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Dissorhina cretensis n. sp. and some other remarkable oribatid mites (Acari: Oribatida) from Crete, Greece

S. Mahunka[1]

Abstract. Newly collected and identified oribatids from Crete are studied and a list of the hitherto known species is provided. Altogether 37 species are enumerated from several sites of the island, among them 23 newly determined. One species new to science, *Dissorhina cretensis* n. sp., is described and three known, but rare species – *Chamobates dentotutorii* Shaldybina, 1969, *Ocesobates boedvarssoni* (Sellnick, 1974) and *Humerobates rostrolamellatus* Grandjean, 1936 – are described and/or commented and illustrated. With 18 figures.

INTRODUCTION

The oribatid fauna of Greece, especially that of the Greek islands, is rather poorly known. This raises objections when someone aims to get to know and investigate the origin of the oribatid fauna of the entire Balkan Peninsula, including its historical changes and possible movements (see also Mahunka & Mahunka-Papp, 2008). The ultimate goal of our research is the comprehensive description of the already detected, but till now not fully understood north-south migration of this little animals.

Our knowledge regarding the oribatids of the Balkan Peninsula is mostly based on the collectings carried out by Beier in 1929, and more recently by Hauser in 1970–1980, as well as on the collected materials elaborated by Sellnick (1931) and Mahunka (1974, 1977a, 1977b, 1979, 1982, 2001). However, the data on the fauna of the Greek islands are almost exclusively based on the collecting activities by Hauser.

All the data on the oribatids of Greece were summarised by Flogaitis (1992). According to him, 220 species have hitherto been recorded from the whole country. Unfortunately, this sum is not exact since there are several incorrect data in his list. For instance, many species are listed twice, the identified "cf." and also species referred to as genus name plus "sp." are both contained in it). The above mentioned species and the identification of several further ones are therefore rather uncertain. On the other hand, a species already reported from Greece, *Papillacarus aciculatus* (Berlese, 1905), is omitted from the enumeration. The real list should contain about 200 oribatid species only.

As for Crete, no more than 14 species have been reported so far (Mahunka, 1979, 1982). This number must be considered a small fraction of the expected species from that great island. As a result of our recent investigations, I can add 23 further species to the oribatid fauna of Crete. One of them, *Dissorhina cretensis* sp. n. proved to be new to science, further twelve species for the fauna of Greece, and nine species for the fauna of Crete. The number of the oribatid species known from Crete amounts to 37. Among them, poorly known and rare species have also been observed, like *Chamobates dentotutorii* Shaldybina, 1969, *Ocesobates boedvarssoni* (Sellnick, 1974) and *Humerobates rostrolamellatus* (Grandjean, 1936). Hereunder I give some remarks on their morphology, relatedness or kinship.

Similarly to my earlier papers, I follow the system of Marshall *et al*. (1987) based on that of Grandjean (1954, 1965), but with some modifications introduced by Subías (2004, 2008) and Weigmann (2006). As to the descriptions, the morphological terminology of Grandjean was used with some modifications concerning the studied groups or organs (e.g. Mahunka & Zombori, 1985; Norton *et al*., 1997; Mahunka & Mahunka-Papp, 2001; Niedbała, 1992, and the before mentioned publications).

[1]*Prof. Dr. Sándor Mahunka,* Magyar Természettudományi Múzeum Állattára és MTA Zootaxonómiai Kutatócsoport (Department of Zoology, Hungarian Natural History Museum, and Zootaxonomy Research Group of the Hungarian Academy of Sciences), H-1088 Budapest, Baross u. 13, Hungary. E-mail*: mahunka@nhmus.hu*

MATERIAL AND METHODS

The most recent studies on the oribatid fauna of Crete, including my work and that of my collaborators (Luise Mahunka-Papp, József Világi and Cecilia Világi-Szeredi), are based on the materials collected by the former researchers of the Hungarian Natural History Museum (Dr. Tamás Szűts and Ágnes Garai). The first parts of the results arising from the elaboration of the Crete material are presented in this paper.

