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A revision of the species of *Geostiba* THOMSON and *Tropimenelytron* PACE of the Eastern Mediterranean, the Caucasus, and adjacent regions (Coleoptera: Staphylinidae, Aleocharinae)

V. ASSING

A b s t r a c t : Based on an examination of types and non-type material, the previously unrevised species of the Eastern Mediterranean, including all of the Balkans and the southeast of Central Europe, and the Caucasus region are (re-)described and illustrated, among them five species new to science: *Geostiba* (*Tropogastrosipalia*) *mosorica* **sp.n.** (Croatia), *G.* (*Sipalotricha*) *incognita* **sp.n.** (Bulgaria), *G.* (*S.*) *extorta* **sp.n.** (Turkey), *G.* (*S.*) *gontarenkoi* **sp.n.** (Ukraine), and *G.* (*Sibiota*) *dinarica* **sp.n.** (Croatia). 21 synonymies are proposed: *Geostiba mihoki* (BERNHAUER 1932) = *G. biharica* PACE 1990, **syn.n.**; *G. spinicollis* (KRAATZ 1862) = *G. croatica* EPPELSHEIM 1880, **syn.n.**, = *G. carinthiaca* SCHEERPELTZ 1957, **syn.n.**, = *G. krapinensis* PACE 1990, **syn.n.**; *G. armicollis* (BREIT 1917) = *G. tergestina* PACE 1988, **syn.n.**; *G. apfelbecki* EPPELSHEIM 1892 = *G. wunderlei* PACE 1996, **syn.n.**; *G. spizzana* (BERNHAUER 1932) = *G. maderi* PACE 1996, **syn.n.**; *G. biokovensis* PACE 1990 = *G. cribripennis* PACE 1990, **syn.n.**; *G. tiflisensis* PACE 1996 = *G. amica* PACE 1996, **syn.n.**; *G. infirma* (WEISE 1878) = *G. pacei* ZERCHE 1988, **syn.n.**; *G. cuneiformis* (KRAATZ 1856) = *G. gyorffyi* (BERNHAUER 1929), **syn.n.**, = *G. hcejkai* (ROUBAL 1932), **syn.n.**; *G. oertzeni* (EPPELSHEIM 1888) = *G. tenenbaumi* (BERNHAUER 1940), **syn.n.**; *G. zoufali* (RAMBOUSEK 1915) = *G. optima* PACE 1983, **syn.n.**; *G. samai* PACE 1977 = *G. coiffaiti* PACE 1983, **syn.n.**; *G. meixneri* (BERNHAUER 1910) = *G. mostarensis* PACE 2002, **syn.n.**; *G. weiratheri* PACE 1984 = *G. behnei* ZERCHE 2002, **syn.n.**; *G. carinicollis* (EPPELSHEIM 1878) = *G. medea* PACE 1996; **syn.n.**; *G. kobrisensis* PACE 1996 = *G. crucis* PACE 1996, **syn.n.**; *G. rhilensis* (RAMBOUSEK 1924) = *G. bulgarica* PACE 1983, **syn.n.**; *G. cingulata* (EPPELSHEIM 1878) = *G. tbilisensis* PACE 1996, **syn.n.** Three species remain of doubtful identity, because they are represented only by females: *G.* (*Tropogastrosipalia*) *bernhaueri* (BREIT), *G. (T.) huberi* PACE, and *G.* (*Sibiota*) *zerchei* PACE 1996. Three species are referred to different subgenera: *G. zerchei* PACE (ex *Lioglutosipalia* SCHEERPELTZ) to *Sibiota* CASEY, *G. arida* (EPPELSHEIM) (ex *Trachyglutosipalia* SCHEERPELTZ) and *G. cingulata* (EPPELSHEIM) (ex *Chondridiosipalia*) both to *Sipalotricha* SCHEERPELTZ. Lectotypes are designated for *Homalota spinicollis* KRAATZ, *H. chyzeri* EPPELSHEIM, *H. croatica* EPPELSHEIM, *Leptusa arida* EPPELSHEIM, *L. bituberculata* EPPELSHEIM, *L. carinicollis* EPPELSHEIM, *L. cingulata* EPPELSHEIM, *Sipalia mihoki* BERNHAUER, *S. hummleri* BERNHAUER, *S. paganettiana* BERNHAUER, *S. spizzana* BERNHAUER, *S. deubeli* BERNHAUER, *S. kocsii* BERNHAUER, *S. stussineri* BERNHAUER, *S. bernhaueri* BREIT, *S. armicollis* BREIT, *S. hcejkai* ROUBAL, *S. carinicollis krzysztofi* ROUBAL, *S. carinthiaca* SCHEERPELTZ, and *Geostiba apfelbecki* EPPELSHEIM. Numerous additional records of previously revised *Geostiba* and *Tropimenelytron* species from the study area are reported. The known *Geostiba* fauna of the study region now includes 136 species. The highest diversities were observed for Turkey (44 species) and Greece (42

species). The distributions of 27 species are mapped. A catalogue and an updated key to species are provided.

K e y w o r d s : Coleoptera, Staphylinidae, Aleocharinae, *Geostiba, Tropimenelytron,* Palaearctic region, Central Europe, Balkans, Turkey, Middle East, Caucasus region, taxonomy, revision, new species, new synonyms, catalogue, key to species.

Contents

1. Introduction

The *Geostiba* species of the southeast of Central Europe, the southern Balkans, and Turkey have been revised in several steps (ASSING 1999, 2000a, 2000b, 2000c, 2001a, 2001b, 2003, 2004a); The objective of the present paper is a revision of the previously unexamined species from the Caucasus region and from the northern parts of southeastern Europe.

In the 19th and 20th centuries, collecting activity was much higher in the southeast of Central Europe and the northern Balkans than elsewhere in the Eastern Mediterranean, so that numerous *Geostiba* species were described from that region. Except for most of the Bulgarian species, which were revised by ZERCHE (2002), practically all of these descriptions were made on a more or less additive basis, without revisory work. The known distributions were often either restricted to the respective type localities, very vaguely indicated, or zoogeographically not plausible. The latter is true especially of some species described from the southeast of Central Europe (e. g. *G. gyorffyi* and *G. hcejkai*). Moreover, the previous revisions of the *Geostiba* fauna of the southern Balkans and Turkey had revealed that intraspecific variation had often been underestimated and, in addition, zoogeographic considerations had often been neglected. In particular, many descriptions were based on the assumption that *Geostiba* species always have more or less restricted distributions. It turned out, however, that some species (e. g. *G. oertzeni*, *G. lucens*, *G. euboica*) are widespread and at the same time subject to pronounced intraspecific variation, which explains why they now have so many synonyms; in the case of *G. oertzeni*, the number of junior synonyms amounts to 16 (including a new synonym proposed in this paper). At least three species (*G. circellaris*, *G. oertzeni*, *G. lucens*) are wing-dimorphic or wing-polymorphic, so that their huge ranges are not surprising. Another reason for the taxonomic confusion in the genus is the fact that the original descriptions of several species are based only on females (e. g. PACE 1983a, 1983b, 1984, 1990, 1996, 2002), although in many species groups a reliable interpretation and identification is possible only based on the male sexual characters. Against this background, it does not seem particularly surprising that a reliable identification of many *Geostiba* species from the study region had become difficult, if not impossible, without a study of types.

SMETANA (2004) reports *Geostiba fasciata* (MOTSCHULSKY 1858), a species originally described in the genus *Sipalia* MULSANT & REY, from Croatia. The type material was not examined, but based on the details indicated in the original description ("Tête un peu plus large que le corselet. ... Elytres ... fortement punctuées"), there is little doubt that this species belongs to *Leptusa* KRAATZ.

2. Material, methods, and abbreviations

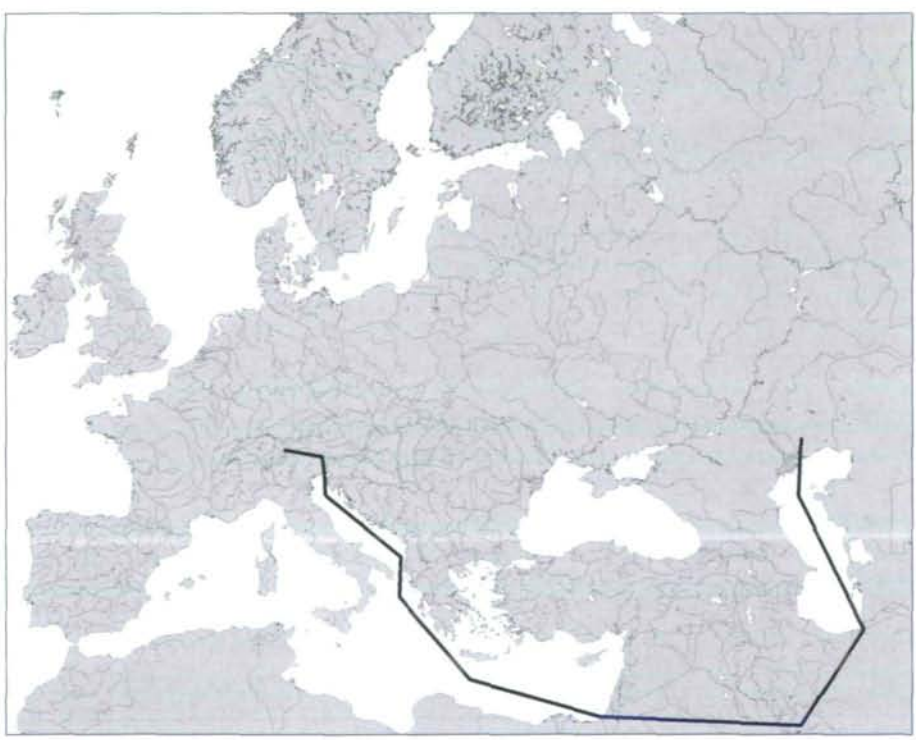
The material referred to in this study is deposited in the following public institutions and private collections:

DEI..... Deutsches Entomologisches Institut Müncheberg (L. Zerche)
FMNH..... Field Museum of Natural History, Chicago (A.F. Newton, P.P. Parrillo)
HNHM ..... Hungarian Natural History Museum, Budapest (O. Merkl, G. Makranczy)
MHNG ..... Muséum d'Histoire Naturelle, Genève (G. Cuccodoro)

MNHNP ..... Muséum national d'Histoire naturelle, Paris (T. Deuve, J.-C. Lecoq, A. Taghavian)
MNHUB ..... Museum für Naturkunde der Humboldt-Universität Berlin (J. Frisch, J. Willers)
NHMW ..... Naturhistorisches Museum Wien (H. Schillhammer)
NMP..... Národní Muzeum Praha (J. Hajek)
SNM..... Slovenské Národné Múzeum, Bratislava (via Peter Hlaváč)
TLMFI ..... Tiroler Landesmuseum Ferdinandeum Innsbruck (M. Kahlen)
cAss ..... author's private collection
cGol ..... private collection V. Gollkowski, Oelsnitz
cGon..... private collection A. Gontarenko, Odessa
cKal..... private collection M. Kalashian, Yerevan
cKra ..... private collection P. Krásenský, Chomutov
cMor..... private collection P. Moravec, Litoměřice
cSch ..... private collection M. Schülke, Berlin
cWun..... private collection P. Wunderle, Mönchengladbach
cZan ..... private collection A. Zanetti, Verona

The morphological studies and drawings were carried out using a Stemi SV 11 microscope (Zeiss Germany) and a Jenalab compound microscope (Carl Zeiss Jena) with a drawing tube. For the photographs a digital camera (Nikon Coolpix 995) was used. The maps were generated using the online generic mapping tool (GMT) of the Geomar website at www.aquarius.geomar.de/omc.

Head length was measured from the anterior margin of the clypeus to the posterior carina; elytral length was measured along suture from the apex of the scutellum to the posterior margin.



Map 1: Study region.

3. Revision of the *Geostiba* species of the Eastern Mediterranean and the Caucasus region: general results

The study region includes the area from the southeast of Central Europe (including southeastern Austria and Slovenia), to the southern Balkans, the Middle East, Iran, and the Caucasus region (Map 1). All the previously unexamined types and numerous additional specimens were studied. A total of 136 valid species is reported from the study region; three of them are of doubtful identity; their male sexual characters are unknown. Altogether, 56 species were described for the first time. As was to be expected (see introduction), the revision revealed a high degree of synonymy. In all, among the 154 available names, 54 new synonymies were discovered, the total number of synonyms now amounting to 63 (41 %). The most prolific authors are (number of valid species-group names and of synonyms given in brackets): PACE (33/33), BERNHAUER (12/5), SCHEERPELTZ (6/5), and EPPELSHEIM (8/2). For more details see the catalogue in section 6.

Tab. 1: Diversity of the *Geostiba* fauna of the study region by countries.

Country	Σ species	Σ exclusive species
Turkey	44	40
Greece	42	39
Bulgaria	10	8
Bosnia-Herzegovina	7	3
Croatia	8	3
Georgia	6	5
Macedonia	5	4
Romania	5	3
Ukraine	4	2
Austria	4	
Slovenia	4	
Slovakia	4	
Albania	3	2
Montenegro	3	2
Hungary	3	
Lebanon	2	2
Iran	2	2
Azerbaijan	2	1
Russia: Daghestan	2	
Poland	2	
Russia: Kar.-Tcherkessia	1	1
Israel	1	1
Cyprus	1	1
Armenia	1	1
Yugoslavia (excl. Montenegro)	1	1

Five subgenera are represented in the study region: *Tropogastrosipalia* (68 species), *Sipalotricha* (32), *Sibiota* (29), *Geostiba* (2), and *Typhlusida* (2); the subgeneric affiliations of three additional species are doubtful.

From a zoogeographic point of view it seems interesting that the areas of distribution of individual *Geostiba* species tend to become larger and the diversity increases along a gradient from the south and southeast to the north and northwest of the region. This is also true of the species of the subgenus *Tropogastrosipalia*, which, with few exceptions, are highly endemic e. g. in Greece and Turkey, but are partly widespread in the northern Balkans and in the southeast of Central Europe. Correspondingly, in the Eastern Mediterranean the diversity of *Geostiba* species increases from the north to the south. The - by far - highest number of species was observed for Turkey and Greece (Tab. 1). 44 species have become known from Turkey, 40 of them are exclusive to Turkish territory. 42 species, 39 of them exclusive, have been reported from Greece. The constant rate of discoveries of undescribed species suggests that, especially in some parts of Turkey, the known inventory of the *Geostiba* fauna is still somewhat incomplete.

4. New species, redescriptions, and new records

Below, new records are commented on only when the known range of distribution is extended or when they are remarkable in other respects.

4.1. *Geostiba* (*Geostiba*) *circellaris* (GRAVENHORST)

Material examined:

Sweden: 1 ex., Skåne, Skaralid, 6.IX.1988, leg. Kahlen (TLMFI); 1 ex., Uppland, Älukarleby, 7.IX.1988, leg. Kahlen (TLMFI); 1 ex., Älukarleby, 31.VIII.1988, leg. Kahlen (TLMFI). **France:** 1 ex., Jura, 3 km NW Gex, 700 m, spruce litter, 12.IX.1993, leg. Zerche (DEI); 6 exs., Savoie, Chartreuse, Saint Pierrre d'Entremont, 1150 m, 26.X.1998, leg. Kahlen (TLMFI). **Switzerland:** 1 ex., Genève, Allondon, 30.VI.1990, leg. Zerche (DEI). Italy: 1 ex., Pordenone, Claut/Contron, 30.V.1984, leg. Kahlen (TLMFI).

Austria: Vorarlberg: 2 exs., Bodensee, W Bregenz, NSG "Rohrspitz", flooded pasture, 13.V.1999, leg. Wunderle (cWun); 3 exs., Verwall, Silbertal, 1700 m, *Formica* nest, 11.V.1997, leg. Kahlen (TLMFI); 1 ex., Silbertal, 1530 m, 11.V.1997, leg. Kahlen (TLMFI). **Tirol:** 1 ex., Hall, leg. Ammann (TLMFI); 1 ex., Schwaz env., Tratzberg, 18.X.1946, leg. Kofler (TLMFI); 1 ex., Schwaz env., Dill [?], bank of Inn river, 30.V.1951, leg. Kofler (TLMFI); 1 ex., Schwaz env., Slans [?], 6.III.1946, leg. Kofler (TLMFI); 3 exs., Schwaz env., Arzberg, 21.-23.VI.1950, leg. Kofler (TLMFI); 1 ex., same data, but 1.IV.1946 (TLMFI); 1 ex., Reutte env., Bad Krekelmoos, 4.VII.1946, leg. Kofler (TLMFI); 1 ex., same locality, 14.IX.1959 (TLMFI); 6 exs., Forchach, IV.1941, leg. Kofler (TLMFI); 1 ex., same data, but X.1941 (TLMFI); 2 exs., same data, but III.1941 (TLMFI); 1 ex., same data, but XI.1941 (TLMFI); 2 exs., same data, but III.1942 (TLMFI); 4 exs., same data, but V.1944 (TLMFI); 1 ex., Forchach, 8.VIII.1985, leg. Kahlen (TLMFI); 1 ex., Weissenbach, V.1944, leg. Kofler (TLMFI); 1 ex., Schwarzwasser, Krottenkopf, date illegible, leg. Kofler (TLMFI); 2 exs., Elmen, 3.VI.1937, leg. Lechleitner (TLMFI); 1 ex., same data, but 14.IV.1941 (TLMFI); 3 exs., same data, but 20.X.1941 (TLMFI); 1 ex., same data, but 1.V.1941 (TLMFI); 1 ex., same data, but 5.IX.1945 (TLMFI); 1 ex., same data, but 1.IV.1938 (TLMFI); 1 ex., same data, but 26.IV.1946 (TLMFI); 1 ex., same data, but 26.X.1942 (TLMFI); 1 ex., same data, but 23.V.1942 (TLMFI); 5 exs., Jungholz, leg. Ammann (TLMFI), 1 ex., Hall env., Mils, 17.IV.1964, leg. Kahlen (TLMFI); 2 exs., Hall env., Häusern Au, 18.X.1963, leg. Kahlen (TLMFI); 1 ex., Brixlegg, Hygna, 27.IX.1964, leg. Kahlen (TLMFI); 1 ex., Wattens, 11.IV.1964, leg. Kahlen (TLMFI); 1 ex., Bärnbad near Wörgl, 4.VI.1967, leg. Kahlen (TLMFI); 1 ex., Innsbruck, Arzler Alm, 26.VIII.1962, leg. Hernegger (TLMFI); 3 exs., Innsbruck, Arzl, 25.III.1964, leg. Kahlen (TLMFI); 1 ex., Fritzens env., Thierburg, 1.XI.1963, leg. Kahlen (TLMFI); 1 ex., Thierburg, 12.XI.1960, leg. Hernegger (TLMFI); 1 ex., Brandenberg, Kaiserhaus, 13.VIII.1965, leg. Kahlen (TLMFI); 2 exs., Brandenberg, Erzh. Johannklause, 5.IX.1980, leg. Kahlen (TLMFI); 1 ex., Innsbruck, Raitis, 15.IX.1965, leg. Kahlen (TLMFI); 2

exs., Unterinntal, Stimmersee, 6.IV.1966, leg. Kahlen (TLMFI); 2 exs., Karwendel, Falzturntal, 18.IX.1966, leg. Kahlen (TLMFI); 3 exs., Karwendel, Eng, 8.IX.1965&9.X.1966, leg. Kahlen (TLMFI); 1 ex., Zirl-Ehnbach, 26.X.1965, leg. Kahlen (TLMFI); 2 exs., Kitzbühel, 14.XI.1984, leg. Kahlen (TLMFI); 1 ex., Kundl env., Kundler Klamm, 30.IV.1964, leg. Kahlen (TLMFI); 1 ex., Außerfern, Weissenbach, Feldele, 910 m, 22.IX.1989, leg. Kahlen (TLMFI); 1 ex., Feldele, VIII.1989, leg. Kahlen (TLMFI); 1 ex., locality not specified, leg. Kofler (TLMFI). **Niederösterreich:** 2 exs., Klosterneuburg (MNHUB); 1 ex., Lobau, leg. Mandl (MNHUB); 3 exs., Baden env., Oberwaltersdorf, 3.XII.1967, leg. Kahlen (TLMFI); 1 ex., Mistelbach, 4.II.1968, leg. Kahlen (TLMFI); 5 exs., locality not specified (MNHUB). **Steiermark:** 2 exs., Graz (MNHUB); 7 exs., Pleschkogel, Rein, 470 m, sifted forest litter, 20.V.1995, leg. Behne (DEI). **Kärnten:** 1 ex., Karawanken, Eberstein, 17.VII.1986, leg. Wunderle (cWun); 1 ex., Karawanken, Ledenitzen, VI.1942, leg. Liebmann (DEI); 2 exs., Koralpe, below Riedling, 900 m, forest floor sifted, 11.VIII.1995, leg. Zerche (DEI).

Czech Republic: 2 exs., Bohemia, Šumava, vrch Ždanidla, 1150 m, 12.VIII.1995, leg. Moravec (cMor); 3 exs., Šumava, Křemelná, pr. Pračily, 820 m, 13.VIII.1995, leg. Moravec (cMor); 1 ex., Prísty pr. Budyně n. O., 22.IV.1994, leg. Moravec (cMor); 1 ex., České středohoří, vrch Sedlo, 17.IV.1996, leg. Moravec (cMor); 1 ex., same data, but 9.IX.1994 (cMor); 1 ex., České středohoří, Nebolady, 28.X.1994, leg. Moravec (cMor); 1 exs., České středohoří, Magnetovac, 19.X.1994, leg. Moravec (cMor); 1 ex., České středohoří, Zlatnik, 29.IX.1994, leg. Moravac (cMor); 2 exs., České středohoří, Stčpdnov. hora, 29.VI.1995, leg. Moravec (cMor); 2 exs., České středohoří, v. Plečivac pr. Ltm. 24.IV.1994, leg. Moravec (cMor); 4 exs., Pořičan (TLMFI); 2 exs, Novohrad hory, Jeleni vrch, 750-880 m, 14.VIII.1995, leg. Moravec (cMor); 1 ex., Novohrad hory, Kamenec, 950-1076 m, 15.VIII.1995, leg. Moravec (cMor); 1 ex., Novohrad hory, Jeleni vrch, 750-880 m, 14.VIII.1995, leg. Moravec (cMor); 1 ex., Majdalena-piskovna, 23.IV.1999, leg. Moravec (cMor); 2 exs., Břehyňský ryb., Břehyně, 3.IX.1994 & 2.III.1997, leg. Moravec (cMor); 1 ex., Moravia, M.-S. Beskydy, Travný, 900-1000 m, 8.V.1994, leg. Moravec (cMor). **Slovakia:** 1 ex., Cerkov range, SW Bardejov, Lysá peak, N Sabinov, 49°10N, 21°09E, 1055 m, 27.VI.2001, leg. Zerche (DEI). **Slovakia**: 1 ex., Livovská Huta env., 23.-24.VIII.1997, leg. Prudek (cGol). **Hungary:** 1 ex., Nyírség, Bátorliget, 7.-10.VI.1949, leg. Kaszab & Székessy (HNHM); 1 ex., Mohács, leg. Kaufmann (HNHM); 1 ex., Hortobágy N. P., Egyek, 14.VII.1976, leg. Hámori (HNHM); 1 ex., Szikra (HNHM); 1 ex., Bács-Kiskun, Solt, Duna-sziget, sifted, 3.III.1980, leg. Hámori (HNHM); 1 ex., Ócsa, Nagyerdő, 28.X.1952, leg. Kaszab (HNHM); 1 ex., Kiskunsági N. P., Lakitelek, Tőserdő, VII-IX.1978, leg. Hámori (HNHM); 1 ex., same data, but 20.IX.1978 (HNHM); 1 ex., same data, but 7.IV.1977 (HNHM); 1 ex., same data, but 24.11.1978 (HNHM); 1 ex., same data, but 20.IX.1978 (HNHM). **Romania:** 1 ex., Braşov, Barcarozsnyó (=Râşno), ["Burggrund"], 7.VII.1918, leg. Fodor (cAss); 1 ex., Braşov, "Gespengberg", 20.III.1918, leg. Fodor (HNHM); 1 ex., Braşov, Kermen, 16.X.1918, leg. Fodor (HNHM); 5 exs., Braşov, Bicfalău ["Bikfalva"], 21.X.1918, leg. Fodor (HNHM); 7 exs., Braşov, "Kapellenberg", 5.III.1918, leg. Fodor (HNHM); 3 exs., Braşov, Zărneşti "[Zemest"], Propastin, 27.IV.1918, leg. Fodor (cAss); 24 exs., Braşov, 11.IV.1918, leg. Fodor (HNHM, cAss); 1 ex., Braşov, 20.IX.1918, leg. Fodor (HNHM); 1 ex., Braşov, Csiga-Hegy, 3.IX.1918, leg. Fodor (HNHM); 2 exs., Braşov, Valea Cetatii, 29.V.1928, leg. Fodor (HNHM); 2 exs., Braşov, Lisnău ["Lisznyó"], 25.X.1918, leg. Fodor (HNHM); 3 exs., 4 km SE Braşov, Honterus-forrás, 1.VI.1918, leg. Fodor (HNHM); 7 exs., Munţii Ciuc, Kászonfürdő, 3.V.-9.VI.1943, leg. Fodor (HNHM); 1 ex., Munţii Ciuc, Şumuleu-Ciuc ["Csiksomlyó"], Nagysomlyó, 14.VIII.1916 (cAss); 7 exs., Munţii Ciuc, Şumuleu-Ciuc, Nagysomlyó-h., 1916, leg. Fodor (HNHM); 2 exs., Munţii Ciuc, Valea Rece ["Hidegség"], Hegyeshavas, 10.IX.1918, leg. Fodor (HNHM); 1 ex., Odorheiu Secuiesc ["Udvarhely"], Goagiu ["Gagy"], Zálos-Tető, 19.IX.1916, leg. Fodor (HNHM); 2 exs., Odorheiu Secuiesc, Mt. Harghita ["Hargita"], Tolvajos-patak, 27.V.1917, leg. Fodor (HNHM); 1 ex., Háromszék, Târgu Secuiesc ["Kézdivásárhely"], Katroza-patak (stream), 7.VIII.1943, leg. Fodor (HNHM); 1 ex., Mt. Trascau: Mt. Bedeleu-Sălciua, 800-900 m, 13.V.1995, leg. Moravec (cAss); 2 exs., Făgăraş, Cîrtisoara, 650 m, 6.VI.1988, leg. Zerche & Behne (DEI); 1 ex., "♀ / Kimakovicz [name of collector], Siebenbürgen, 1886 / ex coll. Scheerpeltz / Typus Sipalia transsylvanica O. Scheerpeltz" (NHMW); 1 ex., same data, but without type label (NHMW). **Bulgaria:** 1 ex., NE Varna, Kranevo, 16.IX.1965, leg. Nohel (NHMW); 5 exs., Pirin, Predel pass, 1100 m, bank of stream, 19.VI.1979, leg. Uhlig (MNHUB); 7 exs., Stara Planina, Etropolska planina, peak, Murgana, 42°42N, 24°03E, 1600-1630 m, grass and *Juniperus* sifted,

11.V.2001, leg. Zerche & Behne (DEI); 1 ex., same data, but 42°44N, 24°01E, 1640 m (DEI). **Bosnia-Herzegovina:** 7 exs., Zeljeznica ["Zelgernica"], flood debris, IX.1931, leg. Fodor (HNHM, cAss). **Ukraine:** 3 exs., L´viv env., Vinniki, VII.-VIII.1916, leg. Fodor (HNHM); 1 ex., Csinagyijovo (=Čžinadno) ["Szt Miklós"], 1910, leg. Biró (HNHM); 16 exs., Kanev near Kiev, 28.IX.1988, leg. Zerche (DEI). **Georgia:** 2 exs., Kratlizkiy Khrebet, Sabaduris Tre, 1800 m, 8.VI.1987, leg. Schülke & Wrase (MNHUB); 2 exs., Mzcheta near Tbilisi, 4.-23.VI.1987, leg. Wrase & Schülke (MNHUB). **Caucasus region:** 1 ex., "Kaukas, Leder / ... / Typus Sipalia formiceticola O. Scheerpeltz" (NHMW); 4 exs., "circellaris v. formiceticola Eplsh. Caucasus Reitter" (DEI); 1♂, 1♀: "Kaukas Leder"/ ... / Typus Sipalia crebrepunctata O. Scheerpeltz" (NHMW); 2 ex., "Kaukas Leder" (DEI).

Comments: In addition to the material listed above, numerous specimens from Central Europe were examined. The species is wing-dimorphic, which explains its huge area of distribution ranging from northern Europe to northern Anatolia, to the Caucasus region, and into Siberia (ASSING 2003; and material examined). It is apparently very rare in the south of its range (southern Balkans, Turkey), whereas in the north (e. g. Central Europe, Scandinavia), where congeneric competitors are absent, it is common everywhere. The exact limits of its distribution in Western Europe and in Italy have not yet been investigated. The genitalia are illustrated by ASSING (2001a).

4.2. *Geostiba* (*Tropogastrosipalia*) *chyzeri* (EPPELSHEIM) (Figs 1-8, Map 2)

Homalota (Geostiba) chyzeri ["*Chyzeri*"] EPPELSHEIM 1883a: 270 f.

Homalota (Geostiba) chyzeri ["*Chyzeri*"] EPPELSHEIM 1883b: 207 f.

Type material examined: Lectotype ♂, here designated: Czéke [= Slovakia: Cejkov], Chyzeri mihi, Hungaria, Chyzer / c. Epplsh., Steind. d. / Chyzeri Eppelsh. Wien. Col. Zeit. II. (1883. p. 271) /Chyzeri det. Bernh. / Typus / Lectotypus ♂ *Homalota chyzeri* Eppelsheim desig. V. Assing 2004 / *Geostiba chyzeri* (Eppelsheim) det. V. Assing 2004 (NHMW). Paralectotypes: 1♀: on same label as lectotype (NHMW); 1♂, 6♀♀: Czéke [2♀♀ with date: 7.10] (HNHM, NHMW); 1♂: ♂ / 65 / Czéke, 17.1.83 / Hungar. bor. / Eppelsh. / Chyzeri Eppels. / type / ex coll. Skalitzky / Cotypus Sipalia Chyzer Dr. Eppelsheim (NHMW).

Additional material examined: **Hungary:** 1 ex., Bükk mts., Lillafüred (HNHM); 1 ex., Lillafüred, leg. Peregi (cAss); 1 ex., Bükk mts., Lillafüred, IX-X.1934, leg. Fodor (HNHM); 3 exs., Bükk mts., Őserdő, V.1975, leg. Szontagh (HNHM); 1 ex., Bükk N. P., Cserépfalu, Ódorvári rom, 450 m, 27.IV.1982, leg. Ádám & Hámori (HNHM); 1 ex., Bükk N. P., Miskolc, Forrás-völgy, 250 m, beech forest, III.1982, leg. Ádám (HNHM); 6 exs., Bükk N. P., Szilvásvárad, Keskeny-rét, 850 m, 24.IX.1981, leg. Ádám & Hámori (HNHM); 1 ex., same data, but Szilvásvárad, Köves-gerinc, 850 m, beech forest, 2.VII.1981 (HNHM); 1 ex., same data, but Szilvásvárad, Tar-kő, 950 m, mixed deciduous forest, 4.X.1983, leg. Merkl (HNHM); 1 ex., Bükk N. P., Felsőtárkány, Fekete-lem, 500 m, 16.IV.1985, leg. Merkl (HNHM); 1 ex., Bükk N. P., Bánkút, 16.VII.1965, leg. Horvatovich (cAss); 2 exs., Heves Megye, Mátra, Ötházhuta, 4.VII.1923, leg. Fodor (HNHM, cAss); 19 exs. [2 exs. teneral], Aggeleki Karszt, 2 km N Szögliget, 48°32N, 20°40E, 210 m, Carpinetum, 31.VII.2001, leg. Zerche (DEI, cAss); 2 exs., Sátoraljaújhely, 48°24N, 21°40E (NHMW). **Slovakia:** 17 exs., Slovenska Lupča, E Banská Bystrica, 7.VI.1995, leg. Behne (DEI, cAss); 1 ex., Tajov near Banská Bystrica, 29.VII.1984, leg. Dieckmann (DEI); 4 exs., Tajov, 29.VII.1988, leg. Behne (DEI); 1 ex., Banská Bystrica, leg. Roubal (DEI); 3 exs., Banská Bystrica, 8.III.1922, leg. Roubal (NHMW, cAss); 1 ex., Velka Fatra, Blatnica, 1400 m, 11.VII.1992, leg. Assing (cAss); 1 ex., Slovenské Rudohorie, Hručovo, 8.V.1989, leg. Janák (cAss); 1 ex., Slovenské Rudohorie, Hostišovce, 7.V.1989, leg. Janák (cAss); 1 ex., Nový Salač, 24.VIII.2002, leg. Smatana (cSch); 1 ex., Liptov ["Liptau"] (NHMW); 3 exs., Cejkov (MNHUB, NHMW); 6 exs. [2 exs. teneral], Vtáčnik [48°40N, 18°40E], 1200 m, 30.VII.1988, leg. Behne (DEI, cAss, cWun); 9 exs. [2 exs. teneral], Slovenský kras, S Rožňava, E Silica, 48°33N, 20°33E, 450 m, beech forest, 29.VII.2001, leg. Zerche (DEI, cAss); 14 exs., Rožňava ["Rosenau Com., Gömör"; 48°40N, 20°32E], leg. Moczarski (NHMW, cAss); 1 ex., Rožňava, 7.V.1967 (cWun); 1 ex., Smižany, 20.VII.1965, leg. Nohel (NHMW); 2 exs., Zákostol'any (=Vel'ke Kostol'any), vm. Nyitra (old Hungarian county, now in Slovakia) ["Kostolany"], leg. Machulka (DEI). **Locality illegible:** 2 exs. (DEI, NHMW).

Redescription: 2.1-3.0 mm. Habitus as in Fig. 1. Coloration: yellowish brown to reddish brown, with abdominal segment VI and often also the adjacent parts of the neighbouring segments more or less distinctly infuscate; appendages yellowish to light brown.

Head oblong, distinctly narrower than pronotum; puncturation very fine; microsculpture shallow; eyes of rather variable size, usually approximately half the length of postocular region in dorsal view, but occasionally distinctly smaller. Antenna of similar morphology as in other species of the subgenus.

Pronotum with distinct sexual dimorphism (Figs 2-3), distinctly larger than head and conspicuously convex in cross-section; puncturation very fine, barely noticeable; microreticulation usually more pronounced than that of head.

Elytra as short as in other species of the subgenus, with distinct sexual dimorphism (Figs 2-4). Hind wings reduced.

Abdomen with more or less distinct microsculpture and with fine sparse puncturation; posterior margin of tergite VII with palisade fringe.

♂: pronotum (in large ♂♂) up to 1.20-1.25 times as wide as head and distinctly elongated, up to 1.20 times as long as wide and projecting over scutellum, posterior margin weakly convex to almost truncate (Fig. 2); elytra with distinctly granulose and relatively sparse puncturation, often with more or less pronounced transverse impression, and in anterior two thirds of suture with distinctly elevated sutural carina of characteristic shape (lateral view) (Fig. 4); tergite VII in posterior half with pair of posteriorly converging carinae (Fig. 5); tergite VIII near hind margin with rudiments of such carinae, in large ♂♂ usually projecting beyond posterior margin in the form of minute dents (Figs 5-6); sternite VIII of similar shape and chaetotaxy as in other species of the subgenus; median lobe of aedeagus with relatively large spear-shaped cristal process (Fig. 7).

