DESCRIPTION OF *ORIBATULA DENTATA* SP. NOV. (ORIBATULIDAE, ORIBATIDA) FROM SPAIN AND COMPLEMENTARY DATA ON *O. LONGELAMELLATA* AND *O. MACROSTEGA*

BY Lorinda GROBLER [1] and Piotr SKUBALA [2]

(*Accepted March 1999*)

TAXONOMY
ORIBATIDA
NEW SPECIES

SUMMARY: A new species, *Oribatula dentata* sp. nov., is proposed for the oribatid mite previously recorded as *O. macrostega sensu* ITURRONDOBEITIA (1985). This new species is characterised by prominent, bidentate lamellar cusps. The possibility of *O. longelamellata* Schweizer, 1956 and *O. macrostega* Iturrondobeitia, 1985 being conspecific was also investigated and complementary data on both these species are provided.

SYSTÉMATIQUE
ORIBATIDA
ESPÈCES NOUVELLES

RÉSUMÉ : Une nouvelle espèce *Oribatula dentata* sp. nov. est décrite au sein du groupe d'oribates cités antérieurement comme *O. macrostega sensu* ITURRONDOBEITIA (1985). Cette nouvelle espèce est caractérisée par un grand cuspide lamellaire, doublement denté. Après études, *O. longelamellata* Schweizer, 1956 et *O. macrostega* Iturrondobeitia, 1985 sont distingués et des données complémentaires sont fournies.

INTRODUCTION

The genus *Oribatula* Berlese, 1896 is difficult to deal with taxonomically, due to the large number of species described (80, according to BALOGH & BALOGH (1992)) and the absence of clearly defined diagnostic characters in many of the older descriptions, often resulting in the misidentification of species.

In the present paper, a new species, *Oribatula dentata* sp. nov., is proposed for mites previously recorded as *O. macrostega* by ITURRONDOBEITIA (1985). Furthermore, problems concerning the status of *O. longelamellata* Schweizer, 1956 and *O. macrostega* Iturrondobeitia, 1985 are discussed and complementary data and descriptions of both species are also provided.

In the following descriptions, measurements are given in micrometres (µm) and were taken from specimens mounted temporarily on cavity slides. Specimen measurements are as follows: total length (tip of rostrum to posterior edge of notogaster); total width (widest part of notogaster). Scanning electron micrographs are of mites ultrasonically cleaned, air-dried, placed on 1/2 inch aluminium stubs and coated with AuPd in a Bio Rad Coating System before observa-

1. Department of Acarology, National Museum, Bloemfontein, South Africa.
2. Department of Ecology, University of Silesia, Katowice, Poland.

tion in a JOEL Winsem Scanning Electron Microscope.

Oribatula dentata sp. nov.

ITURRONDOBEITIA (1985) mentioned that he studied a soil sample from Basque country, Spain containing numerous specimens of an oribatid mite easily recognisable by its large lamellae, namely *O. macrostega* Subias. He did, however, note that the form of the lamellae of the specimens he studied differed slightly from those described by SUBIAS (1977) in that they presented prominent, bidentate lamellar cusps. He considered this an intraspecific variation, but also suggested that the characters susceptible to variation should be studied further in future. To investigate this matter, we compared some of the above-mentioned specimens with dentate lamellar cusps, provided by courtesy of Dr ITURRONDOBEITIA, with *O. macrostega* specimens, provided by courtesy of Dr SUBIAS. Unfortunately, some of the specimens showed deterioration, especially of the lamellar apices, which is an important distinguishing character. This deterioration might have contributed to the problem concerning the identity of these specimens. However, careful examination of the above-mentioned species revealed differences in lamellar structure that cannot be attributed to deterioration. We consider the specimens with bidentate cusps as a new species, described in this paper as *O. dentata* sp. nov.

Oribatula longelamellata Schweizer, 1956

SCHWEIZER (1956) described *O. longelamellata* from Switzerland. However, the status of this species remained uncertain due to SCHWEIZER's brief description, which made it difficult to determine its diagnostic characters and the fact that it was only recorded once after its description (SCHWEIZER, 1957). This problem was solved by recently collected material from Poland (SKUBALA, 1996) which is, in our opinion, identical to SCHWEIZER's *O. longelamellata*. The lamellar form of the Polish specimens, especially the prolamellae and the lamellar cusps, correspond completely with SCHWEIZER's illustration (Fig. 242, p. 306). A complementary description of this species, based on the recently collected Polish material, is presented in this paper.

Oribatula macrostega Iturrondobeitia, 1985

SUBIAS (1977) described *O. longilamellata* from Spain. However, ITURRONDOBEITIA (1985) renamed this species as *O. macrostega* to avoid confusion between the species names *longilamellata* Subias and *longelamellata* Schweizer. Concurrently, he also noted the possibility of *O. longelamellata* and *O. macrostega* being conspecific because it was difficult to differentiate between the two species based on the available information at that stage. However, he retained them as separate species until more information became available, especially concerning SCHWEIZER's *O. longelamellata*. To investigate this possible synonymy, we compared the type series of *O. macrostega* (provided by courtesy of Dr SUBIAS) with the previously mentioned *O. longelamellata* specimens. They differ mainly by the presence of rounded lamellar cusps in the case of *O. longelamellata* and the absence of cusps in the case of *O. macrostega*. Based on the above-mentioned differences, we conclude that *O. longelamellata* and *O. macrostega* are not conspecific. In the present paper complementary data of *O. macrostega* is provided, based on the material kindly provided by Dr SUBIAS.