The material examined is deposited at the Hungarian Natural History Museum, Budapest (HNHM), and some paratypes are preserved with the Muséum d'histoire naturelle de Genève (MHNG). The samples originate from four localities of which the list is given hereunder while in the list of species only the reference code numbers are indicated. At earlier published species only the authors and years of publication are mentioned.

LIST OF LOCALITIES

HNHM 08/21: Greece, Crete, Kato Karouzano. 23.VI.2008. Bush litter, clump of grass, roofs. Leg. S. Mahunka & J. Világi.

HNHM 08/23: Greece, Crete, Ano Kera. 23.VI.2008. Dry moss and lichens from rocky wall. Leg. S. Mahunka & J. Világi.

HNHM 08/24: Greece, Crete, Leraptera. 25.VI. 2008. Dry litter with soil from bush. Leg. S. Mahunka & J. Világi.

HNHM 08/31: Greece, Crete, Idaio, Cave Antro. 30.VII.2008. Soil and decaying debris from the cave. Leg. Á. Garai.

LIST OF IDENTIFIED SPECIES

BRACHYCHTHONIIDAE Thor, 1934

Brachychthonius hauserorum Mahunka, 1979 (Mahunka, 1979)

Eobrachychthonius similis Mahunka, 1979

Liochthonius horridus (Sellnick, 1928)

Liochthonius strenzkei Forsslund, 1963 (Mahunka 1982)

Poecilochthonius spiciger (Berlese, 1910)
Localities: HNHM-08/21, HNHM-08/24.

COSMOCHTHONIIDAE Grandjean, 1947

Cosmochthonius reticulatus Grandjean, 1947

SPHAEROCHTHONIIDAE Grandejan, 1956

Sphaerochthonius splendidus (Berlese, 1904)
Locality: HNHM 08/21.

EPILOHMANNIIDAE Oudemans, 1923

Epilohmannia cylindrica cylindrica (Berlese, 1904)

LOHMANNIIDAE Berlese, 1916

Papillacarus aciculatus (Berlese, 1905)

PHTHIRACARIDAE Perty, 1841

Phthiracarus (Archiphthiracarus) tzanoudakisi Mahunka, 1979

STEGANACARIDAE Niedbala, 1986

Atropacarus platakisi (Mahunka, 1979)

Notophthiracarus (*Calyptophthiracarus*) *heterotrichus* (Mahunka, 1979)

Steganacarus (Steganacarus) flagellatissimus Mahunka, 1979

Steganacarus (Tropacarus) lasithiensis Mahunka, 1979

NOHRIDAE Berlese, 1896

Nothrus anauniensis Canestrini et Fanzago, 1876
Locality: HNHM 08/23.

HERMANNIELLIDAE Grandjean, 1934

Hermanniella septentrionalis Berlese, 1910
Locality: HNHM 08/21.

LICNOBELBIDAE Grandjean, 1965

Licnobelba caesarea (Berlese, 1910)

ZETORCHESTIDAE Michael, 1898

Zetorchestes falzonii Coggi, 1898
Locality: HNHM 08/24.

Zetorchestes flabrarius Grandjean, 1951
Locality: HNHM 08/23.

XENILLIDAE Woolley et Higgins, 1966

Xenillus tegeocranus (Hermann, 1804)
Locality: HNHM 08/21.

TECTOCEPHEIDAE Grandjean, 1954

Tectoepheus sarekensis Träghårdh, 1910
Locality: HNHM 08/24.

OPPIIDAE Sellnick, 1937

Dissorhina cretensis n. sp.

Dissorhina peloponnesiaca Mahunka, 1974
Locality: HNHM 08/21.

Lauroppia marginedentata (Strenzke, 1951)
Locality: HNHM 08/31.

Oppiella nova (Oudemans, 1902)
Locality: HNHM 08/31.

