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Isotomiella from Seychelles islands

(Insecta, Collembola, Isotomidae)

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Three species of the genus *Isotomiella* are recorded from Seychelles islands. Two were recently described from Amazonia (*I. prussianae* Oliveira et Deharveng, 1990 and *I. nummulifer* Deharveng et Oliveira, 1990). The third one (*I. spinosa*, spec. nov.) is a new species described in this paper.

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This paper is the first in a series about the Collembola of Seychelles, where one of us realized a fairly large collection of soil samples in December 1975. The present contribution deals with the genus *Isotomiella*.

Isotomiella is a major component of many soil arthropoda communities. It seems to be especially important in tropical forests, such as those of Amazonia (Deharveng & Oliveira, 1990; Oliveira & Deharveng, 1990) or SouthEast Asia (unpublished data) where it frequently outnumbers all other Collembola. In our Seychelles material three species were present, of which one is new to science. The two others proved unexpectedly to be conspecific with two recently described Amazonian species.

Isotomiella spinosa, spec. nov.

Figs 1-11

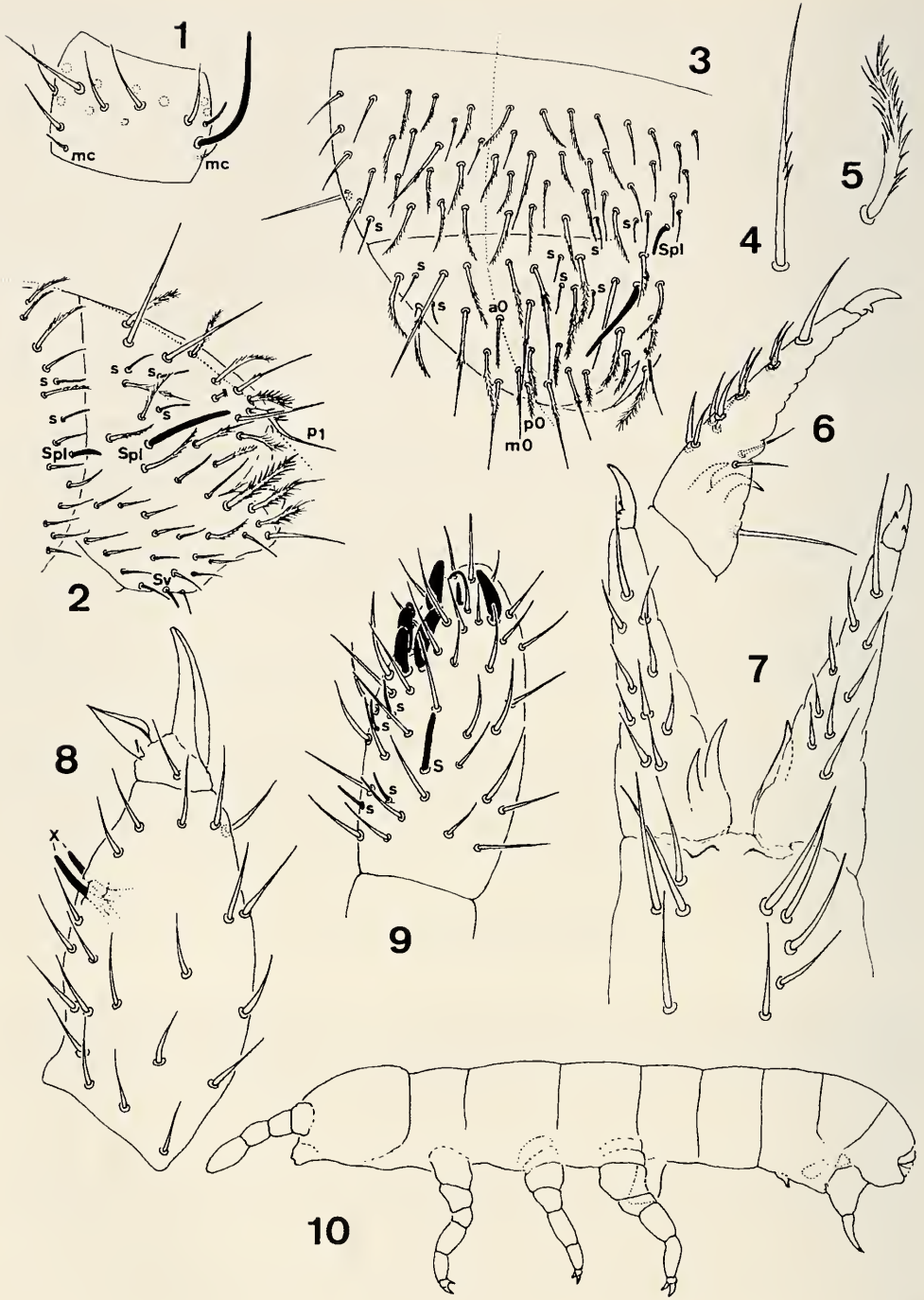
Types. Holotype male and numerous paratypes: Mahé, 7.12.75, Morne Seychellois, 940-950 a.s.l., thick leaf foerna (n°14), leaf litter (n°15) and *Northaea* litter (n°46). Holotype and 9 paratypes in the collection of the Laboratoire d'Ecobiologie des Arthropodes Edaphiques, Université P. Sabatier, Toulouse (France); 4 paratypes in the collection of the Museum National d'Histoire Naturelle de Paris.

