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A NEW SPECIES OF *DENISIELLA* (COLLEMBOLA: SMINTHURIDIDAE) FROM NICARAGUA.

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RESUMEN

Se describe e ilustra una nueva especie de *Denisiella* de Nicaragua, además se redefine el género y se incluye una clave para las seis especies nominadas que se conocen a nivel mundial.

ABSTRACT

A new species of *Denisiella* from Nicaragua is described and illustrated, a redefinition of the genus and a key for the six named species known on the world level is given.

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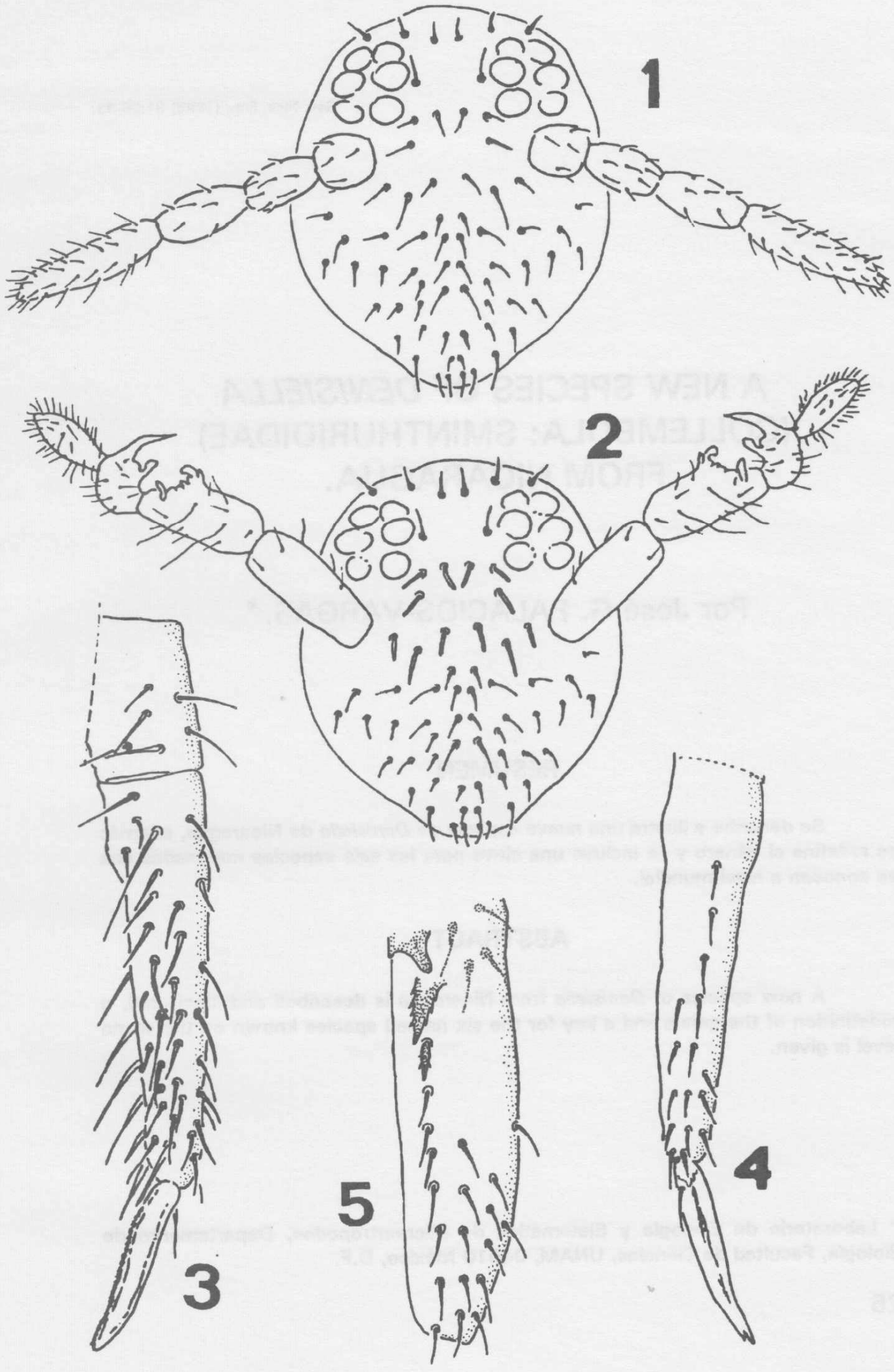
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INTRODUCTION

The genus *Denisiella* includes very small globoid Collembola, with a well differentiated sexual dimorphism. The following species have been described : *D. serroseta* Börner, 1908; *D. seurati* (Denis, 1925); *D. sexpinnata* (Denis, 1931); *D. ramosa* Folsom, 1932; *D. lithophila* Snider, 1988, and one undescribed species was recorded from Madagascar (Betsch, 1980).