QUADROPPIIDAE Balogh, 1983

Quadroppia michaeli Mahunka, 1977
Locality: HNHM 08/24.

SUCTOBELBIDAE Jacot, 1938

Suctobelbella similis (Forsslund, 1941)
Locality: HNHM 08/23.

Suctobelbella subcorbcornigera (Forsslund, 1941)
Locality: HNHM 08/21.

PASSALOZETIDAE Grandjean, 1954

Passalozetes hauseri Mahunka, 1977

HUMEROBATIDAE Grandjean, 1970

Humerobates rostrolamellatus Grandjean, 1936
Localities: HNHM 08/21, HNHM 08/24.

PUNCTORIBATIDAE Thor, 1937

Minunthozetes pseudofusiger (Schweizer, 1922)
Localities: HNHM 08/21, HNHM 08/31

Minunthozetes semirufus (C. L. Koch, 1841)
Locality: HNHM 08/24.

CHAMOBATIDAE Thor, 1937

C*hamobates dentotutorii* Shaldybina, 1969
Locality: HNHM 08/21, HNHM 08/24.

Chamobates spinosus Sellnick, 1928
Locality: HNHM 08/31.

Ocesobates boedvarssoni (Sellnick, 1974)
Locality: HNHM 08/31.

ACHIPTERIIDAE Thor, 1929

Parachipteria punctata (Nicolet, 1855)
Locality: HNHM 08/24.

ORIBATELLIDAE Jacot, 1925

Oribatella ornata (Coggi, 1900)
Locality: HNHM 08/31

ORIBATULIDAE Thor, 1929

Zygoribatula frisiae (Oudemans, 1900)
Locality: HNHM 08/21.

DESCRIPTION OF THE NEW AND NOTES ON RARE SPECIES

Dissorhina cretensis n. sp.

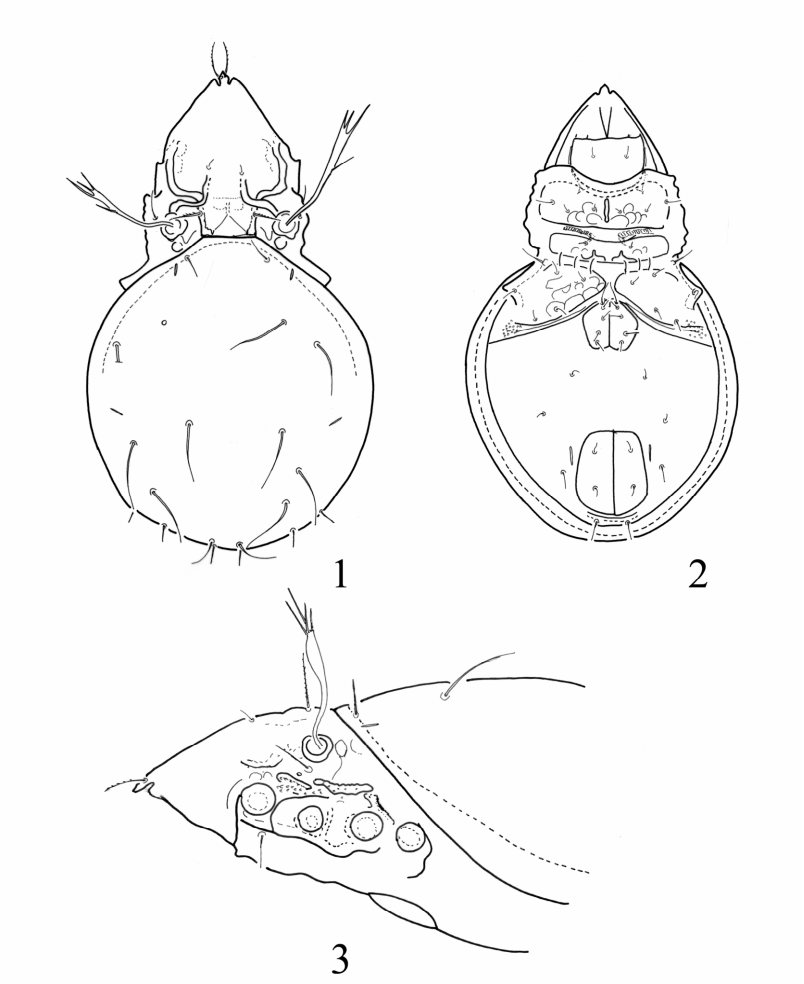
(Figs. 1–5)

