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Article

A contribution to the knowledge of oribatid and mesostigmatic mites (Acari) with new records in Georgia

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ABSTRACT
We provide new records of five oribatid and 10 mesostigmatic mite species for Georgia. As a result, the number of oribatid mites registered for Georgia increased to 548 and the preliminary number of Mesostigmata species to 136. For each record, diagnostic characters, coordinate data, habitat and information about regional and world distribution are provided.

KEY WORDS: Biodiversity; Caucasus; checklist; Gamasina; Cryptostigmata.

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INTRODUCTION

The Caucasus is one of the few temperate biodiversity hot-spots harboring great variety of habitats and species (Mittermeier *et al*. 2004). On the other hand, the information about most of invertebrate taxa is still insufficient to be used in practical applications like decision making for conservation or biomonitoring programs. The few exceptions include oribatid mites (Acari, Oribatida) which are the best-studied arthropod group in Georgia. According to a recent checklist by Murvanidze and Mumladze (2016), there were 534 oribatid species known for Georgia. Seven more species were later added to this list by Murvanidze and Arabuli (2017) and Miko *et al.* (2017). Georgian oribatid diversity can be compared with the much larger and well-studied countries like Germany (with around 570 oribatid species (Weigmann *et al*. 2015)). The knowledge of oribatid species diversity in Georgia has significantly improved during the last two decades. Namely, the number of orbatid mites of Georgia increased dramatically since 2000, from 340 (Murvanidze and Darejanashvili 2000) to 546 and discovering of new species still continues.

In contrast, other taxa of mites are much poorly studied. For instance, the data on mesostigmatic mites of Georgia come from publications of 50–80th of the last century (Wainstein 1958, 1960, 1961; Gomelauri 1968a, b, 1974; Wainstein and Arutunjan 1968, 1970; Wainstein and Vartapetov 1972, 1973a, b; Darejanashvili and Gomelauri 1975; Djaparidze and Gomelauri 1986) which indicate presence of 124 species of Gamasina (excluding morphospecies) in Georgian fauna. The only recent paper including mesostigmatic mites by Murvanidze *et al*. (2018) listed 15 species of infraorders

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Gamasina and Uropodina for central Georgia, from which two new records for Georgia and two for Caucasian region were registered.

The aim of presented paper is to provide information about new country/regional records of oribatid and mesostigmatic mites from Georgia based on materials collected in 2016–2018.

MATERIALS AND METHODS

Mites were collected during 2016–2018 from various locations in Georgia using standard soil sampling techniques (i.e. taking 10 m^3 soil sample and extracting mites using modified Berlese-Tullgren apparatus for one week).

Identification of adults was based on Ghilarov and Krivolutsky (1975) and Weigmann (2006) for oribatid mites and Ghilarov and Bregetova (1977) and Karg (1993) for Mesostigmata.

The classification of oribatid mites followed Schatz *et al*. (2011) and of Mesostigmata – Beaulieu *et al.* (2011). Data for global distribution of oribatid mites are provided after world catalogue of Subías (2004, update 2018) and of mesostigmatic mites – after Ghilarov and Bregetova (1977) and Karg (1993); data for distribution in Caucasian region are shown after Shtanchaeva and Subías (2010) (for Oribatida) and Ghilarov and Bregetova (1977) (for Mesostigmata).

Synonymy for Oribatida is provided after Weigmann (2006); for Gamasina: Parasitidae – after Kazemi and Rajaei (2013), Pachylaelapidae – after Mašan & Halliday (2013), Ascoidea – after Moraes *et al.* (2016), Ologamasidae – after Castilho *et al.* (2016).

In addition, we found several species of oribatid mites missing from a recent checklist by Murvanidze and Mumladze (2016) and here we provide information on them.

For each new record, synonyms, diagnostic characters, exact location with coordinates and preferred habitat(s) are provided.

Measurements of the specimen are taken: for oribatida - length: from the tip of the rostrum to the posterior margin of notogaster; width: the widest part of notogaster; for Gamasina – length: from the tip of idiosoma to its posterior margins. Measurements of setae are taken in the dorsal aspect from the insertion point to the end of the setae.

RESULTS

Suborder Oribatida van der Hammen, 1968
Superfamily Crotonioidea Thorell, 1876
Family Nanhermanniidae Sellnick, 1928

Nanhermannia comitalis Berlese, 1916

Material – Village Tabagrebi, Shvilobisa cave (N 42.326525, E 43.268253, 615m a.s.l.), bare soil from the cave entrance, four individuals, coll. Barjadze, Sh., 19.04.2017.

Distribution in Caucasus – This species is missing from the checklist by Murvanidze and Mumladze (2016). Early finding is known from Cross Pass (Medoeva *et al*. 1987). Also known from Azerbaijan – Lenkoran (Shtanchaeva and Subias 2010).

