

Dicranocentroides Imms, 1912

Type Species: *Dicranocentroides fasciculatus* Imms, 1912

The genus is characteristic with its well developed tuft of ornamental setae on antennal segments. In reality, however, it is not far different from *Callyntrura* and may be regarded a satellite genus of it adapted to exhibit mimicry to jumping spiders. On the head frontal spines are present in 4 pairs. Chaetal pattern is almost the same and v-group is rather reduced (v_6, v_3 absent) as in case of *Borneaphysa*. Labral setae are 4/5,5,4 and with 4 marginal tubercles, but the prelabral setae are smooth and not feathered in contrast to *Callyntrura*. On the trunk the chaetal pattern is also in the same scheme having a transverse median row on abd.IV. Only the posterior group of the segment is arranged in V-shape (fig. 20, E) and not in a cluster. Ventral tube has no s.s.-like setae, but with some long, smooth setae. Dens is with dental spines, but without distal appendix. Mucro is broader than in *Callyntrura*. Thus the genus is more related to *Borneaphysa* than to *Istanaphysa* in general.

From the tropical Asia following species have been reported.

<i>Sira plumicornis</i> Parona, 1892	Burma
<i>Dicranocentroides fasciculatus</i> Imms, 1912, Yosii 1966	India
<i>Paronella crassicornis</i> Carpenter, 1917	Burma, India
<i>Dicranocentroides argentatus</i> Schött, 1925	Borneo
<i>Dicranocentroides longiceps</i> Handschin, 1925	Sumatra
<i>Dicranocentroides coomani</i> Delamare, 1948, Yosii 1961	Vietnam, Thailand

According to Mitra 1974 *Paronella travancorica* Imms, 1912 and *Aphysa indica* Handschin, 1929 must be included in this genus although the tuft of antennae are not witnessed. Even when the thick bundle of antennal setae is absent, the genus may be easily defined by the smooth prelabral setae. Possibly *Callyntrula brevicornis* Yosii, 1959 of Singapore may also belong to the same category.

Dicranocentroides argentatus Schött., 1925

Fig. 20

Sepitok Laut (1 ex. 10.III 1979, Saikoh Lantoh), Ulu Segama (3 ex. 5.VII 1980, m.), Kinabatangan (2 ex. 6.VII 1980, m. et Dius Tadong)

Body length up to 5.0 mm. Ground colour lightly castaneous. Posterior part of abdomen is broadly banded black. Antennae are brownish on proximal two segments, but they are heavily black by the tuft of blackish setae. Distal two antennal segments are pale, almost colourless. Legs are brownish up to the femur as in the ventral tube, while tibiotarsi and furca are pale. Antennae short, ant.I: head as 28:30 and ant. segm. ratio as 28:25:20:30. Ant.I and II are thick, plumose with many long setae especially well developed on their dorsal side. As they are heavily pigmented black two segments look like a brush bundle in appearance. Scales are seen only on the dorso-proximal part of these segments. Both ant.III and IV are with small setae, unscaled and ant.IV is faintly annulated in full mature examples. Eyes 8+8, separately pigmented. Frontal spines 4+4. Labrum with setae

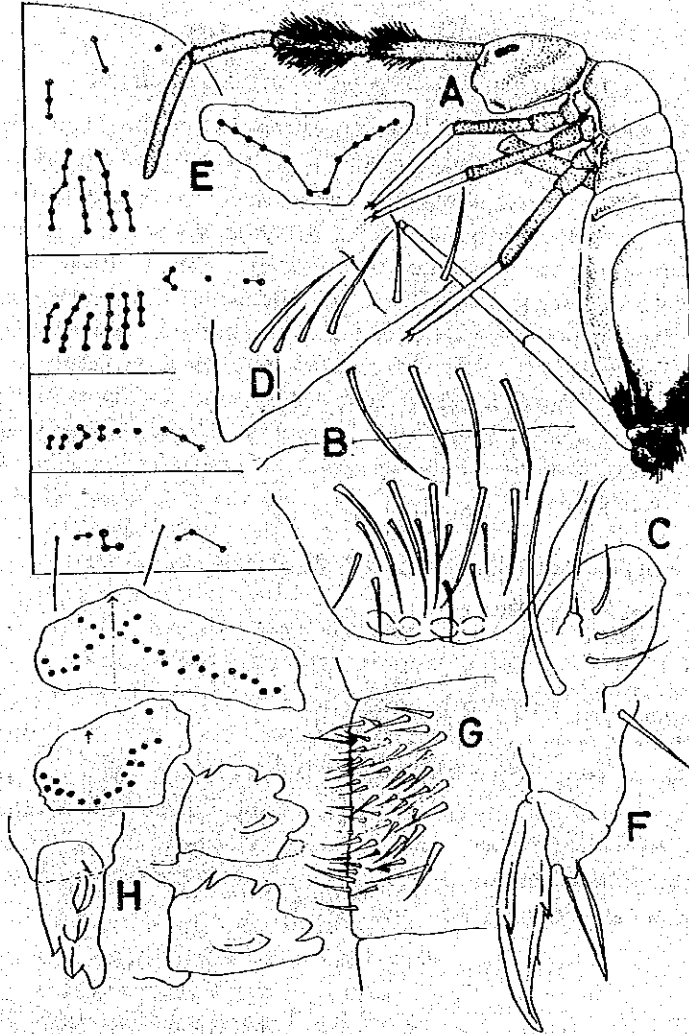


Fig. 20 *Dieranocentroides argentatus* Schött from Kinabatangan

A: Habitus, B: Labrum, C: Outer ramus of maxilla, D: Labial basis, E: Chaetal pattern of the head, th. II-abd. II, and abd. IV (med. post.), F: Hind claw, G: Trochanteral organ, H: Mucro in dorsal and lateral view.

4/5,5,4, prelabral setae smooth and no labral setae are turned to blunt ones. Labral margin has 4 large tubercles. Basal seta of outer maxillary ramus is not blunt and in form of usual long seta. Basal setae of labium are as mmre/11, so that all of them are smooth and m_2 , r are smaller than others. Legs are scaled up to femur and all tibiotarsi have several very long setae on all sides. Unguis is with a pair of dorsal, a pair of inner basal and one inner distal teeth. Unguiculus is lanceolate and untoothed. Tenent hair is long and triangularly spatulate distally. Opposite seta of hind-leg seems to be rather short, but thickly built. Trochanteral organ is composed of more than 60 spiny setae in a quadrangular area. Ventral tube is long. Distal setae of the anterior face is not much thicker than others. Posterior face has no s.s.-like setae but with several long setae, which are quite smooth.

Lateral flap is beset with many all smooth setae. Terminal vesicle has a diverticulum. Furca is with man.:d. as 35:40. Manubrium is ventrally scaled and dorsally hirsute, some of the setae are elongate and both these setae and scales are becoming larger near the dental end. Dens is also scaled ventrally and setose dorsally. There are many (more than 80) smooth, hyaline spines on its dorso-inner side in two irregular longitudinal rows. Mucro is short, rounded, with 6 teeth, but all of them are broad and better to be mentioned as lobes with the exception of a proximal dorsal one, which remains pointed.

Chaetal arrangement is near *Borneaphysa* of *Callyntrura*. On the head v-group has no v_0 nor v_3 . That of the trunk is formulated as:

th.II.:	ant. 3/2/1,	post. 6,4,5,3.
th.III.:	ant. 3/1/2,	post. 4,5,3,5,5,3.
abd.I:	11/3.	abd.II: s/2+3/s/3.
abd.IV:	median group in two incomplete zones. posterior group ca. 10+10.	

Our examples coincide well with the Schött's figure and description of the species from Sarawak. Absence of v_0 and v_3 on the head and presence of 3 setae on lateral group of abd.II indicates the relationship with *Borneaphysa*, while the presence of scales on antennae and legs, absence of s.s.-like setae of ventral tube and presence of dental spines indicate its close relationship to *Istanaphysa*. Endemic to Borneo (Sabah, Sarawak)

Microparonella Carpenter, 1916

Typical species: *Microparonella caerulea* Carpenter, 1916
syn. *Lepidonella* Yosii, 1964

Body rather small for the family, not exceeding 2.0 mm. Antennae short and almost like *Lepidocyrtus* in appearance. Antennae not scaled except on dorsal side of ant.I. Ant.III-organ is not detected. Ant.I-organ is reduced to some 4-5 setae. Head is devoid of frontal spines and macrosetae are restricted to the antennal group and one pair of D as others are reduced. Labral setae 4/5,5,4. Prelabral setae thick and plumose. Labral margin with 4 large tubercles. Legs not scaled. Trochanteral organ with fewer number of setae in L-arrangement. Tenent hair spathulate, not ciliate. Unguiculus truncate. Ventral tube not scaled. Tenaculum with quadridentate rami and one large anterior seta. Furca not elongate, ventrally scaled. Dens bears two rows of strong spines all through the length. Terminal vesicle absent. Mucro quadridentate, the apical two are subequally conspicuous and other two are laterally situated. Dens is not crenulated. Chaetotaxy is typically paurochaetotic and no macrosetae are on the trunk. Scales are hyaline, rounded and almost without striae. s.s. are in 2,3,2 pairs on abd.II-IV, very long and beset with accessory scales near their basis, whose arrangement seems to be constant in all specimens examined.

How to discriminate *Microparonella* from *Paronella* is not yet fixed as the type species of the latter genus, *P. fusca* Schött, 1891 is poorly known for us. Since it is very large species attaining 4.0 mm in length, it would have many macrosetae on the trunk just as

Paronella bougainvilleae Yosii, 1960. Besides the unguiculus of *P. fusca* is elongate and lanceolate, while that of *Microparonella* spp. are all truncate. Provided that it is different we may enumerate following Asiatic species to *Microparonella*:

Sira annulicornis Oudemans, 1889

Microparonella caerulea Carpenter, 1916

Microparonella seychellensis (Salmon, 1964) = *Microparonella flava* Carpenter, 1916

Microparonella ceylonica Yosii, 1966; Gapud 1971

Paronella subcarpenteri Denis, 1941

Microparonella duodecimoculata Prabhoo, 1971

All these species have been described after the pattern of the body and by the minute structural difference of no great meaning. Sabahan specimens show all varieties of the colour pattern of the body, but I could not find any decisive character to separate them from many other species. At present all of them must be placed in one species under the name of *M. annulicornis* (Oud.).

***Microparonella annulicornis* (Oudemans, 1889) Fig. 21**

Sira annulicornis: Oudemans 1889

Paronella annulicornis: Schött 1903, Handschin 1925, 1926, 1928, Denis 1941.

Brumas nr. Tawau (7 ex. 18. VII 1979, m.), Sepilok (2 ex. 28.VIII 1978, m.), Sandakan (20 ex. 26. XII 1979, m.).

