

On Some Collembola of New Caledonia, with Notes on the "Colour Pattern Species"

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KEY WORDS Collembola/ Oceania/ taxonomy

In September 1986, when I visited Dr. J. Najt in her laboratory in the Museum d'Histoire naturelle de Paris, she has kindly entrusted me with rich materials of Collembola-Entomobryomorpha from New Caledonia for inspection, which were collected by the participants of the "Action spécifique du Museum national d'Histoire naturelle: Evolution et Vicariance en Nouvelle-Calédonie." It was very interesting, because I have once made a short report of the small collection of them from the island in 1960. Since that time about 30 years have passed and the research of the collembola has made good advance. It is, therefore, of great pleasure for me to revise them, to evaluate the key characters from the recent viewpoints. Hearty thanks are, therefore, to be directed to Dr. J. Najt for furnishing me with such a nice opportunity to study them, all of which must be ultimately preserved in Paris.

The collection sites are as following:

- no. 1: Rivière Blanche, Pte 5, Malaise Trap, 18. - 20. III 1986, J. Boudinot col.
- no. 2: Col d'Amieu, Malaise Trap, 11 - 14. III 1986, Boudinot col.
- no. 3: Rivière Blanche, Pte 5, Malaise Trap, 18 - 20. III 1986, J. Boudinot col.
- no. 4: Mont Mou, 350 m. Forêt humide, 4. XI 1984, Tillier et Boudinot col.
- no. 5: Col d'Amieu, 430 m. Forêt humide, 17. X 1984, Tillier et Bouchet col.
- no. 6: Rivière Blanche, Malaise Trap, 4 - 7. III 1986, J. Boudinot col.
- no. 7: Col d'Amieu, 430 m., Forêt humide, 17. X 1984, Tillier et Bouchet col.
- no. 8: Mont Panié, 360 m., Forêt humide, 11 - 16. XII 1983, Malaise Trap, D. Matile col.
- no. 9: Mont Do, Litière Berlèse, 900 m., 27. XI 1983, D. Matile col.
- no. 10: Vallée de la Ouinné-flanc S., 730 m., Forêt humide avec Araucaria, 30. X 1984, Tillier et Bouchet col.
- no. 11: Mine Galliéni, 800 m., Maquis haut sur Peridotites, 15. XI 1984, Tillier et Bouchet col.
- no. 12: Pic du Pin, Flanc Est, 250 m., Forêt humide sur Minier, 12. XI 1984, Tillier et Bouchet col.
- no. 13: Haute Rivière Bleue, 250 m., 11. XI 1984, Tillier et Bouchet col.
- no. 14: Mont Panié, 260 m., 11 - 16. XII 1983, Malaise Trap, D. Matile col.

Subgenus *Austrocyrtus* nov.

Type species: *Pseudosinella speciosa* sp. n.

Eyes reduced, tenent hair pointed. But, in contrast to others, there are two rows of spines on dentes. Labral form is also peculiar.

***Pseudosinella (Austrocyrtus) speciosa* sp. n. Fig. 1**

no. 9 (1 ex.)

Body length 2.0 mm., ground colour bluish white, mottled all over the body, antennae and legs darker, furca and ventral tube white. ant.: head as 23:10, ant. segm. ratio as 10:20:18:15. Antennae unscaled, with many short setae mixed with small, smooth and suberecting setulae. Ant. III -organ is two rods in a separate area. Ant. I - III with long setae, especially on ant. I and II, where the setae are verticillating on the distal end. Labral setae 4/5, 5, 4, prelabrals barbed. From the setae of the first row the outer pair is very large, then the median ones, the inner pair is smaller, but still larger than of the other rows. Median intrusion is broad and labral margin is without structures. Outer max. lobe with setae II + ii and two setae of its basal segment are barbed. Setae of labial basis as MMm (r) e/1L. Eyes with 4 + 4 cornea, but they are 6 + 6 after the pigmentation, there being 2 + 2 additional round spots without cornea. Thorax is not protruded over the head. Legs unscaled, but with strong, ciliated setae. Unguis is broad, with only one inner tooth. Dorsolateral teeth small. Unguiculus narrowly lanceolate on all legs. Tenent hair is setaceous, apically pointed. Trochanteral organ is composed of ca. 90, rather long setae in a quadrangle. Ventral tube unscaled, anteriorly with ca. 10 + 10 subequally large setae. Posterior face has smaller setae and distal 1 + 1 are strong, smooth and large. Lateral flap bearing 4 - 5 smooth and 3 - 4 smaller, ciliated setae. Terminal tubule is smooth. Furca with m:d as 10:15. Manubrium is ventrally only scaled, ending with 1 + 1 long, ciliated setae plus tridentate marginal thickening (Fig. F), to which the sclerotic basis of dens is articulated. Dorsal median streak is not scaled. Setae are all elongate, including longer ones on distal area and its sides. There are two rows of furcal spines, the outer one begins from the manubrium, extending to the middle of dens, where it is gradually transforming to ciliated ones and ends just before mucro. The inner row is ca. 8 in number and restricted to the basal part of dens, suddenly transforming to usual, ciliated setae. These rows of spines are, in contrast to the case of *Lepidocyrtus (Acrocyrtus)*, not along the outer margin of the dorsal crenulated streak, but the second row from the dorsum (Fig. H). Ventral side is densely beset with ovate scales. Mucro is elongate, bidentate subequally and with a basal spine, not accompanied by the spinule. Male genital opening is conically produced, with many small, smooth setulae of the same length. Macrochaetotaxy is not well observed. On the head the antennal group is composed of ca. 10, long, ciliated setae and frontal pentangle seems to be absent, except for, possibly, one median seta.

Cervical setae are well represented, without modification. Chaetal pattern of the trunk is unknown.

The species has been described based on only one example, because it is so peculiar having furcal spines and peculiar labral form. Although it is placed tentatively to *Pseudosinella* by the reduced number of eyes and pointed tenent hair it must be reviewed afterwards, when the genus is revised.

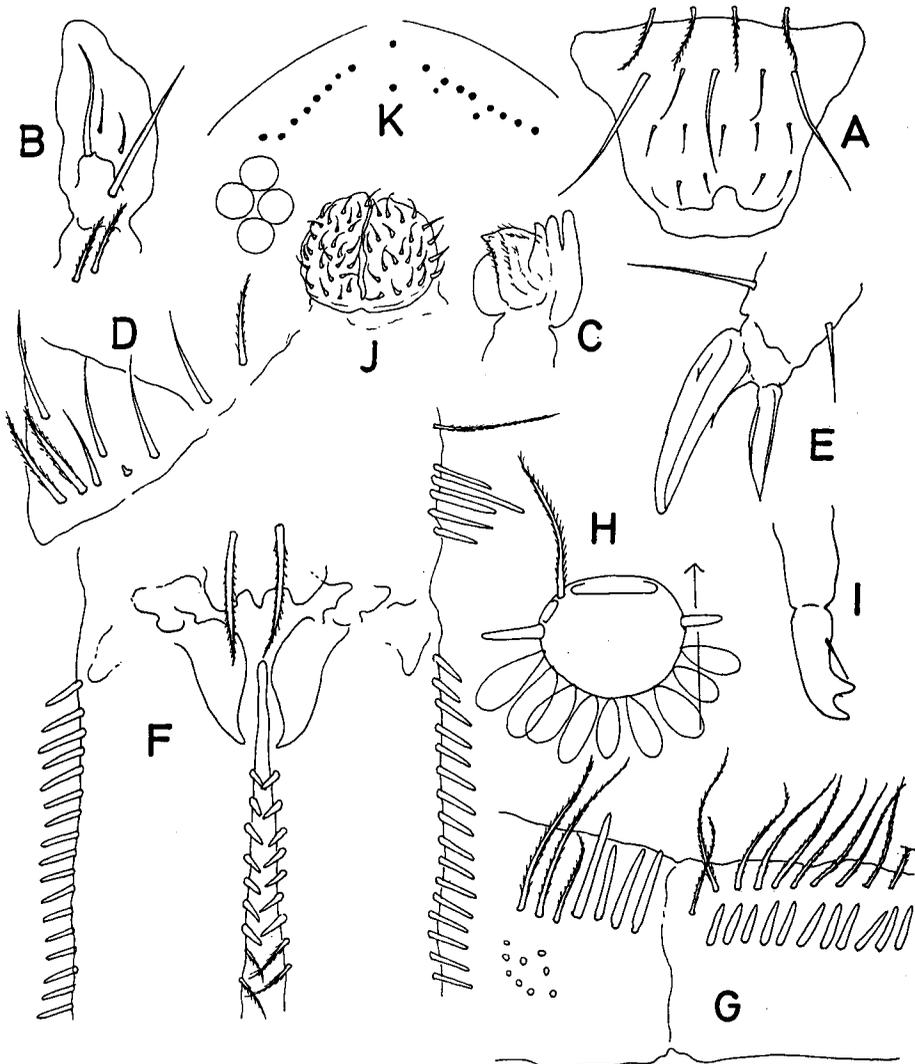


Fig. 1. *Pseudosinella (Austrocyrtus) speciosa* sp. n.
 A: labrum, B: outer maxillary lobe, C: maxillary head,
 D: labial basis, E: hind claw, F, G: manubrium and
 dens (ventral and outer lateral view), H: cross section
 of dens (diagram), I: mucro, J: male genital orifice,
 K: frontal area and eyes.

Subgenus *Najtsira* nov.

Type species: *Lepidosira najtae* sp. n.

The subgenus represents a group of *Lepidosira*, by which the distal area of manubrium in dorsum is beset with some pairs of blunt ending, modified setae. Many of the scales of the trunk of the small size are peculiarly boat shaped as in Fig. 2 k. In all species here treated, the mesothorax is strongly protruding over the head, showing its affinity to *Lepidocyrtoides*, but in the cited genus, the details of the body are incompletely known and the presence of such modified setae is quite doubtful. Presence of the scales on the venral tube is noteworthy. The subgeneric name is to commemorate our colleague, N. J. Najt of the Paris Museum, whom I owe all the material in this report.

Lepidosira (Najtsira) najtae sp. n. Fig. 2

no. 1 (8 ex.), no. 3 (1 ex.), no. 4 (1 ex.), no. 12 (2 ex.), no. 13 (3 ex.)

