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VIETNURA CAERULEA NEW GENUS, NEW SPECIES, FROM VIETNAM: FIRST RECORD OF THE PALAEARCTIC TRIBE NEANURINI IN TROPICAL ASIA (COLLEMBOLA: NEANURIDAE)

Louis Deharveng and **Anne Bedos**

Laboratoire d'Ecologie Terrestre, UMR 5552 du CNRS, Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse Cedex 4, France.

ABSTRACT. - Eleven species of Neanurinae Collembola are recorded from Vietnam. They are listed and re-assigned to genera according to the current taxonomy of the subfamily. *Vietnura caerulea* new genus, new species is described from central and northern Vietnam. It is the first native representative of the large palaearctic tribe Neanurini in the tropics.

KEYWORDS. - Collembola, Neanuridae, palaearctic, Vietnam.

INTRODUCTION

The Neanurinae Collembola of Vietnam are mainly known by the works of Denis (1934, 1948), Stach (1965) and Nguyen Tri Tien (1995). These authors recorded ten species in total, which we tentatively replace here in the most recent classification of the subfamily. During a series of trips in the country from 1993 to 1998, we collected a large material of Neanurinae, including tens of species unknown to science. Among these forms, several were found to belong to the tribe Neanurini, hitherto only known from the Palaearctic Region (Cassagnau, 1989), with closest representatives in Korea and Japan. Moreover, Neanurini seem to be quite common and diversified in Vietnam as south as 12°N. We describe in this paper, *Vietnura caerulea* new genus, new species, a species of this tribe widespread in the central and northern part of Vietnam.

LIST OF THE NEANURINAE OF VIETNAM

Eleven species of Neanurinae, including the new species described in this paper, are recorded from Vietnam. We have assigned them, when possible, to the modern tribes and genera of the subfamily according to the most recent works (Cassagnau, 1983; Cassagnau & Deharveng, 1984; Deharveng, 1988).

Tribe Paleonurini

Present from northern to southern Vietnam, Paleonurini are however much less diversified than in other Southeast Asian countries.

Womersleya Denis, 1948

Womersleya vicina (Denis, 1934)
Protanura vicina Denis, 1934
Womersleya vicina (Denis, 1934) in Denis (1948).

Type locality. - Dalat (Vietnam)

Distribution. - known only from type locality.

Rambutanura Deharveng, 1988

Rambutanura dawydoffi (Denis, 1934)
Acanthanura dawydoffi Denis, 1934
Womersleya dawydoffi (Denis, 1934) in Denis (1948)
Rambutanura dawydoffi (Denis, 1934) in Deharveng (1988).

Type locality. - Hon-Ba near Nha Trang (Vietnam)

Distribution. - known only from type locality.

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Blasconura Cassagnau, 1983

Blasconura hirtella (Boerner, 1906)
Achorutes hirtellus Boerner, 1906 in Denis (1934, 1948).

Type locality. - Bogor (Indonesia)

Distribution. - tropical Asia.

Distribution in Vietnam. - Bana near Tourane (Denis, 1934, 1948).

Remark. - *Blasconura hirtella* may correspond to a complex of closely related species, the identification of the Vietnamese specimens has to be checked.

Blasconura separata (Denis, 1934)

Achorutes separatus Denis, 1934

Type locality. - Phu Ho near Yenbai (Vietnam)

Distribution. - known only from type locality.

Remark. - the attribution to the genus *Blasconura* is uncertain (Cassagnau, 1988).

Vitronura Yosii, 1969

Vitronura giselae (Gisin, 1950)

Type locality. - Geneva (Switzerland)

Distribution. - tropical Africa, eastern Asia, and gardens in western Europe.

Distribution in Vietnam. - northern Vietnam (Nguyen Tri Tien, 1995).

Remark. - several described and undescribed species exist in eastern Asia (Yosii, 1976; Deharveng & Weiner, 1984); identification of the Vietnamese material has to be confirmed.

Tribe Lobellini

Lobellini include a large number of species, mostly undescribed, from northern to southern Vietnam.

Paralobella Cassagnau & Deharveng, 1984

Paralobella perfusa (Denis 1934), new comb.
= *Lobella perfusa* Denis, 1934

Type localities. - material described from 4 Vietnamese localities: Dalat; Bana; Tourane; pic Lang-Biang

Distribution. - known only from type localities.

Lobellina Yosii, 1956

Lobellina perfusionides (Stach, 1965), new comb.
= *Lobella perfusionides* Stach, 1965

Type locality. - Cha-Pa (Vietnam)

Distribution. - known only from type locality.

