

Oribatids from the Carpathian Basin with zoogeographical and taxonomical notes (Acari: Oribatida), II

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Abstract. A list of oribatids collected at several sites in Transylvania, Romania (Carpathian Basin) includes 17 species. The study yielded some species new for the examined area and three (*Dissorhina muranyii*, *Oppiella (Rhinoppia) mikoi*, *Conchogneta weigmanni* spp. n.) new to science. Some taxonomical notes on rare or little known species (e.g. *Hungarobelba visnyai*, *Dissorhina* spp.) and notes on zoogeographical distribution of some species are given. With 13 figures.

INTRODUCTION

The goals and possibilities of the oribatidological research in the Carpathian Basin* I had already summarised in the first part (Mahunka 2006 a) of this series of papers. Reference was made to the same also in the publication of the results obtained (Mahunka 2006 b) in the elaboration of the fauna of Máramaros (Romania). It was striking to notice already then that as far as the genesis of the fauna of the Carpathian Basin is concerned, what an important role is played by the fauna of Transylvania. In the progress of this work this impression became even stronger justifying the correctness of my “pincers” theory (Mahunka 1999, Mahunka & Mahunka-Papp 2004) which I formulated when examining the immigration of certain faunal elements during and after the glacial period from the Balkan Peninsula towards Transylvania and the other regions of the Basin.

For this very reason I continue to examine the various material derived from Transylvania. I discuss the total of 6 species, of which three are new to science, and several new to the fauna of

this geographical region. The samples come from various areas of Transylvania. The collecting localities as given by the collectors have already been published in my earlier papers. Likewise, I made reference to the most important authors whose systems I used, in the majority of cases modified including the most comprehensive morphological works.

LIST OF LOCALITIES

- E-1564 Transylvania, Băile Balványos (Bálványosfürdő), beach forest, moss from tree bark. 1000 m, 20.09.2007., leg. Zs. Jely and E. Horváth.
- E-1567 Transylvania, Băile Balványos (Bálványosfürdő), beach forest, litter and soil. 1054 m, 21.09.2007., leg. Zs. Jely and E. Horváth.
- E-1569 Transylvania, Băile Tuşnad (Tusnádfürdő), Szt. Anna lake, moss from the lake shore, 21.09.2007., leg. Zs. Jely and E. Horváth
- E-1580 Transylvania, Bihar Mts., Nof Canda, beach forest, Arvenul Zuresti depression, 900 m, 25. 07. 2003. Leg. T. Pócs.
- E-1588 Transylvania, Harghita Mts., below the summit, marshland, *Sphagnum* bog, 1750 m, 07.2003., leg. Cs. Csuzdi.
- E-1677 Transylvania, Retezat (Retyezát) Mts., Lapusnyik-valley, cca. 1200 m, spruce-wood, 02.07.2005., leg. Cs. Csuzdi.
- E-1679 Transylvania, Vladeasa (Vlegyásza) Mts., below the hospice, 1300 m, spruce-wood, 01.07.2005. leg. Cs. Csuzdi.

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LIST OF THE NEWLY IDENTIFIED SPECIES

BRACHYCHTHONIIDAE Thor, 1934

Eobrachychthonius borealis Forsslund, 1942

Locality: Romania, E-1677.

Liochthonius muscorum Forsslund, 1964

Locality: Romania, E-1569.

Liochthonius peduncularis (Strenzke, 1951)

Locality: Romania, E-1569.

COLLOHMANNIIDAE Grandjean, 1958

Collohmanna gigantea Sellnick, 1922

Locality: Romania, E-1580.

CARABODIDAE C. L. Koch, 1837

Odontocepheus elongatus (Michael, 1879)

Locality: Romania, E-1679.

ORIBELLIDAE Kunst, 1971

Oribella pectinata (Michael, 1885)

Locality: Romania, E-1677.

OPPIIDAE Sellnick, 1937

Berniniella sigma (Strenzke, 1951)

Locality: Romania, E-1567.

Dissorhina signata (Schwalbe, 1989)

Localities: Romania, E-1588, E-1677.

Lauroppia acuminata (Strenzke, 1951)

Locality: Romania, E-1564.

SUCTOBELBIDAE Jacot, 1938

Suctobelbella sarekensis (Forsslund, 1941)

Locality: Romania, E-1677.

ORIBATELLIDAE Jacot, 1925

Oribatella hungarica Balogh, 1943

Locality: Romania, E-1677.

DESCRIPTIONS OF NEW AND NOTES ON RARE SPECIES

HUNGAROBELBIDAE Miko & Travé, 1996

Hungarobelba visnyai (Balogh, 1938)

The species was already recorded for Transylvania, particularly from the Retezat Mts. Miko & Travé (1996) thoroughly examined the species when describing a new species from the Pyrenees. The recently collected specimen by having a robust *Aa* protuberance on its pro-dorsum is unequivocally closer to *visnyai* than to *pyrenaica*. On the other hand, the *spinae adnatae* on the Transylvanian specimen are much narrower and longer too, and what is more, it has a further protuberance at the basis of the inter-lamellar seta. The prodorsal protuberance (*ptp*) is elongate, comparatively small, its brim comprises several small arches, and in front there is a semi-lunar rib being somewhat more robust than the rest. For this particular reason in case further specimens come forward, the examination will have to be made anew.

