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

#### Volker Assing

A b s t r a c t : Four species of *Geostiba* THOMSON, 1858 from Georgia and Greece are described and illustrated: *Geostiba* (*Tropogastrosipalia*) xirosica nov.sp. (Greece: Evvoia); G. (T.) svanetica nov.sp. (Georgia: Svaneti); G. (T.) gibberiventris nov.sp. (Georgia: Mtskheta-Mtianeti); G. (Sibiota) granisuturalis nov.sp. (Georgia: Svaneti). Additional records of seven species are reported. The distributions of the eight species of the subgenus *Tropogastrosipalia* SCHEERPELTZ, 1951 recorded from the Caucasus region, those of the nine species of *Sibiota* CASEY, 1906 known from the West and Central Greater Caucasus, and the distribution of G. (Chondridiosipalia) cingulata (EPPELSHEIM, 1878) in the Caucasus region are mapped. Supplements to recently published keys to the *Geostiba* fauna of the West Palaearctic region are provided.

K e y w o r d s: Coleoptera, Staphylinidae, Aleocharinae, Geostibini, *Geostiba*, Caucasus region, Georgia, Greece, West Palaearctic region, taxonomy, zoogeography, new species, new records, key to species, distribution maps.

## Introduction

The Holarctic genus *Geostiba* THOMSON, 1858 is particularly speciose in the southern West Palaearctic region, where it currently includes several hundred described species, approximately 200 of which are distributed in the region including the East Mediterranean (east of Italy), the Caucasus region, and Iran (ASSING 2017). The vast majority of these species is more or less locally endemic and usually collected by sifting the leaf litter and/or upper soil layers of montane to subalpine forest, bush, or grassland habitats. An identification at the species level is difficult, not only owing to the small body size, but also because of relatively little interspecific variation in diagnostic characters, generally rather uniform shapes of the primary sexual characters, and often pronounced intraspecific variation, particularly of the male secondary sexual characters. Taking all this into account, it is not surprising that new species are continuously being discovered, even in regions that have been subject to more intense collecting activity in recent years.

The present paper primarily deals with material that has become available since 2016 (ASSING 2016a) and that has not been treated in recent papers focusing on regional faunas and/or infrageneric taxa (ASSING 2016b, 2017).

#### Material and methods

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

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

NMP......National Museum of Natural History, Praha (J. Hájek)

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) and Axiocam ERc 5s. The maps were created using MapCreator 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 (Tropogastrosipalia) armata (EPPELSHEIM, 1878)

M a t e r i a l e x a m i n e d : Greece: 13 ♂ ♂, 10 ♀ ♀, Fthiótida, Oros Óthris, 39°03'N, 22°36'E, 1620 m, plateau with *Salix* and *Juniperus*, grass roots sifted, 7.IV.2017, leg. Schülke (MNB).

C o m m e n t: Geostiba armata is by far the most widespread representative of the subgenus in Greece, its previously known distribution ranging from the northern Pindos southeastwards to Kato Olympos and Oros Ossa, Thessalía. The above material represents the first record from Oros Óthris and Fthióida. It is distinguished from other propulations by darker average coloration, an on average broader body, coarser punctation of the male elytra, an on average larger spine on the male tergite VII, and a slightly larger (more dagger-shaped) cristal process of the aedeagus. However, I have been unable to find any discrete differences suggesting that the population from Oros Óthris should represent a distinct species.

## Geostiba (Tropogastrosipalia) xirosica nov.sp. (Figs 1-6)

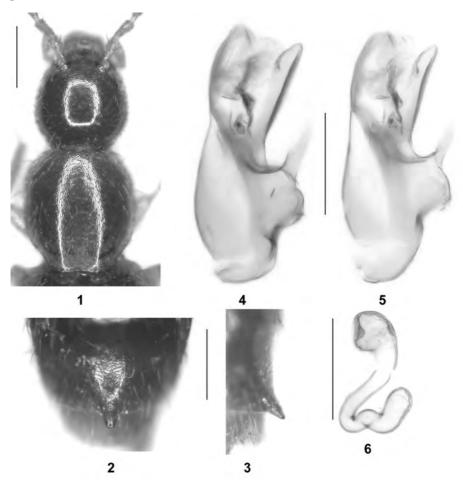
Type material: <u>Holotype ♂</u>: "Limni/Euböa (GR), Drimona, Mt. Xiros, oberh. Wasserfall, leg. Esser & Niefeldt 22-26.3.16 / Holotypus ♂ *Geostiba xirosica* sp. n. det. V. Assing 2016" (MNB). <u>Paratypes</u>: 4♂♂,6♀♀: same data as holotype (MNB, cAss).