♀: pronotum at least as long as wide, but usually weakly oblong, puncturation slightly denser than in ♂ and weakly granulose at most (Fig. 3); spermatheca as in Fig. 8.

Comparative notes: The species is readily distinguished from other species of the subgenus especially by the highly distinctive male sexual characters (shape of pronotum, sutural carinae on elytra, modifications of tergites VII and VIII), but additionally also by the conspicuously convex pronotum, and from many species by the presence of a palisade fringe at the posterior margin of the abdominal tergite VII.

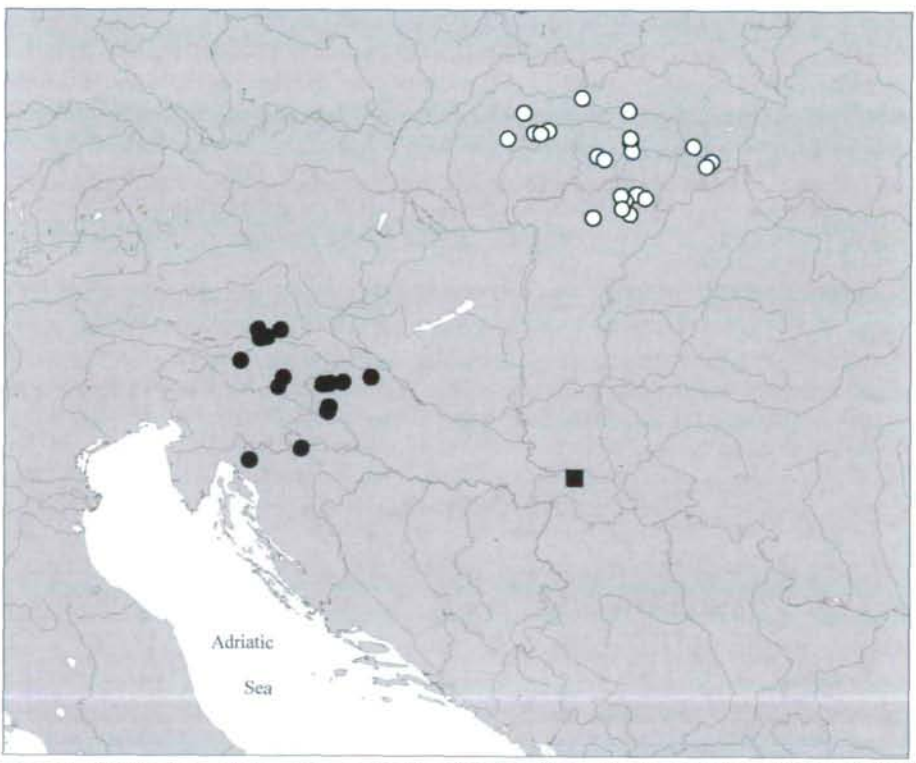
Systematics: ÁDÁM & HEGYESSY (2001) attribute the species to the genus *Ditroposipalia* SCHEERPELTZ, today a junior synonym of the subgeneric name *Sibiota* CASEY. However, based on the morphology especially of the primary and secondary sexual characters - dimorphism of pronotum, shape of male pronotum, modifications of male elytra, shape of median lobe of aedeagus (with cristal process), shape and chaetotaxy of the apical lobe of the paramere, shape of spermatheca, shape and chaetotaxy of posterior margin of female sternite VIII - , it doubtlessly belongs to *Tropogastrosipalia*, a conclusion indirectly suggested already by EPPELSHEIM (1883a).

Comments: The original description is based on an unspecified number of syntypes collected "im Zempliner Comitat bei Satoralja-Ujhély und Czéke in mehreren Exemplaren" (EPPELSHEIM 1883a); one of the specimens from Czéke is here designated as the lectotype. EPPELSHEIM (1883b) described the species in Hungarian in an obscure Hungarian journal; in order to bring the species to the attention of his non-Hungarian

colleagues, he published the description also in German (EPPELSHEIM 1883a).

In contrast to all other authors, ÁDÁM & HEGYESSY (2001) attribute the species to BIRÓ instead of EPPELSHEIM. The description published in the paper by BIRÓ (1883) is followed by the indication "EPPELSHEIM in litt". Apparently, EPPELSHEIM had sent the description to Biró, who then probably translated it and included it in his paper. To my knowledge, a precise publication date is available for neither of the two descriptions, so that December 31, 1883, must be assumed as the official publication date for both articles. In the absence of further evidence that the species should be attributed to BIRÓ, who never described a species of Staphylinidae, the long-standing tradition of regarding EPPELSHEIM as the author is here maintained.

Distribution and bionomics: The species has become known from various localities in Slovakia and Hungary (Map 2), where it apparently occurs preferably in various kinds of deciduous forest at lower to intermediate altitudes (250-1400 m). The material examined was collected during the period from March through October; teneral specimens were repeatedly found in July.



Map 2: Distributions of *Geostiba spinicollis* (filled circles), *G. chyzeri* (open circles), and *G. hummleri* (square) in the southeast of Central Europe and in the northern Balkans, based on examined records.

4.3. *Geostiba* (*Tropogastrosipalia*) *rodopensis* PACE (Fig. 9)

Geostiba (Geostiba) rodopensis PACE 1990: 121 f.

Type material examined: Holotype ♂ [dissected prior to present study; teneral, somewhat damaged, and without antennae]: Bulgarie, Batak, Rodopes, H. Coiffait, 7.X.70 / Holotypus Geostiba rodopensis m., det. R. Pace 1985 / Museum Paris / Geostiba rodopensis sp.n. det. R. Pace 1985 (MNHNP).

Redescription: Due to the malformed condition, the length of the holotype is difficult to measure; in normal preparation, it would probably be approximately 1.8 mm long. Since other characters, too, are affected by the poor condition of the type specimen (Fig. 9), the redescription must focus on the following characters:

Eyes small, composed of little more than about 15 ommatidia. Pronotum apparently with pronounced, elytra with moderate sexual dimorphism.

♂: pronotum elongated posteriorly, approximately 1.10-1.15 times as long as wide, posterior margin broadly convex; elytra with distinctly granulose and moderately dense puncturation, near apex of scutellum with weakly pronounced narrow sutural carina; tergite VII in posterior half with pair of diagonal (posteriorly converging!), weakly pronounced carinae; aedeagus as illustrated by PACE (1990: Fig. 29).

Comparative notes: As is suggested by the male primary and secondary sexual characters (shape of cristal process of aedeagus, modifications of male pronotum and elytra, and especially the presence of a pair of carinae - instead of a single process - on the male tergite VIII), *G. rodopensis* is closely related to *G. chyzeri*, the only species with a similar character combination. It is distinguished from that species by the more weakly pronounced, more diagonal, and more widely separated carinae on the male tergite VIII, as well as by the apically rounded cristal process (lateral view!) of the aedeagus. In addition, the holotype is smaller than average specimens of *G. chyzeri* and the eyes are of somewhat reduced size.

Comments: Since its original description, which is based on a single male, the species has not been recorded again. The distinctly teneral holotype is somewhat damaged and deformed (possibly as a result of boiling). In addition, its antennae are missing and the aedeagus is of somewhat transparent and milky condition, so that its morphology can no longer be fully assessed.

Distribution and bionomics: The type locality is situated in the surroundings of Batak, northern Rhodope mountains, Bulgaria. Bionomic data are not available.

4.4. *Geostiba* (*Tropogastrosipalia*) *bernhaueri* (BREIT), species dubia (Figs 10-11)

Sipalia bernhaueri ["*Bernhaueri*"] BREIT 1912: 201 f.

Type material examined: Lectotype ♀, here designated: ♂ [sic] /♂ [sic] / Klst. Kokos Dobrutscha, Breit / Sipalia Bernhaueri Breit Type / Typus Sipalia Bernhaueri J. Breit / Lectotypus *Sipalia bernhaueri* Breit desig. V. Assing 2004 / Geostiba bernhaueri Breit det. V. Assing 2004 (NHMW). Paralectotypes: 1 ♀: same data as lectotype, but "♀ / ♀" (NHMW); 1 ♀: ♂ [sic] /♂ [sic] / Nd. Dobrud. Rum. Kuchta (NHMW).

Comments: The original description is based on few syntypes collected "in der Umgebung des Klosters Kokos [now Cocos Monastry near Niculitel; approx. 45°09N, 28°27E] im Waldgebirge der Nord-Dobrutscha in wenigen Stücken". As can be inferred from the original description and from the labels attached to the type specimens, BREIT

(1912) evidently believed both sexes to be represented in the sample. Consequently, the species has been attributed to the subgenus *Sipalotricha* or its junior synonym *Lioglutosipalia* SCHEERPELTZ. A dissection of the types, however, revealed that they are all females and that they refer to the subgenus *Tropogastrosipalia*. A reliable interpretation of the species of this subgenus is possible only based on the male primary and secondary sexual characters, so that a redescription is pointless, until males from the surroundings of the type locality become available. The surroundings of the type locality are apparently not inhabited by locally endemic beetle species (STAN pers. comm.), so that *G. bernhaueri* is unlikely to have a very restricted distribution. It seems worth noting that the species is rather pale-coloured and that the head is not particularly slender. The pronotum is approximately 1.15 times as wide as the head (Fig. 11). The spermatheca is of the condition usually encountered in the subgenus (Fig. 10).

4.5. *Geostiba* (*Tropogastrosipalia*) *mihoki* (BERNHAUER) (Figs 12-23)

Sipalia mihoki ["*Mihoki*"] BERNHAUER 1932: 240.

Geostiba (*Geostiba*) *biharica* PACE 1990: 119; **syn.n.**

Type material examined:

S. mihoki: Lectotype ♂, here designated: Körösbarlang [today apparently Peşterea] / spinicollis Kr. det. Bernh. / Mihoki Bernh. Typus / Chicago NHMus M.Bernhauer Collection / Lectotypus ♂ *Sipalia mihoki* Bernhauer desig. V. Assing 2004 / Geostiba mihoki (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotype ♂: Bihar Rév. [=jud. Bihor, Vadu Crişului], coll. Mihok / spinicollis Kr. det. Bernh. / Mihoki Bernh. Cotypus / Chicago NHMus M.Bernhauer Collection (FMNH).

G. biharica: Holotype ♂: ♂ / mts Bihor, Fânate [46°30N, 22°32E], env. de grotte / Juin 22. Jeannel et Winkler / ex coll. Scheerpeltz / Typus *Sipalia biharica* O. Scheerpeltz [unavailable name] / Geostiba biharica Sch. i. l. det. R. Pace 1983 (NHMW). Paratypes: 1♂, 1♀: same data as holotype, but "Cotypus ..." (NHMW); 1♀: Hungaria (Com. Bihar) Dr. Fleischer (NHMW).

Additional material examined: **Romania:** 2 exs., Banat (NHMW); 5 exs., Caraş-Severin, Bocşa ["N. Bogsán"] (NHMW, cAss); 1 ex., "Bihar" (MHNG).

Redescription: 2.3-2.9 mm. Habitus as in Figs 12, 14. Coloration: body light brown to dark brown, with the head usually at least slightly darker than pronotum and elytra and with the preapical abdominal segments more or less extensively infuscate; legs testaceous; antennae yellowish brown to brown.

Head weakly oblong; eyes approximately half the length of postocular region in dorsal view; integument with very shallow microreticution; puncturation extremely fine and sparse, barely noticeable. Antenna of similar morphology as in other species of the subgenus.

Pronotum distinctly larger than head; with distinct sexual dimorphism; puncturation very fine, barely noticeable; microreticulation more pronounced than that of head.

Elytra as short as in other species of the subgenus, with distinct sexual dimorphism. Hind wings reduced.

Abdomen with rather pronounced microsculpture and with fine sparse puncturation; posterior margin of tergite VII with narrow palisade fringe.

♂: pronotum (in large ♂♂) up to 1.40 times as wide as head and about 1.1 times as long as wide; posteriorly sharply convex (not distinctly pointed) and projecting over scutellum (Figs 13, 15); elytra with distinctly granulose and moderately dense puncturation, with more or less pronounced, extensive, diagonal impression, and in anterior half of suture with weakly to distinctly elevated sutural carinae, these carinae narrow and parallel in

normal ♂♂, broader and anteriorly diverging in very large ♂♂ (Figs 13, 15); anterior abdominal tergites unmodified; tergite VII at posterior margin with short suberect process, this process apically rounded or obtuse in antero-dorsal view (Figs 16-17); posterior margin of tergite VIII of variable shape, often in the middle projecting posteriad and with pair of (sometimes fused) tooth-like processes (Figs 18-21); median lobe of aedeagus with minute and slender cristal process (Figs 22-23).

♀: pronotum weakly (1.05-1.10 ×) transverse and with weakly convex posterior margin; elytra with shallower impressions and with non-granulose puncturation; spermatheca of similar morphology as in other species of the subgenus (see PACE 1990: Fig. 21).

Intraspecific variation: All male secondary sexual characters are subject to considerable intraspecific variation. In small males, the secondary sexual characters may be (almost) completely reduced; in males of intermediate size, the process of the abdominal tergite VII is weakly elevated and apically more acute than in large males.

Comparative notes: The species is readily distinguished from other species of the subgenus by the highly distinctive male sexual characters, especially the often modified male tergite VIII.

Comments: The original description of *S. mihoki* is based on two male syntypes collected by Mihok (BERNHAUER 1932). The male from in Körösbarlang (today Aştileu) is here designated as the lectotype.

PACE (1990) based the original description of *G. biharica* on a holotype and several paratypes, but failed to attach any type labels to the specimens. However, it can be assumed that when referring to the holotype he meant the male syntype labelled by SCHEERPELTZ as the "Typus". The types of *G. biharica* are most unlikely to represent a species distinct from *G. mihoki*. The main distinguishing characters indicated by PACE (1990) are the shape of the pronotum and the shape of the cristal process of the aedeagus. The slightly larger and more oblong pronotum (and the more pronounced sutural carinae on the elytra) in the holotype of *G. biharica* are accounted for by the fact that it is a large male with pronounced secondary sexual characters. This extent of intraspecific variation is absolutely normal in species of *Tropogastrosipalia*, and indeed, the shape of the pronotum of the examined paratype is identical to those of the types of *G. mihoki*. No appreciable difference was found in the morphology of the aedeagus. At first, the shape of the posterior margin of the male tergite VIII was believed to represent a constant distinguishing character. However, a comparison of all available males revealed that the extreme conditions in the types of *G. mihoki* on the one hand and in the paratype of *G. biharica* on the other are linked by every possible transition, suggesting that the shape of the tergite is subject to considerable intraspecific variation. Finally, the type locality of *G. biharica* is apparently situated within the range of *G. mihoki*, so that the hypothesis that *G. biharica* represents a distinct species, would not be plausible from a zoogeographical point of view either. Consequently, *G. biharica* is here placed in the synonymy of the senior name *G. mihoki*.

Distribution and bionomics: The species is apparently endemic to the southwestern Carpathians and the Bihor range. Aside from the month of collection (June) of some of the type specimens of *G. biharica*, bionomic data are not available.

4.6. *Geostiba* (*Tropogastrosipalia*) *torisuturalis* ASSING

Material examined: **Greece:** 1 ex., "armata Epp. Graecia, Croissandeau / ... / Typus" (NHMW).

Comment: The above specimen has no type status, since the original description of *G. armata* is explicitly based on a single holotype specimen from the Olympos (ASSING 1999, EPPELSHEIM 1878a).

4.7. *Geostiba* (*Tropogastrosipalia*) *taygetana* (BERNHAUER)

Material examined: **Greece:** 20 exs., Pelopónnisos, Meligalás, Dhervénion, 600 m, 26.III.1992, leg. Frisch (MNHUB, cAss); 1 ex., Taygetos, leg. Brenske (HNHM); 1 ex., Koúmani [36°47'N, 22°20E], leg. Brenske (NHMW).

Comment: Previously, only the holotype of this species (type locality: "Dorf Sola") was known (ASSING 1999).

4.8. *Geostiba* (*Tropogastrosipalia*) *meschniggi* PACE

Material examined: **Greece:** 10 exs., Pelopónnisos, Taygetos, Kalamata-Sparta, 1300 m, 1.IV.1992, leg. Frisch (MNHUB, cAss).

Comment: The species is endemic to the Taygetos range (ASSING 1999).

4.9. *Geostiba* (*Tropogastrosipalia*) *spinicollis* (KRAATZ) (Figs 24-28, Map 2)

Homalota spinicollis KRAATZ 1862: 267 f.
Homalota (Geostiba) croatica EPPELSHEIM 1880: 208 f.; **syn.n.**
Sipalia (*Sipalia*) *carinthiaca* SCHEERPELTZ 1957: 136 ff.; **syn.n.**
Geostiba (*Geostiba*) *krapinensis* PACE 1990: 117 ff.; **syn.n.**

Type material examined:
H. spinicollis: Lectotype ♂, here designated: Kroat. / Hampe / spinicollis mihi / Syntypus / coll. Kraatz / Lectotypus ♂ *Homalota spinicollis* Kraatz desig. V. Assing 2005 / Geostiba spinicollis (Kraatz) det. V. Assing 2005 (DEI). Paralectotypes: 2♂♂, 4♀♀: Croatia / Syntypus / coll. Kraatz (DEI).
H. croatica: Lectotype ♂, here designated: ♂ / croatica mihi Croatia Reitter / c. Epplsh. Steind. d. / croatica det. Bernh. / Typus / vidit R. Pace 1983 / Lectotypus ♂ *Homalota croatica* Eppelsheim desig. V. Assing 2004 / Geostiba spinicollis (Kraatz) det. V. Assing 2004 (NHMW). Paralectotype ♀: same data as lectotype (NHMW).
S. carinthiaca: Lectotype ♂, here designated: ♂ / Carinthia, Lavamünd, Hölzel leg. / ex coll. Scheerpeltz / Typus Sipalia carinthiaca O. Scheerpeltz / Lectotypus ♂ *Sipalia carinthiaca* Scheerpeltz desig. V. Assing 2005 / Geostiba spinicollis (Kraatz) det. V. Assing 2005 (NHMW). Paralectotypes: 5♂♂, 2♀♀: same data as lectotype (NHMW); 2♂♂: Johannisberg, St. Paul, SO-Kärnten / leg. Dr. H. Franz 1956 (NHMW).
G. krapinensis: Holotype ♂: ♂ / Dr. Hensch, Krapina Cro. / croatica Epp. / ex coll. Scheerpeltz / Holotypus Geostiba krapinensis m. det. R. Pace 1983 / Geostiba krapinensis n. sp. det. R. Pace 1983 / Geostiba spinicollis (Kraatz) det. V. Assing 2004 (NHMW). Paratype ♀: same data as holotype (NHMW).

Additional material examined: **Austria:** 4 exs., Koralpe, Soboth/Laaken env., Hühnerkogel, 1520 m, unforested habitat with sedges, 6.VI.1990, leg. Kahlen (TLMFI, cAss); 2♂♂, Steiermark, Koralpe, Wies env. (NHMW, cAss). **Slovenia:** 7 exs., Celje ["Cilli"], leg. Strupi, etc. (NHMW, cAss); 1 ex., Rimske Toplice ["Römerbad", 46°08N, 15°12E], leg. Franz (cAss); 1 ex., Kamnicko-Savinjské, Logarská dolina [46°24N, 14°38], 11.V.2000, leg. Krásenský & Svarc (cAss); 2 exs., "Krain" (HNHM). **Croatia:** 1 ex., Kapela ["Capella"], leg. Reitter (NHMW); 5 exs., Ludbreg, leg. Apfelbeck (NHMW); 6 exs., Zagreb (DEI, NHMW); 1 ex., Ogulin (NHMW); 12 exs., "Croatia", "Kroatien", etc., leg. Birnbacher, Hampe, Kraatz, etc.

(MNHUB, NHMW); 4 exs., Ivančica planina [46°11N, 16°10E] (NHMW, cAss); 1 ex., Medvednica ["Sljemen Gebirge", 45°55N, 15°58E] (NHMW); 1 ex., Golubovec [46°10N, 15°59E], leg. Hummler (cAss); 3 exs., Karlovac, Ozaljska ñpilja env., 8.V.2000, leg. Krásenský & Svarc (cKra); 1 ex., "Bonul" [?]. **Locality not specified or illegible:** 18 exs. (DEI, MNHUB, NHMW).

Redescription: 2.3-3.0 mm. Habitus as in Fig. 24. Coloration: reddish brown, with the head usually somewhat darker than pronotum and with the preapical abdominal segments more or less intensively infuscate; legs and antennae testaceous to yellowish brown.

Head weakly oblong and with shallow microreticulation. Pronotum with distinct microreticulation. Pronotum and elytra with distinct sexual dimorphism (Fig. 25). Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum large in relation to head, in large ♂♂ moderately oblong, about 1.10 times as long as wide and approximately 1.35 times as wide as head, posterior margin pointed in the middle; elytra usually with very shallow extensive impression, along anterior two thirds of suture with moderately elevated narrow sutural carinae, and with weakly granulose puncturation (Fig. 25); abdominal segments III-V unmodified; process of segment VII distinctly erect, apically convex in antero-dorsal view, and rather flattened dorso-ventrally (Figs 26-27); median lobe of aedeagus with short and slender cristal process (Fig. 28).

♀: pronotum about as wide as long and approximately 1.25 times as wide as head; spermatheca not distinctive.

Comparative notes: *Geostiba spinicollis* is distinguished from almost all other species of the subgenus occurring in the northern Balkans especially by the posteriorly pointed male pronotum. For separation from *G. hummleri*, which is somewhat similar in this respect, see the comparative notes in the following section.

Comments: The original description of *G. spinicollis* is based on an unspecified number of syntypes from "Croatien" collected by "Dr. Clemens Hampe" (KRAATZ 1862). Of the seven syntypes found in the Kraatz collection, a male in good condition and with the full set of Kraatz' labels attached to it is designated as the lectotype. EPPELSHEIM (1880) described *H. croatica* based on a male and a female ("in einem einzigen Pärchen") from "Croatien" collected by Reitter. Both syntypes were located in the collections of the NHMW. The male syntype of *H. croatica*, which is here designated as the lectotype, is a small male (with somewhat reduced male secondary sexual characters) of *G. spinicollis*; hence the synonymy proposed above.

Based on an examination of the types of *S. carinthiaca* SCHEERPELTZ and additional material from the Koralpe, no evidence was found suggesting that they should represent a distinct species. The male sexual characters are within the range of intraspecific variation of *G. spinicollis*; hence the synonymy indicated above. The male labelled by Scheerpeltz as "Typus" is here designated as the lectotype.

The holotype of *G. krapinensis* is a small male with very weakly pronounced secondary sexual characters, a common phenomenon in the subgenus. I have seen similar specimens from other Croatian localities and from Celje in Slovenia. In addition, *G. spinicollis* has been recorded from the vicinity of Krapina, the type locality of *G. krapinensis*. Since no convincing distinguishing characters were found, *G. krapinensis* is here placed in the synonymy of *G. spinicollis*, a species not even mentioned and proba-

bly overlooked in the key provided by PACE (1990) to distinguish *G. krapinensis* from similar species occurring in the Balkans.

Distribution and bionomics: The species has become known from several localities in Croatia, Slovenia, and Austria (Koralpe) (Map 2). The altitudes are specified only in two samples: 1000 m and 1520 m. The types of *Sipalia carinthiaca* were sifted from deep layers of forest leaf litter, several other specimens were found in unforested habitats.

4.10. *Geostiba* (*Tropogastrosipalia*) *hummleri* (BERNHAUER) (Figs 29-34, Map 2)

Sipalia hummleri ["*Hummleri*"] BERNHAUER 1932: 239.

Type material examined:
Lectotype ♂, here designated: Fruska Gora / Kroatien Hummler Mai 1929 / Sipalia Hummleri Brnh. Cotypus / Chicago NHMus M.Bernhauer Collection / Lectotypus ♂ *Sipalia hummleri* Bernhauer desig. V. Assing 2004 / Geostiba hummleri (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotypes: 4♂♂, 1♀: same data as lectotype (FMNH, NHMW).

Additional material examined: **Yugoslavia:** 1 ex., Slavonia, Fruška Gora, 1907, leg. Hensch (NHMW).

Redescription: Relatively small species, 2.1-3.0 mm. Habitus as in Fig. 29. Coloration: reddish brown, with the head usually somewhat darker than pronotum and with the preapical abdominal segments more or less intensively infuscate; legs and antennae testaceous.

Head weakly oblong and with shallow microreticulation. Pronotum, too, with shallow microreticulation and with distinct shine. Pronotum and elytra with rather weakly pronounced sexual dimorphism (Fig. 30). Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

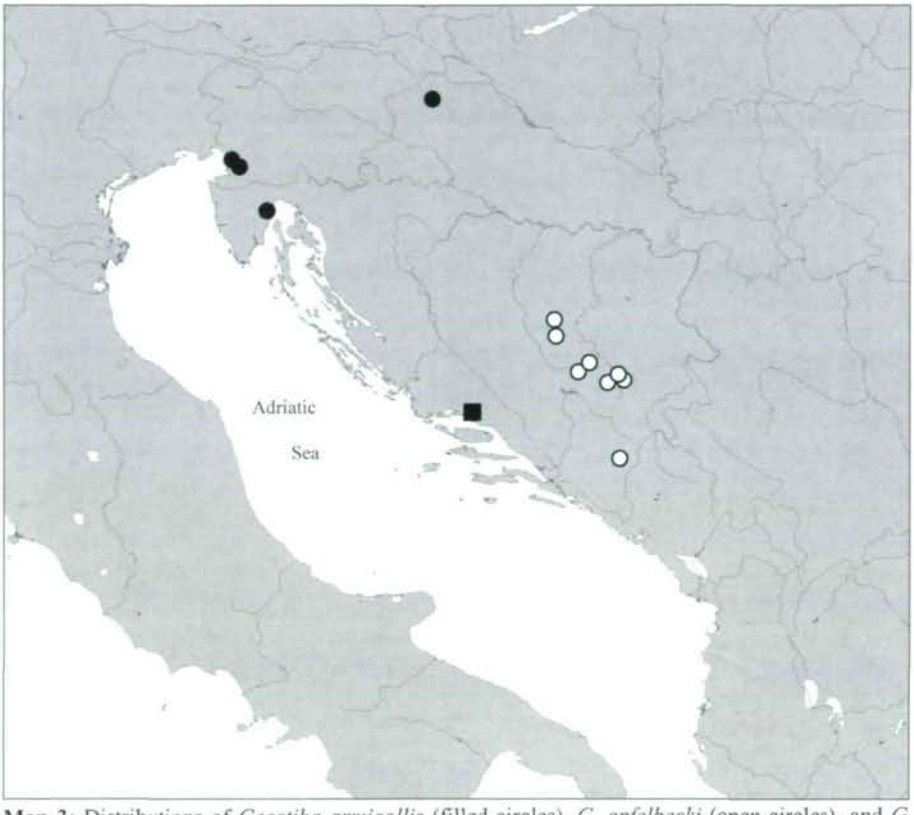
♂: pronotum moderately large in relation to head, in large ♂♂ weakly oblong, about 1.05-1.10 times as long as wide and approximately 1.25 times as wide as head, posterior margin obtusely or convexly pointed in the middle; elytra without impressions, along anterior two thirds of suture with weakly elevated narrow sutural carinae, and with weakly granulose puncturation (Fig. 30-32); abdominal segments III-V unmodified; process of segment VII distinctly erect, apically acute in antero-dorsal view, and rather flattened dorso-ventrally (Fig. 33); median lobe of aedeagus with moderately long and slender cristal process (Fig. 34).

♀: pronotum about as wide as long and approximately 1.15-1.20 times as wide as head; spermatheca not distinctive.

Comparative notes: *Geostiba hummleri* is distinguished from almost all other species of the subgenus occurring in the northern Balkans by the shape of the male pronotum. It is distinguished from the geographically close *G. spinicollis* by the smaller, less distinctly microsculptured, and much more shining pronotum, by the posteriorly less sharply pointed posterior margin of the male pronotum (large ♂♂!), and by the larger and longer cristal process of the aedeagus.

Comments: The original description of *G. hummleri* is based on an unspecified number of syntypes ("in mehreren Stücken"). One of the male syntypes from the Bernhauer collection is here designated as the lectotype.

Distribution and bionomics: The species has become known only from the Fručka Gora range in northern Serbia, not far from the border to Croatia (Map 2).



Map 3: Distributions of *Geostiba armicollis* (filled circles), *G. apfelbecki* (open circles), and *G. mosorica* (square) in the northern Balkans, based on examined records.

4.11. *Geostiba* (*Tropogastrosipalia*) *armicollis* (BREIT) (Figs 35-38, Map 3)

Sipalia armicollis BREIT 1917: 68 f.
Geostiba (*Geostiba*) *tergestina* PACE 1988: 11 ff.; **syn.n.**

Type material examined:
S. armicollis: Lectotype ♂, here designated: ♂ / Ivancica [46°11N, 16°10E], Croatia bor. / Sipalia armicollis ♂ Breit / Type / Typus Sipalia armicollis Breit Lectotypus ♂ *Sipalia armicollis* Breit desig. V. Assing 2004 / Geostiba armicollis (Breit) det. V. Assing 2004 (NHMW). Paralectotypes: 10♂♂, 22♀♀: same data as lectotype (DEI, NHMW, cAss).
G. tergestina: Holotype ♂: Opicina [45°41N, 13°47E] TS, 27.III.81, leg. Seriani M. / Holotypus Geostiba tergestina m. det. R. Pace 1985 / Geostiba tergestina sp.n. det. R. Pace 1985 / Geostiba armicollis (Breit) det. V. Assing 2004 (cZan).

Additional material examined: **Italy:** 1 ex., Trieste, Opicina, Basovizza [45°38N, 13°51E], 21.-28.IV.1921, leg. Moczarski & Scheerpeltz (NHMW). **Croatia:** 21 exs., Učka, leg. Breit, Winkler ["Mte. Maggiore"; 45°15N, 14°12E (DEI, NHMW, cAss); 1 ex., Ivancica [labelled: "Typus Sipalia plicicollis O. Scheerpeltz"] (NHMW).

Redescription: 2.3-3.1 mm. Habitus as in Fig. 35. Coloration: reddish brown, with the head usually somewhat darker than pronotum and with the preapical abdominal segments more or less intensively infuscate; legs and antennae testaceous to yellowish brown.

Head weakly oblong and usually with shallow, sometimes without appreciable microreticulation. Pronotum, too, with very shallow, occasionally without microreticulation, and with distinct shine. Pronotum and elytra with pronounced sexual dimorphism (Fig. 36). Posterior margin of abdominal tergite VII without palisade fringe.

♂: pronotum (in large ♂♂) distinctly oblong, about 1.20 times as long as wide and approximately 1.25 times as wide as head, posterior margin projecting over scutellum, broadly concave, and with pronounced posterior angles; lateral margins in very large ♂♂ weakly sinuate near posterior angles; elytra with distinctly granulose puncturation, with extensive impression, in anterior half of suture with weakly elevated narrow carina, lateral margins of elytra more or less distinctly elevated (Fig. 36); abdominal segments III-V unmodified; process of segment VII moderately long and distinctly erect, apically acute in antero-dorsal and in lateral view, not flattened dorso-ventrally (Fig. 37); median lobe of aedeagus with slender and relatively short cristal process (Fig. 38).

♀: pronotum about as wide as long and approximately 1.20-1.25 times as wide as head; spermatheca not distinctive.

Comparative notes: *Geostiba armicollis* is readily distinguished from all other species of the subgenus occurring in the northern Balkans by the highly distinctive shape of the male pronotum. From most other *Tropogastrosipalia* species, it is also separated by the weakly pronounced microsculpture and the distinct shine of the head and pronotum.

Comments: The original description of *G. armicollis* is based on an unspecified number of syntypes ("in einiger Zahl"). One of the male syntypes in good condition and with pronounced secondary sexual characters is here designated as the lectotype. Two specimens labelled "Mte. Maggiore" and "Cotypus" have no type status, since the only locality mentioned in the original description is "Ivancica".

In the original description of *G. tergestina*, PACE (1988) compares the species with *G. turcica* (BERNHAUER) and *G. winkleri* (BERNHAUER) from Turkey and the Crimea, respectively. There is no reference to *G. armicollis*. Based on a study of the holotype and additional material from the type locality of *G. tergestina*, there is no doubt that *G. tergestina* is conspecific with *G. armicollis*; the male primary and secondary sexual characters are identical.

Distribution and bionomics: The species has become known from four localities in northern Croatia and northeastern Italy (Map 3). BREIT (1917) collected the types by sifting leaf litter in a beech forest.

4.12. *Geostiba* (*Tropogastrosipalia*) *apfelbecki* EPPELSHEIM (Figs 39-43, Map 3)

Geostiba apfelbecki ["*Apfelbecki*"] EPPELSHEIM 1892: 289 ff.
Geostiba (Geostiba) wunderlei PACE 1996: 10 ff., **syn.n.**
Type material examined:
G. apfelbecki: Lectotype ♂, here designated: Apfelbecki Epp., Bosnien, Apfelbeck / c. Eppelsh. Steind. d. / Apfelbecki det. Bernh / Typus / vidit R. Pace 1981 / Lectotypus ♂ Geostiba apfelbecki Eppelsheim desig. V. Assing 2004 / Geostiba apfelbecki det. V. Assing 2004 (NHMW). Paralectotypes: 2♂♂, 2♀♀: same data as lectotype (NHMW).
G. wunderlei: Holotype ♂: YU - Bosnien, Umg. Sarajevo, 700 m, Dusina, Nadelstreu, 04.05.90, Wunderle / Geostiba wunderlei m. det. R. Pace 1992 / Geostiba apfelbecki Eppelsheim det. V. Assing 2004 (cWun). Paratypes: 4♂♂, 1♀ [1♂ teneral]: same data as holotype (DEI, cWun, cAss).

Additional material examined: **Bosnia-Herzegovina:** 9 exs., Sarajevo, Igman Planina, 8.VIII.1933, leg. Fodor (HNHM, cAss); 17 exs., Sararevo, Trebević, alpine zone, grass roots, 1902, leg. Apfelbeck (NHMW, cAss); 2 exs., Trebević (MNHUB); 2 exs., Sarajevo, Gromiljak (Kisljak), 9.V.1990, leg. Wunderle (cWun); 4 exs., Sarajevo, leg. Apfelbeck (DEI); 1 ex., Vlasic planina, 1500 m, 6.V.1990, leg. Wunderle (cWun); 17 exs., Bjelačnica planina (DEI, NHMW, cAss); 1 ex., "Ljubična", 1902, leg. Apfelbeck (DEI); 1 ex., Travnik, "Holotypus Geostiba apfelbecki parva m. det. R. Pace 1981 [unavailable name]" (NHMW); 2 exs., Travnik (MNHUB, NHMW); 2 exs., S-Bosnia, "Halma" (NHMW, cAss); 2 exs., Sarajevo, Dusina, 700 m, 4.V.1990, leg. Wunderle; "Geostiba apfelbecki (BN) [sic] det. R. Pace 1992" (cAss, cWun); 4 exs., "Bosnien", "Central-Bosnien", etc. (HNHM, NHMW).

