




First report of the genera *Paralobella* and *Blasconura* (Collembola: Neanuridae: Neanurinae) from Japan with the description of three new species

HIRO KASAI¹*, DAISUKE HAYASAKA^{2,3} & TAKUO SAWAHATA^{2,4}

¹Graduate School of Agriculture, Kindai University, Nakamachi 3327-204, Nara 631-8505, Japan.

²Faculty of Agriculture, Kindai University, Nakamachi 3327-204, Nara, 631-8505, Japan.

³✉ hayasaka@nara.kindai.ac.jp; ✉ awayotou@hotmail.com;  <https://orcid.org/0000-0002-4108-7101>

⁴✉ tsawahata@nara.kindai.ac.jp;

*Corresponding author. ✉ shkhiro1@gmail.com

Abstract

This study reports the first record of the genera *Paralobella* Cassagnau & Deharveng, 1984 and *Blasconura* Cassagnau, 1983, three new species from Kuchinoerabu-jima and Miyako-jima of Japan, respectively. *Paralobella kuchierabu* **sp. nov.** can be distinguished from all known genus members by distinct morphological characteristics: yellow body color, mandible with 3 teeth, presence of chaeta O on head, and tubercle De of Th. II–III with 5 (4+s) chaetae, tubercle Di of Th. I with 1 chaeta, tubercles De and D1 of Abd. V separated. *Blasconura triangulum* **sp. nov.** is characterized by a tubercle Fr fused to An, unguis without an inner tooth, and 2 very closely placed tubercles Di on head. *Blasconura cordis* **sp. nov.** is unique in the genus, with a tubercle An fused to Cl. Other characteristic features of the species are the absence of chaeta O on head, tubercle Oc with 3 chaetae, Ant. I with 7 chaetae, and tubercle De of Th. III with 5 (4+s) chaetae. A key to all species of the genus *Paralobella* and *Blasconura* is provided.

Key words: taxonomy, springtails, saproxylic, East Asia, Osumi Islands, Miyako Islands

Introduction

The subfamily Neanurinae is a large group of Collembola, comprising about 105 genera and more than 800 species reported worldwide (Bellinger *et al.* 1996–2022). Currently, the Neanurinae fauna in Japan includes 12 genera: *Morulodes* Cassagnau, 1955; *Metanura* Yosii, 1954; *Deutonura* Cassagnau, 1979; *Paranura* Axelson, 1902; *Paleonura* Cassagnau, 1982; *Vitronura* Yosii, 1969; *Crossodonthina* Yosii, 1954; *Propeanura* Yosii, 1956; *Yuukianura* Yosii, 1955; *Lobellina* Yosii, 1956; *Lobella* Börner, 1906; and *Coecoloba* Yosii, 1956 (Deharveng 1989; Machida 2020). Many species of these genera have been found in mainland Japan. However, the study area of the current work ‘Nansei Islands’, Japan has mostly remained unexplored or inadequately explored, indicating possibility of discovering previously unknown genera in this subtropical habitat in future.

In this work, springtails inhabiting dead wood were surveyed in Kuchinoerabu-jima and Miyako-jima, which belong to the Nansei Islands, southwest Japan. We discovered three new species of the genus *Paralobella* Cassagnau & Deharveng, 1984 and *Blasconura* Cassagnau, 1983 in the area, which is the first record of these genera in Japan. We describe and illustrate here these three new species of *Paralobella* and *Blasconura*, and provide updated keys to all species in the genera.

Material and methods

Specimens were collected from dead wood samples using a Berlese-Tullgren funnel and stored in 95% ethanol. Subsequently, the specimens were mounted on slides in Hoyer’s solution and observed under a microscope (Olympus BH-2). All specimens were deposited in the National Museum of Nature and Science, National Science Museum, Tokyo (NMNS, MSMT), Tokyo Province, Japan, in the collection of Apterygota (Ap).

Terminology. The terminology and layout of the tables used in this study follow those of Deharveng (1983), Deharveng & Weiner (1984), Smolis & Deharveng (2006), and Smolis (2008).

Abbreviations used. General morphology: Abd.—abdomen, Ant.—antenna, AOIII—sensory organ of antennal segment III, Cx—coxa, Fe—femur, Scx2—subcoxa 2, T—tibiotarsus, Th.—thorax, Tr—trochanter, VT—ventral tube.

Groups of chaetae: Ag—antegenital, An—chaetae of anal lobes, ap—apical, ca—centroapical, cm—centromedial, cp—centroposterior, d—dorsal, Fu—furcal, vc—ventrocentral, Ve or ve—ventroexternal, Vea—ventroexternoanterior, Vem—ventroexternomedial, Vep—ventroexternoposterior, Vel—ventroexternolateral, Vec—ventroexternocentral, Vei—ventroexternointernal, Vi or vi—ventrointernal, VI—ventrolateral.

Tubercles: Af—antenna-frontal, An—antennal, Fr—frontal, Cl—clypeal, De—dorsoexternal, Di—dorsointernal, Dl—dorsolateral, L—lateral, Oc—ocular, So—subocular.

Types of chaetae: Ml—long macrochaeta, Mc—short macrochaeta, Mcc—very short macrochaeta, me—mesochaeta, mi—microchaeta, ms—s-microchaeta, S or s—chaeta s, bs—s-chaeta on Ant. IV, miA—microchaetae on Ant. IV, iv—ordinary chaetae on ventral Ant. IV, or—organite of Ant. IV, brs—border s-chaeta on Ant. IV, i—ordinary chaeta on Ant. IV, mou—cylindrical s-chaetae on Ant. IV.

Taxonomy

Family Neanuridae Börner, 1901

Subfamily Neanurinae Börner, 1901

Tribus Lobellini Cassagnau, 1983

Genus *Paralobella* Cassagnau & Deharveng, 1984

Paralobella kuchierabu sp. nov.

[Japanese name: kuchierabu-yokoge-ibotobimushi]