Body length ca. 1.8 mm, ground colour whitish, with black patches. Antennae diffusely dark throughout. Body with a longitudinal lateral patch from the eyes along the side of th. II - abd. III, interrupted on th. III and abd. I. Extension of abd. III is with a small patch at the middle and on posterior margin. Abd. IV has small patches near the middle and near posterior end. Abd. V, VI are partly patched. Legs have distal patch of femur and a strong median patch on tibiotarsus, excepting the diffusely coloured fore legs. Other extremities pale. ant.: head as 34:10, ant. segm. ratio as 10:20:18:30. Ant. IV annulated, with two apical bulbs. Ant. III - organ is two blunt rods in a definite area. Ant. I, II dorsally scaled and not with long macrosetae. Eyes 8 + 8, G, H smaller. Labral setae as 4/5, 5, 4, prelabrals barbed, all labral setae subequal, labral margin without any structures. Outer maxillary ramus with setae II + iii. Setae of labial basis as MRE/LL. Thorax is considerably hanging over the head. Legs scaled until to the end. Unguis dorsally with winged teeth and two inner teeth, all faintly present. Unguiculus lanceolate in all legs. Tenent hair elongate, dilated apically. Trochanteral organ is ca. 40 spiny setae in a triangle. Ventral tube strongly elongate. Anterior face is scaled, with 3 + 3 larger and some smaller setae and without distal row of large setae. Posterior face is unscaled, with fewer number of short setae, distal 1 + 1 are smooth. Lateral flap bearing some 3 longer smooth and 5 smaller ciliate setae. Terminal tubule is very elongate and with a streak of very minute granulation on its inner side, which is sometimes poorly present as figured. Furca with man:d as 10:17, manubrium is ventrally only scaled, with 2 + 2 ciliate terminal setae and dorsally only setose, whose distal area is with 3 + 3 broadly modified, blunt ending setae. Other setae around them, are also thicker and lightly modified. Dens ventrally with slender scales, the smooth distal portion rather long. Mucro is bidentate equally, with a basal spine.

Macrochaetotaxy of the head as in Fig. H, v-group is reduced and posterior half

is without macrosetae. Cervical row of setae all smooth and small. On the trunk they are as:

th. II : ant. 2, post. 4.

th. III : 2.

abd. I : 0.

abd. II : s/3/s/1.

abd. III : s/1.

abd. IV : med. ca. 4 + 4, post. 3 + 3.

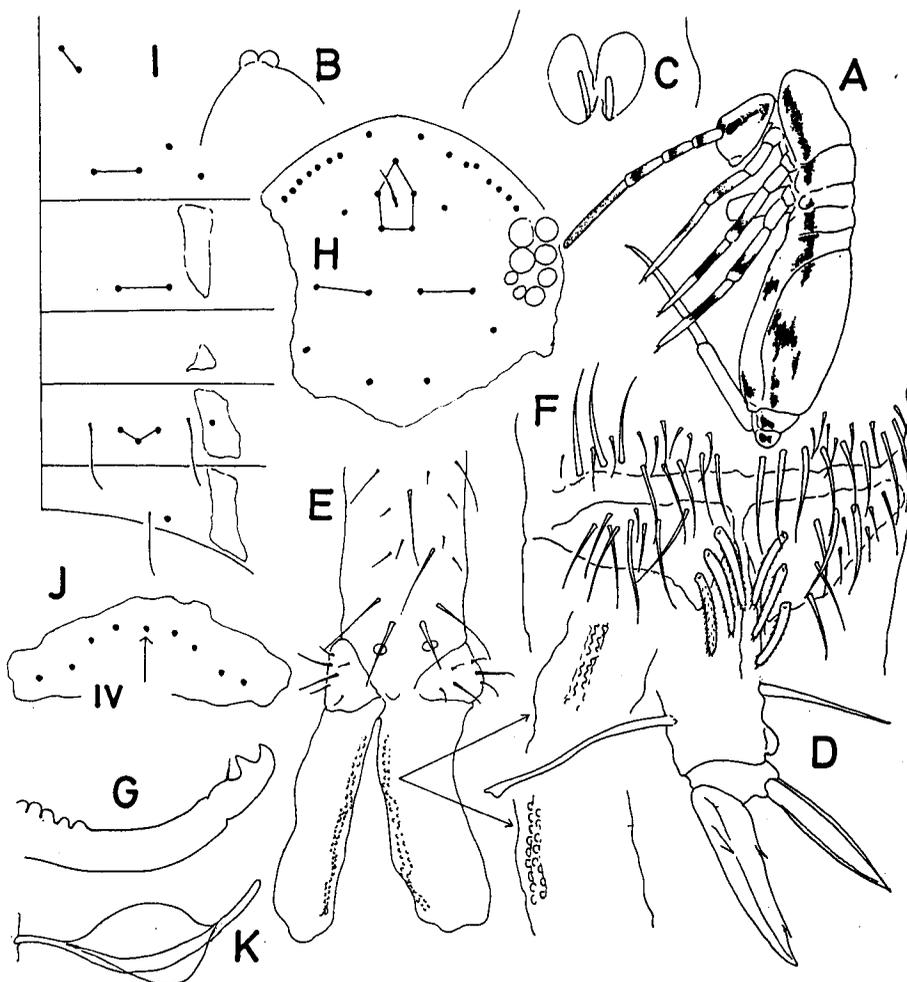


Fig. 2. *Lepidosira (Najtsira) najtae* sp. n.

A: habitus, B: apex of ant. IV, C: ant. III -organ, D: hind claw, E: ventral tube (posterior face), F: manubrial distal area (ciliation of setae partly omitted), G: mucro, H: macrochaetotaxy of head, I: ditto of the trunk, J: ditto of med. gr. of abd. IV, K: scale of the trunk.

They are all long, ciliated and pointed setae. Scales are sometimes not well expanded, to form a kind of boat-shaped scales.

Lepidosira (Najtsira) novaecaledoniae (Yosii) Fig. 3

Lepidocyrtoides novae-caledoniae: Yosii 1960

no. 11 (4 ex.)

Body length up to 3.5 mm. Colour totally white, but often with faint suffusion on lateral part. Antennae banded. Legs faintly with pigments sometimes. Antennae very long, ant.: head being 4:1, and segm. ratio as 10:15:14:30. Ant. IV annulated, with two obscure apical bulbs. Ant. III -organ is two rods with a depressed area. Ant. I, II, III (prox.) scaled, without long macrosetae. Eyes 8 + 8, G, H smaller. Labral setae 4/5, 5, 4, prelabrals smooth, three median setae of the first row are larger than others, labral margin with a transverse ridge of granules, but without spinule. Outer maxillary lobe with setae II + iii, not modified. Labial basis with setae MRE/LL. Legs scaled up to the end and with long setae. Thorax is strongly produced over the head and trunk is very elongate, more than in case of *L. najtae* m. Coxa is elongated, longer than trochanter in all legs (Fig. C). Unguis broad, with two inner teeth and a pair of lateral ones. Unguiculus lanceolate, un-toothed. Tenent hair thick, apically spatulate. Trochanteral organ composed of ca. 90 spiny setae in a quadrangle. Ventral tube rather long, anteriorly scaled, with many elongate, ciliate setae, some of them are very large and broad (Fig. E). Posterior face is not scaled, with some almost filiform setae and distal 1 + 1 is smooth. Lateral flap bearing both larger smooth and smaller ciliated setae. Terminal tubule is seemingly smooth. Furca with m:d as 10:23. Manubrium ventrally only with scales, which are larger distally and ending with some 6-8 long, ciliated ones plus 2 + 2 terminal setae of the same type (Fig. H). Dorsally it is only with setae, ending with distal area of 4 + 4 blunt, modified setae and some 7 + 7 setae near by (Fig. G). Smooth distal portion of dens is rather long. Mucro is bidentate equally and with a basal spine. Male genital opening simple as in Fig. I.

Chaetal pattern of the head is as in Fig. J, where all setae of the pentangle are elongate, ciliated and blunt ending. Median group is 2 + 2 and v-group is ca. 5 + 5, rather reduced. Posterior half is without any macrosetae, excepting the one seta posterior to the eyes. Cervical setae all small and smooth. Macrosetae of the trunk are, in contrast to my previous description, well represented as in Fig. K, where the absence of it from abd. I is remarkable. The protruded portion of th. II is also with some macrosetae, but their arrangement is usually not in a fixed pattern. Abd. IV has the median group ca. 20 + 20, dispersed at random and posterior group is 3 + 3. Scales of the body are rounded, roughly sculptured and those of the segmental margins are larger. Especially those of the lateral part of abdomen are brownish coloured.

Distinction to *L. najtae* m. is in the number of modified setae of the distal manubrial area, in smooth prelabral setae and in the absence of granulated streak of the terminal tubule. Difference in the macrochaetotaxy of th. II, III is decidedly specific.

