. 1 by 0.8–1 mm. *Infructescence* with 1–4 fruits. *Fruits*: pedicel 1–2 mm; drupe ellipsoid, 10–12 mm long, 6–7 mm in diam., acute or blunt at apex, glabrous, smooth, 1-seeded.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma, Thailand (Long 1987, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 450 m. In evergreen forests. Flowers in May; fruits in March.

Notes — Although this Asian mainland plant is recently treated as conspecific with the Javanese plant, *B. glauca* Blume (Dressler 1996b, Govaerts et al. 2000, van Welzen et al. 2000), in my limited observation the latter is distinguishable from the former in its leaves with often truncate base, large number of secondary vein pairs (11–18), and long pedicels of pistillate flowers and fruits.

4. Bridelia retusa (L.) A. Juss. — Fig. 4.

Bridelia retusa (L.) A. Juss., Euphorb. Gen.: 109 (1824); Spreng., Syst. Veg. 3: 48 (1826); Baill., Étude Euphorb.: 584 (1858); Müll. Arg. in DC., Prodr. 15(2): 493 (1866); Kurz, Forest Fl. Burma 2: 368 (1877); Hook. f., Fl. Brit. India 5: 268 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 769 (1987); Dressler, Blumea 41: 289 (1996); Philcox, Rev. Handb. Fl. Ceylon 13: 81 (1999); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 289 (2000); Dressler & van Welzen, Thai Forest Bull., Bot. 28: 64 (2000); Manandhar, Pl. People Nepal: 122 (2002). — *Clutia retusa* L., Sp. Pl.: 1042 (1753); Willd., Sp. Pl. 4: 883 (1806). — *Bridelia airy-shawii* P. T. Li, Acta phytotax. Sin. 20: 117 (1982), nom. superfl. — [*Bridelia retusa* (L.) A. Juss. var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 493 (1866), nom. inval.] — Lectotype designated by Dressler (1996b): *Herb. Hermann 2: fol. 71, # 367* (BM n. v.).

Clutia squamosa Lam., Encycl. 2: 54 (1786). — *Bridelia retusa* (L.) A. Juss. var. *squamosa* (Lam.) Müll. Arg. in DC., Prodr. 15(2): 493 (1866); Hook. f., Fl. Brit. India 5: 268 (1887). — *Bridelia squamosa* (Lam.) Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908); Siwakoti & Varma, Pl. Divers. E. Nepal: 321 (1999). — [*Bridelia squamosa* (Lam.) Gehrm. var. *typica* Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908), nom. inval.] — Type: *Herb. Sonnerat* (P? (fide Dressler 1996b) n. v.); *Herb. Commerson* (P? (fide Dressler 1996b), India oriental.

Clutia spinosa Roxb., Pl. Coromandel 2: 38, t. 172 (1802). — *Bridelia spinosa* (Roxb.) Willd., Sp. Pl. 4: 979 (1806); Roxb., Fl. Ind. ed. 1832, 3: 735 (1832); Wall., Numer. List: 273, no. 7883 (1847). — Lectotype designated by Dressler (1996b): *Roxburgh s. n.* (*Herb. Martius*) (BR n. v.; iso BM p. p., n. v.).

Bridelia fruticosa Pers., Syn. Pl. 2: 591 (1807). — Type: (n. v.), India.

Bridelia crenulata Roxb., [Hort. Bengal.: 70 (1814), nom. nud.] Fl. Ind. ed. 1832, 3: 734 (1832). — *Bridelia retusa* (L.) A. Juss. var. *roxburghiana* Müll. Arg. in DC., Prodr. 15(2): 493 (1866); Hook. f., Fl. Brit. India 5: 268 (1887). — *Bridelia roxburghiana* (Müll. Arg.) Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908), nom. superfl. — Type: [*Wallich, List no. 7880*] (K!, K-WALL!, BM, G-DC (fide Dressler 1996b) n. v.), the Botanic garden [Calcutta], origin from the mouth of the river Megna.

[*Andrachne doonkyboisca* B. Heyne ex Wall., Numer. List: 273, no. 1819 (1847), nom. nud.]

Bridelia amoena Wall. ex Baill., Étude Euphorb.: 584 (1858). — Type: *Wallich in Herb. Gaudichaud* (P? (fide Dressler 1996b) n. v.), Calcutta?

Bridelia retusa (L.) A. Juss. var. *glauca* Hook. f., Fl. Brit. India 5: 268 (1887). — Type: (n. v.), Deccan Peninsula.

Bridelia retusa (L.) A. Juss. var. *glabra* Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908). — Type: not designated.

Bridelia retusa (L.) A. Juss. var. *pubescens* Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908). — Type: not designated.

Bridelia retusa (L.) A. Juss. var. *stipulata* Gehrm., Bot. Jahrb. Syst. 41(95): 30 (1908). — Type: not designated.

Bridelia squamosa (Lam.) Gehrm. var. *meeboldii* Gehrm, Bot. Jahrb. Syst. 41(95): 30

(1908). — Type: not designated.

Bridelia cambodiana Gagnep., Bull. Soc. Bot. France 70: 432 (1923). — Lectotype designated by Dressler (1996b): *Chatillon s. n.* (P n. v.; iso P n. v.), Cambodge, Preykdey.

Bridelia pierrei Gagnep., Bull. Soc. Bot. France 70: 434 (1923). — Lectotype designated by Dressler (1996b): *Pierre 6287*, Nov. 1867 (US n. v.; iso K!, BM, BO, BR, E, NY, P n. v.), Cambodia, Caudoc, Mt. Cam.

Bridelia chinensis Thin, J. Biol. (Vietnam) 9: 37 (1987).

Bridelia montana auct. non Willd., Sp. Pl. 4: 978 (1806): Wall., Numer. List: 273, no. 7879 p. p. (1847).

Monoecious shrub, small tree or tree, 3.6–15 m high, stem diameter 16–25 cm. *Twigs* tomentose when young, with scattered lenticels. *Leaves* alternate; stipules early caducous; petiole tomentose, 6–13 mm long; blade elliptic, 6.5–17.5 by 3–10.5 cm, base acute or rounded, apex acute or obtuse, margin entire, coriaceous, secondary veins prominent, 13–23 pairs, upper surface glabrous or pilose at the midrib, lower surface pubescent or tomentose. *Inflorescences* glomerules, axilary or on leafless twigs. *Staminate flowers*: pedicel ca. 1 mm long, glabrous or sparsely villous; sepals 5, triangular, 1.5–2 by 1–1.2 mm, apex acute or acuminate, margin entire, glabrous or sparsely villous; petals 5, obovate, 1–1.5 by ca. 1 mm, lacerate; staminal column 1–1.2 mm long; free part of filaments 0.7–0.9 mm long; anthers ellipsoid, 0.4–0.6 mm long; disc annular, 2–3 mm diameter. *Pistillate flowers*: pedicel 1–1.5 mm long, glabrous or pilose; sepals triangular, 1.8–2 by 1–1.3 mm, apex acuminate, sparsely pilose or glabrate; petals elliptic, obovate or narrowly elliptic, base spatulate, apex rounded, ca. 1.5 by 0.3–0.7 mm. *Infructescences* with 1–7 fruits. *Fruits*: pedicel 1.5–2.5 mm long; drupe globose, 6.5–7 mm long, 6–7 mm in diam., smooth, glabrous, 1- or 2-seeded.

Distribution — Sri Lanka, India, Nepal, Bhutan, Burma, Thailand, Malaysia, Cambodia, Vietnam, Philippine, S. China (Dressler 1996b). *SE Asian-Malaysian element.* In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude up to 1350 m. In riverside bushs. Rare in eastern plains (Siwakoti & Varma 1999). Flowers from July to October; fruits from October to January.

Vernacular names — Nepali: *gayo* (Manandhar 2002), *gudi* (Manandhar 2002), *kaja* (Manandhar 2002). Chepang: *ranbo* (Manandhar 2002), *ropsi* (Manandhar 2002). Danuwar: *gaiyo* (Manandhar 2002), *kanjhi* (Manandhar 2002). Magar: *gayo* (Manandhar 2002). Mooshar: *kanjhi* (Manandhar 2002). Rai: *hasung* (Manandhar 2002). Tamang: *gramsachhe* (Manandhar 2002).

Uses —Fruit is edible (Manandhar 2002). Bark yields tannin (Manandhar 2002). Lopped leaf is used as fodder (Manandhar 2002). Juice of bark is medicinally applied for peptic ulcer (Manandhar 2002).

Notes — Although *Bridelia fordii* Hemsl. is treated as a synonym of *B. retusa* in Dressler (1996b) and Govaerts et al. (2000), both of syntypes from Kwangtung, China (*C. Ford 249 & 254*, K!) are different from the latter in their ellipsoid drupe and glabrous leaves.

5. Bridelia sikkimensis Gehrm. — Fig. 3.

Bridelia sikkimensis Gehrm., Bot. Jahrb. Syst. 41(95): 34 (1908); D. G. Long in Fl.

Bhutan 1: 768 (1987); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 291 (2000). — Type: *King 90* (n. v.); *I. D. Hooker* (n. v.); *Hooker* (n. v.), Khasia Mts.; [*C. B.*] *Clarke 45628*[A, 15 Oct. 1886] (K! with an annotation by D. G. Long as the lectotype), Khasia Mts., [Mamlos, 4000 ft.]; *Clarke 45839* (n. v.), Khasia Mts.

Bridelia sikkimensis Gehrm. var. *macrophylla* Gehrm., Bot. Jahrb. Syst. 41(95): 34 (1908).

Bridelia sikkimensis Gehrm. var. *minuta* Gehrm., Bot. Jahrb. Syst. 41(95): 34 (1908).

Bridelia verrucosa Haines, J. Bot. 59: 189, 193 (1921); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982). — Type: *Hooker* [*4501*] (holo K!), Parasnath.

Bridelia montana sensu Wall., Numer. List.: 273, no. 7879 (1847), p. p., non Willd., Sp. Pl. 4: 978 (1806); Hook. f., Fl. Brit. India 5: 269 (1887).

Shrub or small tree, 2–8 m high, stem diameter 10–20 cm. *Twigs* glabrous or pilose, with densely scattered lenticels. *Leaves* alternate; stipules narrowly triangular, ca. 3 by 1–1.2 mm, apex acuminate, villous, caducous; petiole 5–10 mm long, glabrous or pilose; blade obovate, widely obovate or elliptic, 7–20.5 by 4–10 cm, base obtuse, rounded or cuneate, apex acute, obtuse or rounded, margin entire, thinly chartaceus, secondary veins prominent, 12–16 pairs, upper surface glabrous, lower surface puberulent throughout and pubescent on veins. *Inflorescences* glomerules, axilary. *Staminate flowers* sessile; sepals triangular, ca. 1.5 by ca. 1.2 mm, glabrous; petals elliptic or obovate, ca. 1 by 0.6–0.9 mm, apex rounded; free part of filaments ca. 0.5 mm long; anthers shortly ellipsoid, ca. 0.5 mm long; staminal column ca. 0.8 mm long. *Pistilate flowers* sessile; sepals triangular, 1–1.5 by 0.8–1 mm, glabrous; petals ovate, 0.8–1 by ca. 0.5 mm, apex rounded or acute. *Fruits* sessile; drupe ellipsoid, 5–6 mm long, 4–5 in diam., glabrous, smooth, 1-seeded. *Seeds* ellipsoid, with deep lateral furrow, 4–4.5 mm by 2.5–3.2 by 1.8–2.5 mm.

Distribution — Pakistan, India (Assam, Sikkim), Nepal, Bhutan, Bangladesh (Long, 1987; Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Far Western, Mid Western, Western.

Habitat & Ecology — Altitude 130–1333 m. In dry deciduous forests. Flowers from August to October; fruits from January to April.

Notes — *Bridelia sikkimensis* was proposed with two infraspecific taxa, var. *macrophylla* and var. *minuta* (Gehrmann 1908). According to the International Code of Botanical Nomenclature (Greuter et al. 2000), one of the varietal epithet will be preempted by that of the autonym, *Bridelia sikkimensis* var. *sikkimensis*, when the valid lectotypification will be published.

2. **Leptopus** Decne.

Leptopus Decne. in Jacquem., Voy. Inde 4: 155 (1844). — Type species: *Leptopus cordifolius* Decne.

1. Leptopus cordifolius Wall. ex Decne. — Fig. 5.

Leptopus cordifolius Wall. ex Decne. in Jacquem., Voy. Inde 4: 155 (1844); G. L. Webster, Ann. Missouri Bot. Gard. 81: 40 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998). — [*Phyllanthus cordifolius* Wall., Numer. List.: 273, no. 7913, p. p. (1847), "*cordifolia*", nom. nud.].— *Andrachne decaisneana* Baill., Étude Euphorb.: 577 (1858), nom. superfl. — *Andrachne cordifolia* (Wall. ex Decne.) Müll. Arg. in DC., Prodr. 15(2): 234 (1866); Hook. f., Fl. Brit. India 5: 283 (1887); Burkill, Rec. Bot.

Surv. India 4: 130 (1910); Kitam. in Fauna Fl. Nepal Himal.: 171 (1955); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 165 (2000). — *Arachne cordifolia* (Wall. ex Decne.) Hurus., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 6: 339 (1954); Hurus. & Ya. Tanaka in Fl. E. Himal.: 174 (1966); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 194 (1982); Malla et al., Fl. Kathmandu Valley: 622 (1986). — Type: (n. v.), Circà Nagkundah, alt. 1500 metr. circiter.

Phyllanthus hoffmeisteri Klotzsch, Bot. Ergebn. Reise Waldemar: 117 (1862). — Type: *Hoffmeister* (n. v.), Himalaya.

Monoecious shrub, 1–3 m high, stem diameter 1.9–2.5 cm. *Branching* non phyllanthoid (i. e. branchlets subtended by normal leaves). *Twigs* pubescent or villous. *Leaves* deciduous, alternate; stipules persistent, free, lanceolate or narrowly ovate, 1–1.5 by ca. 0.5 mm, apex acuminate, margin entire, densely pubescent; petiole 0.7–2.5 cm long, pubescent or villous; blade ovate or narrowly ovate, 2.5–6 by 1–3 cm, base cordate or rounded, apex rounded or mucronate, margin entire, midrib raised beneath, upper surface glabrous (glabrous or villous when young), lower surface pubescent or villous. *Cymules* axillary. *Staminate flowers*: pedicel 5–15 mm long; sepals 5, elliptic or obovate, 2–2.5 by 1.1–1.8 mm, apex obtuse or rounded, margin entire or ciliate, outside pilose, inside glabrous; petals 5, elliptic, ca. 1.2 by ca. 1 mm, margin entire, glabrous; stamens 5; filaments free, 1–1.5 mm long; anthers ca. 0.3 mm long. *Pistillate flowers* 0 or 1 per cymule; pedicel 1.5–2.3 cm long; sepals persistent, 5, orbicular or widely elliptic, 2.5–3.2 by 2.2–3.1 mm, apex obtuse or rounded, margin entire, outside pilose, inside glabrous; petals 5, semicircular, ca. 0.2–0.3 by 0.3–0.4 mm, margin entire, glabrous, apex rounded; disc annular, 5-lobed, lobes ca. 0.2 mm long, obcordate; ovary 3-carpellate, globose,

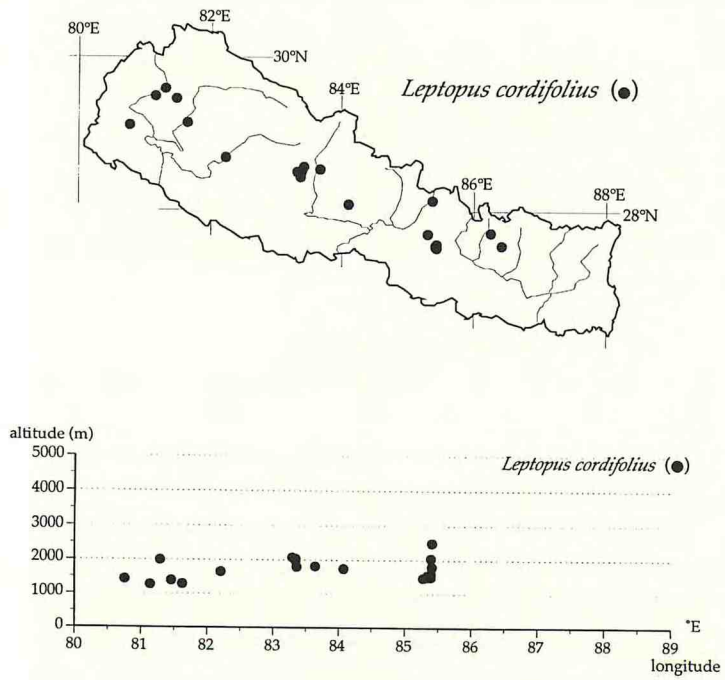

Fig. 5. Distribution of *Leptopus cordifolius* Wall. ex Decne. in Nepal.

glabrous, smooth; styles 3, bifid at base, branches 0.7–1 mm long. *Fruits*: pedicel 3.4–3.8 cm long; sepals persistent, ca. 4 by ca. 3.5 mm; capsule transversally ellipsoid, ca. 4 mm long, ca. 6 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 3 mm long. *Seeds* trigonous, ca. 3.3 mm long, ca. 2.5 mm wide, ca. 2.2 mm tangentially, smooth.

Distribution — Pakistan, India (Kashmir), Nepal, China (South-Central) (Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 950–2500 m. On roadsides, on open slopes, or in open forests. Flowers from April to October; fruits from April to December.

Notes — Govaerts et al. (2000) erroneously treated *Phyllanthus hoffmeisteri* Klotzsch as a synonym of a tropical American *Phyllanthus*, *P. stipulatus* (Raf.) G. L. Webster.

3. Flueggea Willd.

Flueggea Willd., Sp. Pl. 4: 637 (1806), "*Flüggea*." — Type species: *Flueggea leucopyrus* Willd. See Webster (1984) for orthography of the name.

1. Flueggea virosa (Roxb. ex Willd.) Voigt subsp. **himalaica** D. G. Long — Fig. 6.

Flueggea virosa (Roxb. ex Willd.) Voigt subsp. *himalaica* D. G. Long, Notes Roy. Bot. Gard. Edinburgh 44: 167 (1986); D. G. Long in Fl. Bhutan 1: 776 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 929 (2000). — Type: *Grierson & Long 2149*, 21 June 1979 (holo E!; iso K!, TI!, A, THIMPHU n. v.), Bhutan, Deothang district, Samdrup-Jongkhar to Deothang road, 11 km above Samdrup-Jongkhar, 26°50'N, 91°28E, 600 m.

Securinega virosa auct. non (Roxb. ex Willd.) Baill., Adansonia 6: 334 (1886); Hurus. & Ya. Tanaka in Fl. E. Himalaya: 177 (1966); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 199 (1982); Malla et al., Fl. Kathmandu Valley: 632 (1986); Siwakoti & Varma, Pl. Divers. E. Nepal: 334 (1999); Manandhar, Pl. People Nepal: 421 (2002). — *Flueggea virosa* auct. non (Roxb. ex Willd.) Voigt, Hort. Suburb. Calcutt.: 152 (1845); G. L. Webster, Allertonia **3**: 288 (1984), p. p.; Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 12: 494 (1988), p. p.

Flueggea microcarpa auct. non Blume: Hook. f., Fl. Brit. India 5: 328 (1887), p. p.

Shrub or small tree, 1.5–6 m high, stem diameter 8.6–15 cm. *Branching* not phyllanthoid (i. e. branchlets subtended by normal leaves). *Twigs* subterete, more or less angled when young, glabrous. *Leaves* deciduous, alternate, glabrous; stipules persistent, triangular or narrowly triangular, 1–2 by 0.5–0.8 mm, margin entire; petiole 3–10 mm long, channeled adaxially; blade elliptic or ovate (basal 1 or 2 leaves often obovate), 3.5–8.5 by 1.7–4 cm, base cuneate or obtuse, decurrent to petiole, apex acuminate, acute or obtuse, margin entire, upper surface green, lower surface paler, midrib prominently raised beneath. *Cymose clusters* axillary. *Staminate flowers* many per cymule; pedicel 2–5 mm long; sepals 5, unequal, elliptic or widely elliptic, 0.7–1.2 by 0.5–1 mm, margin entire or obscurely denticulate distally; stamens 5, free; filaments becoming ca. 1.5 mm long; anthers ca. 0.4 mm long; pistillode ca. 1 mm long. *Pistillate flowers* 1–6 per cymule; pedicel 2–3.5 mm long, glabrous; sepals 5 or 6, ovate or elliptic, unequal, 0.8–1 by 0.5–0.8 mm, obscurely lacerate, glabrous; ovary globose, ca. 1.3 mm in diam., glabrous,

smooth; styles 3, ca. 1.1 mm long, lower half connate, upper half bifid. *Fruits*: pedicel 3–5 mm long, somewhat dilated distally; bacca white, not dehiscent. *Seeds* trigonous, ca. 1.8 mm long, ca. 1.3 mm radially, ca. 1.2 mm tangentially, smooth.

Distribution — India (Darjeeling, Sikkim, Assam), Nepal, Bhutan, Burma (Long 1986). *E Himalayan element*. In Nepal: Far Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 350–2100 m. In roadside scrubs, in secondary forests, or on sunny slopes. Occasional in eastern plains (Siwakoti & Varma 1999, as *Securinega virosa*). Flowers from May to June; fruits from June to July.

Vernacular names — Nepali: *nundhiki* (Manandhar 2002), *paileti* (Manandhar 2002), *sano nundhiki* (Manandhar 2002). Chepang: *wakarang* (Manandhar 2002).

Uses — Ripe fresh fruit is edible (Manandhar 2002). Bark is used as astringent (Manandhar 2002). Squeezed bark is used as fish poison (Manandhar 2002).

Notes — *Flueggea virosa* subsp. *himalaica* differs from subsp. *virosa* in larger ovate or elliptic leaves with an acute or obtuse apex as pointed by Long (1986, 1987). These differences seem to be rather clear in my limited observation, although Chakrabarty & Gangopadhyay (1988) reported innumerable transitions between them. Characters of all Nepalese specimens well agree with the description of subsp. *himalaica*, but only one collection from Chitwan District (*H. Tabata et al. 9773*, KYO) has chartaceous, obovate leaves with rounded apex.

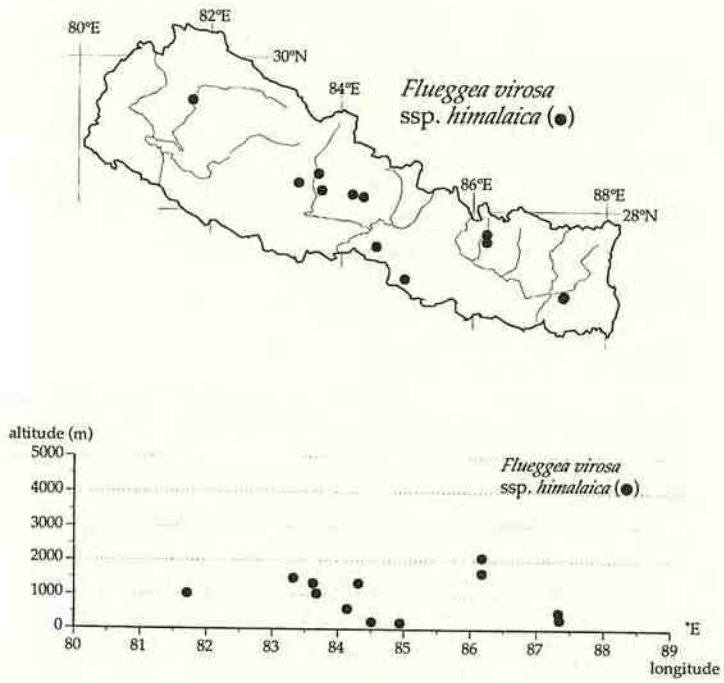

Fig. 6. Distribution of *Flueggea virosa* (Roxb. ex Willd.) Voigt subsp. *himalaica* D. G. Long in Nepal.

4. Phyllanthus L.

Phyllanthus L., Sp. Pl.: 981 (1753). — Lectotype species designated by Small in Britton & Brown, Ill. Fl. N. US. ed. 2, 2: 453 (1913): *Phyllanthus niruri* L.

Key to the subgenera

A. Branching not phyllanthoid (i. e. branchlets subtended by normal leaves); fruits dry capsular ..... I. Subgenus **Isocladus**

A. Branching phyllanthoid (i. e. branchlets subtended by cataphylls on main axes); fruits dry or fleshy capsular, or baccate

B. Sepals irregularly toothed; staminate sepals 4, stamens 2; fruits dry capsular ..... II. Subgenus **Eriococcus**

B. Sepals entire; staminate sepals 5 or 6, stamens 3–5 (not seen in Nepalese *P. leschenaultii*); fruits dry or fleshy capsular, or baccate

C. Stamens 4 or 5 (not seen in *P. leschenaultii*), filaments free (not seen in Nepalese *P. reticulatus* and *P. leschenaultii*); pedicels of fruits 2–11 mm long ..... III. Subgenus **Kirganelia**

C. Stamens 3 (not seen in Nepalese *P. acidus* and *P.* aff. *embergeri*), filaments connate into a column; pedicels of fruits 0–3 mm long

D. Trees or shrubs; fruits baccate or fleshy capsular, 17–22 mm in diam.; seeds smooth (not seen in *P. acidus*) ..... IV. Subgenus **Cicca**

D. Herbs; fruits dry capsular, 1.8–3 mm in diam.; seeds more or less longitudinally or transversely rugose ..... V. Subgenus **Phyllanthus**

I. Subgenus **Isocladus** G. L. Webster

Isocladus G. L. Webster, J. Arnold Arbor. 37: 345 (1956). — Type species: *Phyllanthus maderaspatensis* L.

Key to the species

A. Shrubs; leaf blades elliptic, obovate or narrowly obovate; seeds smooth or with obscure minute tubercles

B. Leaf blades 0.3–1 by 0.2–0.5 cm; capsules ca. 3 mm in diam.; pedicels of capsules 1–2 mm long ..... **1. P. parvifolius** Buch.-Ham. ex D. Don

B. Leaf blades 0.7–2.4 by 0.6–1.2 cm; capsules 3.2–3.8 mm in diam.; pedicels of capsules 4–13 mm long

C. Leaves elliptic, seeds with longitudinally arranged obscure minute tubercles ..... **2. P.** aff. **clarkei** Hook. f.

C. Leaves obovate, seeds smooth ..... **3. P. clarkei** Hook. f.

A. Herbs; leaf blades lanceolate or narrowly elliptic; seeds granulate . **4. P. simplex** Retz.

1. Phyllanthus parvifolius Buch.-Ham. ex D. Don —Plates 63, 64; Fig. 7.

Phyllanthus parvifolius Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 63 (1825), "*parvifolia*"; Müll. Arg. in DC., Prodr. 15(2): 385 (1866); Hook. f., Fl. Brit. India 5: 294 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Murata, Acta Phytotax. Geobot. 25: 115 (1973); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 198 (1982); Malla et al., Fl. Kathmandu Valley: 630 (1986); D. G. Long in Fl. Bhutan 1: 775 (1987); P. T. Li, Fl.

Reipubl. Pop. Sin. 44(1): 96, t. 27, f. 7–10 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Ohba in Contr. Fl. Ganesh Himal.: 46 (1999); T. Kuros. in Fl. Hinku & Hunku Valleys: 118 (2000); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1313 (2000); Rajbhandari, Ethnobot. Nepal: 60 (2001); Manandhar, Pl. People Nepal: 360 (2002). — Type: *Hamilton* [*s. n.*, 5 June 1802] (holo BM!), ad Suembu Nepalensium (Swayambhu, Nepal).

Phyllanthus juniperinus Wall. [Numer. List: 273, no. 7901 (1847), "*juniperiana*", nom. nud.] ex Müll. Arg., Linnaea 32: 28 (1863). — Type: *Wallich, List no. 7901B* (K!, K-WALL!), in Nepalia; *T. Thomson* (G-DC (IDC microfiche in TI) n. v.), in Himalaya boreali-occidentali [alt 4–5000 ped].

Phyllanthus juniperinus Müll. Arg. var. *obovatus* Müll. Arg., Linnaea 32: 28 (1863). — *Phyllanthus praetervisus* Müll. Arg., Linnaea 34: 73 (1865); Müll. Arg. in DC., Prodr. 15(2): 385 (1866). — Type: *Hook. & Thoms.* (n. v.), in Indiae orientalis montibus Khasia.

Deciduous monoecious shrub, 0.5–2.5 m high, stem diameter 6 cm. *Branching* not phyllanthoid (i. e. branchlets subtended by normal leaves), sympodial. *Twigs* 1–7 cm long, glabrous or minutely granulate on ridges. *Leaves* alternate, 5–18 per twig; stipules free, lanceolate, ca. 1 by ca. 0.1 mm, apex acuminate, margin entire; petiole 0.2–0.3 mm long, glabrous; blade elliptic or obovate, 0.3–1 by 0.2–0.5 cm, base obtuse or rounded, apex obtuse or rounded, margin entire, both surfaces glabrous. *Cymules* axillary. *Staminate flowers* 0 or 1 per cymule; pedicel 0.2–0.6 mm long, glabrous; sepals 6, elliptic, 0.7–1 by 0.5–0.8 mm, entire, glabrous; stamens 3; filaments free, ca. 0.4 mm long; disc 6-segmented. *Pistillate flowers* 0 or 1 per cymule; pedicel 0.7–1 mm long; sepals 6, narrowly ovate or narrowly elliptic, 0.8–1 by 0.6–0.7 mm, apex acute or obtuse, margin entire, glabrous; disc annular or somewhat hexagonal, margin entire; ovary 3-carpellate, glabrous; styles 3, ca. 0.4 mm long, bifid. *Fruits*: pedicel 1–2 mm long; capsule depressed-globose, ca. 2 mm long, ca. 3 mm in diam., smooth; columella persistent after dehiscence, ca. 1 mm long. *Seeds* trigonous, 1.3–1.8 mm long, 1–1.2 mm radially, ca. 1 mm tangentially, smooth.

Distribution — N. Pakistan, India (Kashmir, Assam), Nepal, Bhutan, China (Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 500–2200 m. On sunny place in forests or bushs, or on roadsides. Flowers from April to November; fruits from July to December.

Vernacular names — Nepali: *khareto* (Rajbhandari 2001a, Manandhar 2002), *paitei* (Manandhar 2002), *sunpate* (Manandhar 2002). Chepang: *khareto* (Manandhar 2002). Gurung: *nabhya* (Manandhar 2002). Majhi: *khargaja* (Manandhar 2002). Tamang: *chhetrephya* (Rajbhandari 2001a), *khagan* (Manandhar 2002), *maimanthara* (Manandhar 2002), *mirman* (Manandhar 2002), *ramhagam* (Manandhar 2002), *ramalakan* (Manandhar 2002), *rawagan* (Manandhar 2002), *wasipsip* (Manandhar 2002).

Uses — Dried sticks are used as broom (Rajbhandari 2001a). Leaf extract or powdered leaf is used for washing head to treat dandruff and head lice (Rajbhandari 2001a, Manandhar 2002). Paste of plant, powdered plant, powdered leaf, decoction of leaf, and leaf juice are medicinally used for various diseases (Rajbhandari 2001a, Manandhar 2002).

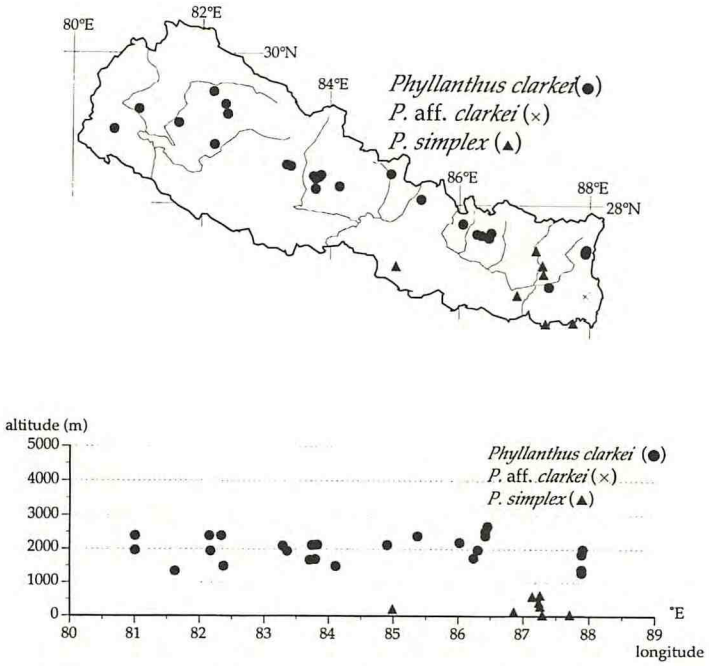

Fig. 7. Distribution of *Phyllanthus parvifolius* Buch.-Ham. ex D. Don in Nepal.

2. Phyllanthus aff. **clarkei** Hook. f. — Fig. 8.

Distribution — *E Himalayan element*. In Nepal: Eastern.

Habitat & Ecology — Flowers and fruits in December.

Notes — This species was misidentified as *P. griffithii* in my previous report (Kurosawa 2002). Identity and circumscription of this species will be discussed in another paper.

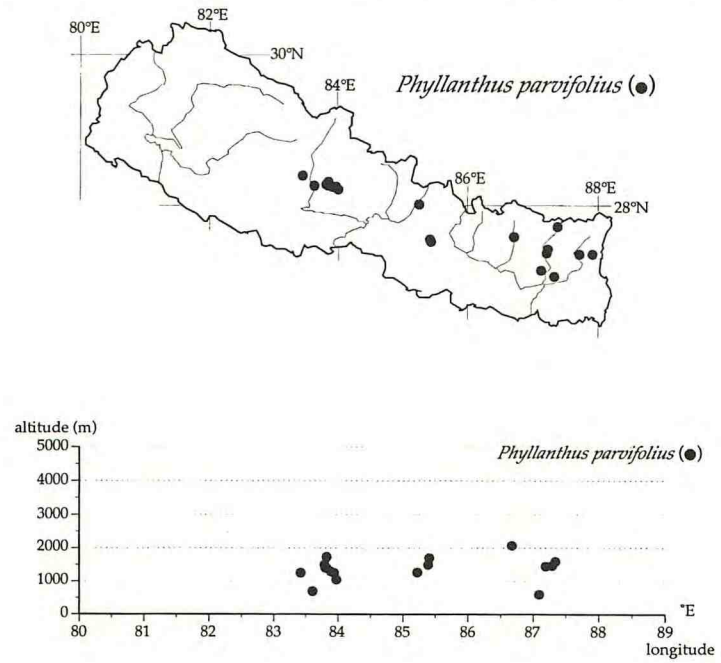

Fig. 8. Distribution of *Phyllanthus aff. clarkei* Hook. f., *P. clarkei* Hook. f., and *P. simplex* Retz. in Nepal.

3. Phyllanthus clarkei Hook. f. — Fig. 8.

Distribution — *Pan Himalayan element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 1500–2530 m. On roadsides, on slopes, on banks, in thicket, or in forests. Flowers from June to December; fruits from July to December.

Notes — Lectotypification and circumscription of this species in relation with the identity of "*P.* aff. *clarkei*" will be discussed in another paper.

4. Phyllanthus simplex Retz. — Fig. 8.

Phyllanthus simplex Retz., Observ. Bot. 5: 29 (1788); Roxb., Fl. Ind. ed. 1832, 3: 654 (1832); Wall., Numer. List: 273, no. 7898A, B, part of D (1847); Müll. Arg., Linnaea 32: 32 (1863); Müll. Arg. in DC. Prodr. 15(2): 391 (1866); Hook. f., Fl. Brit. India 5: 295 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966); G. L. Webster in Rev. Handb. Fl. Ceylon 11: 213 (1997). — [*Phyllanthus simplex* Retz. var. *genuinus* Müll. Arg. in DC. Prodr. 15(2): 391 (1866), nom. inval.] —Type: *König s. n.* (*C* (fide Webster 1997) n. v.), E. Tranquebar.

Phyllanthus anceps Vahl, Symb. Bot. 2: 95 (1791). — *Melanthesa anceps* (Vahl) Miq., Fl. Ned. Ind. 1(2): 371 (1859).

[*Phyllanthus fruticosus* Heyne ex Wall., Numer. List: 273, no. 7899A p. p. (1847), "*fruticosa*", nom. nud.]

[*Phyllanthus marginatus* Heyne ex Wall., Numer. List: 273, no. 7899A p. p. (1847), nom. nud.]

Macraea oblongifolia Wight, Icon. Pl. Ind. Orient. 5(2): 27, t. 1092-1 (1852). — *Phyllanthus simplex* Retz. var. *oblongifolius* (Wight) Müll. Arg., Linnaea 32: 32 (1863); Müll. Arg. in DC., Prodr. 15(2): 391 (1866). — Type: (n. v.), Pulney Mountains?

Macraea ovalifolia Wight, Icon. Pl. Ind. Orient. 5(2): 27, t. 1092-2 (1852). — Type: (n. v.), eastern slopes of the Neilgherries.

Melanthesa rupestris Miq., Fl. Ned. Ind. 1(2): 371 (1859). — Type: *Zollinger* (n. v.).

Phyllanthus virgatus auct. non G. Forst., Fl. Ins. Austr. Prodr.: 65 (1786): Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982); D. G. Long in Fl. Bhutan 1: 772 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 91, t. 25, f. 5–9 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 332 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1333 (2000); Manandhar, Pl. People Nepal: 360 (2002).

Annual monoecious herb. *Branching* not phyllanthoid (i. e. branchlets subtended by normal leaves). *Stem* erect or ascending, branched out throughout, 18–50 cm long, glabrous, with ridges. *Leaves* alternate, many; stipules triangular, 0.7–2 by 0.7–1 mm, apex acuminate, base auriculate, margin lacerate or almost entire; petiole 0.2–0.7 mm long; blade lanceolate or narrowly elliptic, 0.9–3.7 by 0.3–0.7 cm, apex rounded, obtuse or acute, base truncate or rounded, margin entire, midrib raised beneath, both surfaces glabrous. *Cymules* axillary. *Staminate flowers* 0 or 1 per cymule; sepals 6, widely ovate, 0.3–0.4 by 0.3–0.4 mm, apex rounded, margin entire, glabrous; stamens 3; filaments ca. 0.3 mm long, connate at base; pedicel ca. 0.4 mm long; anthers dehiscing horizontally. *Pistillate flowers* 0 or 1 per cymule; sepals 6, lanceolate or narrowly ovate, 0.6–0.7

by 0.3–0.4 mm, apex obtuse, margin entire, glabrous; ovary 3-carpellate, glabrous, minutely verrucose; styles 3, ca. 0.2 mm long, bifid. *Fruits*: pedicel 4–6 mm long; capsule depressed-globose, ca. 2 mm long, ca. 3 mm in diam., verrucose or almost smooth; columella persistent after dehiscence, ca. 0.8 mm long. *Seeds* sharply trigonous, 1.6–1.8 mm long, 1–1.3 mm radially, 1–1.2 mm tangentially, granulate, brown.

Distribution — Sri Lanka, India, Nepal, Bhutan, Indo-China, China (South), Taiwan, Japan (Nansei-shoto (Ryukyu Isls.)) (Webster 1986, 1997, Kurosawa 2001). *S Asian-Malaysian element*. In Nepal: Western, Central, Eastern

Habitat & Ecology — Altitude up to 1350 m. On roadsides or in crop fields. A common weed. Flowers & fruits from July to December.

Vernacular name — Nepali: *amala jhar* (Manandhar 2002 as *P. virgatus*).

Uses — Plant is used as antiseptic agent (Siwakoti & Varma 1999 as *P. virgatus*). Juice of leaf is medicinally applied to boil and pimle (Manandhar 2002 as *P. virgatus*).

Notes — This species often has been treated as a synonym of *Phyllanthus virgatus*, although the latter has smaller seeds of ca. 1 mm long, 0.8 mm radially, 0.9–0 mm tangentially, and restrict to Pacific Ocean (Webster 1986, 1997).

II. Subgenus **Eriococcus** (Hassk.) Croizat & F. P. Metcalf

Subgenus *Eriococcus* (Hassk.) Croizat & F. P. Metcalf, J. Arnold Arbor. 23: 32 (1942). — *Eriococcus* Hassk. in Hoeven & De Vries, Tijdschr. 10: 143 (1843). — Type species: *Eriococcus gracilis* Hassk. [=*Phyllanthus gracilipes* (Miq.) Müll. Arg.]

Key to the species

A. Blanchlets hirsute; petioles hirsute, leaf blades 1.9–3.9 by 0.9–2.2 cm; capsules papillose-puberulous; seeds ca. 2.5 mm long, 1.5–1.7 mm radially, 1.5–1.8 mm tangentially ..... **5. P. sikkimensis** Müll. Arg.

A. Blanchlets glabrous; petioles glabrous, leaf blades ca. 1.8 by ca. 1 cm; capsules glabrous; seeds 2–2.2 mm long, 1.2–1.3 mm radially, 1.2–1.4 mm tangentially ..... **6. P.** aff. **sikkimensis** Müll. Arg.

5. Phyllanthus sikkimensis Müll. Arg. — Fig. 9.

Phyllanthus sikkimensis Müll. Arg., Linnaea 32: 48 (1863); Müll. Arg. in DC., Prodr. 15(2): 425 (1866); Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982); D. G. Long in Fl. Bhutan 1: 774 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1325 (2000). — Type: *J. D. Hook.* [*Reidia 6*] (G-DC (IDC microfiche in TI) n. v.), in Indiae orientalis prov. Sikkim [alt 1000 ped].

Agyneia tetrandra Buch.-Ham., Trans. Linn. Soc. London 15: 125 (1826); Wall., Numer. List: 274, no. 7951 (1847). — *Phyllanthus hamiltonianus* Müll. Arg., Linnaea 34: 75 (1865), nom. nov.; Müll. Arg. in DC., Prodr. 15(2): 424 (1866); Hook. f., Fl. Brit. India 5: 304 (1887). — *Reidia hamiltoniana* (Müll. Arg.) A. M. Cowan & Cowan, Trees N. Bengal: 117 (1929), nom. superfl.— *Eriococcus hamiltonianus* (Müll. Arg.) Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966), nom. illeg.

Phyllanthus secundiflora Ridl., J. Straits Branch Roy. Asiat. Soc. 59: 170 (1911). — Type: *15189* (n. v.), Lower Siam, Perlis, Telor Jambu Hill, Kanga.

Phyllanthus perlisensis Ridl., J. Straits Branch Roy. Asiat. Soc. 59: 171 (1911). — Type: *15188* (n. v.), Lower Siam, Perlis, near Kanga, Ginting Kabok.

Subshrub or shrub, 0.5–2 m high, stem diameter up to 3 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* 14–35 cm long, hirsute. *Cataphylls* narrowly triangular, 1.5–2.5 by 0.5–1.2 mm, apex acuminate, margin entire, glabrous. *Normal leaves* alternate, 5–27 per branchlet; stipules free, narrowly triangular, 1.5–1.8 by 0.5–1 mm, apex acuminate, margin entire; petiole 1.5–1.8 mm long, hirsute; blade elliptic or ovate, 1.9–3.9 by 0.9–2.2 cm, apex acute, base obtuse or cuneate, margin entire, both surfaces glabrous or more or less hirsute on margin and on under surface midrib. *Cymules* axillary. *Staminate flowers* 5–14 per cymule; pedicel 5–8 mm long, glabrous; sepals 4, narowly ovate or ovate, 1–1.5 by 0.5–1 mm, margin fimbriate, outside hirsute; disc 4-segmented; stamens 2; filaments connate into a short column. *Pistillate flowers* 0 or 1 per cymule; sepals 5 or 6, narrowly ovate, 1.5–1.8 by 0.7–1 mm, apex acute, glabrous, margin fimbriate; disc annular; ovary 3-carpellate, papillose-puberulous; styles 3, 0.2–0.3 mm long, deeply bifid. *Fruits*: pedicel 15–22 mm long; capsule ellipsoid, ca. 3 mm long, ca. 3.5 mm in diam., papillose-puberulous; columella persistent after dehiscence, 2–2.4 mm long. *Seeds* trigonous, ca. 2.5 mm long, 1.5–1.7 mm radially, 1.5–1.8 mm tangentially, smooth, brown.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma, Thailand, N. Malay Peninsula (Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Eastern.

Habitat & Ecology — Altitude 900–1400 m. On river bed, on roadsides, or in Castanopsis forests. Flowers from May to October; fruits from May to November.

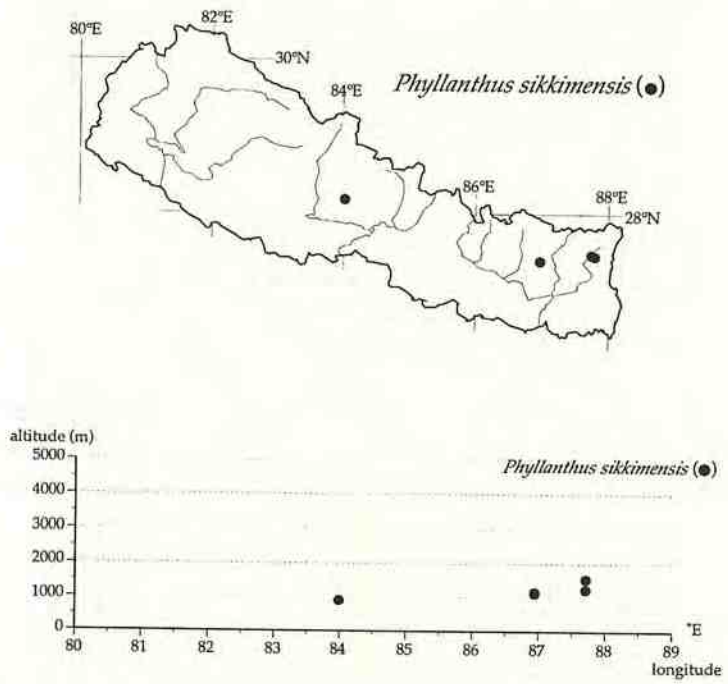

Fig. 9. Distribution of *Phyllanthus sikkimensis* Müll. Arg. in Nepal.

6. Phyllanthus aff. **sikkimensis** Müll. Arg.

Distribution — Endemic to Nepal. In Nepal: Western.

Habitat & Ecology — Altitude 1400 m. Flowers & fruits from July to October.

Notes — Identity and circumscription of this species will be discussed in another paper.

III. Subgenus **Kirganelia** (Juss.) G. L. Webster

Subgenus *Kirganelia* (Juss.) G. L. Webster, J. Arnold Arbor. 37: 344 (1956). — *Kirganelia* Juss., Gen. Pl.: 387 (1789). — Type species: *Kirganelia phyllanthoides* Desf. [= *Phyllanthus casticum* Soy.-Willem]

Key to the species

A. Pistillate flowers solitary in cymule; fruits baccate, pedicel 3–11 mm long
  B. Pedicels of bacca 5–11 mm long; styles entire, 1–1.5 mm long; ovary 3-carpellate; stamens 4 ..... **7. P. glaucus** Wall. ex Müll. Arg.
  B. Pedicels of bacca 3–5 mm long; styles bifid, 0.1–0.2 mm long; ovary 4–8-carpellate; stamens 5 ..... **8. P. reticulatus** Poir.

A. Pistillate flowers 1 or 2 per cymule; fruits dry capsular, pedicel 2–3 mm long ..... **9. P. leschenaultii** Müll. Arg.

7. Phyllanthus glaucus Wall. ex Müll. Arg. — Plate 65; Fig. 10.

Phyllanthus glaucus Wall. [Numer. List: 274, no. 7927A (1847), "*glanca*", nom. nud.] ex Müll. Arg., Linnaea 32: 14 (1863); Hook. f., Fl. Brit. India 5: 288 (1887); Kitam. in Fauna Fl. Nepal Himal.: 278 (1955); Murata, Acta Phytotax. Geobot. 25: 115 (1973); Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982); D. G. Long in Fl. Bhutan 1: 774 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 85, t. 22, f. 4–6 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998); T. Kuros. in Fl. Hinku & Hunku Valleys: 118 (2000); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1290 (2000). — *Phyllanthus flueggeiformis* Müll. Arg. in DC., Prodr. 15(2): 349 (1866), nom. superfl. — *Fluggeopsis glauca* (Wall. ex Müll. Arg.) A. Das in Kanjilal et al., Fl. Assam 4: 158 (1940); Banerji, Rec. Bot. Surv. India 19(2): 82 (1966). — *Hemicicca glauca* (Wall. ex Müll. Arg.) Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966). — *Hemicicca glauca* (Wall. ex Müll. Arg.) Hurus. & Ya. Tanaka var. *flueggeiformis* (Müll. Arg.) Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966), nom. superfl. — Type: *Wallich, List no. 7927[A]* (holo G-DC (IDC microfiche in TI) n. v.; iso K!, K-WALL!, BM!), in India orientali [Napaul, Nepal].

[*Phyllanthus griseus* Wall., Numer. List: 274, no. 7918 (1947), p. p., nom. nud.]

Phyllanthus flexuosus auct. non (Siebold & Zucc.) Müll. Arg. in DC., Prodr. 15(2): 324 (1866): Croizat, J. Jap. Bot. 16: 647 (1940).

Monoecious shrub, 1.5–4.5 m high, 3–8 cm in diameter. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 9–21 cm, glabrous. *Normal leaves* deciduous, alternate, 15–20 per branchlet, glabrous; stipules persistent or deciduous, free, lanceolate or narrowly oblong, 1.5–2 by 0.5–0.7 mm, margin entire, green; petiole 2.2–2.8 mm long; blade elliptic or ovate, 2.5–4.8 by 1.3–2.5 cm, base obtuse or cuneate, apex acute, rounded or obtuse, margin entire, midrib raised beneath. *Cymules* axillary. *Staminate flowers* 2–8 per cymule; pedicel ca. 2.7 mm

long; sepals 5 or 6, elliptic, 1–1.2 by 0.6–0.7 mm, margin entire; disc not seen; stamens 4; filaments free, ca. 0.5 mm long; anthers dehiscing vertically. *Pistillate flowers* 1 per cymule; pedicel 3–5 mm long, gradually thickened distally; sepals deciduous, 6, often unequal, narrowly ovate, 1.2–1.5 by ca. 0.8 mm, margin entire; disc not seen; ovary 3-carpellate, spheroidal, ca. 0.8 mm long, ca. 0.9 mm in diam.; styles free, 1–1.5 mm long, entire. *Fruits*: pedicel 5–11 mm long, gradually thickened distally; bacca spheroidal, ca. 8 mm in diam., ca. 7 mm long.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, China (South-central, Hainan, Southeast, Tibet-Qinghai) (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 1560–2235 m. On slopes, in bushs, or in forests of *Pinus*, *Rhododendron*, or *Lithocarpus*. Flowers from April to June; fruits from June to October.

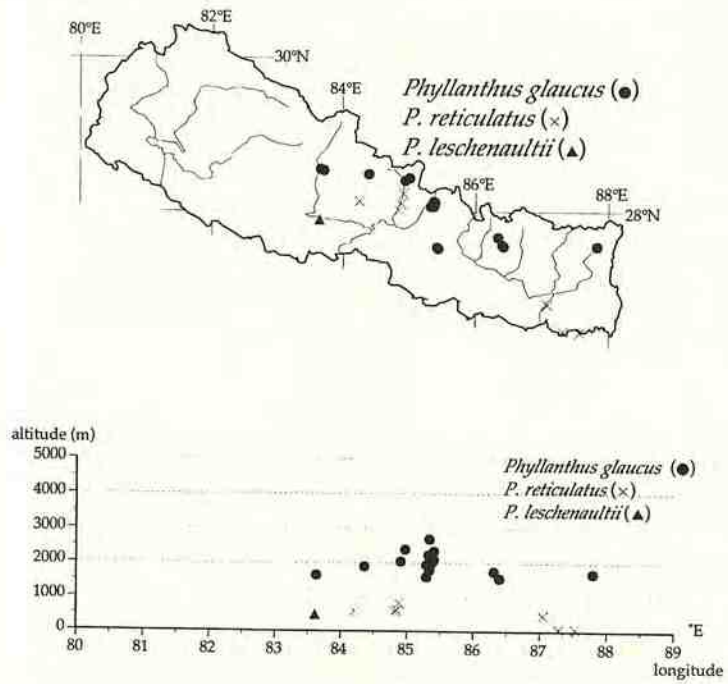

Fig. 10. Distribution of *Phyllanthus glaucus* Wall. ex Müll. Arg., *P. reticulatus* Poir., and *P. leschenaultii* Müll. Arg. in Nepal.

8. Phyllanthus reticulatus Poir. — Fig. 10.

Phyllanthus reticulatus Poir. in Lam., Encycl. 5: 298 (1804), "*reticulata*"; Müll. Arg., Linnaea 32: 12 (1863); Müll. Arg. in DC. Prodr. 15(2): 344 (1866); Hook. f., Fl. Brit. India 5: 288 (1887); G. L. Webster, J. Arnold Arbor. 38: 57 (1957); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 198 (1982); D. G. Long in Fl. Bhutan 1: 773 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 82, t. 22, f. 1–3 (1994); G. L. Webster in Rev. Handb. Fl. Ceylon 11: 217 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1320 (2000); Manandhar, Pl. People Nepal: 360 (2002). — *Anisonema reticulatum* (Poir.) A. Juss., Euphorb. Gen.: 19 (1824).

— *Kirganelia reticulata* (Poir.) Baill., Étude Euphorb.: 613 (1858); Banerji, Rec. Bot. Surv. India 19(2): 83 (1966); Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966); Siwakoti & Varma, Pl. Divers. E. Nepal: 328 (1999). — *Cicca reticulata* (Poir.) Kurz, Forest Fl. Burma 2: 354 (1877). —Type: (holo in P-LA (fide Webster 1957) n. v.), les Indes..

Phyllanthus multiflorus Willd., Sp. Pl. 4: 581 (1805); Roxb., Fl. Ind. ed. 1832, 3: 664 (1832); Wall., Numer. List: 274, no. 7921 (1847). — *Kirganelia multiflora* (Willd.) Baill., Étude Euphorb.: 614 (1858). — *Anisonema multiflorum* (Willd.) Wight, Icon. Pl. Ind. Orient. 5(2): 26, t. 1899 (1852), "*multiflora.*" —Type: *D. Klein* (n. v.), India orientali.

Anisonema dubium Blume, Bijdr.: 589 (1826), "*dubia.*" — *Kirganelia dubia* (Blume) Baill., Étude Euphorb.: 614 (1858). — Type: (n. v.), in fructicetis prope Tangerang.

Anisonema intermedium Decne., Nuov. Ann. Mus. Hist. Nat. 4: 482 (1831). — *Kirganelia intermedia* (Decne.) Baill., Étude Euphorb.: 614 (1858).

Cicca decandra Blanco, Fl. Filip.: 701 (1837). — Type: not designated.

Phyllanthus scandens Roxb. ex Dillwyn, Rev. Hortus Malab.: 7 (1839).

Melanthesa oblongifolia Oken, Allig. Naturgesch. 3(3): 1602 (1841). — Type: (n. v.), Timor.

Phyllanthus chamissonis Klotzsch, Nova Acta Acad. Caes. Leop-Carol. German. Nat. Cur. 19, Suppl. 1: 420 (1843).

[*Phyllanthus griseus* Wall., Numer. List: 274, no. 7918A (1847) p. p., nom. nud.]

[*Phyllanthus spinescens* Wall., Numer. List: 274, no. 7934 (1847), p. p., nom. nud.]

[*Kirganelia eglandulosa* Baill., Étude Euphob.: 614 (1858), nom. nud.]

[*Kirganelia puberula* Baill., Étude Euphob.: 614 (1858), nom. nud.]

[*Anisonema puberulum* Baill., Étude Euphorb.: 614 (1858), nom. nud.]

[*Kirganelia sinensis* Baill., Étude Euphorb.: 614 (1858), nom. nud.] — [*Phyllanthus sinensis* Müll. Arg., Linnaea 32: 12 (1863), nom. nud.]

Phyllanthus jamaicensis Griseb., Fl. Brit. W. I.: 34 (1859). — *Anisonema jamaicense* (Griseb.) Griseb., Fl. Brit. W. I.: 716 (1864). — Type: *Macf., Wils.* (n. v.), Jamaica.

Kirganelia prieuriana Baill., Adansonia 1: 82 (1860). — *Phyllanthus prieurianus* (Baill.) Müll. Arg., Linnaea 32: 12 (1863).

Phyllanthus alaternoides Rchb. ex Baill., Adansonia 1: 83 (1860).

Cicca microcarpa Benth., Fl. Hongk.: 312 (1861); Kurz, Forest Fl. Burma 2: 355 (1877). — *Phyllanthus microcarpus* (Benth.) Müll. Arg., Linnaea 32: 51 (1863); Müll. Arg. in DC. Prodr. 15(2): 343 (1866). — [*Phyllanthus microcarpus* (Benth.) Müll. Arg. var. *genuinus* Müll. Arg. in DC. Prodr. 15(2): 343 (1866), nom. inval.] — *Kirganelia microcarpa* (Benth.) Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966). —Type: *Seemann* [*2485*, Dec. 1850] (K!), Hongkong [S. China]; *Wilford* [*228*, Dec. 1857] (K!), in a ravine on the south side of the island, [Hong Kong].

Phyllanthus oblongifolius Pax in Engl. & Prantl, Nat. Pflanzenfam. 3(5): 19 (1890).

Phyllanthus microcarpus (Benth.) Müll. Arg. var. *dalbergioides* Müll. Arg. in DC., Prodr. 15(2): 343 (1866). — *Phyllanthus dalbergioides* Wall. [Numer. List: 274, no. 7934 p. p. (1847), nom. nud.] ex J. J. Sm. in S. H. Koorders & T. Valeton, Bijdr. Boomsoort. Java 12: 67, 69 (1910). — [*Phyllanthus sinensis* Müll. Arg. var. *dalbergioides* Müll. Arg. in Linnaea 32: 12 (1863), nom. nud.] — Type: *Wallich, List no. 7934* (G-DC

(IDC microfiche in TI) n. v.), in India orient. prope Amherst; *Wallich, List no. 7940* (K-WALL (IDC microfiche in TI) n. v.), in Silhet.

Phyllanthus takaoensis Hayata, Icon. Pl. Formosan. 9: 94 (1920). —Lectotype designated by Kurosawa & Shimizu (2000): *B. Hayata s. n.*, [22] Apr. 1917 (TI!), Formosa, Ape's Hill (Taiwan).

Phyllanthus erythrocarpus Ridl., Bull. Misc. Inform. Kew 1923: 362 (1923). — Type: *Ridley*, March 1915 (n. v.), Malay Peninsular, Selangor, Batu Caves.

Kirganelia lineata auct. non (Willd.) Alston: Alston in Trimen, Handb. Fl. Ceylon 6: 259 (1931).

Monoecious shrub, 1.2–4.5 m high, 7 cm in diameter. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 6–17 cm, glabrous or villous. *Normal leaves* deciduous, alternate, 7–16 per branchlet; stipules persistent, free, narrowly triangular, 1–3 by 0.5–0.6 mm, apex rounded or acute, margin entire; petiole 1.5–2.4 mm long, glabrous or villous; blade elliptic, 1.5–5.3 by 0.7–1.9 cm, base obtuse or cuneate, apex rounded or obtuse, margin entire, midrib raised beneath, both surfaces glabrous or villous at base. *Cymules* axillary. *Staminate flowers* 3–5 per cymule; pedicel 3–4 mm long, glabrous or vilous; sepals 5, elliptic or narrowly ovate, 1–1.8 by 0.6–1.2 mm, margin entire; stamens 5; filaments not seen; anthers not seen; disc not seen. *Pistillate flowers* 1 per cymule; sepals persistent, 5 or 6, often unequal, orbicular, narrowly ovate or ovate, 1.2–1.8 by 0.4–1 mm, apex acute or obtuse, margin entire; disc not seen; ovary 4–8-carpellate, spheroidal; styles 0.1–0.2 mm long, bifid. *Fruits*: pedicel 3–5 mm long, gradually thickened distally, glabrous or villous; bacca spheroidal.

Distribution — Tropical & South Africa, Pakistan, Sri Lanka, India, Nepal, Bhutan, Thailand, Cambodia, Laos, Vietnam, Borneo, Jawa, Moluccas, New Guinea, Philippines, Sulawesi, Sumatera, Australia (Northern Tessitory, Queensland, Western), China (South-central, Hainan, Southeast), Taiwan, Japan (Nansei Shoto [Ryukyu]) (Webster 1957, Long 1987, Govaerts et al. 2000). In Nepal: Western, Eastern.

Habitat & Ecology — Altitude 400–830 m. In forests, on riversides, or rocky cliffs. Common in eastern plains (Siwakoti & Varma 1999). Flowers & fruits throughout the year.

Vernacular names — Nepali: *nundhik* (Manandhar 2002). Mooshar: *sikat* (Manandhar 2002). Tamang: *khayal* (Manandhar 2002).

Uses — This species is planted as a hedge plant (Siwakoti & Varma 1999). Ripe fruit is edible (Manandhar 2002). Juice of bark and leaf are medicinally applied for various diseases (Manandhar 2002).

9. Phyllanthus leschenaultii Müll. Arg. — Plate 66; Fig. 10.

Phyllanthus leschenaultii Müll. Arg., Linnaea 32: 37 (1863); Müll. Arg. in DC. Prodr. 15(2): 398 (1866); Hook. f., Fl. Brit. India 5: 296 (1887); D. G. Long in Fl. Bhutan 1: 775 (1987); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1298 (2000). — Type: *Leschenault 129*, [in 1823] (G-DC (IDC microfiche in TI) n. v.), in montibus Neilgherries Indiae orientalis; *Hook. & Thoms.* [*Phyllanthus 22*] (G-DC (IDC microfiche in TI) n. v.), Khashia (India).

Deciduous shrub, ca. 50 cm high. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* glabrous. *Leaves* alternate; stipules free, narrowly triangular, ca. 1.5 by ca 0.6 mm, apex acuminate, margin entire; petiole 2–2.5 mm long,

glabrous; blade elliptic, 1.6–2.3 by 0.7–1.3 cm, base acute or obtuse, apex rounded, margin entire. *Cymules* axillary. *Staminate flowers* 0 or 1 per cymule; pedicel 1.5–2 mm long, glabrous; sepals 5?, orbicular or widely obovate, 0.7–0.8 by 0.6–0.8 mm, glabrous, margin entire; disc not seen; stamens not seen; filaments not seen. *Pistillate flowers* 1 or 2 per cymule; sepals 6, elliptic or widely elliptic, ca. 1.2 by ca. 1 mm, glabrous, apex acute, margin entire; disc annular, margin irregularly clefted; ovary 3-carpeled, glabrous, smooth; styles 3, ca. 0.4 mm long, bifid. *Fruits*: pedicel 2–3 mm long, gradually thickened distally; capsule depressed-globose, ca. 2.5 mm in diam., ca. 1.8 mm long, glabrous, smooth; columella persistent after dehiscence, ca. 1.3 mm long. *Seeds* not seen.

Distribution — India, Nepal, Bhutan (Long 1987, Govaerts et al. 2000). *Deccan element*. In Nepal: Western.

Habitat & Ecology — Altitude 510 m. In grasslands near river. Flowers & fruits in October.

Notes — This is the first record of the species from Nepal.

IV. Subgenus **Cicca** (L.) G. L. Webster

Subgenus *Cicca* (L.) G. L. Webster, J. Arnold Arbor. 37: 344 (1956). — *Cicca* L., Mant. Pl.: 17 (1767). — Type species: *Phyllanthus acidus* (L.) Skeels

Key to the species

A. Leaves elliptic or ovate, 2.5–3.5 cm wide; fruits baccate ..... **10. P. acidus** (L.) Skeels

A. Leaves linear, 0.1–0.3 cm wide; fruits fleshy capsular ..... **11. P. emblica** L.

10. Phyllanthus acidus (L.) Skeels — Fig. 11.

Phyllanthus acidus (L.) Skeels, U. S. D. A. Bur. Pl. Industr. Bull. 148: 17 (1909); G. L. Webster, J. Arnold Arbor. 38: 66 (1957); Short & Vickery in Enum. Flow. Pl. Nepal

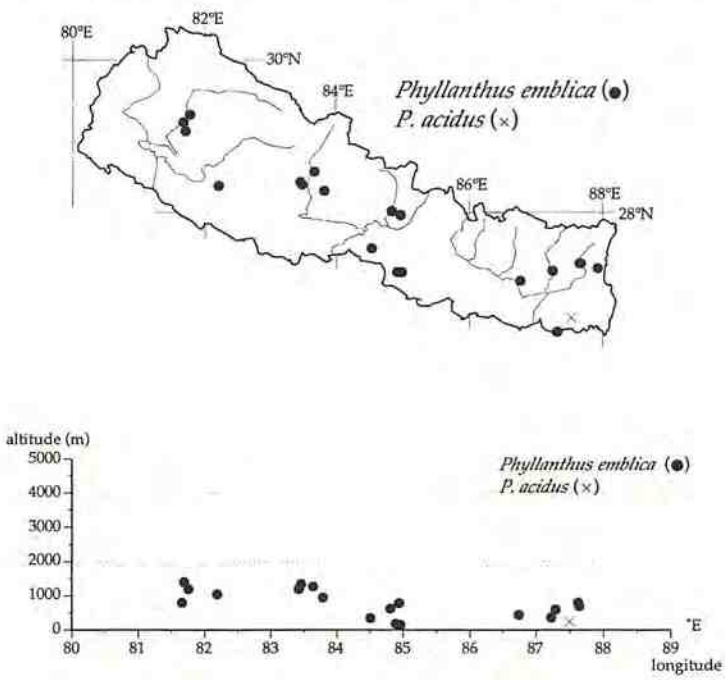

Fig. 11. Distribution of *Phyllanthus acidus* (L.) Skeels. and *P. emblica* L. in Nepal.

3: 198 (1982); D. G. Long in Fl. Bhutan 1: 773 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 330 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1264 (2000); Manandhar, Pl. People Nepal: 359 (2002). — *Averrhoa acida* L., Sp. Pl.: 428 (1753). — *Cicca acida* (L.) Merr., Interpr. Herb. Amboin.: 314 (1917). — Lectotype designated by Webster (1957): *Herb. Linnaeus, No. 592-3* (LINN n. v.), India.

Cicca disticha L., Mant. Pl.: 124 (1767); Kurz, Forest Fl. Burma 2: 353 (1877). — *Phyllanthus cicca* Müll. Arg., Linnaea 32: 50 (1863), nom. illeg. — *Phyllanthus distichus* (L.) Müll. Arg. in DC. Prodr. 15(2): 413 (1866); Hook. f., Fl. Brit. India 5: 304 (1887). — *Diasperus distichus* (L.) O. Ktze., Rev. Gen. 2: 599 (1891). — Type: *Koenig in Herb. Linnaeus, No. 1108-1* (holo LINN n. v.), India.

[*Phyllanthus tetrandrus* Wall., Numer. List: 274, no. 7930 (1847), "*tetrandra*", nom. nud.]

See Govaerts et al. (2000) for further synonyms.

Distribution — Native probably to South America (Webster 1957), widely cultivated throughout the tropics, and naturalized elsewhere (Govaerts et al. 2000). In Nepal: Eastern.

Habitat & Ecology — Altitude 260 m. Occasional along roadsides and gardens on plains (Siwakoti & Varma 1999). Flowers & fruits in September.

Vernacular names — Nepali: *amala* (Siwakoti & Varma 1999). Danuwar: *aura* (Manandhar 2002).

Uses — Cultivated. Fresh or pickled fruit are edible (Siwakoti & Varma 1999, Manandhar 2002).

11. Phyllanthus emblica L. — Fig.11.

Phyllanthus emblica L., Sp. Pl.: 982 (1753); Roxb., Fl. Ind. ed. 1832, 3: 671 (1832); Wall., Numer. List: 273, no. 7903 p. p. (1847); Baill., Étude Euphorb.: 627 (1858); Müll. Arg., Linnaea 32: 15 (1863); Müll. Arg. in DC., Prodr. 15(2): 352 (1866); Hook. f., Fl. Brit. India 5: 289 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Kitam. in Fauna Fl. Nepal Himal.: 172 (1955); G. L. Webster, J. Arnold Arbor. 38: 76 (1957); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966); Murata, Acta Phytotax. Geobot. 25: 115 (1973); N. P. Manandhar, Med. Pl. Nep. Himal.: 53 (1980); Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 484 (1983); Malla et al., Fl. Kathmandu Valley: 629 (1986); D. G. Long in Fl. Bhutan 1: 772 (1987); Stainton, Flow. Himal. Suppl.: 55, pl. 104 (1988); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 87, t. 23, f. 1–5 (1994); G. L. Webster in Rev. Handb. Fl. Ceylon 11: 219 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 16 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 331 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1285 (2000); Rajbhandari, Ethnobot. Nepal: 60 (2001); Manandhar, Pl. People Nepal: 359 (2002). — *Emblica officinalis* Gaertn., Fruct. Sem. Pl. 2: 122, t. 108(2) (1790); Banerji, Rec. Bot. Surv. India 19: 82 (1966); C. R. Rao, Ind. For. 93: 95 (1967). — *Cicca emblica* (L.) Kurz, Forest Fl. Burma 2: 352 (1877). — *Diasperus emblica* (L.) O. Ktze., Rev. Gen. 2: 599 (1891). — Possible type fide Webster (1957, 1997): *Herb. Linnaeus, No. 1105-11* (LINN n. v.), India.

Phyllanthus mimosifolius Salisb., Prodr. Stirp. Chap. Allerton: 391 (1796).

Phyllanthus taxifolius D. Don, Prodr. Fl. Nepal.: 63 (1825), "*taxifolia.*" — Type: *Kamroop* (n. v.), Sirinagur.

Emblica arborea Raf., Sylva Tellur.: 91 (1838).

[*Phyllanthus glomeratus* Roxb. ex Wall., Numer. List: 273, no. 7903B (1847), nom. nud.]

Phyllanthus mairei H. Lév., Bull. Acad. Int. Géogr. Bot. 25: 23 (1915). — Type: *E. E. Maire s. n.*, Apr. 1912 (holo E (fide Lauener 1983) n. v.), China, Yunnan, rives du fleuve à Siao-ho, 400 m.

Monoecious shrub, small tree or tree, 0.5–12 m high, stem diameter 10–15 cm. *Branching* phyllanthoid (i. e. deciduous branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 10–29 cm long, hispidulous. *Leaves* deciduous, alternate, many per branchlet, glabrous; stipules persistent or deciduous, free, triangular, ca. 1 by ca. 0.6 mm, margin entire or serrate; petiole 0.3–0.5 mm long; blade linear, 0.7–1.4 by 0.1–0.3 cm, base obtuse or rounded, apex obtuse or acute, margin entire, midrib raised beneath, upper surface green, lower surface whitish. *Cymules* axillary. *Staminate flowers* 2–7 per cymule; pedicel 1.3–2.3 mm long; sepals 5 or 6, unequal, narrowly elliptic or oblanceolate, 1.5–1.7 by 0.5–0.8 mm, margin entire or obscurely serrate; disc not seen; stamens 3; filaments connate, ca. 0.5 mm long; anthers elliptic, 0.6–0.8 mm long, dehiscing vertically. *Pistillate flowers* 0 or 1 per cymule; pedicel 0.2–0.3 mm long; sepals 6, deciduous, narrowly elliptic, 1.5–2 by ca. 0.6 mm, margin entire; disc not seen; ovary 3-carpellate; styles 3, thick, bifid, free, 2–2.8 mm long. *Fruits* subsessile; fleshy capsule sphaeroidal, 1.8–2.2 mm in diam., pericarp 1–1.5 mm thick. *Seeds* trigonous, 4.8–5.8 mm long, 2.5–3.5 mm radially, 2.8–3.5 mm tangentially, smooth, brown.

Distribution — Sri Lanka, India (Kumaon, Assam), Nepal, Bhutan, Burma (North), Thailand, Cambodia, Laos, Borneo, Jawa, Lesser Sunda Isls., Malaya, Sumatera, China (South-central, Hainan, Southeast), Taiwan (Short & Vickery 1982, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 150–2000 m. In *Shorea robusta* forests or *Pinus* forests, on cliffs, on slopes, or on riversides. Flowers from April to June; fruits from June to January.

Vernacular names — Nepali: *amala(a)* (Siwakoti & Varma 1999, Rajbhandari 2001a, Manandhar 2002). Chepang: *tausi* (Manandhar 2002). Danuwar: *rikhiya* (Manandhar 2002). Gurung: *kyun* (Manandhar 2002), *tigi* or *titi* (Rajbhandari 2001a, Manandhar 2002). Khaling: *korosi* (Manandhar 2002). Limbu: *aagra* (Manandhar 2002). Magar: *aaunlesa* (Manandhar 2002), *ghwarbhet* or *ghwarmeth* (Rajbhandari 2001a, Manandhar 2002). Majhi: *amala* (Manandhar 2002). Mooshar: *rikhiya* (Manandhar 2002). Newari: *amba* (Manandhar 2002). Rai: *chimbak* (Manandhar 2002), *jurse* (Manandhar 2002), *korosi* (Rajbhandari 2001a). Raute: *aurya* (Manandhar 2002). Satar: *meral* (Rajbhandari 2001a). Tamang: *amble* (Manandhar 2002), *harimnal* (Manandhar 2002), *tebu* (Manandhar 2002). Tharu: *aonla* (Rajbhandari 2001a), *aura* (Manandhar 2002). Tibetan: *kyu-ru-ra* (Manandhar 2002).

Uses — Fresh fruit is acidic, edible and rich in vitamin C, and is medicinally used for various diseases (Siwakoti & Varma 1999, Manandhar 2002). Pickled fruit is also eaten (Manandhar 2002). Bark and leaf are used for tanning (Manandhar 2002). Detergent properties of dried fruit are used for washing head (Manandhar 2002). Juice of bark, juice of leaf, dried fruit, and endosperm are medicinally applied for various diseases (Rajbhandari 2001a, Manandhar 2002).

V. Subgenus **Phyllanthus**

Key to the species

A. Capsules verrucose or obscurely verrucose, pedicel 0.1–0.5 mm long; seeds transversely rugose or almost smooth
  B. Perennial herbs; stipules of normal leaves 1.5–3 mm long; capsules obscurely verrucose, ca. 3 mm in diam.; seeds 1.6–1.8 mm long, with transverse ridges on the back or almost smooth ..... **12. P.** aff. **embergeri**
  B. Annual herbs; stipules of normal leaves 0.7–1.2 mm long; capsules verrucose, ca. 2.5 mm in diam.; seeds 1.2–1.3 mm long, with transverse ridges on the back
    C. Seeds with obscure ridges on the side, with 13–17 ridges on the back; margin of female disc crenate or dentate ..... **13. P. lepidocarpus** Siebold & Zucc.
    C. Seeds with sharp ridges on the side, with 10 or 11 ridges on the back; margin of female disc crenulate ..... **14. P. embergeri** Haicour & Rossignol

A. Capsules smooth; pedicel 1–3 mm long; seeds longitudinally rugose
  B. Sepals of pistillate flowers 5, acute or obtuse at apex, 0.8–1 mm long ..... **15. P. amarus** Schumach. & Thonn. ex D. Don
  B. Sepals of pistillate flowers 6, obtuse or rounded at apex, 1–2 mm long
    C. Sepals of pistillate flowers 0.7–1.3 mm long; seeds 0.9–1 mm long; pedicels of capsules 1–1.5 mm long ..... **16. P. fraternus** G. L. Webster
    C. Sepals of pistillate flowers ca. 2 mm long; seeds ca. 1.2 mm long; pedicels of capsules 2.5–3 mm long ..... **17. P. airy-shawii** Brunel & J. P. Roux

12. Phyllanthus aff. **embergeri** — Fig. 12.

Distribution — *S Asian-Malaysian element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 1200 m. Flowers & fruits in October.

Notes — Identity and circumscription of this species will be discussed in another paper.

13. Phyllanthus lepidocarpus Siebold & Zucc. — Fig. 13.

Phyllanthus lepidocarpus Siebold & Zucc., Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 143 (1845); T. Kuros., Acta Phytotax. Geobot. 52: 18 (2001). — Type: (holo L? n. v.; iso? K!), Japonia.

Phyllanthus urinaria auct. non L., Sp. Pl.: 982 (1753); Müll. Arg. in DC. Prodr. 15(2): 364 (1866), p. p.; Hook. f., Fl. Brit. India 5: 293 (1887), p. p.; Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966), p. p.; Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982), p. p.; D. G. Long in Fl. Bhutan 1: 772 (1987), p. p.; T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1331 (2000), p. p.; Rajbhandari, Ethnobot. Nepal: 61 (2001), p. p.; Manandhar, Pl. People Nepal: 360 (2002), p. p.

Phyllanthus niruri sensu Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966), p. p., non L., Sp. Pl.: 981 (1753).

Annual monoecious herb. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Stem* erect, ascending or procumbent, branched out main axes throughout, 5–69 cm long, glabrous, with ridges. *Branchlets* 2–9 cm long, hispidulous or glabrous. *Cataphylls* at the base of branchlets, lanceolate or narrowly triangular, 1.7–3

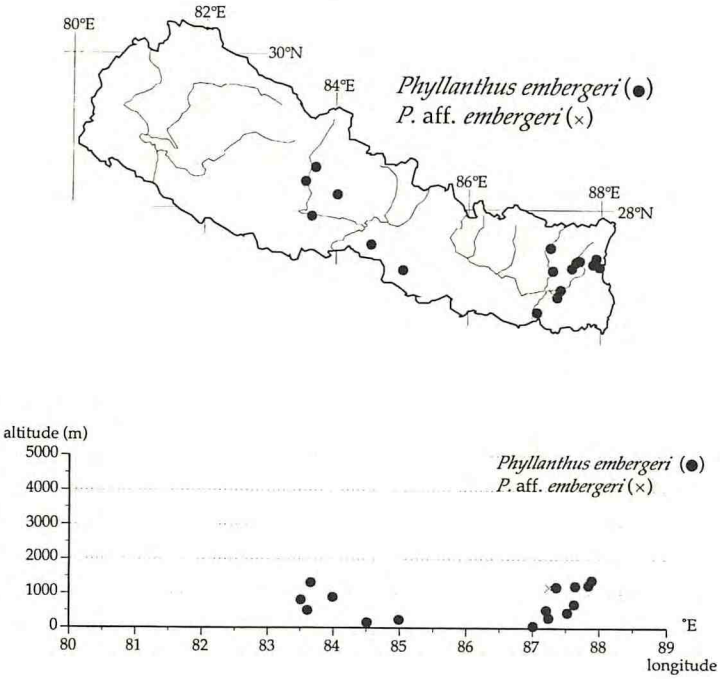

Fig. 12. Distribution of *Phyllanthus aff. embergeri* and *P. embergeri* Haicour & Rossignol in Nepal.

by ca. 0.8 mm, apex acuminate, margin entire, glabrous; stipules on nodes, lanceolate or narrowly triangular, 1.2–3 by 0.4–1 mm, base auriculate, peltate, apex acuminate. *Normal leaves* alternate, 20–34 per branchlet; stipules narrowly triangular or lanceolate, 1–1.2 by 0.4–0.5 mm, base auriculate, apex acuminate; petiole 0.3–0.5 mm long; blade oblong or elliptic, 0.6–1.6 by 0.3–0.6 cm, base obliquely obtuse, apex mucronate or obtuse, margin minutely hispidulous, midrib raised beneath. *Cymules* axillary. *Staminate flowers* 0–2 per cymule; pedicel ca. 0.2 mm long; sepals 6, elliptic, ca. 0.3 by 0.2 mm, glabrous, apex rounded, margin obscurely toothed; stamens 3; filaments connate into a column; anthers dehiscing longitudinally. *Pistillate flowers* 0 or 1 per cymule; sepals 6, lanceolate or narrowly ovate, 0.6–0.8 by ca. 0.2 mm, glabrous, apex obtuse, margin obscurely toothed or almost entire; disc annular, with crenate or dentate margin; ovary 3-carpellate, glabrous, verrucose; styles 3, ca. 0.1 mm long, bifid. *Fruits*: pedicel ca. 0.1 mm long; capsule depressed-globose, ca. 1.5 mm long, ca. 2.5 mm in diam., verrucose; columella persistent after dehiscence, ca. 0.8 mm long. *Seeds* sharply trigonous, 1.2–1.3 mm long, 0.9–1 mm radially, 0.9–1 mm tangentially, with 13–17 transverse ridges on the back, with obscure radial ridges on the side, minutely granulate on the ridges, brown.

Distribution — Sri Lanka, India, Nepal, Thailand, Vietnam, Malaya, Philippines, China (South-central, Southeast), Taiwan, Japan (Rossignol et al. 1987 as *P. hookeri*, Chen & Wu 1997 as *P. hookeri*, Govaerts et al. 2000 as *P. urinaria* var. *hookeri*, Kurosawa 2001). *S Asian-Malaysian element.* In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude up to 2500 m. On roadsides, in crop fields, or in sunny forests. Flowers & fruits throughout the year.

Vernacular names — Nepali: *bhuin amala* (Manandhar 2002 as *P. urinaria*). Satar: *kanthad* (Rajbhandari 2001a as *P. urinaria*).

Uses — Paste of plant is applied to boil, wound and sore (Rajbhandari 2001a as *P. urinaria*, Manandhar 2002 as *P. urinaria*).

Notes — Based on chromosome numbers and flower and seed morphology, Rossignol et al. (1987) distinguished 4 species and 1 subspecies within annual weeds collectively treated as *P. urinaria* L. Among these *P. hookeri* sensu Rossignol et al. (1987) and *P. embergeri* were found in Nepal. The name, *P. lepidocarpus* Siebold & Zucc., is prior to *P. hookeri* (Kurosawa 2001).

One of the specimens cited as *P. niruri* L. in Hurusawa & Tanaka (1966) is referable to this species. See note under *P. amarus*.

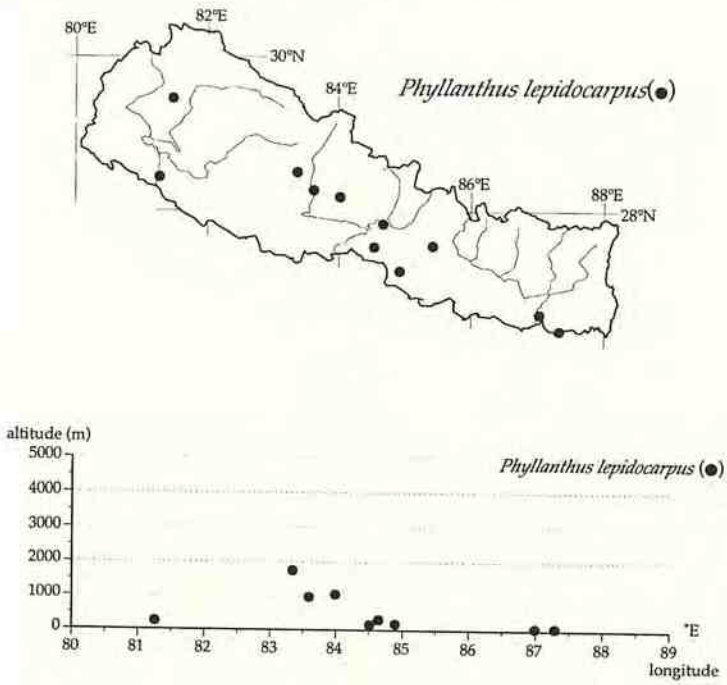

Fig. 13. Distribution of *Phyllanthus lepidocarpus* Siebold & Zucc. in Nepal.