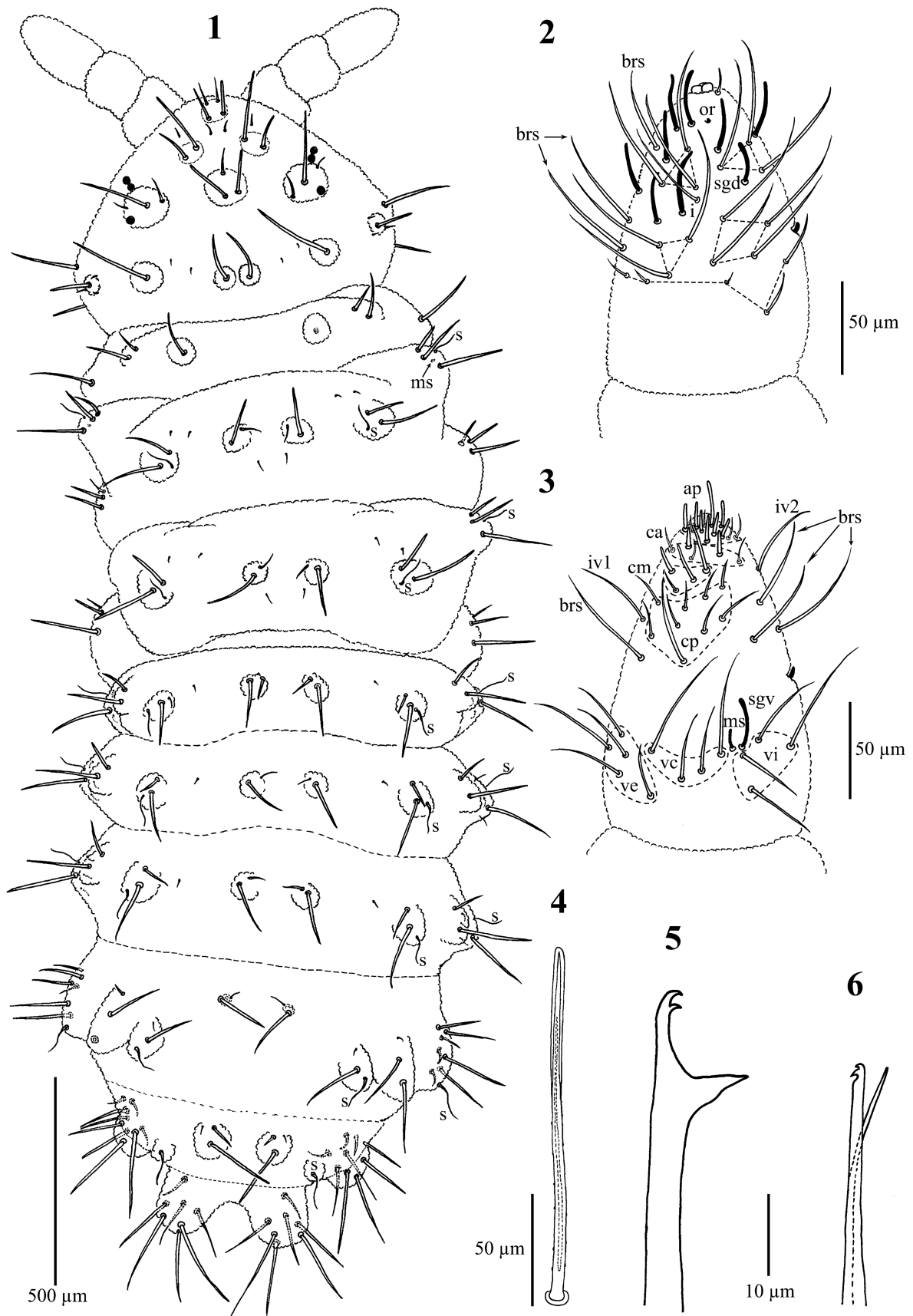
Figures 1–11, Table 1

Type material. Holotype: female, Japan, Kagoshima, Kuchinoerabu-jima (alt. 255 m, 30°27'25"N, 130°13'52"E), 4-XII-2021, Hiro Kasai leg. (NMNS, NSMT-Ap 591). Paratypes: 2 females (NMNS, NSMT-Ap 592, NSMT-Ap 594), male (NMNS, NSMT-Ap 593) and juvenile (NMNS, NSMT-Ap 595), same data as holotype.

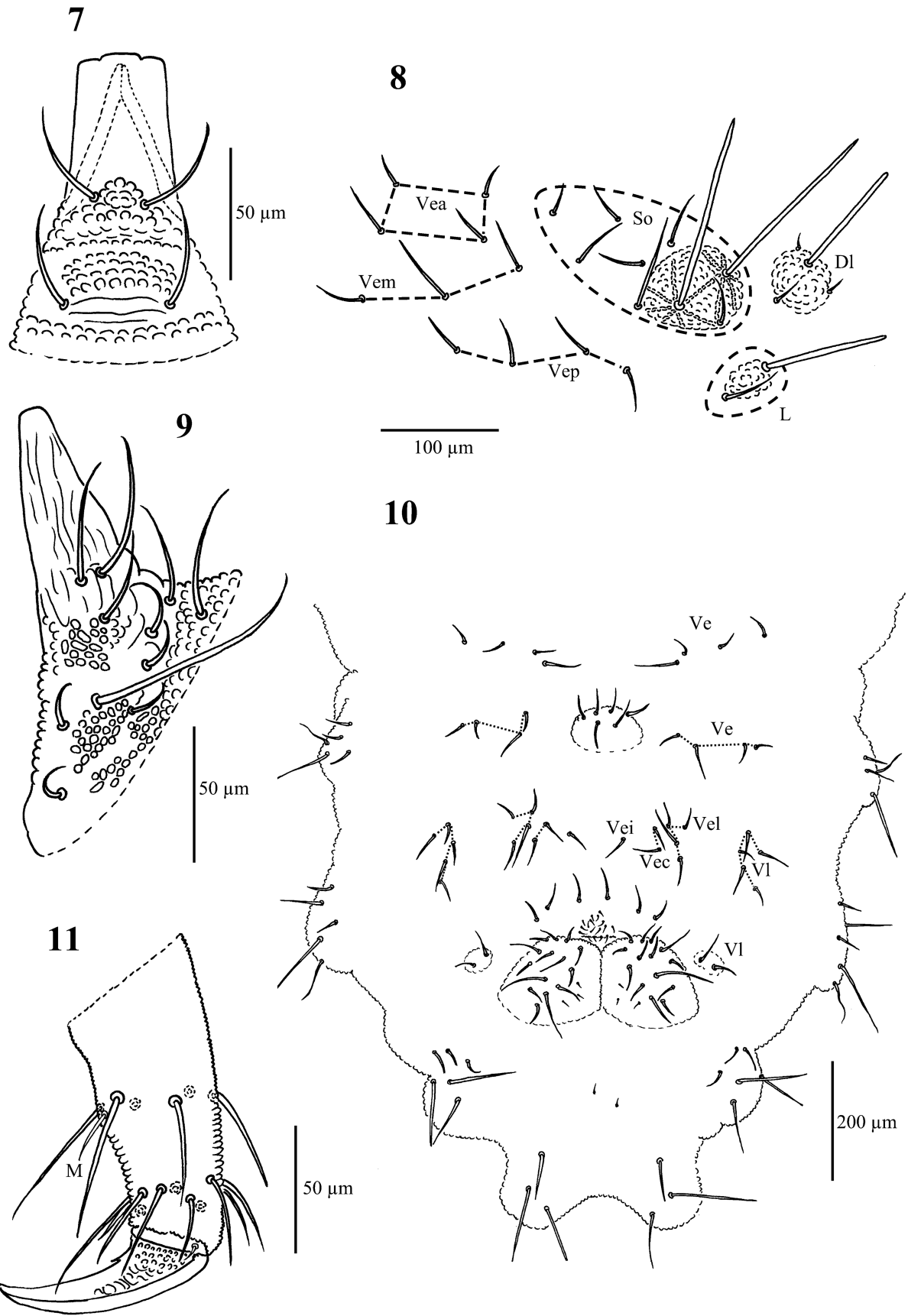
Diagnosis. 3+3 black eyes on head. Body color yellow living and white in alcohol. Body elongated and flattened, dorsal tubercles weakly developed. Labrum chaetotaxy as 0/ 2, 2. Mandible with three teeth. maxilla consists of 2 styliform lamellae, one pointed and smooth and one with two distal microteeth. Cephalic chaeta O present. Cephalic tubercle Dl separate from L and So. Tubercle Di of Th. I with 1 chaeta. Tubercle De of Th. II–III with 5 (4+s) chaetae. Tubercle De on Abd. V separated with only 1 sensory chaeta. Furcular remnant with 5–6 chaetae. Ventral chaetae Ve in Abd. VI with 14 mesochaetae and 3 microchaetae.

Description. Body length: 2.84–3.73 mm in adults. Color: Yellow alive, white in alcohol. Eyes: 3+3, pigmented. Body elongated and flattened, and head and tergite tubercles weakly developed (Fig. 1). Types of dorsal ordinary chaetae: macrochaetae Ml relatively long and thickened, arc-like or straight, narrowly sheathed, feebly serrated, apically rounded (Fig. 4); some lateral chaetae weakly acuminate, and slightly sheathed. Macrochaetae Mc and Mcc morphologically similar to long macrochaetae, but much shorter. Mesochaetae and microchaetae similar to ventral chaetae: thin, smooth, and pointed. S—chaetae of tergites thin, smooth.

Antennal morphology and chaetotaxy (Figs 2, 3 and Table 1c). Antenna 4-segmented. Ratio of antennal segments as I: II: III + IV = 1: 1: 1.5. Ant. I and II with 7 and 11 chaetae respectively, without serrated chaetae. Ant. III dorsally fused to Ant. IV. AOIII consists of 2 short rods, ventral ms and 2 longer sensory chaetae (sgd and sgv), with sgd positioned at a location higher than the 2 rods (Fig. 2). Ant. IV dorsally with 13 mou-sensilla (immature with 12) (Fig. 2). Ant. IV laterally with 2 iv and 7 brs (immature with 6). (Figs 2–3). Apical bulb distinct, trilobed.



