A new species of Lobellina and first record of Vietnura from China (Collembola: Neanuridae: Neanurinae)

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Abstract

A new species of Lobellina Yosii, 1956 and a key to all species of the genus is provided. It is distinguished from all known members of the genus by its unique set of morphological characters: mandible with six teeth, cephalic chaeta O present, and free from tubercle Fr, cephalic tubercle Oc with three chaetae, cephalic tubercle Di separate, and tubercle Dl with four (sometimes three) chaetae, Ant. I with eight chaetae, and claw with an inner tooth. Vietnura caerulea Deharveng & Bedos, 2000 is recorded from China for the first time. New localities of Rambutanura hunanensis Jiang & Dong, 2018 and Vitronura paraacuta Wang, Wang & Jiang, 2016 from southwest China are also provided.

Keywords

key, Lobellina yinae sp. n., new records, taxonomy

Introduction

Maolan National Nature Reserve is located at Libo County, Qiannan Buyi and Miao Nationalities Autonomous Region of Guizhou Province, southwest China. It covers area of 212.85 km² and is located in the subtropical monsoon humid climate zone. The main objectives of Maolan National Nature Reserve are the protection of the karst...
forest, and its rare animals and plants. It is from 430 to 1078 m above sea level. So far, no Neanuridae was reported from this reserve. During the field research at Maolan National Nature Reserve in 2015, four species of the subfamily Neanurinae were collected. They are described in the present paper.

**Materials and methods**

Specimens were extracted from soil samples with the aid of Tullgren funnels or directly collected with an aspirator, and preserved in 95% ethanol. They were cleared in Nesbitt’s fluid and mounted on slides in Hoyer’s medium. Preparations were dried for 7–15 days in oven at 55 °C, then ringed with lacquer. The morphological characters were observed and figures were drawn using a phase contrast microscope Nikon 80i. Material is deposited in Shanghai Entomological Museum, Chinese Academy of Sciences.

The terminology and layout of the tables used in this paper follow Deharveng (1983), Deharveng and Weiner (1984), Smolis and Deharveng (2006), and Smolis (2008). The abbreviations used are listed below.

**General morphology**

| Symbol | Meaning |
|--------|---------|
| Abd. | abdomen |
| Ant. | antenna |
| AOIII | sensory organ of antennal segment III |
| Cx | coxa |
| Fe | Femur |
| Scx2 | subcoxa 2 |
| Ti | tibiotarsus |
| Th. | thorax |
| Tr | trochanter |
| VT | ventral tube |

**Groups of chaetae**

| Symbol | Meaning |
|--------|---------|
| Ag | antegenital |
| An | 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 | ventroexteroanterior |
| Vel | ventroexternolateral |
| Vec | ventroexternocentral |
| Vei | ventroexternointernal |
| Vi or vi | ventrointernal |
| Vl | venteral |

**Tubercles**

| Symbol | Meaning |
|--------|---------|
| An | antennal |
| Fr | frontal |
| Af | antenno-frontal |
| Cl | clypeal |
| De | dorsoexternal |
| Di | dorsointernal |
| Dl | dorsolateral |
| L | laterial |
| Oc | ocular |
| So | subocular |
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Types of chaetae

| Symbol | Description                                  |
|--------|----------------------------------------------|
| Ml     | long macrochaeta                             |
| Mc     | short macrochaeta                            |
| Mcc    | very short macrochaeta                       |
| me     | mesochaeta                                   |
| mi     | microchaeta                                  |
| ms     | s-microchaeta                                |
| s      | s-chaeta                                     |
| bs     | s-chaeta on Ant. IV                          |
| mA     | microchaetae on Ant. IV                      |
| iv     | ordinary chaetae on ventral Ant. IV          |

Material. Holotype, male, on slide. Maolan National Nature Reserve, Libo County, Guizhou Province, China. 25°16.400′N, 107°53.864′E, ca. 780 m above sea level, 22 July 2015. Collected by Cheng-Wang Huang, Yan Liang and Ai-Min Liu. Paratype, one subadult, same slide and data as holotype.

Etymology. The species is named after Prof. Wen-Ying Yin, in honor of her important contributions to the study of Chinese soil animals.

