

# NEW OPPIID SPECIES (*ACARI, ORIBATIDA, OPPIIDAE*) FROM ROMANIAN CAVES

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*Abstract.* Three new species of the family *Oppiidae* Grandjean, 1951 are described in this paper, as result of study of the faunistic material collected from some Romanian caves: *Lasiobelba (Lasiobelba) pontica* n. sp., *Lauroppia incognita* n. sp. and *Moritzoppia guanicola* n. sp. The genus *Lasiobelba* is recorded for the first time in Romanian fauna, as well as *Ramusella (Rectoppia) fasciata sahariensis* (Hammer, 1975), for which some complementary characters are given.

*Key words:* oribatid mites, *Oppiidae*, new species, caves, Romania.

## 1. INTRODUCTION

The family *Oppiidae* Grandjean, 1951 represent one of the largest groups of oribatid mites, which comprises over 1,000 species (SUBIAS, 2004), most of them described in the last 3–4 decades. These mites populate almost all terrestrial habitats, including caves and superficial subterranean environment. A long series of species have been recorded in such habitats, and in addition some new oppiid species were described (ARILLO *et al.*, 1994; BERNINI, 1980; PÉREZ-IÑIGO, 1976; VASILIU, IVAN, 2009).

## 2. MATERIAL AND METHOD

The faunistic material analyzed in this study was collected mainly by the researchers from the Institute of Speleology in Bucharest, during a relatively long time. Some earlier collections have been made by Drs. ALEXANDRINA and ȘTEFAN NEGREA in different caves from South-Western part of the country, such as Cuptoare Cave. Another substantial acarological collection was achieved in the context of some investigations carried out in the Movable Cave area by the same research team.

In the description of species was followed the morphological terminology and chaetotaxic notation suggested by BALOGH (1972), MAHUNKA and ZOMBORI (1985), and the systematic ranking of the new species – according to SUBIAS and BALOGH (1989) and SUBIAS (2004).

### 3. RESULTS

#### *Lasiobelba (Lasiobelba) pontica* n. sp. (Figs. 1–3)

**Material examined:** holotype and 7 paratypes, Movile Cave (Constanța county), leg. Dr. E. Nitzu, D. Pegulescu.

**Description.** Relatively large sized species (*Table 1*), chestnut in colour.

*Prodorsum* elongated, representing about 38% of the body's length, ends by a rostral tectum, naso shaped; seen in profile, the rostrum has the aspect of a bent beak. The basis of prodorsum evidences a straight interbothridial bridge which surrounds postero-laterally the bothridial cups. In front of bothridia, three pairs of large foveolae can be observed, bordered laterally by a chitinous thickening joined with the interbothridial bridge. Two pairs of sigilla occur between the interlamellar setae. The sensillar setae are large, fusiform elongated and slightly bent, and set with bristles on their surface, excepting the stalk. The other prodorsal setae are long, baciliform, with spiniform cilia on the whole length; relation between dimensions of the prodorsal setae can be expressed as follows:  $ss > le > in > ex > ro$  (*Table 2*). Lateral sides of the prodorsum, as well as the wide pedotecta I, evidence rugosities, the rest of prodorsal surface being smooth.

*Notogaster* is oval, convex, with the breadth/length ratio about 0.88 (*Table 1*). Ten pairs of heterotrichous setae are present; *ta* is relatively short, thin and smooth, the others are long, baciliform, and densely ciliate. Posterior rows of setae *r* and *p*, and especially *p*<sub>3</sub>, are shorter than the anterior ones (*Table 2*). In the antero-median part of notogaster cuticula evidences small foveolae, which are absent in the remaining surface.