Material examined. Holotype: Greece, Crete, Ano Kera. 23.VI.2008. Leg. S. Mahunka & J. Világi (HNHM 08/23). 2 paratypes from the same sample. Holotype (1767-HO-2008) and 1 paratype (1767-PO-2008): HNHM, 1 Paratype: MHNG.

Diagnosis. Rostral apex well protruding anteriorly, triangular bearing rostral setae. Costula short, weakly developed, ending far from the lamellar setae. Interbothridial lath straight, not divergent, located near to each other. Sensillus long, without true head. Distal end with 5 very long branches, much longer than the diameter of the widest part of the sensilus. Notogastral setae mostly long. Exobothridial region well sclerotised and granulated. Epimeres with irregular maculae. Posterior border (*bo. 4*) of the epimeral region with furrow in which tubercles present. Five pairs of genital setae, arranged in one row.

Measurements. Length of body 252–270 μm, width of body 143–160 μm.

Prodorsum. Rostral apex triangular, well protruding from rostral part of prodorsum. Incisures small, lateral teeth rounded, much shorter than rostral apex. Rostral setae arising on median apex. Prodorsal surface with weak costulae, one pair of short, thick, but narrower ones located basally and a pair of S-shaped ones laterally. A pair of thin, divergent lines present medially (Fig. 1). No lath or costula reaching to the insertion of lamellar setae. Basal part of the median costulae straight, run parallel with each other, bearing interlamellar setae (Fig. 5). Ratio of prodorsal setae: *ro* > *exa* > *in* > *le* (Fig. 3), setae *in* thicker than the others, finely barbed. Sensillus gradually dilated distally, without true head, this part bearing 5 very long bristles on its margin. A pair of well developed, singular posterobothridial tubercles present.



Figures 1–3. *Dissorhina cretensis* sp. n. 1 = body in dorsal view, 2 = body in ventral view, 3 = body in lateral view

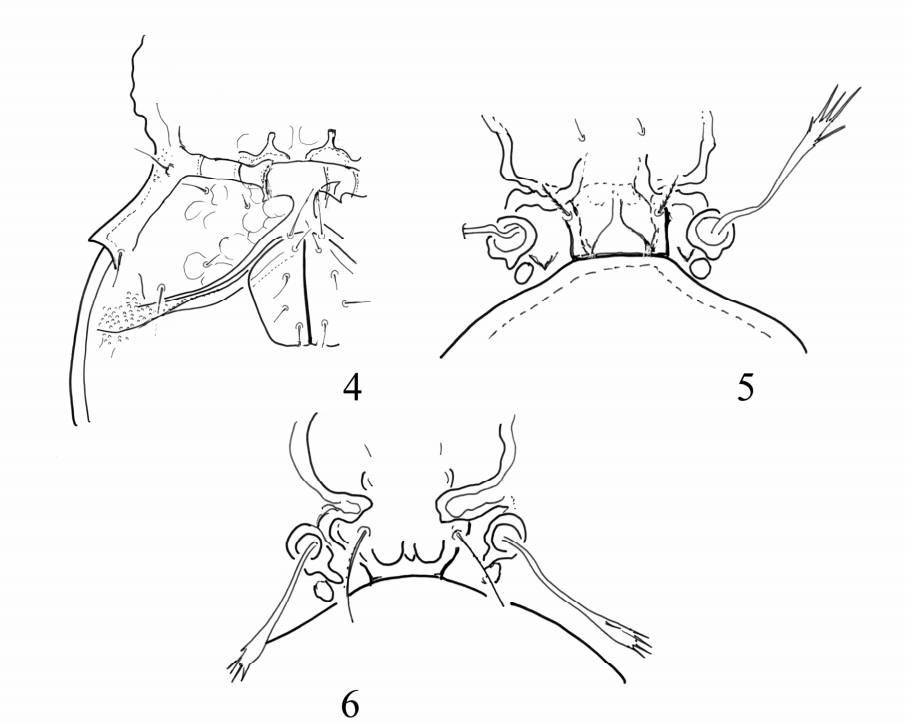
Notogaster. Comparatively wide, dorsosejugal suture straight medially. Ten pairs of mostly long notogastral setae present, setae c_2 minute, p_1, p_2 and p_3 shorter than the others. Setae *la* arising far anteriorly from *lm*, h_1 bent outwards, h_2 bent inwards. All setae smooth.

