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NEW AND LITTLE KNOWN ORIBATID MITES FROM THE CARPATHIAN BASIN AND THE BALKAN PENINSULA (ACARI: ORIBATIDA)

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Studies on oribatid mites collected on several sites in the Carpathian Basin and Balkan Peninsula, from Hungary, Romania and Greece are presented. Altogether 30 species are listed, six of them (*Phthiracarus duplex* sp. n., *Lauroppia (Lauroppia) brevisimilis* sp. n., *Lauroppia (Rhinoppia) undulata* sp. n., *Oribellopsis grecus* sp. n., *Oribatella valeriae* sp. n. and *Zygoribatula longa* sp. n.) are new to science. A total of 17 species are recorded from Romania and Greece for the first time. Some taxonomical and zoogeographical notes on rare or little known species are also given. With 39 figures.

Key words: taxonomical studies, new and little known species, new distributional data, Hungary, Romania and Greece

INTRODUCTION

Our own (e.g. MAHUNKA & MAHUNKA-PAPP 2004, 2008, MAHUNKA 2007) and other specialists' (e. g. CSUZDI & ZICSI 2003, CSUZDI & POP 2006, 2007) zoological research seem to indicate that the soil fauna of the Carpathian Basin has developed in comparatively young geohistorical area through a south-northward directed immigration. This direction of animal migration has been recognized and proved by other specialists too.

The relationship with farther regions, although has been recognized, as far as to the Ponto-Mediterranean region, the proper evaluation of data on the relationships of the Carpathian Basin and the Balkan Peninsula is still missing. Thus, the aim of our present investigation is to be acquainted with the details and the full exploration of the fauna-genesis, the comparison of the historical changes and the origin of soil inhabiting animal groups, and finally a comparative analysis of the chorological synthesis of the entire fauna.

The results gained so far are based on thorough international investigations (e. g. SELLNICK 1931, TARMAN 1984, VASILIU *et al.* 1993), though the Hungarian investigations, specifically the soil-zoological examinations in all the regions of the Carpathian Basin and in the Balkan have always been significant (e. g. CSIKI

1940, KUNST 1957, CSISZÁR & JELEVA 1962, KONTSCHÁN 2005, DÁNYI *et al*. 2006, MAHUNKA & MAHUNKA-PAPP 2008). Recently, this aim of investigation has again been emphasized, first by a research group of Hungarian soil zoologists (FEHÉR *et al.* 2004) from the Hungarian Natural History Museum, that later was supported by the the Hungarian Scientific Research Fund (OTKA). In taking advantage of the opportunities numerous field trips have been carried out and the obtained results were published besides our present endeavour.

MATERIAL AND METHODS

Our present contribution is based on the examination of such materials (excepting one new species collected by S. MAHUNKA on the soil zoological sample area of Szendehely) which had been gathered with the direct aim as outlined above. The collectors are the members of the Hungarian Academy of Sciences Systematic Zoology Research Group (CSABA CSUZDI, JENŐ KONTSCHÁN and ZSOLT UJVÁRI) and the staff members of the Hungarian Natural History Museum (SZILVIA CZIGÁNY and DÁVID MURÁNYI), as well as VIKTOR POP (Romania), most of them soil zoologists, who paid special attention to the versatility of soil samples. The number of samples is much bigger than the samples listed in this contribution, therefore, only a portion of the identified species is figured herewith, the others will be published elsewhere. In this paper we discuss 30 species belonging to different families, of them six are new to science: *Phthiracarus duplex* sp. n., *Lauroppia (Lauroppia) brevisimile* sp. n., *Lauroppia (Rhinoppia) undulata* sp. n., *Oribellopsis grecus* sp. n., *Oribatella valeriae* sp. n. and *Zygoribatula longa* sp. n. Besides the description of the new species we publish the data of 17 species new to the fauna of Greece. Furthermore, the list includes some poorly known or rare species whose collecting locality is entirely new.

Thus, the species list does not contain all the identified species which became known from the fauna of the investigated countries. These data will be compiled later and published separately. Species which have only been found sporadically or those which enlarge the distribution area are treated hereunder.

In this paper we follow the system of NORTON and BEHAN-PELLETIER (2009), based on that of GRANDJEAN (1954, 1965) and besides we also use the works of SUBÍAS (2004, 2009) and WEIGMANN (2006). In the descriptions the morphological terminology of GRANDJEAN (1952) 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, NIEDBAŁA 1992, 2002, WOAS 2002, WEIGMANN 2006) and first of all in the already mentioned publication of NORTON and BEHAN-PELLETIER 2009.

Depositories: the material examined is deposited in the Hungarian Natural History Museum, Budapest (HNHM) and some paratypes and also some voucher specimens are in the Muséum d'Histoire naturelle de Genève (MHNG).

List of collecting sites

H-2328b*: Hungary: Szendehely, Carpinetum, 10.11.1981. Leg. S. MAHUNKA

* Collection number of the soil samples material in HNHM

E-1999: Greece, Florina DL 126 Kotas, river valley and oak forest S of the village, N40°39'01.8" E21°10'39.3", 836 m, soil and litter. 15.05.2006. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI.

E-2001: Greece, Thesprotia county, DL 110 Petrovista, gorge near the village, N39°33'28.5" E20°28'07.8", 314 m, soil and litter, 12.05.2006. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI.

E-2307: Greece, Skiathos, Koukounaries beach, Pinu forest litter, soil, decaying debris, 25.08.2007. Leg. ZS. UJVÁRI.

E-2427: Greece, Ioannina county, Klidonia, gallery of a big sidestream of River S of the village, soil and moss, 406 m, N39°58.376' E20°39.555', 14.03.2008. Leg.: SZ. CZIGÁNY. & D. MURÁNYI 2008/29.

E-2556: Greece, Arkadia county, Elliniko, Platanus forest S of the Gortis ruins, 380 m, N32.l020' E22°03.191', 06.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI (2008/48).

E-2557: Greece, Larisa county, Ossa Mts. Beech forest, 1115 m, N39°47.865' E22°45.298' 09.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI (2008/48).

E-2561: Greece, Arkadia county Magouliana, spruce forest SW of the village, 1130 m, N37°39.404' E22°06.976', 06.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI (2009/50).

E-2562: Greece, Arkadia County l'Tetrazi Mts, Ag. Theodora, oak forest above the spring, 795 m, N37°21.290' E21°59.848', 09.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI (2009/45).

E-2564: Greece, Arkadia county, Tetrazi Mts, Ag. Theodora, oak forest the shrine, 610 m, N37°20.96' E21°59.342', 05.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI (2009/44).

E-2572: Greece, Arkadia county, Elliniko, Gortis ruins, Platanus gallery of Lousios River, 320 m, N37°32.378' E22°02.788', 06.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI, 2009/47.

E-2580: Greece, Larisa county, Karitsa, oak forest S of the village, 520 m, N39°49.615' E22°46.174', 09.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI, 2009/82.

E-2668: Romania, Ic Ponor, Sphagnum moor, birch wood, from moss and Sphagnum, N46°37.417', E22°48.218' 1065 m, 25.10.2009. Leg. CS. CSUZDI, J. KONTSCHÁN, V. POP and ZS. UJVÁRI.

E-2672: Romania, near to Zam, 4 km, pasture, N45°58,438', moss from living tree and litter from fork, E22°27.021', 180 m, 26.10.2009. Leg. CS. CSUZDI, J. KONTSCHÁN, V. POP and ZS. UJVÁRI.

E-2681: Romania, Cave Meziad, litter from Fagus forest and moss from rocks, N46°45.765', E22°28.504' 390 m, 29.10.2009. Leg. CS. CSUZDI, J. KONTSCHÁN, V. POP and ZS. UJVÁRI.

LIST OF THE SPECIES STUDIED

Phthiracaridae PERTY, 1841

Phthiracarus duplex sp. n. – Greece.

Oribotritiidae GRANDJEAN, 1954

Mesotritia nuda (BERLESE, 1887) – New record for Greece. Locality: E-2307.

