

Earthworms (Annelida: Oligochaeta) deposited in The University Museum, The University of Tokyo

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Abstract

Oligochaeta material in 40 historical jars in the collection of the University Museum at University of Tokyo's Department of Zoology (UMUTZ) were inspected and catalogued. Most are from the Meiji era (明治時代), that extended from 1868 through to July 1912, and evidence is some samples were associated with the works of Goto & Hatai (1898, 1899). Syntypes are newly determined for two of their taxa: *Amyntas levis* (Goto & Hatai, 1899), an erstwhile junior synonym of *A. tokioensis* (Beddard, 1892), and *Metaphire communissima* (Goto & Hatai, 1899) that was originally misidentified by Goto & Hatai (1898) as *?Perichaeta Sieboldii*, Horst (sic). Contemporaneous topotypes of *Amyntas micronarius* (Goto & Hatai, 1898) – yet having no name bearing status – are recognized. Other materials are identified as far as possible based on the extent of label information and state of deterioration of specimens, including several unidentified earthworm species from Okinawa and from Taiwan (Formosa) collected shortly after its territorial cession to Japan in 1895.

Introduction

Only about ten Japanese pheretimoids were known when Professor Sietaro Goto (五島清太郎) and his Assistant Shinkichi Hatai (畑井新喜司) working from the First High School at Ueno in Tokyo that was to become integrated as the Komaba campus of The University of Tokyo (Todai) in later years, purported to describe “new or imperfectly known species of earthworms collected from various parts of the Japanese Empire” (Goto & Hatai, 1898, 1899). The first publication was “Printed September 30th, 1898”. Both publications were flawed (Table 1). Giving names to ca. 27 ‘new’ species, their descriptions were so inadequate and/or confused that most quickly went directly into synonymy or incertae sedis in Michaelsen (1899) and in his classical review “Das Tierreich” (Michaelsen, 1900) or, at best, some as species inquirendae in Michaelsen (1903: 85). Horst (1899: 242) also remarked on the “strange fact that hitherto they [Goto & Hatai] have not come across any of the nine species, described by European authors”. To this, the terse reply in Goto & Hatai (1899: 23) was that they have seen all earlier species except for “*P. Ijima*e Rosa, *P. japonica* Horst and *P. Sieboldi* (sic) Horst” albeit under the

taxon name *ijimae* were united *kamakurensis*, *parvula* and *decimpapillata*, all offerings from Goto & Hatai (1898), by Beddard (1900: 636) – these all subsequently placed under *Amyntas corticis* (Kinberg, 1876) e.g. by Easton (1981), Blakemore (2003).

Yet providing scant review of earlier species, their descriptions were so contradictory (e.g. their miscounting segments, confusing spermathecal pores with genital markings and vice versa, misrepresenting forms of the intestinal caeca or missing them, etc. – see Table 1), that similar specimens have not generally been found subsequently. Ignoring routine deposition of types, neophytes Goto & Hatai (1898: 65) from the outset apportioned their rôles thusly:

“For the practical portion of the work as well as the determination of new species the credit is entirely due to the junior writer (H), while for a general supervision of the work and the form in which the results are presented the senior writer is alone responsible. The species will be described without any definite order...” [bolding added].

As the only acknowledged collectors were a Mr Y. Takatori of the Agricultural Department of the Government of Formosa (Goto & Hatai, 1898: 76 footnote), Mr Akira Iizuka, and Mr Wada (Goto & Hatai, 1899: 14, 15, 22), it was presumed that they collected most of the specimens themselves (but see collector details in material below).

Prof. Goto, a specialist of ectoparasitic Trematodes of Japan, made no further contribution and the next earthworm publication was 25 years later by Hatai (1924) after his return to Japan in 1921. In a subsequent footnote, Hatai (1929: 271) remarked that he had collaborated (as an Assistant) with Prof. Seitaro Goto more than 25 years previously, but that this work was discontinued (around 1900) owing to the change of his residency to the USA. The whereabouts of the original type material, if any, has been elusive and the errors and ambiguities in Goto & Hatai (1898, 1899) have largely remained unresolved to this day, more than 112 years later.

Attempts to unravel the confusion in systematics of Japanese earthworms were notably by Easton (1981), Blakemore (2003, 2005) and Blakemore et al. (2010). Despite search efforts, none of these studies could locate original Japanese types other than those held in European institutions. The only evidence for existence of early domestic types was a remark in Easton (1979: 43) that the holotype of his *Polypheretima iizukai* (Goto & Hatai, 1899) [= *Amyntas fuscatus* (Goto & Hatai, 1898)] was at one time in the University of Tokyo collection although Dr M. Imajima told him it could no longer be found there.

In 1999, old annelid specimens, including some earthworms, deposited in The University Museum, The University of Tokyo (UMUTZ) were sent to Dr Eijiro Nishi at Yokohama National University for his critical studies on Akira Iizuka’s polychaete collection (see polychaete catalogue in this volume). During the loan, earthworm specimens (c.a. 40 lots) were examined by Mr Kotaro Ishizuka but no type specimen was identified. In October, 2010 the earthworm specimens were made available for the current inspection and the results are summarized below.

Most of the glass jars were original, some were cracked, and the labels and contents were in various states of deterioration and leakage which is a great shame as these samples

must have survived, due to the diligence of earlier curators who recognized their value, both the 1923 Great Kanto Earthquake and the 1940s fire bombing of Tokyo.