*Table 1*

Dimensions of the body and of its parts (μm)

Species	Body	Prodorsum	Notogaster		Genital aperture		Anal aperture	
	l	l	l	b	D	d	D	d
<i>Lasiobelba (L.) pontica</i> n. sp.	566	217	349	307	51	21	96	45
<i>Lauropia incognita</i> n. sp.	425–440	160–170	265–270	205–210	37.5	22.5	67.5	35
<i>Moritzoppia (M.) guanicola</i> n. sp.	340–375	80–95	260–280	150–175	35–38	20–25	57–65	28–30
<i>Ramusella (R.) fasciata sahariensis</i> (Hammer)	322–337	107–112	215–225	165–170	32	18	53	24

*Legend:* l – length; b – breadth; D – longitudinal diameter; d – transversal diameter.

Table 2

Dimensions of the dorsal setae ( $\mu\text{m}$ )

Species	Prodorsum					Notogaster				
	ss	in	le	ro	ex	ta	te, ti, ms		r <sub>1</sub> -r <sub>3</sub> , p <sub>1</sub> , p <sub>2</sub>	p <sub>3</sub>
<i>Lasiobelba (L.) pontica</i> n. sp.	105	66	72	38	52	25	90		67.5	57.5
<i>Lauroppia incognita</i> n. sp.	77.5	27.5	7.5	25	37.5	30-32.5 (except ms)			12.5-15 (including ms)	
<i>Moritzoppia (M.) guanicola</i> n. sp.	55	32.5	17.5	20	15	40	35 (te)	25	25	
<i>Ramusella (R.) fasciata sahariensis</i> (Hammer)	55-60	35-40	23	35-37.5	20-22.5	alveoli	50-57.5 (including r <sub>1</sub> -r <sub>3</sub> )		32.5 (p <sub>1</sub> - p <sub>3</sub> )	

*Epimeral region* shows well-defined epimeres, and well-developed apodemes. No ornamentation on the epimeres 1 and 2, while the epimeres 3+4 show a polygonal network, more obvious in the median and posterior part. The discidium is small, sharp and slightly bent postero-laterally. The epimeral setae are densely ciliate, being distributed according to the usual formula in *Oppiidae* – 3:1:3:3. The setae of epimeres 1, as well as the other median ones (2a, 3a, 4a and 3b) are shorter (13–16  $\mu\text{m}$ ), while the lateral setae are long, especially 3c and 4c (34, respectively 41  $\mu\text{m}$ ).

*Genito-anal region* has smooth integument, without ornamentation. All the setae of this region are densely ciliate and arranged following formula: 5:1:2:3. The genital setae are short (12  $\mu\text{m}$ ), while the aggenital and adanal ones are longer (27 and 37  $\mu\text{m}$  respectively). The iad lyrifissure is positioned directly apoanal.

**Differential diagnosis.** The new species obeys the diagnosis of the genus (SUBIAS, BALOGH, 1989; OHKUBO, 2001), being quite close to *Lasiobelba (L.) arcidiaconoae* (Bernini, 1973); nevertheless, it is different by its larger size, by the shape of rostral tectum, and also by the field with foveolae in the antero-median part of notogaster. In addition, the baciliform setae on the notogaster and the length of ta setae (2.5 times longer at *L. pontica*), as well as the barbed genital and anal setae, are distinctive to the new species. *L. pontica* is quite similar to *L. (L.) neonominata* Subias, 2004 (= *Oppia yodai africana* Kok, 1967), but the different position of iad lyrifissure, the shape of sensillus, less distended and with a sharp terminal thorn, the smooth genital setae, also the slightly larger size in the last species, are the main differences (KOK, 1967; ARILLO, SUBIAS, 1997). As well, the new species is comparable with *L. (L.) arabica* Mahunka, 2000 (smaller in size, with interlamellar setae shorter and thinner than the other prodorsal setae), with *L. (L.) hesperidiana* (Perez-Iñigo, 1986) (seta ta is reduced to alveoli), with *L. (L.) decui* Vasiliu and Ivan, 1995 (rostral tectum is tridentate in this species).