In this paper I give the description of a new species collected by Dr. Jean-Michel Maes from León, Nicaragua; I also redefine the genus and include a key to identify the species of the genus. Illustrations of males, females and some important characteristics of the juveniles are included.

METHODS

Nine specimens of *Denisiella* preserved in alcohol were mounted after clearification in KOH and lactophenol. After mounting in Hoyers' solution they were studied under a phase contrast microscope, and the drawings were done with the help of a camara lucida. All measurements are in microns (μm), made with the aid of a calibrated ocular.

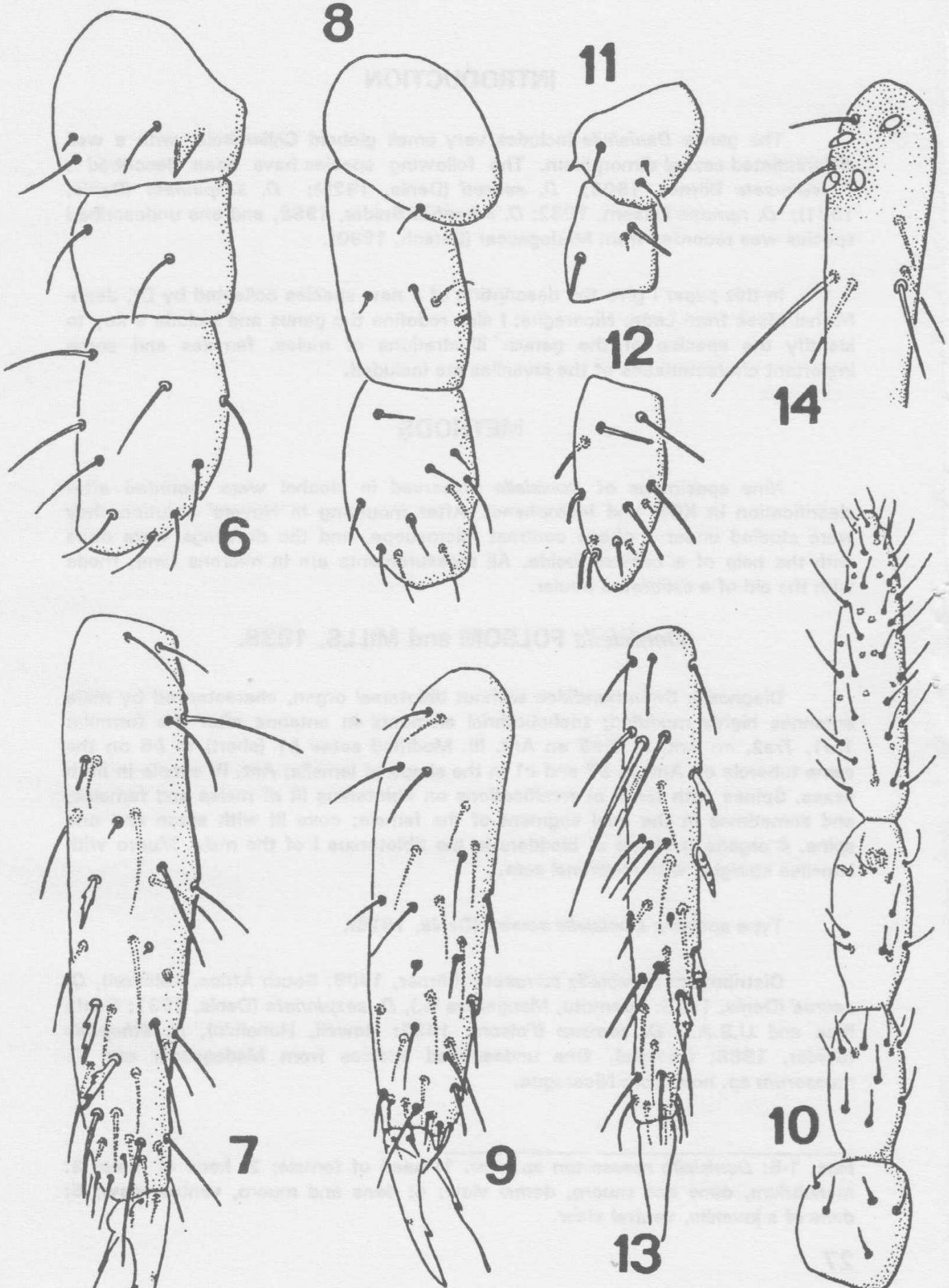
Denisiella FOLSOM and MILLS, 1938.