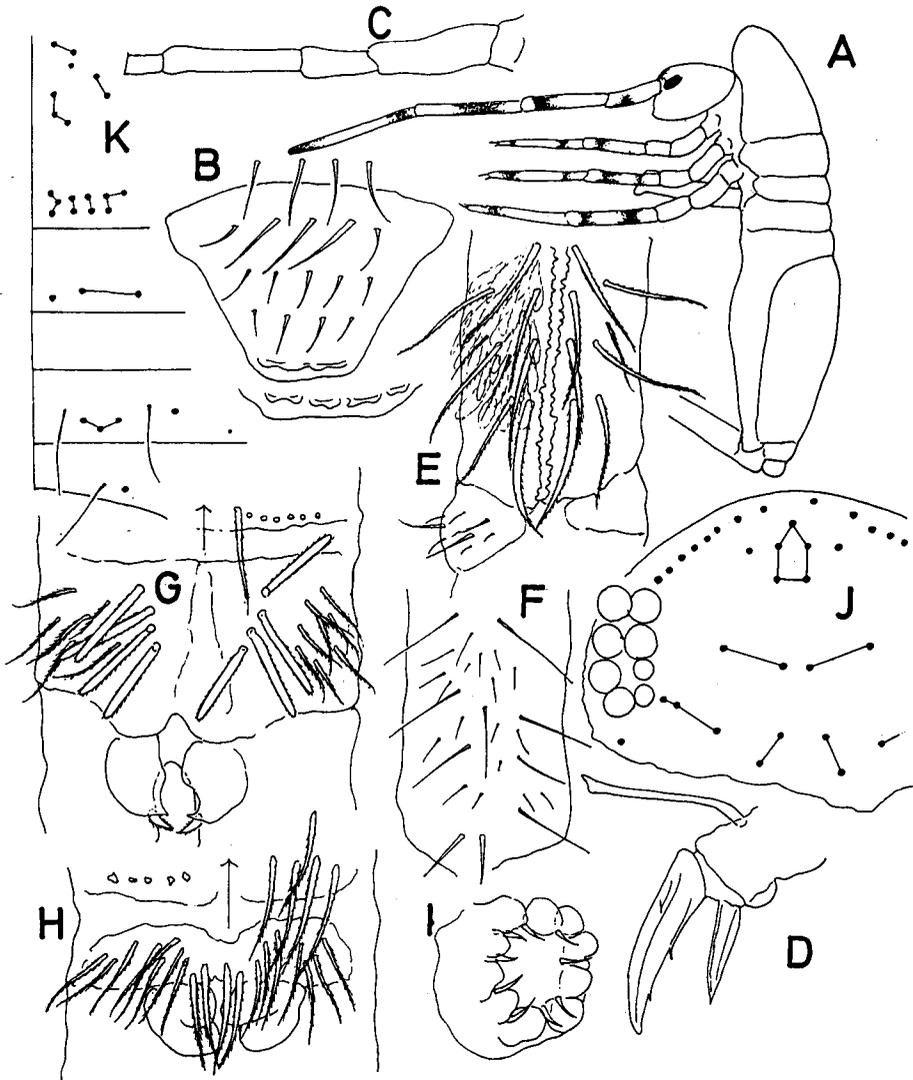


Fig. 3. *Lepidosira (Najtsira) novaecaledoniae* (Yosii)
 A: habitus, B: labrum, C: hind leg, D: hind claw, E, F: ventral tube (anterior and posterior face), G, H: distal area of manubrium (dorsal and ventral side), I: male genital orifice, J, K: macrosetal arrangement of head and trunk.

Lepidosira (Najtsira) sp.

no. 10 (2 ex.)

In general form the examples are very alike to *L. najtae* m., also in the colouration it is alike to it, but abd. IV is diffusely pigmented blue all over, with some longitudinal white band laterally. In the morphological details, they are as in the cited species having barbed prelabral setae and granulated stripe on terminal tubule of the ventral tube. But the modified setae on distal area of manubrium are 4 + 4 in number and macrochaetotaxy of the trunk is just the same as in *L. novaecaledoniae* on th. II and III.

Subgenus *Nusasira* Yoshii et Yayuk, 1989

Two species here described are intermittent between *Sundasira* and *Nusasira* in that the tubule of the ventral tube is without granulation and abd. I is without macrosetae. Possibly, they represent a separate subgenus endemic to southern Pacific islands, but until our knowledge to the genus is more enriched, it is retained as embers of *Nusasira*, because the absence of macrosetae on abd. I seems to be more significant than the other character.

Lepidosira (Nusasira) vicina sp. n. Fig. 4

no. 2 (5 ex.), no. 8 (3 ex.), no. 10 (2 ex.), no. 11 (4 ex.), no. 12 (2 ex.)

Body length ca. 2.0 mm. ant.: head as 28:10, ant. segm. ratio as 10:13:12:16. Ground colour dirty white, patched with bluish black pigments. Antennae with irregular arrangement of pigments, deeper on lateral and basal portion of each segments. Head with a streak between eyes and laterally near the neck. Th. II, III with a streak marginally. Abdominal segments are dotted with pigments laterally in pale forms and besides, with longer patch on the middle and distal part of the extension of abd. III and laterally on abd. IV in the more coloured forms. Abd. V, VI are laterally with a small patch. Legs are with a median patch on femur and tibiotarsus, deeper on hind legs. In the pale form, however, the patches of the head and anterior half of the trunk disappear completely. Ant. IV not annulated, with two obscure apical bulbs. Ant. III-organ is two blunt rods in a separated area. Ant. I-III scaled. Labrum with setae 4/5, 5, 4, prelabrals barbed, margin with 2 + 2 small, rounded tubercles. Outer max. lobe with setae II + iii, all not modified. Maxillar head as in Fig. C, lamella not exceeding the teeth. Setae of labial basis as MRE/LL, R is smaller than others. Eyes 8 + 8, G, H are small. Legs scaled up to the femur, but not on tibiotarsus. Unguis is strongly elongate and narrow in form, with three inner teeth, the basal pair is quite near the basis and other two are very near the apex. A paired dorsal teeth are also near the basis. Unguiculus is narrow and remarkably truncate in all legs having a prominent inner tooth. Trochanteral organ is with ca. 70 spiny

setae in a quadrangle. Ventral tube is not scaled. Anterior face is with many slender, ciliated setae, the distal ones are larger. Posterior face is also with many small ciliate setae, the distal 1 + 1 are smooth. Lateral flap bears 3 smooth and some 10 ciliated setae. Terminal tubule is without granulation. Furca with man: d as 10:15. Ventral side is with scales, going to be larger and elongate distally and with 2 + 2 obscure terminal setae. Dorsal side is only with ciliated setae, larger on manubrial distal area and on proximal part of dens. Mucro is equally bidentate, with a basal spine. Abd. VI is elongate posteriorly to some extent and seems to be protrusible telescopically from within abd. V and there is a pair of small gland opening on each side at about the middle of the segment.

Chaetal arrangement is quite reduced and each macrosetae are poorly developed, so that the study is not easily to be done. On the head it is as in Fig. I, seta L and V-group are absent and post antennal group is strongly reduced. Cervical setae are smooth. Macrosetae of the trunk are also reduced as in Fig. J, where the absence of macrosetae on abd. I is to be noted.

The new species is very near *Lepidosira punctata* Yosii, 1960 in the colour pattern, but different in having patches on the head and anterior half of the trunk. Also

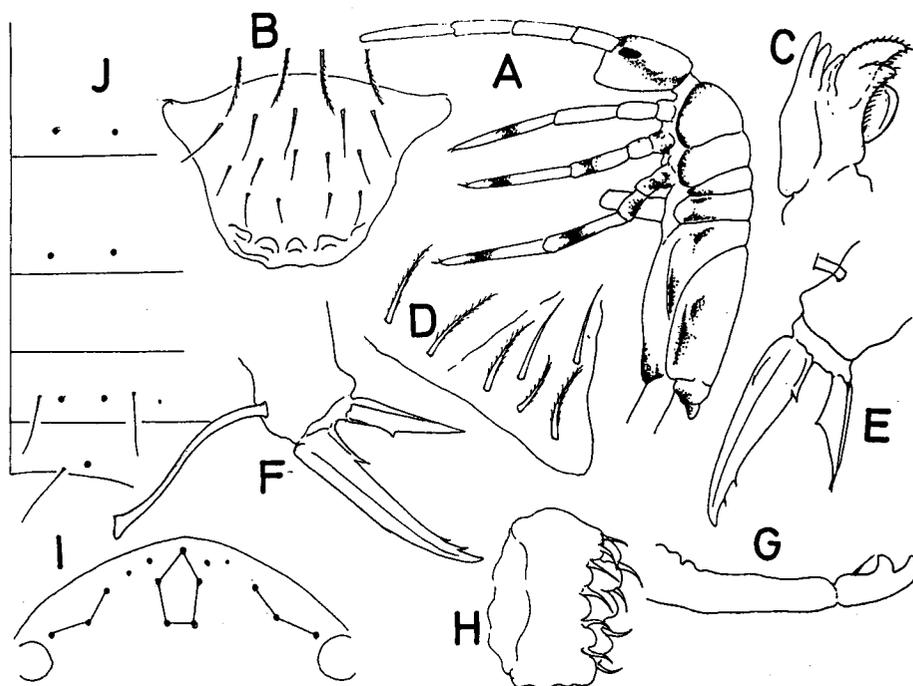


Fig. 4. *Lepidosira (Nusasira) vicina* sp. n.

A: habitus (dark form), B: labrum, C: maxillar head, D: labial basis, E: fore claw, F: hind claw, G: mucro, H: male genital orifice, I, J: macrochaetotaxy of head and trunk.

the unguiculus is truncate and not lanceolate and the setae of abd. II are as s/2/s/1 instead of s/3/s/1 of the cited species.

***Lepidosira (Nusasira) fallaciosa* sp. n.**

Fig. 5, A-F

no. 5 (2 ex.), no. 7 (7 ex.)

Body length ca. 2.0 mm. Ground colour dirty white, shadowed with bluish black pigments. Head is pigmented all over in contrast to the trunk, which has scattered patches along the side from th. II up to the end of abdomen. These patches are rather in form of suffusion not to have the fixed pattern. Antennae almost pale. Legs are with pigmented band on femur and tibiotarsus, almost pale on fore and intensely so on hind legs. Especially the femur of the latter is deeply pigmented throughout. ant.: head as 28:10, ant. segm. ratio as 3:7:7:10. Ant. IV with whorls of setae and with two apical bulbs. Ant. III -organ is two rods in a special area. Ant.

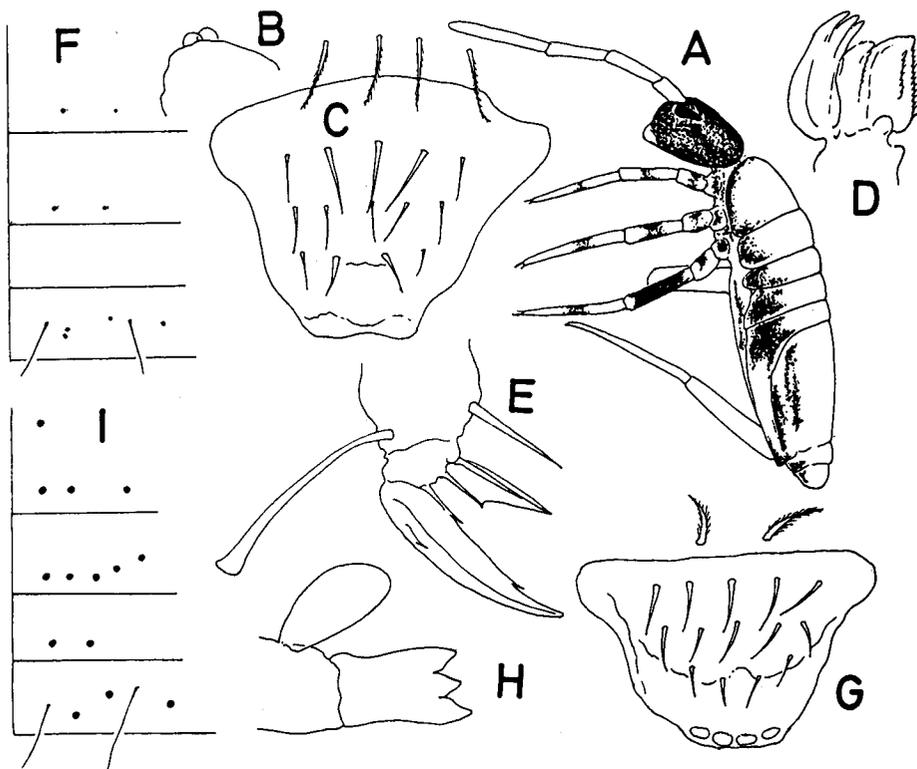


Fig. 5. *Lepidosira (Nusasira) fallaciosa* sp. n.