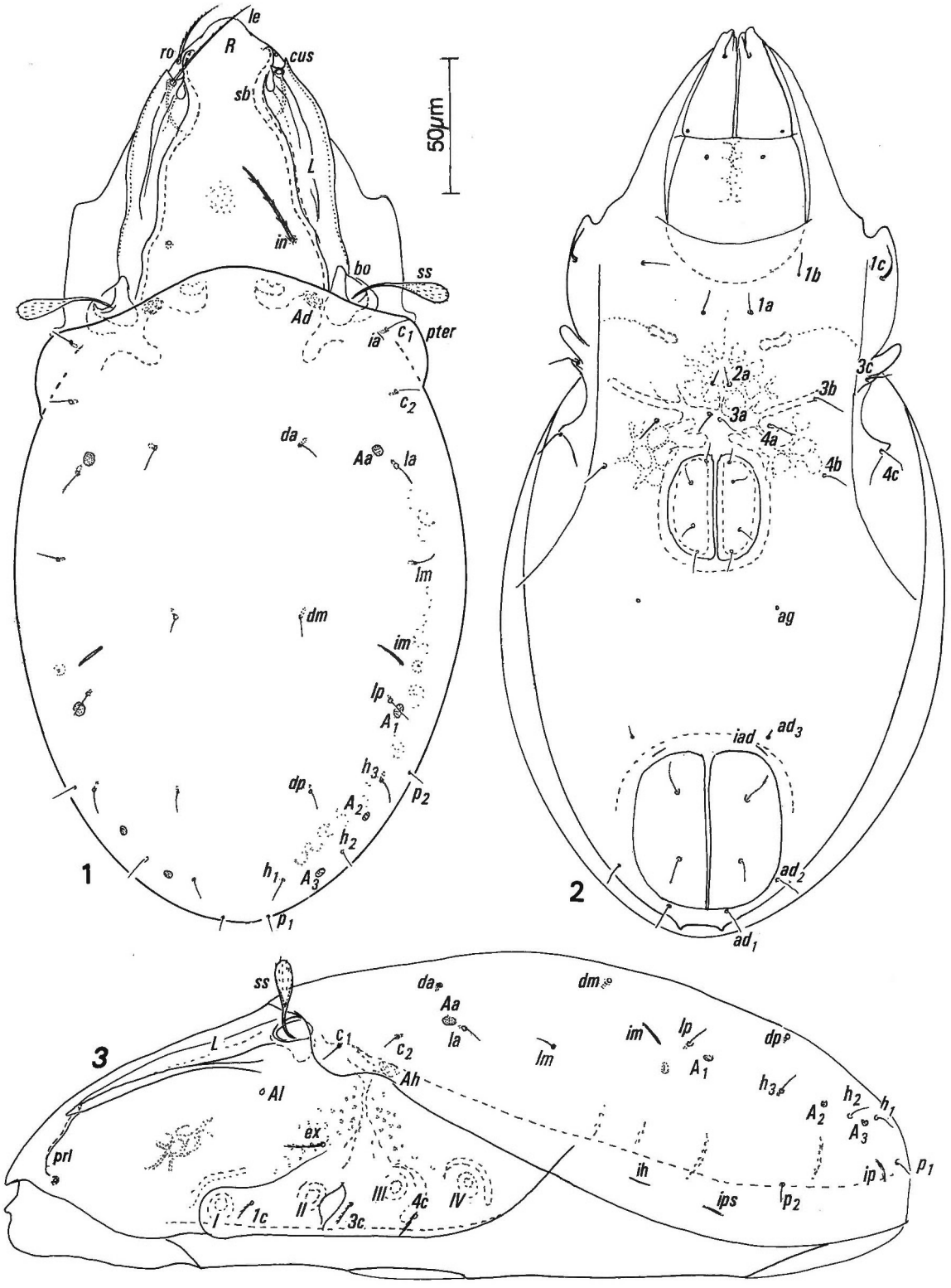
Oribatula dentata sp. nov.

(Figs. 1–6, 19, Table 1)

O. macrostega (not Iturrondobeitia) ITURRONDOBEITIA, 1985 (misidentification).

DIAGNOSTIC CHARACTERS: Lamellae with robust, bidentate cusps. Lamellar setae inserted apically on cusps. Prolamellae complete. Sensilli short, heads fusiform, barbed. Thirteen pairs of short, smooth notogastral setae present. Four pairs of small, round areae porosae present.

MATERIAL EXAMINED: Eight specimens from Basque country, Spain, previously recorded as *O. macrostega* (ITURRONDOBEITIA, 1985) and kindly provided by Dr ITURRONDOBEITIA. The holotype and five paratypes are deposited in the Zoological Laboratory,



FIGS. 1–3: *Oribatula dentata* sp. nov. 1. — Dorsal aspect. 2. — Ventral aspect. 3. — Lateral aspect.

O. dentata	*O. longelamellata*	*O. macrostega*
Lamellae long, apices almost reaching rostral setal alveoli (Fig 1).	Lamellae of medium length, apices well separated from rostral setal alveoli (Fig. 7).	Lamellae of medium length, apices well separated from rostral setal alveoli (Fig. 14)
Lamellar cusps robust, apically bidentate (Fig. 4).	Lamellar cusps small, apically rounded (Fig 10).	Lamellar cusps absent (Fig. 17).
Lamellar setae inserted apically on cusps (Fig. 4).	Lamellar setae inserted apically on cusps (Fig. 10).	Lamellar setae inserted at medial edge of lamellar apices (Fig. 17).
Prolamellae complete, extending to medially of rostral setal alveoli (Fig. 19).	Prolamellae incomplete, not extending to rostral setal alveoli (Fig. 20).	Prolamellae complete, extending to laterally of rostral setal alveoli (Fig. 21).

TABLE 1: Diagnostic characters of *O. dentata* sp. nov., *O. longelamellata* and *O. macrostega*.