Redescription: 2.3-3.0 mm. Coloration variable: head brown to dark brown; pronotum and elytra yellowish brown to castaneous, usually lighter than head; abdomen light brown to brown with the preapical segments infuscate and the apex yellowish brown; legs testaceous; antennae yellowish brown to reddish brown.

Head weakly oblong and with shallow microreticulation. Pronotum with distinct microreticulation and with pronounced sexual dimorphism. Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum large in relation to head, in large ♂♂ distinctly oblong, about 1.15 times as long as wide, posterior margin moderately convex, in one very large ♂ seen from Trebević even slightly concave; elytra often with extensive transversely diagonal impression, along anterior half of suture with distinctly elevated, but very narrow sutural carinae (Figs 39-41); abdominal segments III-V unmodified; process of segment VII distinctly erect, apically acute both in antero-dorsal and in lateral view; aedeagus as in Figs 42-43; see also PACE (1996: Fig. 14).

♀: pronotum about as wide as long; spermatheca not distinctive, as figured by PACE (1996: Fig. 16).

Comments: *Geostiba apfelbecki* is distinguished from other species of the subgenus occurring in the region especially by the shape of the male pronotum, which is rather large, long, and posteriorly not pointed, by the modifications of the male elytra (short narrow sutural carinae), by the acute and erect process of the male tergite VII, and by the shape of the cristal process of the aedeagus.

Comments: The original description of *G. apfelbecki* is based on an unspecified number of syntypes from "Bosnien" (EPPELSHEIM 1892). The male syntype with the most pronounced secondary sexual characters is here designated as the lectotype. According to PACE (1996), *G. wunderlei* is distinguished from *G. apfelbecki* by the shapes of the head and pronotum, the length of the sutural carinae on the male elytra, the length of the process of the male tergite VII, the shape of the cristal process of the aedeagus, and by the shape of the apical cuticular intrusion of the spermatheca. A comparison of the types of both names and numerous additional specimens, however, revealed no such differences; apparently, Pace had seen only few specimens. Species of *Tropogastrosipalia* are extremely variable especially regarding the male secondary sexual characters. Also, there is no zoogeographic evidence supporting the hypothesis that the types of *G. wunderlei* should represent a distinct species, so that the name is here placed in the synonymy of *G. apfelbecki*. Interestingly, Pace identified two of the specimens from the type locality of *G. wunderlei* as *G. apfelbecki* (see above).

Distribution and bionomics: The species has become known from the surroundings of Sarajevo, Bosnia-Herzegovina (Map 3), where it was found both at

relatively low altitudes (700 m) and in the alpine zone in litter of coniferous trees and in grass roots, respectively. One of the types of *G. wunderlei* collected in the beginning of May is teneral.

4.13. *Geostiba* (*Tropogastrosipalia*) *paganettiana* (BERNHAUER) (Figs 44-47, Map 4)

Sipalia paganettiana BERNHAUER 1936: 246 f.

Type material examined: Lectotype ♂, here designated: Kobilja Bosn. / Paganettiana Bernh. Typus / Paganettiana Brnh. Typus Sipalia / Chicago NHMus. M.Bernhauer Collection / Lectotypus ♂ *Sipalia paganettiana* Bernhauer desig. V. Assing 2004 / Geostiba paganettiana (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotypes : 1♂, 1♀: same data as lectotype, but labelled as "Cotypus" (FMNH).

Additional material examined: **Bosnia-Herzegovina:** 12 exs., Sarajevo, Kobilja Glava, 10.IV.1935, leg. Fodor (HNHM, cAss).

Redescription: Small species, 1.8-2.3 mm. Coloration: head and abdomen, except for the lighter apex, dark brown to blackish brown; pronotum and elytra reddish; legs testaceous; antennae yellowish to reddish brown.

Head with shallow microreticulation; eyes relatively small, less than half the length of postocular region in dorsal view. Pronotum approximately as wide as long, with very weak sexual dimorphism (Fig. 44). Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum with convex posterior margin; elytra with somewhat granulose punctuation and near apex of scutellum with small, weakly defined, indistinct elevation, without distinct carinae and without impressions (Fig. 44); abdominal segments III-V unmodified; segment VII posteriorly only with oblong median tubercle, without erect or suberect process (Fig. 45); aedeagus with rather massive cristal process (Figs 46).

♀: posterior margin of pronotum more or less truncate; spermatheca as in Fig. 47.

Comparative notes: *Geostiba paganettiana* is distinguished from the geographically close, possibly sympatric *G. apfelbecki* by lower average size, the usually less pronounced microreticulation of the pronotum, the weakly pronounced sexual dimorphism of the pronotum and the elytra, the weakly pronounced process of the male abdominal tergite VII, and by the more massive cristal process of the aedeagus.

Comments: The original description is based on an unspecified number of syntypes from "Kobila Glava" (BERNHAUER 1936). Three syntypes were found in the Bernhauer collection. The larger of the two male syntypes is here designated as the lectotype.

Distribution and bionomics: The species has become known only from the type locality near Sarajevo (Map 4); other records (SCHEERPELTZ 1951) should be considered doubtful.

4.14. *Geostiba* (*Tropogastrosipalia*) *spizzana* (BERNHAUER) (Fig. 48, Map 4)

Sipalia spizzana BERNHAUER 1932: 240 f.

Geostiba (*Geostiba*) *maderi* PACE 1996: 14; **syn.n.**

Type material examined:

S. spizzana: Lectotype ♂, here designated: Dalmatia merid. 1881, Spizza-Sutomore, Stussinger / armata det. Bernh. / Spizzana Bernh. Typus / Chicago NHMus M.Bernhauer Collection / Lectotypus ♂ *Sipalia spizzana* Bernhauer desig. V. Assing 2004 / Geostiba spizzana (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotypes: 1♂, 1♀: same data as lectotype (FMNH, NHMW).

G. maderi: Holotype ♂: ♂ / Kruja, Alban., Mader / ex coll. Scheerpeltz / Typus Sipalia Maderi O.

Scheerpeltz / Geostiba maderi Sch. i. l. det. R. Pace 1983 / Geostiba spizzana (Bernhauer) det. V. Assing 2004 (NHMW). Paratypes: 1♂, 2♀♀: same data as holotype, 1♀ labelled "Typus ...", 1♂, 1♀ labelled "Cotypus ..." (NHMW).

Additional material examined: **Yugoslavia:** 5 exs., Montenegro, Ulcinj ["*Dulcigno*"], leg. *Winneguth (NHMW, cAss).*

Redescription: 2.1-2.6 mm. Coloration: reddish brown, with the head usually somewhat darker than the pronotum and with the preapical abdominal segments more or less intensively infuscate; legs and antennae testaceous to yellowish brown.

Head weakly oblong and with shallow microreticulation. Pronotum with more pronounced microreticulation and with weakly pronounced sexual dimorphism. Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum in large ♂♂ weakly oblong, up to about 1.10 times as long as wide and up to approximately 1.30 times as wide as head; posterior margin of pronotum broadly convex (PACE 1996: Fig. 25), in ♂♂ with very pronounced secondary sexual characters weakly concave in the middle; elytra with shallow impression, lateral margin weakly elevated, with weakly granulose puncturation, and near scutellum with carinae of distinctive shape and arrangement: anteriorly diverging and at some distance from suture (PACE 1996: Fig. 25); abdominal segments III-V unmodified; process of segment VII long and slender, distinctly erect, and apically acute both in lateral and in antero-dorsal view; median lobe of aedeagus as in Fig. 48.

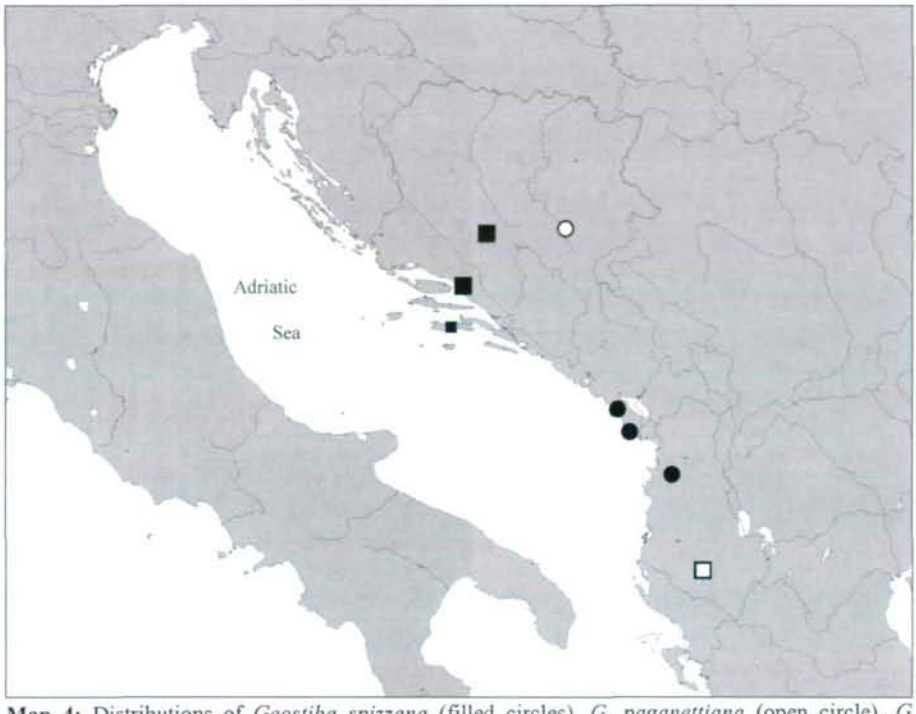
♀: pronotum about as wide as long and approximately 1.15-1.20 times as wide as head, posterior margin weakly convex to almost truncate; spermatheca not distinctive (PACE 1996: Fig. 28).

Comparative notes: *Geostiba spizzana* is distinguished from almost all other species of the subgenus occurring in the Balkans especially by the distinctive shape and arrangement of the elytral carinae near the scutellum; from most species additionally by the weakly pronounced sexual dimorphism of the male pronotum, the elevated lateral margins of the male elytra, and by the long and slender process of the male abdominal tergite VII.

Comments: The original description of *G. spizzana* is based on an unspecified number of syntypes (BERNHAUER 1932), three of which were found in the Bernhauer collection and in the collections of the NHMW. The male in the Bernhauer collection is here designated as the lectotype.

When examining the types of *G. maderi*, Pace did not attach any type labels to the specimens, but it can be assumed that when referring to a male holotype he meant the male specimen labelled by Scheerpeltz as "Typus". According to PACE (1996), *G. maderi* is distinguished from *G. spizzana* by smaller eyes, a differently shaped pronotum, a differently shaped cristal process of the aedeagus, and by a more robust spermatheca. A comparison of the type material of *G. maderi* with that of *G. spizzana*, however, did not produce any evidence that the former should represent a distinct species. In external characters, including eye size, and especially in the male sexual characters they are identical. Apparently, PACE (1996) had not seen a male of *G. spizzana* with pronounced secondary sexual characters. Consequently, *G. maderi* is here placed in the synonymy of *G. spizzana*.

Distribution and bionomics: The species has been recorded from southern Montenegro and northwestern Albania (Map 4); for two additional records see ASSING (2003). Bionomic data are unknown.



Map 4: Distributions of *Geostiba spizzana* (filled circles), *G. paganettiana* (open circle), *G. biokovensis* (large filled squares), *G. curzolae* (small filled square), and *G. winkleriana* (open square) in the western Balkans, based on examined records.

4.15. *Geostiba* (*Tropogastrosipalia*) *curzolae* (BERNHAUER) (Figs 49-53, Map 4)

Sipalia curzolae BERNHAUER 1932: 241.

Type material examined:
Holotype ♂: Curzola [=Korčula], Paganetti / spinicollis det. Bernh. / curzolae Bernh. Typus unic. / Chicago NHMus M.Bernhauer Collection / Geostiba curzolae (Bernhauer) det. V. Assing 2004 (FMNH).

Redescription: 2.9 mm. Habitus as in Fig. 49. Coloration: reddish brown, with the head dark brown; abdominal segment VI and parts of neighbouring segments infuscate; legs and antennae yellowish to yellowish brown.

Head weakly oblong and with shallow microreticulation. Pronotum with pronounced microreticulation and with weakly pronounced sexual dimorphism. Elytra with very indistinct sexual dimorphism. Posterior margin of abdominal tergite VII with barely noticeable rudiment of a palisade fringe.

♂: pronotum very weakly oblong, about 1.05 times as long as wide and approximately 1.20 times as wide as head, posterior margin in the middle obtusely pointed; elytra with somewhat granulose puncturation, but without impressions and without sutural carinae (Fig. 50). Anterior abdominal tergites unmodified; process of tergite VII acute and slender (Figs 51-52); tergite VIII unmodified; aedeagus similar to that of *G. spinicollis*, with small and slender cristal process (Fig. 53).

♀: unknown.

Comparative notes: Since only the holotype has become known, it is not possible to assess intraspecific variation. The type may well be a male with weakly pronounced sexual characters, and only based on more material will it be possible to clarify whether or not it is really specifically distinct from *G. spinicollis* and *G. biokovensis*. From the former, it is distinguished by the absence of impressions and sutural carinae on the male elytra, and from the latter by a slightly different shape of the male pronotum, larger body size, and by longer and more massive antennae.

Comments: The original description is explicitly based on a single male holotype.

Distribution and bionomics: The type locality is the Croatian island Korčula (Map 4). Bionomic data are not available.

4.16. *Geostiba* (*Tropogastrosipalia*) *biokovensis* PACE (Figs 54-56, Map 4)

Geostiba (*Geostiba*) *biokovensis* PACE 1990: 117.
Geostiba (*Geostiba*) *cribripennis* PACE 1990: 119 ff.; **syn.n.**
Type material examined: *G. biokovensis*: Holotype ♂: Croatie: Mt. Biokovo [43°20N, 17°03E], 1000 m, 18.v.84, Besuchet / Holotypus Geostiba biokovensis m. det. R. Pace 1985 / Geostiba biokovensis det. R. Pace 1985 / Geostiba biokovensis Pace det. V. Assing 2005 (MHNG). Paratypes: 2 ♀♀: same data as holotype (MHNG).
G. cribripennis: Holotype ♂ [teneral]: Dačnik Gbg. / Südw.-Bosn. / (westlich von / Prozor) / Leo Weirather / Innsbruck / M. Linke donavit / ex coll. Scheerpeltz / Typus Sipalia cribripennis O. Scheerpeltz / Geostiba (s. str.) cribripennis Sch. i. l. det. R. Pace 1983 / Geostiba biokovensis Pace det. V. Assing 2005 (NHMW).

Redescription: Since only the two holotypes are available, one of them teneral, some characters cannot be fully assessed. Small species, 2.0-2.3 mm.

Head with very shallow microreticulation; eyes relatively small, less than half the length of postocular region in dorsal view; antennae conspicuously short (Fig. 56). Pronotum with moderately pronounced sexual dimorphism; microsculpture more distinct than that of head. Posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum approximately as long as wide, posterior margin in the middle pointed, moderately projecting caudad over scutellum; elytra with rather dense and somewhat granulose puncturation, without impressions and with weak sutural carinae near apex of scutellum (Fig. 54); abdominal tergites III-V unmodified; process of segment VII relatively short, slender, and erect, apically acute both in lateral and in antero-dorsal view (Fig. 55); aedeagus as figured by PACE (1990: Fig. 8).

♀: spermatheca as figured by PACE (1990: Fig. 10).

Comparative notes: The shape of the pronotum somewhat resembles that of *G. spinicollis*, *G. curzolae*, and *G. hummleri*. From all these species, *G. biokovensis* is distinguished by shorter antennae and by smaller body size, from *G. spinicollis* and *G. hummleri* also by the much less pronounced sutural carinae, from the latter additionally by the more distinct microsculpture of the forebody, and from *G. curzolae* by the finer puncturation of the male elytra.

Comments: The original description of *G. cribripennis* is based on a single teneral holotype. Based on the data indicated in the description (locality, collector, collection), there is no doubt that the above specimen is the holotype, although there is no type label attached to it. The specimen is evidently a nanistic male with weakly pronounced secon-

dary sexual characters. The aedeagus is completely damaged, which raises the question how figures 25-26 in PACE (1990) were generated. The more weakly pronounced male secondary sexual characters of the holotype of *G. cribripennis* are accounted for by its small size, a common phenomenon in the subgenus. Since no further distinguishing characters were found and the type localities are separated by a distance of only some 60-70 km, there is little doubt that the holotypes of *G. biokovensis* and *G. cribripennis* are conspecific.

Distribution and bionomics: The species has become known only from two localities in southern Croatia and Bosnia-Herzegovina (Map 4). Bionomic data are not available.

4.17. *Geostiba* (*Tropogastrosipalia*) *winkleriana* PACE (Figs 57-60, Map 4)

Geostiba (*Geostiba*) *winkleriana* PACE 1996: 12 ff.

Type material examined: Holotype ♂: ♂ / Tomor: Kulmak, Alban. mer. / Winkler, Lona, Bischoff, V.1931 / ex coll. O. Kaiser / Typus Sipalia winkleriana O. Scheerpeltz / Geostiba (s. str.) winkleriana Sch. i. l. det. R. Pace 1983 / Geostiba winkleriana Pace det. V. Assing 2004 (NHMW). Paratypes: 1♂, 3♀♀: same data as holotype, 1♀ labelled "Typus ...", 1♂, 1♀ labelled "Cotypus ..." (NHMW).

Additional material examined: **Albania:** 1 ex., Tomor: Kulmak, V.1931, leg. Winkler (cAss).

Redescription: 2.4-3.0 mm. Coloration as in *G. apfelbecki* and allied species.

Head with distinct microreticulation; eyes of moderate size, approximately half the length of postocular region in dorsal view or slightly shorter.

Pronotum with distinct microreticulation; without appreciable sexual dimorphism, weakly transverse, 1.05-1.10 times as wide as long, and distinctly (1.3-1.4 ×) wider than head (Fig. 57); posterior margin broadly convex.

Elytra with moderately pronounced sexual dimorphism. Posterior margin of abdominal segment VII with narrow rudiment of a palisade fringe.

♂: elytra with slightly granulose puncturation, with extensive, but very shallow impression, in anterior half with short, but distinctly elevated and moderately narrow sutural carinae (Figs 57-58); anterior abdominal tergites unmodified; process of tergite VII slender, dorso-ventrally somewhat compressed, and apically acute both in lateral and in antero-dorsal view (Figs 59-60); median lobe of aedeagus with slender cristal process (PACE 1996: Fig. 20).

♀: elytra with fine, non-granulose puncturation; spermatheca not very distinctive (PACE 1996: Fig. 22).

Comparative notes: Among other species of the subgenus occurring in the Balkans, *G. winkleriana* is characterised especially by the absence of a sexual dimorphism of the pronotum, the relatively broad pronotum, by the modifications of the male elytra, and by the shape of the process of the male abdominal tergite VII.

Comments: When examining the types of *G. winkleriana*, Pace did not attach any type labels to the specimens, but it can be assumed that when referring to a male holotype he meant the male specimen labelled as "Typus" by Scheerpeltz.

Distribution and bionomics: The species has become known only from the type locality in Albania (Map 4). Bionomic data are not available.

4.18. *Geostiba* (*Tropogastrosipalia*) *mosorica* sp.n. (Figs 61-65, Map 3)

Type material: Holotype ♂: ♂ / R. Heberdey, U.Spalato, D. / Mosor [= Mosor planina; 43°31N, 16°39E] / Dr. Schönmann donavit 4.63 / ex coll. Scheerpeltz / Sipalia (Sipalia s. str.) Schönmanni m. / Typus Sipalia Schönmanni O. Scheerpeltz / Holotypus ♂ *Geostiba mosorica* sp.n. det. V. Assing 2004 (NHMW).

Description: 3.0 mm. Habitus as in Fig. 61. Coloration: head dark brown; pronotum reddish brown; elytra yellowish brown; abdomen brown, with segment VI and parts of neighbouring segments somewhat infuscate; legs and antennae yellowish to yellowish brown.

Head with very shallow microreticulation; eyes relatively small, less than half the length of postocular region in dorsal view. Pronotum with pronounced sexual dimorphism; microsculpture more distinct than that of head. Segments III and IV with sexual dimorphism; posterior margin of abdominal tergite VII with narrow rudiment of a palisade fringe.

♂: pronotum distinctly oblong, approximately 1.15 times as long as wide (in holotype!), posterior margin distinctly projecting caudad over scutellum and in the middle broadly truncate; elytra with rather dense and granulose puncturation, with narrow and weakly elevated carinae extending over anterior two thirds of suture, and each with rather distinct impression of triangular shape, rendering the lateral margins somewhat elevated (Fig. 62); tergites III and IV in the middle with indistinct elevation behind anterior transverse impression; process of tergite VII relatively short and stout, in antero-dorsal view broadly rounded apically (Figs 63-64); median lobe of aedeagus with relatively short and slender cristal process (Fig. 65).

♀: unknown.

Comparative notes: The shape of the male pronotum somewhat resembles that of *G. armicollis*, from which *G. mosorica* is distinguished by the posteriorly truncate (not concave) male pronotum, by the more pronounced pronotal microsculpture, by the modified male tergites III and IV, by the apically obtuse process of the male tergite VII, and by the slightly different shape of the cristal process of the aedeagus.

Distribution and bionomics: The species has become known only from the Mosor planina near Split, Croatia (Map 3), where the holotype was collected at an altitude of approximately 1300 m.

4.19. *Geostiba* (*Tropogastrosipalia*) *slaviankaensis* ZERCHE (Fig. 66, Map 5)

Geostiba (Geostiba) slaviankaensis ZERCHE 2002: 211 ff.

Type material examined: Holotype ♂: BG: Slavianka (= Ali-Botusch), S Goleschovo, NW Mt. Gozev Vrach, W-Hang, 2070 m, Hoch- / tal, Schneefeld, Wiese, Distelreste, 41°22′52N, 23°36′45O, 6.V.2000, leg. Zerche / Holotypus Geostiba slaviankaensis Zerche (DEI). Paratypes: 5 exs.: same data as holotype (DEI); 5 exs.: BG: Slavianka (Ali-Botusch), S Goleschovo, NW Mt. Gozev Vrach, O-Hang, 2030 m, Schneefeld- / rand, Gesiebe einzelne *Pinus, Juniperus*, 41°23′07N, 23°36′35O, 6.V.2000, leg. Zerche & Behne (DEI); 3 exs.: BG: Slavianka (Ali-Botusch), S Goleschovo, NW Mt. Gozev Vrach, O-Hang, 1970 m, Schneefeldrand / Gesiebe 41°23′21N, 23°36′29O, 6.V.2000, leg. Zerche (DEI, cAss); 3 exs.: BG m.oc., Ali Botusch, N-Seite bei Goleschowo, 1015 m, 15.06.1997, 41°24′13N, 23°35′21E, Buchenwald, leg. Behne (DEI, cAss); 5 exs.: BG: Ali Botusch, N-Seite b. Goleschowo, 1630 m, 15.06.1997, 41°24′N, 23°35′, *Pinus* mit *Juniperus*, leg. Zerche (DEI); 1♂, 2♀♀: BG: S-Pirin, Orelek, S Popovi Livadi, S-Seite, N-Hang, 1880 m, Unterkante Schneefeld / 41°33′37N, 23°36′43 O, 29.IV.2001, leg. Zerche & Behne (DEI); 1♂, 2♀♀: BG: S-Pirin, Dorf Pirin, N-Hang, 800 m, Laubwald, 41°31′07N, 23°32′56 O, 2.V.2001, leg. Behne (DEI).

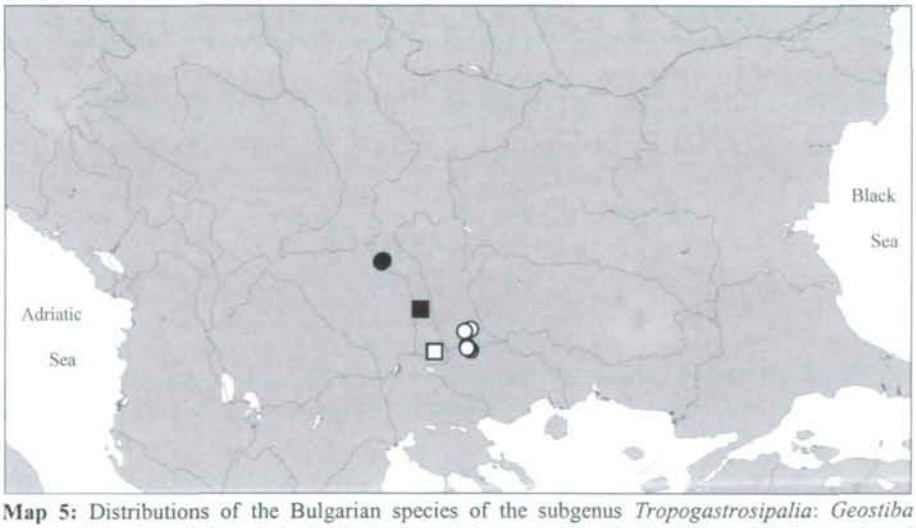
Redescription: 2.2-2.9 mm. Coloration: pronotum and elytra reddish brown to dark brown; head and abdomen, except for the slightly lighter anterior segments and the apex, dark brown to blackish; legs yellowish brown; antennae light brown to brown, usually with the basal antennomeres lighter.

Head approximately as wide as long; eyes approximately half the length of postocular region in dorsal view or slightly smaller; microsculpture very shallow. Pronotum approximately 1.25-1.30 times as wide as head and about as wide as long; sexual dimorphism indistinct (Fig. 66); posterior margin broadly convex; microreticulation more pronounced than that of head. Elytra with moderate sexual dimorphism. Anterior abdominal segments without sexual dimorphism; posterior margin of tergite VII usually with narrow rudiment of a palisade fringe.

♂: elytra shallowly impressed and with short, narrow, and moderately elevated sutural carinae extending from apex of scutellum to middle of suture or slightly beyond (Fig. 66); process of tergite VII relatively short, slender, and apically acute (ZERCHE 2002: Figs 5-6); cristal process of median lobe of aedeagus rather variable (ZERCHE 2002: Figs 11-17).

♀: spermatheca not distinctive (ZERCHE 2002: Figs 19-20).

Distribution and bionomics: The known distribution of the species includes the Slavianka range and the adjacent parts of the Pirin range (Map 5). The types were found in various types of woodland (beech, mixed deciduous forest, pine forest) and in the subalpine region at altitudes of 800-2070 m (material examined and ZERCHE 2002).



Map 5: Distributions of the Bulgarian species of the subgenus *Tropogastrosipalia*: *Geostiba ossogovskaensis* (filled circles), *G. slaviankaensis* (open circles), *G. ilievi* (large filled square), and *G. belasizaensis* (open square), based on examined records.

4.20. *Geostiba* (*Tropogastrosipalia*) *ossogovskaensis* ZERCHE (Fig. 67, Map 5)

Geostiba (Geostiba) ossogovskaensis ZERCHE 2002: 215 ff.

Type material examined: Holotype ♂: BG: Ossogovska Planina, O-Gipfel des

Ruen-Massivs, SO-Hang, 2055 m, Schneefeld mit Ginster, 42°10′28 N, 22°33′28 O, 10.V.2000, leg. Zerche & Behne / Holotypus Geostiba ossogovskaensis Zerche (DEI). Paratypes: 2 exs.: same data as holotype (DEI); 5 exs.: same data, but "S-Hang, 2025 m, Schneefeld mit Gister u. Gras, leg Zerche" (DEI); 1 ex., same data, but 4.V.2001 (DEI); 1 ex.: same data, but N-Hang, 1910 m, Schneefeld mit *Juniperus*, 42°10′41 N, 22°33′35 O, 42°10′28N (DEI).

Redescription: In external morphology highly similar to *G. slaviankaensis*. Distinguished as follows:

Elytra and abdomen with distinctly denser puncturation.

♂: modifications of elytra similar to those in *G. slaviankaensis*, but sutural carinae even shorter and less distinctly elevated, anteriorly usually not reaching scutellar apex (Fig. 67); process of tergite VII shorter, even in specimens with fully developed ♂ secondary sexual characters (ZERCHE 2002: Figs 27-28); median lobe of aedeagus with very slender cristal process (ZERCHE 2002: Figs 21-22).

♀: spermatheca as illustrated by ZERCHE (2002: Fig. 30).

Distribution and bionomics: The species is apparently endemic to the Ossogovska Planina in southwestern Bulgaria (Map 5). The type specimens were collected at altitudes of 1900-2055 m.

4.21. *Geostiba* (*Tropogastrosipalia*) *ilievi* ZERCHE (Figs 68-69, Map 5)

Geostiba (Geostiba) ilievi ZERCHE 2002: 217 ff.

Type material examined: Holotype ♂: BG: Maleschevska Planina, oberh. Gorna Bresniza, 1650 m, Senke, N-Hang, Fagus-Wald, Waldrand / Schneewand unter gr. Buche, 41°45′13 N, 23°01′16 O, 8.V.2000, leg. Zerche / Holotypus Geostiba ilievi Zerche (DEI). Paratypes: 7 exs.: same data as holotype (DEI); 2 exs.: same data, but "1680 m, O-Hang, Schneefelder in flachem Ginster" (DEI); 1 ex.: same data, but 1700 m, S-Hang, zwischen Steinen am Schneefeld, 41°45′22 N, 23°01′07 O" (DEI); 1 ex.: SW-Bulgarien, Besniza b. Kresna, 17.VII.1985, leg. Iliev (DEI).

Redescription: Size and coloration similar to that of *G. slaviankaensis*.

Head similar to that of *G. slaviankaensis*, with shallow microsculpture. Pronotum with distinct sexual dimorphism, rather large in relation to head; microsculpture more pronounced than that of head. Elytra with moderate sexual dimorphism.

♂: pronotum (in large ♂♂!) elongated, slightly (1.05-1.10 ×) longer than wide, about 1.35-1.40 times as wide as head, and with broadly truncate posterior margin almost or completely covering scutellum; elytra with more or less diagonal impressions, with posteriorly somewhat elevated lateral margins, with short sutural carinae extending from scutellar apex to middle of suture or slightly beyond, and with moderately dense granulose puncturation (Fig. 68-69); process of tergite VII rather short and stout (ZERCHE 2002: Figs 31-32); median lobe of aedeagus with straight and moderately stout cristal process (ZERCHE 2002: Figs 37-38).

♀: spermatheca as illustrated by ZERCHE (2002: Fig. 40).

Distribution and bionomics: The species is apparently endemic to the Maleschevska Planina in southwestern Bulgaria (Map 5), where the types were collected at altitudes of 1650-1700 m.

4.22. *Geostiba* (*Tropogastrosipalia*) *belasizaensis* ZERCHE (Fig. 70, Map 5)

Geostiba (Geostiba) belasizaensis ZERCHE 2002: 220 ff.

Type material examined: Holotype ♂: BG: Belasiza S Petritsch, W Hütte Belasiza, 810 m, Gesiebe, *Castanea-Fagus*-Wald, 41°21′53 N, 23°11′04 O, 4.V.2000, leg. Zerche & Behne / Holotypus Geostiba belasizaensis Zerche (DEI). Paratypes: 52 exs.: same data as holotype (DEI, cAss); 31 exs.: same data, but "720 m, 41°22′11 N, 23°11′13 O, 5.V.2000, leg. Behne" (DEI, cAss).

Redescription: Highly similar to *G. ilievi*, but distinguished as follows:

♂: pronotum (in large ♂♂!) elongated, of similar dimensions as in *G. ilievi*, but posterior margin even weakly concave and with more pronounced posterior angles; elytra with similar modifications, but puncturation denser and on average more distinctly granulose (Fig. 70); process of tergite VII similarly short, but apically acute (ZERCHE 2002: Figs 41-42); median lobe of aedeagus with more slender cristal process (ZERCHE 2002: Figs 47-48).

♀: spermatheca as illustrated by ZERCHE (2002: Fig. 50).

Distribution and bionomics: The species has been recorded only from the Belasiza range in southwestern Bulgaria, not far from the Macedonian and the Greek border. The types were collected in mixed beech and chestnut forests at lower altitudes (720-810 m).

4.23. *Geostiba* (*Tropogastrosipalia*) *khnzoriani* PACE (Figs 71-74)

Geostiba (Geostiba) khnzoriani PACE 1983a: 132.
Type material examined: Holotype ♂: [locality in Cyrillic, according to original description "Goris"] ACCP - 12-6-50 [Fig. 74] / Holotypus Geostiba (s. str.) khnzoriani m., det. R. Pace 1981 / Geostiba (s. str.) khnzoriani n. sp. det. R. Pace 1981 (cKal). Paratype ♀: [locality in Cyrillic, according to original description: "Kafan"] ACCP - 11-8-52 (cKal).

Redescription: 2.5-2.7 mm. Coloration: reddish to brown, with the preapical abdominal segments more or less extensively infuscate; legs and antennae yellowish to yellowish red.

Head weakly oblong and with shallow microreticulation. Pronotum with more distinct microreticulation and with pronounced sexual dimorphism. Anterior abdominal segments without sexual dimorphism.

♂: pronotum large in relation to head, in large ♂♂ distinctly oblong, about 1.10-1.15 times as long as wide, posteriorly distinctly projecting caudad and covering scutellum, posterior margin in the middle with distinct concave excision; elytra with short, narrow, and weakly elevated sutural carinae, posteriorly with extensive diagonal impressions, and with finely granulose sparse puncturation (Fig. 71); abdominal tergite VII with rather long, slender, apically acute, suberect process (Fig. 72-73); aedeagus as figured by PACE (1983a).

♀: pronotum about as wide as long; spermatheca not distinctive, as figured by PACE (1983a).

Distribution and bionomics: The species has become known only from two localities (Goris, Kafan) in Armenia; the types were collected in June and August.

4.24. *Geostiba* (*Tropogastrosipalia*) *winkleri* (BERNHAUER) (Figs 75-77)

Sipalia winkleri BERNHAUER 1915: 269 f.
Type material examined: Lectotype ♂, here designated: ♂ / Iaila-Gebirge,

Krim, Winkler / ex coll. Scheerpeltz / Cotypus Sipalia winkleri Bernhauer / Lectotypus *Sipalia winkleri* Bernhauer desig. V. Assing 2004 / Geostiba winkleri (Bernhauer) det. V. Assing 2004 (NHMW). Paralectotypes: 17 exs.: Iaila-Gebirge, Krim, Winkler (NHMW, cAss)

Additional material examined: **Ukraine, Crimea:** 12 exs., Iaila range, leg. Moczarski (DEI, MNHUB, NHMW, cAss); 2 exs., Simferopol (NHMW); 2 exs., pass between Foros and Orlinoje ["Baidar Thor", = Baidarisches Tor], leg. Knirsch (NHMW).

Redescription: 2.0-2.8 mm. Coloration: head dark brown; pronotum brown; elytra yellowish brown; abdomen brown, with the apical parts of the preapical segments infuscate; appendages yellowish to yellowish brown.

Head weakly oblong and with shallow microreticulation. Eyes relatively small, less than half the length of postocular region in dorsal view.

Pronotum with pronounced sexual dimorphism; microsculpture shallow. Elytra with distinct sexual dimorphism. Abdomen without or with very narrow rudiment of a palisade fringe at posterior margin of tergite VII.

