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## A revision of *Geostiba* of the West Palaearctic region. XXVI. New species and additional records, primarily from the Caucasus region (Coleoptera: Staphylinidae: Aleocharinae)

Volker ASSING

**A b s t r a c t :** Seven species of *Geostiba* THOMSON, 1858 from the Caucasus region and Ukraine are described and illustrated: *Geostiba (Tropogastrosipalia) reducta* nov.sp. (Russia: West Caucasus); *G. (T.) defecta* nov.sp. (Russia: West Caucasus); *G. (Sibiota) breviflagellata* nov.sp. (Georgia: Imereti); *G. (S.) nigrohortensia* nov.sp. (Nagorno-Karabakh); *G. (S.) deliqua* nov.sp. (South Armenia); *G. (Sipalotricha) marmotae* nov.sp. (Ukraine); *G. (S.) manca* nov.sp. (Georgia: Imereti). The primary sexual characters of several previously described species are illustrated. *Geostiba cingulata* (EPPELSHEIM, 1878), previously in the subgenus *Chondridiosipalia* SCHEERPELTZ, 1951 is moved to the subgenus *Sipalotricha* SCHEERPELTZ, 1951. Additional records of eight Caucasian species are reported. The currently known distributions of 15 Caucasian species of the subgenera *Tropogastrosipalia* SCHEERPELTZ, 1951, *Sibiota* CASEY, 1906, and *Sipalotricha* are mapped.

**Key words :** Coleoptera, Staphylinidae, Aleocharinae, Geostibini, *Geostiba*, Caucasus region, Georgia, Armenia, Nagorno-Karabakh, Ukraine, West Palaearctic region, taxonomy, zoogeography, new subgeneric assignment, new species, new records, distribution maps.

### Introduction

The Caucasian fauna of the speciose Holarctic genus *Geostiba* THOMSON, 1858 has been addressed in several articles (ASSING 2005, 2016a, b, 2017a, c). In all, 40 species had been recorded from the region including including Northeast Turkey (from Ordu to the border with Georgia), Georgia, Armenia, Azerbaijan, and the Russian part of the Greater Caucasus. Most of these species (25 species) belong to the subgenus *Sibiota* CASEY, 1906, eight to *Tropogastrosipalia* SCHEERPELTZ, 1951, four to *Sipalotricha* SCHEERPELTZ, 1951, two to the nominal subgenus, and one to *Chondridiosipalia* SCHEERPELTZ, 1951. Two wing-dimorphic species are widespread, the remainder, with one exception micropterous, is composed of regional or local endemics.

The previously known *Geostiba* fauna of Ukraine is composed of six species, three of *Sipalotricha*, one of *Sibiota*, one of the nominal subgenus, and one of *Tropogastrosipalia*. Three species are widespread and three are locally or regionally endemic (ASSING 2005).

Material collected during recent field trips to the West Caucasus conducted by Andrey Gontarenko (Odessa), to Georgia conducted by Volker Brachat (Geretsried) and Heinrich

Meybohm (Großhansdorf), and to Armenia and Nagorno-Karabakh conducted by Michael Schülke (Berlin) and the author included six undescribed species and additional records of six previously described species. One new species was collected in Ukraine by Andrey Gontarenko.

### Material and methods

The material treated in this study is deposited in the following collections:

MNB ..... Museum für Naturkunde, Berlin (including the collection of Michael Schülke)

cAss..... author's private collection

cGon..... private collection Andrey Gontarenko, Odessa

The morphological studies were conducted using a Stemi SV 11 microscope (Zeiss), a Discovery V12 microscope (Zeiss), and a Jenalab compound microscope (Carl Zeiss Jena). The images were created using a digital camera (Nikon Coolpix 995), Axiocam ERc 5s, as well as Labscope and Picolay software. The maps were created using Map-Creator 2.0 (primap) software.

Body length was measured from the anterior margin of the labrum to the abdominal apex, the length of the forebody from the anterior margin of the labrum to the posterior margin of the elytra, head length along the middle from the anterior margin of the clypeus to the posterior carina of the head, elytral length at the suture from the apex of the scutellum to the posterior margin of the elytra, and the length of the median lobe of the aedeagus from the apex of the ventral process to the base of the capsule. The "parameral" side (i.e., the side where the sperm duct enters) is referred to as the ventral, the opposite side as the dorsal aspect.

### Results

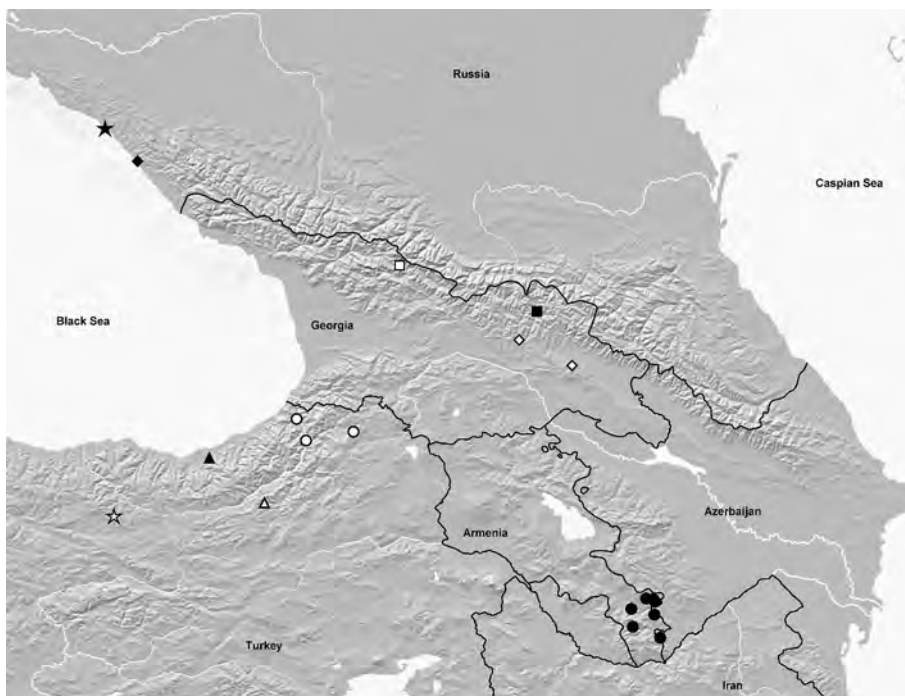
#### *Geostiba (Geostiba) sororcula* ASSING, 2001

**Material examined:** Armenia: 1♂, 1♀, ca. 30 km W Kapan, 39°15'N, 46°08'E, 1680 m, river bank, litter and debris sifted, 11.VII.2018, leg. Assing (cAss).

**Comment:** The known distribution of this species ranges from Northeast Turkey (Gümüşhane and Ardahan provinces) to Armenia. For a recent distribution map see ASSING (2017a).

#### *Geostiba (Tropogastrosipalia) khnзорiani* PACE, 1983 (Map 1)

**Material examined:** Armenia: 1♂, ca. 30 km W Kapan, 39°15'N, 46°08'E, 1680 m, river bank, litter and debris sifted, 11.VII.2018, leg. Assing (cAss); 2♀♀, 20 km SW Sisian, Darbas, 39°26'N, 46°07'E, 1680 m, margin of secondary deciduous forest, litter and soil sifted, 16.VII.2018, leg. Assing (cAss).



**Map 1:** Distributions of the species of the subgenus *Tropogastrosipalia* in the Caucasus region, based on examined records: *G. reducta* (black star); *G. defecta* (black diamond); *G. svanetica* (white square); *G. gibberiventris* (black square); *G. tiflisensis* (white diamonds); *G. artvinensis* (white circles); *G. pontica* (black triangle); *G. solodovnikovi* (white triangle); *G. priva* (white star); *G. khnzoriani* (black circles).