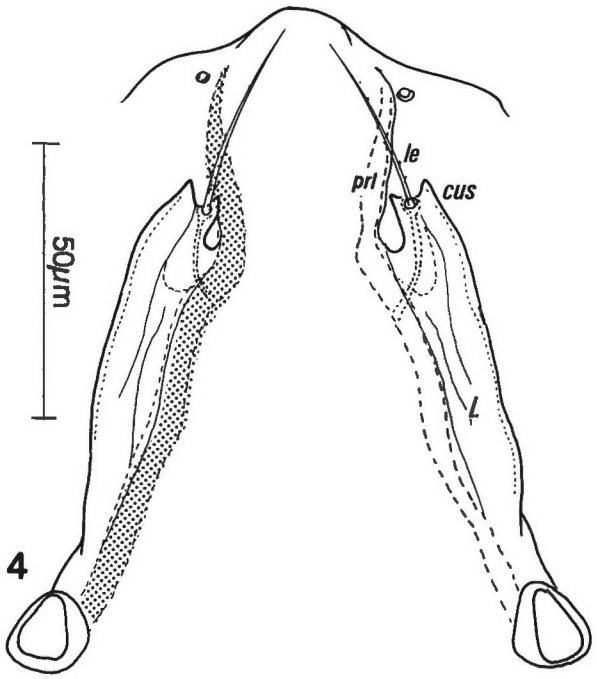


FIG. 4: *Oribatula dentata* sp. nov., view of lamellae with prodorsum raised.

Department of Biology, Faculty of Science, University of Pais Vasco and two paratypes are deposited in the Acarology Collection of the National Museum, Bloemfontein, Republic of South Africa.

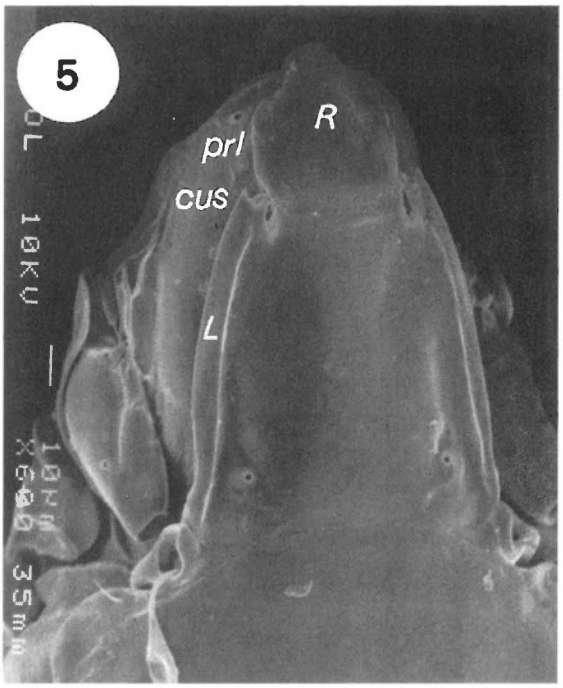
DESCRIPTION: Holotype: length 347; width 166; paratypes (n = 7): mean length 349 (range 316–379); mean width 188 (range 163–216).

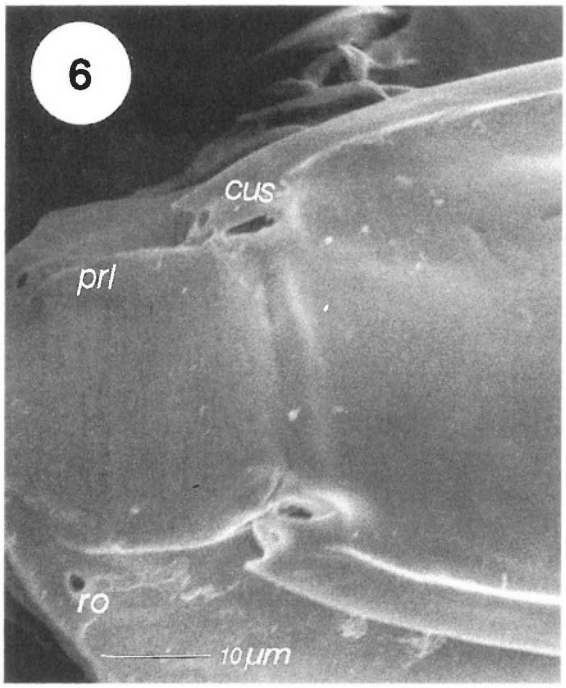
Prodorsum (Figs. 1, 3–6, 19): Prodorsal surface faintly punctate. Rostral setae *ro* unilaterally barbed. Lamellae *L* narrow, long, apices almost reaching rostral setal alveoli in normal dorsal view, lamellae apically slightly curved medially. Lamellar cusps *cus* robust, apically bidentate. Lamellar setae *le* inserted apically on cusps. Prolamellae *prl* complete, extending slightly medially of rostral setal alveoli. Inner margins of lamellae and prolamellae darkly sclerotized. Sclerotization accompanying prolamellae tapering anteriorly. Faint translamellar band sometimes present. Sensilli *ss* fusiform, barbed. Sublamellar areae porosae *Al* minute, located ventrally to bases of lamellae, areae porosae humeralis *Ah* large, situated ventrally to the pteromorphae *pter*. Exobothridial setae *ex* small, indistinctly barbed, situated dorsally to acetabuli II. Areae porosae dorsosejugales *Ad* situated medially to bothridia *bo*, covered by notogaster.

Notogaster (Figs. 1, 3). Notogastral surface faintly punctate, slightly roughened. Pteromorphae *pter* well-rounded. Four pairs of small, round areae porosae present, areae porosae *Aa* situated slightly anteromedially to setae *la*, A_1 situated posteriorly to setae *lp*, A_2 situated posteriorly to setae h_3, A_3 situated posteriorly to h_2. Thirteen pairs of short, thin, smooth notogastral setae present. Lyrifissures *ia* indistinct, situated close to setae c_1, *im* distinct, situated anteriorly to setae *lp*, *ih* and *ips*, distinct, situated on lateral borders of notogaster, *ip* distinct, situated posteriorly on notogaster, close to setae p_1.

Ventral surface (Fig. 2). Epimeral surface with indistinct branched structure medially. Epimeral setal formula 3-1-3-3, all epimeral setae thin, smooth, except setae *1c*, *3c*, *4c* slightly longer, minutely barbed. Anogenital setal formula 4-1-2-3, anogenital setae thin, smooth. Adanal lyrifissures *iad* situated preanally.

DISTRIBUTION: This species is known to date only from the type locality, Basque country, Spain.