OPPIIDAE Sellnick, 1937

Dissorhina muranyii sp. n.
(Figs. 1-3.)

Material examined. Holotype: Romania, Transylvania, Vladeasa (Vlegyásza) Mts., below the hospice, 1300 m, spruce-wood, 01.07.2005. leg. Cs. Csuzdi (E-1679)¹. 7 paratypes from the same sample. Holotype (1727-HO-2007) and 2 paratypes (1727-PO-2007): HNHM², 1 Paratype: MHNG³.

¹ Collection number of the Soil samples material in the HNHM.

² HNHM: deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.

³ MHNG: deposited in the Muséum d'histoire naturelle, Genève.

Diagnosis. Rostrum tripartite with large and well-protruding median apex.

Two pairs of weak transversal costulae and one pair of short, longitudinal ones present basally. Sensillus gradually widened distally, with 5 (4) long branches. Postbothridial tubercles present. No essential difference – except the short setae *ta* - in length of the notogastral setae. Five pairs of genital setae arranged nearly in one row, *g*₅ much longer than the others.

Measurements. Length of body: 218-231 µm, width of body: 118-129 µm.

Prodorsum. Rostral apex triangular, conspicuously protruding from the rostral part of prodorsum. Incisure wide, lateral teeth rounded, much shorter than the rostral apex. Prodorsal surface ornamented by a peculiar structure, consisting of 2-3 pairs short, slightly bent transversal and a pair of short, longitudinal ones basally (Fig. 1). Some weak maculae visible laterally. Rostral setae slightly pilose, arising in typical position on the rostral apex. Ratio of the prodorsal setae: *ro* = *exa* > *in* > *le*. Sensillus gradually dilated distally, with rounded distal end bearing 4-5 branches on its margin. A pair of well-developed posterobothridial tubercles present.

Notogaster. Anterior part well narrowed anteriorly, a short median part straight. Ten pairs of comparatively thick and long notogastral setae present, *c*₂ much shorter, setae *p*₂ and *p*₃ not shorter than the others. Setae *h*₁ characteristically bent outwards.

Lateral part of podosoma. Pedotecta I very small. Some maculae and some granulate spots present in this region, some well-sclerotised crests present above the legs (Fig. 3).

Ventral parts (Fig. 2). Apodemes and epimeral borders mostly weakly developed. *Ap* 2 not connected medially and only a short, anterior part of the sternal apodemes observable. *Ap* 4 well developed, wide, a pair of postero-epimeral fossa also observable. Epimeral surface ornamented by polygonal pattern, epimere I granulate anteriorly. Epimeral setae short, some of them finely ciliate. All setae in the anogenital region short and simple, setae *g*₅ longer than the other genital ones.

Lyrifissures *iad* in adanal position setae *ad*₁ arising on a short crest.

Legs. Not studied.

Remarks. See the notes on the *Dissorhina* Hull, 1916 species.

Etymology. I dedicate the new species to Dávid Murányi (Budapest, HNHM) for his intensive collecting activities, also in soil zoology.

Dissorhina carpatica Gordeeva et Melamud, 1991 stat. n. (Figs. 4-6.)

The taxon was described by the authors as a subspecies of *Oppia longipilosa* Kunst, 1958. On the basis of the rostral shape, the length of the setae of both the prodorsum and the notogaster, but more especially the shape of the sensillus, I consider it to be an independent species standing closer rather to *D. peloponnesiaca* (Mahunka, 1974) than to *D. longipilosa*.

Measurements. Length of body: 218-231 µm, width of body: 118-129 µm.

Prodorsum. Rostral apex triangular (Fig. 6). Prodorsal costulae compose a peculiar network (Fig. 4), a long transversal costula distinct, and a pair of longitudinal ones also well observable. Lamellar setae very short, interlamellar ones conspicuously long.

Notogaster. Ten pairs of long, well-ciliate notogastral setae present.