A: habitus, B: antennal end, C: labrum, D: maxillar head, E: hind claw, F: macrochaetotaxy of trunk.

Salina (Salina) oceanica sp. n. G: labrum, H: mucro, I: macrochaetotaxy of trunk.

I, II dorsally scaled. Labral setae 4/5, 5, 4, prelabrals barbed, labial margin without structures. Outer max. lobe with setae II + iii, not modified. Setae of labial basis as MRE/LL. Eyes 8 + 8, G, H smaller. Legs scaled up to the femur, but not on tibiotarsus. Unguis slender, with two inner and a pair of dorsolateral teeth. Unguiculus is truncate on all legs. Tenent hair elongate, apically spatulate. Trochanteral organ is ca. 70 spiny setae in a quadrangle. Ventral tube unscaled, anteriorly with many ciliated setae, distal ones longer. Posterior face is with fewer, smaller setae plus 1 + 1 smooth ones near distal end. Lateral flap bearing ca. 4 larger smooth and 8 smaller ciliated setae. Terminal tubule is without granulation. Furca with man: d as 10:15. Manubrium ventrally only scaled, larger distally and ending with 2 + 2 ciliated setae. Dorsal side is only setose, the setae of the distal area are not modified. Dens converging, with long ventral scales and ending with a bidentate mucro having one basal spine.

Macrochaetotaxy is strongly reduced as that of *Lepidosira vicina* m. on the head and trunk (Fig. F) and each seta is weakly developed. Scales are, however, strongly chitinized, rounded and with heavy striae.

The species is alike to *Lepidosira nigrocephala* (Womersley) in Yosii 1960, but in the cited species the legs are not pigmented at all and macrosetae are more in number. Unguiculus is not truncate. Seemingly the species is a colour pattern species of the *vicina* group., but differing in the form of unguis and its teeth.

***Salina (Salina) oceanica* sp. n.**

Fig. 5, G-I

no. 2 (1 ex.)

Body length 2.3 mm. Totally white, with suffusion of pigments on ventral side. Eyes 8 + 8, in two rows and poorly pigmented. Labral setae 2/5, 5, 4, prelabrals barbed, all labral setae subequally large, labral margin with 2 + 2 transverse tubercles. Outer max. lobe with setae II + iii, all setaceous and pointed. Setae of labial basis as MrE/LL. Unguis with two inner and a pair of lateral teeth. Unguiculus truncate, with a rounded outer lamella. Tenent hair long, dilated and ciliated in full length. Trochanteral organ and ventral tube as in *S. pallens* m. On the furca the distal area of manubrium is with many, long setae. Dens distally with a large terminal vesicle. Mucro is tridentate and with a minute toothlet on dorsal side. Head is with 1 + 1 spinule on frontal area. Macrochaetotaxy of the trunk is unique, as represented in Fig.5, I,

th. II : ant. 1, post. 1, 1, 1 (= 3),

th. III : 1, 1, 1, 1, 1 (= 5),

abd. I : 1, 1 (= 2),

abd. II : s/2/s/1.

With the reduced number of prelabral setae, the genus *Salina* seems to be divided into two subgenera in the following way, although it must be ultimately decided after

the type species, *S. banksi* MG. is checked of its characters.

Prelabral setae 1 + 1 *Salina* (s. str.)

Prelabral setae 2 + 2, *Cremastocephalus* Schäffer

Also the setae of the labial basis are as MrE/LL in stead of M-E/LL of the usual species.

***Pseudoparonella* Handschin, 1925**

Type species: *Paronella appendiculata* Schött

Just as in the genus *Callyntrura* of the tropical Asia, so the genus *Pseudoparonella* is prevalent in Oceania, diverged to various subgenera and species after the geographical position of the location. The key character of the genus is the presence of bi- or tridentate mucro almost fused with the dens, differing from *Paronella* by the absence of the row of spinous setae on manubrium and dens (Najt, in litt.).

The representatives of New Caledonia may be divided to the following subgenera:

1. Basal seta of outer max. lobe is thick, blunt ending on apex. Antennae, legs elongate, with long macrosetae *Plumachaetas* Salmon
Basal seta of it slender and apically pointed. Extremities are not especially long, with short macrosetae or none at all. 2
2. Distal area on the dorsum of manubrium with some 3 + 3 thick setae
..... *Oceaniella* nov.
Dorsal area on the dorsum of it with many elongate setae, never thickly built
..... *Najtnella* nov.

Since the details of the type species is unknown, it is impossible to compare these subgenera with *Pseudoparonella* (s. str.).

In the previous report (Yoshii, R. et R. S. Yayk, 1989, p. 36), there has been stressed the presence of the pentangular pattern on the frontal area of the head in Entomobryomorpha with a comment that, it is absent in Paronellidae. The conclusion is valid so long as the Asian forms are concerned. But, actually, the pentangle is to be found in *Pseudoparonella* spp, together with a paired seta of L, although the median central setula C is always absent. Whether the presence of such pentangle means the primitive form of the genus within Paronellidae can not be confirmed as yet.

Subgenus *Plumachaetas* Salmon, 1951

(= *Chaetoceras* Handschin, 1926)

Type species: *Chaetoceras sarasini* Handschin, 1926

The subgenus is established by the presence of many long macrosetae on antennae and legs. In other morphological details, also, it is to be separated from others by the labral setae and blunt basal seta of outer max. lobe. Macrochaetotaxy is well developed, when compared with *Oceaniella* etc.

In the original report the genus is described as being unscaled, but with the

broadly elongate setae, which does not coincide with the present report. Since, however, these setae are well chitinized and rather tough, it may be that some of them may be regarded as the broadened setae, when viewed from the side.

***Pseudoparonella (Plumachaetas) sarasini* (Handschin)**

Fig. 6

Chaetoceras sarasini: Handschin 1926

Plumachaetas sarasini: Salmon 1951

no. 13 (3 ex.)

Body length ca. 3.5 mm, white all over, only the antennal basis slightly dark. Antennae and legs darkly bluish all over, a little stronger on femur and tibiotarsus. Furca pale. Antennae very elongate, much longer than the body or ca. 6 times the head and related as 10:13:12:28. Ant. IV is annulated. Ant. III-organ is two rods

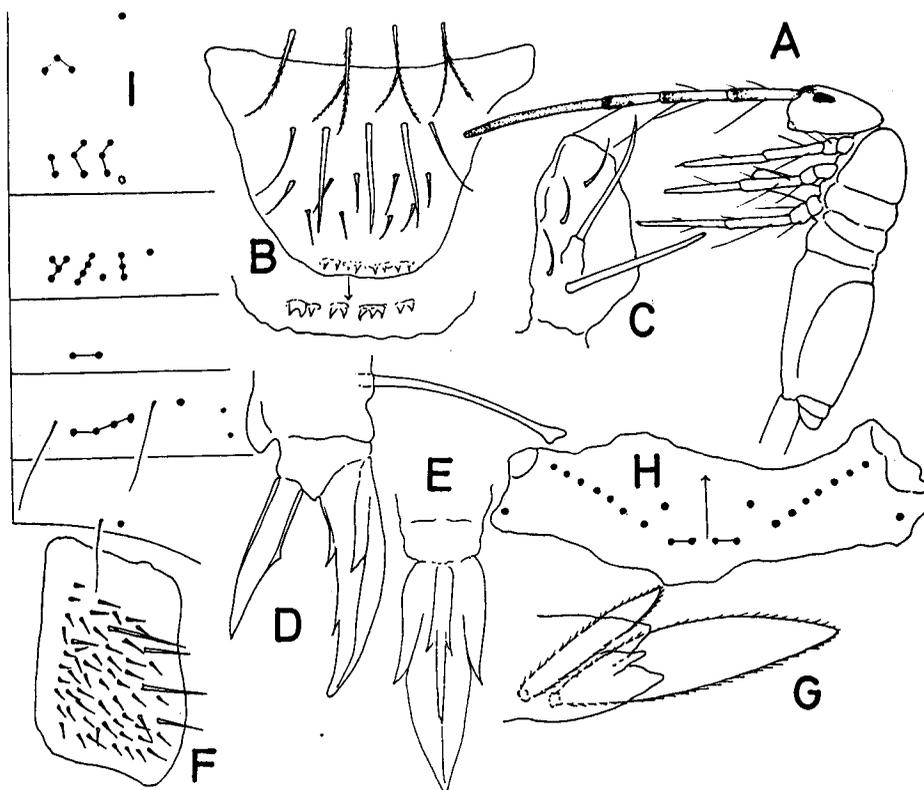


Fig. 6. *Pseudoparonella (Plumachaetas) sarasini* (Handschin)
 A: habitus, B: labrum, C: outer maxillary lobe, D: hind claw, E: unguis (inner view), F: trochanteral organ, G: mucro, H: macrochaetotaxy of v-group of head, I: ditto of th. III-abd. III.

in a special field. Ant. I, II scaled and, together with ant. III, beset with some extremely long, smooth macrosetae. Eyes 8 + 8, G, H smaller. Labral setae as 4/5, 5, 4, prelabrals barbed and forked usually. Median three setae of the first row are straightly upwright, longer than others. Labral margin with many small spinules in 2 + 2 groups and often more than 10 in number. Outer max. lobe with setae II + iii, the basal seta of the papilla is long, blunt ending. Setae of labial basis as MRE/LL. Legs also very slender, unguis is broad, with two inner teeth and its dorsolateral pair is half separated from the main body by the furrow (Fig. E) to have the appearance of the tunica. Unguiculus is narrow, almost truncate by the presence of an inner tooth on all legs. All legs are with long macrosetae, especially on femur. Trochanteral organ is ca. 60 spiny setae in a quadrangle and those along its posterior border are very elongated. Ventral tube unscaled, anterior face with long, ciliated setae, the distal 5 + 5 are elongate, posterior face is also setose and with 1 + 1 distal smooth setae. Lateral flap bearing 4 smooth longer, and many ciliated, smaller setae. Terminal tubule without granulation. Furca with m: d as 1:1. Manubrium ventrally only scaled, becoming longer posteriorly and with 2 + 2 ciliated terminal setae. Dorsal side is only with setae, the distal area is bearing many slender, almost filiform setae in two transverse groups. Dental lobe is well sclerotized, the inner distal corner is with 2 + 2 thick, short and ciliated setae. Dens is ending with two large, fusi-form scaly setae. Mucro is inconspicuously divided from dens, almost bidentate, but with one smaller lateral tooth, when viewed from the side.