Description

Length: 0,65-0,85 mm. Habitus cylindrical (Fig. 10). Secondary granules and "craters" on the integument absent. Integument channels difficult to see, but present from head to at least th.III. Pseudopora not seen.

Head (Figs 1, 9). Anterolateral setae of labrum not or only slightly thicker than others. Maxillary outer lobe with a bifurcate palp, without ciliated setae, and with 3 (?) sublobal hairs. Antennae 1/5 of body length. Setae S1-S6 of ant.IV ovoid and large. Several supplementary external S-setae, of which one is distinctly thicker on ant.IV. Ant.I with 14-15 ordinary setae, 2 basal microchaetae and 2 unequal S-setae, of which one is very long. All setae of head smooth and subequal.

Tergites (Figs 2-5). Axial chaetotaxy from th.II to abd.IV: 20-22, 14-16/8,7-8,8,7-9 (with frequent asymmetries on abd.IV). Ordinary dorsal setae differentiated in oblique mesochaetae and erect macrochaetae which are hardly longer. All setae on th.II-abd.II are smooth. On abd.III 1-2+1-2 postero-



Figs 1-10. *Isotomiella spinosa*, spec. nov. 1. Right antennal segment I, external view. mc, basal microchaetae; S-setae in black. 2. Posterior part of abd.IV and abd.V-VI, lateral view; S-setae in black. 3. Abd.IV to VI, dorso-lateral view; S-setae in black. 4. Macrochaeta of abd.V, enlarged; 5. Mesochaeta of abd.V, enlarged; 6. Mucrodens, external view; 7. Furca, ventral view; 8. Tibiotarsus III of male; 9. Antennal segment IV; S-setae in black; 10. Habitus, lateral view.

axial mesochaetae are ciliated, other setae smooth. On abd.IV macrochaetae (3+3) are either smooth or with a few cilia at mid-length; half of the mesochaetae are smooth, half are strongly ciliated. On abd.V-VI, most mesochaetae are thick and strongly ciliated, except ventro-lateral ones which are smooth. Macrochaetae are thinner and longer, with only a few (2-8) cilia like those of abd.IV. Posterior mesochaetae of abd.VI are rather short with very long cilia. No unpaired postero-axial seta on abd.IV. On abd.VI p1 macrochaeta with medium-sized cilia in its midpart, and a long, curved terminal filament. Unpaired setae from anterior to posterior of abd.VI: a0 is a strong ciliated mesochaeta; m0 is a thinner macrochaeta with a few cilia at mid-length; p0 is a strong ciliated mesochaeta. Formula of s-setae: 3,2/0,0,1,3,5 by half somite from th.II to abd.V. SL3 of th.II has not migrated towards the subcoxae. Spl of abd V thick and long.

Appendages (Figs 6, 7, 8, 11). Ventral tube with 4+4 distal, 2+2 anterior and 2+2 posterior setae. Male has 2 stick-like x-setae on tibiotarsi, with furcated roots; corresponding setae are thin and acuminate in the female. Tenent hairs of tibiotarsus III not thickened, thinner than other distal mesochaetae and not longer. Numerous spine-like setae are developed ventrally on femora, trochanter and coxae. Tenaculum with 3+3 teeth and 1 seta. Subcoxae anterior with 6-7, posterior with 7-8 smooth setae. Manubrium with 3+3 to 5+5 large ventral setae and 3 lateral setae. Dorsal setae on dens and manubrium are smooth and thin, ventral setae thicker and smooth. Dens with 9-10 ventral setae (the distal one longer), and 3 dorsal setae (one long basal and 2 median shorter). Mucro large, tridentate, distal tooth much larger than the 2 basal teeth. Basal hooks of dens very strong.