Euphthiracaridae JACOT, 1930

Microtritia minima (BERLESE, 1904) – New record for Greece. Locality: E-2307.

Cosmochthoniidae GRANDJEAN, 1947

Cosmochthonius reticulatus GRANDJEAN, 1947 – Localities: E-1999, E-2562.

Hermanniellidae GRANDJEAN, 1934

Hermanniella dolosa GRANDJEAN, 1931 – New record for Greece. Locality: E-2562.

Licnobelbidae GRANDJEAN, 1954

Licnobelba latiflabellata (PAOLI, 1908) – New record for Greece. Locality: E-2580.

Microzetidae GRANDJEAN, 1936

Miracarus similis SUBÍAS et ITURONDOBEITIA, 1978 – New record for Greece. Locality: E-2580.

Astegistidae BALOGH, 1961

Furcoribula furcillata (NORDENSKIÖLD, 1901) – New record for Greece. Locality: E-2427.

Spinozetidae BALOGH, 1972

Spinozetes inexpectatus PIFFL, 1966 – Locality: E-2580.

Quadroppiidae BALOGH, 1983

Quadroppia monstruosa (HAMMER, 1979) – New record for Greece. E-2580.

Autognetidae GRANDJEAN, 1960

Conchogneta weigmanni MAHUNKA, 2005 – Locality: 2668.

Oppiidae SELLNICK, 1937

Lauroppia (Lauroppia) acuminata (STRENZKE, 1951) – New record for Greece. Locality: E-2572.
Lauroppia (Lauroppa) brevisimile sp. n. – Greece.
Lauroppia (Rhinoppia) undulata sp. n. – Hungary.

Suctobelbidae JACOT, 1938

Suctobelba altvateri MORITZ, 1970 – New record for Greece. Locality: E-2672.
Suctobelbella longirostris (FORSSLUND, 1941) – New record for Greece. Locality: E-2668.

Thyrisomidae GRANDJEAN, 1954

Oribellopsis graecus sp. n. – Greece.

Chamobatidae GRANDJEAN, 1954

Ocesobates boedvarssoni (SELLNICK, 1974) – Locality: E-2427.

Oribatellidae JACOT, 1925

Ophidiotrichus tectus (MICHAEL, 1884) – New record for Greece. Locality: E-1999.
Oribatella valeriae sp. n. – Greece.
Tectoribates ornatus (SCHUSTER, 1958) – New record for Greece. Locality: E-2001.

Oribatulidae THOR, 1929

Lucoppia burrowsi (MICHAEL, 1890) – New record for Greece. Locality: E-2427.
Oribatula tibialis (NICOLET, 1855) – New record for Greece. Locality: E-2562.
Phauloppia nemoralis (BERLESE, 1916) – New record for Greece. Locality: E-1999.
Zygoribatula exarata BERLESE, 1916 – New record for Greece. Localities: E-2556, E-2562.
Zygoribatula glabra (MICHAEL, 1890) – New record for Greece. Locality: E-2562.

Zygoribatula longa sp. n. – Greece.
Zygoribatula propinqua (OUDEMANS, 1900) – New record for Greece. Locality: 1999.

Scheloribatidae JACOT, 1935

Scheloribates (S.) pallidulus (C. L. KOCH, 1841) – New record for Greece. Locality: E-1999.

Galumnidae JACOT, 1925

Pilogalumna crassiclava (BERLESE, 1914) – New record for Greece. Locality: E-2561.

DESCRIPTIONS OF NEW SPECIES

Phthiracarus duplex sp. n.
(Figs 1–5)

Material examined. Holotype: E-2427: Greece, Ioannina county, Klidonia, gallery of a big sidestream of River S of the village, soil and moss, 406m, N39°58.376' E20°39.555', 14.03.2008. Leg.: SZ. CZIGÁNY. & D. MURÁNYI, 2008/29 and 1 paratype from the same sample Holotype (1778-HO-10) and 1 paratype (1778-PO-10) deposited in HNHM.

Diagnosis. Body surface finely punctuate. Anterior margin of rostral part widely rounded. Median field narrowed medially, comparatively long. Rostral setae long, directed inwards. Lateral carina distinct and long. All prodorsal setae filiform. Sensillus long, about ten times longer than wide, slightly dilated medially, blunt at tip. Fifteen pairs of notogastral setae, varying in size and length, setiform, curved, 2 pairs (f_1 and f_2) vestigial notogastral setae and 2 pairs (*ia* and *im*) lyrifissures present. Ano-adanal plates with five pairs of long setae, two pairs of anal setae shorter than the others. Leg chaetotaxy is of the complete type.

Measurements. Length of prodorsum: 186–196 μm, length of notogaster: 350–358 μm, height of notogaster: 197–219 μm.

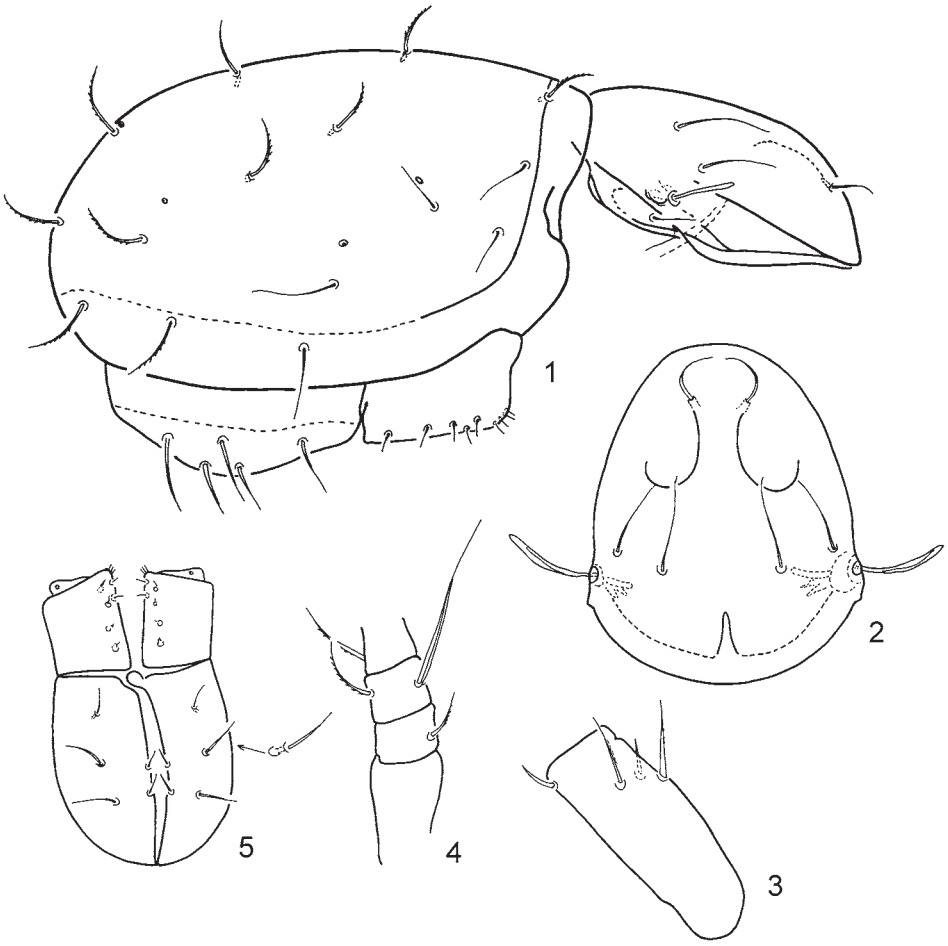
Prodorsum. Prodorsum high, well bulging in lateral view. Rostrum wide, rounded in dorsal view (Fig. 2). Rostral setae arising far from anterior margin, located far from each other, curved inwards. Median field comparatively long, converging medially. Lateral carina long, reaching to lateral rim (Fig. 1). All prodorsal setae filiform, interlamellar setae slightly longer than lamellar ones. Exobothridial setae distinct, long. Sensillus directed forward, long, about ten times longer than wide, slightly dilated medially, with finely roughened margin. Its distal end blunt at tip, or rounded.