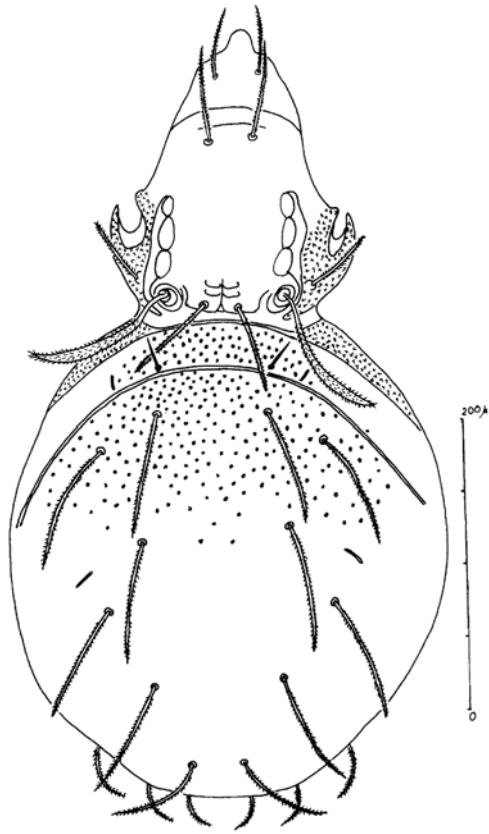


Fig. 1. *Lasiobelba (Lasiobelba) pontica* n. sp., dorsal view.

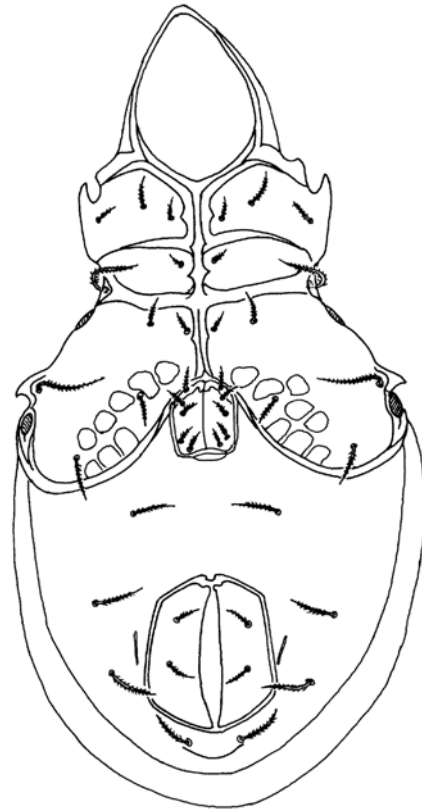


Fig. 2. *Lasiobelba (Lasiobelba) pontica* n. sp., ventral view.

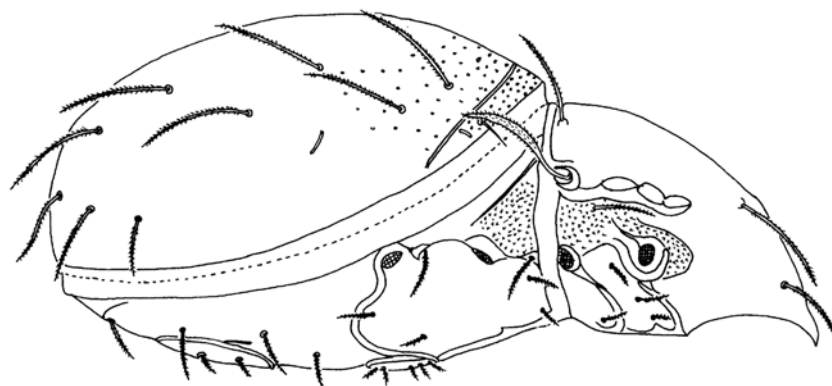


Fig. 3. *Lasiobelba (Lasiobelba) pontica* n. sp., lateral view.