All the samples, now returned to UMUTZ, have again survived the recent ‘Eastern Japan Great Earthquake Disaster’ (11th March, 2011). This catalogue provides particulars of their contents and, where possible, the taxonomic status of the specimens is determined in order to ensure this historically important material – some over 124 years old – is preserved and made available for morphological or DNA analysis into the future.

Material and Methods

Samples are registered with specimens stabilized in fresh alcohol (75% EtOH), some in new glass jars with additional number slips included. Provisional numbers stickers on the outside of the jars are thought allocated by Mr Kotaro Ishizuka. Corresponding UMUTZ labels will be added as provided in this catalogue along with the original labels found inside or stuck on the outside of jars which are deciphered as far as possible.

The priority was to identify possible type specimens rather than to confirm all species, nevertheless, for each lot a scientific name and collecting information are determined in the following order:

- 1, current name (as identified by current author);
- 2, reference to the original description (i.e., authorities and synonyms if needed);
- 3, registration number of UMUTZ;
- 4, type status (as determined by current author);
- 5, collecting locality;
- 6, collecting date;
- 7, collector name(s);
- 8, number of specimens in the jar;
- 9, original label data (English translation and original Japanese are noted if legible);
- 10, specimen condition e.g. whether wet or desiccated; dissected etc.
- 11, remarks;
- 12, reference(s) if relevant.

Results

Syntypes of *Metaphire communissima* (Goto & Hatai, 1899) and *Amyntas levis* (Goto & Hatai, 1899) were newly discovered. Unfortunately, type specimens of other taxa described by Goto & Hatai (1898, 1899) were missing from this collection.

List of earthworms deposited in UMUTZ

Phylum Annelida
Class Oligochaeta
Order Tubificida

Family Tubificidae
?*Nais communis* Piguet, 1907

UMUTZ-Ann-Og-5

Type status: Probably not types?

Locality: ?

Date: ?

Collector: ?

No. of specimens: Several.

Label information: Label partly illegible reading “..MMADRILUS COMMUNIS Oligochaeta, Chaetopoda”.

Condition: Good (small white worms).

Remarks: .

References:

Nais proboscidea O.F. Müller, 1774,
a junior synonym of *Stylaria lacustris* (Linnaeus, 1767)

UMUTZ-Ann-Og-11

Type status: ?

Locality: Leipzig, Germany

Date: ?

Collectors: ?

No. of specimens: 1.

Label information: “200/2 *Nais proboscides* [sic lapsus] O.F. Müller Naidomorpha, Oligochaeta. Leipzig”.

Condition: Good.

Remarks: Possibly loaned from Naturkundemuseum Leipzig (although enquiries there are thus far unanswered) that, opening in 1912, housed the first German deep sea expedition (1898) material. Or, more likely, this worm was collected by Prof. Isao Ijima who also collected leeches in Leipzig in 1884 (see Hirudinida catalogue in this volume).

Note that *Stylaria lacustris*, originally *Nereis lacustris* Linnaeus, 1767, is type of *Stylaria* Lamarck, 1816 [Syns.: *Stylinais* Gervais, 1838 (Type: *Nais proboscidea*); *Caecaria* Floericke, 1892 (Type: *Caecaria rara* Floericke, 1892)] and is a widely distributed, cosmopolitan, lacustrine microdrile.

References: Müller (1774).

Order Megadrilacea

Family Megascolecidae sensu Blakemore (2000)

Metaphire sieboldi (Horst, 1883)

UMUTZ-Ann-Og-2

Type status: Non type.

Locality: ?

Date: ?

Collector: ?

No. of specimens: 1.

Label information: None.

Condition: Fair (mature in two halves, previously dissected ventrally and most of intestine removed).

Remarks: A native pheretimoid species often recorded from south-central Japan.

References: Easton (1981); Blakemore (2003).

UMUTZ-Ann-Og-29

Type status: Non types.

Locality: Shiroyama, Kagoshima Pref., Kyushu.

Date: 明治 42/4/? [=April, 1909].

Collectors: 乗野 (and Kamiya?).

No. of specimens: 6~7.

Label information: “琉球鹿児島県城山” Shiroyama, Kagoshima Prefecture, Ryukyu (= Kyushu) “神谷理学士の好意により” (Courtesy of BSc Kamiya).

Condition: Good, moist (none previously dissected).

Remarks: Location within known range.

References: Easton (1981).

UMUTZ-Ann-Og-27-1

Type status: Non types.

Locality: Kagoshima Shiroyama (Kyushu).

Date: 明治 33/6/9 [=9 Jun, 1900].

Collectors: ??島 [illegible]

No. of specimens: 1 mature.

Label information: 鹿児島城山 Kagoshima Shiroyama (Kyushu)

Condition: Fair, previously undissected.

Remarks: The jar contains *M. hilgendorfi* (UMUTZ-Ann-Og-27-2). Label is disintegrating; location is within range of both taxa.

References: Blakemore (2010).

Metaphire hilgendorfi (Michaelsen, 1892)

UMUTZ-Ann-Og-27-2

Type status: Non types.

Locality: Kagoshima Shiroyama (Kyushu).

Date: 明治 33/6/9 [=1900].

Collectors: ??島 [illegible]

No. of specimens: 2 matures.

Label information: 鹿児島城山 Kagoshima Shiroyama (Kyushu) .

Condition: Fair, previously undissected.

Remarks: The jar contains *M. sieboldi* (UMUTZ-Ann-Og-27-1). Label is disintegrating; location is within range of both taxa.

References: Blakemore (2010).