Sphaeronura Cassagnau, 1983

Sphaeronura bornensis (Schoett, 1925), new comb.
= *Lobella (Propeanura) bornensis* (Schoett, 1925)

Type locality. - Sarawak (Malaysia)

Distribution. - Sarawak, Vietnam

Distribution in Vietnam. - northern Vietnam (Nguyen Tri Tien, 1995).

Remark. - it is likely that the Borneo and the Vietnam forms belong to different species.

Deuterobella Yoshii & Suhardjono, 1992

Deuterobella murphyi (Yosii, 1976), new comb.
= *Lobella (Lobella) murphyi* Yosii, 1976

Type locality. - Malaya (Malaysia)

Distribution. - Malaya, Vietnam.

Distribution in Vietnam. - northern Vietnam (Nguyen Tri Tien, 1995).

Remark. - it is likely that the Malaya and the Vietnam forms belong in fact to different species.

Tribe Neanurini

Except the subcosmopolitan parthenogenetic species *Neanura muscorum* (Templeton), Neanurini were considered to be strictly restricted to the north

temperate zone, where they are highly diversified. A number of genera and species, still undescribed, were however found recently in Vietnam, as south as Dalat (12°N).

Vietnura, new genus

Vietnura caerulea n. gen., n. sp.

Type locality. - Dong Hoi (Vietnam)

Distribution. - from northern Vietnam (Ha Long Bay) to central Vietnam (Bach Ma near Hue).

Neanura MacGillivray, 1893

Neanura muscorum (Templeton, 1835)

Type locality. - Ireland

Distribution. - subcosmopolitan

Distribution in Vietnam. - northern Vietnam (Nguyen Tri Tien, 1995).

Remark. - the Vietnamese record possibly corresponds to *Vietnura caerulea,* new species, which is the most common Neanurini of Vietnam. *Neanura muscorum,* widespread in temperate zones, has never been met in the numerous samples we collected in the region, nor in any country of Southeast Asia.

Key to Neanurinae genera from Vietnam

1. Blue pigment on the body 2
- No blue pigment on the body 3

2. Tubercles Af and Oc separate on head; 3+3 ocelli ..... *Neanura*
- Tubercles Af and Oc fused on head; 2+2 ocelli ..... *Vietnura*

3. Ocelli absent ..... *Deuterobella*
- Ocelli present 4

4. 2+2 ocelli 5
- 3+3 ocelli 8

5. Body tubercles developed in long, narrow digitations ..... *Rambutanura*
- Body tubercles more or less developed, but never as digitations 6

6 Tubercles Di and De fused on head and on abd.V ..... *Womersleya*
- Tubercles Di and De separate on head and on abd.V 7

7 Tubercles An and Fr separate on head .....*Vitronura*
- Tubercles An and Fr fused on head ..... *Blasconura*

8 Strong plurichaetosis (3-5 Di chaetae on head, 8-12 Di chaetae on abd.I-IV) ..... *Sphaeronura*
- Not as above 9

9 S-chaetae present on tubercle L of abd.II-IV ..... *Paralobella*
- S-chaetae absent on tubercle L of abd.II-IV ..... *Lobellina*

TAXONOMY

The terminology and abbreviations used in the description are those of Deharveng (1983) and Deharveng & Weiner (1984). Type material is deposited in the authors collection (Laboratoire d'Ecologie Terrestre, Université Paul Sabatier, Toulouse, France). Coordinates are given in longitude-latitude decimal degrees when available.

Vietnura, new genus

Type species. - *Vietnura caerulea* n. gen., n. sp.

Description. - Neanurini of small size (up to 1 mm). Blue pigment present on the body. Two pigmented ocelli on each side of the head. S-chaetotaxy normal (0, 2+ms, 2 / 1, 1, 1, 1, 1 on half tergites from th.I to abd.V). Ant.III chaetotaxy reduced, with the two dorsal microchaetae absent. Ant.IV with eight subequal S-chaetae. Reticulated tubercles present on the body. Labrum with 2 proximal and 4 subequal distal chaetae. Maxilla styliform, mandible thin, tridentate. Six tubercles on head, with Af fused to Oc in a large transverse band, and DL fused to (L+So). All tubercles developed on the tergites, separate from th.I to abd.IV. Tubercles Di of abd.V fused along the axis. Tubercles of abd.VI separate. Chaetotaxy of the tubercle (Af + Oc) strongly reduced on head, with only 4 chaetae present (B and Ocm) and chaetae A, C, D, E, Oca and Ocp absent. Tibiotarsal chaetotaxy 19,19,18 (chaeta M present). Claw untoothed.

Etymology. - The name of the genus refers to the country where it has been collected. Gender: feminine.