The genus *Lasiobelba* s. str. Aoki, 1959, with a pantropical and subtropical distribution (Subias, 2004), has not been recorded in Romanian fauna; it is probably that *L. pontica* n. sp. is a relictary form, remained in Movile Cave as a shelter from a warmer climatic period.

**Derivatio nominis.** The name of species comes from the antique designation of the Black Sea, i. e. Pontus Euxinus (hospitable sea), the Movile Cave being situated near Mangalia, few kilometers far from the sea coast.

*Lauroppia incognita* n. sp. (Figs. 4–6)

**Material examined:** holotype and 43 paratypes, Movile Cave area (Constanța county), leg. Dr. E. NITZU, D. PEGULESCU.

**Description.** Medium size species (*Table 1*), yellowish to light chestnut coloured.

*Prodorsum* elongated (about 38% of the body length) has a rounded, entire apex. In the posterior median part of prodorsum, a complex of costulae with peculiar shape can be observed. There is a bothrio-lamellar costula, short and interrupted, bifurcated, with a lateral branch directed to bothridium, and the paraxial one fused with the second, interlamellar ridge. This one is S-shaped, enclosing a small area where the interlamellar seta has its origin; the bothrio-lamellar costula ends at the middle of in-le distance (Figs. 4, 6a). The sensillus is long, sickle-shaped and pectinate, with 7–8 unilateral branches. Interlamellar setae are strong, erect and smooth, nail-shaped; lamellar ones are minute, while rostral, and especially exobothridial setae are long, smooth and thin. The ratio between the prodorsal setae:  $ss > ex > in > ro > le$  (*Table 2*).

*Notogaster* oval, with smooth integument, has a straight anterior edge, bordered by a distinct crista. 10 pairs of notogastral setae heterotrichous, simple and thin are present; the anterior setae (ta, te, ti) are at least twice longer than the remaining ones.

*Epimeral region* evidences well developed apodemes. The epimeres 1 and 2 have no ornamentation, while on the epimeres 3+4 inconspicuous polygonal network can be observed in the postero-median part. Discidium is well developed, with a pointed tip. The median epimeral setae a are short (12  $\mu$ m), simple and thin, the lateral ones b and c are longer (20–22  $\mu$ m) and bifurcate.

*Genito-anal region.* Genital foramen is pentagonal, each valve bearing 6 genital setae, simple and thin;  $g_1$  is twice longer than the remaining setae. One pair of aggenital setae, 2 pairs of setae on the anal plates, and 3 pairs of adanal setae:  $ad_1$  in postanal position,  $ad_2$  paraanal,  $ad_3$  preanal. All the setae of this region are simple and thin. The iad lyrifissure is placed paraanally.

**Differential diagnosis.** The new described species corresponds to the diagnosis of the genus *Lauroppia* Subias et Minguez, 1986, belonging to the group of species with 6 genital setae, undivided rostral tectum, and with weakly developed prodorsal costulae. *L. incognita* is comparable with the type species *L. fallax* (Paoli, 1908), as well as to *L. similifallax* Subias et Minguez, 1986; the larger size of the new species (especially compared to *similifallax*), the shape of sensillus, the aspect of prodorsal costulae, the heterotrachous notogastral setae, are the main differential characters (SUBIAS and ARILLO, 2001). *L. incognita* is similar to *L. hauseri* Mahunka et Mahunka-Papp, 2000, but differs from this by the shape of sensillus and of the prodorsal costulae, that reach and enclose the origins in *hauseri*. As well, it is close to *L. feideri* Vasiliu et Ivan, 1999, however the new species is larger in size, the prodorsal costulae are shorter and different shaped, and posterior setae of notogaster are shorter, too.

**Derivatio nominis.** The species was named *incognita* because of its difficult identification, thus in the faunistic list from Movile Cave area it was included as *Medioppia* sp. (IVAN and VASILIU, 2010).