Notogaster. With 15 pairs of fairly short notogastral setae, two pairs of alveoli of vestigial setae and two pairs of lyrifissures (*ia, im*) present. Among the setae five pairs filiform, mostly longer

than the remaining ones, setae ps_4 the longest of all. Ten pairs of setae thicker than the others, covered with short bristles (Fig. 1). Setae c_1 arising on collar line, setae c_2 and c_3 near to the collar line. Vestigial setae f_1 located between the two setae h_1.

Genitoanal region. Genital setae arising in 4+5 formation. Ano-adanal plates with five pairs of well-developed setae. Setae an_1 and an_2 shorter than adanal setae (Fig. 5).

Legs: Chaetotaxy of legs complete. Setae *d* on femora I setiform, curved (Fig. 3). All setae on femora I situated on the distal end of segment. Seta *d* comparatively long, coupled with solenidium (Fig. 4).



Figs 1–5. *Phthiracarus duplex* sp. n.: 1 = body in lateral view, 2 = prodorsum in dorsal view, 3 = femur of leg I, 4 = genu and tibia of leg IV, 5 = genito-anal region

Remarks. Variations among the notogastral setae have been known earlier in the genus *Phthiracarus* PERTY, 1841 (*spadix* group, see NIEDBALA, 1992). The new species represents another type, in which some notogastral setae are smooth, some bearing short bristles. The new species also differs from other known species of the genus *Phthiracarus* in the shape of sensillus and the form of the median field of prodorsum and the rostral setae. This combination of features is unique in this genus.

Etymology. Named after the form of the notogastral setae, somewhat resembling the notogastral setae of the genus *Steganacarus*.

Lauroppia (Lauroppia) brevisimile sp. n.
(Figs 6–12)

Material examined. Holotype: E-2564: Greece, Arkadia county, Tetrazi Mts. Ag. Theodora, oak forest the spring, 610 m, N37°20.96'E21°59.342', 05.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI, 2009/44 and 3 paratypes from the same sample. Holotype (1780-HO-10) and 2 paratypes (1780-PO-10): HNHM, 1 paratype: MHNG.

Diagnosis. Rostrum tripartite. Costula short, S-shaped. Lamellar seta arising on its distal end, shorter than the interlamellar seta. Sensillus unilaterally pectinate, its head slightly dilated medially. Crista present, median part of notogaster wide, straight anteriorly. Ten pairs of heterotrichous notogastral setae. Epimeral setae varying in length, seta *1a* the longest of all. Some setae bifurcate or irregularly barbed. Genitoanal setal formula: 6–1–2–3.

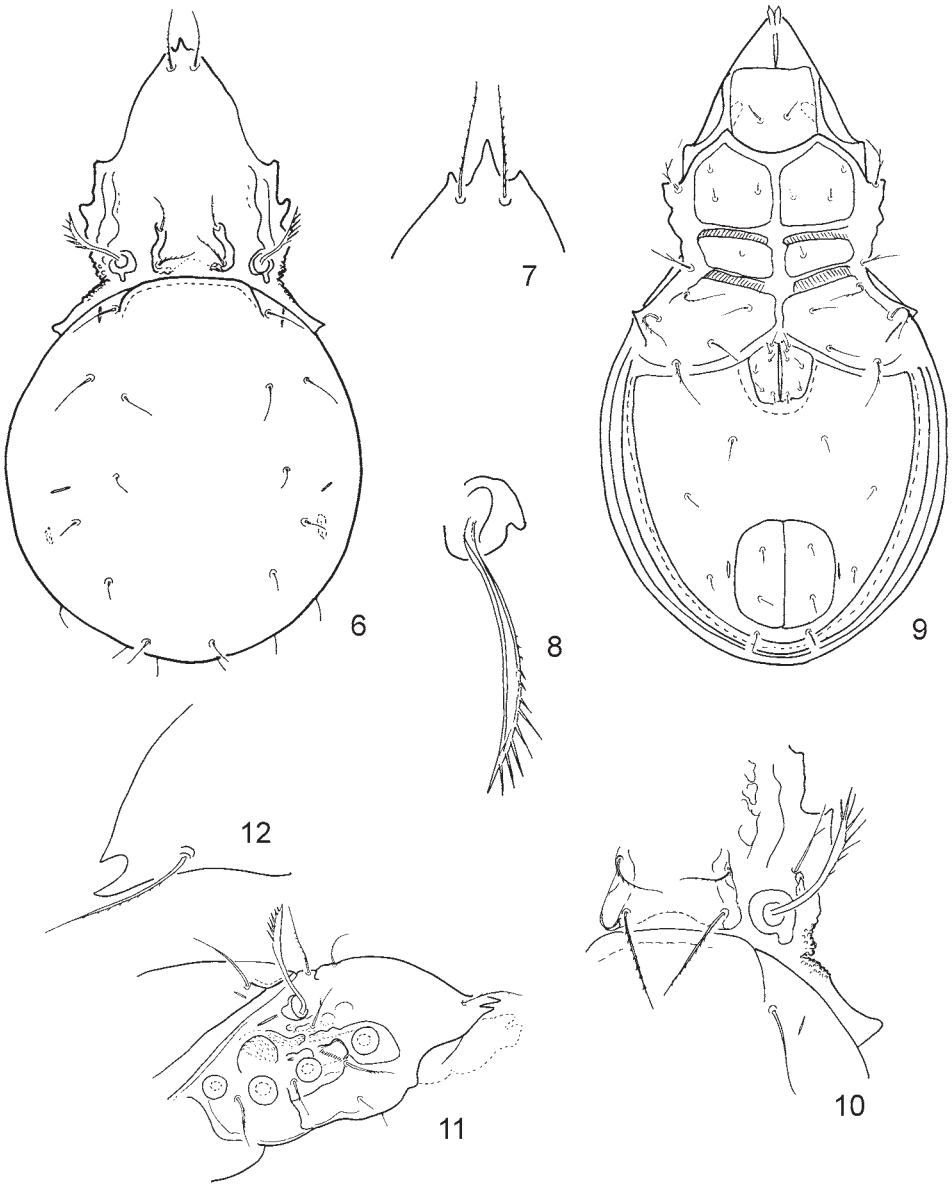
Measurements. Length of body: 400–472 μm, width of body: 242–249 μm.

Prodorsum. Rostrum tridentate (Fig. 7), median apex sharply pointed, longer and narrower than lateral ones (Fig. 12). Rostral setae arising near to median apex. A pair of short, S-shaped interbothridial costulae present bearing short lamellar setae (Fig. 10). Interlamellar setae longer and thicker than preceding ones, well barbed. Exobothridial setae bifurcate. All prodorsal setae short, length ratio: *in* > *ro* > *ex* > *le* (Fig. 11). Bothridium with short, posterior lateral expansion. Sensillus (Fig. 9) small, its head wide medially, bearing unilaterally 5–6 short and thick bristles. An additional costula with 2–3 maculae present laterally.

Notogaster. Anterior margin of notogaster with a straight ridge. Crista short and weak. Notogastral setae short and heterotrichous, setae c_2, *la* and *lm* almost twice as long as the other setae.

Lateral part of podosoma. Pedotectum I minute. Exobothridial surface well granulated, its posterior part covered with larger granules than in anterior part (Fig. 11). Some longitudinal crests present, upper bearing exobothridial setae.

Ventral parts (Fig. 8). Apodemes and epimeral borders composing a rather well closed network, all epimeres nearly equally wide. Apex of discidium sharply pointed. Epimeral surface mainly smooth, only some weak polygonate pattern visible. Epimeral setae strongly differing in length, setae *1c* much longer than *1b*, setae *3c* bifurcate, setae *4b* and *4c* also long, with some short bristles basally. All genitoanal setae short and simple, lyrifissures *iad* in adanal position.



