

## Oribatid mites from the Vohimana Reserve, Madagascar (Acari: Oribatida), II.

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**Abstract.** Further studies on the oribatid species collected from the Vohimana Reserve (Madagascar) are presented. Altogether 13 species are listed, of them two represent new genera (*Rugocephalus* gen. nov. and *Madabelba* gen. nov.), furthermore seven species are new to science. The other six species were earlier mentioned from different regions of the island, they are however little known. With 23 figures.

### INTRODUCTION

I am working continuously on the exploration of the oribatid fauna of Madagascar since the end of the last century (e. g. Mahunka, 2002). The final goal is to write a monograph of this very rich and peculiar fauna. Therefore in the last years several papers with descriptions of new taxa were published (2009 a, 2009 b) or are in preparation.

To achieve this main goal, it is important to examine more freshly collected or not completely studied soil samples. For this reason I continue the examination of an interesting material, which was collected recently by Dr. Cs. Csuzdi, the well-known Hungarian specialist of earthworms, when visited Madagascar in 2008. He carried out soil zoological collecting activities on the northern part of the great island, namely in the Vohimana Nature Reserve, in an area from whence no data on oribatids have hitherto been published. Hereby I describe the second part of the oribatid mites found in his material.

In this paper I discuss thirteen species belonging to different oribatid families. Of them, seven are new to science: *Hymenobelba flagellatissima*, *Rugocephalus formosus*, *Pseudotocephalus atolanaro*, *Multioppia malalatinae*, *Oxyoppia* (*O.*) *tuberosa*, *Madabelba bercziki* and *Protoripoda nasuta* spp. nov.

Six interesting or rare species are known exclusively from the great island. Among the seven new species, two represent new genera: *Rugocephalus formosus* gen. et sp. nov. from the family Carabodidae and *Madabelba bercziki* gen. et sp. nov. from the family Suctobelbidae.

In this paper, I follow the system of Norton and Behan Pelletier (2009), based on that of Grandjean (1954, 1965), and besides I also use the works of Subías (2004, 2009). In the descriptions the morphological terminology of Grandjean (1965 and in several publications) was used with some complementary modifications concerning the studied groups or specific organs (e.g. Mahunka & Zombori, 1985; Norton *et al.*, 1997; Mahunka & Mahunka-Papp, 2001; Niedbala, 2001, 2008; Woas, 2002; Weigmann, 2006) and the already mentioned publication of Norton & Behan Pelletier (2009).

*Depositories.* The material examined is deposited at the Hungarian Natural History Museum, Budapest (HNHM), and some paratypes and vaucher specimens in the Muséum d'histoire naturelle de Genève (MHNG).

### LOCALITY

Afr-996: Malagasy Republic (Madagascar), Vohimana reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi.

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## LIST OF THE SPECIES IDENTIFIED

HERMANNIIDAE Sellnick, 1928

*Hermannia (Phyllhermannia) exornata* (Balogh, 1962)  
Locality: Afr-996.

AMERIDAE Grandjean, 1965

*Hymenobelba flagellatissima* sp. n.

CARABODIDAE C. L. Koch, 1837

*Rugocephalus formosus* gen. et sp. n.

TETRACONDYLIDAE Aoki, 1961

*Pseudotocephalus atolanaro* sp. n.

OPPIIDAE Sellnick, 1937

*Fossoppia calcarata* Mahunka, 1997  
Locality: Afr-996

*Leptoppia benyovszkyi* Mahunka, 1996  
Locality: Afr-996

*Leptoppia procera* Mahunka, 1997  
Locality: Afr-996

*Multioppia malalatiniae* sp. n.

*Oxyoppia (Oxyoppia) tuberosa* sp. n.

SUCTOBELBIDAE Jacot, 1938

*Persuctobelba monster* Mahunka, 2001  
Locality: Afr-996.

*Madabelba bercziki* gen. et sp. n.

ORIPODIDAE Jacot, 1925

*Protoripoda nasuta* sp. n.

GALUMNIDAE Jacot, 1925

*Galumna armatifera* Mahunka, 1996  
Locality: Afr-996.

## DESCRIPTIONS OF THE NEW TAXA

### *Hymenobelba flagellatissima* sp. nov.

(Figs. 1–3)

*Diagnosis.* All prodorsal and notogastral setae long, filiform, sometimes flagellate. Prodorsal setae arising on tubercles. Sensillus very long,

filiform, finely ciliate. Anterolateral margin of prodorsum serrate. Pedotecta I large, rounded, pedotecta II–III reduced. No apodemes on anterior part of epimeral region, sejugal apodemes well developed. All epimeral setae long and thin, aggenital and adanal neotrichy. All setae in this region sword shaped, sometimes with flagellate distal end. All legs monodactylous.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 5 paratypes from the same sample. Holotype (1791-HO-09) and 3 paratypes (1791-PO-09) deposited in HNHM, 2 paratypes in MHNG.