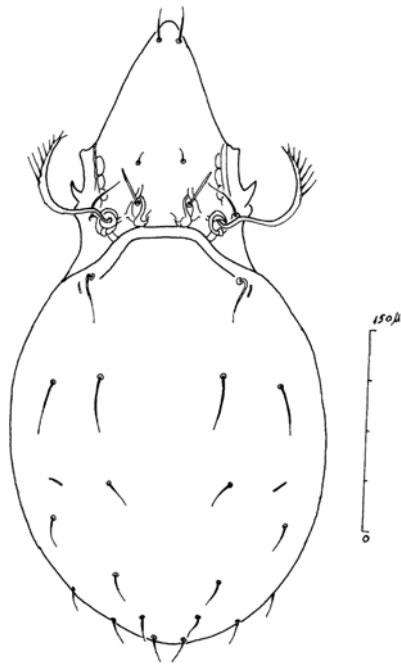


Fig. 4. *Lauroppia incognita* n. sp., dorsal view.

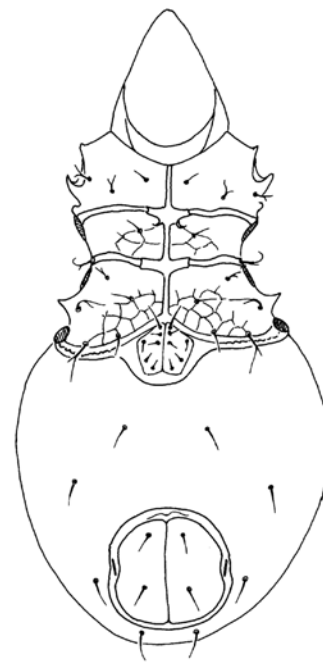


Fig. 5. *Lauroppia incognita* n. sp., ventral view.

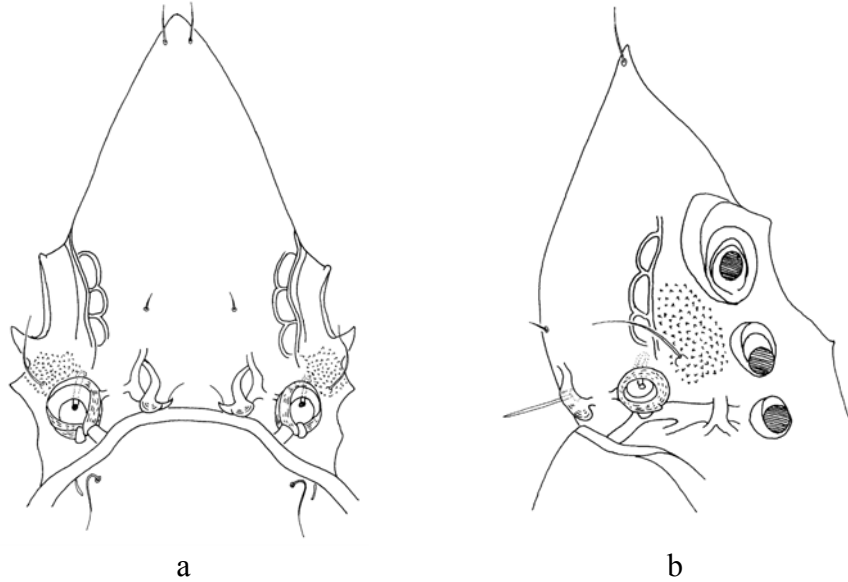


Fig. 6. *Lauroppia incognita* n. sp., details of prodorsum in dorsal (a) and lateral view (b).

***Moritzoppia guanicola* n. sp. (Figs. 7–9)**

**Material examined:** holotype and 27 paratypes, Cuptoare Cave (Caras Severin county), guano, leg. Drs. ALEXANDRINA and ȘTEFAN NEGREA.