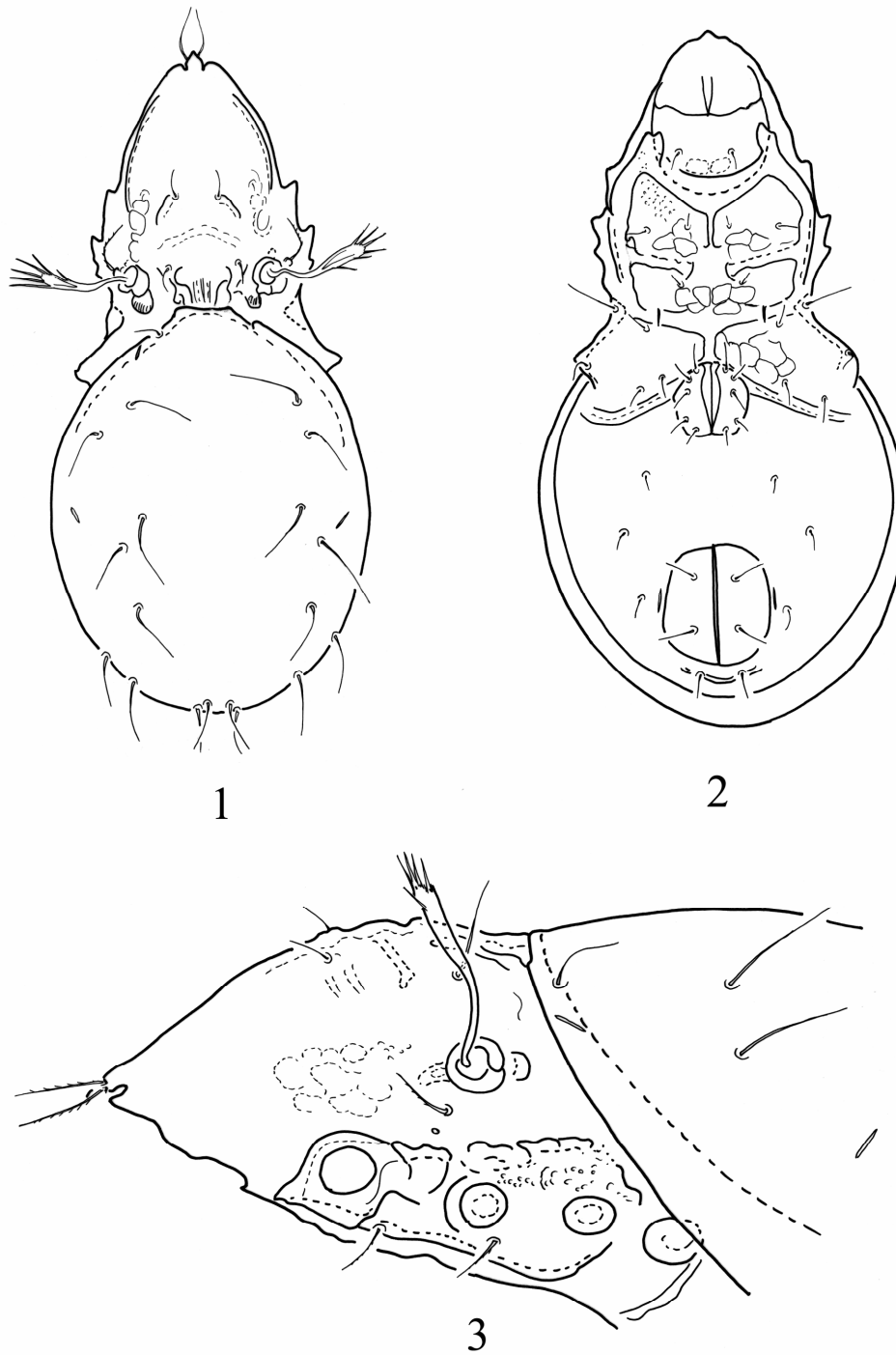
Ventral parts (Fig. 5). Epimeral borders well developed, but sternal one absent between *bo*. 2. and *bo*. *sej*. All epimeral setae comparatively long. A guttiform structure observable in postero-marginal position.