Lateral part of podosoma. Pedotecta I very small, setae *1c* arising far from the lateral margin. Some granulate areas present in this part, some well sclerotised crests also seen above the legs (Fig. 3).

Ventral parts (Fig. 2). Apodemes and epimeral borders different in size. *Ap. 2* not connected medially, sternal apodema reduced, only a short, anterior part of it observable. *Ap. sej.* also narrowing medially, bearing three pair's transversal crests, like bridges on them. Posterior sternal apodema also absent, one pair of characteristic formation located medially. *Ap. 4* well developed, wide, a pair of posteroepimeral furrow with small tubercles (Fig. 4) in them observable. Epimeral surface ornamented by weak polygonal pattern, epimeral setae short, mostly smooth. All setae – except setae *3c* and g_5 - in the anogenital region short and simple. Lyrifissures *iad* in paraanal position. Setae ad_1 arising on a weak transversal crest, located in posteromarginal position.

Remarks. The shape of the sensillus of the new species is unique in the genus *Dissorhina* Hull, 1916.

Etymology. Named after its origin, Crete.



Figures 4–5. *Dissorhina cretensis* sp. n. 4 = median part of the body in ventral view, 5 = basal part of prodorsum.
Figure 6. *Dissorhina peloponnesiaca* Mahunka, 1974. Basal part of prodorsum

Chamobates dentotutorii Shaldybina, 1969

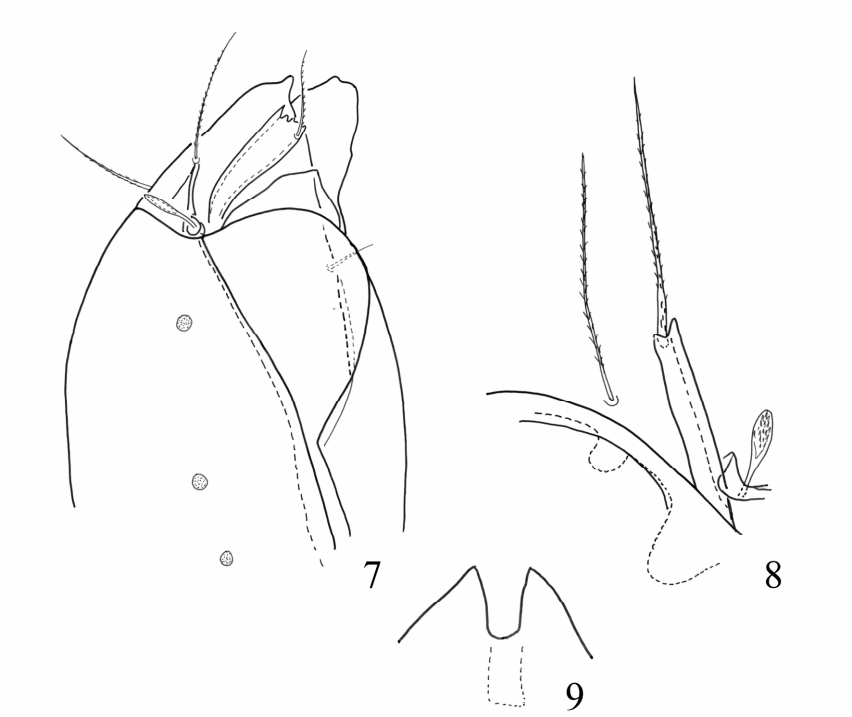
(Figs. 7–9)