Diagnosis. Three pigmented eyes, mandible with six teeth, cephalic chaeta O present and free from tubercle Fr, cephalic tubercle Oc with three chaetae, cephalic tubercle Di separate, tubercle DI with four (sometimes three) chaetae, Ant. I with eight chaetae, and claw with single inner tooth.

Description. General (Figs 1–3). Body length (without antenna) 1.8–2.1 mm. Cuticular granulations medium, tertiary granules absent, body without reticulations. Tubercles well developed on dorsal side of body. Body color red when alive, white in alcohol. Eyes 3+3, pigmented (Fig. 1). Chaetal morphology (Fig. 9). Dorsal ordinary chaetae of five types: Ml, Mc, Mcc, me, and mi. Macrochaetae Ml long, sheathed, weakly toothed and knobbed at apex. Macrochaetae Mc morphologically of two types: one is similar to Ml, but shorter, the other one with slightly pointed apex. Macrochaetae Mcc morphologically similar to Ml and shorter than Mc. Mesochaetae similar to ventral chaetae, thin, smooth, and pointed, with various length. Microchaetae shorter than mesochaetae, with acuminate tip. S-chaetae on terga thin, smooth, shorter than Mc, longer than Mcc. Antenna (Fig. 4 and Table 3). Antenna 4-segmented. Ant. I with eight...
Figure 1. *Lobellina yinae* sp. n. dorsal tubercle and chaetotaxy of head.

 Chaetae. Ant. II with eleven chaetae and dorsally with a smooth circular area. Ant. III dorsally fused to Ant. IV. AOIII consists of two short rods, ventral ms and two longer sensory chaetae (sgd and sgv), sgd on the same level position of the two rods, each rod exposed in separate pit. Ant. IV dorsally with eight thickened and blunt sensilla, slender i-chaeta, and minute capitate organite (or). Apical bulb distinct, trilobed. Each of the eight sensilla distinctly differentiated, larger and two times shorter than “mou”-chaetae. Ventral chaetotaxy of Ant. III–IV is shown in Table 3, ap with eight bs and three miA, ca with two bs and two miA, cm with three bs and one miA, cp with six bs and seven miA. On ventral side of Ant. III, Vi, Vc, Ve respectively with four, four, five chaetae, Ant. III dorsally with 4–5 d chaetae, d1, d2, d3 as me, d4 as mi, d5 as mi and sometimes absent. **Mouthparts.** Buccal cone moderately long, labrum ventral sclerifications truncated (Fig. 8). Labrum chaetotaxy: 0/2, 2. Labium with normal chaetotaxy, and chaeta F almost three times as long as chaeta A, without papillae x (Fig. 8). Maxilla styliform, consisting of two fused lamellae, apically with two tiny teeth (Fig. 7). Mandible with four apical teeth, one middle tooth, and one large basal tooth (Fig. 6). **Dorsal chaetotaxy and tubercles of head** (Fig. 1 and Table 1). Head with 14 tubercles. Tubercle Cl with four chaetae: 2G+2F; tubercle An with four chaetae: B, C, D, E; tubercle Oc with three chaetae; tubercle Fr with three chaetae, chaeta O present, shifting between the two tubercles.
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An; tubercle Di with a single chaeta; De with three chaetae; tubercle Dl separate from tubercle L+So, with four (or three) chaetae; tubercle L+So with 13 chaetae. Dorsal chaetotaxy and tubercles of thorax (Fig. 2 and Table 4). Thoracic dorsal tubercles complete. Th. I with three tubercles, tubercle Di with one chaeta; tubercle De with two chaetae; tubercle Dl with one chaeta. Th. II with four tubercles, tubercle Di with three chaetae; tubercle De with five chaetae (4+s); tubercle Dl with five chaetae and one ms (4+s+ms); tubercle L with three chaetae. Th. III with four tubercles, tubercle Di with three chaetae; tubercle De with five chaetae (4+s); tubercle Dl with five chaetae (4+s); tubercle L with three chaetae. Dorsal chaetotaxy and tubercles of abdomen (Fig. 3 and Table 4). Dorsum of Abd. I with four tubercles, tubercle Di with two chaetae; tubercle De with four chaetae (3+s); tubercle Dl with three chaetae; tubercle L with four chaetae. Tubercles and chaetae arrangements of Abd. II–III as on Abd. I. Abd. IV with four tubercles, tubercle Di with two chaetae; tubercle De with three chaetae (2+s); tubercle Dl with three chaetae; tubercle L with 5–7 chaetae. Abd. V with four tubercles, tubercle Di with three chaetae; tubercle De with one chaetae (s); tubercle Dl with four chaetae; tubercle L with seven chaetae (without s chaetae). Abd. VI bilobed, each side of Abd. VI with one tubercle, each tubercle with seven chaetae. No cryptopygy. S-chaetae formula on tergites as 0, 2+ms, 2/1, 1, 1, 1, 1. Ventral chaetotaxy (Fig. 5, Table 2). On ventral side of head, groups