The genus *Dissorhina* Hull, 1916 and its taxa at species level

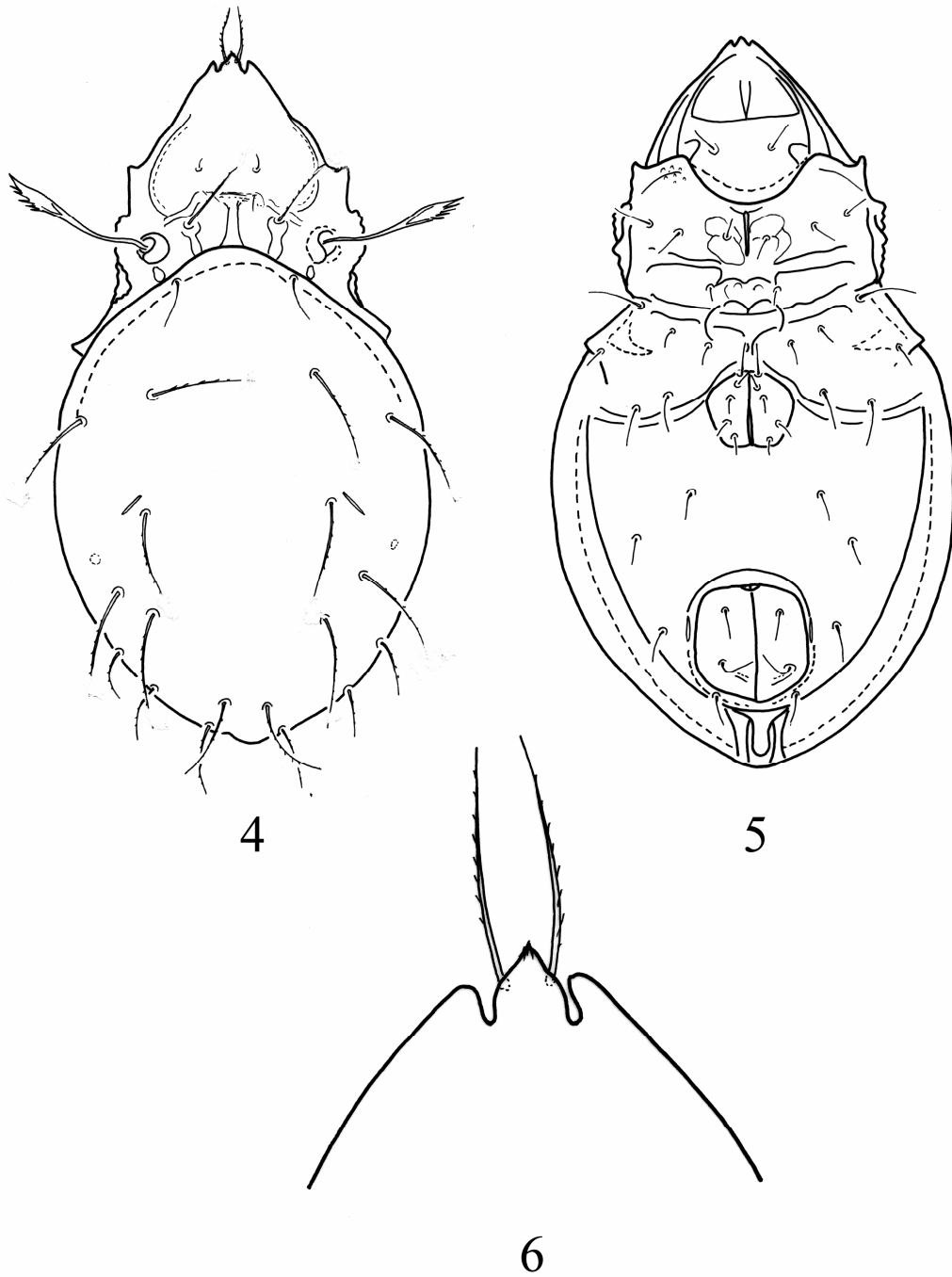
Dissorhina Hull, 1916: 401.

Type species: *Notaspis splendens* Koch, 1841 sensu Michael, 1888 = *Eremaeus ornatus* Oudemans, 1900.

Cosmoppia Balogh, 1983: 24.



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



Figures 4-6. *Dissorhina carpathica* Gordeeva et Melamud, 1991 – 4 = body in dorsal view, 5 = body in ventral view, 6 = rostral apex

Type species: *Eremaeus ornatus* Oudemans, 1900.

According to Subías (2004) the genus comprises seven species and five subspecies. He also records four synonyms of *D. ornata*.

- Dissorhina bolei* (Tarman, 1958)
Dissorhina bulganenesis Bayartogtokh, 1999
Dissorhina longipilosa longipilosa (Kunst, 1958)
Dissorhina longipilosa carpatica (Gordeeva et Melamud, 1991)
Dissorhina neotropicalis Mahunka, 1998
Dissorhina ornata ornata (Oudemans, 1900)
 = *Dissorhina captator* (Hull, 1915)
 = *Dissorhina lignivora* (Jacot, 1939)
 = *Dissorhina tricarinata* (Paoli, 1908)
 = *Dissorhina vetula* (Hull, 1914)
Dissorhina ornata corniculata (Paoli, 1908)
Dissorhina ornata globosa (Paoli, 1908)
Dissorhina ornata peloponnesiaca (Mahunka, 1974)
Dissorhina ornata tunisica (Mahunka, 1980)
Dissorhina signata (Schwalbe, 1989)
Dissorhina tricarinatoides (Dubinina, 1966)

Most of the synonyms are also accepted by Miko in Weigmann (2006), what is more, he also takes *globosa* as a synonym, which is distinct in Paoli's work. This concept is true as we look at the question. However, from among the subspecies we consider *D. carpatica* **stat. n.** independent besides the *D. ornata peloponnesiaca* and *D. ornata tunisica* **stat. n.**

Key to the *Dissorhina* species

1 (10) Distal end of sensillus with some long branches or cilia, at least some of them longer than the largest diameter of the sensillus.

2 (5) Transversal costulae absent, only short or longer longitudinal costulae present starting from the dorsosejugal region to the insertion of the lamellar setae.

3 (4) Only the short basal part of the longitudinal costulae present. They are shorter than the half distance between the dorsosejugal region and the insertion of the lamellar setae

tricarinatoides (Dubinina, 1966)

4 (3) In front of the basal costulae also short longitudinal costulae present, sometimes they are connected with the other ones reaching to the insertion of the lamellar setae

signata (Schwalbe, 1989)

5 (2) On the surface of prodorsum longer or shorter transversal costulae also present.