Figs 6–12. *Lauroppia (Lauroppia) brevisimile* sp. n.: 6 = body in dorsal view, 7 = rostral part in dorsal view, 8 = body in ventral view, 9 = sensillus, 10 = basal part of prodorsum, 11 = podosoma in lateral view, 12 = rostral part in lateral view

Remarks. The new species is well characterised by the tripartite rostrum, the S-shaped interbothridial costulae, the ratio of the prodorsal setae and the ratio and form of the epimeral setae. The new species is close to *Lauroppia breviseta* VASILIU et IVAN, 1999. It may be distinguished from *breviseta* by the distance and shape of prodorsal apices (equal length in *breviseta*), by the shape of interbothridial costulae (straight in *breviseta*) and the form of medially dilated sensillus (setiform in *breviseta*) (see VASILIU & CALUGAR 1999).

Etymology. The name refers to its relation (*L. breviseta* VASILIU et IVAN, 1999).

Lauroppia (Rhinoppia) undulata sp. n.
(Figs 13–15)

Material examined. Holotype: H-2328/b: Hungary: Szendehely, Carpinetum, 10.11.1981. Leg. S. MAHUNKA and 4 paratypes from the same sample. Holotype (1780-HO-10) and 3 paratypes (1780-PO-10) deposited in HNHM, 1 paratypes in MHNG.

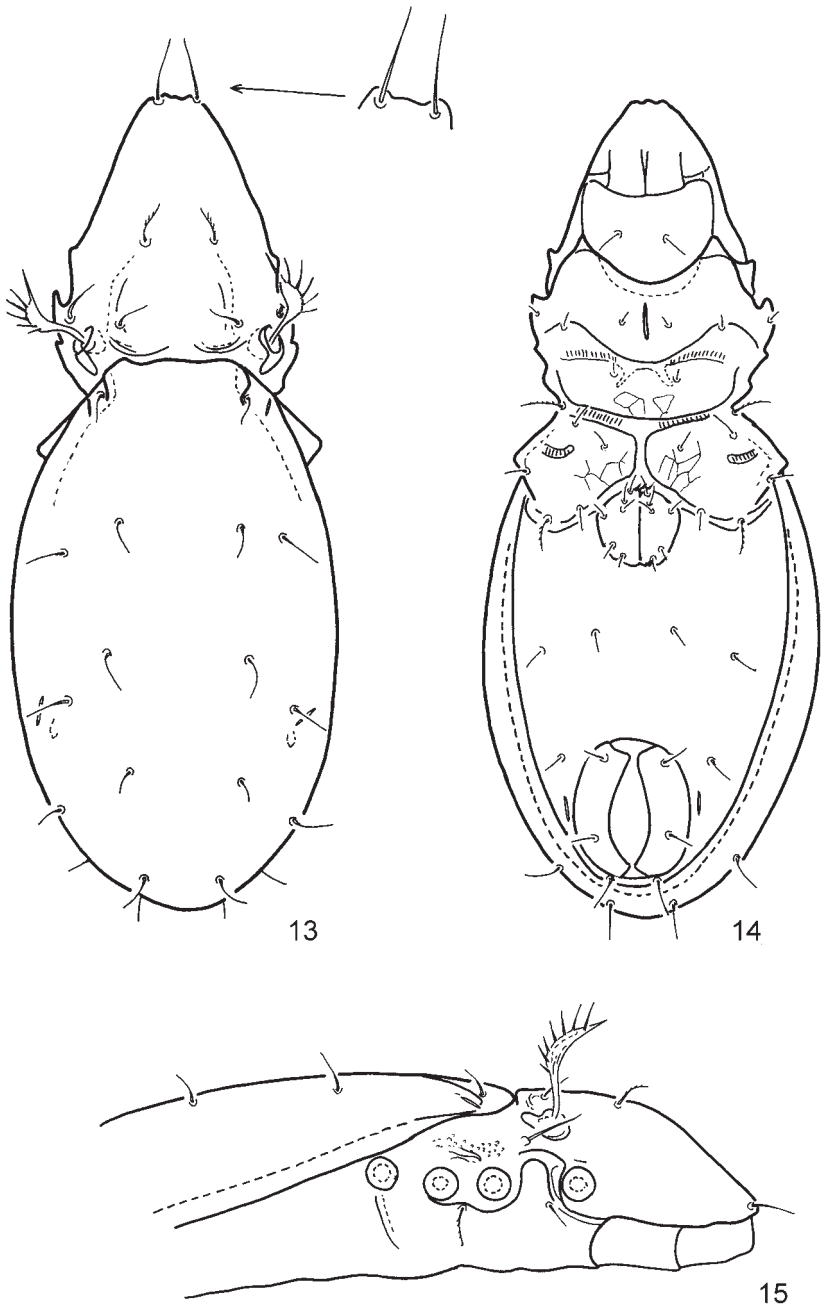
Diagnosis. Body elongated, conspicuously narrow. Rostrum without apex, rostral part blunt at tip, medially widely concave. Prodorsum with weak and short costular lines and a pair of bent transversal crests basally. Rostral setae arising near to rostral margin, lamellar setae arising in median part of prodorsum. Rostral, lamellar and interlamellar setae simple, setiform, exobothridial setae longer and distinctly thicker than others. Sensillus with asymmetrically dilated head bearing 7–8 long bristles. Notogaster with undulating anterior margin. Crista present. Coxisternal region partly well sclerotised, median apodemes partly reduced. Sejugal and apodemes 4. well observable. Genitoanal setal formula: 6–1–2–3. Setae ad_3 located far anteriorly. Lyrifissures *iad* in adanal position.

Measurements. Length of body: 352–380 μm, width of body: 104–116 μm.

Prodorsum. Rostral part wide, without apex, slightly concave or undulate medially (Fig. 13). Rostral setae situated laterally, far from each other, near to the anterior margin. A very weak, short costular line directed to insertion of lamellar setae. A pair of well sclerotised, semicircular, nearly transversal crests in interbothridial position. Bothridium with lateromarginal lath directed posteriorly. Sensillus large, its head wide, bearing unilaterally 7–8 long and thick bristles. All prodorsal setae short, length ratio: $ex > ro > le \cong in$. Exobothridial setae much thicker and longer than others, setae *le* and *in* with some short bristles.

Notogaster. Conspicuously elongate, nearly twice as long as wide, anterior margin widely undulate. A pair of well-developed cristae present. Anteromedian part of notogaster projecting into the prodorsum. Ten pairs of short, nearly equally long notogastral setae, setae c_2 located very near to lyrifissures *ia*, only slightly shorter than other notogastral setae.

Lateral part of podosoma (Fig. 15). Pedotecta I and II small. Posterior part of exobothridial region granulate. Longitudinal crests absent.



Figs 13–15. *Lauroppia (Rhinoppia) undulata* sp. n.: 13 = body in dorsal view, 14 = body in ventral view, 15 = podosoma in lateral view

Ventral parts (Fig. 14). Coxisternal region well sclerotised, but anterior and median part of sternal apodemes and epimeral borders partly or entirely reduced. Epimeral setae varying in length, setae *3c* the longest of all. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal setae, nearly equal in length. Setae ad_1 in postanal, setae ad_2 in paraanal and setae ad_3 in praeanal position, setae ad_3 located far from each other, near to the lateral margin of the ventral plate.

Legs: Excep the elongate femora II and IV all leg segments normal, all of oppioid type.

Remarks. The new species is well characterised by its undulate anterior margin of the notogaster, by the shape of rostrum and by the peculiarly transversal crests in the interbothridial region. On the basis of these peculiar features the new species is close to the relation of *Oppiella (Rhinoppia)* sensu WEIGMANN 2006 or *Lauroppia* sensu SUBÍAS and MINGUEZ (1986). However, on the basis of the prodorsal transversal crests and the ventral chaetotaxy the new species is clearly distinguished from all congeners.

Etymology. The species name refers to the undulate sculpture of the prodorsum and the notogaster.