Global distribution – Holarctic (Subias 2004, update 2018).

Habitat – Wet soils, meadows including acidic bogs (Weigmann 2006).

Remarks

Georgian individuals are larger (about 700 µm) than reported [610–660 µm after Weigmann (2006) and 640–660 µm after Ghilarov and Krivolutsky (1975)]. All other characters match with descriptions.

Superfamily Phthiracaroidea Perty, 1841
Family Phthiracaridae Perty, 1841

Phthiracarus longulus (C.L. Koch, 1841)

Syn.: *Hoplophora longula* C.L. Koch, 1841
Phthiracarus flexisetosus Parry, 1979
Phthiracarus hortobagyensis Mahunka, 1982
Phthiracarus mundus Niedbala, 1983
Phthiracarus setosellus Jacot, 1928
Phthiracarus tardus Forsslund, 1943
Phthiracarus borealis Trägardh, 1910

Material – Javakheti highland: Village Mamtsvara (N41.293114, E43.531515, 1990m a.s.l.), litter from artificial pine forest, 112 individuals, coll. Mumladze, L., 05.07.2018; Village Mamtsvara (N41.29072 E43.541714, 2010m a.s.l.), 82 individuals, coll. Mumladze, L., 05.05.2018, overgrazed subalpine hey meadow; Village Phoka (N 41.37609322, E43.77951954, 2100m a.s.l.), subalpine hey meadow, one individual, coll. Mumladze, L., 16.09.2018; Village Phoka (N 41.37421869, E 43.77305123, 2120m a.s.l.), litter from artificial pine forest, one individual, coll. Mumladze, L., 16.09.2018.

Distribution in Caucasus – This species is missing from the checklist by Murvanidze and Mumladze (2016). Early findings are known from Auadkhara and Batumi (Shtanchaeva and Subias 2010). Also known from Russia – Dombai, Cheget, Bashi, Gokvari, Untsukul, Tsovkra, Gunib; Azerbaijan – Samur, Zakatala; Armenia – Dilizhan (Shtanchaeva and Subias 2010).

Global distribution – Holarctic (Subias 2004, update 2018).

Habitat – Forest soils (Weigmann 2006).

Superfamily Phenopelopoidea Petrunkevich, 1955
Family Phenopelopidae Petrunkevich, 1955

Eupelops hirtus (Berlese, 1916)

Syn.: *Pelops hirtus* Berlese, 1916
Phenopelops hirtus Sellnick, 1960

Diagnostic characters – *Measurements:* 825 × 605 µm; *ng* long 130–150 µm; *ss* fusiform, 10 µm; tectum straight; cerotegument thick.

Material – Close to Ninotsminda City (N 41.294489, E 43.538343, 2293m a.s.l.), soil from artificial pine forest, two male individuals, coll. Mumladze, L., 16.09.2018.

Distribution in Caucasus – New for Georgia. Known from Russia – Cheget, Bashil, Gokvari, Kurush; Armenia – Dilizhan, Sevan (Shtanchaeva and Subias 2010).

Global distribution – Holarctic (Subias 2004, update 2018).

Habitat – Acidic forest soils of medium humidity, frequent on trees (Weigmann 2006).

Remarks

Georgian individuals are somehow smaller in size than reported: 850–1100 µm after Weigmann (2006). Size of *ng* setae match within the provided limit – up to 210 µm (Weigmann 2006); no measures of *ng* setae are given by Perez- Iñigo (1972, 1993) and Mahunka (1992).

Superfamily Oripodoidea Jacot, 1925
Family Haplozetidae Grandjean, 1936

Peloribates glaber Mihelčič, 1956

Syn.: *Peloribates alatus* Mihelčič, 1957

Diagnostic characters – Measurements: 300 × 200 µm; *ss* 25 µm; *in* 25 µm; *le* 40 µm; *ng* 10–15 µm.

Material – Village Kasristskali (N 41.254701, E 46.387832, 179m a.s.l.), eroded grassland, 17 individuals, coll. Todria, N., 15.09.2018; Eldary valley (N 41.254911, E 46.388274, 178m a.s.l.), grassland, four individuals, coll. Todria, N., 15.09.2018; Javakheti highland: (N 41.33444882, E 43.73250361, 2146m a.s.l.), subalpine pasture, one individual, coll. Mumladze, L., 16.09.2018; (N 41.33851523, E 43.77696046, 2178m a.s.l.), soil from artificial pine forest, four individuals, coll. Mumladze, L., 16.09.2018

Distribution in Caucasus – New for Georgia. Known from Russia – Terek-Kuma Lowland (Shtanchaeva and Subias 2010).