6 (7) One long, transversal costula present framing the basal part of the prodorsum. A median, long costula is connected to it from the dorsosejugal region, along it one pair of shorter, but stronger basal costulae or tubercles present

carpatica (Gordeeva et Melamud, 1991)

7 (6) Two pairs of short transversal costulae present, they are never connected medially.

8 (9) A pair of arched costulae starting from the bothridia, directed medially, present. Basal costulae weakly developed, directed laterally

peloponnesiaca (Mahunka, 1974)

9 (8) No costula starts from the bothridia, but a pair of short, independent costulae reaching to the insertion of lamellar setae. Basal costulae strongly developed

muranyii sp. n.

10 (1) Distal end of sensillus either smooth or at least with some minute aciculae or very short bristles.

11 (14) Notogastral setae at least partly very long, some of them reaching the insertion of the setae behind them.

12 (13) Sensillus very long and narrow, its distal end spiniform. Interlamellar setae reaching well over the insertion of lamellar ones. Notogastral setae setiform

longipilosa (Kunst, 1958)

13 (12) Sensillus much shorter and thicker, its distal end blunt, with some aciculae. Interlamellar setae not reaching the insertion of lamellar ones. Notogastral setae filiform

tunisica (Mahunka, 1980)

14 (11) Notogastral setae nearly equal in length, none of them reaching the insertion of the setae behind them.

15 (16) Sensillus very long, its distal end sharply spiniform, also long

longispina Mahunka, 2006

16 (15) Sensillus shorter, thicker, fusiform. Its distal end roundish, blunt at tip, sometimes covered by short aciculae or bristles.

17 (18) The middle surface of the prodorsum with some large tubercles

corniculata (Paoli, 1908)

18 (17) Prodorsal surface only with costulae.

19 (20) Basal costulae thick, reaching to the arched median ones. Insertion of the lamellar setae framed by a crest anteriorly

neotropicalis Mahunka, 1998

20 (19) Basal costulae narrow, directed laterally. Lamellar setae not framed anteriorly

ornata (Oudemans, 1900)

Oppiella (Rhinoppia) miko sp. n.
(Figs. 7-9.)

Material examined. Holotype: Romania, Transylvania, Vlădeasa (Vlegyásza) Mts. below the hospice, 1300 m, spruce-wood, 01.07.2005. leg. Cs. Csuzdi (E-1679). 1 paratype from the same sample. Holotype (1726-HO-2007) and 1 paratype 1726-PO-2007): HNHM.

Diagnosis. Rostrum tripartite, median apex long protruding far anteriorly, lateral incisures small, roundish. Prodorsal costulae reduced, interbothridial region with one pair of arched laths. In this region one pair of punctate maculae exist. Rostral setae long, pilose, lamellar and interlamellar ones minute or short. Exobothridial setae curved inwards, pilose. Sensillus pectinate. Postbothridial tubercle present. Ten pairs of short notogastral setae. Lyrifissures *im* located conspicuously posteriorly. Epimeral setae ciliate, epimeral surface weakly polygonate. Apodemes and epimeral borders well developed, only the sternal apodeme between *ap. 2* and *ap. sej.* absent. Genito-anal setal formula: 6 – 1 – 2 – 3.

Measurements. Length of body: 389-402 μm , width of body: 194-208 μm .

Prodorsum. Rostral apex triangular, protruding from the anterior margin. Beside it a pair of small incisures present, the lateral teeth much shorter

than the apex. Prodorsal costulae absent, only a pair of short, characteristically arched basal lath visible, which directed medially, and also forwards. In their arch a pair of punctate maculae present (Fig. 7). Rostral setae arising near to the rostrum on the dorsal surface of prodorsum, long and comparatively thick, well-ciliated. Lamellar and interlamellar setae short, fine, smooth, interlamellar one longer than the others. Exobothridial setae characteristically bent inwards, long, thin and pilose. Bothridium roundish without a drop-shaped posterior part, but one pair of postero-bothridial tubercles present. Sensillus pectinate, with 5 long branches, its head slightly dilated.