**Description.** Medium size species (*Table 1*), light yellow in colour.

*Prodorsum* triangular in projection has a tripartite rostral tectum, with lateral teeth exceeding the median one. The complex of prodorsal costulae has a peculiar shape. There is a pair of long and medially curved lamellar costulae, originating at the basis of bothridial cups, which end laterally to the insertion of lamellar setae; their proximal part, towards bothridia is bifurcated, and then a secondary branch tends to surround the interlamellar setae's origin. In the middle and anterior part of costula, a longitudinal fissure can be observed. Another pair of ridges occur in the interlamellar region, Z-shaped, enclosing an oval area around the origin of in setae (Fig. 9 a, b). The sensilli are club-shaped, elongated, with minute barbs on the distal part. The setae in, le and ro are simple and thin, only ex being rugged; their length ratio is the following:  $ss > in > ro > le \approx ex$  (*Table 2*).

*Notogaster* is oval, notably elongated, with the anterior part protruding over the basis of prodorsum, up to the level of bothridia. Antero-laterally, in front of ia lyrifissure and ta origin, a small tubercle can be observed each side (Fig. 9 a, b). Ten pairs of heterotrichous, simple and thin setae are present, the anterior ones, and especially ta being longer (*Table 2*). Notogastral cuticula is smooth, without ornamentation.

*Epimeral region* has the same configuration as in the other species of the genus. The epimeres 1 and 2 are without ornamentation, while 3+4 evidence large and well outlined polygons. The epimeral setae are simple and thin, arranged according to the usual formula 3:1:3:3. The median setae a are short, while 3b and 4b are longer; 1c is rugged and originate on the pedotectum 1, 4c is inserted at the basis of discidium.

*Genito-anal region.* Genital foramen pentagonal in shape, each valve bearing 4 genital setae simple and thin;  $g_1$  is longer than the others. Genito-anal setal formula is 4:1:2:3, all these setae being simple and thin; ad and ag setae are longer than the remaining ones. The iad lyrifissure is placed paraanally.

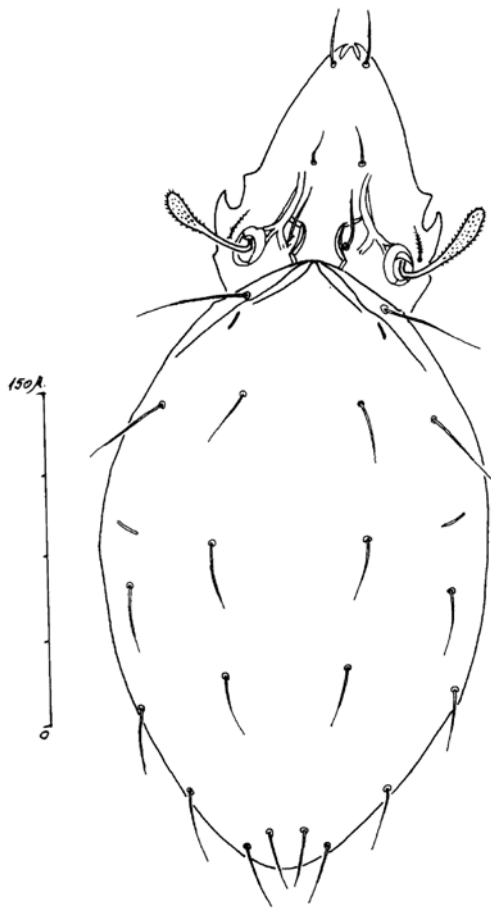


Fig. 7. *Moritzoppia guanicola* n. sp., dorsal view.



Fig. 8. *Moritzoppia guanicola* n. sp., ventral view.