Global distribution – Mediterranean (Subias 2004, update 2018).

Habitat – We have found this species mostly in meadow soils.

Remarks

Georgian individuals are much smaller in size (300 × 200 µm) compared to the original description by Mihelčič (1956) (480 × 370 µm). Perez-Iñigo (1993) also reports smaller size for this species (400–450 × 340–350 µm), however, Georgian individuals are even smaller. The rest of the characters match with diagnostic characters of *P. glaber:* rostrum wide and rounded, *in* much shorter than *le,* sensillus with rounded head and directed forward, presence of four pairs of sacculi, 14 pairs of short *ng* setae, pteromorphae short and wide. The size difference can be regarded as a regional peculiarity unless comparison with type species is possible.

Shaldybina (1975) wrongly placed this species within the genus *Protoribates.* The year of species description is also wrongly provided – "Mihelčič, 1955", while the corresponding image shows drawing from the original description (Mihelčič 1956).

Family Oribatulidae Thor, 1929

Oribatula interrupta (Willmann, 1939)

Syn.: *Zygoribatula interrupta* Willmann, 1939
Oribatula sitnikovae Iordansky, 1991

Material – Javakheti highland (N 41.3647024, E 43.77508485, 2096m a.s.l.), subalpine hey meadow, 6 individuals, coll. Mumladze, L., 18.09.2018; Samgle Klde cave (N,42.344692, E 43.337976, 403m a.s.l.), soil from the cave entrance, one individual, coll. Barjadze, S., 03.03.2017.

Distribution in Caucasus – Presence of this species in Georgia is missing from the checklist. Early findings are known from Batumi (Shtanchaeva and Subias 2010). Other findings in Caucasus are known from Russia – Makhachkala, Tsumilukh, Untsukul, Armenia – Karashamb; Azerbaijan – Massali, Lenkoran, Sheki (Shtanchaeva and Subias 2010).

Global distribution – Holarctic (Subias 2004, update 2018).

Habitat – Mountainous species. Moss and meadows (Weigmann 2006).

Family Scheloribatidae Grandjean, 1933

Scheloribates (*Hemileius*) *ovalis* (Kulijev, 1968)

Syn.: *Hemileius ovalis* Kulijev, 1968

Diagnostic characters – *Measurements:* 380 × 195 μm; *ss* 40 μm; *in* 25 μm; *le* 40 μm.

Material – Leg: Village Kvemo Kedi (N 41.384133, E 46.512133, 465m a.s.l.), grassland, 25 individuals, coll. Todria, N., 25.04.2018; Village Zemo Kedi (N 41.438600, E 46.396000, 560m a.s.l.), grassland, 25 individuals, coll. Todria, N., 25.04.2018; Eldary valley (N 41.280833, E 46.450533, 178 m a.s.l), pasture, 27 individuals, coll. Todria, N., 15.09.2018.

Distribution in Caucasus – New for Georgia. Known from Russia – Untsukul; Azerbaijan – Talish (Shtanchaeva and Subias 2010).

Global distribution – Palaearctic (Subias 2004, 2018 update).

Habitat – According to the original description (Kulijev 1968), the species was found in meadows of Talish and Odessa surroundings. Our findings confirm preference of grassland soils for this species.

Remarks

Bulanova-Zachvatkina (1975) suggested *H. ovalis* as a junior synonym of *S. turanica* Krivolutsky, 1966 without any explanations. This suggestion was not accepted in later catalogues listing Caucasian species (Subias 2004, update 2018; Shtanchaeva and Subias 2010). Subias (2004, 2008 and later updates) regards *Simkinia* Krivolutsky, 1966 as subgenus of *Hemileius* Berlese, 1916. Bayartogtokh *et al.* (2011) analyzed the status of *Simkinia*, did not accept the placement of *Simkinia* by Subias (2008 and later) as subgenus of *Hemileius* and agreed to the earlier concept proposed by Weigmann and Miko (1998) to regard both, *Hemileius* and *Simkinia* as subgenera of *Scheloribates* Berlese, 1908. We agree with the arguments provided by authors (Weigmann and Miko 1998; Bayartogtokh *et al.* 2011) and regard *Hemileius* as a subgenus of *Scheloribates.*

As for synonymy of *H. ovalis* with *S. turanica,* we think that synonymy proposed by Bulanova-Zahkvatkina (1975) is incorrect because of several differences between these two species after examination of original descriptions: (1) *H. ovalis* is smaller in size (males 380 × 198 μm, females 275 × 125 μm) than *S. turanica* (males 460 × 230 μm, females 360 × 205 μm), (2) *H. ovalis* has 10, while *S. turanica* has 11 pairs of *ng* setae; (3) sensilli of *H. ovalis* are taped in females, while for *S. turanica,* they are taped in males (Krivolutsky 1966; Kulijev 1968).