Diagnosis: Sminthurididae without tibiotarsal organ, characterized by male antennae highly modified; trichobothrial elements in antenna after the formula: *Tra*1, *Tra*2, on Ant. II; *Tra*3 on Ant. III. Modified setae *b*1 (short) to *b*6 on the same tubercle on Ant. II, *b*7 and *c*1 in the shape of lamella; Ant. IV simple in both sexes. Spines with teeth or ramifications on tibiotarsus III of males and females, and sometimes in the anal segment of the female; coxa III with setae and one spine. 4 organs in shape of bladders in the tibiotarsus I of the male. Mucro with lamellae straight, with mucronal seta.

Type species: *Denisiella seurati* (Denis, 1925).

Distribution: *Denisiella serroseta* (Börner, 1908: South Africa, Kalahari), *D. seurati* (Denis, 1925: Tuamotu, Mangareva Is.), *D. sexpinnata* (Denis, 1931: Costa Rica and U.S.A.), *D. ramosa* (Folsom, 1932: Hawaii, Honolulu), *D. lithophila* (Snider, 1988: Georgia). One undescribed species from Madagascar and *D. maesorum* sp. nov. from Nicaragua.

Figs. 1-5: *Denisiella maesorum* sp. nov. 1: head of female; 2: head of male; 3: manubrium, dens and mucro, dorsal view; 4: dens and mucro, ventral view; 5: dens of a juvenile, ventral view.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Denisiella maesorum sp. nov.

Female: Length (n=3): 880 μm. Head and body mostly purple. Sternum unpigmented. Antennae clear purple throughout. Legs pale, tinged with purple. Manubrium slightly pigmented; dentes unpigmented.

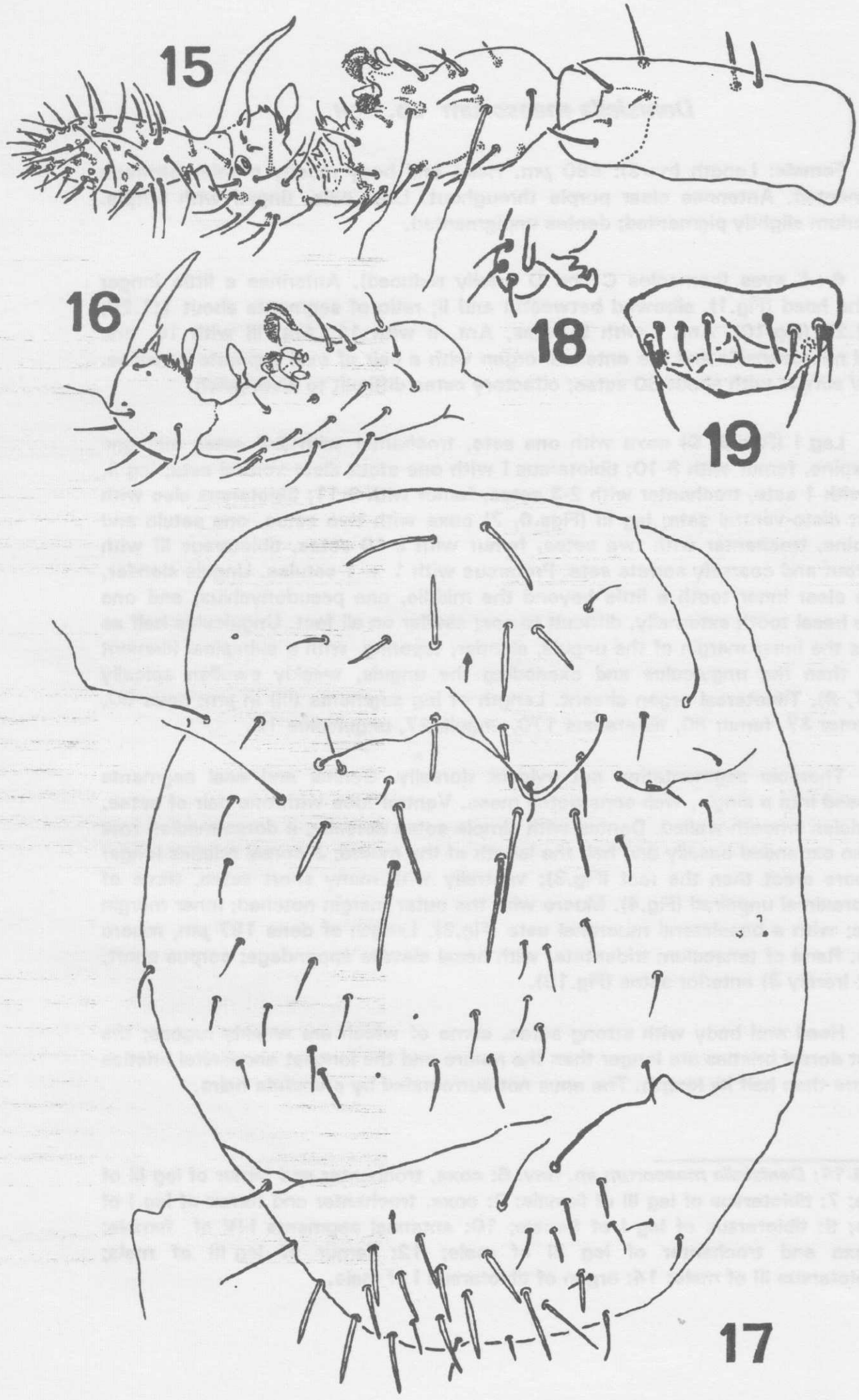
6+6 eyes (corneoles C and D totally reduced). Antennae a little longer than the head (Fig.1), elbowed between I and II; ratio of segments about 1:1.26; 1.4; 2.25 (Fig.10). Ant. I with 5 setae, Ant. II with 11, Ant. III with 10, one ventral microsensilla and the antennal organ with a pair of oval separate sensillae. Ant. IV simple with about 50 setae; olfactory setae difficult to distinguish.