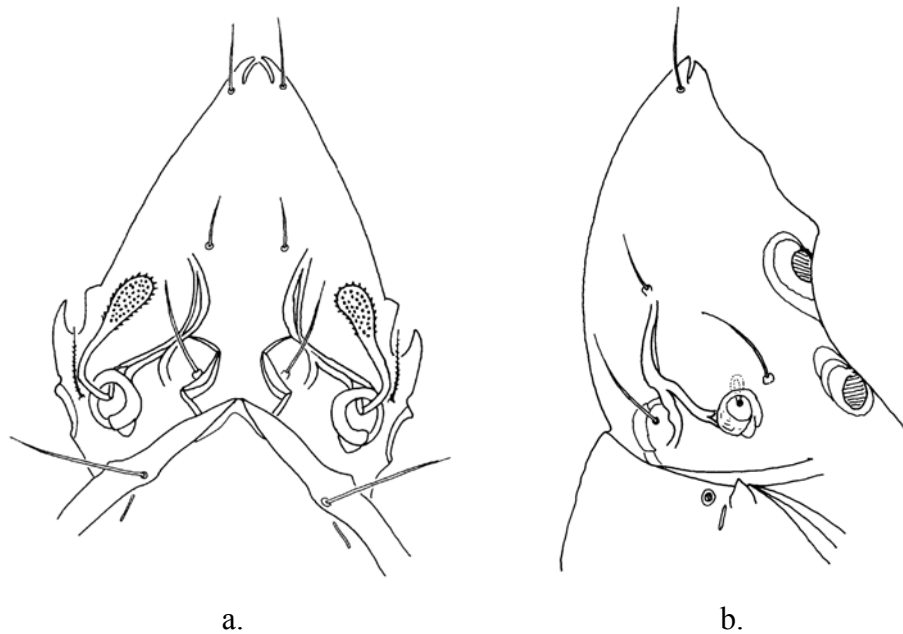


Fig. 9. *Moritzoppia guanicola* n. sp., details of prodorsum in dorsal (a) and lateral view (b).

**Differential diagnosis.** The new species belongs to the genus and the subgenus *Moritzoppia* Subias et Rodriguez, 1988, with the type species *M. keilbachi* (Moritz, 1969), due to the shape of prodorsal costulae, the shape of the anterior border of notogaster, and also to the position of the epimeral setae 4c (Gordeeva, 2000; Gordeeva and Bajartogtokh, 2001; Subias, 2004). Few species of this subgenus have a tridentate rostrum, such as *M. escotata* Subias et Rodriguez, 1986, *M. longilamellata* Subias et Rodriguez, 1986, *M. minuta* Gordeeva et Grishina, 1991, *M. sharipovi* Niemi et Skubala, 1993. *M. guanicola* differs from these by the body size, and especially by the ratio length/width, by the shape and length of prodorsal costulae, the relative length of the prodorsal setae (longer interlamellar seta in the new species).

**Derivatio nominis.** The species name comes from its habitat – guano.

***Ramusella (Rectoppia) fasciata sahariensis*** (Hammer, 1975) (Fig. 10)

*Material examined:* 15 specimens, Ponicoava Cave (Caras Severin county), guano, leg. N. VASILIU.

Based on description of PAOLI (1908), many authors recorded in their faunistic works *Oppia fasciata*. BERNINI (1973) described a *fasciata* from the

Aeolian Islands, evidencing some different characters compared to the original description. Subsequently, HAMMER (1975) describes from Central Sahara *Oppia sahariensis*, and later SUBIAS and RODRIGUEZ (1987) ascertain the identity of this species and the systematic position, as subspecies of *Ramusella (Rectoppia) fasciata* (Paoli, 1908) (SUBIAS, 1978).