***Scheloribates* (*Topobates*) *holsaticus* (Weigmann, 1969)**

Syn.: *Topobates holsaticus* Weigmann, 1969
Setobates holsaticus Perez-Iñigo, 1993

Material – Village Okami (N 41.3427, E 43.35189, 1744m a.s.l.) pasture, one individual, coll. Mumladze, L., 27.06.2016; village Korbouli (N 42.22679, E 43.51036, 1094m a.s.l.), degraded forest (*Carpinus caucasica, Fagus orientalis, Quercus* sp.) with anthropogenic disturbance (grazing), one individual, coll. Mumladze, L., 28.06.2018.

Distribution in Caucasus – The presence of this species in Georgia is missing from the checklist by Murvanidze and Mumladze (2016). Early findings are known from Auadkhara (Shtanchaeva and Subias 2010). Other locations from Caucasus are known from Russia – Dombai, Kuli, Tsumilukh; Azerbaijan – Zakatala (Shtanchaeva and Subias 2010).

Global distribution – Palaearctic (Subias 2004, update 2018).

Habitat – Humid and wet meadows, moderately tolerant to salinity (Weigmann 2006).

Superfamily Ceratozetoidea Jacot, 1925
Family Ceratozetidae Jacot, 1925

***Ceratozetes bregetovae* (Shaldybina, 1970)**

Syn.: *Ceratozetella bregetovae* Shaldybina, 1970

Diagnostic characters – Measurements: 430 × 275 μm; *in* 90 μm; *le* 40 μm; *ss* 40 μm.

Material – Javakheti highland (N 41.515025, E 44.118635, 1587m a.s.l.), overgrazed subalpine meadow, five individuals, coll. Mumladze, L., 15.05.2017; Javakheti highland (N 41.660828, E 43.816969, 1794m a.s.l.), subalpine pasture land, one individual, coll. Mumladze, L., 16.05.2017; Javakheti highland (N 41.232590, E 44.119872, 1768m a.s.l.) subalpine pasture land, one individual coll. Mumladze, L., 20.06.2017; Javakheti highland (N 41.295248, E 43.532858, 1910m a.s.l.), subalpine pasture land, two individuals, coll. Mumladze, L., 20.06.2017; Javakheti highland, (N 41.37609322, E 43.77951954, 2100m a.s.l.), subalpine hay meadow, one individual, coll. Mumladze, L., 16.05.2017.

Distribution in Caucasus – New for Georgia. Known from Russia – Rostov, Teberda, Kurush, military-Ossetian highway (Shtanchaeva and Subias 2010).

Global distribution – Palaearctic (Subias 2004, update 2018).

Habitat – According to the original description (Shaldybina 1970), the species was found in litter under the stones at high altitude (2500m a.s.l.). We also found the species in subalpine meadows at altitudes close to 2000m a.s.l.

Remarks

This species is recorded in Kazbegi, Georgia by Shanchaeva and Subias (2010) with the reference to the original description by Shaldybina (1970). However, in the original description, Kazbegi location is not mentioned. The military-ossetian highway can include territories of both, Georgia and Russia. Therefore, we regard our findings as new records for the country.

Ceratozetes bulanovae Kulijev, 1962

Diagnostic characters – Measurements: 410 × 235 µm; *in* 90 µm; *le* 40 µm; *ss* 30 µm; lamellar cuspides very long, 45 µm.

Material – Udabno Village (N 41.502100, E 45.370250, 769m a.s.l.) overgrazed pasture, one individual, coll. Todria, N., 26.06.2017.

Distribution in Caucasus – New for Georgia. Known from: Russia – Rostov, Sochi, Dilim; Azerbaijan – Gajikend, Zakatala, Chiragedzor, Sheki, Karabakh, Kura-Arax valley (Shtanchaeva and Subias 2010).

Global distribution – Mediterranean (Subias 2004, update 2018).

Habitat – According to the original description (Kulijev 1962), the species is frequently found on anthropogenic disturbed lands, such as arable lands and pastures. We confirm this species to be adapted to disturbed ecosystems by finding them in severely overgrazed pastures.

Remarks

Measures of Georgian individuals generally match with those provided in original description: body size 399–420 × 273–294 µm, *in* 96 µm, *le* 51 µm (Kulijev 1962); sensilla are reported to be about 43 µm in size, while length of sensilla is about 30 µm in Georgian individuals.