E t y m o l o g y: The specific epithet is an adjective derived from Xiros Oros, the mountain where the type locality is situated.

Description: Body length 2.0-3.0 mm; length of forebody 0.9-1.1 mm. Coloration variable: head brown to black; pronotum pale-red to blackish-brown; elytra reddish-yellow to pale-reddish; abdomen bicoloured, with the anterior segments and

segment VIII pale-brown, and with the preapical segments more or less extensively blackish, or completely blackish; legs yellow; antennae reddish-brown, with the basal 2-3 antennomeres pale-reddish.

Large  $\delta$ : pronotum (Fig. 1) distinctly oblong, approximately 1.15 times as long as broad, posterior margin broadly and shallowly concave; elytra with moderately elevated, narrow, oblong tubercle extending along anterior 3/5 of suture; anterior tergites of abdomen unmodified; tergite VII (Figs 2-3) posteriorly with a flat and obliquely erect (lateral view), basally broad (antero-dorsal view) median spine; median lobe of aedeagus (Figs 4-5) approximately 0.25 mm long and with straight, apically narrowed cristal process.



**Figs 1-6**: *Geostiba xirosica* nov.sp.: (1) male head and pronotum; (2-3) male tergite VII in anterodorsal and in lateral view; (4-5) median lobe of aedeagus in lateral view; (6) spermatheca. Scale bars: 1-3: 0.2 mm; 4-6: 0.1 mm.

 $\varphi$ : pronotum approximately as broad as long, posterior margin broadly convex, in the middle truncate; spermatheca (Fig. 6) not distinctive.

Intraspecific variation. In small males, the pronotum is only indistinctly oblong and has a truncate posterior margin, and the modifications of the elytra and the abdominal tergite VII are practically obsolete.

C o m p a r a t i v e n o t e s: *Geostiba xirosica* is readily distinguished from the two other *Tropogastrosipalia* species known from Evvoia, *G. aculeata* (COIFFAIT, 1968) (Likhás Peninsula, extreme northwest of Evvoia) and *G. matsakisi* (COIFFAIT, 1968) (Dirfys Oros in Central Evvoia), by the completely different shape of the male pronotum alone. In both *G. aculeata* and *G. matsakisi*, the male pronotum is not distinctly oblong and its posterior margin is convex or pointed in the middle. For illustrations of these species see ASSING (1999). In order to account for *G. xirosica*, the key in ASSING (2009) is modified as follows:

D is tribution: Xiros Oros (990 m) is situated in the northwest of Evvoia at 38°52'N, 23°19'E. According to the labels, the specimens were collected above Drimona waterfalls, which are situated at 38°52'N, 23°18'E, at an altitude of approximately 600 m.

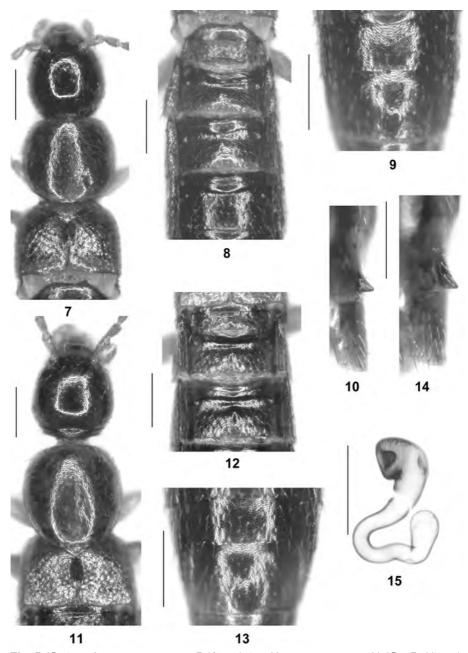
## Geostiba (Tropogastrosipalia) artvinensis ASSING, 2001 (Map 1)