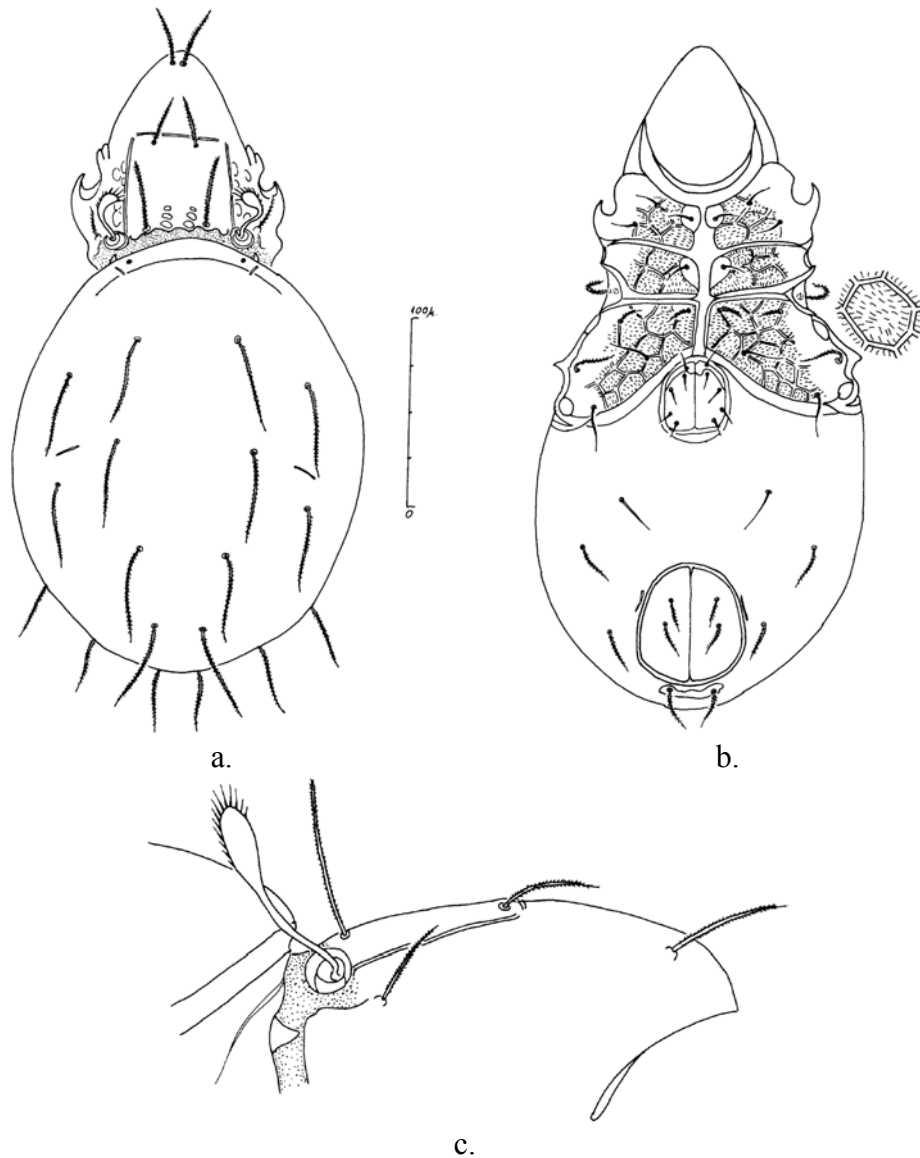


Fig. 10. *Ramusella (Rectoppia) fasciata sahariensis* (Hammer): a. dorsal view; b. ventral view; c. detail of prodorsum in lateral view.

*R. (R.) fasciata sahariensis* is a Mediterranean element (SUBIAS, 2004), being recorded for the first time in Romanian fauna. Our specimens obey in the main the characters indicated by the mentioned authors. However, some features distinguish this population, i. e. the distinct lamellar and translamellar lines present, the slightly longer notogastral setae (compared to measurements of BERNINI) and reduced length of posterior ones (row p), the ornamentation of epimeres, as well as the barbed setae 3c, 4c and an (Fig. 10, Tab. 2). As compared with *fasciata* s. str., the subspecies differs by length of interlamellar and notogastral setae (with 75, respectively 30% longer), also by the slightly longer setae of genito-anal region and the ribbed sculpture of epimeres.

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