***Metaphire communissima* (Goto & Hatai, 1899)**

?*Perichaeta sieboldi* : Beddard, 1892: 759 (part.).

Perichaeta sieboldii : Goto & Hatai, 1898: 65; Goto & Hatai, 1899: 23 [non *Megascolex sieboldi* Horst, 1883: 191; 1899: 240 (= *Metaphire sieboldi*)].

Perichaeta communissima Goto & Hatai, 1899: 23. [From “Tokyo, Sendai, Tsugaru (south side of the Strait of Sangara), Shizuoka, Ibaraki, Bitchū; that is to say all over the Main Island”. Type material previously unknown].

Perichaeta sieboldi lenzi Michaelsen, 1889: 9. [From “Central-Japan, Nakahama in der Prov. Setsu; LENZ leg. Aug. [18]95.” Types missing (from Hamburg?)].

Pheretima communissima : Michaelsen, 1900: 262 [syn. ?*Perichaeta sieboldii* : Goto & Hatai, 1898: 65 (non *Megascolex sieboldi* Horst, 1883), *sieboldi* var. *lenzi*]; Ishizuka, 2001: 66.

Amyntas communissimus : Sims & Easton, 1972: 235 (syn. *sieboldi lenzi*); Easton, 1981: 51 (syn. *sieboldi* : Goto & Hatai, 1898).

Pheretima florea Ishizuka, 1999: 52 [misspelt “frolea” in Ishizuka (2001: 66)]. [From Mt. Daibosatsu-toge (in Yamanashi-ken). Types, four of in National Science Museum, Tokyo].

Metaphire communissima: Blakemore, 2003: 7, 28 (comb. nov.; syns. *sieboldi lenzi*, *florea*), Blakemore, 2005, 2007, 2008a, 2010.

UMUTZ-Ann-Og-26 (Fig. 1)

Type status: SYNTYPES. (Note: the previously dissected specimen may be eligible as a Lectotype thereby making the second undamaged specimen a Paralectotype, although this action is not formally taken here).

Locality: Tokyo.

Date: ?

Collectors: ?

No. of specimens: 2.

Label information: “201 *Perichaeta communissi-ma* Oligochaeta, Chaetopoda Tokyo” (Fig. 1c).

Condition: Both good (one previously dissected).

Remarks: Considered types because of label identification (by original authors?) and the fact that Tokyo is one of locations mentioned by Goto & Hatai (1899).

In a footnote, Sims & Easton (1972: 235) state that: “Both *communissimus* and *sieboldi lenzi* were provided for *Perichaeta sieboldi* : Goto & Hatai, 1898 (non Horst, 1883); *communissimus* has priority”. This was already established by Michaelsen (1900: 262), but appears to have been overlooked by Easton (1981: 51) when he listed *sieboldi lenzi* as a separate “INCLUDED SPECIES” in his *hilgendorfi* species-complex rather than as a synonym.

Horst (1899: 240) quite rightly criticises Goto & Hatai (1898) for their poor and inconsistent work 100 years before contribution from Ishizuka (2001). Having male pores in slight inversions, rather than (everted?) “on top of papillae” as in the original description, just qualifies this taxon for inclusion in *Metaphire*. Michaelsen (1900: 263) stated that the prostatic ducts were thickened at the end but did not have (large?) copulatory pouches (as found in *Pheretima s. strict.* and *Duplodicodrilus* Blakemore, 2008b).

A full redescription will be provided in the near future (Blakemore in prep.).

References: In synonymy above.

Metaphire sp.

UMUTZ-Ann-Og-17

Type status: Non types.

Locality: Izuhara Miyanoue (Tsushima, Nagasaki, Kyushu).

Date: 明治 36/9/9 [=9 Sept., 1903].

Collectors: ?

No. of specimens: ~5 large matures.

Label information: 巖原宮ノ上 Izuhara Miyanoue (Tsushima, Nagasaki, Kyushu).

Condition: Fair (none previously dissected).

Remarks: Not types because collected after 1899.

References:

Metaphire sp.

UMUTZ-Ann-Og-18

Type status: Non type.

Locality: Giran, Taiwan

Date: ?

Collectors: 木村徳蔵氏寄贈 (Donated by Mr. Tokuzou Kimura).

No. of specimens: 1 large mature.

Label information: 台湾宣蘭 [Giran, Taiwan].

Condition: Specimen previously sectioned near caeca only.

Remarks: No date on label but location and collector not provided by Goto & Hatai

(1898) in their description of two Taiwanese worms. Spermathecal pores are in 6/7/8/9, and male pores within large slits on 18 making the specimens eligible for *Metaphire*.

References:

Metaphire sp.

UMUTZ-Ann-Og-22

Type status: Non type.

Locality: Mt Naze, Amami Oshima, Ryukyus.

Date: 明治 42/4/12 [12 April, 1909].

Collectors: 乗野.

No. of specimens: 1.

Label information: 琉球奄美大島名瀬山上 Amami Oshima, Mt Naze, Ryukyus.

Condition: Good (undissected mature).

Remarks: Not types as collected after 1899 from Ryukyus.

References:

Amyntas levis (Goto & Hatai, 1899)

[an erstwhile junior synonym of *A. tokioensis* (Beddard, 1892) – see Blakemore (2003, 2005, 2007, 2008a, 2010)]

Perichaeta levis Goto & Hatai, 1899: 20, fig. 12. [From Takahashi Okayama-ken and Kumamoto (Kyushu)].