FIGS. 5–6: *Oribatula dentata* sp. nov. 5. — Prodorsum. 6. — Detail of rostrum.

REMARKS: The prominent, bidentate cusps distinguish the present new species from its congeners. Different images of the lamellae were observed under scanning electron microscopic (SEM) and light microscopic examination. With SEM examination, they appeared as uncomplicated, narrow structures (Fig. 5) while with light microscopic examination they appeared as wide, complex structures (Fig. 4).

Oribatula longelamellata Schweizer, 1956

(Figs. 7–13, 20, Table 1)

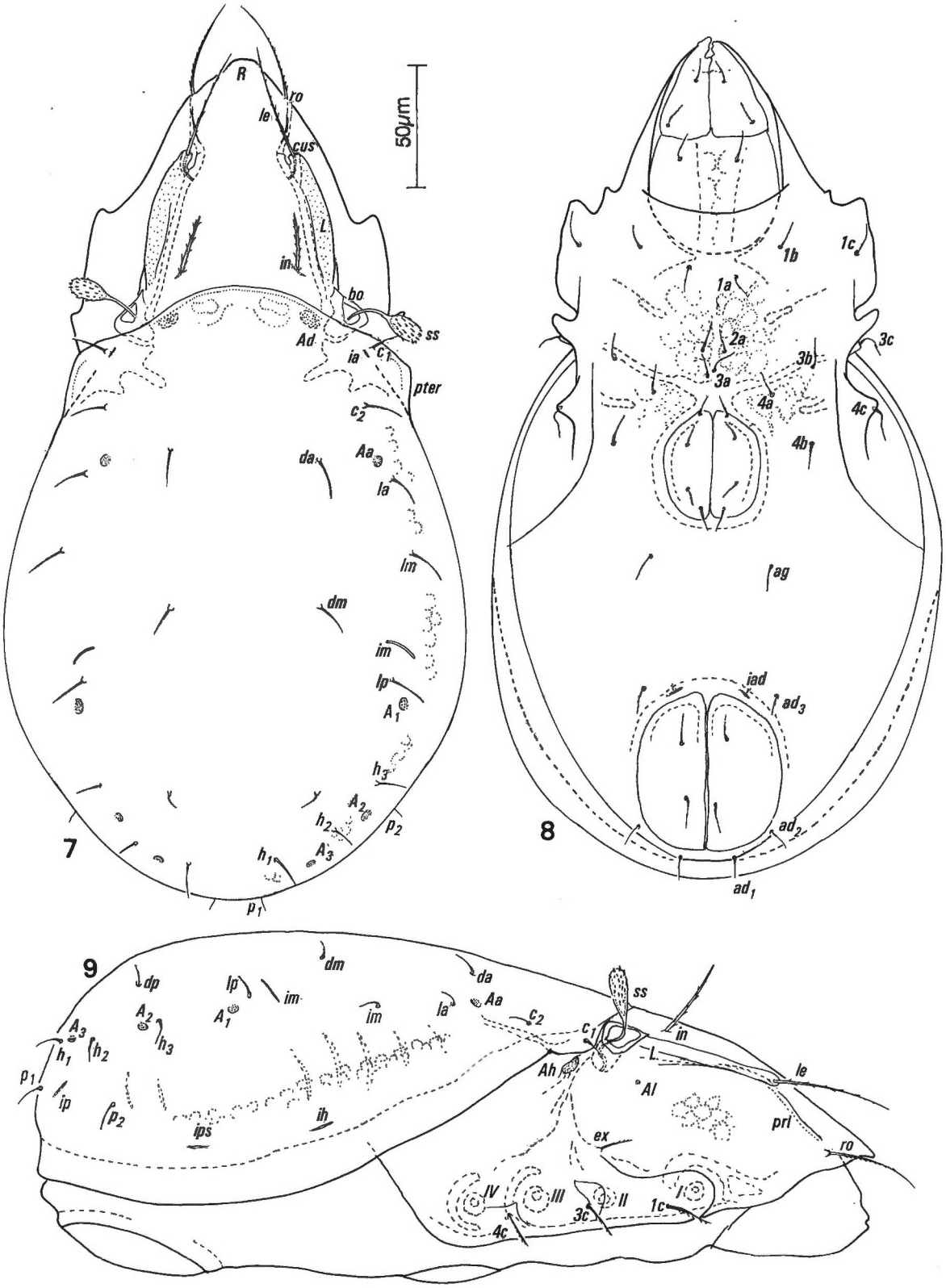
DIAGNOSTIC CHARACTERS: Lamellae with small, apically rounded cusps. Lamellar setae inserted apically on cusps. Prolamellae incomplete. Sensilli fusiform, barbed. Thirteen pairs of short, thin notogastral setae present. Four pairs of small, round areae porosae present.

MATERIAL EXAMINED: We were unable to study the type series of this species and the complementary data provided here is based on the material collected from the galena-calamine wastelands, Poland (SKUBALA, 1996).