14. Phyllanthus embergeri Haicour & Rossignol — Fig. 12.

Phyllanthus embergeri Haicour & Rossignol, Amer. J. Bot. 74: 1860 (1987, publ. 1988). — Type: *Nozeran P.3* (holo VIL n. v.; iso VIL, P n. v.), along bay, North Vietnam.

Phyllanthus niruri auct. non L., Sp. Pl.: 981 (1753): Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966), p. p.

Phyllanthus amarus auct. non Schum., Beskr. Guin. Pl.: 421 (1827): Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982), p. p.

Phyllanthus urinaria auct. non L., Sp. Pl.: 982 (1753): Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966), p. p.; Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982), p. p.; Long in Fl. Bhutan 1: 772 (1987), p. p.; T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998), p. p.; Rajbhandari, Ethnobot. Nepal: 61 (2001), p. p.; Manandhar, Pl. People Nepal: 360 (2002), p. p.

Phyllanthus cochinchinensis auct. non Spreng., Syst. Veg. 3: 21 (1826): Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1280 (2000).

Annual monoecious herb. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Stem* erect, ascending or procumbent, branched out main axes throughout, 5–28 cm long, glabrous, with ridges. *Branchlets* 3.5–6.5 cm long, hispidulous. *Cataphylls* at the base of branchlets, lanceolate, 1–2.5 by 0.4–0.5 mm, apex acuminate, margin entire, glabrous; stipules on nodes, lanceolate or narrowly triangular, 2–3 by ca. 1 mm, base auriculate, peltate, apex acuminate. *Normal leaves* alternate, 8–21 per branchlet; stipules lanceolate, 0.7–1 by 0.3–0.4 mm, base auriculate, apex acuminate; petiole 0.2–0.3 mm long; blade oblong or elliptic, 0.8–1.4 by 0.3–0.6 cm, base obliquely obtuse, apex mucronate, obtuse or acute, margin hispidulous, midrib raised beneath. *Cymules* axillary. *Staminate flowers* 0–2 per cymule; pedicel ca. 0.2 mm long; sepals 6, elliptic, 0.3–0.4 mm long, glabrous, apex rounded, margin obscurely toothed; disc not seen; stamens 3; filaments connate into a column; anthers dehiscing longitudinally. *Pistillate flowers* 0 or 1 per cymule, subsessile; sepals 6, lanceolate or narrowly ovate, ca. 0.8 by 0.2–0.3 mm, glabrous, apex obtuse, margin serrate; disc annular, with crenulate margin; ovary 3-carpellate, glabrous, verrucose; styles 3, ca. 0.1 mm long, bifid. *Fruits*: pedicel ca. 0.2 mm long; capsule depressed-globose, ca. 2.5 mm in diam., ca. 1.5 mm long, verrucose; columella persistent after dehiscence, ca. 0.8 mm long. *Seeds* sharply trigonous, ca. 1.3 mm long, ca. 0.9 mm radially, ca. 1 mm tangentially, with 10 or 11 sharp transverse ridges on the back, with sharp radial ridges on the side, yellowish brown, somewhat glossy.

Distribution — India, Nepal, Vietnam, China (South-central, Southeast), Taiwan, Japan (Nansei-Shoto [Ryukyu]) (Rossignol et al. 1987, Chen & Wu 1997, Kurosawa 2001). *S Asian-Malaysian element*. In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude up to 1400 m. On roadsides, in grazed grasslands, on forest margin or in crop fields. Flowers & fruits from July to January.

Vernacular names — Nepali: *bhuin amala* (Manandhar 2002 as *P. urinaria*). Satar: *kanthad* (Rajbhandari 2001a as *P. urinaria*).

Uses — Paste of plant is applied to boil, wound and sore (Rajbhandari 2001a as *P. urinaria*, Manandhar 2002 as *P. urinaria*).

Notes — Recently Govaerts et al. (2000) regards *P. embergeri* as a synonym of a Vietnamese plant, *P. cochinchinensis* Spreng, although the latter has been known as a shrubby species with pedicellate pistillate flowers (Li 1994).

One of the specimens cited as *P. niruri* L. in Hurusawa & Tanaka (1966) is referable to this species. See note under *P. amarus*.

15. Phyllanthus amarus Schumach. & Thonn. — Fig. 14.

Phyllanthus amarus Schumach. & Thonn., Beskr. Guin. Pl.: 421 (1827); Schumach. & Thonn., Kongel. Danske Vidensk. Selsk. Naturvidensk. Math. Afh. 4: 195 (1829); G. L. Webster, J. Arnold Arbor. 38: 313 (1957); Mitra & Jain, Bull. Bot. Surv. India 27: 164 (1985); G. L. Webster, Rev. Handb. Fl. Ceylon 11: 226 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1267 (2000); Manandhar, Pl. People Nepal: 359 (2002). — *Phyllanthus niruri* L. var. *amarus* (Schumach. & Thonn.) Leandri, Fl. Madag. 111: 73 (1958). —Type: *Schumacher &*

Thonnig (holo C (fide Webster 1957) n. v.), Guinée (Guinea, Africa).

Phyllanthus nanus Hook. f., Fl. Brit. India 5: 298 (1887). — Type: *Griffith* [*Kew distrib. no. 4803*] (K!), Burma, at Tsegau.

Phyllanthus niruri auct. non L., Sp. Pl.: 981 (1753): Swartz, Obs. Bot.: 354 (1791); Müll. Arg., Linnaea 32: 43 (1863), p. p.; Müll. Arg. in DC. Prodr. 15(2): 406 (1866), p. p.; Hook. f., Fl. Brit. India 5: 298 (1887), p. p.; Malla et al., Fl. Kathmandu Valley: 630 (1986); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 101, t. 26, f. 1–5 (1994).

See Govaerts et al. (2000) for further synonyms.

Distribution — Probably native to tropical America, now pantropical (Webster 1957, Govaerts et al. 2000). In Nepal: Eastern.

Habitat & Ecology — Altitude 215 m. On sunny path sides. Flowers & fruits in October.

Vernacular names — Nepali: *bhui amala* (Manandhar 2002). Tharu: *chhotaki dahigola* (Manandhar 2002).

Uses — Infusion of root, decoction of plant, bark, juice of leaf are medicinally applied for various diseases (Manandhar 2002).

Notes — This is one of much misunderstood species in Nepalese Flora. The cited specimens as *P. niruri* in Hurusawa & Tanaka (1966) are not referable to *P. amarus* but *P. embergeri* (*H. Hara et al. s. n.*, Oct. 16, 1963, TI!) and *P. lepidocarpus* (*H. Kanai s. n.*, Sep. 20, 1963, TI!). The cited specimens of this species in Short & Vickery (1982) are *P. airy-shawii* (*Wraber 488*, BM!) and a mixture of *P. embergeri* and *P. fraternus* (*Wraber 119*, BM!).

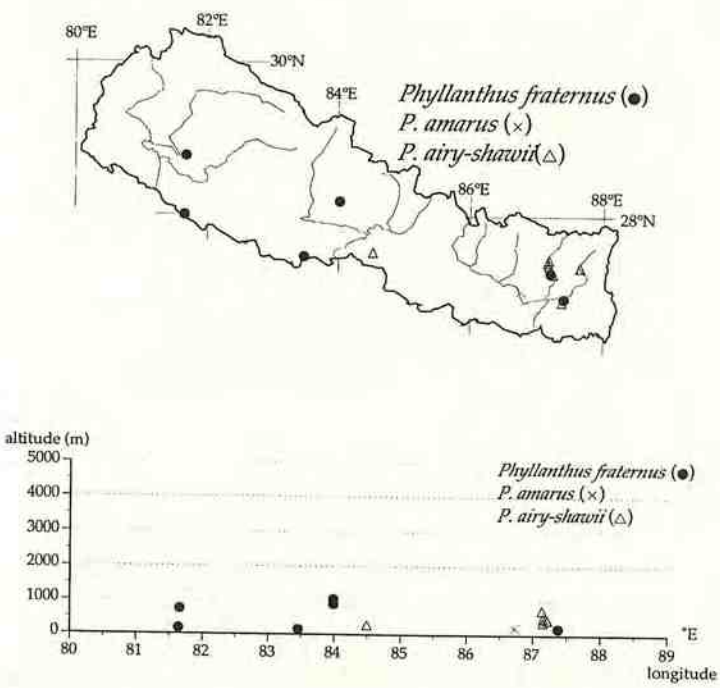

Fig. 14. Distribution of *Phyllanthus amarus* Schumach. & Thonn., *P. fraternus* G. L. Webster, and *P. airy-shawii* Brunel & J. P. Roux in Nepal.

16. Phyllanthus fraternus G. L. Webster — Fig. 14.

Phyllanthus fraternus G. L. Webster, Contr. Gray Herb. 176: 53 (1955); Mitra & Jain, Bull. Bot. Surv. India 27: 172 (1985); Siwakoti & Varma, Pl. Divers. E. Nepal: 331 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1288 (2000). — *Phyllanthus niruri* L. var. *scabrellus* Müll. Arg., Linnaea 32: 43 (1863); Müll. Arg. in DC., Prodr. 15(2): 406 (1866). — Type: *Thomas Thomson*, Oct. 1846 (holo K!), India, Panjab, Tummooghat, Ravee-Chenab Doeb.

[*Phyllanthus lonphali* Wall., Numer. List: 273, no. 7895C (1847), nom. nud.]

Phyllanthus niruri auct. non L., Sp. Pl.: 981 (1753): Hook. f., Fl. Brit. India 5: 298 (1887), p. p.

Phyllanthus amarus auct. non Schum., Beskr. Guin. Pl.: 421 (1827): Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982), p. p.

Phyllanthus debilis auct. non Klein ex Willd., Sp. Pl. 4: 582 (1805); T. Kuros., Newslett. Himal. Bot. no. 22: 17 (1998).

Annual monoecious herb. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Stem* erect, glabrous, 9–42 cm long. *Branchlets* 3–8 cm long, glabrous or serrulate on ridges. *Cataphylls* triangular, ca. 0.8 by ca. 0.6 mm. *Normal leaves* alternate, 12–24 per branchlet; stipules lanceolate, ca. 1 by ca. 0.2 mm, apex acuminate; petiole 0.3–0.4 mm long; blade narrowly elliptic or elliptic, 0.5–1 by 0.2–0.5 cm, base acute, obtuse or rounded, apex obtuse or rounded, margin entire, midrib raised beneath, both surfaces glabrous. *Cymules* axillary. *Staminate flowers* 0–3 per cymule; pedicel 0.3–0.5 mm long; sepals 6, orbicular or widely elliptic, ca. 0.5 mm long, glabrous, apex rounded, margin obscurely toothed or entire; disc not seen; stamens 3; filaments connate into a short column; anthers dehiscing horizontally. *Pistillate flowers* 0 or 1 per cymule; sepals 6, narrowly obovate, unequal, 0.7–1.3 by 0.3–0.7 mm, glabrous, apex rounded or obtuse, margin entire; disc annular, deeply lobed; ovary 3-carpellate, glabrous, smooth; styles 3, ca. 0.05 mm long, bifid. *Fruits*: pedicel 1–1.5 mm long; capsule depressed-globose, ca. 1.8 mm in diam., smooth; columella persistent after dehiscence, ca. 0.6 mm long. *Seeds* sharply trigonous, 0.9–1 mm long, 0.7–0.8 mm radially, 0.7–0.8 mm tangentially, with 6 longitudinal ridges on the back, with 4 or 5 semicircular ridges on the side, brown.

Distribution — Pakistan, India, Nepal (Webster 1955, Mitra & Jain 1985, Govaerts et al. 2000). Introduced into tropical Africa and America (Webster 1955, 1970, Govaerts et al. 2000). *Deccan element*. In Nepal: Mid Western, Western, Eastern.

Habitat & Ecology — Altitude 150–1050 m. On moist and open place or crop fields. Common in eastern plains (Siwakoti & Varma 1999). Flowers and fruits from July to December.

Uses — Plant is medicinally used for de-obstruent, diuretic, astringent and cooling, and in jaundice and genito-urinary infection (Siwakoti & Varma 1999).

Notes — This species often have been misidentified as *P. amarus* or *P. debilis* in both herbarium sheets and publications on Nepalese flora (see notes under those species).

17. Phyllanthus airy-shawii Brunel & J. P. Roux — Fig. 14.

Phyllanthus airy-shawii Brunel & J. P. Roux, Nordic J. Bot. 4: 470 (1984); Mitra & Nayar, Taxon 37: 470 (1988); Siwakoti & Varma, Pl. Divers. E. Nepal: 330 (1999);

Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1265 (2000). — Type: *Roux 81-36* (holo AAU n. v.; iso P, K, STR n. v.), Thailand, near Chiang Dao Caves.

Phyllanthus debilis Hook. f., Fl. Brit. India 5: 299 (1887), non Klein ex Willd., Sp. Pl. 4: 582 (1805); Long in Fl. Bhutan 1: 772 (1987); Siwakoti & Varma, J. Econ. Taxon. Bot. 18: 497 (1994). — Lectotype designated by Mitra & Nayar (1988): *Hamilton s. n.*, 5 July 1811, *Wallich, List no. 7892A*, p. p. (K-WALL! right hand top), India, Bihar, Mungger.

Phyllanthus amarus auct. non Schum., Beskr. Guin. Pl.: 421 (1827): Short & Vickery in Enum. Flow. Pl. Nepal 3: 198 (1982), p. p.

Annual or perennial herb or subshrub. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Stem* 19–66 cm long. *Cataphylls* lanceolate, ca. 2 by ca. 0.3 mm, apex acuminate, margin entire. *Normal leaves* alternate; stipules lanceolate, ca. 2 by ca. 0.3 mm, apex acuminate, margin entire; petiole 0.6–1 mm long; blade widely elliptic, 1–1.8 by 0.7–0.9 cm, base cuneate, apex obtuse, margin entire, both surfaces glabrous. *Staminate flowers*: pedicel ca. 1 mm; disc not seen; sepals 6, widely elliptic, 0.8–1 by 0.6–0.8 mm, apex rounded; stamens 3; filaments connate into a short column. *Pistillate flowers*: sepals 6, elliptic, ca. 2 by ca. 1.3 mm, apex rounded; disc annular, deeply lobed; styles 3, ca. 0.4 mm long, bifid. *Fruits*: pedicel 2.5–3 mm long; capsule depressed-globose, ca. 2.2 mm in diam., ca. 1.5 mm long, smooth; columella persistent after dehiscence, ca. 1 mm long. *Seeds* trigonous, ca. 1.2 mm long, ca. 0.9 mm radially, ca. 0.9 mm tangentially, longitudinally rugose.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Bangladesh, Burma, Thailand (Brunel & Roux 1984, Mitra & Nayar 1988, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 400–750 m. In Shorea robusta forests or on forest margin. Occasional in eastern plains (Siwakoti & Varma 1994 as *P. debilis*, 1999). Flowers & fruits from August to January.

Notes — This species also often have been misidentified in either herbarium sheets or publications on Nepalese flora as *P. amarus* or *P. debilis* (see notes under those species). I treated this species as "*Phyllanthus* (subg. *Phyllanthus*) sp." in my previous paper (Kurosawa 1998).

It is needed to compaire this species with a less known species from Bengal, *P. pendulus* Roxb.

5. Sauropus Blume

Sauropus Blume, Bijdr.: 595 (1826). — Lectotype species designated by G. L. Webster, Ann. Missouri Bot. Gard. 81: 46 (1994): *Sauropus albicans* Blume

Key to the species

A. Leaf blades 1–2.8 by 0.6–1.7 cm; staminate pedicels 1.5–3 mm long; capsules ca. 6 mm in diam., pedicel ca. 4 mm long ..... **1. S. quadrangularis** (Willd.) Müll. Arg.

A. Leaf blades 3.7–8 by 1–3.8 cm; staminate pedicels 8–9 mm long; capsules ca. 11 mm in diam., pedicel 1.8–2.1 mm long ..... **2. S. androgynus** (L.) Merr.

1. Sauropus quadrangularis (Willd.) Müll. Arg. — Fig. 15.

Sauropus quadrangularis (Willd.) Müll. Arg., Linnaea 32: 73 (1863); Müll. Arg. in DC. Prodr. 15(2): 242 (1866); Kurz, Forest Fl. Burma 2: 350 (1877); D. G. Long in Fl. Bhutan 1: 783 (1987); Philcox in Rev. Handb. Fl. Ceylon 13: 107 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1439 (2000); Manandhar, Pl. People Nepal: 414 (2002). — *Phyllanthus quadrangularis* Willd., Sp. Pl. 4: 585 (1805). — *Aalius quadrangularis* (Willd.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — Type: (n. v.), in India orientali.

Phyllanthus rhamnoides Roxb., Fl. Ind. ed. 1832, 3: 663 (1832). — *Ceratogynum rhamnoides* (Roxb.) Wight, Icon. Pl. Ind. Orient. 5(2): 26 (1852). — Type: (n. v.), on the coast of Coromandel.

[*Phyllanthus myrtillus* Wall., Numer. List: 273, no. 7892A p. p. (1847), nom. nud.]

Phyllanthus leschenaultii Müll. Arg. var. *tenellus* Müll. Arg., Linnaea 32: 38 (1863). — Type: *Wallich, List no. 7892B* p. p., as "*7982B*" (G-DC (IDC microfiche in TI) n. v.), in India orientali.

Sauropus ceratogynum Baill. [Étude Euphorb.: 635 (1858), nom. nud.] ex Müll. Arg. in DC., Prodr. 15(2): 243 (1866). — *Aalius ceratogynum* (Baill. ex Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — Type: *Wight* (herb. Hook. n. v.); *Wallich, List no. 7892A* p. p. (K-WALL (IDC microfiche in TI) n. v.); *Wallich, List no. 7892B* p. p. (G-DC (IDC microfiche in TI) n. v.; K-WALL (IDC microfiche in TI) n. v.); *Wallich, List no. 7892D* p. p. (K-WALL (IDC microfiche in TI) n. v.); *Wallich, List no. 7909* p. p. (K-WALL (IDC microfiche in TI) n. v.).

Sauropus compressus Müll. Arg. in DC. Prodr. 15(2): 243 (1866); Kurz, Forest Fl. Burma 2: 350 (1877); Hook. f., Fl. Brit. India 5: 336 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966); Murata, Acta Phytotax. Geobot. 25: 115 (1973); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 173 (1994). — *Aalius compressa* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — *Sauropus quadrangularis* (Willd.) Müll. Arg. var. *compressus* (Müll. Arg.) Airy Shaw, Kew Bull. 26: 337 (1972); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); D. G. Long in Fl. Bhutan 1: 783 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 18 (1998). — Type: *J. D. Hook. Saurop. 8* (holo G-DC (IDC microfiche in TI) n. v.), in Indiae orient. prov. Sikkim.

Sauropus quandrangularis (Willd.) Müll. Arg. var. *puberulus* Kurz, Forest Fl. Burma 2: 350 (1877); D. G. Long in Fl. Bhutan 1: 783 (1987); Siwakoti & Varma, Pl. Divers. E. Nepal: 334 (1999), "*pubescens*." — Type: (n. v), Burma.

Sauropus pubescens Hook. f., Fl. Brit. India 5: 335 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966). — *Aalius pubescens* (Hook. f.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — Type: *Hamilton*, [17 June 1810], *Wallich, List no. 7909* (K-WALL n. v.; iso E!), Morung; *Clarke* [*11650*, 27 May 1870] (K!), Siligoree, at the foot of the Sikkim Hills.

Monoecious subshrub or shrub, 0.5–1.8 m high, stem diameter 3 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes), narrowly winged. *Deciduous branchlets* 3–17.5 cm, glabrous or pubescent. *Cataphylls* alternate, triangular or narrowly triangular, 1.5–2.5 by ca. 1 mm, apex acuminate. *Normal leaves* alternate, 8–21 per branchlet; stipules persistent, free, lanceolate, 1.5–2 by ca. 0.8 mm, apex acuminate, margin entire; petiole 0.6–1.5 mm long; blade elliptic or ovate, 1–2.8 by 0.6

–1.7 cm, base obtuse or cuneate, apex rounded, obtuse or acute, margin entire, both surfaces glabrous or pubescent, midrib and secondary veins raised beneath, secondary veins 4 or 5 pairs. *Staminate flowers* 1 or 2 per cymule; pedicel 1.5–3 mm long; sepals connate into a disc with 6 lobes, disc circular, 3–4 mm in diam.; stamens 3; anthers sessile, connate into a column of ca. 0.3 mm long. *Pistillate flowers* 1 per cymule; pedicel ca. 2.5 mm long; calyx ca. 5 mm diameter; calyx lobes 6, depressed ovate or depressed obovate, 1.8–2 by ca. 2.5 mm, glabrous or pubescent, apex rounded, margin entire; ovary transversely ellipsoid, glabrous, smooth; styles 3, free, bifid, 0.8–1.2 mm long, borne on 0.3 mm from the top of ovary. *Fruits*: pedicel ca. 4 mm long; calyx persistent, 7–8 mm diam.; capsule spheroidal or transeversely ellipsoid, ca. 4 mm long, ca. 6 mm in diam., glabrous, smooth; styles persistent, borne separately. *Seeds* trigonous, 4–4.5 mm long, 2.2 –2.5 mm wide, 2.5 mm tangentially, smooth.

Distribution — India (Assam, Sikkim), Nepal, Bhutan, Burma, Cambodia, Thailand, Vietnam, China (South-central, Southeast, Tibet-Qinghai) (Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 220–2200 m. On roadsides, riversides or rocky cliffs or *Shorea robusta* forests. Common in eastern plains (Siwakoti & Varma 1999). Flowers from May to October; fruits from June to October.

Vernacular name — Nepali: *pyaunli* (Manandhar 2002).

Uses — Smoke of dried leaf is medicinally used for tonsillitis (Manandhar 2002).

Notes — *Sauropus quadrangularis* is surprisingly similar to *Breynia retusa* in such vegetative characters as size and shape of leaves, and reproductive characters as size and shape of capsule and calyx (Long 1987). The latter differs from the former in obconical staminate flowers and styles borne not separately.

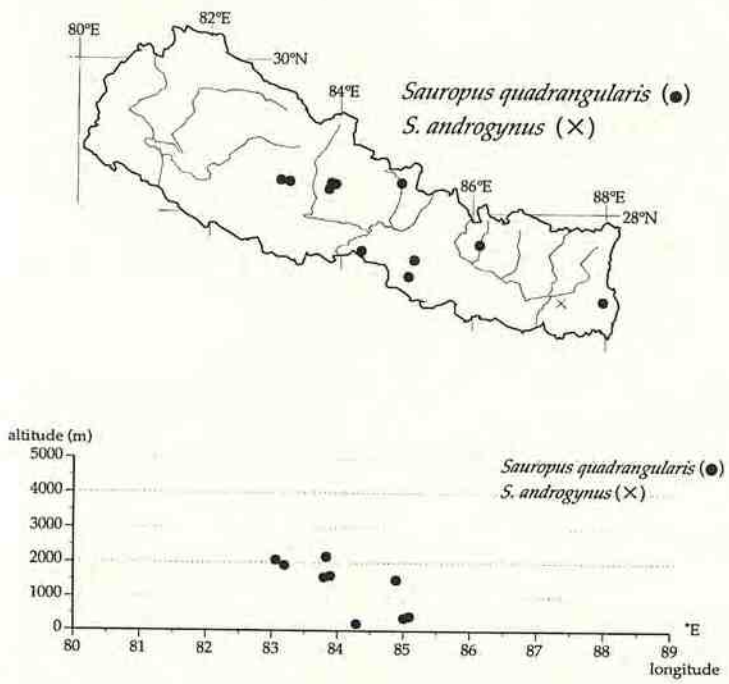

Fig. 15. Distribution of *Sauropus quadrangularis* (Willd.) Müll. Arg. and *S. androgynus* (L.) Merr. in Nepal.

2. Sauropus androgynus (L.) Merr. — Fig. 15.

Sauropus androgynus (L.) Merr., Bull. Bur. Forest. Philipp. Islands 1: 30 (1903); Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); D. G. Long in Fl. Bhutan 1: 783 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 175, t. 49, f. 8–11 (1994); Philcox in Rev. Handb. Fl. Ceylon 13: 102 (1999); T. Kuros., Newslett. Himal. Bot. no. 22: 18 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1434 (2000). — *Clutia androgyna* L., Mant. Pl.: 128 (1767). — *Aalius androgyna* (L.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — Type: (n. v.), India.

Phyllanthus acidissimus Noronha, Verh. Batav. Genootsch. Kunsten 5(4): 22 (1790).

[*Phyllanthus speciosus* Noronha, Verh. Batav. Genootsch. Kunsten 5(4): 22 (1790), nom. nud.].

Agyneia ovata Poir. in Lamarck, Encycl., Suppl. 1: 243 (1810).

Sauropus albicans Blume, Bijdr.: 596 (1826); Baill., Étude Euphorb.: 635 (1858); Kurz, Forest Fl. Burma 2: 349 (1877); Müll. Arg., Linnaea 32: 72 (1863); Müll. Arg. in DC. Prodr. 15(2): 240 (1866); Hook. f., Fl. Brit. India 5: 332 (1887). — [*Sauropus albicans* Blume var. *genuinus* Müll. Arg. in DC. Prodr. 15(2): 241 (1866), nom. inval.] — Type: (n. v.), in montains Provinciarum Buitenzorg, Bantam, Tjanjor etc. (Java).

Phyllanthus strictus Roxb., Fl. Ind. ed. 1832, 3: 670 (1832). — Type: [*Rr. Roxb.* (*Herb. Forsyth*) *s. n.*] (K!), [East India].

Sauropus gardnerianus Wight, Icon. Pl. Ind. Orient. 6: 6, t. 1951-2 (1853), "*gardneriana.*" — *Sauropus albicans* Blume var. *gardnerianus* (Wight) Müll. Arg., Linnaea 32: 72 (1863); Müll. Arg. in DC., Prodr. 15(2): 241 (1866). — Type:*Gardner 742* (n. v.), Ceylon, Hautane.

Sauropus indicus Wight, Icon. Pl. Ind. Orient. 6: 6, t. 1952-2 (1853), "*indica.*" — Type: (n. v.), Courtallum and Shevagherry Hills.

Sauropus zeylanicus Wight, Icon. Pl. Ind. Orient. 6: 6, t. 1952 (1853), "*zeylanica.*" — *Sauropus albicans* Blume var. *zeylanicus* (Wight) Müll. Arg. in DC. Prodr. 15(2): 241 (1866). — Type: *Wight* (n. v.), Ceylon.

Sauropus sumatranus Miq., Fl. Ned. Ind., Eerste Bijv.: 179, 446 (1861). — *Aalius sumatrana* (Miq.) Kuntze, Revis. Gen. Pl. 2: 591 (1891). — Type: (n. v.), Sumatra orient, in prov. Palembang; (n. v.), in Sumatra austr. prov. Lampong, ad Pager-dewok.

Sauropus albicans Blume var. *intermedius* Müll. Arg., Linnaea 32: 72 (1863); Müll. Arg. in DC., Prodr. 15(2): 241 (1866). — Type: *Wallich absq. n.* [*273*?] (G-DC (IDC microfiche in TI) n. v.), in India orientali prope Prome.

Sauropus macranthus Rern.-Vill. in Blanco, Fl. Filip. ed. 3, 4(13A); 187 (1880), non Hassk., Retzia 1: 166 (1855).

Sauropus scandens C. B. Rob., Philipp. J. Sci., C 4: 72 (1909). — Type: *For. Bur. 1934 Borden* (n. v.), Luzon, Province of Bataan, Mount Mariveles, Lamao River.

Sauropus parviflorus Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 218 (1922).

Monoecious shrub. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 28–47 cm, glabrous. *Cataphylls* alternate, triangular or deltate, 1.5–2 by 1.5 mm, apex acuminate. *Normal leaves* alternate, 20–32 per branchlet, glabrous; stipules persistent, free, lanceolate, 1.8–2 by 0.6–0.9 mm, apex acuminate, margin entire; petiole 1.5–2.5 mm long; blade ovate, 3.7–8 by 1–3.8 cm, base obtuse, apex obtuse, margin entire, midrib and secondary veins raised beneath, secondary veins

6–8 pairs. *Staminate flowers*; pedicel 8–9 mm long; sepals connate into a disc, ca. 4 mm in diam.; stamens 3; anthers sessile. *Pistillate flowers* 1 per cymule; pedicel 1.2–1.5 mm long; calyx ca. 6 mm in diam.; calyx lobes 6, arranged 2 rows, outer lobes obovate, ca. 2 by ca. 2.5 mm, apex rounded, margin entire, inner lobes circular or transversely elloptic, 1–2 by 1.5–2 mm, margin entire; styles 3, bifid, ca. 1.5 mm long. *Fruits*: pedicel 1.8–2.1 mm long; calyx persistent, 8–9 mm in diam.; capsule spheroidal, ca. 9 mm long, ca. 11 mm in diam. *Seeds* not seen.

Distribution — Sri Lanka, India, Nepal, Indo-China, China (South-central, Hainan, Southeast), Cambodia, Laos, Thailand, Vietnam, Malaya, Sumatera, Borneo, Jawa, Lesser Sunda Isl., Molucca, Sulawesi, New Guinea, Philippines (Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 450–900 m (Short & Vickery 1982, as 4500–900 m). Flowers & fruits in October.

6. **Breynia** J. R. & G. Forst.

Breynia J. R. & G. Forst., Char. Gen. Pl.: 145 (1776), nom. cons. — Type species: *Breynia disticha* J. R. Forst. & G. Forst.

Key to the species

A. Fruits capsular, ca. 7 mm in diameter, calyx conspicuous, 9–11 mm in diameter, pedicel 3–5 mm long; leaf blades 1.5–2.5 cm long, petioles 1.5–2.2 mm long ..... **1. B. retusa** (Dennst.) Alston

A. Fruits baccate, 5–6 mm in diameter, calyx 2.5–3 mm in diameter, pedicel 2.5–4 mm long; leaf blades 2.1–3.7 cm long, petioles 2–4 mm long ..... **2. B. vitis-idaea** (Burm. f.) C.E.C. Fisch.

1. Breynia retusa (Dennst.) Alston — Fig. 16.

Breynia retusa (Dennst.) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204 (1929); Alston in Trimen, Handb. Fl. Ceylon 6: 261 (1931); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 782 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 181, t. 54, f. 1–4 (1994); Philcox in Rev. Handb. Fl. Ceylon 11: 240 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 18 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 282 (2000); van Welzen & Esser, Thai Forest Bull., Bot. 28: 76 (2000); Manandhar, Pl. People Nepal: 121 (2002). — *Phyllanthus retusus* Dennst., Schlüssel Hortus Malab.: 31 (1818). — *Melanthesa retusa* (Dennst.) Kostel., Allg. Med.-Pharm. Fl. 5: 1771 (1836). — *Melanthesopsis variabilis* Müll. Arg. var. *arborea* Müll. Arg., Linnaea 32: 75 (1863), nom. illeg.

Phyllanthus pomaceus Moon, Cat. Pl. Ceylon: 65 (1824). — *Melanthesopsis variabilis* Müll. Arg. var. *oblongifolius* Müll. Arg., Linnaea 32: 75 (1863), nom. illeg. — *Melanthesopsis patens* Roxb. var. *oblongifolia* Müll. Arg. in DC., Prodr. 15(2): 437 (1866).

Phyllanthus patens Roxb., Fl. Ind. ed. 1832, 3: 667 (1832); Wall., Numer. List: 273, no. 7911A (1847). — *Melanthesopsis variabilis* Müll. Arg. var. *patens* (Roxb.) Müll. Arg., Linnaea 32: 75 (1863), nom. illeg. — *Melanthesopsis patens* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 437 (1866); Kurz, Forest Fl. Burma 2: 348 (1877). —

[*Melanthesopsis patens* (Roxb.) Müll. Arg. var. *genuina* Müll. Arg. in DC. Prodr. 15(2): 438 (1866), nom. inval.] — *Breynia patens* (Roxb.) Rolfe, J. Bot. 20: 359 (1882); Hook. f., Fl. Brit. India 5: 329 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910). — Type: [*Rr. Roxb.* (*Herb. Forsyth*) *s. n.*] (K!), the Botanic garden (Calcutta), native of Chittagong [East India].

Phyllanthus turbinatus Roxb., Fl. Ind. ed. 1832, 3: 666 (1832), non Sims, Bot. Mag. 44: t. 1862 (1817). — *Melanthesa turbinata* (Roxb.) Oken, Allig., Naturgesch. 3(3): 1603 (1841). — *Melanthesopsis variabilis* Müll. Arg., Linnaea 32: 75 (1863), nom. illeg. — [*Melanthesopsis variabilis* Müll. Arg. var. *vulgaris* Müll. Arg., Linnaea 32: 75 (1863), nom. inval.] — *Melanthesopsis patens* Roxb. var. *turbinata* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 437 (1866). — *Melanthesopsis patens* Roxb. var. *vulgaris* Müll. Arg. in DC., Prodr. 15(2): 438 (1866), nom. illeg. — *Breynia turbinata* (Roxb.) Cordem., Fl. Réunion: 348 (1895). — Type: (n. v.), the mountains of Orissa.

[*Phyllanthus suffultus* Wall., Numer. List: 274, no. 7939A (1847), nom. nud.]

Melanthesa obliqua Wight, Icon. Pl. Ind. Orient. 5(2): 26, t. 1898 (1852). — Type: not designated.

Breynia angustifolia Hook. f., Fl. Brit. India 5: 330 (1887). — *Breynia microphylla* (Kurz ex Teijsm. & Binn.) Müll. Arg. var. *angustifolia* (Hook. f.) Airy Shaw, Kew Bull. 36: 272 (1981). — Type: *M'Lelland* [*s. n.*] (K!), Pegu, at Rangoon; *Griffith* [*949*] (K!), Tenasserim, at Mergui; *Parish* [*260*, in 1839] (K!), Tenasserim, Moulmein; *King's Collector* [*3949*, Mar. 1883] (K!, with an annotation as lectotype by Esser; K!, with an annotation as isolectotype by Esser), Perak.

Monoecious shrub, 1–1.5 m high, stem diameter ca. 2 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 12–19 cm, glabrous. *Cataphylls* alternate, triangular, 1.4–2 by ca. 1 mm, apex acute or acuminate. *Normal leaves* alternate, 10–25 per branchlet, glabrous; stipules persistent, free, triangular, 1.3–2 by 0.6–1 mm, apex acuminate, margin entire; petiole 1.5–2.2 mm long; blade elliptic or ovate, 1.5–2.5 by 1–1.5 cm, base obtuse, apex acute or obtuse, margin entire, midrib and secondary veins raised beneath, secondary veins 3 or 4 pairs. *Staminate flowers* obconic, 1 or 2 per cymule, 2.5–3 mm long, 2.8–3 mm in diam., glabrous; pedicel 4–5 mm long; calyx lobes 6, semicircular, entire, 0.3–1 by 0.7–1.2 mm; stamens 3, connate into a cone of ca. 2 mm long, ca. 0.8 mm in diam.; anthers elliptic, ca. 1 mm long, sessile, with appendage on the top. *Pistellate flowers* 1 per cymule; sepals 6, glabrous, margin entire; ovary 3-carpellate, spheroidal; styles bifid, free, ca. 0.5 mm long. *Fruits*: pedicel 3–5 mm long; calyx persistent, 9–11 mm diameter, lobes circular or depressed obovate, 2–3 by 4–4.5 mm; capsule depressed globose, ca. 4.5 mm long, ca. 7 mm in diam. *Seeds* trigonous, ca. 4 mm long, ca. 2.3 mm wide, ca. 2.1 mm tangentially, smooth.

Distribution — Réunion, Sri Lanka, India, Nepal, Bhutan, Burma, Thailand, Vietnam, Malaysia (Peninsular), China (South-central, Southeast, Tibet-Qinghai) (Govaerts et al. 2000; van Welzen et al. 2000). *S Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 1000–1500 m. In roadside scrubs. Flowers from June to July; fruits from July to August.

Vernacular name — Nepali: *sano nundhiki* (Manandhar 2002).

Uses — Juice of bark is medicinally used for indigestion, and pase of leaf is

medicinally applied to cuts and wounds (Manandnar 2002).

Notes — This species has very similar leaves and fruits to *Sauropus quadrangularis* (Long 1987). See note under the latter species for the difference between them.

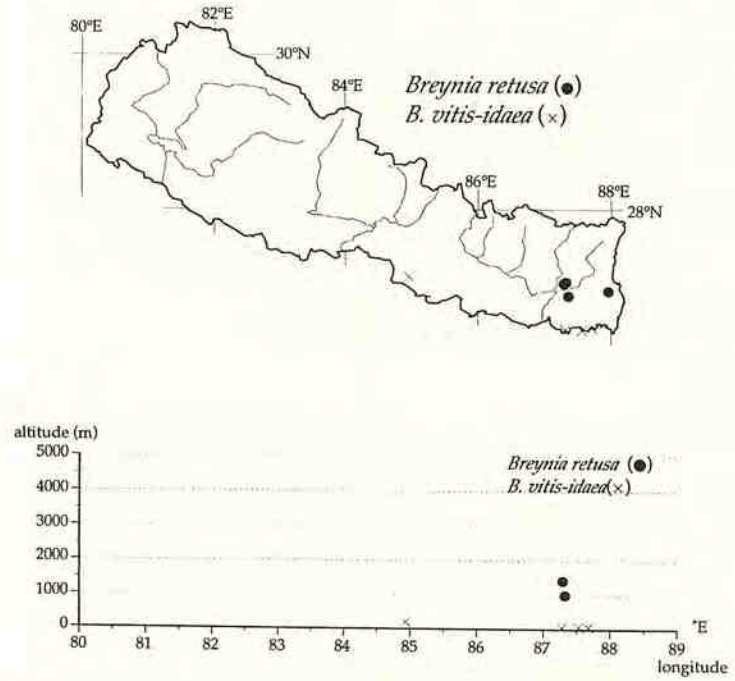

Fig. 16. Distribution of *Breynia retusa* (Dennst.) Alston and *B. vitis-idaea* (Burm. f.) C.E.C. Fisch. in Nepal.

2. Breynia vitis-idaea (Burm. f.) C.E.C. Fisch. — Fig. 16.

Breynia vitis-idaea (Burm. f.) C. E. C. Fisch., Bull. Misc. Inform. Kew 1932: 65 (1932); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 179 (1994); Philcox in Rev. Handb. Fl. Ceylon 11: 238 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 18 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 283 (2000); Dressler & van Welzen, Thai Forest Bull., Bot. 28: 67 (2000); van Welzen & Esser, Thai Forest Bull., Bot. 28: 77 (2000). — *Rhamnus vitis-idaea* Burm. f., Fl. Ind.: 61 (1768). — *Phyllanthus rhamnoides* Retz., Observ. Bot. 5: 30 (1788); Willd., Sp. Pl. 4: 580 (1805), nom. illeg. — *Melanthesa rhamnoides* (Retz.) Blume, Bijdr.: 591 (1826), nom. illeg.; Wight, Icon. Pl. Ind. Orient. 5(2): 26, t. 1898 (1852); Müll. Arg., Linnaea 32: 73 (1863). — *Phyllanthus vitis-idaea* (Burm. f.) D. Koenig ex Roxb., Fl. Indica ed. 1832, 3: 665 (1832). — [*Breynia rhamnoides* (Retz.) Müll. Arg. var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 440 (1866), nom. inval.] — *Breynia rhamnoides* (Retz.) Müll. Arg. in DC., Prodr. 15(2): 440 (1866); Kurz, Forest Fl. Burma 2: 350 (1877), nom. illeg.; Hook. f., Fl. Brit. India 5: 330 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 175 (1966).

Phyllanthus tristis A. Juss., Euphorb. Gen.: 108, t. 5, f. 16 (1824).

Melanthesa ovalifolia Kostel., Allg. Med.-Pharm. Fl. 5: 1772 (1836).

[*Phyllanthus calycinus* Wall., Numer. List: 274, no. 7939B (1847), "*calycina*", nom. nud.]
[*Phyllanthus sepiarius* Roxb. ex Wall., Numer. List: 273, no. 7914A (1847), "*sepiaria*", nom. nud.]
[*Phyllanthus tinctorius* Vahl ex Baill., Étude Euphorb.: 633 (1858), nom. nud.]
Breynia officinalis Hemsl., J. Linn. Soc., Bot. 26: 427 (1894).
Breynia accrescens Hayata, J. Coll. Sci. Imp. Univ. Tokyo 20(3): 22 (1904). — *Breynia officinalis* var. *accrescens* (Hayata) M. J. Deng & J. C. Wang in Fl. Taiwan, ed.2, 3: 430 (1993). — Type: *K. Miyake* [*s. n.*, 20 Nov.] 1899 (TI!), Formosa, Kotôshô (Taiwan); *T. Makino* [*s. n.*, 19 Nov.] 1896 (TI!), Formosa, Tamsui (Taiwan).
Breynia stipitata Müll. Arg. var. *formosana* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 20(3): 22 (1904). — Type: *T. Makino s. n.* (TI!), Formosa, Shintekku (Taiwan); [*unknown collector s. n.*] in 1896[?] (TI!), Formosa, Taipea[?] (Taiwan).
Breynia keithii Ridl., J. Straits Branch Roy. Asiat. Soc. 59: 174 (1911). — Type: [*H. N. R. (Ridley)*] *14888*, [Jul. 1891?] (K!, with an annotation as lectotype by H. J. Esser), Lower Siam, Kedah, Alor Sta; *14887* (n. v.), Setul at Bukit Bunga.
Breynia microcalyx Ridl., J. Fed. Malay States Mus. 10: 114 (1920). — Type: *6547* (n. v.), Peninsular Siam, Koh Pipidon off Ghirbi.

Monoecious shrub, 3 m high. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Deciduous branchlets* 11–25 cm, glabrous. *Cataphylls* alternate, triangular, 2–3 by 2–2.2 mm, apex acuminate. *Normal leaves* alternate, 12–21 per branchlet, glabrous; stipules persistent, free, triangular, 1–1.5 by 0.6–1 mm, apex acuminate, margin entire; petiole 2–4 mm long; blade widely ovate or ovate, 2.1–3.7 by 1.6–3 cm, base obtuse or rounded, apex rounded or obtuse, margin entire, midrib and secondary veins raised beneath, secondary veins 4 or 5 pairs. *Staminate flowers*: pedicel 3–4 mm long; calyx 1–1.2 mm long, 1.2–1.3 mm in diam.; sepals not seen. *Pistillate flowers* 1 per cymule; pedicel 1.5–2.5 mm long; calyx cup shape, ca. 1 mm long, ca. 1.5 mm in diam.; calyx lobes 6, unequal, depressed ovate or widely ovate, 0.3–0.6 by 0.5–0.8 mm, margin entire; ovary 3-carpellate; styles connate, crown shape. *Fruits*: pedicel 2.5–4 mm long; bacca spheroidal, 4–4.5 mm long, 5–6 mm diameter; calyx persistent, 2.5–3 mm in diam.; calyx lobes 6, eltate or triangular, 0.5–1 by 0.4–0.6 mm. *Seeds* not seen.

Distribution — Pakistan, Sri Lanka, India, Nepal, Burma, Cambodia, Thailand, Vietnam, Malaya, Sumatera, Philippines, China (South-central, Southeast), Taiwan, Japan (Nansei-Shoto [Ryukyu]) (Philcox 1997, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude up to 240 m. Flowers from May to December; fruits from October to December.

7. **Glochidion** J. R. & G. Forst.

Glochidion J. R. & G. Forst., Char. Gen. Pl. 113, t. 57 (1776), nom. cons. — Type species: *Glochidion ramiflorum* J. R. & G. Forst.

Key to the species
(See also Table 6)
A. Styles flat, very short
B. Branchlets glabrous or pilose; leaf blades narrowly elliptic, lanceolate or

oblanceolate, lower surface glabrous or pilose; pistillate flowers solitary in cymule, pedicel 2–4 mm long; capsules ca. 15 mm in diam., shallowly 6- or 7-lobed, pedicel 4–8 mm long, glabrous ..... **1. G. multiloculare** (Roxb. ex Willd.) Voigt

B. Branchlets Branchlets villous; leaf blades elliptic or ovate, lower surface sparsely pubescent on veins; pistillate flowers 1–5 per cymule, pedicel 0.5–1 mm long; capsules 8–10 mm in diam., deeply 8–10-lobed, pedicel 3–4.5 mm long, villous .... **2. G. nubigenum** Hook. f.

A. Styles connate into a column, 0.6–2.5 mm long

B. Lower surface of leaf blandes glaucous; pistillate flowers 10 or more per cymule; capsule ca. 6 mm in diam. ..... **3. G. triandrum** (Blanco) C. B. Rob.

B. Lower surface of leaf blandes green or pale green; pistillate flowers 1–10 per cymule; capsule 7–17 mm in diam.

C. Lower surface of leaves pubescent at least on veins when young; styler columns 0.6–1.5 mm long; capsules 7–10 mm in diam., hairy

D. Branchlets densely tomentose; leaf blades ovate, both surfaces pubescent especially on veins, petiole tomentose; pedicel of staminate flowers pubescent; pedicel of pistillate flowers 1–2 mm long; capsule 8–10-lobed, 9–10 mm in diam., tomentose ..... **4. G. heyneanum** (Wight & Arn.) Wight

D. Branchlets sparsely pubescent or glabrate; leaf blades elliptic, upper surface glabrous, lower surface sparsely pubescent on veins when young, often glabrate when mature, petiole puberulous or glabrate; pedicel of staminate flowers glabrous; pistillate flowers subsessile; capsule unlobed or very shallowly 3–4-lobed, 7–8 mm in diam., puberulous ..... **5. G. ellipticum** Wight

C. Lower surface of leaves glabrous; styler columns 2–2.5 mm long; capsules 14–17 mm in diam., glabrous

D. Leaf blades elliptic, petiole 5–7 mm long; sepals of staminate flower 3.5–5 mm long, staminate columns ca. 1.5 mm long; pedicels of capsule 4–5 mm long, glabrous ..... **6. G. lanceolarium** (Roxb.) Voigt

D. Leaf blades lanceolate, petiole 2–3 mm long; sepals of staminate flower 1.8–2.4 mm long; staminate columns ca. 1 mm long; pedicels of capsule 2.5–3 mm long, tomentose ..... **7. G. daltonii** (Müll. Arg.) Kurz

1. Glochidion multiloculare (Roxb. ex Willd.) Voigt — Fig. 17.

Glochidion multiloculare (Roxb. ex Willd.) Voigt, Hort. Suburb. Calcutt.: 152 (1845); Müll. Arg., Linnaea 32: 59 (1863); Kurz, Forest Fl. Burma 2: 343 (1877); Hook. f., Fl. Brit. India 5: 307 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 178 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 778 (1987); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 217 (1995); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 957 (2000). — *Agyneia multilocularis* Roxb. ex Willd., Ges. Naturf. Freunde Berlin Neue Schriften 4: 206 (1803). — *Bradleia multiloculare* (Roxb. ex Willd.) Spreng., Syst. Veg. 3: 19 (1826); Roxb., Fl. Ind. ed. 1832, 3: 696 (1832); Wall., Numer. List : 272, no. 7864 (1847), "*multilocularis*." — *Phyllanthus multilocularis* (Roxb. ex Willd.) Müll. Arg., Flora 48: 370 (1865); Müll. Arg. in DC., Prodr. 15(2): 279 (1866). — Type: *Roxburgh s. n.* (B-WILLD (fide Chakrabarty & Gangopadhyay 1995) n. v.),

TABLE 6. Comparison of characters of Nepalese *Glochidion* species

	G. multiloculare	*G. nubigenum*	*G. triandrum*	*G. heyneanum*	*G. ellipticum*	*G. lanceolarium*	*G. daltonii*
Blanchlet	glabrous or pilose	villous	pubescent	densely tomentose	sparsely pubescent or glabrate	glabrous	glabrous or villous
Leaf blade shape	narrowly ellliptic, lanceolate or oblanceolate	ellliptic or ovate	lanceolate	ovate	elliptic	elliptic	lanceolate
size (mm)	4.5–16 × 1.5–5	6–12 × 3–5	8.5–13.5 × 2.5–4	6–10.5 × 3.5–5	6.5–17.5 × 3–7.2	7.5–16 × 4–7.5	6.5–12 × 2–3.5
upper surface	glabrous	glabrous or sparsely pubescent	sparsely strigose	pubescent especially on veins	glabrous	glabrous	glabrous
lower surface	glabrous or pilose	sparsely pubescent	pubescent and glaucous	pubescent especially on veins	sparsely pubescent on veins or glabrate	glabrous	glabrous
Petiole length (mm)	2–3	3–5	2–4	2.5–5	2–4	5–7	2–3
surface	glabrous or pilose	villous or glabrous	pubescent	tomentose	puberulous or glabrate	glabrous	glabrous
Staminate flower							
sepal size (mm)	2–2.5 × 0.4–1	2.5–3 × 0.5–1.5	1.5–2.2 × 1–1.2	ca. 2 × ca. 1	1.7–2.2 × 0.7–1	3.5–5 × 1–1.4	1.8–2.4 × 0.8–1.4
sepal outside	glabrous	glabrous	pubescent	pubescent on midrib	glabrous	glabrous	glabrous
pedicel (mm)	6–9	5–11	5–7	6–9	5–10	10–12	7–12
pedicel surface	glabrous	glabrous	pubescent	pubescent	glabrous	glabrous	glabrous
stamens	3	3	(not seen)	(not seen)	3	(not seen)	3
column (mm)	ca. 1	ca. 1	(not seen)	(not seen)	1–1.2	ca. 1.5	ca. 1
Pistillate flower							
flower / cymule	1	1–5	10 or more	2–10	1–10	1–8	2–7
sepal size (mm)	2–2.5 × 1–1.8	1–1.5 × 0.2–1	0.6–1.5 × 0.4–0.6	1.5–2 × ca. 0.4	1–1.5 × 0.5–0.8	ca. 1.5 × ca. 1	1.3–2 × 0.5–1
ovary	5-carpellate	4–5-carpellate	4–5-carpellate	4–5-carpellate	3–4-carpellate	4–5-carpellate	4–5-carpellate
style	flat	flat	connate into a column	connate into a column	connate into a column	connate into a column	connate into a column
style length (mm)	very short	very short	1–1.8	1–1.5	0.6–0.7	ca. 2	2–2.5
pedicel (mm)	2–4	0.5–1	0.3–0.8	1–2	subsessile	ca. 1	ca. 0.5
Capsule lobes	shallowly 6 or 7	deeply 8–10	deeply 2–5	8–10	unlobed or very shallowly 3 or 4	shallowly 8–10	unlobed
diameter (mm)	ca. 15	8–10	ca. 6	9–10	7–8	14–17	ca. 14
surface	glabrous	glabrous	glabrous	tomentose	puberulous	glabrous	glabrous
pedicel length (mm)	4–8	3–4.5	6–9	7–9	3–9	4–5	2.5–3
pedicel surface	glabrous	villous	pubescent	tomentose	puberulous	glabrous	tomentose

Roxburgh in Lambart 1816 (G-DC (fide Chakrabarty & Gangopadhyay 1995) n. v.), *Roxburgh in herb. Rottler s. n.* (K!), Bengal.

[*Bradleia pubera* Roxb. ex Wall., Numer. List: 272, no. 7870 (1847), nom. nud.]

Deciduous subshrub or shrub, 0.3–2 m high. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* glabrous or pilose. *Cataphylls* lanceolate, ca. 1.3 by ca. 0.4 mm, apex acuminate, glabrous. *Normal leaves* alternate; stipules free, triangular, 1.5–2.5 by 0.9–1.2 mm, apex acuminate, margin entire; petiole 2–3 mm long, glabrous or pilose; blade narrowly elliptic, lanceolate or oblanceolate, 4.5–16 by 1.5–5 cm, base cuneate, apex acute, obtuse or rounded, margin entire, upper surface glabrous, lower surface glabrous or pilose. *Cymules* axillary. *Staminate flowers* 1–6 per cymule; pedicel 6–9 mm long, glabrous; sepals 6, narrowly elliptic or elliptic, 2–2.5 by 0.4–1 mm, apex obtuse, both surfaces glabrous; stamens 3, connate into a column of ca. 1 mm long. *Pistillate flowers* 1 per cymule; pedicel 2–4 mm long, glabrous; sepals 6, ovate, 2–2.5 by 1–1.8 mm, glabrous, apex acute, margin entire; ovary 5-carpellate, depressed globose, 2.5 mm long, 3.5–4 mm in diam., glabrous, smooth; styles flat, obscure. Fruits: pedicel 4–8 mm long, glabrous; capsules shallowly 6 or 7-lobed, depressed-globose, ca. 5 mm long, ca. 15 mm in diam., glabrous, smooth; styles obscure. *Seeds* with aril, widely ovate, 4–4.6 mm long, ca. 4 mm wide, ca. 2 mm thick.

Distribution — India, Nepal, Bangladesh, Burma (North) (Govaerts et al. 2000). *Deccan element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude up to 450 m. On river banks, in grasslands, or on margin of *Shorea robusta* forests. Flowers from August to January; fruits from December to January.

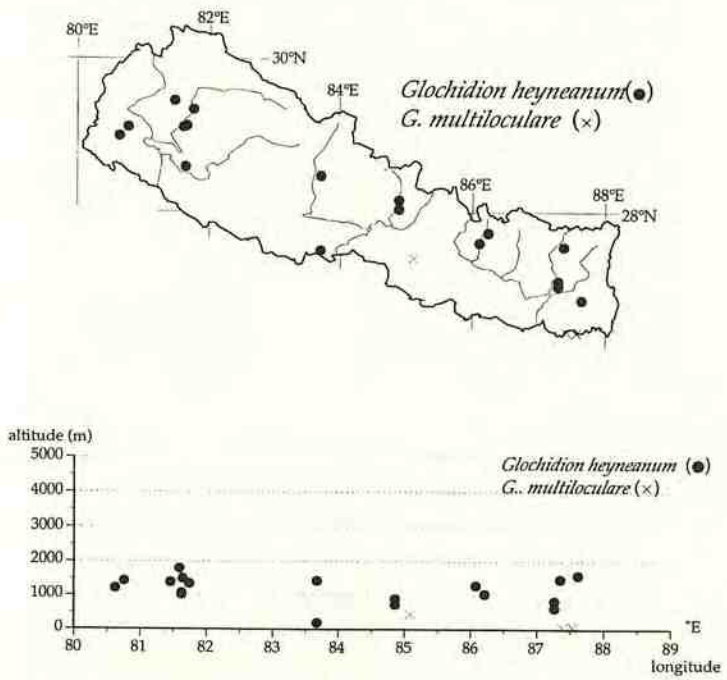

Fig. 17. Distribution of *Glochidion multiloculare* (Roxb. ex Willd.) Voigt. and *G. heyneanum* (Wight & Arn.) Wight in Nepal.

2. Glochidion nubigenum Hook. f. — Fig. 18.

Glochidion nubigenum Hook. f., Fl. Brit. India 5: 315 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 178 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 779 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 150 (1994); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 219 (1995); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 958 (2000); van Welzen, Thai Forest Bull., Bot. 28: 89 (2000). — *Glochidion velutinum* Wight var. *nubigenum* (Hook. f.) Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 14: 720 (1990). — Type: *J. D. Hooker* [*s. n.*] (K!), Sikkim Himalaya, [Lubong]; *Clarke* [*25453A*, 21 Oct. 1875] (K!), Sikkim Himalaya, [Lingcham]; *Clarke* [*2730A & 2730B*] (CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.), Sikkim Himalaya; [*C. B.*] *Clarke* [*23087A*, 12 June 1876] (K!), at Darjeeling, [7000 ft].

Glochidion metanubigenum Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998). — Type: [*H. Hara et al. 6306761*], 19 Nov. 1963 (holo TI!), Nepal, Ghatte–Khebang, 1600–2400 m. See Kurosawa & Shimizu (2002) for a photograph of the holotype.

Deciduous monoecious shrub, 1.5 m high. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* villous. *Normal leaves* alternate; stipules free, narrowly triangular or triangular, 2–3.5 by 1–2.5 mm, hairy or glabrous,apex acuminate; petiole 3–5 mm long, villous or glabrous; blade elliptic or ovate, 6–12 by 3 –5 cm, base obtuse or cuneate, apex acute or acuminate, margin entire, upper surface glabrous or sparsely pubescent, lower surface sparsely pubescent on veins. *Staminate cymules* axillary often of fallen leaves. *Staminate flowers* 1–11 per cymule; pedicel 5 –11 mm long, glabrous; sepals 6, narrowly elliptic or obovate, 2.5–3 by 0.5–1.5 mm, margin entire, glabrous; disc absent; stamens 3; filaments short, connate into a column of ca. 1 mm long; anthers ca. 0.8 mm long, dehiscing vertically. *Pistillate cymules* axillary. *Pistillate flowers* 1–5 per cymule; pedicel 0.5–1 mm long, tomentose; sepals 6, unequal, ovate or widely ovate, ca. 1–1.5 by 0.2–1 mm, villous, apex acute or obtuse; ovary 4- or 5-carpellate, shallowly 4- or 5-lobed, glabrous; styles flat. *Fruits*: pedicel 3–4.5 mm long, villous; capsule depressed-globose, deeply 8–10-lobed, ca. 3 mm long, 8–10 mm in diam., glabrous, smooth; styles flat. *Seeds* with aril, widely ovate, ca. 4 mm long, ca. 3 mm wide.

Distribution — India (Assam, Sikkim), Nepal, Bhutan, Burma, Thailand (North) (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 1330–2120 m. In forests. Flowers in April or from November to December; fruits in November.

Notes — *Glochidion metanubigenum* was described from Eastern Nepal by Hurusawa & Tanaka (1966) based on its submembranaceous leaves and characters of staminate flower. Chakrabarty & Gangopadhyay (1995) and Govaerts et al. (2000), however, treated it as a synonym of *G. nubigenum*. I agree with the latter treatment because I could not distinguish them by leaf nor flower characters.

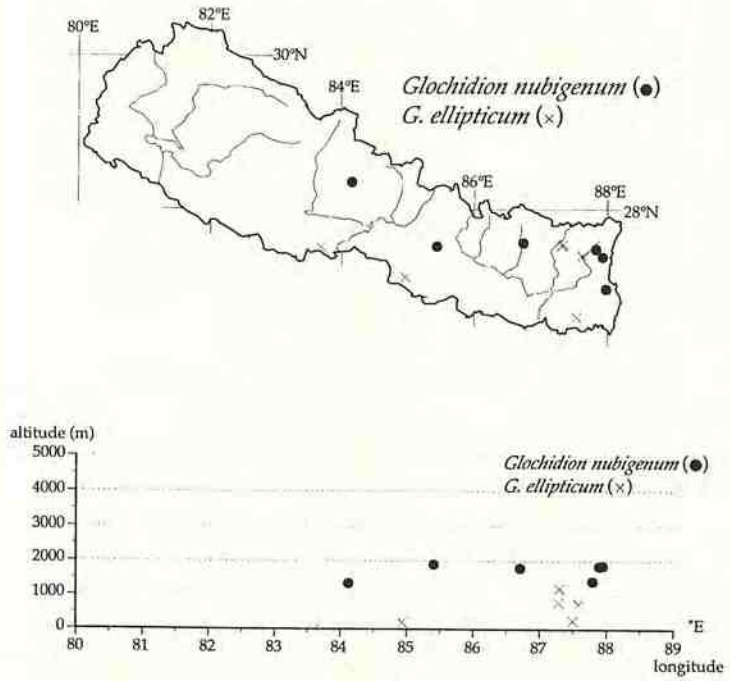

Fig. 18. Distribution of *Glochidion nubigenum* Hook. f. and *G. ellipticum* Wight in Nepal.

3. Glochidion triandrum (Blanco) C. B. Rob. — Plate 68.

Glochidion triandrum (Blanco) C. B. Rob., Philipp. J. Sci., C 4: 92 (1909); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 146, t. 44, f. 1–4 (1994); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 965 (2000). — *Kirganelia triandra* Blanco, Fl. Filip.: 711 (1837). — *Phyllanthus triandrus* (Blanco) Müll. Arg., Flora 48: 379 (1865); Müll. Arg. in DC., Prodr. 15(2): 299 (1866). — Type: not designated.

Glochidion acuminatum Müll. Arg., Linnaea 32: 68 (1863); Hook. f., Fl. Brit. India 5: 323 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982), p. p.; D. G. Long in Fl. Bhutan 1: 779 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 181 (1995); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 940 (2000). — [*Bridelia acuminata* Wall., Numer. List: 273, no. 7885 (1847), nom. nud.] — *Phyllanthus bicolor* Müll. Arg., Flora 48: 389 (1865), nom. nov.; Müll. Arg. in DC. Prodr. 15(2): 311 (1866). — *Glochidion bicolor* (Müll. Arg.) Hayata, J. Coll. Sci. Imp. Univ. Tokyo 20(3): 18 (1904), nom. superfl. — Type: *Wallich, List no. 7885* (G-DC (IDC microfiche in TI) n. v.; iso K!, K-WALL!, E!, BM!), in Nepalia Indiae orientalis (Nepal); *J. D. Hooker* (G-DC (IDC microfiche in TI) n. v.; iso K!), in Sikkim.

Glochidion eleutherostylum Müll. Arg., Linnaea 32: 69 (1863). — Type: *Cuming 509* (n. v.), in insulis Pilippinis.

Glochidion quinquestylum Elmer, Leafl. Philipp. Bot. 1: 303 (1908). — Type: *A. D. E. Elmer 8916*, Mar. 1907 (holo †?; iso CAL (fide Datta et al. 1985) n. v.), Philippine, Luzon, Province of Benguet.

Glochidion hypoleucum Hayata, Icon. Pl. Formosan. 9: 95 (1920), non (Miq.) Boerl., Handl. Fl. Ned. Ind. 3: 275 (1900). — *Glochidion hayatae* Croizat & H. Hara, J. Jap.

Bot. 16: 316 (1940), nom. nov. — Type: *B. Hayata s. n.*, [28] Apr. 1916 (holo TI!; iso TI!), Formosa, Holisha, Giochi (Taiwan).

Deciduous monoecious shrub. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* pubescent. *Normal leaves* alternate; petiole 2–4 mm long, pubescent; stipules free, narrowly triangular or lanceolate, ca. 2 by ca. 0.3 mm, pubescent, apex acuminate; blade lanceolate, 8.5–13.5 by 2.5–4 cm, base obtuse or acute, apex acuminate, margin entire, upper surface sparsely strigose, lower surface pubescent, glaucous. *Cymules* axillary. *Staminate flowers* 7–17 per cymule; sepals 6, unequal, elliptic, 1.5–2.2 by 1–1.2 mm, apex obtuse, outside pubescent; pedicel 5–7 mm long, pubescent. *Pistillate flowers* 10 or more per cymule; pedicel 0.3–0.8 mm long; sepals not seen, narrowly elliptic or lanceolate, 0.6–1.5 by 0.4–0.6 mm, apex obtuse or acute, outside tomentose; ovary 4- or 5-carpellate, tomentose; styles obscurely bifid, connate into a column of 1–1.8 mm long, 0.5–0.8 mm in diam.. *Fruits*: pedicel 6–9 mm long, pubescent; capsule deeply 2–5-lobed, depressed-globose, ca. 3 mm long, ca. 6 mm in diam., glabrous; styles persistent, ca. 0.4 mm long, ca. 0.3 mm in diam. *Seeds* not seen.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Cambodia, Philippines, China (South-central, Southeast), Taiwan, S. Japan (Long 1987, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Central.

Habitat & Ecology — Altitude 910–1100 m (Short & Vickery 1982).

Notes — Numbers of capsular lobes of *Glochidion triandrum* seem to vary. Indian and Himalayan specimens have (3–)4–5(–6)-lobed capsules (Long 1987, Chakrabarty & Gangopadhyay 1995) and Japanese and Taiwanese specimens have 3(or 4)-lobed ones (Deng & Wang 1993, Ohba 1999).

4. Glochidion heyneanum (Wight & Arn.) Wight — Plate 67; Fig. 17.

Glochidion heyneanum (Wight & Arn.) Wight, Icon. Pl. Ind. Orient. 5(2): 29, t. 1908 (right hand) (1852); Hook. f., Fl. Brit. India 5: 323 (1887); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 205 (1995); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 950 (2000). — *Gynoon heyneanum* Wight & Arn., Edinburgh New Philos. J. 14: 300 (1833). — *Phyllanthus heyneanus* (Wight & Arn.) Müll. Arg., Flora 48: 389 (1865), non Müll. Arg., Linnaea 32: 49 (1863); Müll. Arg. in DC., Prodr. 15(2): 311 (1866). — Type: *Wight 942* (K!, E!), in provincia "Circas" dicta [Peninsular Ind. Orientalis].

Glochidion velutinum Wight, Icon. Pl. Ind. Orient. 5(2): 29, t. 1907-2 (1852); Hook. f., Fl. Brit. India 5: 322 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); Malla et al., Fl. Kathmandu Valley: 625 (1986); D. G. Long in Fl. Bhutan 1: 779 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 153, t. 41, f. 1–3 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Rajbhandari, Ethnobot. Nepal: 59 (2001); Manandhar, Pl. People Nepal: 246 (2002). — *Phyllanthus velutinus* (Wight) Müll. Arg., Flora 48: 387 (1865); Müll. Arg. in DC., Prodr. 15(2): 309 (1866). — Type: [*Wight, Kew Distrib. no. 2575*] (CAL & K (fide Chakrabarty & Gangopadhyay 1995) n. v.), Neilgherries, Northern slopes towards Mysore.

Eriococcus glaucescens Zoll., Tijdschr. Ned.-Ind. 14: 173 (1857).

Phyllanthus nepalensis Müll. Arg., Flora 48: 375 (1865); Müll. Arg. in DC., Prodr. 15(2): 291 (1866). — [*Bradleia ovata* Wall., Numer. List: 272, no. 7852 (1847), nom. nud.; Baill., Étude Euphorb.: 638 (1858)]. — *Glochidion nepalensis* (Müll. Arg.) Kurz,

Forest Fl. Burma 2: 344 (1877), "*nepalense*." — Type: *Wallich, List no. 7852* (G-DC (IDC microfiche in TI) n. v.; iso E!, BM!, excl. center plant, K-WALL!), Nepalia (Nepal).

Phyllanthus asperus Müll. Arg., Flora 48: 377 (1865); Müll. Arg. in DC., Prodr. 15(2): 297 (1866); Hook. f., Fl. Brit. India 5: 327 (1887). — *Glochidion asperum* (Müll. Arg.) Bedd., Fl. Sylv. S. India: 193 (1872). — Type: *Stocks & Law s. n.* (holo G-DC (IDC microfiche in TI) n. v.), India, Malabar, Concan.

Deciduous monoecious shrub or small tree, 1.5–10 m high, stem diameter 5–20 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* densely tomentose. *Normal leaves* alternate; stipules free, narrowly triangular or triangular, 1.7–3 by 0.5–0.8 mm, apex acuminate, tomentose; petiole 2.5–5 mm long, tomentose; blade ovate, 6–10.5 by 3.5–5 cm, base obtuse or acute, apex acuminate, margin entire, both surfaces pubescent especially on veins. *Cymules* axillary. *Staminate flowers* 2–6 per cymule; pedicel 6–9 mm long, pubescent; sepals 6, narrowly elliptic, ca. 2 by ca. 1 mm, apex obtuse, outside pubescent on midrib. *Pistillate flowers* 2–10 per cymule; pedicel 1–2 mm long; sepals 6, narrowly elliptic or lanceolate, 1.5–2 by ca. 0.4 mm, apex acute, outside tomentose; ovary 4- or 5-carpellate, tomentose; styles obscurely bifid, connate into a column of 1–1.5 mm long, ca. 1 mm in diam.. *Fruits*: pedicel 7–9 mm long, tomentose; capsule 8–10-lobed, depressed-globose, ca. 5 mm, 9–10 mm in diam. long, tomentose; styles persistent, ca. 2 mm long. *Seeds* with aril, widely ovate, ca. 3 mm long, ca. 3.5 mm wide.

Distribution — Pakistan, India (Assam, Kashimir, Bengal), Nepal, Bhutan, Bangladesh, Burma (North), Thailand, Cambodia, Laos, Vietnam, China (South-central) (Chakrabarty & Gangopadhyay 1995, Govaerts et al. 2000). *S Asian-Malaysian element.* In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 200–1800 m. On roadsides, on rocky cliffs, on slopes, or in forests of *Pinus* or *Shorea robusta*. Flowers from April to September; fruits from July to September.

Vernacular names — Nepali: *bahiro* (Manandhar 2002), *kaalikaath* (Rajbhandari 2001a), *kane bahiro* (Manandhar 2002), *kane mauwa* (Manandhar 2002), *lati kath* (Manandhar 2002), *mauwa* (Manandhar 2002), *muse deli* (Manandhar 2002). Chepang: *maisi* (Manandhar 2002). Gurung: *chaulani* (Manandhar 2002). Raute: *niniya* (Manandhar 2002). Tamang: *rabagachhi* (Manandhar 2002).

Uses — Juice of bark is medicinnally used to heal wounds (Rajbhandari 2001a, Manandhar 2002). Paste of bark is applied externally to treat dislocated bones (Manandhar 2002). Paste of fruit is medicinally use to cure pimples (Rajbhandari 2001a, Manandhar 2002). Lopped plant is used for fodder (Manandhar 2002). Bark yields tannin (Manandhar 2002).

5. Glochidion ellipticum Wight — Fig. 18.

Glochidion ellipticum Wight, Icon. Pl. Ind. Orient. 5(2): 29, t. 1906 (1852); Hook. f., Fl. Brit. India 5: 321 (1887); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 199 (1995); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 947 (2000). — *Phyllanthus diversifolius* Miq. var. *longifolius* Müll. Arg., Flora 48: 378 (1865); Müll. Arg. in DC., Prodr. 15(2): 298 (1866). — Type: [*Wight 2894, Kew distrib. 2546*] (K!), [Peninsular

Indiae Orientalis]; [*Wight s. n., Kew distrib. 2546*, Apr. 1846] (K!, CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.), [Siespauray (India)].

Phyllanthus malabaricus Müll. Arg., Linnaea 34: 69 (1865); Müll. Arg., Flora 48: 386 (1865); Müll. Arg. in DC., Prodr. 15(2): 305 (1866). — *Glochidion malabaricum* (Müll. Arg.) Bedd., Fl. Sylv. S. India: 194 (1872); Hook. f., Fl. Brit. India 5: 319 (1887). — Type: *Stocks* [, *Law et al. s. n. Bradleia 42*] (K!, hb. berol. n. v.; iso CAL, fide Chakrabarty & Gangopadhyay (1995), n. v.), [Concan] in India orientali Malabarica.

Phyllanthus assamicus Müll. Arg., Flora 48: 378 (1865); Müll. Arg. in DC., Prodr. 15(2): 297 (1866). — *Glochidion assamicum* (Müll. Arg.) Hook. f., Fl. Brit. India 5: 319 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); D. G. Long in Fl. Bhutan 1: 780 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 158, t. 46, f. 1–5 (1994); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); van Welzen, Thai Forest Bull., Bot. 28: 84 (2000). — Type: *Jenkins 530* (CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.), Assam, India; *J. D. Hooker* [*& Thomson*], [*Glochidion 51*] (G-DC (IDC microfiche in TI) n. v., CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.), Upper Assam, India; *J. D. Hooker*, [*Bradleia 45*] (G-DC (IDC microfiche in TI) n. v., NY, CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.), Sikkim, India.

Phyllanthus diversifolius Miq. var. *wightiana* Müll. Arg., Flora 48: 378 (1865); Müll. Arg. in DC., Prodr. 15(2): 298 (1866). — [*Bradleia wightiana* Wall., Numer. List: 272, no. 7862 (1847), nom. nud]. — *Glochidion diversifolium* (Miq.) Merr. var. *wightianum* (Müll. Arg.) Bedd., Fl. Sylv. S. India: 193 (1872). — *Glochidion ellipticum* Wight var. *wightianum* (Müll. Arg.) Hook. f., Fl. Brit. India 5: 321 (1887), "*wightiana.*" — Type: *Wallich, List no. 7862* (G-DC (IDC microfiche in TI) n. v.), in peninsula Indiae orient.

Phyllanthus diversifolius Müll. Arg. var. *longifolius* Müll. Arg., Flora 48: 378 (1865).

Phyllanthus andersonii Müll. Arg., Flora 55: 3 (1872), non Müll. Arg. in DC., Prodr. 15(2): 395 (1866).

Glochidion assamicum (Müll. Arg.) Hook. f. var. *brevipedicellatum* Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966). — Type: [*H. Hara & M. Togashi 3022*] *no. 2191*, 20 Apr. 1960 (holo TI!), India, Darjeeling, Takdah, 1500 m.

Deciduous monoecious shrub or small tree, 3–7 m high, stem diameter 15 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* sparsely pubescent or glabrate. *Normal leaves* alternate; stipules free; petiole 2–4 mm long, puberulous or glabrate; blade elliptic, 6.5–17.5 by 3–7.2 cm, base acute or obtuse, apex acuminate, margin entire, upper surface glabrous, lower surface sparsely pubescent on veins when young, often glabrate when mature; secondary veins 7 pairs. *Cymules* axillary. *Staminate flowers*: pedicel 5–10 mm long, glabrous; sepals 6, narrowly elliptic, 1.7–2.2 by 0.7–1 mm, apex obtuse, glabrous; stamens 3, connate into a column of 1–1.2 mm long; anthers sessile, ellipsoid, ca. 0.8 mm long. *Pistillate flowers* 1–10 per cymule, subsessile; sepals 6, unequal, narrowly ovate or lanceolate, 1–1.5 by 0.5–0.8 mm, apex acute or obtuse, margin entire, outside glabrous; ovary 3- or 4-carpellate, densely puberulous; styles connate into a column of 0.6–0.7 mm long, ca. 0.3 mm in diam.. *Fruits*: pedicel 3–9 mm long, puberulous; capsule unlobed or very shallowly 3- or 4-lobed, depressed globose, ca. 4 mm long, 7–8 mm in diam., puberulous; styles persistent, ca. 0.7 mm long. *Seeds* with aril, widely ovoid, ca. 4 mm long, ca. 3 mm wide.

Distribution — India (Kumaon, Sikkim, Assam), Nepal, Bhutan, Bangladesh, Burma,

Thailand, Vietnam, China (South-central, Hainan), Taiwan (Long 1987, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 100–1200 m. In riverside forests, in moist forests, or on slopes. Flowers from April to August; fruits from March to September.

6. Glochidion lanceolarium (Roxb.) Voigt — Fig. 19.

Phyllanthus flaxinifolius Lodd., Bot. Cab.: t. 839 (1824), pro. syn.

Glochidion lanceolarium (Roxb.) Voigt, Hort. Suburb. Calcutt.: 153 (1845); Müll. Arg., Linnaea 32: 60 (1863); Kurz, Forest Fl. Burma 2: 343 (1877); Hook. f., Fl. Brit. India 5: 308 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 780 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 144, t. 42, f. 5–8 (1994); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 214 (1995); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 952 (2000); van Welzen, Thai Forest Bull., Bot. 28: 88 (2000). — *Bradleia lanceolaria* Roxb., Fl. Ind. ed. 1832, 3: 697 (1832); Wall., Numer. List: 272, no. 7855, excl. C, D, K (1847). — *Phyllanthus lanceolarius* (Roxb.) Müll. Arg., Flora 48: 371 (1865); Müll. Arg. in DC., Prodr. 15(2): 282 (1866). — Type: [*Wallich, List no. 7855F*] (K-WALL!, G-DC (IDC microfiche in TI) n. v.; iso K!), [Hort. Calc.]; [*Collector unknown 2523 & 2525*] (BM!).

Glochidion macrophyllum Benth., London J. Bot. 1: 491 (1842).

Glochisandra acuminata Wight, Icon. Pl. Ind. Orient. 5(2): 28, t. 1905 (1852). — Type: not designated.

Phyllanthus benthamianus Müll. Arg., Flora 48: 371 (1865), non Müll. Arg., Linnaea 32: 29 (1863).

Glochidion cantoniense Hance, Ann. Sci. Nat., Bot., V, 5: 241 (1866).

Glochidion subsessile N. P. Balakr. & Chakrab. var. *birmanicum* Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 13: 716 (1989). — Type: *J. C. Prazer 96*, 6 July 1894 (holo CAL n. v.; iso CAL n. v.), Burma, Kalay hills.

Deciduous monoecious small tree or tree, 4.5–12 m high. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* glabrous. *Cataphylls* alternate, ovate, ca. 1.5 by ca. 0.8 mm, glabrous, apex acute. *Normal leaves* alternate; stipules free, triangular, ca. 2.2 by ca. 1.5 mm, glabrous, apex acuminate; petiole 5–7 mm long, glabrous; blade elliptic, 7.5–16 by 4–7.5 cm, base acute, apex caudate or acuminate, margin entire, both surfaces glabrous, secondary veins 6 or 7 pairs. *Cymules* axillary. *Staminate flowers* 2–9 per cymule; pedecel 10–12 mm long, glabrous; sepals 6, narrowly elliptic, 3.5–5 by 1–1.4 mm, glabrous, apex obtuse; filaments connate into a column of ca. 1.5 mm long. *Pistillate flowers* 1–8 per cymule; pedicel ca. 1 mm long, glabrous; sepals narrowly ovate, ca. 1.5 by ca. 1 mm, glabrous, apex acute; ovary globose, ca. 1 mm long, ca. 1 mm in diam., glabrous; styles 4 or 5, connate into a column of ca. 2 mm long, 0.8–1.2 mm in diam. *Fruits*: pedicel 4–5 mm long, glabrous; capsule shallowly 8–10-lobed, depressed-globose, ca. 7 mm long, 14–17 mm in diam., glabrous; styles persistent, ca. 1.5 mm long, ca. 0.8 mm in diam.. *Seeds* with orange-red aril, widely ovate, ca. 5 mm long, ca. 4.5 mm wide, ca. 3.5 mm thick.

Distribution — India (North, Sikkim, Assam), Nepal, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam, China (South-central, Hainan, Southeast) (Govaerts et al.

2000). *SE Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 150–600 m. In *Shorea robusta* forests or on open slopes. Flowers from March to May; fruits in March.

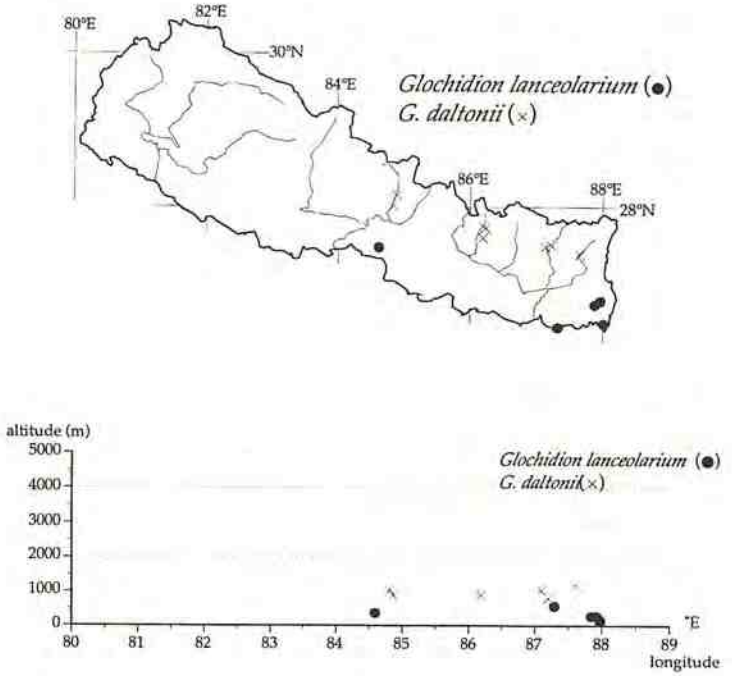

Fig. 19. Distribution of *Glochidion lanceolarium* (Roxb.) Voigt and *G. daltonii* (Müll. Arg.) Kurz in Nepal.

7. Glochidion daltonii (Müll. Arg.) Kurz — Plate 69; Fig. 19.

Glochidion daltonii (Müll. Arg.) Kurz, Forest Fl. Burma 2: 344 (1877); Hook. f., Fl. Brit. India 5: 320 (1887); D. G. Long in Fl. Bhutan 1: 781 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 159 (1994); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 19: 194 (1995); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 946 (2000); van Welzen, Thai Forest Bull., Bot. 28: 86 (2000). — *Phyllanthus daltonii* Müll. Arg., Flora 48: 388 (1865); Müll. Arg. in DC., Prodr. 15(2): 310 (1866). — Type: [*J. D.*] *Hooker*, [*Bradleia 47*] (G-DC (IDC microfiche in TI) n. v.; iso K!), Sikkim; *Wallich s. n.* (G-DC (fide Chakrabarty & Gangopadhyay 1995) n. v.), Martaban, near Attran (Burma).

Glochidion gamblei Hook. f., Fl. Brit. India 5: 310 (1887). — Type: *Hooker* [*s. n., 47 Bradleia*] (K!), Sikkim; *Hooker* [*s. n., 47 Bradleia*] (K!), Sikkim, [Kunsing]; *Gamble* [*447*, 17 Apr. 1876] (K!, CAL (fide Chakrabarty & Gangopadhyay 1995) n. v.; iso K!), Darjeeling, Terai, [Dulkaghar].

Glochidion acuminatum auct. non Müll. Arg., Linnaea 32: 68 (1863): Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982), p. p.