Pheretima levis : Kobayashi, 1938: 129 fig. 7; Gates, 1958.

Metaphire levis : Sims & Easton, 1972: 238 (*Metaphire glandularis* species-group).

Genus? *levis* : Easton, 1981: 51 (genus not stated within his “*Amyntas hilgendorfi* species-complex” but assumed to be *Amyntas* by default).

?*Metaphire levis* : Blakemore, 2003: 30, 2007, 2010 (and cf. *A. tokioensis* synonymy).

UMUTZ-Ann-Og-34 (Fig. 2)

Type status: SYNTYPES.

Locality: Kikkuchi, Kumamoto-ken.

Date: 明治 29/8/? [=August, 1896].

Collectors: 高山 (Takayama).

No. of specimens: 4 matures (one previously dissected).

Label information: “*P. levis* Goto & Hatai. 明治 29/8/? [=August, 1896]. [Location:] 熊本県菊池 (Kikkuchi, Kumamoto-ken). [Collector:] 高山 (Takayama)”. Label is same format as that in jar #36. External stuck on label is now placed in a separate jar from original (Fig. 2c).

Condition: Good.

Remarks: The label identifies these specimens with Goto & Hatai’s (1899) taxon from a time and place compatible to their description. Although Goto & Hatai

(1899) describe only one specimen in detail, they give two localities as: “Loc. -- Takahashi (Prov. Bitchu), Kumamoto (Kyushu)”. The present specimens are from the latter place and, although biometry differs from type description (they have length = 85 mm with 88 segments, rather than 102 mm with 84 segments in current dissected specimen), they nevertheless conform to the prior *Amyntas tokioensis* (Beddard, 1892) biometry as redescribed by Blakemore (2005).

Spermathecal pores are in 6/7/8 but male pores are absent in most of the current specimens, or only present on one side and my current opinion is that, since there is no reliable evidence that the male pores when complete are invaginate, *P. levis* defaults back to *Amyntas* and is most probably in synonymy of *A. tokioensis* or, where stripes are indicative, into the ambit of *A. vittatus* (Goto & Hatai, 1898) but note that the current syntypes are uniformly pigmented a light brown colour suggesting this latter possibility is unlikely.

A full redescription will be provided in the near future (Blakemore in prep.).

References: In synonymy above.

Amyntas hupeiensis (Michaelsen, 1895)

UMUTZ-Ann-Og-28

Type status: Non types.

Locality: Institute of Biology, Nanking, China.

Date: 24/10/1924.

Collectors: Prof. Goto or Prof. C. Ping?

No. of specimens: 10 mostly matures.

Label information: “南京中央科学 ? 生物研究所 (China)..., Prof. C. Ping..
Perichaeta hupeiensis Mich (?) Goto Oct 1924”.

Condition: Good.

Remarks: A widespread cosmopolitan species in tropical countries, including Japan.

References: Blakemore (2008a)

Amyntas micronarius (Goto & Hatai, 1898)

(syn. ?*yamizoyamensis* ; *obtusa* ; *hinoharensis*; ?*hypogaea*; ?*edoensis* – see Blakemore, 2003, 2005, 2008)

UMUTZ-Ann-Og-35

Type status: Topotypes (non primary types with no taxonomic status).

Locality: Tokyo.

Date: “6/91” [=June/1891?].

Collectors: ?

No. of specimens: 2 (both ‘head’ ends, neither dissected, plus a longer ‘tail’ portion).

Label information: “*Perichaeta micronaria* Tokyo”; “No. 4”; “6/91”.

Condition: Poor (desiccated).

Remarks: *Amyntas micronarius* was originally described with markings in both

17/18 and 18/19 with 8-10 setae between superficial male pores on 18 (as in G & H text figure and in the current dried specimens). However, these contemporaneous topotypes are not considered syntypes of *micronarius* as, despite their damage, neither anterior portion appears to have been dissected previously and thus would not have contributed to the original description. Further morphological data on internal anatomy of current specimens is not readily available due to their poor preservation.

References: Blakemore (2003, 2005, 2008) as noted above.

UMUTZ-Ann-Og-36-1

Type status: Non types.

Locality: Tosaki, Kikkuchi, Kumamoto Pref.

Date: 明治 29/8/? [=1896].

Collectors: 高山 Takayama.

No. of specimens: At least 1

Label information: “*Perichaeta micronaria*” “明治 29/8/? [=1896]. [Location:] 熊本県菊池郡戸崎 (Tozaki, Kikuchi, Kumamoto-ken). [Collector:] 高山 (Takayama)”.

Label is same format as that in jar #34; other labels on inside and outside of jar say: “*Perichaeta micronaria*” but are otherwise illegible.

Condition: Good, all life stages; at least one previously dissected.

Remarks: The jar contains *Amyntas* cf. *heteropodus* (UMUTZ-Ann-Og-36-2). *Amyntas micronarius* (Goto & Hatai, 1898: 74) was originally described (variously) as either 55 or 66 mm long, whereas the current dissected specimen is ca. 100 mm long with markings on 17/18 only (rather than in both 17/18 and 18/19); it has about 8-10 setae between superficial male pores on 18. Moreover, the location differs from the originally stated single specimen’s type-locality that was “Loc. – Tokyo”. Hence the current specimens are not considered syntypes of *micronarius* per se; neither are the other specimens likely types of *P. heteropoda* as Kumamoto was not a type locality.

References: Blakemore (2003, 2005) as noted above.