Body length ca. 2.0 mm. Ground colour white. Antennae are diffusely dark on their distal half of ant. II, III and on the whole of ant. IV. Ant. I is not pigmented. Head has a light band connecting eyes. Trunk is with a dorsal patch at the middle of abd. IV. Other parts of the body and extremities are quite pale. Ant.: head as 10:6. Ant. segm. ratio as 10:30:25:36. Only the dorsal side of ant. I is scaled, but the scales are the flattened setae and not the real scales. Labrum with setae 4/5, 5, 4, prelabral setae heavily barbed. Labral margin has 4 large tubercles. Setae of labial basis is as MMM(r)E/LL where r is vestigial and all others are a little inflated at the middle. Eyes 6+6, intensely black. Legs not scaled. Trochanteral organ is composed of ca. 18 setae in L shape. Ventral tube is not scaled, but with many setae on both faces and on lateral flaps. Terminal tubule is with a small diverticulum. Unguis has a pair of inner basal teeth well developed together with 2 inner distal teeth. Unguiculus is diverging and truncate on its inner side. Furca is in ratio as man: d=1:1. Manubrium and dens are ventrally scaled. Dens bears two rows of spines from the basis up to near the mucronal end. Spines of the inner row are stronger and more regularly arranged than of the outer row. Mucro is quadridentate, the apical two teeth are large and subequal, other two are small cuspidately pointed and lateral to the mucro in position. Body surface is covered with hyaline, rounded scales of *Lepidocyrtus* type. Setae sensuales are well represented and long, accompanied with some accessory scales, whose arrangement is as in fig. 1.

The specimens at hand are almost concordant with the description of Oudemans in 1889 from Java in colour pattern, but antennae are not distinctly patched and a patch on abd. IV is not in one pair, but in one continuous transverse band. All Sepilok examples have the transverse band of abd. IV continuous up to the sides of the body and in a few examples among them the lateral margins of th. II and III as well as the coxae of all legs are also patched.

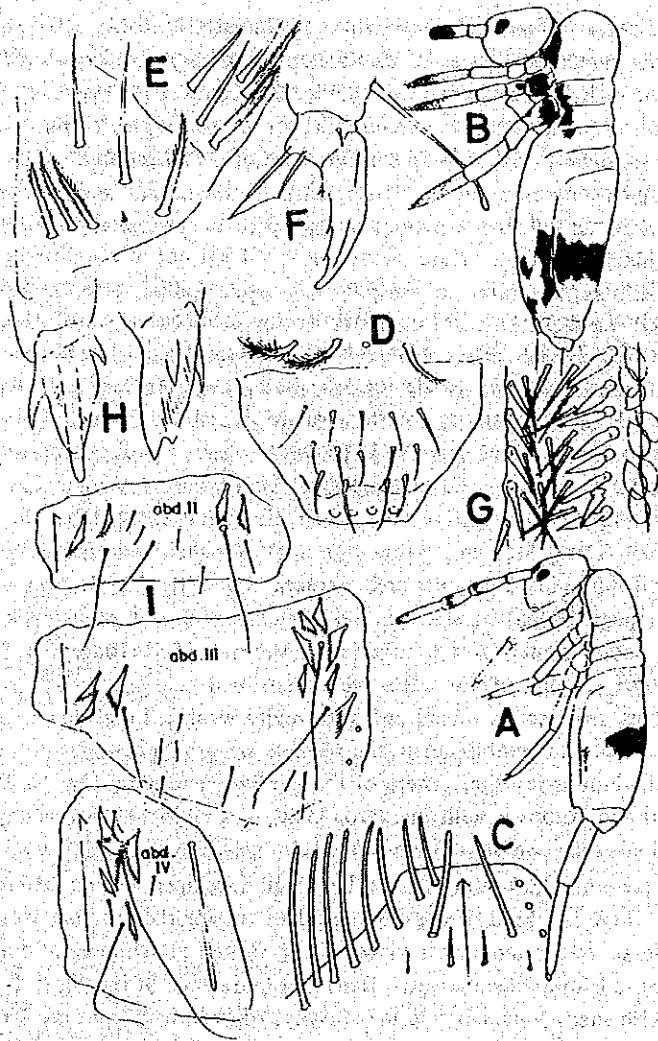


Fig. 21 *Microparonella annulicornis* (Oudemans) from Sandakan

A, B: Habitus, C: Frontal margin, D: Labrum, E: Labial basis, F: Hind claw, G: Dental spines (dorsal view), H: Mucro (dorsal and lateral view), I: s.s. and accessory scales of abd. II-IV.

***Bromacanthus* Schött, 1925**

Typical species: *Bromacanthus handschini* Schött, 1925
 syn. nov. *Handschinella Yosii*, 1959

The genus is well characterized with the femoral organ on hind legs. The difference to *Pseudoporonella* Hds., 1925 is not restricted to the presence of this organ as the chaetal

pattern is clearly different. *Bromacanthus* is almost achaetotic, while *Paronella appendiculata* Schött, the type species of *Pseudoparonella* has many large setae on the trunk as may be seen in Schött's figure (Taf. 2, Fig. 5). There is no reason to place *P. setigera* (Börner) and *Bromacanthus handschini* Schött in the separate genus. Accordingly the genus *Handschinella* Yosii, 1959 falls in synonym of *Bromacanthus*.

Three species of the genus have been detected from Sabah and the common characters among them are as follows: Antennae scaled up to the proximal part of ant.IV. Eyes 8+8, intensively black and their arrangement (fig. 22, E) is not in two longitudinal rows as in other Paronellidae, but rather of *Entomobrya* type. Labral setae 4/5,5,4, prelabral setae plumose. Labral margin with 2+2 marginal tubercles, the outer pair of which is rather transversely long (fig. 22, B). Setae of labial basis is different according to species and furnishes the most reliable character to distinguish them. Legs are scaled up to the tibiotarsus. Unguis (fig. 24, C, D) is long and with a pair of dorsal and 3 inner teeth, the basal one of the latter is in one pair and near the basis, while others are distal in position. Unguiculus is heavily truncate on fore- and mid-legs and either truncate or almost lanceolate on hind-legs. As in case of *Callyntrura* (cf. Mitra, 1974) the young example has the truncate type of it. Tenent hair is very long and clubbed on apex. Trochanteral organ is composed of more than 40 small spines in a triangular area. Femoral organ (fig. 23, G) is represented by ca. 40 blunt setae, longitudinally arranged in 3-4 irregular rows, each of which is brownish, finely barbed and spoon-shaped in a peculiar way. Ventral tube is long, anterior face is scaled and with some slender, ciliate setae, whose terminal ones are in 4-6 pairs and strongly brownish. Posterior face is scaled and with many weaker, long, ciliate setae. Lateral flap bears both ciliate and smooth setae, the formers are proximal in position. Terminal tubule has a diverticulum as in other genera of the family. Tenaculum (fig. 24, H) is with quadridentate rami and corpus is with one strong, ciliate seta. Manubrium is dorsally with many long, feathered setae and ventrally covered with scales. No lateral row of setae is differentiated. The terminal thickening (fig. 24, F) is well developed, but no different according to the species. There is a kind of organ to be called "manubrial terminal organ" composed of 3+3 small setae at the innermost place of the forked attachment of the pair of dentes, whose structure is sometimes specific. Dens is as in diagram of fig. 24, E, F, it is scaled ventrally and with many long, ciliate setae dorsally. Among them there are 4 rows of modified setae, two on outer and two on inner side. The most conspicuous is a smooth "dental spines" of the inner side, which is either simple or compound and accompanied by a row of small, smooth setae below it. The alike row is present on the outer side, but setae are finely ciliated and there is a row of larger, ciliated setae above it. Some setae near the mucro are larger, but they are not so well differentiated as in *Pseudoparonella* and may easily fall off. Mucro (fig. 22, H) is broadly bidentate and with a spoon-like process of dentes ventrally.

Chaetotaxy is reduced. On the head v-group is quite absent and macrosetae are restricted only along the antennal basis in 6+6 and on the frontal margin, where there are 5 setae in a symmetrical pattern (fig. 22, C). Posterior margin of the head capsule is only with ca. 5+5 small, smooth setae in a row. Th.II is surrounded marginally with a row of long setae, slender and faintly ciliate, but there is none in the inside of the segment. Th.III has some 3-5 such setae on postero-lateral corner only. Abd.I is without setae and on abd.II-IV there may be found well developed s.s. 2,3,2 in number, each of which is accompanied with the brownish patellate accessory scales near the basis and their arrange-

ment is as in fig. 23, C, D, E. This pattern is not different among the species treated here. Abd.II has one slender seta just lateral to s.s.₂. Abd.III has some 3 of them near s.s. group. On abd.IV there are many of them on postero-ventral portion of the segment and also on abd.V and VI. Sometimes there may be found extra s.s. posteriorly on abd.IV, but there is no patellate accessory scales for it. Coxa and subcoxa of each legs have many setae, but their arrangement is not well orientated. Scales of the body are all hyaline, ovate and minutely striated as in *Lepidocyrtus*, although some of them are densely coloured and dark.

At first I have regarded all representatives of Sabah as *Brom. setigerus* (Börner), but later on, since I have found the difference of the chaetal pattern of labial basis, which is linked with the difference of the body marks and others, it is necessary to divide them into species. To the commonest one I give the name *B. setigerus* described from Java and all previous data about the occurrence of this species from various places of Asia must be checked once again with respect to their specific characters. Even after careful researches with rich materials from various places, very few reliable characters of the species have been found and in the description below, those common characters as stated above have been omitted.

- | | |
|---------------------------------------|--|
| 1. Dental spines simple | 2 |
| Dental spines compound | <i>Bromacanthus handschini</i> Schött, 1925 |
| 2. Setae of labial basis as mm(r)e/11 | <i>Bromacanthus setigerus</i> (Börner, 1906) |
| Setae of labial basis as Mm(r)e/11 | <i>Br. elongatus</i> sp. n. |
| Setae of labial basis as MMrE/11L | <i>Br. flavidulus</i> sp. n. |

Following species are sp. inquirenda for the moment.

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| <i>Pseudoparonella incerta</i> Handschin, 1925 | Java |
| <i>Pseudoparonella nigrofasciata</i> Handschin, 1928 | Java |
| <i>Pseudoparonella orientalis</i> Handschin, 1930 | Philippines |
| <i>Pseudoparonella doveri</i> Carpenter, 1932 | Malaya |

***Bromacanthus setigerus* (Börner, 1906)**

Fig. 22

Paronella setigera Börner, 1906, Imms 1912, Handschin 1925, 1928
Handschinella setigera Yosii 1959

20 m. south of Kudat (20 ex. 5.I 1980, m.), Gum Gum nr. Sandakan (35 ex. 23.X 1979, Saïkeh Lantoh), Kota Kinabalu (4 ex. 5.I 1980, m.), Kota Belud (24 ex. 6.I 1980, m.), Tuaran (15 ex. 4.I 1980; Dius Tadong), Sandakan (55 ex. 22.II 1980, m.), Madai (3 ex. 20.X 1979, Saïkeh Lantoh), Batu Puteh (7 ex. 6.VII 1980, m.)

Body length up to 2.5 mm. Ground colour whitish, banded with black pigments. Head has a median patch between antennae and a longitudinal streak crossing the eyes. Lateral margins of th.II and III are deeply pigmented and it is extending to the subcoxal area and coxa on mid- and hind-legs. Antennae diffusely violet purple, deeper distally. Legs are with a small patch distally on femur and with diffuse pigment on tibiotarsus. Ventral tube and furca pale. Antennae rather short, ant.I: head being as 2:3. Labral setae as 4/5,5,4, prelabral ones feathered. Labral margin with 1+1 oblique tubercles. Labial basis with setae as mm(r)e/11, so that r is vestigial (fig. 22, D). Trochanteral organ is composed of ca. 60 rather small setae. Femoral organ of hind foot is composed of ca. 15-20 short, ciliate setae peculiarly spoon-shaped. Other details as in the description of the genus.

Distribution: Java, Sumatra, Malay, Borneo (nov.), Philippines.