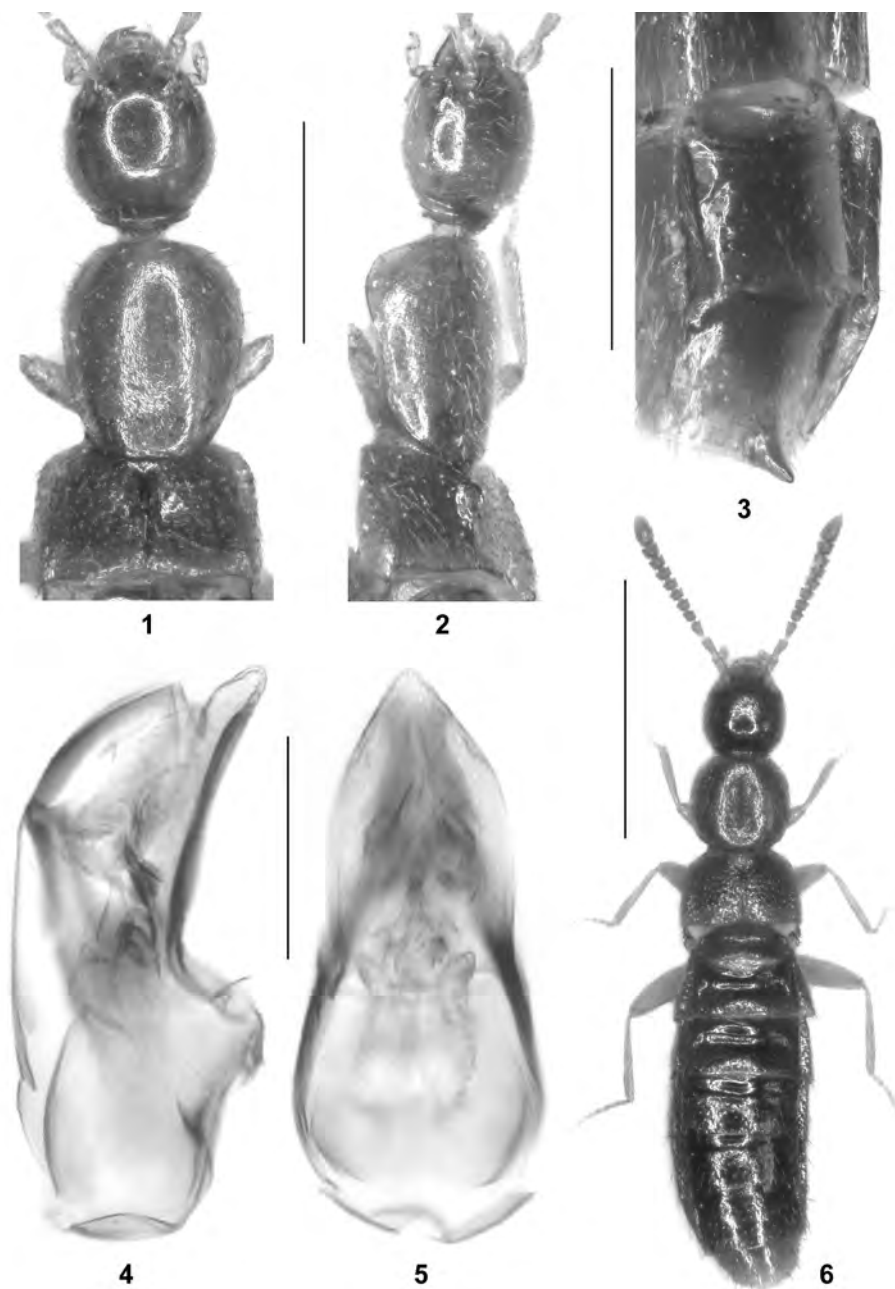
**Comment:** The previously known distribution of *G. khnzoriani* was confined to South Armenia, from the environs of Goris in the north to the mountains south of Kapan in the south (Map 1). The above records expand the known range further to the west.

### *Geostiba (Tropogastrosipalia) reducta* nov.sp. (Figs 1-5; Map 1)

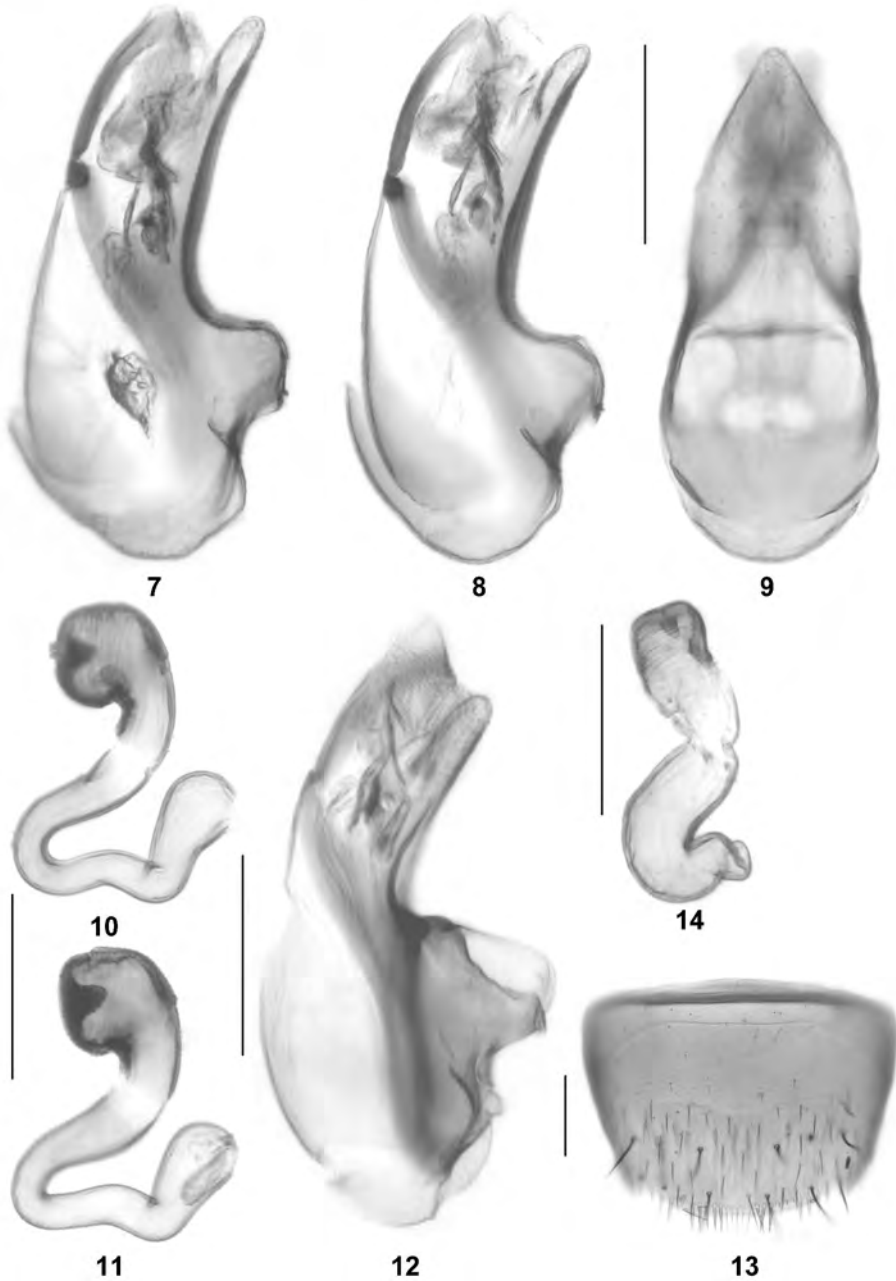
**Type material:** Holotype ♂: "RU - Krasnodar area, Tuapse distr., Olginka env., Saray Gora, 250 m, leaf litter, 18.V.2017, leg. Gontarenko / Holotypus ♂ *Geostiba reducta* sp. n. det. V. Assing 2018" (cAss). Paratypes: 1♂: same data as holotype (cAss); 1♂: "Krasnodar area, Tuapse distr., Olginka env., h ~50, 19.05.017, leg. Salnizkaya M.O. / under stone near stream" (cGon).

**Etymology:** The specific epithet is the past participle of the Latin verb *reducere* and alludes to the minute cristal process of the aedeagus.

**Description:** Body length 2.7-3.2 mm; length of forebody 1.15-1.25 mm. Coloration: head reddish to blackish; pronotum reddish to dark-brown; elytra yellowish-red to yellowish-brown; abdomen reddish to brown with segments V-VI and the anterior portion of VII more or less extensively blackish; antennae reddish to brown with the basal two antennomeres paler. Head and pronotum with sparse and very fine punctation and with microreticulation. Posterior margin of abdominal tergite VII without palisade fringe.



**Figs 1-6:** *Geostiba reducta* nov.sp. (1-5) and *G. defecta* (6): (1) male forebody in dorsal view; (2) male forebody in lateral view; (3) male tergites VI-VII in lateral view; (4-5) median lobe of aedeagus in lateral and in ventral view; (6) habitus. Scale bars: 6: 1.0 mm; 1-3: 0.5 mm; 4-5: 0.1 mm.



**Figs 7-14:** *Geostiba defecta* nov.sp. (7-11) and *G. articularinata* (12-13): (7-9, 12) median lobe of aedeagus in lateral and in ventral view; (10-11, 14) spermatheca; (13) female sternite VIII. Scale bars: 0.1 mm.

Large ♂: pronotum (Figs 1-2) distinctly oblong, approximately 1.2 times as long as broad, posterior margin truncate, in the middle indistinctly concave; elytra (Figs 1-2) with extensive and somewhat diagonal impressions, sharply edged lateral margins, and short, but strongly elevated sutural carinae; abdomen with anterior tergites unmodified, tergite VII (Fig. 3) with pronounced postero-median spine; median lobe of aedeagus (Figs 4-5) 0.27 mm long, with minute cristal process.

♀: unknown.