Amyntas cf. *heteropodus* (Goto & Hatai, 1898)

[= *A. corticis* (Kinberg, 1867)]

UMUTZ-Ann-Og-36-2

Type status: Non types.

Locality: Tozaki, Kikuchi, Kumamoto Pref.

Date: 明治 29/8/? [=1896].

Collectors: 高山 Takayama.

No. of specimens: At least 1.

Label information: “*Perichaeta micronaria*” “明治 29/8/? [=August, 1896].

[Location:] 熊本県菊池郡戸崎 (Tosaki, Kikkuchi, Kumamoto-ken). [Collector:] 高山 (Takayama)". Label is same format as that in jar #34; other labels on inside and outside of jar say: "*Perichaeta micronaria*" but are otherwise illegible.

Condition: Good.

Remarks: The jar contains *Amyntas micronarius*. See the remarks of *Amyntas micronarius* (UMUTZ-Ann-Og-36-1)

References:

***Amyntas cf. carnosus* (Goto & Hatai, 1899)**

UMUTZ-Ann-Og-25-1

Type status: ?

Locality: ?

Date: ?

Collectors: ?

No. of specimens: 1

Label information: Illegible therefore material status indeterminate.

Condition: Fair (odor of formalin preservation but many specimens macerated).

Remarks: No identification labels found. The jar includes three echiuran specimens and many unidentified *Amyntas/Metaphire* spp. (UMUTZ-Ann-Og-25-2)

References:

***Amyntas cf. catenus* Tsai et al., 2001**

UMUTZ-Ann-Og-9-1

Type status: Non types.

Locality: Teraso, Taiwan.

Date: 明治 32/7/30 [=30 July,1899].

Collectors: ?

No. of specimens: 1

Label information: テラソ (Mtn.) Teraso, Taiwan.

Condition: Good (none previously dissected).

Remarks: Not Taiwan types because collected after 1898. The jar contains *Amyntas cf. corticis* (UMUTZ-Ann-Og-9-2) and unidentified *Amyntas/Metaphire* spp.(UMUTZ-Ann-Og-9-3)

References:

***Amyntas cf. corticis* (Kinberg, 1867)**

UMUTZ-Ann-Og-9-2

Type status: Non types.

Locality: Teraso, Taiwan.

Date: 明治 32/7/30 [=30 July,1899].

Collectors: ?

No. of specimens: 1

Label information: テラソ (Mtn.) Teraso, Taiwan.

Condition: Good (none previously dissected).

Remarks: Not Taiwan types because collected after 1898. The jar contains *Amynthas* cf. *catenus* (UMUTZ-Ann-Og-9-1) and unidentified *Amynthas/Metaphire* spp.(UMUTZ-Ann-Og-9-3)

References:

***Amynthas* cf. *corticis* (Kinberg, 1867)/*heteropodus* (Goto & Hatai, 1898)**

UMUTZ-Ann-Og-10-1

Type status: Non types.

Locality: University of Tokyo campus.

Date: 明治 29/7/? [=July,1896].

Collectors: ?

No. of specimens: At least 1.

Label information: 大学構内 Tokyo University campus; “10 % Picric acid Supporting in moist chamber for 3 days”.

Condition: Fair (none previously dissected, one mature dissected by RJB 17/II/2011).

Remarks: Probably not type as none named nor previously dissected and, although *A. heteropodus* type-locality includes Tokyo, markings are absent and the caeca are manicate plus first dorsal pores in current specimens are in 12/13 rather than 10/11 as stated for *heteropodus*. *Amynthas irregularis* has manicate caeca but allegedly lacks spermathecae, moreover, Tokyo is not listed by Goto & Hatai (1899) as its locality. The jar contains *Amynthas* cf. *irregularis* (UMUTZ-Ann-Og- 10-2)

References: Michaelsen (1900), Easton (1981), Blakemore (2003, 2010).

***Amynthas* cf. *irregularis* (Goto & Hatai, 1899)**

UMUTZ-Ann-Og-10-2

Type status: Non types.

Locality: University of Tokyo campus.

Date: 明治 29/7/? [=July,1896].

Collectors: ?

No. of specimens: At least 1.

Label information: 大学構内 Tokyo University campus; “10 % Picric acid Supporting in moist chamber for 3 days” (Fig. 2).

Condition: Fair (none previously dissected, one mature dissected by RJB 17/II/2011).

Remarks: See the remarks of UMUTZ-Ann-Og-10-1.

References:

Amyntas sp.

UMUTZ-Ann-Og-40

Type status: Non type.

Locality: Akita-ken.

Date: Taisho (=>1912~1926).

Collectors: ?

No. of specimens: 1.

Label information: In Japanese.

Condition: Poor (macerated).

Remarks: The poor condition of the specimen makes identification difficult and evidence from the label precludes Goto & Hatai type status.

References:

Amyntas sp.

UMUTZ-Ann-Og-14

Type status: Non types.

Locality: Naze, Amami, Ryukyu

Date: 明治 42/4/12 [=12 April, 1909].

Collectors: 乘野.

No. of specimens: ~10 large.

Label information: 琉球奄美大島名瀬 (Label is same format as that in jar #16).

Condition: Good (none dissected).

Remarks: Not types because collected after 1899 and Goto & Hatai did not describe any species from the Ryukyus.

References:

Amyntas sp.

UMUTZ-Ann-Og-21

Type status: Non type.

Locality: Ako, Taiwan.

Date: 明治 44/5/30 [30 May, 1911].