Species characterised by the U-shaped incisure of the rostral apex are difficult to tell apart, and their differentiation necessitates the thorough study of further types. The species described first from the species group, *C. interpositus* Pschorn-Walcher, 1953, and the other species belonging to this group (*C. dentotutorii* Shaldybina, 1969, *C. kieviensis* Shaldybina, 1980 and *C. bispinosus* Mahunka, 1987) could be differentiated by the number of agenital setae, and the shape of the following anatomic parts also differ among them: the distal end of the tutorium, the incisure of the rostral apex, and the sensillus. *C. bispinosus* Mahunka, 1987 and *C. kieviensis* Shaldybina, 1980 both possess two pairs of aggenital setae, while the rest of the species possess only one pair. The discernible difference between *interpositus* and *dentotutorii* is the following: on the distal end of the tutorium there are many dents in the case of *dentotutorii,* while in *interpositus* this margin is simple, concave, without dents.

The specimens collected on Crete can be identified as *C. dentotutorii* based on the following traits: the shape of the sensillus, the presence of the spur on the pteromorpha and, above all, it is proved by the wider and flatter incisure on the apex of the rostrum. To facilitate identification I give some detailed drawings.

Genus *Ocesobates* Aoki, 1965

The genus was described by Aoki (1965), with the type species: *Ocesobates kumadai* Aoki, 1965. The description is detailed and completely adequate. After a short while, Sellnick (1974) from Northern Europe and Shaldybina (1974) from the Russian Far East also described independently new species. Sellnick did not realise the great similarity of his own oribatid with *Ocesobates* Aoki, 1965 genus, and erected a new genus: he described the specimens under the name *Cha-*



Figures 7–9. *Chamobates dentotutorii* Shaldybina, 1969. 7 = body in lateral view, 8 = bothridial part of prodorsum, 9 = rostrum

mozetes boedvarssoni Sellnick, 1974 gen. n., sp. n. Shaldybina realised that her species belonged to the genus *Ocesobates* Aoki, and described it as *O. bregetovae* Shaldybina, 1974. Some years later Gjelstrup (1978) again described a similar species from Northern Europe, and at the same time erected a new genus for it, *Danobates insignitus* Gjelstrup, 1978 (see also Subías, 2008). Meanwhile the species was also detected in Spain (Pérez-Iñigo, 1993).

From among the known taxa of the genus based on the description of Aoki (1965) the genus and its type is clearly defined. The type species differs from all the other species in the genus by its rounded median apex of the rostrum. The other species are characterised by a U-shaped incisure at the rostral apex. Unfortunately I could not obtain the types of these species, and the question of priority between the species of Sellnick and that of Shaldybina could not be resolved. The specimens found in Crete show a high similarity to them with the only difference in having thicker ends of interlamellar setae, but this feature is not mentioned by any other author.

The specimens from Crete are described and depicted below, and according to the alphabet I provisorily regard the description of Sellnick as valid.