Deciduous monoecious shrub, small tree, or tree 2.4–12 m high, stem diameter 25–40 cm. *Branching* phyllanthoid (i. e. branchlets subtended by cataphylls on main axes). *Branchlets* glabrous or villous. *Normal leaves* alternate; stipules free, triangular, 1.2–

2 by 0.8–1.2 mm, apex acuminate, margin entire; petiole 2–3 mm long, glabrous; blade lanceolate, 6.5–12 by 2–3.5 cm, base obtuse, decurrent to petiole, apex acuminate, margin entire, both surfaces glabrous. *Cymules* axillary. *Staminate flowers*: pedicel 7–12 mm long, glabrous; sepals 6, unequal, elliptic, 1.8–2.4 by 0.8–1.4 mm, glabrous, apex obtuse, margin entire; stamens 3, connate into a column of ca. 1 mm long; filaments ca. 0.2 mm long, glabrous; anthers narrowly ellipsoid, ca. 0.8 mm long. *Pistillate flowers* 2–7 per cymule; pedicel ca. 0.5 mm long, tomentose or glabrous; sepals 6, unequal, obovate or oblanceolate, 1.3–2 by 0.5–1 mm, apex acute or obtuse, margin entire, outside glabrous; ovary 4- or 5-carpellate, villous or glabrous; styles connate into a column of 2–2.5 mm long, 1.2–1.5 mm in diam.. *Fruits*: pedicel 2.5–3 mm long, tomentose; capsule depressed globose, ca. 14 mm in diam., glabrous, smooth; styler column persistent, ca. 1.5 mm long, ca. 1.5 mm in diam. *Seeds* widely ovoid, with orange aril, ca. 5 mm long, ca. 4–4.2 mm wide, 2.5–3 mm thick.

Distribution — India (Sikkim, Assam), Nepal, Burma, Thailand, Vietnam, Malaysia (Peninsular), China (South-central, Southeast) (Chakrabarty & Gangopadhyay 1995, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 810–1800 m. In open or moist forests or on slopes. Flowers from April to August; fruits in April.

Notes — This is the first record of the species from Nepal.

8. **Putranjiva** Wall.

Putranjiva Wall., Tent. Fl. Napal.: 61 (1826). — Type species: *Putranjiva roxburghii* Wall.

1. Putranjiva roxburghii Wall. — Fig. 20.

Putranjiva roxburghii Wall., Tent. Fl. Napal.: 61 (1826); Royle, Ill. Bot. Himal. Mts.: 347, t. 83 (1836); Wight, Icon. Pl. Ind. Orient. 5(2): t. 1876 (1852); Müll. Arg. in DC., Prodr. **15**(2): 443 (1866); Kurz, Forest Fl. Burma 2: 366 (1877); Hook. f., Fl. Brit. India **5**: 336 (1887); Philcox in Rev. Handb. Fl. Ceylon 11: 258 (1997); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1382 (2000). — *Drypetes roxburghii* (Wall.) Hurus., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 6: 335 (1954); Chakrab. et al., J. Econ. Taxon. Bot. 21: 271 (1997); Rajbhandari, Ethnobot. Nepal: 58 (2001). — Type: not designated.

Nageia putranjiva Roxb., Fl. Ind. ed. 1832, 3: 766 (1832). — Type: (n. v.), mountainous countries of Coromandel and hindoosthan.

[*Cyclostemon racemosus* Zipp. ex Span., Linnaea 15: 348 (1841), nom. nud.]

Pycnosandra timorensis Blume, Mus. Bot. 2: 192 (1856). — *Drypetes timorensis* (Blume) Pax & K. Hoffm. in Englar, Pflanzenr., IV, 147, XV: 278 (1922). — *Drypetes roxburghii* (Wall.) Hurus. var. *timorensis* (Blume) Airy Shaw, Kew Bull., Addit. Ser. 4: 107 (1975). — Type: (n. v.), in Timor.

Putranjiva amblyocarpa Müll. Arg. in DC. Prodr. 15(2): 444 (1866). — Type: *Royle* (n. v.), in montibus himalayensibus Indiae orient.

Putranjiva sphaerocarpa Müll. Arg. in DC. Prodr. 15(2): 443 (1866). — Type: *Thwait. 2122* (holo G-DC (IDC microfiche in TI) n. v.; iso G-DC (IDC microfiche in TI) n. v., CAL (fide Chakrabarty et al. 1997) n. v.), in insula Ceylonia (Sri Lanka).

Twigs pubescent. *Leaves* alternate; stipules lanceolate, 1.2–1.5 by 0.5–0.7 mm,

pubescent, apex acute or acuminate; petiole 4–5 mm long, pubescent; blade narrowly ovate or narrowly elliptic, 4.8–6 by 1.5–2.2 cm, base cuneate or obtuse, apex acute or obtuse, margin shallowly serrate, secondary veins inconspicuous, 9 or 10 pairs, upper surface glabrous, lower surface pubescent. *Staminate inflorescences* not seen. *Staminate flowers* not seen. *Pistillate racemes* pubescent. *Pistillate flowers* not seen. *Fruits*: pedicel 3–10 mm long, pubescent; drupe ellipsoid, 15–16 mm long (excl. styles), 9–10 mm in diam., apex acuminate, surface puberullent.

Distribution — Pakistan, Sri Lanka, India, Thailand, Laos, Malaysia (Peninsular), Borneo, Jawa, Lesser Sunda Isls, Moluccas, New Guinea (Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Far Western.

Habitat & Ecology — Altitude 230–250 m. Along river. Fruits in October.

Vernacular names — Nepali: *putranjiva* (Rajbhandari 2001a). Tharu: *pitamaari* (Rajbhandari 2001a).

Uses — Seed is used for making nacklaces (Rajbhandari 2001a).

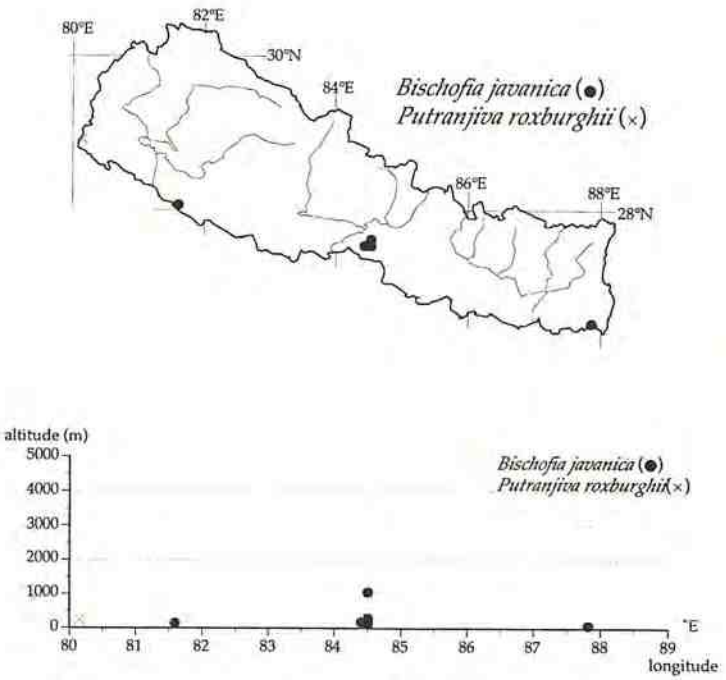

Fig. 20. Distribution of *Bischofia javanica* Blume and *Putranjiva roxburghii* Wall. in Nepal.

9. **Baccaurea** Lour.

Baccaurea Lour., Fl. Cochinch.: 661 (1790). — Lectotype species designated by Merrill, Trans. Amer. Philos. Soc. 24 (1935): *Baccaurea ramiflora* Lour.

1. Baccaurea ramiflora Lour. — Fig. 21.

Baccaurea ramiflora Lour., Fl. Cochinch.: 661 (1790); Müll. Arg. in DC., Prodr. 15(2): 458 (1866); Gagnep., Fl. Gén. Indo-Chine 5: 551 (1927); Airy Shaw, Kew Bull. 26: 221 (1972); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 788 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 131 (1994); T. Kuros.,

Newslett. Himal. Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 238 (2000); Haegens & van Welzen, Thai Forest Bull., Bot. 28: 73 (2000); Haegens, Blumea, suppl. 12: 172 (2000). — Lectotype designated by Haegens (2000): *Loureiro s. n.* (BM sheet 31252 n. v.), Hortis Cochinchinae.

Baccaurea cauliflora Lour., Fl. Cochinch.: 661 (1790); Müll. Arg. in DC., Prodr. 15(2): 458 (1866); Gagnep., Fl. Gén. Indo-Chine 5: 551 (1927). — Neotype designated by Haegens (2000): *Fleury 32043* (P n. v.), Vietnam, Cochinchina, Bien Hoa Province, Trañg Bône Forest Reserve.

Pierardia sapida Roxb., Fl. Ind. ed. 1832, 2: 254 (1832); Wall., Numer. List: 277, no. 8072 (1847). — *Baccaurea sapida* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 459 (1866); Kurz, Forest Fl. Burma 2: 356 (1877); Hook. f., Fl. Brit. India 5: 371 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 174 (1966). — Lectotype designated by Haegens (2000): *Wallich, List no. 8072* (K-WALL n. v.), Burma?

Baccaurea flaccida Müll. Arg. in DC., Prodr. 15(2): 459 (1866); Hook. f., Fl. Brit. India 5: 370 (1887). — [*Pierardia flaccida* Wall., Numer. List: 277, no. 8074 (1847), nom. nud.] — Lectotype designated by Haegens (2000): *Wallich, List no. 8074* (K-WALL n. v.), Burma.

Baccaurea propinqua Müll. Arg. in DC., Prodr. 15(2): 463 (1866). — Lectotype designated by Haegens (2000): *Wallich, List no. 8071* (G-DC (IDC microfiche in TI) n. v.), in India orientali, in Silhet.

Baccaurea wrayi King ex Hook. f., Fl. Brit. India 5: 374 (1887). — Lectotype designated by Haegens (2000): *King's Collector s. n.* (K n. v.), Peninsular Malaysia, Perak.

Baccaurea oxycarpa Gagnep., Bull. Soc. Bot. France 23: 431 (1923); Gagnep., Fl. Gén. Indo-Chine 5: 549 (1927). — Lectotype designated by Haegens (2000): *Pierre 614* (K n. v.; isolecto P n. v.), Cambodge, monts de Knang-krépeuh, alt. 600–1500 m.

Gatnaia annamica Gagnep., Bull. Soc. Bot. France 24: 870 (1924); Gagnep., Fl. Gén. Indo-Chine 5: 540 (1927) — Lectotype designated by Haegens (2000): *Eberhardt 3042* (P n. v.; isolecto K, L n. v.), Annam, Thua-thien Prov.

Dioecious tree, 9–15 m high. *Young twigs* tomentose. *Leaves* alternate; stipules early caducous; petiole 1–5 cm long, tomentose or glabrate; blade obovate, 7.5–17.5 by 3.5–9.5 cm, base cuneate or obtuse, apex obtuse, rounded or acute, margin entire, upper surface glabrous, lower surface pilose on veins, secondary veins conspicuous, 7–9 pairs. *Staminate panicles* 4.5–6.5 cm, tomentose; bracts ovate or lanceolate, 2–5 by 1–2 mm, pilose. *Staminate flowers*: pedicel 0.5–1 mm long, granulate; sepals 4 or 5, elliptic or circular, 1.7–2.4 by 1–1.8 mm, granulate, apex rounded or obtuse; anthers elliptic, ca. 0.3 mm long. *Pistillate racemes* not seen. *Pistillate flowers*: not seen. *Fruits* coriaceous, fleshy, indehiscent, ellipsoid, 2–2.3 cm long, 1.4–1.6 cm in diam., pubescent.

Distribution — India (Assam, Andaman Isl.), Nepal, Bhutan, Burma, Thailand, Laos, Vietnam, Malaysia (Peninsular), China (South-central, Hainan) (Govaerts et al. 2000, Haegens 2000). *SE Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 250–450 m. In *Shorea* forests. Flowers from March to April; fruits in May.

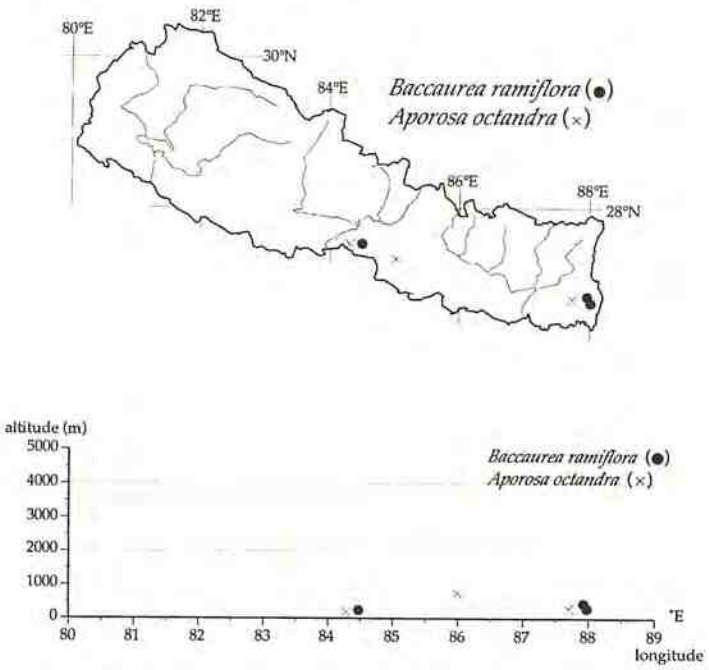

Fig. 21. Distribution of *Baccaurea ramiflora* Lour. and *Aporosa octandra* (Buch.-Ham. ex D. Don) A. R. Vickery in Nepal.

10. **Aporosa** Blume

Aporosa Blume, Bijdr.: 514 (1826). — Type species: *Aporosa frutescens* Blume — See Schot (1995) for orthography of *Aporosa* and *Aporusa*.

1. Aporosa octandra (Buch.-Ham. ex D. Don) A. R. Vickery — Plate 70; Fig. 21.

Aporosa octandra (Buch.-Ham. ex D. Don) A. R. Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982), "*Aporusa*"; Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 17: 166 (1993), "*Aporusa*"; D. G. Long in Fl. Bhutan 1: 785 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998), "*Aporusa*"; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 210 (2000), "*Aporusa*." — *Myrica octandra* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 56 (1825). — Type: *Buch.-Ham.* [*s. n.*, 2 Apr. 1802] (holo BM!), Ettaura (Hetaunda, Nepal).

Alnus dioica Roxb., Fl. Ind. ed. 1832, 3: 580 (1832). — *Aporosa dioica* (Roxb.) Müll. Arg. in DC. Prodr. 15(2): 472 (1866); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 126, t. 37 (1994). — Type (fide Chakrabarty & Gangopadhyay 1993): *Roxburgh, Icon. No. 2378* (CAL, n. v.), [native of Silhet].

Lepidostachys roxburghii Wall. [Numer. List: 229, no. 6816 (1832), nom. nud.] ex Lindl., Intr. Nat. Syst. Bot., ed. 2: 441 (1836); Steud., Nomencl. Bot., ed. 2, 1: 56 (1840). — *Aporosa roxburghii* (Wall. ex Lindl.) Baill, Étude Euphorb.: 645 (1858); Kurz, Forest Fl. Burma 2: 362 (1877); Hook. f., Fl. Brit. India 5: 347 (1887). — Type: *Wallich, List no. 6816* (n. v.; iso BM!).

Scepa stipulacea Lindl., Intr. Nat. Syst. Bot., ed. 2: 441 (1836). — Type: *Griffith* (n. v.), in regno Burmano.

Leiocarpus serratus Hassk., Hort. Bogor. Desc.: 55 (1858).

Aporosa frutescens auct. non Blume, Bijdr. 514 (1826); Benth., Fl. Hongk.: 317 (1861).

Aporosa villosula Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 23 (1873); Kurz, Forest Fl. Burma 2: 362 (1877). — Type fide Chakrabarty & Gangopadhyay (1993): [*Kurz s. n.*] (CAL n. v.), [South Andaman Is., Corbyn's Cove]; [*Kurz 1616*] (CAL n. v., K n. v.), [Burma, Pegu, Toukyeqhat].

Leiocarpus tinctorius Blume ex Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 101 (1922).

Aporosa microcalyx (Hassk.) Hassk. var. *intermedia* Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 102 (1922).

Shrub or small tree, 4.5–10 m high. *Young twigs* pilose. *Leaves* alternate; stipules early caducous; petiole 1–1.5 cm long, glabrous, apex with a pair of glands; blade elliptic or narrowly elliptic, 8.5–15 by 2.5–6 cm, base cuneate or obtuse, apex acuminate, margin entire, both surfaces glabrous, secondary veins relatively conspicuous, 6–8 pairs. *Staminate racemes* not seen. *Staminate flowers* not seen. *Pistillate racemes* 1–4 mm long, bracteate. *Pistillate flowers* sessile; ovary ovoid, 0.5–2 mm long, 1.2–1.7 mm in diam., pubescent, smooth; styles 2, ca. 0.5 mm long, deeply bifid; stigmas papilose. *Fruits*: pedicel 0.9–1 cm long, pubescent; drupe ellipsoid, ca. 1 cm long, 0.7–0.8 cm in diam., glabrous, smooth.

Distribution — India (Sikkim, Assam, Andaman Isl.), Nepal, Bhutan, Burma, Thailand, Vietnam, Malaysia (Peninsular), Borneo, Jawa, Sumatera, Philippines, China (South-central, Hainan, Southeast) (Long 1987, Li 1994, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 200–900 m. In *Shorea* forests. Flowers in March; fruits in May.

11. **Antidesma** L.

Antidesma L., Sp. Pl.: 1027 (1753). — Type species: *Antidesma alexiteria* L.

Key to the species
(See also Table 7)

A. Twigs tomentose; leaf blades broadly elliptic, petiole 5–8 mm long; racemes much branched at base; drupes ca. 3.5 mm long ..... **1. A. ghaesembilla** Gaertn.

A. Twigs pilose or pubescent; leaf blades elliptic, narrowly elliptic, lanceolate, obovate or oblanceolate; petiole 3–6 mm long; racemes simple or 1- or 2-branched at base (not seen in staminate raceme of Nepalese *A. bunius*); drupes 4–7 mm long

B. Twigs pilose; drupes 6–7 mm long, pedicel 3–6 mm long ..... **2. A. bunius** (L.) Spreng.

B. Twigs pubescent; drupes 4–4.5 mm long, pedicel 0.7–2 mm long

C. Leaf blades elliptic or lanceolate, 8–21 by 3.2–7 cm, secondary veins 7–12 pairs; stamens 3 or 4, pedicels of staminate flowers 0.3–0.8 mm long ..... **3. A. acuminatum** Wight

C. Leaf blades obovate or oblanceolate, 5.5–11 by 1.5–4.5 cm, secondary veins 5–8 pairs; stamens 2, pedicels of staminate flowers 0.8–1.1 mm long ..... **4. A. acidum** Retz.

1. Antidesma ghaesembilla Gaertn.

Antidesma ghaesembilla Gaertn., Fruct. Sem. Pl. 1: 189, t. 39 (1788); Müll. Arg. in DC., Prodr. 15(2): 251 (1866); Kurz, Forest Fl. Burma 2: 358 (1877); Hook. f., Fl. Brit. India 5: 357 (1887); Gagnep. in Lecomte, Fl. Indo-Chine 5: 505 (1927); Airy Shaw, Kew Bull. 35: 694 (1980); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 193 (1982); D. G. Long in Fl. Bhutan 1: 787 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 56, t. 15, f. 1–5 (1994); Philcox in Rev. Handb. Fl. Ceylon 11: 276 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 184 (2000); Hoffmann, Thai Forest Bull., Bot. 28: 147 (2000). — [*Antidesma ghaesembilla* Gaertn. var. *genuinum* Müll. Arg. in DC., Prodr. 15(2): 251 (1866), nom. inval.] — Type: (L (fide Airy Shaw 1980) n. v.), e collect. sem. hort. lugdb.

Antidesma pubescens Roxb., Pl. Coromandel 2: 35, t. 167 (1802); Blume, Bijdr.: 1123 (1826–1827); Roxb., Fl. Ind. ed. 1832, 3: 770 (1832); Wight, Icon. Pl. Ind. Orient. 3(2): 2, t. 821 (1844–1845); Wall., Numer. List: 289, no. 8567 (1847).

Antidesma frutescens Jack, Malayan Misc. 2: 91 (1822).

Antidesma paniculatum Willd., Sp. Pl. 4: 764 (1806), "*paniculata*"; Blume, Bijdr.: 1126 (1826–1827); Roxb., Fl. Ind. ed. 1832, 3: 770 (1832), "*paniculata*"; Wight, Icon. Pl. Ind. Orient. 3(2): 1, t. 820 (1844–1845), "*paniculata*"; Wall., Numer. List: 245, no. 7280 (1847). — *Antidesma ghaesembilla* Gaertn. var. *paniculatum* (Willd.) Müll. Arg. in DC., Prodr. 15(2): 251 (1866). — Type: (n. v.), in India orientali.

Antidesma rhamnoides Brongn. ex Tul., Ann. Sci. Nat., Bot., III, 15: 217 (1851).

Antidesma vestitum C. Presl, Epimel. Bot.: 232 (1851). — *Antidesma ghaesembilla* Gaertn. var. *vestitum* (C. Presl) Müll. Arg. in DC., Prodr. 15(2): 251 (1866).

Antidesma schultzii Benth., Fl. Austral. 6: 86 (1873). — Type: *Schultz 610 & 743* (K (fide Airy Shaw 1980) n. v.), Australia, Port Darwin.

Dioecious tree. *Twigs* tomentose. *Leaves* alternate; stipules early caducous, linear or lanceolate, 4–7 by 0.8–1 mm, tomentose, apex acuminate; petiole 5–8 mm long, tomentose; blade broadly elliptic, 5–6.5 by 3.5–5 cm, base subcordate or truncate, apex obtuse or rounded, margin entire, upper surface pubescent at least on veins, lower surface pubescent or tomentose, secondary veins conspicuous, 5 pairs. *Inflorescences* racemose, much branched, terminal or axillary of upper leaves, tomentose. *Staminate racemes* 4.5–5.5 cm long, 4–8-branched at the base; bracts lanceolate, ca. 1 by 0.2–0.3 mm, tomentose. *Staminate flowers* sessile; calyx lobes 4, quadrate, ca. 0.6 by 0.4–0.6 mm, apex rounded, outside densely pubescent, inside glabrate; stamens 4; filaments ca. 2 mm long; anthers V-shapes. *Pistilate racemes* not seen. *Pistilate flowers*: pedicel 0.4–0.5 mm long, pubescent; calyx lobes 5, lanceolate, 0.8–1 by 0.2–0.3 mm, pubescent, apex acuminate; ovary globose, ca. 1 mm long, ca. 1 mm in diam., pubescent, smooth; styles 2, ca. 0.3 mm long, bifid. *Fruits*: pedicel ca. 1 mm long; drupe ellipsoid, ca. 3.5 mm long (excl. styles), ca. 3 mm in diam.

Distribution — Sri Lanka, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam, Malaysia (Peninsular), Sumatera, Borneo, Java, Bismarck Archipelago, Sulawesi, Lesser Sunda Isls., Moluccas, New Guinea, Australia (Northern Territory, Queensland, Western), Philippines, China (South-central, Hainan, Southeast) (Long 1987, Govaerts et al. 2000, Hoffmann 2000). *S Asian-Malaysian element*. In Nepal: Central.

TABLE 7. Comparison of characters of Nepalese *Antidesma* species

	A. ghaesembilla	*A. bunius*	*A. acuminatum*	*A. acidum*
Twig	tomentose	pilose	pubescent	pubescent
Leaf blade shape	broadly elliptic	obovate, narrowly elliptic or oblanceolate	elliptic or lanceolate	obovate or oblanceolate
size	5–6.5 × 3.5–5 cm	8–15 × 4–7 cm	8–21 × 3.2–7 cm	5.5–11 × 1.5–4.5 cm
apex	obtuse or rounded	acute, obtuse or truncate	acute, acuminate or caudate	acuminate, acute or obtuse
lower surface	pubescent or tomentose	pilose on veins	pubescent on veins	pubescent
secondary veins	5 pairs	5 or 6 pairs	7–12 pairs	5–8 pairs
Staminate raceme	4–8-branched	(not seen)	unbranched	0–2-branched
Staminate pedicel	sessile	(not seen)	0.3–0.8 mm	0.8–1.1 mm
Stamens	4	(not seen)	3 or 4	2
Fruit length	ca. 3.5 mm	6–7 mm	4–4.5 mm	4–4.5 mm
Fruit pedicel	ca. 1 mm	3–6 mm	0.7–2 mm	1.5–1.8 mm

Habitat & Ecology — Altitude 500 m. In *Shorea robusta* forests. Flowers & fruits in June.

2. Antidesma bunius (L.) Spreng. — Fig. 22.

Antidesma bunius (L.) Spreng., Syst. Veg. 1: 826 (1824); Blume, Bijdr.: 1122 (1826–1827); Wall., Numer. List: 245, no. 7282, except A and part of B (1847); Müll. Arg. in DC. Prodr. 15(2): 262 (1866); Wight, Icon. Pl. Ind. Orient. 3(2): 1, t. 819 (1844–1845); Kurz, Forest Fl. Burma 2: 358 (1877), "*bunias*"; Hook. f., Fl. Brit. India 5: 358 (1887); Banerji, Rec. Bot. Surv. India 19(2): 82 (1966); Airy Shaw, Kew Bull. 35: 693 (1980); Short & Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982); D. G. Long in Fl. Bhutan 1: 787 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 64, t. 18, f. 1–6 (1994); Philcox in Rev. Handb. Fl. Ceylon 11: 277 (1997); T. Kuros., Newslett. Himalayan Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 181 (2000). — *Stilago bunius* L., Mant. Pl.: 122 (1767); Roxb., Fl. Ind. ed. 1832, 3: 758 (1832). — *Antidesma stilago* Poir. in Lam., Encycl., Suppl. 1: 403 (1811), nom. superfl. — [*Antidesma bunius* (L.) Spreng. var. *genuinum* Müll. Arg. in DC. Prodr. 15(2): 262 (1866), nom. inval.]. — Type: (n. v.), India; *Bunius sativus* Rumph, Amb. 3. p. 204, t. 131.

Antidesma sylvestre Lam., Encycl. 1: 207 (1783), "*sylvestris*." — *Antidesma bunius* (L.) Spreng. var. *sylvestre* (Lam.) Müll. Arg. in DC. Prodr. 15(2): 263 (1866).

Antidesma ciliatum C. Presl, Epimel. Bot.: 234 (1851).

Antidesma cordifolium C. Presl, Epimel. Bot.: 235 (1851). — *Antidesma bunius* (L.) Spreng. var. *cordifolium* (C. Presl) Müll. Arg. in DC. Prodr. 15(2): 262 (1866).

Antidesma glabrum Tul., Ann. Sci. Nat., Bot., III, 15: 188 (1851).

Antidesma floribundum Tul., Ann. Sci. Nat., Bot., III, 15: 189 (1851). — *Antidesma bunius* (L.) Spreng. var. *floribundum* (Tul.) Müll. Arg. in DC. Prodr. 15(2): 263 (1866). — Type: *Macrae s. n.* (CGE, G (fide Philcox 1997) n. v.), Ceylon, Kandy; Walker s. n. (CGE, G (fide Philcox 1997) n. v.), Kandy, Ceylon.

Antidesma rumphii Tul., Ann. Sci. Nat., Bot., III, 15: 238 (1851).

Antidesma bunius (L.) Spreng. var. *wallichii* Müll. Arg. in DC. Prodr. 15(2): 263 (1866). — Type: *Wallich, list no. 7282* (G-DC (IDC microfiche in TI) n. v.), in India orientali; *Hook. et Thoms.* (n. v.), in Madras.

Antidesma dallachyanum Baill., Adansonia 6: 337 (1866). — Type: *Dallachy s. n.* (P, MEL (fide Airy Shaw 1980) n. v.; iso K, excl. lowermost piece (fide Airy Shaw 1980) n. v.), Dalrymph Cape, Rockhampton (Queensland, Australia).

Antidesma andamanicum Hook. f., Fl. Brit. India 5: 364 (1887). — Type: *Kurz* (n. v.), South Andaman Islands.

Sapium crassifolium Elmer, Leafl. Philipp. Bot. 2: 485 (1908). — *Antidesma crassifolium* (Elmer) Merr., Philipp. J. Sci., C 7: 383 (1912 publ. 1913). — Type: *A. D. E. Elmer 10312*, June 1908 (n. v.), Philippine, Negros, Province of Negros Oriental, Cuernos Mountains, Dumaguete.

Antidesma collettii Craib, Bull. Misc. Inform. Kew 1911: 461 (1911).

Antidesma thorelianum Gagnep., Bull. Soc. Bot. France 70: 124 (1923). — Type: *Thorel 684 p. p.* (n. v.), Laos, Nong-kay, Kemmarat, Vien-thian, Stung-treng, La-khon.

Dioecious small tree or tree, 7–15 m high, stem diameter 30 cm. *Twigs* pilose. *Leaves* alternate; stipules lanceolate, 4–7 by 0.7–1.2 mm, early caducous, densely pilose, apex

acuminate; petiole 3–6 mm long, pilose; blade obovate, narrowly elliptic or oblanceolate, 8–15 by 4–7 cm, base acute or obtuse, apex acute, obtuse or truncate, margin entire, both surfaces pilose on veins, secondary veins conspicuous, 5 or 6 pairs. *Inflorescences* racemose, pilose. *Staminate racemes* not seen. *Staminate flowers* not seen. *Pistillate racemes* simple, 7–8 cm long in fruits. *Pistillate flowers* not seen. *Fruits*: pedicel 3–6 mm long, puberulous; drupe ellipsoid, 6–7 mm long (excl. styles), 4–6 mm diameter.

Distribution — Christmas Isls., Sri Lanka, India, Nepal, Burma, Thailand, Laos, Vietnam, Malaysia (Peninsular), Borneo, Sumatera, Jawa, Sulawesi, Lesser Sunda Isls., Moluccas, New Guinea, Australia (Queensland), Philippines, China (South-central, Hainan, Southeast, Tibet-Qinghai), Tahiti, Hawaiian Isls. (Govaerts et al. 2000, Hoffmann 2000). *S Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 1100 m. On roadsides. Fruits in July.

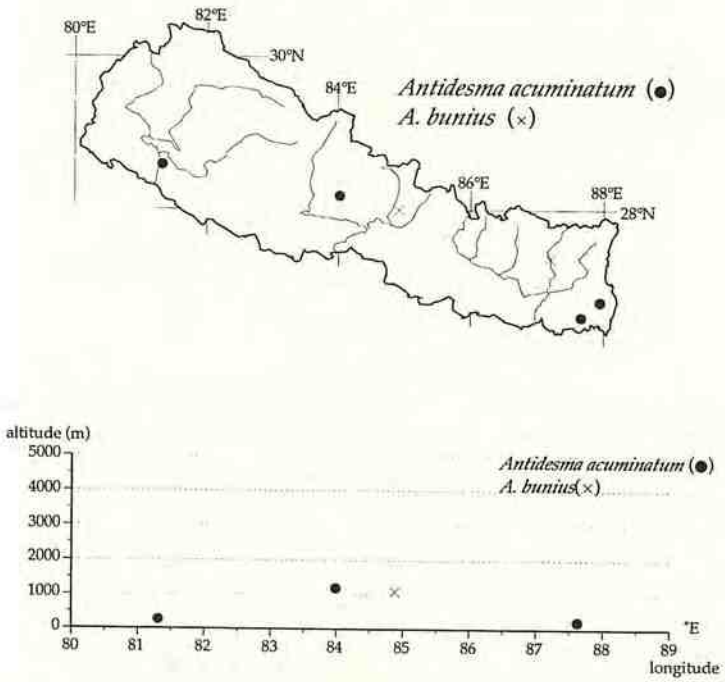

Fig. 22. Distribution of *Antidesma acuminatum* Wight and *A. bunius* (L.) Spreng. in Nepal.

3. Antidesma acuminatum Wight — Fig. 22.

Antidesma macrophyllum Wall. ex Voigt, Hort. Suburb. Calcutt.: 295 (1845), nom. illeg.

Antidesma acuminatum Wight, Icon. Pl. Ind. Orient. 6: 12, t. 1991 (1853), "*acuminata*"; Müll. Arg. in DC., Prodr. 15(2): 268 (1866); Hook. f., Fl. Brit. India 5: 363 (1887), p. p.; Hurus. & Ya. Tanaka in Fl. E. Himal.: 173 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982); D. G. Long in Fl. Bhutan 1: 787 (1987); T. Kuros., Newslett. Himalayan Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 181 (2000). — Type: (n. v.; iso? E!), Malabar, Calcutta Botanic Garden.

Antidesma refractum Müll. Arg. in DC., Prodr. 15(2): 257 (1866). — Type: *Hook. f.* (herb.

reg. berol. n. v.), in Indiae orient. prov. Sikkim alt. 2000 ped. s. m.

Antidesma simile Müll. Arg. in DC., Prodr. 15(2): 259 (1866). — Type: *Wallich, List no.7282B, F* (G-DC (IDC microfiche in TI) n. v.), in Indiae orient. prov. Silhet.

Dioecious small tree or tree, 4.5–12 m high. *Twigs* pubescent. *Leaves* alternate; stipules caducous, lanceolate, 7–20 by 1.5–2 mm, pilose, apex acuminate; petiole 3–6 mm long, pubescent; blade elliptic or lanceolate, 8–21 by 3.2–7 cm, apex acute, acuminate or caudate, base acute or obtuse, margin entire, without marginal gland and basal gland, secondary veins conspicuous, 7–12 pairs, both surfaces pubescent on veins. *Inflorescences* racemose, terminal and axillary, pubescent or glabrate. *Staminate racemes* simple; bracts ca. 0.5 mm long, pubescent, without gland. *Staminate flowers*: pedicel 0.3–0.8 mm long, pubescent; sepals 0.3–0.6 mm long, glabrous; stamens 3 or 4; filaments ca. 1.5 mm long. *Pistillate racemes* simple, 7–12 cm long in fruits. *Pistillate flowers* not seen. *Fruits*: pedicel 0.7–2 mm long; drupe 1-seeded, ellipsoid, 4–4.5 mm long (excl. styles), 2–4 mm in diam.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma (Long 1987, Govaerts et al. 2000). *E Himalayan element.* In Nepal: Mid Western, Western, Eastern.

Habitat & Ecology — Altitude 225–1200 m. Flowers in May; fruits from August to December.

Notes — Hoffmann (2000) regarded *A. simile* as a synonym of *A. montanum* Blume. Further studies are needed to clarify the delimitation of *A. montana* and *A. acuminata.*

4. Antidesma acidum Retz. — Fig. 23.

Antidesma acidum Retz., Obserb. Bot. 5: 30 (1788), "*acida*"; Müll. Arg. in DC., Prodr. 15(2): 249 (1866); C. E. C. Fischer, Kew Bull. 1932: 65 (1932); Airy Shaw, Kew Bull. 26: 352 (1972); Short & Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982); D. G. Long in Fl. Bhutan 1: 786 (1987); P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 60 (1994); T. Kuros., Newslett. Himalayan Bot. no. 22: 19 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 179 (2000); Hoffmann, Thai Forest Bull., Bot. 28: 145 (2000); Rajbhandari, Ethnobot. Nepal: 57 (2001); Manandhar, Pl. People Nepal: 92 (2002). — Type: *König* (n. v.).

Stilago diandra Roxb., Pl. Coromandel 2: 35, t. 166 (1802); Roxb., Fl. Ind. ed. 1832, 3: 759 (1832). — *Antidesma diandrum* (Roxb.) Roth, Nov. Pl. Sp.: 369 (1821); Müll. Arg. in DC., Prodr. 15(2): 266 (1866); Kurz, Forest Fl. Burma 2: 360 (1877); Hook. f., Fl. Brit. India 5: 361 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Banerji, Rec. Bot. Surv. India 19(2): 82 (1966); Hurus. & Ya. Tanaka in Fl. E. Himal.: 174 (1966); Murata, Acta Phytotax. Geobot. 25: 114 (1973). — [*Antidesma diandrum* (Roxb.) Roth var. *genuinum* Müll. Arg. in DC., Prodr. 15(2): 267 (1866), nom. inval.] — Type: [*Collector unknown s. n.*] (E!).

[*Antidesma sylvestre* Wall., Numer. List: 245, no. 7281 (1847), nom. nud.]

Stilago lanceolaria Roxb., Fl. Ind. ed. 1832, 3: 760 (1832). — *Antidesma lanceolarium* (Roxb.) Wall. [Numer. List: 245, no. 7284 (1847), nom. nud.] ex Wight, Icon. Pl. Ind. Orient. 3(1): 4, t. 766 (1844), "*lanceolaria*"; Thwaites, Enum. Pl. Zeyl.: 289 (1861). — Type: (n. v.), the Botanic garden (Calcutta), native of Chittagong.

Antidesma diandrum (Roxb.) Roth var. *ovatum* Tul., Ann. Sci. Nat., Bot., III, 15: 198 (1851); Müll. Arg. in DC., Prodr. 15(2): 266 (1866).

Antidesma diandrum (Roxb.) Roth var. *lanceolatum* Tul., Ann. Sci. Nat., Bot., III, 15: 199 (1851); Müll. Arg. in DC., Prodr. 15(2): 267 (1866).

Antidesma diandrum (Roxb.) Roth var. *parvifolium* Tul., Ann. Sci. Nat., Bot., III, 15: 199 (1851); Müll. Arg. in DC., Prodr. 15(2): 267 (1866).

Antidesma wallichianum C. Presl, Epimel. Bot.: 235 (1851).

Antidesma diandrum (Roxb.) Roth f. *javanicum* J. J. Sm. in S. H. Koorders & T. Valeton, Bijdr. Boomsoort. Java 12: 275 (1910). — *Antidesma diandrum* (Roxb.) Roth var. *javanicum* (J. J. Sm.) Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 144 (1922).

Antidesma parviflorum Ham. ex Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 143 (1922).

Antidesma henryi Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, XV: 132 (1922), non Hemsl., J. Linn. Soc., Bot. 26: 431 (1894). — *Antidesma paxii* F. P. Metcalf, Lingnan Sci. J. 10: 485 (1931), nom. nov.

Dioecious shrub, 1.2–6 m high, stem diameter 3–10 cm. *Twigs* pubescent. *Leaves* alternate; stipules lanceolate or linear, 4–7 by 0.8–1.1 mm, early caducous, tomentose, apex acuminate; petiole 3–6 mm long, pubescent; blade obovate or oblanceolate, 5.5–11 by 1.5–4.5 cm, base cuneate or obtuse, apex acuminate, acute or obtuse, margin entire, secondary veins conspicuous, 5–8 pairs, upper surface pubescent on veins, lower surface pubescent. *Inflorescences* racemose, terminal, glabrous or pubescent. *Staminate racemes* 3–6 cm, 0–2-branched at the base; bracts ovate or widely ovate, 0.6–1 by 0.3–0.7 mm, glabrous or pubescent. *Staminate flowers*: pedicel 0.8–1.1 mm long, pubescent or glabrous; calyx lobes ca. 0.4 mm long, glabrous; stamens 2; filaments 0.9–1.5 mm long. *Pistillate racemes* simple or 1-branched at base, 1.5–2.5 cm long (2.5–3.5 cm in fruits);

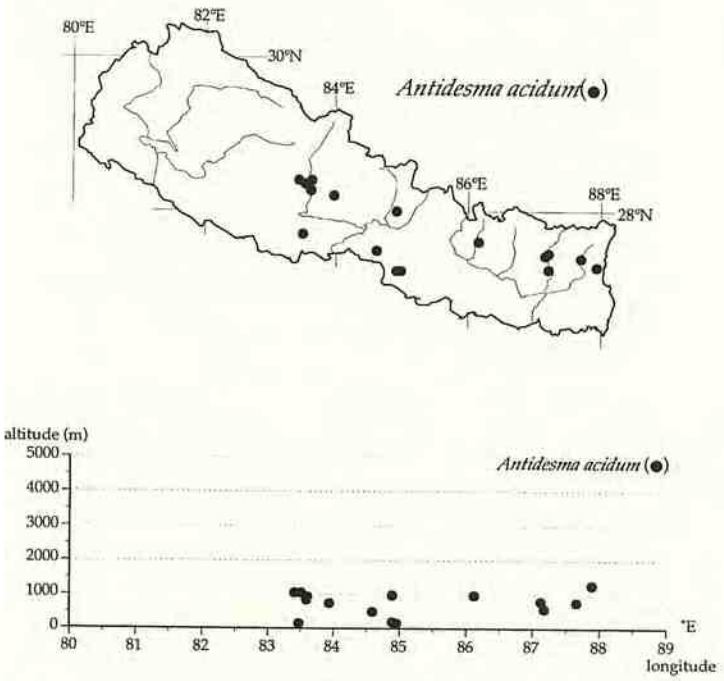

Fig. 23. Distribution of *Antidesma acidum* Retz. in Nepal.

bracts ovate or widely ovate, 0.8–0.9 by 0.5–0.7 mm, glabrous. *Pistillate flowers*: pedicel 1.5–1.6 mm long, glabrous; calyx lobes 0.4–0.6 mm long, glabrous; ovary ellipsoid, ca. 1 mm long, ca. 0.8 mm in diam., glabrous, smooth; styles 3, ca. 0.4 mm long. *Fruits*: pedicel 1.5–1.8 mm long; drupe ellipsoid, 4–4.5 mm long (excl. styles), 2.5–3 mm in diam.

Distribution — Pakistan, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam, China (South-central), Jawa (Govaerts et al. 2000, Hoffmann 2000). *S Asian-Malaysian element*. In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 150–1600 m. In forests or on slopes. Flowers from May to June; fruits from July to November.

Vernacular names — Nepali: *amali* (Manandhar 2002), *archal* (Rajbhandari 2001a, Manandhar 2002), *himal churi* (Manandhar 2002). Tamang: *nakadansing* (Rajbhandari 2001a, Manandhar 2002). Tharu: *ban musari* (Rajbhandari 2001a)

Uses — Fresh or pickled ripe fruits are eaten (Manandhar 2002). Tender acidic leaves are eaten by children (Manandhar 2002). Bark paste is medicinally used to treat mumps (Rajbhandari 2001a, Manandhar 2002). Tree is used for fodder (Manandhar 2002).

12. **Bischofia** Blume

Bischofia Blume, Bijdr.: 1168 (1826–1827). — Type species: *Bischofia javanica* Blume

1. Bischofia javanica Blume — Fig. 20.

Bischofia javanica Blume, Bijdr.: 1168 (1826–1827); Decne. in Jacquem. Voy. Inde 4: 153 (1844); Müll. Arg. in DC., Prodr. 15(2): 478 (1866); Kurz, Forest Fl. Burma 2: 355 (1877); Hook. f., Fl. Brit. Ind. 5: 345 (1887); Hara in Fl. E. Himalaya 2: 69 (1971); Whitmore in Enum. Flow. Pl. Nepal 2: 99 (1979), as Staphyleaceae; D. G. Long in Fl. Bhutan 2: 130 (1991), as Bischofiaceae; P. T. Li, Fl. Reipubl. Pop. Sin. 44(1): 185, t. 56, f. 2–4 (1994); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 264 (2000); Manandhar, Pl. People Nepal: 112 (2002). —[*Bischofia javanica* Blume var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 478 (1866), nom. inval.]. — Type: *Blume 154* (holo L (fide Radcliffe-Smith 1987b) n. v.; iso BO (fide Radcliffe-Smith 1987b) n. v.), W. Java.

Andrachne trifoliata Roxb., Fl. Ind. ed. 1832, 3: 728 (1832). — *Stylodiscus trifoliatus* (Roxb.) Benn., Pl. Jav. Rar.: 133, t. 29 (1840). — *Bischofia trifoliata* (Roxb.) Hook., Hooker's Icon. Pl. 9: t. 844 (1851). — *Bischofia javanica* Blume var. *lanceolata* Müll. Arg. in DC., Prodr. 15(2): 479 (1866). — Type: not designated.

Microelus roeperianus Wight & Arn., Edinburgh New Philos. J. 14: 298 (1833); Wight, Icon. Pl. Ind. Orient. 5(2): 22, t. 1880 (1852). — *Bischofia roeperiana* (Wight & Arn.) Decne. in Jacquem., Voy. Inde 4: 153 (1844). — Type: *Wight, Cat. no. 941 [941, 941A, B, C]* (E!), in dumetis montium provinciae Madura; *Hamilton* (E n. v..), in Nepala inferlore; *Hamilton* (E. n. v.), Bengala orientali.

Bischofia cumingiana Decne. in Jacquem., Voy. Inde 4: 153 (1844). — Type: *Cumming. exsiccat., no. 1174, v. 1185* (herb. Mus. Par.), in silvis ad Manillam.

Bischofia oblongifolia Decne. in Jacquem., Voy. Inde 4: 152, t. 154 (1844). — *Bischofia javanica* Blume var. *oblongifolia* (Decne.) Müll. Arg. in DC., Prodr. 15(2): 479 (1866). — Type: (n. v.), in umbrosis humidis Keyri Pass, Dehra-Dhoun.

Bischofia toui Decne. in Jacquem., Voy. Inde 4: 153 (1844). — *Bischofia javanica* Blume var. *toui* (Decne.) Müll. Arg. in DC., Prodr. 15(2): 478 (1866). — Type: *Cl. Calléry* (herb. Mus. Par. n. v.), in silvis circa Manillam, ubi tagale Toui dicitur, secund.

[*Andrachne apetala* Roxb. ex Wall., Numer. List: 274, no. 7956 (1847), nom. nud.]

Phyllanthus gymnanthus Baill., Adansonia 2: 240 (1862).

Bischofia leptopoda Müll. Arg. in DC., Prodr. 15(2): 479 (1866). — Type: *Un. Stat. Explor. Exped.* [*Herb. U. S. Exploring Expedition*] (holo G-DC (IDC microfiche in TI) n. v.), in insula Tongatabu Archipelagi Samoanensis Oceani Pacifici.

Deciduous dioecious tree, 12–18 m high, stem diameter 12.5–50 cm. *Branching* not phyllanthoid (i. e. branchlets subtended by normal leaves). *Twigs* glabrous. *Leaves* alternate, trifoliolate; stipules caducous; petiole 8.5–12 cm long, glabrous; petiolules of terminal leaflets 1.8–3.5 cm long, those of lateral leaflets 0.4–1.2 cm long, glabrous; leaflets elliptic, 7–11.5 by 4–8 cm, base obtuse or acute, apex caudate or acuminate, margin serrate. *Panicles* axillary. *Staminate panicles* many-flowered, much branched, 6–16 cm long, 3–9 cm wide, glabrous. *Staminate flowers*: pedicel 1–1.5 mm long, glabrous; sepals 5, elliptic, ca. 1.5 by ca. 1 mm, glabrous, reflexed, margin entire; disc 6-segmented; stamens 5; filaments free, 0.5–0.9 mm long; anthers elliptic, ca. 0.8 mm long, ca. 0.4 mm in diam.; pistillidia ca. 0.5 mm long, ca. 0.5 mm in diam. *Pistillate panicles* 16–23 cm long, 5–8 cm wide in fruits. *Pistillate flowers* not seen. *Fruits*: pedicel 5–10 mm long; drupe globose 8–10 mm in diam., glabrous, smooth.

Distribution — India, Nepal, Bhutan, Burma, Thailand, Cambodia, Laos, Vietnam, Borneo, Jawa, Lesser Sunda Isls., Sulawesi, New Guinea, Australia (Queensland), New Caledonia, Samoa, Cook Isls., Philippines, China (South-central, Hainan, Southeast), Taiwan, Japan (Nansei-Shoto (Ryukyu)) (Long 1987, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Far Western, Mid Western, Central, Eastern.

Habitat & Ecology — Altitude up to 1060 m. In grasslands or secondary forests. Flowers from March to April; fruits from December to January.

Vernacular name — Nepali: *kainjalo* (Manandhar 2002).

Uses — Fresh ripe fruit is eaten for sweet (Manandhar 2002). Root is used for controlling bedwetting (Manandhar 2002). Wood is used for furniture (Manandhar 2002). Bark yields red dye (Manandhar 2002).

Subfamily II. ACALYPHOIDEAE Asch.

Acalyphoideae Asch., Fl. Prov. Brandenburg 1: 58 (1864). — Acalyphaceae Klotzsch & Garcke, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 246 (1859). — Type: *Acalypha* L.

13. **Chrozophora** Necker ex A. Juss.

Chrozophora Necker ex A. Juss., Euphorb. Gen.: 27 (1824), "*Crozophora*", nom. & orth. cons. — Type species: *Chrozophora tinctoria* (L.) A. Juss.

1. Chrozophora rottleri (Geiseler) A. Juss. ex Spreng. — Fig. 24.

Chrozophora rottleri (Geiseler) A. Juss. ex Spreng., Syst. Veg. 3: 850 (1826); Prain, Bull. Misc. Inform.: 95 (1918); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); van Welzen, Blumea

44: 419 (1999); Siwakoti & Varma, Pl. Divers. E. Nepal: 322 (1999); Rajbhandari, Ethnobot. Nepal: 58 (2001); Manandhar, Pl. People Nepal: 150 (2002). — *Croton rottleri* Geiseler, Croton. Monogr.: 54 (1807). — *Chrozophora plicata* (Vahl) A. Juss. ex Spreng. var. *rottleri* (Geiseler) Müll. Arg. in DC., Prodr. 15(2): 747 (1866). — Type: *Vahl s. n.* (C (fide van Welzen 1999) n. v.).

Chrozophora plicata auct. non (Vahl) A. Juss. ex Spreng.; Hook. f., Fl. Brit. India 5: 409 (1887), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 337 (2000).

Herb or subshrub, 0.6 m high. *Stem* stellate-hairy. *Leaves* alternate; stipules caducous, linear triangular, ca. 3.1 by ca. 0.2 mm, stellate-hairy; petiole 2.2–3.9 cm long, densely stellate-hairy; blade ovate, shallowly 3 or 5-lobed, 4–9 by 3.5–10.5 cm, base obtuse or emarginate, apex rounded, margin entire, lower surface with 2 glands near the base, 1 mm diam., upper surface stellate-hairy, lower surface densely stellate-hairy, venation impressed at upper surface, raised at lower surface, secondary veins ca. 4 pairs. *Inflorescences* in fruit 10.5 cm long, densely stellate-hairy. *Staminate flowers* not seen. *Pistillate flowers*: sepals 5, triangular, 1.1–1.5 by ca. 0.6 mm; petals 1–1.2 by 0.3–0.4 mm. *Fruits*: pedicel 0.6–1.8 cm long, densely stellate-hairy; capsule dehiscing, ca. 7 mm long, stellate-hairy; columella persistent after dehiscence, ca. 3.5 mm long. *Seeds* broadly ellipsoid, 3.8–3.9 mm long, 2.9–3 mm wide, 2.7–2.9 mm thick.

Distribution — India, Nepal, Burma, Thailand, Andaman Isls., Jawa (introduced?) (Van Welzen, 1999). *S Asian-Malaysian element.* In Nepal: Eastern.

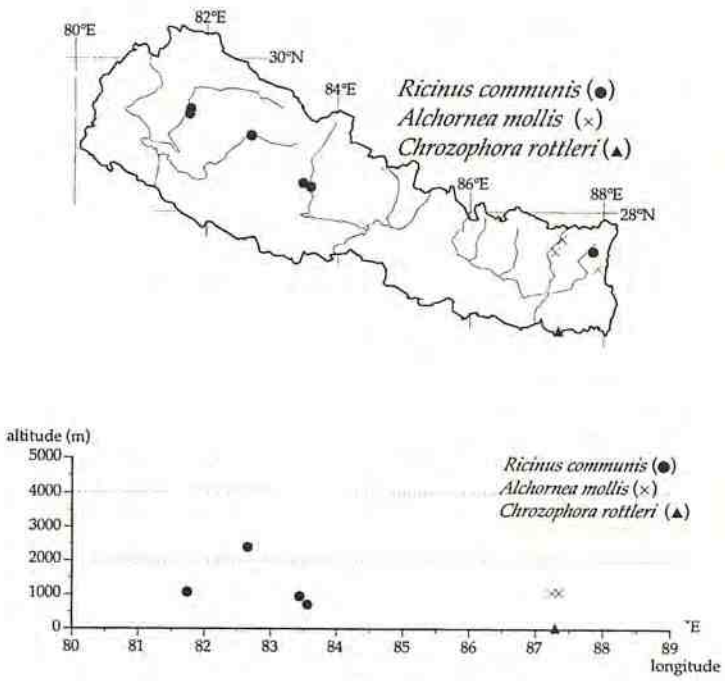

Fig. 24. Distribution of *Ricinus communis* L., *Chrozophora rottleri* (Geiseler) A. Juss. ex Spreng., and *Alchornea mollis* (Benth.) Müll. Arg. in Nepal.

Habitat & Ecology — Altitude 75 m. On waste ground. Common in eastern plains (Siwakoti & Varma 1999). Fruits in May.

Vernacular name — Tharu: *chotaki-hunkatath* (Rajbhandari 2001a, Manandhar 2002).

Uses — Juice of fruit is medicinally applied to couth and cold (Manandhar 2002). Fruit is worn around neck to relief from cold (Rajbhandari 2001a).

Notes — *Chrozophora plicata* (Vahl) A. Juss. ex Spreng. is often confused with *C. rottleri*. The former is, however, distinguishable from the latter by its 3-dimensional stellate hairs on ovaries and fruits and smaller (less than 3 cm long) leaf blades (van Welzen 1999).

14. Alchornea Sw.

Alchornea Sw., Prodr. 6: 98 (1788). — Type species: *Alchornea latifolia* Sw.

1. Alchornea mollis (Benth.) Müll. Arg. — Fig. 24.

Alchornea mollis (Benth.) Müll. Arg., Linnaea 34: 168 (1865); Müll. Arg. in DC., Prodr. 15(2): 902 (1866); Hook. f., Fl. Brit. India 5: 420 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 173 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982); D. G. Long in Fl. Bhutan 1: 798 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 72 (1996); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 144 (2000). — [*Rottlera mollissima* Wall., Numer. List: 272, no. 7825 (1847), nom. nud.] — *Stipellaria mollis* Benth., Hooker's J. Bot. Kew Gard. Misc. 6: 3 (1854). — Type: *Wallich, List no. 7825* (K-WALL!), Nepalia.

Sapium cordifolium Roxb., Fl. Ind. ed. 1832, 3: 693 (1832). — Type: not designated.

Monoecious shrub, 2–3.5 m high, 2–3 cm in diameter. *Twigs* tomentose. *Leaves* alternate; stipules lanceolate, 4–5 by 0.5–0.7 mm, early caducose, pubescent, apex acuminate; petiole 3–30 cm long, tomentose; stipels 2 or 4, at the end of petiole, linear or lanceolate, 3–6 by 0.5–0.8 mm, pubescent; blade widely ovate, 11 or 24.5 by 8–24.5 cm, base truncate or cordate, apex acuminate, caudate, acute or obtuse, margin crenate-serrate with marginal glands, upper surface pubescent, lower surface tomentose, venation palmately 3-veined at base, secondary veins pinnate, 5 or 6 pairs, 4 discoid basal glands between veins on lower surface, circular, ca. 1 by 0.7 mm. *Staminate inflorescences* racemoses, 9–17 cm long, tomentose. *Staminate flowers* not seen. *Pistillate inflorescences* racemoses, tomentose. *Pistillate flowers*: pedicel 2–2.5 mm, tomentose; sepals 2–3, unequal, ovate or widely ovate, 3.5–4 by 2–4 mm, apex acute or obtuse, outside pubescent; ovary spheroid, ca. 2.5 mm diam., densely tomentose; styles 3, 0.8–1.2 mm long, glabrous. *Fruits*: pedicel 3–4 mm long, tomentose; capsule dehiscent, globose, shallowly 3-lobed, 9–10 mm long, 9–11 mm in diam., tomentose; styles persistent, ca. 8 mm long; columella persistent after dehiscence, 6–8 mm long. *Seeds* widely elliptic, 7–8 mm long, 6–7 mm wide, ca. 4 mm thick, rough.

Distribution — India (Assam, Sikkim), Nepal, Bhutan, China (South-central) (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 520–1090 m. On path sides, on forest margin or on riversides. Flowers from July to November; fruits from July to August.

15. Ricinus L.

Ricinus L., Sp. Pl.: 1007 (1753). — Type species: *Ricinus communis* L.

1. Ricinus communis L. — Fig. 24.

Ricinus communis L., Sp. Pl.: 1007 (1753); Roxb., Fl. Ind. ed. 1832, 3: 689 (1832); Müll. Arg. in DC., Prodr. 15(2): 1017 (1866); Kurz, Forest Fl. Burma 2: 400 (1877); Hook. f., Fl. Brit. India 5: 457 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966); C. R. Rao, Ind. For. 93: 55 (1967); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); Polunin & Stainton, Fl. Himal.: 362, f. 1241 (1984); Malla et al., Fl. Kathmandu Valley: 631 (1986); D. G. Long in Fl. Bhutan 1: 808 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 88 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 175 (1997); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); van Welzen, Blumea 43: 152 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 333 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1403 (2000); Rajbhandari, Ethnobot. Nepal: 61 (2001); Manandhar, Pl. People Nepal: 400 (2002). — Possible type fide van Welzen (1998): *Herb. Linnaeus, no. 1142-1, 1142-2* (LINN (fide van Welzen 1998) n. v.), *392-11, 392-13* (S (fide van Welzen 1998) n. v.).

Croton spinosus L., Sp. Pl.: 1005 (1753). — Type: (n. v.), India.

Ricinus speciosus Burm. f., Fl. Indica: 207, as "307", t. 63, f. 2 (1768). — Type: (n. v.), Java.

Ricinus spectabilis Blume, Bijdr.: 623 (1826). — Type: (n. v.), in montanis (Java).

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of NE Tropical Africa (Govaerts et al. 2000), widely cultivated and occasionally naturalized throughout the tropics (Webster & Burch 1968, van Welzen 1998). In Nepal: Far Western, Mid Western, Western, Eastern.

Habitat & Ecology — Altitude 720–2400 m. On roadsides, on open slopes, or on edge of cultivation. Common in eastern plains (Siwakoti & Varma 1999). Flowers from March to August; fruits from April to November.

Vernacular names — Nepali: *aaril* (Manandhar 2002), *ander* (Rajbhandari 2001a), *andi ko bot* (Siwakoti & Varma 1999), *arend* (Manandhar 2002), *arer* (Manandhar 2002). Chepang: *areth* (Manandhar 2002), *ater* (Manandhar 2002), *kukat* (Manandhar 2002), *lidis* (Manandhar 2002). Danuwar: *andi* (Rajbhandari 2001a, Manandhar 2002). Darai: *ander* (Rajbhandari 2001a). Gurung: *yanyan* (Rajbhandari 2001a, Manandhar 2002). Majhi: *madhishe aril* (Manandhar 2002). Mooshar: *andi* (Manandhar 2002). Newari: *aa ma* (Manandhar 2002). Rai: *daldo* (Manandhar 2002). Raute: *indeyo* (Manandhar 2002). Satar: *iradam* (Rajbhandari 2001a). Tamang: *dandarobi* or *dhandarobi* (Rajbhandari 2001a, Manandhar 2002), *thatur* (Manandhar 2002). Tharu: *reyar* (Manandhar 2002). Tibetan: *dan-khra* (Manandhar 2002), *dar-ta* (Manandhar 2002), *e-ra* (Manandhar 2002).

Uses — This species is cultivated for its oil of seed, castor oil. Seed is used for poisoning mad dogs or as fish poizon (Siwakoti & Varma 1999, Manandhar 2002). Juice of root, paste of root, paste of bark, leaf, juice of leaf, paste of flower, juice of fruit, seed oil, paste of seed, and cotyledon are medicinally applied for various diseases (Siwakoti & Varma 1999, Rajbhandari 2001a, Manandhar 2002).

16. Mercurialis L.

Mercurialis L., Sp. Pl.: 1035 (1753). — Lectotype species designated by Small in Britton & Brown, Ill. Fl. N. US. ed. 2, 2: 460 (1913): *Mercurialis perennis* L.

1. Mercurialis leiocarpa Siebold & Zucc. — Fig. 25.

Mercurialis leiocarpa Siebold & Zucc., Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 45 (1845); Müll. Arg. in DC., Prodr. 15(2): 795 (1866); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 197 (1982); Malla et al., Fl. Kathmandu Valley: 628 (1986); D. G. Long in Fl. Bhutan 1: 796 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 83 (1996); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1174 (2000). — Type: (n. v.), (Japan).

Mercurialis transmorrisonensis Hayata, Icon. Pl. Formosan. 5: 199 (1915). — *B. Hataya* [*s. n.*, Apr. 1912] (holo TI!; iso TI!), Formosa, Mt. Arisan, Tôzan, ad 8000 ped alt. (Taiwan).

Mercurialis leiocarpa Siebold & Zucc. var. *trichocarpa* W. T. Wang, Acta Bot. Yunnan. 10: 39 (1988). — Type: *Ying Zun-sheng 4016*, 18 Aug. 1960 (holo PE n. v.), China, Sichuan, Jioulong, Sanyanlong, 2900 m.

Monoecious or dioecious perennial herb with creeping slender rhizome. *Stem* deciduous, simple, erect, 17–40 cm long, glabrous. *Leaves* deciduous, 8–20, opposite; stipules persistent, free, lanceolate or ovate, 1.5–2 mm long; petiole 1–2.5 cm long in middle leaves, shorter in upper leaves; blade membranaceous, ovate or narrowly ovate, 3–7 by 1.5–3.5 cm, base obtuse, rounded or truncate, with a pair of glands, apex acuminate

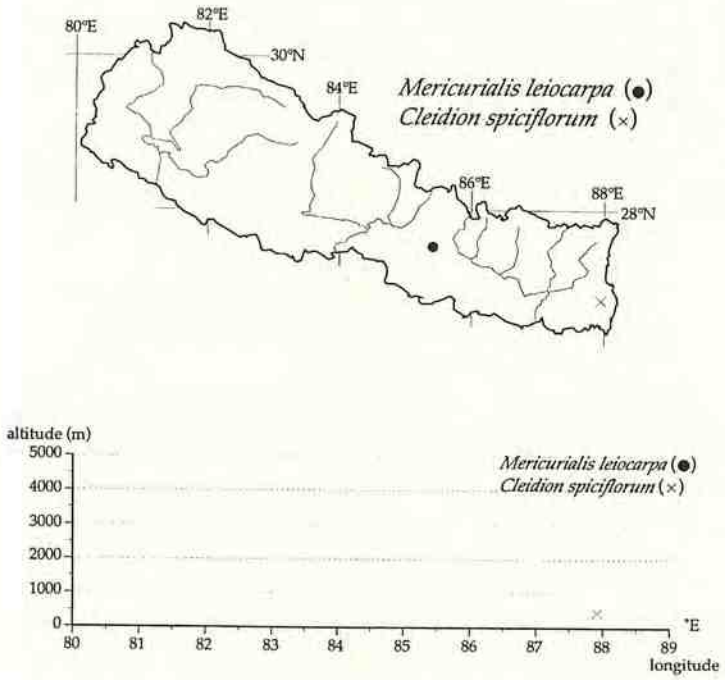

Fig. 25. Distribution of *Mercurialis leiocarpa* Siebold & Zucc. and *Cleidion spiciflorum* (Burm. f.) Merr. in Nepal.

or cuspidate, margin crenate, with a gland on each tooth, upper surface pubescent, lower surface pubescent on veins, scattered with glandular spots. *Inflorescences* unisexual or less commonly bisexual, axillary, solitary; upper inflorescences female or bisexual, lower male in monoecious shoots; upper flowers female, lower male in bisexual inflorescences; peduncle 4–6 cm long; modified thyrse 1.2–3.5 cm long; bracts ovate, glabrous, 0.8–1.2 mm long. *Staminate flowers* 1 to several per bract; pedicel ca. 0.5 mm long; sepals 3, widely ovate, 1.2–1.5 by 0.9–1.1 mm, glabrous, base connate, apex acute, margin entire; filaments ca. 1 mm. *Pistillate flowers* 1 per bract, short pedicellate; sepals 3, elliptic, ca. 1 by ca. 0.4 mm, glabrous, base connate, apex acute, margin entire; ovary 2-carpellate, reniform, glabrous; styles 0.8–1 mm long. *Fruits*: pedicel ca. 3 mm long; capsule dehiscent, 2-valved, verrucose; columella persistent after dehiscence. *Seeds* not seen.

Distribution — India (Assam), Nepal, Bhutan, Thailand (North), China (South-central, North-central), Taiwan, Korea, Japan (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 2550 m. In moist forests. Flowers from December to May; fruits in December.

17. **Cleidion** Blume

Cleidion Blume, Bijdr.: 612 (1826). — Type species: *Cleidion javanicum* Blume

1. Cleidion spiciflorum (Burm. f.) Merr. — Fig. 25.

Cleidion spiciflorum (Burm. f.) Merr., Interpr. Herb. Amboin.: 322 (1917); Airy Shaw, Kew Bull. 35: 608 (1980); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); D. G. Long in Fl. Bhutan 1: 803 (1987); Philcox in Rev. Handb. Fl. Ceylon 11: 167 (1997); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 358 (2000). — *Acalypha spiciflora* Burm. f., Fl. Indica: 203, as "303" (1768). — *Claoxylon spiciflorum* (Butm. f.) A. Juss., Euphorb. Gen.: 43 (1824). — Type: (n. v.), India orientalis.

Tragia filiformis Poir. in Lam., Encycl. 7: 727 (1806).

Cleidion javanicum Blume, Bijdr.: 613 (1826); Müll. Arg. in DC., Prodr. 15(2): 987 (1866); Kurz, Forest Fl. Burma 2: 390 (1877); Hook. f., Fl. Brit. India 5: 444 (1887); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 75 (1996). — Type: [*Collector unknown s. n.*] (BO (fide Airy Shaw 1980) n. v.), in monte Bonkok Provinciae Tjanjor (Java).

Acalypha spicigera Klotzsch in Seemann, Bot. Voy. Herald: 101 (1853).

Macaranga tamiana K. Schum., Notizbl. Bot. Gart. Berlin-Dahlem 1: 52 (1895).

Cleidion javanicum Blume var. *longipedicellatum* Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 12: 491 (1988, publ. 1989). — Type: *Kari 1161*, 26 Apr. 1909 (holo CAL n. v.; iso CAL n. v.), India, Sikkim, Munsong.

Dioecious tree, 12 m high. *Twigs* glabrous. *Leaves* alternate; stipules early caducous; petiole 3.5–11 cm long, glabrous but pilose when young; blade narrowly elliptic or oblanceolate, 13–20 by 3.5–8 cm, base cuneate, apex acuminate or bluntly apiculate, margin serrate, both surface glabrous, secondary veins pinnate, 5–8 pairs, upper surface with a pair of basal glands, glands circular, sessile, ca. 0.2 mm in diam., situated at 2–5 mm from base. *Staminate inflorescences* racemiform, 11–16 cm long, villous; bracts depressed ovate, 1.5–2 by 2.5–3 mm, apex obtuse. *Staminate flowers* 1–5 per node, ca. 3

mm diam.; pedicel 3–4 mm long, villous; sepals 3, ovate, 2.5–3 by ca. 1.2 mm, outside villous or glabrate, inside glabrous; stamens many; anthers ellipsoid, ca. 0.2 mm long. *Pistillate inflorescences* not seen. *Pistillate flowers* not seen. *Fruit* not seen. *Seeds* not seen.

Distribution — India, Nepal, Bhutan, Thailand, Malaysia (Peninsular), Bismarck Archipelago, Borneo, Jawa, Sulawesi, Sumatera, Lesser Sunda Isls., New Guinea, Australia (Queensland), Solomon Isls., Philippines, China (South-central) (Govaerts et al. 2000). *S Asian-Malaysian element.* In Nepal: Eastern.

Habitat & Ecology — Altitude 450 m. In *Shorea robusta* forests. Flowers in March.

18. **Macaranga** Thouars

Macaranga Thouars, Gen. Nova Madag.: 26 (1806). — Lectotype species designated by Coode, Taxon 25: 184 (1976): *Macaranga mauritiana* Bojer ex Müll. Arg.

Key to the species

A. Leaves not peltate; discoid gland 2, on the base of blade
..... **1. M. pustulata** King ex Hook. f.

A. Leaves peltate; discoid gland 2–8, 0.5–2.5 cm from petiole attachment

B. Petioles inserted 3–9 cm from the base of blade, glabrous; twigs glabrous
..... **2. M. indica** Wight

B. Petioles inserted 0.7–2.5 cm from the base of blade, tomentose; twigs tomentose ....
..... **3. M. denticulata** (Blume) Müll. Arg.

1. Macaranga pustulata King ex Hook. f. — Fig. 26.

Macaranga pustulata King ex Hook. f., Fl. Brit. India 5: 445 (1887); Banerji, Rec. Bot. Surv. India 19(2): 83 (1966); Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 805 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 55, t. 13, f. 7–8 (1996); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1097 (2000); Manandhar, Pl. People Nepal: 302 (2002). — Type: *Duthie* (n. v.), tropical Himalaya, Kumaon, alt. 4000–5000 ft.; *King* (n. v.), Sikkim; *Clarke* (n. v.), Sikkim.

Macaranga gmelinaefolia King ex Hook. f., Fl. Brit. India 5: 445 (1887). — Type: *Kurz* (n. v.), Sikkim Himalaya, at Kursiong, alt. 4500 ft.

Deciduous small tree or tree, 4.5–15 m high, 21–39 cm in diameter. *Twigs* tomentose. *Leaves* alternate; petiole 4.5–13 cm long, densely villosulous or glabrate; stipules free, triangular, 1.2–1.6 by 0.7–1.2 cm, caducous, densely villosulous, apex acuminate; blade widely ovate; 9–18 by 8–20 cm, base obtuse or shallowly cordate, apex shortly acuminate, margin entire, sparsely glandular, both surface glabrous or villosulous on veins, lower surface with dense minute red glands, vanation palmately 5–7-veined, secondary veins pinnate, 9 or 10 pairs; a pair of glands on upper surface of blade, situated on petiole attachment, sessile, circular or elliptic, concave, 0.7–2.5 mm by 0.5–2 mm. *Inflorescences* axillary, paniculate, erect, tomentose. *Staminate inflorescences* 5–9 cm long, branches up to 3 cm long, 1–1.5 mm diam., villosulous. *Staminate flowers* sessile, ca. 3 mm diam.; calyx lobes 2 or 3, unequal, outside villosulous or glabrate, inside

glabrate; stamens 18–21; filaments ca. 1 mm long; anthers globose, ca. 0.2 mm in diam. *Pistillate inflorescences* 4–8 cm long, 1.5–3 mm in diam. *Pistillate flowers* 1 per node; pedicel 1–3 mm long, villosulous; sepals 2 or 3, ovate or transversely elliptic, 1.5–2 by 2–2.5 mm, apex acute or obtuse, outside villosulous outside; ovary 2-locular, depressed globose, tomentose; stigmas 2, ca. 2 mm long, recurved, villosulous. *Fruits*: pedicel 1.5–3 mm long; capsule dehiscent, 2-lobed, ca. 5 mm long, ca. 8.5 mm wide, tomentose but glabrate on lobes. *Seeds* depressed obovoid, ca. 4.5 mm long, 5–5.5 mm wide, ca. 3.5 mm thick, smooth.

Distribution — India (Uttrakhand, Sikkim), Nepal, Bhutan (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 900–1920 m. In secondary forests, on edge of cultivation, or on stream sides. Flowers from March to November; fruits from July to August.

Vernacular names — Nepali: *banare* (Manandhar 2002), *mallato* (Manandhar 2002). Chepang: *pahasingh* (Manandhar 2002). Gurung: *kala* (Manandhar 2002), *khorsani chhi* (Manandhar 2002).

Uses — Wood is used for fuel (Manandhar 2002). Leaf is used as plates and wrappings for food (Manandhar 2002).

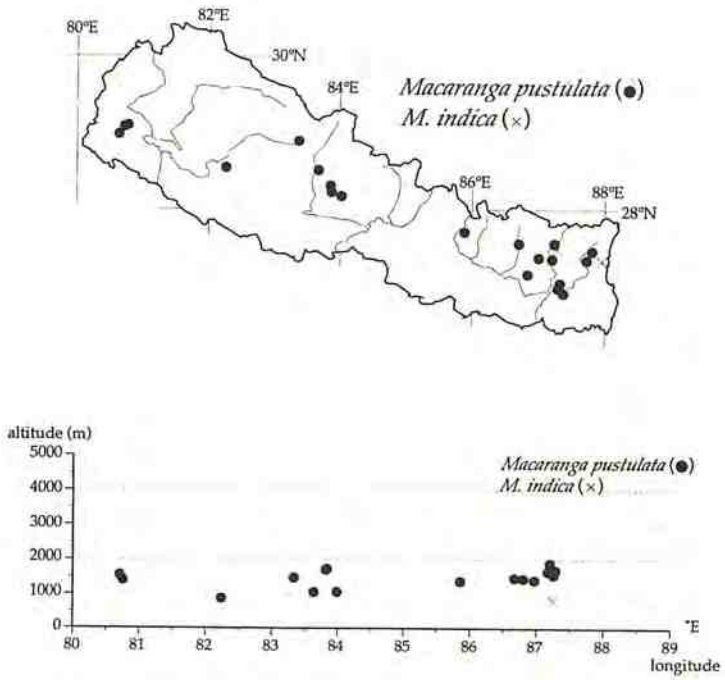

Fig. 26. Distribution of *Macaranga pustulata* King ex Hook. f. and *M. indica* Wight in Nepal.

2. Macaranga indica Wight — Fig. 26.

Trewia hernandifolia Roth, Nov. Pl. Sp.: 374 (1821), pro. syn.

Macaranga indica Wight, Icon. Pl. Ind. Orient. 5(2): 23, t. 1883 (1852), 6: 5, t. 1949-2 (1853); Müll. Arg. in DC., Prodr. 15(2): 1009 (1866); Kurz, Forest Fl. Burma 2: 387 (1877); Hook. f., Fl. Brit. India 5: 446 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal: 179 (1966); D. G. Long in Fl. Bhutan 1: 805 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 51 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 169 (1997); T. Kuros.,Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1091 (2000). — Type: (n. v.), Neilgherries, Courtallum (India).

Macaranga flexuosa Wight, Icon. Pl. Ind. Orient. 5(2): 23 (1852), 6: 5, t. 1949-3 (1853); Müll. Arg. in DC., Prodr. 15(2): 1010 (1866). — Type: (n. v.), Courtallum (India).

Macaranga adenantha Gagnep., Bull. Soc. Bot. France 69: 701 (1922 publ. 1923). — Type: *Eberhardt 4960* (n. v.), Tonkin, prov. de Vinh-yen, à Tam-dao; *Cavalerie 3409* (n. v.), Chine, Koay-tcheou.

Dioecious small tree, 7 m high, stem diameter 10 cm. *Twigs* glabrous. *Leaves* alternate; petiole inserted 3–9 cm from the base of blade, 5–35 cm long, glabrous; blade ovate or widely ovate; 15–46 by 11–36 cm, base peltate, rounded, apex shortly acuminate, margin entire, sparsely glandular, upper surface sparsely villous or glabrous, lower surface villous or villosulous, with dense minute red glands, venation palmately 9–11 veined, secondary veins pinnate, 7–10 pairs, glands 2–4, on upper surface of blade, situated on veins 0.5–2.1 cm from petiole attachment, discoid, sessile. *Inflorescences* axillary, paniculate, erect, villosulous. *Staminate inflorescences* 6–10 cm long, branches up to 2.5 cm long, ca. 0.6 mm diameter, villosulous, discoid glands 1.2–1.4 mm in diam. *Staminate flowers* not seen. *Pistillate inflorescences* not seen. *Pistillate flowers* not seen. *Fruis* not seen. *Seeds* not seen.

Distribution — Sri Lanka, India, Nepal, Andaman Isls., Thailand, Malaysia (Peninsular), China (South-central) (Govaerts et al. 2000). *S Asian-Malaysian element.* In Nepal: Eastern.

Habitat & Ecology — Altitude 840 m. In evergreen forests. Flowers in August.

3. Macaranga denticulata (Blume) Müll. Arg. — Fig. 27.

Macaranga denticulata (Blume) Müll. Arg. in DC., Prodr. 15(2): 1000 (1866); Kurz, Forest Fl. Burma 2: 387 (1877); Hook. f., Fl. Brit. India 5: 446 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 804 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 53 (1996); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1086 (2000); Manandhar, Pl. People Nepal: 302 (2002). — *Mappa denticulata* Blume, Bijdr.: 625 (1826). — [*Macaranga denticulata* (Blume) Müll. Arg. var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 1000 (1866), nom. inval.] — Type: (n. v.), in sylvis montium Salak et Gede (Java).

Mappa gummiflua Miq., Fl. Ned. Ind., Eerste Bijv.: 458 (1861). — *Macaranga gummiflua* (Miq.) Müll. Arg. in DC., Prodr. 15(2): 1000 (1866). — Type: *D.* (n. v.), Sumatra occid. in prov. Priaman, gummi Getah fundens.

Macaranga perakensis Hook. f., Fl. Brit. India 5: 447 (1887). — Type: *Scortechini* (n. v.), Perak.

Macaranga henricorum Hemsl., J. Linn. Soc., Bot. 26: 442 (1894).

Dioecious small tree or tree, 4–12 m high, stem diameter 22 cm. *Twigs* tomentose. *Leaves* alternate, peltate; petiole inserted 0.7–2.5 cm from the base of blade, 6–16 cm long, tomentose, densely villosulous or glabrate; blade ovate, 11–24 by 10–21 cm, base rounded or truncate, apex shortly acuminate, margin entire, sparsely glandular, both surfaces glabous (tomentose on veins when young), lower surface with dense minute red glands, venation palmately 9–11-veined at base, secondary veins pinnate, 7–13 pairs, glands 6–8, on upper surface of blade, situated on the veins, 0.5–2.5 cm from petiole attachment, discoid, sessile. *Inflorescences* axillary, paniculate, erect, villosulous. *Staminate inflorescences* 4.5–8 cm long, branches up to 3.5 cm long, ca. 1 mm diam., tomentose. *Staminate flowers* sessile, ca. 1.5 mm in diam.; calyx lobes 2 or 3, unequal, outside tomentose or glabrate, inside glabrate; stamens ca. 12; filaments ca. 0.8 mm long; anthers globose, ca. 0.2 mm diam. *Pistillate inflorescences* 1–7 cm long, 1–2 mm in diam. *Pistillate flowers* 1–3 per node; pedicel 1–3 mm long; calyx lobes 2, persistent, widely ovate, ca. 1 by ca. 1 mm, apex acute or obtuse, outside tomentose; ovary 2-locular, depressed obovoid, deeply bilobed; stigmas 2, 0.6–0.8 mm long, recurved. *Fruits*: pedicel 4–6 mm long; capsule dehiscent, obovoid, deeply bilobed, ca. 3.5 mm long, 4.5–5 mm wide, glabrate. *Seeds* globose, ca. 2.5 mm in diam., striate.

Distribution — India (Sikkim, Assam, Andaman Isls.), Nepal, Bhutan, Burma, Thailand, Malaysia (Peninsular), Sumatera, Jawa, China (Southeast) (Govaerts et al. 2000). *SE Asian-Malaysian element.* In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 200–1350 m. On riversides or in *Schima* forests.

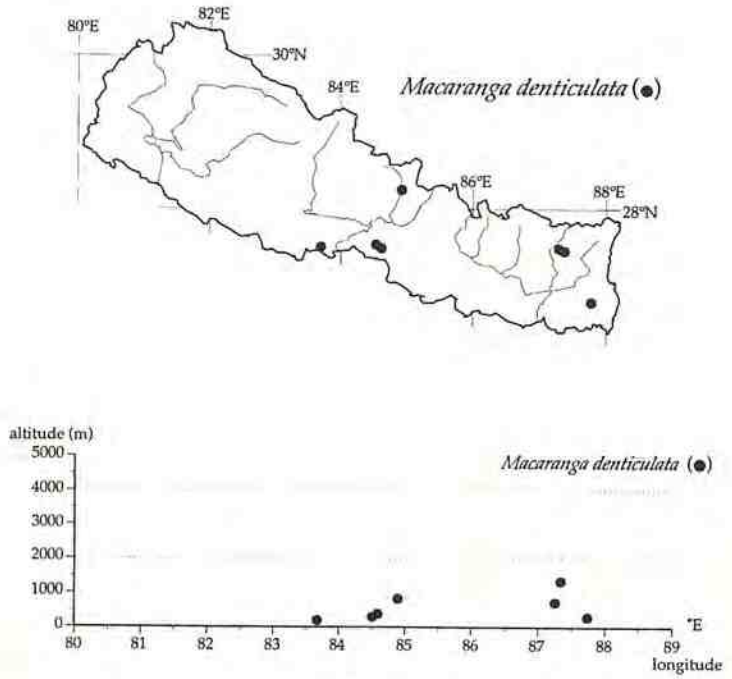

Fig. 27. Distribution of *Macaranga denticulata* (Blume) Müll. Arg. in Nepal.

Flowers from April to May; fruits from May to July.

Vernacular name — Raute: *indolya* (Manandhar 2002).

Uses — Lopped plant is used for fodder (Manandhar 2002). Paste of bark is medicinally applied for swellings and bruises (Manandhar 2002).

19. **Mallotus** Lour.

Mallotus Lour., Fl. Cochinchi.: 635 (1790). — Type species: *Mallotus cochinchensis* Lour.

Key to the species

A. Capsules without spine-like hairs or verrucae (not seen in Nepalese *M. repandus*)
  B. Twigs and leaves with minute red glands; leaves not peltate, secondary veins 6–8 pairs; capsules densely red-glandular
    C. Leaf blades acuminate or acute at apex, a pair of basal glands situated on petiole attachment; pistillate pedicels 0.5–1.5 mm; capsules (2–)3(–4) locular ..... **1. M. philippensis** (Lam.) Müll. Arg.
    C. Leaf blades acuminate or caudate at apex, 1 or 2 pairs of basal glands situated at 0.5–3.5 mm from petiole attachment; pistillate pedicels 1.2–2 mm; capsules 2- or 3-locular ..... **2. M.** aff. **philippensis** (Lam.) Müll. Arg.
  B. Twigs, leaves, and capsules (not seen in Nepalese plants) without red-gland; petioles attached at 1–1.5 mm from the base of blade, secondary veins 4 or 5 pairs ..... **3. M. repandus** (Willd.) Müll. Arg.