Collectors: 渡瀬、朴澤、安田 (Watase, Hozawa, Yasuda).

No. of specimens: 1.

Label information: 台湾阿候乃東港街 [Ako,Taiwan].

Condition: Fair (aclitellate sub-adult, rehydrated and undissected).

Remarks: Not types as collected after 1898 from Taiwan.

References:

Amyntas sp.

UMUTZ-Ann-Og-32

Type status: Non types.

Locality: Okinawa Agricultural School, Nago, Ryukyus.

Date: 明治 42/4/2 [=2 April, 1909].

Collectors: 乗野.

No. of specimens: Several.

Label information: 琉球沖繩名護農学校内 (Nago Agricultural School, Okinawa, Ryukyus).

Condition: Fair.

Remarks: Non types as collected after 1899 and Goto & Hatai had no Ryukyu names.

References:

Amyntas sp.

UMUTZ-Ann-Og-23

Type status: Non types.

Locality: Tokyo.

Date: 27/05/1903.

Collectors: ?

No. of specimens: 2 matures.

Label information: "No. 204"; "*Perichaeta* in copula May 27 1903 Tokyo"

Condition: Fair (flaccid, neither dissected).

Remarks: Not types as collected after 1899.

References:

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-25-2

Type status: ?

Locality: ?

Date: ?

Collectors: ?

No. of specimens: Ca. 30 (mostly matures, none dissected).

Label information: Illegible therefore material status indeterminate.

Condition: Fair (odor of formalin preservation but many specimens macerated).

Remarks: No identification labels found. The jar includes three echiuran specimens and one *A. cf. carnosus* (UMUTZ-Ann-Og-25-1)

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-20

Type status: Non types.
Locality: Izuhara, Tsushima, Nagasaki
Date: 明治 36/9/29 [=29 Sept., 1903].
Collectors: ワタセ、ヤスダ [Watase, Yasuda].
No. of specimens: 3~4.
Label information: 厳原 [Izuhara, Tsushima, Nagasaki].
Condition: Good.
Remarks: Not types as collected after 1899.
References:

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-3

Type status: Non types.
Locality: Okinawa.
Date: 明治 42/4/2 [=1910].
Collector: 乗野
No. of specimens: Many.
Label information: 沖縄農学校 Okinawa Agricultural School.
Condition: Good.
Remarks: Unidentified megascolecid species, not Goto & Hatai (1898, 1899) types because collected after 1899 and, moreover, they do not name any Okinawan species.
References:

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-7

Type status: Non types.
Locality: Kiirun, Taiwan.
Date: 明治 32/7/8 [=8 July, 1899].
Collectors: ?
No. of specimens: Several.
Label information: 基隆石 [Kiirun, Taiwan].
Condition: Poor (macerated and wet in tight jar).
Remarks: Unidentified. Not Taiwan types because collected after 1898.
References:

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-8

Type status: Non types.
Locality: Koushun, Taiwan.
Date: 明治 32/7/27 [=1899].

Collectors: ?
No. of specimens: 2.
Label information: 恒春 [Koushun, Taiwan].
Condition: Poor (dried posterior portions only).
Remarks: Not Taiwan types because collected after 1898.
References:

Amyntas/Metaphire spp.

UMUTZ-Ann-Og-9-3

Type status: Non types.
Locality: Teraso, Taiwan.
Date: 明治 32/7/30 [=30 July, 1899].
Collectors: ?
No. of specimens: ~7 including 3 'tails'.
Label information: テラソ (Mtn.) Teraso, Taiwan.
Condition: Good (none previously dissected but one damaged).
Remarks: Not Taiwan types because collected after 1898. The jar contains one *Amyntas* cf. *catenus* (UMUTZ-Ann-Og-9-1) and one *A.* cf. *corticis* (UMUTZ-Ann-Og-9-2)
References:

Family Lumbricidae

Eisenia fetida (Savigny, 1826)

UMUTZ-Ann-Og-1

Type status: Non types.
Locality: ?
Date: ?
Collector: ?
No. of specimens: 2.
Label information: None.
Condition: Dried.
Remarks: A common exotic lumbricid species often recorded from Japan.
References: Easton (1981); Blakemore (2003, 2010).

UMUTZ-Ann-Og-13

Type status: Non types.
Locality: ?
Date: ?
Collectors: ?
No. of specimens: 5 (four mature, one immature).
Label information: None.

Condition: Fair (some previously dissected).

Remarks: No label.

References:

UMUTZ-Ann-Og-24

Type status: Non types.

Locality: Kofu, Kai (Yamanashi Pref.).

Date: ?

Collectors: ?

No. of specimens: 2 + 7 cocoons.

Label information: “*Allolobophora foetida*” (sic – the old taxonomic name).

Condition: Fair (two matures, one dissected, plus cocoons).

Remarks:

References:

UMUTZ-Ann-Og-31

Type status: Non type.

Locality: ?

Date: ?

Collectors: ?

No. of specimens: 1 mature.

Label information: None.

Condition: Good.

Remarks: Already noted above.

References:

UMUTZ-Ann-Og-39

Type status: Non types.

Locality: Tokyo, Koishikawa (Tokyo Univeristy Botanical Gardens?).

Date: 明治 39/4/? [=April, 1906].

Collectors: 内山 (Uchiyama)

No. of specimens: Many (~30).

Label information: “*Eisenia* sp.” “東京小石川”(Koishikawa, Botanical Gardens?)

Condition: Good.

Remarks:

References:

UMUTZ-Ann-Og-33

Type status: Non types.