Figure 2. Lobellina yinae sp. n. dorsal tubercles and chaetotaxy on Th. I–III.
Table 1. Cephalic dorsal tubercles and chaetotaxy of *Lobellina yinae* sp. n.

| Tubercle | Number of chaetae | Types of chaetae | Names of chaetae |
|----------|------------------|------------------|------------------|
| Cl       | 4                | Ml, me           | F                |
|          |                  |                  |                  |
| An       | 4                | M, Mcc, me       | B, E, C, D       |
| Fr       | 3                | Ml, me           | A, O             |
| Oc       | 3                | Ml, Mcc          | Ocm, Ocp         |
|          |                  | me or mi         | Oca              |
| Di       | 1                | Ml               | Chaetal homology uncertain |
|          |                  |                  |                  |
| De       | 3                | Ml, Mc, mi      | De1, De2         |
|          |                  |                  |                  |
| Di       | 4 (3)            | Mcc+Mcc+2me (or mi) | Chaetal homology uncertain |
| L+So     | 13               | 4Ml+9me          | Chaetal homology uncertain |

Table 2. Cephalic ventral chaetotaxy of *Lobellina yinae* sp. n.

| Group | Number of chaetae |
|-------|------------------|
| Vi    | 5                |
| Vea   | 5                |
| Vem   | 4                |
| Vep   | 4                |
| Labium| 11, 0 X          |

Table 3. Chaetotaxy of antenna of *Lobellina yinae* sp. n.

| Segment, group | Number of chaetae | Segment, group | Number of chaetae |
|----------------|------------------|----------------|------------------|
| I              | 8                | IV             | or, 8, s, 12 mou, ? brs, 2 iv |
| II             | 11               |                |                  |
| III            | 5 sensilla AOIII |                |                  |
| Ve             | 5                | ap             | 8 bs, 3 miA      |
| Vc             | 4                | ca             | 2 bs, 2 miA      |
| Vi             | 4                | cm             | 3 bs, 1 miA      |
| d              | 4(2me+2mi)–5(2me+3mi) | cp             | 1brs, 7 miA     |

Vea, Vem, and Vep with five, four, four chaetae respectively. Group Vi on head with five chaetae. On Abd. I, VT with one proximal and three distal chaetae. On Abd. III, furca rudimentary with three chaetae, and without microchaeta. On Abd IV, group Vei, Vec, Vel respectively with one, two, four chaetae. On Abd. V, group VI with 2–3 chaetae, Ag with 3–4 chaetae, chaeta L’ absent. Anal lobe with 14–15 chaetae and three mi. Legs (Table 4). Unguis with an inner tooth and without lateral tooth. Chaeta M on tibiotarsus present. Tibiotarsus of foreleg, midleg, and hindleg with 19, 19, 18 chaetae respectively.

Ecology and distribution. In fallen leaves of bamboo. *Lobellina yinae* sp. n. is only known from Libo (Fig. 16).
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**Table 4.** Postcephalic tubercles and chaetotaxy of *Lobellina yinae* sp. n.

| Terga | Legs |
|-------|------|
|       | Di   | De   | DI  | L   | Scx2 | Cx  | Tr  | Fe  | T   |
| Th. I | MI   | MI+me| MI  | –   | 0    | 3   | 6   | 13  | 19  |
| Th. II| MI+Mc+mi | MI+Mc+Mcc+me+s | 3MI+Mcc+s+ms | MI+2Mcc | 2 | 7 | 6 | 12 | 19 |
| Th. III| MI+Mc+mi | MI+Mc+Mcc+me+s | 3MI+Mcc+s | MI+2Mcc | 2 | 8 | 6 | 11 | 18 |

