

***Folsomia abrupta* n. sp. (Collembola, Isotomidae) from southern Vietnam**

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Folsomia abrupta n. sp. (Collembola, Isotomidae) from southern Vietnam. – A new Isotomid Collembola, *Folsomia abrupta* n. sp., is described from the Bi Doup massif in southern Vietnam, where it frequently occurs in medium to high altitude forest soils. Together with *F. minipunctata* Zhao & Tamura, 1992 from China, it constitutes a well-defined species group restricted to Southeast Asia.

Key words: Collembola, Isotomidae, *Folsomia abrupta* n. sp., New species, Vietnam.

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Introduction

The genus *Folsomia* is widespread in the Holarctic region with a few species extending to lower latitudes. In the tropics of Southeast Asia, three species have been recorded: *Folsomia candida* Willem, 1902 from Indonesia (SUHARDJONO, 1989) and southeast China (RUSEK, 1971); *Folsomia fimetaria* (Linn., 1758) from southern Vietnam (DENIS, 1948, but the record needs to be confirmed); and *Folsomia octocolata* Handschin, 1925 from Malaysia and Singapore (YOASII, 1959), Indonesia (SUHARDJONO, 1989), northern Thailand (BEDOS, 1994), and southeastern China (ZHAO & TAMURA, 1992: cit. after ZHAO et al., 1997; RUSEK, 1971). Each of the listed forms is also widespread in the Holarctic region.

However, the tropical fauna of *Folsomia* might be richer than previously supposed, at least in southeast Asia: for example, four undescribed species are cited from northern Thailand by BEDOS (1994): *Folsomia* cf. *diplophthalma* (Axelson, 1902) and three unnamed species from the groups *sensibilis*, *fimetaria* and *quadriocolata*. During recent biological exploration of the Dalat mountains (southern Vietnam), no less than four species were collected on the forest slopes of the Bi Doup Massif. One of these, of very peculiar habitus, was found in relatively large numbers, and is described in the present paper as *F. abrupta* n. sp.

The type material is kept in the University

Paul Sabatier in Toulouse (UPS), in the Museum d'Histore Naturelle de Paris (MNHN), and the Moscow State Pedagogical University (MSPU).

Results

Folsomia abrupta n. sp.

Type material

Holotype (female, alcohol): Vietnam, Lam Dong province: Dalat, Bi Doup, 1910 m a.s.l., soil, 01 III 1997, leg. L. Deharveng & A. Bedos (sample VIET-305) (UPS).

Paratypes: 8 specimens from holotype site (2 in UPS, 2 in MNHN, 4 in MSPU).

Additional material

(leg. L. Deharveng & A. Bedos)