Leg I (Figs.8, 9) coxa with one seta, trochanter with 2-3 setae and one small spine, femur with 9-10; tibiotarsus I with one stout disto-ventral seta; leg II, coxa with 1 seta, trochanter with 2-3 setae, femur with 9-11; tibiotarsus also with a stout disto-ventral seta; leg III (Figs.6, 7) coxa with two setae, one setula and one spine, trochanter with two setae, femur with 9-10 setae, tibiotarsus III with four stout and coarsely serrate seta. Pretarsus with 1 + 1 setulae. Unguis slender, with a clear inner tooth a little beyond the middle, one pseudonychius, and one minute basal tooth externally, difficult to see; similar on all feet. Unguiculus half as long as the inner margin of the unguis, slender, tapering, with a subapical filament longer than the unguiculus and exceeding the unguis, weakly swollen apically (Figs.7, 9). Tibiotarsal organ absent. Length of leg segments (III) in μm: coxa 50, trochanter 37, femur 80, tibiotarsus 170, unguis 27, unguiculus 12.

Thoracic segmentation not evident dorsally. Genital and anal segments ankylosed into a single, well-constricted mass. Ventral tube with one pair of setae, its vesicles smooth-walled. Dentes with simple setae dorsally, a dorso-median row of setae expanded basally and half the length of the mucro; 3 dorsal bristles longer and more erect than the rest (Fig.3); ventrally with many short setae, three of them proximal unpaired (Fig.4). Mucro with the outer margin notched; inner margin serrate; with a basolateral mucronal seta (Fig.3). Length of dens 187 μm, mucro 60 μm. Rami of tenaculum tridentate, with basal clavate appendage; corpus short, with 2 (rarely 3) anterior setae (Fig.18).

Head and body with strong setae, some of which are weakly rugose; the longest dorsal bristles are longer than the mucro and the longest anogenital bristles are more than half its length. The anus not surrounded by crenulate hairs.

Figs. 6-14: *Denisiella maesorum* sp. nov. 6: coxa, trochanter and femur of leg III of female; 7: tibiotarsus of leg III of female; 8: coxa, trochanter and femur of leg I of female; 9: tibiotarsus of leg I of female; 10: antennal segments I-IV of female; 11: coxa and trochanter of leg III of male; 12: femur of leg III of male; 13: tibiotarsus III of male; 14: organ of tibiotarsus I of male.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Five pairs of trichobothria are present in the body, 3 pairs on the dorsum, their bases forming a triangle; 2 pairs on the anogenital segment (Fig.17). Maximum length of the setae (in μm): on head 10, on body 15, on dens 11, on tibiotarsus 15. Integument weakly granulate.

Male. Length (n = 2): 730 μm. Body and antennae purple. Legs tinged with purple. Furcula unpigmented.