Macrochaetotaxy is rather reduced in number. On the head v-group is reduced, without v_0 . Chaetal pattern is as:

th. II : ant. 3/2, post. 3, 3, 4 or 3, 3, 3.

th. III : 4, 4, 1, 3, 1 = 11,

abd. I : 2, abd. II : s/4/1 + ii,

abd. III : s/1.

abd. IV : ant. 2 + 2, med. ca 11 + 11, post. 3 + 3.

Scales of the trunk are never brownish, but hyaline and often in form of a boat, when not well expanded.

Examples at hand coincide fairly well with Handschin's description and figure, although the macrosetae of antennae are less elongated, still they are by far the more than in the usual case. Body colour is actually pale, without any sign of red pigment on abd. IV, which may be, however, of no great importance. *Pseudosinella queenslandica flavotruncata* Yosii, 1960 is almost the same with this species, but different in having more number of macrosetae on th. II-abd. I.

***Pseudoparonella (Plumachaetas) oceanica* sp. n.**

Fig. 7

no. 2 (3 ex.), no. 4 (2 ex.), no. 5 (2 ex.), no. 6 (3 ex.), no. 9 (6 ex.)

Body length up to 3.5 mm., elongate, the extremities being very long. Ground

colour whitish, with black patches, which extend from the eye-field to the posterior extension of abd. III, interrupted on abd. I, II. Abd. II, III has a transverse patch and abd. IV is with scattered spots at the middle and along the posterior border. Abd. V, VI slightly patched. Antennae and legs equally dark all over, deeper distal-

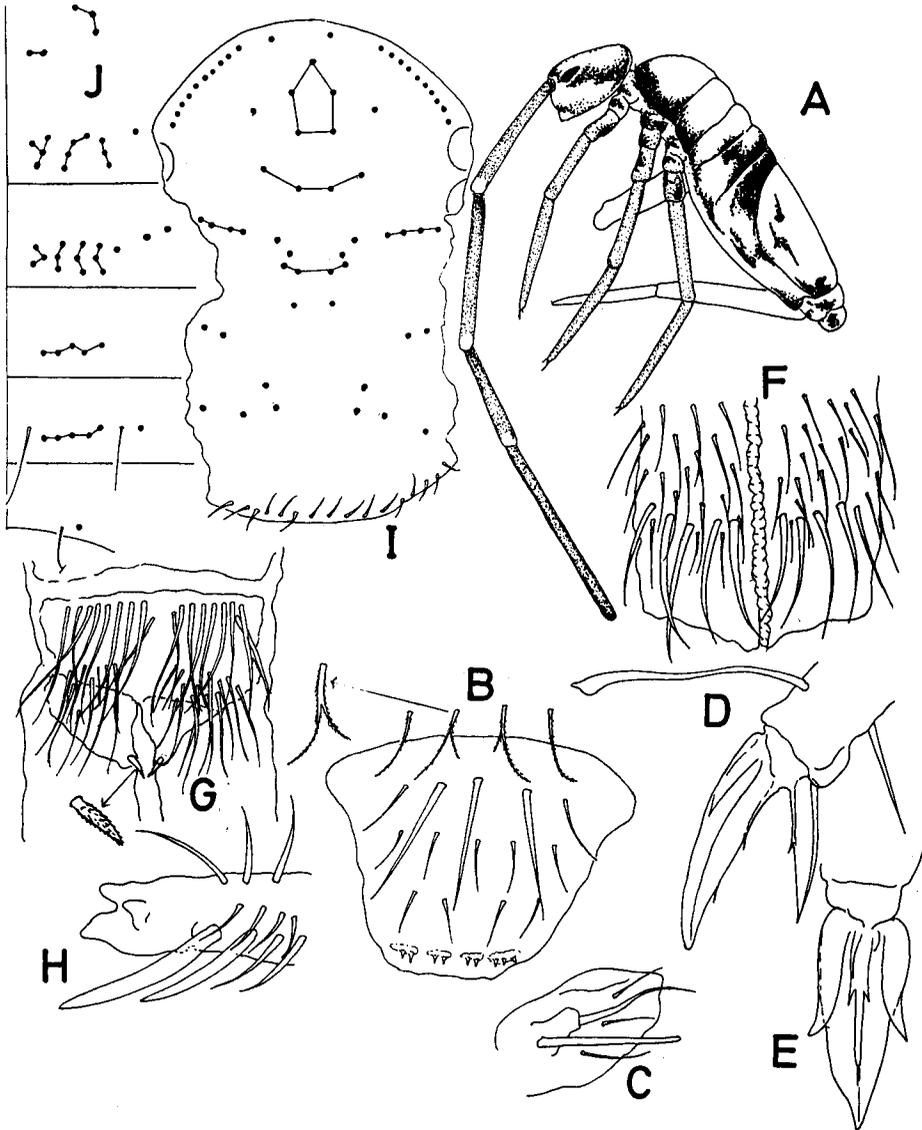


Fig. 7. *Pseudoparonella (Plumachaetas) oceanica* sp. n.
 A: habitus, B: labrum, C: outer maxillary lobe, D: hind claw, E: unguis (inner view), F: ventral tube (anterior face), G: distal area of dorsum in manubrium, H: mucro, I: Macrochaetotaxy of head, J: ditto of trunk.

ly. Furca pale. Antennae very long, longer than the body or ca. 8 times the head in length. ant. segm. ratio as 10:12:8:25. Ant. IV slightly annulated and with one obscure apical bulb. Ant. III -organ is two rods in a special field. Ant. I, II, III dorsally scaled and all of them are with extremely large macrosetae. Eyes 8 + 8, subequally large. Labrum with setae 4/5, 5, 4, prelabrals barbed and often forked with a short branching. From the first row of labral setae the median three are larger and upwrightly standing. Labral margin bearing ca. 8 small, recurving, spinulate processes. Outer max. lobe is with setae II + iii, the basal seta of the papilla is blunt ending. Setae of labial basis as MRE/LL. Legs scaled to the end and with many macrosetae on all segments. Unguis broad, with two inner teeth and a pair of lateral teeth, which are extremely well developed, as if they are a kind of tunica, being separated from the unguis from the basis as in Fig. E. Unguiculus is truncate in fore and mid legs and almost lanceolate in hind legs. Tenent hair long, distally dilated. Trochanteral organ is well developed, composed of ca. 80 spiny setae in a quadrangle. All legs are with long, straight macrosetae. Ventral tube is anteriorly with many, ciliate setae, the distal ones are enlarged (Fig. F), without scales. Posterior face is also with many ciliated setae, among which ca. 5 + 5 are more enlarged and elongated. Terminal 1 + 1 are smooth, but not very long. Lateral flap with some smooth and many ciliated setae, terminal tubule smooth. Furca with man: d as 10:8. Manubrium is ventrally only scaled and terminal setae are 2 + 2, ciliated. Dorsally it is only setose, distal area is without any modified setae, but there are ca. 10 + 10 slender, elongate setae on anterior border and more than that on the posterior border of the area, together with 2 + 2 broad, ciliated setae on the inner corner of the sclerotized area. Dens is ventrally only with elongate scales, dorsally with a dorsal streak, with many ciliated setae, which are going to be longer distally and ending with two broad, large setae near the mucronal end. Mucro is incompletely divided from dens and with three teeth.

Macrochaetotaxy is well developed. On the head the pentangle plus seta L is existing (Fig. I), the median group is 2 + 2 and vertical group is without v_0 (always?). Posterior half is with ca. 6 + 6 macrosetae and cervical setae are well developed. Macrosetae of the trunk is as in Fig. J, where abd. I and II are conspicuous. On abd. IV the median group is ca. 20 - 21 pairs in a broad area, posterior group is 3 + 3 plus some 3 + 3 in symmetrical order. Scales of the trunk are rounded, heavily chitinized and brownish in colour, with rough striae.

There is no firm ground to separate this species from *P. dahlui* Schäffer, 1899, *P. tamarensis* Schott, 1901, *P. queenslandica* Schött, 1917 and *P. insularis* Uchida, 1944. It is only because the details of these species are quite unknown, although the colour pattern is alike to this species. It is preferable to describe it as new to science, to be compared later on with the topotype of these species. There seems to exist some fundamental difference between them, as, for example, in *P. insularis* Uchida the terminal tubule of ventral tube is possibly with a warty streak.

The subgeneric rank is almost sure, as the long macrosetae are present on antennae and legs, although they are not so elongated as in the type species of the subgenus. Such long macrosetae are quite absent in other groups of the genus.

Subgenus *Najtnella* nov.

Type species: *Pseudoparonella novaecaledoniae* Yosii, 1960

The subgenus is characterized by having no special characters. Thus the antennae are with macrosetae of moderate length, mouth parts not specialized. Unguis and unguiculus are not very different. Mucro of normal shape. The only positive character to be mentioned is the presence of long, verticillating setae on the distal area of manubrium of dorsal side. It is likely to be assumed as *Pseudoparonella* (s. str.) and to be established only by the reason that we know very little of the details of the type species: *Pseudoparonella appendiculata* (Schött, 1917).

Pseudoparonella (Najtnella) novaecaledoniae Yosii Fig. 8

Ps. novaecaledoniae: Yosii 1960

no. 1 (6 ex.)