Discussion. - *Vietnura* is a typical Neanurini, most closely related to *Deutonura* Cassagnau, 1979, a widely distributed genus in the palaearctic region. It differs from *Deutonura* by the fusion of the tubercles DL to (L+So) on the lateral part of the head, and the strongly reduced chaetotaxy of the head. The unique (DL+L+So) tubercle is only found in a single species of Neanurini, *M. cassagnaui* Deharveng, 1981, which differs of *Vietnura* by many important characters (fusion of Di tubercles on abd.IV, fusion of Af, Oc, CL on head, no blue pigment, head chaetotaxy not reduced).

Vietnura caerulea, new species

(Figs. 1-4, Table 1)

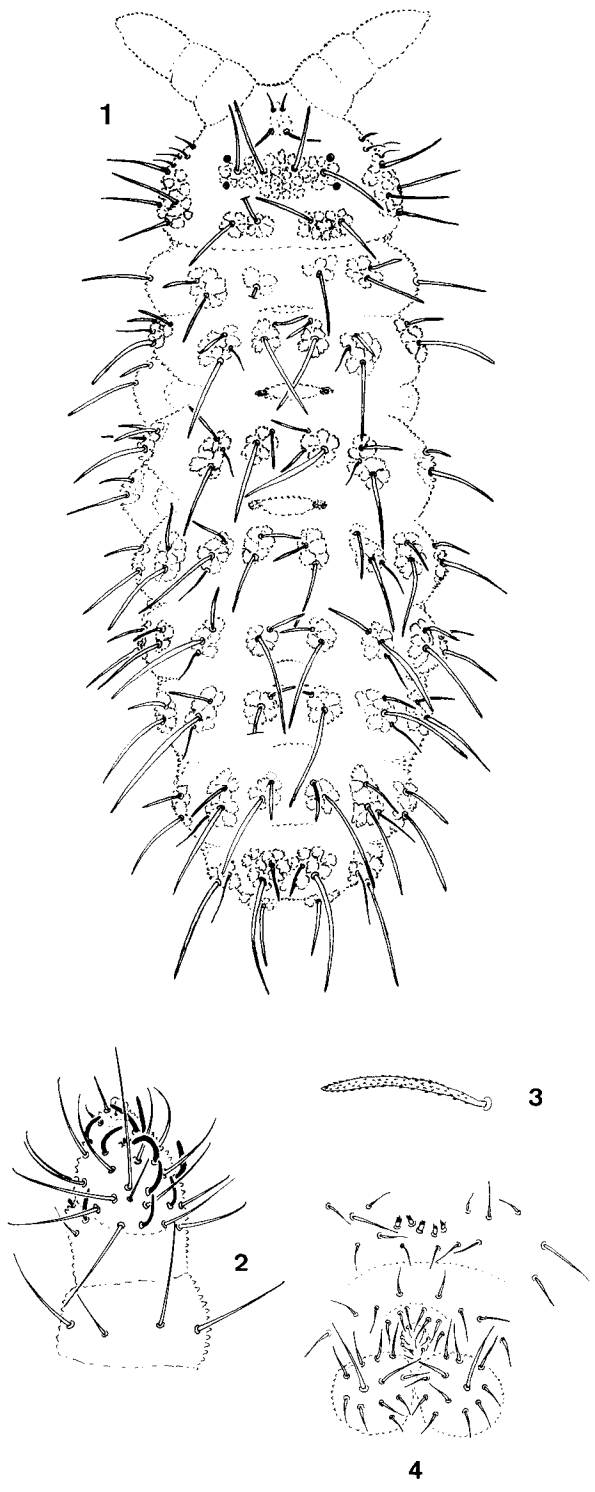
Type material. - Holotype - female, Vietnam, Quang Binh province, north-west of Dong Hoi, near Phong Nha, alt. 80 m, 106,29° x 17,57°N, 12 Jan.1995, forest litter, Deharveng & Bedos leg. (sample VIET-118).

Paratypes. - 2 females & 1 juvenile, ibid. (VIET-118); 1 juvenile, ibid. (VIET-119); 2 females & 1 juvenile, ibid., 90 m, 106,30° x 17,58°N, 6 Jan.1995, litter (VIET-100); 2 females, 2 males & 1 juvenile, ibid., litter on rock (VIET-102).