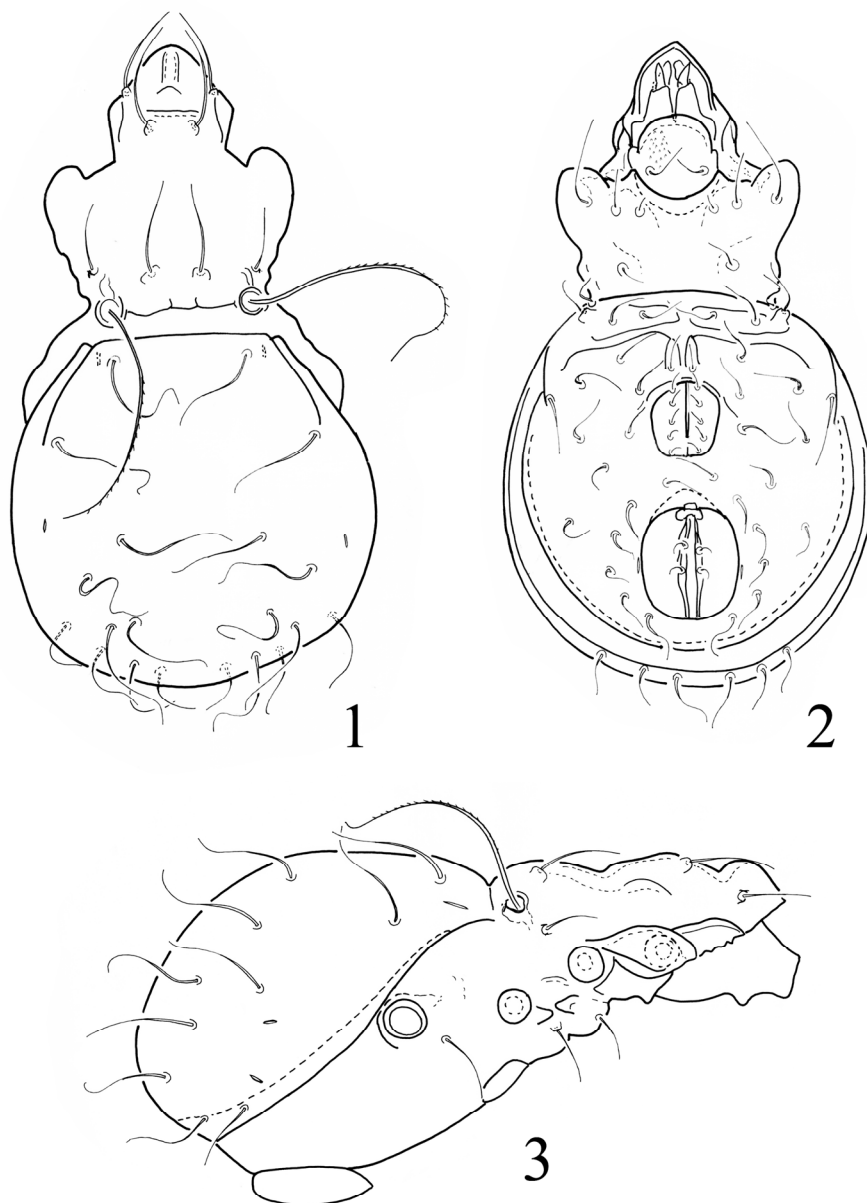
*Measurements.* Length of body: 439–506 µm, width of body: 252–297 µm.

*Prodorsum.* Rostral part wide, rostrum conical with a pair of weak longitudinal laths and a transversal one located in front of lamellar setae. All four pairs of prodorsal setae inserted in tubercles, far from one another. All setae long, their length: *le* – *in* – *ro* – *ex*. A weak transversal line in interbothridial region present. Bothridium cup-shaped, sensillus long, setiform, curving slightly distally, finely ciliate.

*Notogaster.* Dorsosejugal furrow straight, with a pair of small humeral processes. Notogastral surface without lateral cavities. Ten pairs of notogastral setae, all filiform, mostly flagellate (Fig. 1). Anterior setae nearly equal in length, only setae *p* much shorter.

*Lateral part of podosoma.* Prodorsum characteristically excavate behind the rostrum and in medial part. Lateral margin serrate. Pedotecta I very large, rounded distally. Tutorium well developed, curving laterally. Pedotecta II dentiform (Fig. 3).

*Ventral parts* (Fig. 2). Surface punctate, without well developed structure, only sejugal and apodemes IV visible. Epimeral setae located on epimeres I–III thin, setiform, setae on epimeres



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

IV slightly dilated basally. Length of setae highly varying, setae *Ic* longest of all, setae *Ia* and *2a* shortest of all. Setae *3c* arising on tubercles. Epimeral setal formula: 3-1-3-3-. Genital setae arising in longitudinal rows. Anal setae arising medially on two longitudinal crests. Aggenital and adanal neutrichy present.

*Legs.* All legs conspicuously thin, monodactylous. Claws on legs I thinner and smaller than on legs II–IV. Setae *u* on legs II–IV thick, spini-form.

*Remarks.* The new species is well characterised by the absence of the prodorsal sculpture, the

form and length of the prodorsal and notogastral setae, the distance of the lamellar and interlamellar ones and the absence of the notogastral cavity. On the basis of most these features *H. flagellatissima* sp. nov. stands nearest to *H. flexisetosa*. Luxton, 1988, however the prodorsal setae of the new species arising on tubercles stand far from each other.

*Etymology.* Named after the form of notogastral setae.

### ***Rugocephus* gen. nov.**

*Diagnosis.* Family Carabodidae. Body covered by secretion layer. Lamellae narrow with median transversal extension, lamellar setae arising on separate tubercles of the lamellar surface, translamella absent. Humeral apophyses small, no setae in humeral position. Ten pairs of large, notogastral elevations bearing long, thin setiform setae. Fourteen pairs of thin, setiform notogastral setae, among them 4 pairs in posteromarginal position. Gnathosoma with median transversal protuberances. Epimeral region well sclerotised, sternal apodemes absent, sternal region very wide, with an annular ring-shaped formation anteriorly. All epimeres located far from each other. Four pairs of genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae. Lyrifissures *iad* located far from the anal aperture. All legs tridactylous.

Type species: *Rugocephus formosus* sp. n.

*Remarks.* Form of the lamellar protuberances, the ten pairs of notogastral elevation combined with the thin and long notogastral setae, the form of the epimeral structure and the well sclerotised ventral region as a feature combination has been unknown in the family Carabodidae. First of all, the position of the lamellar setae and the form of the notogastral protuberances and setae are unique in this family. On this basis the new genus is well distinguishable from all other genera of the family.