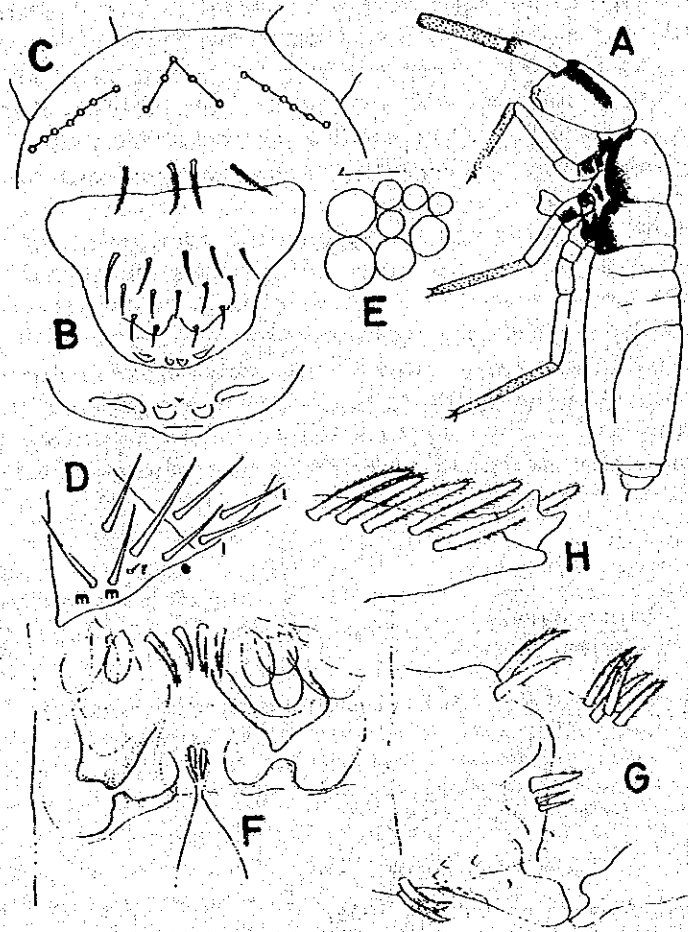


Fig. 22 *Bromacanthus setigerus* (Börner) from Kota Belud
 A: Habitus, B: Labrum, C: Chaetal pattern of the frontal margin of the head,
 D: Labial basis, E: Eyes, F, G: Distal end of manubrium in ventral and lateral
 view.

Bromacanthus elongatus sp. n.

Fig. 23

Gunung Alab (5 ex. 7.I 1980, m. et Dius Tadong). Tamparuli (5 ex. 19.I 1980, m.), Kundasang (14 ex. 5.I 1980, m.), Sepitok (15 ex. 18.X 1979, m.), Mostyn (15 ex. 9.VII 1980, m.)

Body length up to 2.5 mm. Ground colour pure white and with black small patches. Head with a small spot on antennal bases and behind eyes. Trunk is almost white, but with a small marginal patch laterally on th.II. Antennal segments with a small black patch near distal end of each segment. Ant.IV is obscurely pale all over. Legs are with a small spot on coxa I and II, the latter is sometimes larger. Besides the distal end of all femur is with black spot. Ventral tube and furca pale. Antennae long and ant.I: head as 4:3.

Setae of labial basis (fig. 23, B) as Mm(r)e/1L, so that M_1 and L_2 are feathered. Manubrial terminal organ is not different from *B. setigerus*.

Beside the difference of labial basis the species is poorer pigmented than *B. setigerus* and the antennae, furca etc. are much longer and more slender. The form and pattern of the antennae furnishes us the easy separation of two species even under small magnification.

Typus: One female from Kundasang.

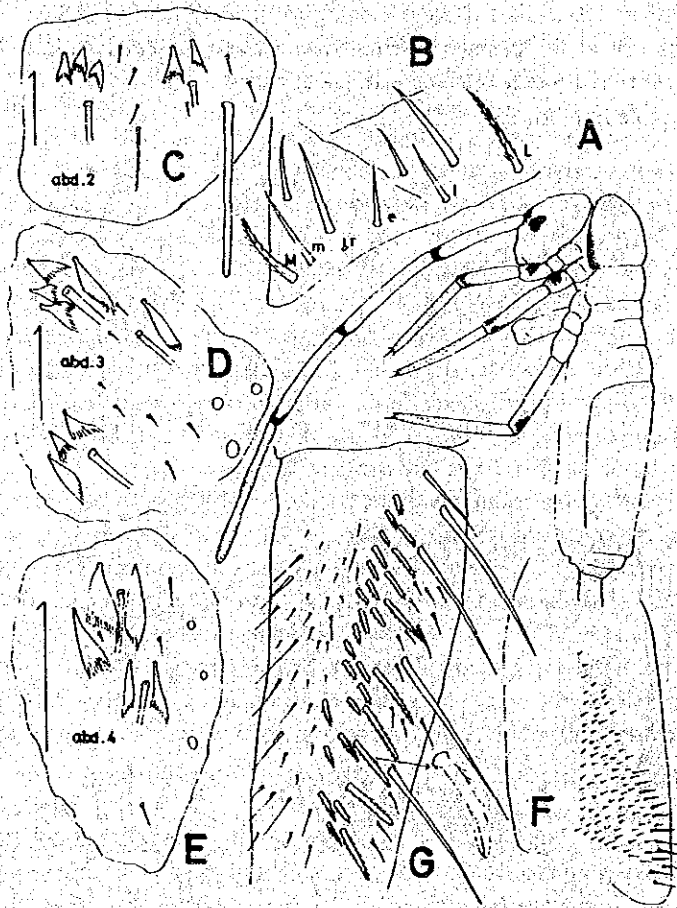


Fig. 23 *Bromacanthus elongatus* sp. n.

A: Habitus, B: Labial basis, C,D,E: Setae around s.s. of abd. II, III and IV,
F: Trochanteral organ, G: Femoral organ.

Bromacanthus flavidulus sp. n.

Fig. 24

Kudat (32 ex. 6.1 1980, m. et Dius Tadong)

Body length ca. 2.5 mm. Colour uniformly white, excepting the narrow band of the antennal basis and black eyes. Antennae slightly dark on distal part of each segment. Legs with faint patch on coxae of fore- and mid-legs. Antennae short, ant. I: head being 20:25 in length. Setae of labial basis (fig. B) is represented as MMrE/LL, so that only the short r is smooth and others feathered. Manubrial terminal organ is composed of 3+3 setae, all of them are equally large and the dorsal pair is ciliate, while others are smooth.

The difference of labial basis is corresponding to the very faint or almost pale body colour. The difference of the manubrial terminal organ is conspicuous in lateral view in transparency. In other respects it is almost the same with *B. setigerus*.

Typus: One male from Kudat.

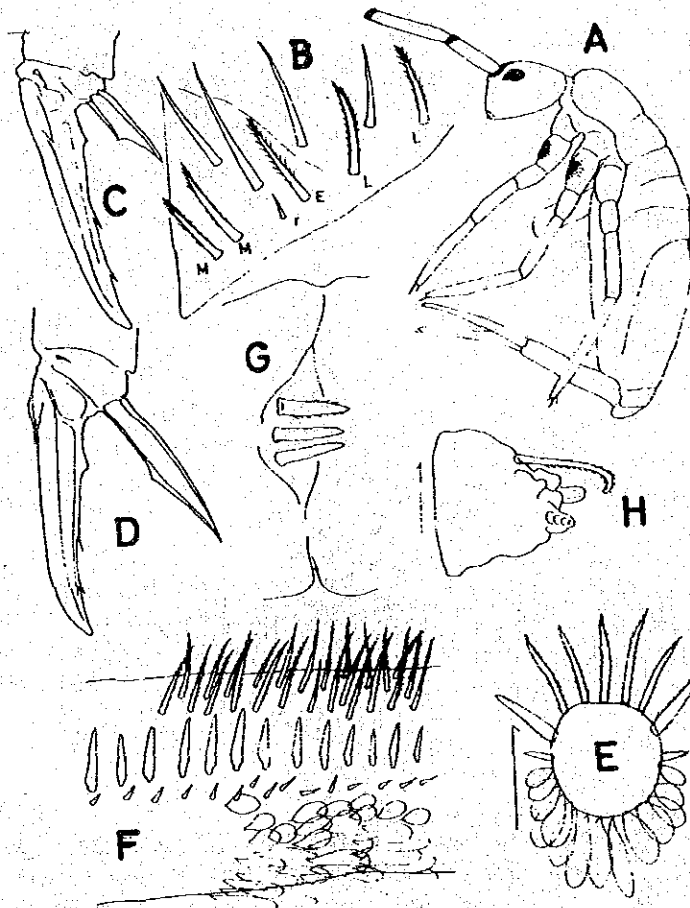


Fig. 24 *Bromacanthus flavidulus* sp. n.

A: Habitus, B: Labial basis, C,D: Fore and hind claw, E: Cross section of the middle of dens (diagrammatic), F: Inner lateral view of dens, G: Manubrial terminal organ, H: Tenaculum.

Salina Macgillivray, 1894

Typical species: *Salina banksi* MacGillivray, 1894

Compared to other places of southeast Asia the genus *Salina* is poorly represented in Sabah both in species and population. In general the colour pattern of the body is variable within one species as in case of *Callyntrura* and depicted form of various species may look quite akin to each other, namely the dorsal side is quite pale and unpigmented, while the ventral side is mottled with black pigments. But there may appear characteristic patches and patterns peculiar to each species on the trunk, when the pigment is well developed. Consequently the pale form is not easy to identify. All such pale forms have been hitherto regarded as *Salina celebensis* by various authors, which is nothing but a dust bin in which many species were put together. Chaetal pattern is possibly the only reliable character to divide them in a reasonable way.

The common characters of these three Sabahan species here reported may be given as follows: Ant.I-organ is present in reduced form. Eyes 8+8, black, arranged in two rows typical for Paronellidae and G, H are smaller than others (fig. 27C). Labral setae (fig. 25 B) are as 4/5,5,4. Prelabral setae barbed, but others are not modified. Labral margin with 4 large tubercles. Basal seta on outer ramus of maxilla is not modified (fig. 25 C). Setae of labial basis (fig. 25 D, 26 C) is reduced to ME/LL, R being quite absent. Unguis (fig. 27 D) with one paired and one unpaired inner tooth and a pair of dorsal teeth. Unguiculus truncate and narrowly lamellate both on outer and inner side in the hind legs at least. Trochanteral organ (fig. 26 D) is composed of ca. 25 small spines, the lateral ones are larger and some 3-5 spines of the same sort are extended to the basal part of the femur in a row. Ventral tube is anteriorly (fig. 25 G) with 4+4 terminal long setae together with 5+5 small ones arranged in a symmetry. Posterior face (fig. 25 H) has 2+2 distal and 6+6 smaller setae also in a symmetry. Each lateral flap bears some larger smooth and some 10 ciliate smaller setae. Terminal tubule is without diverticulum. Tenaculum quadridentate, with one large anterior seta. Dens is without spines, but with a terminal vesicle (fig. 26 E,F,G), which is finely ciliate on the surface. Mucro is broad, tridentate and its form is not very constant.