**Intraspecific variation:** In the two paratypes, the male secondary sexual characters are somewhat reduced. The pronotum is 1.08-1.10 times as long as broad and has the posterior margin convex, the sutural carinae and the impressions of the elytra are much less pronounced, and the postero-median spine of tergite VII is of much smaller size (only weakly indicated in one of the paratypes).

**Comparative notes:** Only three species of the subgenus *Tropogastrosipalia* SCHEERPELTZ, 1951 were previously known from the Greater Caucasus: *Geostiba svanetica* ASSING, 2017, *G. gibberiventris* ASSING, 2017, and *G. tiflisensis* PACE, 1996 (ASSING 2017c). *Geostiba reducta* is distinguished from all of them by a much smaller cristal process of the aedeagus. From *G. svanetica* (Georgia: Svaneti), the geographically closest species, it additionally differs by a distinctly oblong male pronotum, the modifications of the male elytra, unmodified anterior tergites of the male abdomen, and a more pronounced postero-median spine on the male tergite VII. For illustrations of *G. svanetica*, *G. gibberiventris*, and *P. tiflisensis* see ASSING (2017c).

**Distribution:** The type specimens were collected in two localities in the Saray Gora near Ol'ginka (44°12'N, 38°53'E), to the northwest of Tuapse, Krasnodarskiy Krai, in the northwestern extension of the West Caucasus (Map 1). Two specimens were sifted from leaf litter at an altitude of 250 m, one was found under a stone near a stream at an altitude of only 50 m.

***Geostiba (Tropogastrosipalia) defecta* nov.sp.** (Figs 6-11; Map 1)

**Type material:** Holotype ♂: "RU - Krasnodar area, Lazarevskoye distr., Soloniki env., 550 m, leaf litter, 4.VI.2017, leg. Gontarenko / Holotypus ♂ *Geostiba defecta* sp. n. det. V. Assing 2019" (cAss). Paratypes: 4♂♂, 3♀♀: same data as holotype (cAss, Gon); 1♀: same data, but 430 m (cGon).

**Etymology:** The specific epithet is the past participle of the Latin verb deficere (to lack) and alludes to the near absence of modifications of the male pronotum, elytra, and abdomen, as well as to the completely absent cristal process of the aedeagus.

**Description:** Body length 2.5-3.0 mm; length of forebody 1.0-1.2 mm. Habitus as in Fig. 6. Coloration: head reddish to black; pronotum and elytra reddish to dark-brown; abdomen reddish to dark-brown with tergites V-VI and the anterior portion of VII blackish; legs yellowish; antennae reddish to dark-brown with the basal two antennomeres more or less distinctly paler.

Head and pronotum with microreticulation and with moderately dense and very fine punctation. Pronotum approximately as broad as long. Abdomen large and broad, distinctly broader than elytra; posterior margin of tergite VIII with or without fine rudiment of a palisade fringe.

♂: pronotum and abdomen unmodified; elytra with granulose punctation and with shal-

low impression in postero-lateral portion; median lobe of aedeagus (Figs 7-9) 0.27-0.28 mm long, without cristal process.

♀: elytra with fine non-granulose punctation, with or without very indistinct impression in postero-lateral portion; spermatheca as in Figs 10-11, not distinctive.

**Comparative notes:** Despite the absence of modifications of the male abdomen, *G. defecta* belongs to the subgenus *Tropogastrosipalia*, as can be inferred not only from the habitus, but especially from the characteristic shape of the spermatheca. The species is distinguished from all other *Tropogastrosipalia* species by the unmodified male abdomen alone, from most of them also by the unmodified male pronotum and the weakly modified male elytra without sutural carinae, without lateral edges or elevations, and without pronounced impressions. The only other *Tropogastrosipalia* species with a completely reduced cristal process of the aedeagus is *G. perdita* ASSING, 2017, an endemic of the Greek island Ikaría, which differs from the new species by sexually dimorphic pronotum, a more slender abdomen, and the presence of a postero-median spine on the male tergite VII. For illustrations of *G. perdita* see ASSING (2017b).

**Distribution:** The type locality is situated near Soloniki (43°53'N, 39°22'E) to the southeast of Lazarevskoye (Krasnodarskiy Kray: SE Tuapse) in the western extension of the West Caucasus (Map 1). The specimens were sifted from leaf litter at altitudes of 430 and 550 m.

#### ***Geostiba (Sibiota) articularinata* ASSING, 2016 (Figs 12-14)**

**Material examined:** Russia: 1♂, 1♀, Adygeia, 14 km NE Mt. Fisht, Lagonaki Plateau, 1700 m, 16.VI.1999, leg. Smetana (cAss); 1♀, Adygeia, 12 km NE Mt. Fisht, Lagonaki Plateau, 1800 m, debris along the edges of a snow field sifted, 14.VI.1999, leg. Smetana (cAss).

**Comment:** The original description is based on a unique male (ASSING 2016a). The above material was collected close to the type locality. Based on the shape of the spermatheca, the morphology of the aedeagus, and the shape of the male tergite VIII (posterior margin broadly and deeply concave), *G. articularinata* is most closely allied to *G. krzysztofi* ROUBAL, 1913, not to *G. convergens* ASSING, 2011 as suggested by ASSING (2016a). The previously unknown female sexual characters and the aedeagus of the above male are illustrated in Figs 12-14.

#### ***Geostiba (Sibiota) batumiensis* PACE, 1996**

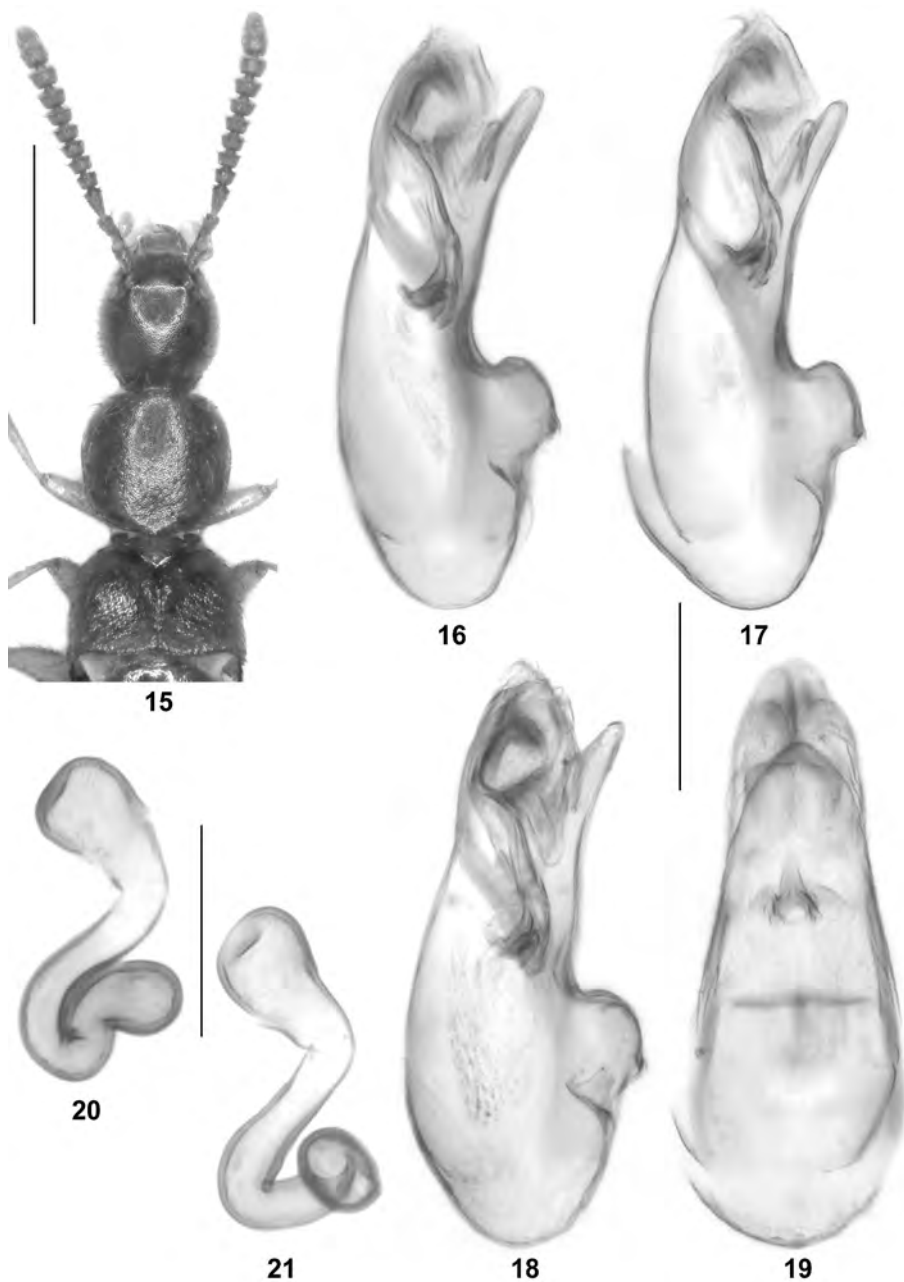
**Material examined:** Georgia: 2♂♂, 2♀♀, Adjara, 7 km NE Batumi 41°39'N, 41°46'E, 550 m, 22.V.2018, leg. Brachat & Meybohm (cAss).