Other material. - 2 females & 1 male, Vietnam, Thua Thien province, south-east of Hue, Bach Ma National Park, 1240 m, 107,85° x 16,19°N, 6 Mar.1997, forest litter, Deharveng & Bedos leg. (VIET-343, VIET-355); 1 female, ibid., 1375 m, about 107,86° x 16,19°N (VIET-364); 1 female, ibid., 1235 m, about 107,86° x 16,19°N (VIET-387). 1 male, Vietnam, Haiphong province, Cat Ba island, near the trail to Viet Hai, close to Ao Ek lake, 107,03° x 20,80°N, 25 Sep.1998, litter, Deharveng leg. (VIET-436); 1 male, ibid., near Trung Trang, about 106,99° x 20,80°N, 30 Sep.1998, *Podocarpus fleuryi* forest soil, Deharveng leg. (VIET-470); 1 male, Vietnam, Quang Ninh province, Ha Long Bay, Mo Da island, 3 Oct.1998, soil, Deharveng leg. (VIET-515).

Description. - Body length: 0.8-1 mm. Colour: blue. Ocelli 2+2, pigmented, subequal. All dorsal tubercles well developed. Abd.V overlapping abd.VI in dorsal view. Three kinds of ordinary dorsal chaetae: (1) thin, smooth and acuminate mesochaetae, mainly on the lateral part of the head; (2) short, thick and (3) long macrochaetae, serrated, slightly sheathed (Fig. 3). S-chaetae on abd.I-V thin, shorter than the nearest macrochaetae.

Head. S-chaetae of ant.IV of medium length, thick, bent, subequal; apical vesicle slightly trilobed. Ant.III with a reduced number of chaetae (the 2 dorsal microchaetae or small mesochaetae are absent). Buccal cone elongated; labrum not pointed, large and with 4



Figs. 1-4: *Vietnura caerulea,* new genus and species. 1, habitus showing dorsal chaetotaxy (body length: 0.84 mm); 2, left ant.III-IV, dorsal side; 3, macrochaeta Di1 of th.II; 4, abd.IV-VI, ventral view of a male with the modified chaetae on abd.IV.

Table 1. Chaetotaxy of *Vietnura caerulea*, new species.

Dorsal cephalic chaetotaxy

	Tubercle	Number of chaetae	Type of chaetae	Chaetae
CL	(+)	4	Mc	F
			me	G
Af+Oc	+	4	ML	B,Ocm
Di+De	+	2	ML	Di1,De1
DL+L+So	+	11	ML	5 chaetae
			me	6 chaetae

Ventral cephalic chaetotaxy

Vi	5
Ve	8
Labrum	2/2,4
Labium	11,0x
Ant.I-II	7,11
Ant.III	15+5S
Ant.IV	or+8S+i+12mou

Postcephalic chaetotaxy

	Di	De	DL	L
Th.I	1	2	1	-
Th.II	2-(3)*	2+S	3+S+ms	3
Th.III	(2)-3*	2+S	3+S	3
Abd.I	2	2+S	2	3
Abd.II	2	2+S	2	3
Abd.III	2	2+S	2	3
Abd.IV	2	2+S	2	4
Abd.V	2+2**	----------4+s----------		
Abd.VI	----------7----------			

Scx2	Cx	Tr	Fe	Ti
0	3	6	13	19
2	7	6	12	19
2	8	6	11	18

TV=4+4
Ve=4 (Ve1 present)
Fu=3-(4),0mi Ve=3-4
Ve=8 VL=4
Ag+VL=4
Ve=12 An: not seen

* Di3 absent, or a microchaeta, or a short macrochaeta

** Di2 a microchaeta, or a mesochaeta, or a short macrochaeta

minute tooth-like processes at the apex; the 2+2 distal chaetae subequal. Maxilla styliform, mandible thin, tridentate. 2+2 pigmented ocelli, on the margin of the ocular tubercle. Six tubercles on head, with Af fused to Oc in a large transverse band, and DL fused to (L+So). Chaetotaxy of head very reduced (Table 1).

Postcephalic chaetotaxy as in Figs. 1 & 4 and Table 1. On th.II-III, Di3 is either absent, or present as a microchaeta or a short macrochaeta, often asymmetrically (Fig. 1). On abd.V, Di3 is absent and Di2 is either a microchaeta, or a mesochaeta, or a short macrochaeta. Male with 4 or 5 chaetae Ve shortened, strongly thickened and distally ciliated on abd.IV. Tibiotarsal chaetotaxy 19,19,18 (chaeta M present). Claw untoothed.

Etymology. - The species name comes from the latin word *caerulea* which means blue.

Discussion. - *Vietnura caerulea* n. sp. is very frequent from northern to central Vietnam, from the lowest altitude to mid-mountain (up to 1375 m a.s.l.). An other species of this genus is present in the Dalat mountains (southern Vietnam) and a third one in the Ke Bang karst (Quang Binh province, central Vietnam); they are not described here due to the insufficient number of individuals being available.

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