M a t e r i a l e x a m i n e d: <u>Turkey</u>: 1 ♂, Artvin, 8 km E Şavşat, Karagöl Sahara Nat. Park, 41°14'N, 42°27'E, wet coniferous forest with dominant spruce and fir, 1930 m, 4.-5.VII.2004, leg. Růžička & Hájek (NMP).

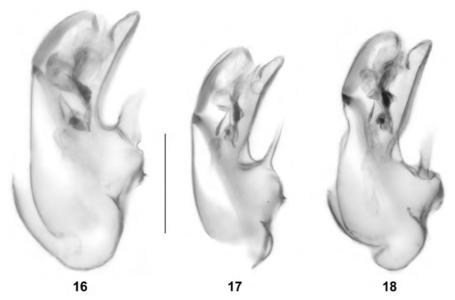
C o m m e n t: The above male represents the first record since the original description, which is based on type material from the area to the south of Artvin and from the environs of Borçka, Artvin province (ASSING 2001). The currently known distribution is illustrated in Map 1.

## Geostiba (Tropogastrosipalia) tiflisensis PACE, 1996 (Fig. 16, Map 1)

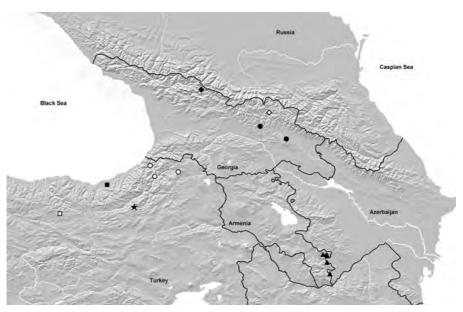
This species is currently known only from Ananuri (ASSING 2005a, 2009) and a locality to the southwest of Telavi (ASSING 2016a). The aedeagus of a male from Telavi is illustrated in Fig. 16. The previous record from the environs of Gudani (ASSING 2016a) is based on a misidentification and refers to *G. gibberiventris* nov.sp. The currently known distribution is illustrated in Map 1.



**Figs 7-15**: *Geostiba svanetica* nov.sp. (**7-10**) and *G. gibberiventris* nov.sp. (**11-15**): (**7, 11**) male forebody; (**8, 12**) anterior portion of male abdomen; (**9, 13**) male tergites VI-VII in antero-dorsal view; (**10, 14**) male tergites VII-VIII in lateral view; (**15**) spermatheca. Scale bars: 7-14: 0.2 mm; 15: 0.1 mm.



Figs 16-18: Median lobe of aedeagus in lateral view of *Geostiba tiflisensis* (16), *G. svanetica* nov.sp. (17), and *G. gibberiventris* nov.sp. (18). Scale bar: 0.1 mm.



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

### Geostiba (Tropogastrosipalia) svanetica nov.sp. (Figs 7-10, 17, Map 1)

Type material: <u>Holotype &</u>: "N42°54'40 E43°03'00 (17), Georgien Svaneti Ushguli-Zagaro Pass 2400 m, Brachat & Meybohm 28.6.2017 / Holotypus & *Geostiba svanetica* sp. n. det. V. Assing 2017" (cAss).

E t y m o l o g y: The specific epithet is an adjective derived from the name of the region where the type locality is situated.

Description: Body length 2.4 mm; length of forebody 0.95 mm. Coloration: head blackish-brown; pronotum reddish-brown; elytra brownish-yellow; abdomen blackish, with tergite II and the apex (segments VIII-X, posterior margin of tergite VII) paler; legs yellow; antennae reddish, with the basal two antennomeres pale-reddish. Microsculpture on head and pronotum very shallow, absent on elytra (Fig. 7). Posterior margin of abdominal tergite VII without palisade fringe.