Body is not scaled. On the head (fig. 25 E) 1+1 frontal spines are always present. From the v-group of setae only v1 and v2 are developed and others are reduced. On th.II (fig. 25 F, 26 H) the marginal setae are differentiated on the dorsum near the median area to form a "marginal group", whose pattern of distribution seems to be specific. Whereas the "anterior group" of the segment is highly specific and most reliable for identification, although the posterior group is quite variable in arrangement more than in case of *Callyntrura*. On th.III the chaetal pattern is more stable than the posterior group of th.II, but still not quite fixed. On abd.I the pattern is fairly constant, but rather group specific. That of abd.II is either s/2/s/1 (*celebensis* group) or s/2/s/2 (*borneensis* group), thus to divide the genus *Salina* into two groups although this division has no concern with the Wallace line. On abd.IV there are 2+2 setae anterior to others (fig. 25 F, 26 I), whose arrangement seems to be fixed to each species. Other setae on the posterior half of the

segment were not well orientated. Male genital field and opening seems to be always as already figured in Yosii (1959, fig. 25 D) for *celebensis*.

Sabahan species may be divided by the chaetal pattern as:

- | | | |
|--|-------|---------------------------------|
| 1. Abd.II with setae s/2/s/1 | | <i>celebensis</i> group |
| | | <i>S. celebensis</i> (Schäffer) |
| Abd.II with setae s/2/s/2 | | <i>borneensis</i> group |
| 2. Anterior group of th.II 3 in number | | 2 |
| Anterior group of th.II 7 in number | | <i>S. borneensis</i> sp. n. |
| | | <i>S. pallens</i> sp. n. |

For the chaetal research of *Salina* fully mature examples are necessary as the integument is very thin and sockets of macrosetae are obscured.

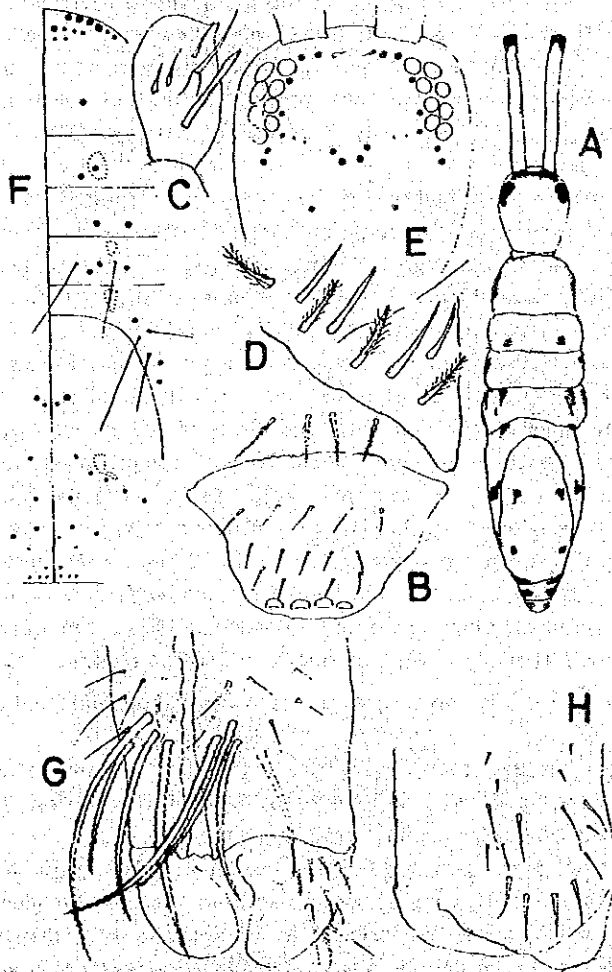


Fig. 25 *Salina celebensis* (Schäffer) from Sepilok
 A: Well pigmented example, B: Labrum, C: Outer ramus of maxilla, D: Labial basis, E,F: Chaetal arrangement.
Salina borneensis sp. n.
 G,H: Anterior and posterior face of ventral tube.

Salina celebensis (SCHÄFFER, 1898)

Fig. 25

Cremastocephalus celebensis Schäffer, 1898

Salina celebensis: Yosii, 1959

Sepilok (34 ex. 14.III 1980, m.), 5 m. Labuk Road, Sandakan (10 ex. 14.III 1980, m.), Kundasan (9 ex. 9.I 1980, m.), Tamparuli (3 ex. 7.I 1980, m. et Dius Tadong), Ranau (6 ex. 13.I 1980, m. et Saikeh Lantoh), Brumas nr. Tawau (5 ex. 25.VII 1980, Y. Yano)

Of this species I have already reported in Yosii, 1959, p.42 based on examples from Singapore to which the Sabahan specimens coincide very well. Colouration of the body shows all gradations from uniformly pale to the spotted examples as in fig. A, although there is no difference in the chaetal pattern and other morphological features. Additional to my previous description is that the marginal group of th.II is reduced to a few transverse rows of setae and abd.II is with setae arranged as s/2/s/1 constantly. In other details observed Sabahan specimens show typical structure of the genus as summarized under the generic diagnosis.

Spotted form of this species is concordant with *S. pallida* var. *punctata* Uchida, 1943 from the southern Japan. *S. celebensis* Schäffer sensu Salmon 1957 in Mitra 1973 of India may represent different species just as *S. affinis* (Folsom, 1899) of Japan.

The species is hitherto reported from various countries, but the sure locations are Malaya, Borneo and Celebes.

Salina borneensis sp. n.

Fig. 25, 26

11 m. Labuk Road, Sandakan (3 ex. 14.III 1980, m.), 5 m. Labuk Road, Sandakan (3 ex. 15.III 1980, m.), Madai (1 ex. 16.VIII 1979, Saikeh Lantoh)

Body length up to 3.0 mm. In well pigmented examples the ground colour is whitish brown, with pale black pigments suffused with brownish colour. Poorly pigmented ones are without dorsal colour pattern and quite pale. Antennae lightly brown, distal end of each segments darker. Head is with black antennal bases and slightly dark lateral margins. Trunk is with the diffusely dark pigmented sides together with dark spots suffused with broader brown pigments. Ventral side is with black pigmented spots. Legs are brownish and with a faint longitudinal stripe. Furca and ventral tube pale. Ant.II:head as 30:25. Furca with man.:d. as 70:90. Chaetal pattern in as in fig. F, where the apical group of th.II is arranged in 4+4 longitudinal rows, each composed of ca. 6 setae. Anterior group of it is usually 3 (rarely 4). Pattern of th.III is not constant, although not much deviated from the pattern given in the figure, while that of abd.I and II is almost stable.

The chaetal pattern and colouration of the body is alike to *S. bengalensis* Mitra, 1973 of India, but the cited species has more number of setae on th.III and on abd.I. Further researches must be made.

Typus: One example from mile 11, Labuk Road, Sandakan.

Salina pallens sp. n.

Fig. 27

Kudat (4 ex. 6.I 1980, m.), Sandakan (3 ex. 10.III 1980, m.), Sepilok (3 ex. 19.IV 1980, m.)

Body length ca. 3.0 mm. Ground colour pale white and there is no pigmented spots and stripes on dorsal side of the body. Antennae and other extremities are quite pale. Ant.I: head is as 40:25, man:d. as 35:38. Eyes are poorly pigmented and each cornea is visible without difficulty (Fig. C).

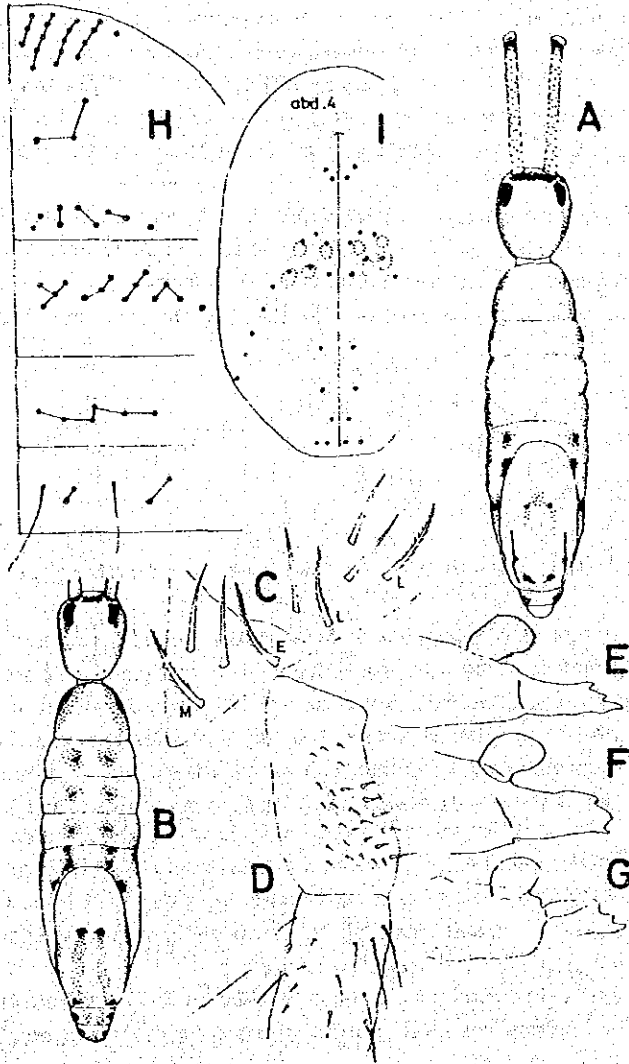


Fig. 26 *Salina borneensis* sp. n.

A: Moderately pigmented example, B: Fully pigmented example, C: Labial basis, D: Trochanteral organ and its extension to femur, E, F: Mucronal end, G: Ditto from Sepilok.

Although the body is pale and not different from the pale form of other species in outlook, the species belongs to the *borneensis*-group having s/2/s/2 setae on abd.II. In contrast to the pale form of *S. borneensis* m. the anterior group of th.II has more number of setae in a fixed arrangement and there is no transitional examples between them. Setae of th.III are also simpler in pattern.

Typus: One male from Sandakan.

Mitra's report (1973, p.167) on pale form of *Salina* from Borneo may perhaps correspond to this species, although the presence of 7 setae on abd.II is incredible (lapsus calami?). Comparison with *S. indica* (Imms, 1916) *S. sulcata* (Ritter, 1912) and with *S. affinis* (Folsom, 1899) must succeed.

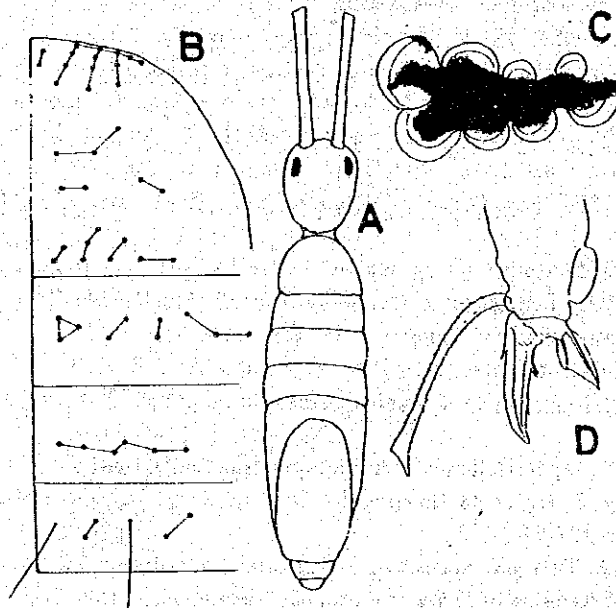


Fig. 27 *Salina pallens* sp. n.

A: Habitus, B: Chaetal pattern, C: Eyes, D: Hind claw.