FIGURES 1–6. *Paralobella kuchierabu* sp. nov. 1, dorsal tubercles and chaetotaxy (left side of tubercle D1 on Th. III abnormal); 2, dorsal chaetotaxy of Ant. III–IV; 3, ventral chaetotaxy of Ant. III–IV; 4, chaeta Di1 of abd. V; 5, mandible; 6, maxilla.



FIGURES 7–11. *Paralobella kuchierabu* sp. nov. 7, labrum; 8, chaetotaxy of lateral area and ventral side on head; 9, labium; 10, ventral side of abdomen; 11, chaetotaxy of tibiotarsus III and unguis.

Mouthparts. Labrum chaetotaxy 0/2, 2 (Fig. 7). Labium with 4 basal, 3 distal, and 4 lateral chaetae, papillae x absent (Fig. 9). Mandible with 2 apical teeth and 1 basal tooth (Fig. 5). Maxilla styliform, maxillary head consisting of 2 lamellae, one pointed and smooth and one with two distal microteeth (Fig. 6).

Cephalic tubercles and chaetotaxy (Figs 1, 8 and Table 1a, 1b). Dorsal central area with 3 well-differentiated tubercles (2 Oc and Fr), tubercles Cl and An weakly differentiated. Dorsal posterior area with 4 separate tubercles (2 Di and 2 De); 2 tubercles Di close to each other (Fig. 1). Dorso-lateral area with 6 differentiated tubercles (2 Dl, 2 L, 2 So), tubercle L much lower (Fig. 8). Chaetal group So with 9 chaetae, 3–6 chaetae out of tubercles. On the ventral side of head, group Vi with 6+6 chaetae, and groups Vea, Vem, and Vep with 4, 3, and 4 chaetae respectively (Fig. 8).

Body tubercles and chaetotaxy (Figs 1, 10 and Table 1d). Tubercles L on Abd. I–IV, each with 1 additional sensory chaeta in addition to ordinary chaetae. Abd. IV dorsally with 4+4 tubercles (Di, De, Dl, L), tubercle Di much lower (sometimes absent), tubercles De, Dl, and L on Abd. IV close to each other and situated on the lateral side. Abd. V dorsally with 3+3 tubercles (Di, De, Dl), tubercle De separated with only 1 sensory chaeta, and tubercle L ventrally situated. Abd. VI with 1+1 tubercles, no cryptopygy. Ventral chaetotaxy of Abd. II–VI given on Fig. 10. VT with 4+4 chaetae. Furcular remnant with 5–6 rather long chaetae. Genital plate with 17–18 and 38 chaetae in females and males respectively.

Legs (Fig. 11 and Table 1d). Tibiotarsi I, II and III with 19, 19, and 18 chaetae respectively. Unguis ventrally with 1 inner tooth, basal granules and medial transverse striae. Tenent hair absent (Fig. 11).

TABLE 1. Chaetotaxy of *Paralobella kuchierabu* sp. nov.

a) Cephalic chaetotaxy—dorsal side.

Chaetal group	Tubercle	Number of chaetae	Types of chaetae	Names of chaetae
Cl	+	4	Mc	F
			me	G
An	+	2	Ml	B
			Mc	E
Fr	-	2	me or mi	C, D
	+	2	Mc	A
Oc	+	3	Mcc	O
			Ml	Ocm
Di	+	1	me or mi	Oca, Ocp
	-	1	Mc	Di1
De	+	1	mi	Di2
	-	1	Ml	De1
Dl	+	4	mi	De2
	-	1	Mc+me+2mi	uncertain
L	+	2	Mc+me	uncertain
So	+	9 (3–6 chaetae free)	2Ml+7me	uncertain

b) Cephalic chaetotaxy—ventral side.

Group	Number of chaetae
Vi	6
Vea	4
Vem	3
Vep	4
labium	11, 0x

c) Chaetotaxy of antennae.

Segment, Group	Number of chaetae	Segment, Group	Number of chaetae adult
I	7me	IV	or, 8 S, i, 13 mou, 7 brs, 2 iv
II	11me		
III	5 sensilla AOIII		
ve	5	ap	8 bs, 5 miA
vc	4	ca	2 bs, 3 miA
vi	4	cm	3 bs, 1 miA
d	5	cp	8 miA, 1 brs

d) Postcephalic chaetotaxy.

	Terga					Legs			
	Di	De	Dl	L	Scx2	Cx	Tr	Fe	T
th. I	1	2	1		0	3	6	12	19
th. II	3	4+s	3+s+ms	3	2	7	6	11	19
th. III	3	4+s	3+s	3	2	8	6	10	18
							Sterna		
abd. I	2	3+s	2	3–4+s	VT: 4				
abd. II	2	3+s	2	4+s	Ve: 4				
abd. III	2	3+s	2	4+s	Ve: 4			Fu: 5–6 me	
abd. IV	2	2+s	3	6–7+s	Vel: 1	Vec: 2	Vel: 4	VI: 5	
abd. V	3	s	4	6	Ag: 3			VI: 2	
abd. VI		-----7-----			Ve: 14me, 3mi			An: 2mi	

Etymology. After Japanese name: kuchierabu-yokoge-ibotobimushi.

Ecology. This new species was discovered amid fallen trees and branches decaying with brown rot in evergreen broad-leaved forests dominated by *Castanopsis sieboldii* subsp. *sieboldii*.

Remarks. *Paralobella* is widely distributed in East and South-East Asia and has been reported in Thailand, Malaysia, the Philippines, China, and Indonesia (Jiang *et al.* 2018). Morphologically *Paralobella kuchierabu* **sp. nov.**, is most similar to *P. tianmuna* Jiang, Wang & Xia, 2018, resembling this species in having cephalic chaeta O present, tubercle De of Th. II–III with 5 (4+s) chaetae, tubercle Di of Th. I with 1 chaeta, tubercles De and Dl of Abd. V separated, and tubercle Di of Th. II–III with 3 chaetae. However, this new species is clearly distinguishable from *P. tianmuna* by its body color (in *P. kuchierabu* **sp. nov.** yellow, in *tianmuna* red), number of mandibular teeth (in *P. kuchierabu* **sp. nov.** 3, in *tianmuna* 7), and number of chaetae on tubercle L of Abd. II–III (in *P. kuchierabu* **sp. nov.** 5, in *tianmuna* 7). This new species is also similar to *P. perfusa* (Denis, 1934). However, they differ in the body color (in *P. kuchierabu* **sp. nov.** yellow, in *perfusa* red), number of chaetae on tubercle Di of Th. II–III (in *P. kuchierabu* **sp. nov.** 3, in *perfusa* 2), and the number of chaetae on tubercle L of Abd. II–III (in *P. kuchierabu* **sp. nov.** 5, in *perfusa* 4). The key for all species of the genus is as follows:

Key to *Paralobella* modified from Jiang *et al.* (2018)

1	Chaeta O of tubercle Fr absent	2
-	Chaeta O of tubercle Fr present	6
2	Tubercle Dl of Th. II–III with 5 (4+s) chaetae (besides of ms)	<i>P. erawan</i> (Yosii, 1976) (Thailand)
-	Tubercle Dl of Th. II–III with 4 (3+s) chaetae (besides of ms)	3
3	Tubercle Di of Th. II–III only with 1 chaeta, tubercle Oc on head only with Ocm chaeta	
-		<i>P. selangorica</i> (Yosii, 1976) (Malasia)
-	Tubercle Di of Th. II–III with 2–3 chaetae, tubercle Oc on head with 2–3 chaetae	4
4	Tubercle Di of Th. II–III with 2 chaetae	<i>P. penangensis</i> (Yosii, 1976) (Malasia)
-	Tubercle Di of Th. II–III with 3 chaetae	5