A. Capsules verrucose or with spine-like hairs
  B. Leaves truncate or rounded at base; stigmas 3, ovaries 3-locular; capsules with long spine-like hairs of 5–7 mm long and stellate hairs but not obscured
    C. Leaf margin denticulate, petiole inserted 10–20 mm from the base of blade; capsules sparsely on racemes, pedicels 6–14 mm long ..... **4. M. roxburghianus** Müll. Arg.
    C. Leaf margin entire, petiole inserted 0–2.5 mm from the base of blade; capsules densely on racemes, pedicels 1–3 mm long
      D. Petioles attached at base, lower surfaces of blades stellate-hairy, not obscured, a pair of basal glands on upper surfaces; seeds ca. 5 mm long, ca. 4.5 mm wide ..... **5. M. nepalensis** Müll. Arg.
      D. Petioles inserted 0.8–1.5 mm from the base of blade, lower surfaces of blades densely stellate-hairy, obscured, basal glands obscure; seeds 3.8–4.2 mm long, 3.6–4.2 mm wide ..... **6. M. oreophilus** Müll. Arg.
  B. Leaves rounded, truncate or cordate at base; stigmas 4, ovaries 4-locular; capsules with dense verrucae of 1–4 mm long ..... **7. M. tetracoccus** (Roxb.) Kurz

1. Mallotus philippensis (Lam.) Müll. Arg. — Fig. 28.

Mallotus philippensis (Lam.) Müll. Arg., Linnaea 34: 196 (1865), "*philippinensis*"; Müll. Arg. in DC., Prodr. 15(2): 980 (1866), "*philippinensis*"; Kurz, Forest Fl. Burma 2: 381 (1877), "*philippinensis*"; Hook. f., Fl. Brit. India 5: 442 (1887), "*philippinensis*"; Burkill, Rec. Bot. Surv. India 4: 130 (1910); Kitam. in Fauna Fl. Nepal Himal.: 172 (1955); Banerji, Rec. Bot. Surv. India 19(2): 83 (1966); Hurus. & Ya. Tanaka in Fl.

E. Himal.: 180 (1966); C. R. Rao, Ind. For. 93: 55 (1967); Airy Shaw, Kew Bull. 35: 655 (1980); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 483 (1983), "*philippinensis*"; D. G. Long in Fl. Bhutan 1: 802 (1987); Stainton, Flow. Himal. Suppl.: 55, pl. 103 (1988); S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 31, t. 8, f. 7 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 158 (1997); T. Kuros., Newslett. Himalayan Bot. no. 22: 20 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 328 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1122 (2000); van Welzen et al., Thai Forest Bull., Bot. 28: 105 (2000); Rajbhandari, Ethnobot. Nepal: 59 (2001); Manandhar, Pl. People Nepal: 307 (2002). — *Croton philippense* Lam., Encycl. 2: 206 (1786). — Type: *M. Sonnerat s. n.* (P (fide Airy Shaw 1980) n. v.), Philippines.

Croton punctatus Retz., Obserb. Bot. 5: 30 (1788), non Jacq., Collectanea 1: 166 (1787). — Type: *König* (n. v.), E. Zeylonia.

Croton coccineus Vahl, Symb. Bot. 2: 97 (1791), non Noronha, Verh. Batav. Genootsch. Kunsten 5(4): *11 (1790).* — Type: *König (n. v.), in Zeylona.*

Rottlera tinctoria Roxb., Pl. Corom. 2: 36, t. 168 (1798); Roxb., Fl. Ind. ed. 1832, 3: 827 (1832); Benth., Fl. Hongk.: 307 (1861).

Croton montanus Willd., Sp. Pl. 4: 547 (1805); Wall., Numer. List: 270, no. 7723A (1847). — Type: *D. Klein* (n. v.), in India orientali.

[*Croton distans* Wall., Numer. List: 270, no. 7772A p. p., B (1847), nom. nud.]

Mappa stricta Rchb. f. & Zoll., Acta Soc. Regiae Sci. Indo-Neerl. 1: 31 (1856). — *Macaranga stricta* (Rchb. f. & Zoll.) Müll. Arg. in DC., Prodr. 15(2): 1004 (1866).

Mallotus reticulatus Dunn, J. Linn. Soc., Bot. 38: 365 (1908). — *Mallotus philippensis* (Lam.) Müll. Arg. var. *reticulatus* (Dunn) F. R. Metcalf, J. Arnold Arbor. 22: 207 (1941).

Euonymus hypoglaucus H. Lév., Fedde, Rep. Sp. Nov. 13: 260 (1914). — Type: *Cavalerie 2733*, 4 Apr. 1906 (holo E!), China, Kweichow, Lofou.

Mallotus philippensis (Lam.) Müll. Arg. var. *mengliangensis* C. Y. Wu ex S. M. Hwang, Acta Phytotax. Sin. 23: 294 (1985). — Type: *Y. H. Li 3543* (SCBI n. v.), China, Yunnan, Xishuangbanna.

Dioecious shrub, small tree, or tree, 3–15 m high; stem diameter 15–50 cm. *Twigs* stellate-tomentose with minute red glands. *Leaves* alternate; petiole 2–10.5 cm long, stellate-tomentose with minute red glands; blade ovate or narrowly ovate, 7–23 by 3–10 cm, base acute, obtuse or rounded, apex acuminate or acute, margin entire, upper surface glabrous, lower surface obscured by stellate-tomentose, with minute red glands, secondary veins pinnate, 6–8 pairs, a pair of basal glands on upper surface, circular or elliptic, 0.4–1.8 by 0.4–1 mm, situated on petiole attachment. *Inflorescences* terminal or axilary, racemose or much branched at base, forming panicles, erect, stellate-tomentose. *Bracts* triangular, 1–1.3 by 1–1.2 mm, stellate-tomentose, apex acute. *Staminate inflorescences* 6–16.5 cm long, branches up to 9.5 cm long, 0.6–1.5 mm diam., stellate-tomentose. *Staminate flowers* 2–3 mm diam.; pedicel 1–3 mm, stellate-tomentose; calyx lobes 3 or 4, unequal, ovate, 1.5–2 by 1–1.8 mm, outside stellate-tomentose, inside glabrate; stamens 18–41; filaments 1–2.5 mm long; anthers ellipsoid, 0.5–0.8 mm long. *Pistillate inflorescences* 3–13 cm long, 1–2 mm diam., 1 flower per node. *Pistillate flowers*: pedicel 0.5–1.5 mm; calyx lobes 3–5, unequal, narrowly ovate, ovate or widely ovate, 1–1.8 by 0.8–1.8 mm, persistent, apex acute, outside stellate-tomentose; ovary spheroid, (2–)3(–4)-locular,

stellate-hairy and with minute red glands; stigmas (2–)3(–4), sessile, 2–3 mm long, 0.4–0.8 mm in diam., with papillae up to 0.6 mm long. *Fruits*: pedicel 1.5–2 mm long; capsule dehiscent, densely red glandular; column persistent after dehiscence, ca. 7.5 mm long, ca. 4 mm in diam., prominently winged. *Seeds* depressed globose, 4.5–5.3 mm long, 4–4.3 mm wide, 3.7–3.9 mm thick, smooth, black.

Distribution — Pakistan, Sri Lanka, India, Nepal, Bhutan, Thailand, Vietnam, Malaysia (Peninsular), Smatera, Jawa, Borneo, Lesser Sunda Isls., Sulawesi, Moluccas, New Guinea, Bismarck Archipelago, Philippines, Australia (New South Wales, Northern Territory, Queensland), Polynesia, China (Southeast), Taiwan, Japan (Nansei-Shoto (Ryukyu Isls.)) (Long 1987, Ohba 1999, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude up to 1333 m. On roadsides, on slopes, in grasslands, in tickets, or in *Shorea robusta* forests. Flowers & fruits throughout the year.

Vernacular names — Nepali: *rohini* (Manandhar 2002), *roina* (Manandhar 2002), *sindure* or *singure* (Siwakoti & Varma 1999, Rajbhandari 2001a, Manandhar 2002). Chepang: *dusi* (Manandhar 2002), *paras* (Manandhar 2002), *sindurya* (Manandhar 2002). Danuwar: *sunphunari* (Manandhar 2002). Darai: *raini* (Rajbhandari 2001a). Gurung: *sindare* (Manandhar 2002). Lepcha: *puroa* (Manandhar 2002), *tukla* (Manandhar 2002). Magar: *sinduri* (Manandhar 2002). Newali: *kamila* (Manandhar 2002). Raute: *rohinya* (Manandhar 2002). Satar: *rora* (Rajbhandari 2001a). Tamang: *pyongla* (Manandhar 2002), *sililin* (Manandhar 2002), *sindri* (Manandhar 2002), Tharu: *rohini* (Rajbhandari 2001a, Manandhar 2002).

Uses — Lopped plant is used for fodder (Manandhar 2002). Powder of red glands of

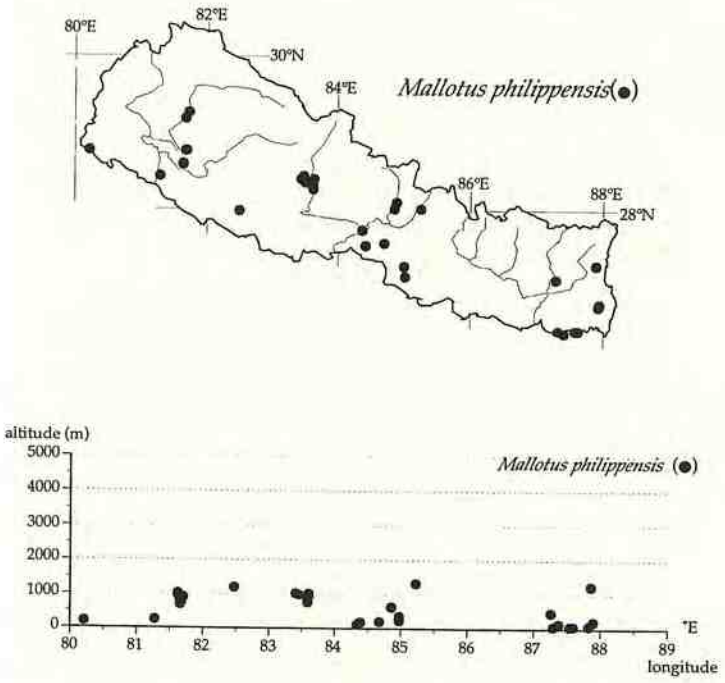

Fig. 28. Distribution of *Mallotus philippensis* (Lam.) Müll. Arg. in Nepal.

fruit is used as a dye or anthelmintic and purgative (Siwakoti & Varma 1999, Rajbhandari 2001a, Manandhar 2002). Juice of root, boiled root, decoction of bark, juice of bark, juice of leaves, and dried fruit are medicinally applied for various diseases (Rajbhandari 2001a, Manandhar 2002).

2. Mallotus aff. **philippensis** (Lam.) Müll. Arg.*

Distribution — Endemic to Nepal. In Nepal: Western, Central.

Habitat & Ecology — Altitude 1350–2100 m. In forests. Flowers from April to August; fruits from July to October.

Notes — This species was treated as *M. philippensis* in Malla et al. (1986). Identity and circumscription of this species will be discussed in another paper*.

3. Mallotus repandus (Willd.) Müll. Arg.

Mallotus repandus (Willd.) Müll. Arg., Linnaea 34: 197 (1865); Müll. Arg. in DC. Prodr. 15(2): 981 (1866); Hook. f., Fl. Brit. India 5: 442 (1887); Croizat, J. Arnold. Arbor. 19: 145 (1938); D. G. Long in Fl. Bhutan 1: 802 (1987); Siwakoti & Varma, J. Econ. Taxon. Bot. 18: 497 (1994); Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 28, t. 8, f. 5–6 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 165 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 329 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1123 (2000); van Welzen et al., Thai Forest Bull., Bot. 28: 107 (2000). — *Croton repandus* Willd., Ges. Naturf. Freunde Berlin Neue Schriften 4: 206 (1803). — [*Mallotus repandus* (Willd.) Müll. Arg. var. *geninus* Müll. Arg., Linnaea 34: 197 (1865), nom. inval.] — Type: *Klein s. n.* (B† (fide Airy Shaw 1980)), S. India.

Croton rhombifolius Willd., Sp. Pl. 4: 555 (1805). — Type: (n. v.), in Zeylona.

Rottlera scabrifolia A. Juss., Euphorb. Gen.: 111 (1824). — *Mallotus repandus* (Willd.) Müll. Arg. var. *scabrifolius* (A. Juss.) Müll. Arg., Linnaea 34: 197 (1865); Müll. Arg. in DC. Prodr. 15(2): 982 (1866).

Rottlera scandens Span., Linnaea 15: 348 (1841). — *Mallotus scandens* (Span.) Müll. Arg. in DC. Prodr. 15(2): 982 (1866). — Type: (n. v.), circa Koepang.

[*Croton baccifera* Wall., Numer. List: 272, no. 7826 (1847), nom. nud.]

Croton volubilis Llanos, Mem. Real. Acad. Ci. Exact. Madrid 4: 503 (1856).

Dioecious climbing shrub. *Twigs* surface obscured by stellate tomentum. *Leaves* alternate; petiole 1–3.5 cm long, attached at 1–1.5 mm from the base of blade, surface obscured by stellate tomentum; blade ovate or widely ovate, 4–9.5 by 3–8.5 cm, base truncate, narrowly peltate, apex acuminate, margin entire, upper surface stellate-hairy on veins, lower surface stellate-hairy, not obscured, secondary veins pinnate, 4 or 5 pairs; 1 or 2 pairs of basal glands on upper surface, elliptic, 0.4–0.6 by 0.3–0.4 mm, situated at 1.5–6 mm from petiole attachment. *Inflorescences* terminal, racemose or paniculate, erect, surface obscured by stellate tomentum, bracts persistent, linear, 1–1.5 by ca. 0.2 mm, apex acute, surface obscured by stellate tomentum. *Staminate inflorescences* not seen. *Staminate flowers* not seen. *Pistillate inflorescences* not seen. *Pistillate flowers* not seen. *Fruit* not seen. *Seeds* not seen.

Distribution — Sri Lanka, India, Nepal, Bhutan, Thailand, Malaysia (Peninsular),

* The taxon was described as *Mallotus bicarpellatus* T. Kuros. (Kurosawa in Edinburgh J. Bot. 61: 31 (2005)).

Siumatera, Jawa, Lesser Sunda Isls., Sulawesi, New Guinea, Australia (Queensland), New Caledonia, Philipinnes, China (Southeast, Hainan), Taiwan (Long 1987, Kiu et al. 1996, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Western.

Habitat & Ecology — Altitude up to 160 m. Occasional in eastern plains (Siwakoti & Varma 1994, 1999). Flower buds in January.

Notes — This species was firstly reported by Siwakoti & Varma (1994) from Biratnagar.

4. Mallotus roxburghianus Müll. Arg. — Fig. 29.

Mallotus roxburghianus Müll. Arg., Linnaea 34: 186 (1865), nom. nov.; Müll. Arg. in DC., Prodr. 15(2): 962 (1866); Kurz, Forest Fl. Burma 2: 383 (1877); Hook. f., Fl. Brit. India 5: 428 (1887); D. G. Long in Fl. Bhutan 1: 802 (1987); S. M. Hwang, Acta Phytotax. Sin. 23: 301 (1985); S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 24, t. 6, f. 6–9 (1996); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1124 (2000). — *Rottlera peltata* Roxb., Fl. Ind. ed. 1832, 3: 828 (1832); Wight, Icon. Pl. Ind. Orient. 5(2): 21, t. 1873 (1852); Wall., Numer. List: 272, no. 7823 (1847). — Type: [*Collector unknown s. n.*] (BM!).

Shrub, 4 m high, stem diameter 5 cm. *Twigs* stellate-tomentose or stellate-hirsute. *Leaves* alternate; petiole 3–11 cm long, stellate-tomentose or densely stellate-hirsute, attached at 1–2 cm from the base of blade; blade simple, widely ovate, 9–22 by 5.5–21 cm, base rounded, peltate, apex acuminate or caudate, margin denticulate, glandular, venation palmately 7–10-veined, with 4–6 secondary veins, upper surface pubescent or hirsute with sparse stellate hairs, lower surface stellate-pubescent with minute glands, basal glands 1 or 2 pairs, situated from 2–12 mm from petiole attachment on upper surface, elliptic, 0.2–0.8 by 0.1–0.5 mm. *Inflorescences* terminal, racemose, erect; rachis simple, stout, angular, stellate-tomentose or densely stellate-hirsute; bracts persistent, linear or lanceolate, 2–7 by 0.2–1 mm, stellate-tomentose or stellate-hirtsute, apex acuminate. *Staminate inflorescences* 11–13.5 cm long. *Staminate flowers*: pedicel 3–4 mm long, stellate-pubescent; calyx lobes 5, obovate, ca. 2 by ca. 1 mm, outside stellate-pubescent, inside glabrate; stamens many; filaments ca. 2.5 mm long; anthers subglobose, ca. 0.4 mm long. *Pistillate inflorescences* ca. 17 cm long. *Pistillate flowers*: pedicel 1–3 mm long, stellate-tomentose; calyx lobes 2–4, unequal, lanceolate, ca. 3 by ca. 1 mm, apex acuminate, outside stellate-tomentose; ovary depressed globose, ca. 1.5 mm long, ca. 2 mm in diam., with dense soft spine, densely stellate-hairy; stigmas 3, sessile, ca. 3.5 mm long, papillate. *Infructescences* 12–25 cm long. *Fruits*: pedicel 6–14 mm long; capsule dehiscent, 3-locular, subglobose, ca 4.5 cm long, ca. 6 mm in diam., stellate with long soft spines of 7–8 mm long; columella persistent after dehiscence, ca. 4 mm long. *Seeds* compressed globose, 4.5–5 mm long, 4.2–4.5 mm wide, ca. 3.8 mm thick, shiny, smooth, dark brown, released after dehiscence.

Distribution — India (Sikkim, Assam), Nepal, China (South-central) (Hwang 1985, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 500–550 m. In *Shorea robusta* forests. Flowers in June; fruits in September.

Notes — This species was recently reported by Chalise (1995) and Wesche (1995) and treated as "*Mallotus* sp." in my previous paper (Kurosawa 1998).

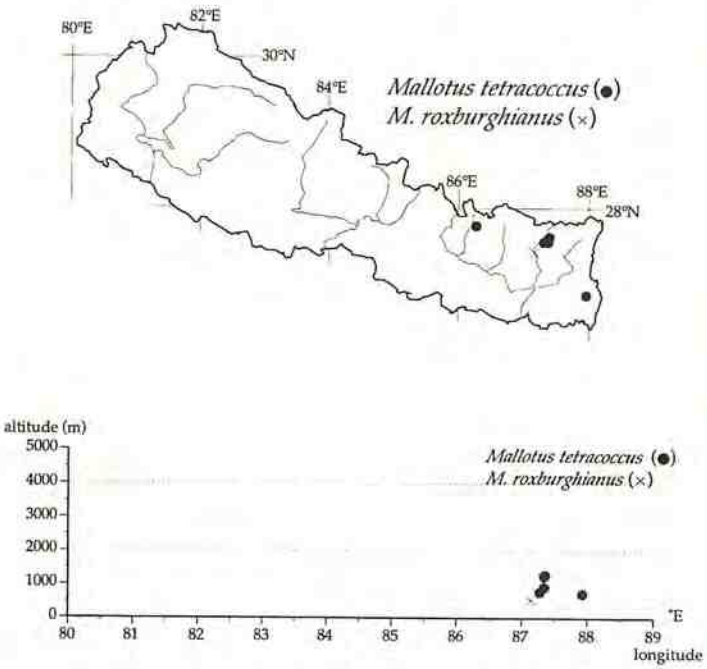

Fig. 29. Distribution of *Mallotus tetracoccus* (Roxb.) Kurz and *M. roxburghianus* Müll. Arg. (Burm. f.) Merr. in Nepal.

5. Mallotus nepalensis Müll. Arg. — Plate 71; Fig. 30.

Mallotus nepalensis Müll. Arg., Linnaea 34: 188 (1865); Müll. Arg. in DC., Prodr. 15(2): 964 (1866); Hook. f., Fl. Brit. India 5: 428 (1887), p. p.; Croiz., J. Arnold Arbor. 19: 135 (1938); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966); Airy Shaw, Kew Bull. 21: 387 (1968); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); Malla et al., Fl. Kathmandu Valley: 627 (1986); D. G. Long in Fl. Bhutan 1: 800 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1120 (2000). — Type: *Wallich, List no. 7824* (herb. Soc. Linn. Londin. n. v.; iso K!, K-WALL!, BM!), in Nepalia Indiae orientalis.

Mallotus oreophilus Müll. Arg. var. *floccosus* Müll. Arg., Linnaea 34: 188 (1865); Müll. Arg. in DC., Prodr. 15(2): 964 (1866); S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 44 (1996). — *Mallotus nepalensis* Müll. Arg. var. *floccosus* (Müll. Arg.) Pax in Engl., Pflanzenr., IV, 147, VII: 166 (1914). — *Mallotus tenuifolius* Pax var. *floccosus* (Müll. Arg.) Croizat, J. Arnold Arbor. 19: 138 (1938). — *Mallotus japonicus* (Thunb.) Müll. Arg. var. *floccosus* (Müll. Arg.) S. M. Hwang, Acta Phytotax. Sin. 23: 299 (1985). — Type: *Hook. & Thoms., Rottl. 5 quoad foem.* (holo G-DC (IDC microfiche in TI) n. v.); iso K!), [Mont Khasia, alt 5000 ped.].

Dioecious shrub, small tree, or tree, 3.6–12 m high, stem diameter 7–25 cm. *Twigs* densely stellate-hairy. *Leaves* alternate; petiole 5–14 cm long, densely stellate-hairy; blade ovate or widely ovate, 8.5–24 by 5.5–20 cm, base rounded or truncate, not peltate, apex acuminate, margin entire, upper surface stellate-hairy or glabrate, lower surface stellate-hairy, punctate, not obscured, secondary veins pinnate, 9–11 pairs, a pair of basal glands on upper surface, elliptic, 0.8–2 by 0.4–0.9 mm, situated at 0.5–3 mm from

petiole attachment. *Inflorescences* terminal, racemose, erect; rachis simple, stout, angular, densely stellate-hairy; bracts persistent, linear, 2.5–7 by 0.3–1 mm, stellate-tomentose, apex acute. *Staminate inflorescences* 10.5–20 cm long. *Staminate flowers* 5–7 mm diam.; pedicel 4–6 mm long, densely stellate-hairy; calyx lobes 3 or 4, ovate, 3.5–4 by 2.5–3.5 mm, outside densely stellate-hairy, inside glabrate; stamens many; filaments ca. 3 mm long; anthers subglobose, 0.3–0.4 mm long. *Pistillate inflorescences* ca. 3.5 cm long, 3.5–5 mm in diam. (6–18 cm long when fruit). *Pistillate flowers* subsessile; calyx lobes narrowly triangular, 2–3 by 0.7–0.9 mm, densely stellate-hairy, apex acuminate; stigmas 3, sessile, 3.5–4 mm long, 0.6–0.8 mm in diam., papillate. *Fruits*: pedicel ca. 3 mm long; capsule dehiscent, 3-locular, subglobose, 7–8 mm long, ca. 7 mm in diam., stellate-hairy, with long soft spines of 5–6 mm long. *Seeds* compressed globose, ca. 5 mm long, ca. 4.5 mm wide, ca. 3.8 mm thick, shiny, smooth, black, not released after dehiscence.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma, China (South-central) (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 1650–2400 m. In forests, on forest margin, or on slopes. Flowers from May to August; fruits from June to August.

Notes — *Mallotus japonicus* (Thunb. ex L. f.) Müll. Arg. differs from *M. nepalensis* by its paniculate inflorescences and pedicellate (3–4 mm long) pistillate flowers.

See notes under *M. oreophilus* for the typification of *M. oreophilus* var. *floccosus*.

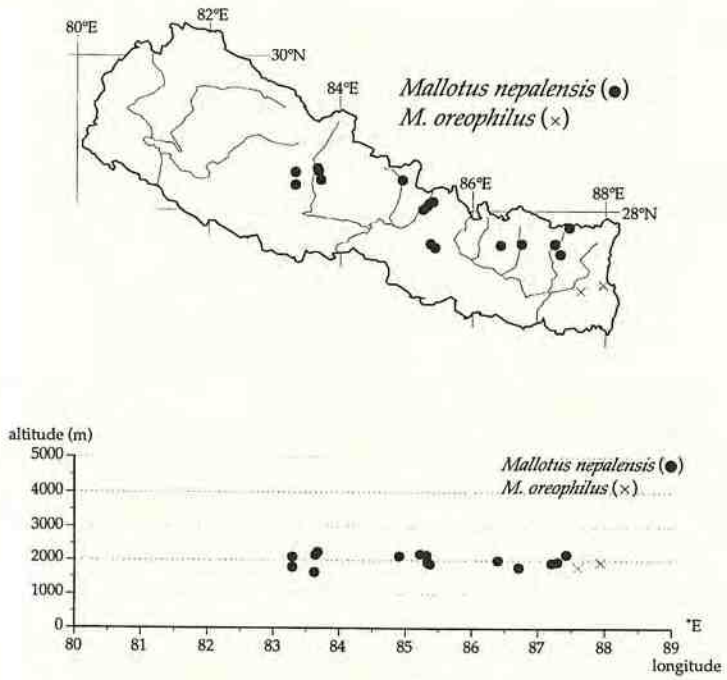

Fig. 30. Distribution of *Mallotus nepalensis* Müll. Arg. and *M. oreophilus* Müll. Arg. in Nepal.

6. Mallotus oreophilus Müll. Arg. — Plate 10; Fig. 30.

Mallotus oreophilus Müll. Arg., Linnaea 34: 188 (1865); Müll. Arg. in DC., Prodr. 15(2): 964 (1866); Airy Shaw, Kew Bull. 21: 387 (1968); D. G. Long in Fl. Bhutan 1: 800 (1987); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1121 (2000). — *Mallotus oreophilus* Müll. Arg. var. *ochraceo-albidus* Müll. Arg., Linnaea 34: 188 (1865), nom. superfl.; Müll. Arg. in DC., Prodr. 15(2): 964 (1866). — *Mallotus nepalensis* Müll. Arg. var. *ochraceo-albidus* (Müll. Arg.) Pax in Engl., Pflanzenr., IV, 147, VII: 166 (1914), nom. illeg.; Croiz., J. Arnold Arbor. 19: 135 (1938); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966). — *Mallotus japonicus* (Thunb.) Müll. Arg. var. *ochraceo-albidus* (Müll. Arg.) S. M. Hwang, Acta Phytotax. Sin. 23: 298 (1985), nom. illeg. — *Mallotus japonicus* (Thunb.) Müll. Arg. var. *oreophilus* (Müll. Arg.) S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 44 (1996). — Type: *Hook. & Thoms., Rottl. 5 quoad male* (holo G-DC (IDC microfiche in TI) n. v.; iso K!, BM!), in India orientali, in Sikkim.

Mallotus nepalensis auct. non Müll. Arg., Linnaea 34: 188 (1865): Hook. f., Fl. Brit. India 5: 430 (1887), p. p.

Mallotus japonicus auct. non (L. f.) Müll. Arg., Linnaea 34: 189 (1865): Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1117 (2000), p. p.

Dioecious small tree or tree, 7–12 m high, stem diameter 12 cm. *Twigs* stellate-tomentose. *Leaves* alternate; petiole 2.5–16 cm long, stellate-tomentose, attached at 0.8–1.5 mm from the base of blade; blade ovate or narrowly ovate, 12–26 by 5.5–21 cm, base rounded, narrowly peltate, apex acuminate, margin entire, upper surface stellate-hairy or glabrate, lower surface stellate-tomentose, completely obscured, secondary veins pinnate, 7–9 pairs, a pair of basal glands obscure or on upper surface, elliptic, 1.2–1.5 by 0.6–0.8 mm, situated at 1–2.5 mm from petiole attachment. *Inflorescences* terminal, racemose, erect; rachis simple, stout, angular, stellate-tomentose; bracts persistent, linear, 3.5–7 by ca. 0.5 mm, stellate-tomentose. *Staminate inflorescences* not seen. *Staminate flowers* not seen. *Pistillate inflorescences* ca. 8 cm long, ca. 5 mm in diam. (ca. 15 cm long in fruit). *Pistillate flowers* subsessile; calyx lobes 4 or 5, unequal, narrowly triangular or triangular, 1–2 by 0.7–1 mm, apex acuminate, outside stellate-tomentose, inside stellate-hairy; stigmas 3, sessile, 3–3.5 mm long, ca. 1 mm in diam., papillate. *Fruits*: pedicel 1–3 mm long; capsule dehiscent, 3-locular, subglobose, ca. 6 mm long, ca. 7 mm in diam., stellate-hairy, with soft spines of 5–7 mm long; columella persistent after dehiscence, ca. 3.5 mm long. *Seeds* compressed globose, 3.8–4.2 mm long, 3.6–4.2 mm wide, 3–3.3 mm thick, shiny, smooth, black.

Distribution — India (Sikkim), Nepal, China (South-central) (Long 1987, Kiu et al. 1996, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 1800–1950 m. In forests. Flowers from May to June; fruits in September.

Notes — *Mallotus oreophilus* was proposed with two infraspcific taxa, var. *ochraceo-albidus* based on *Hooker & Thomson*, "*Rottlera No. 5, quoad specim. masc.*" from Sikkim and var. *floccosus* based on *Hooker & Thomson*, "*Rottlera No. 5, quoad specim. foem.*" (Müller Argoviensis 1865). The former is interpreted as the type of the species (Croizat 1938, Airy Shaw 1968, Boufford 1990). Hence, according to the International Code of Botanical Nomenclature (Greuter et al. 2000) the name *M. nepalensis* var. *ochraceo-albidus* and *M. japonicus* var. *ochraceo-albidus* are incorrect (Boufford 1990) and the

treatment of *M. oreophilus* Müll. Arg. var. *ochraceo-albidus* Müll. Arg. as a synonym of *M. japonicus* Müll. Arg. by Govaerts et al. (2000) is inconsistent with their treatment of *M. oreophilus* as a distinct species.

Mallotus japonicus (Thunb. ex L. f.) Müll. Arg. differs from the *M. oreophilus* by its not peltate leaves, paniculate inflorescences and pedicellate (3–4 mm long) pistillate flowers.

7. Mallotus tetracoccus (Roxb.) Kurz — Fig. 29.

Mallotus tetracoccus (Roxb.) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 41(2): 245 (1873); Kurz, Forest Fl. Burma 2: 382 (1877); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 802 (1987); S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 33, t. 9, f. 1 or 2 (1996); T. Kuros., Newslett. Himal. Bot. no. 22: 20 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1126 (2000). — *Rottlera tetracocca* Roxb., Fl. Ind. ed. 1832, 3: 826 (1832). — Type: [*Collector unknown s. n.*] (BM!).

Rottlera ferruginea Roxb., Fl. Ind. ed. 1832, 3: 828 (1832). — *Mallotus ferrugineus* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 982 (1866). — Type: [*Collector unknown s. n.*] (BM!).

Rottlera alba auct. non Roxb., Fl. Ind. ed. 1832, 3: 829 (1832): Wall., Numer. List: 271, no. 7812C, D (1847). — *Mallotus albus* auct. non (Roxb.) Müll. Arg., Linnaea 34: 188 (1865): Hook. f., Fl. Brit. India 5: 429 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966).

Dioecious shrub or small tree, 3–9 m high, stem diameter 6–25 cm. *Twigs* densely stellate-hairy. *Leaves* alternate; petiole 5–26 cm long, attached at 1–8 mm from the base of blade, surface obscured by dense stellate tomentum; blade simple or shallowly 3-lobed, widely depressed ovate or very widely ovate, 10–24 by 12–28 cm, base rounded, truncate or cordate, narrowly peltate, apex acute, acuminate or cuspidate, margin entire, upper surface glabrous, lower surface obscured by stellate tomentum, secondary veins pinnate, 7–11 pairs; 1 or 2 pairs of basal glands on upper surface, elliptic or narrowly elliptic, 0.8–4 by 0.4–0.8 mm. *Inflorescences* terminal, racemose or paniculate, erect, surface obscured by stellate tomentum, bracts surface obscured by stellate tomentum. *Staminate inflorescences* 18–34 cm long, branches up to 23 cm long. *Staminate flowers* 4–5 mm diam.; pedicel 1–2 mm long, surfaces obscured by stellate tomentum; calyx lobes 4–6, ovate, ca. 2.5 by 1–1.6 mm, outside densely stellate-hairy, inside glabrate; stamens many; filaments 2–2.5 mm long; anthers subglobose, 0.2–0.3 mm long. *Pistillate inflorescences* 15–23 cm long in fruit, branches up to 14 cm in fruit. *Pistillate flowers*: pedicel 1–4 mm, surfaces obscured by stellate tomentum; calyx lobes 3 or 4, persistent, ovate, 2–3 by 1–2.5 mm, apex acute, outside obscured by stellate tomentum; ovary ovoid, 4-locular, surface obscured by stellate tomentum, densely warted; stigmas 4, sessile, ca. 2.5 mm long, papillate. *Fruits*: pedicel 1.5–3 mm long; capsule depressed globose, ca. 6 mm long, ca. 8 mm in diam., surface obscured by stellate tomentum, with dense verrucae of 1–4 mm long; column persistent after dehiscence. *Seeds* trigonous, 4.2–4.5 mm long, 3–4 mm wide, 3.2–3.5 mm thick.

Distribution — Sri Lanka, India, Nepal, Bhutan, China (South-central) (Govaerts et al. 2000). *Deccan element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 790–1300 m. On sunny slopes. Flowers from July to August; fruits from August to December.

20. Trewia L.

Trewia L., Sp. Pl.: 1193 (1753). — Type species: *Trewia nudiflora* L.

1. Trewia nudiflora L. — Fig. 31.

Trewia nudiflora L., Sp. Pl.: 1193 (1753); Roxb., Fl. Ind. ed. 1832, 3: 837 (1832); Wall., Numer. List: 271, no. 7816, 7817 (1847); Wight, Icon. Pl. Ind. Orient. 5(2): 21, t. 1870, 1871 (1852), "*nudiflorae*"; Müll. Arg. in DC., Prodr. 15(2): 953 (1866); Kurz, Forest Fl. Burma 2: 379; Hook. f., Fl. Brit. India 5: 423 (1887); C. R. Rao, Ind. For. 93: 55 (1967); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); D. G. Long in Fl. Bhutan 1: 799 (1987); Stainton, Flow. Himal. Suppl.: 56, pl. 101 (1988); S. M. Hwang, Fl. Reipubl. Pop. Sin. 44(2): 11, t. 4, f. 1–4 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 143 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 20 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 335 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1560 (2000); Manandhar, Pl. People Nepal: 463 (2002). — Type: (n. v.), in Malabariae arenosis (India).

Trewia integrrima Stokes, Bot. Mat. Med. 4: 570 (1812).

Trewia macrophylla Roth, Nov. Pl. Sp.: 373 (1821).

Trewia macrostachya Klotzsch, Bot. Ergebn. Reise Waldemar: 117, t. 23 (1862). — Type: *Hoffmeister* (n. v.), im Himalaya gefunden.

Trewia polycarpa Benth. & Hook. f., Gen. Pl. 3: 318 (1880); Hook. f., Fl. Brit. India 5: 424 (1887). — Type: (n. v.), peninsulae Indiae.

Mallotus cardiophyllus Merr., Philipp. J. Sci., C 7: 398 (1912 publ. 1913). — Type:

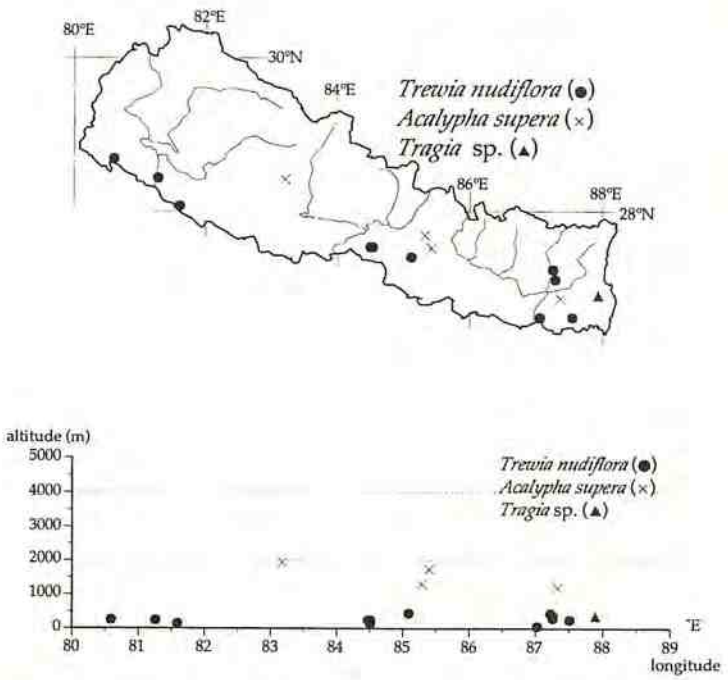

Fig. 31. Distribution of *Trewia nudiflora* L., *Acalypha supera* Forssk., and *Tragia* sp. in Nepal.

Cuming 1267 (n. v.), Luzon, Province of Cagayan.

Small tree or tree, 9–15 m high, stem diameter 42 cm. *Twigs* stellate-tomentose or stellate-hairy. *Leaves* opposite; stipules triangular, ca. 2.5 by ca. 1 mm, apex acuminate, early caducous; petiole 3–16 cm long, stellate-hairy or stellate-tomentose; blade narrowly ovate, ovate or widely ovate, 7–17 by 9–15 cm, base cordate or obtuse, apex acuminate, margin entire, upper surface stellate-hairy or glabrate, lower surface stellate-hairy, venation palmately 5-veined at base, secondary veins pinnate, 4–7 pairs; 2–8 basal glands on upper surface, narrowly elliptic or elliptic, 1–2.5 by 0.3–0.8 mm, situated 2–8 mm from petiole attachment. *Staminate inflorescences* axillary, modified thyrse, 10–23 cm long, 1–2 mm in diam., stellate-tomentose; bracts caducous, narrowly ovate, 4–5 by 1.2–1.5 mm, apex acuminate, outside stellate-tomentose, inside glabtous. *Staminate flowers* 1–5 per node; pedicel 4–9 mm long, stellate-tomentose; sepals 2 or 3, ovate, ca. 5 by 4–5 mm, apex acute, outside stellate-tomentose, inside pilose; stamens many; filaments ca. 2 mm long; anthers ellipsoid, ca. 1 mm long. *Pistillate inflorescences* not seen. *Pistillate flowers* not seen. *Fruits*: pedicel ca. 6 cm long, stellate-hairy or stellate-tomentose; drupaceous, fleshy, indehiscent, obloid, ca. 3.5 cm long, ca. 4 cm in diam., stellate-tomentose or glabrate. *Seeds* not seen.

Distribution — Sri Lanka, India, Nepal, Thailand (North), Vietnam, China (South-central, Hainan), Sumatera, Borneo, Jawa, Philippines (Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Far Western, Mid Western, Central, Eastern.

Habitat & Ecology — Altitude up to 440 m. On roadsides, on river banks, or in *Shorea robusta* forests. Common in eastern plains (Siwakoti & Varma 1999). Flowers from February to March; fruits from June to August.

Vernacular names — Nepali: *belar* (Manandhar 2002), *gamari* (Manandhar 2002), *gule kapasi* (Manandhar 2002), *rambrero* (Manandhar 2002), *ramritha* (Manandhar 2002), *ranipha* (Manandhar 2002). Danuwar: *pithari* (Manandhar 2002). Mooshar: *pitho* (Manandhar 2002).

Uses — Wood is used for planking and in match and paper industries (Manandhar 2002). Lopped leaves is used for fodder (Manandhar 2002). Juice of root is medicinally applied for indigestion, diarrhea, and dysentery (Manandhar 2002).

21. **Acalypha** L.

Acalypha L., Sp. Pl.: 1003 (1753). — Lectotype species designated by Small in Britton & Brown, Ill. Fl. N. US. ed. 2, 2: 457 (1913): *Acalypha virginica* L.

Key to the species

A.Spikes 0.3–1.5 cm long; pistillate bracts deeply 3-lobed ..... **1. A. supera** Forssk.
A.Spikes 1.5–6 cm long; pistillate bracts dentate, unlobed ..... excl. 1. **A. indica** L.

1. Acalypha supera Forssk. — Fig. 31.

Acalypha supera Forssk., Fl. Aegypt.-Arab.: 162 (1775); Hepper & Friis, Pl. P. Forssk. Fl. Aegypt.-Arab.: 153 (1994); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 90 (2000). — Type: not designated.

Acalypha brachystachya Hornem., Hort. Bot. Hafn.: 909 (1815); Müll. Arg. in DC., Prodr. 15(2): 870 (1866); Hook. f., Fl. Brit. India 5: 416 (1887); Short & Vickery in

Enum. Flow. Pl. Nepal 3: 193 (1982); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 475 (1983); D. G. Long in Fl. Bhutan 1: 797 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 103, t. 25, f. 1–5 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 130 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 20 (1998). — *Ricinocarpus brachystachyus* (Hornem.) Kuntze, Revis. Gen. Pl. 2: 617 (1891). — Type: (holo C (fide Radcliffe-Smith 1987b) n. v.), China, specimen cult. 1806 in Copenhagen Botanic Garden.

Acalypha conferta Roxb., Fl. Ind. ed. 1832, 3: 677 (1832). — Type: (n. v.), the Botanic garden (Calcutta), native of China.

[*Acalypha calyciformis* Wight ex Wall., Numer. List: 271, no. 7786 (1847), nom. nud.]

[*Acalypha fissa* Wall., Numer. List: 271, no. 7786B (1847), nom. nud.]

[*Tragia tenuis* Wall., Numer. List: 271, no. 7787 (1847), nom. nud.]

Acalypha elegantula Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 246 (1850). — Type: *Schimper 1708*, 31 Aug. 1840 (holo TUB (fide Radcliffe-Smith 1987b) n. v.; iso G, K, P (fide Radcliffe-Smith 1987b) n. v.), Ethiopia, Tegre (Tigray), near Djeladjeranne.

Nanocnide closii H. Lév. & Vant., Bull. Soc. Bot. France 51: 144 (1904). — Type: *Cavalerie in herb. Bodinier 2732*, Sep. 1899 (holo E (fide Lauener 1983) n. v.), China, Kweichow, environs de Tou-chan.

Annual monoecious herb. *Stems* erect, branched at middle and lower nodes, 20–45 cm long, sparsely hirsute and with dense short decending hairs. *Leaves* 10–16, alternate; stipules persistent, triangular or lanceolate, 0.8–1 mm long; petiole 1.5–3 cm long, sparsely hirsute with short ascending hairs; blade ovate, 2–4.5 by 1–3 cm, base obtuse or rounded, apex caudate, margin dentate, both surfaces sparsely hirsute, venation 3-veined at base. *Inflorescences* axillary, spiciform, bisexual or unisexual, without peduncles, 0.3–1.5 cm long, hirtellous. *Staminate flowers* many, dense at upper part of inflorescence. *Pistillate flowers* sessile, 1 or 2 per bract; bracts deeply 3-lobed, 1 to several at base of inflorescence, lobes lanceolate, 2.5–5 by 1–2 mm, apex acute or acuminate, hirtellous; ovary globose, hirtellous; styles 3, fimbriate, 1–1.8 mm long, often reddish. *Fruits*: capsule very broadly ovoid, ca. 1.2 mm long, ca. 2 mm in diam., hirtellous. *Seeds* carunculate, ellipsoid, 1.2–1.5 mm long, 0.8–1 mm wide, smooth, brown or whitish.

Distribution — West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Yemen, Pakistan, Sri Lanka, India, Nepal, Bhutan, Sumatera, Jawa, Sulawesi, Lesser Sunda Isls., China (South-central) (Long 1987, Govaerts et al. 2000). *Pan old tropic*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 1200–1950 m. On roadsides, on stone walls, or in crop fields. Flowers & fruits from August to September.

22. **Tragia** L.

Tragia L., Sp. Pl.: 980 (1753). — Lectotype species designated by Small in Britton & Brown, Ill. Fl. N. US. ed. 2, 2: 458 (1913): *Tragia volubilis* L.

Key to the species

A. Leaf blades elliptic, 14–18 by 6.5–8.5 cm, base cordate ..... **1. Tragia** sp.

A. Leaf blades narrowly ovate-lanceolate, 4–7.5 by 0.5–1.5 cm, base cuneate ..... excl. 2. **T. involucrata** L.

1. Tragia sp. — Plate 11; Fig. 31.

Tragia involucrata sense Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982), non L., Sp. Pl.: 980 (1753); T. Kuros., Newslett. Himal. Bot. no. 22: 21 (1998).

Twinning herb. *Stems* densely pilose or tomentose. *Leaves* alternate; stipules persistent lanceolate, 5–10 by 1.5–3 mm, densely pilose, apex acuminate; petiole 2–7 cm long, tomentose; blade elliptic, 14–18 by 6.5–8.5 cm, base cordate, apex acuminate or caudate, margin dentate, venation 3-veined at base, secondary veins 4–6 pairs, upper surface pilose, lower surface densely pubescent. *Inflorescences* not seen. *Staminate flowers* not seen. *Pistillate flowers* not seen. *Fruit* not seen. *Seeds* not seen.

Distribution — Unknown. In Nepal: Eastern.

Habitat & Ecology — Altitude 390 m. Among shrubs.

Notes — I could find only one sheet of *Tragia* specimen from Nepal during the study that Short & Vickery (1982) regarded as *T. involucrata*. The specimen consists of a twinning shoot without any reptoductive organs. Although I could not identify it to species level, it seems rather to be resemble to *T. montana* (Twaites) Müll. Arg., *T. hispida* Willd., or *T. involcrata* L. var. *rheediana* Müll. Arg. in its large elliptic leaves with cordate base and large stipules.

Tragia involucrata have been recorded from East Nepal (Siwakoti & Varma 1999, Rajbhandari 2001a). See under excluded taxa.

Subfamily III. CROTONOIDEAE Pax

Crotonoideae Pax, Bot. Jahrb. Syst. 5: 413 (1884). — Type: *Croton* L.

23. Manihot Mill.

Manihot Mill., Gard. Dict. Abr. ed. 4 (1754). — Type species: *Manihot esculenta* Crantz [*Jatropha manihot* L.].

1. Manihot esculenta Crantz — Fig. 32.

Manihot esculenta Crantz, Inst. Rei Herb. 1: 167 (1766); D. G. Long in Fl. Bhutan 1: 795 (1987). — *Jatropha manihot* L., Sp. Pl.: 1007 (1753). — Lectotype fide Radcliffe-Smith (1987b): *Herb. Linnaeus, No. 1141-11* (LINN n. v.)

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of Mexico and tropical America, widely cultivated in tropical region (Govaerts et al. 2000). In Nepal: Eastern.

Habitat & Ecology — Altitude 1200 m.

24. Jatropha L.

Jatropha L., Sp. Pl.: 1006 (1753). — Lectotype species, not traced: *Jatropha gossypiifolia* L.

Key to the species

A. Leaves deeply 3–5-lobed, with densely glandular-hairy margin; capsules ca. 1.3 cm long, ca. 1 cm in diameter ..... **1. J. gossypiifolia** L.

A. Leaves shallowly 3–5-lobed, with glabrous margin; capsules ca. 2.5 cm long, ca. 2 cm in diameter ..... **2. J. curcas** L.

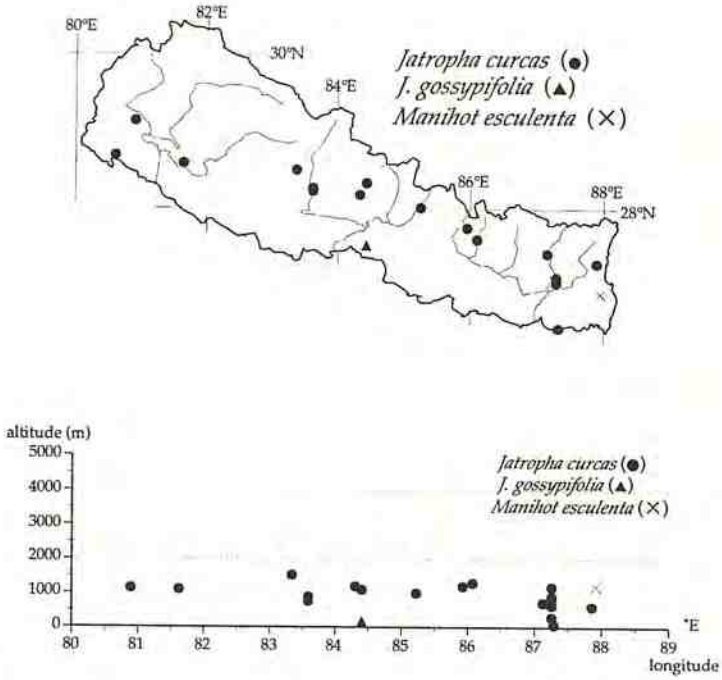

Fig. 32. Distribution of *Jatropha gossypiifolia* L., *J. curcas* L. and *Manihot esculenta* Crantz in Nepal.

1. Jatropha gossypiifolia L. — Fig. 32.

Jatropha gossypiifolia L., Sp. Pl.: 1006 (1753), "*gossypifolia*"; Müll. Arg. in DC., Prodr. 15(2): 1086 (1866); Hook. f., Fl. Brit. India 5: 383 (1887); Baehni, Candollea 17: 70 (1959); C. R. Rao, Ind. For. 93: 55 (1967); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); T. Kuros., Newslett. Himal. Bot. no. 22: 21 (1998), "*gossypifolia*"; Siwakoti & Varma, Pl. Divers. E. Nepal: 327 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1025 (2000); Manandhar, Pl. People Nepal: 279 (2002). — Type fide Coode et al. (1982): *Herb. Linnaeus, No. 1141-1* (LINN (fide Radcliffe-Smith 1987b) n. v.), in America meridionali; *Royen* (L (fide Radcliffe-Smith 1987b) n. v.), in America meridionali.

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of SE. Mexico and Tropical America (Govaerts et al. 2000), cultivated in pantropical areas and introduced into the Old World (Webster & Burch 1968). In Nepal: Central.

Habitat & Ecology — Altitude 200 m. On sunny waste ground. Common in eastern plains (Siwakoti & Varma 1999). Flowers from December to February; fruits in December.

Vernacular names — Nepali: *bepane danti* (Manandhar 2002). Danuwar: *chhotaka baghandi* (Manandhar 2002). Mooshar: *lal baghandi* (Manandhar 2002).

2. Jatropha curcas L. — Fig. 32.

Jatropha curcas L., Sp. Pl.: 1006 (1753); Roxb., Fl. Ind. ed. 1832, 3: 686 (1832); Wall., Numer. List: 271, no. 7799A–C, D, p. p., H (1847); Müll. Arg. in DC., Prodr. 15(2):

1080 (1866); Kurz, Forest Fl. Burma 2: 403 (1877); Hook. f., Fl. Brit. India 5: 383 (1887); Burkill, Rec. Bot. Surv. India 4: 120 (1910); Baehni, Candollea 17: 70 (1959); Banerji, Rec. Bot. Surv. India 19(2): 82 (1966); Hurus. & Ya. Tanaka in Fl. E. Himal.: 179 (1966); Murata, Acta Phytotax. Geobot. 25: 114 (1973); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); Malla et al., Fl. Kathmandu Valley: 626 (1986); D. G. Long in Fl. Bhutan 1: 790 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 148 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 85 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 21 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 327 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1022 (2000); Manandhar, Pl. People Nepal: 278 (2002). — Lectotype fide Radcliffe-Smith (1987b): *Hort. Cliff.: 445* (BM n. v.), from 'America calidiore.'

See Govaerts et al. (2000) for further synonyms.

Distribution — Native probably to Mexico and Guatemala (Webster & Burch, 1968), cultivated as a medicinal or hedge plant in pantropical areas, and often escaping (Webster & Burch 1968). In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 290–2000 m. On roadsides or on edge of cultivation. Flowers from May to November; fruits from June to November.

Vernacular names — Nepali: *arin* (Manandhar 2002), *kadam* (Manandhar 2002), *nimte* (Manandhar 2002), *sajyon* (Manandhar 2002), *saruwa* (Siwakoti & Varma 1999). Chepang: *dhuching* (Manandhar 2002), *nirguri* (Manandhar 2002). Danuwar: *akakgachha* (Manandhar 2002), *arari* (Manandhar 2002). Gurung: *rajani giri* (Manandhar 2002), *sajin* (Manandhar 2002), *satiman* (Manandhar 2002). Magar: *ratyun* (Manandhar 2002). Majhi: *aren* (Manandhar 2002), *aril* (Manandhar 2002). Mooshar: *baghandi* (Manandhar 2002). Rai: *kadam* (Manandhar 2002). Raute: *dekiro* (Manandhar 2002). Tamang: *desya* (Manandhar 2002), *gara* (Manandhar 2002), *gyagar desya* (Manandhar 2002). Tharu: *ratanjot* (Manandhar 2002).

Uses — Cultivated as hedge plant or to collect seeds containing oil for lighting (Siwakoti & Varma 1999, Manandhar 2002). Tender shoots are cooked as a vegetable (Manandhar 2002). Juice, bark, leaf, cotyledon and seed oil are medicinally applied for various diseases (Siwakoti & Varma 1999, Manandhar 2002).

25. **Ostodes** Blume.

Ostodes Blume, Bijdr.: 619 (1826). — Type species: *Ostodes paniculata* Blume

1. Ostodes paniculata Blume — Fig. 33.

Ostodes paniculata Blume, Bijdr.: 620 (1826); Müll. Arg. in DC., Prodr. 15(2): 1115 (1866); Kurz, Forest Fl. Burma 2: 404 (1877); Hook. f., Fl. Brit. India 5: 400 (1887); Banerji, Candollea 19: 218 (1964); Banerji, Rec. Bot. Surv. India 19(2): 83 (1966); Hurus. & Ya. Tanaka in Fl. E. Himal.: 180 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 197 (1982); D. G. Long in Fl. Bhutan 1: 795 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 157 (1996); T. Kuros., Newslett. Himal. Bot. no. 22: 21(1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1231 (2000); Manandhar, Pl. People Nepal: 343 (2002). — Type: (n. v.), in sylvis montium Salak, Burangrang et Tjerimai (Java).

Ostodes corniculata Baill., Étude Euphorb.: 391 (1858).

Ostodes kerrii Craib, Bull. Misc. Inform. Kew 1911: 464 (1911).

Ostodes thyrsantha Pax in Engler, Pflanzenr., IV, 147, II: 18 (1911). — *Ostodes paniculata* Blume var. *thyrsantha* (Pax) Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 27: 260 (1985 publ. 1987).

Ostodes prainii Gand., Bull. Soc. Bot. France 66: 287 (1919 publ. 1920).

Shrub or small tree, 3–10 m high, stem diameter 15–31 cm. *Twigs* tomentose. *Leaves* alternate; petiole 4–24 cm long, with appressed hairs or glabrous, paired glands at apex, ca. 0.5–1 mm broad, stalked or sessile; blade narrowly ovate or ovate, 11.5–27 by 5.5–13 cm, base subcordate or rounded, apex acuminate or caudate, margin bluntly serrate, with a gland at the top of every tooth, 3-veined, upper surface glabrous, lower surface hairy at sides and axils of veins. *Staminate inflorescences* paniculate, cauliflorious, 6–30 cm long, 1–1.5 mm in diam., glabrous; the lowest branch 0.5–4.5 cm long. *Staminate flowers*: pedicel 4–5 mm long, glabrous; sepals 3, unequal, elliptic or orbicular, 3–3.5 by 2–3 mm, glabrous or villous; petals 5, unequal, ellptic, orbicular or transversely elliptic, 4–7 by ca. 5 mm, apex rounded, margin entire, glabrous; stamens many; filaments ca. 5 mm long, lower half villous; anthers ellipsoid, ca. 0.8 mm long. *Pistillate inflorescences* racemose, cauliflorious, 15–30 cm long when fruit. *Pistillate flowers* on racomes, cauliflorious; ovary 3-carpellate. *Fruits*: capsule subglobose, 1.8–2.2 cm high, 2.3–2.5 cm in diam., tomentose; columella persistent after dehiscence, 1.7–1.9 cm long. *Seeds* broadly ellipsoid, 1.4–1.6 cm long, 1.2–1.3 cm wide, glabrous.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma, Thailand, Vietnam, Malaysia (Peninsular), Sumatera, Jawa, China (South-central, Hainan) (Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 600–1350 m. On rocky slopes, on roadsides, or in

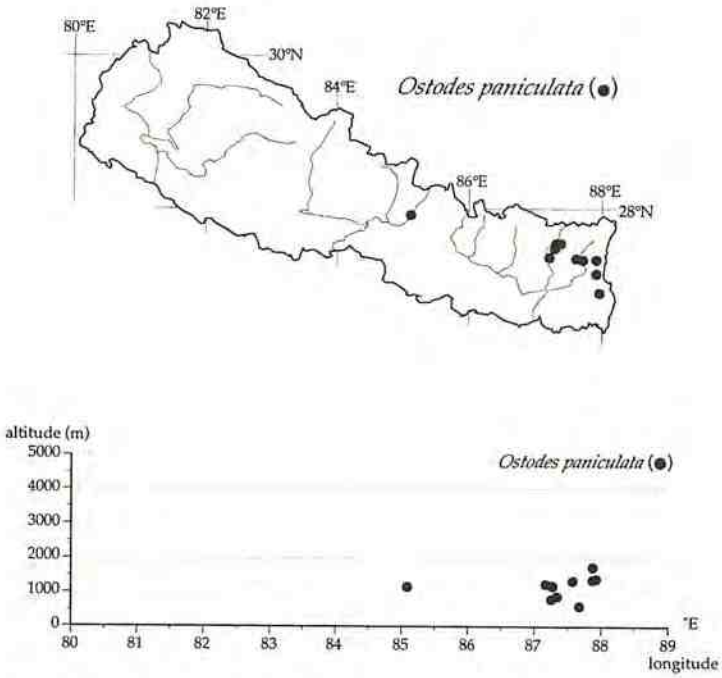

Fig. 33. Distribution of *Ostodes paniculata* Blume in Nepal.

forests. Flowers in April; fruits from July to November.

Vernacular name — Nepali: *bepari* (Manandhar 2002).

Uses — Seed oil is medicinally used for muscular swellings (Manandhar 2002).

26. **Baliospermum** Blume

Baliospermum Blume, Bijdr.: 603 (1826). — Type species: *Baliospermum axillare* Blume

Key to the species

A. Monoecious; leaf margin crenate; sepals of pistillate flowers ca. 1 by ca. 0.6 mm, pubescent, styles ca. 1.5 mm long; capsules globose, pubescent
..... **1. B. montanum** (Willd.) Müll. Arg.

A. Dioecious; leaf margin crenate; sepals of pistillate flowers 5–7 by 1–2.5 mm, villous or glabrate, styles ca. 3 mm long; capsules depressed ovoid, glabrous
..... **2. B. corymbiferum** Hook. f.

1. Baliospermum montanum (Willd.) Müll. Arg. — Fig. 34.

Baliospermum montanum (Willd.) Müll. Arg. in DC., Prodr. 15(2): 1125 (1866); Kurz, Forest Fl. Burma 2: 410 (1877); Hurus. & Ya. Tanaka in Fl. E. Himal.: 174 (1966); C. R. Rao, Ind. For. 93: 55 (1967); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 811 (1987); H. S. Kiu et al., Fl. Reipubl. Pop. Sin.44(2): 178, t. 47, f. 4 (1996); T. Kuros., Newslett. Himal. Bot. no. 22: 21 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 320 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 243

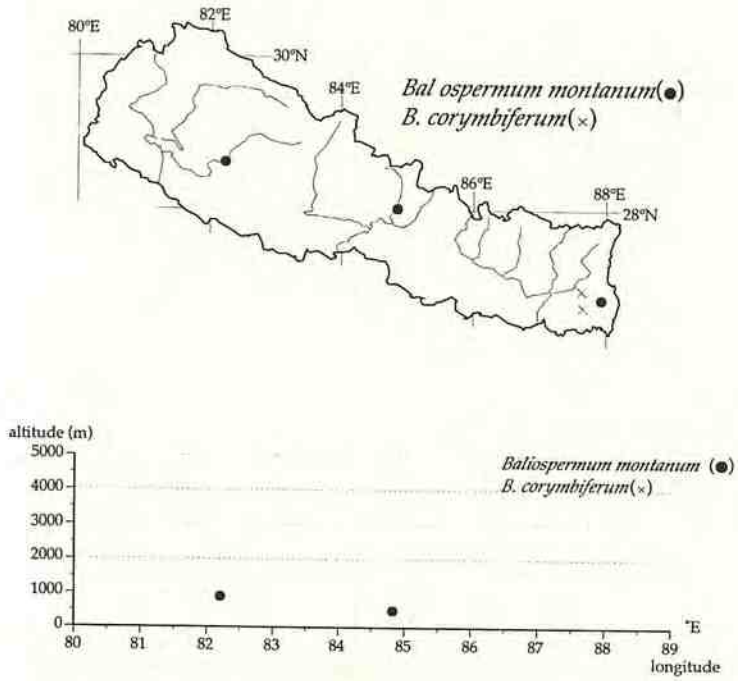

Fig. 34. Distribution of *Baliospermum montanum* (Willd.) Müll. Arg. and *B. corymbiferum* Hook. f. in Nepal.

(2000); Rajbhandari, Ethnobot. Nepal: 57 (2001). — *Jatropha montana* Willd., Sp. Pl. 4: 563 (1805). — *Croton polyandrus* Roxb., Fl. Ind. ed. 1832, 3: 682 (1832), nom. illeg. — *Ricinus montanus* (Willd.) Wall., Numer. List: 270, no. 7727 (1847) — *Baliospermum polyandrum* Wight, Icon. Pl. Ind. Orient. 5(2): 23, t. 1885 (1852), nom. superfl. — Type: [*Klein s. n.*] (B-WILLD (fide Chakrabarty & Balakrishnan 1990) n. v.), India orientali.

Croton solanifolius Geiseler, Croton. Monogr.: 74 (1807); A. Juss., Euphorb. Gen.: 31 (1824). — *Baliospermum indicum* Decne. in Jacquem., Voy. Inde 4: 154, t. 155 (1844), nom. illeg. — *Baliospermum solanifolium* (Geiseler) Suresh in Nicolson et al., Interpret. Rheede's Hort. Malab: 106 (1988). — Type: *Vahl s. n.* (C (fide Chakrabarty & Balakrishnan 1990) n. v.), India.

Baliospermum axillare Blume, Bijdr.: 604 (1826); Hook. f., Fl. Brit. India 5: 461 (1887). — Type: [*Blume*] (L? (Chakrabarty & Balakrishnan 1990) n. v.), Java, in montosis.

[*Baliospermum moritzianum* Baill., Étude Euphorb.: 395 (1858), nom. nud.]

Baliospermum pendulinum Pax in Engl., Pflanzenr., IV, 147, IV: 28 (1912). — Type: *Wawra 2495* (n. v.), Gebiet der Sandwich-Inseln, Honolulu.

Bliospermum raziana Keshava, Murthy & Yagan., Curr. Sci. 56: 486 (1987). — Type: K. *R. Keshava Murthy & Party 4218A* (holo Herbarium of the Regional Research Centre, Bangalore n. v.; iso (*4218B, C*) Herbarium of the Regional Research Centre, Bangalore n. v.), India, Karnataka, Nagarahole.

Monoecious shrub, up to 1.8 m high. *Twigs* pubescent. *Leaves* alternate; petiole 2–7 cm long, pubescent; blade elliptic or narrowly elliptic, 5–20 by 2–15 cm, base subcordate or rounded, with a pair of glands, apex acuminate, margin crenate, with a gland at the top of every tooth, venation 3-veined, both surfaces pubescent. *Inflorescences* axillary, racemose or paniculate, 1.5–9 cm long, with many staminate flowers and 0–3 pistillate flower at base and rarely also at top. *Staminate flowers*: pedicel 2–5 mm long, pubescent or glabrate; sepals 5, circular or transversely elliptic, 1–2 by 0.8–2.5 mm, apex rounded, outside pubescent at lower half; petals absent; stamens many. *Pistillate flowers*: pedicel 1–2.5 mm long, pubescent or tomentose; sepals 5, ovate, ca. 1 by ca. 0.6 mm, apex acute, pubescent; ovary depressed globose, ca. 1.4 mm high, ca. 2 mm in diam., densely tomentose; styles 3, ca. 1.5 mm, bifid, glabrous. *Fruits*: pedicel 5–8 mm long, pubescent; capsule globose, ca. 8 mm high, ca. 8 mm in diam., pubescent. *Seeds* broadly ellipsoid, ca. 6 mm long, ca. 4 mm wide, glabrous.

Distribution — India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Vietnam, Malaysia (Peninsular), Sumatera, Jawa, Lesser Sunda Isls., China (South-central) (Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Mid Western, Western, Eastern.

Habitat & Ecology — Altitude 500–900 m. In open forests on riversides. Common in eastern plains (Siwakoti & Varma 1999). Flowers & fruits from December to June.

Vernacular names — Rai: *dudhe jaar* (Rajbhandari 2001a). Satar: *danti* (Rajbhandari 2001a).

Uses — Seeds are used medicinally for gastric disorders, gouts and rheumatism (Rajbhandari 2001a).

2. Baliospermum corymbiferum Hook. f. — Fig. 34.

Baliospermum corymbiferum Hook. f., Fl. Brit. India 5: 463 (1888); Hurus. & Ya. Tanaka in Fl. E. Himal.: 174 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982);

D. G. Long in Fl. Bhutan 1: 810 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 21 (1998). — *Baliospermum calycinum* Müll. Arg. var. *corymbiferum* (Hook. f.) Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 32: 13 (1990, publ. 1992); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 242 (2000). — Lectotype designated by Chakrabarty & Balakrishnan (1990): [*G.*] *King s. n.* (K n. v.), Sikkim.

Baliospermum nepalense Hurus. & Ya. Tanaka in Fl. E. Himal.: 174, f. 20, A–F (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 194 (1982); D. G. Long in Fl. Bhutan 1: 810 (1987). — *Baliospermum calycinum* Müll. Arg. var. *nepalense* (Hurus. & Ya. Tanaka) Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 32: 20 (1990, publ. 1992); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 243 (2000). — Lectotype designated by Kurosawa & Shimizu (2000): *H. Hara et al. 6306822* (TI!), Nepal, Below Mai Majuwa–Dhara Pani, 1600–1500m. See Kurosawa & Shimizu (2002) for a photograph of the lectotype.

Dioecious shrub, 0.9–1.2 m high. *Twigs* villous. *Leaves* alternate; petiole 6–16 cm long, villous; blade elliptic, 11–22 by 5–14 cm, base shallowly cordate or rounded, apex acuminate, margin crenate, without a gland, venation 3-nerved, both surfaces pubescent. *Inflorescences* axillary paniculate. *Staminate inflorescences* 4–9 cm long, 2–4 cm wide; peduncle 12–18 cm long, villous; the lowest branch 0.2–0.9 cm long; scale-like leaves ovate, 1.5–2 by 0.5–0.8 mm, apex acuminate or acute. *Staminate flowers* many; pedicel ca. 4 mm long, glabrous or sparsely villous; sepals 5, widely elliptic, apex rounded, ca. 2 by ca. 1.8 mm, glabrous or sparsely villous; stamens many; filaments ca. 2 mm long; anthers ellipsoid, ca. 0.5 mm long. *Pistillate inflorescences* paniculate, 1–2 cm long, villous; peduncle 1–2.5 cm long; scale-like leaves lanceolate 2–5 by 0.7–1 mm, apex acuminate. *Pistillate flowers* 4 or 5 per panicle; pedicel 0.5–4 mm long, glabrous; sepals 5, lanceolate, 5–7 by 1–2.5 mm, villous or glabrate, apex acute; ovary globose, ca. 2 mm long, ca. 2.2 mm in diam., glabrous, smooth; styles 3, ca. 3 mm long, connate for ca. 0.6 mm from base, bifid at upper half, glabrous, smooth. *Fruits*: pedicel 4–5 mm long; sepals persistent, unequal, narrowly elliptic, 5–6 by 1–2 mm, apex acute or acuminate; capsule depressed ovoid, deeply 3-lobed, ca. 5 mm high, ca. 9 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 4 mm long. *Seeds* broadly ellipsoid, 4.5–5 mm long, 3.2–3.8 mm wide, glabrous.

Distribution — India (Sikkim), Nepal, Bhutan, Burma (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 1500–1800 m. Flowers from September to December; fruits in December.

Notes — Chakrabarty & Balakrishnan (1990) considered *Baliospermum calycinum* as an "exceedingly variable polymorphic" in its shape of leaves, and branching and bracts size of male inflorescences and *B. colymbiferum* and *B. nepalense* were treated as its varieties. I, however, treat *B. colymbiferum* as a distinct species because it is distinguishable from *B. calycinum* in leaf shape and breadth of male panicule as pointed out by Chakrabarty & Balakrishnan (1990).

Chakrabarty & Balakrishnan (1990) treated *B. colymbiferum* and *B. nepalense* as distinct varieties based on subtle difference of breadth of male inflorescences: the lowest branches of the former is up to 1 cm long and that of the latter is 2–5 cm long. Here the two taxa are not regarded as distinct varieties because the length of lowest branches seems to be

overlapped in some specimens including syntypes of *B. nepalense* (1–2.5 cm long).

27. Croton L.

Croton L., Sp. Pl.: 1004 (1753). — Lectotype species designated by Webster (1967): *Croton aromaticus* L.

Key to the species

A. Subshrub; leaf blades 4.5–7 by 2.5–4 cm; styles ca. 1.5 mm long ..... **1. C. bonplandianus** Baill.

A. Tree or shrub; leaf blades 9–25 by 3–10 cm; styles 3–8 mm long

B. Leaf blades narrowly ovate or lanceolate, pinnately veined, paired glands sessile, at apex of petiole; twigs, lower surfaces of leaves, and capsules lepidote ..... **2. C. roxburghii** N. P. Balakr.

B. Leaf blades elliptic, ovate or widely ovate, palmately veined, paired glands stalked, at base of blade; twigs, lower surfaces of leaves, and capsules stellate-hairy

C. Leaf blades base cordate, subcordate or rounded; capsule broadly ovoid, densely stellate-hairy

D. Leaf margins serrulate, marginal gland absent; sepals of pistillate flowers 2–2.5 by 1.5–1.8 mm; styles ca. 3 mm long; capsules 8–10 mm long, 8–10 mm in diam., pericarp 0.2–0.4 mm thick; seeds ca. 6 mm long, ca. 4 mm wide ..... **3. C.** aff. **caudatus** Geiseler

D. Leaf margins serrate or duplicate-serrate, stalked marginal glands present; sepals of pistillate flowers ca. 4 by ca. 3 mm; styles 7–8 mm long; capsules 17–20 mm long, 16–18 mm in diam., pericarp 1.5–2 mm thick; seeds 12–13 mm long, ca. 9 mm wide ..... **4. C. caudatus** Geiseler

C. Leaf blades base cuneate or obtuse; capsules broadly ellipsoid, stellate-hairy ..... **5. C. tiglium** L.

1. Croton bonplandianus Baill. — Fig. 35.

Croton bonplandianus Baill., Adansonia 4: 339 (1864); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 195 (1982); Chakrab., J. Econ. Taxon. Bot. 4: 579 (1983); D. G. Long in Fl. Bhutan 1: 793 (1987); Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 34: 31 (1992); Philcox in Rev. Handb. Fl. Ceylon 11: 89 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 22 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 322 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 434 (2000). — Type: *Bonpland s. n.*, in 1833 (holo P (fide Radcliffe-Smith 1987b) n. v.; iso P (fide Radcliffe-Smith 1987b) n. v.), Argentina, Corrientes Province.

Croton sparsiflorus Morong, Ann. New York Acad. Sci. 7: 221 (1893). — Type: *Morong 43* (NY (fide Radcliffe-Smith 1975) n. v.; iso K n. v.), Paraguay, Asunción; *Morong 940* (NY (fide Radcliffe-Smith 1975) n. v.), Pilcomayo River.

Croton spiciflorus sensu Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966), non Thunb., Fl. Jav.: 23 (1825).

See Govaerts et al. (2000) for further synonyms.

Monoecious subshrub, 0.3–0.5 m high. *Twigs* stellate-hairy. *Leaves* alternate; petiole 1.5–3 cm long; a pair of sessile glands at apex of petiole, circular, 0.2–0.4 mm in

diameter, ca. 0.8 mm broad; blade narrowly ovate or ovate, 4.5–7 by 2.5–4 cm, base cuneate, apex acuminate, margin serrulate, without gland between teeth, venation palmately 3-veined, upper surface glabrous or sparsely stellate-hairy, lower surface sparsely stellate-hairy. *Inflorescences* terminal, racemose, 5–17 cm long, with many staminate flowers on upper part, 6–11 pistillate flowers on lower part. *Staminate flowers* glabrous; pedicel 1–1.5 mm long; sepals 5, elliptic, ca. 1 by ca. 0.7 mm, apex rounded, outside glabrous; petals 5, narrowly elliptic, ca. 1.2 by ca. 0.5 mm, apex rounded; stamens ca. 14; filaments ca. 1.3 mm; anthers elliptic, ca. 0.4 mm long. *Pistillate flowers*: pedicel ca. 0.5 mm long, stellate-hairy; sepals 5, ovate, ca. 1.5 by ca. 0.7 mm, stellate-hairy, apex acuminate; petals absent; ovary orbicular, ca. 1 mm in diam., densely stellate-hairy; styles 3, ca. 1.5 mm long, bifid. *Fruits*: capsule ellipsoid, ca. 5 mm high, ca. 4 mm in diam., stellate-hairy; columella persistent after dehiscence, ca. 5 mm long, trifid at the top. *Seeds* ellipsoid, ca. 4 mm long, ca. 2 mm wide, glabrous, carunculate.

Distribution — Native of S. Bolivia, Paraguay, SW. Brazil and N. Argentina (Radcliffe-Smith 1975), naturalized throughout tropical Asia and Africa (Radcliffe-Smith 1975, Short & Vickery 1982, Chakrabarty 1983b, Chakrabarty & Balakrishnan 1992). In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 100–390 m. On river banks or on roadsides. Common in eastern plains (Siwakoti & Varma 1999). Flowers & fruits throughout the year.

Vernacular name — Nepali: *khursane jhar* (Siwakoti & Varma 1999).

Notes — Short & Vickery (1982) and Chakrabarty (1983a) independently pointed out that the records of *Croton spiciflorus* from Nepal by Hurusawa & Tanaka (1966) is referable to *C. bonplandianus*.

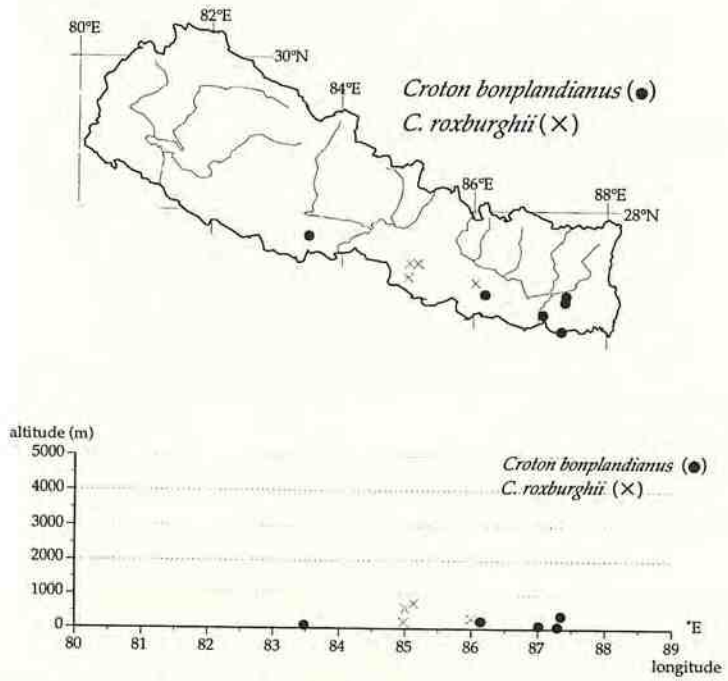

Fig. 35. Distribution of *Croton bonplandianus* Baill. and *C. roxburghii* N. P. Balakr. in Nepal.

Chakrabarty (1983b) made an attempt to trace the major migratory routes of *C. bonplandianus* in Indian Subcontinent on the basis of herbarium specimens and literature. He supposed that it spreaded from Chittagong, Bangladesh, over the subcontinent, and reached Nepal from Bihar (and Utter Pradesh?), India.

2. Croton roxburghii N. P. Balakr. — Fig. 35.

Croton roxburghii N. P. Balakr., Bull. Bot. Surv. India 3: 39 (1962), nom. nov.; Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); D. G. Long in Fl. Bhutan 1: 792 (1987); Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 34: 67 (1992); T. Kuros., Newslett. Himal. Bot. no. 22: 22 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 323 (1999); Rajbhandari, Ethnobot. Nepal: 58 (2001); Manandhar, Pl. People Nepal: 176 (2002). — *Croton oblongifolius* Roxb., [H. Beng.: 69 (1814), nom. nud.] Fl. Ind. ed. 1832, 3: 685 (1832), "*oblongifolium*", non Delile, Descr. Egypte, Hist. Nat.: 283 (1812), nec Sieber ex Spreng., Syst. Veg. 3: 850 (1826); Müll. Arg. in DC., Prodr. 15(2): 573 (1866); Kurz, Forest Fl. Burma 2: 373 (1877); Hook. f., Fl. Brit. India 5: 386 (1887); C. R. Rao, Ind. For. 93: 55 (1967). — Type fide Chakrabarty & Balakrishnan (1992), but without Roxburgh's identification: [*Roxburgh s. n.*] (BM!), [Bengal] (India).

[*Croton elaeocarpifolius* Wall., Numer. List: 270, no. 7734 (1847), "*elaeocarpifolium*", nom. nud.]

[*Croton laevigatus* Wall., Numer. List: 270, no. 7735A, p. p. (1847), "*laevigatum*", nom. nud.]

[*Croton dubia* Wall., Numer. List: 270, no. 7735A, p. p. (1847), nom. nud.]

[*Croton boragatch* Wall., Numer. List: 270, no. 7735D (1847), nom. nud.]

Croton laevigatus auct. non Vahl, Symb. Bot. 2: 97 (1791): H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 136 (1996), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 467 (2000).

Monoecious shrub, small tree, or tree, 3–12 m high. *Twigs* lepidote. *Leaves* alternate; petiole 1.5–2.5 cm long; a pair of sessile glands at apex of petiole, elliptic, ca. 1.3 by ca. 0.7 mm; blade narrowly ovate or lanceolate, 12–19 by 4.5–7.2 cm, base cuneate or rounded, apex acute or obtuse, margin crenate or serrate, without gland between teeth, venation pinnately veined, secondary veins 13–17 pairs, upper surface glabrous, lower surface sparsely lepidote. *Inflorescences* terminal, racemose, 9–29 cm long, with many staminate flowers on upper part and 0–7 pistillate flowers on lower part. *Staminate flowers*: pedicel 5–7 mm long, 0.2–0.3 mm in diam., stellate-hairy; sepals 5, ovate, 2.5–3 by 1.5–2 mm, apex acute, outside stellate-hairy; petals 5, elliptic, 2.5–3 by 1.2–1.4 mm, apex acute, outside pilose; stamens 11–13; filaments ca. 4 mm; anthers elliptic, ca. 1.3 mm long. *Pistillate flowers*: pedicel 4–6 mm long, densely stellate-tomentose; sepals 5, ovate, 2–2.5 by 1.2–1.8 mm, apex acute, stellate-hairy; petals absent; ovary globose, ca. 2 mm high, ca. 2 mm in diam., densely stellate-hairy; styles 3, ca. 4.5 mm, bifid. *Fruits*: pedicel 5–8 mm long; capsule ellipsoid, ca. 10 mm high, ca. 8 mm in diam., densely lepidote; columella persistent after dehiscence, ca. 7 mm long. *Seeds* broadly ellipsoid, 7–8 mm long, 5–5.5 mm wide, glabrous, carunculate.

Distribution — Sri Lanka, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Cambodia, Vietnam, China (South-central) (Chakrabarty & Balakrishnan 1992). *S Asian-Malaysian element.* In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 200–750 m. On roadsides, in *Shorea robusta* forests, or

in deforested place. Common in eastern plains (Siwakoti & Varma 1999). Flowers from February to March; fruits in April.

Vernacular names — Nepali: *aule* (Rajbhandari 2001a, Manandhar 2002). Danuwar: *mahason* or *mahasun* (Rajbhandari 2001a, Manandhar 2002). Mooshar: *mahison* (Manandhar 2002). Satar: *guti* (Rajbhandari 2001a).

Uses — Bark juice is medicinally used to cure malarial fever (Rajbhandari 2001a, Manandhar 2002). Bark and root are used as purgative (Rajbhandari 2001a). Seed oil is medicinally used as a laxative or used as fish poizon and insecticidal property (Manandhar 2002).

Notes — This species has been occasionally treated as a synonym of Hainanese species, *C. laevigatus* Vahl. (Kiu et al. 1996, Govaerts et al. 2000), but is considered to be a distinct species as Croizat (1942) asserted. *Croton laevigatus* has smaller leaves (8.5–16 by 3.5–5 cm) and clearly 3-lobed transversely ellipsoid capsule (ca. 8 mm high, ca. 10 mm in diameter).

Further studies are needed to clarify the delimitation of this species and an Assamese species, *C. joufra* Roxb.

3. Croton aff. **caudatus** Geiseler *

Distribution — Endemic to Nepal. In Nepal: Western, Central.

Habitat & Ecology — Altitude 970–1800 m. On rocky places, on slopes, or in forsts. Flowers & fruits from July to August.

Notes — Identity and circumscription of this species will be discussed in another paper.

4. Croton caudatus Geiseler — Fig. 36.

Croton caudatus Geiseler, Croton. Monogr.: 73 (1807); Müll. Arg. in DC., Prodr. 15(2): 599 (1866); Kurz, Forest Fl. Burma 2: 375 (1877); Hook. f., Fl. Brit. India 5: 388 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); D. G. Long in Fl. Bhutan 1: 793 (1987); Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 34: 38 (1992); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 133 (1996); Philcox in Rev. Handb. Fl. Ceylon 11: 94 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 22 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 438 (2000). — [*Croton caudatus* Geiseler var. *genuinus* Müll. Arg. in DC., Prodr. 15(2): 599 (1866), nom. inval.] — Type: *Rottler s. n.* (C (fide Chakrabarty & Balakrishnan 1992) n. v.), India Orientali.

Croton aromaticus Gaertn., Fruct. Sem. Pl. 2: 119, t. 167(6) (1790), non L., Sp. Pl.: 1005 (1753).

Croton denticulatus Blume, Bijdr.: 603 (1826), "*denticulatum*." — *Croton caudatus* Geiseler var. *denticulatus* (Blume) Müll. Arg. in DC., Prodr. 15(2): 599 (1866). — Type: [*Blume*] (L (fide Chakrabarty & Balakrishnan 1992) n. v.), (Java).

Croton drupaceus Roxb., Fl. Ind. ed. 1832, 3: 683 (1832), "*drupaceum*"; Wall., Numer. List: 270, no. 7720A, C, 7721 (1847). — Type: [*Roxburgh s. n.*] (BM!), [H. B. C.]; *herb. Francis Buchanan Hamilton 2111* (E!, fragment), [Hort. Beng.].