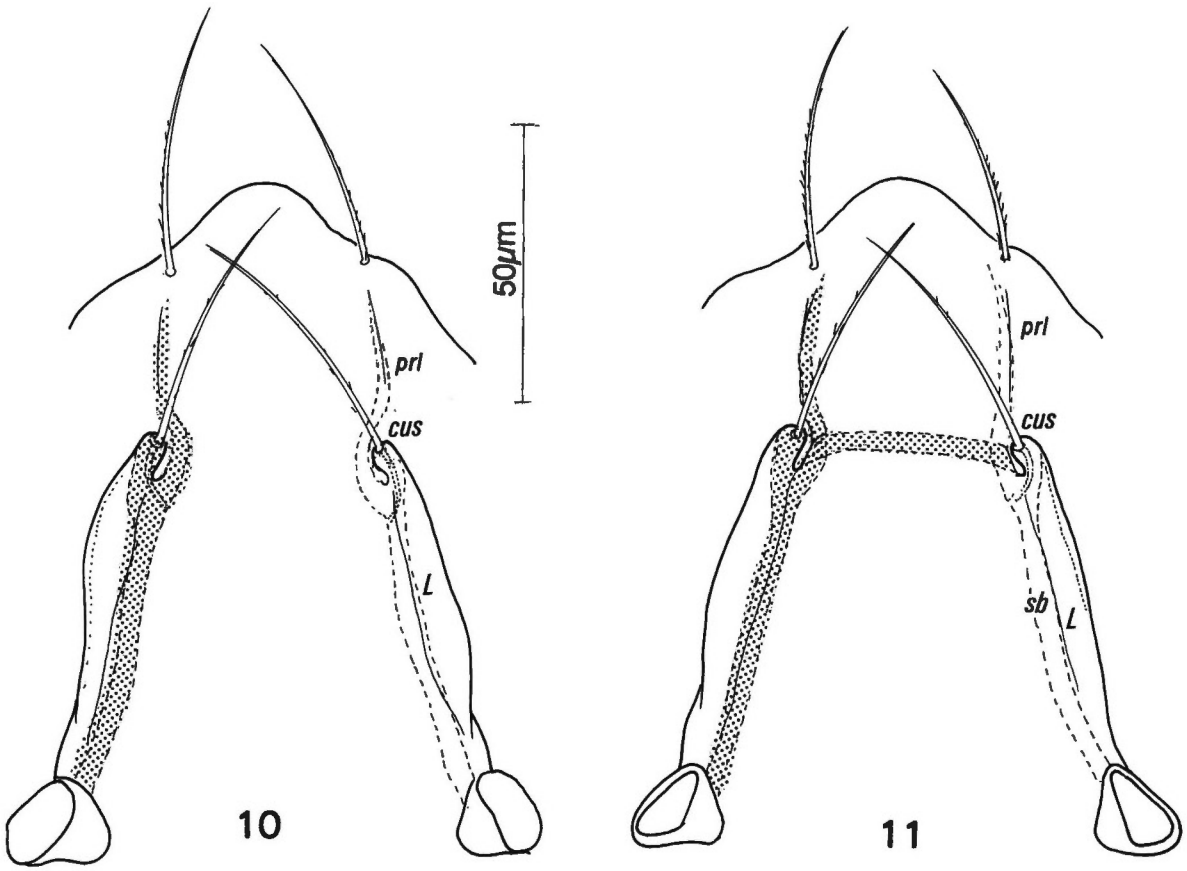
DESCRIPTION: Mean length 373 (range 333–400); mean width 204 (range 183–222); n = 12.

Prodorsum (Figs. 7, 9–13, 20). Prodorsal surface faintly punctate. Rostral setae *ro* apically thin, unilaterally barbed. Lamellae *L* narrow, of medium length, apices not reaching close to rostral setal alveoli in normal dorsal view, lamellae apically slightly medially curving. Lamellar cusps *cus* small, apically rounded. Lamellar setae *le* inserted apically on cusps. Prolamellae *prl* incomplete, not reaching rostral setal alveoli. Inner margins of lamellae and prolamellae darkly sclerotized. Sclerotization accompanying prolamellae tapering anteriorly. Distinct translamellar band sometimes present. Sensilli *ss* fusiform, barbed. Sublamellar areae porosae *Al* small, located ventrally to bases of lamellae. Areae porosae humeralis *Ah* large, situated ventrally to the pteromorphae *pter*. Exobothridial setae *ex* small, indistinctly barbed, situated dorsally to acetabuli II. Areae porosae dorsosejugales *Ad* situated medially to bothridia *bo*, covered by notogaster.

Notogaster (Figs. 7, 9). Notogaster faintly punctate. Pteromorphae *pter* not well-rounded. Four pairs of small, round areae porosae present, *Aa* situated



FIGS. 7–9: *Oribatula longelamellata* Schweizer, 1956. 7. — Dorsal aspect. 8. — Ventral aspect. 9. — Lateral aspect.



FIGS. 10–11: *Oribatula longelamellata* Schweizer, 1956. 10. — View of lamellae with prodorsum raised. 11. — Lamellae with translamellar band.

slightly anteromedially to setae *la*, A_1 situated posteriorly to setae *lp*, A_2 situated posteriorly to setae h_3, A_3 situated posteriorly to setae h_2. Thirteen pairs of short, thin, smooth notogastral setae present. Lyrifissures *ia* indistinct, situated close to setae c_1, *im* distinct, situated anteriorly to setae *lp*, *ih* and *ips*, distinct, situated on lateral borders of notogaster, *ip* distinct, situated posteriorly on notogaster, close to setae *p1*.

Ventral side (Fig 8). Epimeral surface with indistinct branched structure medially. Epimeral setal formula 3-1-3-3, all epimeral setae thin, glabrous, setae *1c*, *3c*, *4c* slightly longer, minutely barbed. Anogenital setal formula 4-1-2-3. Anogenital setae thin, smooth. Adanal lyrifissures *iad* situated preanally.