Locality: Tokyo.

Date: May 1st, 190?.

Collectors: ?.
No. of specimens: 5 plus cocoon.
Label information: "Allolobophora foetida Loc. Tokyo Date: May 1st 190..."
Condition: Good.
Remarks: As already noted above.
References:

Family unidentified
Megadriles (unidentified)

UMUTZ-Ann-Og-4

Type status: ?
Locality: Tokyo.
Date: ?
Collector: ?
No. of specimens: Two or more.
Label information: Illegible.
Condition: Poor ("soup").
Remarks: Unidentified species.
References:

UMUTZ-Ann-Og-6

Type status: Non types.
Locality: Horisya, Taiwan.
Date: 明治 44/5/22 [=22 May, 1911].
Collectors: 渡瀬、朴澤、安田 Watase, Hozawa, Yasuda.
No. of specimens: About 10.
Label information: 南投? 埔里社 Horisya, Taiwan
Condition: Poor (dried and moldy in broken jar).
Remarks: Not Taiwan types because collected after 1898.
References:

UMUTZ-Ann-Og-12

Type status: Non types.
Locality: Shuri, Okinawa
Date: 明治 42/4/? [=April, 1909].
Collectors: 古田誠(乗野) Makoto Furuta.
No. of specimens: Numerous.
Label information: 沖縄首里 Okinawa Shuri.
Condition: Poor (dark 'soup').
Remarks: Not types because collected after 1899.

References:

UMUTZ-Ann-Og-15

Type status: ?

Locality: ?

Date: ?

Collectors: ?

No. of specimens: Many.

Label information: None.

Condition: Fair (none previously dissected).

Remarks: No label.

References:

UMUTZ-Ann-Og-16

Type status: ?

Locality: ?.

Date: ?

Collectors: 乗野.

No. of specimens: ~10 large.

Label information: ? 島砂地 [?? Island, sandy bottom (Ryukyus?)]. Label is same format as that in jar #14.

Condition: Poor (dried).

Remarks: Label partly illegible. Not Goto & Hatai types as from the Ryukyus.

References:

UMUTZ-Ann-Og-19

Type status: Non types.

Locality: Ryukyus.

Date: 明治 42/4/? [=April, 1909].

Collectors: 波江、安田 (Namiye, Yasuda).

No. of specimens: Several.

Label information: Partly illegible, 琉球沖?山附近 (Ryukyus, Okinawa?) 降雨後洗い出されしもの (washed out by rain).

Condition: Poor (a clump of mixed dried worms).

Remarks: Non type status determined by collection from Ryukyus after 1899 by Yasuda.

References:

UMUTZ-Ann-Og-37

Type status: Non types.

Locality: Saikyo..., Kikkuchi (Kumamoto, Kyushu).

Date: 1887-1889.

Collectors: ?

No. of specimens: Many mixed together.

Label information: "Bipalium Saikyo... Kikuchi Summer of 1887 – 1889 90% Alcohol"

Condition: Dried and not much apparent differentiation value.

Remarks: The jar includes some possible planarians. Planaria are often predators of *Oligochaeta* species but neither could be confirmed from this dried mass.

References:

UMUTZ-Ann-Og-38

Type status: Non types.

Locality: Okinawa Island, Ryukyus.

Date: 明治 42/4/5 [=5 April, 1909].

No. of specimens: Several.

Label information: "琉球沖繩貝納 (Kaino, Okinawa Island, Ryukyus)"

Condition: Reasonable.

Remarks: Date and location auger against any type status.

References:

UMUTZ-Ann-Og-30

Type status: ?

Locality: ?

Date: ?

Collectors: ?

No. of specimens: Many.

Label information: Illegible.

Condition: Fair (formalin).

Remarks: Label data insufficient to warrant sorting and description of materials.

The jar includes some echiurans and cnidarians.

References:

Acknowledgments

The authors are grateful to Dr Eijiro Nishi, Faculty of Education & Human Sciences, Yokohama National University (YNU) for initial access to the material. Dr Toshiaki Kuramochi of National Museum of Nature and Science, Tokyo has helped to facilitate earthworm taxonomic progress. We also give thanks to the staff of The University Museum, The University of Tokyo for their assistance to the study and financial support.

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Table 1. Most critical errors and mistakes in Goto & Hatai's Japanese worms, all initially described in currently defunct genus *Perichaeta* Schmarda 1861