5	Abd. I–III: tubercle De with 5 (4+s) chaetae, tubercle D1 with 3 chaetae; mandible complicated, totally with 16 teeth in two rows	<i>P. apsala</i> (Yosii, 1976) (Thailand)
-	Abd. I–III: tubercle De with 4 (3+s) chaetae, tubercle D1 with 2 chaetae; mandible relatively simple, with 5 or 6 teeth in one row	<i>P. kinabaluensis</i> (Yoshii, 1981) (Malasia)
6	Tubercle De of Th. II–III with 4 (3+s) chaetae, VT with 3+3 chaetae	<i>P. sabahna</i> (Yoshii, 1981) (Malasia)
-	Tubercle De of Th. II–III with 5 (4+s) chaetae, VT with 4(5)+4(5) chaetae	7
7	Tubercle Di, De, DL of Th. I respectively with 2, 2, 1 chaetae	8
-	Tubercle Di, De, DL of Th. I respectively with 1, 2, 1 chaetae	9
8	Tubercle D1 of Th. II–III with 4 (3+s) chaetae, tubercle D1 of Abd. IV with 6 (5+s) chaetae	<i>P. khaochongensis</i> (Yosii, 1976) (Thailand)
-	Tubercle D1 of Th. II–III with 5 (4+s) chaetae, tubercle D1 of Abd. IV with 3 (2+s) chaetae	<i>P. paraperfusa</i> (Gapud, 1968) (Philippines)
9	Tubercle De and D1 of Abd. V fused, body bicolor or tricolor	<i>P. ousseti</i> Cassagnau & Deharveng, 1984 (Philippines)
-	Tubercle De and D1 of Abd. V separate, body monochlor	10
10	Mandible with 20 teeth	<i>P. palustris</i> Jiang, Luan & Yin, 2012 (China)
-	Mandible with less than 8 teeth	11
11	Mandible with 3 teeth, body color yellow	<i>P. kuchierabu</i> sp. nov. (Japan)
-	Mandible with 6 or 7 teeth, body color red	12
12	Mandible with 6 teeth, tubercle L of Abd. II–III with 6 (5+s) chaetae	<i>P. breviseta</i> Luo & Palacios-Vargas, 2016 (China)
-	Mandible with 7 teeth, tubercle L of Abd. II–III with 4 (3+s) or 7 (6+s) chaetae	13
13	Tubercle Di of Th. II–III with 2 chaetae, tubercle L of Abd. II–III with 4 (3+s) chaetae, mandibular basal tooth much larger than the second tooth	<i>P. perfusa</i> (Denis, 1934) (Indochina)
-	Tubercle Di of Th. II–III with 3 chaetae, tubercle L of Abd. II–III with 7 (6+s) chaetae, mandibular basal tooth slightly larger than the second one	<i>P. tianmuna</i> Jiang, Wang & Xia, 2018 (China)

Tribus Paleonurini Cassagnau, 1989

Genus *Blasconura* Cassagnau, 1983

Blasconura triangulum sp. nov.

[Japanese name: sankaku-niseamime-ibotobimushi]

Figures 12–24, Table 2

Type material. **Holotype:** female, Japan, Okinawa, Miyako-jima (alt. 39 m, 24°48'38"N 125°18'48"E), 24-XII-2021, Hiro Kasai leg. (NMNS, NSMT-Ap 596). **Paratypes:** 2 females (NMNS, NSMT-Ap 600–601), 3 males (NMNS, NSMT-Ap 597–599) and 2 juveniles (NMNS, NSMT-Ap 602–603), same data as holotype.

Diagnosis. 2+2 unpigmented eyes on head. Body color light red alive and white in alcohol. Dorsal tubercles well developed, with tertiary granulation. Tubercle Fr fused to An, forming an Af tubercle. 2 tubercles Di very close to each other, but not fused. Labrum chaetotaxy as 0/2, 2. Mandible with three teeth. Maxilla consists of 2 styliform lamellae. Ant. I and II with 7 and 11 chaetae respectively. Cephalic chaeta O absent. Cephalic tubercles D1, L, and So fused with 15 chaetae. Chaetae formula of tubercle Di on Th. I–Abd. V as 1, 3, 3/2, 2, 2, 2, 3. Length of chaeta D11 in Abd. V 146–163 µm. Tibiotarsi I–III with 19, 19, and 18 chaetae respectively. Unguis without an inner tooth.

Description. Body length: 1.33–1.79 mm in adults. Color: Light red alive (Fig. 12) and white in alcohol. Eyes: 2+2, unpigmented. All dorsal tubercles well developed with tertiary granulation (Figs 12–13). Ordinary chaetae of five types: Ml, Mc, Mcc, me, and mi. Macrochaetae Ml relatively long, thickened, and barbulated (Fig. 16); some lateral and ventral chaetae weakly acuminate, and slightly serrated. Macrochaetae Mc morphologically similar to long macrochaetae, but much shorter. Macrochaetae Mcc shorter than Mc, slightly barbulated, apically pointed. Mesochaetae and microchaetae similar to ventral chaetae: thin, smooth, and pointed. S-chaetae of tergites thin, smooth.

Antennal morphology and chaetotaxy (Figs 14–15 and Table 2c). Antenna 4-segmented. Ratio of antennal segments as I: II: III + IV = 1: 1: 1.8. Ant. I with 2 Ml and 5 me. Ant. II with 2 Ml, 1 Mc (me), and 8 me. Antennal macrochaetae located in subcuticular reticulation areas (Fig. 14). Ant. III dorsally fused to Ant. IV. AOIII consists of 2 short rods, exposed in separate pits. Guard chaeta sgd positioned near the 2 rods (Fig. 14). Apical bulb trilobed.

Mouthparts. Labrum chaetotaxy 0/2, 2 (Fig. 19). Labium with 4 basal, 3 distal, and 4 lateral chaetae, papillae x absent (Fig. 20). Mandible with 3 teeth (Fig. 17). Maxilla styliform, maxillary head consisting of 2 lamellae (Fig. 18).



FIGURES 12. Live specimen of *Blasconura triangulum* sp. nov.

Cephalic tubercles and chaetotaxy (Figs 13, 21, 24, and Table 2a, 2b). Tubercle Fr fused to An across the midline, forming an Af tubercle, not fused to Cl (Figs 13, 21). The anterior margin area (between chaetae C) of tubercle Af slightly or deeply hollow (Fig. 21). Tubercles Dl, L, and So fused. 2 tubercles Di very close to each other, but not fused. Macrochaeta length in adults ($n = 6$): chaeta F 86 μm (63–86 μm), chaeta B 98 μm (92–122 μm), chaeta A 82 μm (62–93 μm), chaeta Ocm 115 μm (99–133 μm), chaeta Ocp 76 μm (33–76 μm), chaeta Di1 95 μm (76–113 μm), chaeta De1 107 μm (88–121 μm), lateral Ml 97–134 μm (96–151 μm), and lateral Mc 41 μm . Lateral chaeta Mc basically me. On the ventral side of head, group Vi with 6+6 chaetae, and groups Vea, Vem, and Vep with 5, 3, and 4 chaetae respectively (Fig. 24).