Ocesobates boedvarssoni (Sellnick, 1974)

(Figs. 10–14)

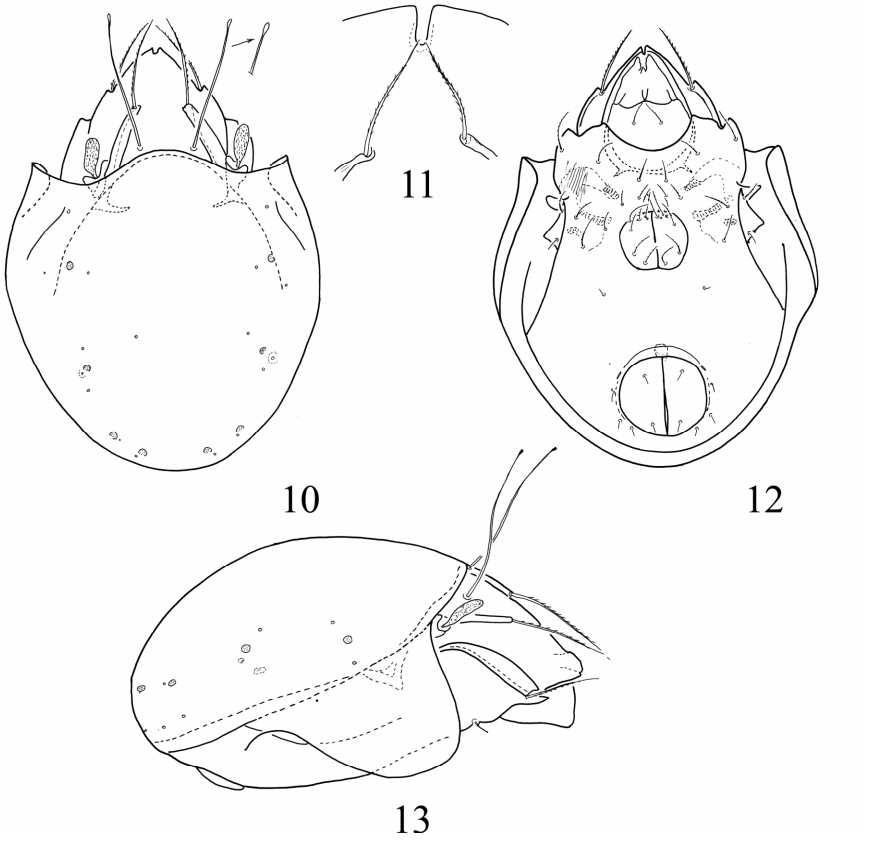
Diagnosis. Rostral apex with U-shaped incisure. Lamellae short, simple, its apices blunt at tip bearing lamellar setae. Tutorium well-developed, with pointed apex. Interlamellar setae very long with dilated distal end. Sensillus short with large, asymmetrical head. On the notogaster four pairs of round porose areae, 10 pairs of setal alveoli and a distinct glandular opening present. Epimeral setae very thin and long, anterior genital setae also conspicuously long. All legs three- and heterodactylous.

Measurements. Length of body 326–371 μm, width of body 252–283 μm.

Prodorsum. Rostrum conical, rostral apex with deep, U-shaped median incisure (Fig. 11), its lateral teeth sharply pointed. Lamellae simple, short, without sharply pointed apices, its distal end blunt at tip, slightly wide, lamellar setae arising on them (Fig. 10). Rostral, lamellar and firstly, interlamellar setae long, latter's longer than the length of prodorsum. Distal end of the interlamellar setae with minute, distinct broadened end (Fig. 10). Tutorium long, well observable also in dorsal view. Bothridium cup-shaped, sensillus very large, mostly asymmetrical, proclinate, its head much longer than peduncle. Surface of the head with distinct, minute barbs.

Notogaster. Pteromorphae large, with a longitudinal line on both. All notogastral setae reduced, their alveoli well visible. Four pairs of porose areas present, all nearly equal in size. Lyrifissures *im* fine, located laterally, in transversal position.

Lateral part of podosoma. Lamellae short, much shorter than the tutorium. Tutorium with sharp distal apex. Pteromorpha very large, tongue-shaped, its lateral margin rounded (Fig. 14).