Oribellopsis grecus sp. n.
(Figs 16–22)

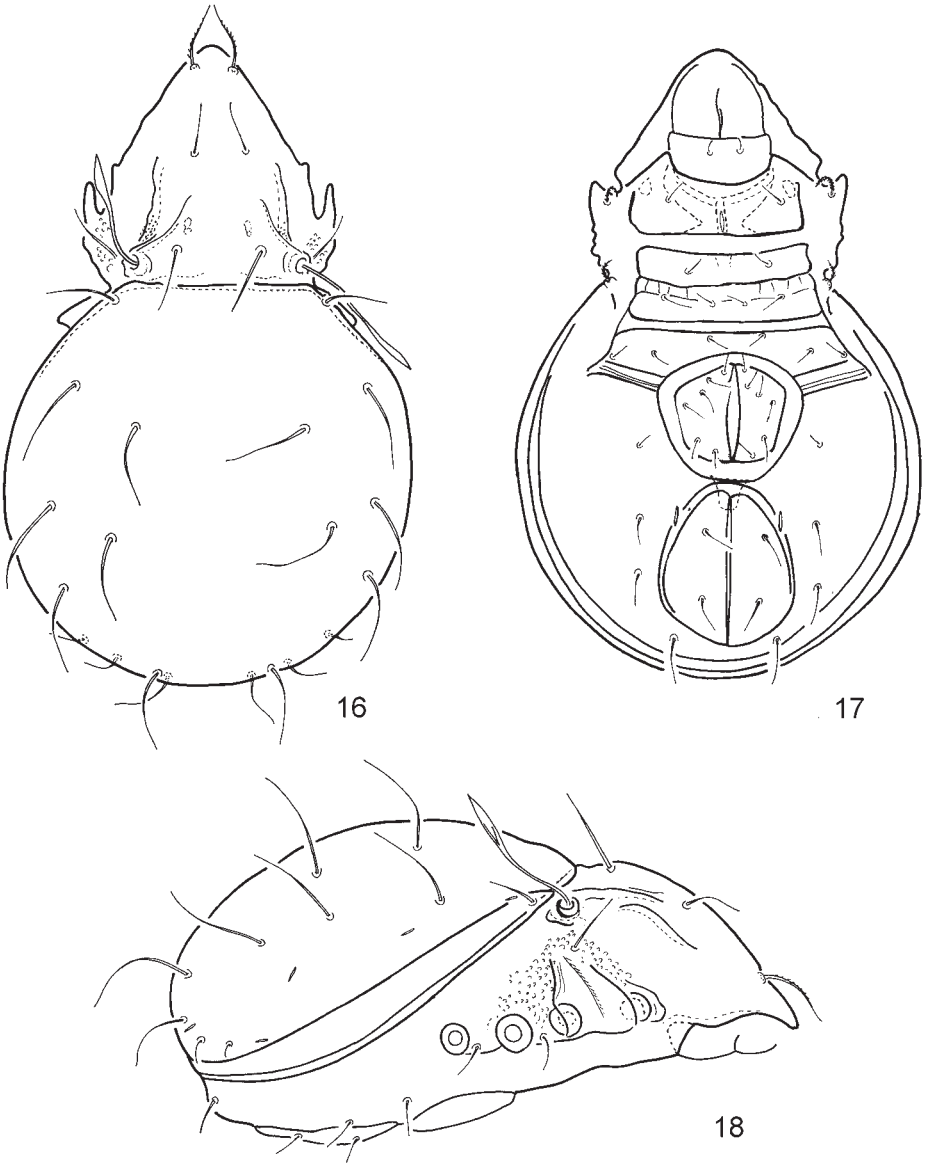
Material examined. Holotype: E-2427: Greece, Ioannina county, Klidonia, gallery of a big sidestream of River S of the village, soil and moss, 406 m, N39°58.376' E20°39.555', 14.03.2008. Leg.: SZ. CZIGÁNY & D. MURÁNYI, 2008/29 and 2 paratypes from the same sample. Holotype (1781-HO-10) and 1 paratype (1781-PO-10) deposited in HNHM, 1 paratype in MHNG.

Diagnosis. Rostral part narrow, apex rounded, without teeth or incision. Rostral setae arising on tubercles, barbed. Prodorsum with short, narrowing median costulae, lateral costulae much longer than inner ones. Lamellar and exobothridial setae setiform, pointed at tip, interlamellar seta blunt at tip. Sensillus very long, its head narrow, slightly lanceolate. Anterior margin of notogaster straight, with small humeral tubercles. Ten pairs of setiform, curved setae, excepting posteromarginal setae all others nearly equal in length. Four pairs of transversal apodemes, apodemes 4 consisting of double lines. Genital and anal aperture very large, touching medially. Genito-anal setal formula: 6–1–2–3. Lyrifissures *iad* in longitudinal position, in front of anal aperture.

Measurements. Length of body: 417–451 μm, width of body: 252–285 μm.

Prodorsum. Anterior part of prodorsum triangulate, median apex absent. Rostral setae (Fig. 22) distinctly ciliate, located near to anterior margin, arising on tubercles, short, as long as their mutual distance, curved inwards. Costulae short, much shorter than half length of prodorsum (Fig. 16). Median costulae strongly narrowing anteriorly, well convergent, ending far from the insertion of

lamellar setae. Lateral costulae on each side much longer and thicker than the median ones (Fig. 19). A pair of indistinct maculae present in interlamellar region Lamellar and exobothridial setae nearly equal in length, both pairs sharply pointed at tip (Fig. 18). Interlamellar setae slightly stronger and longer than preceding ones, distinctly blunt at tip. Bothridium angular, sensillus (Fig. 20) conspicuously long, with barely dilated, small head with smooth surface.



Figs 16–18. *Oribellopsis grecus* sp. n.: 16 = body in dorsal view, 17 = body in ventral view, 18 = podosoma in lateral view

Notogaster. Anterior margin straight, a pair of indistinct, hardly observable humeral apophyses present (Fig. 16). Ten pairs of setiform, curved notogastral setae, all smooth. Setae p_1, p_2 and p_3 much shorter than others.

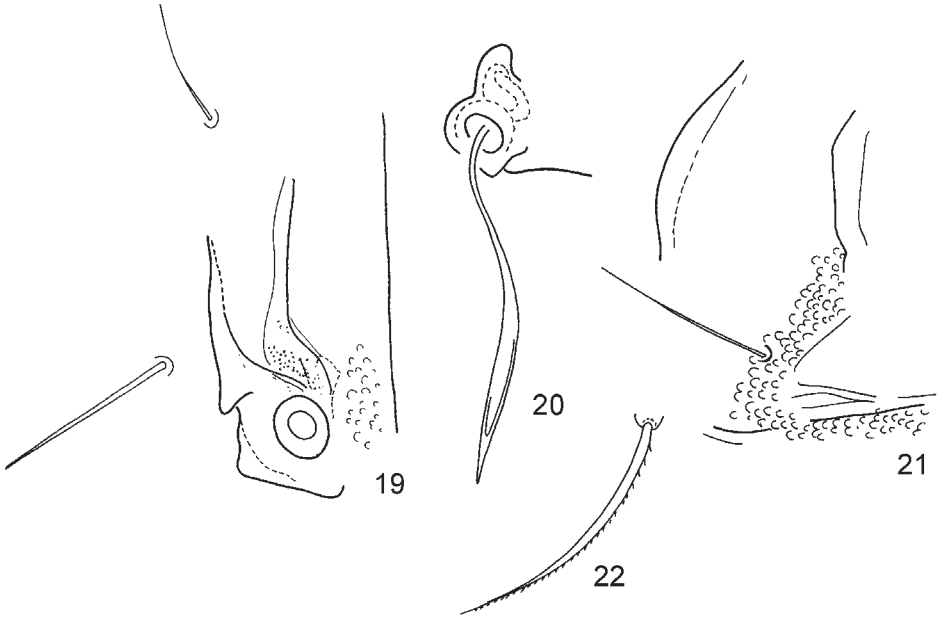
Lateral part of podosoma. Exobothridial field and a great part of sejugal region distinctly granulate (Fig. 17). Pedotecta I and II very small. Tutorium without cusp (Fig. 21).