♂: pronotum (Fig. 7) not distinctly modified, weakly transverse, nearly 1.1 times as broad as long and 1.2 times as broad as head, posterior margin broadly and smoothly convex; elytra (Fig. 7) with short sutural carinae (extending along anterior half of suture) immediately behind scutellum and with fine non-granulose punctation, disc very shallowly impressed; abdominal tergites III and IV (Fig. 8) each with a median tubercle; tergite VII (Figs 9-10) with a short, narrow (antero-dorsal view), and erect median spine at posterior margin; median lobe of aedeagus (Fig. 17) 0.22 mm long and with straight and very slender cristal process.

#### ♀: unknown.

C o m p a r a t i v e n o t e s: This species is easily distinguished from *G. tiflisensis*, the only other *Tropogastrosipalia* species previously recorded from the Greater Caucasus, by much less pronounced microsculpture on the head and the pronotum, a darker head (reddish in *G. tiflisensis*), and the male sexual characters: the practically unmodified, transverse male pronotum, male elytra with sutural carinae (absent in *G. tiflisensis*), non-granulose punctation (granulose in *G. tiflisensis*), and very shallowly impressed disc (distinctly impressed in *G. tiflisensis*), modified male tergites III and IV (unmodified in *G. tiflisensis*), and a much narrower cristal process of the aedeagus. For characters distinguishing *G. svanetica* from *G. gibberiventris* see the comparative notes in the following section. The median lobe of the aedeagus of *G. tiflisensis* is illustrated in Fig. 16.

D i s t r i b u t i o n : The type locality is situated near the Zagaro Pass in the east of Svaneti region, North Georgia (Map 1). The holotype was found under a stone in a subalpine grassland at an altitude of 2400 m (MEYBOHM pers. comm.).

#### Geostiba (Tropogastrosipalia) gibberiventris nov.sp. (Figs 11-15, 18, Map 1)

T y p e m a t e r i a 1 : <u>Holotype &</u>: "N42°26'40 E44°55'57 (19), GG Zentral-Kaukasus, Gudani - Zhinvali 1200 m, Brachat & Meybohm 19.7.2015 / Holotypus & *Geostiba gibberiventris* sp. n. det. V. Assing 2017" (cAss). <u>Paratypes</u>: 1& [without apex of abdomen],  $3 \circ \circ$ : same data as holotype (cAss, MNB).

E t y m o l o g y: The specific epithet is an adjective composed of the Latin noun gibber (tubercle) and the adjectival ending -ventris (of the abdomen). It alludes to the presence of median tubercles on the male tergites III and IV, one of the characters distinguishing the new species from the geographically close *G. tiflisensis*.

Description: Body length 2.1-2.8 mm; length of forebody 0.9-1.1 mm. Coloration: head brown to dark-brown; pronotum pale-brown to reddish-brown; elytra yellowish to yellowish-brown; abdomen blackish, with tergite II (rarely also III and IV) and the apex (posterior margin of tergite VII, segments VIII-X) paler; legs yellow; antennae dark-yellowish to pale-reddish, with the basal 2-3 antennomeres pale-reddish. Head, pronotum, and elytra with shallow to distinct microsculpture (Fig. 11). Posterior margin of abdominal tergite VII without palisade fringe.

- $\delta$ : pronotum (Fig. 11) distinctly modified, weakly oblong, approximately 1.05 times as broad as long and 1.2 times as broad as head, posterior margin produced, broadly and weakly concave in the middle; elytra (Fig. 11) with relatively weakly elevated sutural carinae extending along distinctly more than anterior half of suture, with moderately fine and rather dense non-granulose punctation, disc very shallowly impressed; abdominal tergites III and IV (Fig. 12) each with a median tubercle; tergite VII (Figs 13-14) with a short, narrow (antero-dorsal view), and suberect median spine at posterior margin; median lobe of aedeagus (Fig. 18) 0.24 mm long and with nearly straight and slender cristal process.
- $\varsigma$ : pronotum approximately as long as broad, posterior margin broadly and weakly convex in the middle; spermatheca (Fig. 15) not distinctive.