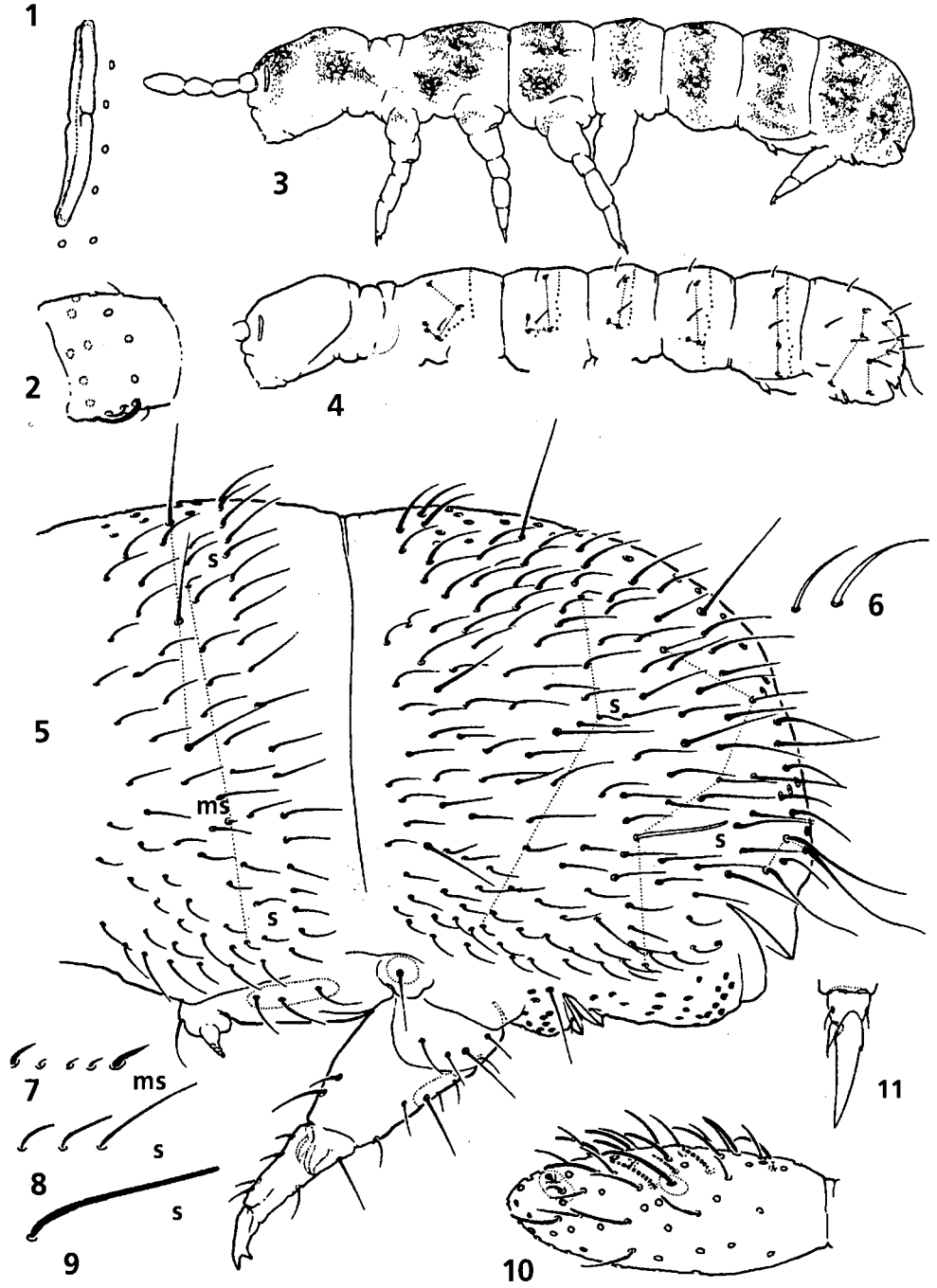
3 specimens, *ibid*, 1910 m a.s.l., litter, 01 III 1997 (sample VIET-296) 10 specimens, *ibid*, 1910 m a.s.l., soil, 01 III 1997 (samples VIET-299, VIET-301) 16 specimens, *ibid*, 1750 m a.s.l., soil, 01 III 1997 (samples VIET-307, VIET-309) 4 specimens, *ibid*, 1535 m a.s.l., litter, 01 III 1997 (sample VIET-314) 1 specimen, *ibid*, near Klong Lanh village, 1410 m a.s.l., litter, 18 XII 98 (sample VIET-675).

Description

Length up to 1.1 mm. Body stout, three last abdominal segments shortened. Pigmentation rather weak, black grains scattered irregularly on head, thorax and abdomen, appendages white. The darkest specimen is

Figs. 1-11. *Folsomia abrupta* n. sp.: 1. Postantennal organ; 2. Antennal segment I in lateral view; 3. Habitus of darkest specimen; 4. Arrangement of sensilla, microsensilla and macrochaetae on body; 5. Posterior part of the body; 6. Common chaeta of dorsomedial area of Th.II (left) and Abd.V (right); 7. Microsensilla of Th.II, III and Abd.I, II and III, respectively; 8. Medial sensilla of Th.II, Abd.IV, and Abd.V, respectively; 9. Lateral sensillum of Abd.V; 10. Ant.IV (only sensilla shown); 11. Claw of Leg III, outer side. (s. Sensillum; ms. Microsensillum.)