This species is described by one example from Koghi, which is very alike to *Ps. oceanica* sp. n. in colour pattern, but to be distinguished by the patched antennae and legs. The rich materials of this time have afforded me to complete the diagnosis as follows: Ground colour whitish, with blackish patches. Lateral patch extends from the eyes continuing to abd. VI, deeper on abd. II, III, where it is united with the transverse patch to occupy the whole segments. Abd. IV has a large lateral patch on posterior half, extending to abd. V, VI and there is one small patch at the middle of the segment. Antennae deeply pigmented on proximal part of each segment. Legs with two bands on femur and tibiotarsus, thinner on fore and more intensive on hind legs, especially deep on femur. Coxa, trochanter and ventral tube are faintly dark. Furca pale. Antennae I, II scaled, but with very short macrosetae. Ant. IV is annulated and with an obscure apical bulb. Eyes 8 + 8, G. H smaller. Labral setae 4/5, 5, 4, prelabrals barbed. Labral margin is with a slight ridge having some 8 minute plications. Outer maxillary lobe with setae II + iii, all pointed. Labial basis with setae as MRE/LL. Legs scaled until to the end. Unguis rather broad, with well developed two inner teeth and a pair of dorsolateral tooth. Unguiculus is lanceolate on hind legs, slightly truncate on other legs. Trochanteral organ composed of many, rather long setulae in a quadrangle. Ventral tube anteriorly unscaled, with many long, ciliated setae, the distal row of ca. 5 + 5 are elongated. Posterior face also unscaled, with many long, ciliated setae, the distal pair is smooth. Lateral flap with some longer smooth and many smaller ciliated setae. Terminal tubule is smooth. Manubrium is ventrally only scaled, distal setae 2 + 2, ciliated. Dorsally it is unscaled, only with ciliated setae, which are longer distally and with 1 + 1 long s. s.-like setae near

the distal margin. Distal area is without thick modified setae of *Oceaniella* spp., but with some pairs of very long, ciliate setae at the place. Dental lobe has two well developed, ciliated basal setae on its inner distal corner. Dens is with two large scaled setae near the mucro, which is almost ankylosed with dens, bidentate, but with slight sign of the third tooth on its inner side. Macrochaetotaxy is well developed. On the head pentangle plus seta L is existing, but without central seta. Median group is 2 + 2, and v-group is with 4 setae at the middle, followed by 1 + 1 posterior to them and with ca. 8 setae on both sides. Posterior half of the head is without macrosetae

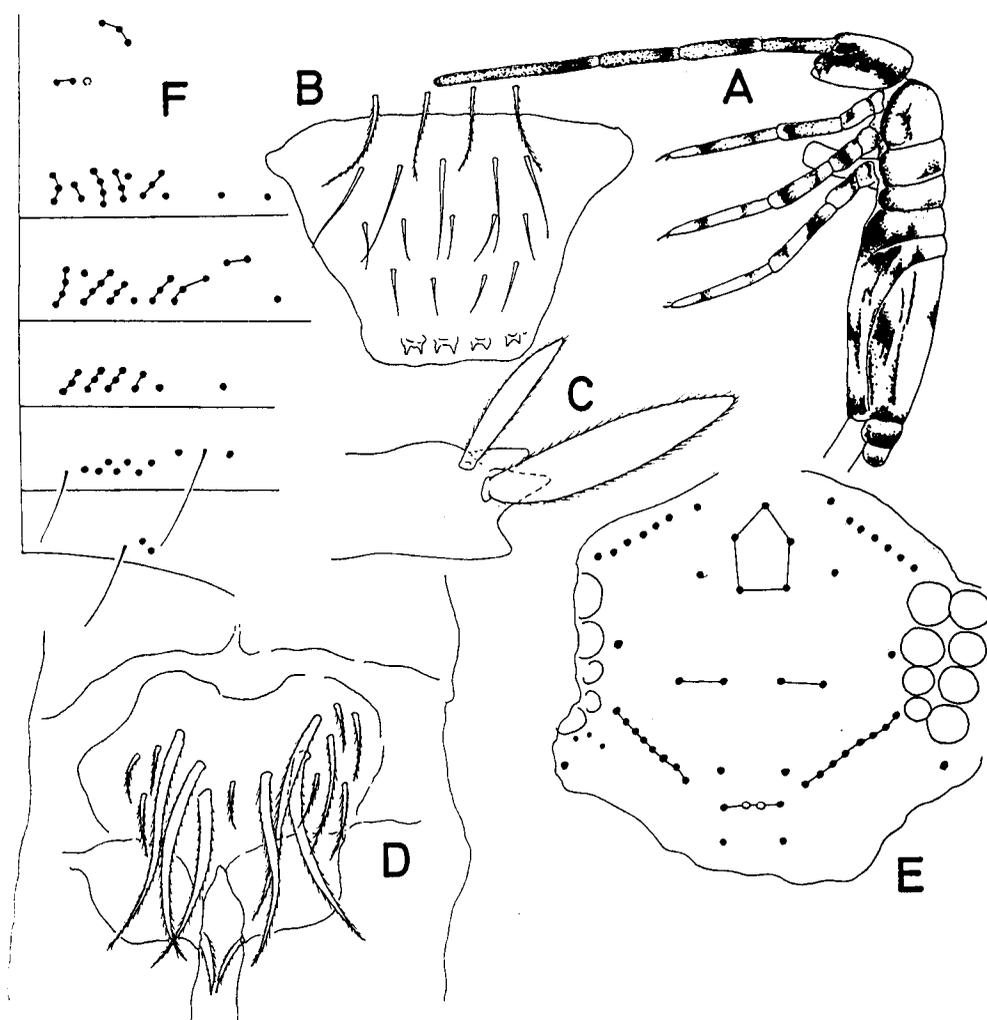


Fig. 8. *Pseudoparonella (Najtnella) novaecaledoniae* Yosii
 A: habitus, B: labrum, C: mucro, D: distal area of
 dorum of manubrium, E: macrochaetotaxy of the
 head, F: ditto of trunk.

and cervical setae are well represented. On the trunk the chaetal pattern is as in Fig. F, where the arrangement on abd. I seems to be very constant. In some examples, one dorsal s. s. of abd. II is not to be identified.

In the colour pattern this species is alike to *Ps. oceanica* sp. n., to be separated from it by the shorter antennae and banded legs. In the details of the body, however, the two species are easily separable by the structure of labrum, outer maxillary lobe, unguis etc.

Pseudoparonella (Najtnella) sp.

no. 11 (3 ex.)

The specimens at hand are very near *Ps. novaecaledoniae* m., but smaller in body length (ca. 2.1 mm.). Colour pattern is paler, having lateral patch only on ant. II, III and abd. IV is with a small linear patch to the side. Head is rather darkly and uniformly pigmented. Antennae and legs are quite without any pattern. Details of the body are just like the cited species, but the macrochaetotaxy is different. On the head all of the v-group are existing, th. II -abd. II are with less number of macrosetae and abd. III has dorsally s/1 in stead of s/2 of the cited species.

Owing to the scarcity of the material, it can not be decided, whether it is separate species or possibly, a young form of the cited species.

Subgenus *Oceaniella* nov.

Type species: *Pseudoparonella najtae* sp. n.

The subgenus is characterized by the presence of the thick, enlarged setae near the dental end in dorsal side of the manubrium. Macrochaetotaxy is rather reduced on the head and trunk. Mucro is tridentate, inconspicuously separated from dens and there are two enlarged scales on its inner side.

***Pseudoparonella (Oceaniella) najtae* sp. n. Fig. 9**

no. 2 (many ex.), no. 5 (16 ex.), no. 7 (25 ex.)

Body length up to 3.5 mm. Ground colour whitish. Antennae banded ventrally near each articulations. Body with purplish patch on the posterior border of abd. IV, leaving a pale median part. Abd. V is also patched. In pale forms other parts of the trunk are almost pale, but in dark forms the lateral parts of the trunk are diffusely suffused with dark pigments, without forming patches. Legs are with a patch on femur, stronger on hind legs. Other extremities are pale. Ant. I - III dorsally scaled. ant.: head as 30:10, ant. segm. ratio as 10:15:20:38. Ant. IV is annulated and with an obscure, round swelling at the end. Ant. III-organ is two short rods without groove. Eyes 8 + 8, black, A, B large and G, H small. Labrum with setae 4/5, 5, 4, prelabrals barbed, labral setae not modified and labral margin is with 4 + 4 small,

but distinct tooth-like processes. Maxilla well developed as in Fig. C, quite different from *Lepidosira* (Fig. 1, C). Outer maxillary ramus with setae II + iii, all smooth and pointed. Labial basis with setae MRE/LL, R is smaller. Legs scaled all over up to the end. Unguis is strongly carinate, with a small inner basal and larger inner distal