Ventral parts. Coxisternal region well chitinised, consisting of 4 equally wide transversal and a very short anterior, longitudinal apodemes. Sejugal apodemes wider than the other, apodemes 4 consisting of double lines, apodemes 3 slightly narrower (Fig. 18). Epimeral setal formula: 3–1–3–3, all distinctly barbed. Outer border of genital and anal aperture touching medially, both openings large. Genitoanal chaetotaxy: 6–1–2–3. Anal and adanal setae equal in length, setae ad_1 arising in adanal position on the same level with lyrifissures *iad*.

Legs. All legs monodactylous.

Remarks. The new species is closely related to *Oribellopsis etruscus* (BERNINI, 1980) according to SUBÍAS (2004, 2009) and belongs in the *cavaticus* kinship. The length of costulae of the new species are short, ending far of the insertion of lamellar setae and strongly converging (much longer and reaching to the insertion of costulae in *O. etruscus*). Its apodemes 4 double lines and sternal apodema between apodemes 2 and 3 present (apodemes 4 simple in *etruscus* and sternal apodema between ap. 2 and 3 absent in *O. etruscus*).

Etymology. Named after its country origin.



Figs 19–22. *Oribellopsis grecus* sp. n.: 19 = lateral region of prodorsum, 20 = sensillus, 21 = exobothridial region, 22 = seta *ro*

Oribatella valeriae sp. n.
(Figs 23–30)

Material examined. Holotype: E-2564: Greece, Arkadia county, Tetrazi Mts, Ag. Theodora, oak forest the spring, 610 m, N37°20.96'E21°59.342', 05.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI, 2009/44 and 6 paratypes from the same sample. Holotype (1782-PO-10) and 5 paratypes (1782-PO-10) deposited in HNHM, 1 paratype in MHNG.

Diagnosis. Rostrum with a sharp median apex. Lamellae long, narrow, its median and lateral cusps equal in length. Interlamellar region with transversal bridge, median tooth absent. Tutorium serrated dorsally. Sensillus bacilliform, curved. Interlamellar setae phylliform. Notogastral surface striated anteriorly and covered with microtubercles posteriorly. Epimeral region coarsely striated. Apodemes and borders weakly developed. Epimeral setae very short, setae *3c* and *4c* similar to each other. All legs monodactylous.

Measurements. Length of body: 285–313 μm, width of body: 181–204 μm.

Integument. Surface of whole body covered with microtubercles and/or striated pattern (Fig 23). Surface of tutorium reticulate, surface of ventral plate with microtubercles and pits. Surface of median part of lamellae, of notogaster, of mentum and of epimeres covered with microtubercles. Lateral part of lamellae, of tutorium and of epimeres with longitudinal striae.

Prodorsum. Rostral apex sharply pointed, with convex lateral margin (Fig. 24). Rostral setae (Fig. 26) dilated, phylliform, curved medially, unilaterally barbed. Lamella long, cusps equal in length, with some secondary teeth on its outer margin. A short, bridge-shapedarch present between them. Long striae extending longitudinally along outer margin of lamellae, median part with microtubercles. Interlamellar region without tooth, a short bridge present posteriorly. Lamellar setae (Fig. 27) short and thick, distinctly barbed, extending beyond tip of rostrum. Interlamellar setae (Fig. 28) phylliform, strongly narrowing anteriorly, barely barbed, reaching to lamellar apex. Sensillus (Fig. 29) bacilliform, rounded distally, directed medially, finely roughened.

Notogaster. Anterior margin straight or slightly concave. Some transversal striae present in humeral position. Pteromorpha large, without incision. Four pairs of small porose areas, *Ap* much larger than posterior ones. Ten pairs of fine, smooth and short notogastral setae present, all directed laterally, posterolaterally and posteriorly. Setae *lm* arising far behind *la*, in former arching as lateral notogastral setae. Setae p_1 and p_2 much shorter than the others.

Lateral part of podosoma. Genal tooth comparatively small. Tutorium very large with many teeth dorsally and anterodorsally, some teeth present also on dorsal margin (Fig. 30). Pedotectum I covering acetabulum completely, its surface striate.

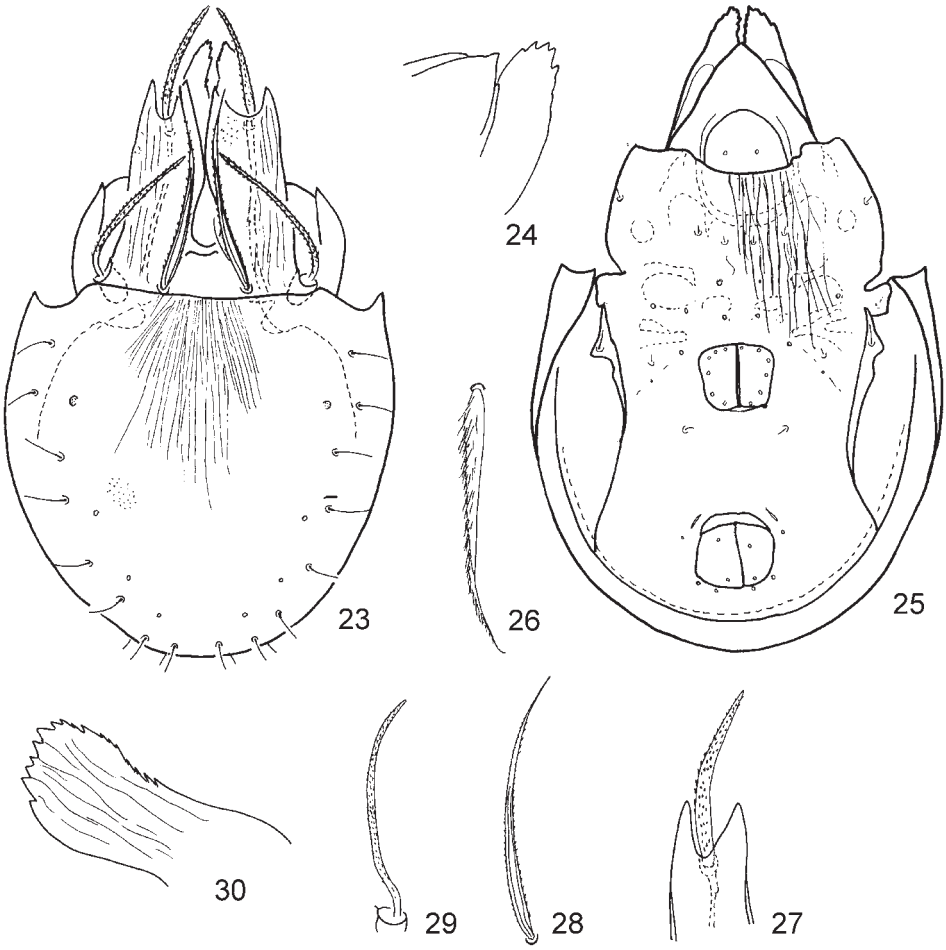
Ventral parts. Epimeral setae very short. Epimeral setal formula: 3–1–3–3. Setae *4c* slightly longer than *3c*, much shorter than discidium, setiform (Fig. 25). All setae in ventral plate short or minute. Postanal porose area conspicuously long, longer than diameter of anal aperture.

Legs. All tarsi monodactylous.

Remarks. Only one species of the genus *Oribatella* is known having phylliform interlamellar setae (*O. phyllophora* JELEVA, 1962). The new species is very close to this species (CSISZÁR & JELEVA 1962). However, the lamellar apices are

equal in length in the new species (well differing in *phyllophora*), the interlamellar setae extend to the lamellar apices (much shorter in *phyllophora*) and the bridge shaping the transversal crest is in interlamellar position (absent in *phyllophora*).

Etymology. With much love we dedicate the new species to our friend Dr. VALERIE BEHAN-PELLETIER, the excellent oribatidologist, from whom we have learnt a great deal. At the same time, we send our heartiest greetings upon the occasion of her retirement.