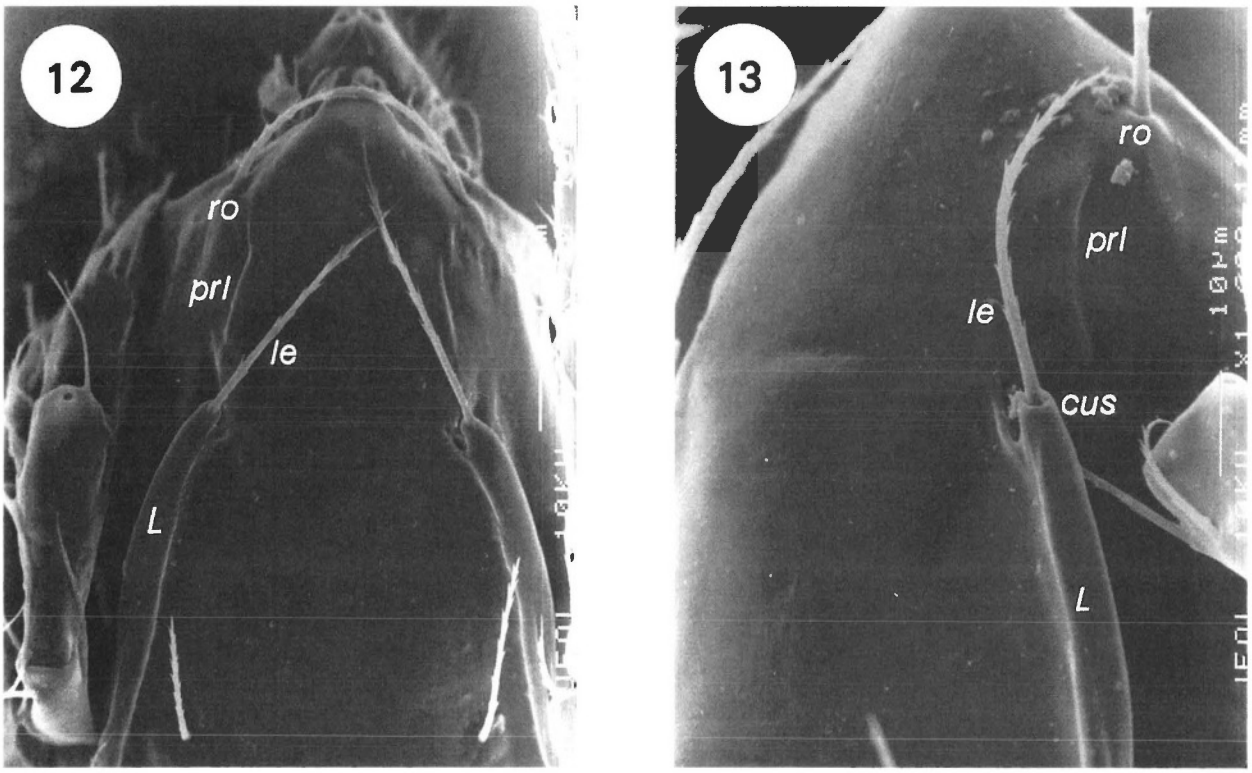
DISTRIBUTION: *O. longelamellata* is presently known only from Switzerland (SCHWEIZER, 1956, 1957) and Poland (SKUBALA, 1996).

REMARKS: *O. longelamellata* can be distinguished from its congeners by the presence of short, apically rounded cusps on which the lamellar setae are inserted apically. In his description of this species, SCHWEIZER (1956) mentioned the presence of 10 pairs of notogastral setae, while his Figure 242 (p. 306) indicates thirteen pairs. The specimens from Poland examined in this study all have 13 pairs of notogastral setae.

Oribatula macrostega (Iturrondobeitia, 1985)
(Figs. 14–18, 21, Table 1)

Oribatula longilamellata Subias, 1977.
O. macrostega Iturrondobeitia, 1985 (in part, replacement name).

This species is easily identifiable by using SUBIAS's description and figures. An important distinguishing character not mentioned in the original description is the presence of small granulae situated laterally on the prodorsum, close to the lamellar apices. Due to



FIGS. 12–13: *Oribatula longelamellata* Schweizer, 1956. 12. — Prodorsum. 13. — Detail of rostrum.

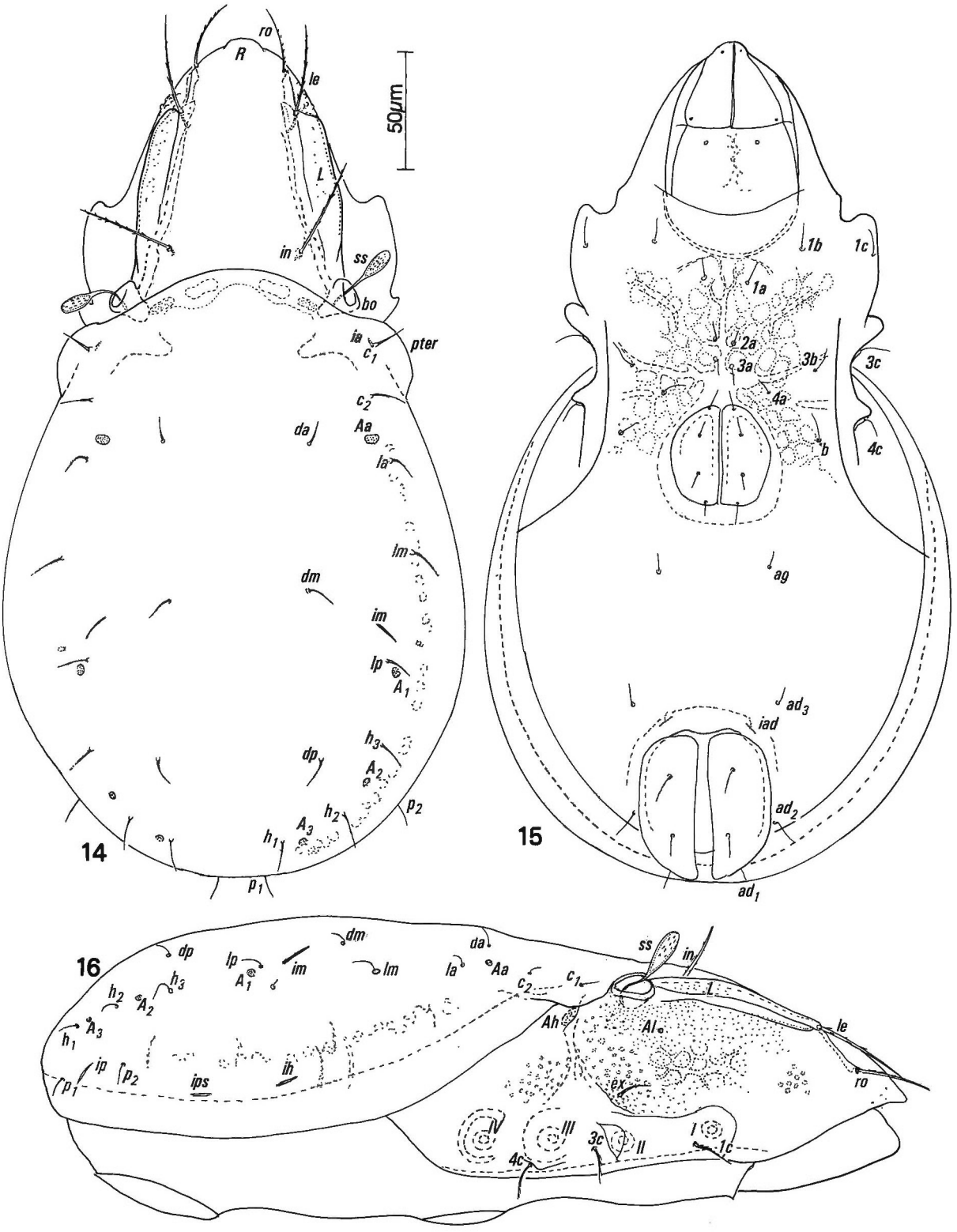
the fact that SEM examination of this species could not be carried out, complementary data, especially concerning the form of the lamellar apices, are still required.