### ***Rugocephus formosus* sp. nov.**

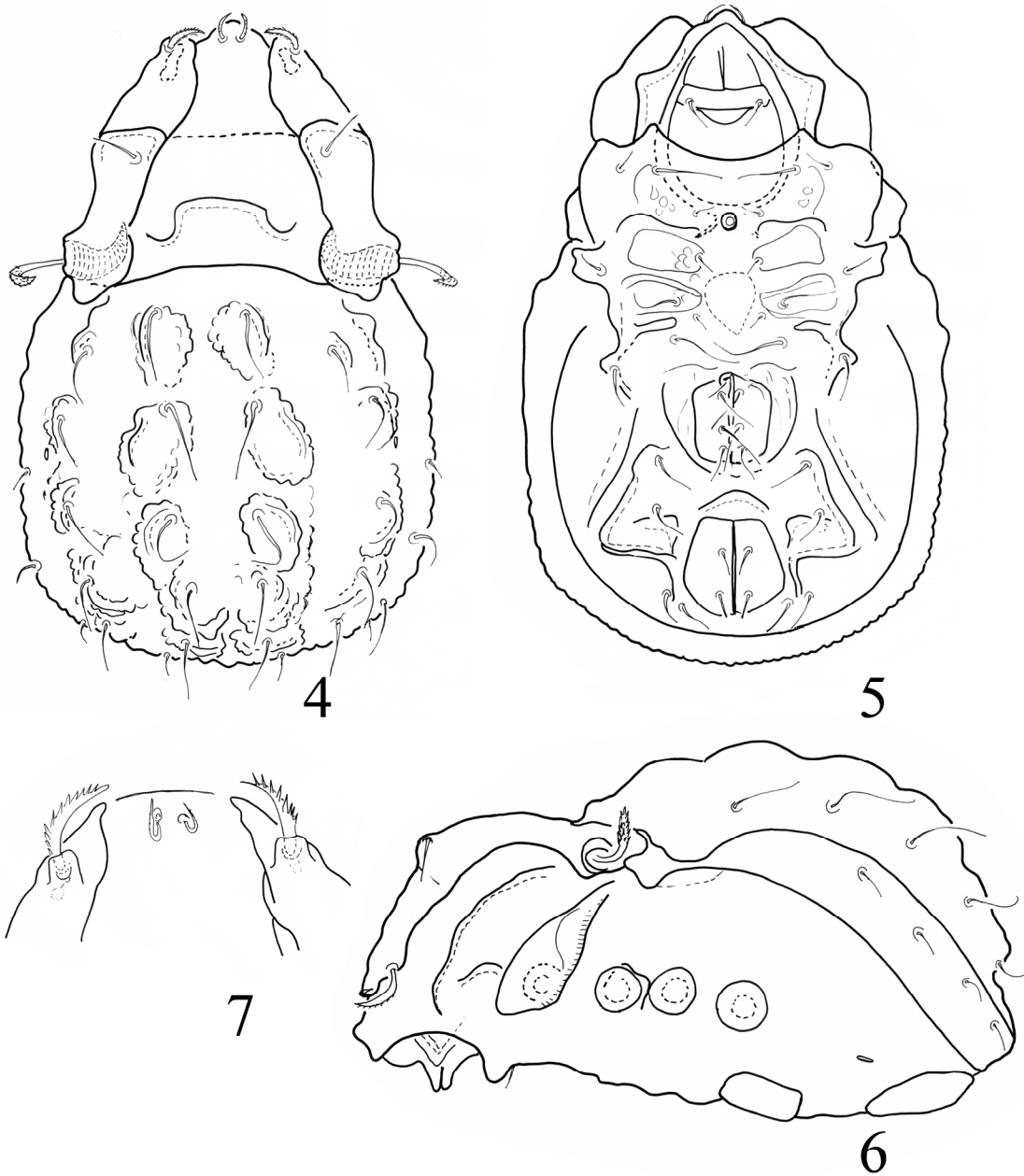
(Figs. 4–7)

*Diagnosis.* Rostral apex protruding anteriorly, rostral setae arising near to each other. Lamellar cusps narrowing anteriorly, spiniform, lamellar setae arising on tubercles, located behind the cusps; lamellae with transversal line medially. Interlamellar region with a curved, strong median crest. Interlamellar setae setiform. Sensillus short, directed backwards, with recurved distal end. Notogaster with 10 pairs of large elevations bearing thin, setiform notogastral setae. Further four pairs of notogastral setae in posteromarginal position. Infracapitulum peculiarly protruding. Epimeral region with distinct apodemes and borders, epimeral setae varying in length. Ventral region with longitudinal and transversal ribs, Genitoanal setal formula 4-1-2-3, genital setae conspicuously long. Lyrifissures *iad* well observable, located far from the anal opening.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 1 paratype from the same sample. Holotype (1792-HO-09) and 1 paratype (1792-PO-09) in HNHM, 1 paratype in MHNG.

*Measurements.* Length of body: 596–625 µm, width of body: 362–439 µm.

*Prodorsum.* Rostrum with small, rounded apex, rostral setae arising very near to each other, between the conspicuously long and narrow lamellar apices (Fig. 4). Lamellae long, with distinct apices, lamellar setae located behind them on tubercles of the lamellar surface (Fig. 7). Anterior and posterior part of the prodorsum marked by an angular line, in the posterior part a pair of the characteristic transversal costulae also present. Interlamellar setae setiform, arising on the lamellar surface, near to the transversal elevations. Bothridium long, curved anteriorly, horn-shaped; sensillus short, curved, lanceolate, with recurved distal end.



Figures 4–7. *Rugocephalus formosus* gen. et sp. n. – 4 = body in dorsal view, 5 = body in ventral view, 6 = body in lateral view  
7 = rostral region

*Notogaster*. Dorsosejugal furrow slightly convex. Humeral apophyses small, distinct, directed forwards. Ten pairs of large notogastral elevation, with undulate margin, bearing long, thin setiform setae, directed backwards. They are nearly as long

as the elevations. Altogether fourteen pairs of thin, setiform notogastral setae, among them 4 pairs in posteromarginal position. These latter ones much shorter than the median setae. All setae smooth.

*Lateral part of podosoma.* Tutorium weak, simple, without apex (Fig. 6). Pedotectum I large, smooth. Lamellar setae phylliform, with unilaterally serrate margin. Pedotectum II large.

*Ventral parts* (Fig. 5). Apodemes and borders typical for the genus, well sclerotised and observable. Sternal region wide, with an annular formation anteriorly and a heart-shaped field medially present. Epimeral setal formula 3-1-3-3, among the inner ones and setae *1c*, *3c*, and *4c* short, simple, setae *1b*, *3b* and *4b* very long, flagellate. Behind the epimeral borders IV a pair of well-developed longitudinal and angulate transversal laths directed inwards present. In front of the anal aperture a semicircular rib also observable. All setae in the ventral region conspicuously thin, long, setiform. All anal and adanal setae also fine and long, setae *ad*<sub>1</sub> and *ad*<sub>2</sub> arising very near to each other. Lyrifissures *iad* well observable, located far from the anal aperture.

*Legs.* All segment without foveolae. Femora of legs II-IV with blade like formation basally.

*Remarks.* See the remarks after the genus diagnosis.

*Etymology.* Named after the fascinating notogastral sculpture.

***Pseudotocepheus atolanaro* sp. n.**

(Figs. 8–11)

*Diagnosis.* Rostral part of prodorsum wide, rostral apex rounded. Lamellae converging anteriorly, narrow, straight. Whole interlamellar surface foveolate. Sensillus fusiform. Median prodorsal condyles large, semicircular. Dorsosejugal margin of notogaster slightly concave, with indistinct lateral condyles. Surface of notogaster distinctly punctate. All notogastral setae finely aciculate (roughened), their distal end spiniform. Apodemes, excepting *ap. 4* well developed, *ap. 2* and *ap. sej.* straight. *Ap. 4* much thinner and shorter than the others. Genitoanal setal formula 3-1-3-3. Genital and aggenital setae very short, anal and

adanal ones much longer than latter. Lyrifissures *iad* located far from the anal aperture.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). Holotype (1793-HO-09) deposited in HHNM.