Superfamily Galumnoidea Jacot, 1925
Family Galumnidae Jacot, 1925

Galumna rossica Sellnick, 1926

Material – Surroundings of Kaspi City (N 41.9282, E 44.3963, 520m a.s.l.) highly disturbed meadow (reclaimed mining sites, overgrazed), one individual, coll. Murvanidze, M., 23.10.2015.

Distribution in Caucasus – The presence of this species in Georgia is missing from the checklist by Murvanidze and Mumladze (2016). Early findings are known from the mixed forest in Algety reserve (Murvanidze *et al*. 2003). Other findings from Caucasus are known from: Russia – Northern Ossetia, Makhachkala; Armenia – Sevan (Shtanchaeva and Subias 2010).

Global distribution – Palaearctic (Subias 2004, update 2018).

Habitat – Forest soils, rare in meadows (Weigmann 2006).

Order Mesostigmata G. Canestrini, 1891
Infraorder Gamasina Kramer, 1881
Superfamily Parasitoidea Oudemans, 1901
Family Parasitidae Oudemans, 1901

Parasitus kempersi Oudemans, 1902

Syn.: *Gamasus kempersi* Oudemans, 1902

Diagnostic characters (female) – Measurements: 1100 × 550 µm. Body divided into two parts, cylindrical, with parallel sides, podonotal shield 550 µm and opisthonotal shield 560 µm long; tectum with three teeth of equal size, teeth are smooth, without further subdivision; dorsal setae *z1* and *r2* shorter than others 30 µm and 25 µm respectively, other dorsal setae long, 125–130 µm; setae *al1* and *al2* on palp genu spatulate, while setae *al* on palp femur divided into three parts; endogynium oval, granulated; sternal shield with net-like structure, *st1* located out of the shield, all *st* setae 60 µm; genital setae 80 µm; nine pairs of ventrianal setae, two pairs of them short 25 µm, others longer 80 µm; leg I longer than the body 1275 µm. The species differs from other species of the same group [e.g. *P. fimetorum* (Berlese, 1904), *P. americanus* Berlese, 1905] by undivided tips of the tectum (Karg 1993).

Material – Leg: Goderdzi pass (Ajara) (N 41.63954 E 42.58273, 1700m a.s.l.) litter of coniferous forest (*Abies nordmaniana*), one female, coll. Mumladze, L., 24.09.2017.

Distribution in Caucasus – New for the Caucasus. According to Tikhomirova (1977), the species is found everywhere in USSR except the Arctic, and coasts of Kaspian and Aral Seas, however, there is no direct information proofing the presence of *P. kemperski* in Caucasus until now.

Global Distribution – Holarctic (Tikhomirova 1977; Nazari and Hajizadeh 2013).

Habitat – Mostly at sea costs (Tikhomirova 1977; Bolger *et al*. 2018), we found the species in coniferous forest litter at high altitude.

Holoparasitus rotulifer (Willmann, 1940)

Diagnostic characters (female) – Measurements: 605–610 × 480 µm. Idiosoma well sclerotized, reddish-brown, shield wide, extending to the ventral side and fused with ventri-anal shield; dorsal setae short, fine, 10–15 µm; presternal plate represents stripe, narrower in the middle, postero-lateral endings pointed; paragynia large, with thickened borders, sternal plate with net-like structure, very short: length/width ratio 30–45 × 115–120 µm, three pairs of sternal setae, 55–60 µm; epigynial shield heptagonal, with net-like structure, central apex and concave margins with well-developed tips, one pair of smooth setae 40–45 µm; endogynium circular, with thorn-like projections of equal size (8–10 µm), distributed around and directed inside. The species differs from other species of this group [*H. calcaratus* (Koch, 1839), *H. excipuliger* (Berlese, 1906), *H. kerkirensis* Witalicski & Skorupski, 2002, *H. paradisiacus* Witalincski & Skorupski, 2003, *H. pollicipatus* (Berlese, 1903), *H. pseudoperforatus* (Berlese, 1906)] (Witalincski and Skorupski 2003) by well-developed excipulum and by endogynium with thorn-like projectios of equal size around.

Material – Javakheti highland (N 41.35355189, E 43.69564534, 2229m a.s.l.) soil from artificial pine forests, one female, coll. Mumladze, L., 16.09.2018; Javakheti highland (N 41.32644469 E 43.72254523, 2295m a.s.l.), subalpine hay meadow, one female, coll. Mumladze, L., 16.09.2018.

Distribution in Caucasus – New for Caucasus.

Global Distribution – South-Western Europe (Karg 1993).

Habitat – According to Karg (1993) the species can be found in bird nests and according to Tikhomirova (1977), it is frequent in caves. We found two individuals of this species in subalpine meadows.

Remarks

While all other characters match with the description, Georgian individuals are smaller in size than reported by Tikhomirova (1977), 720–730 µm and Karg (1993), 705–730 µm.