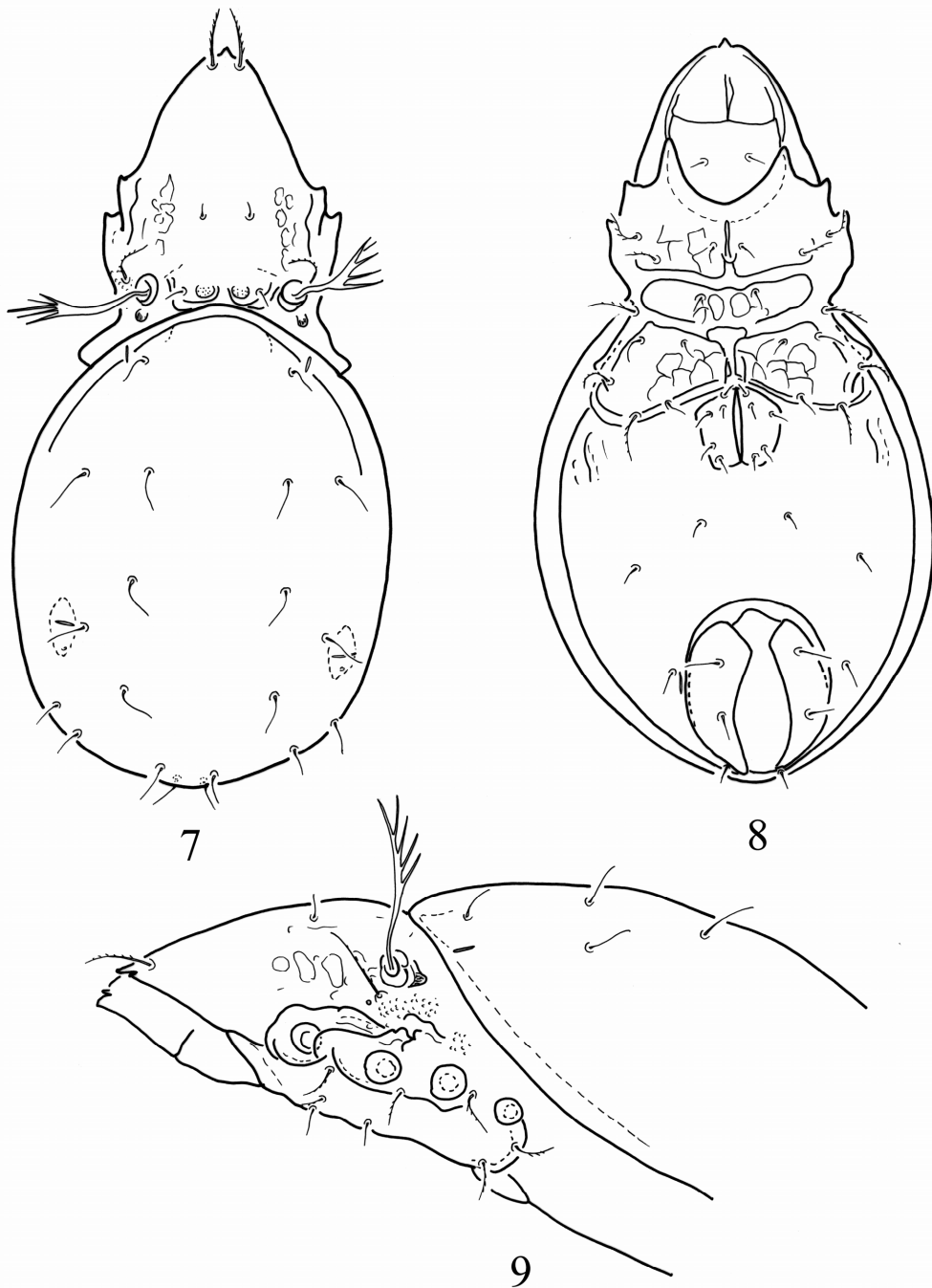
Notogaster. Dorsosejugal suture evenly protruding anteriorly. Ten pairs of short notogastral setae present, *c*₂ slightly shorter than the others. Setae *da* and *la* arising along a transversal line. Lyrifissures *ia* in normal, *im* in conspicuously posterior position, latter one very near to the glandular opening.

Lateral part of podosoma. Some irregular crests in exobothridial region, most part of this region granulate. Exobothridial setae very long (Fig. 9), slightly pilose, much longer than the other prodorsal setae.

Ventral parts (Fig. 8). Apodemes and epimeral borders – except the sternal ones – well developed, conspicuously bent and strong *ap. 4*. A part of the sternal apodeme reduced between *ap. 2* and *ap. sej.*, a knot present on its anterior part. Epimeral surface ornamented by polygonal pattern. Epimeral setae comparatively long, most of them, firstly *1a*, *1b*, *3b*, *3c*, *4b* and *4c* well pilose. Genito-anal setal formula: 5 – 1 – 2 – 3. All setae – except setae *g*₅ – short, nearly equal in length.

Remarks. The new species belongs to the *subpectinata* group of the genus *Oppiella (Rhinoppia)*. It stands nearest to *O. (R.) epilata* Miko, 2006, however, the dorsosejugal suture of *epilata* is straight medially, and the punctate maculae in the interbothridial region are missing.

Etymology. I dedicate the new species to Dr. L. Miko (Brussels), the renown Chech specialist of Oribatida, a co-author with G. Weigmann in Die Tierwelt Deutschlands Oribatida volume.



Figures 7-9. *Oppiella (Rhinoppia) mikoi* sp. n. – 7 = body in dorsal view, 8 = body in ventral view, 9 = prodorsum in lateral view

***Suctobelbella paracutidens* Mahunka, 1983**

This species stands very near to *S. acutidens acutidens* (Forsslund, 1941), *S. acutidens lobata* (Strenzke, 1951) and to *S. sarekensis* (Forsslund, 1941). However, the notogastral setae of these species are simple, smooth, on other hand, they are well pilose in *paracutidens*. Sensilli in the previous species smooth, or only with few, short cilia, but in *paracutidens* with much longer, and distinct cilia on its sensillus.