Croton malvifolius Griff., Itin. Pl. Khasyah Mts. 200: 1166 (1848), nom. illeg.

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* The taxon was described as *Croton nepalensis* T. Kuros. (Kurosawa in Edinburgh J. Bot. 61: 34 (2005)).

Tiglium klotzschianum Wight, Icon. Pl. Ind. Orient. 5: t. 1914 (1852). — *Croton caudatus* Geiseler var. *klotzschianus* (Wight) Müll. Arg. in DC., Prodr. 15(2): 599 (1866). — Type: (n. v.), Travancore, Martabar.

Croton caudatus Geiseler var. *oblongifolius* Müll. Arg. in DC., Prodr. 15(2): 600 (1866). — Type: *Zolling 642* (holo G-DC (IDC microfiche in TI) n. v.; iso G-DC (IDC microfiche in TI) n. v.), in insula Java.

Croton caudatus Geiseler var. *minor* Kurz, Forest Fl. Burma 2: 376 (1877). — Type: (n. v.), Burma.

Croton caudatus Geiseler var. *hispidus* Hook. f., Fl. Brit. India 5: 389 (1887), "*hispida.*" — Type: not designated.

Croton caudatus Geiseler var. *ruminatus* Hook. f., Fl. Brit. India 5: 389 (1887), "*ruminata.*" — Type: [*J. D. Hooker s. n.*] (K!), Sikkim, [Terai]; [*J. D. Hooker & T. Thomson 491*, 11 June 1850] (K!), Khasia Mts.; [*Griffith s. n.*, in 1865] (K!), Khasia Mts. [Khasiya, Jemann].

Croton caudatus Geiseler var. *globosus* Hook. f., Fl. Brit. India 5: 389 (1887), "*globosa.*" — Type: not designated.

Croton caudatus Geiseler var. *tomentosus* Hook. f., Fl. Brit. India 5: 389 (1887), "*tomentosa.*" — Type: *Wallich, List no. 7838* (K!, CAL (fide Chakrabarty & Balakrishnan 1992) n. v.; iso BM!, K-WALL!), Silhet [Sillet]; *Griffith* [*s. n.*] (K!), Assam.

Croton caudatus Geiseler var. *malaccanus* Hook. f., Fl. Brit. India 5: 389 (1887), "*malaccana.*" — Type: *Griffith* [*s. n.*], *Kew distrib. no. 4775* (K!, CAL (fide Chakrabarty & Balakrishnan 1992) n. v.), Malacca; [*A. C.*] *Maingay* [*1802*], *Kew distrib. no. 1376, in 1865-66* (K!, CAL (fide Chakrabarty & Balakrishnan 1992) n. v.),

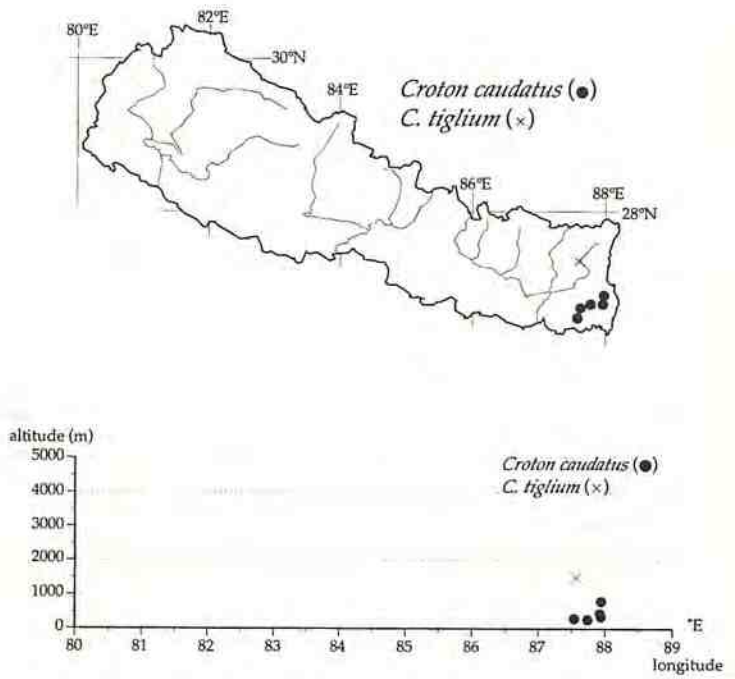

Fig. 36. Distribution of *Croton caudatus* Geiseler and *C. tiglium* L. in Nepal.

Malacca; *Griffith* [*s. n.*] (K!; iso K!), Mergui (Burma).

Croton caudatus Geiseler var. *harmandii* Gagnep. in Lecomte, Fl. Indo-Chine 5: 286 (1925). — Type: *P. Coudec* (n. v.), Cambodge, Wat-preas, vers Kampur; *Harmand* (n. v.), Cochinchine, delta; *Pierre* (n. v.), Cochinchine, prov. de Bien-hoa.

Croton caudatus Geiseler var. *obovoideus* N. P. Balakr. & Chakrab., Bull. Bot. Surv. India 25: 190 (1983, publ. 1985). — Type: *Sebastine 25343A* (CAL (fide Chakrabarty & Balakrishnan 1992) n. v.), India, Kerala, Kottayam dist., Velara.

Monoecious shrub, 1.5–2.4 m high. *Twigs* stellate-tomentose. *Leaves* alternate; petiole 2.3–9 cm long; a pair of stalked glands at apex of petiole, 1–1.3 mm high, 0.5–0.7 mm broad; blade ovate or widely ovate, 7–17 by 6–16 cm, base cordate or subcordate, apex acuminate, margin serrate or duplicate-serrate, with stalked gland of 0.2–0.5 mm high, 0.2–0.3 mm broad between teeth, venation palmately 5-veined or 3-veined with 2 additional weaker ones, upper surface sparsely stellate-hairy, lower surface stellate-hairy. *Inflorescences* terminal and uppermost nodes, racemose, 12–31 cm long, with many staminate flowers above, ca. 6 pistillate flowers below. *Staminate flowers*: pedicel 5–7 mm long, densely stellate-hairy; sepals 5, ovate, ca. 3.5 by ca. 2 mm, apex acute, outside densely stellate-tomentose, inside glabrate; petals 5, elliptic, ca. 3.5 by ca. 1.5 mm, apex rounded, outside densely tomentose, inside glabrate; stamens 29–32; filaments 3.5–5 mm; anthers elliptic, ca. 1 mm long. *Pistillate flowers*: pedicel 4–5 mm long, densely stellate-tomentose; sepals 5, ovate, ca. 4 by ca. 3 mm, apex acute, stellate-hairy; petals absent; ovary globose, ca. 4 mm in diam., densely stellate-tomentose; styles 3, 7–8 mm long, bifid. *Fruits*: capsule broadly ovoid, 17–20 mm high, 16–18 mm in diam., densely stellate-hairy; pericarp 1.5–2 mm thick, often peeled off when dry. *Seeds* broadly ellipsoid, 12–13 mm long, ca. 9 mm wide, glabrous, carunculate.

Distribution — Pakistan, Sri Lanka, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam, Malaysia (Peninsular), Sumatera, Jawa, Borneo, Lesser Sunda Isls., Sulawesi, Philippines, China (South-central) (Chakrabarty & Balakrishnan 1992, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 240–450 m. On stream side. Flowers in April; fruits from May to September.

5. Croton tiglium L. — Fig. 36.

Croton tiglium L., Sp. Pl.: 1004 (1753); Roxb., Fl. Ind. ed. 1832, 3: 682 (1832); Wall., Numer. List: 270, no. 7722C (1847); Müll. Arg. in DC., Prodr. 15(2): 600 (1866); Kurz, Forest Fl. Burma 2: 374 (1877); Hook. f., Fl. Brit. India 5: 393 (1887); Hurus. & Ya. Tanaka in Fl. E. Himal.: 177 (1966); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 476 (1983); D. G. Long in Fl. Bhutan 1: 793 (1987); Chakrab. & N. P. Balakr., J. Econ. Taxon. Bot. 12: 370 (1988); Chakrab. & N. P. Balakr., Bull. Bot. Surv. India 34: 72 (1992); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 134 (1996); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 508 (2000). — *Tiglium officinale* Klotzsch, Nov. Act. Acad. Nat. Cur. 19, Suppl. 1: 418 (1843). — *Croton officinalis* (Klotzsch) Alston in Trimen, Handb. Fl. Ceylon 6: 264 (1931), nom. superfl. — Type: *Hermann 2: fol. 5, #343* (BM (fide Chakrabarty & Balakrishnan 1988) n. v.), India [Ceylon].

Croton acutus Thunb. in Murray, Syst. Veg. ed. 14: 863 (1784).

Croton jamalgota Buch.-Ham., Trans. Linn. Soc. London 14: 258 (1825). — Type: [*F.*

Buchanan Hamilton 2115, 13 May 1908] (E!, K-WALL 7722B, p. p. (IDC microfiche in TI) n. v.), [Gualpara] (Assam, India).

Croton camaza Perr., Mém. Soc. Linn. Paris 3: 112 (1825).

Croton pavana Buch.-Ham., Trans. Linn. Soc. 14: 259 (1825); Müll. Arg. in DC., Prodr. 15(2): 623 (1866), "*pavanae*." — Type: [*F. Buchanan Hamilton 2116*, 10 June 1908] (E!, K-WALL 7722B, p. p. (fide Chakrabarty & Balakrishnan 1992), n. v.), [Gualpara] (Assam, India).

Croton muricatus Blanco, Fl. Filip., ed. 2: 518 (1845).

Alchornea vaniotii H. Lév., Cat. Pl. Yun-Nan: 95 (1916), "*vanioti*"; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 147 (2000). — Type: *E. E. Maire s. n.*, in 1910 (holo E (fide Lauener 1983) n. v.), Chana, Yunnan, Tong tchouan.

Croton himalaicus D. G. Long, Notes Roy. Bot. Gard. Edinburgh 44: 170 (1986); D. G. Long in Fl. Bhutan 1: 792 (1987); T. Kuros., Newslett. Himal. Bot. no. 22: 22 (1998). — Type: *Haines 828*, June 1904 (holo E!), Darjeeling District, near Pedong, 1640 m [5400'].

Croton birmanicus auct. non Müll. Arg., Linnaea 34: 112 (1865): Govaerts et al., World Checkl. Bibliogr. Euphorb.: 433, 525 (2000), p. p.

Shrub or small tree, 4.5–6 m high. *Twigs* stellate-pubescent. *Leaves* alternate; petiole 2.2–4 cm long; blade ovate or elliptic, 10–14.5 by 4–7 cm, base cuneate or obtuse, apex acuminate, margin serrulate, without gland between teeth, venation 3-veined or with 2 additional weaker veins, upper surface glabrous or sparsely stellate-hairy, lower surface sparsely stellate-pubescent or glabrate; a pair of stalked glands at 0–1 mm from petiole attachment, ca. 0.5 mm high, 0.5–0.6 mm in diam. *Inflorescences* terminal, racemose. *Staminate flowers* not seen. *Pistillate flowers*: pedicel ca. 4 mm long, densely stellate-tomentose; sepals 5, ovate, ca. 2.5 by 1.5–2 mm, apex acute, outside stellate-tomentose, inside glabrous; petals absent; ovary globose, densely stellate-tomentose; styles 3, ca. 4 mm, bifid. *Fruits*: capsule broadly ellipsoid, 15–20 mm long, 15–20 mm in diam., stellate-hairy; pericarp ca. 0.1 mm thick. *Seeds* not seen.

Distribution — Sri Lanka, India, Bangladesh, Burma, Thailand, Cambodia, Vietnam, Borneo, Jawa, Lesser Sunda Islands, Malaya, Philippines, Sulawesi, Sumatera, China (South-central, Hainan, Southeast), Taiwan (Chakrabarty & Balakrishnan 1992, Govaerts et al. 2000). *S Asian-Malaysian element*. In Nepal: Eastern.

Habitat & Ecology — Altitude 1500 m. Fruits in July.

Notes — As critically shown by Chakrabarty & Balakrishnan (1988), it is difficult to distinguish *C. himalaicus* from *C. tiglium* by differences shown by Long (1986).

This description was described from a paratype of *C. himalaicus* D. G. Long from Eastern Nepal. The specimen also has both characters of *C. tiglium* as defined in Long (1986) (glabrous habit, 3-veined leaves with a pair of glands situated on leaf margin) and those of *C. himalaicus* (leaf glands stalked).

On the other hand, Govaerts et al. (2000, p. 525) treated *C. himalaicus* as a synonym of a Burmese species, *C. birmanicus* Müll. Arg. The latter has, however, leaves with marginal glands and smaller capsules.

28. Vernicia Lour.

Vernicia Lour., Fl. Cochinch.: 586 (1790). — Type species: *Vernicia montana* Lour.

1. Vernicia fordii (Hemsl.) Airy Shaw

Vernicia fordii (Hemsl.) Airy Shaw, Kew Bull. 20: 394 (1966); Radcliffe-Smith, Kew Bull. 28: 296 (1973); H. S. Kiu et al., Fl. Reipubl. Pop. Sin. 44(2): 143 (1996); Stuppy et al., Blumea 44: 91 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1585 (2000). — *Aleurites fordii* Hemsl., Hooker's Icon. Pl. 29: t. 2801 (1906); Gagnep. in Lecomte, Fl. Indo-Chine 5: 293 (1925). — Lectotype designated by Radcliffe-Smith (1973): *Henry 878* (K n. v.), China, Hupeh Province, Ichang.

Dryandra oleifera auct. non Lam., Encycl. 2: 329 (1786), nom. superfl.: Wall., Numer. List: 274, no. 7958 (1847). — *Aleurites cordata* auct. non (Thunb.) R. Br. ex Steud., Nomencl. Bot., ed. 2, 1: 49 (1840); Hook. f., Fl. Brit. India 5: 384 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 193 (1982). — *Vernicia cordata* auct. non (Thunb.) Airy Shaw, Kew Bull. 20: 394 (1966); T. Kuros., Newslett. Himal. Bot. no. 22: 23 (1998).

Distribution — Native of S. Burma, China (South-Central, Hainan, Southeast), Vietnam (Stuppy et al. 1999, Govaerts et al. 2000). Cultivated in subtropical regions (Stuppy et al. 1999). In Nepal: unknown.

Notes — The record of this species depends on a specimen, *Wallich, List no. 7958B* (K-WALL (IDC microfiche in TI) n. v.), which has been treated as *Aleurites cordata* or *Vernicia cordata* by authors (Hooker 1886–1888, Short & Vickery 1982, Kurosawa 1998).

Subfamily IV. EUPHORBIOIDEAE (Boiss.) G. L. Webster

Euphorbioideae (Boiss.) G. L. Webster, Taxon 24: 600 (1975). — Subordo *Euphorbieae* Boiss. in DC., Prodr. 15(2): 3 (1862). — Type: *Euphorbia* L.

29. Excoecaria L.

Excoecaria L., Syst. Nat. ed. 10, 2; 1288 (1759). — Type species: *Excoecaria agallocha* L.

1. Excoecaria acerifolia Didr. — Fig. 37.

Excoecaria acerifolia Didr., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenharn 1857: 129 (1857); Müll. Arg. in DC., Prodr. 15(2): 1222 (1866); Hook. f., Fl. Brit. India 5: 473 (1888); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 18: 197 (1994); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 11, t. 2, f. 1 or 2 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 23 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 913 (2000); Manandhar, Pl. People Nepal: 231 (2002). — [*Excoecaria acerifolia* Didr. var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 1222 (1866), nom. inval.]

Stillingia himalayensis Klotzsch, Bot. Ergebn. Reise Waldemar: 116, t. 21 (1862). — *Excoecaria himalayensis* (Klotzsch) Müll. Arg., Linnaea 32: 122 (1863). — *Excoecaria acerifolia* Didr. var. *himalayensis* (Klotzsch) Pax in Engler, Pflanzenr., IV, 147, V: 168 (1912). — Type: *Hoffmeister* (n. v.), Himalaya.

Excoecaria himalayensis (Klotzsch) Müll. Arg. var. *cuspidata* Müll. Arg., Linnaea 32: 122 (1863). — *Excoecaria acerifolia* Didr. var. *cuspidata* (Müll. Arg.) Müll. Arg. in

DC., Prodr. 15(2): 1222 (1866). — *Excoecaria cuspidata* (Müll. Arg.) Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 14: 182 (1990). — Type: *J. D. Hook. & T. Thoms. s. n.* (G-DC (IDC microfiche in TI) n. v.), in Indiae orientalis montibus Khasia.

Excoecaria acerifolia Didr. var. *lanceolata* Pax & K. Hoffm. in Engler, Pflanzenr., IV, 147, V: 168 (1912). — Type: *Henry 12095D* (n. v.), Yünnan, Szemao.

Deciduous shrub with milky sap, 0.8–3 m high, stem diameter 2.5–3 cm. *Twigs* glabrous. *Leaves* alternate, glabrous; petiole 2–5 mm long; stipules caducous; blade elliptic, 6–12 by 3.5–4.5 cm, base cuneate or obtuse, apex acuminate or cuspidate, margin serrate, without foliar gland, secondary veins 9–12 pairs. *Inflorescences* terminal or axillary, spiciform, bisexual, 3–4 cm long, glabrous; bracts of staminate flowers deltate, 1–1.2 by ca. 1.3 mm, apex cuspitate; bracts of pistillate flowers triangular, ca. 2.6 by ca. 2 mm, apex acuminate. *Staminate flowers* many per spike, sessile; calyx lobes deltate, ca. 0.5 by ca. 0.7 mm, irregularly toothed, with gland of 0.6–0.8 by 0.3–0.5 mm; stamens with filaments ca. 0.7 mm long; anthers ca. 0.3 mm long. *Pistillate flowers* 1 per spike; pedicel ca. 1 mm long; calyx lobes narrowly triangular, ca. 1.8 by ca. 0.8 mm, apex acuminate; ovary glabrous; styles 3, free, ca. 3 mm long, recurved. *Fruits*: pedicel ca. 5 mm long; capsule depressed globose, 3-lobed, ca. 1.2 cm long, ca. 1.6 cm in diam., glabrous, smooth; pericarp 0.5–0.6 mm thick; columella persistent after dehiscence, ca. 7 mm long. *Seeds* ovoid, 5.5–6.5 mm long, 4.5 mm in diam., glabrous, smooth.

Distribution — India (Uttarkhand, Assam), Nepal, China (South-central) (Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Far Western, Mid Western, Western, Central.

Habitat & Ecology — Altitude 1200–1950 m. On open slopes, on roadsides, or on river banks. Flowers from April to August; fruits from August to September.

Vernacular names — Nepali: *gadasilo* (Manandhar 2002), *rajeli* (Manandhar 2002).

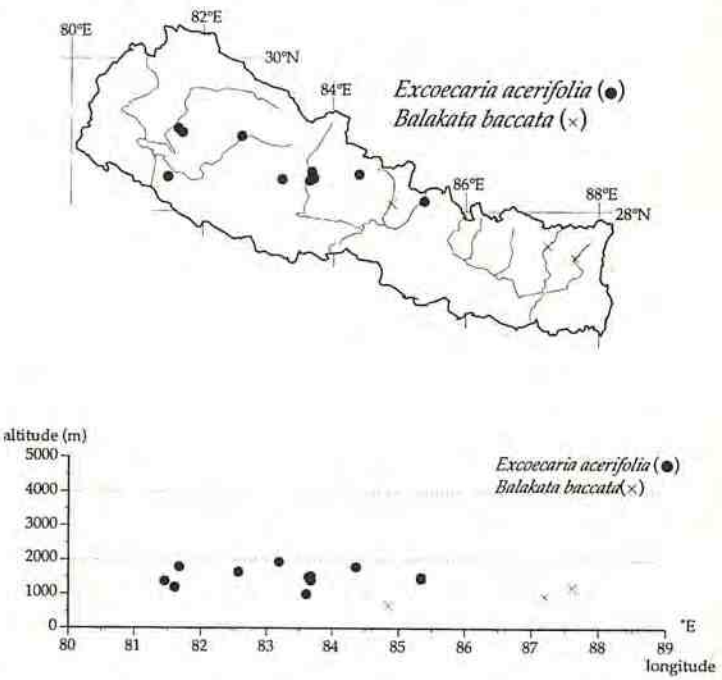

Fig. 37. Distribution of *Excoecaria acerifolia* Didr. and *Balakata baccata* (Roxb.) Esser in Nepal.

30. Falconeria Royle

Falconeria Royle, Ill. Bot. Himal. Mts.: 354 (1839). — Lectotype species designated by Pfeiffer, Nomencl. Bot. 1, 2: 1334 (1874): *Falconeria insignis* Royle

1. Falconeria insignis Royle — Fig. 38.

Falconeria insignis Royle, Ill. Bot. Himal. Mts.: 354, t. 98, f. 2 (1839); Esser, Blumea 44: 162 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 923 (2000). — *Excoecaria insignis* (Royle) Müll. Arg. in DC., Prodr. 15(2): 1212 (1866). — *Carumbium insigne* (Royle) Kurz, Forest Fl. Burma 2: 412 (1877). — *Sapium insigne* (Royle) Trimen, Syst. Cat. Fl. Pl. Ceylon: 83 (1885); Hook. f., Fl. Brit. India 5: 471 (1888); Banerji, Rec. Bot. Surv. India 19(2): 83 (1966); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); Malla et al., Fl. Kathmandu Valley: 631 (1986); D. G. Long in Fl. Bhutan 1: 812 (1987); Stainton, Flow. Himal. Suppl.: 56, pl. 103 (1988); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 20 (1997); Philcox in Rev. Handb. Fl. Ceylon 11: 183 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 23 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 333 (1999); Rajbhandari, Ethnobot. Nepal: 61 (2001); Manandhar, Pl. People Nepal: 411 (2002). — Lectoype designated by Esser (1999): [*Royle s. n.*] (LIV n. v.), Deyra Doon and above Rajpore (India).

Falconeria wallichiana Royle, Ill. Bot. Himal. Mts.: 354, as "*wallichii*" in t. 84a or 98, f. 3 (1839). — Lectotype designated by Esser (1999): [*Royle s. n.*] (LIV n. v.), Buneepa (Burupa) in Nepal.

Falconeria malabarica Wight, Icon. Pl. Ind. Orient. 5(2): 20, t. 1866 (1852). — *Sapium insigne* Royle var. *malabaricum* (Wight) Hook. f., Fl. Brit. India 5: 472 (1888), "*malabarica*."

Monoecious shrub or small tree, 3–10 m high, stem diameter 12–23 cm. *Leaves* glabrous; petiole 2.5–6 cm long, with distal petiolar glands of 0.7–1.5 mm in diam.; blade elliptic or obovate, 15–28 by 5–10 cm, apex acuminate, base cuneate, margin serrulate, with a gland on each tooth, secondary veins 12–21 pairs. *Inflorescences* terminal on leafless twigs, elongated thyrses. *Staminate thyrses* 9–13 cm long, 3–4 mm in diam., glabrous, 6 or 7 flowers per node. *Staminate flowers* sessile; calyx lobes 2, obovate, ca. 1 by 1–1.5 mm, irregularly toothed, membranaceous, glabrous; stamens 2; anthers ca. 0.5 mm in diam. *Pistillate thyrses* ca. 6 cm long, ca. 5 mm in diam; a pair of glands per node, elliptic, 2.5–3 by 1.3–2 mm; 1 flower per node. *Pistillate flowers* sessile; calyx lobes 2, depressed obovate, 0.7–1 by 1.7–2 mm, irregularly toothed, glabrous, membranaceous; ovary ovoid, 1.5–2 mm long, 1.3–1.7 m across, glabrous, smooth; stigmas 2, sessile. *Infructescences* 7–19 cm long, 3–8 mm in diam. *Fruits* fleshy, globose or ovoid, 8–10 mm long, 8–9 mm in diam., glabrous, 1- or 2-seeded; columella persistent after dehiscence, 8–9 mm long, distictly alate by ca. 3 mm. *Seeds* ovate, ca. 7 mm long, ca. 6 mm wide, ca. 3 mm thick, smooth.

Distribution — Sri Lanka, India, Nepal, Bhutan, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam, Malaysia (Peninsular), China (South-central) (Esser 1999, Govaerts et al. 2000). *S Asian-Malaysian element.* In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 300–1800 m. On roadsides, on stream side, or on edge of cultivation. Occasional in eastern plains (Siwakoti & Varma 1999). Flowers from

January to May; fruits from March to June.

Vernacular names — Nepali: *khirro* (Siwakoti & Varma 1999, Rajbhandari 2001a, Manandhar 2002). Chepang: *rangati* (Manandhar 2002). Magar: *khirra* (Manandhar 2002), *mibalang* (Manandhar 2002). Majhi: *khirra* (Manandhar 2002). Tamang: *dese* (Manandhar 2002), *khalung* (Manandhar 2002), *khyuru* (Manandhar 2002).

Uses — Bark and leaf are used as fish poison (Manandhar 2002). Juice of plant, juice of root, juice of bark, and milky latex are medicinally applied for various diseases (Rajbhandari 2001a, Manandhar 2002).

31. **Triadica** Lour.

Triadica Lour., Fl. Cochinch. 2: 598 (1790). —Lectotype species designated by G. L. Webster, Ann. Missouri Bot. Gard. 81: 123 (1994): *Triadica sinensis* Lour.

1. Triadica cochinchinensis Lour. — Fig. 38.

Triadica cochinchinensis Lour., Fl. Cochinch.: 610 (1790); Esser, Blumea 44: 201 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1562 (2000). — *Stillingia cochinchinensis* (Lour.) Baill., Adansonia 1: 351 (1861). — *Excoecaria loureiroana* Müll. Arg. in DC. Prodr. 15(2): 1217 (1866), nom. nov. —*Sapium cochinchinense* (Lour.) Pax & K. Hoffm. in Engl., Pflanzenr., IV, 147, V: 252 (1912), non (Lour.) Kuntze, Revis. Gen. Pl. 3(2): 293 (1898). — *Shirakia cochinchinensis* (Lour.) Hurus., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 6: 318 (1954). — Type: [*Loureiro s. n.*] (holo BM (fide Esser 1999), n. v.; iso BM (fide Esser 1999) n. v.), in sylvis Cochinchinae.

Stillingia discolor Champ. ex Benth., Hooker's J. Bot. Kew Gard. Misc. 6: 1 (1854). — *Sapium discolor* (Champ. ex Benth.) Müll. Arg., Linnaea 32: 121 (1863); Hook. f., Fl. Brit. India 5: 469 (1888); Chakrab. & M. G. Gangop., J. Econ. Taxon. Bot. 14: 183 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 18 (1997). — *Excoecaria discolor* (Champ. ex Benth.) Müll. Arg. in DC., Prodr. 15(2): 1210 (1866). — Lectotype designated by Esser (1999): *Champion s. n.* (holo K, n. v.; iso GH, K n. v.), Hongkong.

Stillingia lanceolaria Miq., Fl. Ned. Ind., Eerste Bijv.: 183, 461 (1861). — *Excoecaria lanceolaria* (Miq.) Müll. Arg. in DC., Prodr. 15(2): 1221 (1866). — Type: *Teijsmann* [*HB 549*] (holo U (fide Esser 1999), n. v.; iso CAL (fide Esser 1999) n. v.), Poeloe Pisang bij Padang (Sumatra).

Sapium eugeniaefolium Buch.-Ham. [in Wall., Numer. List: 275, no. 7970 (1847), nom. nud.] ex Hook. f., Fl. Brit. India 5: 470 (1888); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); D. G. Long in Fl. Bhutan 1: 812 (1987), "*eugeniifolium*"; T. Kuros. in Newslett. Himal. Bot. no. 22: 23 (1998). — Type: *Duthie* (n. v.) from Kumaon, alt. 3–4000 ft.; *King* (n. v.), to Sikkim; [*F. Buchanan*] *Hamilton* [*2120*, 17 Aug. 1808] (n. v.; iso E!) Assam, at Goyalpara [Gualpara]; *J. D. Hooker & T. T.* (n. v.), Khasia Mts., alt. 4000 ft.

Sapium laui Croizat, J. Arnold Arbor. 21: 505 (1940). — Type: *S. K. Lau 5498*, Feb. 1935 (A n. v.), Hainan, Chim Fung near Fong Ngau Po Village, Kan-en District..

Sapium discolor Champ. ex Benth. var. *wanhsienensis* S. B. Ho, Fl. Tsinlingensis 1(3): 180, 451 (1981). — Type: *C. Y. Chang 10447*, 1 Sep. 1959 (n. v.), China, Kansu, Wen Hsien, Pi Kou, Fan-Pa, Miao-kou, in valley, alt 700 m.

Deciduous tree, 11–15 m high, 20–40 cm in diameter. *Twigs* glabrous. *Leaves* alternate, glabrous; stipules caducous; petiole 3–4.5 cm long; blade ovate or elliptic, 7.5–11 by 4–5.5 cm, base cuneate or obtuse, apex acute, upper surface with a pair of basal glands of ca. 1.2 by ca. 0.7 mm at the petiole attachment, lower surface whitish, with 1–3 glands per side, 0.5–0.8 mm diam., 1–3 mm distant from margin, secondary veins 8 or 9 pairs. *Inflorescences* terminal. *Staminate flowers* not seen. *Pistillate flowers* not seen. *Fruits*: pedicel 4–6 mm long; capsule dehiscent, globose, ca. 11 mm long, 11.5–12 mm in diam., glabrous, smooth, apex cuspidate; pericarp 1–1.2 mm thick; columella persistent after dehiscence, ca. 8–9 mm long, distinctly alate by ca. 2.5 mm. *Seeds* broadly ellipsoid or globose, ca. 5 mm long, 4.5–5 mm wide, ca. 4 mm thick, glabrous, smooth.

Distribution — India (Sikkim, Assam), Nepal, Bhutan, Burma, Thailand, Laos, Vietnam, Borneo, Philippines, China (South-central), Taiwan (Long 1987, Esser 1999, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Central.

Habitat & Ecology — Altitude 1060–1130 m. On riversides. Fruits from August to October.

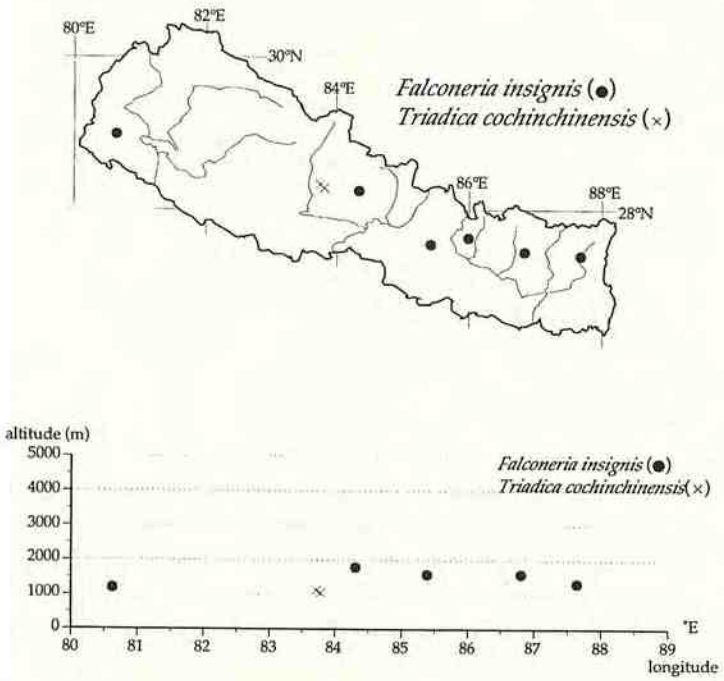

Fig. 38. Distribution of *Falconeria insignis* Royle and *Triadica cochinchinensis* Lour. in Nepal.

32. **Balakata** Esser

Balakata Esser, Blumea 44: 154 (1999). — Type species: *Balakata luzonica* (S. Vidal) Esser, based on *Myrica luzonica* S. Vidal

1. Balakata baccata (Roxb.) Esser — Fig. 37.

Balakata baccata (Roxb.) Esser, Blumea 44: 155 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 241 (2000). — *Sapium baccatum* Roxb., [Hort. Bengal.: 69 (1814),

nom. nud.] Fl. Ind. ed. 1832, 3: 694 (1832); Wight, Icon. Pl. Ind. Orient. 6: 6, t. 1950-2 (1853); Baill., Étude Euphorb.: 513 (1858); Müll. Arg., Linnaea 32: 121 (1863); Hook. f., Fl. Brit. India 5: 470 (1888); Short & Vickery in Enum. Flow. Pl. Nepal 3: 199 (1982); D. G. Long in Fl. Bhutan 1: 812 (1987); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 19, t. 4, f. 1–3 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 23 (1998); Manandhar, Pl. People Nepal: 411 (2002). — *Stillingia baccata* (Roxb.) Baill., Étude Euphorb.: 513 (1858). — *Excoecaria baccata* (Roxb.) Müll. Arg. in DC., Prodr. 15(2): 1211 (1866). — *Carumbium baccatum* (Roxb.) Kurz, Forest Fl. Burma 2: 412 (1877). — Type: [*Roxburgh s. n.*] (A, P, Icones Roxburghianae 2397 (fide Esser 1999) n. v.), [Silhet].

[*Sapium daidece* Ham. ex Wall., Numer. List: 274, no. 7965A, p. p. (1847), nom. nud.]

[*Sapium hexandrum* Wall., Numer. List: 274, no. 7965A, p. p. (1847), nom. nud.]

Excoecaria affinis Griff., Not. Pl. Asiat. 4: 486 (1851), non Endl., Prodr. Fl. Norfolk: 83 (1833); Müll. Arg. in DC., Prodr. 15(2): 1223 (1866). — [*Sapium populifolium* Wight, Icon. Pl. Ind. Orient. 6: 6, t. 1950-2 (1853), nom. inval.]. — Type: *Griffith* [*704* or *706*], Nov. 1834 (GH, K, TCD (fide Esser 1999) n. v.), Mergue (Burma).

Stillingia paniculata Miq., Fl. Ned. Ind., Eerste Bijv.: 183, 461 (1861). — Lectotype designated by Esser, Blumea 44: 156 (1999): *Teijsmann* [*HB 3677*] (U n. v.; iso K n. v.), Sumatra orient, in prov. Palembang, inter Kebus et Labat.

Monoecious tree, 9–24 m high, stem diameter 47–72 cm. *Leaves* glabrous; stipules caducous; petiole 2–5 cm long; blade ovate or narrowly ovate, 5.5–15 by 2.5–6.5 cm, base obtuse or rounded, apex acuminate, margin entire, secondary veins 8–16 pairs, marginal glands 4–6 per side on under surface, 0.5–0.8 mm diam., 0–1.5 mm distant from margin, basal glands 1.2–1.5 mm diam., on the lowest secondary veins. *Inflorescences* terminal and in the axils of few uppermost leaves, glabrous. *Staminate thyrses* 10–20 cm long, 1–2 mm in diam., with 1–5 branches, glabrous, 5–8 flowers per cymules; bracts depressed ovate, 0.4–1 mm long, glands elliptic, 1–1.5 by 0.4–0.8 mm. *Staminate flowers*: pedicel 1–2 mm long; calyx lobes irregularly toothed, 0.5–0.8 mm long, membranaceous, glabrous; stamens 2; filaments ca. 0.5 mm long. *Pistillate flowers* not seen. *Fruits*: pedicel 3–9 mm long; bacca globose, 8–13 mm long, 8–13 mm in diam., 1 or 2 seeded. *Seeds* not seen.

Distribution — India (Sikkim, Assam, Andamans Isls.), Nepal, Bhutan, Bangladesh, Burma, Thailand, Laos, Cambodia, Vietnam, Malaysia (Peninsular), Borneo, Sumatera, China (South-central) (Esser 1999, Govaerts et al. 2000). *SE Asian-Malaysian element*. In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 500–1200 m. On rocky slopes, in forests, or on river basin. Flowers in April; fruits from July to September.

Vernacular name — Nepali: *ban pipal* (Manandhar 2002).

Uses — Latex is medicinally applied to muscular swellings (Manandhar 2002).

33. **Euphorbia** L.

Euphorbia L., Sp. Pl.: 450 (1753). — Lectotype species designated by Millspaugh in Publ. Field Columbian Mus., Bot. 2: 306 (1909): *Euphorbia antiquorum* L.

Key to the subgenera

Subgeneric circumscriptions follow Turner (1995).

A. Stipular spines present, if absent, main axis extremely short, cauline leaves radical; succulent
  B. Floral leaves prominent, red, 10–12 mm wide; seeds carunculate ..... I. Subgenus **Lacanthis**
  B. Floral leaves inconspicuous, scaly, greenish, 3–4 mm wide; seeds without caruncle ..... II. Subgenus **Euphorbia**
A. Spines absent; succulent or non-succulent
  B. Stipules present; involucral glands 1 or 2(–4); seeds without caruncle; non-succulent ..... III. Subgenus **Poinsettia**
  B. Stipules absent; involucral glands 4 or 5; seeds carunculate; succulent or non-succulent
    C. Succulent shrubs ..... IV. Subgenus **Tirucalli**
    C. Non-succulent herbs ..... V. Subgenus **Esula**

I. Subgenus **Lacanthis** (Raf.) M. G. Gilbert

Subgenus Lacanthis (Raf.) M. G. Gilbert, Kew Bull. 42: 238 (1987). — *Lacanthis* Raf., Fl. Tell. 2: 94 (1837). — Type species: *Euphorbia splendens* Bojer ex Hook. (= *Lacanthis splendens* (Bojer ex Hook.) Raf.)

See *Euphorbia milii* Des Moul in Excluded taxa.

II. Subgenus **Euphorbia**

Key to the species

A. Herb with root stock; main axis extremely short, without spines; cymes arising from the top of rhizome ..... **1. E. fusiformis** Buch.-Ham. ex D. Don

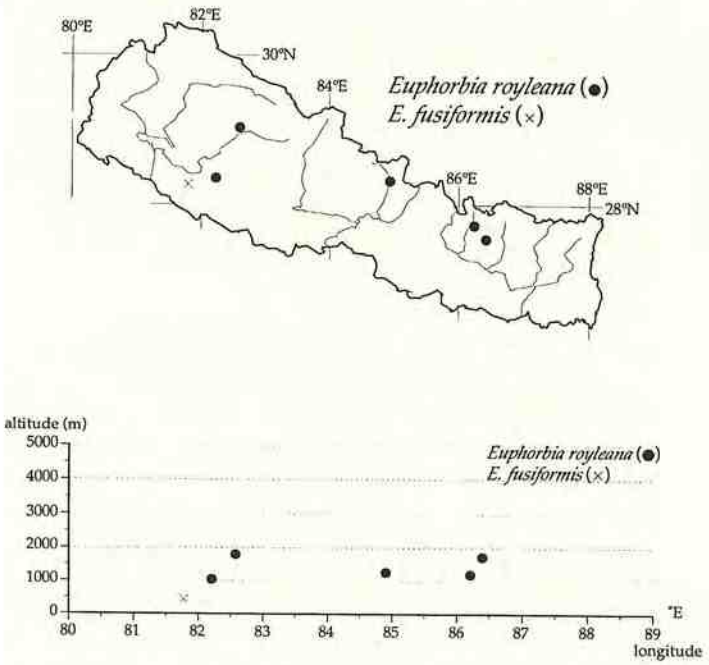

Fig. 39. Distribution of *Euphorbia royleana* Boiss. and *E. fusiformis* Buch.-Ham. ex D. Don in Nepal.

A. Shrub with long spiny main axis; cymes arising above axiles of fallen leaves
B. Branches 3–5 cm in diam.; capsules ca. 9 mm in diam. (not seen in Nepalese plants) ..... **2. E. royleana** Boiss.
B. Branches ca. 1.9 cm in diam.; capsules ca. 13 mm in diam. ..... excl. 4. **E. neriifolia** L.

1. Euphorbia fusiformis Buch.-Ham. ex D. Don — Plate 74; Fig. 39.

Euphorbia fusiformis Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 62 (1825); Wall., Numer. List: 269, no. 7703 (1847); Boiss. in DC. Prodr. 15(2): 93 (1862); Hook. f., Fl. Brit. India 5: 257 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); Oudejans, World Cat. Tribe Euphorbieae: 167 (1990); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 732 (2000). — Type: [*Buchanan*] *Hamilton* [*s. n.*] (holo BM!), Nepaliâ (Nepal).

Euphorbia acaulis Roxb., [Hort. Bengal.: 36 (1814), nom. nud.] Fl. Ind. ed. 1832, 2: 472 (1832); Boiss. in DC. Prodr. 15(2): 93 (1862). — Type: (n. v.), the Botanic garden at Calcutta, from Poornea, Bengal.

Euphorbia humilis Royle, Ill. Bot. Himal. Mts.: 329, t. 82, f. 3 (1836), non C. A. Mey. in Ledebour, Fl. Altaic. 4: 185 (1833). — Type: (n. v.), Kheree Pass, and low elevations in the Himalayas.

Euphorbia nana Royle, Ill. Bot. Himal. Mts.: 329, t. 82, f. 2 (1836); Boiss. in DC. Prodr. 15(2): 94 (1862). — Type: (n. v.), Kheree Pass and Suen Range.

Perennal herb, with extremely short main stem. *Rhizomes* cylindric, 2.5–3.5 cm in diam. *Cymes* arising from the top of rhizome, dichotomous; rays 3.5–5 cm long, glabrous; bracts sessile, opposite, exstipulate, narrowly triangular or deltate, 5–6 by 3–4 mm, apex acute or apiculate, margin entire, glabrous. *Cyathia*: stalk 1–4 cm; involucre ca. 2.5 by 4–5 mm in diam., glabrous outside; glands transversely elliptic, ca. 2 mm in diam., surface flat, without appendage. *Fruits*: pedicel 1.1–1.3 cm long; capsule depressed ovoid, ca. 5 mm long, ca. 9 mm in diam., 3-lobed, glabrous, smooth. *Seeds* spheroid, ca. 3.5 mm in diam., smooth, black, without caruncles.

Distribution — India, Nepal (Govaerts et al. 2000). *NW Himalayan element*. In Nepal: Mid Western, Central.

Habitat & Ecology — Altitude 450 m. Flowers & fruits from April.

2. Euphorbia royleana Boiss. — Fig. 39.

Euphorbia royleana Boiss. in DC. Prodr. 15(2): 83 (1862); Hook. f., Fl. Brit. India 5: 257 (1887); L. H. J. Williams in J. RHS. 78: 329, "*roylei*"; Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Polunin & Stainton, Fl. Himal.: 360, pl. 112 (1984); Malla et al., Fl. Kathmandu Valley: 625 (1986); D. G. Long in Fl. Bhutan 1: 761 (1987); Oudejans, World Cat. Tribe Euphorbieae: 360 (1990); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Siwakoti & Varma, Pl. Divers. E. Nepal: 326 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 822 (2000); Rajbhandari, Ethnobot. Nepal: 59 (2001); Manandhar, Pl. People Nepal: 228 (2002). — *Euphorbia pentagona* Royle, Ill. Bot. Himal. Mts.: 329, t. 82, f. 1 (1836), non Noronha, Verh. Batav. Genootsch. Kunsten 5(4): 14 (1790), nom. nud. nor Haw., Philos. Mag. Ann. Chem. 1: 187 (1827). — Type: (n. v.), along the foot of the hills, especially on Suen Range.

Euphorbia ligularia auct. non Roxb., [Hort. Bengal.: 36 (1814)] Fl. Ind. ed. 1832, 2: 465 (1832): Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998).

Succulent shrub, 3–5 m high, stem diameter 18–25 cm. *Branches* terete, 3–5 cm in diam., 5-angled, glabrous, wings 7–15 mm broad. *Leaves* deciduous, sessile; stipules spiny, 2–4 mm long; blade obovate or oblanceolate, 4–10 by 1–5 cm, base cuneate or attenuate, apex obtuse, margin entire, glabrous. *Cymes* above axils of fallen leaves, sessile; bracts elliptic, ca. 2.5 by ca. 2 mm, apex rounded. *Cyathia* sessile; involucre ca. 2 mm long, ca. 4 mm in diam., glabrous outside; glands transversely elliptic, 2–3 mm in diam., without appendage, surface flat. *Fruit* not seen. *Seeds* not seen.

Distribution — Pakistan, India, Nepal, China (Tibet-Qinghai, South-central, Southeast) (Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Mid Western, Western, Eastern.

Habitat & Ecology — Altitude 1050–1800 m. On sunny riversides or on dry slopes. Flowers from March to June.

Vernacular names — Nepali: *siudi* or *siundi* (Siwakoti & Varma 1999, Rajbhandari 2001a), *syuri* (Manandhar 2002). Chepang: *jeri* (Manandhar 2002), *jeru* (Manandhar 2002), *syuri* (Rajbhandari 2001a, Manandhar 2002). Danuwar: *mahur* (Manandhar 2002), *parsidha* (Manandhar 2002), *sidha* (Rajbhandari 2001a, Manandhar 2002), *syundi* (Manandhar 2002). Gurung: *syuri* (Manandhar 2002). Limbu: *seritakma* (Manandhar 2002), *srisin* (Manandhar 2002). Magar: *dha* (Manandhar 2002), *mete* (Manandhar 2002), *simjha* (Manandhar 2002). Majhi: *kanpate* (Manandhar 2002). Mooshar: *pasij* (Rajbhandari 2001a, Manandhar 2002). Newari: *duri kan* (Manandhar 2002). Rai: *mukrim* (Manandhar 2002), *patechurdham* (Manandhar 2002). Sherpa: *dhersya* (Manandhar 2002). Sunwar: *baro* (Manandhar 2002). Tamang: *deshe* (Rajbhandari 2001a), *desya* (Manandhar 2002). Tharu: *seunwahar* (Manandhar 2002), *seuri* (Manandhar 2002).

Uses — This species is cultivated as hedge plant. This species is also grown in pot and kept on the roof (Manandhar 2002). Boiled pith is pickled for food (Manandhar 2002). Pith, leaf and milky latex are medicinally used for various deseases (Rajbhandari 2001a, Manandhar 2002). Cutted plant into pieces is used as fish poison (Rajbhandari 2001a, Manandhar 2002).

Notes — Cited specimen as *E. ligularia* Roxb. by Short & Vickery (1982) (*Polunin et al. 3224*, BM!) is a juvenile succurent shrub without any reproductive organs. I believe it belongs not to *E. ligularia* but *E. royleana* because it has thick stems (3 cm in diam.) with wide wings (7 mm broad).

III. Subgenus **Poinsettia** (Graham) House

Subgenus Poinsettia (Graham) House, Bull. N. Y. State Mus. 254: 472 (1924). — *Poinsettia* Graham, Edinb. New Phil. J. 20: 412 (1836). — Type species: *Euphorbia pulcherrima* Willd. (= *Poinsettia pulcherrima* (Willd.) Graham)

Key to the species

A. Shrubs; floral leaves red ..... **3. E. pulcherrima** Willd. ex Klotzsch

A. Annual herbs

B. Floral leaves usually pandurate, reddish; involucral glands oblong ..... excl. 5. **E. cyathophora** J. A. Murray

B. Floral leaves ovate or lanceolate, whitish green; involucral glands orbicular ..... **4. E. heterophylla** L.

3. Euphorbia pulcherrima Willd. ex Klotzsch — Fig. 40.

Euphorbia pulcherrima Willd. ex Klotzsch in Otto & Dietr., Allg. Gartenzeitung 2: 27 (1834); Boiss. in DC. Prodr. 15(2): 71 (1862); Kurz, Forest Fl. Burma 2: 418 (1877); C. R. Rao, Ind. For. 93: 55 (1967); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Polunin & Stainton, Fl. Himal.: 360 (1984); D. G. Long in Fl. Bhutan 1: 762 (1987); Oudejans, World Cat. Tribe Euphorbieae: 342 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 63, t. 16, f. 1–3 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 814 (2000); Manandhar, Pl. People Nepal: 228 (2002). — *Poinsettia pulcherrima* (Willd. ex Klotzsch) Graham, Edinburgh New Philos. J. 20: 412 (1836); Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966). — Type: (BW 9259† (fide Coode et al. 1982)), Mexique.

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of central America, widely cultivated (Govaerts et al. 2000). In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 1050–1950 m. On roadsides. Flowers from September to April.

Vernacular names — Nepali: *lalupate* (Manandhar 2002). Bhojpuri: *lalpatta* (Manandhar 2002). Danuwar: *lalpate* (Manandhar 2002). Gurung: *olat* (Manandhar 2002). Lepcha: *lopahirarip* (Manandhar 2002). Limbu: *hekaphekwa* (Manandhar 2002).

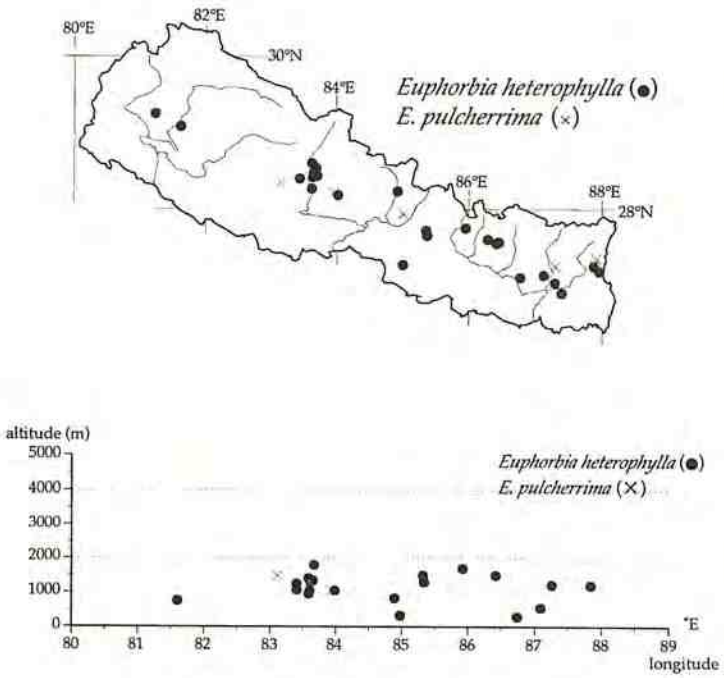

Fig. 40. Distribution of *Euphorbia heterophylla* L. and *E. pulcherrima* Willd. ex Klotzsch in Nepal.

Magar: *lalpote* (Manandhar 2002). Newari: *lalpatya* (Manandhar 2002). Rai: *halabakabu* (Manandhar 2002). Sunwar: *lalmapha* (Manandhar 2002). Tamang: *lalpate mhendo* (Manandhar 2002). Tharu: *lalpate* (Manandhar 2002).

Uses — This species is cultivated as ornamental. Milky latex is medicinally applied to boils (Manandhar 2002). Paste of leaves is medicinally applied for various cutaneous diseases (Manandhar 2002). Infusion of inflorescences has a galactagogue property (Manandhar 2002).

4. Euphorbia heterophylla L. — Fig. 40.

Euphorbia heterophylla L., Sp. Pl.: 453 (1753); Boiss. in DC., Prodr. 15 (2): 72 (1862); Murata, Acta Phytotax. Geobot. 25: 114 (1973); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); Malla et al., Fl. Kathmandu Valley: 624 (1986); Oudejans, World Cat. Tribe Euphorbieae: 193 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 67, t. 17, f. 5–8 (1997); Philcox in Rev. Handb. Fl. Ceylon 11: 200 (1997), p. p.; T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); T. Kuros. in Fl. Hinku & Hunku Valleys: 117 (2000); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 746 (2000); Manandhar, Pl. People Nepal: 227 (2002). — *Tithymalus heterophyllus* (L.) Haw., Syn. Pl. Succ.: 141 (1812). — *Cyathophora heterophylla* (L.) Raf., Fl. Tellur. 4: 117 (1838). — *Poinsettia heterophylla* (L.) Klotzsch & Garcke, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 253 (1859). — Type fide Coode et al. (1982): Plukenet, Alm: 369, t. f. 6 (1969) (n. v.), America calidiore.

Euphorbia geniculata Ortega, Nov. Pl. Descr. Dec. 2: 18 (1797); Boiss. in DC. Prodr. 15(2): 72 (1866); Siwakoti & Varma, J. Econ. Taxon. Bot. 18: 496 (1994); Siwakoti & Varma, Pl. Divers. E. Nepal: 324 (1999). — *Poinsettia geniculata* (Ortega) Klotzsch & Garcke, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 253 (1859); Hurus. & Ya. Tanaka in Fl. E. Himal.: 181 (1966). — Type: *Hort. Madrid* (MA? (fide Radcliffe-Smith 1987b), n. v.), Cuba.

Euphorbia prunifolia Jacq., Pl. Hort. Schoenbr. 3: 15, t. 277 (1798); Wall., Numer. List: 269, no. 7690A (1847); Hook. f., Fl. Brit. India 5: 266 (1887). — *Tithymalus prunifolia* (Jacq.) Haw., Syn. Pl. Succ.: 143 (1812). — *Poinsettia prunifolia* (Jacq.) Klotzsch & Garcke, Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1859: 253 (1859).

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of central America, now a pantropical weed (Webster & Burch 1968; Short & Vickery 1982). In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 290–1800 m. On roadsides, on riversides, or in crop fields. A common weeds. Flowers & fruits from April to November.

Vernacular names — Nepali: *maitula jhar* (Manandhar 2002). Chepang: *dudhiya* (Manandhar 2002). Tamang: *nator chhe* (Manandhar 2002).

Uses — Milky latex is medicinally applied to boils (Manandhar 2002). Juice is medicinally applied to cuts and wounds (Manandhar 2002).

Notes — Siwakoti & Varma's record (1999) of this species is referable to *E. cyathophola* by its red upper leaf and glands with a fissure-like apex.

IV. Subgenus **Tirucalli** (Boiss.) S. Carter

Subgenus Tirucalli (Boiss.) S. Carter, Kew Bull. 40: 823 (1985). — Section Tirucalli Boiss. in DC. Prodr. 15 (2): 94 (1862). — Type species: *Euphorbia tirucalli* L.
See *Euphorbia tirucalli* L. in Excluded taxa.

V. Subgenus **Esula** Pers.

Subgenus Esula Pers., Synop. Pl. 2: 14 (1806). — Type species: *Euphorbia esula* L.
Sectional cercumscriptions follow Prokhanov (1949).

Key to the species
(See also Table 8)

A. Involucral glands semicircular or lunate, with 2 horn-like appendages on both sides; floral leaves opposite
  B. Perennial herbs with ligneous rhizome; involucres ca. 2.5 mm long; glands 1–1.8 mm in diam.; capsules ca. 5.5 mm long, ca. 6 mm in diam. ..... Section **Esula**, **5. E. prolifera** Buch.-Ham. ex D. Don
  B. Annual herbs without rhizome; involucres ca. 1 mm long; glands ca. 1 mm in diam.; capsules 3–4 mm long, ca. 4 mm in diam. — Section **Cymatospermum** (Prokh.) Prokh.
    C. Cauline leaves oblanceolate or narrowly obovate, 0.8–1.4 cm wide; verticillate leaves elliptic or oblanceolate, 0.9–1.3 cm wide ..... **6. E. maddenii** Boiss.
    C. Cauline leaves linear, 0.3–0.4 cm wide; verticillate leaves linear, 0.2–0.3 cm wide ..... **7. E. dracunculoides** Lam.

A. Involucral glands transversely elliptic, without appendages; floral leaves opposite or 3(or more)-whorled
  B. Cauline leaves more than 16; ovary smooth or with obtuse verrucae; styles bifid; capsules 3.5–4 mm long, ca. 4.5 mm in diam. (not seen in Nepalese *E. sikkimensis*) — Section **Tulocarpa** (Raf.) Prokh.
    C. Stems 49–193 cm long, arising from rhizome; seeds smooth
      D. Stems 49–65 cm long, axillary ray 0 or 1; ovary smooth or almost smooth, glabrous or pilose ..... **8. E. sikkimensis** Boiss.
      D. Stems 80–193 cm long, axillary rays 3–11; ovary with obtuse verrucae or almost smooth, glabrous ..... **9. E. pseudosikkimensis** (Hurus. & Ya. Tanaka) Radcl.-Sm.
    C. Stems 30–50 cm long, arising from woody stock; seeds rough or nearly smooth ..... **10. E. cashmeriana** Royle
  B. Cauline leaves 0–20; ovary smooth; styles entire; capsules 4–6 mm long, 4.3–8 mm in diam. (not seen in Nepalese *E. himalayensis*) — ..... Section **Holophyllum** Prokh.
    C. Stems 33–70 cm long; involucres 3–4 mm long, glands 4–4.5 x 1.3–1.8 mm; styles 3–4 mm long; capsules ca. 6 mm long, ca. 8 mm in diam.; seeds 4.3–4.5 mm long, 3.8–4 mm wide ..... **11. E. wallichii** Hook. f.
    C. Stems 0–40 cm long; involucres 1.5–2.5 mm long, glands 1–2.2 x 0.6–1 mm; styles 1–3 mm long; capsules 4–4.5(–5) mm long, 4.3–6 mm in diam.; seeds 2.5–3.5(–4.2) mm long, 1.6–3 mm wide

D. Cauline leaves (2–)3.6–9.3 by 1–3 cm; verticillate leaves (1.9–)2.5–6.2 by 1.2–2.7 cm; involucres ca. 2.5 mm long; styles ca. 3 mm long ..... **12. E. luteoviridis** D.G. Long

D. Cauline leaves 0.5–4.5 by 0.2–1.5 cm; verticillate leaves 0.4–3.3 by 0.2–1.2 cm; involucres 1.5–2 mm long; styles 1–2.5 mm long

E. Stems 2.5–36 cm long; vegetative branches 3–5, erect; cauline leaves narrowly ovate or narrowly elliptic, 1–4.5 by 0.3–1.5 cm; branch leaves narrowly elliptic or narrowly ovate, 1.7–4.3 by 0.7–1.3 cm; verticillate leaves narrowly ovate, narrowly elliptic or elliptic, 0.7–3.3 by 0.5–1.2 cm; involucres 1.7–2 mm long ..... **13. E. himalayensis** (Klotzsch) Boiss.

E. Stems 0–3.5 cm long; vegetative branches 4–20, procumbent or ascending; cauline leaves oblanceolate or narrowly obovate, 0.5–1.1 by 0.2–0.6 cm; branch leaves orbicular, widely elliptic or widely ovate, 0.5–1.1 by 0.3–1 cm; verticillate leaves obovate, 0.4–1 by 0.2–0.6 cm; involucres ca. 1.5 mm long ..... **14. E. stracheyi** Boiss.

5. Euphorbia prolifera Buch.-Ham. ex D. Don — Plate 75, 76; Fig. 41.

Euphorbia prolifera Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 62 (1825); Hook. f., Fl. Brit. India 5: 264 (1887); Murata, Acta Phytotax. Geobot. 25: 114 (1973); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 480 (1983); Oudejans, World Cat. Tribe Euphorbieae: 335 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 118, t. 39, f. 1–4 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 812 (2000). — *Galarrhoeus proliferus* (Buch.-Ham. ex D. Don) H. Hara, J. Jap. Bot. 14: 356 (1938), "*Galarhoeus prolifera.*" — *Tithymalus proliferus* (Buch.-Ham. ex D. Don) Soják, Cas. Nár. Mus., Odd. Prír. 140: 175 (1972). — Type: [*Buchanan*] *Hamilton* [*s. n.*] (holo BM!), Nepaliâ (Nepal).

Euphorbia cuneifolia Roxb., [Hort. Bengal.: 91 (1814), nom. nud.] Fl. Ind. ed. 1832, 2: 471 (1832), non Guss., Pl. Rar.: 190 (1826); Wall., Numer. List: 269, no. 7701 (1847). — Type: (n. v.), the northern parts of Hindoostan.

Euphorbia nepalensis Boiss. in DC. Prodr. 15(2): 157 (1862). — Type: [*T.*] *Thomson* [*s. n.*, 18 Oct. 1849] (K!), Pundjah [Panjab]; *Royle* (n. v.), Pandjah; [*Mayir*] *Madden* [*s. n.*] (K!), Almorah, [500 ft.]; *Edgew* (K!), Loudhiana; *Strachey* (K!), Kumaon ad Chiring pass; *Wallich, List no. 7698A* (G-DC (IDC microfiche in TI) n. v.; iso K!, BM!, TI!), Nepaliâ (Nepal).

Euphorbia pinus H. Lév., Repert. Spec. Nov. Regni Veg. 11: 296 (1912). — Type: *Jul. Cavalerie 3779*, 3 June 1910 (holo E (fide Lauener 1983) n. v.), Kouy-Tchéou [Kweichow], Tin-Lan, montagnes, 1550 m (China).

Summer-green perennial herb. *Rhizomes* ligneous. *Stems* slender, deciduous, 2–5 from a rhizome, erect, 20–29 cm long, glabrous, 0 or 1 vegetative branches at upper part; rays 3–5. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous, midrib raised beneath; cauline leaves 18–70, alternate, lanceolate or narrowly obovate, 1.5–4.5 by 0.4–0.8 cm, apex acute or obtuse, base rounded; branch leaves many, alternate, lanceolate; verticillate leaves 3–5, ovate, 1.2–2 by 0.5–0.8 cm, base rounded, apex obtuse or rounded; floral leaves opposite, widely ovate, ovate or depressed ovate, base truncate, apex obtuse. *Cyathia* in the terminal pleiochasium and some lateral dichasia; involucre ca.

TABLE 8. Comparison of characters of Nepalese *Euphorbia* section Tulocarpa and section Holophyllum species

	E. sikkimensis	*E. pseudosikkimensis*	*E. cashimeriana*	*E. wallichii*	*E. luteoviridis*	*E. himalayensis*	*E. stracheyi*
Stem length (cm)	49–65	80–193	30–50	33–70	(13–)18–40	2.5–36	0–3.5
surface	glabrous or villous	glabrous or upper part rarely villous	glabrous or sparsely pilose	villous	upper part villosulous	villous	glabrous or villous
Vegetative branches	3–6	0–8	4–6	0–6	4 or 5	3–5	4–20
Rays	5 or 6	5–8, often 5	5 or 6, often 5	5–6, often 5	5	4–8	3–5, often 5
length (cm)	not seen	4–11	1.3–7	2–12	0.7–2.7	2.6–9	1.4–3.5
surface	villous or glabrate	glabrous	glabrous	villous	villosulous	villosulous	glabrous or villous
Axillary rays	0 or 1	3–11	0–2	0–1	0–2	0–4	0–4
Cauline leaves	17–28	many	many	10–20	(4–)9–18	2–11	0–5
size (cm)	5.5–10 × 0.8–1.6	6.8–14 × 1.5–2.5	6–11.5 × 1–2	(4.5–)6.1–12 × 1.4–4.1	(2–)3.6–9.3 × 1–3	1–4.5 × 0.3–1.5	0.5–1.1 × 0.2–0.6
Verticillate leaves							
size (cm)	3–6.5 × 1.2–1.8	3.5–6 × 1.5–2.5	3.5–5.5 × 1.3–2	3.5–8 × 1.7–3.7	(1.9–)2.5–6.2 × 1.2–2.7	0.7–3.3 × 0.5–1.2	0.4–1 × 0.2–0.6
Involucre length (mm)	3–4	ca. 3	ca. 3	3–4	ca. 2.5	1.7–2	ca. 1.5
gland size (mm)	ca. 2 × ?	1.2–2 × 0.6–1.2	1.2–1.5 × 0.5–0.8	4–4.5 × 1.3–1.8	1.8–2.2 × ca. 0.8	1.3–2 × 0.8–1	1–2 × 0.6–0.7
Styles	bifid	bifid	bifid	entire	entire	entire	entire
length (mm)	ca. 2.5	2–3.5	2.5–3.5	3–4	ca. 3	1.3–2.5	1–1.7
Ovary surface	smooth or almost smooth; glabrous or pilose	with obtuse verrucae or almost smooth; glabrous	with obtuse verrucae; glabrous or pilose	smooth; glabrous	smooth; glabrous	smooth; glabrous	smooth; glabrous
Capsule length (mm)	(not seen)	3.5–4	ca. 4	ca. 6	ca. 4.5	ca. 4.2	ca. 4(–5)
diameter (mm)	(not seen)	ca. 4.5	ca. 4.5	ca. 8	ca. 6	ca. 4.5	ca. 4.3
Seed size (mm)	(not seen)	2.7–3 × 2–2.2	ca. 2.8 × 1.9–2	4.3–4.5 × 3.8–4	ca. 3.5 × 2.7–3	2.7–3 × 1.6–1.8	2.5–2.9(–4.2) × 1.6–1.9(–2.6)
surface	(not seen)	smooth	rough or nearly smooth	smooth	smooth	smooth	smooth

2.5 mm long, outside glabrous; glands semicircular, 1–1.8 mm in diam., with horn-like appendages on both sides; involucral lobes triangular or deltate, margin serrate. *Pistillate flower*: ovary glabrous, smooth; styles ca. 1.4 mm long, shortly bifid. *Fruits*: pedicel 7–10 mm long; capsule widely ovoid, 3-ridged, ca. 5.5 mm long, ca. 6 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 3.6 mm long. *Seeds* not seen.

Distribution — Pakistan, India (Kumaon), Nepal, Thailand, China (South-central) (Short & Vickery 1982, Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Far Western, Western, Central.

Habitat & Ecology — Altitude 900–1900 m. On bare grasslands or cultivated fields. Flowers from April to May; fruits from April to June.

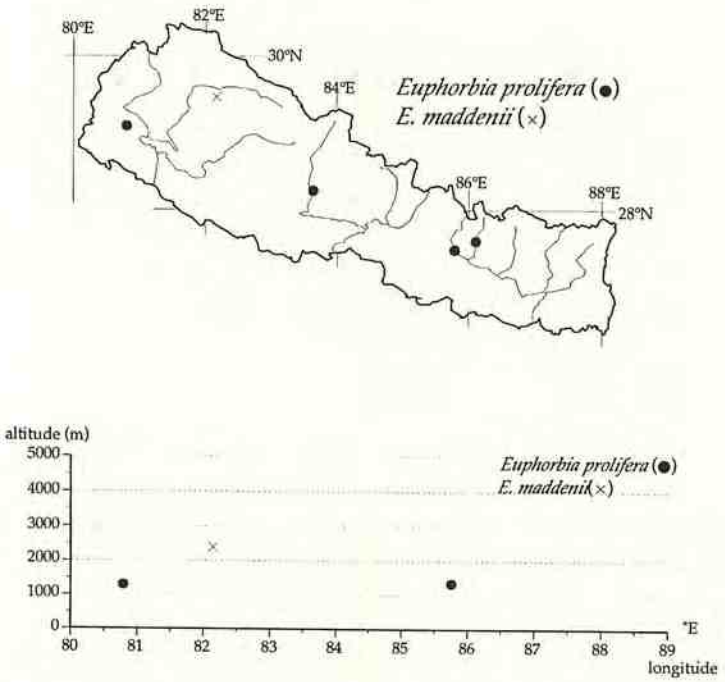

Fig. 41. Distribution of *Euphorbia prolifera* Buch.-Ham. ex D. Don and *E. maddenii* Boiss. in Nepal.

6. Euphorbia maddenii Boiss. — Fig. 41.

Euphorbia maddenii Boiss. in DC. Prodr. 15(2): 141 (1862), "*maddeni*"; Hook. f., Fl. Brit. India 5: 263 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); Oudejans, World Cat. Tribe Euphorbieae: 251 (1990); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 773 (2000). — *Tithymalus maddenii* (Boiss.) Soják, Cas. Nár. Mus., Odd. Prír. 140: 173 (1972). — Type: *Edgeworth* (K!), circa Simla; [*Mayir*] *Madden* [*25*] (K!), Nynee Tal [Nynee Tall, 7300 ft]; [*R.*] *Strachey* [*& J. E. Winterbottom 15*] (K!), Nynee Tal [Naini Tal], 6400', [Kumaon]; [*T.*] *Thomson* [*572*, Apr. 1844] (G-DC (IDC microfiche in TI) n. v., K!), Nynee Tal, [Kumaon].

Annual herb without rhizome. *Stems* slender, erect, 15–25 cm long, glabrous, branched at base; rays 3–5. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous,

midrib raised beneath; cauline leaves 5–15, alternate, oblanceolate or narrowly obovate, 2.5–4 by 0.8–1.4 cm, base acute or cuneate, apex rounded; verticillate leaves 3–5, elliptic or oblanceolate, 1.8–3.4 by 0.9–1.3 cm, base acute, apex obtuse or rounded; floral leaves opposite, ovate, base truncate or obtuse, apex obtuse or rounded. *Cyathia* in the terminal pleiochasium and 0–2 lateral dichasia; involucre ca. 1 mm long, outside glabrous; glands semicircular, ca. 1 mm in diam., with horn-like appendages on both sides. *Pistillate flowers*: ovary glabrous, smooth. *Fruits*: pedicel 4–5 mm long; capsule depressed ovoid, 3-lobed, ca. 3 mm long, ca. 4 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 2.3 mm long. *Seeds* ellipsoid, carunculate, ca. 2 mm long, ca. 1.4 mm in diam., glabrous, with 6 longitudinally elliptic pits.

Distribution — Pakistan, India (Kumaon), Nepal (Govaerts et al. 2000). *NW Himalayan element*. In Nepal: Mid Western.

Habitat & Ecology — Altitude 2400 m. On stony ground. Flowers & fruits in May.

7. Euphorbia dracunculoides Lam. — Plate 78.

Euphorbia dracunculoides Lam., Encycl. 2: 428 (1788); Roxb., Fl. Ind. ed. 1832, 2: 474 (1832), "*dracumculoides*"; Boiss. in DC. Prodr. 15(2): 139 (1862); Boiss., Icon. Euphorb.: t. 91 (1866); Hook. f., Fl. Brit. India 5: 262 (1887); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 195 (1982); Oudejans, World Cat. Tribe Euphorbieae: 137 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 118, t. 38, f. 1–4 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 714 (2000). — *Tithymalus dracunculoides* (Lam.) Klotzsch & Garcke, Abh. Königl. Akad. Wiss. Berlin 1859: 84 (1860). — [*Euphorbia dracunculoides* Lam. subsp. *eudracunculoides* Maire, Bull. Soc. Hist. Nat. Afrique N. 1929: 734 (1929), nom. inval.] — Type: *M. Commerson 545* (holo P-LA (fide Radcliffe-Smith 1987b) n. v.), Mauritius.

Euphorbia angustifolia Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 62 (1825), non (Haw.) Steud., Nomencl. Bot. ed. 1: 323 (1821); Hook. f., Fl. Brit. India 5: 265 (1887). — *Euphorbia hamiltonii* Oudejans, Phytologia 67: 46 (1989), nom. nov.; Oudejans, World Cat. Tribe Euphorbieae: 187 (1990); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 742 (2000). — Type: [*Buchanan*] *Hamilton* [*s. n.*, 26 March 1802] (holo BM!), ad Norcotera Nepalensium (Nepal).

Euphorbia lanceolata Spreng., Mant. Prim. Fl. Hal.: 41 (1807).

Euphorbia dracunculoides Lam. var. *africana* Rikli & Schröt., Vierteljahrschr. Naturf. Ges. Zürich 57: 127 (1912).

Annual herb. *Stems* slender, erect, more than 20 cm long, glabrous, without branches; rays 3. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous, midrib raised beneath; cauline leaves alternate, linear, 3.5–4.5 by 0.3–0.4 cm, base obtuse, apex acute or obtuse; verticillate leaves 3, linear, 4–4.5 by 0.2–0.3 cm, base obtuse, apex acute; floral leaves opposite, linear or lanceolate, base obtuse, apex acute or obtuse. *Cyathia* in the terminal pleiochasium and some lateral dichasia; involucre ca. 1 mm long, outside glabrous; glands semicircular, ca. 1 mm in diam., with horn-like appendages on both sides. *Pistillate flowers*: ovary glabrous, smooth. Fruits: capsule widely ovoid, 3-lobed, ca. 4 mm long, ca. 4 mm in diam., glabrous, smooth. *Seeds* not seen.

Distribution — Northern Africa, West Tropical Africa, Northeast Tropical Africa,

Middle Atrantic Ocean, Gulf States, Oman, Saudi Arabia, Kuwait, Iran, Iraq, Pakistan, India, Nepal, China (South-central) (Govaerts et al. 2000). In Nepal: Central.

Habitat & Ecology — Flowers & fruits in March.

8. Euphorbia sikkimensis Boiss. — Fig. 42.

Euphorbia sikkimensis Boiss. in DC., Prodr. 15(2): 113 (1862), excl. *Griffith 963* (type of *E. griffithii*); Hook. f., Fl. Brit. India 5: 259 (1887); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 481 (1983); D. G. Long in Fl. Bhutan 1: 764 (1987); Oudejans, World Cat. Tribe Euphorbieae: 383 (1990); Turner, Euphorbias: 161 (1995); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 76, t. 21, f. 2–5 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 835 (2000). — *Tithymalus sikkimensis* (Boiss.) Hurus. & Ya. Tanaka in Fl. E. Himalaya: 184 (1966). — Type: *J. D. Hooker* [*s. n.*, 23 May 1849] (K!) & *J. D. Hooker* [*s. n.*, 20 Aug. 1849] (K!), in ditione Sikkim temperatâ ad Chongtam [Choongtam]; *J. D. Hooker* [*s. n.*, 31 July & 1 Oct. 1849] (K!), in ditione Sikkim temperatâ ad Luchong, alt. 9000'-11000'; *J. D. Hooker* [*s. n.*, 24 Oct. 1849] (K!), in ditione Sikkim temperatâ ad Luchong, alt. 10000 ft.

Euphorbia chrysocoma H. Lév. & Vaniot, Bull. Herb. Boisser, II, 6: 762 (1906); Lauener, Notes Roy. Bot. Gard. Edinburgh 40: 478 (1983). — Type: *J. Bodinier 1615*, 1 June 1897 (holo E (fide Lauener 1983) n. v.), Kouy-Tchéou [Kweichow], mont de Lou-Tsoug-Koan (China).

Euphorbia chrysocoma H. Lév. & Vaniot var. *glaucophylla* H. Lév. & Vaniot, Bull. Herb. Boisser, II, 6: 762 (1906). — Type: *Ducloux 118*, Mar. 1897 (holo E (fide Lauener 1983) n. v.), Yun-Nan, environs de Yun-Nan-Sen, My-Tsao, Te-Tse-Sen (China).

Summer-green perennial herb. *Rhizomes* not seen. *Stems* slender, deciduous, erect, 49–65 cm long, glabrous or villous, with 3–6 well developed vegetative branches from upper part; rays 5 or 6, with 0 or 1 axillary ray, trichotomous, villous or glabrate. *Leaves* sessile, exstipulate, margin entire, upper surface glabrous, lower surface villous on midrib or glabrous, midrib raised beneath; cauline leaves 17–28, alternate, lanceolate or narrowly elliptic (lower ones oblanceolate), 5.5–10.5 by 0.8–1.6 cm, base cuneate, apex acute; verticillate leaves 5 or 6, narrowly elliptic or narrowly ovate, 3–6.5 by 1.2–1.8 cm, base obtuse, apex acute or obtuse; floral leaves elliptic or circular, base obtuse or rounded, apex obtuse or rounded; the first floral leaves 3-whorled; other floral leaves not seen. *Cyathia* in the terminal and 0 or 1 lateral pleiochasia; involucre 3–4 mm long, outside glabrous or pilose; glands transversely elliptic, ca. 2 mm in diam., surface flat, without appendage; involucral lobes transversely elliptic, emarginate, margin entire, ciliate. *Pistillate flowers*: ovary glabrous or pilose, smooth or almost smooth; styles ca. 2.5 mm long, shortly bifid. *Fruit*: not seen. *Seeds* not seen.

Distribution — India (Sikkim), Nepal, Bhutan?, China (Tibet-Quinghai, South-central, Southeast), Vietnam (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Far Western, Mid Western.

Habitat & Ecology — Altitude 2100–2400 m. On stream sides. Flowers from April to May.

Notes — *Euphorbia sikkimensis* described by Boisser (1862) based on Sikkim Himalayan plant (*Hooker s. n.*) and Bhutan plant (*Griffith 963*). Hooker (1886–1888),

however, pointed out the latter having scarlet coloured floral leaves and treated it as a new species, *E. griffithii*. Long (1987) suggested them as being subspecifically distinct.

This is a poorly-known and misunderstood species in Himalayan region (Long 1987). The records of this species from Ganesh Himal by Amano (1999) and from east Nepal by Short & Vickery (1982) are referable to *E. luteoviridis* and *E. pseudosikkimensis*, respectively. In addition to the record from Bhutan as pointed by Long (1987), those from China may also require confirmation, because the illustration and the description in Ma & Tseng (1997) are distinct from original description in many characters such as leaf shape and stem length.

Ma & Wu (1993) recorded *Euphorbia griffithii* from Nepal with the citation of two specimens, *Polunin* (as "*Polumin*") *et al. 1859*, E, and *Polunin et al.* (as "*Grierson & Long*") *4083*, E. The former was not found and the latter is referable to *E. sikkimensis*.

Hooker (1886–1888) pointed out that *E. sikkimensis* was distinguished from *E. pseudosikkimensis* (as *E. longifolia*) by its leaves narrowed into a slender petiole, short involucres, and smooth capsules. It was, however, difficult for me to delimit between *E. sikkimensis* and *E. pseudosikkimensis*, partly because verrucae of ovary and capsule in herbarium specimens of *E. pseudosikkimensis* are variable in size and often obscure, partly because Hooker's delimitation (1886–1888) is insufficient or these two taxa are not good species. Hence, some identification of the two species in here may be subjective and doubtful.

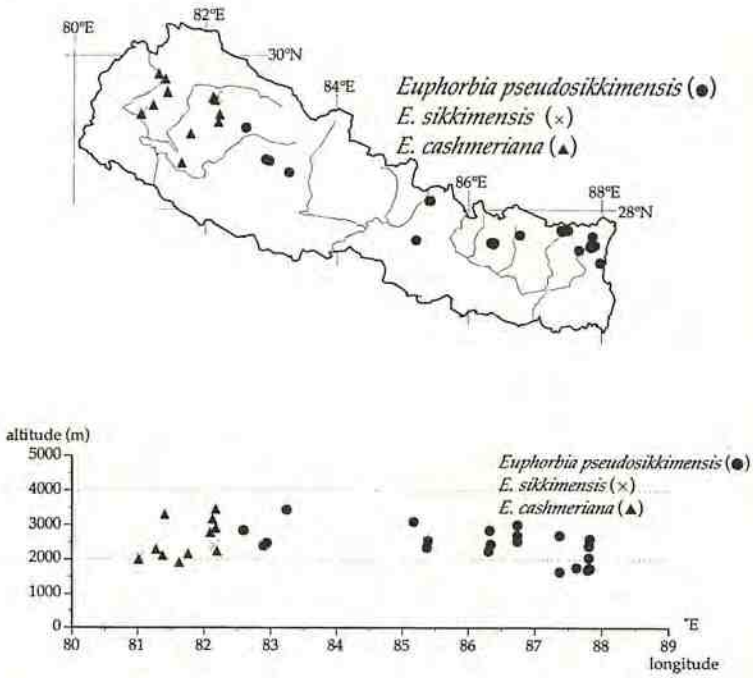

Fig. 42. Distribution of *Euphorbia pseudosikkimensis* (Hurus. & Ya. Tanaka) Radcl.-Sm., *E. sikkimensis* Boiss., and *E. cashmeriana* Royle in Nepal.

9. Euphorbia pseudosikkimensis (Hurus. & Ya. Tanaka) Radcl.-Sm. — Fig. 42.

Euphorbia pseudosikkimensis (Hurus. & Ya. Tanaka) Radcl.-Sm., Kew Bull. 36: 216 (1981); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Oudejans, World Cat. Tribe Euphorbieae: 340 (1990); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 813 (2000). — *Tithymalus pseudosikkimensis* Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966). — Type: [*Tuyama 6306778*], 9 Nov. 1963 (holo TI!), Nepal, above Lelep, 2600 m. See Kurosawa & Shimizu (2000) for a photograph of the holotype.

Euphorbia donii Oudejans, Phytologia 67: 45 (1989), nom. nov.; Oudejans, World Cat. Tribe Euphorbieae: 136 (1990); Turner, Euphorbias: 102 (1995); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 83 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); T. Kuros. in Fl. Hinku & Hunku Valleys: 116 (2000); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 714 (2000). — *Euphorbia longifolia* D. Don, Prodr. Fl. Nepal.: 62 (1825), non Gueldenst., Reis. Russland 1: 192 (1787), nec Lam., Encycl. 2: 417 (1788); Boiss. in DC., Prodr. 15(2): 120 (1862); Hook. f., Fl. Brit. India 5: 261 (1887); Kitam. in Fauna Fl. Nepal Himal.: 172, t. 35 (1955); Murata, Acta Phytotax. Geobot. 25: 114 (1973); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); Polunin & Stainton, Fl. Himal.: 361 (1984); D. G. Long in Fl. Bhutan 1: 765 (1987); Ohba & Akiyama, Alpine Fl. Jaljale Himal.: 40 (1992). — *Tithymalus longifolius* (D. Don.) Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966). — Type: *Hamilton* (n. v.), Nepaliâ.

Euphorbia schillingii Radcl.-Sm., Kew Mag. 4: 112 (1987); Oudejans, World Cat. Tribe Euphorbieae: 369 (1990); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 825 (2000). — Type: *Schilling 2060* (K!), Nepal.

Euphorbia schillingii Radcl.-Sm. var. *praecox* Radcl.-Sm., Kew Mag. 8: 46 (1991). — Type: *Wight s. n.* (K!), Nepal.

Euphorbia sikkimensis auct. non Boiss. in DC., Prodr. 15(2): 113 (1862): Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982).

Summer-green perennial herb. *Rhizomes* thick. *Stems* slender, deciduous, 1 to several from a rhizome, erect, 80–193 cm long, glabrous (rarely upper part villous), with 0–8 vegetative branches from upper part; rays 5–8, often 5, with 3–11 axillary rays, 4–11 cm long, glabrous, tetrachotomous, trichotomous or dichotomous, then dichotomous. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous, midrib raised beneath; cauline leaves many, alternate, oblanceolate or narrowly elliptic, 6.8–14 by 1.5–2.5 cm, apex acute or obtuse, base cuneate; verticillate leaves 5–8, usually 5, narrowly elliptic or narrowly ovate, 3.5–6 by 1.5–2.5 cm, apex obtuse, base obtuse; floral leaves elliptic or circular, apex obtuse or rounded, base obtuse or rounded; the first floral leaves 3- or 4-(rarely 5-)whorled; other floral leaves opposite or 3-whorled. *Cyathia* in the terminal and 3–11 lateral pleiochasia; involucre ca. 3 mm long, outside glabrous; glands without appendage, transversely elliptic, 1.2–2 by 0.6–1.2 mm, surface flat; involucral lobes widely ovate, minutely irregularly toothed, margin ciliate. *Pistillate flowers*: ovary glabrous, with obtuse verrucae; styles 2–3.5 mm long, bifid. *Fruits*: capsule sphaeroidal, 3.5–4 mm long, ca. 4.5 mm in diam., with sparse obtuse verrucae or almost smooth, glabrous; columella persistent after dehiscence, 3–3.3 mm long. *Seeds* carunculate, broadly ellipsoid, 2.7–3 mm long, 2–2.2 mm wide, smooth, brown or grayish.