Superfamily Rhodacaroidea Oudemans, 1902
Family Halolaelapidae Karg, 1965

Leitneria pugio (Karg, 1961)

Diagnostic characters – Measurements: male 390 × 225 µm, female 325 × 190 µm; dorsal shield ornamented, divided in two parts, margins of the shields straight; tectum of females with three teeth, medial tooth slightly shorter than lateral ones; posterior part of idiosoma with additional Z_x setae between Z_1 and Z_2; genital opening is rounded from anterior part; ventrianal plate roundish oval, with length and width almost similar in size (63 × 58); Tarsus I with claws. The species differs from *L. granulata* by the shape of tectum, female with anal rather than with ventrianal shield and shields with net-like structure rather than granulated (Karg 1993).

Material – Village Zemo Kedi (N 41.438600, E 46.396000, 517m a.s.l.), steppe grassland, five individuals – one male, three females, one tritonymph, coll. Todria, N., 15.06.2017.

Distribution in Caucasus – New for Caucasus.

Global distribution – Palaearctic (Karg 1993).

Habitat – Meadows and arable soils (Karg 1993).

Family Ologamasidae Ryke, 1962

Sessiluncus colchicus Bregetova, 1977

Diagnostic characters (female) – Measurements: 585–590 × 245–250 µm; tectum with central projection, two lateral teeth and dentate sides; idiosoma with net-like sculpture, dorsal setae 50 µm; four pairs of sternal setae 25 µm; one pair of genital setae 25 µm; ventrianal plate 295 × 195 µm; five pairs of ventrianal setae 40 µm; trochanter IV with thorn-like projections. The species differs from other representatives of this genus by projections on the trochanter IV.

Material – Javakheti Highland (N 41.291997, E 43.532688, 2036m a.s.l.), soil from artificial pine forest, one female, coll. Mumladze, L., 16.09.2018; Javakheti Highland (N 41.36775901, E 43.78562484, 2106m a.s.l.), subalpine hay meadow, one female, coll. Mumladze, L., 16.09.2018.

Distribution in Caucasus – New for Georgia. Known from Russia – Akhun Mountain, Krasnodar territory, litter at decaying hornbeam (*Carpinus* sp.) (Bregetova 1977).

Global distribution – Caucasus (Bregetova 1977).

Habitat – Decaying wood, litter, soil (Bregetova 1977)

Remarks

In the original description, Black Sea coast of Georgia is indicated as an assumed distribution area along with type locality with no further details (Bregetova 1977). Accordingly, we consider our finding as to the first geo-referenced occurrence of this species in Georgia.

***Sessiluncus hungaricus* Karg, 1964**

Diagnostic characters (female) – *Measurements:* 450 × 245 µm; tectum asymmetric, with one large projection and small lateral teeth; sternal shield with four pairs of short setae 15 µm, *st1* slightly barbed; one pair of genital setae 15 µm; ventrianal plate: 250 × 160 µm, six pairs of ventrianal setae 25µm; all shields with net-like structure; tarsi I without pretarsus. Most representatives of this genus have tropical distribution (Castilho *et al.* 2016). From European species *S. hungaricus* differs from *S. cavensis* Willmann, 1940 and *S. reticulatus* Loots, 1980 by body size [600 µm for *S. cavensis* (Bregetova, 1977) and 750 µm for *S. reticulatus* (Castilho *et al.* 2016)], shape of tectum and barbed *st1*. According to Bregetova (1977), *S. hungaricus* is very close or even similar to *S. holostaspodes* Canestrini, 1884.

Material – Eldary valley (N 41.2808333, E 46.450533 178m a.s.l.) moderately overgrazed pasture, one female coll. Todria N. 15.09.2018.

Distribution in Caucasus – New record for Georgia, in Caucasus is recorded from Azerbaijan – Lenkoran (Bregetova 1977).

Global distribution – Europe (Bregetova 1977).

Habitat – Litter, soil (Bregetova 1977).

Superfamily Eviphidoidea Berlese, 1913
Family Pachylaelapidae Berlese, 1913

***Pachyseius humeralis* Berlese, 1910**

Diagnostic characters (female) – Measurements: 745 × 370 µm; tectum straight, dentate; dorsal shield with parallel margins, setae simple, J1-J5 40µm, Z1-Z5 and S2-S4 65 µm; sternal plate with three pairs of setae 30 µm; one pair of genital setae 40 µm; ventrianal plate 300 × 235 µm, with three pairs of setae 50 µm; metapodal shields long, narrow, 85 µm. Four species of genus other than *P. humeralis* have three pairs of ventrianal setae: *P. pachylaelapoides* Mašan & Mihal, 2007, *P. cicacki* Mašan & Mihal, 2007, *P. iraola* Moraza, 1993 and *P. wideventris* Afifi & Nasr, 1984 (Mašan and Mihal 2007). *Pachyseius humeralis* differs from them by weakly sclerotized presternal shields connected to the sternal shield, oblong (longer than wide) ventrianal plate and metapodal shields well separated from the lateral margins of ventri-anal plate.