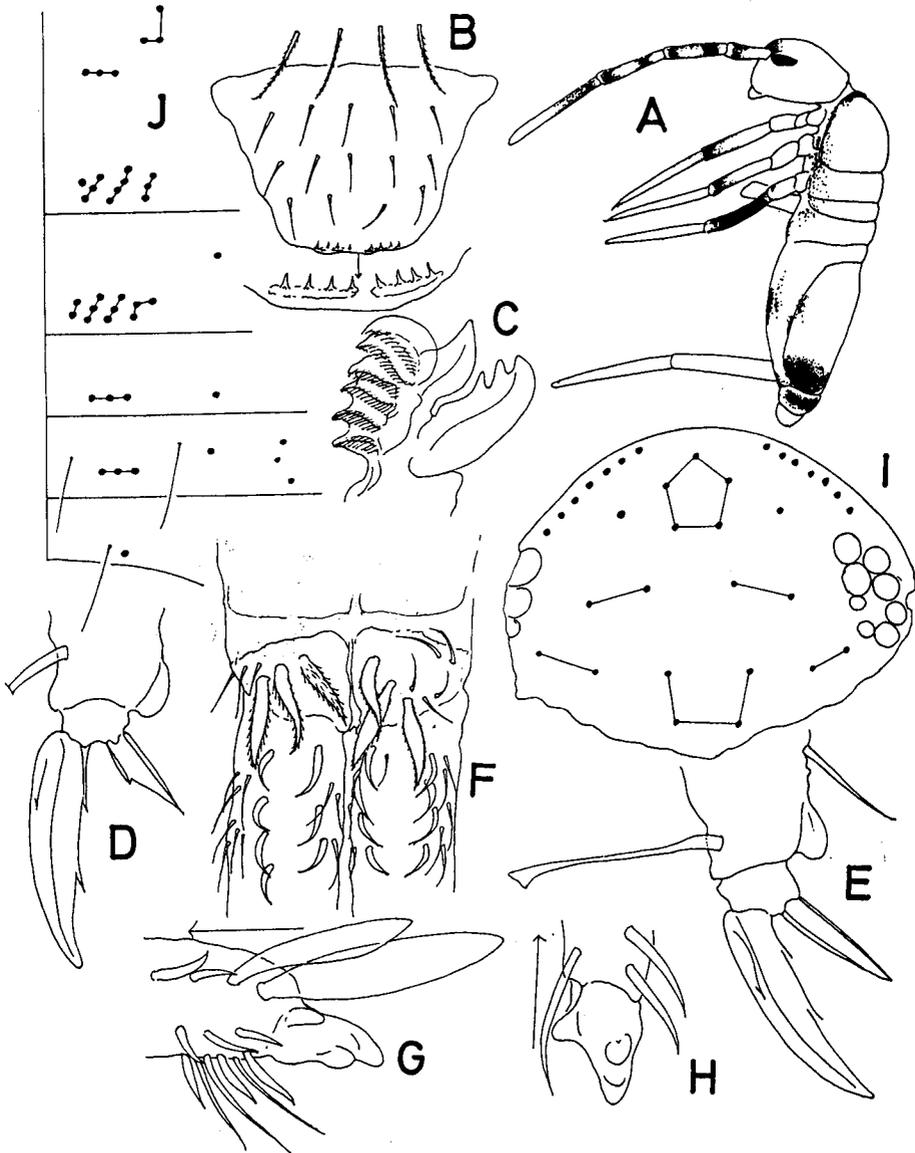


Fig. 9. *Pseudoparonella (Oceaniella) najtae* sp. n.
 A: habitus, B: labrum, C: maxillar head, D: fore claw,
 E: hind claw, F: distal area of manubrial dorsum,
 G, H: mucro (lateral and dorsal view), I: macrochaetotaxy
 of head, J: ditto of trunk.

tooth. Dorsolateral teeth are existing not in a symmetrical position. Unguiculus is elongate, strongly truncate on fore and mid legs, having a prominent inner corner tooth and lightly truncate on hind legs. Tenent hair long, spatulate distally. Trochanteral organ is well developed, with about 100 spiny, short setae in a quadrangle. Ventral tube is anteriorly with many slender, ciliated setae, the distal 6 + 6 are thicker and longer, with some small, pointed scales directly anterior to the row. Posterior face is not scaled, with numerous long, ciliated setae, the two median setae among them are larger and almost s. s. like and 1 + 1 distal ones are smooth. Lateral flap is bearing many larger, smooth, and smaller ciliated setae. Terminal tubule is not granulated. Furca with man.: d. as 7:6. Manubrium is ventrally only with scales, which are elongate near the dental end, where there are also 3 + 3 ciliated terminal setae. Dorsally, it is only with setae, the median stripe having no scales and there exist 3 + 3 enormously large terminal setae heavily barbed. Such modified setae are extending to the dentes in a small form on both sides of the dorsal glabrous stripe, transforming gradually to the usual setae up to the mucronal end, where there are two fusiform, especially large, scale-like setae on its inner side. Ventral side of dens is with scales, larger and elongate near distal end. Mucro is tridentate subequally, the third tooth is located to their inner side.

Chaetal pattern is rather fixed. On the head the frontal pentangle is existing, but without C and with a pair of L. Median row is 2 + 2 and v-group is rather reduced, composed of only 4 + 4 setae. Posterior part of head with very few macrosetae. Cervical row of setae are all smooth, short setae. Macrochaetotaxy of the trunk is as in Fig. J, they are rather constant and expressed as:

- th. II: ant. 3/3, post. 1, 3, 4, 3
 th. III: 2, 3, 3, 3/1.
 abd. I: 3/1,
 abd. II: s/4/s/1, 3.
 abd. III: s/1, abd. IV., med: in two levels.

Scales of the body are brownish, rounded and larger on segmental margins of the trunk. They are distinctly sculptured and striated.

The species is very nearly related to *Ps. shibatai* Ys., 1960, differing from it in the colouration of legs and of abd. IV and V. No morphological difference can be found between them.

***Pseudoparonella (Oceaniella) shibatai* Yosii** Fig. 10

Pseudoparonella shibatai: Yosii 1960

no. 1 (35 ex.), no. 3 (3 ex.), no. 8 (21 ex.), no. 12 (31 ex.)

Body length ca. 3.0 mm., totally white all over, only antennae are dark on basal part of each segment. ant.: head as 10:40, ant. segm. ratio as 10:13:10:22. Ant. IV annulated, with an obscure apical bulb. Ant. III-organ is two blunt rods in a groove.

Ant. I, II scaled, but without large macrosetae. Eyes 8 + 8, subequally large. Labrum with setae 4/5, 5, 4, prelabrals ciliated, labral setae subequal and margin is with 8 cuspidate spinules. Outer maxillary lobe with setae II + iii, basal seta is pointed apically. Setae of labial basis as MRE/LL. Legs scaled until to the end. Unguis is rather broad, with two inner teeth and its dorsolateral teeth are not separated from the main body of unguis (Fig. E). Unguiculus truncate on fore and mid legs and faintly so on hind legs. Tenent hair is as long as unguis, apically dilated. Trochanteral organ is an assembly of ca. 70 rather long spiny setae in a quadrangle. Ventral tube anteriorly with many setae, the distal 5 + 5 are enlarged. Posterior face is also with many setae, distal 1 + 1 are smooth. Lateral flap bearing some 4 larger smooth and many smaller ciliated setae. Terminal tubule smooth. Furca with man.: d. as 10:18. Manubrium ventrally scaled, with 2 + 2 barbed terminal setae, dorsally it is only setose and its distal area is bearing 3 + 3 enormously modified,

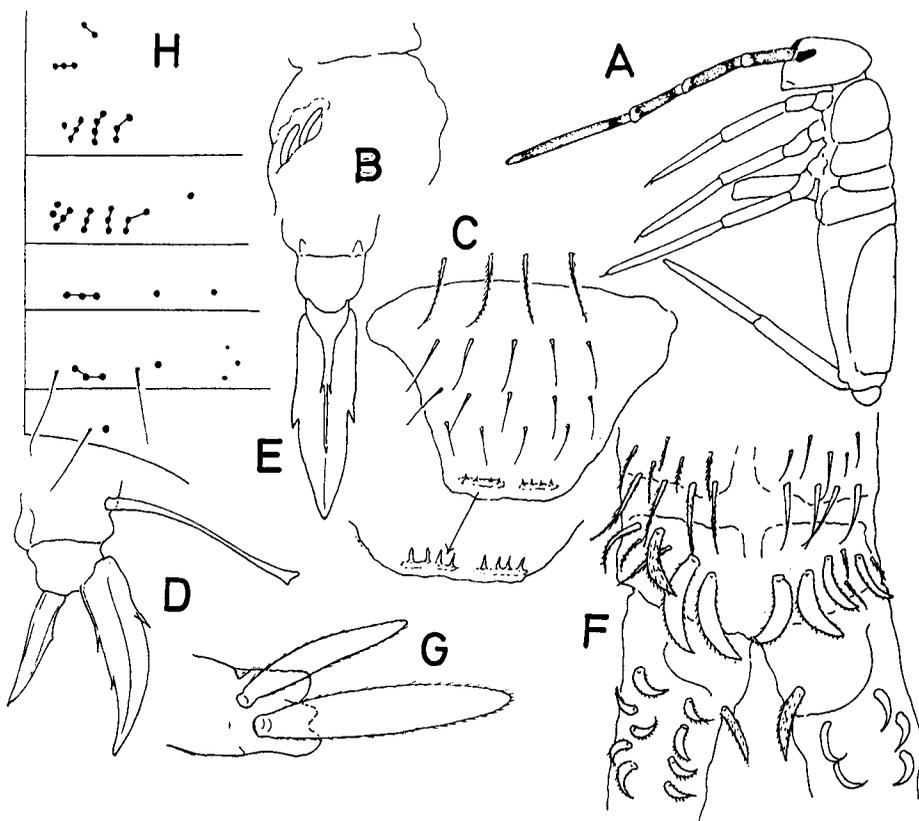


Fig. 10. *Pseudoparonella (Oceaniella) shibatai* Yosii
 A: habitus, B: ant. III-organ, C: labrum, D: hind claw,
 E: unguis (inner view), F: distal area of manubrial dor-
 sum, G: mucro, H: macrochaetotaxy of the trunk.

thickly built and curving setae. Setae of the same kind, but much smaller are in a row on each side of the dorsal stripe of dens until to the mucronal end, where there are two large, lanceolate, scaly setae on inner side. Mucro is inconspicuously divided from dens, irregularly tridentate, all with blunt apices.

Macochaetotaxy is rather reduced. On the head the setae are in the same arrangement with *Ps. najtae* sp. n., but more obscured. On the trunk they are approximately as:

- th. II : ant. 3, post. 4, 3, 2 (= 9),
 th. III : 1, 3, 3, 1/2, 1,
 abd. I : 1, 1, 1 (= 3),
 abd. II : s/3/s/1,
 abd. III : s/1,
 abd. IV : median group: dispersely zonated
 posterior group: absent.

The macrosetae are weakly chitinized, but the scales are brownish on dorsal side and enlarged on the posterior margin of the segments.

The species can be identified by its pale body colour, which is not transient to others of the same subgenus. But, in the morphological details, it can not be separated from others.

***Pseudoparonella (Oceaniella) griseocoerulea* sp. n.**

Fig. 11, A

no. 1 (6 ex.), no. 2 (1 ex.), no. 3 (1 ex.), no. 8 (1 ex.), no. 12 (10 ex.)