Distribution — India (Sikkim), Nepal, Bhutan, China (Tibet-Qinghai) (Long 1987, Govaerts et al. 2000). *E Himalayan element*. In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 1650–3510 m. On stream sides, on grassy slopes, in forests, on forest clearings, or in open meadows. Flowers from May to November; fruits from May to November.

Notes — *Euphorbia pseudosikkimensis* was described from Mechi Zone in East Nepal characterized by its subpetiolate leaves, obscurely warted capsules, and glabrous stem (Hurusawa & Tanaka 1966). These characters, however, almost agree with Hooker's description of *E. longifolia* D. Don as "glabrous or sparsely hairy", "leaves sessile", and "capsule covered obscurely and sparsely with conical warts."

The name widely accepted for this species, *Euphorbia longifolia* D. Don, was recently revealed as the later homonym of *E. longifolia* Gueldenst. and renamed *E. donii* by Oudejans (1989). A Hurusawa & Tanaka's name (1966), *Euphorbia pseudosikkimensis*, is prior to *E. donii*, although I had erroneously united the former under the latter (Kurosawa 1998, 2002).

Another East Nepalese species, *Euphorbia schillingii*, was recently described by Radcliffe-Smith (1987a). He pointed out the species is restricted to Dudh Kosi valley and separates from *E. longifolia* D. Don by later flowering period (mid-July to mid-September), and by broader (up to 3 cm), obtuse, membranaceous cauline leaves. However, the range of flowering period and leaf apex of *E. schillingii* in Radcliffe-Smith (1987a) are included in that of *E. pseudosikkimensis*. Although its leaf width slightly exceeds the range, I think that *E. schillingii* should be regarded as conspecific with *E. pseudosikkimensis*.

In some case, this species is difficult to distinguished from *E. sikkimensis* because of obscured verrucae on capsules in herbarium specimens. See note under *E. sikkimensis*.

Euphorbia cashmeriana also resembles this species. See note under *E. cashmeriana*.

10. Euphorbia cashmeriana Royle — Plate 79; Fig. 42.

Euphorbia cashmeriana Royle, Ill. Bot. Himal. Mts.: 329, t. 82, f. 4 (1836); Boiss. in DC., Prodr. 15(2): 120 (1862); Oudejans, World Cat. Tribe Euphorbieae: 95 (1990). — Type: (n. v.), Cashmere and neighbouring mountains.

Tithymalus cognatus Klotzsch ex Klotzsch & Garcke, Abh. Königl. Akad. Wiss. Berlin 1859: 66 (1860); Klotzsch in Klotzsch & Garcke, Bot. Ergebn. Reise Waldemar: 114, t. 19 (as *E. consanguinea*) (1862). — *Euphorbia cognata* (Klotzsch ex Klotzsch & Garcke) Boiss. in DC., Prodr. 15(2): 120 (1862); Oudejans, World Cat. Tribe Euphorbieae: 107 (1990). — *Euphorbia pilosa* L. var. *cognata* (Klotzsch ex Klotzsch & Garcke) Hook. f., Fl. Brit. India **5**: 261 (1887). — Type: *Hoffmeister* (n. v.), Himalaya.

Summer-green perennial herb or subshrub. *Roots* ligneous. *Stems* 1–3 from woody stocks, slender, erect, 30–50 cm long, glabrous or sparsely pilose, with 4–6 vegetative branches from upper part; rays 5 or 6, often 5, with 0–2 axillary rays, 1.3–7 cm long, glabrous, trichotomous or dichotomous, then dichotomous. *Leaves* sessile, exstipulate, margin entire, upper surface glabrous, lower surface glabrous or sparsely pilose on midrib, midrib raised beneath; cauline leaves many, alternate, oblanceolate, narrowly

elliptic, 6–11.5 by 1–2 cm, base cuneate, apex acute; verticillate leaves 5 or 6, usually 5, lanceolate or narrowly elliptic, 3.5–5.5 by 1.3–2 cm, apex acute or obtuse, base obtuse; floral leaves ovate or widely ovate, apex obtuse, base obtuse; the first floral leaves opposite or 3-whorled; other floral leaves opposite. *Cyathia* in the terminal and 0–2 lateral pleiochasia; involucre ca. 3 mm long, outside glabrous; glands transversely elliptic, 1.2–1.5 by 0.5–0.8 mm, without appendage, surface flat; involucral lobes widely ovate, hairy on margin. *Pistillate flowers*: ovary glabrous or sparsely pilose, with obtuse verrucae; styles 2.5–3.5 mm long, bifid. *Fruits*: capsule sphaeroidal, ca. 4 mm long, ca. 4.5 mm in diam., with sparse obtuse verrucae, glabrous or pilose; columella persistent after dehiscence, ca. 3.3 mm long. *Seeds* carunculate, broadly ellipsoid, ca. 2.8 mm long, 1.9–2 mm wide, rough or nearly smooth, dark brown or grayish.

Distribution — Afghanistan, Pakistan, India (Kashimir), Nepal (Govaerts et al. 2000). *NW Himalayan element*. In Nepal: Far Western, Mid Western.

Habitat & Ecology — Altitude 1850–3490 m. In grasslands, in forests, and on roadsides. Flowers from July to September; fruits from July to September.

Notes — This is the first record of the species from Nepal.

Euphorbia pseudosikkimensis resembles *E. cashmeriana* in its middle sized capsule with sparse obtuse swellings. In herbarium specimens, the latter is distinguished only by its shorter stems arising from woody stocks, occasionary pilose ovaries and capsules, and rough or nearly smooth seeds.

Another closely related species is *E. cornigera*, from Pakistan, Kashmir and northwestern India. It differes in its conical swellings of ovaries and capsules, smooth seeds, and serrulate leaves (Hooker 1886–1888, Turner 1995).

11. Euphorbia wallichii Hook. f. — Fig. 43.

Euphorbia wallichii Hook. f., Fl. Brit. India 5: 258 (1887); Baehni, Candollea 17: 70 (1959); A. R. Smith, B. Mag. 175: t. 442 (1964); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982), p. p.; Polunin & Stainton, Fl. Himal.: 361, pl. 111 (1984); Oudejans, World Cat. Tribe Euphorbieae: 437 (1990); J. S. Ma & C. Y. Wu, Collect. Bot. (Barcelona) 21: 111 (1992), p. p.; J. S. Ma & C. Y. Wu, Acta Bot. Yunnan. 15: 115 (1993), p. p; Turner, Euphorbias: 174 (1995); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 88, t. 25, f. 5–8 (1997), p. p.; T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Amano in Contr. Fl. Ganesh Himal.: 46 (1999); T. Kuros. in Fl. Hinku & Hunku Valleys: 117 (2000); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 859 (2000), p. p.; Manandhar, Pl. People Nepal: 229 (2002). — [*Euphorbia involucrata* Wall., Numer. List: 269, no. 7696 (1847), nom. nud.] — *Tithymalus wallichii* (Hook. f.) Soják, Cas. Nár. Mus., Odd. Prír. 140: 177 (1972). — Type: *Wallich, List no. 7696A*, [in 1821] (K-WALL (IDC microfiche in TI) n. v.), Nepal, [Gossain Than]; *Aitchison* [*94*, Aug. 1877] (K!), Kashmir; [*T.*] *Thomson* [*s. n.*, 9 May 1848] (K!), [Himal. Bor. Occ., Banahal Pass]; [*T.*] *Thomson* [*s. n.*, 4 June 1848] (K!), [Himal. Bor. Occ., Badarwar, E. Kashmir, near Padri Pass].

Summer-green perennial herb. *Rhizomes* thick, creeping horizontally, 2–3.5 cm in diam. *Stems* slender, deciduous, erect, 33–70 cm long, villous, with 0–6 vegetative branches; rays 5 or 6, often 5, with 0 or 1 axillary ray, 2–12 cm long, villous. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous or villous at base (rately lower surface

densely wooly), midrib raised beneath; cauline leaves 10–20, alternate, oblanceolate, narrowly elliptic or narrowly ovate, (4.5–)6.1–12 by 1.4–4.1 cm, base cuneate or obtuse, apex acute; branch leaves 12–18, narrowly elliptic, 3.7–5.3 by 0.7–1.2 cm, base cuneate, apex acute, obtuse or rounded; verticillate leaves 5 or 6, usually 5, narrowly ovate or ovate, 3.5–8 by 1.7–3.7 cm, base obtuse or rounded, apex acute or obtuse; floral leaves ovate or widely ovate, base obtuse or rounded, apex acute or obtuse; the first floral leaves 3- or 4-whorled; other floral leaves 3-whorled. *Cyathia* in the terminal and 0 or 1 lateral pleiochasia; involucre 3–4 mm long, glabrous or villous outside; glands transversely elliptic, 4–4.5 mm in diam., 1.3–1.8 mm long, without appendage, surface flat; involucral lobes widely ovate, irregularly toothed, margin ciliate. *Pistillate flowers*: ovary glabrous, smooth; styles 3–4 mm long, entire. *Fruits*: capsule sphaeroidal, ca. 6 mm long, ca. 8 mm in diam., glabrous, smooth; columella persistent after dehiscence, 6–7 mm long. *Seeds* carunculate, broadly ellipsoid, 4.3–4.5 mm long, 3.8–4 mm wide, smooth.

Distribution — Afganistan, Pakistan, India, Nepal, China (Tibet-Quinghai, South-central) (Govaerts et al. 2000). *Pan-Himalayan element*. In Nepal: Far Western, Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 2250–4500 m. On open slopes, in forests, in forest clearings, in grasslands, or in kharka. Flowers from April to August; fruits from May to September.

Vernacular name — Tibetan: *duk* (Manandhar 2002).

Uses — Milky latex is medicinally used to treat goiter (Manandhar 2002).

Notes — Some specimens from Jumla District in Mid Western development region (*O. Polunin et al. 2129*, BM, E; *O. Polunin et al. 952*, BM) have leaves with remarkable wooly hairs on undersurface.

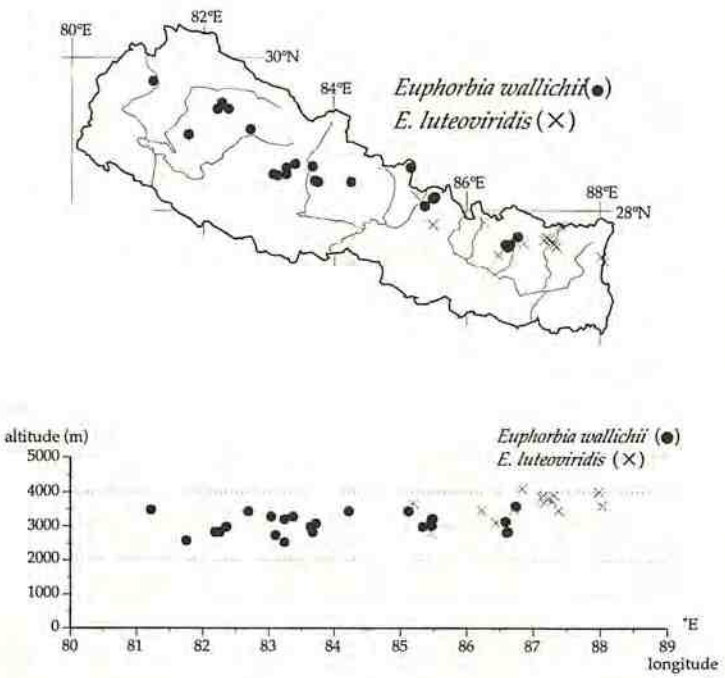

Fig. 43. Distribution of *Euphorbia wallichii* Hook. f. and *E. luteoviridis* D. G. Long in Nepal.

12. Euphorbia luteoviridis D. G. Long — Fig. 43.

Euphorbia luteoviridis D. G. Long, Notes Roy. Bot. Gard. Edinburgh 44: 163 (1986); D. G. Long in Fl. Bhutan 1: 764 (1987); Oudejans, World Cat. Tribe Euphorbieae: 245 (1990); Turner, Euphorbias: 128 (1995); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); T. Kuros. in Fl. Hinku & Hunku Valleys: 117 (2000). — Type: [*R. E.*] *Cooper 160*, 5 Jul. 1913 (holo E!), Sikkim, Kapup, 3960 m [13000'].

Euphorbia himalayensis auct. non (Klotzsch) Boiss. in DC., Prodr. 15(2): 113 (1862): Hook. f., Fl. Brit. India 5: 258 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982), p. p. — *Tithymalus himalayensis* auct. non Klotzsch: Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966).

Euphorbia griffithii auct. non Hook. f., Fl. Brit. India 5: 259 (1887): Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998).

Euphorbia wallichii auct. non Hook. f., Fl. Brit. India 5: 258 (1887): J. S. Ma & C. Y. Wu, Collect. Bot. (Barcelona) 21: 111 (1992), p. p.; J. S. Ma & C. Y. Wu, Acta Bot. Yunnan. 15: 115 (1993), p. p.; J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 88 (1997), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 771 (2000), p. p.

Euphorbia sikkimensis auct. non Boiss. in DC., Prodr. 15(2): 113 (1862): Amano in Contr. Fl. Ganesh Himal.: 40 (1999).

Summer-green perennial herb. *Rhizomes* thick. *Stems* somewhat thick or slender, deciduous; subterranean part of stems 2.5–8 cm long, glabrous, scaly, simple; aerial part of stems erect, (13–)18–40 cm long, with 4 or 5 vegetative branches, lower part glabrate, upper part villosulous; vegetative branches erect, 3.5–12 cm long; rays 5, with 0–2 axillary rays, 0.7–2.7 cm long, villosulous. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous, green, midrib raised beneath; cauline leaves (4–)9–18, alternate, narrowly elliptic, elliptic or widely elliptic, (2–)3.6–9.3 by 1–3 cm, apex acute or obtuse, base cuneate or obtuse; branch leaves 7–16, narrowly elliptic, (2.8–)3.7–4.5 by 0.8–1.7 cm, apex acute or obtuse, base cuneate; verticillate leaves 5, elliptic, narrowly ovate or narrowly elliptic, (1.9–)2.5–6.2 by 1.2–2.7 cm, apex acute, base cuneate; the first floral leaves 3-whorled. *Cyathia* in the terminal and 0–2 lateral pleiochasia; involucre ca. 2.5 mm long, outside villous or glabrous; glands transversely elliptic, 1.8–2.2 by ca. 0.8 mm, without appendage, surface flat; involucral lobes widely ovate, margin irregularly toothed, ciliate. *Pistillate flowers*: ovary glabrous, smooth; styles ca. 3 mm long, entire. *Fruits*: capsule sphaeroidal, ca. 4.5 mm long, ca. 6 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 4 mm long. *Seeds* carunculate, broadly ellipsoid, ca. 3.5 mm long, 2.7–3 mm wide, smooth.

Distribution — India (Sikkim, W Bengal), Nepal, China (Tibet-Qinghai)? (Long, 1986). *E Himalayan element*. In Nepal: Central, Eastern.

Habitat & Ecology — Altitude 2800–4100 m. On rocky slopes, on grassy slopes, in open meadows, or in *Rhododendron* bushs. Flowers from May to August; fruits from August to October.

Notes — This is a much misunderstood species in Nepalese Flora. As pointed by Long (1986), the species had been confused with *E. himalayensis* for a long time. *Euphorbia griffithii* in Short & Vickery (1982) (based on *Lancaster & Morris 44*) and *E. sikkimensis* in Amano (1999) (based on *F. Miyamoto et al. 9440086*, BM!) are referable to the species.

Ma & Wu (1992, 1993) and Govaerts et al. (2000) regarded *E. luteoviridis* as a synonym of *E. wallichii* in spite of distinct differences of size of involucres and capsules.

13. Euphorbia himalayensis (Klotzsch) Boiss. — Plate 77; Fig. 44.

Euphorbia himalayensis (Klotzsch) Boiss. in DC., Prodr. 15(2): 113 (1862); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982), p. p.; D. G. Long, Notes Roy. Bot. Gard. Edinburgh 44: 167; D. G. Long in Fl. Bhutan 1: 765 (1987); Oudejans, World Cat. Tribe Euphorbieae: 195 (1990); Turner, Euphorbias: 120 (1995); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998). — *Tithymalus himalayensis* Klotzsch in Klotzsch & Garcke, Bot. Ergebn. Reise Waldemar: 115, t. 20 (1862); Hurus. & Ya. Tanaka in Fl. E. Himal.: 182 (1966). — Type: *Hoffmeister s. n.* (B† (fide Ma & Wu 1993, p. 115)), Himalaya entdeckt.

Euphorbia stracheyi auct. non Boiss. in DC., Prodr. 15(2): 114 (1866): Hand.-Mazz., Symb. Sin. 7: 228 (1931), p. p.; J. S. Ma & C. Y. Wu, Collect. Bot. (Barcelona) 21: 109 (1992), p. p.; J. S. Ma & C. Y. Wu, Acta Bot. Yunnan. 15: 113 (1993), p. p.; J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 81, t. 23, f. 3–8 (1997), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 841 (2000), p. p.

Summer-green perennial herb. *Stems* slender, deciduous; subterranean part of stems 5–11 cm or more, glabrous, scaly, simple; aerial part of stems erect, 2.5–36 cm long, villous, with 3–5 vegetative branches; rays 4–8, with 0–4 axillary rays, 2.6–9 cm long, villosulous; vegetative branches erect, 4.5–58 cm long, villosulous. *Leaves* sessile, exstipulate, margin entire, both surfaces glabrous, midrib raised beneath; cauline leaves 2–11, alternate, narrowly ovate or narrowly elliptic, 1–4.5 by 0.3–1.5 cm, base attenuate,

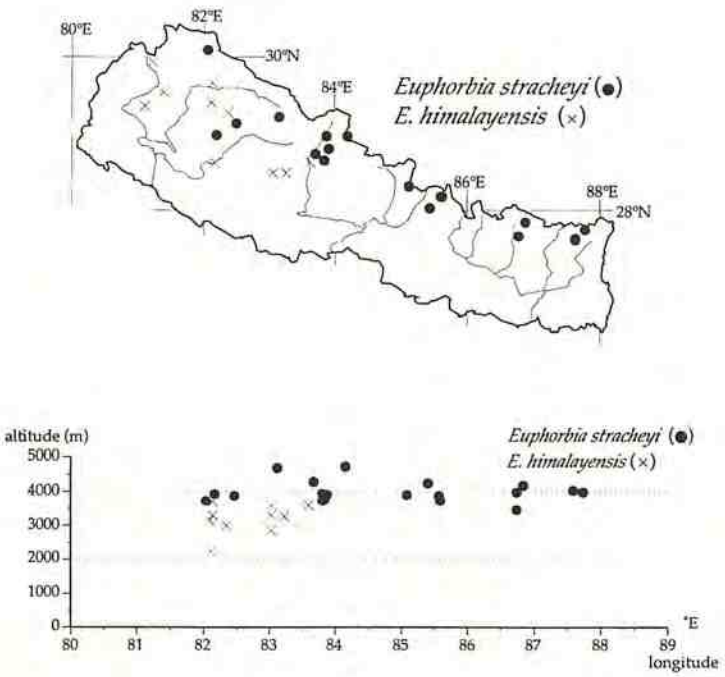

Fig. 44. Distribution of *Euphorbia stracheyi* Boiss. and *E. himalayensis* (Klotzsch) Boiss. in Nepal.

rounded or truncate, apex acute or obtuse; branch leaves 7–18, blade narrowly elliptic or narrowly ovate, 1.7–4.3 by 0.7–1.3 cm, base rounded or truncate, apex acute; verticillate leaves 4–8, narrowly ovate, narrowly elliptic or elliptic, 0.7–3.3 by 0.5–1.2 cm, base attenuate or obtuse, apex acute or obtuse; floral leaves ovate, widely ovate or orbicular, base obtuse or rounded, apex obtuse or rounded; the first floral leaves 4-whorled; other floral leaves 3- or 4-whorled. *Cyathia* in the terminal and some lateral pleiochasia; involucre 1.7–2 mm long, outside villous or glabrous; glands transversely elliptic, 1.3–2 by 0.8–1 mm, without appendage, surface flat; involucral lobes widely oblong, margin entire. *Pistillate flowers*: ovary glabrous, smooth; styles 1.3–2.5 mm long, entire. *Fruits*: capsule sphaeroidal, ca. 4.2 mm long, ca. 4.5 mm in diam., glabrous, smooth; columella persistent after dehiscence. *Seeds* carunculate, broadly ellipsoid, 2.7–3 mm long, 1.6–1.8 mm wide, smooth.

Distribution — Nepal, Bhutan, China (Tibet) (Long 1986). *Tibetan element*. In Nepal: Far Western, Mid Western, Western, Central.

Habitat & Ecology — Altitude 2100–3700 m. In forests, on grassy slopes, in kharka, or on exposed slopes. Flowers from April to July; fruits from May to September.

Notes — This species is closely related to *E. stracheyi*. Habit of some plants with short aerial stem is quite similar to that of *E. stracheyi*. Some authors have been treated this species as a synonym of *E. stracheyi* (Handel-Mazzetti 1929–1936, Ma & Wu 1992, 1993, Ma & Tseng 1997, Govaerts et al. 2000).

Euphorbia luteoviridis had been confused with this species (Long 1986).

14. Euphorbia stracheyi Boiss. — Fig. 44.

Euphorbia stracheyi Boiss. in DC., Prodr. 15(2): 114 (1862); Hook. f., Fl. Brit. India 5: 259 (1887); Hand.-Mazz., Symb. Sin. 7: 228 (1931), p. p.; Kitam. in Fauna Fl. Nepal Himal.: 172 (1955); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 196 (1982); Polunin & Stainton, Fl. Himal.: 361 (1984); D. G. Long in Fl. Bhutan 1: 765 (1987); Oudejans, World Cat. Tribe Euphorbieae: 394 (1990); Ohba & Akiyama, Alpine Fl. Jaljale Himal.: 40 (1992) ; J. S. Ma & C. Y. Wu, Collect. Bot. (Barcelona) 21: 109 (1992), p. p.; J. S. Ma & C. Y. Wu, Acta Bot. Yunnan. 15: 113 (1993), p. p.; J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 81, t. 23, f. 1 (1997), p. p.; T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 841 (2000), p. p.; Manandhar, Pl. People Nepal: 229 (2002). — *Tithymalus stracheyi* (Boiss.) Hurus. & Ya. Tanaka in Fl. E. Himal: 184 (1966). — Type: *Strachey & Winterbottom* (K!), in Tibeto ad Renikim; [*R.*] *Strachey &* [*J. E.*] *Winterbottom* [*18*] (K!), in Tibeto ad Kyanger; *Strachey* (K!), Kumaon ad Champwar; *Edgew. 147* (K!), ad Choor; *J. D. Hooker* [*s. n.*, 11 Sep. 1949] (G-DC (IDC microfiche in TI) n. v., K!), in prov. Sikkim alt. 16000p, [Samdug]; *Jacquem. 857* (n. v.), ad Kedarkanta.

Euphorbia megistopoda Diels, Notes Roy. Bot. Gard. Edinburgh 5: 218 (1912). — Type: *G. Forrest 2237*, June 1906 (E!; iso CAL (fide Ramamurthy & Samaddar 1985) n. v.), China, [N. W. Yunnan], Lichian Range, Lat. 27°10'N, alt. 10,000 ft.

Summer-green perennial herb. *Roots* thick; rhizomes thick. *Stems* slender, deciduous; subterranean part of stems 1–12 cm or more, glabrous, scaly, simple; aerial part of stems, erect, 0–3.5 cm long, glabrous or villous, with 4–20 vegetative branches; rays 3–5, often 5, with 0–4 axillary rays, 1.4–3.5 cm long, glabrous or villous; vegetative branches

procumbent or ascending, 3–22 cm, villous or glabrate. *Leaves* exstipulate, margin entire, both surfaces glabrous or villous, midrib raised beneath; cauline leaves sessile, 0–5, alternate, oblanceolate or narrowly obovate, 0.5–1.1 by 0.2–0.6 cm, apex obtuse or rounded, base attenuate or cuneate; branch leaves 13–22 or more, petiole 0.5–1.5 mm long, blade orbicular, widely elliptic or widely ovate, 0.5–1.1 by 0.3–1 cm, base obtuse or attenuate, apex rounded or emarginate; verticillate leaves sessile, 3–5, usually 5, obovate, 0.4–1 by 0.2–0.6 cm, base attenuate or cuneate, apex rounded; floral leaves sessile, orbicular or widely obovate, base obtuse, apex rounded; the first floral leaves 4-whorled; the second floral leaves 3- or 4-whorled. *Cyathia* in the terminal and some lateral pleiochasia; involucre ca. 1.5 mm long, outside glabrous; glands 4 or 5, transversely elliptic, 1–2 by 0.6–0.7 mm, without appendage, surface flat; involucral lobes widely oblong, margin entire or irregularly toothed. *Pistillate flowers*: ovary glabrous, smooth; styles 1–1.7 mm long, entire. *Fruits*: capsule sphaeroidal, ca. 4(–5) mm long, ca. 4.3 mm in diam., glabrous, smooth; columella persistent after dehiscence, ca. 4 mm long. *Seeds* carunculate, ellipsoid, 2.5–2.9(–4.2) mm long, 1.6–1.9(–2.6) mm wide, smooth.

Distribution — India (Garhwal), Nepal, Bhutan, China (Tibet-Quinghai, Southeast) (Short & Vickery 1982). *Tibetan element*. In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 3600–4700 m. In alpine meadows, on open grassy slopes, on rocky slopes, or exposed ground. Flowers from April to September; fruits from May to September.

Vernacular name — Tamang: *sangmen* (Manandhar 2002).

Uses — Paste is medicinally applied for diarrhea (Manandhar 2002).

Notes — One collection from Mustang District (*S. Noshiro et al. 20106092*, TI) has larger capsules (ca. 5 mm long) and larger ovoid seeds (3.8–4.2 mm long, 2.2–2.6 mm wide).

34. **Chamaesyce** S. F. Gray

Chamaesyce S. F. Gray, Nat. Arrang. Brit. Pl. 2: 260 (1821). — Type species: *Chamaesyce maritima* S. F. Gray

Key to the species
(See also Table 9)

A. Glandular appendages equal
  B. Stems ascending to erect; leaf blades 13–40 by 5–18 mm
    C. Stems with yellowish hairs; leaf blades obliquely rhombic-ovate; appendages of involucral glands 0.1–0.2 mm long; capsules 1–1.1 mm long, 1.2–1.4 mm in diam.; seeds ca. 0.8 mm long, ca. 0.4 mm wide ..... **1. C. hirta** (L.) Millsp.
    C. Stems with white hairs or glabrous; leaf blades obliquely elliptic or narrowly elliptic, appendages of involucral glands 0.3–0.8 mm long; capsules ca. 1.5 mm long, 1.8–2 mm in diam.; seeds 1–1.2 mm long, 0.7–0.8 mm wide
      D. Stems and leaves villous, villosulous or glabrous; cyathia in cymes; involucres ca. 0.6 mm long
        E. Stems villosulous, leaves and capsules villous
          ..... **2. C. parvifolius** (L.) Soják

E. Stems, leaves and capsules glabrous
..... excl. 7. **C. hypericifolia** (L.) Millsp.

B. Stems procumbent or ascending; leaf blades 3–9 by 2–5 mm

C. Capsules 1.2–1.3 mm long, 1.3–1.4 mm in diam., vollous on ridges, complately exserted from involucre; seeds 0.7–0.8 mm long .... **4. C. prostrata** (Aiton) Small

C. Capsules ca. 1 mm long, ca. 1 mm in diam., villosulous throughout, not completely exserted from involucre; seeds ca. 0.6 mm long
..... **5. C. thymifolia** (L.) Millsp.

A. Glandular appendages of 2 large, of 2 very small
..... excl. 8. **C. rosea** (Retz.) G. L. Webster

1. Chamaesyce hirta (L.) Millsp. — Fig. 45.

Chamaesyce hirta (L.) Millsp., Publ. Field Columbian Mus., Bot. Ser. **2**: 303 (1909); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966); Malla et al., Fl. Kathmandu Valley: 623 (1986); T. Kuros., Newslett. Himal. Bot. no. 22: 25 (1998); Rajbhandari, Ethnobot. Nepal: 57 (2001). — *Euphorbia hirta* L., Sp. Pl.: 454 (1753); Roxb., Fl. Ind. ed. 1832, 2: 472 (1832); Banerji, Rec. Bot. Surv. India 19(2): 82 (1966); C. R. Rao, Ind. For. 93: 55 (1967); Murata, Acta Phytotax. Geobot. 25: 114 (1973); Short & Vickery in Enum. Flow. Pl. Nepal **3**: 195 (1982); D. G. Long in Fl. Bhutan 1: 766 (1987); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 196 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 44, t. 8, f. 5–8 (1997); Philcox in Rev. Handb. Fl. Ceylon 11: 198 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 324 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 750 (2000); Manandhar, Pl. People Nepal: 228 (2002). — [*Euphorbia hirta* L. var. *typica* L. C. Wheeler, Contr. Gray Herb. 127: 68 (1939), nom. inval.] — Lectotype designated by Wheeler (1939): *Herb. Linnaeus 630-7* (LINN (fide Esser & Cafferty 2001) n. v.), India.

Euphorbia pilulifera auct. non L., Sp. Pl.: 454 (1753); Boiss. in DC. Prodr. 15(2): 21 (1862), p. p.; Hook. f., Fl. Brit. India 5: 250 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Kitam. in F. Fl. Nepal Himal.: 172 (1955).

Euphorbia obliterata Jacq., Enum. Syst. Pl.: 22 (1760).

Euphorbia capitata Lam., Encycl. 2: 422 (1788).

Euphorbia gemella Lag., Ben. Sp. Pl.: 17 (1816). — *Chamaesyce gemella* (Lag.) Small, Fl. Maiami: 110 (1913).

Euphorbia globulifera Kunth in Humboldt et al., Nov. Gen. Sp. 2: 56 (1817).

Euphorbia verticillata Vell., Fl. Flumin.: 202 (1829), non Fisch., Mém. Soc. Imp. Naturalistes Moscou 3: 81 (1812), nec Poir. in Lam., Encycl., Suppl. 2: 611 (1812). — *Euphorbia nudiflora* Steud., Nomencl. Bot., ed. 2, 1: 613 (1840), nom. nov.

Euphorbia pilulifera L. var. *discolor* Engelm. in Emory, Rep. U. S. Mex. Bound. 2(1): 188 (1859).

Euphorbia karwinskyi Boiss., Cent. Euphorb.: 6 (1860). — *Chamaesyce karwinskyi* (Boiss.) Millsp., Publ. Field Mus. Nat. Hist., Bot. Ser. 2: 407 (1916).

Euphorbia bancana Miq., Fl. Ned. Ind., Eerste Bijv.: 463 (1861). — Type: A, Oct. 1858 (n. v.), Bangka, locis graminosis prope Muntok.

Chamaesyce rosei Millsp., Publ. Field Mus. Nat. Hist., Bot. Ser. 2: 402 (1916).

Euphorbia chrysochaeta W. Fitzg., J. Roy. Soc. W. Australia 3: 162 (1918).

TABLE 9. Comparison of characters of Nepalese *Chamaesyce* species

	C. hirta	*C. parviflora*	*C. hispida*	*C. prostrata*	*C. thymifolia*
Stem	ascending to erect	erect	ascending to erect	procumbent	procumbent or ascending
surface	strigose with short white hairs and hirsute with yellowish multicellular hairs	villosulous	hirsute with white multicellular hairs	villosulous on upper side	villosulous on upper surface
Leaf shape	rhombic-ovate	elliptic	elliptic or narrowly	elliptic	ovate or elliptic
size (mm)	15–40 × 6–18	21–26 × 10–14	elliptic	3–4 × 2–3	5–9 × 2–5
upper surface	strigose	glabrate	13–19 × 5–9	glabrous	glabrous
lower surface	strigose with short white hairs and hirsute with yellowish multicellular hairs	villose	hirsute with white multicellular hairs hirsute with white multicellular hairs	villous at least on margin and at apex	glabrous or with curved white hairs
Cyathia	in glomerules	in cymes		solitary at nodes usually on	on congested lateral
Involucres			solitary at nodes	congested lateral branches	branches
length (mm)	0.5–0.7	ca. 0.6		0.6–0.7	ca. 0.8
glandular appendage length (mm)	0.1–0.2	0.3–0.5	ca.1	obscure	obscure
Capsule length (mm)	1–1.1	ca. 1.5	0.4–0.8	1.2–1.3	ca. 1
diameter	1.2–1.4	ca. 1.8	ca. 1.5	1.3–1.4	ca. 1
surface	with appressed short white	villous	ca. 2	villous on ridges	villosulous
Seed size (mm)	hairs ca. 0.8 × ca. 0.4	1.1–1.2 × 0.7–0.8	glabrous ca. 1 × ca. 0.8	0.7–0.8 × ca. 0.3	ca. 0.6 × ca. 0.3

Euphorbia hirta L. var. *destituta* L. C. Wheeler, Contr. Gray Herb. 127: 70 (1939). — Type: *A. Weberbauer 5953*, March 1912 (Gray Herb. n. v.), Peru, Dept. Piura, between Piura and Ñomala, alt. 100-250 m.

Herb. *Roots* slender, sometimes ligneous. *Stems* ascending to erect, 5–70 cm long, strigose with short white hairs and hirsute with yellowish multicellular hairs, branched at lower nodes, base sometimes ligneous. *Leaves*: stipules free, narrowly triangular, 1–1.1 by ca. 0.2 mm, incised, strigose; petiole 1–2 mm long, strigose and hirsute; blade obliquely rhombic-ovate, 15–40 by 6–18 mm, base obliquely cuneate, obtuse or rounded, apex acute or obtuse, margin serrulate, upper surface strigose, green or reddish, sometimes with an elongate purple spot centrally, lower surface strigose with short white hairs and hirsute with yellowish multicellular hairs, 3–5 secondary veines raised beneath. *Cyathia* in glomerules; peduncle 3–10 mm long; bracts lanceolate, small; stalk up to 1 mm long, strigose; involucre 0.5–0.7 mm long, outside strigose; glands transversely elliptic, ca. 0.1 mm wide; glandular appendages white, 0.1–0.2 mm long; ovary densely covered with appressed short white hairs. *Fruits*: capsule broadly depressed ovoid, 3-ridged, 1–1.1 mm long, 1.2–1.4 mm in diam., with appressed short white hairs. *Seeds* ovoid, 4-ridged, ca. 0.8 mm long, ca. 0.4 mm wide, transversely wavy, brown.

Distribution — Pantropical (Webster & Burch 1968). In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 160–1500 m. On roadsides, on riversides, on banks, or in crop fields. A common weed. Flowers & fruits throughout the year.

Vernacular names — Nepali: *aank(h)le jha(a)r* (Rajbhandari 2001a, Manandhar 2002), *chimphar jhar* (Manandhar 2002), *dudhe* (Manandhar 2002), *dude jhar* or *dudhe jhar* (Siwakoti & Varma 1999, Manandhar 2002), *jotane jhar* (Manandhar 2002), *ratango* (Manandhar 2002), *rhatulo* (Manandhar 2002), *kanguil* (Manandhar 2002). Chepang: *byauli* (Manandhar 2002), *dudhe jhaar* (Rajbhandari 2001a), *hanuman* (Manandhar 2002), *kapram* (Rajbhandari 2001a), *tikapara* (Rajbhandari 2001a, Manandhar 2002). Danuwar: *dudhiya* (Rajbhandari 2001a), *dudhiya jhar* (Manandhar 2002). Darai: *rani-dubi* (Rajbhandari 2001a). Gurung: *chimphar jha(a)r* (Rajbhandari 2001a, Manandhar 2002), *taleno* (Manandhar 2002). Magar: *dudhi jhar* (Manandhar 2002). Majhi: *dudhe aainar* (Manandhar 2002). Mooshar: *dudhiya* (Rajbhandari 2001a, Manandhar 2002). Rai: *dudhe* (Manandhar 2002), *dudhiya* (Manandhar 2002). Satar: *sangadare* (Rajbhandari 2001a). Tamang: *chhumen* (Rajbhandari 2001a, Manandhar 2002), *dapranchhu* (Manandhar 2002), *gnenoba* (Manandhar 2002), *makaman* (Manandhar 2002), *trishubha mran* (Manandhar 2002). Tharu: *dudhiya-jhyang* (Rajbhandari 2001a).

Uses — Tender shoots are cooked (Rajbhandari 2001a, Manandhar 2002). Plant paste and saps are medicinally applied to various skin disease, to relieve body pain, or to other diseases (Rajbhandari 2001a, Manandhar 2002). Plant extraction is given to lactating mother for increasing milk (Rajbhandari 2001a). Anthelmintic, laxative and cooling properties of the plant is used as a tonic (Manandhar 2002). Smoke of dried plant is inhaled to treat asthma (Manandhar 2002). Inflorescences are chewed to relieve headaches (Manandhar 2002).

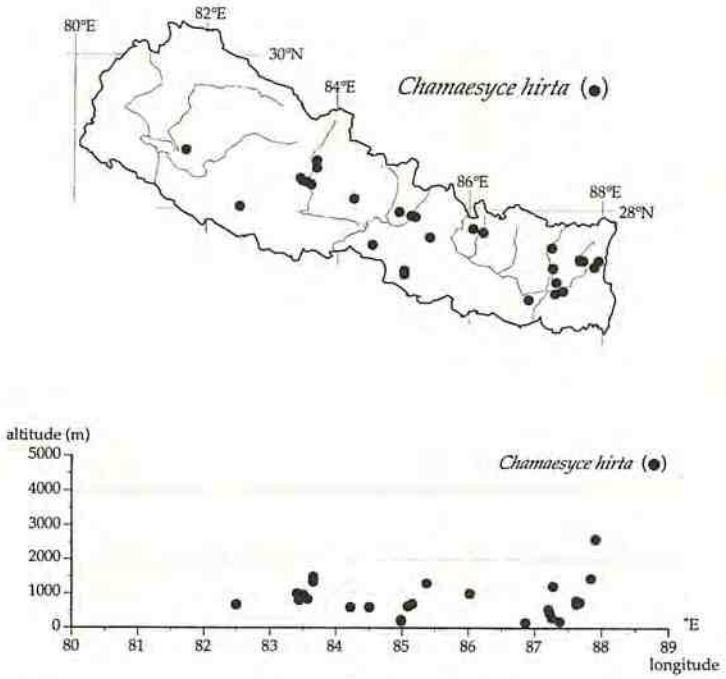

Fig. 45. Distribution of *Chamaesyce hirta* (L.) Millsp. in Nepal.

2. Chamaesyce parviflora (L.) Soják — Plate 81; Fig. 46.

Chamaesyce parviflora (L.) Soják, Cas. Nár. Mus., Odd. Prír. 140: 169 (1972); T. Kuros., Newslett. Himal. Bot. no. 22: 25 (1998). — *Euphorbia parviflora* L., Syst. Nat. ed. 10, 2: 1047 (1759); Roxb., Fl. Ind. ed. 1832, 2: 472 (1832); Boiss. in DC., Prodr. 15(2): 20 (1862); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 306 (1990); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 799 (2000); Esser & Chayamarit, Harverd Pap. Bot. 6: 263 (2001); Manandhar, Pl. People Nepal: 228 (2002). — Lectotype designated by Esser & Chayamarit (2001): Burm., Thes. Zeyl. t. 105, f. 2 (1736); epitype designated by Esser & Chayamarit (2001): *P. Hertog s. n.* (G (fide Esser & Chayamarit 2001) n. v.), Sri Lanka.

Euphorbia pilulifera L., Sp. Pl.: 454 (1753), provisional synonym; Esser & Cafferty, Taxon 50: 2001. — Lectotype designated by Brown et al. in Oliver, Fl. Trop. Afr. 6(1): 497–498 (1911): *Herb. Linnaeus No. 630-8* (LINN n. v.).

Euphorbia granulata Forssk. var. *decumbens* Forssk., Fl. Aegypt.-Arab.: 112 (1775). — *Euphorbia decumbens* (Forssk.) Willd., Enum. Pl., Suppl.: 27 (1814).

Euphorbia indica Lam., Encycl. 2: 423 (1788); Boiss. in DC., Prodr. 15(2): 22 (1862); Wall., Numer. List: 269, no. 7711A (1847); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 208 (1990); Philcox in Rev. Handb. Fl. Ceylon 11: 196 (1997); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 757 (2000). — *Anisophyllum indicum* (Lam.) Schweinf., Beitr. Fl. Aethiop. 1: 34 (1867). — *Chamaesyce indica* (Lam.) Croizat, Lilloa 6: 299 (1941). — Type: *M. Sonnerat* (P-LA (fide Coode 1982) n. v.), les Indes orientalis.

Euphorbia androsaemoides Dennst., Schlüssel Hortus Malab.: 36 (1818).

Euphorbia pubera Blume, Bijdr.: 635 (1826). — *Euphorbia indica* Lam. var. *angustifolia* Boiss. in DC., Prodr. 15(2): 22 (1862). — Type: (n. v.), circa Bataviam in graminosis.

Euphorbia tenuis Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 61 (1825); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 407 (1990). — Type: [*Buchanan*] *Hamilton* [*s. n.*, 10 Mar. 1802] (holo BM!), ad Bassaria Nepalensium (Nepal).

Euphorbia purpurascens Schmach. & Thonn. in Schumach., Beskr. Guin. Pl.: 253 (1827), non Schousb. in Hornem., Hort. Bot. Hafn.: 508 (1815).

Euphorbia uniflora Roxb., Fl. Ind. ed. 1832, 2: 473 (1832), non (Haw.) G. Don in Loud., Suppl. Hort. Brit.: 588 (1850). — Type: not designated.

Euphorbia ovalifolia Kostel., Allig. Med.-Pharm. Fl. 5: 1724 (1836).

Euphorbia cassioides C. Presl, Bot. Bemerk: 119 (1844).

Euphorbia indica Lam. var. *procumbens* Pax, Bot. Jahrb. Syst. 19: 117 (1894). — Type: *Stuhlmann 308*, 5 Dec. 1889 & Jan. 1890 (n. v.), Deutsch-Ostafrika, Pangani.

Euphorbia hypericifolia auct. non L., Sp. Pl.: 454 (1753): Hook. f., Fl. Brit. India 5: 249 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 195 (1982); Siwakoti & Varma, Pl. Divers. E. Nepal: 325 (1999), p. p. — *Chamaesyce hypericifolia* auct. non (L.) Millsp., Publ. Field Columbian Mus., Bot. Ser. **2**: 302 (1909): T. Kuros., Newslett. Himal. Bot. no. 22: 25 (1998).

Herb. *Roots* slender. *Stems* erect, 7–30 cm long, villosulous, branched throughout. *Leaves*: stipules fused or free, shallowly triangular, 0.7–1.3 by ca. 1 mm, incised, strigose; petiole 1.5–2 mm long, villosulous; blade obliquely elliptic, 21 or 26 by 10–14 mm, base obliquely emarginate, apex rounded or obtuse, margin serrulate, upper surface glabrate, lower surface villous, midrib raised beneath. *Cyathia* in cymes at the top of branches; bracts lanceolate, small; stalk up to 1 mm long, glabrous; involucre ca. 0.6 mm long, glabrous; glands transversely elliptic, 0.1–0.2 mm wide; glandular appendages white or pink, 0.3–0.5 mm long; ovary villosulous. *Fruits*: capsule, broadly depressed ovoid, 3-ridged, ca. 1.5 mm long, ca. 1.8 mm in diam., villous; columella persistent after dehiscence, ca. 1.5 mm long. *Seeds* ovoid, 4-ridged, 1.1–1.2 mm long, 0.7–0.8 mm wide, whitish.

Distribution — Pakistan, Sri Lanka, Maladives, India, Nepal, Bhutan, Burma, Cambodia, Laos, Thailand, Vietnam (Long 1987 as *E. hypericifolia*, Govaerts et al. 2000, Esser & Chayamarit 2001). *S Asian-Malaysian element*. In Nepal: Mid Western, Western, Central, Eastern.

Habitat & Ecology — Altitude 160–1950 m. On roadsides, on stream sides, on banks, or in crop fields. A common weed. Flowers & fruits from January to September.

Vernacular names — Nepali: *dudhi* (Manandhar 2002), *masino dudhi* (Manandhar 2002). Tharu: *chikini dudhi* (Manandhar 2002).

Uses — Milky latex is medicinally applied to wounds and boils (Manandhar 2002). Infusion of dried leaf is medicinally used as astringent and feebly narcotic (Siwakoti & Varma 1999 as *Euphorbia hypericifolia*). Squeezed plant is used for washing clothes (Manandhar 2002).

Notes — This species is closely related to *C. hypericifolia*. They differ only in hairiness on stems and ovaries (Esser & Cafferty 2001). Long (1987) treated this species in "*Euphorbia hypericifolia* L. agg."

The cited specimen of *E. hypericifolia* in Short & Vickery (1982) (*Shakya 9112*, BM!) is a young plants without fruits, but is referable to *C. parvifolia* by its villosulous stems and villous undersurvace of leaves. The records of *E. hypericifolia* by Siwakoti & Varma (1999) at least in part also may be this species, judging from thier description.

Govaerts et al. (2000) treated that *Euphorbia indica* is identical with *E. hypericifolia.*

Esser & Cafferty (2001) considered the type of *Euphorbia pilulifera* L. to be identical with *E. parviflora*, and proposed the former name for rejection.

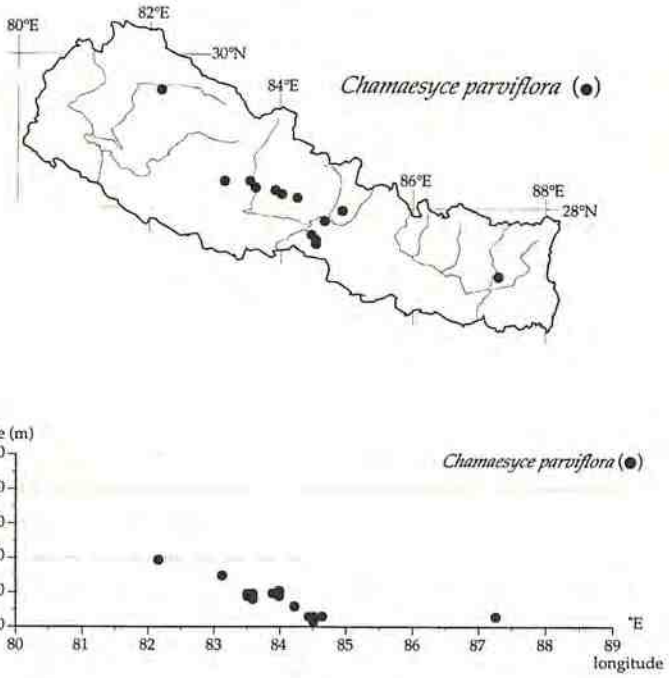

Fig. 46. Distribution of *Chamaesyce parviflora* (L.) Soják in Nepal.

3. Chamaesyce hispida (Boiss.) V. S. Raju & P. N. Rao — Plate 80; Fig. 47.

Chamaesyce hispida (Boiss.) V. S. Raju & P. N. Rao, Phytologia 37: 454 (1977). — *Euphorbia hispida* Boiss., Cent. Euphorb.: 8 (1860); Boiss. in DC., Prodr. 15(2): 37 (1862); Hook. f., Fl. Brit. India 5: 265 (1887); Oudejans, World Cat. Tribe Euphorbieae: 197 (1990). — Type: *Wallich, List no. 207 & 325* (K n. v.), India orientali ad Hawalbaugh. The numbers of Wallich's Numerical List cited in the original description (Boissier 1860) may be incorrect (Hooker 1886–1888).

Euphorbia emodi Hook. f., Fl. Brit. India 5: 250 (1887). — *Chamaesyce emodi* (Hook. f.) Soják, Cas. Nár. Mus., Odd. Prír. 140: 169 (1972). — Type: *Edgeworth* [*8055*] (K!), Kulu; [*H.*] *Jaeschke* [*s. n.*, in 1865] (K!), Lahul, [Panjaub]; *Clarke* (n. v.), *Ellis* (n. v.), Simla, Kulu, Chamba and Lahul, alt. 4000–4500 ft; *C. B. Clarke* (n. v.), Iskardo, alt. 6–7000 ft.

Herb. *Roots* slender. *Stems* ascending to erect, 30–60 cm long, hirsute with white multicellular hairs, branched throughout; stipules free, lanceolate or narrowly triangular, 1–1.8 by 0.2–0.3 mm, glabrous. *Leaves*: petiole 0.7–2 mm long, hirsute; blade obliquely elliptic or narrowly elliptic, 13–19 by 5–9 mm, apex rounded, base obliquely emarginate

or truncate, margin serrulate, both surfaces hirsute with white multicellular hairs, midrib raised beneath. *Cyathia* solitary at the nodes; stalk 1.2–2 mm long, glabrous; involucre ca. 1 mm long, glabrous outside; glands transversely elliptic, ca. 0.2 mm wide; glandular appendages white or pink, 0.4–0.8 mm long. *Pistillate flowers*: ovary glabrous. *Fruits*: capsule, broadly depressed ovoid, 3-ridged, ca. 1.5 mm long, ca. 2 mm in diam., glabrous; columella persistent after dehiscence. *Seeds* ovoid, 4-ridged, ca. 1 mm long, ca. 0.8 mm wide, obscurely transversely wavy, white.

Distribution — Kwait, Afghanistan, Iran, Pakistan, Nepal (Govaerts et al. 2000). *NW Himalayan element*. In Nepal: Far Western, Mid Western.

Habitat & Ecology — Altitude 1333–1606 m. On open ground or in grassland. Flowers & fruits in August.

Notes — This is the first record of this species from Nepal. This species was recognized as *Chamesyce* sp. (pro parte) in my previous report (Kurosawa 1998).

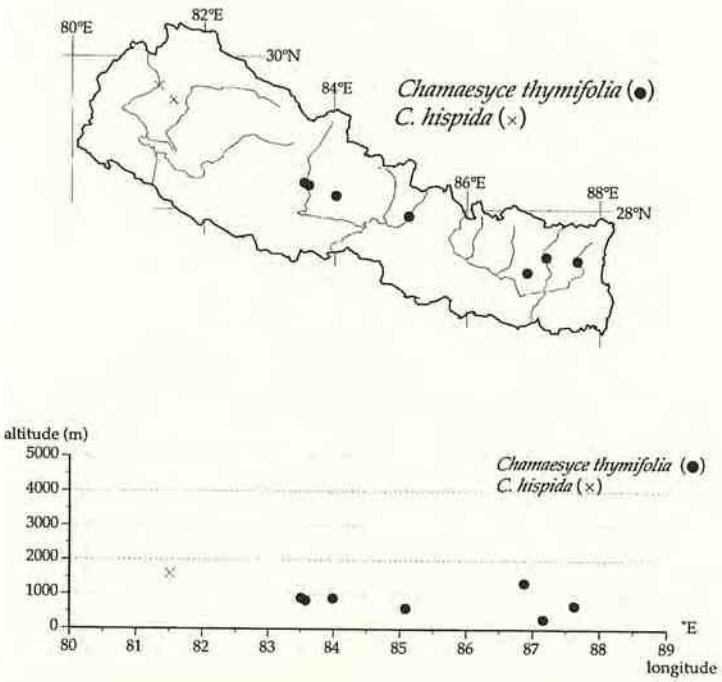

Fig. 47. Distribution of *Chamaesyce thymifolia* (L.) Millsp. and *C. hispida* (Boiss.) V. S. Raju & P. N. Rao in Nepal.

4. Chamaesyce prostrata (Aiton) Small — Fig. 48.

Chamaesyce prostrata (Aiton) Small, Fl. S. E. U. S.: 713 (1903); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966); Malla et al., Fl. Kathmandu Valley: 623 (1986); T. Kuros., Newslett. Himal. Bot. no. 22: 25 (1998). — *Euphorbia prostrata* Aiton, Hort. Kew. **2**: 139 (1789); Boiss. in DC., Prodr. 15(2): 47 (1862); Hook. f., Fl. Brit. India 5: 266 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 336 (1990); D. G. Long in Fl. Bhutan 1: 767 (1987); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 51, t. 10, f. 5–8 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 325 (1999); Govaerts et al., World Checkl. Bibliogr.

Euphorb.: 812 (2000); Manandhar, Pl. People Nepal: 228 (2002). — *Anisophyllum prostratum* (Aiton) Haw., Syn. Pl. Succ.: 163 (1812). — *Tithymalus prostratus* (Aiton) P. Bubani, Fl. Pyren. 1: 116 (1897). — Type: *Philip Miller* (holo BM (fide Coode et al. 1982) n. v.), cultivated in 1758 in England, Nat. of the West Indies.

Euphorbia chamaesyce sensu Wheeler, Rhodora 43: 265 (1941), non L., Sp. Pl.: 455 (1753).

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of Central USA to N. Argentina , now pantropical. In Nepal: Far Western, Mid Western, Central, Eastern.

Habitat & Ecology — Altitude 300–1350 m. On roadsides or on stone walls. Common in eastern plains (Siwakoti & Varma 1999). Flowers & fruits throughout the year.

Vernacular names — Nepali: *kanike ghans* (Manandhar 2002). Tharu: *dudhai* (Manandhar 2002).

Uses — Plant paste is applied to snakebites (Manandhar 2002).

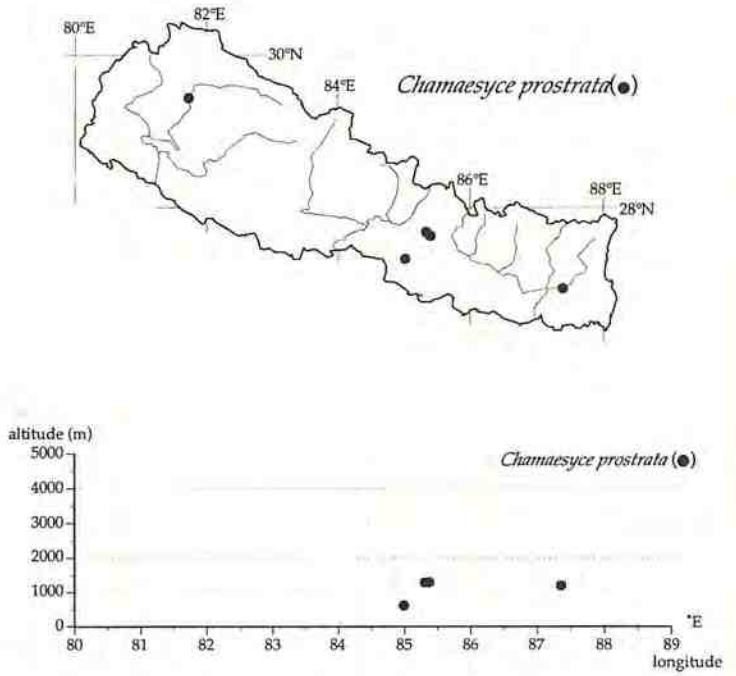

Fig. 48. Distribution of *Chamaesyce prostrata* (Aiton) Small in Nepal.

5. Chamaesyce thymifolia (L.) Millsp. — Fig. 47.

Chamaesyce thymifolia (L.) Millsp., Publ. Field Mus. Nat. Hist., Bot. Ser. **2**: 412 (1916); T. Kuros., Newslett. Himal. Bot. no. 22: 25 (1998). — *Euphorbia thymifolia* L., Sp. Pl.: 454 (1753); Roxb., Fl. Ind. ed. 1832, 2: 473 (1832); Wall., Numer. List: 269, no. 7710A, B (1847); Boiss. in DC., Prodr. 15(2): 47 (1862); Hook. f., Fl. Brit. India 5: 252 (1887); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 410 (1990); D. G. Long in Fl. Bhutan 1: 766 (1987); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 52, t. 11, f. 6–11 (1997);

Philcox in Rev. Handb. Fl. Ceylon 11: 201 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 326 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 848 (2000). — *Anisophyllum thymifolium* (L.) Haw., Syn. Pl. Succ.: 160 (1812). — Type: *Herb. Linnaeus 630-10* (LINN (fide Coode et al. 1982) n. v.), India.

Euphorbia microphylla Lam., Encycl. 2: 423 (1788). — *Chamaesyce microphylla* (Lam.) Soják, Cas. Nár. Mus, Odd. Prír. 140: 169 (1972). — Type: *Commerson* (P-LA (fide Coode et al. 1982) n. v.), Rodrigues.

[*Euphorbia botryoides* Noronha, Verh. Batav. Genootsch. Kunsten 5(4): 14 (1790), nom. nud.]

Euphorbia rubicunda Blume, Catalogus: 73 (1823).

Euphorbia foliata Buch.-Ham. ex Dillwyn, Rev. Hortus Malab.: 52 (1839).

Euphorbia thymifolia L. var. *suffrutescens* Boiss. in DC., Prodr. 15(2): 47 (1862). — *Chamaesyce thymifolia* (L.) Millsp. f. *suffrutescens* (Boiss.) Hurus., J. Fac. Sci. Univ. Tokyo sect. 3, Bot. 6: 287 (1954). — Type: *Comm.* (herb. Lam., n. v.), in insulâ Rodrigue; *Bory* (G-DC (IDC microfiche in TI) n. v.), *Mauritio*; (Mus. Par., n. v.), Philippinis.

Euphorbia rubrosperma Lotsy, Bot. Gaz. 20: 349 (1895). — *Chamaesyce rubrosperma* (Lotsy) Millsp., Publ. Field Mus. Nat. Hist., Bot. Ser. 2: 411 (1916).

Euphorbia afzelii N. E. Br. in Oliver, Fl. Trop. Afr. 6(1): 506 (1911).

Chamaesyce mauritiana Comm. ex Denis, Euphorb. Iles Austr. Afr.: 37 (1921).

Chamaesyce supina auct. non (Raf.) Moldenke, Annot. Classif. List Moldenke Collect.: 135 (1939); Hurus. & Ya. Tanaka in Fl. E. Himal.: 176 (1966).

Herb. *Roots* slender or ligneous. *Stems* procumbent or ascending, 5–26 cm long, branched throughout, upper surface villosulous, lower surface glabrous. *Leaves*: stipules free, linear or narrowly triangular, 0.5–1.2 mm long, incised, hairy; petiole 0.5–1 mm long, villosulous; blade obliquely ovate or elliptic, 5–9 by 2–5 mm, base obliquely truncate, apex rounded, margin serrulate, upper surface glabrous, lower surface glabrous or with curved white hairs, with raised midrib. *Cyathia* on congested lateral branches from nodes; bracts scaly or leaf-like; stalk up to 0.8 mm long, villosulous; involucre ca. 0.8 mm long, outside villosulous; glands transversely elliptic, ca. 0.1 mm wide; glandular appendages obscure. *Pistillate flowers*: ovary villosulous. *Fruits*: capsule depressed ovoid, 3-ridged, ca. 1 mm long, ca. 1 mm in diam., villosulous, not completely exserted from involucre. *Seeds* ovoid, 4-ridged, ca. 0.6 mm long, ca. 0.3 mm wide, transversely wavy, brown with one longitudinal dark brown line.

Distribution — Pantropics (Govaerts et al. 2000). In Nepal: Western, Central, Eastern.

Habitat & Ecology — Altitude 300–1350 m. On riversides, on stone walls, on banks, or in crop fields. A common weed. Flowers & fruits from April to October.

Uses — Leaf is medicinally used as stimulant, astringent anthelmintic and laxative (Siwakoti & Varma 1999).

33. **Pedilanthus** Necker & Poit.

Pedilanthus Necker ex Poit., Amm. Mus. Nat. Hist. Nat. 19: 388 (1812). — Type species: *Pedilanthus tithymaloides* (L.) Poit.

See *Pedilanthus tithymaloides* (L.) Poit. in Excluded taxa.

Excluded Taxa

Acalypha indica L.

Acalypha indica L., Sp. Pl.: 1003 (1753); Müll. Arg. in DC., Prodr. 15(2): 868 (1866); Hook. f., Fl. Brit. India 5: 416 (1887); Siwakoti & Varma, J. Econ. Taxon. Bot. 18: 496 (1994); Philcox in Rev. Handb. Fl. Ceylon 11: 132 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 320 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 68 (2000). — *Ricinocarpus indicus* (L.) Kuntze, Revis. Gen. Pl. 2: 618 (1891). — Lectotype designated by Radcliffe-Smith (1987b): *Herb. Hermann 3: #2* (BM n. v.), Indiis ad fimeta [Ceylon].

Acalypha decidua Forssk., Fl. Aegypt.-Arab.: 161 (1775). — *Ricinocarpus deciduus* (Forssk.) Kuntze, Revis. Gen. Pl. 2: 617 (1891).

Acalypha spicata Forssk., Fl. Aegypt.-Arab.: 161 (1775). — Type: *Forsskål s. n.* (LD (fide Hepper & Friis 1994) n. v.).

Acalypha caroliniana Blanco, Fl. Filip.: 748 (1837), non Walter, Fl. Carol.: 238 (1788), nec Elliott, Sketch Bot. S. Carolina 2: 645 (1824). — Type: not designated.

[*Acalypha canescens* Wall., Numer. List: 271, no. 7785 (1847), nom. nud.]

[*Acalypha ciliata* Wall., Numer. List: 271, no. 7779J (1847), nom. nud.]

Acalypha fimbliata Baill., Adansonia 1: 272 (1861).

Acalypha bailloniana Müll. Arg., Linnaea 34: 44 (1865). — *Ricinocarpus baillonianus* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 617 (1891). — *Acalypha indica* L. var. *bailloniana* (Müll. Arg.) Hutch. in D. Oliver, Fl. Trop. Afr. 6(1): 904 (1912). — Type: *Boivin* [Apr. –May 1845] (holo P (fide Radcliffe-Smith 1987b) n. v.), in Zanzibaria.

Acalypha somalium Müll. Arg., Bremen Abh. 7: 27 (1880). — Type: *Hildebrandt 1518* (holo BREM† (fide Radcliffe-Smith 1987b); iso G (fide Radcliffe-Smith 1987b) n. v.), Somalia, Meid.

Acalypha somalensis Pax, Bot. Jahrb. Syst. 19: 100 (1894). — Type: *Hildebrandt 1455*, April 1875 (n. v.), Somaliland, Gebirgsregion Ahl bei Meid, 1000 m.

Acalypha cupamenii Dragend., Heilpfl.: 380 (1898).

Acalypha minima H. Keng, Taiwania 6: 32 (1955). — *Acalypha indica* L. var. *minima* (H. Keng) S. F. Huang & T. C. Huang, Taiwania 36: 83 (1991). — Type: *T. Hosokawa 2056* (n. v.), Taiwan, Liukiu-yu, Kaoshung.

Acalypha chinensis auct. non Roxb., Fl. Ind. ed. 1832, 3: 677 (1832); Benth, Fl. Hongk.: 303 (1861).

Distribution — West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean, Pakistan, Sri Lanka, India, Thailand, Malaysia (Peninsular), Sumatera, Jawa, Lesser Sunda Isls., New Guinea, Philippines, Taiwan, Japan (Nansei-Shoto [Ryukyu]) (Govaerts et al. 2000).

Habitat & Ecology — According to Siwakoti & Varma (1994, 1999), this species is occasionally found in moist waste place on plains.

Notes — Siwakoti & Varma (1994, 1999) were reported this species from Biratnagar based on *Siwakoti 475* (Bhagalpur University Herbarium, n. v.).

Tragia involucrata L.

Tragia involucrata L., Sp. Pl.: 980 (1753); Müll. Arg. in DC., Prodr. 15(2): 943 (1866);

Kurz, Forest Fl. Burma 2: 398 (1877); Hook. f., Fl. Brit. India 5: 465 (1888); Philcox in Rev. Handb. Fl. Ceylon 11: 140 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 334 (1999); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 1547 (2000); Rajbhandari, Ethnobot. Nepal: 62 (2001). — [*Tragia involucrata* L. var. *genuina* Müll. Arg. in DC., Prodr. 15(2): 943 (1866), nom. inval.] — Type: (n. v.), India.

Croton urens L., Sp. Pl.: 1005 (1753). — Type: (n. v.), India.

[*Tragia trifida* Wall., Numer. List: 271, no. 7795E (1847), nom. nud.]

Distribution — Sri Lanka, India, Bangladesh (Govaerets et al. 2000).

Habitat & Ecology — According to Siwakoti & Varma (1999), this species is common in forest hedges and thickets in eastern plains.

Vernacular names — Nepali: *lahare sisnu* (Siwakoti & Varma 1999). Satar: *sangelsim* (Rajbhandari 2001a).

Uses — Paste of leaf is medicinally applied on swelling of hand and foot (Rajbhandari 2001a).

Notes — Siwakoti & Varma (1999) was reported this species from Charkoshe Jhari, based on *Siwakoti 463* (Bhagalpur University Herbarium, n. v.).

The cited specimen of Short & Vickery (1982) as *T. involucrata* is treated as "*Tragia* sp." in this checklist. See note under *Tragia* sp.

Euphorbia milii Des Moul.

Euphorbia milii Des Moul., Bull. Hist. Nat. Soc. Linn. Bordeaux 1: 27 (1826); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); D. G. Long in Fl. Bhutan 1: 762 (1987); Oudejans, World Cat. Tribe Euphorbieae: 266 (1990); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 779 (2000); Manandhar, Pl. People Nepal: 228 (2002). — Type: *Bojer s. n.* (P? (fide Coode et al. 1982) s. n.), Madagascar.

See Govaerts et al. (2000) for synonyms.

Distribution — Native of Madagascar (Govaerts et al. 2000). According to Manandhar (2002) this species distribute to the throughout Nepal.

Habitat & Ecology — According to Short & Vickery (1982), this species is commonly naturalized on the tops of walls in Kathmandu valley.

Vernacular name — Nepali: *simri* (Manandhar 2002).

Uses — This species is cultivated in gardens and on walls (Manandhar 2002). Milky latex is medicinally applied to sprains (Manandhar 2002).

Notes — Short & Vickery (1982) recorded this species without specimen citation.

Euphorbia neriifolia L.

Euphorbia neriifolia L., Sp. Pl.: 451 (1753); Roxb., Fl. Ind. ed. 1832, 2: 467 (1832), "*nereifolia*"; Boiss. in DC. Prodr. 15(2): 79 (1862); Kurz, Forest Fl. Burma 2: 416 (1877); Hook. f., Fl. Brit. India 5: 255 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 786 (2000). — Type fide Coode et al. (1982): *Herb. Linnaeus, No. 630-1* (LINN n. v.), Chine.

Euphorbia edulis Lour., Fl. Cochinch.: 298 (1790). — *Tithymalus edulis* (Lour.) H. Karst., Deut. Fl.: 587 (1882).

[*Euphorbia pentagona* Noronha, Verh. Batav. Genootsch. Kunsten 5(4): 14 (1790), nom. nud.]

Euphorbia pentagona Blanco, Fl. Filip.: 413 (1837), non Haw., Philos. Mag. Ann. Chem. 1: 187 (1827), nor Royle, Ill. Bot. Himal. Mts.: 329, t. 82, f. 1 (1836).

Distribution — Iran, Pakistan, India, Burma, Thailand, Vietnam, Borneo, Lesser Sunda Is., Moluccas, New Guinea, China (South-Central, Hainan, Southeast, Tibet-Quinghai) (Govaerts et al. 2000).

Notes — Burkill (1910) reported this species from Central Nepal, based on *Burkill 29915* (CAL n. v.).

Euphorbia cyathophora Murray

Euphorbia cyathophora Murray, Commentat Soc. Regiae Sci. Gott. 7: 81 (1786); Oudejans, World Cat. Tribe Euphorbieae: 121 (1990); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 706 (2000). — *Tithymalus cyathophorus* (Murray) Moench, Methodus: 667 (1794). — *Poinsettia cyathophora* (Murray) Klotzsch & Garcke, Monatsber. Königl Preuss. Akad. Wiss. Berlin 1859: 253 (1859). — *Euphorbia heterophylla* L. var. *cyathophora* (Murray) Griseb., Fl. Brit. W. I.: 45 (1859). — *Euphorbia heterophylla* L. f. *cyathophora* (Murray) Voss, Vilm. Blumengärtn. ed. 3, 1: 898 (1895). — Type: (holo GOET (fide Coode et al. 1982) n. v.; iso MO (fide Coode et al. 1982) n. v.), Hort. Bot. Goett.

Euphorbia heterophylla auct. non L., Sp. Pl.: 453 (1753); Philcox in Rev. Handb. Fl. Ceylon 11: 200 (1997), p. p.; Siwakoti & Varma, Pl. Divers. E. Nepal: 324 (1999).

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of Central U.S.A. to Venezuela (Govaerts et al. 2002).

Habitat & Ecology — According to Siwakoti & Varma (1999, as *E. heterophylla*), this species is occasional in waste place on eastern plains.

Notes — Siwakoti & Varma (1999) recorded this species from Biratnagar based on *Siwakoti 68* (Bhagalpur University Herbarium, n. v.), as *E. heterophylla* L.

Euphorbia tirucalli L.

Euphorbia tirucalli L., Sp. Pl.: 452 (1753); Roxb., Fl. Ind. ed. 1832, 2: 470 (1832); Wall., Numer. List: 269, no. 7687A (1847); Boiss. in DC. Prodr. 15(2): 96 (1862); Kurz, Forest Fl. Burma 2: 417 (1877); Hook. f., Fl. Brit. India 5: 254 (1887); Burkill, Rec. Bot. Surv. India 4: 130 (1910); Short & Vickery in Enum. Flow. Pl. Nepal 3: 196 (1982); Oudejans, World Cat. Tribe Euphorbieae: 412 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 58, t. 14, f. 5–6 (1997); T. Kuros., Newslett. Himal. Bot. no. 22: 24 (1998); Govaerts et al., World Checkl. Bibliogr. Euphorb.: 849 (2000). — *Tithymalus tirucalli* (L.) Haw., Syn. Pl. Succ.: 139 (1812). — *Arthrothamnus tirucalli* (L.) Klotzsch & Garcke, Monatschr. Königl Preuss. Akad. Wiss. Berlin 1859: 251 (1859). — Lectotype fide Coode et al. (1982) and Philcox (1997): Commel., Hort. Med. Amst. 1: 27, t. 14 (n. v.), grown in Amsterdam, introduced from Ceylon.

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of Macaronesia, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean, North Indian Ocean (Govaerts et al. 2000).

Notes — Burkill (1910) reported this species from Central Nepal without specimen citation.

Chamaesyce hypericifolia (L.) Millsp.

Chamaesyce hypericifolia (L.) Millsp., Publ. Field Columbian Mus., Bot. Ser. **2**: 302 (1909). — *Euphorbia hypericifolia* L., Sp. Pl.: 454 (1753); Boiss. in DC., Prodr. 15(2): 23 (1862); Oudejans, World Cat. Tribe Euphorbieae: 203 (1990); J. S. Ma & Y. C. Tseng, Fl. Reipubl. Pop. Sin. 44(3): 41 (1997); Siwakoti & Varma, Pl. Divers. E. Nepal: 325 (1999), p. p.; Govaerts et al., World Checkl. Bibliogr. Euphorb.: 753 (2000). — *Aplarina hypericifolia* (L.) Raf., New. Fl. 4: 99 (1838). — *Xamesike hypericifolia* (L.) Raf., Autikon Bot.: 98 (1840). — *Anisophyllum hypericifolium* (L.) Haw., Syn. Pl. Succ.: 161 (1812). — *Galarrhoeus hypericifolius* (L.) Nakai, Bull. Natl. Sci. Mus. (Tokyo) 31: 70 (1952), "*Galarhoeus*." — Lectotype designated by Burch (1966): Sloane, Voy. Jamaica: 197, t. 126 (1707), from Jamaica.

Euphorbia papilligera Boiss., Cent. Euphorb.: 8 (1860). — Type: *Wallich, List no. 581* (n. v.), in India orientali ad Hyauk Talong.

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of tropical or subtropical America (Govaerts et al. 2000).

Uses —Infusion of dried leaf is medicinally used as astringent and feebly narcotic (Siwakoti & Varma 1999).

Notes — This species resembles *C. parviflora* but differs in that it is glabrous throughout. Short & Vickery's record (1982) is referable to *C. parviflora* (see note under *C. parviflora*).

Siwakoti & Varma (1999) recorded this species from Biratnagar on the basis of *Siwakoti 669* (Bhagalpur University Herbarium, n. v.). It is possible that the record is not referable to *C. hypericifolia* but to *C. parviflora* because Siwakoti & Varma (1999) treated both species as conspecific.

Chamaesyce rosea (Retz.) G. L. Webster

Chamaesyce rosea (Retz.) G. L. Webster, J. Arnold Arbor. 48: 423 (1967). — *Euphorbia rosea* Retz., Observ. Bot. 4: 26 (1786–1787); Boiss., Icon. Euphorb.: t. 21 (1866); Boiss. in DC., Prodr. 15(2): 50 (1862); Hook. f., Fl. Brit. India **5**: 251 (1887); Oudejans, World Cat. Tribe Euphorbieae: 358 (1990); Philcox in Rev. Handb. Fl. Ceylon 11: 204 (1997). — *Anisophyllum roseum* (Retz.) Haw., Syn. Pl. Succ.: 163 (1812). — *Tithymalus rosea* (Retz.) Raf., Fl. Tellur. 4: 115 (1838). — Type: *König* (n. v.), in arena mobili Indiae Orientalis.

Euphorbia satureioides Lam., Encycl. 2: 424 (1788). — Type: *M. Sonnerat* (n. v.), dans l'Inde.

Distribution — Afghanistan, Pakistan, Sri Lanka, Laccadive Isl., India, Vietnam (Govaerts et al. 2000).

Notes — The record of this species from Nepal appears only in Malla et al. (1976) without any specimen citation and locality data.

Pedilanthus tithymaloides (L.) Poit.

Pedilanthus tithymaloides (L.) Poit., Ann. Mus. Natl. Hist. Nat. **19:** 390, t. 19 (1812); Kurz, Forest Fl. Gurma 2: 418 (1887); Boiss. in DC., Prodr. 15(2): 5 (1862); D. G. Long in Fl. Bhutan 1: 767 (1987); Oudejans, World Cat. Sp. Name Tribe Euphorbieae: 412 (1990); Siwakoti & Varma, Pl. Divers. E. Nepal: 329 (1999); Govaerts et al.,

World Checkl. Bibliogr. Euphorb.: 1243 (2000). — *Euphorbia tithymaloides* L., Sp. Pl.: 453 (1753). — *Tithymalus tithymaloides* (L.) Croizat, Amer. J. Bot. 24: 704 (1937). — Type: (n. v.), Curassao; (n. v.), India.

See Govaerts et al. (2000) for further synonyms.

Distribution — Native of Mexico & tropical America (Govaerts et al. 2000).

Habitat & Ecology — According to Siwakoti & Varma (1999) this species escapes in plains (Siwakoti & Varma 1999).

Uses — This species is cultivated in gardens (Siwakoti & Varma, 1999).

Notes — Siwakoti & Varma (1999) reported this species from Biratnagar based on *Siwakoti 798* (Bhagalpur University Herbarium, n. v.).

Appendix: Specimens Examined from Nepal

1.1. Bridelia tomentosa Blume

Eastern: **Koshi Zone, Morang Distr.**: Chula chuli (*Williams & Stainton 8511*, K); Kathgare–Rangali (*H. Kanai et al. 6306835*, KYO, TI). **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306834*, K, KYO, TI); Ghorwa–Sanichare (*H. Hara et al. s. n.*, 10 Dec. 1963, TI). **Jhapa Distr.**: Sibganja–Mahara Bahara (*G. Murata & M. Togashi 6306836*, KYO, TI); Gauriganja–Rangali (*H. Hara et al. 6306833*, TI) , (*H. Hara et al. 6306834*, KYO).

1.2. Bridelia stipularis (L.) Blume

Far Western: **Seti Zone, Kailali Distr.**: Ataria (*H. Tabata et al. 402*, KYO); between Dhangarhi and Ataria (*H. Tabata et al. 351*, KYO).

Mid Western: **Bheri Zone, Bardiya Distr.**: Royal Bardia National Park, Danawatal (*M. Mikage et al. 9689061*, TUS); Royal Bardia National Park, near the head quarter, Thakurduar (*M. Mikage et al. 9681374*, TUS), (*M. Mikage et al. 9689001*, TUS).

Western: **Lumbini Zone, Palpa Distr.**: Butwal (*Stainton et al. 8824*, E).

Central: **Narayani Zone, Bara Distr.**: NW. of Amlekganj, E. of Bherah Khola (*M. Mikage et al. 9550597*, TUS); en route from Parasuwa to Bakeya (*H. Tabata et al. 9613*, KYO). **Chitawan Distr.**: Sauraha–Devi Tal (*M. Mikage et al. 9611819*, TUS); between Saurha and Kasara (*H. Tabata et al. 7562*, KYO).

Eastern: **Koshi Zone, Sunsari Distr.**: Kushaha, Koshi Tappu Wildlife Reserve, SW. of Headquarter Office (*M. Mikage et al. 9550639*, TUS). **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306829*, KYO, TI); Ghorwa–Sanichare (*H. Hara et al. 6306830*, TI); Illam–Ranga Pani (*H. Hara et al. 6306832*, TI). **Jhapa Distr.**: Gauriganja–Rangali (*H. Hara et al. 6306831*, TI).

1.3. Bridelia pubescens Kurz

Eastern: **Mechi Zone, Ilam Distr.**: Mai Khola, Soktim (*J. D. A. Stainton 6493*, TI); 5 mile E. of Soktim Tea Estate (*J. D. A. Stainton 6886*, TI).

1.4. Bridelia retusa (L.) A. Juss.

Far Western: **Mahakali Zone, Kanchanpur Distr.**: Royal Suklaphanta Wildlife Reserve, Pipariya, along Mahakari river (*M. Mikage et al. 9689181*, TUS).

Mid Western: **Bheri Zone, Bardiya Distr.**: Royal Bardia National Park, near the head quarter, Thakurduar (*M. Mikage et al. s. n.*, 2 Oct. 1996, TUS); Royal Bardia National Park, Tiger top (*M. Mikage et al. s. n.*, 3 Oct. 1996, TUS). **Jajarkot Distr.**: Kuepani, near Jajarkot (*O. Polunin et al. 5765*, E). **Rapti Zone, Distr. unknown**: Tin Pipla (*K. R. Rajbhandari & B. Roy 4771*, KYO).

Western: **Gandaki Zone, Gorkha Distr.**: Anp Pipal (*A. Blachshaw 54*, E). **Distr. unknown**: Pokharatar–Tarku Ghat (*H. Kanai 670624*, KYO, TI). **Lumbini Zone, Palpa Distr.**: Butwal (*Stainton et al. 8819*, E, TI).

Central: **Narayani Zone, Bara Distr.**: Nijgar–Patraia (*H. Kanai 675192*, TI). **Chitawan Distr.**: Sauraha–Kasara (*M. Suzuki et al. 9611754*, TUS); Sauraha–Devi Tal (*M. Mikage et al. 9611818*, TUS). **Makawanpur Distr.**: Hitaura, Churia Hills (*Williams*

& Stainton 8240, K). **Distr. unknown**: Lothar, Rapti Valley (*Williams & Stainton 8308*, TI).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhankuta (*H. Hara et al. s. n.*, 19 Oct. 1963, TI); Panche–Dihale (*M. Suzuki et al. 8860042*, E). **Morang Distr.**: Rangali–Biratnagar (*H. Kanai et al. 6306827*, KYO, TI), (*H. Kanai et al. 6306828*, KYO, TI). **Sankhuwasabha Distr.**: Sabha Khola–Khandbari (*S. Noshiro et al.* 9755079, TI); Tumlingtar–Baireni Bagar (*S. Noshiro et al. 9840218*, E). **Mechi Zone, Jhapa Distr.**: Sibganja–Gauriganja (*H. Hara et al. s. n.*, 12 Oct. 1963, TI).

1.5. Bridelia sikkimensis Gehrm.

Far Western: **Seti Zone, Bajura Distr.**: Jugado (*H. Tabata et al. 2501*, KYO).

Far Western or Mid Western: **Zone unknown**: Karnali Valley (*J. D. A. Stainton 6151*, TI).

Western: **Gandaki Zone, Gorkha Distr.**: Buri Gandaki River, 16 miles above Araghat Bazar (*P. C. Gardner 239*, TI). **Kaski Distr.**: Pokhara (*Stainton et al. 7150*, E, TI). **Manang Distr.**: Marsyandi Khola, Jagat–Bahundanda (*H. Ohba et al. 8340382*, E). **Dhaulagiri Zone, Myagdi Distr.**: Tatopani–Ghorepani (*M. Mikage et al. 9455377*, E, TUS), Mayangdi Khola (*Stainton et al. 9187*, TI).

2.1. Leptopus cordifolius Wall. ex Decne.

Far Western: **Seti Zone, Bajhang Distr.**: Talkot–Aagar (*M. Suzuki et al. 9170773*, TI); between Basala and Jugado (*H. Tabata et al. 2489*, KYO); between Dharagaon and Dilbagar (*H. Tabata et al. 1348*, KYO). **Doti Distr.**: between Barigad and Galsera (*H. Tabata et al. 693*, KYO).

Mid Western: **Bheri Zone, Jajarkot Distr.**: Gad Rangchi (*Polunin et al. 5737*, E). **Karnali Zone, Kalikot Distr.**: Badarigaon–Kota (*M. Suzuki et al. 9194111*, E); Khallagad to Talaserogaon (*K. R. Rajbhandari & B. Roy 3134*, KYO).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Muri–below Dhar (*M. Mikage et al. 9684148*, TUS); Dhar–Lumsung (*M. Mikage et al. 9686096*, TUS); Lumsung–Dhara Khola (*M. Mikage et al. 9682994*, TUS), (*M. Mikage et al. 9684291*, TUS); Boghara–Dobang (*M. Mikage et al. 9685214*, TUS). **Gandaki Zone, Gorkha Distr.**: Buri Gandaki, between Kal Tal and Ngyak (*S. Nakao s. n.*, 2–4 Dec. 1952, KYO). **Mustang & Myagdi Distr.**: Lower Lete–Tatopani (*M. Mikage et al. 9455370*, TUS). **Syangja Distr.**: Bhanjang –Tikabhairab (*Kanai & Bista 11072*, TI).