Figures 10–14. *Ocesobates boedvarssoni* (Sellnick, 1974). 10 = body in dorsal view, 11 = rostral part of prodorsum, 12 = body in ventral view, 13 = porose area postanalis, 14 = body in lateral view

Ventral parts (Fig. 12). Epimeral surface striated laterally. Apodemes weakly developed, their form typical for the genus. All epimeral setae thin, setiform, comparatively long and finely barbed. Setae *1c* longest of all. Circumpedal carina long, reaching to the lateral margin of ventral plate. Genito-anal setal formula: 6–1–2–3. Setae in genital region strong, setiform, barbed. Three pairs of genital setae arising along the anterior margin of genital plates. Setae in the anal region much shorter, sometimes minute or represented only by their alveoli, all smooth.

Legs. All legs three- and heterodactylous.

Remarks. The studied specimens belong to the "*boedvarssoni*" species group, but I think all similar species do belong to this one. I am not able to find one or more features differing from the description of Shaldybina (1974). The descriptions of Sellnick (1974) and Gjelstrup (1978) are much more simple than the preceding one, but they correspond to the time given. Therefore I consider all these species to be synonyms of *boedvarssoni*.

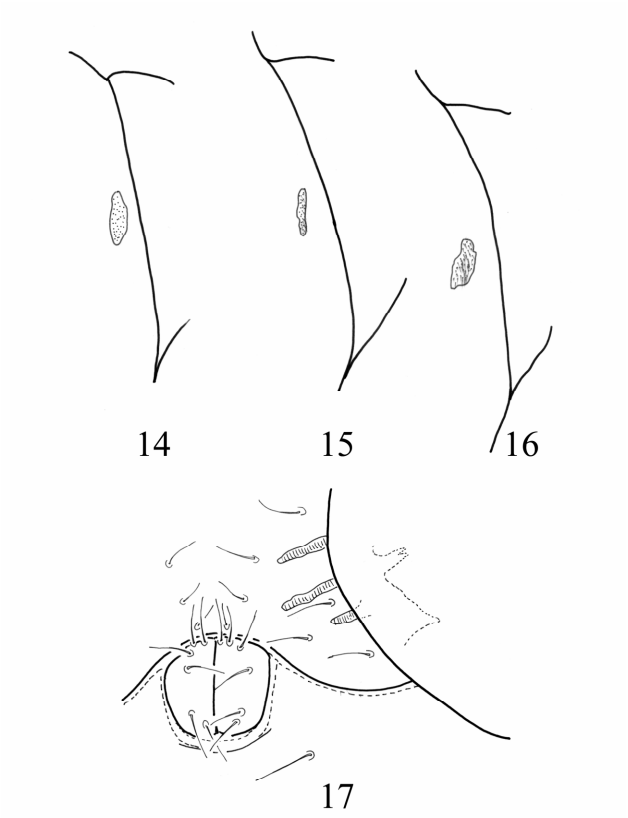
***Humerobates rostrolamellatus* Grandjean, 1936**

(Figs. 15–18)

In his description Grandjean (1936) only gave a somewhat superficial figure of the ventral side of the new species, from which the size and shape of the setae is not rather indistinct. The epimeral and genital setae of the specimens collected in Crete are much longer (Fig. 18) compared to those given by Grandjean, or by the publications afterwards.

In a large series of specimens collected in Crete I found that the genital setae are considerably longer in every individual than those depicted in the figure by Grandjean. The distal end of the tutorium is simple, concave.

The porose areas of the notogaster exhibit large differences both in shape and especially in their length, and it is very evident in the case of the *Aa* area (Figs. 15–17). The shape and development of the translamella is also very varied. The considerable variance in this trait is a proof for the variability of this species, and possibly indicates its capability of adaptation. Therefore the status of the closely related taxa should be validated with the study of the types. This is exemplified by the findings of Pérez-Iñigo (1972). When describing his subspecies he found only the following traits as differences between the subspecies and its parent species (*H. rostrolamellatus guadarramicus*): the single dent at the distal edge of the tutorium, and the longer genital setae.



Figures 15–18. *Humerobates rostrolamellatus* Grandjean, 1936. 15–17 = variation of the porose area *Aa*, 18 = lateral part of genital region

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