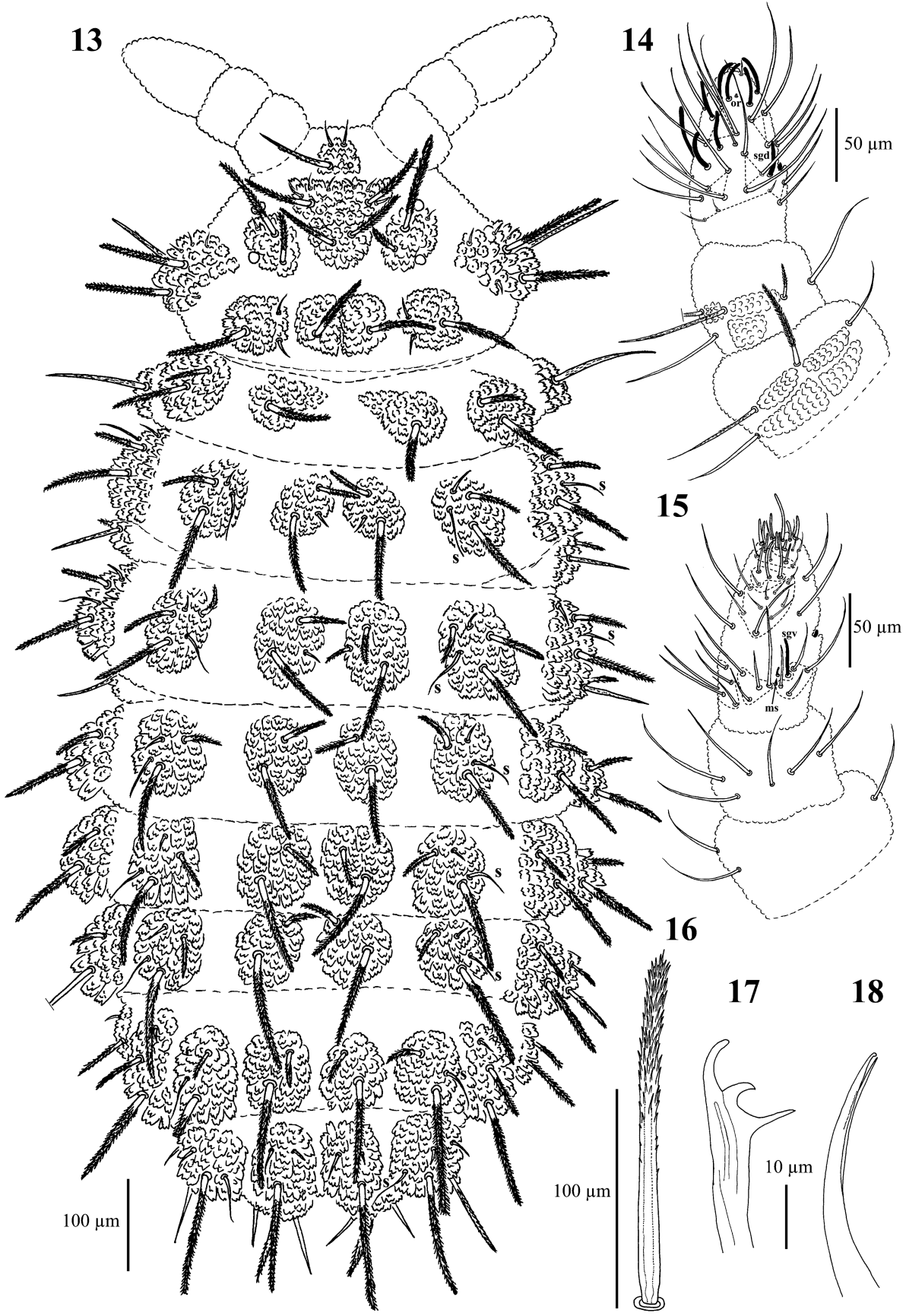
Body tubercles and chaetotaxy (Figs 13, 22 and Table 2d). Tubercle L on Abd. I–IV shifts backward or to the ventral side. Abd. V with 6 tubercles, De and Dl fused, and L situated on the ventral side. Weakly cryptopygy. Length of chaeta Di1 on Abd. V in adults ($n = 6$) 163 μm (146–163 μm) (Fig. 16). Ventral chaetotaxy of Abd. I–VI (Fig. 22). Chaeta L2 on Abd. V smooth (sometimes weakly serrated) and apically pointed (Fig. 22). VT with 4+4 chaetae. Furcular remnant with 4 chaetae. Genital plate with 10–27 and 43–57 chaetae in females and males respectively.

Legs (Fig. 23 and Table 2d). Tibiotarsi I–III respectively with 19, 19, 18 chaetae, chaetae M present. Unguis without inner tooth and tenent hair (Fig. 23).

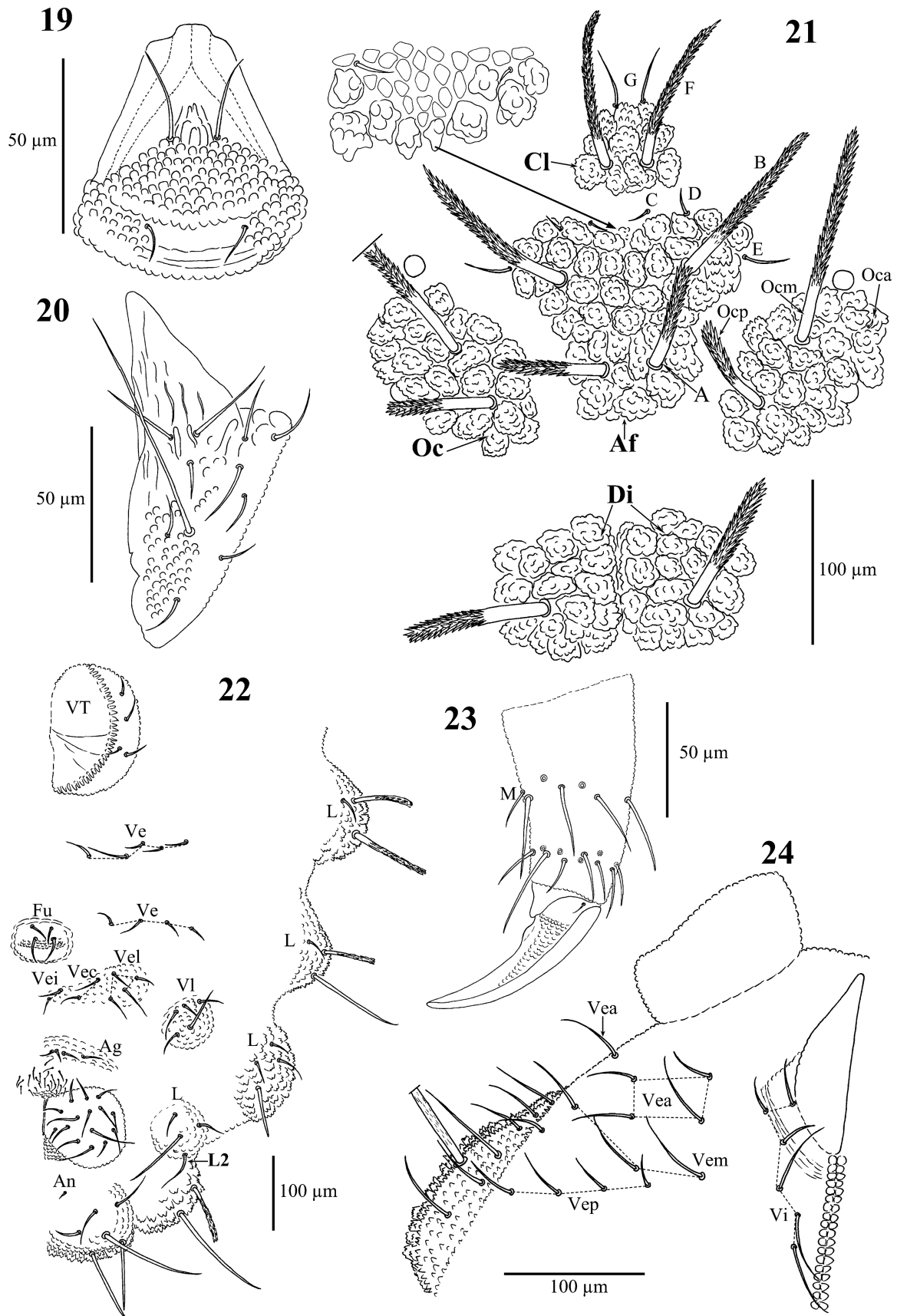
Etymology. The species epithet “triangulum” is used here to mean “triangle” and is in reference to the tubercle Af triangle form.

Ecology. The new species is a resident of fallen branches on the floor of secondary forests dominated by *Pinus luchuensis*.

Remarks. Nine species of the genus *Blasconura* have been reported till date, mainly from South and Southeast Asia (Bedos & Deharveng 2000). Six of these species have tubercle Af on head, and the other three species have tubercle



FIGURES 13–18. *Blasconura triangulum* sp. nov. 13, dorsal tubercles and chaetotaxy; 14, dorsal chaetotaxy of Ant. I–IV; 15, ventral chaetotaxy of Ant. I–IV; 16, chaeta Di1 of abd. V; 17, mandible; 18, maxilla.