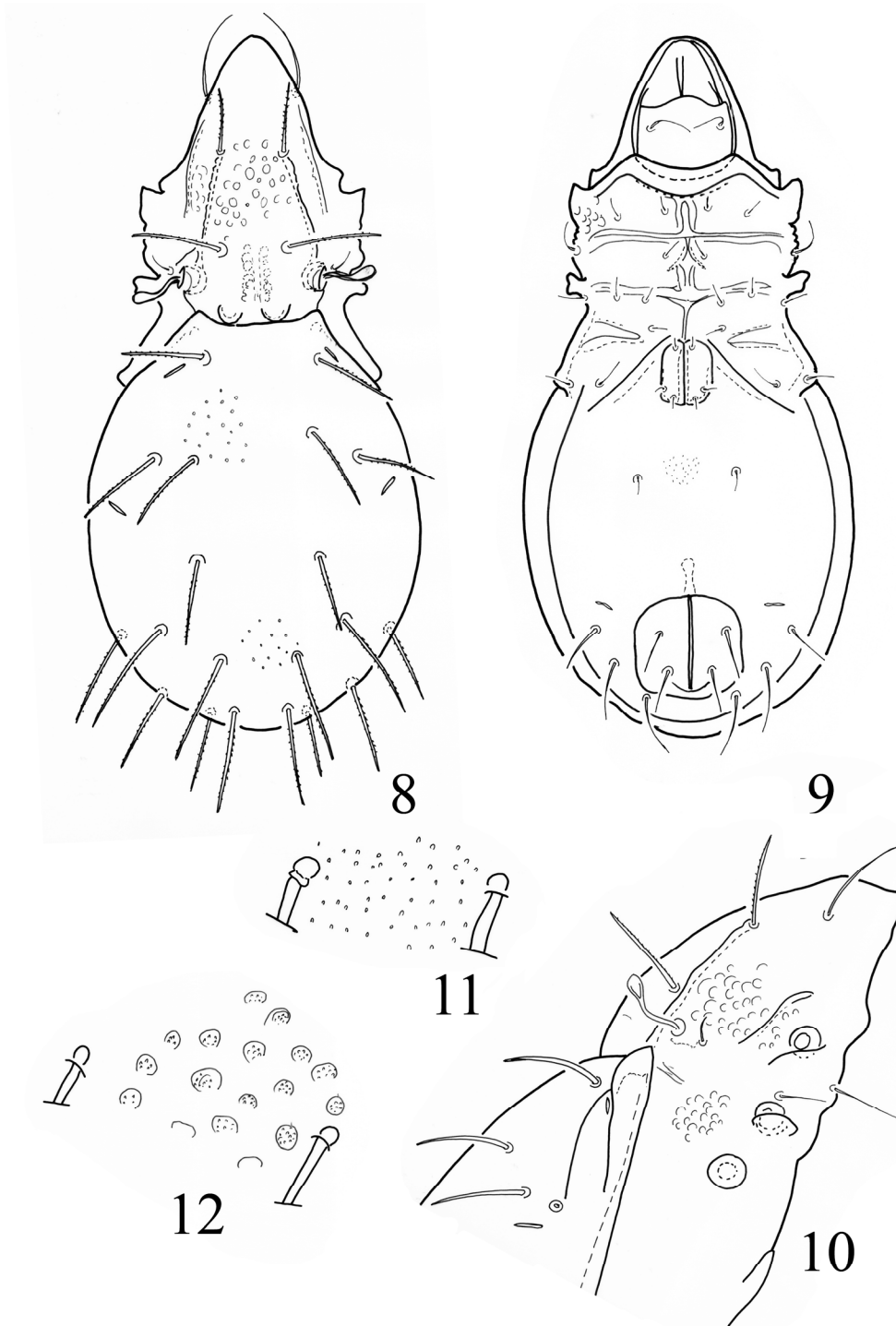
*Measurements.* Length of body: 730 µm, width of body: 290 µm.

*Prodorsum.* Rostrum rounded, rostral setae setiform, smooth, with fine distal end, located far from the rostral apex. Lamellae narrow, diverging from each other, their margin indistinct (Fig. 8). Distal end without apex, bearing needle-shaped lamellar setae. Interlamellar surface covered by foveolae, posteromedian part with 2 rows of weaker, irregular spots. Interlamellar setae also needle shaped, straight, exobothridial setae short, curved, setiform. Sensillus small, its peduncle bent, directed outwards. Its head fusiform, rounded. One pair of comparatively large median prodorsal condyles present, lateral ones indistinct.

*Notogaster.* Dorsosejugal furrow concave medially, with forward protruding humeral part. True condyles absent. Notogastral surface without foveolae, whole surface distinctly punctate (Fig. 11). This feature is very conspicuous. Ten pairs of erect, needle-shaped notogastral setae, all finely aciculate. Setae *c*<sub>2</sub> only hardly shorter than setae *la*, however, the end of the latter thinner than in setae *c*<sub>2</sub>. Setae in posterior part of notogaster slightly longer than remaining ones (Fig. 8).

*Lateral part of podosoma* (Fig. 10). Tutorium short, slightly curved. Lateral part of prodorsum foveolate.

*Ventral parts* (Fig. 9). Apodemes and borders in anterior part of epimeral region well developed, mostly straight. Sternal apodeme between the sejugal and apodemes 2 with double lines, similar formation present in front of *ap. 2* (Fig. 9). Epimeral setae short and simple, setae *1c* arising far posteriorly. Surface of ventral plate finely punctate. Genital and aggenital setae short, anal



**Figures 8–11.** *Pseudotocepheus atolanaro* sp. n. – 8 = body in dorsal view, 9 = body in ventral view, 10 = body in lateral view, 11 = notogastral sulpture. **Figure 12.** *Pseudotocepheus tolanaro* Mahunka, 1997, notogastral sculpture

and adanal ones much longer. Lyrifissures *iad* in preanal position.

*Legs.* Type of ultimate setae: L-L-L-L. Tarsi of legs II-IV with dorsal tooth.