6 + 6 eyes. Antennae remarkably stout, a third longer than the head (Fig.2), elbowed between II and III; ratio of segments about 1:0.9; 0.4; 0.6 (Figs.15, 16). Ant. I with 7 setae, Ant. II with 23, two trichobothria, one microsensilla, and modified setae B1-6, Ant. III with 11, three setulae, one trichobothrium, one ventral microsensilla and the antennal organ with a pair of oval separate sensillae. Ant. IV simple, elliptical with about 50 setae; olfactory setae difficult to distinguish.

Leg I: coxa with one seta, trochanter with 2 setae, femur with 10. Tibiotarsus I basally on the outer side with 4 sense organs, suboblong, thick-walled, and sligtly elevated (Fig.14), and one very long seta (longer than in female), and with one stout disto-ventral seta; leg II, coxa with 1 seta, trochanter with 2-3 setae, femur with 9-11; tibiotarsus also with a stout disto-ventral seta; leg III (Figs.11, 12, 13), coxa with two setae, one setula and one spine, trochanter with two thick setae and one setula, femur with 9 setae and two setulae, tibiotarsus with four stout and coarsely serrate setae. Unguis and unguiculus similar to those of female. Tibiotarsal organ absent.

Thoracic segmentation not evident dorsally. Genital and anal segments ankylosed into a single mass. Genital plate of the male with one pregenital seta and 4 + 4 eugenital (Fig. 19). Dentes, mucro and tenaculum similar to those of female, although the mucro is more slender and longer. Length of dens 162 μm, mucro 75 μm.

Body chaetotaxy is as shown in figure 17, very similar to that of the female, except that setae are thicker. Maximum length of the setae, head 10, on body 15, on dens 12, on tibiotarsus 25.

Figs. 15-19: *Denisiella maesorum* **sp. nov. 15: antennal segments I-IV of male, ventral view; 16: antennal segments II-III of male, dorsal view; 17: dorsal chaetotaxy of thorax and abdomen of male; 18: tenaculum partial view; 19: genital opening of male.**

Sexual dimorphism: The sexual difference is very remarkable. Females are bigger (880 μm) than males (730 μm) and their setae in body and legs are thinner than on the male. Antenna of male are very modified as clasping organs (Figs.1, 2). The male has four organs in tibiotarsus I. Other small differences include the real proportions of the dens and mucro, and small details of leg chaetotaxy. Juveniles are very small (520 μm) and lack serrate setae on tibiotarsus and also lack the setae of tenaculum. Some very young juveniles (probably males, because they have 7 setae on Ant. I, adults and juveniles of females have only 5 setae) present one inner spine ventrally on manubrium, and two of the ventral setae of the dens are modified into ramified spines (Fig.5). Preadults of male present the development of the antennal structures under the skin very easy to see as well as the four vesicles in tibiotarsus I.

Variation: Small variation in leg chaetotaxy was found, mainly on femora as mentioned in the description.

Type locality: León, Nicaragua, Central America. Data of material: 20-VI-1989, washing soil from the city. J.-M. Maes col.

Type material: Holotype male adult; one paratype female and three preadult; two paratypes preadult males and two juveniles. One female and one male preadult will be kept in Museo Entomológico, S.E.A., León, Nicaragua. Holotype and remaining paratypes at author's Institution.

Etimology: Species dedicated to Juanita, Anne Isabelle and Jean-Michel Maes.

KEY TO THE SPECIES OF *DENISIELLA*.

1. No crenulate or serrate bristles near the anus.....2.
1'. Crenulated bristles situated near the anus.....4.

2. With 5 stout and coarsely serrate setae on tibiotarsus III.....
.....*D. serroseta* Börner, 1908.
2'. With fewer than 5 such setae on tibiotarsus III.....3.

3. With 3 unpaired ventral setae on dens; 3 teeths on each ramus of tenaculum, 4 swellings on tibiotarsus I.....*D. maesorum* sp. nov.
3'. With 2 unpaired ventral setae on dens; 4 teeths on each ramus of tenaculum, without 4 swellings on tibiotarsus I.....*D. lithophila* Snider, 1988.

4. Two crenulate bristles near the anus.....*D. seurati* (Denis, 1925).
4'. Six crenulate bristles near the anus.....5.

5. Longest dorsal bristles longer than the mucro. Second antennal segment longer than the 3rd.....*D. ramosa* Folsom, 1932.
5'. Longest dorsal bristles 2/3 the length of the mucro. Second antennal segment shorter than the 3rd.....*D. sexpinnatus* Denis, 1931.

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