♂: pronotum in large ♂♂ distinctly elongated posteriad, projecting over scutellum, and large in relation to head, about 1.2 times as long as wide and up to 1.25 times as wide as head; posterior margin in ♂♂ with strongly elongated pronotum weakly concave in the middle, in ♂♂ with less distinctly modified pronotum more or less truncate to weakly convex; elytra flattened, with granulose puncturation, without distinct sutural carinae, but with carinate lateral margins, these lateral fold highest near posterior margin and somewhat flexed mediad (only in ♂♂ with pronounced secondary sexual characters) (Figs 75-76); process of tergite VII moderately long, somewhat flattened, suberect, and apically rounded in antero-dorsal view; posterior margin of tergite VIII strongly convex (Fig. 77); median lobe of aedeagus with moderately long and slender cristal process.

♀: pronotum about as wide as long or weakly transverse; spermatheca not distinctive.

Intraspecific variation: As is usual in the species of the subgenus, especially the male secondary sexual characters are subject to considerable intraspecific variation; in small ♂♂ they may be almost completely reduced.

Comparative notes: *Geostiba winkleri* is distinguished from other species of the subgenus especially by the distinctive male secondary sexual characters, above all the shape of the pronotum and the modifications of the elytra.

Comments: The original description is based on numerous syntypes collected "von Freund Winkler in Mehrzahl im Jaila-Gebirge (Krim)" (BERNHAUER 1915). A male syntype with pronounced secondary sexual characters from the collections of the NHMW is here designated as the lectotype.

Distribution and bionomics: The species is apparently endemic to the mountain ranges of the Crimean Peninsula. Bionomic data are not available.

4.25. *Geostiba* (*Tropogastrosipalia*) *tiflisensis* PACE (Figs 78-79)

Geostiba (Geostiba) tiflisensis PACE 1996: 20.
Geostiba (Geostiba) amica PACE 1996: 18 ff.; **syn.n.**
Type material examined: *G. tiflisensis*: Holotype ♂: Ananuri b. Tiflis / Zentralkaukasus lg. H. Franz 1.-8.6.77 / Holotypus Geostiba tiflisensis m., det. R. Pace 1989 / Geostiba tiflisensis sp.n. det. R. Pace 1989 / Geostiba tiflisensis Pace det. V. Assing 2004 (NHMW). Paratype ♀: same data as holotype (NHMW).
G. amica: Holotype ♂ [teneral, Fig. 79]: Ananuri b. Tiflis / Zentralkaukasus lg. H. Franz 1.-8.6.77

/ Holotypus Geostiba amica m., det. R. Pace 1989 / Geostiba amica sp.n. det. R. Pace 1989 / Geostiba tiflisensis Pace det. V. Assing 2004 (NHMW).

Redescription: 2.3-2.6 mm. Coloration: yellowish brown to brown, with the preapical abdominal segments more or less extensively infuscate; legs and antennae yellowish to yellowish red.

Head weakly oblong; eyes conspicuously small, less than one third the length of postocular region. Head and pronotum with distinct microreticulation. Pronotum with pronounced sexual dimorphism. Anterior abdominal segments without sexual dimorphism. Posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂ [since of the two ♂♂ available one is teneral (Fig. 79) and the other is a small male, the secondary sexual characters cannot be fully assessed]: pronotum relatively large in relation to head, posterior margin obtusely pointed; elytra [in holotype of *G. amica* missing] with somewhat granulose puncturation, but otherwise apparently unmodified (Fig. 78); tergite VII with short, wide-based, suberect process; median lobe of aedeagus in lateral view with relatively stout cristal process (PACE 1996: Figs 57, 61).

♀: spermatheca not distinctive (PACE 1996: Figs 59, 63).

Comparative notes: From other species of the subgenus, the species is distinguished especially by the small eyes, but also by the shape of the male pronotum, the absence of distinct modifications on the male elytra, the short process on the male tergite VII, and by the shape of the median lobe of the aedeagus.

Comments: The types of *G. tiflisensis* and *G. amica* were collected on the same occasion and in the same locality. The holotype of *G. amica* is a distinctly teneral male with moderately pronounced male secondary sexual characters, that of *G. tiflisensis* is a small male with weakly pronounced male secondary sexual characters. A comparative examination of both holotypes revealed that they are conspecific. The differences suggested by the illustrations in PACE (1996) are based on artefacts resulting from the teneral condition of the holotype of *G. amica*. Both names were made available in the same paper. In view of the better condition of the type material, *G. tiflisensis* is here attributed seniority and *G. amica* is placed in the synonymy of that name.

Distribution and bionomics: The species has become known only from the type locality near Tiflis, Georgia.

4.26. *Geostiba* (*Tropogastrosipalia*) *sengleti* PACE (Figs 80-83)

Geostiba (Geostiba) sengleti PACE 1983a: 130 ff.

Type material examined: Holotype ♂: Iran Mâzanderân, Gol-e-Loweh, 700 m, 37°20'N, 55°44E, A. Senglet, 21.8.75 / Holotypus Geostiba sengleti m. det. R. Pace 1983 / Geostiba sengleti n. sp. det. R. Pace 1983 (MHNG). Paratypes: 2♀♀: same data as holotype (MHNG).

Redescription: 2.5-2.9 mm. Facies as in Fig. 80. Coloration: light brown to brown, with the head, abdominal segment VI and anterior half of segment VII slightly darker; legs yellowish; antennae light brown.

Head with shallow to distinct microreticulation; eyes small, less than half the length of postocular region in dorsal view. Pronotum 1.20-1.30 times as wide as head and 1.15-1.20 times as wide as long; with weakly pronounced sexual dimorphism; microreticulation distinct. Elytra with moderately pronounced sexual dimorphism. Anterior abdominal

segments without sexual dimorphism. Posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂: posterior margin of pronotum in the middle indistinctly pointed and with minute shining tubercle; elytra only with indistinct impressions, at suture with pronounced, distinctly elevated, relatively narrow, and rather long sutural carinae, which are highest near apex of scutellum and gradually slope down posteriad, almost reaching posterior margin; elytral puncturation weakly granulose (Figs 81-82); abdominal tergite VII [in the only male available!] with short, weakly erect, and narrow process (Fig. 83); median lobe of aedeagus as figured by PACE (1983a: Figs 2-3).

♀: spermatheca not distinctive (PACE 1983a: Fig. 4).

Comparative notes: From other species of the subgenus, the species is distinguished especially by the male sexual characters (minute tubercle in the middle of pronotal posterior margin, shape of elytral carinae).

Distribution and bionomics: The species has become known only from the type locality in the Elburs range, northern Iran.

4.27. *Geostiba* (*Tropogastrosipalia*) *huberi* PACE, species dubia

Geostiba (Geostiba) huberi PACE 1983b: 14.

Type material examined: Holotype ♀: Iran, 80 km from Shapasand to Bojnurd Shah Reza Nat. Park, J.T. Huber, 23.VII.1977 / Holotypus Geostiba huberi m. det. R. Pace 1981 / Geostiba huberi n. sp. det. R. Pace 1981 (MHNG).

Comments: The original description is based only on a female holotype. Since a reliable identification and interpretation of *Tropogastrosipalia* species is possible only based on an examination of the male sexual characters, *G. huberi* must be regarded as a doubtful species. In external morphology it is indistinguishable from *G. sengleti*, but in view of the considerable distance between the respective type localities, it seems rather unlikely that the types of both names should be conspecific.

4.28. *Geostiba* (*Tropogastrosipalia*) *turcica* (BERNHAUER)

Additional material examined: **Turkey, Istanbul:** 1 ex., Alem Dağ, leg. Bodemeyer (DEI).

The species has become known only from Istanbul province, Turkey.

4.29. *Geostiba* (*Tropogastrosipalia*) *sinuosa* ASSING

Additional material examined: **Turkey, Antakya:** 1 ex., surroundings of Iskenderun, IV.1963, leg. Ressl (NHMW).

The species was described only recently and is apparently endemic to the Nur Dağları (ASSING 2004a).

4.30. *Geostiba* (*Sipalotricha*) *deubeli* (BERNHAUER) (Figs 84-92, Map 7)

Sipalia deubeli BERNHAUER 1909: 102.

Type material examined: Lectotype ♂, here designated: Kapellenberg [=Cenkhegy, =Tîmpa, 46°09N, 25°11E], Deubel / Deubeli Typus / Chicago NHMus., M.Bernhauer Collection / Lectotypus ♂ *Sipalia deubeli* Bernhauer desig. V. Assing 2004 / Geostiba deubeli (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotypes: 1♂: same data as holotype (FMNH); 1♂,

1 ♀: Also-Kakos [recte: Alsó-Rákos=Racoş, 46°03N, 25°21E], leg. Deubel / curtipennis det. Bernhauer / Deubeli Brh. Cotypus (FMNH, NHMW); 1 ♀: Transsylv., Kronstadt [=Braşov] / curtipennis Aubé Kaufmann Deubeli Brh. Cotypus (FMNH).

Additional material examined: **Romania:** 3 exs., Braşov, 20.IX.1918, leg. Fodor (HNHM, cAss); 6 exs., Braşov, 11.IV.1918, leg. Fodor (HNHM); 8 exs., Braşov, Valea Cetatii, 29.V.1928, leg. Fodor (HNHM, cAss); 1 ex., same data, but 8.IV.1918 (cAss); 2 exs., Braşov, Cenk-hegy= Tîmpa ["Kapellenberg"], 30.IV.&5.VI.1918 (HNHM, cAss); 2 exs., same data, but 13.V.1918 (HNHM); 14 exs., Braşov, leg. Breit, Schuster, etc. (DEI, NHMW, cAss); 1 ex., Braşov, Covasna, Lisnău ["Lisznyó, patakvölgy"], 25.X.1918, leg. Fodor (cAss); 3 exs., Braşov town, Răcădău ["Rakodó-völgy"], 24.III.1918, leg. Fodor (HNHM); 1 ex., ca. 5 km N Braşov town, Méheskert ["Méhkertek"], 9.V.1918, leg. Fodor (HNHM); 7 exs., Braşov town, Honterus-forrás, 17.VII.1918, leg. Fodor (HNHM); 2 exs., Braşov town, Tâmpa Hill ["Czenk-tető"], 22.VII.1918, leg. Fodor (HNHM, cAss); 1 ex., jud. Hunedoara ["Hunyad"], Pâring [= Paringul Mare, 45°23N, 23°29E], 5.-11.VII.1925, leg. Fodor (HNHM).

Redescription: 1.8-2.4 mm. Coloration of body yellowish brown to reddish brown, with the preapical abdominal segments infuscate.

Head about as wide as long or weakly transverse; puncturation fine, sparse, and shallow; microsculpture very shallow; eyes small and not distinctly projecting from lateral outline of head, about 1/3 the length of postocular region in dorsal view or slightly larger. Antennae with antennomere IV weakly transverse; IV-X gradually increasing in width and increasingly transverse; X about twice as wide as long (Fig. 86).

Pronotum about 1.15 times as wide as head and 1.1 times as wide as long; puncturation very fine, barely noticeable; microsculpture more pronounced than that of elytra (Fig. 85).

Elytra barely 0.6 times as long and only slightly wider than pronotum; puncturation with sexual dimorphism (Figs 84-85). Hind wings reduced.

Abdomen rather shining, with shallow microsculpture, and with very fine and sparse puncturation; posterior margin of tergite VII without or with indistinct rudiments of a palisade fringe.

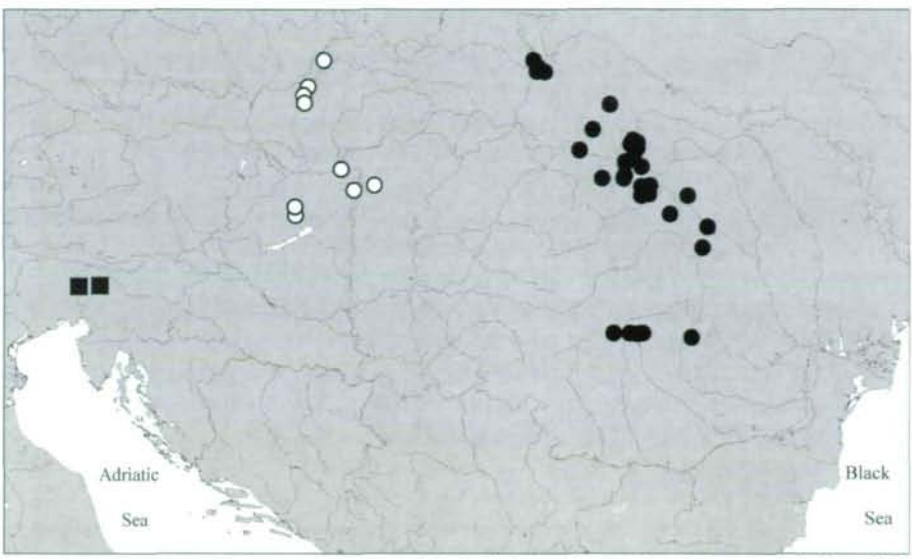
♂: elytra with rather dense and distinctly granulose puncturation, surface almost completely matt (Figs 84-85); tergite VIII posteriorly weakly convex, almost truncate; sternite VIII posteriorly broadly convex (Fig. 87); median lobe of aedeagus as in Fig. 88; apical lobe of paramere wedge-shaped.

♀: elytral puncturation finer and not granulose, elytral surface with some shine; tergite VIII similar to that of ♂; sternite VIII posteriorly broadly convex, not distinctly concave in the middle, and with rather long modified marginal setae (Figs 89-90); spermatheca as in Figs 91-92.

Comparative notes: *Geostiba deubeli* is distinguished from other geographically close *Sipalotricha* species especially by the sexual dimorphism of the elytral puncturation and by the primary sexual characters.

Comments: The original description is based on several syntypes ("auf dem Kapellenberg bei Kronstadt und bei Also Kakos in wenigen Stücken aufgefunden"); a holotype is not specified (BERNHAUER 1909). Four syntypes were found in the collections of the FMNH; the possibility that more syntypes exist cannot be ruled out. In view of the similarity of *Geostiba* species and frequent confusions, one of the males in the Bernhauer collection is here designated as the lectotype.

Distribution and bionomics: The known distribution of the species is confined to the southern Carpathians (Map 7).



Map 6: Distributions of *Geostiba infirma* (filled circles), *G. cuneiformis* (open circles), and *G. matajurensis* (squares), based on examined records.

4.31. *Geostiba* (*Sipalotricha*) *infirma* (WEISE) (Figs 93-106, Map 6)

Homalota infirma WEISE 1878: 38 f.
Sipalia ruthena ROUBAL 1924: 247.
Geostiba pacei ZERCHE 1988: 161 ff.; **syn.n.**

Type material examined:
H. infirma: Lectotype ♂: Hoverla / Homalota infirma m. / Coll. Weise / Lectotypus Homalota infirma Weise, 1878, Zerche desg. 1987 / Geostiba infirma (Weise) Zerche det. 1987 (DEI). Paralectotypes: 1♂, 1♀: Coll. Weise / Paralectotypus Homalota infirma Weise, 1878, Zerche desg. 1987 / Geostiba infirma (Weise) Zerche det. 1987 (DEI).
S. ruthena: Lectotype ♂: ♂ / Podkar. Rus: Čorná hora, VII.23, Roubal / Lectotypus Sipalia ruthena Roubal, 1924 Zerche desg. 1987 / Geostiba infirma (Weise) Zerche det. 1987 / Geostiba infirma (Weise) det. V. Assing 2004 (SNM). Paralectotypes: 6 exs., same data as lectotype (SNM); 2 exs., Hoverla (SNM); 2♂♂, 2♀♀ [not originally included by Zerche (1988)]: same data as lectotype (NHMW); 1 ex., Rus. ... [illegible] Hoverla, Roubal / Cotypus / Sipalia ruthena m. Roubal det. / Emmerich Reitter vend. I.1940 / ex coll. Scheerpeltz / Cotypus Sipalia ruthena Roubal (NHMW).
G. pacei: Paratypes [all labelled "Paratypus Geostiba pacei Zerche"]: 11 exs.: Deubel Rodnaer-Gb (MNHUB); 1 ex.: Koronyis [= Vf. Corongişu, 1994 m] Transsylv. (MNHUB); 4 exs.: Rodnaer-Gb. Transsylv. (MNHUB); 5 exs.: Ganglb. Rodnaergb. (MNHUB); 1 ex.: Kronstadt Transsylv. (MNHUB); 5 exs.: F. [=Fagaraş Mts.] Tax. Negoi [=Negoiu] Tr. (MNHUB).

Additional material examined: **Romania:** 1 ex., jud. Maramureş, Munţii Maramureş, Berdani, 3 km SSE Pop Ivan, 47°54′01N, 24°20′26E, 1350 m, sifted from *Carex* roots, 24.V.2003, leg. Makranczy (cAss); 1 ex., Pop Ivan (DEI); 3 exs., jud. Maramureş, Munţii Maramureş, Berdani, 4.5 km S Pop Ivan, 47°53′10N, 24°18′57E, 1000 m, beech forest, leaf litter, 24.V.2003, leg. Makranczy (cAss); 1 ex., jud. Maramureş, Munţii Maramureş, Berdani, 4 km S Pop Ivan, 47°53′22N, 24°19′32E, 1000 m, edge of spruce forest, leaf litter, 24.V.2003, leg. Makranczy (cAss); 1 ex., Maramureş, Pop Ivan, 18.VII.1924, leg. Fodor (HNHM); 1 ex., Maramureş, Pop Ivan (NHMW); 1 ex., Maramureş, 18.V.1879, leg. Reitter (NHMW); 1 ex., Maramureş, leg. Weise (NHMW); 4 exs., Bistriţa-Năsăud ["Beszterce-Naszód m."], Valea

Vînului ["Borberek"], 21.-25.VII.1942, leg. Fodor (HNHM, cAss); 2 exs., Munţii Tibleşului, V.1999, leg. Weidlich (cAss); 4 exs., Sibiu ["Nagy Szeben"], Vale Serbota, 1888, leg. Ormay (NHMW, cAss); 29 exs., Munţii Rodna, 1896, leg. Ganglbauer (NHMW, cAss); 43 exs., Munţii Rodna, leg. Deubel, Schuster, etc. (MNHUB, NHMW, cAss); 10 exs., Munţii Rodna, Vf. Corongişu (=Korongyos-tető) ["Koronjis", "Koronjez", "Koronies", etc.] (MNHUB, NHMW, cAss); 6 exs., Munţii Hăsmas, Hăghimaşu Mare ["N. Hagymás"], leg. Holdhaus (NHMW, cAss); 3 exs., Ceahlău, leg. Holdhaus (NHMW, cAss); 1 ex., Munţii Călimani ["Caliman"], leg. Holdhaus (NHMW); 2 exs., Fagaraş, Negoiu peak, 1895, leg. Schuster (NHMW, cAss); 4 exs., S Sibiu, Munţii Lotrului, Prejba peak ["Presbe", 45°35N, 24°06E], leg. Gassner (NHMW); 1 ex., Rarău ["Rareu"; 47°27N, 25°34E] (NHMW). **Ukraine:** 3 exs., Hoverla, *Juniperus*, 24.VII.2004, leg. Gontarenko (cAss); 6 exs., Zakarpatjetm, Menčul-Mala Ugolka, 1100 m, 30.VI.1994, leg. Moravec (cMor, cAss); 4 exs., V. Karpaty: Torunskij per. -Vyşkov, 840 m, 8.VII.1994, leg. Moravec (cMor, cAss); 7 exs., Čorna hora, Mt. Čorna hora, 1800-2026 m, 34.VII.1994, leg. Moravec (cMor, cAss); 8 exs., Čorna hora, Hoverla, 1750-1900 m, 1.VII.1993, leg. Moravec (cMor, cAss); 4 exs., Čorna hora, Hoverla, 900-1600 m, 29.-30.VI.1993, leg. Moravec (cMor); 1 ex., Hoverla, 1500-1600 m, 1.VII.1993, leg. Moravec (cMor); 5 exs., Čorna hora, klauzura Balzatul, 1020-1100 m, 2.-4.VII.1994, leg. Moravec (cMor, cAss); 5 exs., same data, but 1600-1750 m (cMor, cAss); 1 ex., Breskul peak [ca. 48°08N, 24°26E], 1908 (NHMW); 5 exs., Gorgany: Mt. Ihrovec-Osmoloda, 1200-1450 m, 6.-7.VII.1994, leg. Moravec (cMor, cAss). **Poland:** 7 exs., Bieszczady mts., source of San river, Polanina Carynska [49°07N, 22°36E], 1212 m, 13.X.1965, leg. Kreissl (NHMW, cAss); 8 exs., Bieszczady mts., Wielka Rauka, 1255 m, 10.VI.1965, leg. Szujecki (DEI, cAss); 2 exs., Bieszczady mts., Tarnica, 1300 m, *Alnus viridis*, 22VIII.1964, leg. Szujecki (DEI); 1 ex., Bieszczady mts., Smerek, 1220 m, 18.IX.1964, leg. Szujecki (DEI). **Locality not identified or not specified:** 1 ex., Maramureş, Gyertyánliget, Scerbylova, VIII.1940, leg. Fodor (cAss); 8 exs., "Carpathen", "Hung. bor.", "Transsylvan.", etc. (*DEI, NHMW*).

Redescription: 2.0-2.6 mm. Coloration variable: head light brown to blackish brown; pronotum and elytra light brown to dark brown, often lighter than head; abdomen dark brown to blackish, with the apex lighter; legs testaceous; antennae brown to dark brown with the basal antennomeres lighter.

Head weakly transverse; puncturation very fine, barely noticeable due to distinct microreticulation, surface almost matt; eyes very small and not distinctly projecting from lateral outline of head, about 1/4 the length of postocular region in dorsal view (Figs 93-94). Antennae with antennomere IV weakly transverse; IV-X gradually increasing in width and increasingly transverse; X about twice as wide as long (Fig. 93).

Pronotum about 1.2 times as wide as head and 1.1 times as wide as long; puncturation very fine, barely noticeable; integument with pronounced microreticulation and matt (Fig. 93).

Elytra less than 0.6 times as long as pronotum; puncturation fine and dense, without sexual dimorphism; interstices with microreticulation. Hind wings reduced.

Abdomen with distinct microsculpture and with very fine sparse puncturation; posterior margin of tergite VII without palisade fringe.

♂: posterior margins of tergite and sternite VIII weakly convex; median lobe of aedeagus as in Figs 95-97; apical lobe of paramere wedge-shaped (Fig. 98).

♀: tergite VIII similar to that of ♂ (Fig. 99); posterior margin of sternite VIII of variable shape, almost truncate to distinctly concave in the middle, with long modified marginal setae (Figs 100-101); spermatheca as in Figs 102-106.

Intraspecific variation: The species is subject to pronounced intraspecific variation especially of size, coloration, eye size, width of pronotum, width of abdomen, microsculpture, size of aedeagus, shape of posterior margin of female sternite

VIII, and shape of the spermatheca. Specimens from the Ukrainian parts of the Carpathians and from Negoi are usually darker and larger, those from the Munţii Rodna are usually smaller, more slender, and of lighter coloration. However, since no significant constant differences were found in the morphology of the genitalia, all the examined populations are regarded as conspecific.

Comparative notes: *Geostiba infirma* is distinguished from the similar *G. deubeli* by on average larger size, broader body, darker coloration, smaller eyes, more pronounced microreticulation especially of head and pronotum, the absence of a dimorphism of the elytra, the posteriorly concave ♀ sternite VIII, and by the primary sexual characters, especially the more massive and compact median lobe of the aedeagus.

Comments: Both *H. infirma* and *S. ruthena* were described from the same region. The original description of *H. infirma* is based on an unspecified number of syntypes from "Czerna Hora". ROUBAL (1924) described *S. ruthena* based on numerous syntypes ("in einiger Anzahl") collected in "der subalpinen Region der Čorna-Hora-Gruppe". The lectotype was designated by ZERCHE (1988). The previously estabished synonymy of *G. ruthena* with *G. infirma* is here confirmed. According to ZERCHE (1988), *G. pacei* is distributed in the Romanian Carpathians, whereas *G. infirma* is confined to the Ukrainian Carpathians and the Bieszczady range in the southeast of Poland; he indicates various external characters distinguishing both species, but does not explicitly mention any differences in the sexual characters. A comparative study of material from various localities in the Carpathians in fact revealed pronounced morphological variation in coloration, body size, eye size, pronotal width, elytral length, etc., but there are transitional conditions, and in contrast to ZERCHE (1988), a plausible distribution pattern with two distribution ranges corresponding to the morphological variation was not observed. In addition, I have been unable to find any constant differences in the genitalia suggesting the presence of two distinct species. Considerable intraspecific variation, often with some local differences, has been found also in other widespread *Geostiba* species, especially *G. oertzeni*, *G. euboica*, *G. rhodiensis*, and *G. lucens*. For these reasons, it seems most plausible to interpret the observed differences as an expression of intra- rather than interspecific variation and, in consequence, consider *G. pacei* a junior synonym of *G. infirma*.

Distribution and bionomics: The known distribution of *G. infirma* includes practically all of the Carpathians, from Transsylvania to the Bieszczady mountains in southeastern Poland (Map 6). JÁSZAY (1994) and JÁSZAY & KODADA (1997) reported the species also from the Bukovske Vrchy mountains in the very northeast of Slovakia. The altitudes indicated on the labels of the examined material range from 840 to 1900 m, with the vast majority of records between 1000 and 1500 m. As far as indicated on the labels, the specimens were found in forest leaf litter (beech, spruce), in stands of *Alnus viridis*, and sifted from *Carex* roots. The types of *G. infirma* were collected by examining grass roots taken from the edges of snowfields (WEISE 1878).

4.32. *Geostiba* (*Sipalotricha*) *cuneiformis* (KRAATZ) (Figs 107-121, Map 6)

Leptusa cuneiformis KRAATZ 1856: 66.
Sipalia kocsii ["*Kocsii*"] BERNHAUER 1910a: 260.
Sipalia gyorffyi ["*györffyi*"] BERNHAUER 1929: 188 f., **syn.n.**
Sipalia hcejkai ["*H. Čejkai*"] ROUBAL 1932: 83 f., **syn.n.**

Type material examined:
L. cuneiformis [completely teneral (Fig. 111)]: Lectotype ♀: Holotypus [sic] / coll. Kraatz / cuneiformis mihi Hung. Friv. / Dtsch. Entomol. Institut / Geostiba cuneiformis (Kr.) det. R. Pace 1984 / Lectotypus Leptusa cuneiformis Kr.; desg. Smetana 1973; Zerche rev. 1996 / DEI Müncheberg (DEI).
S. kocsii: Lectotype ♂, here designated: Hung. Trencsén, Nagy-Sziklás, Kocsi / Zsihlavnik / Cotypus [sic] / Lectotypus ♂ *Sipalia kocsii* Bernhauer desig. V. Assing 2004 / Geostiba cuneiformis (Kraatz) det. V. Assing 2004 (NHMW). Paralectotypes: 1 ex.: Hung. Trencsén, Nagy-Sziklás, 10.V.1910, Kocsi / Monte Zsihlavnik Plateau "Zraz" / Typus [sic] (NHMW); 4 exs.: Hung. Trencsén, 10.V.1910, Kocsi / Zsihlavnik (NHMW); 4 exs.: Hung. Trencsén, Zsihlavnik, Kocsi (DEI, NHMW); 2 exs.: Hung. Trencsén / Szelecz, Kocsi / Mont "Jnovecz", Jazviny, 20.X.1907 (NHMW); 5 exs.: Hung. Szelecz / Kocsi 07 / Kocsii Brnh. Cotypus / ex coll. Scheerpeltz / Cotypus Sipalia kocsii Bernhauer (NHMW); 2♂♂, 2♀♀: Hung. Trencsén, Nagy-Sziklás, Kocsi / coll. Reitter / Paratypus [sic] 1910 Sipalia Kocsii Bernhauer (HNHM); 1♂, 3♀♀: same data, but "Hung. Trencsén, Zsihlavnik" (HNHM); 2♂♂: Hung. Szelesz, Kocsi (HNHM).
S. hcejkai: Lectotype ♂, here designated: Slov. Parkan, Roubal / type / H. Čejkai Roubal det./ Geostiba heinrichcejkai (Roub.) Zerche rev. 88 / Lectotypus ♂ *Sipalia hcejkai* Roubal desig. V. Assing 2005 / Geostiba cuneiformis (Kraatz) det. V. Assing 2005 (SNM). Paralectotypes: 3 exs.: same data as lectotype (SNM).

Additional material examined: **Slovakia:** 8 exs., Trenčín, Cepelák (MNHUB, NHMW, NHMW); 8 exs., Trenčín, Zsihlavnik, leg. Kocsi (DEI, MNHUB); 1 ex., Trenčín, 1907, leg. Brancsik (DEI); 1 ex., Trenčín, Inovec [48°40N, 18°00E], III.1926, leg. Roubal (DEI), 3 exs., Omčenie ["Nagy-Sziklás"], leg. Kocsi (DEI); 1 ex., Slovensko Hvozd'nica, leg. Roubal (DEI). **Hungary:** 3 exs., Bakony mts., Magas-Bakony [47°11N, 17°50E], 1.XI.1982, leg. Podlussány & Rozner (HNHM); 4 exs., Bakony mts., Porva, 12.XII.1982, leg. Podlussány & Rozner (HNHM, cAss); 1 ex., Budapest, Magas-kő, 350 m, oak forest, 21.VII.1989, leg. Ádám (cAss); 2 exs., Budapest, "Johannisberg bei Ofen", leg. Kaszab (NHMW, cAss); 2 exs., Máriabesnyő [47°35N, 19°23E], leg. Fodor (DEI). **Locality not specified:** 2 exs., "Ungarn".

Redescription: 1.9-2.5 mm. Habitus as in Fig. 107. Coloration somewhat variable: testaceous to light brown, with abdominal segment VI and often also adjacent parts of neighbouring segments infuscate; appendages testaceous.

Head approximately as wide as long; eyes small and not protruding from lateral outline of head, postocular region 2.5-3.0 times as long as eyes in dorsal view (Figs 108-110); microsculpture very shallow; puncturation extremely fine, barely noticeable even at higher magnifications. Antennae distinctly incrassate apically, preapical segments strongly transverse, about 2.5-3.0 times as wide as long.

Pronotum about 1.15 times as wide as head and 1.15 times as wide as long; puncturation as fine as that of head; microreticulation similar to that of head or slightly more pronounced (Figs 108,110).

Elytra less than 0.6 times as long as pronotum; puncturation fine; interstices with very shallow microreticulation and more shining than head and pronotum (Figs 108,110). Hind wings reduced.

Abdomen with distinct microsculpture and with very fine sparse puncturation; posterior margin of tergite VII without palisade fringe.

♂: pronotum usually with shallow median impression of variable depth, shape, and extension; posterior margin of tergite VIII truncate to weakly concave (Figs 112-113), that of sternite VIII strongly convex; median lobe of aedeagus as in Figs 114-118; apical lobe of paramere as in Fig. 119.

♀: pronotum without impression; posterior margin of tergite VIII weakly convex, in the middle usually indistinctly concave (Fig. 120); posterior margin of sternite VIII with row of long modified marginal setae, in the middle concave; spermatheca as in Fig. 121.

Comparative notes: The geographically closest congeners of the subgenus *Sipalotricha* are *G. deubeli* and *G. infirma* from the Carpathians. From both species, *G. cuneiformis* is distinguished by the primary and secondary sexual characters (see key in section 5).

Comments: The synonymy of *Sipalia kocsii* with *G. cuneiformis* was established by ZERCHE (1999). The lectotype of *G. cuneiformis*, a completely teneral and deformed female (Fig. 111), was unintentionally designated by SMETANA (1973) (ZERCHE 1999).

The original description of *S. kocsii* is based on an unspecified number of syntypes ("in Anzahl") collected "in der Umgebung Trencsins (Zsihlavnik, Nagy Szyklas, Szelecz)" (BERNHAUER 1910a), that of *S. gyorffyi* is based on an unspecified number of syntypes ("in mehreren übereinstimmenden Stücken") collected "in der allernächsten Nähe von Budapest (Zugliget, Johanneshügel) auf den bewaldeten Höhen von 350 bis 550 m Seehöhe im Westen der Stadt am 12. März 1916" (BERNHAUER 1929). A comparison of the types and additional material from various localities yielded no evidence that the names listed above should refer to different species. No constant differences were found in the morphology of external and sexual characters. According to BERNHAUER (1910a), *S. kocsii* is characterised especially by the presence of an impression on the male pronotum. This impression, however, is very variable in depth, shape, and extension, and it is usually present also in material previously identified as *gyorffyi*. Remarkably, *S. kocsii* is not even mentioned in the original description of *S. gyorffyi*. Finally, the distribution pattern of what was formerly considered *S. gyorffyi* and *G. cuneiformis* would not be plausible from a zoogeographic point of view.

The original description of *Sipalia hcejkai* is based on several syntypes collected in "Parkan" (now Štúrovo) in southern Slovakia, less than 50 km from the type locality of *S. gyorffyi*. According to ROUBAL (1932), *S. hcejkai* is distinguished from that species by the different head shape, the apically less distinctly incrassate antennae, the wider pronotum, the absence of a pronotal impression, the longer elytra, the more densely punctate abdomen, and the different male sexual characters ("andere Sexualcharaktere des ♂"). An examination of type material, however, revealed that regarding all these characters, the specimens are well within the range of *G. cuneiformis*, so that *S. hcejkai* is here considered a junior synonym.

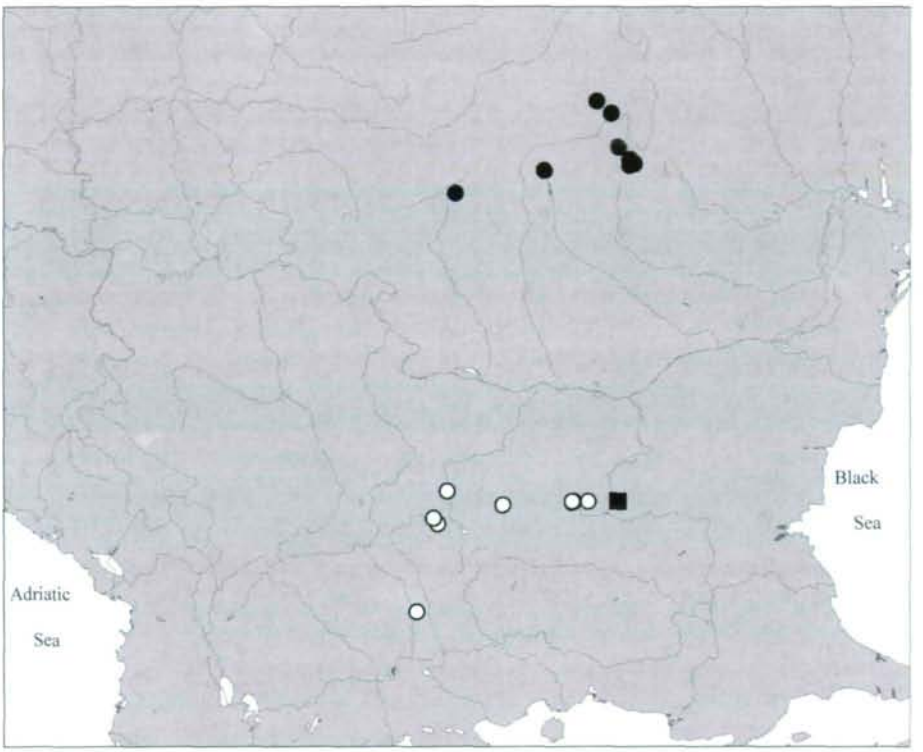
Distribution and bionomics: The known distribution of *G. cuneiformis* is confined to Hungary and Slovakia (Map 6). As far as can be inferred from the localities and additional data indicated on the labels, the material listed above was collected at lower to intermediate altitudes. The few records available suggest that the species is apparently very rare.