*Remarks.* On the basis of the form and ratio of notogastral setae as well as the lateral pattern of the prodorsum, the new species is closest to *Pseudotocepheus tolanaro* Mahunka, 1997. However, it is distinguished from the latter species by the form of distal part of lamellae (conspicuously curved in *tolarano*), by the curved exobothridial setae (straight in *tolanaro*), by the ratio of notogastral setae (setae  $c_2$  much shorter than setae *la* in *tolanaro*), and also by the pattern of the notogaster: rarely punctate in the new species (Fig. 11), ornamented by much bigger foveolae in *tolanaro* (Fig. 12).

*Etymology.* Named after its related species.

***Multioppia malalatinae* sp. n.**

(Figs. 13–15)

*Diagnosis.* Rostral part wide, rounded. Lamellar setae located far from each other. A short lamellar costula medially present bearing lamellar setae. Three pairs of small, interbothridial maculae, irregular in size. Interlamellar setae minute. Bothridium with narrow posterior lobe, a longitudinal crest directed posteriorly from it. Sensillus long, with lanceolate head. Twelve pairs of notogastral setae variously lengths present, setae  $c_2$  represented only by their alveoli. Exobothridial surface with longitudinal crest, partly granulate. Sternal region well sclerotised, sejugal apodemes with a pair of rounded tubercles. Epimeral setae varying in lengths. Five pairs of genital setae. Anal setae and lyrifissures *iad* in typical position.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 1 paratype from the same sample. Holotype (1794-HO-09) and 1 paratype (1794-PO-09) deposited in HHNM.

*Measurements.* Length of body: 280–297  $\mu\text{m}$ , width of body: 171–182  $\mu\text{m}$ , height of body: 192  $\mu\text{m}$ .

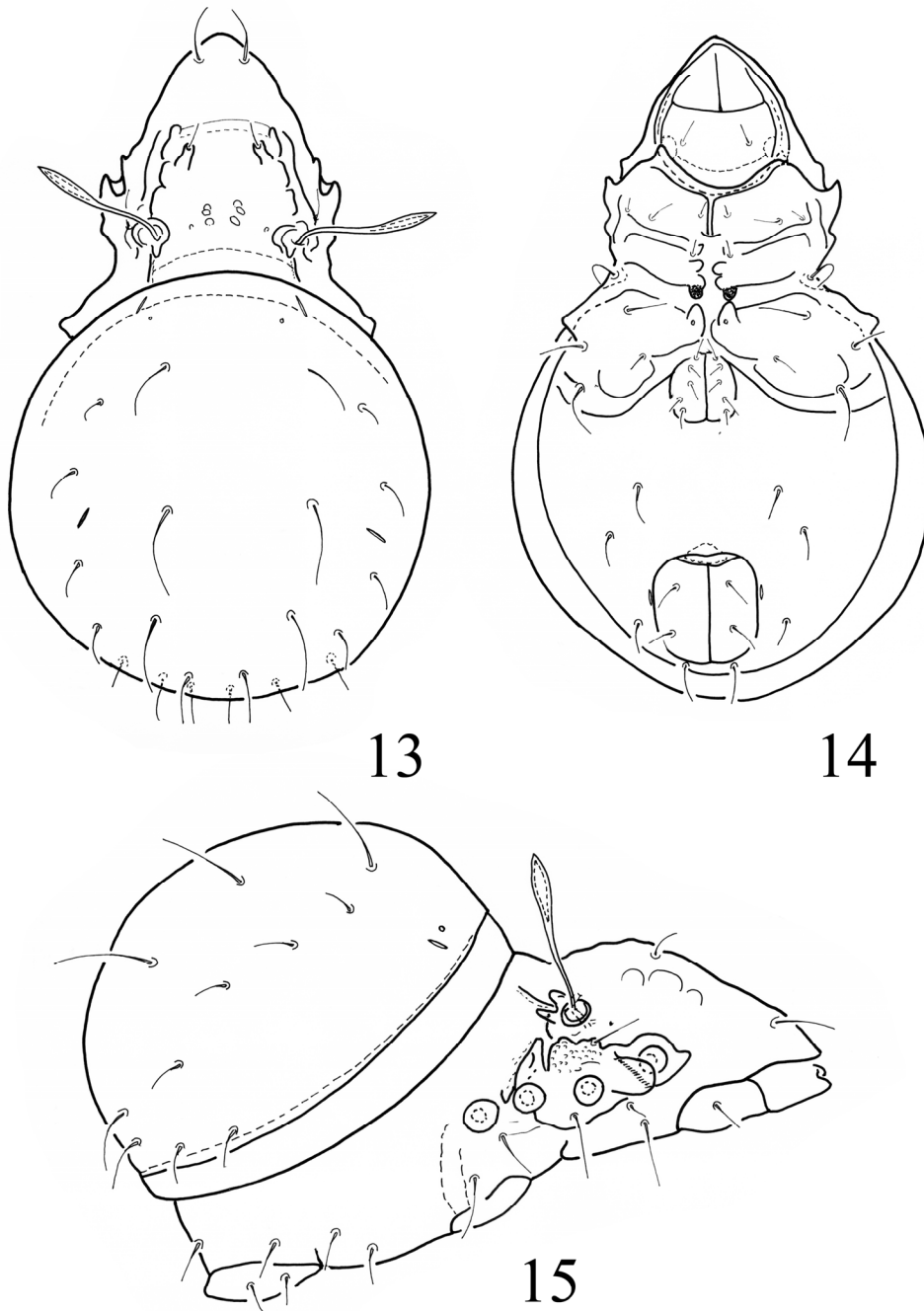
*Prodorsum.* Wide, rostral part triangular, rostral apex rounded. Prodorsal surface with short costulae medially, directed inwards, bearing short lamellar setae. In front of costulae weak, transversal crests and some large lateral maculae present laterally. Three pairs of conspicuously small, irregular median maculae, and a very short, hardly visible interlamellar setae present. Exobothridial setae longer than the lamellar or interlamellar ones, arising on tubercles. Bothridium small, with narrow posterior lobe. A pair of posterior longitudinal laths, directed to the anterior margin of notogaster also visible (Fig. 13). Sensillus with long peduncle and a gradually dilated, lanceolate head. Its surface nearly smooth, some minute aciculae on its distal end.

*Notogaster.* Dorsosejugal part distinct. Form of notogaster conspicuously high, semicircular. Anterior notogastral margin round, crista or humeral apophyses absent. Twelve pairs of notogastral setae different length present, setae  $c_2$  represented only by their alveoli. Four inner pairs of setae (*da*, *dm*, *dp*, and  $h_1$ ) much longer than the outer pairs (*la*, *lm*, *lp* and  $h_2$ ,  $h_3$ ). All setae finely roughened.