FIGURES 19–24. *Blascoconura triangulum* sp. nov. 19, labrum; 20, labium; 21, Dorsal tubercles and chaetotaxy of central area on head; 22, ventral side of abdomen; 23, chaetotaxy of tibia and unguis; 24, ventral chaetotaxy on head.

An separated from Fr. *Blasconura triangulum* **sp. nov.** is the seventh species, with a tubercle Af. *B. triangulum* **sp. nov.** is most similar to *B. batai* Bedos & Deharveng, 2000 and *B. hirtella* (Börner, 1906). Resemblance is observed in terms of absent cephalic chaeta O, cephalic tubercle Oc with 3 chaetae, macrochaeta barbulated, tubercle Di of Th. I with 1 chaeta, and tubercle Di of Abd. I–IV with 2 chaetae. However, these species can be distinguished by the following characteristic features: inner tooth on the claw (in *B. triangulum* **sp. nov.** absent, in *batai* and *hirtella* present), distance between 2 tubercles Di on head (in *B. triangulum* **sp. nov.** very close, in *batai* and *hirtella* distinctly separate), chaetae formula of tubercle Di on Th. I–Abd. V (in *B. triangulum* **sp. nov.** and *hirtella* 1, 3, 3/2, 2, 2, 2, 3, in *batai* 1, 2, 2/2, 2, 2, 2, 2), number of chaetae of tubercle (De+Dl) on Abd. V (in *B. triangulum* **sp. nov.** 4+s, in *batai* 3+s, in *hirtella* 6+s), and number of chaetae on the ventral tube (in *B. triangulum* **sp. nov.** and *batai* 4+4, in *hirtella* 3+3). For morphological characteristics of *B. hirtella*, Yosii (1976) can be referred.

TABLE 2. Chaetotaxy of *Blasconura triangulum* **sp. nov.**

a) Cephalic chaetotaxy—dorsal side.

Tubercle	Number of chaetae	Types of chaetae	Names of chaetae
Cl	4	Mc	F
		me	G
An+Fr	10	MI	B
		Mc	A
		me or mi (or Mcc)	E
		mi	C, D
Oc	3	MI	Ocm
		Mc or Mcc	Ocp
		mi	Oca
Di	1	MI or Mc	Di1
De	3	MI	De1
		me or mi	De2, De3
DI+L+So	15	3MI+Mc+me (Mc)+8me+2mi	uncertain

b) Cephalic chaetotaxy—ventral side.

Group	Number of chaetae
Vi	6
Vea	5
Vem	3
Vep	4
Labium	11, 0x

c) Chaetotaxy of antennae.

Segment, Group	Number of chaetae	Segment, Group	Number of chaetae adult
I	2MI+5me	IV	or, 8 S, i, 12 mou, 6 brs, 2 iv
II	2MI+Mcc(me)+8me		
III	5 sensilla AOIII		
ve	5	ap	8 bs, 5 miA
vc	4	ca	2 bs, 3 miA
vi	4	cm	3 bs, 1 miA
d	5	cp	8 miA, 1 brs

d) Postcephalic chaetotaxy.

	Terga					Legs			
	Di	De	DI	L	Scx2	Cx	Tr	Fe	T
th. I	1	2	1		0	3	6	12	19
th. II	3	3+s	3+s+ms	3	2	7	6	11	19
th. III	3	4+s	3+s	3	2	8	6	10	18
							Sterna		
abd. I	2	3+s	2	3	VT: 4				
abd. II	2	3+s	2	3	Ve: 5				
abd. III	2	3+s	2	3	Ve: 4			Fu: 4me	
abd. IV	2	2+s	3	6–7	Vel: 2(1 or 3)	Vec: 2	Vel: 4–5	VI: 5	
abd. V	3	-----4+s-----		4(5)	Ag: 4(3)			VI: 0	
abd. VI		-----7-----			Ve: 15me			An: 2mi	

***Blasconura cordis* sp. nov.**

[Japanese name: inome-niseamime-ibotobimushi]

Figures 25–36, Table 3

Type material. Holotype: female, Japan, Okinawa, Miyako-jima (alt. 101 m, 24°45'05"N 125°22'31"E), 24-XII-2021, Hiro Kasai leg. (NMNS, NSMT-Ap 604). Paratypes: 3 females (NMNS, NSMT-Ap 605–607), same data as holotype.

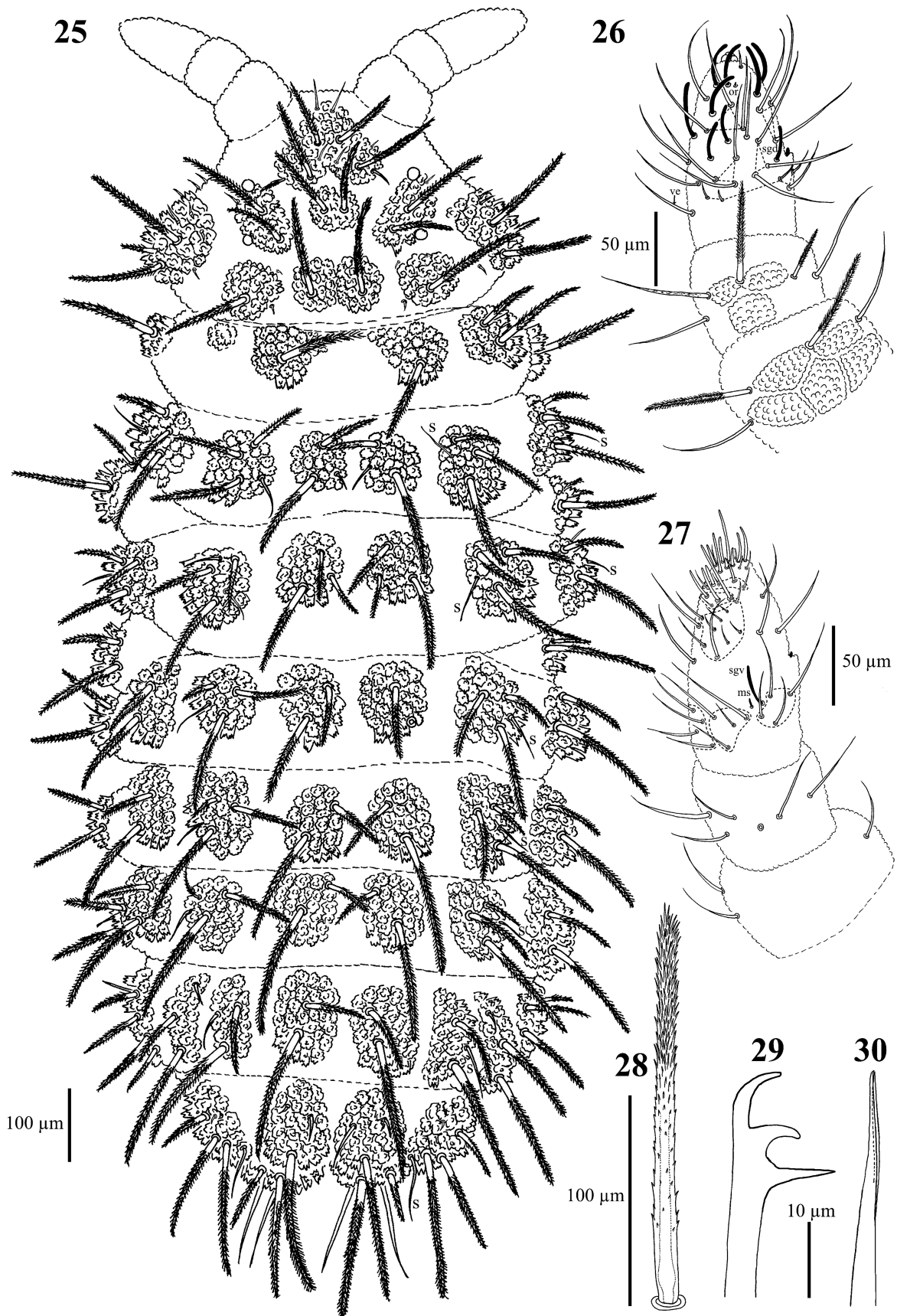
Diagnosis. 2+2 unpigmented eyes on head. Body color light red alive and white in alcohol. Dorsal tubercles well developed, with tertiary granulation. Tubercle An fused to Cl and not fused to Fr. 2 tubercle Di very close to each other. Labrum chaetotaxy as 0/ 2, 2. Mandible with three teeth. Maxilla consists of 2 styliiform lamellae. Ant. I and II with 7 and 11 chaetae respectively. Cephalic chaeta O absent. Cephalic tubercles DI, L, and So fused with 14 chaetae. Chaetae formula of tubercle Di on Th. I–Abd. V as 1, 3, 3/2, 2, 2, 2, 3. Length of chaeta Di1 in Abd. V 182–207µm. Tibiotarsi I–III with 19, 19, and 18 chaetae respectively. Unguis without an inner tooth.