4.33. *Geostiba* (*Sipalotricha*) *matajurensis* (SCHEERPELTZ) (Map 6)

Additional material examined: 1 ex.: "♂ / Mataiur, Vetta, Müller, 9.1945 / ex coll. Scheerpeltz / Typus Sipalia (Lioglutosipalia) matajurensis O. Scheerpeltz"..

Comments: The holotype and additional non-type material of this species, which has been recorded from Slovenia and northeastern Italy, was studied earlier. For a list of this material, a redescription, illustrations, and additional details see ASSING (2000c). The specimen listed above has no type status, although it has the same labels attached to it as the holotype, because in the original description only the holotype in the collections

of the natural history museum in Trieste is mentioned (ASSING 2000c). The specimen above is in much better condition than the teneral holotype. The known distribution is illustrated in Map 6.



Map 7: Distributions of *Geostiba deubeli* (filled circles), *G. bulbifera* (open circles), and *G. incognita* (square), based on examined records.

4.34. *Geostiba (Sipalotricha) bulbifera* ZERCHE (Figs 122-133, Map 7)

Geostiba (Lioglutosipalia) bulbifera ZERCHE 1988: 155 ff.

Type material examined: Holotype ♂: Sofia: Vitoscha Geb. Malak Resen 2000 m, 18.VI.1986, leg. Zerche & Behne / Gesiebe Schneefeldrand / Holotypus Geostiba bulbifera Zerche (DEI). Paratypes: 1♀: same data as holotype (DEI); 2♂♂, 1♀: Bulg. Vitoscha Geb. Tscherni Vrach, 2200 m, 23.VI.1988, leg. Zerche & Behne (DEI).

Additional material examined: 73 exs.: for locality data and dates see details in Zerche (2002).

Redescription: 1.8-2.5 mm. Highly similar to and and as variable as *G. euboica* and *G. infirma*; reliably distinguished from those species only based on the primary and secondary sexual characters.

♂: posterior margin of tergite VIII in the middle truncate to shallowly concave (Fig. 122); posterior margin of sternite VIII broadly and not very strongly convex; median lobe of aedeagus with pronounced crista apicalis and crista proximalis (Figs 123-127); apical lobe of paramere moderately stout (ZERCHE 1988: Fig. 4).

♀: posterior margin of tergite VIII in the middle weakly convex to weakly concave; posterior margin of sternite VIII weakly convex, in the middle not distinctly concave (Fig. 128); duct of spermatheca proximally enlarged and distally comparatively slender (Figs 129-133).

Comparative notes: The species is extremely similar to *G. euboica*, from which it is distinguished only by the truncate or weakly concave posterior margin of the ♂ tergite VIII, the less strongly convex posterior margin of the ♂ sternite VIII, the somewhat larger aedeagus, and by the broader and apically more strongly tapering apical lobe of the paramere.

Distribution and bionomics: The known distribution of *G. bulbifera* includes several mountain ranges (Vitoša, western and central Stara Planina, Maleschevska Planina) in Bulgaria (Map 7), where it seems to be rather common in subalpine and alpine habitats (1600-2200 m) (material examined and ZERCHE 2002). The previous records from Atovo Padalo in the eastern Stara planina (ZERCHE 2002) refer to an undescribed species (see following section).

4.35. *Geostiba* (*Sipalotricha*) *incognita* sp.n. (Figs 134-142, Map 7)

Type material: Holotype ♂: BG: Stara Planina, Rasen-Gipfel [= grassy peak] des Atovo Padalo O Schipka-Pass / 1360 m, 17V.2001, 42°44'14N, 25°25'41O, leg. Zerche & Behne (DEI). Paratypes: 32 exs., same data as holotype (DEI, cAss).

Description: Highly similar to *G. bulbifera*; paler and on average slightly smaller. Habitus as in Fig. 134. Reliably distinguished from that species only by the primary sexual characters.

♂: posterior margin of tergite VIII more or less distinctly concave in the middle (Fig. 135) sternite VIII as in *G. bulbifera*; median lobe of aedeagus smaller, with crista apicalis of different shape and with more strongly projecting crista proximalis (Figs 136-138).

♀: shape and chaetotaxy of tergite and sternite VIII as in *G. bulbifera* (Figs 139-140) spermathecal capsule shorter, with longer and more acute apical cuticular intrusion, and with somewhat shorter duct (Figs 141-142).

Comparative notes: The species can be distinguished from *G. bulbifera* especially by differences in the shapes of the median lobe of the aedeagus and the spermatheca.

Distribution and bionomics: The type locality is situated in the eastern Stara planina (Map 7), where the types were collected at an altitude of 1360 m. Some of the specimens are teneral. The fact that teneral adults were not observed in the material of *G. bulbifera*, which was collected in the same period, suggests that *G. incognita* may have a different life history and phenology.

4.36. *Geostiba* (*Sipalotricha*) *euboica* PACE

Additional material examined: **Macedonia:** 1 ex., Pelister, Magarevo, 23.VII.1936, leg. Fodor (HNHM). **Greece:** 6 exs., Attica, Kaisariani [37°58N, 23°45E], 23.IV.1933, leg. Fodor (HNHM, cAss); 5 exs., Thessalia, Volos, leg. Breit (NHMW); 2 exs., Pelopónnisos, Monemvasía, macchia, 18.IV.1978, leg. Papp (HNHM, cAss); 1 ex., Kephallinia, leg. Winkler (HNHM); 8 exs., "Insel Levkas, Kaligoni, Mittel-Griechenland, Dr. M. Beier, 19.V.33 / ex coll. Scheerpeltz / COTYPUS Sipalia leucadiae O. Scheerpeltz" [previously unexamined paralectotypes of *Sipalia leucadia* SCHEERPELTZ] (NHMW); 1♂: "♀ / Insel Levkas,

Dr. M. Beier leg. / Kaligoni, 18.V.1932 / ex coll. Scheerpeltz / COTYPUS Sipalia leucadiae O. Scheerpeltz [previously unexamined paralectotype of *Sipalia leucadia* SCHEERPELTZ] (NHMW); 1 ex.: "Kephallenia 1905, Eleutherios-Pass, O. Leonhard / Typus Sipalia eleutheriosensis O. Scheerpeltz" (NHMW).

Comments: *Geostiba euboica* is one of the more widespread species in the Balkans. Its distribution is mapped by ASSING (2001b).

4.37. *Geostiba* (*Sipalotricha*) *ulcerifera* ASSING

Additional material examined: **Greece:** 4 exs., Pelopónnisos, Taygetos, Xerokambos, 1.V.1935, leg. Fodor (HNHM); 1 ex., Taygetos, Kalamata-Sparta, 1300 m, 1.IV.1992, leg. Frisch (MNHUB).

Comments: The distribution of this species is evidently confined to the Taygetos range (Greece, Pelopónnisos) (ASSING 1999).

4.38. *Geostiba* (*Sipalotricha*) *arida* (EPPELSHEIM) (Figs 143-150, Map 8)

Leptusa arida EPPELSHEIM 1881: 191 ff.

Type material examined: Lectotype ♂, here designated: ♂ / Dalmatien, Castelnuovo, Reitter / arida Epp. / vidit Bernhauer / ex coll. Skalitzky / Cotypus Sipalia arida Eppelsheim / Lectotypus ♂ *Leptusa arida* Eppelsheim desig. V. Assing 2004 / Geostiba arida (Eppelsheim) det. V. Assing 2004 (NHMW). Paralectotypes: 2 exs. [on same pin]: arida mihi, Montenegro, v. Hopffgarten / arida Eppelsh. Deutsch. ent. Zeit. 1881, p. 191 / arida det. Bernhauer / Typus (NHMW); 5 exs.: Montenegro, westliches, Reitter (DEI, NHMW); 9 exs., Dalmatien, Castelnuovo, Reitter (NHMW); 1 ex.: Castelnuovo, Baccho di Cattaro, Dalmatia / Leptusa arida Eplsh. / Hopffgar. typ. / coll. Heyden / Syntypus (DEI); 6 exs.: Dalmatien, Priworje [42°41N, 18°19E], Reitter (NHMW); 2 exs.: Dalmatien, Ragusa, Reitter (NHMW); 1 ex., Dalmatien, Budua [=Budva], Reitter (NHMW); 1 ex.: Herzegowina, Drieno, Reitter (NHMW).

Material examined: **Croatia:** 1 ex., Dubrovnik, leg. Holdhaus (NHMW); 1 ex., Drijeno ["Drieno"] [ca. 42°40N, 18°11E], leg. Hopffgarten (NHMW); 1 ex., Drieno (DEI); 4 exs., Krivosije [44°25N, 15°56E], leg. Paganetti (NHMW, cAss). **Bosnia-Herzegovina:** 5 exs., Neum, leg. Apfelbeck (NHMW, cAss); 1 ex., Neum (NHMW); 6 exs., Duži, leg. Holdhaus (NHMW, cAss); 1 ex., Duži, 1903, leg. Leonhard (DEI); 5 exs., Trebinje, 1903, leg. Leonhard (DEI, NHMW); 3 exs., locality not specified or illegible (DEI, MNHUB, NHMW). **Montenegro:** 2 exs., Zelenika, IV.-V.1927, leg. Fodor (HNHM, cAss); 75 exs., Herzegnovi, leg. Holdhaus, Kaufmann, Paganetti, Winkler, etc. (DEI, NHMW); 34 exs., Radostak [42°30N, 18°34E], leg. Holdhaus, Paganetti, etc. (MNHUB, NHMW, cAss); 30 exs., Radostak, 1907, leg. Moczarski (NHMW, cAss); 6 exs., Njeguš [42°33N, 18°47E], leg. Apfelbeck (NHMW); 29 exs., Kameno, leg. Paganetti (DEI, MHNG, NHMW, cAss); 17 exs., Savina [42°27N, 18°33E], leg. Paganetti (NHMW, cAss); 1 ex., Savina, 23.VI.1998, leg. Pavićević (cAss); 1 ex., Budva (NHMW); 1 ex., Lovčen [42°24N, 18°49E], 19.VI.1909, leg. Rambousek (DEI); 2 exs., Topla [42°27N, 18°31E], leg. Paganetti (DEI). **Locality not specified:** 3 exs., "Dalmatien" (DEI, MNHUB); 1 ex., "Montenegro, westliches", leg. Reitter (DEI)..

Redescription: 1.8-2.6 mm. Habitus as in Fig. 143. Coloration somewhat variable; body usually yellowish to reddish brown, with abdominal segment VI more or less distinctly infuscate, head sometimes slightly darker than pronotum, and legs more or less testaceous.

Head approximately as wide as long or weakly oblong; eyes of rather variable size, postocular region 2.0-3.0 times as long as eyes in dorsal view; integument with extremely fine and sparse, barely noticeable puncturation and with shallow microreticulation (Fig. 144). Antennae distinctly incrassate apically, preapical antennomeres 2.0-2.5 times as wide as long.

Pronotum about 1.15 times as wide as head and 1.15 times as wide as long; puncturation as fine as that of head; microreticulation more pronounced than that of head.

Elytra approximately 0.6 times as long as pronotum; sexual dimorphism more or less pronounced; microsculpture shallow. Hind wings reduced.

Abdomen with shallow microsculpture and with very fine sparse puncturation; posterior margin of tergite VII with narrow rudiment of a palisade fringe.

♂: elytra usually with more or less pronounced impression; puncturation more or less granulose; near scutellum and suture usually more or less elevated and with aggregations of coarse granulose punctures (Fig. 144); tergite VIII posteriorly truncate and with very sparse marginal setae (Fig. 145); posterior margin of sternite VIII convex to indistinctly angulate in the middle; median lobe of aedeagus as in Figs 146-147.

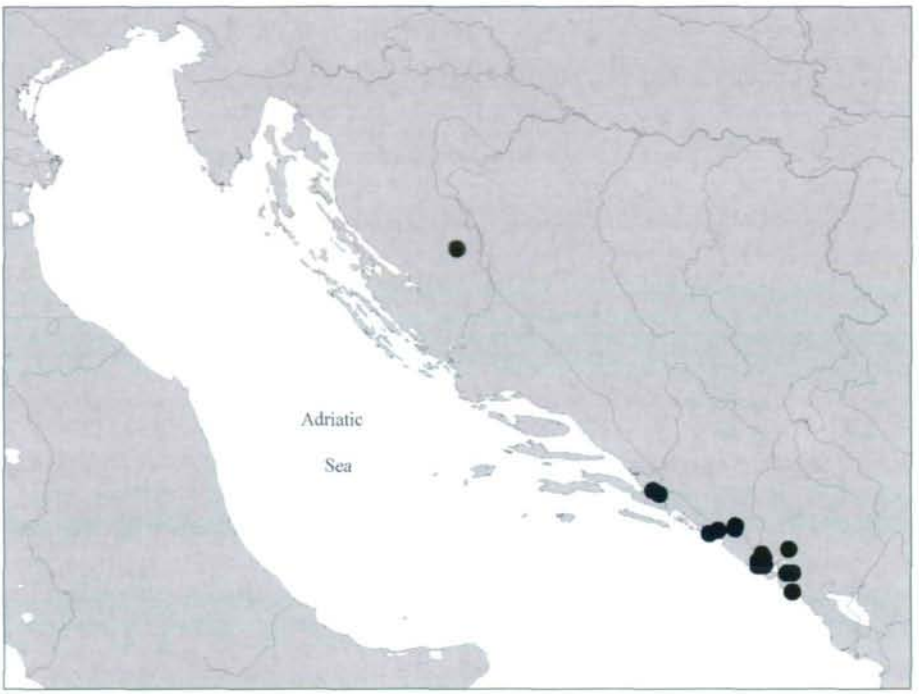
♀: elytra with fine sparse puncturation and with shallow impression at most; without aggregations of granulose punctures near scutellum and near suture; tergite VIII posteriorly weakly convex and with moderately dense marginal setae (Fig. 148); posterior margin of sternite VIII with row of long modified marginal setae, in the middle distinctly concave (Fig. 149); spermatheca as in Fig. 150.

Intraspecific variation: Especially in smaller males, the elytral modifications (impression, aggregations of granulose punctures) may be (almost) obsolete. Coloration, eye size, and other size-related parameters are highly variable, too.

Comparative notes and systematics: *Geostiba arida* was previously attributed to the subgenus *Trachyglutosipalia*. Based on the morphology of the abdominal apex, however, it belongs to *Sipalotricha*. Regarding the puncturation, impressions, and dimorphism of the elytra it resembles some species of both *Sipalotricha* and *Sibiota*. The species is distinguished from similar congeners especially by the sexually dimorphic morphology of the elytra, by the presence of a rudiment of a palisade fringe at the posterior margin of abdominal tergite VII, and by the shapes of the median lobe of the aedeagus and of the spermatheca.

Comments: The original description is based on numerous syntypes collected "bei Ragusa und Castelnuovo in Dalmatien, bei Drieno in der Herzegowina und im westl. Montenegro" (EPPELSHEIM 1881). One of the males from Castelnuovo is here designated as the lectotype.

Distribution and bionomics: The known distribution of the species includes Montenegro and the southern parts of Croatia and Bosnia-Herzegovina. Precise bionomic data are not available.



Map 8: Distribution of *Geostiba arida*, based on examined records.

4.39. *Geostiba* (*Sipalotricha*) *extorta* sp.n.

Type material: Holotype ♀: TR - Adana, N Osmaniye, Karatepe Nat. Park, 200 m, 37°17'123N, 36°14'22E, Laurisilva, *Q. suber*, N. 13, 28.12.2000, V. Assing / Holotypus *Geostiba extorta* sp.n. det. V. Assing 2005 (cAss). Paratype ♂: ♂ / Asia min. Missis / ex coll. O. Kaiser / ex coll. Scheerpeltz / TYPUS Sipalia asiae-minoris O. Scheerpeltz [manuscript name] (NHMW).

Description: 2.0-2.5 mm. Coloration as in *G. rhodiensis*. Head and pronotum with extremely fine and rather sparse, abdomen with fine puncturation; punctures on elytra finely granulose, relatively dense, and coarser than on remainder of body; forebody with pronounced microreticulation, head and pronotum only with little shine; microsculpture of abdomen distinct, predominantly composed of transverse meshes of variable length on anterior tergite and of distinct isodiametric meshes on tergite VII.

Head weakly transverse or as wide as long; eyes relatively large, almost as large as in *G. rhodiensis*. Pronotum approximately 1.20 times as wide as head and 1.20 times as wide as long. Elytra without sexual dimorphism. Abdomen relatively wide, 1.15-1.20 times as wide as elytra.

♂: general outline of posterior margin of tergite VIII weakly convex, but in the middle broadly and shallowly concave; sternite VIII moderately convex posteriorly, marginal setae in the middle very long and laterally relatively short; aedeagus with ventral process of median lobe relatively short, in lateral view rather broad and weakly bent; crista apicalis and crista proximalis well-developed (ASSING 2001a: Figs 72-73); apical lobe of paramere as in ASSING (2001: Fig. 74).

♀: tergite VIII weakly convex posteriorly, chaetotaxy similar to that of ♂; posterior margin of sternite VIII weakly concave in the middle, marginal setae rather stout and long (ASSING 2001a: Fig. 76). Spermatheca of highly distinctive shape, somewhat resembling the condition in *G. oertzeni* of the subgenus *Ditroposipalia*, but with capsule of different morphology (ASSING 2001a: Fig. 75).

Etymology: The name (Lat., adj.: unwound) refers to the distinctive uncoiled duct of the spermatheca.

Comparative notes: From all Turkish species of *Sipalotricha*, *G. extorta* is distinguished by its distinct microsculpture especially of head and pronotum, by the broad and distinctly transverse pronotum, by the morphology of the median lobe of the aedeagus, and especially by the shape of the spermatheca. From all species, except for *G. euxina*, it additionally differs in the relatively wide abdomen.

Comments: The types of this species were previously attributed to *G. medea* PACE (ASSING 2001a). In the original description of *G. medea*, PACE (1996) erroneously states that the type locality is in Turkey; an examination of the type material, however, revealed that it is situated in Daghestan. For more details see comments below *G. carinicollis*.

In view of the highly distinctive shape of the spermatheca, the female is here selected as the holotype.

Distribution and bionomics: The species is known from two localities in the province of Adana, central southern Anatolia: Yakapinar ("Missis") and Karatepe National Park near Osmaniye. The female was sifted from leaf litter in a laurel forest at an altitude of 200 m.

4.40. *Geostiba* (*Sipalotricha*) *lucens* (BENICK)

Additional material examined: **Ukraine:** 1 ex., Odessa env., forest "Lusanovskiy", under rosette of *Verbascum* sp., 10.I.2005, leg. Gontarenko (cGon).

Comments: The specimen above represents the first record from Ukraine.

4.41. *Geostiba* (*Sipalotricha*) *gontarenkoi* sp.n. (Figs 151-158)

Type material: Holotype ♂: Ukraine - ca. 20 km N Odessa, Khuyalnik Liman, 8 km SSE Iljinka, 0 m, u. stones, 15.VI.2004, A. Gontarenko / Holotypus *Geostiba gontarenkoi* sp.n. det. V. Assing 2005 (cAss). Paratype ♀: same data as holotype (cAss).

Description: Small species, 1.8-2.2 mm. Habitus as in Fig. 151. Coloration: body bicoloured; head dark brown to blackish; pronotum and elytra light brown to brown; abdomen blackish with slightly lighter apex; legs and antennae bright testaceous.

Head weakly transverse or about as wide as long; eyes very small, about 1/3 the length of postocular region in dorsal view (Figs 152-153); microsculpture shallow, but distinct; integument shiny; puncturation extremely fine, barely noticeable. Antenna short, distinctly incrassate apically, preapical antennomeres about twice as wide as long.

Pronotum relatively slender, approximately 1.10 times as wide as head and 1.15 times as wide as long; microsculpture very shallow; surface glossy.

Elytra short, about 0.60 times as long as pronotum (Fig. 152); with distinct isodiametric microsculpture; puncturation apparently with sexual dimorphism. Hind wings completely reduced.

Abdomen widest at segment VI, slightly wider than elytra, with distinct microreticulation and somewhat shiny; posterior margin of tergite VII broadly concave and without palisade fringe.

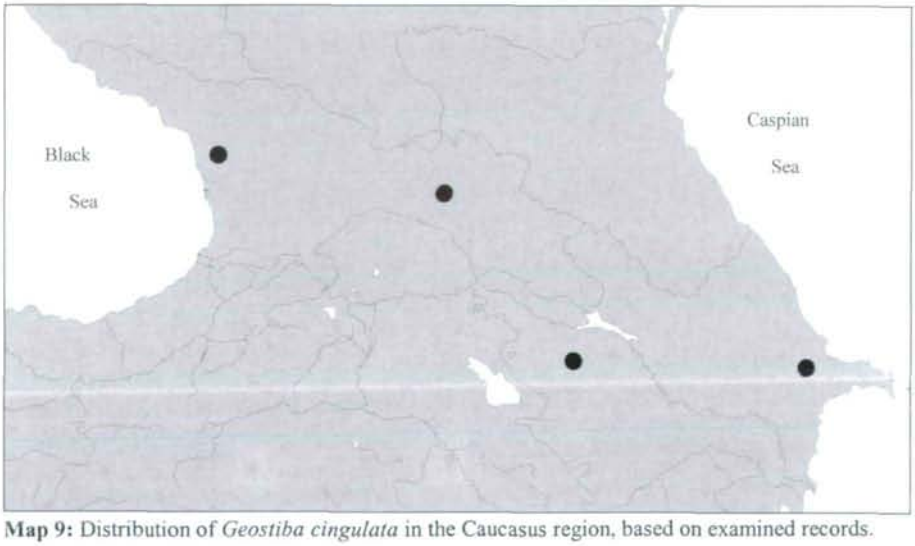
♂: elytra with finely granulose puncturation; tergite VIII posteriorly weakly concave (Fig. 154); sternite VIII longer than tergite VIII, its posterior margin obtusely pointed and weakly serrate; median lobe of aedeagus with pronounced crista proximalis (Figs 155-156); apical lobe of paramere as in Fig. 157.

♀: elytra with very fine non-granulose puncturation; posterior margin of tergite VIII in the middle weakly concave; posterior margin of sternite VIII in the middle weakly concave, with distinctly modified, long and stout marginal setae; spermatheca as in Fig. 158.

Etymology: The species is dedicated to the Ukrainian coleopterist Andrej Gontarenko, who collected the type specimens.

Comparative notes: From *G. lucens*, the only other West Palaearctic *Sipalotricha* species of dark coloration and with small and slender body, the new species is distinguished especially by the testaceous coloration of the antennae, the distinctly smaller eyes and shorter elytra, and the absence of a palisade fringe at the posterior margin of the abdominal tergite VII. Additional distinguishing characters are the bicoloured body, the more shallowly microsculptured and more shining forebody, the broader ventral aspect of the aedeagus, the almost straight ventral process and the shape of the crista apicalis of the aedeagus (lateral view), as well as the shape of the spermatheca. For illustrations of *G. lucens* see ASSING (2001a: Figs 89-97).

Distribution and bionomics: The type locality, the Khuyalnik estuary [approx. 46°39N, 30°40E], is situated ca. 20 km N Odessa. The specimens were collected by turning stones in a saline habitat with loamy soil (GONTARENKO pers. comm.).



Map 9: Distribution of *Geostiba cingulata* in the Caucasus region, based on examined records.

4.42. *Geostiba* (*Sipalotricha*) *cingulata* (EPPELSHEIM) (Figs 159-166, 204, Map 9)

Leptusa cingulata EPPELSHEIM 1878: 97.

Geostiba (*Lioglutosipalia*) [sic] *tbilisensis* PACE 1996: 40; **syn.n.**

Type material examined:

L. cingulata: Lectotype ♂ [dissected prior to present study], here designated: ♂ / 10.6 75 / 109. / Kaukas Leder Mamudly / cingulata det. Bernh. / Typus / Lectotypus ♂ *Leptusa cingulata* Eppelsheim desig. V. Assing 2004 / Geostiba cingulata (Eppelsheim) det. V. Assing 2004 (NHMW). Paralectotypes: 1♀: Kaukas Leder (NHMW); 4♂♂, 1♀: Kaukas Leder 116. (NHMW); 1♂, 1♀: Reitter, Caucasus, VI.1878. 63 (NHMW); 2♀♀: 109. (NHMW); 1♂: Kaukas Leder / Mamudly, 26.10.75 (NHMW); 1♀: Caucas (NHMW).

G. tbilisensis: Holotype ♀: Ananuri b. Tiflis / Zentralkaukasus lg. H. Franz 1.-8.6.77 / Holotypus Geostiba tbilisensis m., det. R. Pace 1989 / Geostiba tbilisensis sp.n. det. R. Pace 1989 / Geostiba cingulata (Eppelsheim) det. V. Assing 2004 (NHMW).

Additional material examined: **Azerbaijan:** 1♂, 3♀♀, Xanlar ["Helenendorf"; 40°35N, 46°19E], leg. Reitter [1♀ with label: "Typus Sipalia Lederi O. Scheerpeltz"] (NHMW). **Georgia:** 1♀, Abastumani, leg. Leder (Reitter) (NHMW). **Locality not specified:** 1♂ (DEI); 3♀♀: "Kaukas Leder" (DEI).

Redescription: 1.5-2.2 mm. Habitus as in Fig. 159. Coloration: yellowish brown, with the head indistinctly paler and with the abdominal segment VI and parts of the adjacent segments slightly infuscate.

Head approximately as wide as long; eyes about half the length of postocular region; surface with distinct microreticulation (Figs 160-161). Antennae not distinctive; preapical antennomeres about twice as wide as long.

Pronotum approximately 1.15 times as wide as long and 1.2 times as wide as head; surface with distinct microsculpture and with weak shine; puncturation extremely fine, barely noticeable.

Elytra at suture about 0.6 times the length of pronotum; near posterior external angles sometimes with shallow impression; puncturation dense (Fig. 160).

Abdomen widest at segment IV/V, slightly wider than elytra; dorsally with sparse fine puncturation and with distinct microsculpture composed of transverse meshes and transverse striae.

♂: tergite VII near posterior margin with small, sometimes barely noticeable circular or oval median tubercle (Fig. 162); posterior margin of tergite VIII convex, in the middle more or less truncate (Fig. 163); sternite VIII convex posteriorly; median lobe of aedeagus with long and slender ventral process (Figs 164-165); apical lobe of paramere as in Fig. 204.

♀: posterior margin of tergite VIII convex, that of sternite VIII weakly convex, in the middle not distinctly concave; spermatheca as in Fig. 166.

Comparative notes: Among the *Geostiba* species of the Caucasus region, *G. cingulata* is readily identified by the presence of a median tubercle on the male tergite VII, by the long and slender ventral process of the median lobe of the aedeagus, by the shape of the spermatheca, as well as by the relatively large eyes, the broad body, and the pronounced microsculpture of the forebody. The relatively broad and compact body with pronounced microsculpture renders this species similar in general appearance to *G. infirma* from the Carpathians. From the latter, *G. cingulata* is distinguished especially by the modified male tergite VII, the long and slender ventral process of the aedeagus, and by the shape of the spermatheca, which has a longer and proximally more distinctly dilated duct.

Subgeneric affiliations: Owing to the presence of a minute tubercle on the male tergite VII, the species would have to be attributed to the *Chondridiosipalia* SCHEERPELTZ, the type species of this subgenus being *G. leonhardi* (BERNHAUER) from Italy. However, based on the primary and secondary sexual characters, external morphology, as well as on zoogeographic considerations, it seems most unlikely that *G. cingulata* should be more closely related to *G. leonhardi* and allied species than to some Eastern Mediterranean species of *Sipalotricha*. There is more evidence suggesting that, as in *G. ulcerifera*, the modified male tergite VII represents an autapomorphy, so that the species is here attributed to the subgenus *Sipalotricha*.

Comments: The original description of *L. cingulata* is based on an unspecified number of syntypes from various Caucasian localities ("Im Kaukasus weit verbreitet und von H. Leder an verschiedensten Punkten gefunden"). A male in good condition and with specified locality is here designated as the lectotype. The original description of *G. tbilisensis* is based on two females (PACE 1996), which resulted in an erroneous subgeneric assignment. An examination of the holotype revealed that it is conspecific with *G. cingulata*.

Distribution and bionomics: The species is widespread in the Caucasus region (Map 9). Bionomic data are unknown.

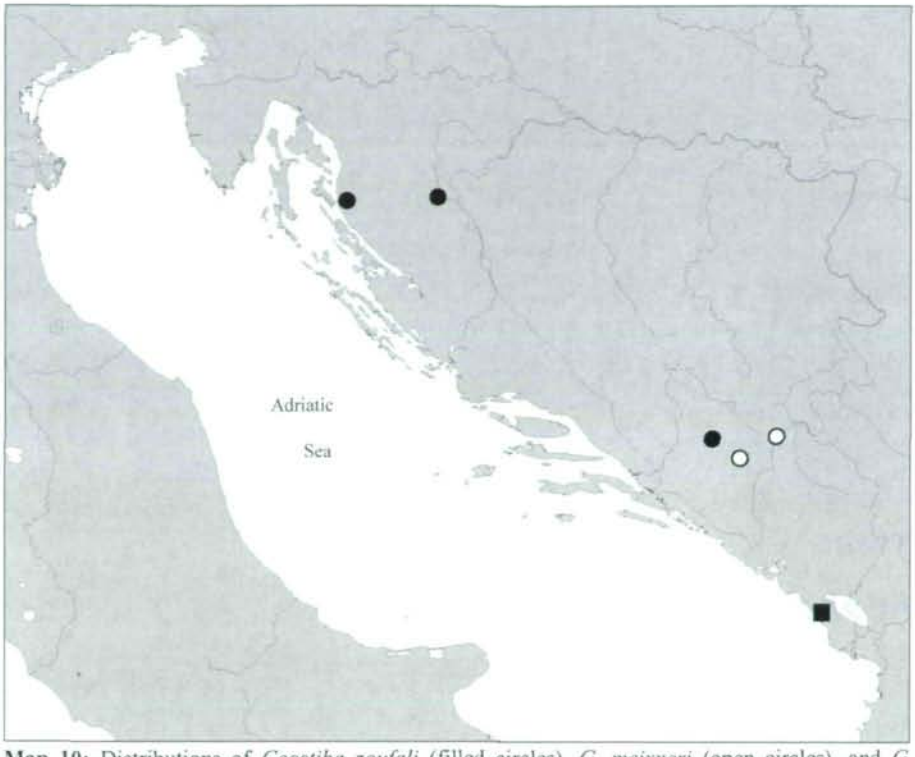
4.43. *Geostiba* (*Sibiota*) *oertzeni* (EPPELSHEIM)

Sipalia tenenbaumi ["*Tenenbaumi*"] BERNHAUER 1940: 639 f., **syn.n.**

Type material examined: Holotype ♂: Wolczkow p. Zaleszczyki, 17.7.1935 / Polen, 250 m, unter Hainbuchenlaub / Tenenbaumi Brnh. Typ. / Tenenbaumi Brnh. Typus unic. Sipalia / Chicago NHMus., M.Bernhauer Collection / Geostiba oertzeni (Eppelsheim) det. V. Assing 2004 (FMNH).

Additional material examined: **Greece: Pelopónnisos:** 1 ex., locality not specified (NHMW); 1 ex., Taygetos, Koúmani, leg. Brenske (NHMW).

Comments: The original description of *S. tenenbaumi* is based on a single holotype collected "im südlichen Polen in der Umgebung von Wolczkow bei Zaleszczyki am 17. Juni 1935 in einer Seehöhe von 250 m unter Hainbuchenlaub" (BERNHAUER 1940). The type locality is now in the Ukraine. *Geostiba tenenbaumi* had never been recorded again since its original description; the record from 1953 listed by BURAKOWSKI et al. (1981) is doubtlessly a typographical error and refers to the date when the holotype was collected. An examination of the holotype revealed that it is conspecific with *G. oertzeni*; *Sipalia tenenbaumi* is the 16th synonym of this species. *Geostiba oertzeni* is widespread in the southern Balkans and in Asia Minor, but an occurrence in Ukraine is most unlikely. There is little doubt that this record is based on a confusion of locality labels.



Map 10: Distributions of *Geostiba zoufali* (filled circles), *G. meixneri* (open circles), and *G. stussineri* (square) in the western Balkans, based on examined records.

4.44. *Geostiba* (*Sibiota*) *zoufali* (RAMBOUSEK) (Figs 167-170, Map 10)

Sipalia zoufali ["*Zoufali*"] RAMBOUSEK 1915: 110 f.
Geostiba (Ditroposipalia) optima PACE 1983a: 138; **syn.n.**
Type material examined: *S. zoufali*: Lectotype ♂, here designated: Nevesinje, Vl. Zoufal / Typus / Sipalia Zoufali m., Typus, det. Rambousek / Lectotypus ♂ *Sipalia zoufali* Rambousek desig. V. Assing 2005 / Geostiba zoufali (Rambousek) det. V. Assing 2005 (NMP). Paralectotypes: 2♂♂: same data as lectotype, but without type label (NMP).
G. optima: Holotype ♂: Mons Alančić [44°44N, 14°58E], 1612 m, Croatia, Meusel 22.6.10 / Holotypus Geostiba optima m. det. R. Pace 1981 / Geostiba optima n. sp. det. R. Pace 1981 / Geostiba zoufali (Rambousek) det. V. Assing 2005 (MNHUB).

Additional material examined: **Croatia:** 1 ex., Pljesevica (cAss).

Redescription: 2.0-2.4 mm. Habitus as in Fig. 167. Coloration rather dark: head dark brown to blackish brown; pronotum and elytra brown; abdomen brown to dark brown, with segment VI and the adjacent parts of the neighbouring segments infuscate; legs and antennae light brown, with the basal antennomeres paler.

Head very weakly transverse; eyes relatively large, slightly more than half the length of postocular region in dorsal view; puncturation very fine and sparse; microsculpture shallow (Fig. 168). Antennae distinctly incrassate apically, preapical antennomeres approximately twice as wide as long.

Pronotum approximately 1.15 times as wide as long and about 1.20 times as wide as head; in posterior median area with shallow depression; microreticulation more distinct than that of head; puncturation very fine.

Elytra relatively long, more than 0.7 times as long as pronotum; puncturation apparently sexually dimorphic.

Abdomen approximately as wide as elytra; maximal width at segment VI; microreticulation composed of distinct and rather large meshes; puncturation fine and sparse; posterior margin of tergite VII with palisade fringe.

♂: elytra with dense and coarsely granulose puncturation (Figs 168-169); tergite VII in posterior half with pair of straight and distinctly parallel carinae, the latter not reaching the middle of tergite (Fig. 170); aedeagus as figured by PACE (1983a).

♀: unknown.