**Figure 3.** *Lobellina yinae* sp. n. dorsal tubercles and chaetotaxy on Abd. IV–VI.

**Remarks.** To date, 15 species of the genus *Lobellina* are known from Asia and one from Central America (Cuba) (Deharveng and Weiner 1984, Ma and Chen 2008, Smolis 2017, Jiang et al. 2018). The new species is similar to *L. montana* Deharveng...
Figures 4–9. Lobellina yinae sp. n. 4 dorsal chaetotaxy of antenna 5 ventral chaetotaxy of head 6 mandible 7 maxilla 8 Labium 9 types of body chaetae.

& Weiner, 1984 and L. paraminuta Deharveng & Weiner, 1984 from Korea by the following characters: cephalic chaeta O free from tubercle Fr (shifting between two tubercles An), cephalic tubercle Dl separate from tubercle L+So, tubercle Oc with three
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chaetae, Abd. V with 3+3 dorsal tubercles and De separate from Dl, and claw with a distinct basal inner tooth. However, L. yinae sp. n. can be distinguished from L. montana and L. paraminuta by its mandible with six teeth versus seven, cephalic tubercle DI with three or four chaetae versus five, tubercle De on Abd. I–III with four chaetae (3+s) versus three (2+s), and tubercle DI on Abd. I–III with three chaetae versus two.

The new species is also similar to L. fusa Jiang, Wang & Xia, 2018 from China by the following characters: mandible with six teeth, maxilla styliform, tubercle Fr on head with three chaetae, tubercle Oc on head with three chaetae, Abd.V with 3+3 dorsal tubercles and De separate from Dl, and claw with a distinct basal inner tooth. However, the new species can be differentiated from L. fusa by the cephalic chaeta O of tubercle Fr free (not free in L. fusa), cephalic tubercles Di separated (fused in L. fusa), cephalic tubercle DI with four chaetae (five in L. fusa), and each tubercle Dl on Abd. I–III with three chaetae (two chaetae in L. fusa).

Key to species of the genus Lobellina Yosii, 1956 (Modified from Jiang et al. 2018)

1 Cephalic chaeta O present ............................................................................. 2
   – Cephalic chaeta O absent ....................................................................... 7
2 Chaeta O included in tubercle Fr .................................................................. 3
   – Chaeta O free on tubercle Fr .................................................................. 4
3 Body color yellow, mandible with seven teeth, tubercle Oc with 2 chaetae, ventral tube with 5+5 chaetae, cephalic tubercles Di separate .................................................. L. nanjingensis Ma & Chen, 2008 (China)
   – Body color red, mandible with six teeth, tubercle Oc with three chaetae, ventral tube with 4+4 chaetae, cephalic tubercles Di fused .................................................. L. fusa Jiang, Wang & Xia, 2018 (China)
4 Mandible with six teeth, Cephalic tubercle DI with four (or three) chaetae .............................................................................................................. L. yinae sp. n. (China)
   – Mandible with seven teeth, Cephalic tubercle DI with five chaetae .......... 5
5 Tubercle DI on Th. II with six chaetae (4 +s+ms) ........................................ L. montana Deharveng & Weiner, 1984 (Korea)
   – Tubercle DI on Th. II with five chaetae (3+s+ms) .................................... 6
6 Tubercle Oc with mesochaeta Oca, Abd.V dorsally with 4+4 tubercles ...... L. paraminuta Deharveng & Weiner, 1984 (Korea)
   – Tubercle Oc without chaeta Oca, Abd.V dorsally with 3+3 tubercles ...... L. weinerae Smolis, 2017 (Vietnam)
7 Body macrochaetae smooth ...................................................................... 8
   – Body macrochaetae serrate .................................................................... 13
8 Cephalic tubercle Oc with three chaetae .................................................... 9
   – Cephalic tubercle Oc with two chaetae .................................................. 10
9 Abd. V with 2+2 dorsal tubercles ......................................................... 
  \textit{L. chosonica} Deharveng & Weiner, 1984 (Korea)
– Abd. V with 3+3 dorsal tubercles ...................................................... 
  \textit{L. proxima} Deharveng & Weiner, 1984 (Korea)
10 Tubercle Di on Abd. V with two chaetae ............................................. 11
– Tubercle Di on Abd. V with three chaetae ...... \textit{L. minuta} (Lee, 1980) (Korea)
11 Mandible with three teeth.................. \textit{L. ipohensis} (Yosii, 1976) (Malaysia)
– Mandible with 6–8 teeth ................................................................. 12
12 Mandible with six teeth, tubercle De+Dl with six chaetae (5+s) ............. 
  \textit{L. pomorskii} Smolis, 2017 (Vietnam)
– Mandible with eight teeth, tubercle De+Dl with five chaetae (4+s) ........ 
  \textit{L. musangensis} (Yosii, 1976) (Malaysia)
13 Cephalic tubercle Oc with two chaetae ............................................. 14
– Cephalic tubercle Oc with three chaetae ........................................... 15
14 Abd. V with 2+2 dorsal tubercles ..................................................... 
  \textit{L. ionescui} (Massoud & Gruia, 1974) (Cuba)
– Abd. V with 3+3 dorsal tubercles ..................................................... 
  \textit{L. perfusionides} (Stach, 1965) (Vietnam)
15 Abd. V with 2+2 dorsal tubercles ........ \textit{L. roseola} (Yosii, 1954) (Japan)
– Abd. V with 3+3 dorsal tubercles .......... \textit{L. kitazawai} (Yosii, 1969) (Japan)