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu Valley, Nagarjun (*H. Ohba et al. 8350016*, TUS). **Lalitpur Distr.**: Godavari, near Kathmandu (*H. Hara et al. 6306803*, TI); Godavari–Phulchauki, Kathmandu (*H. Kanai et al. 3102*, TI); Phulchoki, Kathmandu (*H. Idzumi & M. Togashi s. n.*, 3 Oct. 1978, TI). Phulchauki Danda, Kathmandu Valley (*Williams & Stainton 8125*, K), Godavari, Kathmandu Valley (*A. D. Schilling & C. D. Sayers 557*, K). **Rasuwa Distr.**: Syabru Bensi–Lama Hotel (*S. Akiyama et al. 20100030*, TUS); Chilime and Langtan Valleys, Syaprubensi (*H. Kanai & P. R. Shakya 675191*, KYO, TI); Rasua Ghari–Thangjet (*O. Polunin 960*, E). **Janakpur Zone, Dolakha Distr.**: Tamba Koshi, Pikhuti–Totlabari (*H. Ohba et al. 8331584*, E, TUS). **Zone unknown**: (*Wallich, List no. 7913B*, K)

Eastern: **Janakpur Zone, Ramechhap Distr. & Sagarmatha Zone, Solukhumbu**

Distr.: Bhandar–Sete (*H. Ohba et al. 8571748*, TUS).

Region unknown: Kawa, Khater Dara (*O. Polunin et al. 830*, E)

3.1. Flueggea virosa (Roxb. ex Willd.) Voigt subsp. **himalaica** D. G. Long

Far Western: **Seti Zone, Bajura Distr.**: Berma–Kolti (*M. Suzuki et al. 9194145*, E).

Western: **Dhaulagiri Zone, Baglung Distr.**: Charaudi (W of Baglung) (*Stainton et al. 516*, E). **Myagdi Distr.**: above Rithum Khola (*Stainton et al. 2733*, E, TI); Tatopani, Kali Gandaki Valley (*Stainton et al. 5459*, E). **Parbat Distr.**: Kusma (*Stainton et al. 570*, E). **Gandaki Zone, Lamjung Distr.**: Midan Khola (*Stainton et al. 5163*, E, TI); Madi Khola, Karelung (*Stainton et al. 5907*, E).

Central: **Janakpur Zone, Dolakha Distr.**: Chaubas (*K. Yoda s. n.*, 21 Jun. 1963, KYO); Kapure (*K. Yoda s. n.*, 18 Jun. 1963, KYO); Chittare (*K. Yoda s. n.*, 19 Jun. 1963, KYO). **Narayani Zone, Chitawan Distr.**: en route from Sauraha to Dumre (*H. Tabata et al. 9773*, KYO); en route from Parasuwa to Bakeya (*H. Tabata et al. 9603*, KYO).

Eastern: **Koshi Zone, Dhankuta Distr.**: Mohamabedi Khola–Dhara Pani (*H. Kanai et al. 721216*, TI); Dhara Pani–Teku nala (*H. Kanai et al. 724030*, TI); Tamur Bridge (*H. Kanai et al. 721206*, TI). **Mechi Zone, Taplejung Distr.**: Khokling–Thunglung (*M. Suzuki et al. 9263022*, E, TUS).

4.1. Phyllanthus parvifolius Buch.-Ham. ex D. Don

Western: **Dhaulagiri Zone, Myagdi Distr.**: Babichor–Dharapani (*M. Mikage et al. 9685109*, TUS). **Gandaki Zone, Kaski Distr.**: Pokhara to Hyenda (*Y. Suehiro 101*, KYO); near Lumle (*K. Nishioka 112*, KYO); en route from Ghandrung to Chandrakot (*Y. Suehiro 1515*, KYO); Naudanda (*Y. Suehiro 2072*, KYO); Chandrakot (*Y. Suehiro 2181*, KYO); near Suikett (*K. Nishioka 175*, KYO); near Biretati (*K. Nishioka 706*, KYO). **Parbat Distr.**: between Khaniyaghat and Benari, near Kusma (*H. Tabata et al. 3981*, KYO). **Syangja Distr.**: between Hyanja and Naudara (*H. Tabata et al. 6425*, KYO).

Central: **Bagmati Zone, Kathmandu Distr.**: Sheopuri, north of Kathmandu (*H. Kanai & T. B. Shresta 670016*, TI); Kathmandu, Phulchoki (*H. Kanai & P. R. Shakya 674920*, KYO, TI); Kakani (*H. Hara et al. s. n.*, 24 Sep. 1963, TI). **Lalitpur Distr.**: Godavari (*C. Chuma s. n.*, 8 Sep. 1970, TI), (*H. Hara et al. s. n.*, 18 Sep. 1963, TI). **Rasuwa Distr.**: between Manigaon and Ramche (*H. Tabata et al. 8559*, KYO); Sim Chotala–Gram (*H. Kanai et al. 724047*, TI); Latsu–Bhorlang (*H. Kanai et al. 724045*, TI). **Janakpur Zone, Dolakha Distr.**: en route from Bishnutole to Busti (*H. Tabata et al. 10081*, KYO); Rolwaling Himal, Dadin (*K. Yoda s. n.*, 23 Apr. 1963, KYO); Rolwaling Himal, Dumure (*K. Yoda s. n.*, 21 Jun. 1963, KYO). **Zone unknown**: (*Wallich, List no. 7901B*, BM, K); Bassaria (*Buchanan s. n.*, 5 June 1802, BM).

Eastern: **Koshi Zone, Bhojpur Distr.**: Deurali–Bastim (*M. Mikage et al. 9554256*, E, TUS). **Dhankuta Distr.**: Hile–Diyale (*S. Noshiro et al. 9755011*, TI). **Sankhuwasabha Distr.**: Chichila–Khandbari (*M. Suzuki et al. 8821259*, TUS); below Kiraubi Chlap (*M. Ohsawa & P. R. Shakya 2812*, TI); near Hatiya, Upper Arun Valley (*D. G. Long et al. 737*, E); Arun Valley, ridge between Khandbari and Bhotebas (*D. G. Long et al. 33*, E). **Sunsari Distr.**: Phusri–Dhara Pani (*H. Hara et al. 6306774*, K, KYO). **Mechi Zone, Taplejung Distr.**: Tapejung–Garhi Danra (*H. Hara et al. 630672*, TI); Khebang –Bharomdin (*H. Hara et al. 6306774*, TI). **Sagarmatha Zone, Solukhumbu Distr.**:

Kharikhola–Nunthala (*M. Wakabayashi et al. 9720332*, TI).

4.2. Phyllanthus aff. **clarkei** Hook. f.

Eastern: **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306794*, KYO, TI).

4.3. Phyllanthus clarkei Hook. f.

Far Western: **Seti Zone, Doti Distr.**: between Doti and Rhikula (*H. Tabata et al. 985*, KYO). **Kailali Distr.**: Sahejepur (*H. Tabata et al. 609*, KYO).

Mid Western: **Bheri Zone, Dailekh Distr.**: Lade to Subachhena (*K. R. Rajbhandari & B. Roy 2717*, KYO). **Jajarkot Distr.**: Dhimia (*O. Polunin et al. 521*, BM). **Karnali Zone, Jumla Distr.**: between Sukadhik and Tolibagar (*H. Tabata et al. 2766*, KYO); Luma, E. of Jumla (*O. Polunin et al. 4941*, E, TI); Dillikot to Odan (*K. R. Rajbhandari & B. Roy 3015*, KYO). **Kalikot Distr.**: Chaukebada–Badarigaon (*M. Suzuki et al. 9192172*, BM). **Mugu Distr.**: Toli (*H. Tabata et al. 2845*, BM, KYO); Pina (Ping) near Rara (*O. Polunin et al. 3048*, E).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Muri–below Dhar (*M. Mikage et al. 9686090*, TUS); near Lumsum (*Stainton et al. 9121*, E, TI). **Gandaki Zone, Gorkha Distr.**: Ekle Ghar–Sardu Khola (*M. Suzuki et al. 9455144*, E, TUS); Kasigaon–Keronje (*T. Namba 0930098*, KYO, TI); Buri Gandaki, between Kal Tal and Ngyak (*S. Nakao s. n.*, 2–4 Dec. 1952, KYO). **Kaski Distr.**: Ghorepani–Birethani Bazar (*M. Mikage et al. 9480234*, E, TUS); near Ulleri (*K. Nishioka 651*, KYO); Yangjakot (*Stainton et al. 8999*, BM, E, TI); en route from Ghandrung to Chhumro (*Y. Suehiro 746*, KYO). **Kaski Distr. & Dhaulagiri Zone, Parbat Distr.**: Tirkhedhunga–Ghorepani (*M. Mikage et al. 9550060*, TUS).

Central: **Bagmati Zone, Kathmandu Distr.**: Sheopuri, north of Khathmandu (*H. Kanai & T. B. Shresta 670015*, KYO, TI). **Rasuwa Distr.**: Khodang Danda–Latsu (*H. Kanai et al. 722053*, TI); Syabru–Lama Hotel (*S. Noshiro 9154258*, BM). **Sindhupalchok Distr.**: Kalingchok, Thala–Tale Bisauna (*H. Kanai et al. 70110*, TI), (*H. Kanai et al. 672783*, KYO, TI). **Janakpur Zone, Dolakha Distr.**: Jiri–Sibalaya (*F. Miyamoto et al. 9584001*, TI). **Ramechhap Distr.**: Sibalaya–Bandar (*F. Miyamoto et al. 9580013*, TI); Kyama–Patkare (*H. Ohba et al. 8571290*, K); Choarma–Kyama (*H. Ohba et al. 8571160*, K).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhara Pani–Dhankuta (*H. Hara et al. 6306795*, KYO, TI). **Mechi Zone, Taplejung Distr.**: Yamphodin–Ghatte (*H. Kanai et al. 6306793*, K, KYO, TI); Ghatte (*H. Hara et al. 6306797*, TI); Ghatte–Khebang (*H. Hara et al. 6306775*, KYO, TI); Khebang (*H. Hara et al. 6306796*, TI). **Sagarmatha Zone, Solukhumbu Distr.**: Kensa–Deorali (*F. Miyamoto et al. 9596628*, TI).

Region unknown: near Dhaman (*J. L. Creech & F. de Vos 1309*, TI); Cekhu Bari (*Unknown collector 8315*, BM).

4.4. Phyllanthus simplex Retz.

Western: **Gandaki Zone, Kaski Distr.**: Surauti Khola (*Stainton et al. 6849*, E, TI).

Central: **Janakpur Zone, Dolakha Distr.**: en route from Bishnutole to Busti (*H. Tabata et al. 10095*, KYO). **Dolakha Distr.**: Rolwaling Himal, Pachkhal (*M. Numata 1812*, KYO). **Narayani Zone, Bara Distr.**: Adhabar, vicinity of Parsa Wildlife Reserve

Headquarter Office (*M. Mikage et al. 9554011a*, E, TUS), (*M. Mikage et al. 9552758*, TUS).

Eastern: **Koshi Zone, Bhojpur Distr.**: Bumlingtar–a Shorea forest (*S. Noshiro et al. 9760561*, E, TUS). **Dhankuta Distr.**: Diyale–Bhainse (*S. Noshiro et al. 9760043*, TUS). **Dhankuta Distr. & Sankhuwasabha Distr.**: Ramrista–Khahare (*M. Suzuki et al. 8880124*, E, TUS). **Sankhuwasabha Distr.**: Tumlingtar–Baireni Bagar (*S. Noshiro et al. 9820126*, TI). **Morang Distr.**: Biratnagar (*H. Hara et al. 6306814*, KYO, TI). **Mechi Zone, Jhapa Distr.**: Mahara Bahara–Kathgara (*H. Kanai et al. 6306815*, KYO, TI). **Sagarmatha Zone, Udayapur Distr.**: Beltar–Kattike (*M. Mikage et al. 9552993*, E, TUS). **Zone unknown**: Pelwa Ghat (*M. Osawa & P. R. Shakya s. n.*, 1 Sep. 1971, TI).

4.5. Phyllanthus sikkimensis Müll. Arg.

Western: **Gandaki Zone, Kaski Distr.**: Pokhara (*H. Kanai et al. 26093*, TI), (*H. Kanai et al. 26080*, TI). **Syangja Distr.**: between Hyanja and Naudara (*H. Tabata et al. 6426*, KYO).

Eastern: **Koshi Zone, Bhojpur Distr.**: en route from Phedi to Sagangma along Irkhua Khola (*H. Tabata et al. 10973*, KYO), (*H. Tabata et al. 10974*, KYO). **Sunsari Distr.**: Dharan–Dhara Pani (*H. Kanai et al. 724042*, TI). **Mechi Zone, Taplejung Distr.**: Tuwa –Taplethok (*H. Hara et al. 6306799*, K, KYO, TI); Saju Khola–Dingla (*H. Kanai et al. 720991*, TI); Bhirkuna–Chiruwa (*M. Suzuki et al. 9240229*, E, TUS), (*M. Suzuki et al. 9263119*, E, TUS).

4.7. Phyllanthus glaucus Wall. ex Müll. Arg.

Western: **Dhaulagiri Zone, Myagdi Distr.**: Titre, Kali Gandaki valley (*Stainton et al. 5475*, E, TI); Kali Gandaki, Tatopani–Ghasa (*H. Ohba et al. 8340192*, E, TUS). **Gandaki Zone, Gorkha Distr.**: Ekle Ghar–Sardu Khola (*M. Suzuki et al. 9455129*, E, TUS); Ripche (*S. Nakao & J. H. E. s. n.*, 10 Jul. 1953, KYO). **Manang Distr.**: Marsyandi Khola, Dhanagyang–Tal (*H. Ohba et al. 8340339*, E, TUS); Marsyandi Khola, Dhanagyang–Dharapani (*H. Ohba et al. 8311119*, E, TUS).

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu. Godavari–Phlchoki (*H. Kanai 11331*, KYO, TI), (*H. Kanai et al. 3041*, TI). **Lalitpur Distr.**: Phulchoki, south of Kathmandu (*H. Ohashi & H. Ohba 724029*, TI); Phulchoki (*P. Pradhan & S. Gurung 10567*, TI). **Rasuwa Distr.**: Dhunche station–Dunche (*H. Tabata et al. 8668*, KYO); Chilime and Langtang valleys, Dhunche (*H. Kanai & P. R. Shakya 672020*, KYO, TI); Dhunche–Syabru (*H. Takayama et al. 9239039*, E, TUS); Dhunche–Deolari (*T. Hoshino et al. 9535019*, TI); Dhunche (*Saman & Bista 13061*, TI); above Dhunche along the Trisula Khola–Gosainkund (*H. Hara et al. 69186*, TI); Dunche–Singum Gompa (*H. Kanai et al. 724032*, TI); Trisuli Valley, Syabrubensi (*S. Bowes Lyon 28*, E); between Bharkhu and Syabru (*D. G. Long & S. E. McDermott 21927*, E); Dunche–Syabru (*M. Suzuki & S. Noshiro 540013*, E). **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal, Donla–Kensa (*K. Yoda s. n., 28 Apr. 1963*, KYO). **Ramechhap Distr.**: en route from Those to Shibalaya (*H. Tabata et al. 10190*, KYO); Patkare–Bhandar (*H. Ohba et al. 8571322*, E). **Janakpur Zone, Ramechhap Distr. & Sagarmatha Zone, Solukhumbu Distr.**: Bhandar–Sete (*M. Wakabayashi et al. 9715010*, TI). **Zone unknown**: (*Wallich, List no. 7821*, K); (*Wallich, List no. 7927A*, K).

Eastern: **Mechi Zone, Taplejung Distr.**: Thakpa Bazar–Ramsyang Pati (*M. Suzuki et al. 9240273*, E, TUS).

4.8. Phyllanthus reticulatus Poir.

Western: **Gandaki Zone, Gorkha Distr.**: Macha Khola–Syaule Bhatti (*M. Suzuki et al. 9455084*, E, TUS); Arkhet Bazar–Khorsanedanda (*M. Suzuki et al. 9455054*, TUS); Arughat Bazar, Buri Gandaki River (*P. C. Gardner 223*, BM, E). **Lamjung Distr.**: Madi Khola, Karelung (*Stainton et al. 5876*, BM, E). **Zone unknown**: Kali Gandaki R, Gunsa (*Stainton et al. 8934*, BM).

Eastern: **Koshi Zone, Morang Distr.**: Kathgara–Rangali (*H. Kanai et al. 6306800*, TI), (*H. Kanai et al. 6306813*, KYO, TI); Biratnagar (*H. Hara et al. 6306812*, KYO, TI). **Mechi Zone, Ilam Distr.**: Tea Garden hill (*D. H. Nicholson 3117*, BM, TI). **Distr. unknown**: Mechi bank (*J. S. Gamble 2837A*, K); Mechi bank Nepal side (*J. S. Gamble s. n.*, K). **Sagarmatha Zone, Udayapur Distr.**: between Ghanta and Kanchira (*H. Tabata et al. 7899*, KYO).

4.9. Phyllanthus leschenaultii Müll. Arg.

Western: **Gandaki Zone, Syangja Distr.**: Andhi Kola, 300 m above conflux with Kali Gandaki, south bank (*K. A. Lye 17609*, E).

4.10. Phyllanthus acidus (L.) Skeels

Eastern: **Koshi Zone, Morang Distr.**: Charkosya Jhari, Letang (*Williams & Stainton 8537*, BM, K).

4.11. Phyllanthus emblica L.

Far Western: **Seti Zone, Kailali Distr.**: Godawari (*H. Tabata et al. 425*, KYO); between Buditola and Bhasu (*H. Tabata et al. 518*, KYO).

Mid Western: **Karnali Zone, Kalikot Distr.**: Kiurithani, Karnali valley (*Polunin et al. 796*, E, TI); near Kalikot, Tila Valley (*O. Polunin et al. 1922*, E); Kota–Phukgad (*M. Suzuki et al. 9194124*, E). **Rapti Zone, Salyan Distr.**: Sitalpati (*O. Polunin et al. 1262*, E).

Western: **Dhaulagiri Zone, Baglung Distr.**: between Tagum and Darbang (*H. Tabata et al. 3937*, KYO). **Mustang & Myagdi Distr.**: Lower Lete–Tatopani (*M. Mikage et al. 9455375*, E, TUS). **Myagdi Distr.**: Babichor–Dharapani (*M. Mikage et al. 9684038*, TUS); near Mayangdi Khola (*Stainton et al. 2543*, E). **Gandaki Zone, Gorkha Distr.**: Buri Gandaki, Arughat Bazaar (*S. Nakao s. n.*, 10 Dec. 1952, KYO). **Kaski Distr.**: Biretatti (*K. Nishioka 471*, KYO), (*K. Nishioka 650*, KYO); Surauti (Suranti?) Khola (*Stainton et al. 6866*, E).

Central: **Bagmati Zone, Dhading Distr.**: Charangi Pauwa (*M. Suzuki et al. 9460026*, TUS). **Kabhre Distr.**: Panchkhal (*H. Tabata et al. 9503*, KYO). **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal, Pachkhal (*K. Yoda s. n.*, 19 Apr. 1963, KYO). **Narayani Zone, Bara Distr.**: Bakeya (*H. Tabata et al. 9707*, KYO). **Chitawan Distr.**: Sauraha–Harda Khola (*M. Mikage et al. 9611799*, TUS). **Parsa Distr.**: Parsa Wildlife Reserve, along Mahadev Khola (*M. Mikage et al. 9550586*, TUS); Parsa Wildlife Reserve, along Bhalu Khola (*M. Mikage et al. 9550614*, TUS).

Eastern: **Koshi Zone, Sunsari Distr.**: Daran Bazar, Biratnagar (*J. D. A. Stainton 49*,

E). **Sankhuwasabha Distr.**: Tumlingtar–Baireni Bagar (*S. Noshiro et al. 9840217*, E). **Mechi Zone, Panchthar Distr.**: Tharpu–near Chyangthaphu (*H. Kanai et al. 6306809*, KYO, TI). **Taplejung Distr.**: Dumhan, by the Tamur River (*G. Murata et al. 6306810*, TI); Dumhan (*H. Hara et al. 6306810*, KYO); Upper Gorzha (*K. Nishioka 1166*, KYO). **Sagarmatha Zone, Khotang Distr.**: Regmitar–Khani Danda (*M. Mikage et al. 9555069*, TUS).

Region unknown: between Chamche and Tagring (*T. Fujimura s. n.*, 22 Oct. 1953, KYO).

4.12. Phyllanthus aff. **embergeri**

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhankuta (*H. Hara et al. 6306807*, KATH, TI); (*Hara et al. s. n.*, 18 Oct. 1963, TI).

4.13. Phyllanthus lepidocarpus Siebold & Zucc.

Far Western: **Seti Zone, Bajura Distr.**: Serigaon–Bashala (*M. Suzuki et al. 9160597*, TUS).

Mid Western: **Bheri Zone, Bardiya Distr.**: Royal Bardia National Park, near the head quarter, Thakurduar (*M. Mikage et al. 9689068*, TUS).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Muri–below Dhar (*M. Mikage et al. 9684152*, TUS); above Mayangdi Khola (*Stainton et al. 4037*, E, TI). **Baglung Distr. & Myagdi Distr.**: Baglung (*M. Mikage et al. 9682052*, TUS). **Gandaki Zone, Kaski Distr.**: Pokhara (*Stainton et al. 6740*, E).

Central: **Bagmati Zone, Kathmandu Distr.**: between Kathmandu and Thankot (*H. Kanai s. n.*, 20 Sep. 1963, TI). **Lalitpur Distr.**: Godavari, south of Kathmandu (*C. Chuma 675190*, TI). **Narayani Zone, Chitawan Distr.**: Sauraha–Padampur (*K. Yoda 9614101*, TUS); ca. 4 km east of Mugling (*M. Mikage et al. 9552040*, TI). **Parsa Distr.**: Parsa Wildlife Reserve, along Mahadev Khola (*M. Mikage et al. 9552781*, TUS).

Eastern: **Koshi Zone, Morang Distr.**: Biratnagar (*H. Hara et al. 6306808*, TI). **Sankhuwasabha Distr.**: below Lum Lum La (*M. Ohsawa & P. R. Shakya 1893*, TI), (*M. Ohsawa & P. R. Shakya 1930*, TI). **Koshi Zone, Sunsari Distr. & Sagarmatha Zone, Saptari Distr.**: Koshi Tappu Wildlife Reserve, Simana–Kanchanpur (*M. Mikage et al. 9552945*, TUS).

4.14. Phyllanthus embergeri Haicour & Rossignol

Mid Western: **Rapti Zone, Distr. unknown**: Jimali (*K. R. Rajbhandari & B. Roy 4792*, KYO).

Western: **Dhaulagiri Zone, Myagdi Distr. & Mustang Distr.** : Tatopani–Ghasa (*T. Hoshino et al. 9666048*, E, TUS); Beni–Babichor (*M. Mikage et al. 9687038*, TUS), (*M. Mikage et al. 9685077*, TUS). **Gandaki Zone, Kaski Distr.**: Pokhara (*Stainton et al. 6756*, TI). **Syangja Distr.**: Andhi Khola, 300 m above conflux with Kali Gandaki, sonth bank (*K. A. Lye 17605*, E).

Central: **Narayani Zone, Bara Distr.**: Adhabar, vicinity of Parsa Wildlife Reserve Headquarter Office (*M. Mikage et al. 9554011b*, TUS). **Chitawan Distr.**: Sauraha–Padampur (*K. Yoda et al. 9614101b*, TUS), (*K. Yoda et al. 9614101*, E).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhankuta (*H. Hara et al. 6306807*, KYO).

Koshi Zone, Sunsari Distr. & Sagarmatha Zone, Saptari Distr.: Koshi Tappu Wildlife Reserve, Simana–Kanchanpur (*M. Mikage et al. 9552945*, E). **Sankhuwasabha Distr.**: Apsuwa Doban–Pikhuwa (*S. Noshiro et al. 9760510*, E, TUS); Kyawa Khola–Kyawabesi (*S. Noshiro et al. 9760066*, TUS); Tumlingtar–Baireni Bagar (*S. Noshiro et al. 9820122*, TI). **Sankhuwasabha Distr. or Mechi Zone, Taplejung Distr.**: Mul Pokhari–Dumhan (*H. Hara et al. s. n.*, 30 Oct. 1963, TI). **Sunsari Distr.**: Phusri–Dhara Pani (*H. Hara et al. s. n.*, 16 Oct. 1963, TI). **Mechi Zone, Panchthar Distr.**: near Chyangthaphu–Birwa (*H. Kanai et al. s. n.*, 27 Nov. 1963, TI). **Taplejung Distr.**: Dumhan, by the Tamur River (*G. Murata et al. 6306804*, TI); Dumhan–Taplejung (*H. Kanai et al. 6306805*, TI), Khebang (*H. Hara et al. 6306806*, TI), (*H. Hara et al. s. n.*, 23 Nov. 1963, KYO); Bharomdin–Tharpu (*H. Hara et al. s. n.*, 25 Nov. 1963, TI).

4.15. Phyllanthus amarus Schumach. & Thonn.

Eastern: **Sagarmatha Zone, Khotang Distr.**: Dihigaon–Regmitar (*M. Mikage et al. 9558110*, E, KATH); Dihigaon–Ritha Bhote (*M. Mikage et al. 9558110*, TUS).

4.16. Phyllanthus fraternus G. L. Webster

Mid Western: **Bheri Zone, Banke Distr.**: Nepalganj (*N. P. Manandhar 6982*, KATH). **Dailekh Distr.**: Dungesar–Strithan (*M. Suzuki et al. 9160146*, BM).

Western: **Gandaki Zone, Kaski Distr.**: Pokhara (*Stainton et al. 6731*, BM, KATH, TI), (*Stainton et al. 7631*, E, TI), (*T. Wraber 119*, BM); Pokhara, Simalchaur (*N. P. Manandhar & L. P. Katel 11347*, KATH). **Lumbini Zone Rupandehi Distr.**: Bhairawa (*D. P. Joshi & M. M. Amatya 73/857*, KATH).

Eastern: **Koshi Zone, Dhankuta Distr.**: Mul Ghat–Dhan Kula (*M. Ohsawa & P. R. Shakya 74*, TI). **Sankhuwasabha Distr.**: Khandbari–Tumlingtar (*M. Suzuki et al. 8821289*, BM).

Region unknown: Garhwa, Dang (*N. P. Manandhar & N. K. Bhattarai 8520*, KATH).

4.17. Phyllanthus airy-shawii Brunel & J. P. Roux

Central: **Narayani Zone, Chitawan Distr.**: Sauraha–Harda Khola (*M. Mikage et al. 9614208*, TI, TUS).

Eastern: **Koshi Zone, Bhojpur Distr.**: Bumlingtar–a *Shorea* forest (*S. Noshiro et al. 9760559*, TI, TUS); Arun bridge–Chapabote (*S. Noshiro et al. 9760576*, TI). **Dhankuta Distr.**: Teku Nala–Dhara Pani (*H. Ohashi et al. 771369*, TI). **Sankhuwasabha Distr.**: Pikhuwa–Bumlingtar (*S. Noshiro et al. 9760549*, TI); Arun valley, Tumlingtar (*T. Wraber 488*, BM). **Mechi Zone, Taplejung Distr.**: Sangrati Pati–Doban (*H. Ohashi et al. 771136*, TI), (*H. Ohashi et al. 775406*, TI).

5.1. Sauropus quadrangularis (Willd.) Müll. Arg.

Western: **Dhaulagiri Zone, Baglung Distr.**: Bhuji Khola (*Stainton et al. 9053*, E); Bongakhani (*Stainton et al. 3950*, E). **Gandaki Zone, Gorkha Distr.**: Ekle Ghar–Deng (*M. Suzuki et al. 9455239*, E, TUS). **Kaski Distr.**: Tolka–Ghandruk (*M. Suzuki et al. 8881126*, TUS); Mardi Khola (*Stainton et al. 8449*, E); Chhumro (*Y. Suehiro 2265*, KYO). **Lumbini Zone, Nawalparasi Distr.**: Daunedanda (*H. Tabata et al. 9863*, KYO).

Central: **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal, Pachkhal (*M. Numata*

1820, KYO); Kirentechap (*M. Numata 1691*, KYO); en route from Bishnutole to Busti (*H. Tabata et al. 10083*, KYO). **Narayani Zone, Bara Distr.**: near Amlekhgani, S. Nepal (*Grey–Wilson & Phillips 55*, K). **Chitawan Distr.**: Kasara (In Chitwan National Park) (*H. Tabata et al. 7918*, KYO); between Dumre and Kashara (*H. Tabata et al. 9791*, KYO). **Makawanpur Distr.**: Hitaura, Rapti valley (*Williams & Stainton 8186*, K).

Eastern: **Mechi Zone, Ilam Distr.**: Illam–Ranga Pan (*H. Hara et al. 6306811*, TI).

Region unknown: Garam (*H. Kanai 673212*, TI).

5.2. Sauropus androgynus (L.) Merr.

Eastern: **Koshi Zone, Sunsari Distr.**: Phusri–Dhara Pani (*H. Hara et al. 6306773*, KYO, TI).

6.1. Breynia retusa (Dennst.) Alston

Central: **Zone unknown**: (*Wallich, List no. 7911*, E), (*Wallich, List no. 7911D*, TI).

Eastern: **Koshi Zone, Dhankuta Distr.**: Gholi Kharka–Ramrista (*M. Minaki et al. 9040048*, E, TI); Hile–Diyale (*S. Noshiro et al.* 9755014, TI). **Sunsari Distr.**: Dhara Pani –Sanguri Bhanjyang (*H. Kanai et al. 721231*, TI). **Mechi Zone, Ilam Distr.**: Mai Pokhari –Illam (*S. Noshiro et al. 9241121*, E, TUS).

6.2. Breynia vitis-idaea (Burm. f.) C.E.C. Fisch.

Central: **Narayani Zone, Bara distr.**: en route from Parasuwa to Bakeya (*H. Tabata et al. 9607*, KYO).

Eastern: **Koshi Zone, Morang Distr.**: Kathgara–Rangali (*H. Kanai et al. 6306826*, KYO, TI); Mahara Bahara–Kathgara (*H. Kanai et al. 6306824*, K, KYO, TI); Biratnagar (*H. Hara et al. 6306825*, KYO, TI).

7.1. Glochidion multiloculare (Roxb. ex Willd.) Voigt.

Central: **Narayani Zone, Chitawan Distr.**: Khagendramalli–Machan Wildlife Resort (*M. Mikage et al. 9614262*, BM, E, TUS), (*M. Mikage et al. 9614265*, BM, E, TUS); Lathn (Chitwan area) (*P. R. Shakya 9127*, BM). **Makawanpur Distr.**: Hitaura, Rapti valley (*Williams & Stainton 8208*, BM, K).

Eastern: **Koshi Zone, Morang Distr.**: Rangali–Biratnagar (*H. Kanai et al. 6306757*, TI), (*H. Kanai et al. 6306758*, BM, TI); Kathgara–Rangali (*H. Kanai et al. 6306759*, KYO, TI).

7.2. Glochidion nubigenum Hook. f.

Western: **Gandaki Zone, Kaski Distr.**: Bakhri Kharka, north of Pokhara (*O. Polunin et al. (J. D. A. Stainton ?) 5007*, E).

Central: **Bagmati Zone, Lalitpur Distr.**: Phulchoki, south of Kathmandu (*H. Kanai 722139*, BM). **Narayani Zone, Distr. unknown**: Jaspal–Juleri (*Kanai & Bista 12071*, TI). **Zone unknown**: (*Wallich, List no. 7852*, BM, center plant).

Eastern: **Mechi Zone, Ilam Distr.**: Mai Pokhari–Dhara Pani (*H. Hara et al. 6306762*, TI). **Taplejung Distr.**: Taplethok–Helok (*H. Hara et al. 6306760*, BM, KYO, TI); Ghatte –Khebang (*H. Hara et al. 6306761*, BM, TI). **Sagarmatha Zone, Solukhumbu Distr.**: Dudh Kosi, Josing (*J. D. A. Stainton 5959*, BM).

7.3. Glochidion triandrum (Blanco) C. B. Rob.

Central: **Zone unknown**: (*Wallich, List no. 7885*, BM, E, K), (*Wallich, List no. 7821*, K); (*Wallich s. n.*, BM).

7.4. Glochidion heyneanum (Wight & Arn.) Wight

Far Western: **Seti Zone, Bajura Distr.**: Tolebhir–Berma (*M. Suzuki et al. 9194141*, E); Jugado (*H. Tabata et al. 8913*, KYO). **Kailali Distr.**: Sahejepur (*H. Tabata et al. 610*, KYO). **Doti Distr.**: between Barigad and Galsera (*H. Tabata et al. 690*, KYO).

Mid Western: **Bheri Zone, Dailekh Distr.**: Tal Pokhari to Dungesar (*K. R. Rajbhandari & B. Roy 2765*, KYO). **Surkhet Distr.**: Surkhet–Katukuwa (*M. Suzuki et al. 916005*, TUS), (*M. Suzuki et al. 9160005*, E), (*M. Suzuki et al. 9191005*, E), (*M. Suzuki et al. 9194009*, E). **Karnali Zone, Kalikot Distr.**: Lower Tila Valley (*O. Polunin et al. 1992*, E); Thana, Tila Vadlley (*O. Polunin et al. 3941*, E); Mulpha to Tari (*K. R. Rajbhandari & B. Roy 3184*, KYO). **Rapti Zone, Distr. unknown**: Mahabharat Lekh to Ambas (*K. R. Rajbhandari & B. Roy 4846*, KYO).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Mayangdi Khola, Arman (*Stainton et al. 154*, E); between Sikha and Tatopani (*H. Tabata et al. 6104*, KYO). **Gandaki Zone, Gorkha Distr.**: Khorsanedanda–Macha Khola (*M. Suzuki et al. 9455063*, E, TUS). **Kaski Distr.**: Madi Khola, near Pokhara (*Stainton et al. 6458*, E). **Lumbini Zone, Nawalarasi Distr.**: Nawal Parasi, Girwari forest (*J. Makin 251*, TI).

Central: **Bagmati Zone, Dhading Distr.**: Mulabari–Arkhet Bazar (*M. Suzuki et al. 9480017*, E, TUS). **Janakpur Zone, Dolakha Distr.**: Tamba Kosi, Malephu–Pikhuti (*H. Ohba et al. 8350998*, E), (*H. Ohba et al. 8340412*, E), (*H. Ohba et al. 8331529*, E), (*H. Ohba et al. 8340422*, E); en route from Bishnutole to Busti (*H. Tabata et al. 10059*, KYO); Rolwaling Himal, Kirentechap (*K. Yoda s. n.*, 19 Jun. 1963, KYO). **Zone unknown**: (*Wallich, List no. 7852*, E, K–WALL); Katakote (*K. Yoda s. n.*, 24 Apr. 1963, KYO).

Eastern: **Koshi Zone, Dhankuta Distr.**: Diyale–Kyawa Khola (*S. Noshiro et al.* 9755029, TI); Gholi Kharka (Dholikharka) –Ramrista (*M. Suzuki et al. 8820117*, E), (*M. Suzuki et al. 8840038*, E). **Sankhuwasabha Distr.**: Arun Valley, Hinwan Khola, north of Chainpur (*J. D. A. Stainton 1527*, E); en route from Hedangna to Gola (*H. Tabata et al. 11156*, KYO). **Mechi Zone, Taplejung Distr.**: Sangrati Pati–Doban (*H. Ohashi et al. 775390*, E, TUS). **Sagarmatha Zone, Solukhumbu Distr.**: Bhote Kosi (*J. D. A. Stainton 4466*, E).

7.5. Glochidion ellipticum Wight

Western: **Lumbini Zone, Rupandehi Distr.**: Nawal Parasi (*J. Makin 83*, BM).

Central: **Narayani Zone, Bara Distr.**: en route from Parasuwa to Bakeya (*H. Tabata et al. 9617*, KYO), (*H. Tabata et al. 9600*, KYO).

Eastern: **Koshi Zone, Morang Distr.**: Charkosya Jhari (*Williams & Stainton 8539*, BM, K). **Sankhuwasabha Distr.**: Gadhi Danda–Mude (*S. Noshiro et al. 9840197*, E, TUS); Arun Valley, Num, north of Chainpur (*J. D. A. Stainton 128*, BM, E). **Mechi Zone, Taplejung Distr.**: Tamur Valley, Mewa Khola (*J. D. A. Stainton 5861*, BM); Dingla (*Banerji et al. 3273*, BM).

7.6. Glochidion lanceolarium (Roxb.) Voigt

Central: **Narayani Zone, Chitawan Distr.**: northeast section of the Park, south of Rapti River (*R. G. Troth 782*, BM).

Eastern: **Koshi Zone, Sunsari Distr.**: Dharan Bazar (Biratnagar) (*J. D. A. Stainton 47*, BM). **Mechi Zone, Ilam Distr.**: 5 miles E. of Soktim Tea Estate (*J. D. A. Stainton 6807*, BM); Mai Khola (*J. D. A. Stainton 6405*, BM). **Jhapa Distr.**: Bhadrapur forest (*D. H. Nicolson 3055*, BM); Bhadrapur (*J. D. A. Stainton 5724*, BM).

7.7. Glochidion daltonii (Müll. Arg.) Kurz

Western: **Gandaki Zone, Gorkha Distr.**: Khorsanedanda–Macha Khola (*M. Suzuki et al. 9455069*, TI); Buri Gandaki River, 14 miles above Arughat Bazar (*P. C. Gardner 257*, BM).

Central: **Janakpur Zone, Dolakha Distrr.**: Tamba Kosi, Malephu–Pikhuti (*H. Ohba et al. 8340417*, TI); Kapure (*K. Yoda s. n.*, 18 Jun. 1963, KYO).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Apsuwa Doban–Pikhuwa (*S. Noshiro et al. 9755253*, TI); Arun Valley, Sangkhua Khola (*J. D. A. Stainton 5933*, BM). **Mechi Zone, Taplejung Distr.**: Tamur Valley Taplejung (*J. D. A. Stainton 5852*, BM). **Sagarmatha Zone, Solkhumbu Distr.**: Bhote Kosi (*J. D. A. Stainton 4462*, BM).

8.1. Putranjiva roxburghii Wall.

Far Western: **Mahakali Zone, Kanchanpur Distr.**: Royal Suklaphanta Wildlife Reserve, Pipariya, along Mahakari river (*M. Mikage et al. 8563*, TI), (*M. Mikage et al. 8238*, TI).

9.1. Baccaurea ramiflora Lour.

Central: **Narayani Zone, Chitawan Distr.**: Royal Chitwan National Park, northeast section of the Park, south of Rapti River (*R. G. Troth 816*, TI).

Eastern: **Mechi Zone, Ilam Distr.**: Mai Khola, Soktim (*J. D. A. Stainton 6484*, TI). **Distr. unknown**: Ganjbari (*J. D. A. Stainton 5747*, TI).

10.1. Aporosa octandra (Buch.-Ham. ex D. Don) A. R. Vickery

Central: **Narayani Zone , Chitwan Distr.**: between Kasara and Dhoba (*H. Tabata et al. 7600*, KYO). **Makawawnpur Distr.**: Churya Ghati, north of Amlekhgamj (*J. D. A. Stainton 5295*, TI). **Zone unknown**: Ettaura (*Hamilton s. n.*, 2 Apr. 1802, BM).

Eastern: **Koshi Zone, Morang Distr.**: Chula Chuli (*L. H. J. Williams 282*, TI). **Mechi Zone, Distr. unknown**: Ganjbari (*J. D. A. Stainton 5737*, TI).

11.1. Antidesma ghaesembilla Gaertn.

Central: **Narayani Zone, Chitawan Distr.**: Chitwan, Ramnagar (*K. Wesche 5173*, BM). **Zone unknown**: Napalia (*Wallich, List no. 7280B*, BM).

11.2. Antidesma bunius (L.) Spreng.

Central: **Bagmati Zone, Dhading Distr.**: Lapang–Mulabari (*M. Suzuki et al. 9455034*, BM, E, TUS).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Khandbari–Bhotebas (*M. Suzuki et al.*

8820234, BM, E, TUS).

11.3. Antidesma acuminatum Wight

Mid Western: **Bheri Zone, Bardiya Distr.**: Royal Bardia National Park, Tiger top. (*M. Mikage et al. 9681391*, TUS).

Western: **Gandaki Zone, Kaski Distr.**: Pokhara (*Stainton et al. 6720*, BM, E).

Eastern: **Koshi Zone, Morang Distr.**: Chula Chuli (*Williams & Stainton 8505*, BM). **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306749*, TI). **Distr. unknown**: Retua Khola (W. of Mai Khola) (*J. D. A. Stainton 6920*, TI).

11.4. Antidesma acidum Retz.

Mid Western: **Bheri Zone, Distr. unknown**: near Babai (*K. R. Rajbhandari & B. Roy 2615*, KYO).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Tatopani–Beni (*M. Mikage et al. 9550543*, TUS); Babichor–Ratorunga (*M. Mikage et al. 9684030*, TUS); Beni–Babichor (*M. Mikage et al. 9681178*, TUS); Ranipauwa, north of Beni (*Stainton et al. 598*, E), (*Stainton et al. 587*, E); Mayangdi Khola (*Stainton et al. 2738*, E). **Baglung Distr. & Myagdi Distr.**: Ratnechour–Beni (*M. Mikage et al. 9687035*, TUS). **Gandaki Zone, Kaski Distr.**: Phewa Tal (*Stainton et al. 5295*, E), (*Stainton et al. 5255*, E). **Lamjung Distr.**: Marsyandi Khola, Bahundanda–Shimalchaur (*H. Ohba et al. 8340392*, TUS). **Lumbini Zone, Palpa Distr.**: Butwal (*Stainton et al. 8842*, E).

Central: **Bagmati Zone, Dhading Distr.**: Lapang–Mulabari (*M. Suzuki et al. 9480016*, E, TUS), (*M. Suzuki et al. 9455031*, E, TUS). **Janakpur Zone, Dolakha Distr.**: Tamba Kosi, Pikhuti–Tatlabari (*H. Ohba et al. 8331580*, E, TUS), (*H. Ohba et al. 8351032*, E); en route from Busti to Namdu (*H. Tabata et al. 10124*, KYO); Rolwaling Himal, Chaubas (*K. Yoda s. n.*, 21 Jun. 1963, KYO), (*K. Yoda s. n.*, 21 Jun. 1963, KYO). **Narayani Zone, Chitawan Distr.**: Royal Chitwan National Park, northeast section of the Park, south of Rapti River (*R. G. Troth 874*, TI), (*R. G. Troth 875*, TI). **Parsa Distr.**: Parsa Wildlife Reserve, along Mohadev Khola (*M. Mikage et al. 9554034*, E, TUS); Parsa Wildlife Reserve, along Bhalu Khola (*M. Mikage et al. 9550612*, TUS).

Eastern: **Koshi Zone, Bhojpur Distr.**: en route from Gothebazar to Kulungagrakhe (*H. Tabata et al. 11000*, KYO). **Sankhuwasabha Distr.**: Khahare–Tumlingtar (*M. Minaki et al. 9040061*, E, TI); Pikhuwa–Bumlingtar (*S. Noshiro et al. 9755269*, TI); Arun Valley, Hinwan Khola, N of Chainpur (*J. D. A. Stainotn 1524*, E). **Mechi Zone, Panchthar Distr.**: Tharpu–near Chyangthaphu (*H. Kanai et al. 6306750*, KYO, TI). **Taplejung Distr.**: Mitlung–Khokling (*M. Suzuki et al. 9263011*, E, TUS).

Region unknown: Lidi Khola (*Stainton et al. 6806*, E).

12.1. Bischofia javanica Blume

Far Western: **Seti Zone, Kailali Distr.**: between Godawari and Buditola (*H. Tabata et al. 486*, KYO).

Mid Western: **Bheri Zone, Banke Distr.**: Nepalganj (*J. D. A. Stainton 6240*, TI).

Central: **Narayani Zone, Chitawan Distr.**: Sauraha–Padampur (*K. Yoda et al. 9613001*, E, TUS); Sauraha–Devi Tal (*M. Mikage et al. 9611042*, TUS); Rapti Valley, Tikoli (*J. D. A. Stainton 5271*, TI); between Saurha and Kasara (*H. Tabata et al. 7549*,

KYO); en route from Sauraha to Dumre (*H. Tabata et al. 9777*, KYO).

Eastern: **Mechi Zone, Jhapa Distr.**: Sibganja–Mahara Bahara (*G. Murata & M. Togashi 31212*, TI); Kankani River (*D. H. Nicolson 3107*, TI).

13.1. Chrozophora rottleri (Geiseler) A. Juss. ex Spreng.

Eastern: Koshi Zone, Morang Distr.: Biratnagar (L. H. J. Williams 50, TI).

14.1. Alchornea mollis (Benth.) Müll. Arg.

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Gola–Simbung (*S. Noshiro et al. 9840040*, E, TUS); Arun Nadi–Vedghari (*M. Suzuki et al. 8860138*, E, TUS); Chyurebas (*P. R. Shakya & M. Ohsawa 1111*, TI); Num–Sedua (*M. Suzuki et al. 8820342*, E). **Mechi Zone, Panchthar Distr.**: Tharpu–near Chyangthaphu (*H. Kanai et al. 6306816*, KYO, TI).

15.1. Ricinus communis L.

Far Western: **Karnali Zone, Kalikot Distr. & Seti Zone, Bajura Distr.**: Phukgad–Tolebhir (*M. Suzuki et al. 9160409*, TUS). **Seti Zone, Bajura Distr.**: Tolebhir–Berma (*M. Suzuki et al. 9194144*, E).

Mid Western: **Karnali Zone, Dolpa Distr.**: Phulchangi, Thuli, Bheri River (*O. Polunin et al. 3328*, E). **Kalikot Distr.**: Thibru, Karnali valley (*O. Polunin et al. 4008*, E). **Rapti Zone, Salyan Distr.**: Kumak Ridge, north of Sallyana (*O. Polunin et al. 1807*, E).

Western: **Dhaulagiri Zone, Baglung & Myagdi Distr.**: Ratnechour–Beni (*M. Mikage et al. 9686004*, TUS). **Myagdi Distr.**: Mayangdi Khola (*Stainton et al. 127*, E).

Eastern: **Mechi Zone, Taplejung Distr.**: Tuwa–Taplethok (*H. Hara et al. 6306792*, TI).

16.1. Mercurialis leiocarpa Siebold & Zucc.

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu, Godavari–Phulchoki (*H. Kanai 11329*, TI). **Zone unknown**: Manjet Khola (*S. Bowes Lyon 134*, E).

Eastern: **Mechi Zone, Panchthar Distr.**: Bhuspate Danra–Mai Majuwa (*H. Hara et al. 6306787*, KYO, TI); Batasay–Bhuspate Danra (*H. Hara et al. 6306788*, KYO, TI).

17.1. Cleidion spiciflorum (Burm. f.) Merr.

Eastern: **Mechi Zone, Ilam Distr.**: Mai Khola, Soktim (*J. D. A. Stainton 6495*, TI).

18.1. Macaranga pustulata King ex Hook. f.

Far Western: **Seti Zone, Doti Distr.**: between Sahjpur and Doti (*H. Tabata et al. 9051*, KYO); between Rauttukatte and Barigad (*H. Tabata et al. 730*, KYO); between Barigad and Galsera (*H. Tabata et al. 689*, KYO).

Mid Western: **Bheri Zone, Distr. unknown**: Daragaon (*K. R. Rajbhandari & B. Roy 4679*, KYO). **Rapti Zone, Salyan Distr.**: Marma Khola (*O. Polunin et al. 3783*, E).

Western: **Dhaulagiri Zone, Mustang & Myagdi Distr.**: Lower Lete–Tatopani (*M. Mikage et al. 9550506*, TUS). **Gandaki Zone, Kaski Distr.**: Pokhara–Suiket (*H. Ohba et al. 8343016*,TUS), (*H. Ohba et al. 8340040*,TUS); Pathana–Tolka (Thorka) (*H. Ohba et al. 8330221*, E, TUS), (*M. Suzuki et al. 8860532*, E); Bhichuk (Bhedi Kharka)–Tolka

(Thorka) (*M. Suzuki et al. 8860530*, E); near Bhadauri (*Stainton et al. 2498*, E); en route from Ghandrung to Chandrakot (*Y. Suehiro 1509*, KYO), (*Y. Suehiro 1511*, KYO), (*Y. Suehiro 1523*, KYO), (*Y. Suehiro 1524*, KYO); near Sudame (*K. Nishioka 485*, KYO). **Manang Distr.**: Marsyandi Khola, Tal–Jagat (*H. Ohba et al. 8331369*, E, TUS).

Central: **Bagmati Zone, Sindhupalchok Distr.**: between Lamusangu and Bilaunepani (*H. Tabata et al. 9900*, KYO).

Eastern: **Koshi Zone, Bhojpur Distr.**: en route from Phedi to Sagangma along Irkhua Khola (*H. Tabata et al. 10978*, KYO). **Dhankuta Distr.**: Hile–Gholi Kharka (*M. Minaki et al. 9040014*, E, TI); Dhara Pani–Dhankuta (*H. Hara et al. 6306755*, TI); Hile–Diyale (*S. Noshiro et al. 9755007*, TI). **Sankhuwasabha Distr.**: Manebanjang–Chichila (*M. Minaki et al. 9040100*, E, TI); Nurbu Gaon–Nurbu Chaur (*S. Noshiro et al. 9755151*, TI). **Mechi Zone, Taplejung Distr.**: Tuwa–Taplethok (*H. Hara et al. 6306756*, KYO, TI); Taplejung–Garhi Danra (*H. Hara et al. 6306754*, KYO, TI). **Sagarmatha Zone, Khotang Distr.**: Khani Danda–Dorpa Churi Danda (*M. Mikage et al. 9555080*, TUS). **Solukhunbu Distr.**: Dudh Kosi (*J. D. A. Stainton 6562*, TI).

18.2. Macaranga indica Wight

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Arun Khora–Dhadkhet (*M. Minaki et al. 9060133*, TI). **Mechi Zone, Taplejung Distr.**: Khebang–below Siling Tzokupa (*H. Hara et al. 6306802*, KYO, TI).

18.3. Macaranga denticulata (Blume) Müll. Arg.

Western: **Gandaki Zone, Gorkha Distr.**: Macha Khola–Syaule Bhatti (*M. Suzuki et al. 9455083*, E, TUS); Buri Gandaki, Ngyak–Arughat Bazaar (*S. Nakao s. n.*, 4–9 Dec. 1952, KYO). **Lumbini Zone, Nawalparasi Distr.**: Nawal Parasi, Kusunde Forest (*J. Makin 261*, TI).

Central: **Narayani Zone, Chitawan Distr.**: Sauraha–Harda Khola (*M. Mikage et al. 9611798*, TUS); Royal Chitwan National Park, northeast section of the Park, south of Rapti River (*R. G. Troth 885*, TI).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Arun Valley, Sabhaya Khola (*J. D. A. Stainton 5906*, TI); below Lum Lum La (*M. Ohsawa & P. R. Shakya 1878*, TI); Arun Nadi –Vedghari (*M. Suzuki et al. 8860135*, E). **Mechi Zone, Ilam Distr.**: Ratua Khola (*L. H. J. Williams 305*, TI).

19.1. Mallotus philippensis (Lam.) Müll. Arg.

Far Western: **Karnali Zone, Kalikot Distr.**: Kota–Phukgad (*M. Suzuki et al. 9194123*, E). **Karnali Zone, Kalikot Distr. & Seti Zone, Bajura Distr.**: Phukgad–Tolebhir (*M. Suzuki et al. 9160406*, TUS), (*M. Suzuki et al. 9193163*, TUS). **Mahakali Zone, Kanchanpur Distr.**: Royal Shuklaphanta Wildlife Reserve, Jhilmila, Shuklaphat (*M. Mikage et al. 9681434*, E, TUS). **Seti Zone, Kailali Distr.**: Ataria (*H. Tabata et al. 377*, KYO).

Mid Western: **Bheri Zone, Bardiya Distr.**: Royal Bardia National Park, near the headquarter, Thakurduar (*M. Mikage et al. 9681373*, TUS), (*M. Mikage et al. 9689009*, TUS). **Dailekh Distr.**: Dungesar–Shrithan (*M. Suzuki et al. 9193095*, TUS), (*M. Suzuki et al. 9194052*, E); Rajigaon (Ranigaon ?) (*K. R. Rajbhandari & B. Roy 2784*, KYO).

Surkhet Distr.: Surkhet–Katukuwa (*M. Suzuki et al. 9160004*, TUS), (*M. Suzuki et al. 9194002*, E). **Rapti Zone, Dangdeukhuri Distr.**: between Kurpani and Ghorai (*O. Polunin et al. 1329*, E). **Salyan Distr.**: Lawamjula (*O. Polunin et al. 5866*, E).

Western: **Dhaulagiri Zone, Baglung Distr.**: Baglung (*T. Hoshino et al. 9662140*, TI). **Myagdi Distr.**: Babichor–Ratorunga (*M. Mikage et al. 9686022*, TUS); Beg Khola–Rahughat (*M. Mikage et al. 9550544*, TUS), (*M. Mikage et al. 9551135*, TUS); Myangdi Khola (*Stainton et al. 2550*, E); between Darban and Sasdhara (*H. Tabata et al. 3955*, KYO); Sindure, at Bek Khola (*J. Kawakita s. n.*, 26 Jan. 1964, KYO, TI). **Baglung & Myagdi Distr.**: Baglung–Ratnechour (*M. Mikage et al. 9686003*, TUS); Baglung–Beni (*M. Mikage et al. 9687008*, TUS), (*M. Mikage et al. 9687017*, TUS); Darbang–Babichor (*M. Mikage et al. 9686212*, TUS). **Gandaki Zone, Gorkha Distr.**: Soti (*M. Suzuki et al. 9460046*, E, TI, TUS); Arkhet Bazar–Khorsanedanda (*M. Suzuki et al. 9455048*, E, TI, TUS); Luitel (*H. Kanai 670612*, KYO, TI); Buri Gandaki, Ngyak–Arghat Bazaar (*S. Nakao s. n.*, 4–9 Dec. 1952, KYO). **Lumbini Zone, Nawalparasi Distr.**: Island Jungle Resort–vicinity of Bharatpur (*M. Mikage et al. 9611847*, TUS).

Central: **Bagmati Zone, Rasuwa Distr.**: between Manigaon and Ramche (*H. Tabata et al. 8563*, KYO). **Narayani Zone, Bara Distr.**: NW. of Amlekganj, E. of Bherah Khola (*M. Mikage et al. 9550604*, TUS), (*M. Mikage et al. 9550593*, TUS), (*M. Mikage et al. 9554051*, E, TUS); Bakeya (*H. Tabata et al. 9711*, KYO); Simra–Patraia (*Kanai & Bista 11394*, KYO, TI). **Chitawan Distr.**: Khagendramalli–Machan Wildlife Resort (*M. Mikage et al. 9611829*, TUS); between Saurha and Kasara (*H. Tabata et al. 7551*, KYO).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhara Pani–Dhankuta (*H. Hara et al. 6306766*, KYO, TI), (*H. Hara et al. 6306767*, KYO, TI); Diyale–Kyawa Khola (*S. Noshiro et al.* 9755035, TI). **Morang Distr.**: Kathgara–Rangali (*H. Kanai et al. 6306763*, KYO, TI); Rangali–Biratnagar (*H. Kanai et al. s. n.*, 15 Dec. 1963, TI); Biratnagar (*H. Hara et al. 6306771*, KYO, TI). **Sunsari Distr.**: Phusri–Dhara Pani (*H. Hara et al. s. n.*, 16 Oct. 1963, TI). **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306768*, K, TI), (*H. Hara et al. 6306764*, KYO, TI); Illam–Ranga Pani (*H. Hara et al. 6306765*, TI). **Jhapa Distr.**: Sibganja–Mahara Bahara (*G. Murata & M. Togashi 6306770*, KYO, TI); Gauriganja–Rangali (*H. Hara et al. s. n.*, 13 Dec. 1963, TI); near Rangi Danda (*H. V. T. et al. N212*, TUS). **Taplejung Distr.**: Bharomdin–Tharpu (*H. Hara et al. 6306769*, TI), between Mitlung and Taplejung (*K. Nishioka 1031*, KYO).

19.3. Mallotus repandus (Willd.) Müll. Arg.

Western: **Lumbini Zone, Nawalparasi Distr.**: Island Jungle Resort–vicinity of Bharatpur (*M. Mikage et al. 9611839*, BM, TUS).

19.4. Mallotus roxburghianus Müll. Arg.

Central: **Narayani Zone, Chitawan Distr.**: Chitwan, Ramnagar (*K. Wesche 11120*, BM).

Eastern: **Koshi Zone, Bhojupur Distr.**: Bumlingtar–a Shorea forest (*S. Noshiro et al. 9760562*, TI).

19.5. Mallotus nepalensis Müll. Arg.

Western: **Dhaulagiri Zone, Baglung Distr.**: Lukarban Khola, west of Beni (*Stainton*

et al. 439, BM, E). **Mustang Distr.**: Kali Gandaki, Ghasa–Kalopani (*H. Ohba et al. 8330555*, BM, E, TUS); Titre, Kali Gandaki valley (*Stainton et al. 5470*, BM, E, TI). **Myagdi Distr.**: Lumsum (*Stainton et al. 2896*, BM, E), Ghar Khola (*Stainton et al. 5436*, E). **Mustang & Myagdi Distr.**: Lower Lete–Tatopani (*M. Mikage et al. 9455369*, E, TUS). **Gandaki Zone, Gorkha Distr.**: Ekle Ghar–Sardu Khola (*M. Suzuki et al. 9455138*, BM, E, TUS).

Central: **Bagmati Zone, Lalitpur Distr.**: Phulchoke S. of Kathmandu (*A. D. Schilling 801B*, TI), (*A. D. Schilling 801A*, TI); Godawari N. Nepal valley (*Proud 277*, BM); Nepal Valley, Phulchoki (*J. D. A. Stainton 5389-1*, BM), (*J. D. A. Stainton 5389-2*, BM). **Rasuwa Distr.**: between Syabru Bensi and Bamboo, S. side of Langtang Khola (*S. Akiyama et al. 20100074*, TUS); Dhunche–Syabru (*H. Takayama et al. 9220002*, TUS); Lama Hotel–Syabru (*M. Suzuki & S. Noshiro 8540094*, TUS); Chilime and Langtang valleys, Thade (*H. Kanai & P. R. Shakya 671984*, BM, KYO); Ramche–Thade (*Malla 6561*, BM).

Eastern: **Janakpur Zone, Ramechhap Distr. & Sagarmatha Zone, Solukhumbu Distr.**: Bhandar–Sete (*H. Ohba et al. 8540230*, TUS). **Koshi Zone, Sankhuwasabha Distr.**: Arun Valley, Chyamtang (*J. D. A. Stainton 417*, E), below Chamtang–Chyangrima (*S. Noshiro et al. 9840113*, BM, E, TUS); Num–Chichila (*M. Suzuki et al. 8840393*, TUS); Nurbu Gaon–Nurbu Chaur (*S. Noshiro et al. 9755148*, TI). **Mechi Zone, Taplejung Distr.**: Mewa Khola (*J. D. A. Stainton 7040*, E). **Sagarmatha Zone, Solukhumbu Distr.**: Dudh Kosi, Jubing (*J. D. A. Stainton 5958A*, BM), (*J. D. A. Stainton 5958*, BM).

Region unknown: Phaploo (*L. Dhwoj 87*, BM, E).

19.6. Mallotus oreophilus Müll. Arg.

Eastern: **Mechi Zone, Ilam Distr.**: Goruwale Bhanjang–Mai Pokhari (*S. Noshiro et al. 9261377*, TUS). **Panchthar Distr.**: Mahabharat Lekh, west of Ilam (*Williams & Stainton 8480*, BM, K, TI).

19.7. Mallotus tetracoccus (Roxb.) Kurz

Central: **Janakpur Zone, Dolakha Distr.**: Tamba Kosi, Totlabari–Simigaon (*H. Ohba et al. 8340435*, TUS).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Gola–Gadhi Danda (*S. Noshiro et al. 9840188*, BM, E, TUS); Semma–Gola (*S. Noshiro et al. 9840031*, E, TUS); Baidep–Num (*H. Ohba et al. 9154233*, TUS); Num–Sedua (*S. Noshiro et al. 9755139*, TI); above Lumlumba (P. *R. Shakya & M. Ohsawa 910*, TI); en route from Hedangna to Gola (*H. Tabata et al. 11148*, KYO). **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306786*, TI).

20.1. Trewia nudiflora L.

Far Western: **Seti Zone, Kailali Distr.**: Dhangarhi (*H. Tabata et al. 312*, KYO).

Mid Western: **Bheri Zone, Banke Distr.**: Nepalganj (*J. D. A. Stainton 6239*, E). **Bardiya Distr.**: Royal Bardia National Park, near the head quarter, Thakurduar (*M. Mikage et al. 9681377*, TUS).

Central: **Janakpur Zone, Sindhuli Distr.**: Kamla Khola (*J. D. A. Stainton 8502*, E). **Narayani Zone, Chitawan Distr.**: Sauraha–Padampur (*M. Suzuki et al. 9611759*, TUS);

Royal Chitwan National Park, northeast section of the Park, south of Rapti River (*R. G. Troth 703*, TI); Sauraha (*H. Tabata et al. 9724*, KYO). **Makawanpur Distr.**: Rapti valley, Hetaura (*J. D. A. Stainton 5233*, E).

Eastern: **Koshi Zone, Dhankuta Distr. & Sankhuwasabha Distr.**: Ramrista–Khahare (*M. Suzuki et al. 8820143*, E), (*M. Minaki et al. 9040054*, E). **Morang Distr.**: Charkosya Jhari (*Williams & Stainton 8549*, TI). **Koshi Zone, Sankhuwasabha Distr.**: Tumlingtar–Baireni Bagar (*S. Noshiro et al 9840212*, E, TUS). **Sunsari Distr.**: Kushaha, Koshi Tappu Wildlife Reserve, SW. of Headquarter Office (*M. Mikage et al. 9555005*, TUS).

21.1. Acalypha supera Forssk.

Western: **Dhaulagiri Zone, Baglung Distr.**: Bongakhani (*Stainton et al. 3958*, BM, E).

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu City, Thamel, Chhetrapati (*M. Mikage & K. Yonekura 9682006*, TUS), (*M. Mikage & K. Yonekura* 9552007, TUS). **Lalitpur Distr.**: Pulchoki (*Manandhas & party 7327*, TI). **Zone unknown**: (*Wallich, List no. 7786B*, TI).

Eastern: **Koshi Zone, Sunsari Distr.**: Sanguri Lekh, N. of Dharan (*Williams & Stainton 8333*, BM).

22.1. Tragia sp.

Eastern: **Mechi Zone, Ilam Distr.**: S. of Ilam (*L. H. J. Williams 361*, BM).

23.1. Manihot esculenta Crantz

Eastern: **Mechi Zone, Ilam Distr.**: Illam (*H. Hara et al. 63751*, TI).

24.1. Jatropha gossypiifolia L.

Central: **Narayani Zone, Chitwan Distr.**: between Kasara and Narayanghat (*H. Tabata et al. 7642*, KYO).

Region unknown: Rajbiraj? (*N. P. Manandhar 17093*, TI).

24.2 Jatropha curcas L.

Far Western: **Seti Zone, Doti Distr.**: between Napani and Dipai (*H. Tabata et al. 966,* KYO). **Kailali Distr.**: Dhangarhi (*H. Tabata et al. 9000*, KYO).

Mid Western: **Bheri Zone, Surkhet Distr**.: Surkhet–Katukuwa (*M. Suzuki et al. 9194012*, TI, TUS).

Western: **Dhaulagiri Zone, Baglung Distr.**: Kali Gandaki Valley, near Baglung (*Stainton et al. 581*, E). **Baglung & Myagdi Distr.**: Baglung–Beni (*M. Mikage et al. 9687020*, TUS), (*M. Mikage et al. 9687016*, TUS). **Myagdi Distr.**: Jugepani–Dhola Khola (*M. Mikage et al. 9686085*, TUS); Kali Gandaki, Tatopani–Ghasa (*H. Ohba et al. 8330479*, E). **Parbat Distr.**: Shikha–Tatopani (*H. Ohba et al. 8330466*, TI). **Gandaki Zone, Lamjung Distr.**: Midam Khola, Nalma (*Stainton et al. 5180*, E). **Tanahun Distr.**: Marsyandi Khola, Kani Gaon–Bahundanda (*H. Ohba et al. 8311220*, E, TI, TUS).

Central: **Bagmati Zone, Rasuwa Distr.**: Sim chotala–Ramche *(H. Kanai 673007*, TI). **Sindhupalchok Distr.**: Jaljare–Barabise (*H. Kanai 671918*, TI). **Janakpur Zone, Dolakha Distr**.: Dadin (*K. Yoda s. n.,* 20 Jun. 1963, KYO); Kirentechap (*K. Yoda s. n.,* 19 Jun. 1963, KYO); en ronte from Shera to Bishnutole (*H. Tabata et al. 10047*, KYO).

Eastern: **Koshi Zone, Bhojpur Distr.**: en route from Gothebazar to Kulungagrakhe (*H. Tabata et al. 10999*, KYO). **Dhankuta Distr.**: Diyale–Kyawa Khola (*S. Noshiro et al.* 9755026, TI); Gholi Kharka–Panche (*M. Minaki et al. 9060010*, E, TI); Dihale–Bhainse (*M. Suzuki et al. 8850121*, TI); Panche–Dihale (*M. Suzuki et al. 8860040*, E, TI); Gholi Kharka–Ramrista (*M. Suzuki et al. 8880110*, E, TI), (*M. Suzuki et al. 8810071*, TI), (*M. Suzuki et al. 8820136*, E), (*M. Minaki et al. 9080022*,E). **Dhankuta Distr. & Sankhuwasabha Distr.**: Ramrista–Khahare (*M. Minaki et al. 9020150*, E, TI). **Morang Distr.**: Biratnagar (*H. Hara et al. 6306784*, KYO, TI). **Sunsari Distr.**: Phusri–Dhara Pani (*H. Hara et al. s. n.*, 16 Oct. 1963, TI). **Mechi Zone, Taplejung Distr.**: Bharomdin–Tharpu (*H. Hara et al. 6306785*, TI); Upper Garzha (*K. Nishioka 1162*, KYO).

Region unknown: between Rumre and Bodegaun (*T. Fujimura 22*, KYO).

25.1. Ostodes paniculata Blume

Central: **Bagmati Zone, Nuwakot Distr.**: Trisuli Bazar–Samre Bhanjyang (*M. Suzuki et al. 9455010*, E, TUS).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Num–Sedua (*S. Noshiro et al. 9755122*, TI), (*S. Noshiro et al. 9755121*, TI); Ha-uling–Bungim (*P. R. Shakya & M. Ohsawa 853*, TI); Dhadkhet–Arun Khora (*M. Minaki et al. 9060053*, E); Danda Pangma–Sekaha (*M. Minaki et al. 9060034*, E); Arun valley Kandbari, E. of Dingla (*J. D. A. Stainton 100*, E); en route from Phasida to Hedangna (*H. Tabata et al. 11118*, KYO). **Mechi Zone, Ilam Distr.**: Dhara Pani–Illam (*H. Hara et al. 6306752*, TI); Dhara Pani–Dharan Bazar (*H. Ohba et al. 775600*, E). **Panchthar Distr.**: Yektin–Akasay (*H. Hara et al. 6306751*, KYO, TI). **Taplejung Distr.**: Khebang–Bharomdin (*H. Hara et al. 6306753*, TI); Maewa Khola (*L. H. J. Williams 1060*, TI); en route from Taplejung to Tagwa (*H. Tabata et al. 11977*, KYO).

26.1. Baliospermum montanum (Willd.) Müll. Arg.

Mid Western: **Bheri Zone, Jajarkot Distr.**: between Tatagoan & Jajarkot, Bheri River (*O. Polunin et al. 3809*, E).

Western: **Gandaki Zone, Gorkha Distr.**: Arghat (*H. Kanai 670586*, TI); Arghat Bazar (*H. Kanai 670586*, KYO).

Eastern: **Mechi Zone, Ilam Distr.**: Ranga Pani–Ghorwa (*H. Hara et al. 6306819*, TI); (*H. Hara et al. 6306820*, KYO, TI); Illam–Ranga Pani (*H. Hara et al. 6306821*, KYO, TI).

26.2. Baliospermum corymbiferum Hook. f.

Eastern: **Mechi Zone, Ilam Distr.**: Mai Majuwa–Dhara Pani (*H. Hara et al. 6306822*, KYO, TI), (*H. Hara et al. 6306823*, KYO, TI). **Panchthar Distr.**: Mahabharat Lekh, west of Ilam (*Williams & Stainton 8485*, K). **Zone unknown**: N. of Chula Chuli (*Williams & Stainton 8522*, K).

27.1. Croton bonplandianus Baill.

Western: **Lumbini Zone, Rupandehi Distr.**: Rupandehi Khasyauli Road Camp (*J. Makin 166*, BM).

Central: **Janakpur Zone, Dolakha Distr.**: Chisa pani (*J. D. A. Stainton 5660*, BM).

Eastern: **Koshi Zone, Morang Distr.**: Biratnagar (*H. Hara et al. 6306817*, KYO, TI). **Sankhuwasabha Distr.**: Koshe Jahr (*M. Ohsawa & P. R. Shakya 3318*, TI); Teku Nala–Dhara Pani (*H. Ohashi et al. 771340*, E), (*H. Ohashi et al. 773144*, E); Dharan (*Williams & Stainton 8323*, BM, K). **Sunsari Distr.**: Kosi Tappu (*H. Tabata et al. 12052*, KYO).

27.2. Croton roxburghii N. P. Balakr.

Central: **Narayani Zone, Bara Distr.**: Simra–Patraia (*Kanai & Bista 11412*, KYO); Sekti Mohar Khola (*Kanai & Bista 11412*, TI). **Makawanpur Distr.**: Churya Ghati, north of Amlekhganj (*J. D. A. Stainton 5296*, BM, E); Churia area (*T. B. Shrestha 3946*, BM). **Janakpur Zone, Distr. unknown**: Kamla Khola (*J. D. A. Stainton 5653*, BM).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Koshe Jahr (*M. Ohsawa & P. R. Shakya 1171*, TI).

27.4. Croton caudatus Geiseler

Eastern: **Koshi Zone Morang Distr.**: W of Chula Chuli (*Williams & Stainton 8529*, BM, K). **Mechi Zone, Ilam Distr.**: Tea Garden (*D. H. Nicolson 3125*, BM, KATH); Illam –Ranga Pani (*H. Hara et al. 6306818*, TI); Ratna Khola (*T. B. Shrestha 15345*, KATH); Ratua Khola (*L. H. J. Williams 316*, TI); Soktim T. E. [Tea Estate] (Mai Khola) (*J. D. A. Stainton 6776*, BM, TI). **Jhapa Distr.**: Sanishcare (*P. Pradhan et al. 189/74*, KATH), (*P. Pradhan et al. 312/74*, KATH).

27.5. Croton tiglium L.

Eastern: **Mechi Zone, Taplejung Distr.**: Maewa Khola (*L. H. J. Williams 1059*, BM).

29.1. Excoecaria acerifolia Didr.

Far Western: **Seti Zone, Bajura Distr.**: Serigaon–Bashala (*M. Suzuki et al. 9194194*, E), (*M. Suzuki et al. 9160603*, E).

Mid Western: **Karnali Zone, Dolpa Distr.**: below Luhu, Bheri River (*O. Polunin et al. 3255*, E). **Kalikot Distr.**: Kalikot, Tila Valley (*O. Polunin et al. 3943*, E); Karnali Tila Junction (*O. Polunin et al. 1981*, E).

Western: **Dhaulagiri Zone, Baglung Distr.**: near Bongakhani (*Stainton et al. 2709*, E). **Myagdi Distr.**: Tatopani–Beni (*M. Mikage 9550528*, TUS); Dana, Kali Gandaki valley (*Stainton et al. 623*, E); Shika–Narchang (Nracheng) (*M. Suzuki et al. 8840516*, E), (*M. Suzuki et al. 8881394*, E). **Gandaki Zone, Manang Distr.**: Marsyandi Khola, Dhanayang –Tal (*H. Ohba et al. 8311126*, TUS), (*H. Ohba et al. 83400341*, E); Dhanagyang–Dharapani (*H. Kanai 11126*, E).

Central: **Bagmati Zone, Rasuwa Distr.**: between Syabru Bensi and Syabru, S. side of Langtang Khola (S. *Akiyama et al. 20100012*, TUS); Trisuli river, Syabrubensi (*S. Bowes Lyon 25*, E); Chilime and Langtang Valleys, Syaprubensi (*H. Kanai & P. R. Shakya 672047*, KYO).

30.1. Falconeria insignis Royle

Far Western: **Seti Zone, Kailali Distr.**: Sahejepur (*H. Tabata et al. 615*, KYO), (*H. Tabata et al. 635*, KYO), (*H. Tabata et al. 8902*, KYO).

Mid Western: **Rapti Zone, Salyan Distr.**: Phulgaon (*O. Polunin et al. 3782*, E).

Western: **Gandaki Zone, Lamjung Distr.**: between Ghanpokhara and Lamjung (*Stainton et al. 5137*, E).

Central: **Bagmati Zone, Lalitpur Distr.**: Godavari (*D. H. Nicolson 2912*, TI). **Janakpur Zone, Dolakha Distr.**: en route from Nigale to Shera gaon (*H. Tabata et al. 10041*, KYO).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Bairini–Pelwa (*M. Ohsawa & P. R. Shakya 1334*, TI). **Mechi Zone, Taplejung Distr.**: Tuwa–Taplethok (*H. Hara et al. 6301150*, TI); Khokling–Thunglung (*M. Suzuki et al. 9263017*, E). **Sagarmatha Zone, Solukhumbu Distr.**: between Chochumi to Sotang (*H.Tabata et al. 7779*, KYO).

31.1. Triadica cochinchinensis Lour.

Western: **Dhaulagiri Zone, Parbat Distr.**: between Lamduri and Birethanti (*H. Tabata et al. 6682*, KYO). **Gandaki Zone, Kaski Distr.**: Ghorepani–Birethanti Bazar (*M. Mikage et al. 9455389*, E, TUS).

Central: **Janakpur Zone, Dolakha Distr.**: Tamba Kosi, Malephu–Pikhuti (*H. Ohba et al. 8331552*, E, TUS), (*H. Ohba et al. 8340424*, E, TUS).

32.1. Balakata baccata (Roxb.) Esser

Western: **Gandaki Zone, Gorkha Distr.**: Arkhet Bazar–Khorsanedanda (*M. Suzuki et al. 9455056*, E, TUS).

Central: **Bagmati Zone, Sindhupalchok Distr.**: Basin of Malemchi River (*D. H. Nicolson 2676*, TI).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Nurbu Chaur–Apsuwa Doban (*S. Noshiro et al. 9755247, E, TUS*). **Mechi Zone, Taplejung Distr.**: Tamur Valley, Taplejung (*J. D. A. Stainton 5850*, TI); near Fikkal (*K. Nishioka 578*, KYO)

33.1. Euphorbia fusiformis Buch.-Ham. ex D. Don

Mid Western: **Bheri Zone, Banke Distr.**: Nord de Nepalganj (*J. F. Dobremez 2397*, BM).

Central: **Bagmati Zone, Kabhre Distr.**: Bagdeo–Saraswati (*Kanai & Bista 11491*, TI). **Zone unknown**: (*Buchanan s. n.*, BM).

33.2. Euphorbia royleana Boiss.

Mid Western: **Karnali Zone, Dolpa Distr.**: Ila, Bheri River (*O. Polunin et al. 3224*, BM, TI). **Rapti Zone, Salyan Distr.**: Sitalpati, near Sallyan (*O. Polunin et al. 3756*, BM, TI).

Western: **Gandaki Zone, Gorkha Distr.**: Syaule Bhatti–Jagat (*M. Suzuki et al. 9455108*, TI).

Eastern: **Janakpur Zone, Ramechhap Distr. & Sagarmatha Zone, Solukhumbu Distr.**: Bhandar–Sete (*H. Ohba et al. 8540236*, BM). **Sagarmatha Zone, Solukhumbu Distr.**: Bhote Kosi Khari Khola (*J. D. A. Stainton 4660*, BM).

33.3. Euphorbia pulcherrima Willd. ex Klotzsch

Western: **Dhaulagiri Zone, Baglung Distr.**: Bhuli Khola, S. of Dhorpatan (*Stainton et al. 323*, BM). **Myagdi Distr.**: Dana–Paudwar (*M. Suzuki et al. 8840586*, E). **Gandaki**

Zone, Kaski Distr.: Hills N. of Pokhara (*Stainton et al. 4831*, BM, E).

Central: **Bagmati Zone, Dhading Distr.**: Taluphu–Katonje (*T. Namba 0924042*, KYO).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhara Pani–Dhankuta (*H. Hara et al. 6306790*, KYO, TI). **Sankhuwasabha Distr.**: Kharang (*Bowring 21*, BM). **Mechi Zone, Taplejung Distr.**: Bharomdin–Tharpu (*H. Hara et al. s. n.*, 25 Nov. 1963, TI); below Siling Tzokupa–Khebang (*H. Hara et al. 6306791*, BM, KYO, TI).

33.4. Euphorbia heterophylla L.

Far Western: **Seti Zone, Bajura & Achham Distr.:** Babali–Sanfebagar (*M. Suzuki et al. 9161163*, TUS).

Mid Western: **Karnali Zone, Kalikot Distr.**: near junction of Karnali and Tila river (*O. Polunin et al. 1972*, E).

Western: **Dhaulagiri Zone, Baglung & Myagdi Distr.**: Buglung (*M. Mikage et al. 9682081*, TUS). **Mustang & Myagdi Distr.**: Tallo Ghansa–Dana (*M. Suzuki et al. 8881724-1*, TUS); Tatopani–Ghasa (*T. Hoshino 9666052*, E, TUS). **Myagdi Distr.**: Babichor–Dharapani (*M. Mikage et al. 9687075*, TUS), (*M. Mikage et al. 9685096*, TUS); Shika–Narchang (*M. Suzuki et al. 8811039*, TUS); Narchang (Narcheng)–Gaunapani (*M. Suzuki et al. 8860987*, E); Beg Khola (*T. Hoshino et al. 9662121*, E). **Gandaki Zone, Gorkha Distr.**: Macha Khola–Syaule Bhatti (*M. Suzuki et al. 9470127*, E). **Kaski Distr.**: Pokhara (*Stainton et al. 6734*, E).

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu (*G. Murata et al. 6306789*, KYO, TI), (*T. Namba 0918006*, KYO). **Sindhupalchok Distr.**: Kalingchok Barabise–Thala (*H. Kanai et al. 724099*, TI). **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal, Pasbkhal (*M. Numata 1844*, KYO). **Narayani Zone, Bara Distr.**: NW. of Amlekganj, E. of Bherah Khola (*M. Mikage et al. 9552812*, E, TUS).

Eastern: **Janakpur Zone, Ramechhap Distr. & Sagarmatha Zone, Solukhumbu Distr.**: Bhandar–Sete (*H. Ohba et al. 8571747*, E, TUS). **Ramechhap Distr.**: Jiri–Shivalaya (*M. Suzuki et al. 8580882*, E). **Koshi Zone, Bhojpur Distr.**: Deurali–Bastim (*M. Mikage et al. 9554254*, E, TUS). **Dhankuta Distr.**: Dhara Pani–Dhankuta (*H. Hara et al. s. n.*, 17 Oct. 1963, TI); Gholi Kharka–Ramrista (*M. Suzuki et al. 8880102*, TUS). **Mechi Zone, Panchthar Distr.**: Tharpu (*H. Hara et al. s. n.*, 26 Nov. 1963, TI); Dabale Deurali–Prangbung (*S. Noshiro et al. 9241035*, E). **Sagarmatha Zone, Khotang Distr.**: Regmitar–Khani Danda (*M. Mikage et al. 9558132*, E, TUS). **Solukhumbu Distr.**: Kensa –Deorali (*F. Miyamoto et al. 9584349*, TI).

33.5. Euphorbia prolifera Buch.-Ham. ex D. Don

Far Western: **Seti Zone, Doti Distr.**: Pasala (*J. F. Dobremez 1855*, K).

Western: **Dhaulagiri Zone, Baglung Distr.**: Baglung (*Stainton et al. 55*, BM).

Central: **Bagmati Zone, Kabhre Distr.**: Manga Deorali (*D. McCosh 5*, BM). **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal, Yarusa (*K. Yoda s. n.*, 25 Apr. 1963, KYO); Kirentechap (*M. Numata 1711*, KYO). **Zone unknown**: (*Wallich, List no. 7698A*, BM, E, K, K–WALL, TI); (*Wallich s. n.*, in 1819, BM); (*Wallich s. n.*, in 1820, BM); (*Buchanan s. n.*, BM); Tambur Kosi (*J. D. A. Stainton 8245*, E).

33.6. Euphorbia maddenii Boiss.

Mid Western: **Karnali Zone, Mugu Distr.**: Pina (Ping), near Rara (*O. Polunin et al. 4084*, BM).

33.7. Euphorbia dracunculoides Lam.

Central: **Zone unknown**: Norcotera (*Buchanan s. n.*, 28 Mar. 1802, BM).

33.8. Euphorbia sikkimensis Boiss.

Far Western: **Seti Zone, Doti Distr.**: Doti (*J. F. Dobremez 1910*, BM).

Mid Western: **Karnali Zone, Mugu Distr.**: Pina near Rara (*O. Polunin et al. 4083*, BM, E, TI).

33.9. Euphorbia pseudosikkimensis (Hurus. & Ya. Tanaka) Radcl.-Sm.

Mid Western: **Karnali Zone, Dolpa Distr.**: Kaigaon area (T. *B. Shrestha 5086*, BM). **Rapti Zone, Rukum Distr.**: above Maikot (*Stainton et al. 3268*, E); Yamakar (*J. F. Dobremez 150*, BM).

Western: **Dhaulagiri Zone, Myagdi Distr. & Baglung Distr.**: Jalja La–Maraini (*M. Mikage et al. 9682665*, BM).

Central: **Bagmati Zone, Rasuwa Distr.**: Syabru–Lama Lodge (*H. Takayama et al. 9239102*, TI); Syarpagaon (*O. Polunin 140*, BM). **Sindhupalchok Distr.**: Kuri–Charikot (*H. Kanai et al. 674664*, KYO, TI). **Janakpur Zone, Ramechhap Distr.**: Shivalaya –Bhandar (*M. Wakabayashi et al. 9730017*, TI); Deorali–Serdingma (*H. Ohba et al. 8530104*, TI); Shivalaya–Deorali (*H. Ohba et al. 8570131*, E, TUS); en route from Shibalaya to Bhandar (*H. Tabata et al. 10242*, KYO). **Narayani Zone, Makawanpur Distr.**: Chitlang, 12 miles southwest of Kathmandu (*K. de B. Codrington 165*, BM). **Zone unknown**: (*Wallich, List no. 7694A*, BM, E, K, TI).