DIAGNOSTIC CHARACTERS. Lamellar apices usually pointed, sometimes broadly rounded. Lamellar cusps absent. Lamellar setae inserted at medial edge of lamellar apices. Prolamellae complete. Lateral surface of prodorsum ventral to lamellar apices ornamented with small granules. Sensilli small, fusiform, barbed. Thirteen pairs of short, thin notogastral setae present. Four pairs of small, round areae porosae present.

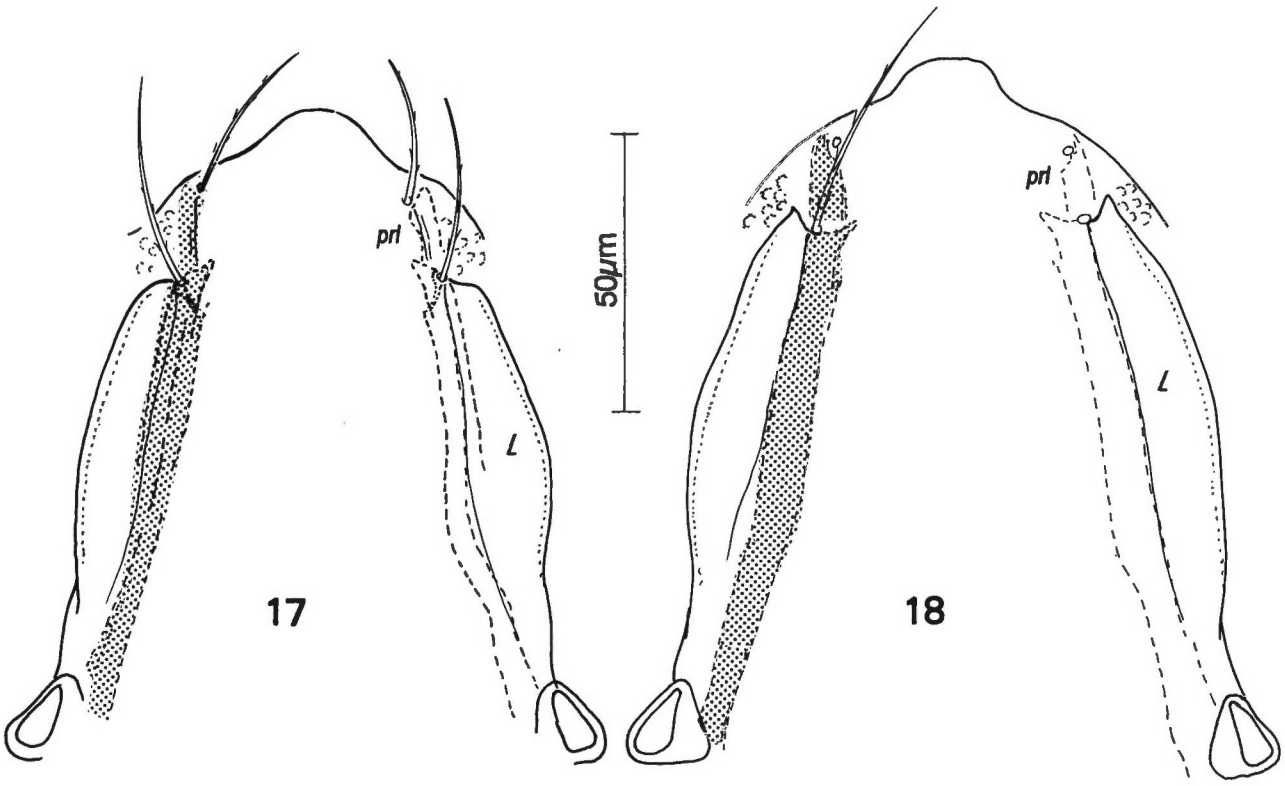
MATERIAL EXAMINED. The complementary data and description are based on the type series as well as two recently collected specimens kindly provided by Dr S. SUBIAS.

DESCRIPTION: See SUBIAS (1977) for dimensions.

Prodorsum (Figs. 14, 16–18, 21). Prodorsal surface faintly punctate, surface ventral to lamellar apices with a few widely spaced, small granules. Rostral setae *ro* apically thin, unilaterally barbed. Lamellae *L* narrow, straight, of medium length, lamellar apices usually pointed, sometimes broadly rounded, apices not reaching close to rostral setal alveoli in normal dorsal view, lamellar cusps absent. Lamellar setae *le* inserted at medial edge of lamellar apices. Prolamellae *prl* complete, extending to laterally of rostral setal alveoli. Inner margins of lamellae and prolamellae darkly sclerotized. Sclerotization accompanying prolamellae wide, almost surrounding rostral setal alveoli. Sensilli *ss* small, fusiform, barbed. Sublamellar areae porosae *Al* small, located ventrally to bases of lamellae, areae porosae humeralis *Ah* large, situated ventrally to pteromorphae *pter*. Exobothridial setae *ex* small, indistinctly barbed, situated slightly anterodorsally to acetabuli II. Areae porosae dorsosejugales *Ad* situated medially to bothridia *bo*, covered by notogaster.