**Tribe Neanurini Börner, 1901 (sensu Cassagnau, 1983)**

**Genus Vietnura Deharveng & Bedos, 2000:** new record to China

\textit{Vietnura caerulea} Deharveng & Bedos, 2000: 209–214, figs 1–4 (Vietnam) new record to China

**Material.** Two males on the same slide, one of them submature, 25°17.453’N, 107°56.359’E, elevation 880–900 m. Three individuals in alcohol, Coordinates: 25°17.516’N, 107°56.371’E, elevation 840 m. One specimen in alcohol, 25°17.483’N, 107°56.245’E, elevation 731 m. All of them were collected by Cheng-Wang Huang, Yan Liang & Ai-Min Liu, from Maolan National Nature Reserve, Libo County, Guizhou Province, China, on 19 July 2015. Material deposited in Shanghai Entomological Museum, Chinese Academy of Sciences.

**Description of the Chinese specimens** (Figs 10–15, Tables 5–7). 

**Body** length (without antenna) 0.9–1.1 mm. Cuticular granulations medium, tertiary granules developed, body with reticulations. Tubercles well developed on dorsal side of body. Body color blue alive and in alcohol. Eyes 2+2, small and pigmented, all on tubercles Oc. **Chaetal morphology** (Fig. 14). Dorsal ordinary chaetae of four types: Ml, Mc, Mcc, and me. Macrochaetae Ml long, sheathed, distinctly toothed and knobbed at apex (Fig. 14a). Macrochaetae Mc morphologically similar to long macrochae-
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Table 5. Cephalic ventral chaetotaxy of *Vietnura caerulea* Deharveng & Bedos, 2000.

| Group | Number of chaetae |
|-------|-------------------|
| Vi    | 5                 |
| Vea   | 2                 |
| Vem   | 2                 |
| Vep   | 2                 |
| Labium| 11, 0x            |

Figures 10–14. *Vietnura caerulea* Deharveng & Bedos, 2000 10 dorsal side of antenna 11 ventral side of Ant. III–IV 12 mandible 13 maxilla 14 body setae, a: macrochaeta, b: S-chaeta.

tae, but shorter. Macrochaetae Mcc morphologically similar to Mc and shorter than Mc. Mesochaetae similar to ventral chaetae, thin, smooth, and pointed, with various lengths. S-chaetae of tergites thin, smooth, shorter than Mc and slightly longer than Mcc “mou” (Fig. 14b). S-chaetae formula on tergites as 0, 2+ms, 2/1, 1, 1, 1, 1. Antenna. Antenna 4-segmented. Ant. I with seven chaetae. Ant. II with 10–11 chaetae. Ant. III dorsally fused to Ant. IV. AOIII consists of two short rods, one ventral ms
Table 6. Chaetotaxy of antenna of *Vietnura caerulea* Deharveng & Bedos, 2000.