S y s t e m a t i c s : Owing to the presence of a pair of carinae on the male tergite VII, the species has been attributed to the subgenus *Ditroposipalia* SCHEERPELTZ, a junior synonym of *Sibiota* CASEY. Based on other characters, however, e. g. the dark coloration, the modifications of the male elytra, and the genitalia (especially the shape and chaetotaxy of the apical lobe of the paramere), it seems most unlikely that it forms a monophyletic group with other species of the subgenus occurring in the study region.

C o m m e n t s : The original description of *Sipalia zoufali* is based on an unspecified number of syntypes from "Nevesinje, Herzegowina (leg. Prof. Vlad. Zoufal)" (RAMBOUSEK 1915); three of them were found in the collections of the NMP. A male in good condition is here designated as the lectotype. A comparison with the holotype of *G. optima* revealed that both are conspecific so that *G. optima* is here placed in the synonymy of *G. zoufali*.

D i s t r i b u t i o n a n d b i o n o m i c s : The considerable distance between the type localities of *G. optima* and *S. zoufali*, as well as the dark coloration, large eyes, relatively long elytra, and the fully developed palisade fringe at the posterior margin of tergite VII suggest that the species is probably widespread in the Balkans (Map 10). It seems to be very rare, as can be inferred from the few records that have become known. The holotype of *G. optima* was collected at an altitude of approximately 1600 m. Further bionomic data are not available.

4.45. *Geostiba (Sibiota) samai* PACE

Geostiba (Trachyglutosipalia) samai PACE 1977: 304 f.
Geostiba (Ditroposipalia) coiffaiti PACE 1983a: 136; **syn.n.**

M a t e r i a l e x a m i n e d : **Macedonia:** 27 exs., Šar Planina, Ljuboten, 4.-18.VII.1935, leg. Fodor (HNHM, cAss); 10 exs., Ljuboten (DEI, MNHUB, cAss); 12 exs., Šar Planina, Popova sapka, 28.VII.1937, leg. Fodor (HNHM, cAss); 20 exs., Bistra Planina, Galicnik, 7.-14.VII.1937, leg. Fodor (HNHM); 6 exs., Šar Planina, Popova sapka env., 1600-2000 m, 16.-17.VII.1997, leg. Moravec (cMor, cAss); 1 ex., Bistra planina [41°37N, 20°44E] (cAss). **Macedonian or Serbian territory:** 18 exs.: "Schar Dagh Ljuboten / sculpticollis Apfelb. / ex coll. Scheerpeltz / PARATYPUS Geostiba ljubotenensis det. R. Pace 1983 [unavailable name!] / Geostiba ljubotenensis n. sp. det. R. Pace 1983" (NHMW).

C o m m e n t s : The synonymy of *G. coiffaiti* with *G. samai* was suspected earlier (ASSING 2001b). Now that material from the vicinity of the type locality of *G. coiffaiti* is available, which is conspecific with *G. samai*, this synonymy is formally established.

4.46. *Geostiba* (*Sibiota*) *sculpticollis* (APFELBECK)

Additional type material examined: Paralectotype: Merdita Bulschari / coll. Franklin Müller / Syntypus / Sipalia temporalis Apfb. Cotype Albanien (DEI).

Additional material examined: 1♂, Albania, "Merdita M. Scheidt" (DEI); 4 exs., "Merdita Bulschari" (DEI); 1 ex., "Merdita Munela" (DEI).

Comment: Most of the non-type specimens indicated above were collected together with the respective lectotypes of *Sipalia sculpticollis* APFELBECK or of its junior synonym *S. temporalis* APFELBECK, which were designated by ASSING (2000a).

4.47. *Geostiba* (*Sibiota*) *galicicana* ASSING

Material examined: **Macedonia:** 1 ex., Ohrid, Crvena Voda, 2.V.1997, leg. Podlussány & Rozner (HNHM).

Comment: The species has become known only from the surroundings of Ohrid.

4.48. *Geostiba* (*Sibiota*) *kasyi* (SCHEERPELTZ)

Material examined: **Macedonia:** 4 exs., Galičica: Bukovo pass, 1200 m, 17.VII.1997, leg. Moravec (cMor, cAss); 1 ex., Jakupica: Čeplez hut, Mt. Šiljegarnik, 1600-1800 m, 21.VII.1997, leg. Moravec (cAss).

Comments: The known distribution of *G. kasyi* is confined to Macedonia. Its sexual characters are illustrated by ASSING (2000a).

4.49. *Geostiba* (*Sibiota*) *meixneri* (BERNHAUER) (Figs 171-172, Map 10)

Sipalia meixneri ["*Meixneri*"] BERNHAUER 1910b: 79.
Geostiba (*Ditroposipalia*) *mostarensis* PACE 2002: 15; **syn.n.**

Type material examined: *Sipalia meixneri*: Lectotype ♂, here designated: Volujak, Herzeg., J. Meixner / Meixneri Bh. Typ. / Meixneri Brh. Typus / Chicago NHMus. M.Bernhauer Collection / Lectotypus ♂ *Sipalia meixneri* Bernhauer desig. V. Assing 2004 / Geostiba meixneri (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotype ♂: same data as lectotype (DEI).
G. mostarensis: see ASSING (2003).

Comments: The original description of *S. meixneri* is based on two syntypes, one male and one female, collected "in der Herzegowina auf dem Volujak in einer Seehöhe von 1900 m unter einem Felsblock". The male syntype, here designated as the lectotype, was found in the Bernhauer collection at the FMNH; the whereabouts of the female syntype are unknown. The second syntype, apparently erroneously sexed as a female, was found in the collections of the DEI.

An examination of the male holotype of *G. mostarensis* PACE 2002 and additional material collected with the holotype (see ASSING 2003) revealed that they are conspecific with *G. meixneri*, so that *G. mostarensis* is here regarded as a junior synonym. PACE (2002) does not even mention *G. meixneri* in the description of *G. mostarensis*. For illustrations of the genitalia and diagnostic details see ASSING (2003); for illustrations of the male genitalia see also PACE (2002). The median lobe of the aedeagus and tergite VIII of the lectotype are illustrated in Figs 171-172. The species is known only from two localities in Bosnia-Herzegovina (Map 10).

4.50. *Geostiba* (*Sibiota*) *stussineri* (BERNHAUER) (Figs 173-179, Map 10)

Sipalia stussineri ["*Stussineri*"] BERNHAUER 1914: 4.

Type material examined: Lectotype ♂, here designated: Dalamatia merid. 1881, Spizza-Sutomore, Stussiner / Stussineri Brnh. Typus / Chicago NHMus, M. Bernhauer Collection / Lectotypus ♂ *Sipalia stussineri* Bernhauer desig. V. Assing 2004 / Geostiba stussineri (Bernhauer) det. V. Assing 2004 (FMNH). Paralectotype ♂: Dalmatia merid. 1881, Spizza-Sutomore, Stussiner / arida Eppelsh. / Stussineri Bh. det. Bernhauer / Chicago NHMus, M. Bernhauer Collection (FMNH).

Redescription: 1.7-1.9 mm. Habitus as in Fig. 173. Coloration uniformly pale testaceous.

Head approximately as long as wide; microreticulation distinct; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, without ommatidia (Fig. 175); antennae of moderate length, preapical antennomeres more than twice as wide as long.

Pronotum approximately 1.1 times as wide as long and 1.10-1.15 times as wide as head; posterior margin truncate, almost weakly concave; microreticulation distinct (Fig. 174).

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism. Abdomen with distinct microreticulation.

♂: elytra with pronounced - i. e. broad, long, and distinctly elevated - carinae near scutellum and with shallow impressions (Figs 174, 177); abdominal tergite VII with pair of weakly pronounced carinae in posterior half, separated from each other by about 1/4-1/5 the width of tergite; tergite VIII posteriorly with very sparse pubescence; posterior margin of sternite VIII obtusely pointed; median lobe of aedeagus rather slender and of distinctive shape in lateral view (Fig. 178); apical lobe of paramere as in Fig. 179.

♀: unknown.

Comparative notes: The species is readily distinguished from other species of the subgenus with strongly reduced eyes and occurring in the Balkans (*G. sculpticollis*, *G. excaecata*, *G. galicicana*, *G. samai*) by the pronounced carinae on the male elytra alone.

Comments: The original description is based on two syntypes collected in "Süddalmatien (Spizza-Sutomore)" in 1881 by Stussiner (BERNHAUER 1914); both specimens were found in the Bernhauer collection. The male in better condition is here designated as the lectotype.

Distribution and bionomics: The species is apparently endemic to the south of Montenegro (Map 10). Bionomic data are not available, but the reduced eyes suggest that the habitat of *G. stussineri* is subterranean.

4.51. *Geostiba* (*Sibiota*) *weiratheri* PACE

Geostiba (*Ditroposipalia*) *weiratheri* PACE 1984: 217f.
Geostiba (*Ditroposipalia*) *behnei* ZERCHE 2002: 209 ff.; **syn.n.**

Type material examined: Holotype ♂: BG: Pirin-Gebirge, Popoina Laka NO Sandanski, 990 m, N-Hang, Buchenwald / 41°39'19N, 23°22'34O, 1.V.2001, leg. Zerche & Behne / Holotypus Geostiba behnei Zerche / Geostiba weiratheri Pace det. V. Assing 2005 (DEI). Paratypes 1♂, 2♀♀: same data as holotype (DEI).

Comments: According to ZERCHE (2002), the types of *G. behnei* are distinguished from *G. weiratheri*, which was described from the Falakró some 70-80 km from the type

locality of *G. behnei*, by differences in the shape and sexual dimorphism of the pronotum, by the morphology of the male elytra, by the more slender median lobe of the aedeagus, and by the shape of the internal spines of the aedeagus. I have compared the types of *G. behnei* with numerous specimens of *G. weiratheri* collected in the Falakró. There are males whose pronotum and elytra are identical with those of the holotype of *G. behnei*. (The male paratype of *G. behnei* is a small specimen with weakly pronounced sexual characters and consequently of little use for taxonomic purposes.) In addition, a comparative examination of the aedeagal characters yielded no differences exceeding the usual extent of intraspecific variation in this species, nor any other evidence that the types of *G. behnei* should represent a distinct species. The female genitalia, too, are identical. Consequently, *G. behnei* is here placed in the synonymy of *G. weiratheri*.

For more details (redescription, illustrations, distribution, etc.) on *G. weiratheri* see ASSING (1999).

4.52. *Geostiba* (*Sibiota*) *bituberculata* (EPPELSHEIM) (Figs 180-188)

Leptusa bituberculata EPPELSHEIM 1878b: 94 f.

Type material examined:
L. bituberculata: Lectotype ♀, here designated: ♀ / Kaukas Leder / ex coll. Scheerpeltz / Cotypus Sipalia bituberculata Eppelsheim / Lectotypus ♀ *Leptusa bituberculata* Eppelsheim desig. V. Assing 2004 / Geostiba bituberculata (Eppelsheim) det. V. Assing (NHMW). Paralectotypes: 3♀♀: same data as lectotype, but "ex coll. Schuster" and "ex coll. Skalitzky", respectively (NHMW); 1♂ [apparently dissected prior to present study, aedeagus missing]: ♂ / Kaukas Leder Kobi 7-8000′ / bituberculata det. Bernh. / Typus / Lectotypus Geostiba (Ditroposipalis) bituberculata Epp. V. B. Semenov, 1991 / Leptusa bituberculata Eppelsheim det. V. Assing 2004 (NHMW); 1♀: 258 / Kaukas Leder 288 / bituberculata Eppelsh. Schneid. u. Led. Beitr. Cauc. Käf. Brünn 1878 p. 94 / bituberculata det. Bernh. / Cotypus (NHMW); 1♀: Kaukas Leder ... [illegible] Letschgum / bituberculata det. Bernh. / Cotypus (NHMW); 1♂ [dissected prior to present study]: Kaukas Leder / bituberculata mihi Swanetien. Leder / bituberculata det. Bernh. / Typus / Geostiba pigra ♂ sp.n. mihi, V. B. Semenov det. 1991 / Holotypus [sic] (NHMW).

Additional material examined: **Caucasus:** 13 exs., Georgia, Likhskiy Khrebet ("Meskisch. Gb."), leg. Leder, Reitter (DEI, MNHUB, NHMW, cAss); 2♀♀ [identification doubtful], "Tbatani", 1879, leg. Leder, Reitter (DEI, NHMW); 1♀ [identification doubtful], "Caucasus" (MNHUB).

Redescription: 2.2-2.8 mm. Habitus as in Fig. 180. Coloration uniformly pale testaceous.

Head weakly oblong, approximately 1.05-1.10 times as long as wide; microreticulation distinct; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, without ommatidia (Fig. 182); antennae of moderate length, preapical antennomeres more than twice as wide as long.

Pronotum not or only very weakly transverse, usually approximately as wide as long, and about 1.2 times as wide as head; posterior margin weakly convex; microreticulation distinct, similar to that of head (Fig. 181).

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism. Abdomen with distinct microreticulation. Posterior margin of tergite VIII in both sexes weakly convex.

♂: elytra with distinct impressions and with pronounced, distinctly elevated sutural carinae extending over full length of suture, these carinae broad anteriorly and rather narrow posteriorly, their dorsal surface smooth, i. e. without aggregations of granula;

elytral puncturation weakly modified, at most indistinctly granulose (Fig. 181); tergite VII posteriorly with pair of moderately pronounced, posteriorly converging carinae (Fig. 183); tergite VIII unmodified; sternite VIII posteriorly obtusely pointed (Fig. 184); median lobe of aedeagus relatively large and broad in ventral view, internal sac with long and partly somewhat sclerotised flagellum (Figs 185-186); apical lobe of paramere of similar shape and chaetotaxy as that of *G. carinicollis*.

♀: sternite VIII broadly convex (Fig. 187); spermatheca as in Fig. 188.

Comparative notes: Among other Caucasian *Sibiota* species with strongly reduced eyes, *G. bituberculata* is characterised especially by the slender pronotum, the pronounced microsculpture, by the secondary sexual characters, and especially by the large aedeagus with a long flagellum in the internal sac.

Comments: The original description of *L. bituberculata* is based on syntypes from "Sarijal ..., ... auch in der Landschaft Letschgum und am Fuss des Suram-Gebirges in der Nähe von Michailowo". Among the syntypes located in the NHMW only one female syntype is labelled "Letschgum", none of the remaining specimens with type labels is labelled "Suram" or "Sarijal". Those with specified localities are from "Kobi" and "Swanetien" and their type status is uncertain. Most of the material identified as *bituberculata* in the collections of the NHMW is from Likhskiy Khrebet ("Meskisch. Gb."). Some of the syntypes without specified locality, unfortunately exclusively females, are indistinguishable from them, which suggests that they are from "Suram", which includes the Likhskiy Khrebet. It is from these syntypes that the lectotype is selected in order to allow a reliable interpretation in the future. A lectotype desgination was necessary, because some of the syntypes doubtlessly refer to different species.

Distribution and bionomics: The species is probably endemic to the Likhskiy Khrebet, to the north of Khashuri, Georgia. Bionomic data are not available, but the reduced eyes suggest that the habitat is subterranean.

4.53. *Geostiba* (*Sibiota*) *carinicollis* (EPPELSHEIM) (Figs 189-192)

Leptusa carinicollis EPPELSHEIM 1878b: 95 f.
Geostiba (Ditroposipalia) medea PACE 1996: 28; **syn.n.**
Type material examined:
L. carinicollis: Lectotype ♂, here designated: Kaukas Leder, Mamudly [= Mamedly (Azerbaijan, Baku)] 4500′ / 122 / carinicollis det. Bernh. / Cotypus / Lectotypus ♂ *Leptusa carinicollis* Eppelsheim desig. V. Assing 2004 / *Geostiba carinicollis* (Eppelsheim) det. V. Assing 2004 (NHMW). Paralectotypes: 1♀: Kaukas Leder / Eppelsh. typ. / 122 / carinicollis Epph. / carinicollis det. Bernh. / Typus / Paralectotypus *Leptusa carinicollis* Eppelsheim desig. V. Assing 2004 / Geostiba bituberculata (Eppelsheim) det. V. Assing 2004 (NHMW); 1♀ [with worker of *Lasius* sp. glued on the same label]: 4.7.75 / 122 / Kaukas Leder Irgau-Tschaisky-gara 4600′ / carinicollis Eppelsh. Schneid. u. Led. Beitr. Cauc. Käf. Brünn 1878 p. 95 / carinicollis det. Bernh. / Typus (NHMW); 1♀: Kaukas Leder, Mamudly 4000′ / 122 / carinicollis det. Bernh. / Cotypus (NHMW); 2♂♂: Kaukas Leder / Mamudly 5800′ / carinicollis / Cotypus Sipalia carinicollis Eppelsheim / ex coll. Skalitzky (NHMW).
G. medea: Holotype ♂: Daghestan, Kurusch, 8.7.89, Schalbusdagh, 3200 m / leg. Meyer, Stockner, Thaler / Schalbusdag, Kurusch [=Kurush], 8.7.89, 3200 m, Gras ... [illegible], Holz [Franz′ original writing] / Holotypus Geostiba medea m.det. R. Pace 1991 / Geostiba medea sp.n. det. R. Pace 1991 / Geostiba carinicollis (Eppelsheim) det. V. Assing 2004 (NHMW).

Redescription: 1.8-2.3 mm. Coloration uniformly pale testaceous.

Similar to *G. bituberculata*, but distinguished by lower average body size, paler coloration, and by the following characters:

Microsculpture of forebody less, puncturation slightly more distinct; pronotum usually at least weakly (about 1.05 ×) transverse; pronotal midline often somewhat smooth and delimited from lateral parts of pronotum by indistinct furrow on either side (Fig. 189).

♂: elytra with sutural carinae narrower (especially anteriorly) and with very shallow impressions at most (Fig. 189); pair of carinae on tergite VII weakly pronounced, in one examined ♂ confluent; sternite VIII posteriorly only indistinctly pointed; median lobe of aedeagus smaller, more slender, of different shape in lateral view, and without long flagellum (Fig. 190).

♀: posterior margin of sternite VIII broadly and weakly convex (Fig. 191; spermatheca with short and rather wide duct (Fig. 192).

Comments: The original description of *L. carinicollis* is based on an unspecified number of syntypes, partly from unspecified localities ("im Kaukasus weiter verbreitet"), but "hauptsächlich bei Mamudly [= Mamedly (Azerbaijan, Baku)] ... und auf dem Irgau-Tschaisky-gara" (EPPELSHEIM 1878b). The only syntypes with specified localities found in the collections of the NHMW are those from "Mamudly", so one of the males from this locality is here designated as the lectotype.

In the original description of *G. medea*, PACE (1996) gives the following data: "Turchia 'Sehellusdag', 3000 m, 8.VII.1989, Hoth leg."; the quotation marks suggest that he had not identified the type locality. Nevertheless, he attributed it to Turkish territory (probably because of the ending "dag") and described the species regardless of the fact that most *Geostiba* species are endemics and that, accordingly, geographic information is of particular significance. In a previous revision of the Turkish representatives of *Geostiba*, a species from Adana province was tentatively attributed to *G. medea*, based on the generally similar morphology of the spermatheca (ASSING 2001a). However, it was not possible to study the holotype, since material from the Franz collection was inaccessible at that time, so that this interpretation was exclusively based on the drawing of the spermatheca in the original description (PACE 1996). An examination of the - now available - holotype revealed that the type locality is not in Turkey, but in Daghestan, eastern Caucasus region and that *G. medea* is conspecific with *G. carinicollis*. According to Fig. 106 in PACE (1996), the eyes of the holotype of *G. medea* are much larger than in *G. carinicollis* and are composed of numerous ommatidia. This illustration either refers to a different species (confusion of drawings?) or is based on an artefact. The eyes of the holotype are of the same size as in *G. carinicollis* and somewhat malformed, probably due to the treatment applied when dissecting the specimen; it is also somewhat darkened, apparently a result of an exposure to chemicals.

Distribution and bionomics: The species is apparently confined to the eastern Caucasus. Apart from the altitudes specified on the specimens from Mamudly, no bionomic data are available.

4.54. *Geostiba (Sibiota) krzysztofi* (ROUBAL) (Figs 193-201)

Sipalia carinicollis krzysztofi ["*Krzysztofi*"] ROUBAL 1913: 485 f.

Type material examined:

Lectotype ♂, here designated: ♂ / Ca. b. Teberda, VI.1912, Roubal / Krzysztofi / ex coll. Scheerpeltz / Lectotypus ♂ *Sipalia krzysztofi* Roubal desig. V. Assing 2004 / Geostiba krzysztofi (Roubal) det. V. Assing 2004 (NHMW). Paralectotypes: 3♂♂, 3♀♀: same data as lectotype (DEI, NHMW, cAss); 1♂: Ca. Kislovodsk, V.912, Roubal / Sipalia ♂ / Typus / v. Krzysztofi m. / Holo-

typus [sic] Sipalia carinicollis krzysztofi Roubal V. I. Gusarov rev. 2003 / Geostiba krzysztofi Roubal V. I. Gusarov det. 2003 (SNM).

Additional material examined: **Caucasus:** 7 exs., same locality and date as type specimens, but apparently not seen by Roubal (DEI, cAss).

Redescription: 2.1-2.6 mm. Habitus as in Fig. 193. Coloration uniformly pale testaceous, sometimes with the preapical abdominal segments indistinctly infuscate.

Head weakly oblong; eyes strongly reduced, but approximately 10 ommatidia present (Fig. 195); microreticulation very shallow, integument somewhat shiny; puncturation sparse and very fine.

Pronotum weakly transverse, about 1.05-1.10 times as wide as long, and about 1.2 times as wide as head; microsculpture shallow, but slightly more distinct than that of head; posterior margin weakly convex (Fig. 194).

Elytra with pronounced sexual dimorphism. Abdomen with shallow, but distinct microreticulation everywhere; posterior margin of tergite VII without palisade fringe.

♂: elytra with extensive diagonal impressions and with long, well-defined, distinctly elevated, narrow, but anteriorly somewhat dilated sutural carinae extending over full length of suture; puncturation indistinctly granulose (Fig. 194); tergite VII with pair of short, but well-defined, posteriorly distinctly converging carinae in posterior half (Fig. 196); tergite VIII posteriorly broadly concave (Fig. 197); posterior margin of sternite VIII obtusely pointed; median lobe of aedeagus and apical lobe of paramere as in Figs 198-199.

♀: posterior margin of tergite VIII weakly concave in the middle, that of sternite VIII broadly convex, in the middle more or less distinctly concave (Fig. 200); spermatheca with short helicoid duct (Fig. Fig. 201).

Comparative notes: From *G. bituberculata* and allied Caucasian species, *G. krzysztofi* is distinguished by the modifications of the male elytra (sharp long sutural carina), the pair of short and distinctly converging carinae on the male tergite VII, the posteriorly distinctly concave male tergite VIII, the shape of the median lobe of the aedeagus, and the characteristic shape of the spermatheca. From *G. bituberculata*, *G. carinicollis*, and *G. kobrisensis*, it is additionally separated by the presence of some ommatidia, a character shared with *G. zerchei*.

Comments: The original description of *S. krzysztofi* is based on an unspecified number of syntypes from Teberda collected by ROUBAL in 1912 (ROUBAL 1913), so that the specimens listed above have type status, although they have no type labels attached to them. A male in good condition and with pronounced secondary sexual characters is here designated as the lectotype.

Distribution and bionomics: *Geostiba krzysztofi* has been recorded only from the type locality in Karatchay-Tcherkessia (Russia). Bionomic data are unknown.

4.55. *Geostiba* (*Sibiota*) *kobrisensis* PACE (Figs 202-203)

Geostiba (*Ditroposipalia*) *kobrisensis* PACE 1996: 26.
Geostiba (*Ditroposipalia*) *crucis* PACE 1996: 28; **syn.n.**
Type material examined: *G. kobrisensis*: Holotype ♂: Tal des Kobris Ghali / Zentralkaukasus lg. H. Franz / Holotypus Geostiba kobrisensis m. det. R. Pace 1985 / Geostiba

kobrisensis sp.n. det. R. Pace 1985 / Geostiba kobrisensis Pace det. V. Assing 2004 (NHMW). Paratypes: 2 ♀ ♀: same data as holotype (NHMW).
G. crucis: Holotype ♀: Gud-Gara südlich d. Kreuzpasses [= Gudauri, 42°29N, 44°28E] 1700 m / Zentralkaukasus lg. H. Franz / Holotypus Geostiba crucis m. det. R. Pace 1985 / Geostiba crucis sp.n. det. R. Pace 1985 / Geostiba kobrisensis Pace det. V. Assing 2004 (NHMW).

Redescription: 1.9-2.6 mm. Coloration uniformly pale testaceous to ferrugineous.

Head approximately as long as wide or weakly oblong; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, without ommatidia; microsculpture distinct, but slightly shallower than in *G. bitubercula*; antennae of moderate length, preapical antennomeres about twice as wide as long.

Pronotum 1.05-1.10 times as wide as long and about 1.2 times as wide as head; posterior margin weakly convex; microreticulation distinct, slightly weaker than in *G. bituberculata*.

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism. Abdomen with distinct microreticulation.

♂: elytra with shallow impressions; sutural carinae rather broad and long, extending over full length of suture (Fig. 202); tergite VII posteriorly with pair of relatively long carinae, these carinae more than half the length of tergite and narrower posteriorly than anteriorly (Fig. 203); posterior margin of tergite VIII in the middle almost truncate; sternite VIII posteriorly strongly convex; median lobe of aedeagus and apical lobe of paramere as figured by PACE (1996: Figs 96, 97, 99).

♀: spermatheca as figured by PACE (1996: Fig. 98).

Comparative notes: The species is distinguished from the similar *G. bituberculata* by lower average size, paler average coloration, posteriorly less distinctly narrowed sutural carinae on the male elytra, long carinae on the male tergite VII, a smaller median lobe of the aedeagus of different shape and with a shorter transparent flagellum.

Comments: The original description of *G. crucis* is based on a single female; a reliable interpretation and identification in this species group, however, is possible only when males are present. A comparison of the holotype of *G. crucis* with the paratypes of *G. kobrisensis* yielded no convincing evidence that they should represent distinct species. The differences in the shape of the spermathecal capsule suggested by the illustrations in PACE (1996) are apparently based on an artefact. The spermatheca of the holotype of *G. crucis* is somewhat damaged and contaminated with a dark substance, apparently as the result of the original dissection procedure, but from what can be seen the length and shape of the spermathecal duct seems to be the same as in *G. kobrisensis*. Moreover, the type locality of *G. crucis* is separated from that of *G. kobrisensis* only by some 20-30 km. Consequently, there is little doubt that the types of both names are conspecific, so that *G. crucis* is here synonymised with *G. kobrisensis*.

Distribution and bionomics: The species is apparently endemic to the southern slopes of the central Caucasus, to the north of Tiflis (Georgia). The code "KS 19" on the reverse side of the locality labels of the type specimens of *G. kobrisensis* refers to the following entry in Franz' notebook: "Kasbegi [=Kazbegi, 42°39N, 44°38E], Tal des Kobris Chali, 5.7.1985, höchster Birkenwald von 2100m aufwärts".

4.56. *Geostiba* (*Sibiota*) *zerchei* PACE, species dubia (Fig. 221)

Geostiba (*Lioglutosipalia*) [sic] *zerchei* PACE 1996: 40.

Type material examined: Holotype ♀: Cauc. min. bor. 4.-7.VII.1986, Trialetskij Chreb., Bakuriani, 1800-2200m, leg. Wrase/Schülke / coll. Zerche / DEI Eberswalde / Holotypus Geostiba zerchei m. det. R. Pace 1992 / Geostiba zerchei sp.n. det. R. Pace 1992 / Geostiba zerchei Pace det. V. Assing 2004 (DEI).

Redescription: 2.2 mm. Coloration light brown, with abdominal segment VI and adjacent parts of neighbouring segments infuscate.

Head approximately as long as wide; microreticulation shallow; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, with few ommatidia; antennae relatively short and apically distinctly incrassate, preapical antennomeres more than twice as wide as long.

Pronotum about 1.15 times as wide as long and 1.15 times as wide as head; posterior margin weakly convex; microreticulation shallow (Fig. 221).

Elytra with very fine and moderately dense puncturation. Abdomen with distinct microreticulation.

♂: unknown.

♀: posterior margins of tergite and sternite VIII weakly convex; spermatheca similar to that of *G. bituberculata* (see PACE 1996: Fig. 165).

Comparative notes: Among the geographically closest representatives of the *G. bituberculata* group, this species is apparently characterised by the presence of some ommatidia. However, it is unknown if this character is constant.

Comments: The original description is based on a single female. The inadequacy of such descriptions is illustrated by the fact that even the original subgeneric assignment is erroneous. An examination of the holotype revealed that it refers to *Sibiota*, not to *Sipalotricha*, the valid senior synonym of *Lioglutosipalia* SCHEERPELTZ. Since males are required for an accurate interpretation of species of this species group, the species must be considered a doubtful species for the time being.

Distribution and bionomics: *Geostiba zerchei* has been recorded only from the type locality.

4.57. *Geostiba* (*Sibiota*) *batumiensis* PACE

Geostiba (*Ditroposipalia*) *batumiensis* PACE 1996: 26.

Type material examined: Holotype ♂: Umg. Batumi, lg. H. Franz / Holotypus Geostiba batumiensis m. det. R. Pace 1985 / Geostiba batumiensis sp. n. det. R. Pace 1985 / Geostiba batumiensis Pace det. V. Assing 2004 (NHMW). Paratypes: 2♀♀ [1 teneral]: same data as holotype (NHMW).

Redescription: 2.2-2.7 mm. Coloration uniformly pale testaceous to ferrugineous.

Head approximately as long as wide or weakly oblong; microreticulation distinct; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, without ommatidia; antennae of moderate length, preapical antennomeres about twice as wide as long.

Pronotum approximately as wide as long and about 1.25-1.30 times as wide as head; posterior margin truncate, in the middle indistinctly pointed in both sexes; microreticulation distinct; puncturation in holotype more distinct than in female paratypes.

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism. Abdomen with distinct microreticulation.

♂: elytra with extensive diagonal impressions and with pronounced sutural carinae extending over full length of suture; tergite VII with pair of not very pronounced, posteriorly distinctly converging carinae near posterior margin; median lobe comparatively broad in ventral view. For illustrations of the male primary and secondary sexual characters see Figs 89-91, 93 in PACE (1996). It should be noted, however, that the furrows on the male pronotum indicated in Fig. 89 are very indistinct.

♀: spermatheca with relatively long and slender duct (PACE 1996: Fig. 94).

Comparative notes: The species is distinguished from the similar *G. fabaeformis* ASSING from the Turkish province Artvin especially by the smaller eye rudiments without ommatidia, by the more widely separated and more weakly pronounced pair of carinae on the male tergite VII, by the differently shaped median lobe of the aedeagus without distinct spines in the internal sac, and by the much longer spermathecal duct. For illustrations of the sexual characters of *G. fabaeformis* see Figs 51-57 in ASSING (2001a). From the similar *G. krzysztofi*, with which it shares the long and narrow sutural carinae, *G. batumiensis* is separated by the more distinct microreticulation of the pronotum, the presence of shallow impressions on the pronotum, the smaller eye rudiments without ommatidia, the less pronounced carinae on the male tergite VII, the different shape of the male tergite VIII, and by the different morphology of the primary sexual characters.

Distribution and bionomics: The species has become known only from the type locality in southwestern Georgia. Bionomic data are unknown.

4.58. *Geostiba* (*Sibiota*) *uhligi* PACE

Additional material examined: **Turkey:** 1 ex., Goek Dağ, leg. Bodemeyer (DEI).

4.59. *Geostiba* (*Sibiota*) *dinarica* sp. n. (Figs 205-220)

Type material: Holotype ♂: Dinar. Alpen, Mte. Dinara, A. Winkler / *Geostiba dinarica* sp. n. det. V. Assing 2005 (MHNG). Paratypes: 1♂, 3♀♀ [1 with mature egg in ovaries]: same data as holotype (MHNG, cAss).

Description: 2.0-2.6 mm. Coloration uniformly testaceous, preapical abdominal segments sometimes weakly infuscate.

Head approximately as long as wide or weakly oblong; microreticulation distinct; puncturation very fine, barely noticeable; eyes reduced to minute rudiments, with few (approximately 10-15) ommatidia (Fig. 209); antennae of moderate length, preapical antennomeres about twice as wide as long (Fig. 205).

Pronotum approximately 1.10-1.15 times as wide as long and about 1.10-1.15 times as wide as head; posterior margin weakly and broadly convex; microreticulation distinct, similar to that of head (Figs 206-207).

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism (Figs 206-207). Abdomen with distinct microreticulation; puncturation sparse and very fine, barely noticeable; posterior margin of tergite VII without palisade fringe.

♂: elytra with pair of distinctly elevated, subcircular, smooth, and shiny tubercles near scutellum (Figs 206-207); puncturation sparse and weakly granulose; tergite VII with sharp, but only weakly elevated, posteriorly diverging carinae of slightly less than half the length of tergite and separated by slightly less than one third the width of tergite (Fig. 210); posterior margin of tergite VIII more or less strongly convex and with very sparse marginal setae (Figs 211-212); sternite VIII posteriorly obtusely pointed; median lobe of aedeagus with weakly pronounced crista apicalis and crista proximalis, and with numerous semitransparent spines in internal sac (Figs 213-215); apical lobe of paramere slender (Fig. 216).

♀: elytra with very fine puncturation, puncture barely noticeable in the microsculpture; near scutellum at most with very indistinct elevations; posterior margin of tergite VIII broadly convex (Fig. 218); posterior margin of sternite VIII not distinctly concave in the middle and with moderately modified marginal setae (Fig. 217); spermatheca as in Figs 219-220.

Comparative notes: The new species is readily separated from other species of the subgenus with strongly reduced eyes especially by the highly distinctive modifications of the male elytra, and by the sharp, weakly elevated, distinctly separated, and posteriorly diverging carinae on the male abdominal tergite VII. The geographically closest *Sibiota* species with distinctly reduced eyes is *G. stussineri*, which has eyes without ommatidia, male elytra with oblong elevations, a differently shaped pair of carinae on the male tergite VII, and different primary sexual characters. *Geostiba arida*, which, too, occurs in the northern and central Balkans and which resembles *G. dinarica* in general appearance (size, coloration, etc.) has distinctly larger eyes and completely different male primary and secondary sexual characters.

Distribution and bionomics: The species has become known only from the type locality, Mt. Dinara (approximately 33°04N, 16°23E; altitude little more than 1800 m), in the Dinaric Alps at the border separating Croatia and Bosnia-Herzegovina. The adaptive reductions of eyes, wings, pigmentation, and palisade fringe suggest that it has a restricted distribution. Bionomic data are not available.

4.60. *Geostiba* (*Typhlusida*) *rhilensis* (RAMBOUSEK) (Figs 222-224, Map 11)

Sipalia rhilensis RAMBOUSEK 1924: 68 f.
Geostiba (*Tylosipalia*) *bulgarica* PACE 1983b: 16 ff.; **syn.n.**

Type material examined:
S. rhilensis: Holotype ♂: Bulg. Rila, Čamkorija, 5.9.23, Dr. Rambousek / Typus / rhilensis m. det. Rambousek / Mus. Nat. Pragae, Inv. 19372 / Geostiba rhilensis det. V. Assing 2005 (NMP).
G. bulgarica: Holotype ♂: ♂ / Bulg. Tschamkorija [=Borovez], M. Hilf 1911, coll. O. Leonhard / Typus Sipalia bulgarica O. Scheerpeltz / Holotypus Geostiba bulgarica m. det. R. Pace 1981 / Geostiba rhilensis (Rambousek) det. V. Assing 2005 (NHMW). Paratypes: 1♀: same data as holotype (NHMW); 15 exs.: Bulgaria, 7.VI.67, Borovetz-Maritza, Cl. Besuchet [labelled by me as *Geostiba bulgarica* PACE] (MHNG).