Figs 23–30. *Oribatella valeriae* sp. n.: 23 = body in dorsal view, 24 = rostral apex, 25 = body in ventral view, 26 = seta *ro*, 27 = lamellar apex, 28 = interlamellar seta, 29 = sensillus, 30 = tutorium in lateral view

Zygoribatula longa sp. n.
(Figs 31–39)

Material examined. Holotype: E-2561: Greece, Arkadia county Magouliana, spruce forest SW of the village, 1130 m, N37°39.404' E22°06.976', 06.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI 2009/50 and 5 paratypes from the same sample. 2 paratypes: E-2557: Greece, Larisa county, Ossa Mts, Beech forest, 1115 m, N39°47.865' E22°45.298' 09.04.2009. Leg.: L. DÁNYI, J. KONTSCHÁN, D. MURÁNYI 2008/48. Holotype (1783-HO-10) and 5 paratypes (1783-PO-10) deposited in HNHM, 2 paratypes in MHNG.

Diagnosis. With the main characters of *Zygoribatula* (see FRANKLIN *et al.* 2008). Rostrum conical. Lamellae and translamella of equal width, lamellae without cusp. Prodorsal setae different in size and length. Sensillus extremely long, longer than interlamellar setae, its head narrow bearing long bristles. Fourteen pairs of short and smooth notogastral setae. All porose areas rounded, *Aa* much larger than the others. Circumpedal carina not reaching the lateral margin of ventral plate. Lyrifissures *iad* immediately anterior to anal opening.

Measurements. Length of body: 356–395 μm, width of body: 232–266 μm.

Prodorsum. Rostral apex triangular in dorsal view. Lamella, translamella and sublamella uniform in width, with fine transversal and longitudinal lines (Fig. 36) and without lamellar cusp (Fig. 24). Prodorsal setae thin, all narrowed, setiform, finely barbed. Seta *le* longer than the others, among them seta *ex* short and smooth. Bothridium with elongate, basal tubercle. Sensillus (Fig. 35) extremely long, longer than distance between setae *in*. Its head symmetrical, shorter than peduncle, distinctly barbed.

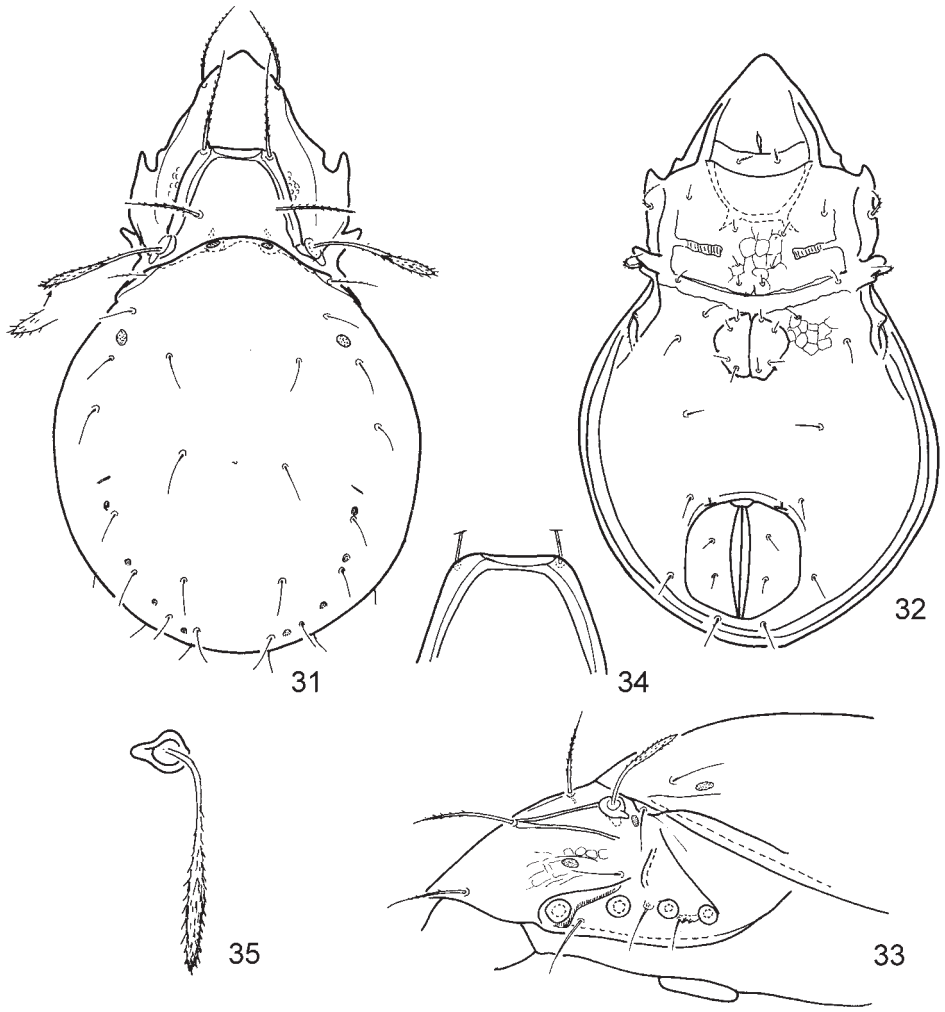
Notogaster. Longer than wide, anterior margin distinctly convex (Fig. 31). Sejugal porose area small. A small humeral apophysis present, bearing setae with short bristles. Some longitudinal striae absent. Rest of notogastral surface without sculpture. Fourteen (rarely thirteen) pairs of thin, short, simple – excepting setae c_1 –, smooth notogastral setae. Posteromarginal setae (p_1–p_3) shorter than the others. Octotaxic system consisting of rounded porose areas, *Aa* much larger than A_1–A_3.

Lateral part of podosoma. Prodorsum without prolamella; but sublamella, sublamellar and humeral(?) porose area and a weak tutorial line present (Fig. 33). Lateral surface in front of sublamelar porose area with polygonal pattern. Pedotectum I narrow, bearing setae *1c*. Setae *ro*, *le* and *ex* with fine distal end, this part blunter than in setae *in.* Their length: *le* > *in* > *ro* > *exa*.

Ventral regions. Mentum broad, shape typical diarthric, bearing distinctly barbed setae (*h*). Coxisternal region weakly sclerotised, with weak pattern. Only apodemes 2 and sejugal apodemes well developed, forming a broad transverse bridge (Fig. 32). Longitudinal apodemes absent. Epimeral setal formula: 3–1–3–3. Setae *1c*, *3c* and *4c* distinctly barbed, much thicker than the smooth and thinner epimeral setae. All lateral setae marginal on pedotecta I, pedotecta II and discidium. Genital aperture much smaller than anal opening. Surface of all fields – except epimeres 3 and 4 – smooth. Genitoanal setal formula: 4–1–2–3, all setae short and simple. Lyrifissures *iad* located between setae ad_3, near to anal aperture (Fig. 37). Postanal porose area very narrow, hardly observable.

Legs. All legs hetero-tridactylous.