Derivatio nominis . One of the numerous peculiar characteristics of this species is the presence of spine-like setae on legs, from which its name is derived.

Discussion

Isotomiella spinosa, spec. nov. is distinguished from other species of the genus by the following characters:

1) a short furca combined with a tridentate mucro;
2) the hypertrophy of the long S-seta of ant.I;
3) the strong ciliation and the shortness of abd.V-VI mesochaetae.
5) the numerous spine-like setae on legs;
6) the dense chaetotaxy unique in the genus.

I. spinosa has the typical habitus of the *delamarei*-group species of the genus *Isotomiella*: cylindrical body, short furca, short dorsal setae. However, its relatively abundant manubrial chaetotaxy, its tridentate mucro and its S-chaetotaxy indicate a closer affinity to the *minor*-group of *Isotomiella*. In this group, *I. spinosa* is presently the only representant affected by a number of regressive evolutions in furcal morphology and body chaetotaxy. We recently found similar features in several Thai and Sumatran *Isotomiella* which are under study, but not in the large material of Amazonian *Isotomiella* we have examined (Oliveira & Deharveng 1990).

I. spinosa seems to be restricted to the highest point of Mahé, contrary to the two other species of the genus.

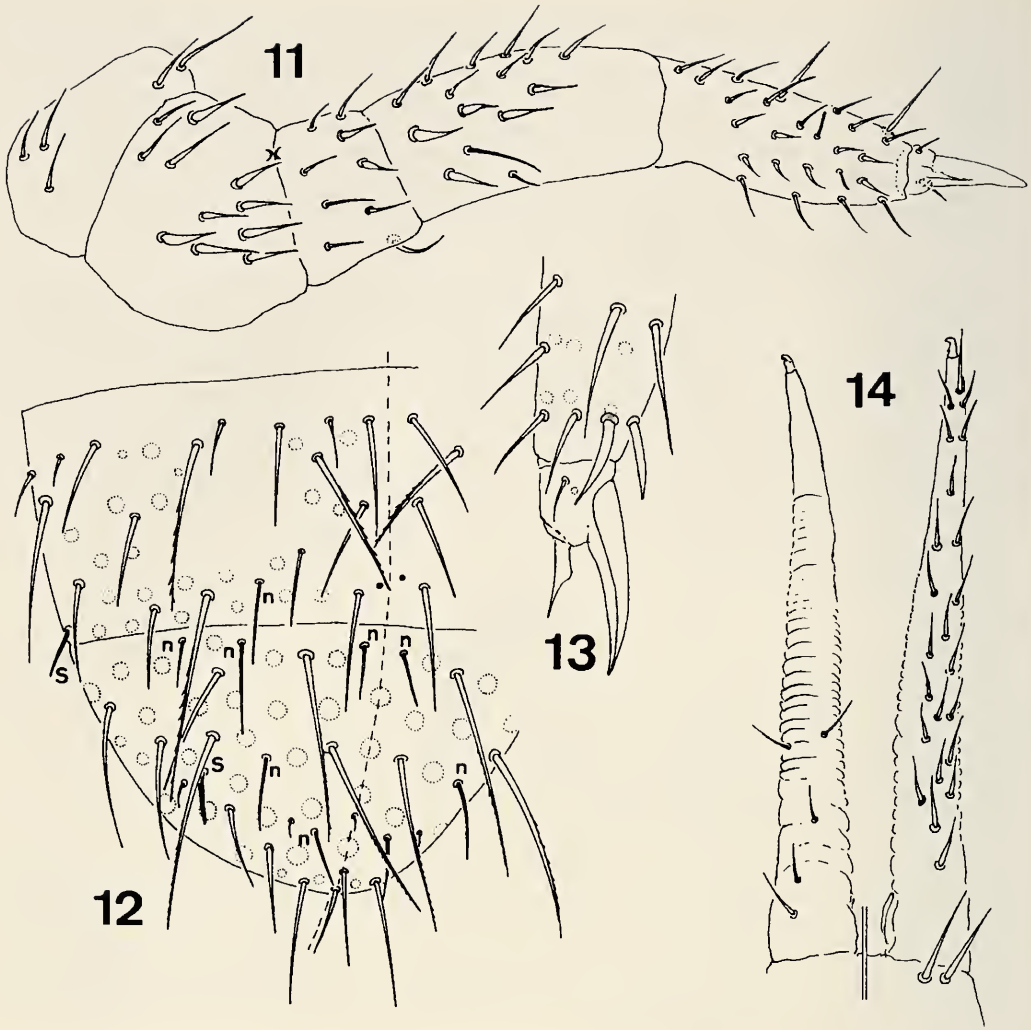
Isotomiella prussianae Oliveira et Deharveng, 1990