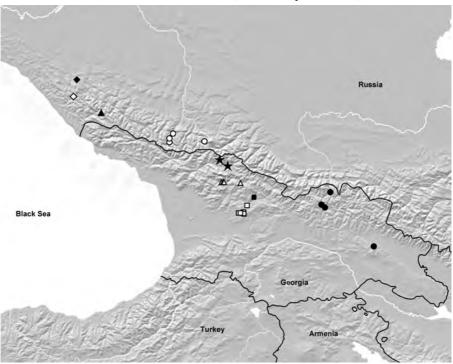
Intraspefic variation: In the (small) male paratype, the pronotum is as broad as long and posteriorly broadly truncate in the middle, the sutural carinae of the elytra are very weakly pronounced (nearly obsolete), the median tubercle on tergites III and IV are present, but not very distinct, and the spine on tergite VII is reduced to a weakly elevated tubercle.

C o m p a r a t i v e n o t e s: Geostiba gibberiventris is distinguished from the geographically close G. tiflisensis particularly by the posteriorly concave or truncate male pronotum, indistinctly impressed elytra with sutural carinae and non-granulose punctation, modified male tergites III and IV, and by the narrower, less broad-based spine (antero-dorsal view) on the male tergite VII. It differs from G. svanetica by the paler coloration of the head, the presence of microsculpture on the elytra, the shape of the male pronotum, longer and less elevated sutural carinae, and the shape of the cristal process.

In order to account for both *G. gibberiventris* and *G. svanetica*, the key in ASSING (2009) is modified as follows:

- Distribution: Greater Caucasus (North Georgia). Male sexual characters different .......34a

D is tribution: The type locality is situated on the east side of the Pshavskaya Aragvi river valley in Mtskheta-Mtianeti, North Georgia (Map 1). The specimens were sifted from leaf litter at an altitude of 1200 m (MEYBOHM pers. comm.).



Map 2: Distributions of the species of the subgenus *Sibiota* in the West and Central Greater Caucasus, based on examined records: *G. articarinata* (black diamond); *G. convergens* (white diamond); *G. uniplicata* (black triangle); *G. krzysztofi* (white circles); *G. granisuturalis* (black stars); *G. recta* (white triangles); *G. artifistula* (black squares); *G. largata* (white squares); *G. kobrisensis* (black circles).

#### Geostiba (Sibiota) oertzeni (EPPELSHEIM, 1888)

M a t e r i a l e x a m i n e d : <u>Ukraine</u>: 1♂, 1♀, Odessa obl., Rozdilna env., 22.III.2016, leg. Gontarenko (cGon).

C o m m e n t: The above specimens represent the third record of this widespread species from Ukraine. For the first two records see Assing (2006, 2009).

## Geostiba (Sibiota) batumiensis PACE, 1996

M a t e r i a l e x a m i n e d : Georgia: 2 ♀ ♀, Adjara, 5 km NE Batumi, 41°39'N, 41°45'E, 320 m, 23.VI.2017, leg. Brachat & Meybohm (cKoc, cAss).

C o m m e n t: This species has been recorded only from the environs of Batumi, Southwest Georgia (ASSING 2005a, 2016b).

## Geostiba (Sibiota) artifistula Assing, 2016 (Map 2)

M a t e r i a l e x a m i n e d : Georgia: 2♂♂, 2♀♀, Racha, NE Ambrolauri Likheti, 42°36′N, 43°14′E, 800 m, 3.VII.2017, leg. Brachat & Meybohm (cAss).

C o m m e n t: The above material was collected close to the type locality near Likheti village (ASSING 2016b). The currently known distribution is illustrated in Map 2.

## Geostiba (Sibiota) recta Assing, 2016 (Map 2)

M a t e r i a l e x a m i n e d : Georgia: 1 ç, Svaneti, NW Lentekhi, 42°48′N, 42°41′E, 1240 m, 2.VII.2017, leg. Brachat & Meybohm (cAss).

C o m m e n t : The above female was collected close to the type locality near Lentekhi (ASSING 2016b). The currently known distribution is illustrated in Map 2.