*Lateral part of podosoma.* Pedotecta I small, rounded, pedotecta II minute, hardly visible. Exobothridial region with short longitudinal crest (Fig. 15).

*Ventral parts* (Fig. 14). Epimeral region with well developed sculpture. Sternal apodema short, not touching apodemes 2. Sejugal apodemes wide, with a distinct pair of tubercles medially, a pair much weaker tubercles in opposite position. Apodemes 4 also wide, with well curved posteriorly. Discidium large. Epimeral setae varying in lengths, setae *1a*, *1c*, *2a*, *3a* and *4a* much shorter than the others. Setae *3c* and *4b* longest of all. Genitoanal setal formula: 5-1-2-3. Genital setae, exceptionally setae  $g_4$ – $g_5$  originate far from each other. Lyrifissures *iad* in paraanal position.





**Figures 13–15.** *Multioppia malalatinae* sp. n. – 13 = body in dorsal view, 14 = body in ventral view, 15 = podosoma in lateral view

*Remarks.* The new species may well be characterised by the notogastral setae of different length and the form of the sensillus. On the basis of these characters it is well distinguished from all related taxa.

*Etymology.* I dedicate the new species to Malalalina Razafindrakoto (IRD, Antananarivo) for her help during the fieldtrip in Madagascar.

***Oxyoppia (Oxyoppia) tuberosa* sp. n.**

(Figs. 16–18)

*Diagnosis.* With the characters of *Oxyoppia*. Basal parts of costulae converging, their anterior parts slightly shorter, running anteriorly in parallel position. Transcostula absent. Two pairs of maculae and one pair of large tubercles present in interlamellar region. Bothridium with posterior lobe. Sensillus long, setiform, covered by bristles. Anterior margin of notogaster with a longitudinal median crest and a pair of very large humeral condyles. Ten pairs of bacilliform notogastral setae. Epimeral setae simple, apodemes well developed. Six pairs of genital setae and a pair of long adanal fissures in direct apoanal position.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 1 paratype from the same sample. Holotype (1795-HO-09) and 1 paratype (1795-PO-09) deposited in HHNM.

*Measurements.* Length of body: 222–230  $\mu\text{m}$ , width of body: 123–130  $\mu\text{m}$ .

*Prodorsum.* Prodorsal surface well granulate, its anterior part covered with larger, basal part with smaller granules. Rostrum conical, rostral apex narrowed. Costulae well developed, wide, comprising two parts. Basal parts running from bothridium slightly longer than the apical ones, basal parts strongly converging, apical ones parallel. Apices of costulae rounded, wide. Interlamellar region with two pairs of rounded maculae and one pair of large tubercles. Rostral setae longest of all, finely ciliate. Lamellar and interlamellar setae short, simple, Exobothridial setae

minute. Bothridium large, with wide posterior lobe. Sensillus long, well curved inwards, setiform, covered with bristles.

*Notogaster.* Anterior margin of notogaster with one pair of robust humeral condyles and an unpaired median crest directed backwards (Fig. 16). Ten pairs of notogastral setae thin, bacilliform, with blunt tip. All setae nearly equal in length, only setae  $c_2$ ,  $p_2$  and  $p_3$  shorter than the other setae.

*Lateral part of podosoma.* With well-developed, distinctly dissected longitudinal crest. A part of this surface also granulate (Fig. 18).

*Ventral parts* (Fig. 17). Sternal region with well developed apodemes, all together composing a closed network. Sternal apodemes with a small round hollow anteriorly. Epimeral surface mostly smooth, lateral part of epimeres 1–2 and mental tectum finely granulate, similar to prodorsal surface. All epimeral setae simple, smooth. Epimeral setal formula: 3-1-3-3. Ventral plate smooth. Genital opening much smaller than the anal one. Genital, aggenital and anal setae simple setiform, adanal setae bacilliform. Genitoanal setal formula: 6-1-2-3. Lyrifissures *iad* conspicuously long, located in direct apoanal position.

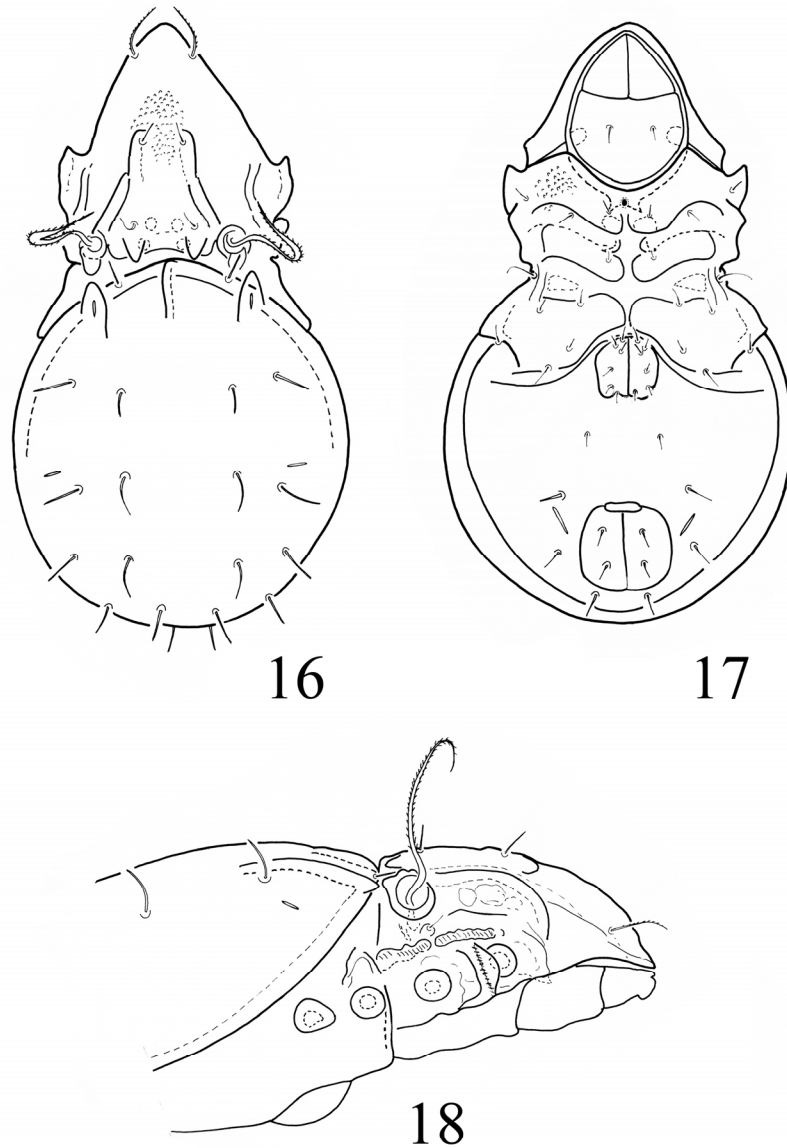
*Legs.* With the characters of *Oxyoppia* species.