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Neanurid Collembola of Sabah

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From the island of Borneo four species of Neanurinae have been reported. In this report two among them have been recovered and together with six additional new species and some others newly found from Borneo, the main component in Sabah, have been detected, although *Achorutes semilunaris* Schött, 1925 (Type species of *Bioctularia* Stach) and *Lobella imadatei* Yosii, 1976 have not been included in the present collection. All Sabahan Neanurinae are belonging to those with the red body colour in living which turns to white in alcohol as may be easily imagined from the tropical nature of the country and this article is actually the continuation of my foregoing paper (Yosii, 1976) dealing with the Southeast Asian species of the group.

Hearty thanks are due to the staffs of the Forest Research Centre in Sandakan, who helped and assisted my research in various ways as well as to JICA (Japan International Cooperation Agency) which has given me the opportunity to stay in Sabah for long time.

Lobella (Lobella) kraepelini (Börner, 1906)

3 m. Labuk Road, Sandakan (7 ex. 20.II 1980, m.)

Distribution: Malaya, Java, Borneo (nov.)

Lobella (Lobellina) sabahna sp. n.

Fig. 1

Tamparuli (4 ex. 8.I 1980, m.), Gunung Alab (4 ex. 7.I 1980, m.), Ranau Pass (13 ex. 12.I 1980, m.), Nalapak (1 ex. 12.I 1980, m.), Brumas nr. Tawau (5 ex. 6.III 1980, Dius Tadong)

Body length up to 2.0 mm. Colour red in living and white in alcohol. Ant.: head as 50:40. Ant.IV with trilobed apical bulbs and 7 slender sensory elements. Ant.III-organ is two curved rods in a groove. Eyes 3+3, poorly pigmented and anterior 2 of them are apart from the tubercle. Buccal cone long. Labrum is cuspidate and truncate apically. Mandible with 6 small teeth. Maxilla almost styliiform, but finely bidentate and with a thin lamella attached. Unguis carinate, with one inner tooth near the basis and its inner side is granulated basally and faintly striate distally. Ventral tube with only 3+3 setae. Furcal rest is a transverse small swelling of the integument.

Body tubercles are well represented and some of them are even papillate. On the head

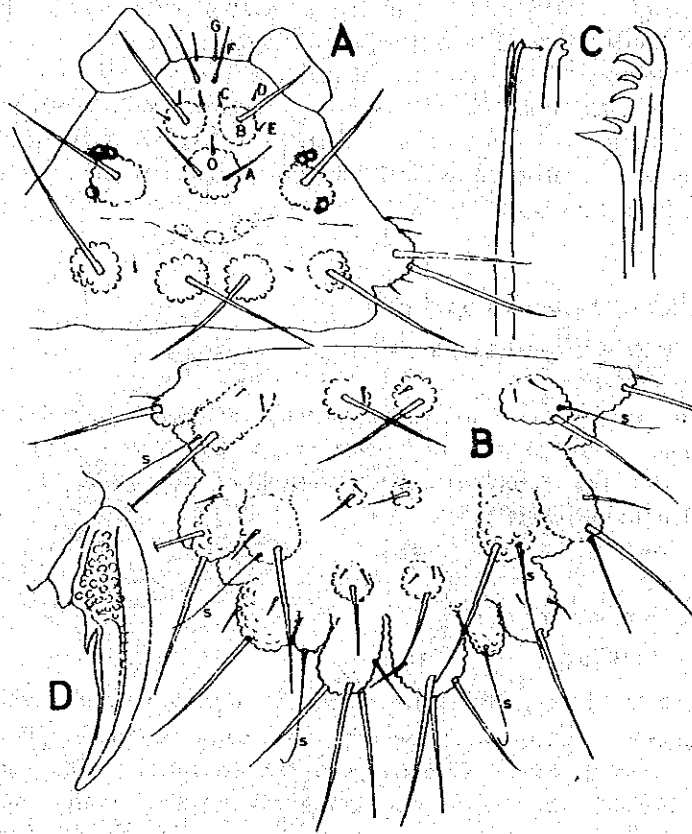


Fig. 1 *Lobella (Lobellina) sabahna* sp. n.

A: Head, B: abd. III-abd. VI, C: Mandible and maxilla, D: Hind claw.

antennal tubercles are almost regressed, but the ocular tubercles are very well developed and lightly papillated. Occipital region has only 3+3 tubercles. On the trunk dorsal tubercles are small and on abd.IV they are so meager that it may be easily overlooked. Other tubercles of the sides of the body are well represented and those of the posterior segments are papillate and elongate. Abd. V has 3+3 tubercles and a paired tubercles of abd. VI are close together. On the head O-seta is present and B is well developed. Other body setae are as:

occ.	1, i+1, 2+iv,
th.I:	1, 2, 1.
th.II, III:	1+ii, s+2+i, 3+s, 3.
abd.I-III:	1+i, 1+ii+s, 1+i, 1+s.
abd.IV:	1+i, 1+i+s, 1+i, 1+s.
abd.V:	1+ii, s, 3+i.

All body setae are long, smooth and sharply pointed. They are uncoloured. Chaetal pattern is often deviated. From the dorsal tubercles of th.II, III the large seta m is always present, but small a and p may be missing. The latter (p) is located much posterior to the tubercles as in case of *L. kinabaluensis* m. In one specimen from Tenompok sublateral tubercle was beset with two s.s., which may be regarded as teratological.

With its well developed lateral tubercles of the body and by the presence of 3+3 tubercles of the occipital region the species may be referable to *Lobella (Lobellina) gedehensis* Yosii, 1976 of Java, from which it is separated by the presence of o-seta of the head as well as by the chaetal arrangement of th.I. Typus: One male from Ranau Pass.

Distribution. Endemic to Sabah.

Lobella (Propeanura) hanuman Yoshii, 1976

Telupid (3 ex. 24.XI 1979, Saikeh Lantoh), Kudat (1 ex. 5.I 1980, m.), Tamparuli (3 ex. 8.I 1980, m. et Dius Tadong)

To this peculiar species with broad alate body setae nothing is to be added for my previous description. In one example from Kudat seta-A of the head is dagger-like as other macrosetae. It is the exceptional and teratological case. The species seems to be widely distributed in the lowland of Sabah.

Distribution: Endemic to Sabah.

Lobella (Propeanura) labukae sp. n.

Fig. 2

Nalapak (4 ex. 13.I 1980, m.)

Body length up to 2.5 mm, red in living and white in alcohol. General shape rather broad and sphaerically swollen. Antennae very short, much shorter than the head. Sensillate elements as usual. Eyes 3+3, poorly pigmented. Buccal cone ventrally situated and rather small. Mandible is slender and tridentate apically. Maxilla is styliform and with a small apical notch. One of the labial setae is elongate. Unguis broadly keeled dorsally and with a inner tooth quite near the basis, so that it looks like an unguiculus. Inner side of the unguis is basally granulate and distally with transverse streaks. Ventral tube with 4+4 rather small setae. Furcal rest is a small granulate median swelling with 1+1 setae before it. Body tubercles are well developed, sphaerically swollen. On the head o-seta is present. B and E are well represented, but C is absent and D may or may not be present as a small seta. Occipital tubercles are with setae as 1, 2, 1, 1. Chaetal pattern of the trunk is as:

th.I:	2, 2, 1.
th.II, III:	3, s+3, 3+s, 2.
abd.I, II:	3, 3+s, 2, 2+s.
abd.III:	2+i, 2+i+s, 2, 2+s.
abd.IV:	1+i, 2+s, 4, —.
abd.V:	1+i (or 1), s, 4.

Dorsal tubercles of th.I has, thus, two large setae, both of which are lying on the tubercle. Abd.I-III has 3 setae on the dorsal tubercle, although a-seta is small on abd.III. Abd.V has 3 pairs of tubercles and dorsal tubercle has well developed p-seta and small a seta, which may be missing. Paired tubercles of abd.VI are spherical and close together.

All the body setae are short, but distinctly spathulate distally and with many oblique striae. s.s. are very short.

The species is the near relative of *P. hanuman* Yosii, 1976 of Sabah with its well developed tubercles of the trunk as well as by the same chaetal pattern of the body. But this new species has the well developed dorsal and subdorsal tubercles of the trunk and with 3+3 tubercles on abd.V instead of 1+1 in the cited species. Both of them are in common that the dorsal tubercles of abd.I-III have 3 setae in stead of usual 2 and it may be comparable with *Lobella newnani* (WOMERSLEY 1933) sensu Yosii, 1966 in this respect. Labuk is the name of the river near the type locality.

Typus: One male from Nalapak.

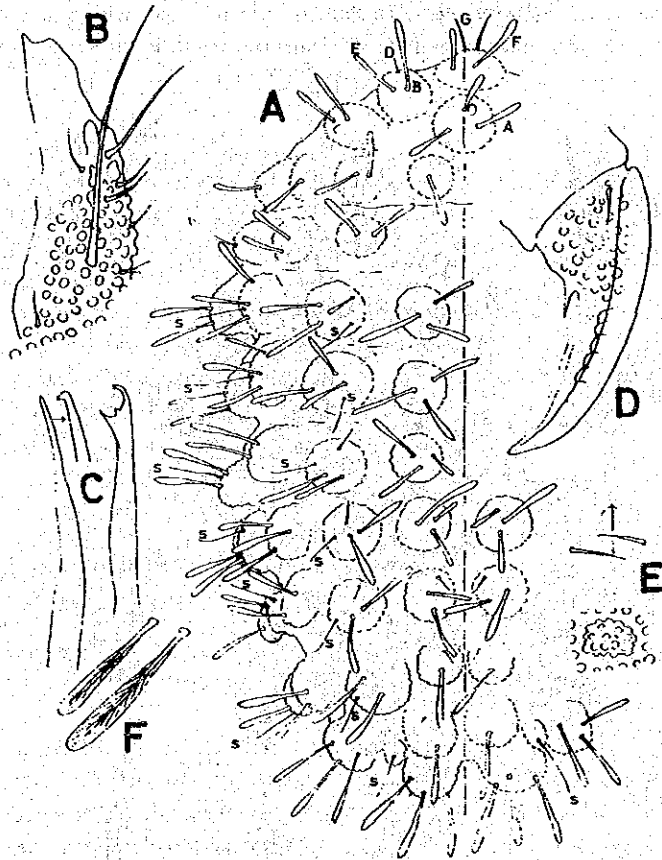


Fig. 2 *Lobella (Propeanura) labukae* sp. n.

A: Chaetotaxy of the body, B: Labium, C: Mandible and maxilla, D: Hind claw, E: Furcal rest, F: Body setae.

***Lobella (Propeanura) guae* Yosii, 1976**

40 m south of Kudat (3 ex. 6.I 1980, m. et. Dius Tadong)

With its absence of dorsal setae and tubercles of abd.V the species is easily to be

identified. Chaetal arrangement of the head is just as in the original description. In *L. corallina* (Imms, 1912) sensu Yosii, 1976 dorsal tubercles of abd. V are also absent, but the setae are present. From the drawings attached to this species in Yosii, 1976, fig. 20, B, the explanation must be read as abd.II-VI, in stead of abd.III-IV (lapsus calami).

Distribution: Malaya, Burma, Borneo (nov.).

Lobella (Propeanura) clavisetis sp. n.