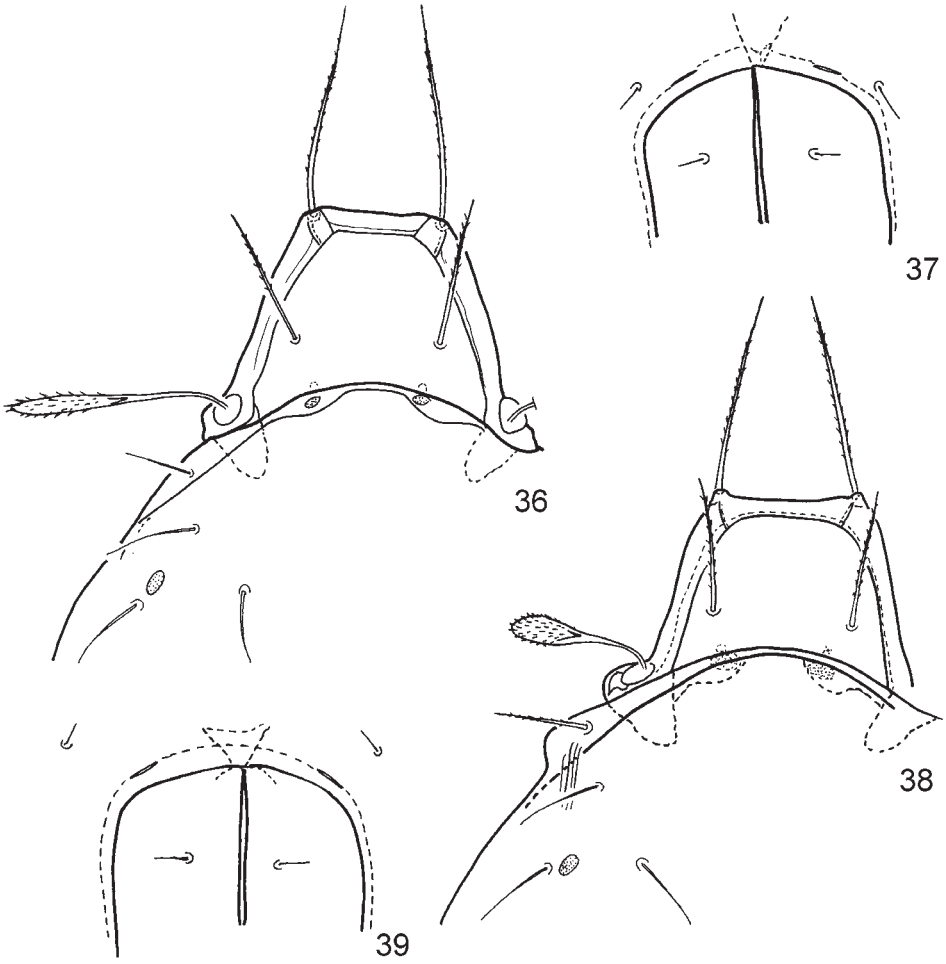
Remarks. The new species is primarily characterised by the extremely long sensillus, by the small dorsosejugal porose area, by the fourteen (rarely thirteen) pairs of notogastral setae, by the position of lyrifissures *iad*, and the position of anterior adanal setae. On the basis of the form of lamellae and the combination of other features, the new species is closest to *Zygoribatula glabra* (MICHAEL, 1890) sensu WEIGMANN (2006) (Figs 38–39). However, the absence of the lamellar cusp, the form of humeral apophysis and setae c_1, the absence of longitudinal lines



Figs 31–35. *Zygoribatula longa* sp. n.: 31 = body in dorsal view, 32 = body in ventral view, 33 = podosoma in lateral view, 34 = lamellae, 35 = sensillus

in posthumeral position and the anal aperture located far from setae ad_3 the new species may be distinguished from *Z. glabra* and from the other species belonging to its kinship.

Etymology. The species name refers to the shape of the conspicuously long and narrow sensillus.



Figs 36–39.36–37. *Zygoribatula longa* sp. n.: 36 = dorsosejugal region, 37 = anterior part of anal region. 38–39. *Zygoribatula glabra* (MICHAEL, 1890): 38 = dorsosejugal region, 39 = anterior part of anal region

TAXONOMICAL AND ZOOGEOGRAPHICAL NOTES

Thyrisomidae GRANDJEAN, 1954 was erected in his basic work by GRANDJEAN in 1954. Later KUNST (1971) split up the taxon into three families (Banksinomidae, Oribellidae and Pantelozetidae), but FUJIKAWA (1979) did not accept it when surveying the group. Subsequently, BERNINI (1980) discussed the question of the *Gemmazetes* species-group, but it was SUBÍAS (2004) who returned to KUNST's division. Some years later WEIGMANN (2006), and most recently NORTON and BEHAN-PELLETIER (2009) accepted the original classification of GRANDJEAN. This is what we follow too, but from among the genera relegated into the family we consider the genus *Infernobates* KARPPINEN et POLTAVSKAJA, 1990 as a synonym of *Oribella* BERLESE, 1908. (*Infernobates* KARPPINEN et POLTAVSKAJA, 1990 syn. n. = *Oribella* BERLESE, 1908).

We should like to note that besides the number of claws (1 and 3) of the two genera (*Montizetes* and *Oribellopsis*) no other significant morphological feature may be distinguished, for this reason we believe that further study is needed. Furthermore, the situation of the genus *Amazoppia* BALOGH et MAHUNKA, 1969 presently placed in the family of Ceratoppiidae KUNST, 1971 should be revised. The genus *Proteremaeus* PIFFL, 1965 at subfamily level should be separated from Thyrisominae (Proteremaeinae subf. n., type species *Proteremaeus jonasi* PIFFL, 1965) owing to the lack or much reduced apodemes 4, the position of notogastral setae and the presence of the caudal sacculus. It may be possible, that owing to the epimeral structure the subfamily of Banksinominae will have to be re-established. The treatment of these questions shall be the subject of a separate paper.

THE IDENTIFICATION KEY OF THE GENERA OF THE FAMILY THYRISOMIDAE

1 Apodemes 3 absent, epimeres 3 and 4 fused or opening posteriorly. Notogastral setae located marginally. – Prodorsal costulae nearly parallel
Proteremaeus PIFFL, 1965

– Apodemes 3 present, epimeres 3 and 4 not fused. – Prodorsal costulae never parallel 2

2 Prodorsal costulae well converging, their apices located very near to each other or fused medially. – 11 pairs of notogastral setae present
Banksinoma OUDEMANS, 1930

–	Apices of prodorsal costulae located far from each other. – 10 pairs of notogastral setae	3
3	Rostral margin with marginal teeth	*Pantelozetes* GRANDJEAN, 1953
–	Rostral margin smooth, rounded or conical	4
4	Fourteen pairs of notogastral setae present. – Intercostular region with secondary longitudinal crests	*Kaszabobates* BALOGH, 1972
–	Ten pairs of notogastral setae praesent. – Intercostular region without longitudinal crests	5
5	Anterior margin of notogaster convex, protruding into the interbothridial field	*Oribella* BERLESE, 1908
–	Anterior margin of notogaster straight, not protruding anteriorly	6
6	Legs with three claws	*Montizetes* KUNST, 1971
–	Legs with one claw	*Oribellopsis* KUNST, 1971

THE FAUNAL RELATIONSHIPS OF ORIBATIDA IN GREECE

The knowledge of the Oribatida fauna of Greece is rather poor so its exact evaluation would be premature. On the other hand, in some questions significant observations have been made.

The genus of *Dissorhina* HULL, 1915 in the family of Oppiidae is considered by SUBÍAS (2009) as a cosmopolitan taxon, and the available data apparently support this view. However, it is rather striking that while in the large fauna-regions each subregion shows up only 1–2 species, from the Mediterranean subregion of the Palaearctic so far more species came forward than the sum of all other regions together. It is also remarkable when we study the distribution of the species from Crete through the Balkan Peninsula to as far as the northern borders of Transylvania (including the Carpathians) many species occure with small distribution area which might also indicate faunal relationships.

This picture is not blurred even by the number of species occurring on the Appennines, since this area also belongs to the Mediterranean region. However, towards West Europe the Carpathian Basin represents a sharp demarcation borderline, because only one single species (*Dissorhina ornata* OUDEMANS, 1900) is known from here, which possesses the largest distribution area in the genus *Dissorhina*.

In many respects a similar distribution has been observed among several closely related species in the family of Microzetidae, in our case the genera of *Microzetes* BERLESE, 1913 and *Miracarus* KUNST, 1959. The distribution of the *Microzetes* species weirdly similar to that of the earlier mentioned *Dissorhina*. In the case of these species Greece (e. g. MAHUNKA 1979) has a central role, but the northernmost border of their distribution is beyond Transylvania, since they appear at several localities all over the Carpathian Basin. On the other hand, the species of *Miracarus*, are rather spread transversally in the Mediterranean region. Consequently, the area of the species is much larger (than that for example of the recently collected *M. similis* SUBÍAS et ITUDORRONBAETIA, 1978 in Greece, thus, this species is now known from Spain, through France and Switzerland to Greece) (see MAHUNKA & MAHUNKA-Papp 2009).

These two examples clearly indicate that an earlier supposition regarding the south-north movement of the taxa may be proved, since besides the above examples several others may be listed from the families of e. g. Autognetidae, Thyrisomidae and Oppiidae.

*

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