Eastern: **Koshi Zone, Sankhuwasabha Distr.**: Hatiya–Hongaon (*S. Noshiro et al. 9820041*, TI); Chyamtang (*L. W. Beer 12237A*, BM); Hatia Gola–Honkon (*H. Ohashi et al. 770416*, BM), (*H. Ohashi et al. 774736*, BM). **Mechi Zone, Taplejung Distr.**: Helok–Baroya Khimty (*H. Kanai et al. 6306781*, K, KYO, TI), (*H. Hara et al. 6306779*, KYO, TI); Iladanda–Helok (*H. Kanai et al. 6306338*, TI); Siling Tzokupa (*H. Hara et al. 6306780*, BM, KYO, TI); Thakpa Bazar–Ramsyang Pati (*M. Suzuki et al. 9240271*, TI); Sakathum–Amjilasa (*S. Noshiro et al. 9240516*, TI); Thunglung–Papung *(M. Suzuki et al. 9240058*, TI); Shewaden–Papung (*H. Kanai et al. 724036*, BM, TI); Shewaden–Mewa Khola (*H. Kanai et al. 720939*, BM); above Lelop (*T. Tuyama 6306778*, TI); S. W. of Amjilassa, Ghunsa Khola (*S. Crawford et al. KEKE 246*, E); Tamur Valley, Mewa Khola, S. E. of Topke Gola (*J. D. A. Stainton 325*, BM); Mewa Khola (*J. D. A. Stainton 7023*, BM), (*L. W. Beer 25685*, BM), (*L. W. Beer et al. 10626*, BM); between Wallun chun Gola and Pembu Tsoki (*K. Nishioka 797*, KYO). **Sagarmatha Zone, Solukhumbu Distr.**: near Chauri–Karka (Khumbu) (*J. H. Haas 2896*, BM); en route from Namche to Lamjo (*H. Tabata et al. 10746*, KYO). **Zone unknown**: Dongen (*L. W. Beer 25711*, BM).

Region unknown: Jansala (*S. Einarsson et al. 101a*, BM).

33.10. Euphorbia cashmeriana Royle

Far Western: **Seti Zone, Bajhang Distr.**: Rasa–Roshiadanda (*M. Suzuki et al. 9193368*,

TUS), (*M. Suzuki et al. 9160850*, BM); Khaptad–Kaudegaon (*M. Suzuki et al. 9161092*, BM); Godilekh (*H. Tabata et al. 2436*, KYO); Dhuli (*H. Tabata et al. 1618*, KYO). **Doti Distr.**: between Doti and Rhikula (*H. Tabata et al. 987*, KYO).

Mid Western: **Bheri Zone, Dailekh Distr.**: Lade to Subachhena (*K. R. Rajbhandari & B. Roy 2713*, KYO). **Surkhet Distr.**: Katukuwa–Ranimatta (*M. Suzuki et al. 9160061*, TI), (*M. Suzuki et al. 9193045*, TI). **Distr. unknown**: Chhanna to Bhabasen (*K. R. Rajbhandari & B. Roy 2877*, KYO). **Karnali Zone, Jumla Distr.**: Bibeya–Deula Deuli (*M. Minaki et al. 9108045*, BM); Jumla–Bibeya (*M. Minaki et al. 9104018*, BM), (*M. Minaki et al. 9105009*, E, TI), (*M. Minaki et al. 9109003*, TI); Jumla (*K. R. Rajbhandari & B. Roy 3303*, KYO). **Mugu Distr.**: Ghurchi Lekh (*K. R. Rajbhandari & B. Roy 3585*, KYO); Rara Lake (*H. Tabata et al. 2998*, KYO).

Region unknown: near Dudila (*Bis Ram 338*, BM).

33.11. Euphorbia wallichii Hook. f.

Far Western: **Seti Zone, Bajhang Distr.**: Ramkot (*J. F. Dobremez 2184*, BM).

Mid Western: **Bheri Zone, Dailekh Distr.**: Bhabasen to Mubu pass (*K. R. Rajbhandari & B. Roy 2905*, KYO), (*K. R. Rajbhandari & B. Roy 2906*, KYO). **Karnali Zone, Jumla Distr.**: Padmara, N. E. of Jumla (*O. Polunin et al. 4036*, BM, E); Chaudhabise Khola (*O. Polunin et al. 952*, BM, E); near Balangra Pass, between Jumla and Tibrikot (*O. Polunin et al. 2129*, BM, E); between Deoli Patan and Kuta (?) (*O. Polunin et al. 3183*, BM); Bundi Lagna, N. of Jumla (*J. D. A. Stainton 5434*, BM).

Western: **Dhaulagiri Zone, Baglung Distr.**: Okhaldhungagaon, S. of Dhorpatan (*Stainton et al. 353*, BM, E); Uttar Ganga, near Dhorpatan (*Stainton et al. 2628*, BM, E). **Mustang Distr.**: Ghasa, south of Tukucha, Kali Gandaki valley (*Stainton et al. 1534*, BM, E); Beside trail from Kuldi Ghar to Hinko (*C. Barclay & P. M. Synge 2369*, K). **Myagdi Distr.**: Valley of Konaban Khola, Dobang–Camp Site (*M. Mikage et al. 9681273*, TUS); Ghar Khola (*Stainton et al. 5409*, BM, E, TI); Gurjakhani (*Stainton et al. 2954*, BM). **Myagdi & Baglung Distr.**: Upper Valley of Gurjaghat Khola (*M. Mikage et al. 9682673*, TUS), (*M. Mikage et al. 9684213*, TUS). **Gandaki Zone, Gorkha Distr.**: Ganesh Himal Shiar Khola (*P. C. Gardner 451*, BM). **Kaski Distr.**: Rambrong, Lamjung Himal (*Stainton et al. 6000*, BM, E); Ban Thanti to Ghorepani Deorali (*H. Kanai 10335*, BM).

Central: **Bagmati Zone, Rasuwa Distr.**: between Thyangsyapu and Langtang, N. side of Langtang Khola (*S. Akiyama et al. 20100132*, TUS); E. of Thyangsyapu, N. side of Langtang Khola (*S. Akiyama et al. 20100129*, TUS); E. of Ghora Tabela, N. side of Langtang Khola (*S. Akiyama et al. 20100117*, TUS); Thale Patil–Mane (*Kanai & Malla 674944*, TI); Chilime and Langtang Valleys, Para Gaon (*H. Kanai & P. R. Shakya 672084*, TI); N. bank of Langtang Khola, Ghora Tabela (*D. G. Long & S. E. McDermott 21948*, E); Ankhu Khola, Jarung (*S. Bowes Lyon 104*, BM, E); Langtang (*Durham University Himalayan Expedition 105*, BM); Dunche Camp–Singum Gompa (*Unknown collector 673175*, KYO); Chilime and Langtan Valleys, Yatumbal–Oo Kharka (*H. Kanai & P. R. Shakya 672157*, KYO). **Distr. unknown**: Tsedang Pokhari–Panghu Danda (*Kanai & Malla 674664*, KYO). **Zone unknown**: Lamrak (*L. Dhevoj 192*, BM, E).

Eastern: **Sagarmatha Zone, Solukhumbu Distr.**: Taktor–Ringmo (*M. Wakabayashi et al. 9710056*, TI); Mopung–Thosa Kharka (*H. Ohba et al. 8530978*, E, TUS); Junbesi (*D. McCosh 26*, BM, E); Namche Bazar (*C. Stonor 35*, K); Solu Khola Johbesi (*J. D. A.*

Stainton 4635, BM); en route from Sallung to Ringmo (*H. Tabata et al. 10393*, KYO).

Region unknown: (*T. Wult 25*, E); Sosminkunb (Dhimsha) (*K. R. Fell 34*, BM); Jansala (*S. Einarsson et al. 79*, BM).

33.12. Euphorbia luteoviridis D. G. Long

Central: **Bagmati Zone, Rasuwa Distr.**: Trisuli valley, Mailung Khola (*S. Bowes Lyon 138*, BM, E); Paldol Base Camp–a Kharka (*F. Miyamoto et al. 9440086*, BM). **Distr. unknown**: Bhanjyang, N. of Kathmandu (*Grey-Wilson & Phillips 146*, BM); **Janakpur Zone, Dolakha Distr.**: Dakcho (*M. L. Dhwoj 13*, BM, E); Rolwaling Himal, Numbur (*K. Yoda s. n.*, 3 Jun. 1963, KYO).

Eastern: **Koshi Zone, Dhankuta Distr.**: Hile Chok–Ghopte (Tal Pokhari) (*H. Kanai et al. 720342*, BM). **Sankhuwasabha Distr.**: Chyakesha (*S. Noshiro et al. 9760355*, E, TUS); Cha Ding Kharka–Khongma (*M. Suzuki et al. 8821030*, E, TUS), (*M. Minaki et al. 9010170*, BM); Camp Site–Kipu Pokhari (*S. Noshiro et al. 9820089*, TI); Arun Valley, Kasuwa Khola, N. of Num (*J. D. A. Stainton 530*, BM, E, TI); Arun Valley, Maghang Khola (*J. D. A. Stainton 595*, BM, E, TI); ridge between Kauma and Shipton La (*D. G. Long et al. EMAK311*, E); Khongma (Kauma)–Shipton Pass (Keke la) (*M. Suzuki et al. 8850423*, E); Milke Danda (*L. W. Beer et al. 10085*, BM); between Tudam and Arun Khola (*L. W. Beer 9460*, BM). **Mechi Zone, Panchthar Distr.**: Phedung Danda (Budipani Kharka)–Gairi Kharka (*S. Noshiro et al. 9240919*, E). **Taplejung Distr.**: Bhitte Kharka –Iwanagi Kharka (*S. Noshiro et al. 9240842*, E). **Sagarmatha Zone, Okhaldhunga Distr.**: Lamche (Ramche?) Danda (*J. F. Dobremez 252*, BM). **Solukhumbu Distr.**: Kurki –Kharikhola (*M. Wakabayashi et al. 9720316*, TI); Chhatarwa–Kurke (*F. Miyamoto et al. 9592497*, TI); Chalem Kharka–Khola Kharka (*M. Wakabayashi et al. 9715087*, TI); N. of Khumgung (Khumbu) (*J. H. Haas 2959*, BM).

Region unknown: Pangchen La. (*F. M. Bailey 37*, BM).

33.13. Euphorbia himalayensis (Klotzsch) Boiss.

Far Western: **Seti Zone, Bajhang Distr.**: Saipal (*H. Tabata et al. 2000*, KYO). **Bajure Distr. & Bajhang Distr.**: Pategaon–Badigaon (*M. Suzuki et al. 9160690*, BM). **Doti Distr.**: Kapthadi (*H. Tabata et al. 1269*, KYO).

Mid Western: **Karnali Zone, Dolpa Distr.**: near Tarakot, Bheri River (*O. Polunin et al. 2396*, BM, E, TI); Tarakot (*S. Einarsson et al. 1424*, BM). **Humla Distr.**: between Chankheli Lagna and Darma (*O. Polunin et al. 4133*, BM, E, TI). **Jumla Distr.**: Sialgarhi, Chaudhabise Khola (*O. Polunin et al. 2070*, BM, E, TI); Chautha, Ghurchi Lagna (*O. Polunin et al. 4079*, E, TI).

Western: **Dhaulagiri Zone, Baglung Distr.**: Okhaldhungagaon, south of Dhorpatan (*Stainton et al. 372*, E, TI), (*Stainton et al. 369*, E); near Dhorpatan (*Stainton et al. 2659*, E, TI). **Myagdi & Baglung Distr.**: Jalja La–Maraini (*M. Mikage et al. 9682660*, TI). **Mustang Distr.**: Lete, Kali Gandaki valley (*Stainton et al. 5586*, E).

Central: **Zone unknown**: (*Wallich, List no. 7685*, K, E).

33.14. Euphorbia stracheyi Boiss.

Mid Western: **Karnali Zone, Humla Distr.**: Dozam Khola, near Simikot (*O. Polunin et al. 4252*, E, TI). **Jumla Distr.**: Bajari Binnu–the highest peak–pass–Camp Site (*M.*

Minaki et al. 9104226, TI); Babaria Lekh (Tibrikot–Jumla) (*O. Polunin et al. 2117*, E, TI).

Western: **Dhaulagiri Zone, Baglung Distr.**: between Purba and Puphal Daha (*H. Tabata et al. 3641*, KYO). **Mustang Distr.**: Alubari Kharka–a mountain ridge above Yak Kharka (*S. Noshiro et al.* 20106042, TI); a kharka–Damodar Kunda (*S. Noshiro et al.* 20106173, TI); Muktinath (*Y. Iokawa et al. 20020227*, TI); Syangmochen–Ghami (*S. Noshiro et al.* 20106092, TI). **Gandaki Zone, Gorkha Distr.**: Ganesh Himal (*M. Farille et al. 847084*, K). **Manang Distr.**: Trail to Tilicho (*C. Barclay & P. M. Synge 2484*, K), (*C. Barclay & P. M. Synge 2600*, K).

Central: **Bagmati Zone, Rasuwa Distr.**: E. side of Tajar Chu, N. of Kyangjin Gompa (*S. Akiyama et al. 20100159*, TUS); Gosainkund Lake (*Kanai & Malla 67492*, TI); Mul Kharka, Chilime Khola (*Kanai & Shakya 672226*, TI); Kyanging, Langtang Khola (*H. Kanai & P. R. Shakya 245*, TI).

Eastern: **Mechi Zone, Taplejung Distr.**: Saju Pokhari–Topke Gola (*H. Kanai et al. 724034*, TI); Topke Gola–Shinsade Kharka (*M. Suzuki et al. 9261026*, TUS); Deuma Kharka–Mongma Kharka–Tipta Kharka–Deuma Kharka (*M. Suzuki et al. 9240364*, E). **Sagarmatha Zone, Solukhumbu Distr.**: Namche Bazar (*Rikkyo University Petanze Team s. n.*, Apr. –May 1964, TI); (*collector unknown s. n.*, Sep. 1964, TI); Khumbu, Dingboche (*J. D. A. Stainton 7155*, E); Pheriche (*H. Tabata et al. 10679*, KYO); en route from Namchebazar to Phungitenga (*H. Tabata et al. 10628*, KYO).

Region unknown: Midway between Jengla and Tarag (*Grey-Wilson & Phillips 731*, K); Second to most west Camp (*S. Nakao & J. H. E. s. n.*, May 1953, KYO).

34.1. Chamaesyce hirta (L.) Millsp.

Mid Western: **Bheri Zone, Dailekh Disr.**: Dungesar–Shrithan (*M. Suzuki et al. 9191068*, E). **Rapti Zone, Dangdeukhuri Distr.**: Ghorahi (*K. R. Rajbhandari & B. Roy 4899*, KYO). **Distr. unknown**: Phalabang (*O. Polunin et al. 653*, E).

Western: **Dhaulagiri Zone, Myagdi Distr.**: Beni–Babichor (*M. Mikage et al. 9681053*, TUS), (*M. Mikage et al. 9685058*, TUS); Babichor–Ratorunga (*M. Mikage et al. 9687074*, TUS); Kali valley near Beni (*Stainton et al. 2525*, E, TI); Tatopani, south of Dana, Kali Gandaki valley (*Stainton et al. 7562*, E); Mayangdi Khola, near Beni (*Stainton et al. 108*, E); Dana (*T. Hoshino et al. 9662058*, E). **Myagdi & Mustang Distr.**: Tatopani–Ghasa (*T. Hoshino et al. 9666056*, E, TUS), (*H. Ohba et al. 8330485*, E). **Kaski Distr.**: Pokhara City, Airport (*M. Mikage et al. 9552056*, E, TUS); Madi Khola (*J. D. A. Stainton 8776*, E). **Lamjung Distr.**: Madi Khola, Karelung (*Stainton et al. 5894*, E).

Central: **Bagmati Zone, Dhading Distr.**: Chauranghi–Sarentar (*T. Namba 0925013*, TI). **Kathmandu Distr.**: Kathmandu Air Port (*H. Hara et al. 6306782*, KYO, TI). **Nuwakot Distr.**: Trisuli Bazar (*M. Suzuki et al. 9485008*, E, TUS); Trisuli–Myobasu (*T. Namba 0923024*, KYO). **Sindhupalchok Distr.**: Kalingchok (*H. Kanai et al. 724098*, TI). **Janakpur Zone, Dolakha Distr.**: Rolwaling Himal (*M. Numata 233*, KYO); Rolwaling Himal, Chitare–Koretechap (*M. Numata 461*, KYO). **Narayani Zone, Bara Distr.**: Adhabar, vicinity of Parsa Wildlife Reserve Headquarter Office (*M. Mikage et al. 9552759*, TUS). **Chitawan Distr.**: Sauraha–Nandan Tal (*M. Mikage et al. 9614144*, E, TUS).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhikure–Gorikharka (*S. Noshiro et al.*

9760032, TUS). **Sankhuwasabha Distr.**: Apsuwa Doban–Pikhuwa (*S. Noshiro et al. 9760522*, TUS); Tumlingtar–Baireni Bagar (*S. Noshiro et al. 9820121*, TI); Mul Ghat –Dhan Khuta (*M. Ohsawa & P. R. Shakya 1238*, TI); below Lum Lum La (*M. Ohsawa & P. R. Shakya 1915*, TI); Arun valley, Chainpur (*J. D. A. Stainton 1520*, E, TI). **Mechi Zone, Panchthar Distr.**: Tharpu (*H. Hara et al. s. n.*, 26 Nov. 1963, TI). **Taplejung Distr.**: Khebang–below Siling Tzokupa *(H. Hara et al. s. n.*, 20 Nov. 1963, TI); Doban (*H. Kanai et al. 721033*, TI); Tamur valley, Dhankuta (*J. D. A. Stainton 62*, E, TI); Tamur valley, Taplejung (*Stainton et al. 1267*, E); Dumhan (*G. Murata et al. s. n.*, 31 Oct. 1963, TI). **Narayani Zone, Bara Distr.**: Patraia–Sakti, Mohar Khola (*Kanai & Bista 11418*, TI). **Sagarmatha Zone, Udayapur Distr.**: Beltar–Simule (*M. Mikage et al. 9552988*, E, TUS).

34.2. Chamaesyce parviflora (L.) Soják

Mid Western: **Karnali Zone, Mugu Distr.**: Gum, near Rara Daha (*O. Polunin et al. 5174*, BM, E, TI), (*O. Polunin et al. 5189*, BM, E).

Western: **Dhaulagiri Zone, Baglung Distr.**: Bhuli Khola, S. of Dhorpatan (*Stainton et al. 324*, BM). **Baglung & Myagdi Distr.**: Baglung–Ratnechour (*M. Mikage et al. 9682105*, BM, TUS); Baglung (*M. Mikage et al. 9682068*, TUS), (*M. Mikage et al. 9682053*, TUS); Beni–Ratnechour (*M. Mikage et al. 9684311*, TUS). **Myagdi Distr.**: Beni–Babichor (*M. Mikage et al. 9681055*, TUS), (*M. Mikage et al. 9685073*, TUS); Mayangdi Khola (*Stainton et al. 4108*, BM, E); Ranipauwa, north of Beni, Kali Gandaki valley (*Stainton et al. 7613*, BM). **Gandaki Zone, Kaski Distr.**: Pokhara–Naudanda Phedi (Naudhara Phedi) (*M. Suzuki et al. 8881032*, TI); Pokhara (*Stainton et al. 6473*, BM, E, TI), (*T. Wraber 120*, BM). **LamjungDistr.**: Karelung, Madi Khola (*Stainton et al. 5887*, BM).

Central: **Bagmati Zone, Dhading Distr.**: Chauranghi–Sarentar (*T. Namba 0925027*, KYO). **Narayani Zone, Chitawan Distr.**: ca. 4 km E. of Mugling (*M. Mikage et al. 9552044*, TUS); Sauraha–Padampur (*K. Yoda et al. 9614126*, E, TUS); Loltscer–Bharatpur (*P. R. Shakya 9112*, BM); Tikoli, Rapti valley (*Williams & Stainton 8252*, K), (*Williams & Stainton 8285*, BM). **Zone unknown**: (*Wallich s. n.*, BM): Bassaria (*Buchanan s. n.*, 10 Mar. 1802, BM).

Eastern: **Koshi Zone, Dhankuta Distr.**: Lagowa–Leguwa (*S. Noshiro 9760060*, E, TUS).

34.3. Chamaesyce hispida (Boiss.) V. S. Raju & P. N. Rao

Far Western: **Seti Zone, Bajura Distr.**: Porakya–Serigaon (*M. Suzuki et al. 9191339*, TI); Aagar–Kinara (*M. Suzuki et al. 9191493*, TI); between Ukhadigaon and Jilli (*H. Tabata et al. 2525*, KYO).

Mid Western: **Karnali Zone, Jumla Distr.**: between Sukadhik and Ratopani (*H. Tabata et al. 2775*, KYO).

34.4. Chamaesyce prostrata (Aiton) Small

Far Western: **Seti Zone, Bajura Distr.**: Berma–Kolti (*M. Suzuki et al. 9191282*, E).

Mid Western: **Rapti Zone, Distr. unknown**: Phalabang (*O. Polunin et al. 636*, BM, E, TI).

Central: **Bagmati Zone, Kathmandu Distr.**: Kathmandu City, west of Chhetrapati, along Vishnumati River (*M. Mikage & K. Yonekura 9682018*, TUS); Kathmandu Air Port (*H. Hara et al. 6306783*, KYO, TI). **Narayani Zone, Bara Distr.**: south of Churiya (*M. Mikage et al. 9552801*, E, TUS). **Chitwan Distr.**: Rapti Valley (*O. Polunin et al. 3608*, TI).

Eastern: **Koshi Zone, Dhankuta Distr.**: Dhankuta (*H. Hara et al. s. n.*, 19 Oct. 1963, TI).

34.5. Chamaesyce thymifolia (L.) Millsp.

Western: **Gandaki Zone, Kaski Distr.**: Pokhara (*T. Wraber 121*, BM). **Dhaulagiri Zone, Myagdi Distr.**: Beni–Babichor (*M. Mikage et al. 9685064*, TUS); Kali, Nr. Beni (*Stainton et al. 2520*, BM, E, TI).

Central: **Bagmati Zone, Nuwakot Distr.**: Horagaru (*M. Suzuki et al. 9485014*, TUS). **Narayani Zone, Chitwan Distr.**: Rapti Valley (*Polunin et al. 3608A*, BM).

Eastern: **Koshi Zone, Bhojpur Distr.**: Bumlingtar–Chewa Besi (*S. Noshiro et al. 9760577*, TUS). **Mechi Zone, Taplejung Distr.**: Dumhan (*G. Murata et al. s. n.*, 31 Oct. 1963, TI); Maewa Khola (*L. H. J. Williams 1031*, BM, TI). **Sagarmatha Zone, Khotang Distr. & Koshi Zone Bhojpur Distr.**: Dorpa Churi Danda–Deurali Danda (*M. Mikage et al. 9558201*, TUS). Region unknown: Sampi Khola (*P. C. Gardner 159*, BM, TI).

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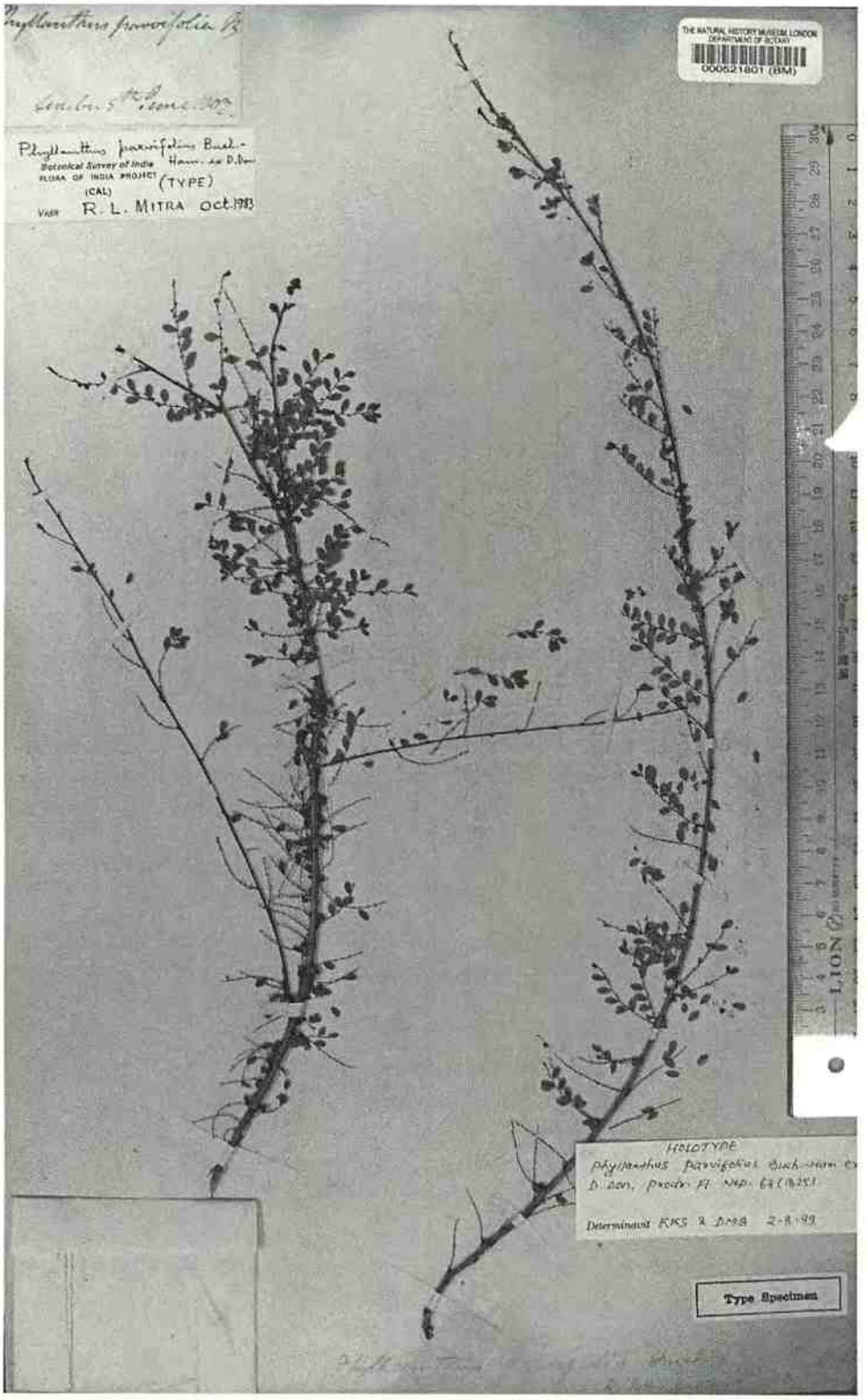

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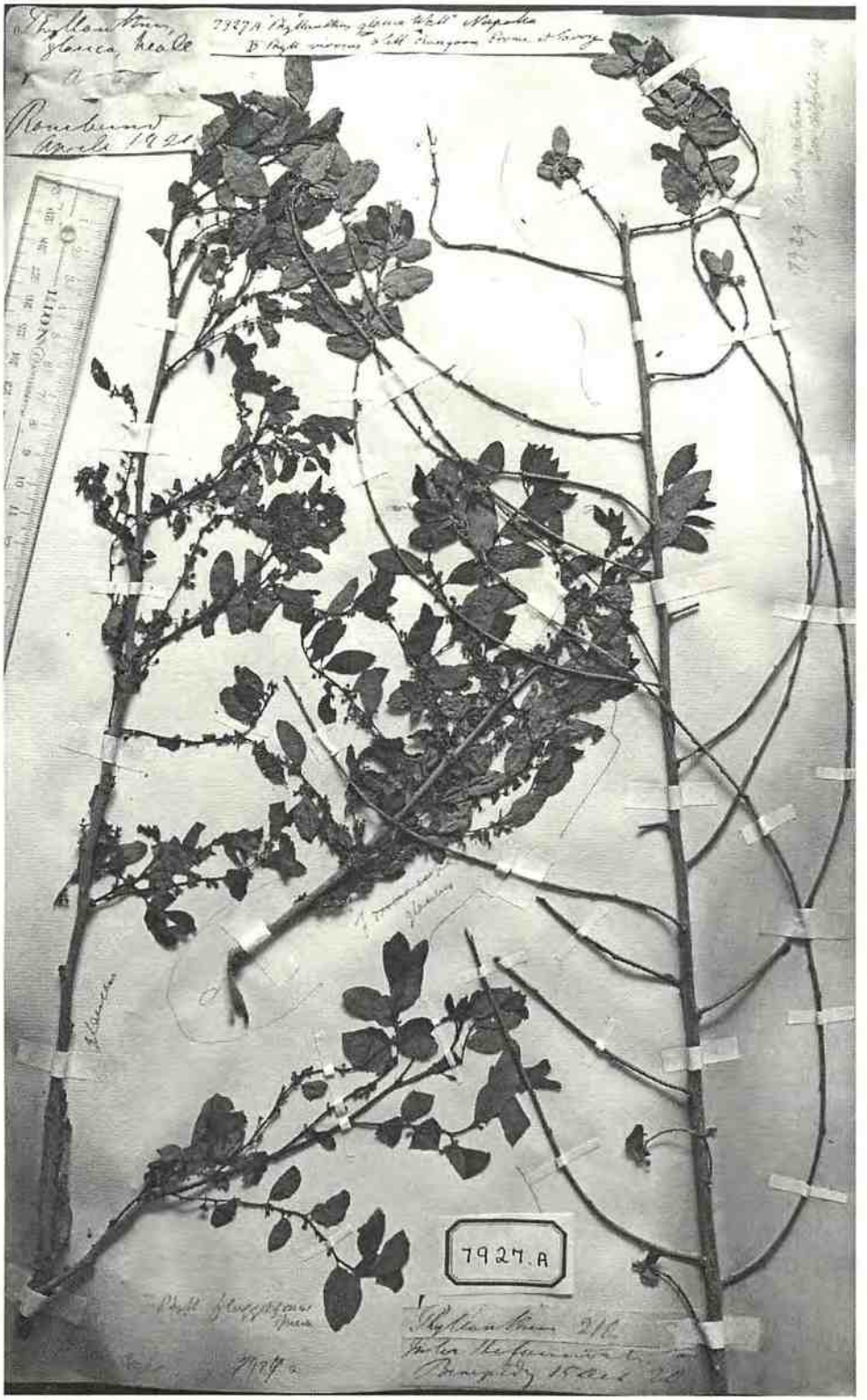

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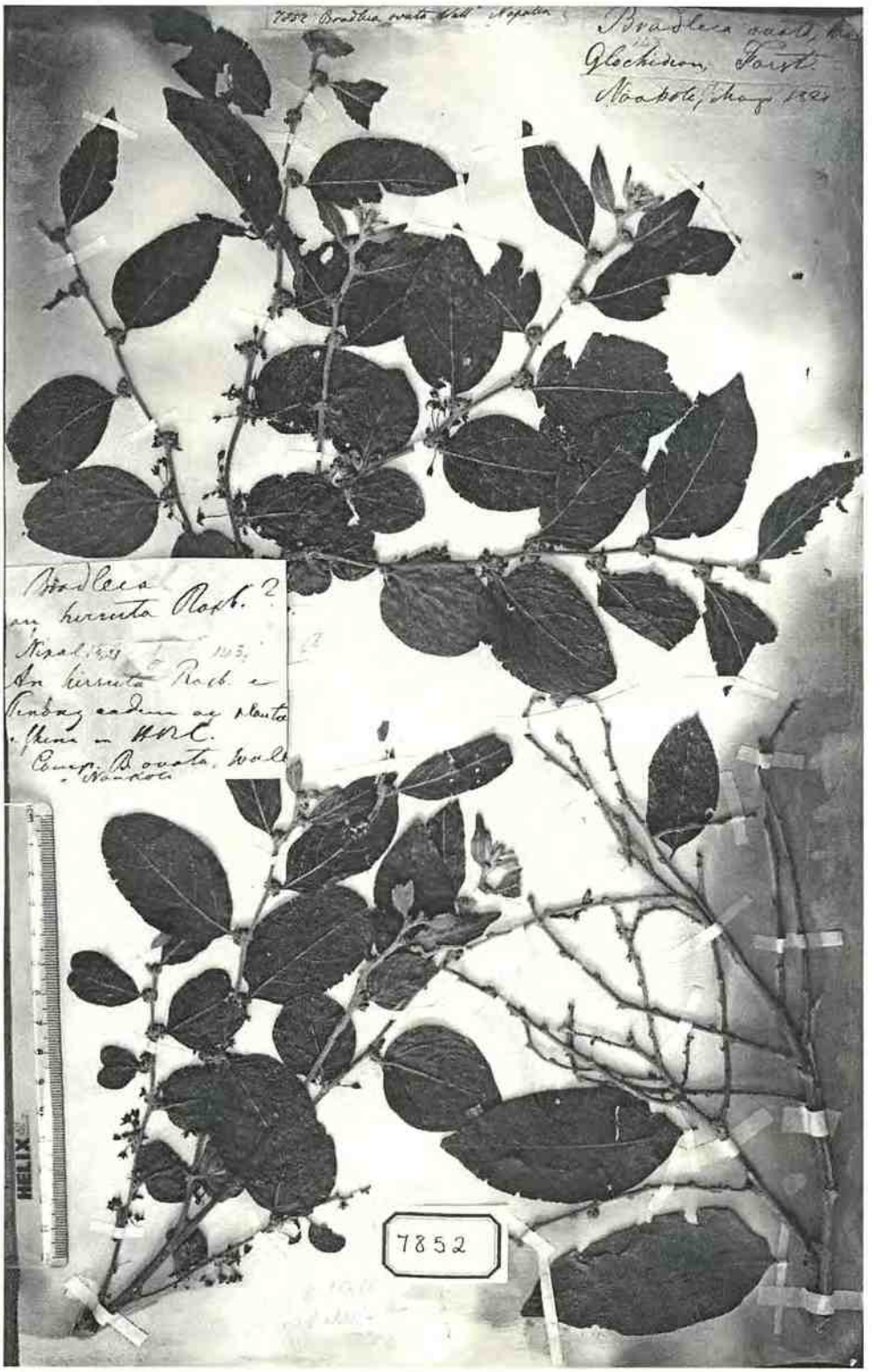

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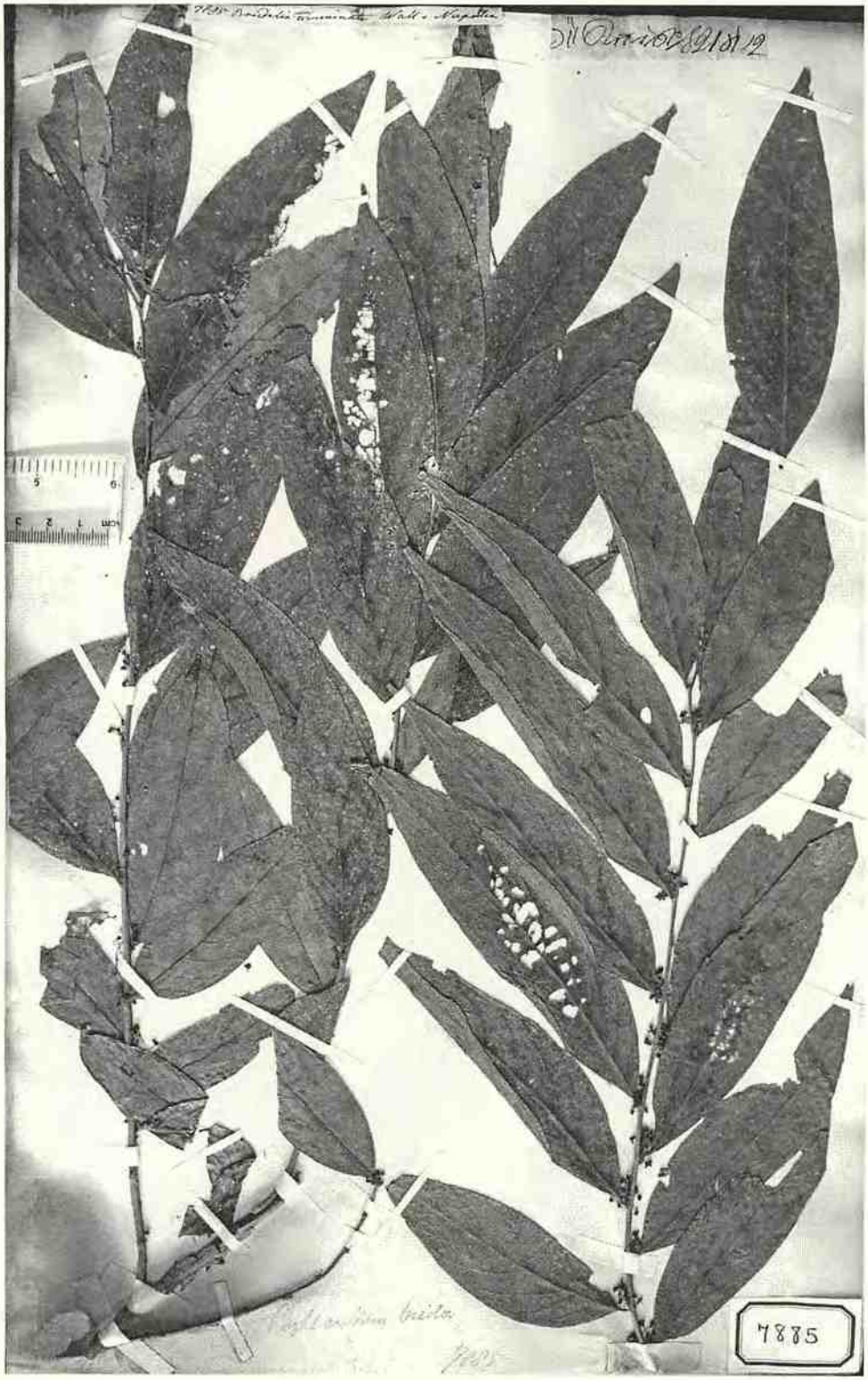

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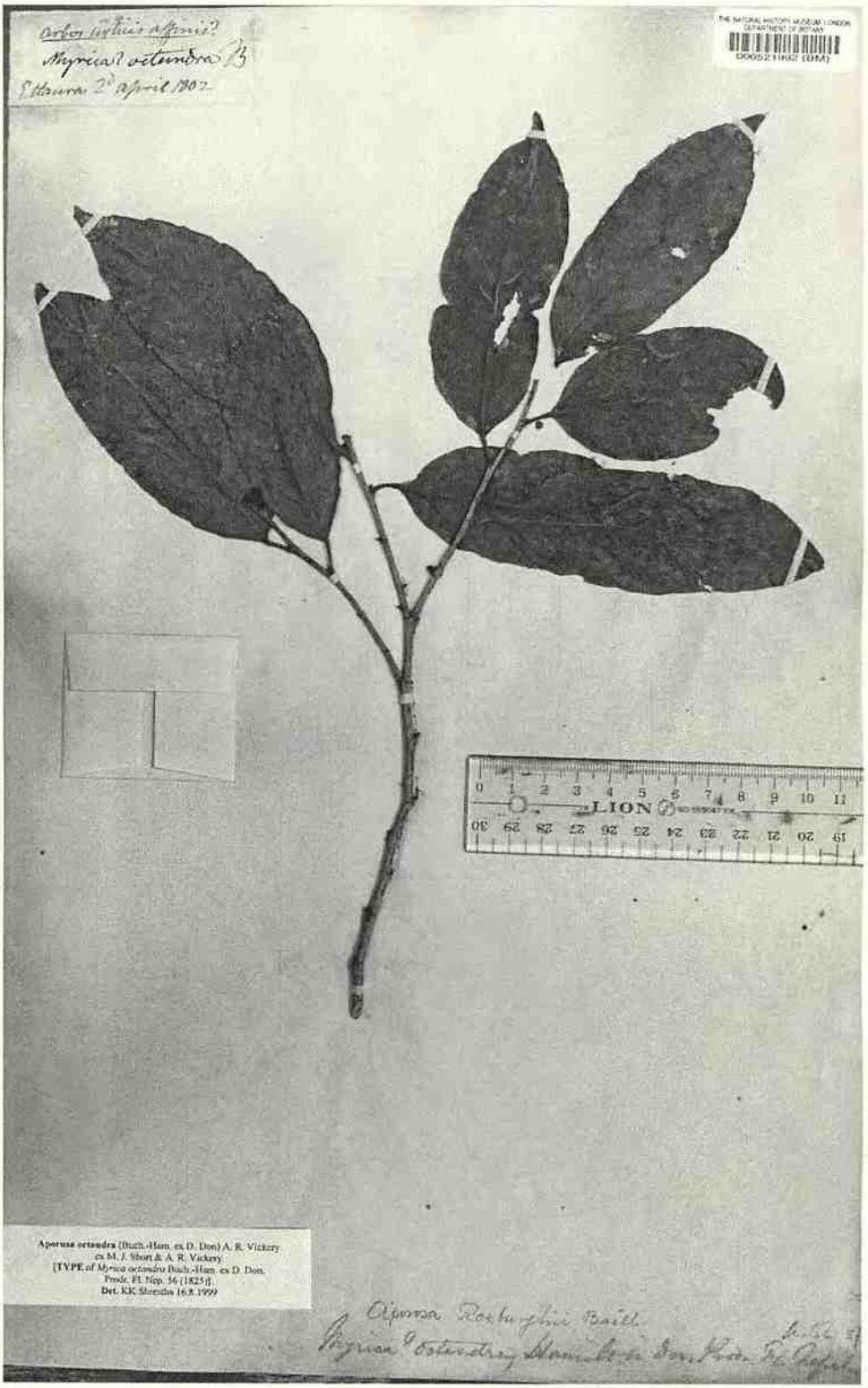

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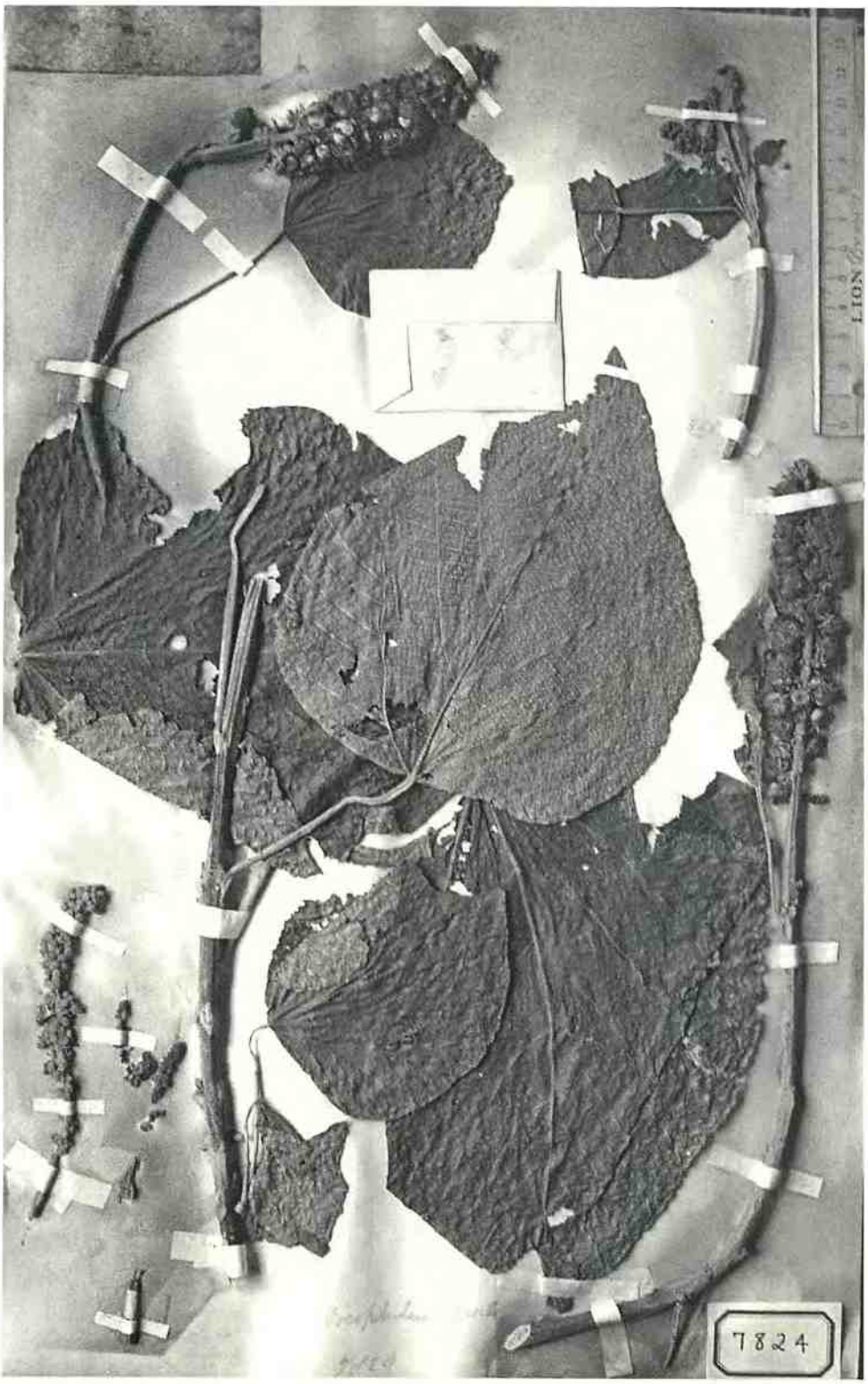

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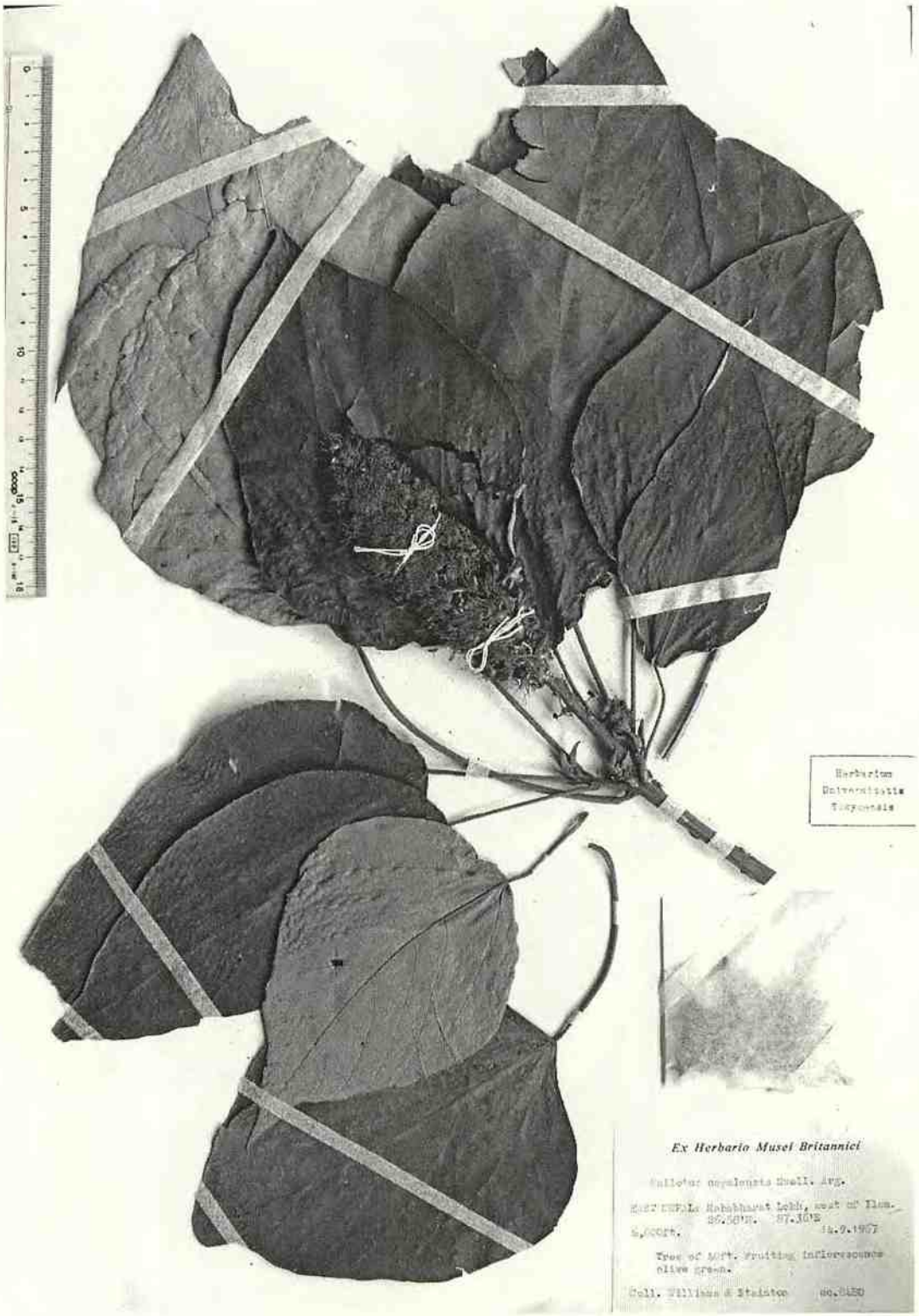

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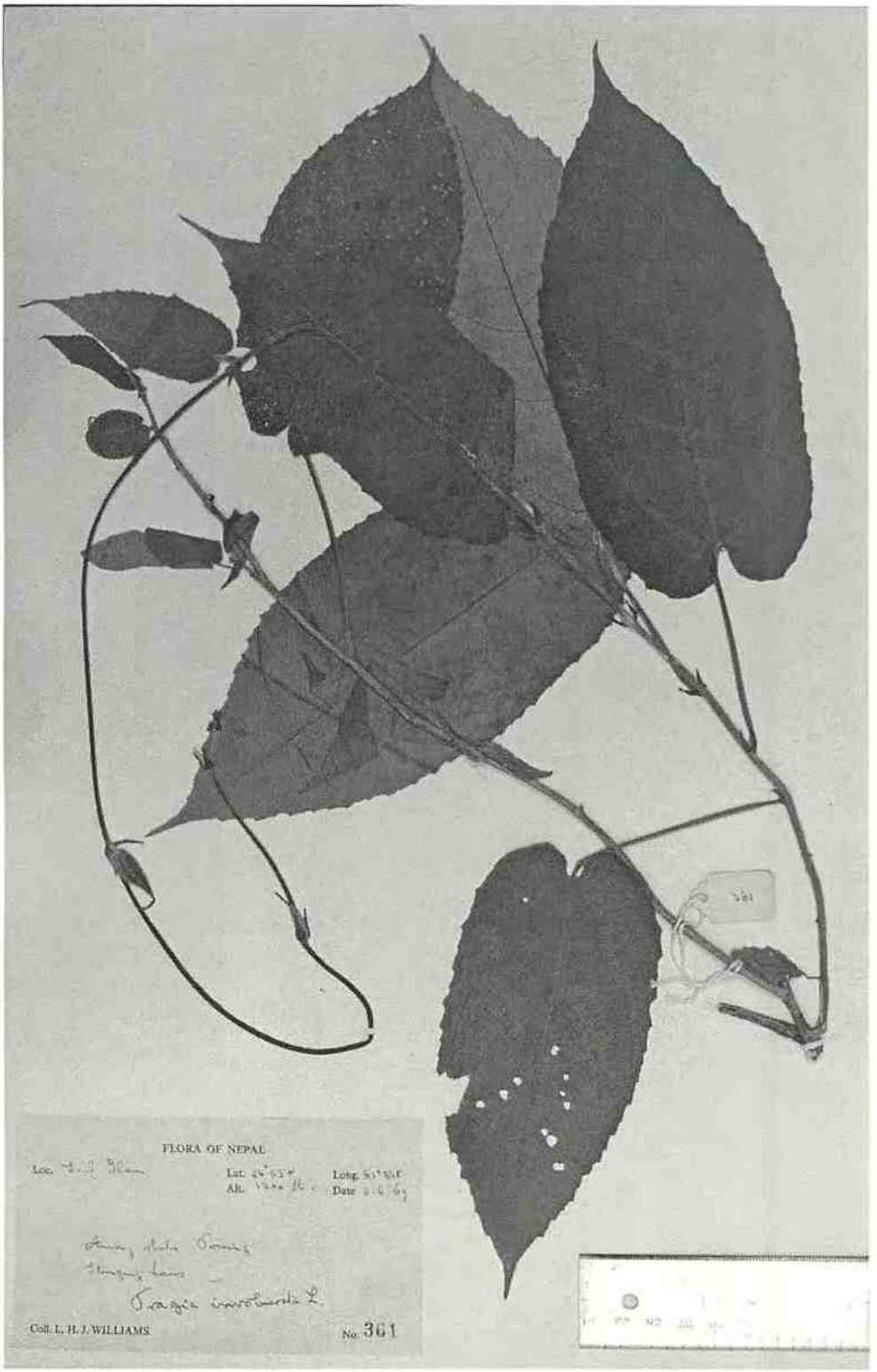

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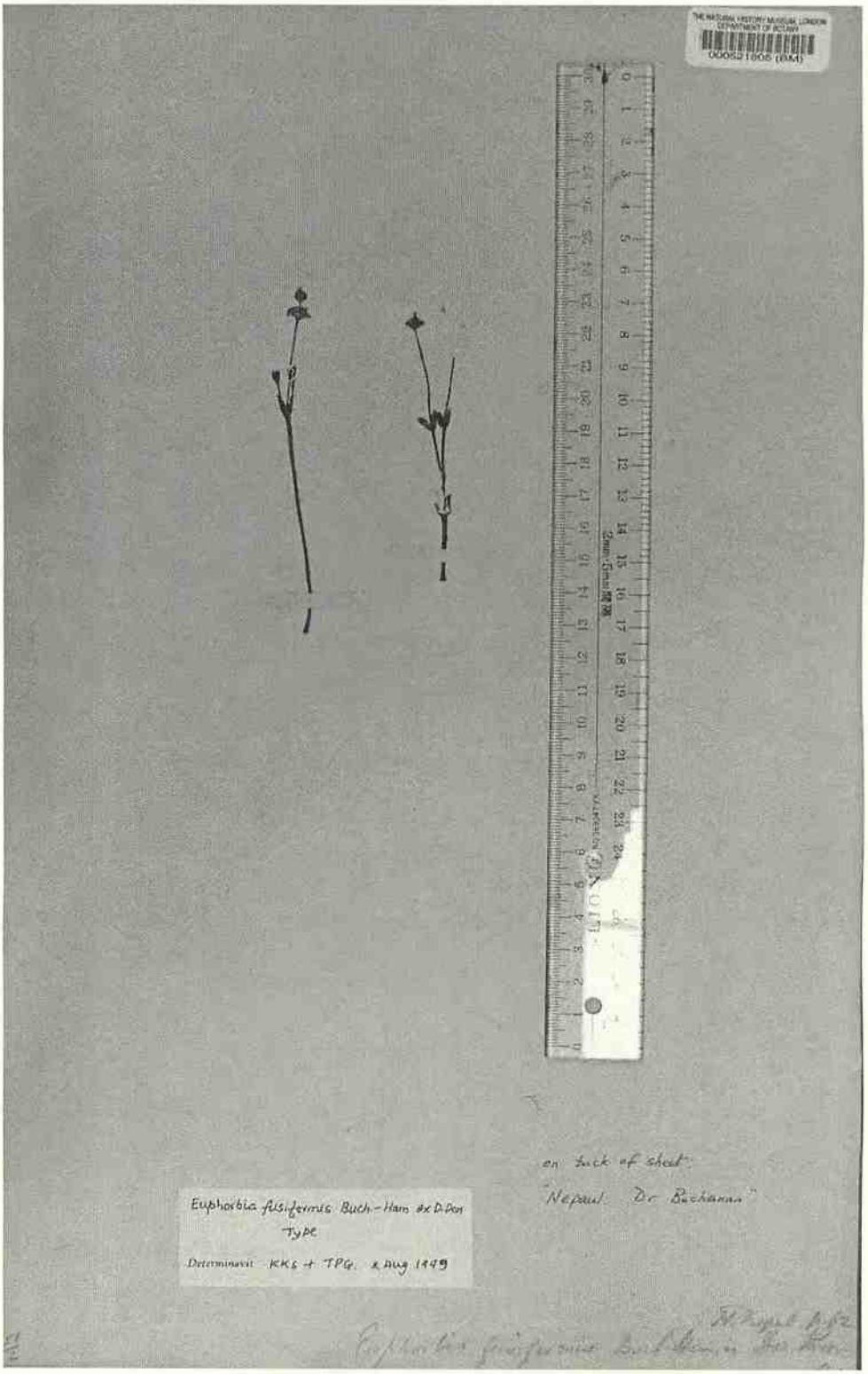

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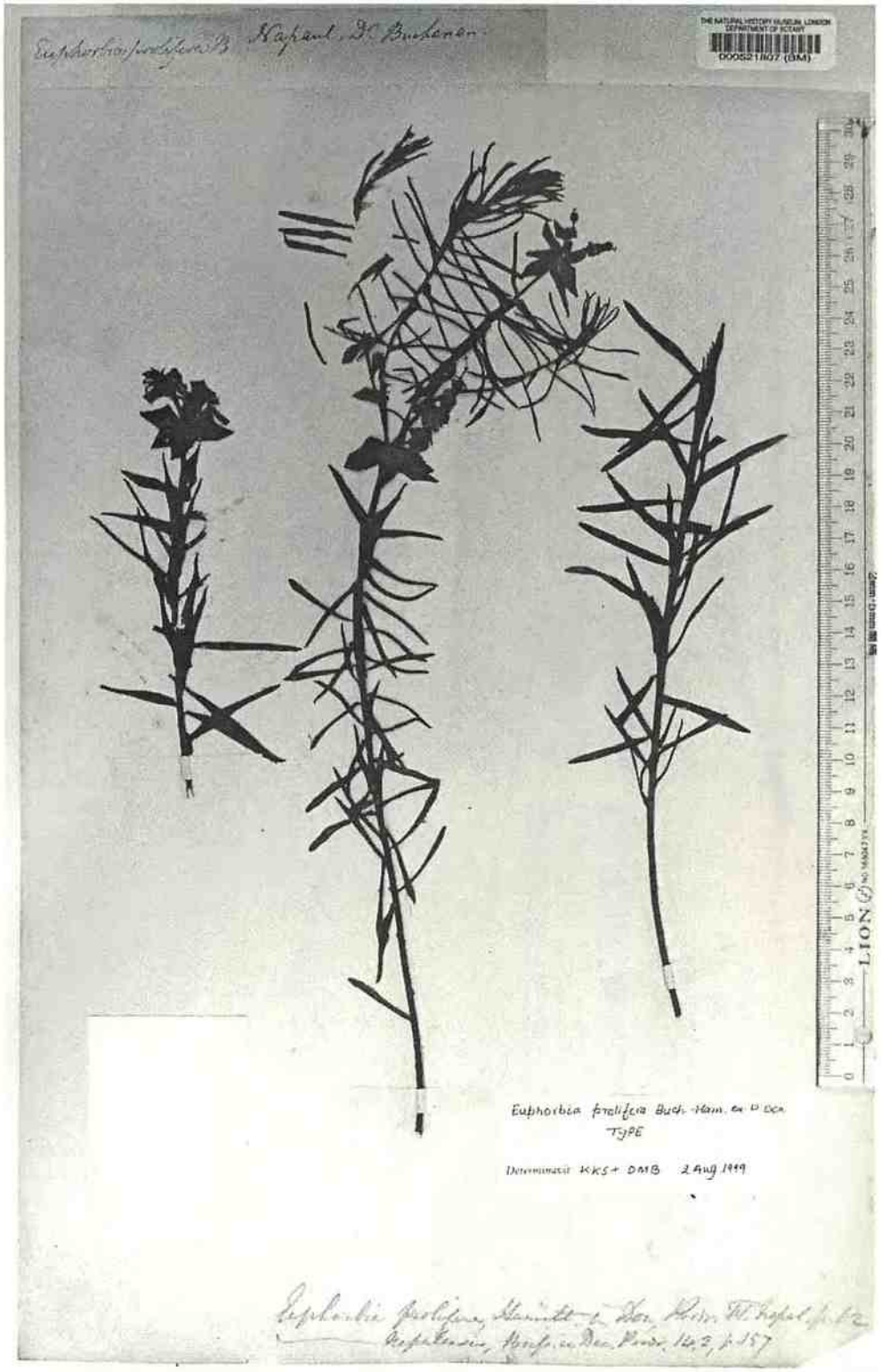

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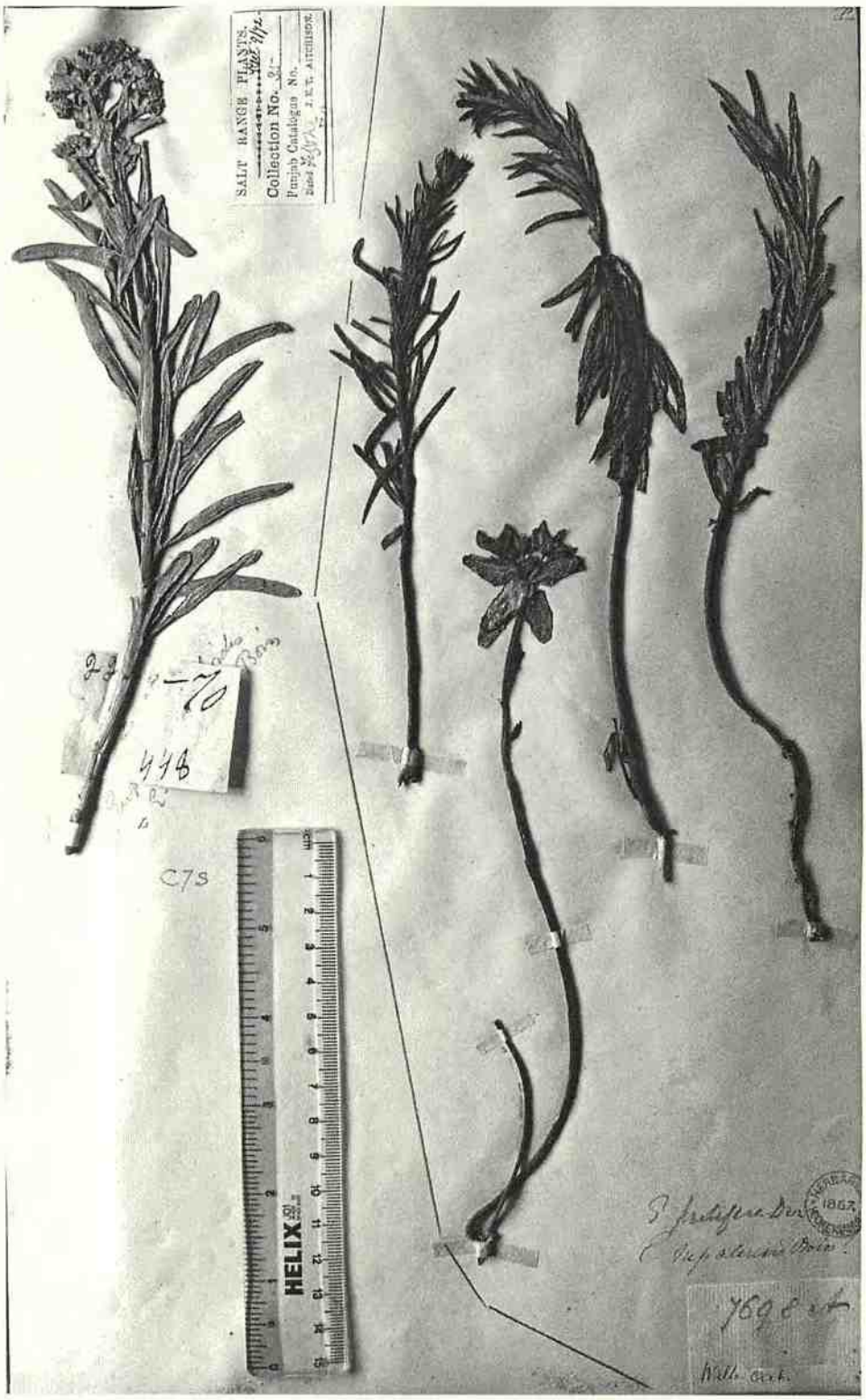

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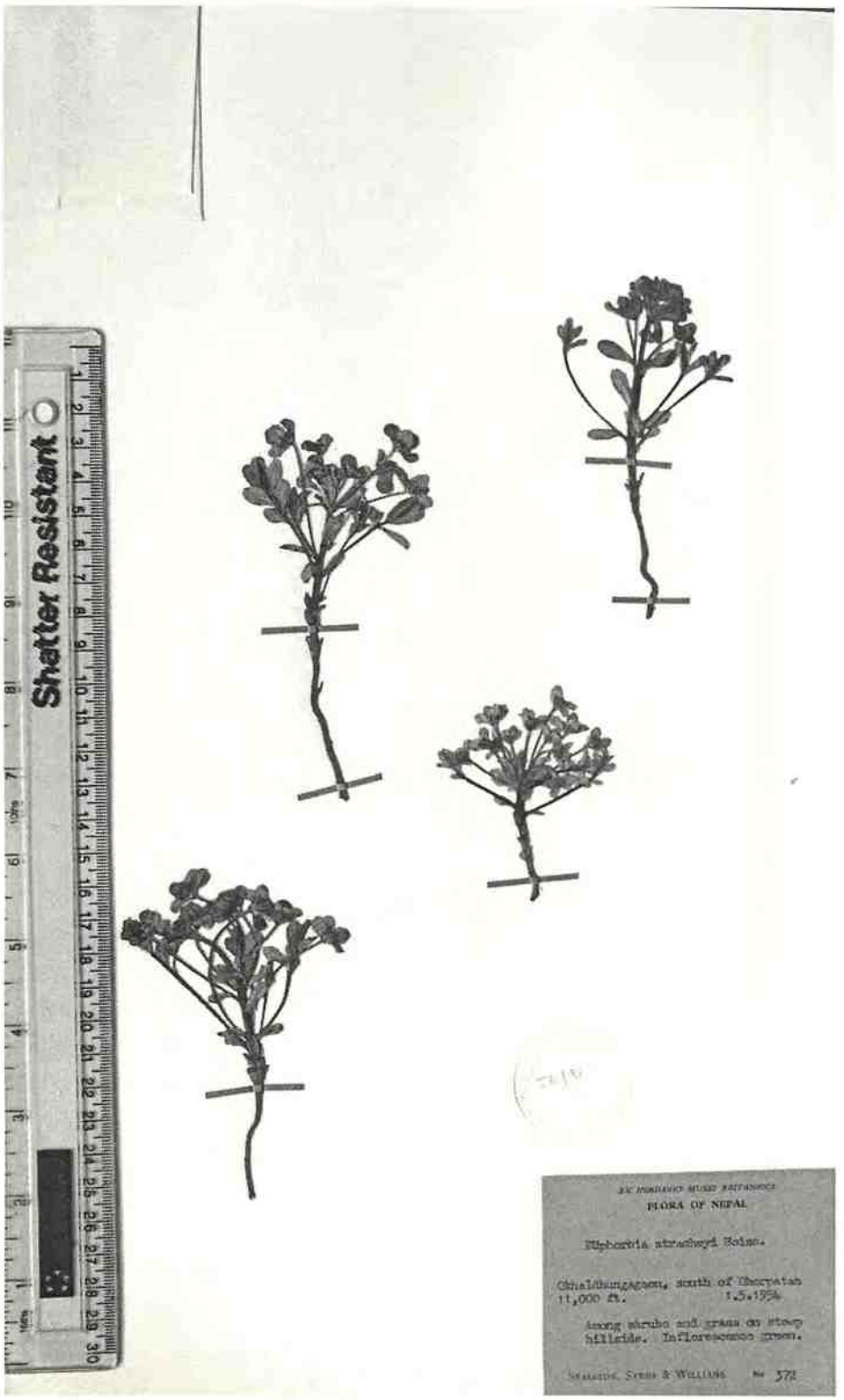

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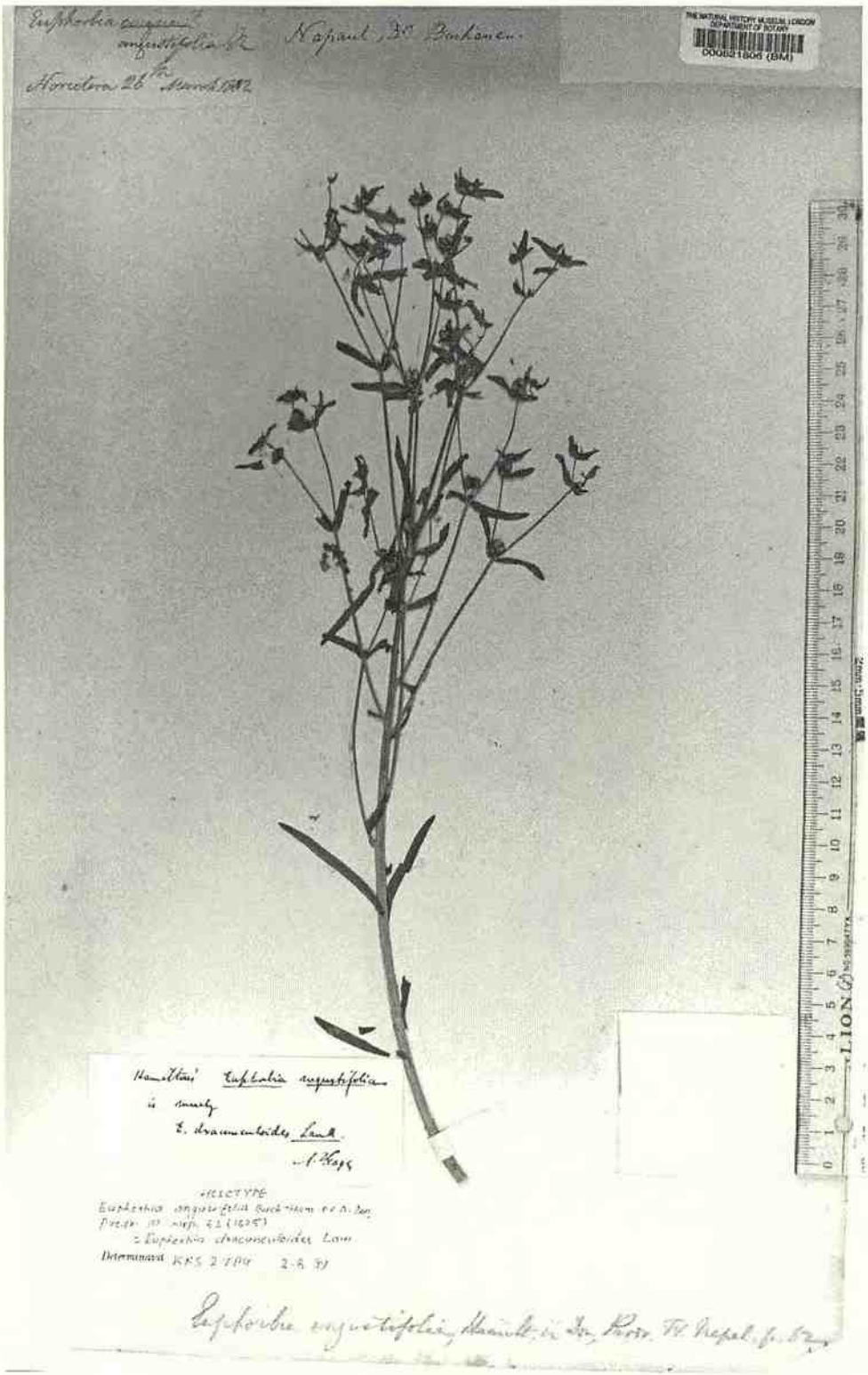

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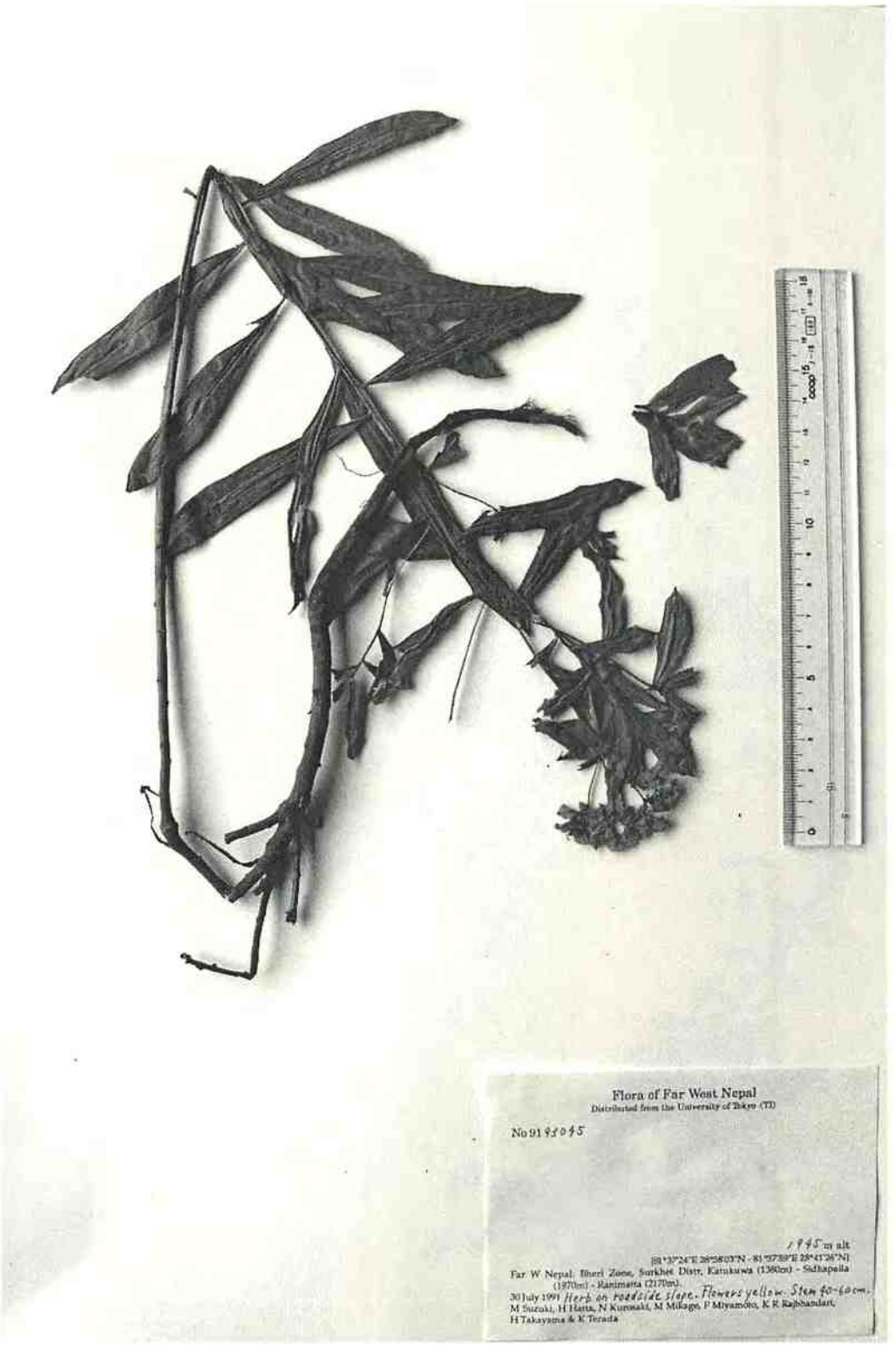

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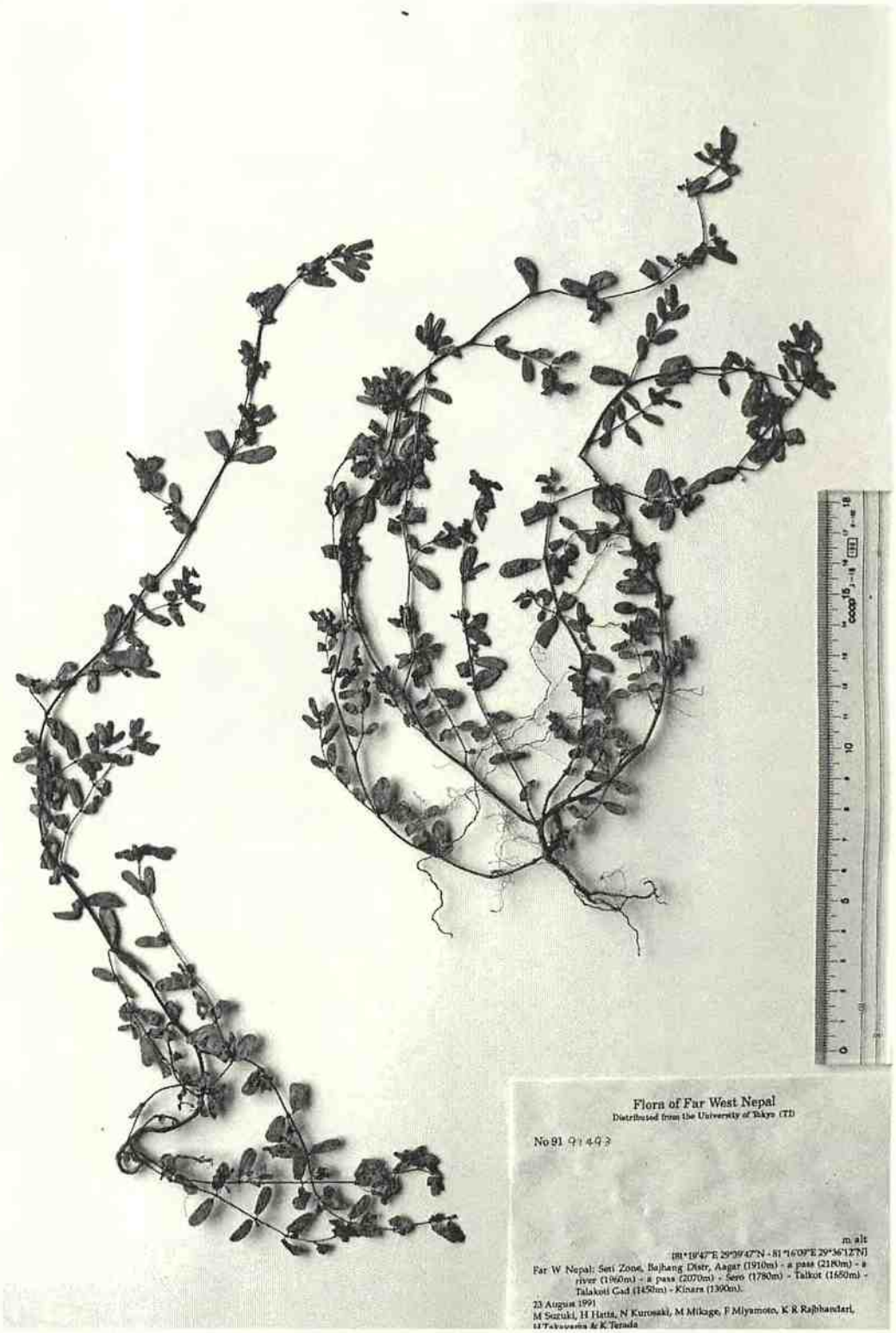

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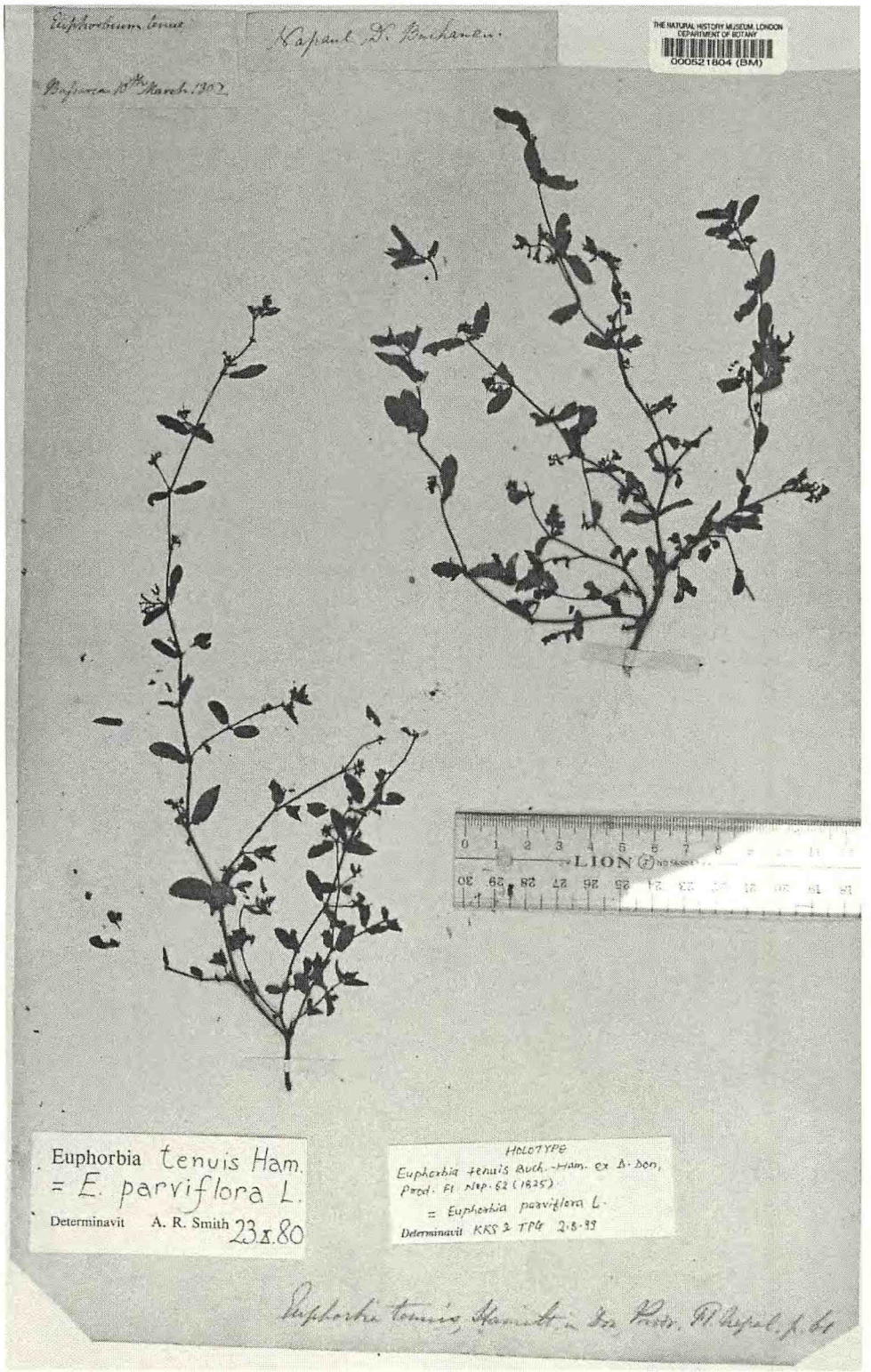

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