Fig. 3

Sepilok Laut (8 ex. 6.II 1980, Saikeh Lantoh),

Body length 0.9 mm, red in living and white in alcohol. Antennae short, subapical pit of ant.IV is well developed. Sensory setae are slender. Ant.III-organ with d- and v-seta well represented. Eyes 2+2, unpigmented. The proximal one is on the tubercle, but the

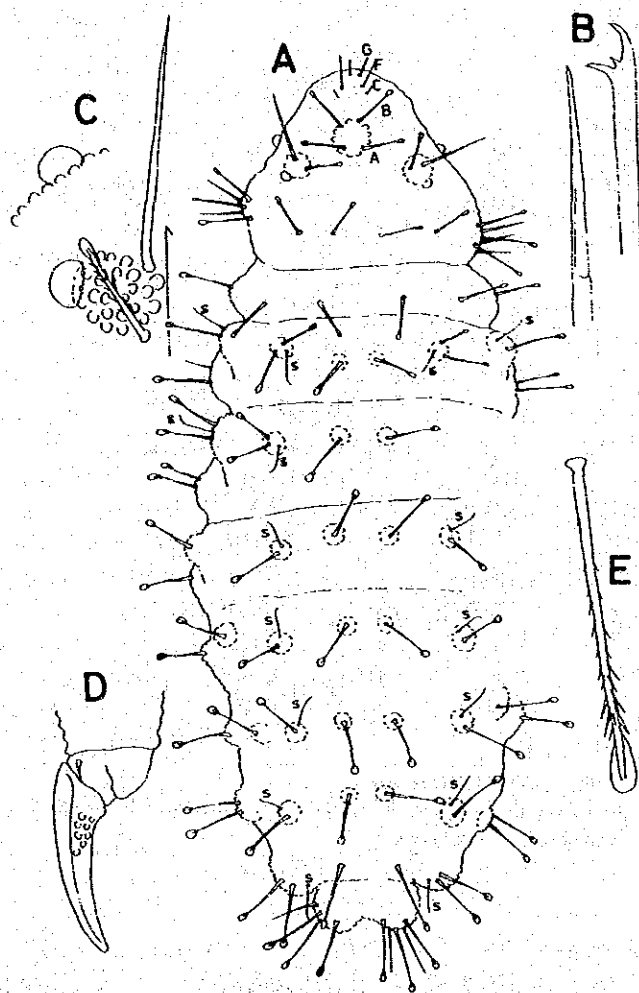


Fig. 3 *Lobella (Propeanura) clavisetis* sp. n.

A: Chaetotaxy of the body, B: Mandible and maxilla, C: Eyes and ocular tubercle, D: Hind claw, E: Body seta.

other is lying remote from it on the lateral margin of the head capsule in dorsal view. Buccal cone is poorly developed and ventrally situated. Mandible is weakly tridentate apically, maxilla is styliform. Legs are short, unguis is carinate, without inner tooth and its inner side is almost smooth, but with a few granules at about the middle. Ventral tube with 4+4 setae. Furcal rest is not observed. Body tubercles are faintly present, small and insignificant. Large body setae are peculiarly modified. They are thick and roughly barbed, stronger distally and with a spatulate, claviform apex, s.s. is short and slender.

On the head there is one central tubercle having 2+2 setae, whose identity is not clear, but may be A and B. Setae F, G are slender and there is a small seta (C?) near the basis. Ocular tubercle is faintly present and from 2 setae situated on it one is slender and the other (oc-2?) is modified. Occipital region has setae as 1, 1, 3+iii. Chaetal pattern of the trunk as:

th.I:	1, 1, 1.
th.II, III:	1, s+2, 1+s, 2.
abd.I-III:	1, 1+s, 1, 1.
abd.IV:	1, 2+s, 2, -.

Abd.V has no tubercles, but with a lateral swelling on which one s.s. and 2 modified setae are located. Dorsal tubercle is completely absent and there is one modified seta at the place. Abd.VI is faintly divided in a pair of swelling having 3 modified and some 3-4 slender setae each.

This species is easily identified with its modified setae and peculiar simplified chaetal pattern and not comparable with any other species.

Typus: One female from Sepilok Laut.

Distribution: Endemic to Sabah.

Lobella (Propeanura) kinabaluensis sp. n.

Fig. 4

Bundu Tuhan (25 ex. 1.I.1980, m.), Kudat (2 ex. 6.I.1980, m.), Kalawat (4 ex. 6.I.1980, m.), Tuaran (6 ex. 4.I.1980, m.), Kota Kinabalu (10 ex. 4.I.1980, m.), Kundasang (8 ex. 9.I.1980, m.), Mirulu (10 ex. 11.I.1980, m.), Batu Puteh (1 ex. 11. VIII.1979, m.).

Body length up to 2.3 mm, red in living and white in alcohol. Antennae normal. Buccal cone ventrally situated and pointed apically. Mandible is tridentate, the apical tooth is with some denticules. Maxilla styliform and with a narrow lamella attached. Eyes 3+3, black the anterior two near together. Unguis is carinate, with one prominent inner basal tooth and its inner side is transversely striated distally and granulated basally. Ventral tube with 4+4 setae. Furcal rest is a small median swelling of the integument. Segmental tubercles are small and rounded, but distinct. Ocular tubercles of the head and the tubercles of abd.V and VI are very well developed. On the head the ventral tubercle has two large setae, the third seta may be missing. Occipital region has 4+4 tubercles with setae arranged as 1, 1, 1+ii, 3 respectively, but the lateral one is very low and hardly to be regarded as tubercles. Chaetal pattern of the trunk is as:

th.I:	1, 2, 1.
th.II, III:	1+ii, s+2+i, 3+s, 2(or 3).

abd.I-III: 1+i, 2+i+s, 2, 2+s.
 abd.IV: 1+i, 1+i+s, 3, 4+s.
 abd.V: 1+ii, s, 4.

On dorsal tubercles of th.II and III only seta m is well represented and small p-seta is far posterior or even absent. Setae of the dorsal tubercles of abd.I-III are registered as 1+i, but small one is more prominent than on th.II, III. Abd.V bears 3+3 tubercles, all of which are well represented and protruded in form of papillae. Paired tubercles of abd.VI are sphaerically swollen and near together, but sometimes a little apart. Large body setae are smooth and alate lightly on their distal end. s1s1 are slender and long.

The chaetal pattern of the head of this species is almost the same with that of *Lobella (Propeanura) perakensis* Yosii, 1976 from the Cameron Highland, Malaya, but the cited species has 2+2 tubercles on abd.V and body setae are lightly ciliate. This new species seems to be the commonest of Sabah.

Typus: One male from Bundu Tuhan.

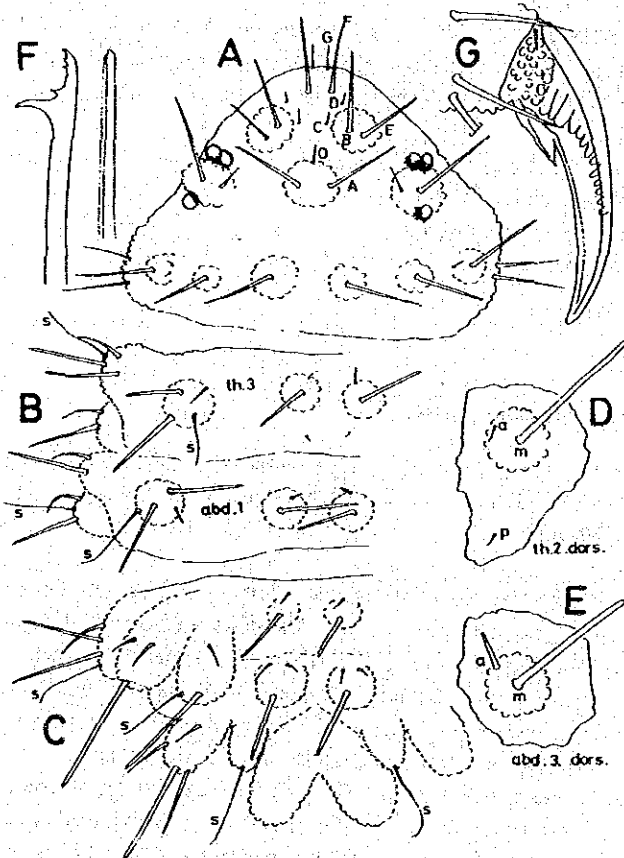


Fig. 4 *Lobella (Propeanura) kinabaluensis* sp. n.

A: Chaetotaxy of the head, B: Ditto of th. III and abd. I, C: Ditto of abd. IV to VI. D: Dorsal tubercle of th. II, E: Ditto of abd. III, F: Mandible and maxilla.

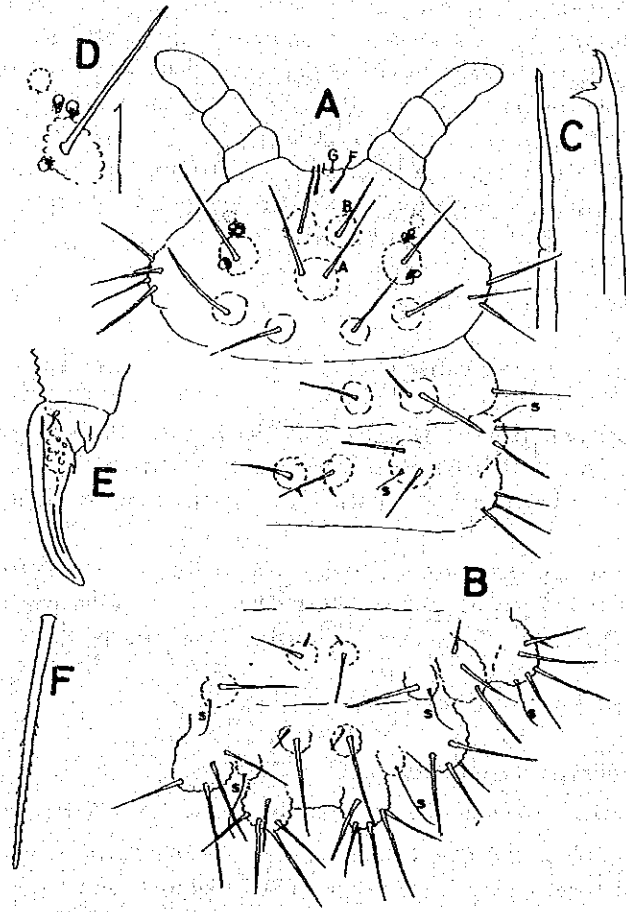


Fig. 5 *Lobella (Propeanura) sandakanensis* sp. n.
 A: Head and th. II, III, B: abd. IV-VI, C:
 Mandible and maxilla, D: Ocular tubercle, E:
 Hind claw, F: Body seta.

Lobella (Propeanura) sandakanensis sp. n.

Fig. 5

Sepilok Laut, Sandakan (12 ex. 6.II, 1980, Saikoh Lantoh), Kg Belian nr. Sandakan (6 ex. 10.IV 1980, m.).