In the newly collected specimens from Transylvania the cilia are much longer than the diameter of the setae.

AUTOGNETIDAE Grandjean, 1960

***Conchogneta weigmanni* sp. n.**
(Figs. 10-13.)

Material examined. Holotype: Romania, Transylvania, Bihar Mts., Nof Canda, beach forest, Arvenul Zuresti depression, 900 m, 25. 07. 2003. Leg. T. Pócs (E-1580) 1 paratype: Romania, Transylvania, Vladeasa (Vlegyásza) Mts., below the hospice, 1300 m, spruce-wood, 01.07.2005. leg. Cs. Csuzdi (E-1679). Holotype (1725-HO-2007) and 1 paratype: (1725-PO-2007): HHNM.

Diagnosis. Rostral apex with a deep incision. Costulae wide consisting of two laths. Along the costulae a well framed oval field present. Exobothridial region covered by small or large tubercles, partly granulate. Two pairs of basal tubercles present, a pair of short longitudinal seen, bearing the thin, setiform interlamellar setae. Sensillus long, directed outwards, its head lanceolate, with 2-3 short spines. Ten pairs of long, setiform notogastral setae present, their distal part filiform. Lyrifissures *iad* located far from the anal plates, setae *ad*₃ much shorter than the other two pairs. The latter ones arising on a weak lath.

Measurements. Length of body: 314-340 µm, width of body: 163-189 µm.

Prodorsum. Rostral incisure slightly narrowing basally, U-shaped. Rostral teeth sharply pointed.

Distal part of lamellae strongly dilated, divided in two laths. Its inner margin running partly parallel, their distal end blunt at tip. (Fig. 10). There is a pair of large, nearly oval, well-framed lateral field, ornamented by hardly observable polygonal pattern (Fig. 12). The lateral tubercles absent. A fine transversal lath present in the interbothridial region, bearing two pairs of tubercles. Rostral and lamellar setae setiform, thin, rostral ones only slightly bent inwards. Interlamellar setae thin, setiform, with filiform distal end. Bothridium with large, guttiform protuberances posteriorly. Sensillus long, directed outwards and backwards, its head lanceolate, distal part covered by 2-3 small spines.

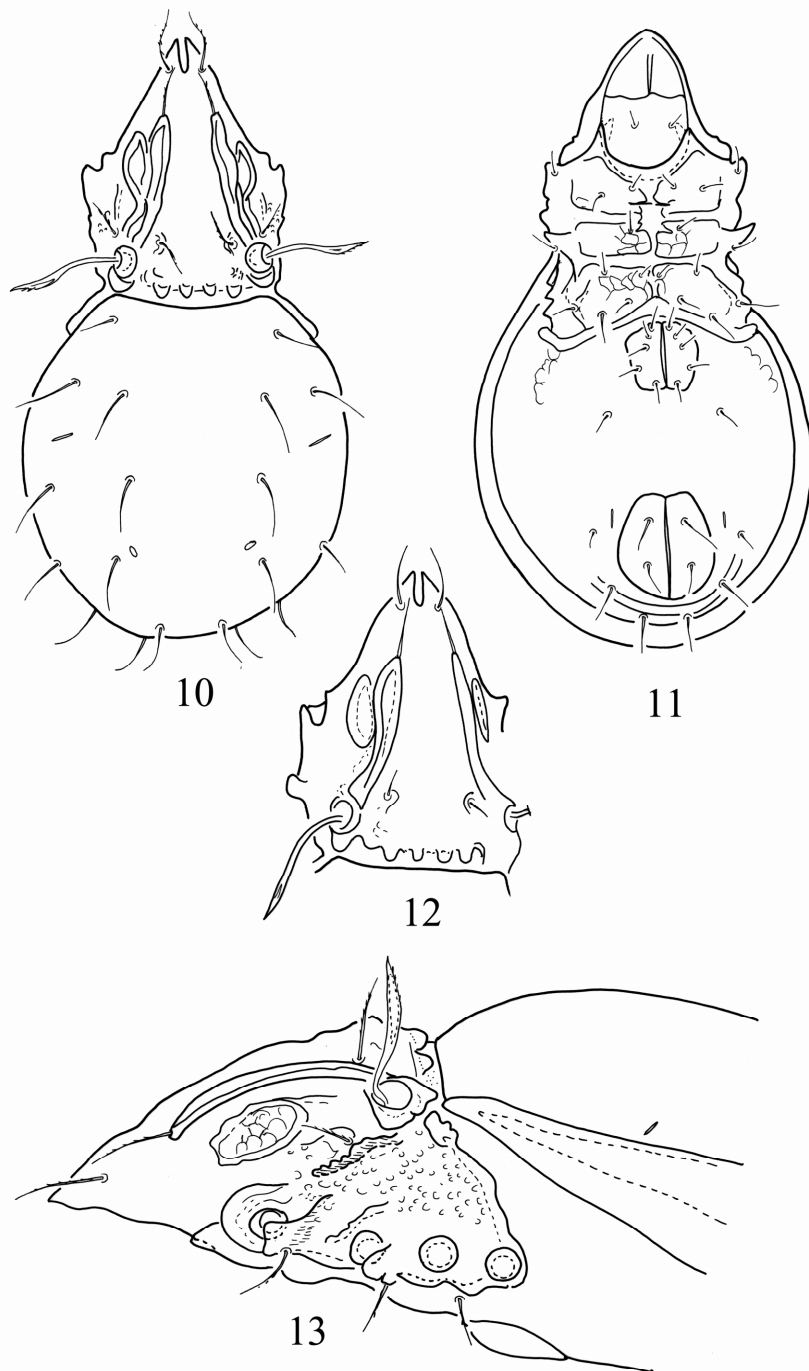
Notogaster. Humeral part of notogaster with a pair of very small protuberances. Ten pairs of setiform, mostly thin notogastral setae present, with filiform distal part. Without larger variation in length, only setae *c*₂ shorter, than the others.