Folsomia abrupta sp. n.: 1. Órgano postantenal; 2. Segmento antenal I, vista lateral; 3. Habitus del ejemplar más oscuro; 4. Disposición de los sensillos, microsensillos y macroquetas en el cuerpo; 5. Parte posterior del cuerpo; 6. Queta común del área dorsomedial de los segmentos Th.II (izquierda) y Abd.V (derecha); 7. Microsensillos de los segmentos Th.II, III y Abd.I, II y III, respectivamente; 8. Sensilio medio de Th.II, Abd.IV, y Abd.V, respectivamente; 9. Sensilio lateral de Abd.V; 10. Ant.IV (sólo se muestran los sensillos); 11. Uña de Leg III, cara externa. (s. Sensilio; ms. Microsensilio.)



shown in fig. 3. Ommatidia missing. PAO narrow, 1.3-1.4 as long as Ant.I width, with distinct constriction and weak "denticles". Upper and lower tips of PAO slightly bilobed (fig. 1). Maxillary palp bifurcate, outer maxillary lobe with four sublobal hairs. Labral formula 4/554. Each of ventral side of head along linea ventralis with three main and one smaller chaetae, the latter situated more laterally between the first and the second one. Ant.I with two basal ms and two s: one long and thick and another short and thin (fig. 2). Ant.II with three basal ms, of which the inner one is considerably larger, and one s. Ant.III with five s: four common and one lateral, no basal ms. Ant.IV with about 30 sensilla of varying length and width, none strongly broadened, one lateral sensillum 1.5 as long as others (encircled in fig. 10). Subapical depressed sensillum roundish.

Body sensilla short, distinct from common chaetae. Sensillar formula for Th.II-Abd.V: 4,3/2,2,2,3,5 (s), 1,1/1,1,1,0,0 (ms). On Th.II-Abd.IV sensilla are situated in front of p-row. Medial sensilla on Abd.I-III between mac1 and mac2. Abd.V with 3+3 moderately long and thin medial, 1+1 longest and distinctly broadened laterally, and 1+1 short and thin ventrally. Microsensilla on Th.II and Abd.III large, on Th.III tiny. Tip of abdomen with 3+3 sinuous macrochaetae (connected on fig. 5). Macrochaetae 1(2),2/3,3,3,4 in number, rather short and pointed. Medial macrochaeta on Th.II short and hardly different from common chaetae. The largest macrochaetae of the dorsal side of last abdominal segments 1.9-2.1 times longer than mucro. Common chaetae smooth, clearly thickened on the three last abdominal tergites (fig. 6, right). Th.III with 26-27 chaetae in p-row. Thorax without ventral chaetae.

Claw with small lateral teeth (fig. 11), of which the anterior is indistinct at least on Leg I and II, no inner tooth. Upper and lower subcoxae with two and six to seven (leg II), two (more rarely three) and six to eight (leg III) chaetae, respectively. Retinaculum with 4+4 teeth and one chaeta on corpus. Ventral tube with 3+3 latero-distal and six to seven posterior chaetae. Anterior furcal subcoxa with two to three, posterior with a single chaeta (encircled on fig. 5). Anterior side of manubrium with

1+2 or 2+2 chaetae. Manubrium on posterior side with 5+5 latero-basal, 3+3 central, 1+1 distal, and 1+1 apical chaetae, wholly with 10+10 ones. Lateral sides of manubrium without chaetae. Dens (fig. 5) thick and short, with four (more rarely five) anterior and two posterior (in basal and in middle parts) chaetae; no distinct crenulations. Mucro bidentate. Ratio manubrium:dens:mucro as 2.7-2.8:1.5-1.6:1.

Derivato nominis

Due to shortened back the abdomen looks "abrupt".

Discussion

F. abrupta n. sp. is a remarkable species, quite distinct from the holarctic members of *Folsomia* due to the following characters:

- one sensillum on Ant.IV elongated (fig. 10). The same condition is shown only in *F. giustii* Dallai, 1970 (Europe).

- PAO split (fig. 1). This unusual feature was figured but not covered in the text by ZHAO & TAMURA (1992) for *F. minipunctata*.

- highly enlarged lateral sensillum on Abd.V longer than the others on the same segment (figs. 4, 9). In our samples of *Folsomia* we found such a condition only in *F. inoculata* Stach, 1947 (Palearctic).

- shortened apical part of abdomen (fig. 3).