Additional material examined: **Bulgaria:** 5 exs., Rila, Borovez, 17.-28.VI.1969, leg. Ermisch (DEI, NHMW); 6 exs., Lakatischka Rila, W Klisura pass, 42°21N, 23°20E, 850 m, beech forest, 23.VI.1997, leg. Zerche & Behne (DEI, cAss); 2 exs., Maleschevska Planina, above Gorna Bresniza, 41°45N, 23°02E, 1660 m, beech forest, 8.V.2000, leg. Behne (DEI); 19 exs., Stara Planina, Etropolska Planina, peak Murgana, 42°42N, 24°03E, ca. 1600 m, 11.V.2001, leg. Zerche & Behne (DEI, cAss).

Redescription: 2.4-2.9 mm. Coloration uniformly pale testaceous.

Head weakly oblong; microreticulation very shallow, barely noticeable; puncturation

very fine; eyes reduced to minute rudiments, without ommatidia (Fig. 223); antennae of moderate length, preapical antennomeres about twice as wide as long.

Pronotum weakly transverse, approximately 1.05-1.10 times as wide as long, and about 1.2 times as wide as head; posterior margin broadly convex; microreticulation shallow, but more distinct than that of head.

Elytra at suture about 0.6 times as long as pronotum; with pronounced sexual dimorphism. Abdomen with shallow microsculpture; posterior margin of tergite VII without palisade fringe.

♂: elytra with somewhat granulose puncturation and on either side of suture with long oblique elevation (Fig. 222); abdominal tergite VII in posterior half with relatively large, oblong, and smooth elevation or tubercle (Fig. 224); median lobe of aedeagus and apical lobe of paramere as illustrated by PACE (1983b: Figs 45, 46, 48).

♀: elytra without elevations and with fine puncturation; spermatheca with long and slender duct (see Fig. 47 in PACE 1983b).

Comparative notes: The species is distinguished from *G. flava*, the only other representative of the subgenus *Typhlusida* in the study region, by the slightly darker coloration, the more distinctly microsculptured elytra, and especially by the sexual characters. In male *G. flava*, the sutural carinae are much narrower, the elytral impressions are shallower and of different shape, and the oblong tubercle on tergite VII is more distinctly elevated and much more well-defined.

Comments: The species had previously been attributed to the subgenus *Geostiba* (see e. g. ZERCHE 2002), i. e. *Tropogastrosipalia* of the present subgeneric concept, although RAMBOUSEK (1924) clearly observes "sur le cinquième tergite [i. e. tergite VII] avec une carrène [sic] médiane occupant la moitié postérieure". This may partly explain why PACE (1983b) described the same species again as *G. bulgarica*, without even mentioning *G. rhilensis* in the original description, although the locality where the holotype of *G. bulgarica* was found ("Tschamkorija", see above) and the type locality of *G. rhilensis* ("Čamkorija") are identical. The types of both species are doubtlessly conspecific, so that *G. bulgarica* is here placed in the synonymy of the senior name *G. rhilensis*.

Distribution and bionomics: *Geostiba rhilensis* has become known from the Rila range, the Maleschevska Planina, and the Western Stara Planina (Map 11), where it was sifted from leaf litter of beech forests and from grass at altitudes of 850-1660 m (ZERCHE 2002, and material examined).

Map 11: Distribution of *Geostiba rhilensis* in Bulgaria, based on examined records.

4.61. *Geostiba (Typhlusida) flava* (KRAATZ)

Homalota flava KRAATZ, 1856: 327f.

Type material examined: see Assing (2000c).

Additional material examined: **Austria:** 17 exs., Steiermark, Turnau (MNHUB); 2 exs., Steiermark, Graz (MNHUB); 2 exs., Niederösterreich, Kranichberg, 1887, leg. Ganglbauer (MNHUB); 1 ex., Niederösterreich or Steiermark, Wechsel (MNHUB). **Locality not specified:** 1 ex., "Styria" (DEI); 1 ex., "Illyrien" (MNHUB). **Evidently mislabelled:** 1 ex., "Ob. Bayern" (MNHUB).

Comment: For a detailed redescription, illustrations, and for comments on synonymy and distribution see ASSING (2000c).

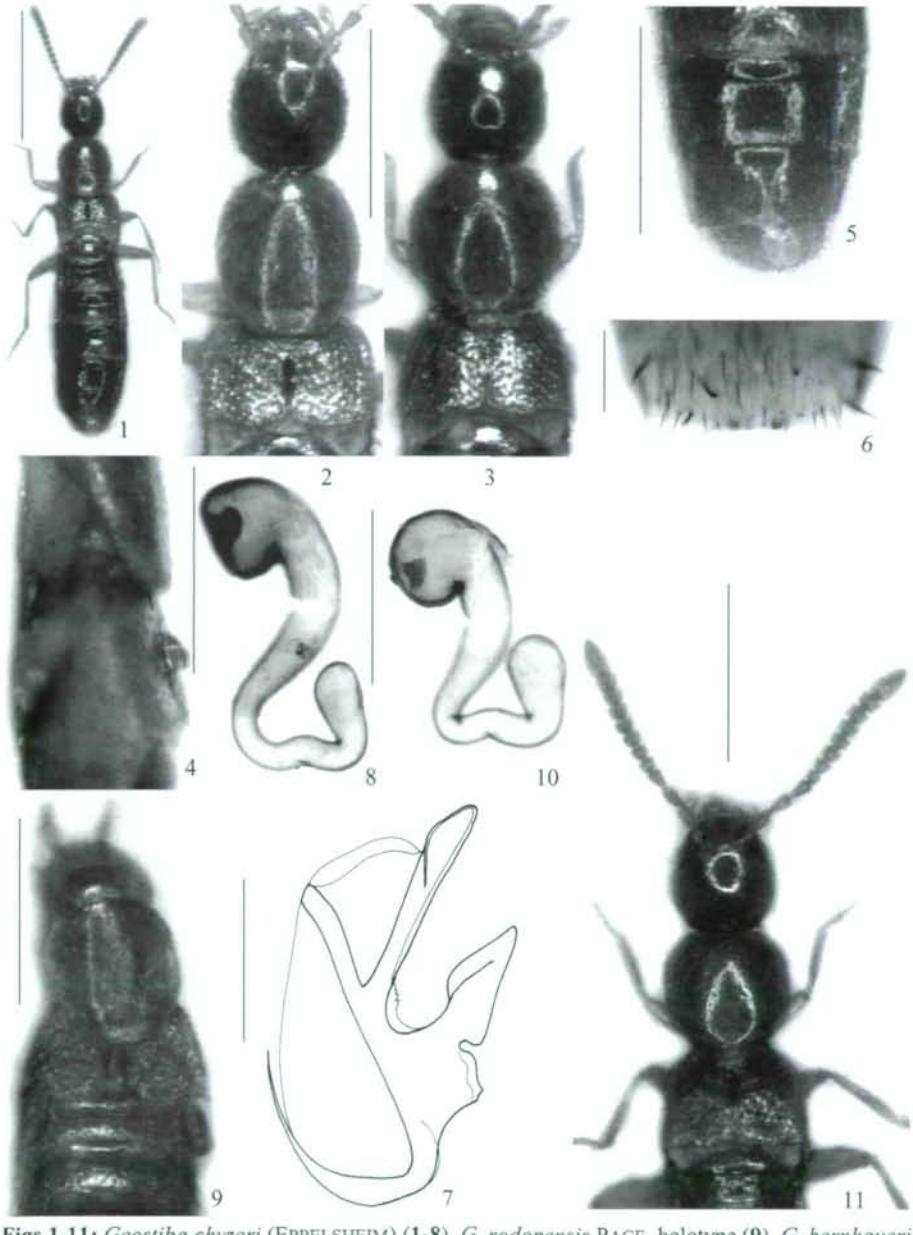
4.62. *Geostiba scheerpeltziana* (FAGEL)

Additional material examined: 2 exs., Lebanon, Kartaba, 1200-1400 m, V.1964, G. Fagel (NHMW, cAss).

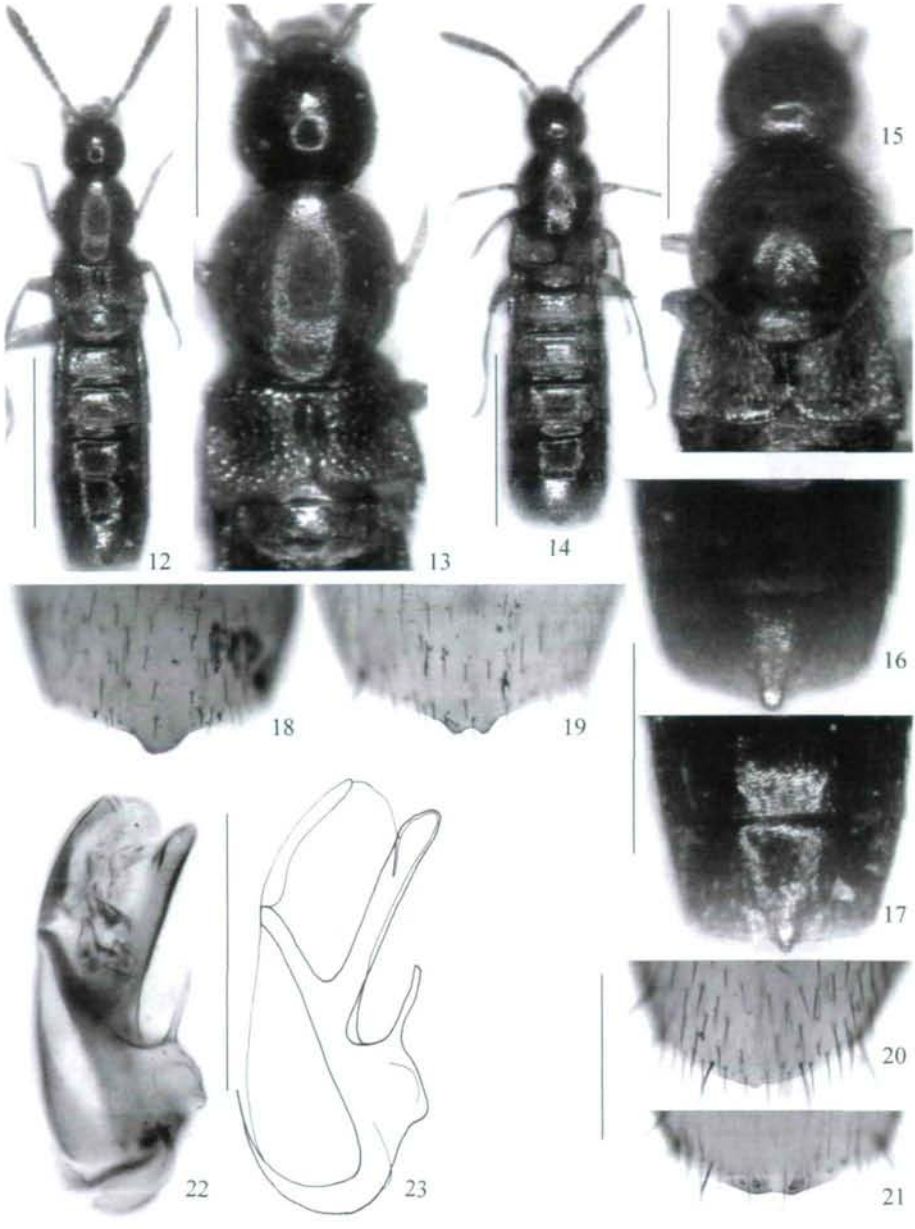
Comment: The specimens listed above were evidently collected together with the types; the data indicated by FAGEL (1966) are: "Liban: Kartaba (vallée du Nahr Ibrahim, 1.200 m, ..., 19V.1964".

4.63. *Tropimenelytron tuberiventris* (EPPELSHEIM)

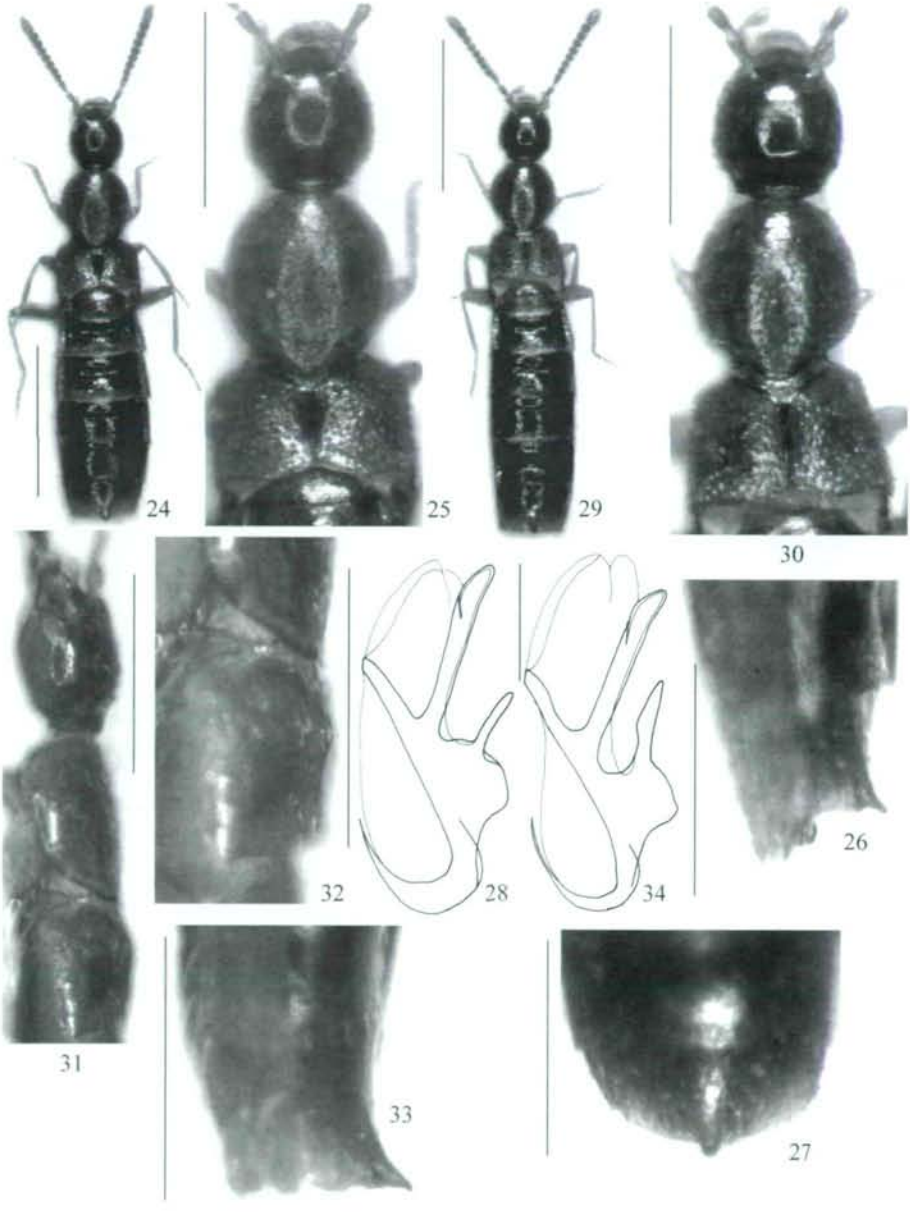
Material examined: **Italy:** 9 exs., Calabria, Aspromonte, 1905 (DEI); 1 ex., Aspromonte, Ana d. Vento, 1000 m, 30.VI.2001, leg. Wolf (cSch); 3 exs., Abruzzi, Mte. Pagano [41°45N, 14°10E], leg. Paganetti (DEI); 1 ex., Abruzzo, Lago di Barrea, 4 km W Barrea, 1000 m, 16.V.1998, leg. Wolf (cSch); 1 ex., Abruzzi, Castel di Sangro (DEI); 2 exs., Lazio, Monti Reatini, road to Leonessa, 42°30N, 13°00E,1315 m, beech forest, 22.V.2003, leg. Schülke (cSch); 1 ex., Sicilia, Mti. Nebrodi, Portella dell'Obolo, 1520 m, mixed beech and oak forest, 37°54N, 14°30E, 2.IV.2001, leg. Schülke (cSch); 1 ex., Sicilia, Monti Nebrodi, N Pizzo Muto, 1290 m, *Fagus*, *Quercus ilex*, scree, 37°56N, 14°38E, 2.IV.2001, leg. Schülke (cSch). **Caucasus region:** 1 ex., "Circassien" (DEI).; 1 ex., "Swanetien" (DEI); 2 exs., "Daghestan" (DEI).



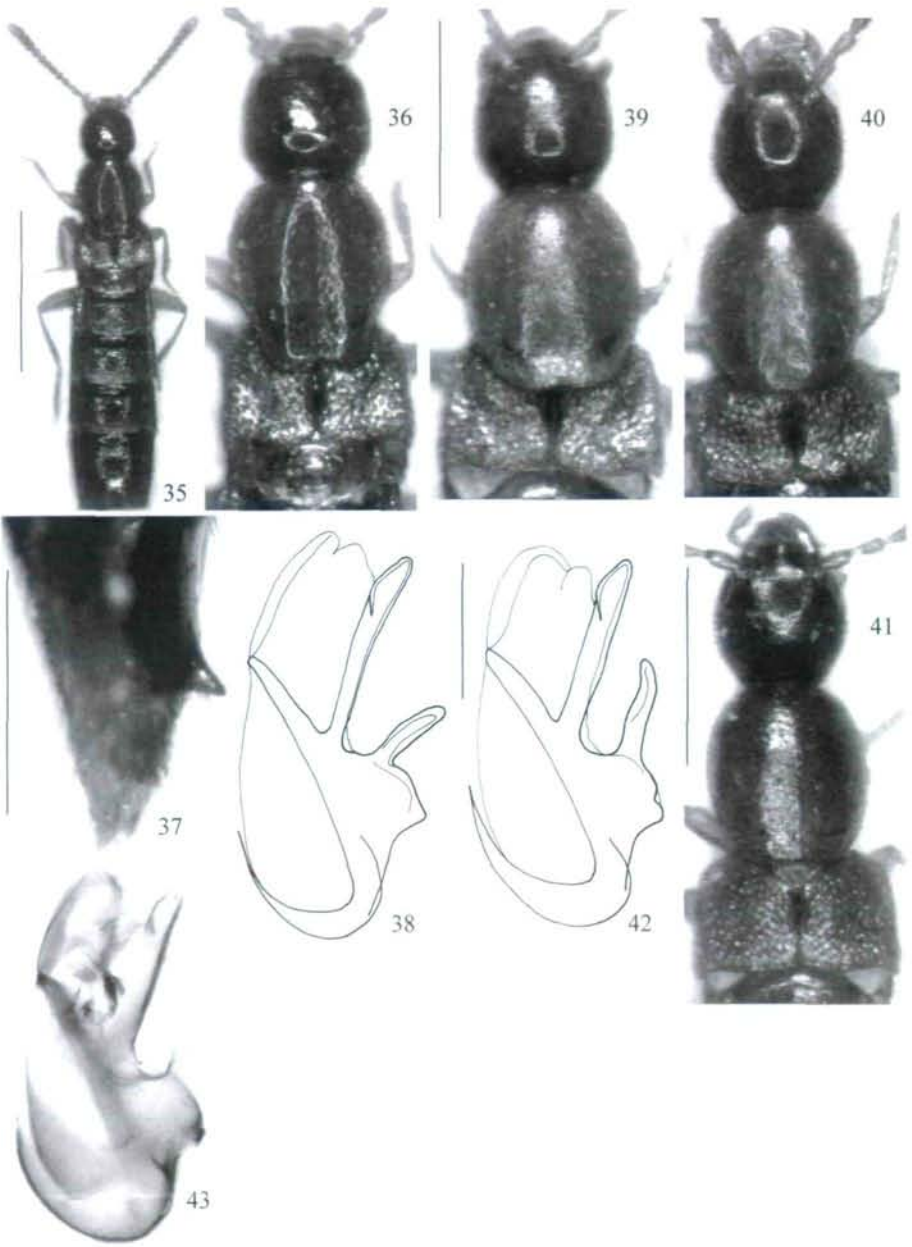
Figs 1-11: *Geostiba chyzeri* (EPPELSHEIM) (**1-8**), *G. rodopensis* PACE, holotype (**9**), *G. bernhaueri* (BREIT), paralectotype (**10-11**): **1** – ♂ habitus; **2** – ♂ forebody; **3, 11** – ♀ forebody; **4** – ♂ elytra in lateral view; **5** – ♂ abdominal apex; **6** – posterior part of ♂ tergite VIII; **7** – median lobe of aedeagus in lateral view; **8, 10** – spermatheca. Scale bars: 1: 1.0 mm; 2-5, 9, 11: 0.5 mm; 6-8, 10: 0.1 mm.



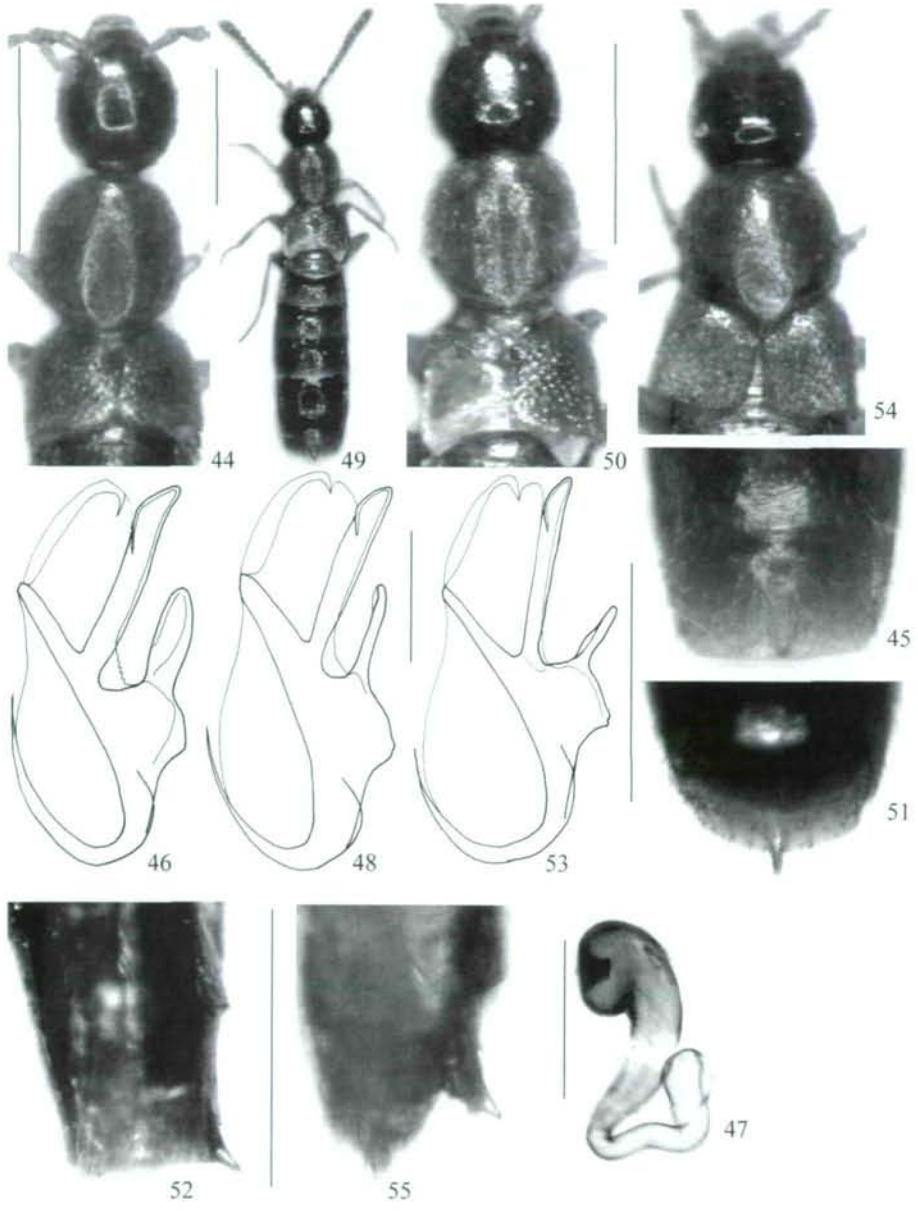
Figs 12-23: *Geostiba mihoki* (BERNHAUER): lectotype (**16, 19**) and paralectotype (**12-13, 17, 18, 22**) of *G. mihoki*; holotype of *G. biharica* (**14-15, 20**): **12, 14** – ♂ habitus; **13, 15** – ♂ forebody; **16, 17** – ♂ abdominal tergites VI-VII; **18-21** – posterior half of ♂ tergite VIII; **22-23** – median lobe of aedeagus in lateral view. Scale bars: 12, 14: 1.0 mm; 13, 15-17: 0.5 mm; 18-23: 0.2 mm.



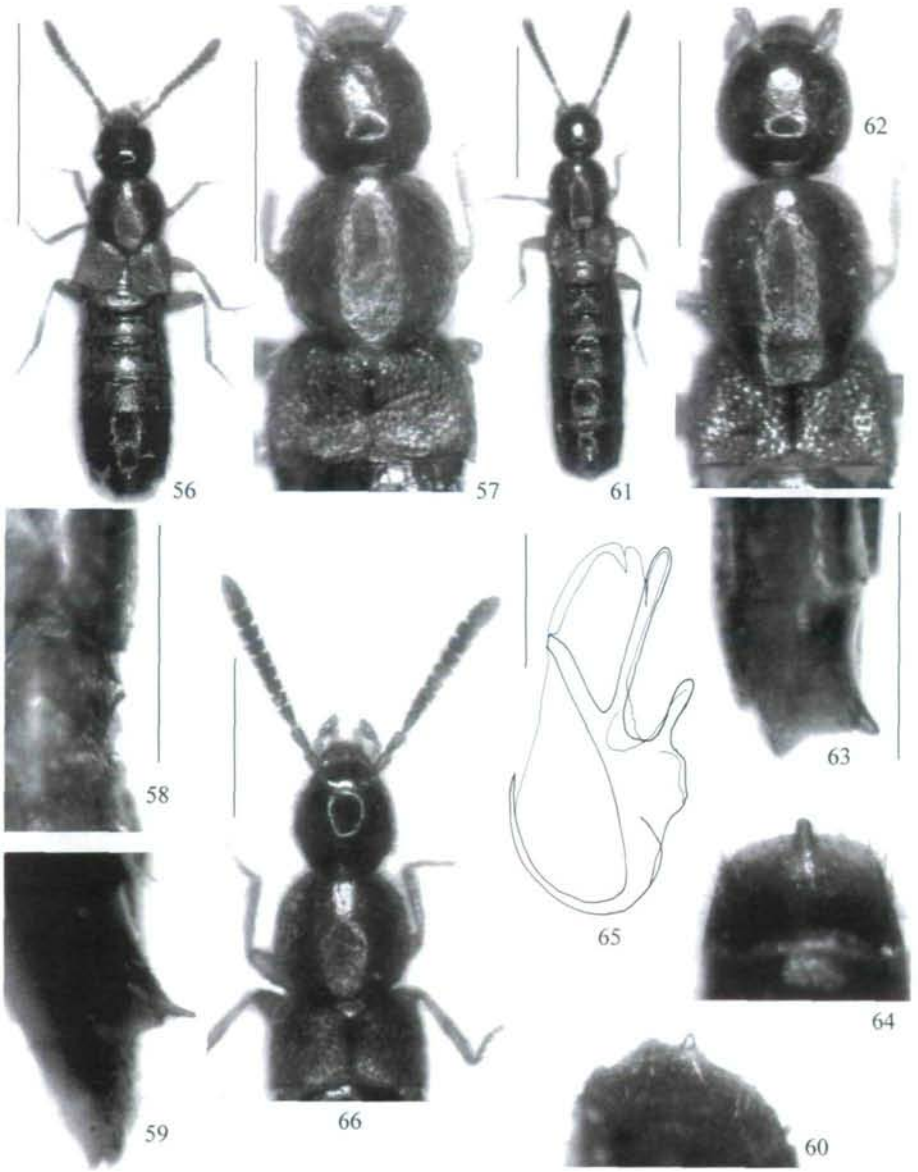
Figs 24-34: *Geostiba spinicollis* (KRAATZ) (**24-28**) and *G. hummleri* (BERNHAUER), lectotype (**29-34**): **24, 29** – ♂ habitus; **25, 30** – ♂ forebody; **26, 33** – ♂ abdominal tergites VI-VII in lateral view; **27** – ♂ abdominal tergites VI-VII in antero-dorsal view; **28, 34** – median lobe of aedeagus in lateral view; **31** – ♂ forebody in lateral view; **32** – ♂ elytra in lateral view. Scale bars: 24, 29: 1.0 mm; 25-27, 30-33: 0.5 mm; 28, 34: 0.1 mm.



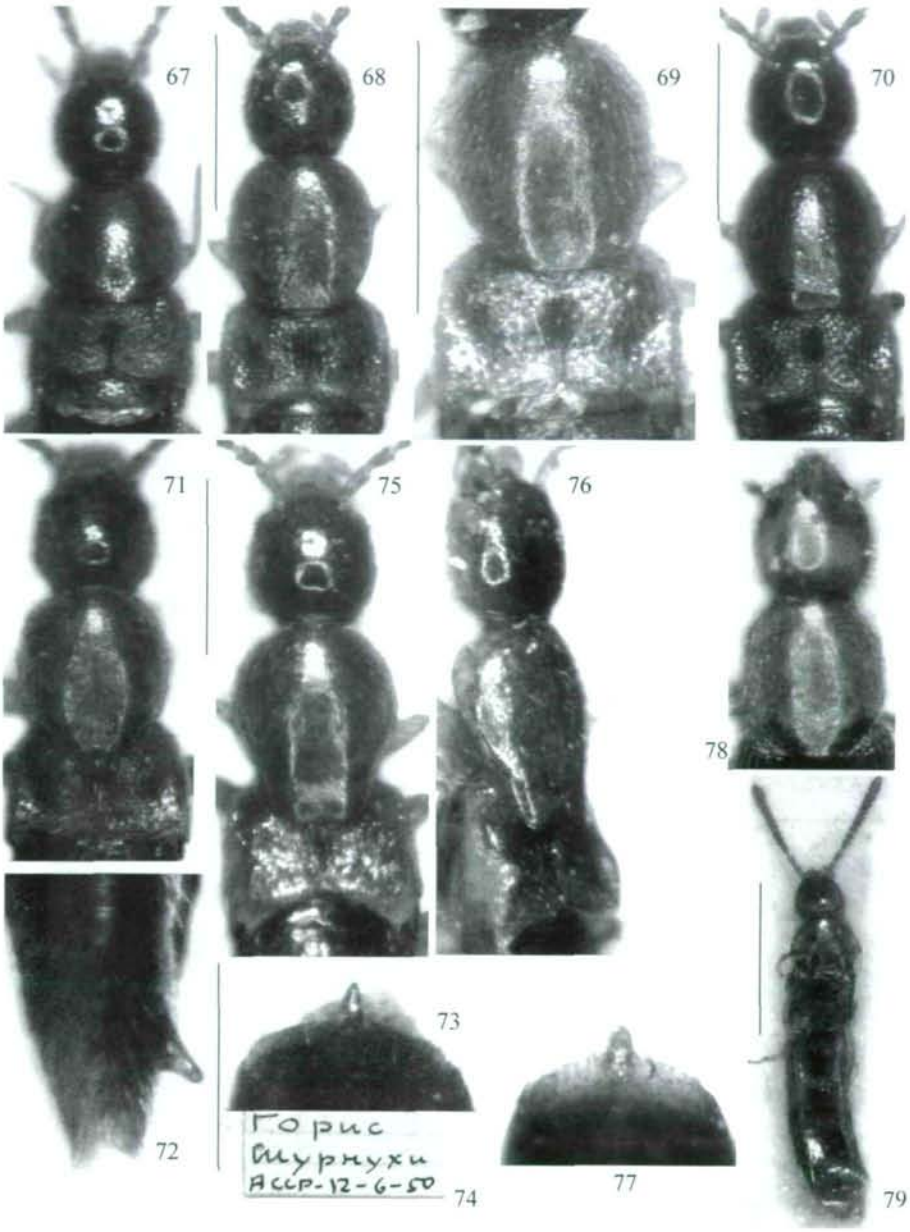
Figs 35-43: *Geostiba armicollis* (BREIT) (**35-38**) and *G. apfelbecki* EPPELSHEIM (**39-43**): **35** – ♂ habitus; **36, 39-41** – ♂ forebody (39-40: Trebević, 41: paratype of *G. wunderlei)*; **37** – ♂ abdominal apex in lateral view; **38, 42-43** – median lobe of aedeagus in lateral view. Scale bars: 35: 1.0 mm; 36-37, 39-41: 0.5 mm; 38, 42-43: 0.1 mm.



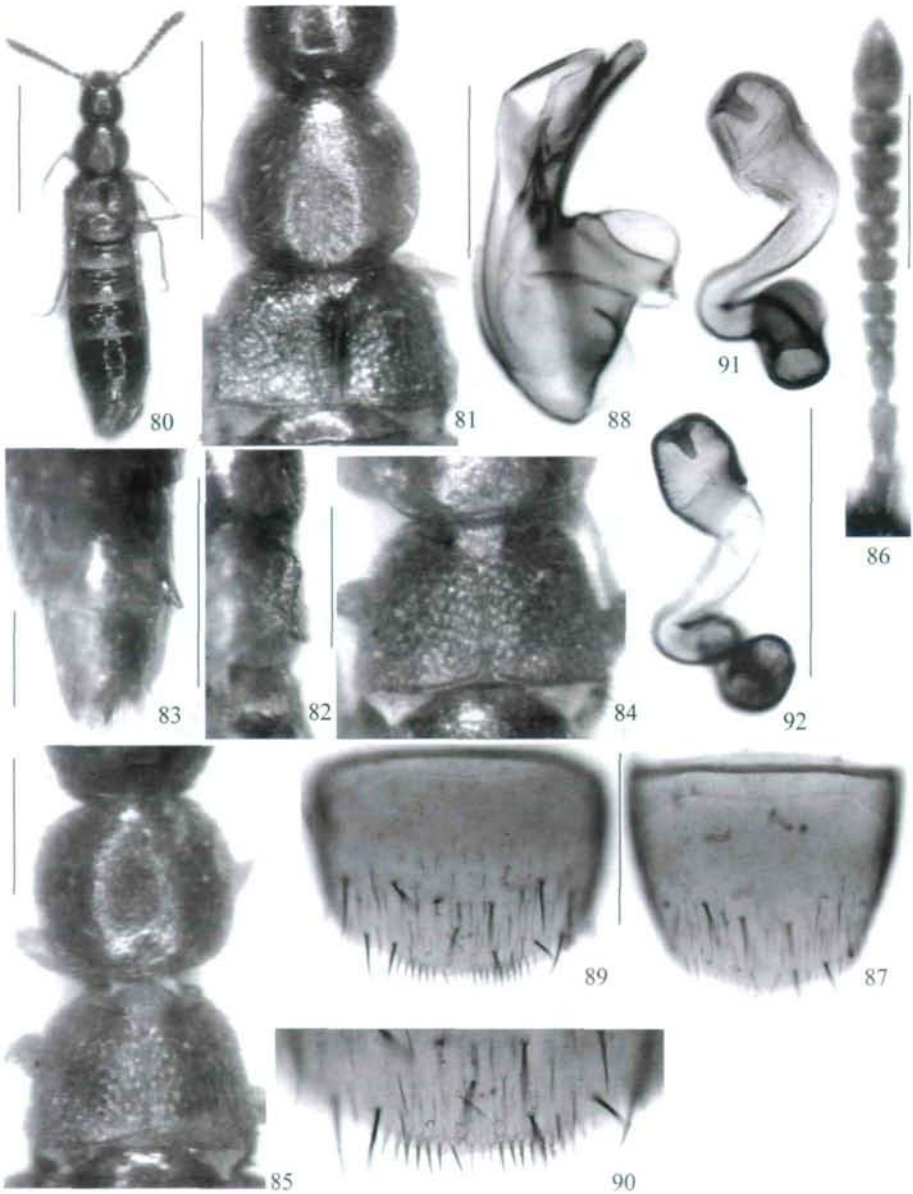
Figs 44-55: *Geostiba paganettiana* (BERNHAUER) (**44-47**), *G. spizzana* (BERNHAUER) (**48**), *G. curzolae* (BERNHAUER) (**49-53**), and *G. biokovensis* PACE (**54-55**): **44, 50, 54** – ♂ forebody; **45, 51** – ♂ abdominal apex in dorsal view; **46, 48, 53** – median lobe of aedeagus in lateral view; **47** – spermatheca; **49** – habitus (♂ holotype); **52, 55** – ♂ abdominal apex in lateral view. Scale bars: 49: 1.0 mm; 44-45, 50-52, 54-55: 0.5 mm; 46-47, 48, 53: 0.1 mm.