**Comment:** This species is endemic to the environs of Batumi, Southwest Georgia (ASSING 2017c).

#### ***Geostiba (Sibiota) artifistula* ASSING, 2016**

**Material examined:** Georgia: 2♂♂, 2♀♀, Racha, Likhети, 42°05'32"N, 43°13'35"E, 800 m, 27.V.2018, leg. Brachat & Meybohm (cAss).

**Comment:** The above material was collected close to the type locality near Likhети village. For a map illustrating the previously known records see ASSING (2017c).



**Figs 15-21:** *Geostiba breviflagellata* nov.sp.: (15) male forebody; (15-19) median lobe of aedeagus in lateral and in ventral view; (20-21) spermatheca. Scale bars: 15: 0.5 mm; 16-21: 0.1 mm.



***Geostiba (Sibiota) breviflagellata* nov.sp.** (Figs 15-21)

**Type material:** Holotype ♂: "N41°57'24 E42°46'10, Georgien Imeretien (51), Sairme N 630 m 18.5.2018, Brachat & Meybohm / Holotypus ♂ *Geostiba breviflagellata* sp. n. det. V. Assing 2018" (cAss). Paratypes: 3♂♂, 2♀♀: same data as holotype (cAss); 1♂: "N42°00'50 E42°48'55, Georgien Imeretien (50), Baghdati 290 m 18.5.2018, Brachat & Meybohm" (cAss).

**Etymology:** The specific epithet (adjective) alludes to the short flagellum in the internal sac of the aedeagus, one of the characters distinguishing this species from the similar and geographically close *G. bituberculata* (EPPELSHEIM, 1878).

**Description:** Body length 2.4-3.0 mm; length of forebody 1.0-1.2 mm. Coloration: body, including antennae, reddish to dark-reddish; legs yellow. Eyes strongly reduced, without ommatidia and pigmentation. External characters as in *G. bituberculata*, except as follows:

Large ♂: elytra with pronounced sutural carinae, these carinae broad anteriorly and strongly tapering posteriorly (Fig. 15); tergite VIII with a pair of posteriorly converging carinae in postero-median portion; medial lobe of aedeagus approximately 0.28 mm long and shaped as in Figs 16-19; internal sac with short flagellum.

♀: spermatheca as in Figs 20-21.

**Intraspecific variation:** The male secondary sexual characters are more or less reduced in small males.

**Comparative notes:** *Geostiba breviflagellata* differs from other species of the *G. bituberculata* group recorded from the Lesser Caucasus as follows:

from *G. bituberculata* by a smaller aedeagus (*G. bituberculata*: approximately 0.33 mm) with a broader ventral process, a differently shaped crista apicalis, and a much shorter flagellum;

from *G. batumiensis* by less strongly impressed male elytra with shorter, anteriorly broader and posteriorly less sharp sutural carinae, more pronounced carinae on the male tergite VII, a smaller aedeagus (*G. batumiensis*: approximately 0.32 mm), and a shorter and less slender spermatheca;

from *G. zerchei* PACE, 1996 (male unknown) by more strongly reduced eyes (*G. zerchei*: eyes composed of few ommatidia).

**Distribution and natural history:** The specimens were collected in two localities in the Imereti region, Lesser Caucasus, Southwest Georgia. They were sifted from leaf litter in a mixed deciduous forest with chestnut, beech, and rhododendron (type locality) and from chestnut litter at the base of a slope (MEYBOHM pers. comm.). The altitudes range from 290 to 630 m.

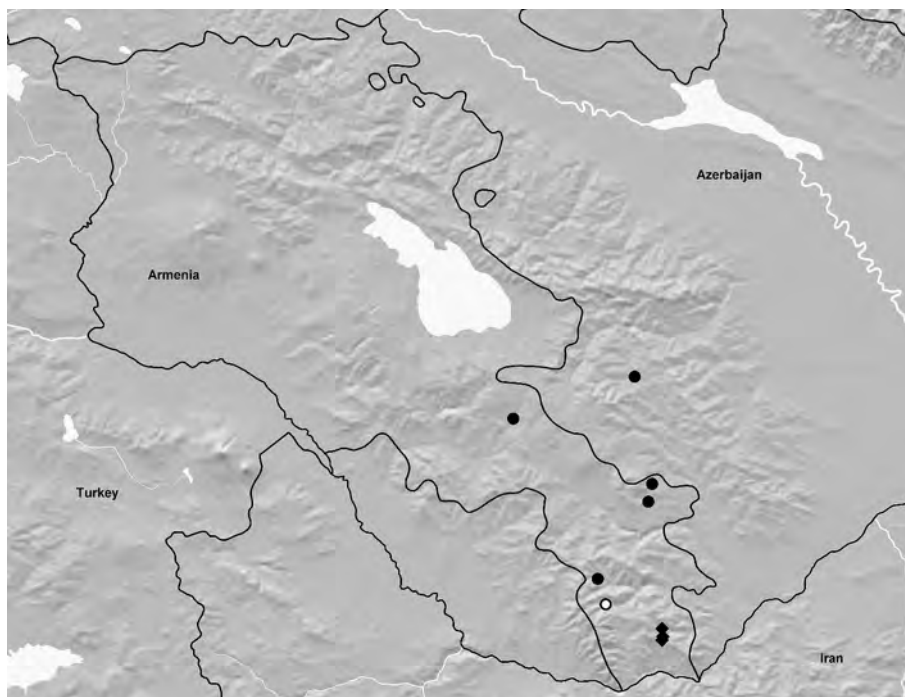
***Geostiba (Sibiota) uniconeata* ASSING, 2016** (Map 2)

**Material examined:** Nagorno-Karabakh: 13♂♂, 3♀♀, ca. 50 km WNW Stepanakert, S Dadivank, 39°59'N, 46°15'E, 1610 m, mixed deciduous forest margin, litter and roots sifted, 5.VII.2018, leg. Assing & Schülke (cAss, MNB). Armenia: 4♂♂, 5♀♀, ca. 30 km W Kapan, 39°15'N, 46°04'E, 2040 m, N-slope, margin of mixed deciduous forest, litter and grass roots sifted, 11.VII.2018, leg. Assing (cAss).

**Comment:** *Geostiba uniconeata* was originally described based on material from the environs of Jermuk and subsequently recorded also from two localities to the north

and northwest of Goris in Armenia (ASSING 2016b, 2017a). The above records reveal that this species is remarkably widespread in the Qarabag range (Armenia, Nagorno-Karabakh) and present also in the Barkushati range in South Armenia; they considerably expand the known distribution towards the north and south (Map 2).

The material from different localities is distinguished by slight differences in the shape of the spermatheca and the aedeagus, but otherwise no convincing evidence was found suggesting that these populations should represent distinct species.



**Map 2:** Distributions of *Geostiba unicuneata* (black circles), *G. deliqua* (white circle), and *G. meghruica* (black diamonds).

#### *Geostiba (Sibiota) meghruica* ASSING, 2016 (Map 2)

**Material examined:** Armenia: 1♂, 1♀, SSW Kapan, forest above Shishkert, 39°04'N, 46°22'E, 2040 m, roots, litter, and stony soil sifted, 12.VII.2018, leg. Assing (cAss).

**Comment:** The original description of *G. meghruica* is based on material from the Gomarants pass and its immediate vicinity. The above record expands the known range to the south slope of Mount Khustup (Map 2).

#### *Geostiba (Sibiota) nigrohortensia* nov.sp. (Figs 22-35, 43)

**Type material:** Holotype ♂: "NAGORNO-KARABAKH [14] – WNW Stepanakert, 39°59'13"N, 46°14'45"E, 1610 m, mixed forest, 5.VII.2018, V. Assing / Holotypus ♂ *Geostiba nigrohortensia* sp. n. det. V. Assing 2018" (cAss). Paratypes: 19♂♂, 46♀♀: same data as holotype (cAss, MNB); 16♂♂, 14♀♀: same data, but leg. Schülke (MNB); 29♂♂, 34♀♀: "NAGORNO-

KARABAKH – [19], pass 20 km SW Stepanakert, 39°41'50"N 46°39'00"E, 1730 m, 6.VII.2018, V. Assing" (cAss, MNB); 2♂♂, 3♀♀: same data, but leg. Schülke (MNB); 1♂: "NAGORNO-KARABAKH – [22], pass 20 km SW Stepanakert, 39°42'13"N 46°39'02"E, 1700 m, 7.VII.2018, V. Assing" (cAss).