Body length up to 2.6 mm. Colour bluish gray all over, deeper on antennae and

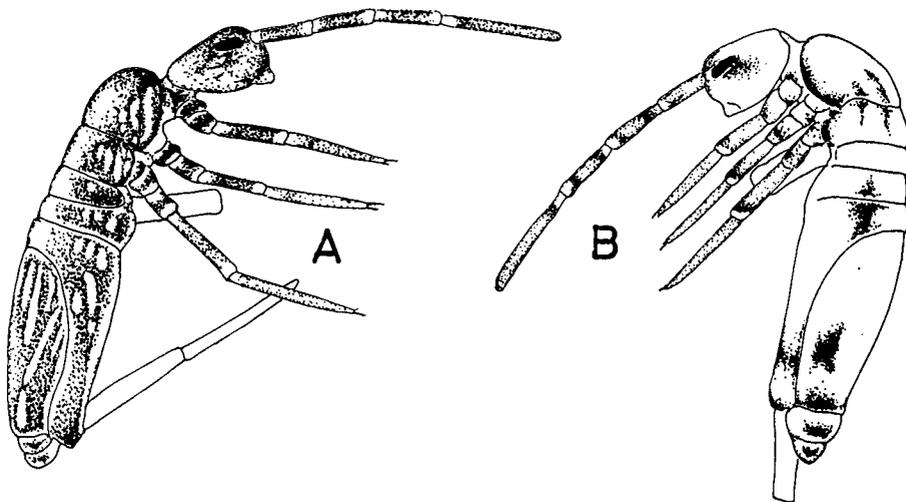


Fig. 11. A: *Pseudoparonella (Oceaniella) griseocoerulea* sp. n.
 B: *Pseudoparonella (Oceaniella) bicincta* sp. n.

legs. Body is not uniformly coloured, but segmental margins and some longitudinal streaks are pale. ant.: head as 45:10, ant. segm. ratio as 10:14:14:26. Ant. IV annulated and with an apical bulb. Ant. III-organ is two rods in a special area. Ant. I, II scaled, but without long macrosetae. Labrum with setae 4/5, 5, 4, prelabrals barbed and its margin is with 4 + 4 minute spinules. Outer max. ramus with setae II + iii. Labial basis with setae MRE/LL, all barbed. Eyes 8 + 8, black, G, H smaller. Thorax not produced. Legs with scales until to the end. Unguis broad, with two inner teeth and one pair of dorsolateral teeth. Unguiculus distinctly truncate on all legs. Tenent hair long, dilated apically. Trochanteral organ is ca. 70 rather long spinules in a triangular area. Ventral tube elongate, anteriorly with many ciliate, long setae, the distal 5 + 5, enlarged and the area just proximal to the row have some small scales. Posterior face with many filiform, ciliate setae, the distal 1 + 1 are smooth. Lateral flap with smooth and ciliated setae. Terminal tubule is smooth. Furca with man: d as 10:8, manubrium ventrally only scaled, its distal setae are 2 + 2, ciliated. Dorsal side is only with ciliated setae and its distal area has 2 + 2 curving, very enlarged setae plus 3 + 3 lesser ones. Dens ventrally scaled and dorsally with many setae including two dorsal rows of the curving, modified setae. Distally, near the mucronal end two setae are enlarged strongly to form a kind of scales. Mucro is tridentate, incompletely divided from the dens.

Macrosetae of the head is reduced. Frontal pentangle is existing, but f_2 is absent and v-group is represented by only 1 + 1 setae. Posterior half of the head without macrosetae. Cervical setae existing, not modified. Macrosetae of the trunk are as in *Ps. najtae* m., where abd. I is only with 3 + 3 setae and abd. II is with s/3/s/1. That of abd. IV has the median group of ca. 3 + 3.

The species is at once to be discriminated by the bluish gray colouration of the body. But in the details, it is quite near *Ps. najtae* m., and no fundamental difference can be found between them (see below).

***Pseudoparonella (Oceaniella) bicincta* sp. n.**

Fig. 11, B

no. 10 (4 ex.)

Body length up to 2.0 mm., ground colour white, but with bluish patches. Beside the slight marginal patch of th. II, and a small lateral patch on abd. II, there are large patches on abd. III. Abd. IV has a pair of spots laterally near the middle and on posterior border. Abd. V is also patched. Antennae diffusely dark, deeper near the articulation. Legs also diffusely pigmented, deeper on distal part of hind femur. Furca pale. ant.: head as 1:3, ant. segm. ratio as 10:15:14:28. Ant. IV is annulated, with an obscure apical bulb. Ant. III-organ is two blunt rods in a deepening. Ant. I, II scaled, without long macrosetae. Eyes 8 + 8, black, G, H smaller. Labral setae 4/5, 5, 4, prelabrals barbed, labral setae subequal and margin is with 8 small recurving spinules. Outer max. lobe with setae II + iii, basal seta pointed. Labial

basis with setae MRE/LL. Legs scaled up to the end. Unguis broad, with two inner teeth and dorsal paired teeth are not separated from the main body. Unguiculus truncate on all legs. Trochanteral organ is ca. 40 rather long setulae in a quadrangle. Tenent hair long, dilated distally. Ventral tube anteriorly unscaled, with ca. 6 + 6 large terminal row of setae. Posterior face is with heavily ciliated setae and distal 1 + 1 are smooth. Lateral flap is with 4 large smooth and many smaller ciliated setae. Terminal tubule smooth. Furca with man: d as 10:8. Manubrium is ventrally only scaled, the terminal 2 + 2 setae are ciliated. Dorsally there are only setae and its distal area is bearing 3 + 3 broadly large, curving setae plus some 3 - 4 small ones and its well developed dental lobe has 2 + 2 thick, broad setae at the inner corner of it. Dens is ventrally only scaled, larger distally. Distal modified lanceolate setae were fallen off and not observed. Mucro is inconspicuously divided from dens and irregularly tridentate.

Macrochaetotaxy of the head rather reduced as in *Ps. najtae* and that of the trunk is almost the same with it, having the following formula.

th. II : ant. 3/2, post. 4, 4, 3,

th. III : 4, 3, 2?/1

abd. I : 3/1

abd. II : s/3/1,

abd. IV : s/1.

The scales are not brownish, rather thin and setae are also uncoloured. In one example one of the four barbed prelabral setae are forked from the middle, which may be, however, only the teratological case.

The species is not to be separated from *Ps. najtae* m. except in the colour pattern, for which there must be in discussion in the following pages.

Discussion

In the foregoing part I have described and figured various species of *Oceaniella* of New Caledonia rather in detail without avoiding the refrain of the same characters. The result is to show the fact that these species are all the same in morphological characters and to be separated only by the colour pattern of the body, which is rather fixed to each of them and there is no transient forms to be found between them. To such a species I would like to propose the name "colour pattern species". At first, I have had the idea, that the macrochaetotaxy is available to distinguish each of them. But, having inspected the rich materials one by one, it has been found, all differences of the macrochaetotaxy is within variation of the same pattern. Thus, on Fig. 12, the right side of the central figure is of the normal or standard pattern of *Oceaniella*. About 60 % of the examined examples has no deviation without regard of their colour pattern, but in others some deviation may appear usually on one side only, but rarely on both sides of the trunk. In the figure the deviated site is with a small arrow and,

when it is symmetrical, then with an arrow and a round circle.

When we look back the history of the research of Collembola from the beginning, from the time of Nicolet, Tullberg and Lubbock, there may come out the apparent tendency to reconstitute the "colour pattern species" to morphological species. Thus the genus *Entomobrya* was to be identified only by the colour pattern (Bonet, 1934) until Christiansen (1958) has pointed out the difference of the labral margin and male genital ring to be available for the taxonomy. The same results we could find in case of *Seira*, *Callyntrura* by the use of macrochaetotaxy and the research of mouth parts, especially of the labrum (Yoshii 1959, 1982a, 1982b, 1983 etc.) and to which the ventral tube is recently added for the purpose (Yoshii et al. 1989).

However, there are still some groups of Entomobryomorpha by which all these procedures are not effective to find out any difference of specific value and that only the colour pattern is to be regarded as the specifying key character. To such group the mentioned *Oceaniella* may belong. An another group of the same kind is the subgenus *Homidia*, which is *Entomobrya* with well developed dental spines in one row. The group is widely distributed in the tropical and eastern part of Asia, and what is to be seen in the southern part of Asia belongs to *H. cingula* Börner, the type of the genus, to be found in India, Bangladesh, Thai, Malaya, Java, Sumatra and Vietnam (f. *subcingula* Denis). In these places the colour pattern is almost constant with very few variations and easily to be identified, in contrast to the temperate region of Asia, namely Japan, China and Korea, where there are huge numbers of forms to be separated by the colour pattern. Thus *H. sauteri* (Börner) is with a transverse band on

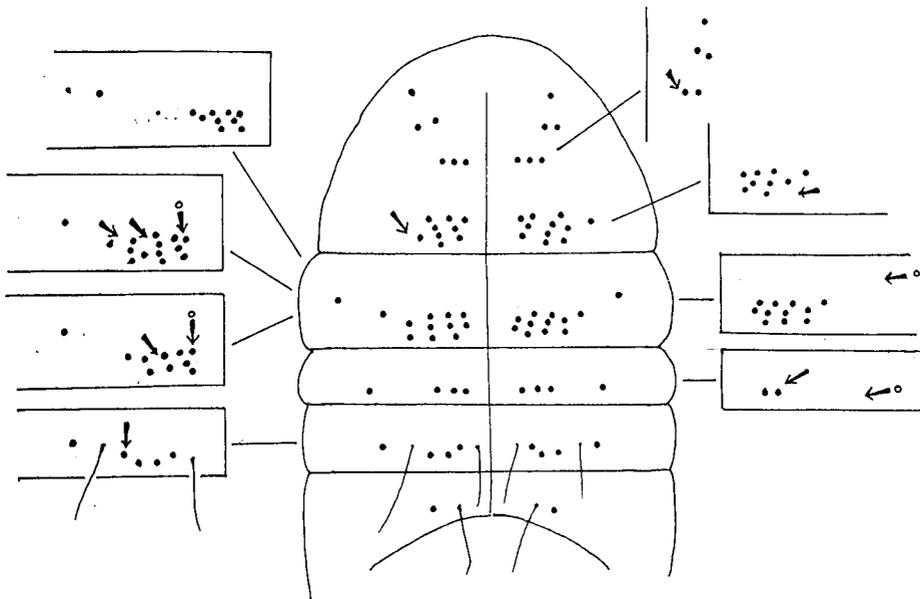


Fig. 12. Variation of macrochaetotaxy within *Oceaniella* spp.

the trunk and *H. socia* (Denis) is with longitudinal bands on it, so that it is quite impossible to regard them as the same species, although there may be found no difference in their morphological characters, including the macrochaetotaxy of the trunk and mouth parts, male genital ring etc. Some important proposal were made in the Korean species by Szepticki, Lee, B. H. etc., but the result is not workable in the Japanese specimens, so that they may be regarded also as "colour pattern species" at present. The same may be said of the *affinis*-group of *Salina*. It does not mean, however, that the research of the further works to find out any available key character to separate them is of no use, but, on the contrary, it is the matter of great importance. The name of "colour pattern species" is, therefore, available only for the present status of the Collembolan taxonomy.

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