*Remarks.* The new species is well characterised by the form of the costula, the presence of the interbothridial tubercles, the form of the sensillus, the very large humeral condyles of the notogaster and by the the form of anal lyrifissure. This combination of features was previously unknown in the family.

*Etymology.* The name refers to the presence of a pair of large tubercles in the interbothridial region.

***Madabelba* gen. n.**

*Diagnosis.* Family Suctobelbidae. Rostral apex wide with deep median incision. No tooth or inci-



Figures 16–18. *Oxyoppia (Oxyoppia) tuberosa* sp. n. – 16 = body in dorsal view, 17 = body in ventral view, 18 = podosoma in lateral view

sure in rostral region. Tectopedial field reduced, paratectopedial field absent. A well developed lamellar knob continued in an interbothridial conspicuous crista. Bothridial lobe wide, with 2 apices. Sensillus long, lanceolate. 4 notogastral condyles present, both pairs connected with each other. Nine pairs of simple notogastral setae. Epimeral

region well sclerotised, postepimeral fossa absent. Four pairs of genital setae. Aggenital and  $ad_3$  setae arising in the same level.

Type species: *Madabelba bercziki* sp. n.

*Remarks.* Form of the rostrum, the prodorsal sculpture, and the bothridial lobe combined with

the number of genital setae as a feature combination has been unknown in the family Suctobelbidae. On this basis the new genus is well distinguishable from all other genera of the family.

***Madabelba bercziki* sp. n.**

(Figs. 19–21)

*Diagnosis.* See the diagnosis in the description of the new genus.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 3 paratypes from the same sample. Holotype (1796-HO-09) and 2 paratypes (1796-PO-09) deposited in HHNM, 1 paratype in MHNG.

*Measurements.* Length of body: 220–243  $\mu\text{m}$ , width of body: 140–158  $\mu\text{m}$ .

*Prodorsum.* Rostral part wide, rostrum with deep, U-shaped incisure medially. Rostral tooth and true incisure absent, only a thin lateral line present. Rostral rib absent anteromedian part of prodorsum without sculpture, inner frame of the tectopedial field absent. Lamellar knob large, long, connected with interbothridial field peculiarly (Fig. 19). Bothridium large with wide, bifurcate bothridial lobe. Prebothridial rib short. Rostral setae with distinct bristles, with long curved distal end. Lamellar, interlamellar and exobothridial setae fine and short. Peduncle of sensillus very long, its head lanceolate.

*Notogaster.* Dorsosejugal region with two pairs of large condyles resembling two large condyles with double apices. Lateral ones with long crest, directed posteriorly. Notogastral sigillum absent. Nine pairs of notogastral setae present, all simple, comparatively short.

*Lateral part of podosoma.* Rostral part of prodorsum conspicuously high. Lateral part of the prodorsum with polygonate pattern. Exobothridial arch weakly developed, without strong crest. Exobothridial region distinctly punctate. Pedotec-

ta I large, rounded, its surface with polygonate pattern. Around the acetabulum of leg III a serrate border present (Fig. 21).

*Ventral parts* (Fig. 20). Epimeral borders and apodemes normally developed, a wide sternal field present between epimeral plates medially. Epimera IV with slightly undulate posterior border. Epimeral setae short and fine, setae *Ic* located laterally on pedotecta I. Genital aperture wide, not smaller than anal one. Anogenital setal formula 4-1-2-3. All setae in ventral region nearly equal in length, setae *ad*<sub>3</sub> arising far from each other, near to the lateral margin of ventral plate.

*Remarks.* See the “Remarks” after the genital diagnosis.

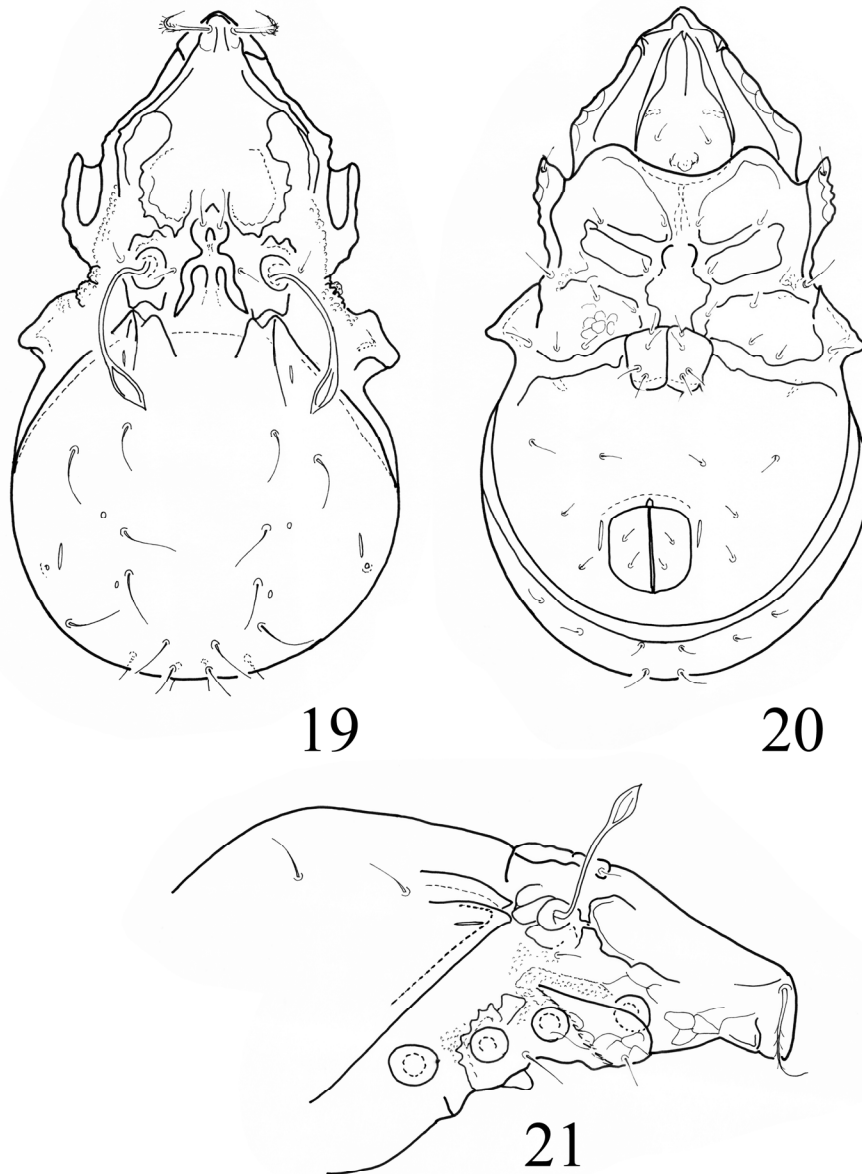
*Etymology.* I dedicate this species to my friend, Dr Árpád Berczik, well-known hydrobiologist, professor emeritus at the Eötvös Loránd University on the occasion of his 80<sup>th</sup> birthday.