Material – Javakheti highland (N 41.31952703, E 43.76917047, 2143m a.s.l.) soil from artificial pine forest, one female, coll. Mumladze, L., 31.08.2018.; Javakheti highland (N 41.348734, E 43.695654, 2113m a.s.l.), soil from artificial maple (*Acer* sp.) plantation, one female, coll. Mumladze, L., 31.08.2018; Javakheti highland (N 41.35541628, E 43.69839602, 2311m a.s.l.), soil from artificial pine forest, two females, coll. Mumladze, L., 31.08.2018.

Distribution in Caucasus – New for Caucasus.

Global distribution – Palaearctic (Mašan and Halliday 2013).

Habitats – Grasslands, broad leaved and coniferous forests, limestone soils, decaying organic material and humus (Karg 1993).

Superfamily Ascoidea Voigts & Oudemans, 1905
Family Ascidae Voigts & Oudemans, 1905

Antennoseius bacatus Athias-Henriot, 1961

Diagnostic characters (female) – Measurements: 535–540 × 240–255 µm with podonotal shield of 265–275 ×240–255 µm and opisthonotal shield 235–265 × 230–245 µm. Body with sculpture made of granules and tubercles; *j1* setae leaf-shaped, barbed, 27–30µm long, others – widened, barbed, 25 µm long; tectum with three dentate projections; ventrianal shield about 115–120 µm long and 125–130 µm wide, with two pairs of preanal and three pairs of anal setae (13–15 µm); leg I without pretarsus and claws, 480 µm. *Antennoseius bacatus* differs from closest species *A. alexandrovi* Bregetova, 1977 by having an additional three unpair setae together with 16 pairs of paired setae and dorsal setae heavily barbed *vs* fusiform, dentate setae in *A. alexandrovi*.

Material – Village Pirosmani (N 41.387850, E 46.569400, 210m a.s.l.) heavily overgrazed pasture, one female, coll. Todria, N., 15.06.2017; village Zemo Kedi (N 41.436067, E 46.389867, 598m a.s.l.), pasture with moderate grazing, one female, coll. Todria, N., 15.06.2017.

Distribution in Caucasus – New for Caucasus.

Global distribution – Europe (Karg 1993).

Habitat – Moss, litter, soil, arable lands (Karg 1993).

Cheiroseius (*Cheiroseius*) *viduus* (C.L. Koch, 1839)

Syn.: *Sejus viduus* Koch, 1839
Epicrius corniger Berlese, 189
Lasioseius (*Lasioseius*) *corniger* Berlese, 1916
Platyseius corniger Schweizer, 1961
Episeiella heteropoda Willmann, 1931
Cheiroseius heteropoda Westerboer, 1963

Diagnostic characters (female) – Measurements: 480–500 × 325–340 µm; tectum with three teeth; idiosomal setae *j1* 55 µm, most of the other dorsal setae 35 µm and setae in the posterior part 20 µm; setae *j1*, *s1* and *r1* located on the upraised vertex; dorsal shield with well-developed net-like ornament; ventrianal plate with four pairs of setae 25 µm. Tarsus I without claws.

Material – Javakheti highland (N 41.37609322, E 43.77951954, 2100m a.s.l.) subalpine hay meadow, three individuals – one male, two females, coll. Mumladze, L., 15.07.2017; Javakheti highland (N 41.35483829, E 43.69465529, 2239m a.s.l.), subalpine meadow two females, coll. Mumladze, L., 15.07.2018; Javakheti highland (N 41.32000838, E 43.77676686, 2220m a.s.l.), subalpine hay meadow, eight individuals – two males, six females, coll. Mumladze, L., 31.08.2018; Javakheti highland (N 41.32363145, E 43.76461981, 2054m a.s.l.), three females soil from artificial pine forest, coll. Mumladze, L., 31.08.2018.

Distribution in Caucasus – New for Caucasus.

Global distribution – Europe (Karg 1993; Moraes *et al.* 2016).

Habitat – Humid meadows, flooded woodlands, grasslands, moss (Karg 1993).