Description. Body length: 1.3–1.61 mm in adults. Color: Light red alive, white in alcohol. Eyes: 2+2, unpigmented. Tubercles well developed on the dorsal side of head and tergite with tertiary granulation (Fig. 25). Types of dorsal ordinary chaetae: Macrochaetae MI long, thickened, and barbulated (Figs 28, 33), some lateral and ventral chaetae weakly acuminate and slightly serrated. Macrochaetae Mc morphologically similar to long macrochaetae, but much shorter. Macrochaetae Mcc shorter than Mc, slightly barbulated, apically pointed. Mesochaetae and microchaetae similar to ventral chaetae, thin, smooth, and apically pointed. S-chaetae of tergites thin, smooth.

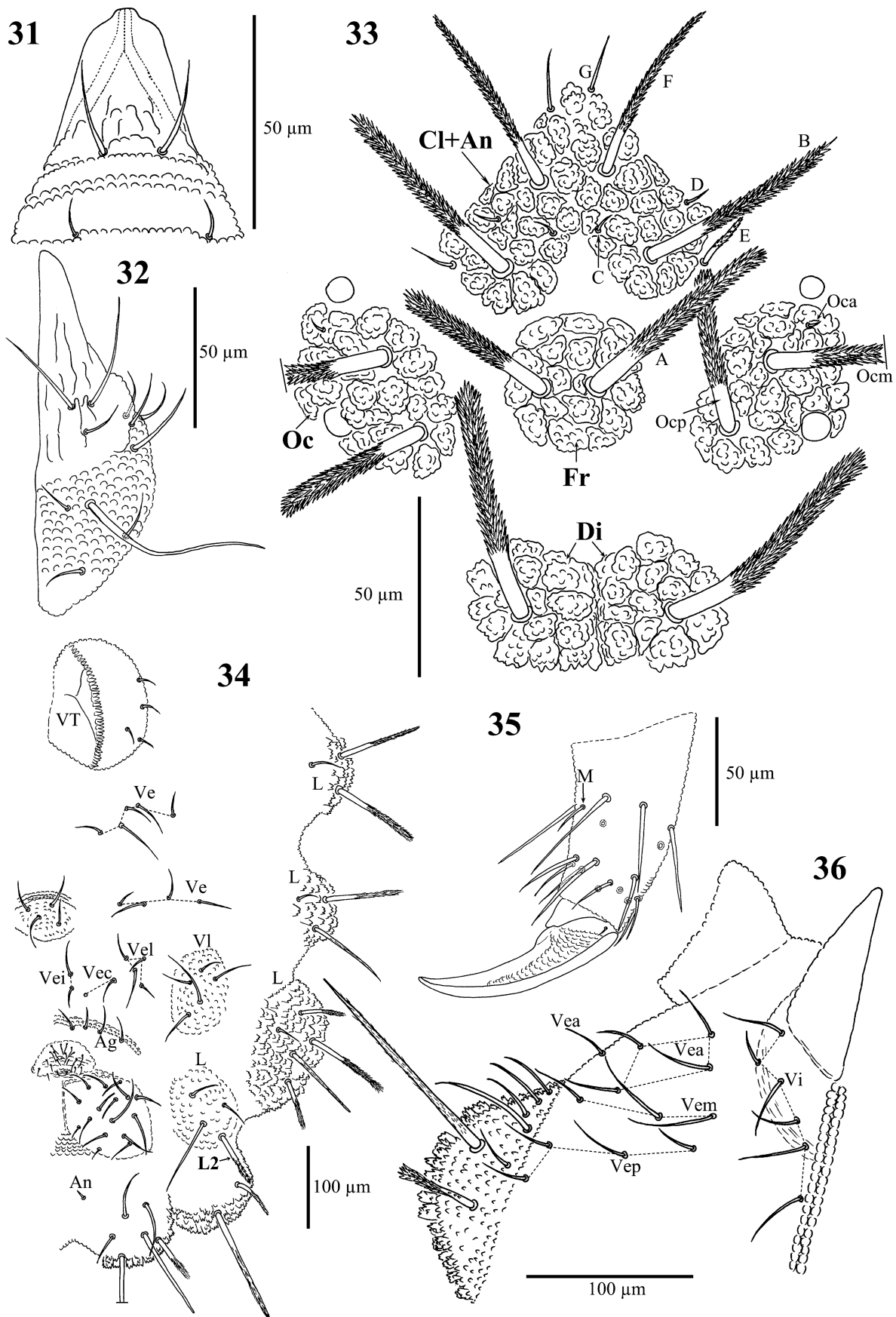
Antennal morphology and chaetotaxy (Figs 26–27 and Table 3c). Antenna 4-segmented. Ratio of antennal segments as I: II: III + IV = 1: 1: 1.8. Ant. I with 7 chaetae: dorsal 2 long chaetae serrated, others smooth. Ant. II with 11 chaetae: dorsal 2 long chaetae serrated and 1 short chaeta smooth or serrated, others smooth. Antennal macrochaetae located in subcuticular reticulation areas (Fig. 26). Ant. III dorsally fused to Ant. IV. AOIII comprises 2 short rods, each rod exposed in separate pits. Guard chaeta sgd positioned near the 2 rods (Fig. 26). Apical bulb trilobed.

Mouthparts. Labrum chaetotaxy 0/2, 2 (Fig. 31). Labium with 11 chaetae and papillae x absent (Fig. 32). Mandible with 3 teeth (Fig. 29). Maxilla styliiform, maxillary head comprising 2 lamellae (Fig. 30).

Cephalic tubercles and chaetotaxy (Figs 25, 33, 36 and Table 3a, 3b). Tubercle An fused to Cl, not fused to Fr (Figs 25, 33). The middle of the anterior margin on tubercle An+Cl deeply furrow, forming a heart shape (Fig. 33). Dorso-lateral area with fused tubercle (DI+L+So), with 14 chaetae (rarely 15 chaetae). 2 tubercles Di very close to each other, but not fused (Fig. 33). Length of macrochaetae in adults (n = 4); chaeta F 96 µm (89–116 µm), chaeta B 123 µm (116–123 µm), chaeta A 100 µm (92–119 µm), chaeta Ocm 136 µm (122–139 µm), chaeta Ocp 90 µm (80–90 µm), Chaeta Di1 135 µm (113–135 µm), chaeta De1 140 µm (125–140 µm), lateral MI 121–152 µm (110–163 µm), and lateral Mc 49 µm (40–57 µm). On the ventral side of head, group Vi with 6+6 chaetae, groups Ve_a, Ve_m and Ve_p with 5, 3, and 4 chaetae respectively (Fig. 36).



FIGURES 25–30. *Blasconura cordis* sp. nov. 25, dorsal tubercles and chaetotaxy (left side of tubercle De on Th. I abnormal); 26, dorsal chaetotaxy of Ant. I–IV; 27, ventral chaetotaxy of Ant. I–IV; 28, chaeta Di1 of abd. V; 29, mandible; 30, maxilla.



FIGURES 31–36. *Blasconura cordis* sp. nov. 31, labrum; 32, labium; 33, Dorsal tubercles and chaetotaxy of central area on head; 34, ventral side of abdomen; 35, chaetotaxy of tibiotarsus III and unguis; 36, ventral chaetotaxy on head.