#	Genus	species	Date: page	Error statement	Actual situation and synonymy
1	<i>Metaphire</i>	<i>sieboldii</i> (Horst)	[1898: 65]	Spermathecae in 5/6/7/8	6/7/8/9, see <i>M. communissima</i>
2	<i>Amyynthas</i>	<i>fuscatus</i>	(1898: 66)	*Spermathecae in 6-9 or in 5-7	<i>A. fuscatus</i>
3	<i>Amyynthas</i>	<i>campestris</i>	(1898: 67)	*Spermathecae in 8 & 9 or in 6-8, dorsal pores in 13/14 or 12/13	= <i>Amyynthas robustus</i> (Perrier, 1872)
4	<i>Amyynthas</i>	<i>kamakurensis</i>	(1898: 68)	One specimen described from "Kamakura, Tokyo"	<i>Amyynthas gracilis</i> (Kinberg, 1867)?
5	<i>Amyynthas</i>	<i>parvulus</i>	(1898: 68)	*Prostates absent (69) or present in 18 (Tab.)	<i>Amyynthas gracilis</i> (Kinberg, 1867)
6	<i>Amyynthas</i>	<i>heteropodus</i>	(1898: 69)	Spermathecal pores shown as markings	? <i>Amyynthas corticis</i> (Kinberg, 1867)
7	<i>Amyynthas</i>	<i>obscurus</i>	(1898: 70)	Spermathecae figured as genital markings	<i>Amyynthas gracilis</i> (Kinberg, 1867)?
8	<i>Amyynthas</i>	<i>scholasticus</i>	(1898: 70)		<i>Amyynthas gracilis</i> (Kinberg, 1867)?
9	<i>Amyynthas</i>	<i>decimpapillatus</i>	(1898: 71)		<i>Amyynthas gracilis</i> (Kinberg, 1867)?
10	<i>Amyynthas</i>	<i>flavescens</i>	(1898: 72)		<i>Amyynthas gracilis</i> (Kinberg, 1867)?
11	<i>Amyynthas</i>	<i>productus</i>	(1898: 73)	Male pore presence or absence confused	<i>A. micronarius</i>
12	<i>Amyynthas</i>	<i>micronarius</i>	(1898: 74)	Male pores shown with 10 setae between but said to be only 8	<i>A. micronarius</i>
13	<i>Amyynthas</i>	<i>vittatus</i>	(1898: 74)	Genital markings confused with spermathecae	<i>A. vittatus</i>
14	<i>Amyynthas</i>	<i>grossus</i>	(1898: 75)		= <i>Amyynthas fuscatus</i>
15	<i>Amyynthas</i>	<i>schizoporus</i>	(1898: 76)	Genital glands confused with spermathecal diverticula	<i>Amyynthas tokioensis</i> (Beddard, 1892)?
16	<i>Amyynthas</i>	<i>irregularis</i>	(1899: 13)	Setae confused as either 61, or 51 on 17	? <i>Amyynthas tokioensis</i> (Beddard, 1892)?
17	<i>Amyynthas</i>	<i>izukai</i>	(1899: 14)	No caeca	Simple caeca present; = <i>Amyynthas fuscatus</i>
18	<i>Amyynthas</i>	<i>carnosus</i>	(1899: 15)	Spermathecae in 5/6/7/8 (i.e. in 6-8) or in 7-9	Spermathecae in 5/6/7/8/9 (i.e. in 6-9); <i>A. carnosus</i>
19	<i>Amyynthas</i>	<i>shimaensis</i>	(1899: 15)		Simple caeca present; = ? <i>Amyynthas fuscatus</i>
20	<i>Metaphire</i>	<i>acincta</i>	(1899: 16)	Clitellum absent!	Clitellum present; <i>M. acincta</i>
21	<i>Amyynthas</i>	<i>agrestis</i>	(1899: 17)	Goto & Hatai (1899: 23) missed <i>A. agrestis</i> manicate caeca	<i>A. agrestis</i>
22	<i>Amyynthas</i>	<i>parvicystis</i>	(1899: 18)	Spermathecal pores and markings confused; G & H (1899: 23) missed <i>A. parvicystis</i> manicate caeca	<i>Amyynthas tokioensis</i> (Beddard, 1892)?
23	<i>Metaphire</i>	<i>glandularis</i>	(1899: 18)	Markings mid-7 (miscounted) and glands near SP and MP	<i>Amyynthas tokioensis</i> (Beddard, 1892)?
24	<i>Amyynthas</i>	<i>levis</i>	(1899: 20)	Papillae around spermathecal pores confused.	Mid-8 and doubtfully glands near those pores; = <i>M. hilgendorfi</i>
25	<i>Metaphire</i>	<i>megascolidioides</i>	(1899: 21)	Multiple intestinal caeca misdescribed	<i>Amyynthas tokioensis</i> (Beddard, 1892)?
26	<i>Metaphire</i>	<i>vesiculata</i>	(1899: 21)	Spermathecal pores in 6/7/8 – but maybe a mistake (as for <i>P. parvicystis</i>)?	<i>M. megascolidioides</i> <i>M. vesiculata</i>
27	<i>Metaphire</i>	<i>communissima</i>	(1899: 23)	See <i>M. sieboldi</i>	<i>M. communissima</i>

* Errors indicated by Horst (1889: 242); SP, MP – spermathecal and male pores.

Plate 1

Figure 1. Syntypes of *Perichaeta levis* Goto & Hatai, 1899, (UMUTZ-Ann-Og-34). a) syntypes in the original jar; **b)** dissected and undissected syntypes and a label inside the jar; **c)** a label attaching outside the jar.

Figure 2. Syntypes of *Perichaeta communissima* Goto & Hatai, 1899, (UMUTZ-Ann-Og-26). a) syntypes in a new jar; **b)** a label inside the original jar; **c)** a label attaching outside the original jar; **d)** another label inside the original jar.

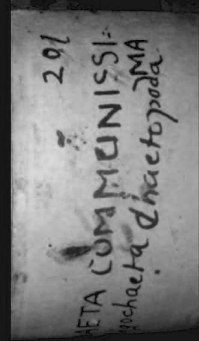
1a



1b



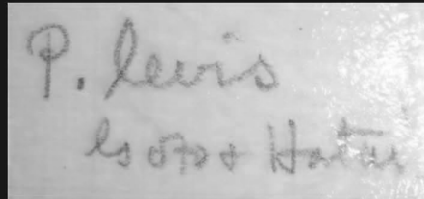
1c



2a



2b



2c



2d