| Segment, group | Number of chaetae | Segment, group | Number of chaetae |
|----------------|-------------------|----------------|-------------------|
| I              | 7                 | IV             | or, 8 s, 12 mou, 2 iv |
| II             | 10–11             |                |                   |
| III            | 5 sensilla AOIII   |                |                   |
| Vc             | 3                 | ap             | 7 bs, 4 miA       |
| Vc             | 4                 | ca             | 2 bs, 2 miA       |
| Vi             | 4                 | cm             | 3 bs, 1 miA       |
| d              | 3                 | cp             | 1 brs, 8 miA      |

Table 7. Postcephalic tubercles and chaetotaxy of *Vietnura caerulea* Deharveng & Bedos, 2000.

| Terga | Legs |
|-------|------|
|       |      | Terga | Sterna |
|       |      | Th. I        | Mc       | L | Scx2 | Cx | Tr | Fe | T |
|       |      | Th. II       | Ml+Mcc   | Mc+Mcc+ss | Ml+Mcc+ss | Ml+Mcc+Mcc | 2 | 7 | 6 | 12 | 19 |
|       |      | Th. III      | Ml+Mcc or Ml+2Mcc | Ml+Mcc+ss | Ml+2Mcc+ss | Ml+Mcc+Mcc | 2 | 8 | 6 | 11 | 18 |
|       |      | Abd. I       | Ml+Mcc   | Ml+Mcc+ss | Ml+Mcc | Ml+Mcc+me | VT: 4 |
|       |      | Abd. II      | Ml+Mcc   | Ml+Mcc+ss | Ml+Mcc | Ml+Mcc+me | Ve: 3 |
|       |      | Abd. III     | Ml+Mcc   | Ml+Mcc+ss | Ml+Mcc | Ml+Mcc+me | Ve: 3–4, Fu: 3–4 me, mi: 0 |
|       |      | Abd. IV      | Ml+Mcc   | Ml+Mcc+ss | Ml+Mcc | 4me | Ve: 1, Vec: 2, Vel: 3, Vi: 3–4 |
|       |      | Abd. V       | Ml+Mcc   | Ml+Mcc+me | VT: 4 |
|       |      | Abd. VI      | 2(Ml+Mcc)* | Ml+Mcc+2me+ss | Ag: 2, Vi: 2 |
|       |      |               | 7 (8)     | Ve: 12, An: 1 mi |

*2 Di fused.

and two longer sensilla (sgd and sgv), sgd shifted basally to the back of the two rods, each rod exposed in separate pit (Fig. 10). Ant. IV dorsally with eight sensilla, slender i-chaeta, and minute capitate organite (or), apical bulb small, trilobed (Fig. 10). Sensilla thicker and shorter than “mou”-chaetae (Fig. 10). Ventral chaetotaxy of Ant. III–IV as in Fig. 11 and Table 6, group ap with seven bs and four miA, ca with two bs and two miA, cm with three bs and one miA, cp with eight miA and brs5. On ventral side of Ant. III, Vi, Vc, Ve respectively with four, four, three chaetae; dorsally with three d chaetae, d3 as mesochaeta (Fig. 10). Mouthparts. Buccal cone short, labral sclerifications not ogival. Labrum chaetotaxy: ?/2, 4. Labium with four basal, three distal, four lateral chaetae, without papillae x. Maxilla reduced, styliform (Fig. 13). Mandible reduced, tridentate (Fig. 12).

*Dorsal chaetotaxy and tubercles* (Table 7). Head with six tubercles. Tubercle Cl with four chaetae: two G and two F; tubercle Af+Oc with four chaetae: two B and two Ocm, chaeta O absent; tubercle Di+De with four chaetae: two Di1, two De1; tubercle Dl+L+So with eleven chaetae (5Ml+6me). Thorax and abdomen tubercles and chaetotaxy as in Table 7. Cryptopygy.

*Ventral chaetotaxy* (Fig. 15 and Table 5). On head, groups Vea, Vem and Vep with two, two, two chaetae respectively. Group Vi on head with five chaetae. VT with one proximal and three distal chaetae. On Abd. III, furca rudimentary with 3–4 chaetae,
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Figure 15. Vietnura caerulea Deharveng & Bedos, 2000, ventral side of Abd. II–VI.