**E t y m o l o g y** : The specific epithet (adjective: of the black garden) alludes to the currently known distribution, which is confined to Karabakh. This Azerbaijanian name means black garden.

**D e s c r i p t i o n** : Body length 2.3-2.8 mm. Habitus as in Fig. 22. Coloration: body pale-reddish to reddish-brown with abdominal segment VI and the anterior half of segment VII more or less distinctly infuscate; legs yellow; antennae reddish-yellow. Eyes with pigmentation and composed of approximately five ommatidia. External characters as in *G. tigrani* ASSING, 2017 (Armenia), distinguished only by the primary and secondary sexual characters.

Large ♂: elytra (Figs 23-24) as in *G. tigrani*, with narrow and distinctly elevated sutural carina, this carina somewhat wider in anterior portion; tergite VII (Fig. 25) with a pair of pronounced and posteriorly noticeably converging oblong tubercles; median lobe of aedeagus 0.24-0.25 mm long and shaped as in Figs 26-30.

♀: spermatheca as in Figs 31-35.

**I n t r a s p e c i f i c v a r i a t i o n** : The male secondary sexual characters are more or less reduced in smaller males.

**C o m p a r a t i v e n o t e s** : Using the key to the Armenian *Geostiba* species in ASSING (2017a), *G. nigrohortensia* would key out at couplet 10, together with *G. tigrani* and *G. pambakica* ASSING, 2016, both of which are distributed in North Armenia. The new species is distinguished from them only by the sexual characters:

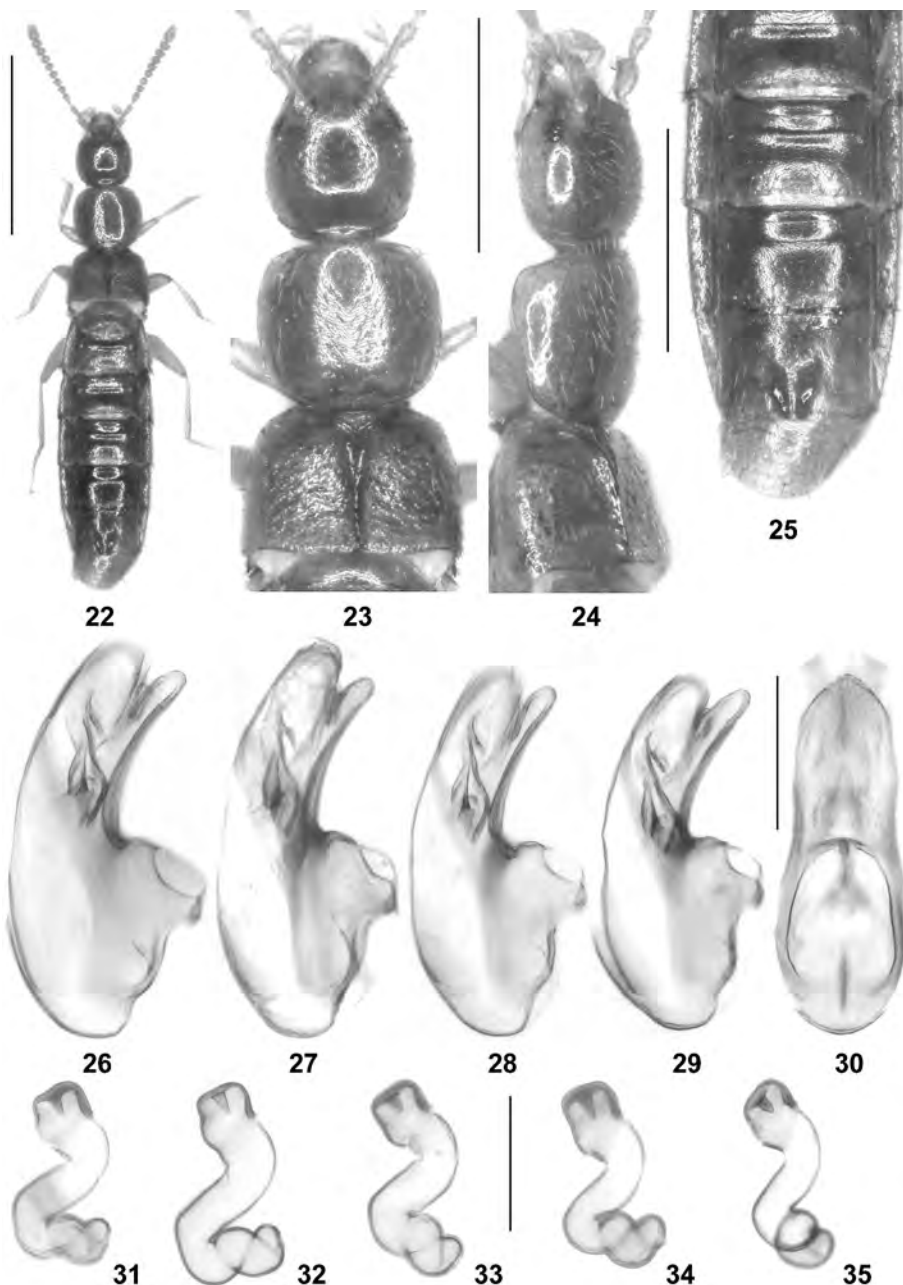
from *G. tigrani* by on average more pronounced and posteriorly more distinctly converging tubercles on the male tergite VII, by a relatively shorter ventral process of the aedeagus, by the shape of the crista apicalis, and by the shape of the spermatheca;

from *G. pambakica* by more pronounced and always distinctly separated tubercles on the male tergite VII (often fused or indistinctly separated in *G. pambakica*), by an apically less acute ventral process of the aedeagus (ventral view), the slightly different shape of the crista apicalis, and a much longer proximal portion of the spermatheca. For illustrations of *G. tigrani* and *G. pambakica* see ASSING (2016b: figures 42-52) and ASSING (2017a: figures 1-13, 22-38).

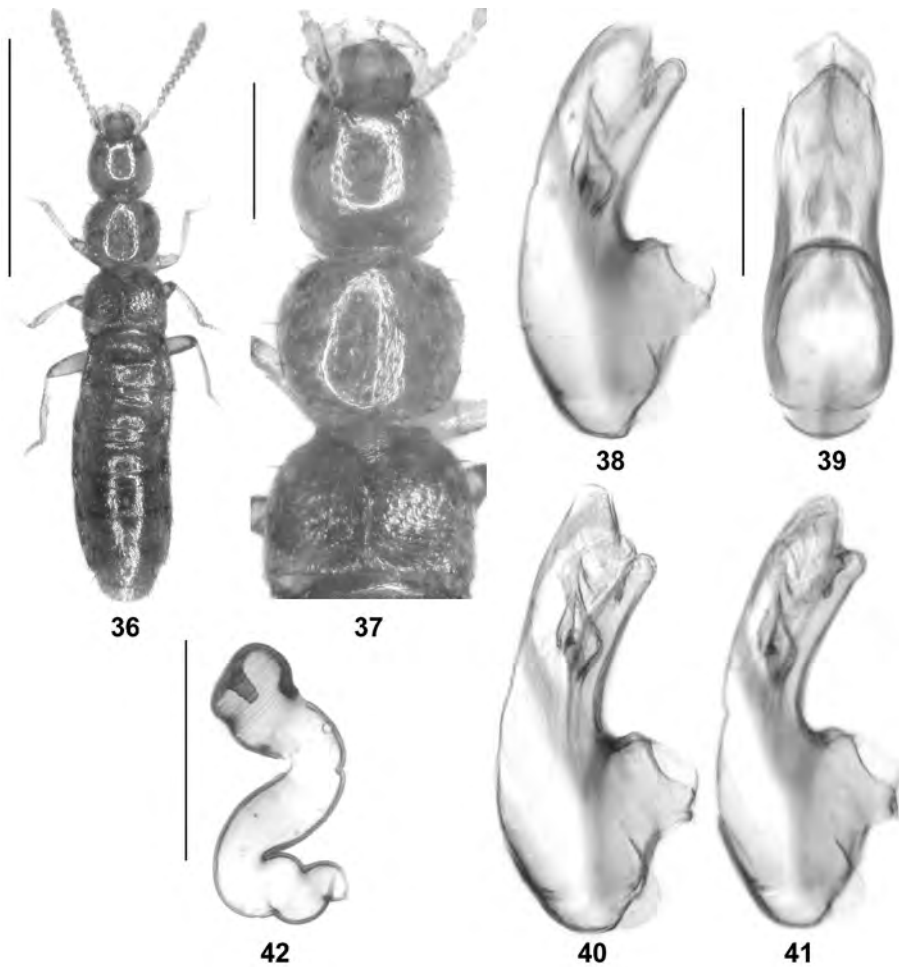
**D i s t r i b u t i o n a n d n a t u r a l h i s t o r y** : The known distribution is confined to three localities in Nagorno-Karabakh, one in the north (48 km WNW Stepanakert) and two in a pass some 17 km to the southwest of Stepanakert. The specimens were sifted from moist litter and debris in mixed deciduous forests and near a stream at altitudes of 1610-1730 m. In the type locality (Fig. 43), it was found together with *G. unicumata*.