FIGS. 14–16: *Oribatula macrostega* Iturrondobeitia, 1985. 14. — Dorsal aspect. 15. — Ventral aspect. 16. — Lateral aspect.



FIGS. 17–18: *Oribatula macrostega* Iturrondobeitia, 1985. Variation in shape of lamellar apices. 17. — Lamellae with rounded apices. 18. — Lamellae with pointed apices.

Notogaster (Figs. 14, 16). Notogaster faintly punctate. Pteromorphae *pter* rounded. Number and type of areae porosae, notogastral setae and lyrifissures very similar to those of *O. longelamellata*.

Ventral surface (Fig. 15). Epimeral surface with indistinct branched structure medially. Ventral side also very similar to that of *O. longelamellata*.

DISTRIBUTION. *O. macrostega* is currently known only from Spain.

REMARKS. *O. macrostega* can be differentiated from its congeners mainly by the absence of cusps and the lamellar setae inserted at the medial edge of the lamellar apices.

ACKNOWLEDGEMENTS

We wish to thank Dr L. S. SUBIAS (Dpto. Biologia Animal, Facultad de Biologia, Universidad Complutense de Madrid, Spain) and Dr J. C. ITURRONDOBEITIA (Universidad del Pais Vasco, Facultad de Ciencias, Dpto. Zoologia y Dinamica, Celular Animal, Spain) for their generous assistance in loaning us the specimens for this study as well as their valuable advice. Special thanks to Dr C. M. ENGELBRECHT (National Museum, Bloemfontein, South Africa) for reading the manuscript.

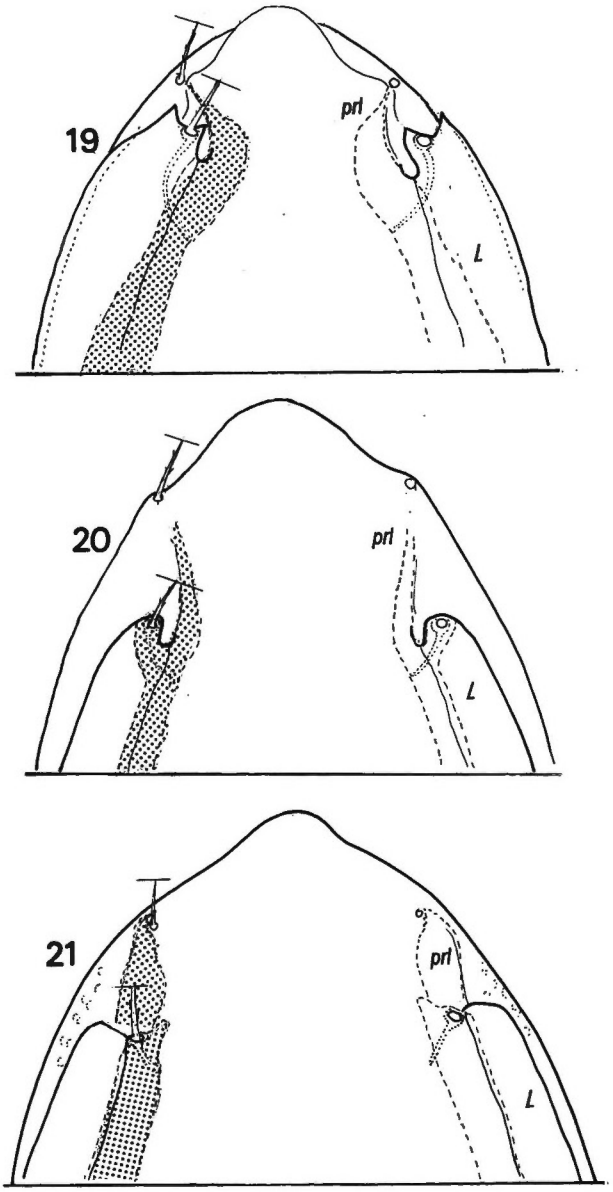
REFERENCES

BALOGH (J.) & BALOGH (P.), 1992. —The Oribatid Mites Genera of the world. Vol. I. — Hungarian National Museum Press, Budapest: 1-263.

ITURRONDOBEITIA (J. C.), 1985. — Acaros oribatidos (Acarida, Oribatida) interesantes del Pias Vasco. — Bol. Asoc. Esp. Entom., **9**: 63-71.

NICOLET (H.), 1855. — Histoire naturelle des Acariens qui se trouvent aux environs de Paris. — Arch. Mus. Hist. nat., Paris, **7**: 381-482.

SCHWEIZER (J.), 1956. — Die landmilben des Schweizerischen Nationalparkes. 3. Teil: Sarcoptiformes Reuter, 1909. — Ergebn. wiss. Unters. schweiz. Nationalparks, **5** (34): 215-377.



FIGS. 19–21: Schematic diagrams of position of lamellar apices in normal dorsal view of prodorsum. 19. — *Oribatula dentata* sp. nov. 20. — *Oribatula longelamellata* Schweizer, 1956. 21. — *Oribatula macrostega* Iturrondobeitia, 1985.

SCHWEIZER (J.), 1957. — Die landmilben des Schweizerischen Nationalparkes. 4. Teil: Ihr Lebensraum, inre Vergesellschaftung unter sich und ihre Lebensweise. — Ergebn. wiss. Unters. schweiz. Nationalparks, **6** (37): 1-107.

SKUBALA (P.), 1996. — Moss mite communities (Acarida, Oribatida), on galena-calamine mining wastelands. — Acta Biol. Sites., **28** (45): 147-169.

SUBIAS (L. S.), 1977. — Taxonomia y ecologia de los Oribátidos saxicoleas y arboricolas de la Sierra del Guadarrama (Acarida, Oribatida). — Dep. Zool., Fac. Biol., Univ. Compl. Madrid., **24**: 1-379.