Body length up to 2.5 mm, red in living and white in alcohol. Antennae as long as head in length. Ant.IV with trilobed apical bulbs and some 7 slender sensory setae. Ant.III-organ is two blunt rods in a groove accompanied by d- and v-seta, the latter is lying ventrally. Buccal cone ventral, pointed apically. Mandible is tridentate distally. Maxilla is styliform. Eyes 3+3, lightly pigmented. Anterior two are remote from the tubercle and with a distinct

postantennal field. Legs short, unguis is with one obscure inner basal tooth and its inner side is distally smooth, basally granulated. Ventral tube has 4+4 setae. Furcal rest is a small median swelling with 2 setae anterior to it. Segmental tubercles are spherical, lateral ones are well developed, but dorsal tubercles of the trunk, including the central tubercle of the head are very obscure and those of th.II to abd.III are quite near to each other. Chaetal pattern is peculiarly abbreviated. On the head only A and B are present and C, D, E are totally absent. Ocular tubercle has only one seta (oc-2 ?) and occipital region has setae as 1, 1, 4-5. Chaetal pattern of the trunk is somewhat variable by the specimens, typically it is as:

th.I:	1, 2, 1.
th.II, III:	1+ii, s+3(2), 3(2)+s, 3.
abd.I-III:	1+i, 2+s, 2, 3.
abd.IV:	2(1+i), 1+(i)+s, 3, s+5.
abd.V:	1(1+i), s, 4.

What is peculiar to this species is that there is no o-seta on the head and dorsal tubercle of abd.V has either 1 or 1+i setae. Abd.VI has a pair of rounded tubercle remotely situated. All body setae are long, straight, blunt apically, faintly alate on distal half and lightly feathered.

In the chaetal arrangement the species is almost the same with *Lobella (Lobellina) selangorica* Yosii, 1976 and may be discriminated by the form of the mandible and maxilla. From *L. kinabaluensis* m. it is readily separated by the chaetal pattern of the head, o-seta being missing.

Distribution: Endemic to Sabah.

Lobella (Propeanura) tawauensis sp. n.

Fig. 6

Brumas nr. Tawau (3 ex. 24.V.1979, m.), Signal Hill, Sandakan (5 ex. 21.VI.1980, m.).

Body length up to 2.0 mm. Colour white in alcohol. Antennae not different from others. Buccal cone small, ventrally situated and slightly truncate apically. Mandible is bidentate, with serration on apical tooth. Maxilla styliform, without appended lamella. Eyes 3+3, poorly pigmented black. Unguis strongly carinate dorsally and with one inner tooth. Interior is transversely striate and basally granulate to some extent. Ventral tube with 4+4 setae. Furca rest is a median swelling with 3 setae anterior to it. Setae around the genital orifice are not modified. On the head frontal tubercle is reduced completely together with the setae A and O. On th.I, the dorsal tubercles are absent. And on abd.IV and V again the dorsal tubercles are not present and setae on them are vestigial. Paired tubercles of abd.VI are remote to each other. Thus the chaetal pattern may be formulated as:

occ.:	i, 1+ii, 3+i.
th.I:	O, 1+i, 1.
th.II, III:	1+ii, s+1+i, 2+s, 1+i.
abd.I-III:	1+i, 1+i+s, 1, 1+s.
abd.IV:	ii, 1+i+s, 1+i, 1+ii+s.
abd.V:	ii, s, 2.

All tubercles are rounded, not very conspicuous and setae are uncoloured and pointed apically. What is very conspicuous for the species is that on the head all median setae except B are reduced to minute setulae, which are not much larger than the diameter of an integumentary granule. Such are also the case with the dorsal setae of abd. IV and V. Typus: One male from Brumas.

The species is near *L. setapauca* Gapud, 1970 (= *Lobella reducta* Gapud, 1968) of Philippines in the arrangement of setae and tubercles. But the mouth parts are quite different and abd. IV and V have distinct dorsal tubercles in the cited species.

Distribution: Endemic to Sabah.

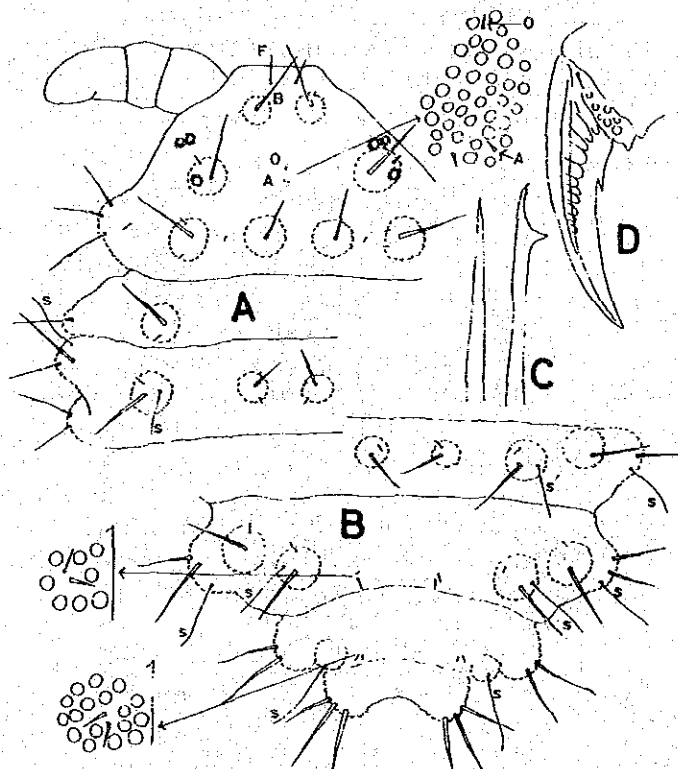


Fig. 6 *Lobella (Propeanura) tawauensis* sp. n.

A: Head and th. I, II, B: Abd. III-VI, C: Mandible and maxilla, D: Hind claw.

Lobella (Propeanura) bornensis (Schött, 1925)

Fig. 7

Achorutes bornensis: Schött, 1925

syn. nov. *Propeanura chaotic*: Yosii, 1976

Sepilok Laut nr. Sandakan (15 ex. 16.III 1980, Saikoh Lantoh), Sandakan (4 ex. 22.II 1980 m.), Nalapak (2 ex. 13.I 1980), Mostyn (1 ex. 8.VII 1980, m.).

I was astonished to find out this peculiar species from Sabah. In living it is crimson

red and the colour retains for some 2 months, when preserved in alcohol or even when treated with lactic acid. After long time, however, it becomes white completely. With its polychaetotic and densely feathered body setae the insect is very spiny or igel-like in low magnification. Usually it is not easy to identify each tubercles as to which segment it belongs, as they are all forming a dense cluster. Setae are intensely barbed and polychaetotic, so that their number is varibale from one example to another, and only the smooth s.s. are located in a typical way. In the figure one such example is shown. Buccal cone is ventrally situated and pointed apically. Mandible is tricuspidate, maxilla is styliform. Labial setae are arranged as in fig. B. Eyes 3+3, pigmented black. One of them is on the well developed ocular tubercle and other two are anterior to it. Unguis is carinate, with one inner basal tooth and its inner side is basally granulate and distally smooth. Ventral tube with 4+4 setae. Furcal rest is a median swelling with 3-5 setae on it. All segmental tubercles are well developed, sphaerically swollen. Occipital region has 4 pairs of them. Abd.V has two pairs of them and s.s. is lying on the dorsal side of the lateral one. Abd.VI is not concealed, but visible in dorsal view.

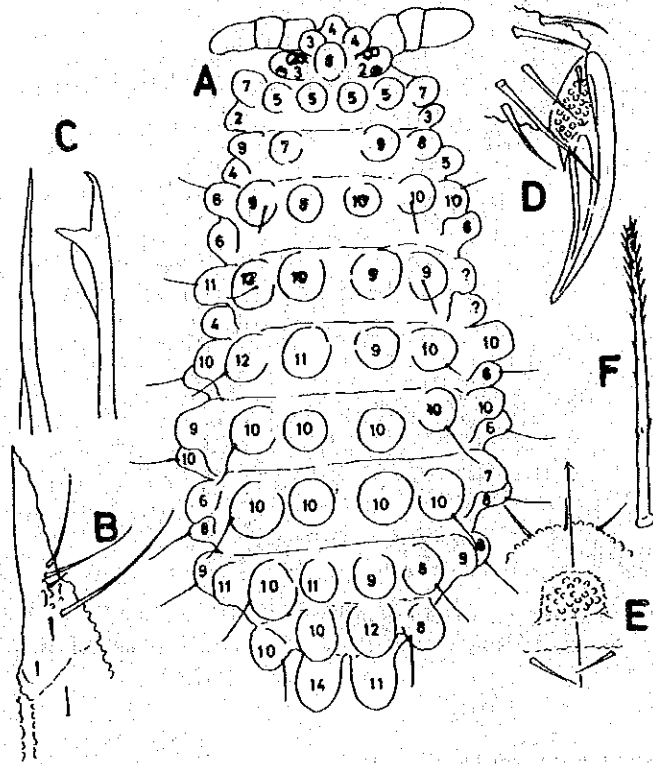


Fig. 7 *Lobella (Propeanura) bornensis* (Schött.) from Sepilok Laut
 A: Habitus, B: Labium, C: Mandible and maxilla, D: Hind claw, E: Furcal rest,
 F: Body setae, G: Main tubercles of the head with eyes.

Schött's description and figure of *A. bornensis* from Mt. Murud in Sarawak is not sufficient for identification. His figure shows 5 barbed setae on the ocular tubercle of the head, which never occurs in our Sabahan specimens. But since such variation may occur in polychaetotic species, I place all of Sabahan materials in his species.

Prop. chaotica Yosii, 1976 from Hongkong is different in that abd.VI is concealed and that all body setae are less developed, not much longer than the diameter of each tubercles. But such variation may occur easily and the name may become junior synonym of *A. bornensis* Schött

Distribution: Hongkong, Borneo.

Crossodonthina altamontana sp. n.

Fig. 8

Mt. Kinabalu, nr. Pakka Cave (2800 m.) (2 ex. 16.VI 1980, Mujin Gakial)

Body length up to 2.0 mm, red in living and white in alcohol. Antennae usual. Eyes 3+3, unpigmented, two of them anterior to the tubercle. Buccal cone hypognathous. Distal end of labrum is extended to a pair of rounded lobes surpassing the apex of labium. Mandible is composed of two fringed, long rami, inner one of which has a basal lobe provided with 4 teeth. Maxilla is almost styliform and divided into two narrow lamella on apex. Unguis is carinate, granulate basally and transversally crenulate distally. The inner basal part has a broad, hyaline area to which one small, but cuspidate tooth is attached. Ventral tube has 4+4 setae. Furcal rest is a very small median swelling. Male genital aperture has no modified setae around.

Chaetal and tubercular pattern is very much modified. On the head only the ocular tubercle with a long oc-2 and small oc-3 is present. A is numute, O is absent. B is well developed, but C, D are absent. E is small and F, G are normal. Occipital area has a long transverse swelling with 2+2 long setae. On the trunk dorsal tubercles are quite absent on th.I and on abd.I to abd.V and the seta on it is reduced to small setula. Thus the formula may be as:

th.I:	i, 1, 1.
th.II:	1, s+1+i, 1+s, 1+ii.
abd.I, II:	i, 1+s, 1, 1+s.
abd.III:	i, 1+s, 1, 1+s+i.
abd.IV:	i, 2, s+2.
abd.V:	i, -.

Chaetal pattern on abd.IV is somewhat dubious and that of abd.V is not well investigated as all examples at hand are teratological having no setae on the lateral tubercles. Tubercles of abd.VI are rounded and near together. Large body setae are very long, almost straight and slightly alate on its whole length.

The species seems to be restricted to the high altitude of Mt. Kinabalu being found from no other places of Sabah. From other species of the genus it is well separated by the reduction of tubercles and setae of the dorsal tubercles of the trunk.

Typus: One female from Mt. Kinabalu, Pakka.