***Geostiba (Sibiota) deliqua* nov.sp.** (Figs 36-42, 44; Map 2)

**T y p e m a t e r i a l** : Holotype ♂: "ARMENIA [27] – WSW Kapan, W Kajaran, 39°09'22"N, 46°06'13"E 2050 m, mixed forest, 10.VII.2018, V. Assing / Holotypus ♂ *Geostiba deliqua* sp. n. det. V. Assing 2018" (cAss). Paratypes: 2♂♂: same data as holotype (cAss); 1♀: same data, but leg. Schülke (MNB).



**Figs 22-35:** *Geostiba nigrohortensia* nov.sp.: (22) male habitus; (23) male forebody in dorsal view; (24) male forebody in lateral view; (25) male abdomen; (26-30) median lobe of aedeagus in lateral and in ventral view; (31-35) spermatheca. Scale bars: 22: 1.0 mm; 23-25: 0.5 mm; 26-35: 0.1 mm.



**Figs 36-42:** *Geostiba deliqua* nov.sp.: (36) male habitus; (37) male forebody; (38-41) median lobe of aedeagus in lateral and in ventral view; (42) spermatheca. Scale bars: 36: 1.0 mm; 37: 0.2 mm; 38-42: 0.1 mm.

**E t y m o l o g y :** The specific epithet (Latin, adjective: missing, absent) alludes to the unmodified male tergite VII.

**D e s c r i p t i o n :** Body length 2.2-2.3 mm; length of forebody 0.8-0.9 mm. Habitus as in Fig. 36. Coloration: body yellowish to reddish-yellow with the middle of abdominal segment VI slightly darker; legs and antennae pale-yellow. Eyes strongly reduced, composed of 3-4 ommatidia and with weak pigmentation (Fig. 37). Other external characters not distinctive.

♂: elytra (Fig 37) extensively and moderately deeply impressed, suture distinctly and broadly elevated near scutellum, posteriorly extending into a narrow keel; tergite VII unmodified, without tubercles or keel; median lobe of aedeagus 0.23 mm long and shaped as in Figs 38-41.



**Figs 43–44:** Type localities of *Geostiba nigrohortensia* nov.sp. (above) and *G. deliqua* nov.sp. (below).

♀: spermatheca as in Fig. 42.

**Comparative notes:** This species is distinguished from most other Armenian representatives of the subgenus *Sibiota* by small body size, pale coloration, and particularly by the unmodified male tergite VII. Using the key in ASSING (2017a), *G. deliqua* would key out at couplet 3, together with *G. immutata* ASSING, 2017 from the environs of Tatev (south of Goris), the only other Armenian *Sibiota* species without tubercles or keels on the male tergite VII. The new species differs from *G. immutata* by even smaller size, on average paler coloration, even smaller eye rudiments with fewer ommatidia (*G. immutata*: eyes composed of approximately 6 ommatidia), much more distinctly modified male elytra (*G. immutata*: without impressions; suture not elevated, with few granules on either side at most), by the shape of the smaller median lobe of the aedeagus (*G. immutata*: median lobe 0.24-0.25 mm long; ventral process more strongly curved in lateral view; crista apicalis smaller), and by the shape of the spermatheca.

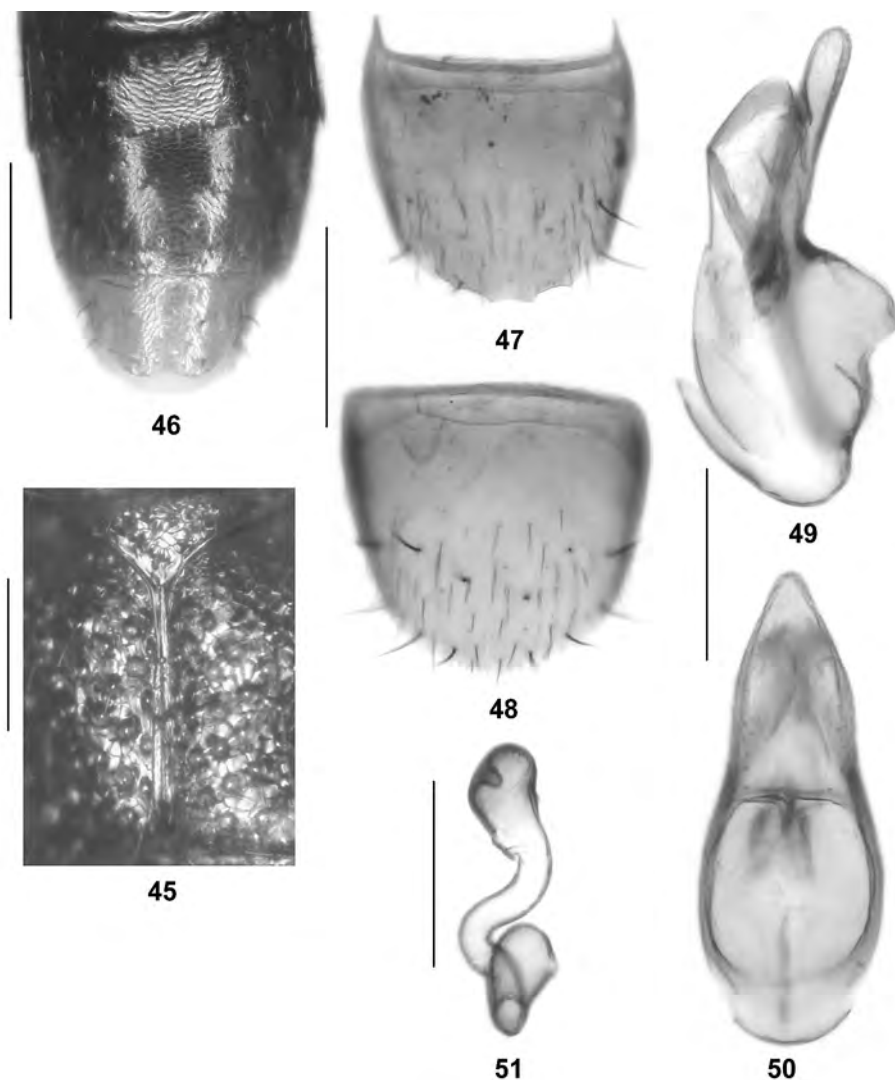
*Geostiba deliqua* is evidently very closely allied to *G. unicuneata*, as can be inferred from the highly similar external characters (coloration, body size, eye size), from the similar modifications of the male elytra, the similar structure of the aedeagus, and from the similar shape of the spermatheca. Aside from the complete absence of the median keel on the male tergite VII, *G. deliqua* is distinguished from *G. unicuneata* only by a slightly larger median lobe of the aedeagus (*G. unicuneata*: median lobe usually 0.21-0.22 mm long) with the apex of the ventral process of slightly different shape and with an on average slightly larger crista apicalis. Despite the similarity of the primary sexual characters, it seems rather unlikely that *G. deliqua* is conspecific with *G. unicuneata*. First, the primary sexual characters are generally rather uniform in Armenian *Sibiota*; for instance, the spermathecae of *G. nigrohortensia* and *G. unicuneata* are of practically identical shape, although these species are readily distinguished based on external characters alone. Second, the 36 males of *G. unicuneata* that have been examined so far have the median keel on tergite VII at least indicated, whereas this keel is completely absent in all three males of *G. deliqua*. Third, in males of *G. unicuneata* with a median keel of reduced size the elytral modifications are usually reduced, too. Finally, the slight differences in the shape of the apex of the ventral process of the aedeagus appear to be constant.

**Distribution and natural history:** The type locality is situated near Kajaran, west-southwest of Kapan, South Armenia (Map 2), at an altitude of 2050 m. The type specimens were sifted from litter and grass roots in a montane mixed deciduous forest (Fig. 44).

***Geostiba (Sipalotricha) marmotae* nov.sp.** (Figs 45-51)

**Type material:** Holotype ♂: "UKRAINE - Kherson obl., Askania-Nova, Yuzhnyi, marmot burrows, 29.II.2017, leg. Gontarenko / Holotypus ♂ *Geostiba marmotae* sp. n. det. V. Assing 2018" (cAss). Paratypes: 5♂♂, 3♀♀: same data as holotype (cGon, cAss); 2♀♀, same data, but 24.III.2017 (cGon, cAss).

**Etymology:** The specific epithet is the genitive of the Latin noun *marmota* (marmot) and alludes to the fact that all the type specimens were collected from marmot burrows.



**Figs 45-51:** *Geostiba marmotae* nov.sp.: (45) sutural portion of male elytra; (46) apex of male abdomen; (47) male tergite VIII; (48) male sternite VIII; (49-50) median lobe of aedeagus in lateral and in ventral view; (51) spermatheca. Scale bars: 46-48: 0.2 mm; 45, 49-51: 0.1 mm.