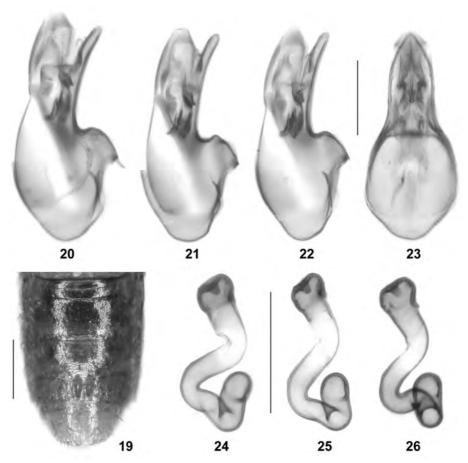
## Geostiba (Sibiota) granisuturalis nov.sp. (Figs 19-26, Map 2)

T y p e m a t e r i a l : <u>Holotype &</u>: "N43°06'15 E42°35'50 (12), Georgien Svaneti, Mazeri 1660 m, Brachat & Meybohm, 26.6.2017 / Holotypus & *Geostiba granisuturalis* sp. n. det. V. Assing 2017" (cAss). <u>Paratypes</u>:  $1 \, \mathring{\sigma}$ ,  $2 \, \mathring{\varphi} \, \mathring{\varphi}$ : same data as holotype (cAss);  $5 \, \mathring{\sigma} \, \mathring{\sigma}$ ,  $9 \, \mathring{\varphi} \, \mathring{\varphi}$ : "N43°01'20 E42°45'00 (14), Georgien Svaneti Mestia-Hatsvali Bergstaion [sic] 2350 m, Brachat & Meybohm, 27.6.2017" (cAss)

E t y m o l o g y: The specific epithet (adjective) alludes to the granulosely punctured suture of the male elytra.

Description: Body length 1.9-2.4 mm; length of forebody 0.9-1.0 mm. Coloration: body dark-yellowish to reddish-yellow. Eyes reduced to minute rudiments without pigmentation and without ommatidia. Pronotum without impressions on either side of midline. Hind wings completely reduced.

- $\delta$ : elytra with weakly to moderately elevated suture, this elevation broader anteriorly than posteriorly, along suture with granulose punctures, disc more or less distinctly impressed; tergite VII (Fig. 19) with median pair of short parallel carinae posteriorly; posterior margin of tergite VIII convex, with small concavity in the middle; posterior margin of sternite VIII obtusely produced posteriorly; median lobe of aedeagus (Figs 20-23) 0.27-0.29 mm long, without distinct flagellum and without semi-transparent spines in internal sac; paramere not distinctive.
- $\ensuremath{\wp}$ : posterior margin of tergite VIII broadly convex, very shallowly concave to truncate in the middle; posterior margin of sternite VIII shallowly concave in the middle; distal portion of spermatheca (Figs 24-26) not distinctly dilated.



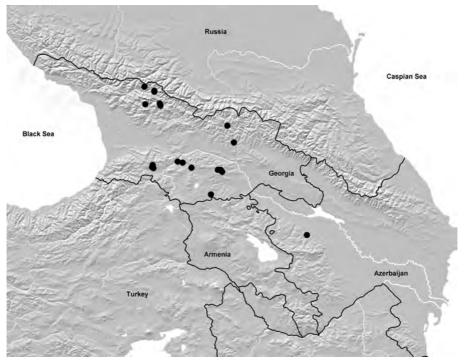
**Figs 19-26**: Geostiba granisuturalis nov.sp.: (19) male tergites VI-VIII; (20-23) median lobe of aedeagus in lateral and in ventral view; (24-26) spermatheca. Scale bars: 19: 0.2 mm; 20-26: 0.1 mm.