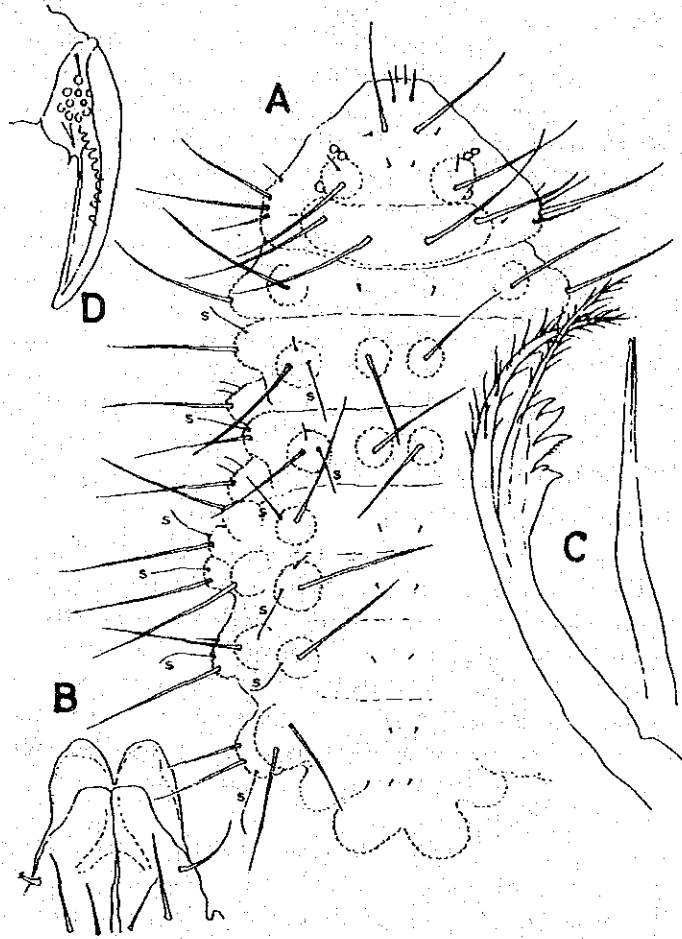


Fig. 8 *Crossodonthina altamontana* sp. n.

A: Chaetal pattern, B: Apex of the buccal cone, C: Mandible and maxilla, D: Hind claw.

Vitronura singaporiensis (Yosii 1956)

Tuaran (1 ex. 4.I 1980, m. et Dius Tadong), Kota Kinabalu (5 ex. 5.I 1980, m.), Papar (1 ex. 14.V 1980, m.), Ranau (15 ex. 11.I 1980, m.), Sandakan (1 ex. 15.IV 1980, m.).

Distribution: Malaya, Java, Borneo (nov.), Formosa.

Vitronura hirtella (Börner, 1906)

Bal Estate, Tawau (7 ex. 8.VII 1980, Mujin Gakjal)

In one example th.I has setae as 2, 2,1, all three setae on dorsal tubercle of th.II, III are well developed. But it is only the exceptional case and other examples are typical as in Yosii 1976. Distribution: Malaya, Java, Borneo (nov.), Philippines, Formosa.

* * * *

Although the new systematic rearrangement of Neanurinae is proposed in *Cassagnau* 1978, I feel it not necessary to change my previous opinion about the generic conception of the group expressed in Yosii, 1977. The main difference between us is how to estimate and evaluate the structure of the tubercles of the body. In his system more weight is given to the chaetal and tubercle arrangement, while it is regarded only as a character of the species group in my works. Possibly this may be due to the difference of the material studied, since in Europe *Neanura* spp. are predominating and in Asia *Lobella* spp. are highly differentiated.

In my previous paper I have treated *Propeanura* as independent from *Lobella* to include such species with equally granulated body tubercles, whose mandible is bi- or tridentate and maxilla is styliform. I now regard it as subgenus of *lobella* as there are all transient forms and there is a serial regression of mouth parts from *Lobella* (s. str.) to *Propeanura* through *Lobellina*.

Southeast Asian species of Neanurinae may be keyed in the following way:

- | | | |
|----|---|--------------------------------|
| 1. | Body tubercles with areolar field. Body dark to white | <i>Neanura</i> (not present) |
| | Body tubercles without areolar field. Colour red or yellow | 2 |
| 2. | Body tubercles warty, with irregular large granules | <i>Vitronura</i> |
| | Body tubercles equally granulate all over | 3 |
| 3. | Mandible fringed and intensively elongate | 4 |
| | Mandible not fringed | 5 |
| 4. | Abd. VI concealed by abd.V | <i>Thaianura</i> |
| | Abd.VI not concealed by abd.V | <i>Crossodonthina</i> |
| 5. | Mandible with a row of saw-like teeth | <i>Womersleya</i> |
| | Mandible not as above | <i>Lobella</i> 6 |
| 6. | Mandible bi- or tridentate, maxilla styliform | subg. <i>Propeanura</i> |
| | Mandible and maxilla more complicated | 7 |
| 7. | Mandible weakly developed. Maxilla faintly bidentate apically and with a narrow pointed lamella | subg. <i>Lobellina</i> |
| | Mandible strongly developed. Maxilla with more than two teeth and with fringed lamellae | subg. <i>Lobella</i> (s. str.) |

Lobella Börner, 1906

subgenus *Lobella* (s. str.)

- A. With o-seta on the head
- L. kraepelini* (Börner, 1906): Dorsal tubercle of abd.IV, V present.
- L. imadatei* Yosii, 1976: Dors. tub. on abd.IV, V absent.
- B. Without o-seta on the head.
- A'. Abd.V with 3+3 tubercles.
- L. erawan* Yosii, 1976: Dors. tub. of th.II, III with two setae.
- L. apsala* Yosii, 1976: Dors. tub. of th.II, III with 3 setae.
- B'. Abd.V with 2+2 tubercles.
- L. murphyi* Yosii, 1976: A-seta of the head small.
- L. onychiuriformis* Yosii, 1976: Subdors. tub. of abd.I-III and dors. tub. of abd.IV missing.
- L. aphoruroides* (Yosii, 1952): All these body tubercles present.

subgenus *Lobellina* Yosii 1956

- A. With o-seta on the head.
 - A'. Setae on th.I as 2,2,1.
 - L. khaochongensis* Yosii, 1976: Body setae smooth.
 - L. paraperfusa* Gapud, 1968: Body setae alate, blunt ending.
 - B'. Setae on th.I as 1,2,1.
 - L. sabahna* m.: Body setae smooth.
 - L. perfusa* (Denis, 1948): Apical teeth of mandible very weak.
- B. Without o-seta on the head.
 - A'. Abd.V with 2+2 tubercles.
 - L. musangensis* Yosii, 1976: Central tub. of head reduced.
 - B'. Abd.V with 3+3 tubercles.
 - L. selangorica* Yosii, 1976: Dors. tub. of th.II to abd.V with 1 seta.
 - L. penangensis* Yosii, 1976: Dors. tub. of abd.IV absent.
 - L. gedehensis* Yosii, 1976: Setae of th.I as 2,2,1. Setae long.
 - L. setapatuca* Gapud, 1970: Setae of th.I as 1,1,1. Seta-A short.

subgenus *Propeanura* Yosii, 1956

- A. Setae polychaetotic.
 - L. bornensis* (Schött, 1925) = *L. chaotica* Yosii, 1976
- B. With o-seta on the head.
 - A'. Setae of th.I as 2, 2, 1. or more
 - L. hanuman* (Yosii, 1976): Abd.V with 1+1 tubercles.
 - L. labukae* m.: Abd. V with 3+3 tubercles.
 - L. soemarwotoi* (Yosii, 1976): Subdors. tub. of abd.V half confluent.
 - B'. Setae of th.I as 1,2,1.
 - a. Abd.V with 2+2 tubercles.
 - L. perakensis* (Yosii, 1976): Setae finely ciliate.
 - L. angustior* (RUSEK 1971): Dors. and subdors. tub. reduced.
 - b. Abd.V with 3+3 tubercles.
 - L. kinabaluensis* m.: Setae blunt apically.
 - C'. Setae of th.I as 0,2,1.
 - L. tawauensis* m.: Seta-O, A etc. minute
- C. Without o-seta on the head.
 - A'. Abd.V with 3+3 tubercles.
 - L. wayang* (Yosii, 1976): Seta small. Central tub. reduced.
 - L. sandakanensis* m.: Seta-A well developed.
 - B'. Abd.V with 2+2 tubercles.
 - a. Seta-A absent. Dors. tub. absent.
 - L. johorensis* (Yosii, 1976): Occ. reg. with 3+3 tubercles
 - b. Seta-A small, but present. Dors. tub. present.
 - L. garuda* (Yosii, 1976): Large species with short setae.
 - C'. Abd.V with 1+1 tubercles. Dors. tub. absent.
 - L. corallina* (Imms, 1912): Occ. reg. with 2+2 tubercles
 - L. guae* (Yosii, 1976): Seta-a absent. Setae ciliate: Occ. reg. with 3+3 tubercles.
 - L. clavisetis* m.: Seta-A present. Setae claviform on apex.

Vitronura Yosii 1969

A. With o-seta on the head.

V. pygmaea (Yosii, 1954): All cephalic tub. present.

V. latior (RUSEK 1969): Without antennal and clypeal tubercles.

B. Without o-seta on the head.

A'. Setae plumose.

V. hirtella (Börner, 1906): Antennal and central tub. fused.

V. singaporiensis (Yosii, 1959): All cephalic tub. separated.

V. sinica Yosii, 1976: Dors. tub. of abd.V fused.

B'. Setae smooth.

V. ipohensis Yosii, 1976: Dors tub. of th.II, III with 2 large setae.

V. luzonica Yosii, 1976: Dors. tub. of th.II, III with 1 large and 2 minute setae.

V. perfusinoides (Stach, 1965): Special structure at the basis of s.s. on abd.V.

Thaianura Yosii, 1961

Only one species:

T. umesaoi Yosii, 1961.

Crossodonthina Yosii, 1954

C. formosana Yosii, 1965: Abd.V with 2+2 tubercles.

C. alatoserrata Yosii, 1965: Abd.V with 3+3 tubercles.

C. altamontana m.: Dorsal tub. reduced.

Womersleya Denis, 1948

A. With digital processes.

W. dawydoffi (Denis, 1934): Abd.I-III with 1+1 long processes.

W. malayana Yosii, 1976: Abd.I-III with 3+3 long processes.

B. Without digital process.

W. vicina (Denis 1934): On abd.V dorsal tub. is larger than lateral one.

W. hongkongensis Yosii, 1976: On abd.V dorsal tub. is smaller than the other.

Following species have not been enumerated.

Anoura fortis Oudemans, 1898: No reliable description.

Gnatholonche lipaspis Börner, 1906: Abd.III-VI fused and may be the near relative of *Phylliomeria*.

Neanura pudibunda Imms, 1912: = ? *L. kraepelini* (Börner)

Protanura spinifera Carpenter, 1917: = ? *L. kraepelini* (Börner)

Achorutes zehntneri Handschin, 1920: ? *Propeanura* sp.

Achorutes semilunaris Schött, 1925: Eyes 2+2, with septum.

Achorutes bakeri Handschin, 1926: Unguis without inner tooth.

Achorutes hypostoma Denis, 1929: ? *Propeanura* sp.

Achorutes separatus Denis, 1934: Peculiar species having s.s. on th.I. Eyes 2+2, with septum.

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