**Description:** Body length 2.0-2.3 mm; length of forebody 0.8-0.9 mm. Coloration: forebody reddish-yellow to pale reddish-brown, with the head sometimes darker brown; abdomen blackish with segment VIII-X yellowish and the anterior segments more or less extensively reddish-yellow to pale brown; legs and antennae yellowish.

Head approximately as long as broad or weakly transverse, slightly wedge-shaped; punctation extremely fine, visible only at high magnification; interstices with or without shallow traces of microsculpture, glossy. Eyes small, composed of approximately 20



ommatidia. Antennae distinctly incrassate; antennomeres IV-X approximately twice as broad as long.

Pronotum approximately 1.2 times as broad as long and 1.1 times as broad as head, small in relation to the head; punctation extremely fine; microsculpture very shallow, but slightly more distinct than that of head; interstices glossy.

Elytra approximately 0.6 times as long as pronotum; punctation sexually dimorphic; interstices with shallow microreticulation. Hind wings completely reduced.

Abdomen slightly broader than elytra; punctation fine, moderately dense on anterior tergites, very sparse on posterior tergites; interstices with shallow, but distinct microreticulation; posterior margin of tergite VII without palisade fringe; posterior margin of tergite VIII sexually dimorphic.

♂: elytra (Fig. 45) with strongly granulate punctation; posterior margin of tergite VIII somewhat produced and concave in the middle (Figs 46-47); posterior margin of sternite VIII moderately strongly convex (Fig. 48); median lobe of aedeagus (Figs 49-50) approximately 0.25 mm long; ventral process straight and rather stout in lateral view; crista apicalis weakly convex and without distinct membrane in lateral view.

♀: elytra with simple, fine punctation; posterior margin of tergite VIII not produced in the middle, simply convex; posterior margin of sternite VIII broadly convex; spermatheca as in Fig. 51.

**Comparative notes:** Regarding the primary sexual characters, *G. marmotae* is similar to the geographically close *G. cuneiceps* (KRAATZ, 1856) (Slovakia, Hungary). It is distinguished from this species by a more slender body, a more glossy forebody with less pronounced microsculpture, a pronounced dimorphism of the elytral punctation, on average darker coloration, a smaller aedeagus (*G. cuneicornis*: median lobe at least approximately 0.3 mm long) with a stouter (lateral view) and apically more acute (ventral view) ventral process, and by a spermatheca of slightly different shape. From *G. gontarenkoi* ASSING, 2005 (Ukraine: region to the north of Odessa), its geographically closest consubgener, *G. marmotae* is distinguished by on average less pronounced microsculpture of the forebody, more extensively and more distinctly granulate punctation of the male elytra, the shape of the male tergite VIII (*G. gontarenkoi*: male tergite VIII more transverse and with smoothly convex posterior margin), the shape of the aedeagus (*G. gontarenkoi*: ventral process smoothly curved in lateral view and less strongly tapering in ventral view; crista apicalis and crista proximalis more pronounced), and by the shape of the spermatheca (*G. gontarenkoi*: distal portion not distinctly dilated apically; proximal portion shorter, less slender, and proximally less strongly dilated. For illustrations of *G. cuneiformis* and *G. gontarenkoi* see ASSING (2005).

**Distribution and natural history:** The type locality is situated in South Ukraine, to the north of the Krym peninsula. Remarkably, all eleven type specimens were collected from burrows of the steppe marmot (*Marmota bobak* (MÜLLER, 1776)). An association of *Geostiba* species with mammal nests, however, has never been observed, so that it is uncertain if marmot burrows are the true habitat of *G. marmotae* or if these records are merely accidental.

***Geostiba (Sipalotricha) manca* nov.sp.** (Figs 52-63; Map 3)

**Type material:** Holotype ♂: "N41°51'26 E42°47'23, Georgien Imeretien (53), Sairme S

1930 m 19.5.2018, Brachat & Meybohm / Holotypus ♂ *Geostiba manca* sp. n. det. V. Assing 2018" (cAss). **Paratypes:** 1♂, 5♀♀: same data as holotype (cAss); 1♂, 1♀: "N41°51'37 E42°46'59, Georgien Imeretien (54), Sairme S 1890 m 19.5.2018, Brachat & Meybohm" (cAss); 3♂♂, 2♀♀: "N41°51'50 E42°47'20, Georgien Imeretien (55), Sairme S 1760 m 19.5.2018, Brachat & Meybohm" (cAss); 2♀♀: "N41°52'47 E42°46'02, Georgien Imeretien (56), Sairme S 1420 m 20.5.2018, Brachat & Meybohm" (cAss).

**E t y m o l o g y :** The specific epithet (Latin, adjective: incomplete) alludes to the absence of a tubercle on the male tergite VII, one of the characters distinguishing this species from the similar and geographically close *G. cingulata* (EPPELSHEIM, 1878).

**D e s c r i p t i o n :** Body length 2.3-2.9 mm; length of forebody 1.0-1.2 mm. Habitus as in Fig. 52. Coloration: forebody reddish to dark-brown; abdomen usually reddish with segment VI and the anterior portion infusate, rarely uniformly reddish or uniformly blackish; legs yellow; antennae pale-reddish to dark-reddish with the basal 2-3 antennomeres reddish-yellow.

Head (Fig. 53) approximately as broad as long and of orbicular shape; punctuation extremely fine and moderately dense; interstices with distinct, but shallow microreticulation. Eyes small, not protruding from lateral contours of head, and composed of 10-15 ommatidia. Antenna 0.7 mm long, strongly incrassate apically; antennomeres IV distinctly transverse, V-X of gradually increasing width and increasingly transverse, VIII-X nearly three times as broad as long, and XI nearly as long as the combined length of VIII-X.

Pronotum approximately 1.1 times as broad as long and 1.15 times as broad as head; punctuation and microsculpture similar to those of head.

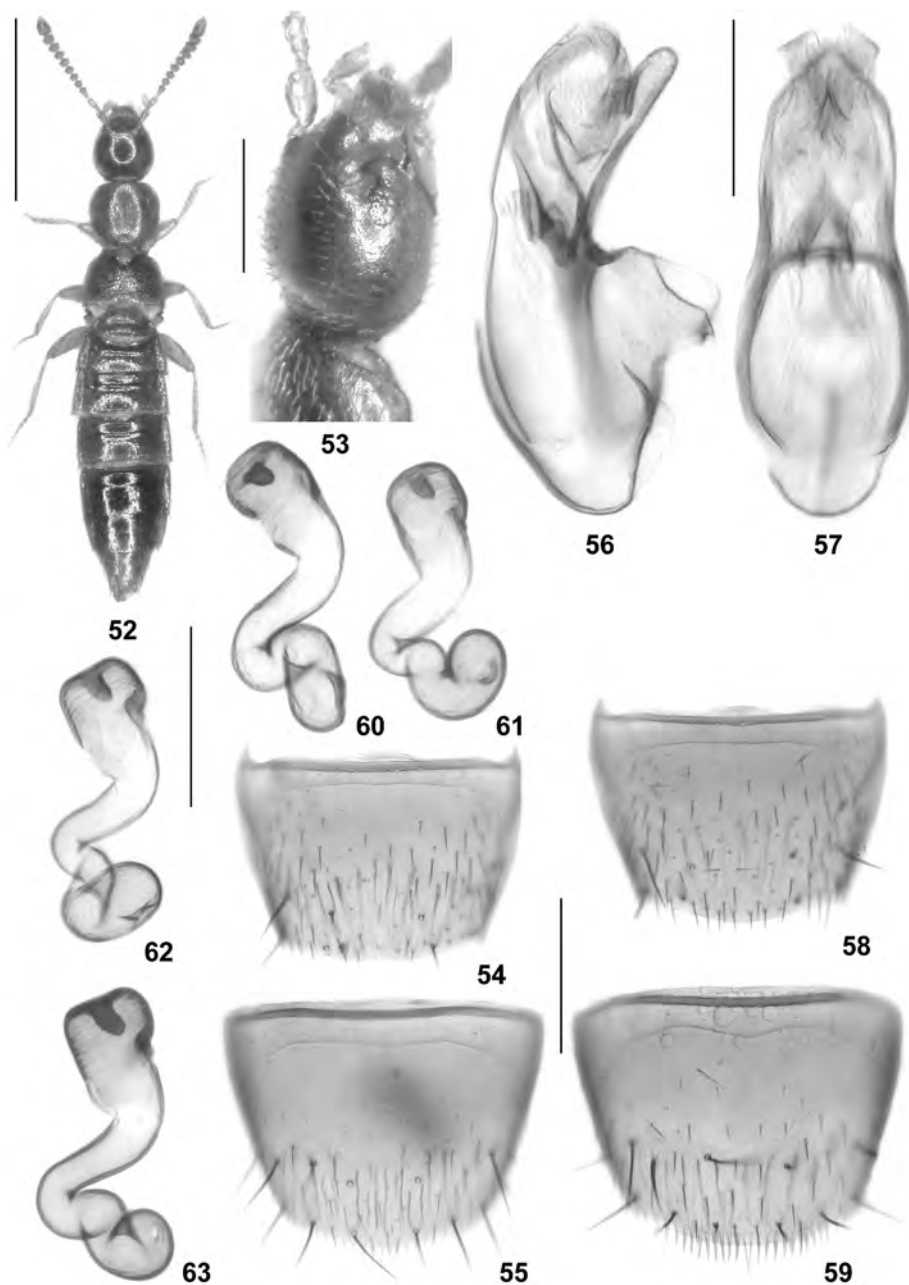
Elytra approximately 0.6 times as long as pronotum; punctuation moderately dense and fine, more distinct than that of head and pronotum; interstices with shallow microsculpture and some shine. Hind wings completely reduced.