- reduced furca. So few anterior chaetae on dens is shared with some European forms, e.g. *F. brevicauda* Agrell, 1939 and *F. bogojevicae* Dunger, 1991, but posterior chaetotaxy of dens is different.

- Upper subcoxa of leg III with two, posterior furcal subcoxa with one chaeta (fig. 3). Such a pattern is not found in any other member of the genus *Folsomia*.

In spite of its isolated position in the genus, *F. abrupta* nevertheless belongs to the quadrioculata-line defined by sensilla on body situated well in front of posterior row of chaetae and the considerable anterior migration of dorso-internal sensillum on Th.II (DEHARVENG, 1979).

F. abrupta can be probably derived from the group of primitive species distributed in high mountains of Europe (*F. alpina* Kseneman, 1936, *F. decemoculata* Stach, 1946, *F. setosa* Gisin, 1953) and in eastern

Asia (*F. octooculata* Handschin, 1925, *F. orientalis* Martynova, 1977). Like *F. abrupta*, these forms show a full set of microsensilla on body, two pairs of macrochaetae on metathorax and more than one pair of anterior chaetae on manubrium. They are, however, characterized by many ommatidia and plesiomorphic conditions for all the above-listed characters.

The new species shares many characters with *F. minipunctata* Zhao & Tamura, 1992, described from East China, of which the following are original synapomorphies: the special form of PAO, long lateral sensillum on Abd.V, broaden sensillum on Ant.I. *F. abrupta* differs from *F. minipunctata* in fewer chaetae on furca (see table 1).

Distribution

The species is only known from the Bi Doup massif, northeastern of Dalat in southern Vietnam, where it is frequent in primary forest soils above 1500 m.

Table 1. Chaetotaxi fo *F. abrupta* and *F. minipunctata*; MA. Manubrium anterior; MP. Manubrium posterior; DA. Dens anterior; DP. Dens posterior.

Quetotaxia de *F. abrupta* y *F. minipunctata*. (Para abreviaturas, ver arriba.)

	MA	MP	DA	DP
<i>F. abrupta</i>	2+2(or 1+2)	10+10	4-5	2
<i>F. minipunctata</i>	3+3	11+11	9-10	3

Resumen

Folsomia abrupta sp. n. (Collembola, Isotomidae) del sur de Vietnam

Se describe un nuevo colémbolo isotómico, *Folsomia abrupta* sp. n. de Bi Doup massif, en el sur de Vietnam, donde se encuentra frecuentemente en suelos de bosques de altitudes media y alta (figs 1-11). Juntamente con *F. minipunctata* Zhao & Tamura, 1992 de China constituyen un grupo de especies bien definido restringido al sudeste asiático.

References

BEDOS, A., 1994. Les Collemboles, édaphiques du massif du Doi Inthanon (Thaïlande): biodiversité et écologie en forêt tropicale. Thèse, Université de Toulouse.

DEHARVENG, L., 1979. Chétotaxie sensillaire et phylogénèse chez les Collemboles Arthropleona. *Travaux du Laboratoire d'Écobiologie des Arthropodes Édaphiques*. Toulouse, 1(3): 1-15.

DENIS, J. R., 1948. Collemboles d'Indochine. Récoltes de M. C. Dawydoff. *Notes d'Entomologie chinoise*, 12(17): 183-311.

RUSEK, J., 1971. Second contribution to knowledge of the Collembola (Apterygota) of China. *Acta Entomologica bohemoslovaca*, 68(2): 108-137.

SUHARDJONO, R. S., 1989. Isotomidae from Indonesia. *Acta Zoologica Asiae Orientalis*, 1: 119-127.

YOSII, R., 1959. Studies on the Collembolan fauna of Malay and Singapore. *Contributions from the Biological Laboratory Kyoto University*, 10: 1-65.

ZHAO, L. & TAMURA, H., 1992. Two new species of Isotomid Collembola from Mt. Wuyangling, East China. *Edaphologia*, 48: 17-21.

ZHAO, L., TAMURA, H. & KE, H., 1997. Tentative checklist of Collembolan species from China. *Publications of Itako Hydrobiological Stations*, 9: 15-40.