Neojordensia levis (Oudemans & Voigts, 1904)

Diagnostic characters (female) – Measurements: 565–570 × 295–300 μm; tectum rounded, smooth; idiosoma with net-like sculpture; all dorsal setae smooth, fine, 10–15 μm; all ventral setae smooth, of almost the same size 25–30 μm; *st1* located on presternal shields and *st4* on metasternal shields; genital plate with 1 pair of setae; ventrianal shield with slightly concave anterior margin, bearing four pairs of preanal and three pairs of anal setae, length of the shield is about 240 μm and width (at widest part) 240 × 280 μm. *Neojordensia levis* differs from other species of the genus occurring in Europe [*N. meritricha* Athias-Henriot, 1973 and *N. sinuata* Athias-Henriot, 1973] (Karg 1993; Castilho *et al.* 2016) by the presence of metasternal setae (*st4*) and straight posterior margin of sternal shield, which is also shorter than distance between coxae II and III.

Material – Javakheti Highland (N 41.291997, E 43.532688, 2036m a.s.l.), soil from artificial pine forest, one female, coll. Mumladze, L., 31.08.2018; Javakheti Highland (N 41.36775901, E 43.78562484, 2106m a.s.l.), subalpine hay meadow, five females, coll. Mumladze, L., 31.08.2018.

Distribution in Caucasus – New for Georgia. Distributed in Caucasus and Transcaucasia (Bregetova 1977).

Global distribution – Europe (Karg 1993; Moraes *et al.* 2016).

Habitat – Litter, soil, sea costs, bogs, nests of rodents (Bregetova 1977).

Remarks

According to Bregetova (1977), the species occurs in the Caucasus, but exact geographic locations are not provided. The presence of this species in Georgia is not proved by other available literature. Therefore, we regard our finding as a new record for the country.

Zerconopsis remiger (Kramer, 1876)

Syn.: *Gamasus remiger* Kramer, 1876
Seiulus remiger Halbert, 1915
Zerconopsis remigera Hull, 1918
Zercoseius remiger Willmann, 1935
Lasioseius remiger Hirschmann, 1962

Lasioseius (*Lasioseius*) *remiger* Westerboer, 1963
Lasioseius (*Lasioseius*) *bispinosus* Berlese, 1916
Lasioseius müstairi Schweizer, 1949

Diagnostic characters (female) – Measurements: 570–585 × 330–335 µm; tectum with three dentate teeth; dorsal shield whole, without lateral cuts, heavily ornamented; shoulder setae *s4* not protruding; three pairs of paddle-like setae; peritrematal shields curved behind coxae IV; one pair of genital setae; ventrianal shield with six pairs of setae; metapodal shields large, oval triangular; legs I with claws.

Material – Leg: Javakheti highland (N 41.33290303, E 43.733682525, 2176m a.s.l.), soil from artificial pine forest, one female, coll. Mumladze, L., 15.09.2018; Javakheti highland (N 41.33444882, E 43.73250361, 2171m a.s.l.), soil from artificial pine forest, one female, coll. Mumladze, L., 15.09.2018.

Distribution in Caucasus – New for Caucasus.

Global distribution – Europe (Karg 1993; Moraes *et al.* 2016).

Habitat – Mixed forests, moss, litter, humid and dry substrates (Karg 1993).

CONCLUDING REMARKS

Our results contribute to the enrichment of regional acarofauna by five oribatid and ten mesostigmatic mites. Oribatid mites are good objects for biological monitoring (Gergocs and Hufnagel 2009) and knowledge of their diversity can help to establish nationwide biomonitoring programs related to local stressors (like land use) and/or global problems (climate change). Though the oribatid mite diversity can be assumed to be well studied for Georgia, there are still many rare species known only from only single or few locations (Murvanidze and Mumladze 2016). Thus, additional samplings are needed to fully understand country scale species distributions and habitat preferences of oribatid mites.

On the other hand, knowledge on the diversity and distribution of other mite taxa is still in initial stages of investigation and much more work is needed to get a good understanding of total diversity of Georgian Acari.

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اطلاعاتی در مورد کنه‌های اریباتید و میان‌استیگما (Acari) همراه با گزارش‌هایی جدید از گرجستان

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چکیده

گزارش‌های جدیدی از پنج گونه کنهٔ اریباتید و ۱۰ گونه کنهٔ میان‌استیگما برای گرجستان تهیه شده است. در نتیجه، شمار گونه‌های اریباتید ثبت شده از گرجستان به ۵۴۸ و شمار اولیهٔ گونه‌های میان‌استیگما به ۱۳۶رسید. برای هر گزارش، صفات تشخیصی، اطلاعات جغرافیایی، زیستگاه و اطلاعاتی در مورد پراکندگی منطقه‌ای و جغرافیایی تهیه شده است.

واژگان کلیدی: تنوع زیستی؛ قفقاز؛ فهرست؛ میان‌استیگمایان؛ نهان‌استیگمایان.

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