Abdomen slightly broader than elytra; punctuation rather sparse and very fine; interstices with distinct, but shallow microreticulation and some shine; tergite VII without sexual dimorphism, its posterior margin without palisade fringe.

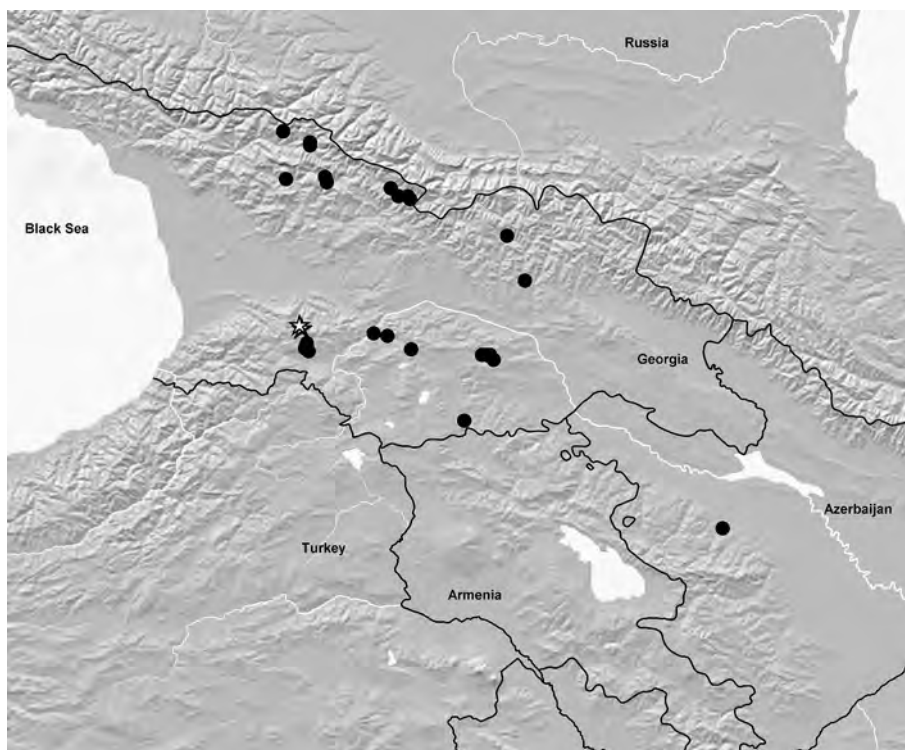
♂: tergite VII unmodified; tergite VIII (Fig. 54) with weakly convex posterior margin; sternite VIII (Fig. 55) with smoothly convex posterior margin and thin marginal setae; median lobe of aedeagus approximately 0.27 mm long and shaped as in Figs 56-57; apical lobe of paramere rather short, shape not distinctive.

♀: posterior margin of tergite VIII (Fig. 58) convex; posterior margin of sternite VIII broadly convex, without median concavity, with rather long and stout marginal setae (Fig. 59); spermatheca as in Figs 60-63.

**C o m p a r a t i v e n o t e s :** *Geostiba manca* is readily distinguished from *G. cingulata*, the only other *Sipalotricha* species known from Georgia, by the unmodified male tergite VII, the absence of a palisade fringe at the posterior margin of tergite VII (present in *G. cingulata*), distinctly smaller eyes (*G. cingulata*: eyes composed of approximately 30-40 ommatidia), less pronounced microsculpture of the forebody, more transverse antennomeres IV-X, and by the primary sexual characters.



**Figs 52-63:** *Geostiba manca* nov.sp.: (52) habitus; (53) head in lateral view; (54) male tergite VIII; (55) male sternite VIII; (56-57) median lobe of aedeagus in lateral and in ventral view; (58) female tergite VIII; (59) female sternite VIII; (60-63) spermatheca. Scale bars: 52: 1.0 mm; 53, 54-55, 58-59: 0.2 mm; 56-57, 60-63: 0.1 mm.



**Map 3:** Distributions of species of the subgenus *Sipalotricha* in the Caucasus region, based on examined records: *G. cingulata* (black circles); *G. manca* (white stars).

The three geographically closest consubgenera in Northeast Turkey are *G. euxina* PACE, 1983, *G. macronorum* PACE, 2002, and *G. soganlica* ASSING, 2006, all of them described from Trabzon province. *Geostiba manca* is reliably distinguished from all of them by the primary sexual characters. For illustrations of *G. cingulata*, *G. euxina*, *G. macronorum*, and *G. soganlica* see ASSING (2001, 2005, 2006) and PACE (1983, 2002).

**Distribution and natural history:** The specimens were collected in the region to the south of Sairme, Imereti, in the Lesser Caucasus, Southwest Georgia (Map 3). The absence of previous records from the Lesser Caucasus suggests that the species may be locally endemic. The material was sifted from maple leaf litter, from litter in a mixed deciduous forest, from litter on a moist slope, and from debris near rocks (MEYBOHM pers. comm.). The altitudes range from 1420 to 1930 m.

### *Geostiba (Sipalotricha) cingulata* (EPPELSHEIM, 1878) (Map 3)

**Material examined:** Georgia: Racha: 1♂, 4♀♀, E Shovi, 42°41'N, 43°42'E, 1720 m, 28.V.2018, leg. Brachat & Meybohm (cAss); 1♀, E Shovi, 42°42'N, 43°41'E, 1570 m, 28.V.2018, leg. Brachat & Meybohm (cAss); 2♀♀, W Glola, 42°42'N, 43°36'E, 1170 m, 28.V.2018, leg. Brachat & Meybohm (cAss); 1♀, Ghebi, 42°45'N, 43°32'E, 1310 m, 29.V.2018, leg. Brachat & Meybohm (cAss).

**C o m m e n t :** Unlike *G. manca*, *G. cingulata* is rather widespread and not uncommon in Georgia and Azerbaijan (Map 3).

Based on the presence of a small tubercle on the male tergite VII, the species was previously attributed to the subgenus *Chondridiosipalia* SCHEERPELTZ, 1951. Other characters, however, suggest that it is more closely allied to geographically close species of the subgenus *Sipalotricha*, suggesting that the presence of a tubercle on the male tergite VII is an autapomorphy rather than a synapomorphy shared with *Geostiba leonhardi* (BERNHAEUER, 1908) from Italy, the type species of *Chondridiosipalia*. This conclusion is also supported by the observation that there is no other species of *Chondridiosipalia* in the West Palaearctic east of Italy.

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### Zusammenfassung

Sieben Arten der Gattung *Geostiba* THOMSON, 1858 aus der Kaukasusregion und der Ukraine werden beschrieben und abgebildet: *Geostiba (Tropogastrosipalia) reducta* nov.sp. (Russland: Westkaukasus); *G. (T.) defecta* nov.sp. (Russland: Westkaukasus); *G. (Sibiota) breviflagellata* nov.sp. (Georgien: Imeretien); *G. (S.) nigrohortensia* nov.sp. (Bergkarabach); *G. (S.) deliqua* nov.sp. (Südarmenien); *G. (Sipalotricha) marmotae* nov.sp. (Ukraine); *G. (S.) manca* nov.sp. (Georgien: Imeretien). Die primären Geschlechtsmerkmale einiger bereits beschriebener Arten werden abgebildet. *Geostiba cingulata* (EPPELSHEIM, 1878), bisher in der Untergattung *Chondridiosipalia* SCHEERPELTZ, 1951, wird der Untergattung *Sipalotricha* zugeordnet. Weitere Nachweise von acht Arten der Kaukasusregion werden gemeldet. Die derzeit bekannten Verbreitungsgebiete von 15 in der Kaukasusregion vorkommenden Arten der Untergattungen *Tropogastrosipalia* SCHEERPELTZ, 1951, *Sibiota* CASEY, 1906 und *Sipalotricha* SCHEERPELTZ, 1951 werden anhand von Karten illustriert.

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