Lateral part of podosoma. Along the lamellae a well framed oval field (Fig. 13) present, ornamented by weak polygonal pattern. Exobothridial region covered by characteristic, comparatively large granules and short laths. Anterior part of this field also granulate. Pedotecta I sharply pointed dorsally.

Ventral parts (Fig. 11). Apodemes and epimeral borders – except *ap. 3* – well developed, composing a thick network. Epimeral surface distinctly polygonate. All epimeral setae short, finely roughened, setae *lc* originating laterally, on pedotecta 1. Genito-anal setal formula: 5 – 1 – 2 – 3. All setae – excepting anal and adanal ones in posteromarginal position (*ad*₁ and *ad*₂) – much shorter than the others.

Remarks. The new species is well characterised by unique features: two pairs of basal tubercles in prodorsum and the shape of the costula with the large lateral oval field along it. This combination of features was unknown in this genus.

Etymology. I dedicate the new species to Prof. Dr. Gerd Weigmann (Berlin) for his outstanding work in Die Tierwelt Deutschlands Oribatida volume.



Figures 10-13. *Conchogneta weigmanni* sp. n. – 10 = body in dorsal view, 11 = body in ventral view, 12 = prodorsum in lateral view, 13 = prodorsum in dorsal view

ZOOGEOGRAPHICAL NOTES

According to the so far completed faunistical and taxonomical examinations the oribatid fauna of the Carpathian Basin is perhaps the richest in the whole of Europe. Especially true is this statement when we consider from among the four living-spaces (air, water, soil and vegetation) the fauna of the soil. Our current examinations (besides the faunistical and taxonomical ones) clearly show the richness of the oribatids prevailing here. Therefore, we would especially like to clarify the presence of the species living here, their origin, and the process and limits of their distribution.

It is highly probable that the present fauna comprises the remnants of the species having lived here during the glacial period enriched with species that immigrated to the Carpathian Basin afterwards. This duality has to be considered in spite of the fact that this regions had not been covered by ice, nevertheless, the selective effect of the glacial climate must have been in force. It is sure that more protected refuges and other warmed areas prevailed, whence in the post-glacial period with warmer and moister climate the spread of species might have occurred.

According to our earlier investigations we can definitely prove two directions of immigration which had become the basis for the whole soil mite fauna: the “pincers theory” (Mahunka 1991, Mahunka & Mahunka-Papp 2004). It is evident and we had already proved it that the decisive proportion of the immigrating species had spread through a south–north immigration route, either considering the western or the eastern branches. Considering even the quantity of the immigrating species, from the point of view of the origin of the whole fauna, special importance should be given to the Transylvanian route, to which we owe a great quantity of eastern-Mediterranean and affiliated elements.

Our recent investigations (Mahunka 2006 a, b) and the newest results clearly stress the impor-

tance of Transylvania when evaluating the fauna of the Carpathian Basin. Besides finding new proofs to demonstrate this kind of immigration, the following points were also discovered:

1. The oribatid fauna of Transylvania is extraordinarily rich. Exact numbers, of course, cannot be defined at the moment, but the preliminary calculations indicate that more species live in Transylvania than in the other parts of the Carpathian Basin collectively. Here we find the highest number of Pontian and Ponto-Mediterranean species.

2. The number of endemisms in Transylvania is outstandingly high, again, we find, there are more endemisms here than in the rest of the Basin collectively.

3. It would be a highly interesting case among the known European faunae, but the results justify us to postulate, that here, centres of species genesis had developed. According to my opinion, this is clearly proved by the recently found genera of *Dissorhina* Hull, 1916 or *Conchogneta* Grandjean, 1963, or the “*getica*” (*Oppiella* (*Rhinoppia*)) species group rich in species and its many allies.

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