Body tubercles and chaetotaxy (Figs 25, 34 and Table 3d). Tubercle L on Abd. I-IV shifts backward or to the ventral side. Abd. V with 6 tubercles, De and D1 fused, and L situated ventrally. Weak cryptopygy. The length of chaeta Di1 on Abd. V in adults (n = 4) 190 µm (182–207 µm) (Fig. 28). Ventral chaetotaxy of Abd. I–VI (Fig. 34). Chaeta L2 on Abd. V thick and serrated (Fig. 34), and sometimes weakly pointed apically. VT with 4+4 chaetae. Furcular remnant with 4 chaetae. Genital plate with 20–29 chaetae in female.

Legs (Fig. 35 and Table 3d). Tibiotarsi I, II and III with 19, 19, and 18 chaetae respectively. Chaetae M present. Unguis without inner tooth and tenent hair (Fig. 35).

Etymology. The species epithet “cordis” is used here to mean “heart” and is in reference to the cephalic tubercle Cl + An heart shape.

Ecology. The new species inhabits among fallen branches in secondary forest in evergreen broad-leaved forests.

Remark. The new species is unique in the genus, with a cephalic tubercle An fused to Cl. *Blasconura cordis* **sp. nov.** is most similar to *B. anamalensis* Cassagnau, 1988 in having cephalic chaeta O absent, Ant. I and II with 7 and 11 chaetae respectively, and tubercle Di of Th. I with 1 chaeta. However, *B. cordis* **sp. nov.** differs from *B. anamalensis* in its cephalic tubercle Oc with 3 chaetae (in *anamalensis* 1), labrum chaetotaxy 0/2, 2 (in *anamalensis* 0/4, 2), tubercle De of Th. III with 5 chaetae (in *anamalensis* 4), and tubercle Di of Th. II with 3 chaetae (in *anamalensis* 2). *B. triangulum* **sp. nov.** is particularly similar in chaetotaxy to *B. cordis* **sp. nov.** However, the two differ in the following characteristics: number of chaetae of tubercle (Dl+L+So) on head (in *B. cordis* **sp. nov.** 14, in *B. triangulum* **sp. nov.** 15), length of cephalic chaeta F (in *B. cordis* **sp. nov.** 89–116 µm, in *B. triangulum* **sp. nov.** 63–86 µm), length of cephalic chaeta De1 (in *B. cordis* **sp. nov.** 125–140 µm, in *B. triangulum* **sp. nov.** 88–121 µm), length of chaeta Di1 on Abd. V (in *B. cordis* **sp. nov.** 182–207 µm, in *B. triangulum* **sp. nov.** 146–163 µm), and chaeta L2 on Abd. V (in *B. cordis* **sp. nov.** developed, in *B. triangulum* **sp. nov.** weakly developed). The key for all species of the genus is as follows:

TABLE 3. Chaetotaxy of *Blasconura cordis* **sp. nov.**

a) Cephalic chaetotaxy—dorsal side.

Tubercle	Number of chaetae	Types of chaetae	Names of chaetae
Cl + An	12	Ml or Mc	F
		me	G
		Ml	B
		me or mi (or Mcc)	C
		mi	D
		me (or Mcc)	E
Fr	2	Mc	A
Oc	3	Ml	Ocm
		Mc	Ocp
		mi	Oca
Di	1	Ml	Di1
De	1	Ml	De1
	2	me or mi	De2, De3
Dl+L+So	14 (rarely 15)	3Ml+Mc+8 (9) me+2mi	uncertain

b) Cephalic chaetotaxy—ventral side.

Group	Number of chaetae
Vi	6
Vea	5
Vem	3
Vep	4
Labium	11, 0x

c) Chaetotaxy of antennae.

Segment, Group	Number of chaetae	Segment, Group	Number of chaetae adult
I	2MI+5me	IV	or, 8 S, i, 12 mou, 6 brs, 2 iv
II	2MI+Mcc(me)+8me		
III	5 sensilla AOIII		
Ve	5	ap	8 bs, 5 miA
Vc	4	ca	2 bs, 3 miA
Vi	4	cm	3 bs, 1 miA
D	5	cp	8 miA, 1 brs

d) Postcephalic chaetotaxy.

	Terga				Legs				
	Di	De	DI	L	Scx2	Cx	Tr	Fe	T
th. I	1	2	1		0	3	6	12	19
th. II	3	3+s	3+s+ms	3	2	7	6	11	19
th. III	3	4+s	3+s	3	2	8	6	10	18
							Sterna		
abd. I	2	3+s	2	3	VT: 4				
abd. II	2	3+s	2	3	Ve: 5				
abd. III	2	3+s	2	3	Ve: 4			Fu: 4me	
abd. IV	2	2+s	3	6(7)	Vel: 2(3)	Vec: 2	Vel: 4-5	VI: 5	
abd. V	3	-----4+s-----		4	Ag: 4(3)			VI: 0	
abd. VI		-----7-----			Ve: 15me			An: 2mi	

Key to *Blasconura* modified from Bedos & Deharveng (2000)

1	Cephalic tubercles An and Fr fused	2
-	Cephalic tubercles An and Fr separated	8
2	Cephalic chaeta O absent	3
-	Cephalic chaeta O present	6
3	Unguis without inner tooth, 2 tubercles Di on head close to each other	<i>B. triangulum</i> sp. nov. (Japan)
-	Unguis with inner tooth, 2 tubercles Di on head distinctly separate	4
4	Ant. I with 7 chaetae, chaetae formula of tubercle Di on Th. I-Abd. V as 1, 2, 2/2, 2, 2, 2	<i>B. batai</i> Bedos & Deharveng, 2000 (Vietnam)
-	Ant. I with 9 chaetae, tubercle Di of Abd. V with 3 chaetae	5
5	Macrochaeta palmate, chaetae formula of tubercle Di on Th. I-Abd. V as 1, 3, 3/2, 2, 2, 2, 3	<i>B. hirtella</i> (Börner, 1906) (South and Southeast Asia)
-	Macrochaeta smooth, chaetae formula of tubercle Di on Th. I-Abd. V as 2, 4, 4/3, 3, 3, 3, 3	<i>B. toda</i> Cassagnau, 1988 (Inde)
6	Ant. I with 8 chaetae, chaetae formula of tubercle Di on Th. I-Abd. V as 1, 3, 3/2, 2, 2, 2, 2-3	<i>B. ceylonica</i> Cassagnau, 1988 (Sri Lanka)
-	Ant. I with 7 chaetae, chaetae formula of tubercle Di on Th. I-Abd. V as 1, 3, 4/4, 4, 4, 3, 3	7
7	Macrochaeta strongly serrated, chaeta Ocm about 6-7 times longer than anterior eye diameter	<i>B. sholica</i> Cassagnau, 1988 (Inde)
-	Macrochaeta weakly serrated, chaeta Ocm about 3-4 times longer than anterior eye diameter	<i>B. prabhooi</i> Cassagnau, 1988 (Inde)
8	Chaeta O on head absent	9
-	Chaeta O on head present	10
9	Tubercles An and Cl fused, tubercle De of Th. III with 5 (4+s) chaetae, chaetae formula of tubercle Di on Th. I-Abd. V as 1, 3, 3/2, 2, 2, 2, 3	<i>B. cordis</i> sp. nov. (Japan)
-	Tubercles An and Cl separated, tubercle De of Th. III with 4 (3+s) chaetae, Chaetae formula of tubercle Di on Th. I-Abd. V as 1, 2, 2/2, 2, 2, 2, 3	<i>B. anamalsensis</i> Cassagnau, 1988 (Inde)
10	Chaeta O on tubercle An, chaetae formula of tubercle Di on Th. I-Abd. V as 2, 3, 3/3, 3, 3, 3, 3	<i>B. palniensis</i> Cassagnau, 1988 (Inde)
-	Chaeta O on tubercle Fr, chaetae formula of tubercle Di on Th. I-Abd. V as 3, 3, 3/2, 2, 2, 2, 2	<i>B. separata</i> (Denis, 1934) (Vietnam)

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