***Protoripoda nasuta* sp. n.**

(Figs. 22–23)

*Diagnosis.* Rostral part wide, rostral apex nasiform, besides its two embayments. Lamellae short, with blunt apices bearing well developed lamellar setae. Rostral setae broken, interlamellar setae medium long, directed outwards. Sensillus partly covered by the protruding pteromorpha. Dorsosejugal furrow absent medially. Large, anteriorly rounded, protruding pteromorphae. Notogaster with ten pairs well developed setae and four pairs of sacculi. Epimeral setae simple, minute or absent (broken?). Epimeral borders and apodemes weakly developed. Anogenital setal formula 4-0(1?)-2-2. Anterior adanal setae arising far anteriorly.

*Material examined.* Holotype: Malagasy Republic, Vohimana Reserve, primary forest. 17. 04. 2008. Leg. Cs. Csuzdi (Afr-996). 2 paratypes from the same sample. Holotype (1797-HO-09) and 1 paratype (1797-PO-09) in HHNM, 1 paratype in MHNG.

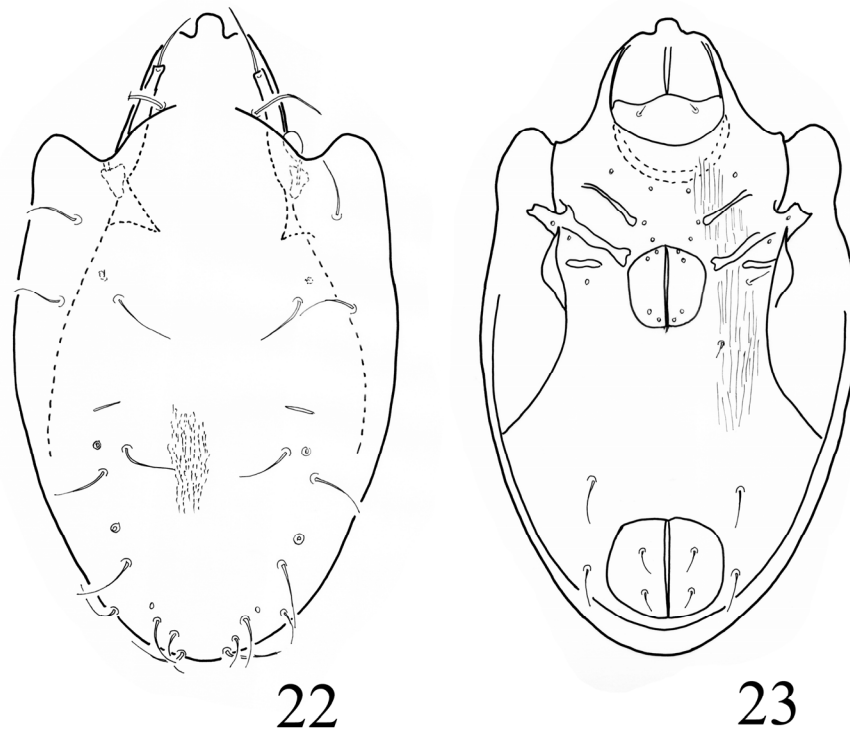


**Figures 19–21.** *Madabelba bercziki* gen. et sp. n. – 19 = body in dorsal view, 20 = body in ventral view, 21 = podosoma in lateral view

*Measurements.* Length of body: 296  $\mu\text{m}$ , width of body: 181  $\mu\text{m}$ .

*Prodorsum.* Rostral part wide, rostral apex projected forwards, comparatively large, rounded, nasiform. Lamellae short, narrow, lamellar cusp straight, slightly dilated bearing strong lamellar

setae. They reach over the rostral apex. Very narrow prelamellae present, at their distal end with the insertion of the broken setae. Interlamellar setae much shorter, spiniform, directed outwards, finely roughened. Bothridium and basal part of sensillus covered by the notogaster. Its head finely aciculate (Fig. 22).



Figures 22–23. *Protoripoda nasuta* sp. n. 22 = body in dorsal view, 23 = body in ventral view

*Notogaster*. Dorsosejugal furrow strongly convex, running to the insertion of interlamellar setae, gradually narrowed, and absent medially. Pteromorphae very large, rounded, protruding anteriorly, auriculate. Its margin conspicuously strong. Notogastral surface nearly smooth anteriorly, with rather scattered punctures or irregular alveoli arranged in ribs. Ten pairs of setiform notogastral setae, nearly equal in length. Four pairs of round sacculi. Lyrifissures *im* well observable in front of setae *lp* and *h*<sub>3</sub>. Posteromarginal setae shorter than the anterior ones.

*Lateral part of podosoma*. Pedotecta I large, pedotecta II much smaller.

*Ventral parts* (Fig. 23). Epimeral and ventral plates ornamented by irregular, or mostly irregular scratches. Epimeral setae minute or represented only by their alveoli. Pedotecta II directed slightly forwards, their posterior part with sharply pointed spur. Discidium well developed, with spiniform anterior custodium. Apodemes are typical

for the genus. Genitoanal setal formula: 4-1-2-2. Genital setae minute or represented by their alveoli, aggenital setae missing in one side, adanal setae much longer than anal setae.

*Legs*. Legs tri- and heterodactylous.

*Remarks*. On the basis of the number of genital setae the new species belongs to the genus *Protoripoda* Balogh, 1970. The new species is well characterised by the striking shape of its rostrum, a feature which has previously been unknown in this genus and the related *Calobates* Balogh, 1961 species.

*Etymology*. The species name refers to the nasiform apex.

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