C o m p a r a t i v e n o t e s: Among the *Sibiota* species known from the Greater Caucasus, *G. granisuturalis* is characterized by the combination of reduced eyes without ommatidia and pigmentation, relatively weakly elevated suture of the male elytra, and the primary sexual characters. It differs from *G. recta* ASSING, 2016, the only other representative of the subgenus recorded from Svaneti, by paler coloration, smaller body size, less pronounced microsculpture on the forebody, the absence of distinct sutural carinae on the male elytra, shorter and parallel carinae on the male tergite VII, an aedeagus with a curved ventral process (lateral view), with a crista apicalis of different shape, and without a long flagellum in the internal sac, as well as by a proximally undilated spermatheca.

To account for the new species the key to the *Sibiota* species of the Caucasus region in ASSING (2016b) is modified as follows:

- Male elytra with less elevated and broader sutural carinae or elevation. Male tergite VII with median pair of carinae subparallel or weakly converging posteriorly ......4a
- 4a. Sutural portion of male elytra weakly to moderately elevated, this elevation with row of granulose punctures on either side of suture; male tergite VII with median pair of short parallel carinae posteriorly (Fig. 19). Median lobe of aedeagus and spermatheca as in Figs 21-26. Distribution: Georgia: Svaneti (Map 2)......granisuturalis nov.sp.

D is tribution and natural history: The specimens were collected in two localities in Svaneti (Map 2) by sifting leaf litter in a valley with alder, hazelnut, and fir, and in a birch forest with dense herb undergrowth (MEYBOHM pers. comm.) at altitudes of 1660 and 2350 m.



**Map 3**: Distribution of *G. cingulata* in the Caucasus region, based on examined records.

## Geostiba (Chondridiosipalia) cingulata (EPPELSHEIM, 1878) (Map 3)

M a t e r i a l e x a m i n e d: <u>Georgia:</u> R a c h a: 1δ, 8φ φ, 2 exs., 10 km W Lentekhi, 42°48′N, 42°38′E, 1100 m, 20.V.2016, leg. Brachat & Meybohm. S v a n e t i:1δ, 1φ, Mestia Ughviri Pass, 43°02′N, 42°50′E, 1900 m, 27.VII.2016, leg. Meybohm; 2δδ, 2φ φ, 4 km N Mazeri, 43°06′N, 42°36′E, 1690 m, 28.VII.2016, leg. Meybohm; 1δ, 3φ φ, 2 km N Ipari,

43°01'N, 42°50'E, 1670 m, 29.VII.2016, leg. Meybohm;  $5\ \footnotesize{3.8}\ \footnotesize{9.5}\ \footnotesize{3.8}\ \footnotesize{9.5}\ \footnot$ 

C o m m e n t: Aside from Georgia, where it is evidently not uncommon, *G. cingulata* has been recorded only from Azerbaijan (Map 3). So far, it has not been found in Armenia (ASSING 2017), although the type locality is very close to the Armenian border. For previous records see ASSING (2005a, 2005b, 2016a).

## Acknowledgements

I am indebted to Volker Brachat (Geretsried) and Heinrich Meybohm (Großhansdorf) for the gift of numerous Staphylinidae from Georgia, as well as to Michael Schülke (Berlin) for making some recently collected material from Greece available for study.

## Zusammenfassung

Vier Arten der Gattung Geostiba THOMSON, 1858 aus Georgien und Griechenland werden beschrieben und abgebildet: Geostiba (Tropogastrosipalia) xirosica nov.sp. (Griechenland: Euböa); G. (T.) svanetica nov.sp. (Georgien: Svaneti); G. (T.) gibberiventris nov.sp. (Georgien: Mtskheta-Mtianeti); G. (Sibiota) granisuturalis nov.sp. (Georgien: Svaneti). Weitere Nachweise von sieben Arten werden gemeldet. Die derzeit bekannten Verbreitungsgebiete der acht aus der Kaukasusregion bekannten Arten der Untergattung Tropogastrosipalia SCHEERPELTZ, 1951, die der neun aus dem West- und Zentralkaukasus nachgewiesenen Arten der Untergattung Sibiota CASEY, 1906 sowie das der im Kaukasusgebiet weit verbreiteten G. (Chondridiosipalia) cingulata (EPPELSHEIM, 1878) werden anhand von Karten illustriert. Die neu beschriebenen Arten werden in aktuelle Bestimmungstabellen integriert.

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