Vel with 3–4 chaetae. On Abd. IV, group Ve1, Vec, Vel respectively with one, two, three chaetae, VI with three or four chaetae. On Abd. V, group VI with two chaetae, chaeta L’ absent, Ag with two chaetae. Anal lobe with twelve chaetae and one mi.

Appendages. Unguis without tooth. Chaeta M on tibiotarsus present. Tibiotarsus of foreleg, midleg and hindleg, respectively with 19, 19, 18 chaetae. Chaetotaxy of ventral tube and furcular remnant as in Table 7.

Ecology and distribution. Among fallen leaves of bamboo and under broad-leaved trees in the forest. The species is described from Vietnam. In China, it is only known from Maolan National Nature Reserve, Libo County (Fig. 16).

Remarks. Vietnura caerulea is easily distinguished among Chinese Neanurinae by its blue body color, six tubercles on the head, 2+2 pigmented eyes on tubercle Af+Oc, and reduced mandible and maxilla. Additionally, Ve chaetal group of Abd. IV has 3–5 shortened, thickened, and distally ciliated chaetae (male), claw is toothless, and hypotrichosis is developed on body tubercles.
Tribe Paleonurini Cassagnau, 1989
Genus Rambutanura Deharveng, 1988

Rambutanura hunanensis Jiang & Dong, 2018

Rambutanura hunanensis Jiang & Dong, 2018: 377–386, figs 1–14 (China)

Material. One juvenile, body length 2.2 mm, on slide; two specimens in alcohol, probably juvenile. Maolan National Nature Reserve, Libo County, Guizhou Province, China, 25°16.400’N, 107°53.864’E, ca. 890 m above sea level. 19 July 2015. Collected by Cheng-Wang Huang, Yan Liang, and Ai-Min Liu.

Diagnosis. The specimen from Libo County is characterized by its body without long digitate tubercles and tertiary granules, 2+2 depigmented eyes, mandible with four teeth, maxilla styliform, head with eight tubercles (Cl, Af, 2 Oc, 2 Di+De, 2 Dl+L+So), claw with a big inner tooth, and ventral tube with 5–6 chaetae. These characters are similar to those of Rambutanura hunanensis Jiang & Dong, 2018 from...
Hunan Province; however, the presence of only four chaetae on genital plate reveals the immaturity of the Maolan specimens.

**Remarks.** The distribution of *R. hunanensis* is given in Fig. 16. The species has been collected from other localities in China, such as Huping Mountain, Shimen County, Hunan Province (unpublished). It is probably widely distributed in central and southwest China.

**Genus Vitronura Yosii, 1969**

**Vitronura paraacuta Wang, Wang & Jiang, 2016**

*Vitronura paraacuta* Wang, Wang & Jiang, 2016: 183–196, figs 1–7 (China)

**Material.** Two females, submature, on slides, five specimens in alcohol, Maolan National Nature Reserve, Libo County, Guizhou Province, China, 25°16.400’N, 107°53.864’E, ca. 880 m above sea level. 19 July 2015. Collected by Cheng-Wang Huang, Yan Liang, and Ai-Min Liu.

**Diagnosis.** The characters of the specimens from Maolan are consistent with those of *Vitronura paraacuta* Wang, Wang & Jiang, 2016: body tubercles well differentiated, head with 14 tubercles (only cephalic tubercle L fused to So), 2+2 depigmented eyes, mandible with four teeth, maxilla styliform, tubercles Fr and Oc with three chaetae each, and claw with an inner tooth.

**Remarks.** The arrangement of the dorsal body tubercles and numbers of chaetae on dorsal tubercles of *V. paraacuta* are very similar to those of *V. dentata* Deharveng & Weiner, 1984 from Korea. However, *V. paraacuta* can be differentiated from *V. dentata* by almost smooth body macrochaetae, four teeth on mandible, chaetae Di2, De2 on cephalic tubercle De and chaeta Oca on cephalic tubercle Oc being mesochaetae (*vs* serrated body macrochaetae, three teeth on mandible, chaetae Di2, De2 on cephalic tubercle De and chaeta Oca on cephalic tubercle Oc being microchaetae in *V. dentata*). The distribution of *V. paraacuta* is given in Fig. 16.

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