Material. Mahé: 3.12.75, Morne Seychellois, 650 a.s.l., forest litter (n°23); 5.12.75, Morne Blanc, 400 a.s.l., litter in wood (n°51); 7.12.75, Anse des Forbans, vegetation at head of ditch (n°65); 7.12.75, Morne Seychellois, 800 a.s.l., moss on stone, dense forest (n°44); 7.12.75, Morne Seychellois, 940-950 a.s.l., thick leaf foerna (n°14) and leaf litter (n°15); 10.12.75, Cascade Est., 250 a.s.l., debris from timber cutting in forest (n°6), and moss on stone (n°49); 18.12.75, Sans Souci, moss on stone and tree trunk (n°55).

Praslin: 12.12.75, vallée de Mai, moist litter in dark palm forest (n°62).

Observations

The absence of setae in a large ventro-lateral area of abd.II, which characterises the species at the adult stage, is clearly observed in all our Seychelles specimens, as well as most details given in the original description. Observed differences concern characters with not yet tested intraspecific variations:



Figs 11-14. 11. *Isotomiella spinosa*, spec. nov. Leg III, with spine-like setae of the ventral side. 12-14. *Isotomiella nummulifer* Deharveng & Oliveira. 12. Dorsal chaetotaxy of abd.IV to VI. Dotted circles, craters of the integument (probably present but not seen on axis and central part of abd.IV half-tergite); n, very thin ordinary setae. 13. Distal part of tibiotarsus III; 14. Dens, dorsal view (left) and ventral view (right).

1) 16 ordinary setae on ant.I (instead of 17 in original description);
2) 3 to 6 supplementary S-setae on ant IV (4 to 8 in original description);
3) 2+2 or 3+3 posterior setae on ventral tube (2+2 in original description);
4) several ciliated setae are present on femora III in the largest specimens (only 0 or 1 in original description).

We found that one of the distal setae of TIII was slightly but constantly thickened in Seychelles as well as Amazonian material.

As in Amazonian samples, no male was found in our Seychelles material. A very similar, if not identical form, exists in the soils of Sumatra. *Isotomiella prussianae* is likely to be a parthenogenetic and pantropical species.

Isotomiella nummulifer Deharveng et Oliveira, 1990
(Figs 12-14)

Material. Bird island: 14.12.75, Center of island, moist litter in thicket (n°58);
Mahé: 5.12.75, Morne Blanc, 400 a.s.l., under bark of dead tree (n°17); 6.12.75, Anse aux Poules Bleues, litter in moist forest (n°20); 6.12.75, Anse Takamaka, litter under coconut tree (n°47); 10.12.75, Cascade Est., 250 a.s.l., debris from timber cutting in forest (n°6); 11.12.75, Anse Jasmin, litter in open forest at hillside (n°41); 18.12.75, Sans Souci, moss on stone and tree trunk (n°55).
Praslin: 12.12.75, Vallée de Mai, moist litter in dark palm forest (n°62), *Lodoicea* litter in forest (n°39 and 59).

Observations

I. nummulifer is easily distinguished in the genus by its peculiar integument, its reduced body chaetotaxy, the unusual combination of a bidentate mucro and a long furca, its 2+2 ventral setae on manubrium and a number of other morphological features. The Seychelles specimens are identical with the type material from Amazonia in all respects, except one minor characters which variability was not possible to check: 17 setae on ant.I instead of 18. The seta SL1 of th.II presents the same range of variability in the Amazonian and Seychelles material.

No male was observed in our material. We recently found the species also in Sumatra (unpublished data). As for *I. prussianae*, *I. nummulifer* seems to be a parthenogenetic pantropical species.

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