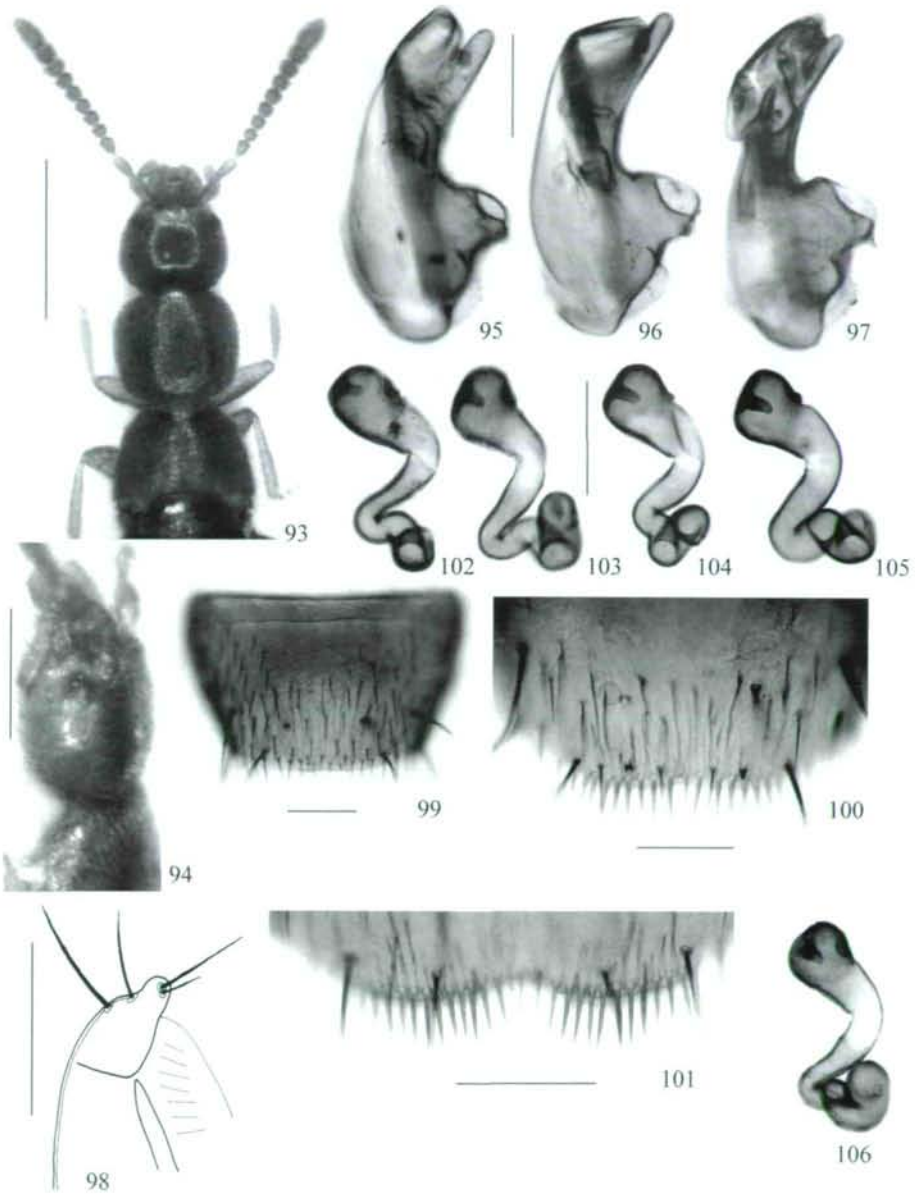
Figs 56-66: *Geostiba biokovensis* PACE (**56**), *G. winkleriana* PACE (**57-60**), *G. mosorica* sp.n. (**61-65**), and *G. slaviankaensis* ZERCHE (**66**): **56, 61** – ♂ habitus; **57, 62, 66** – ♂ forebody; **58** – ♂ elytra in lateral view; **59, 63** – ♂ abdominal apex in lateral view; **60, 64** – ♂ abdominal apex in antero-dorsal view; **65** – median lobe of aedeagus in lateral view. Scale bars: 56, 61: 1.0 mm; 57-60, 62-64, 66: 0.5 mm; 65: 0.1 mm.



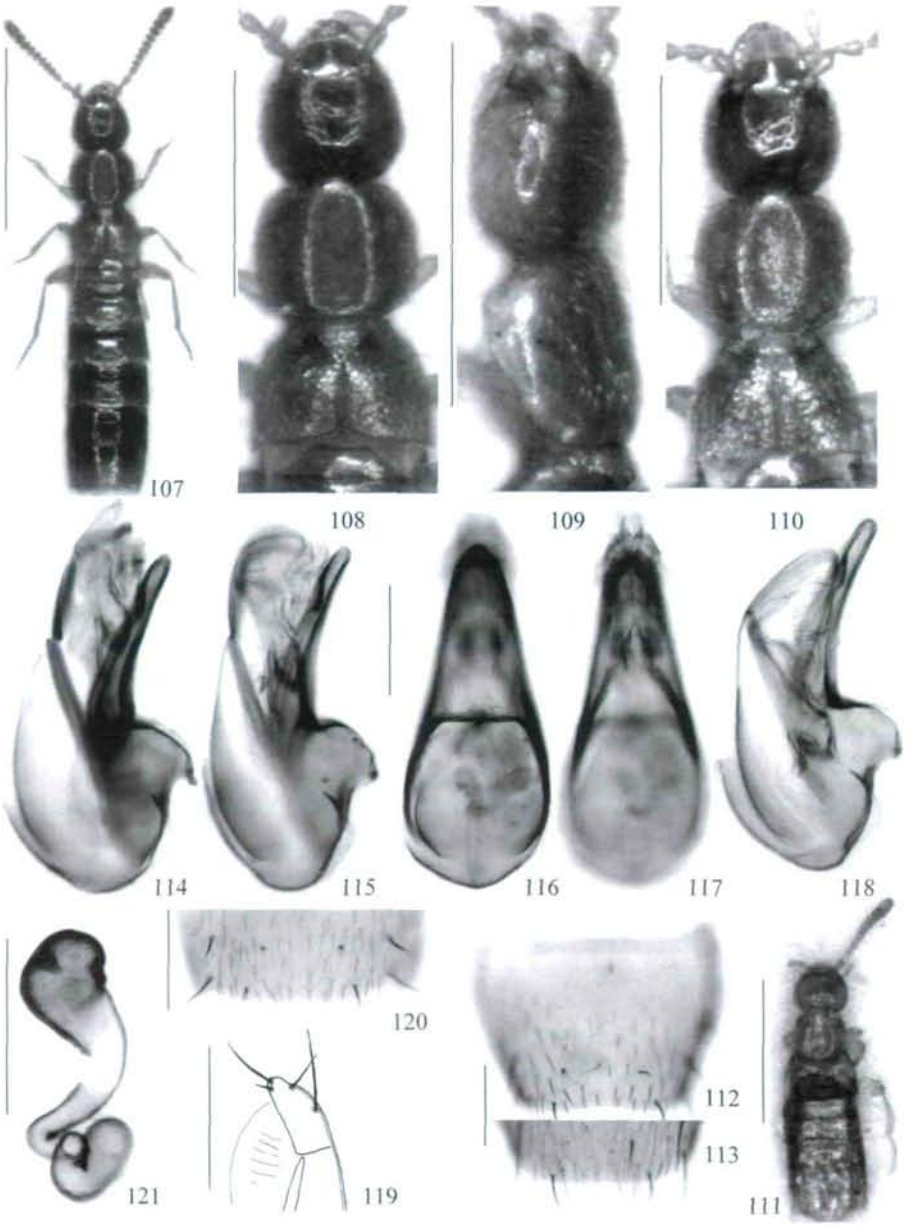
Figs 67-79: *Geostiba ossogovskaensis* ZERCHE, holotype (**67**), *G. ilievi* ZERCHE, holotype (**68-69**) (**68**: holotype, **69**: paratype), *G. belasizaensis* ZERCHE, holotype (**70**), *G. khnzoriani* PACE, holotype (**71-74**), *G. winkleri* (BERNHAUER) (**75-77**), and *G. tiflisensis* PACE (**78-79**) (**78**: holotype of *G. tiflisensis*; **79:** holotype of *G. amica*): **67-71, 75-76, 78** – ♂ forebody; **72** – ♂ abdominal apex in lateral view; **73, 77** – ♂ abdominal apex in antero-dorsal view; **74** – label; **79** – ♂ habitus. Scale bars: 79: 1.0 mm; 67-73, 75-78: 0.5 mm.



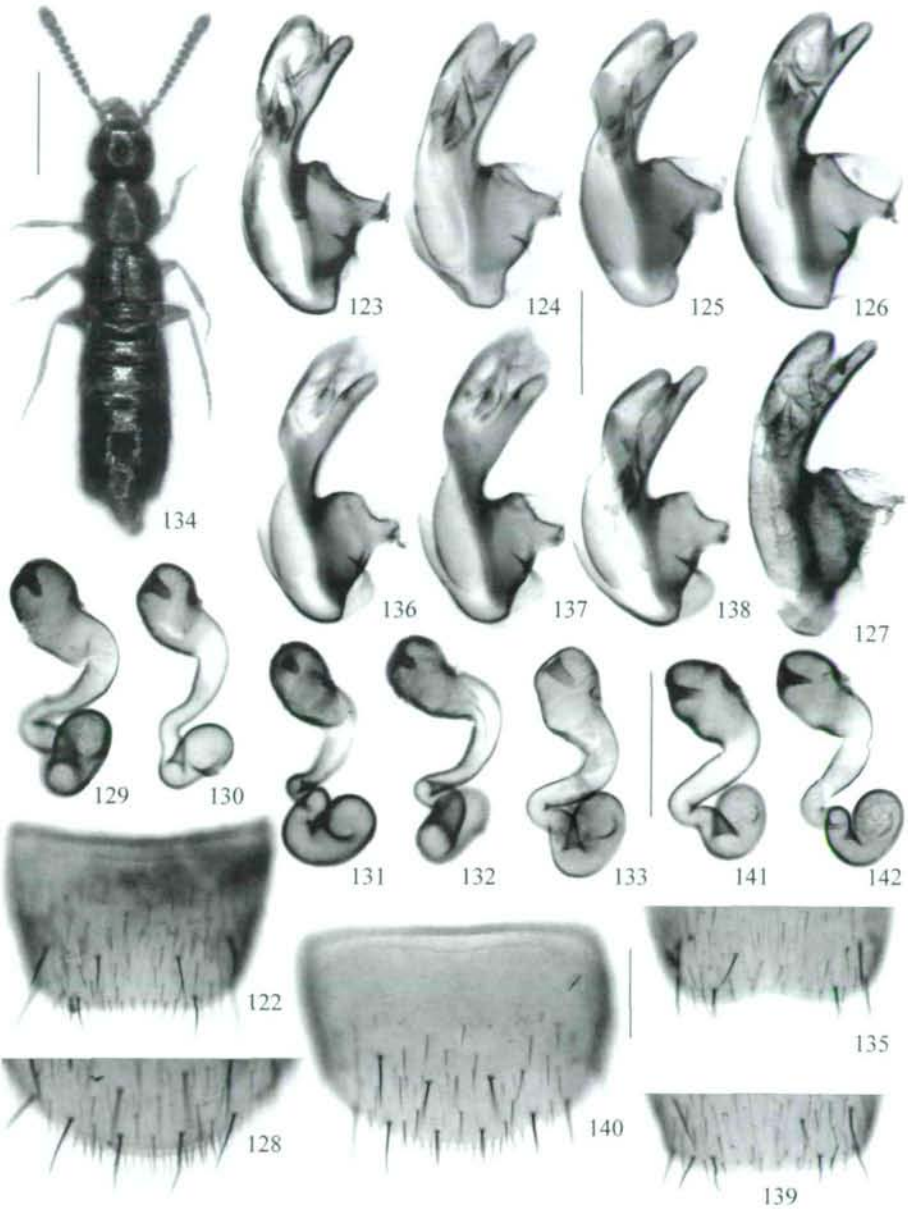
Figs 80-92: *Geostiba sengleti* PACE, holotype (**80-83**), and *G. deubeli* (BERNHAUER) (**84-92**): **80** – ♂ habitus; **81, 85** – ♂ pronotum and elytra; **82** – ♂ elytra in lateral view; **83** – ♂ abdominal apex in lateral view; **84** – ♂ elytra; **86** – antenna; **87** – ♂ sternite VIII; **88** – median lobe of aedeagus in lateral view; **89** – ♀ sternite VIII; **90** – posterior margin of ♀ sternite VIII; **91-92** – spermatheca. Scale bars: 80: 1.0 mm; 81-82: 0.5 mm; 83-87, 89-90: 0.2 mm; 88, 91-92: 0.1 mm.



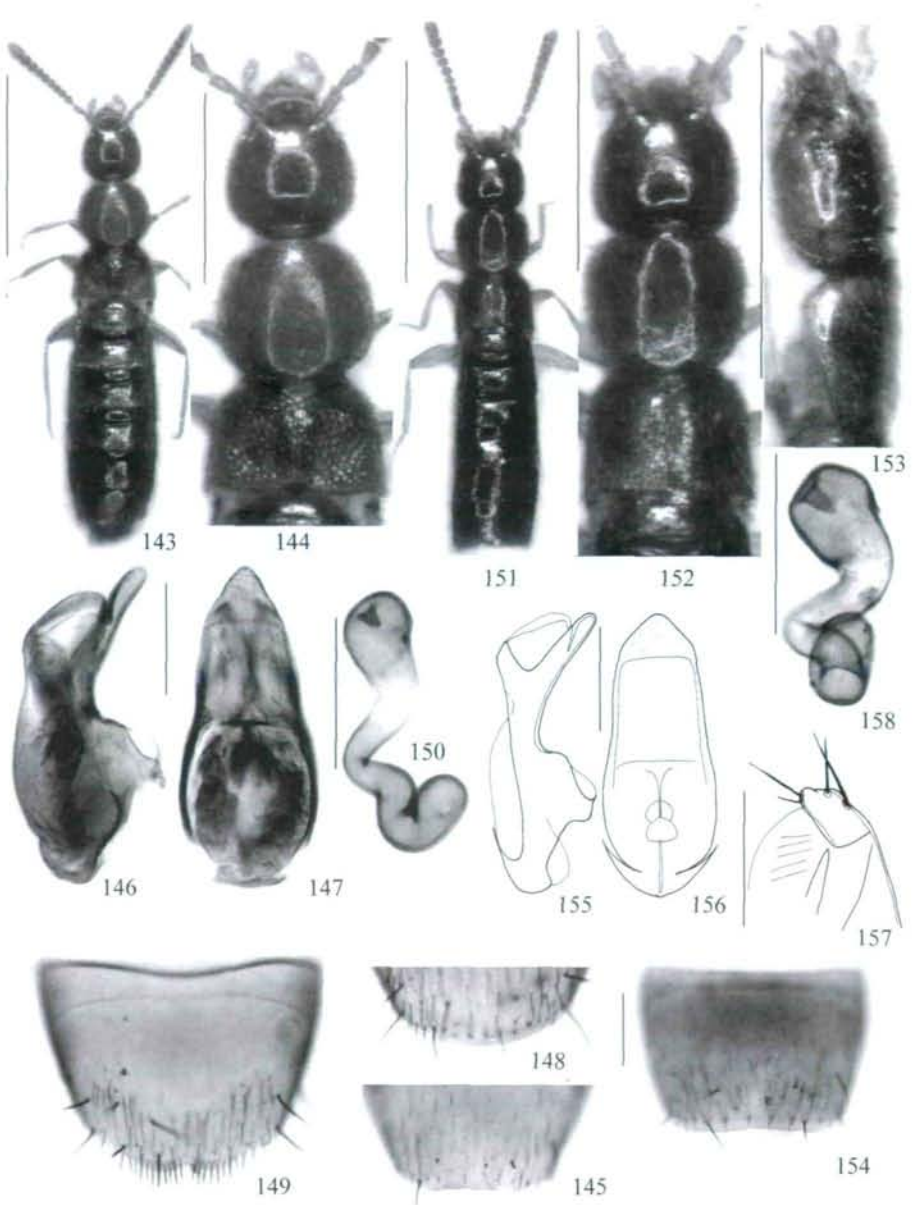
Figs 93-106: *Geostiba infirma* (WEISE): **93** – forebody; **94** – head in lateral view; **95-97** – median lobe of aedeagus in lateral view; **98** – apical lobe of paramere; **99** – ♀ tergite VIII; **100-101** – posterior part of ♀ sternite VIII; **102-106** – spermatheca. Scale bars: 93: 0.5 mm; 83-87, 94: 0.2 mm; 95-102: 0.1 mm.



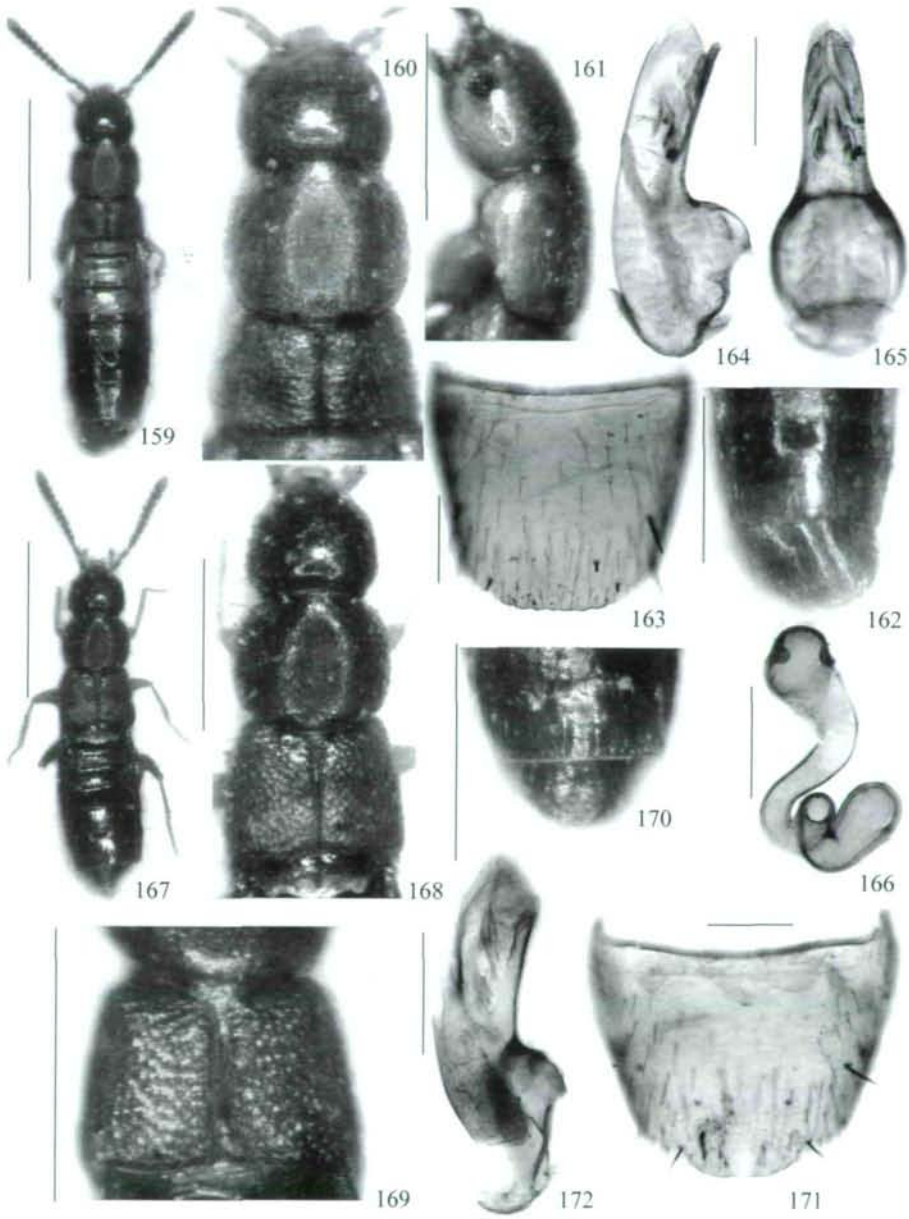
Figs 107-121: *Geostiba cuneiformis* (KRAATZ) (**111**: lectotype of *G. cuneiformis*; **110, 113, 118**: paralectotypes of *G. kocsii*): **107, 111** – habitus; **108-110** – forebody; **112** – ♂ tergite VIII; **113** – posterior part of ♂ tergite VIII; **114-118** – median lobe of aedeagus in lateral and in ventral view; **119** – apical lobe of paramere; **120** – posterior part of ♀ tergite VIII; **121** – spermatheca. Scale bars: 107, 111: 1.0 mm; 108-110: 0.5 mm; 112-121: 0.1 mm.



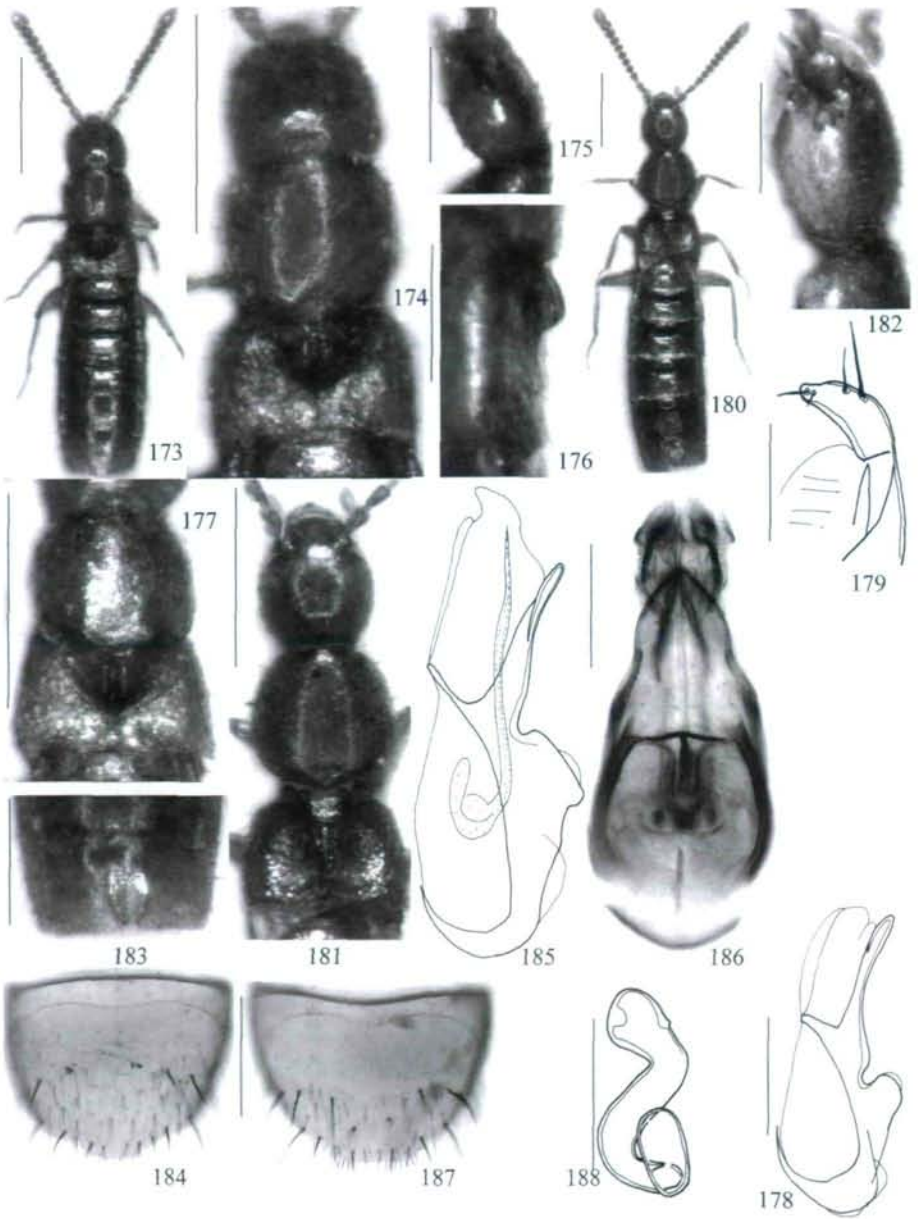
Figs 122-142: *Geostiba bulbifera* ZERCHE (**122-133**) and *G. incognita* sp.n. (**134-142**): **122** – ♂ tergite VIII; **123-127, 136-138** – median lobe of aedeagus in lateral view (**123-124**: Botev; **125**: Etropolska planina; **126**: Maleschevska planina; **127**: Vitoča); **128** – posterior margin of ♀ sternite VIII; **129-133, 141-142** – spermatheca (**133**: paratype); **134** – habitus; **135** – posterior part of ♂ tergite VIII; **139** – posterior part of ♀ tergite VIII; **140** – ♀ sternite VIII. Scale bars: 107, 134: 0.5 mm; 122-133, 135-143: 0.1 mm.



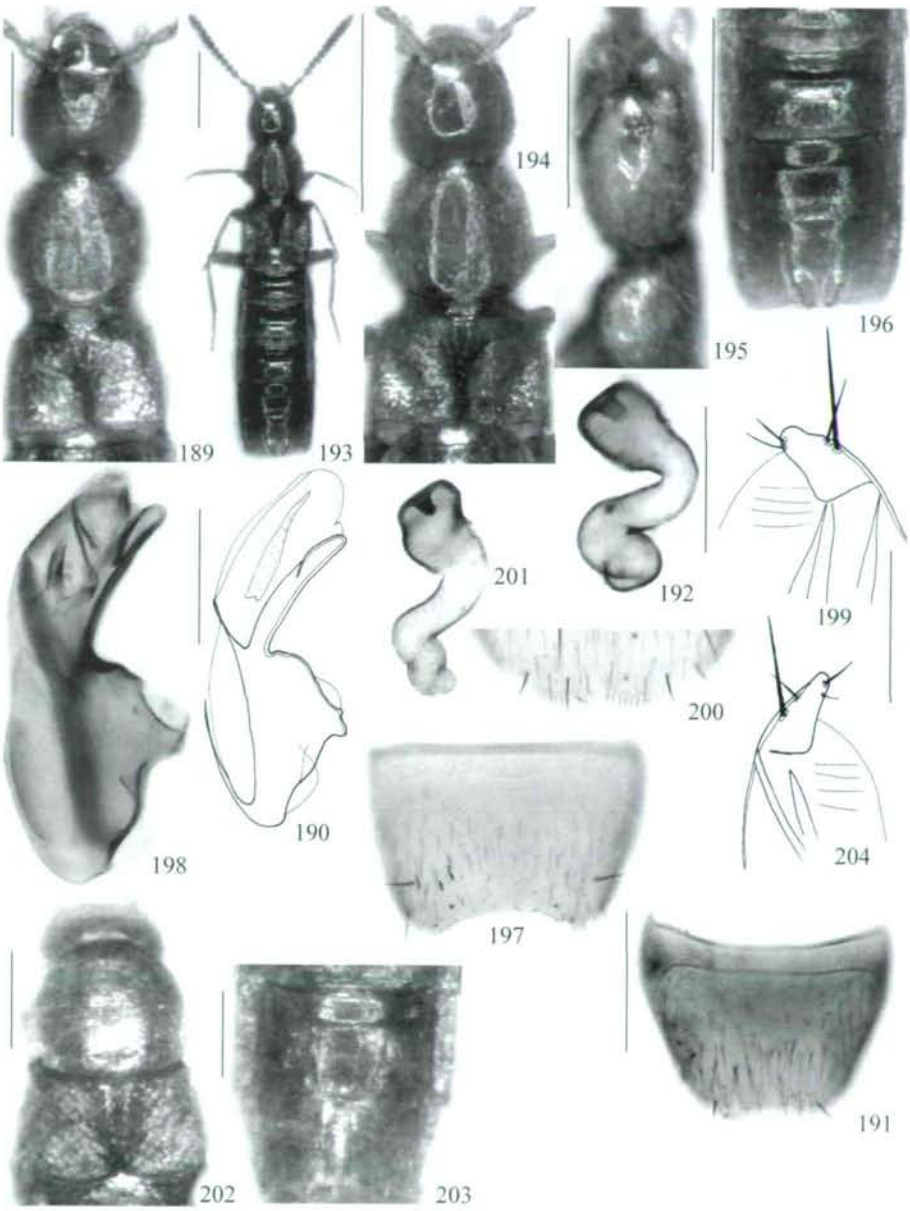
Figs 143-158: *Geostiba arida* (EPPELSHEIM) (**143-150**) and *G. gontarenkoi* sp.n. (**151-158**): **143, 151** – habitus; **144** – ♂ forebody; **145** – posterior part of ♂ tergite VIII; **146-147, 155-156** – median lobe of aedeagus in lateral and in ventral view; **148** – posterior part of ♀ tergite VIII; **149** – ♀ sternite VIII; **150, 158** – spermatheca; **152** – forebody; **153** – head and pronotum in lateral view; **154** – ♂ tergite VIII; **157** – apical lobe of paramere. Scale bars: 143, 151: 1.0 mm; 144, 152-153: 0.5 mm; 145-150, 54-158: 0.1 mm.



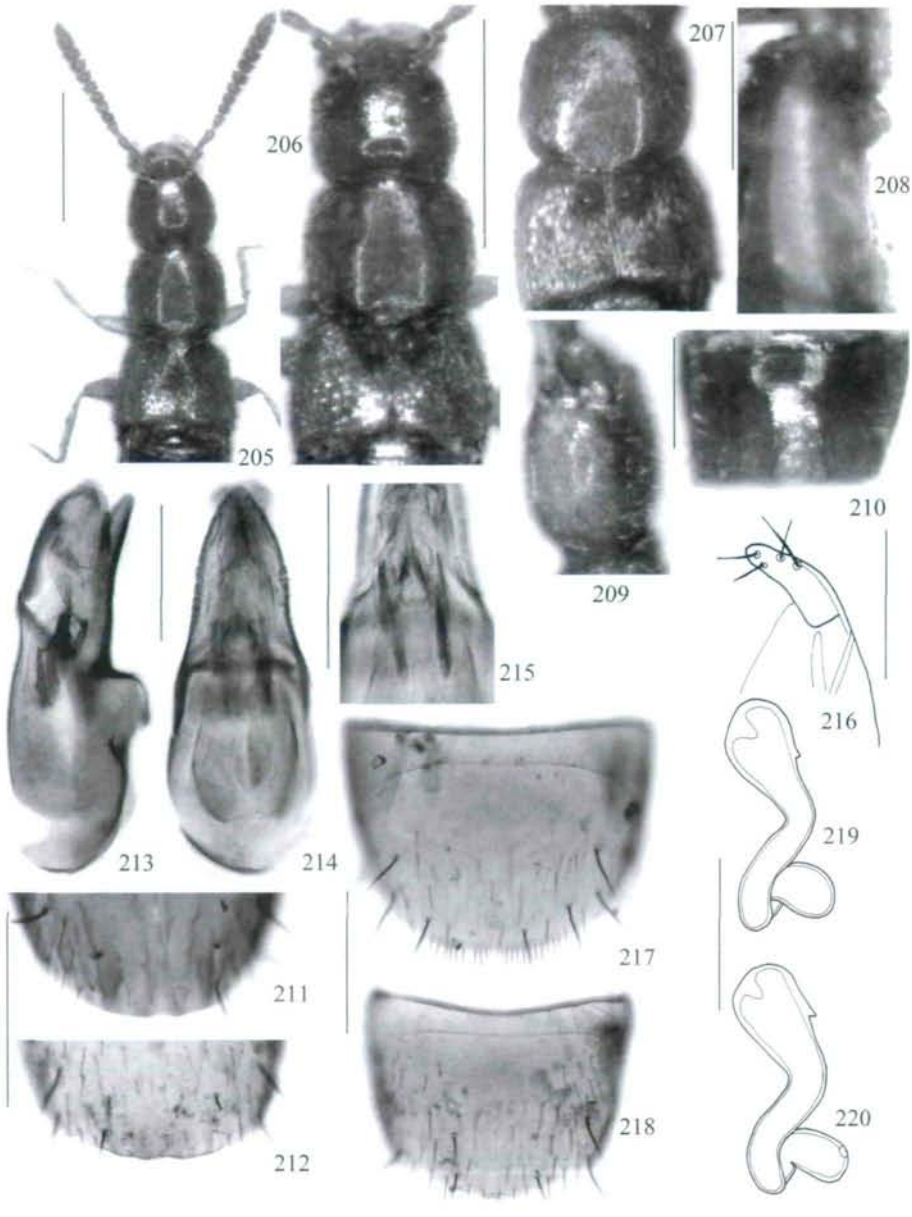
Figs 159-172: *Geostiba cingulata* (EPPELSHEIM) (**159-166**), *G. zoufali* (RAMBOUSEK) (**167-170**) (167-168: lectotype), and *G. meixneri* (BERNHAUER), lectotype (**171-172**): **159, 167** – habitus; **160, 168** – ♂ forebody; **161** – head and pronotum in lateral view; **162, 170** – ♂ abdominal tergites VII-VIII; **163, 171** – ♂ tergite VIII; **164-165, 172** – median lobe of aedeagus in lateral and in ventral view; **166** – spermatheca; **169** – ♂ elytra (holotype of *G. optima*). Scale bars: 159, 167: 1.0 mm; 160-162, 168-170: 0.5 mm; 163-166, 171-172: 0.1 mm.



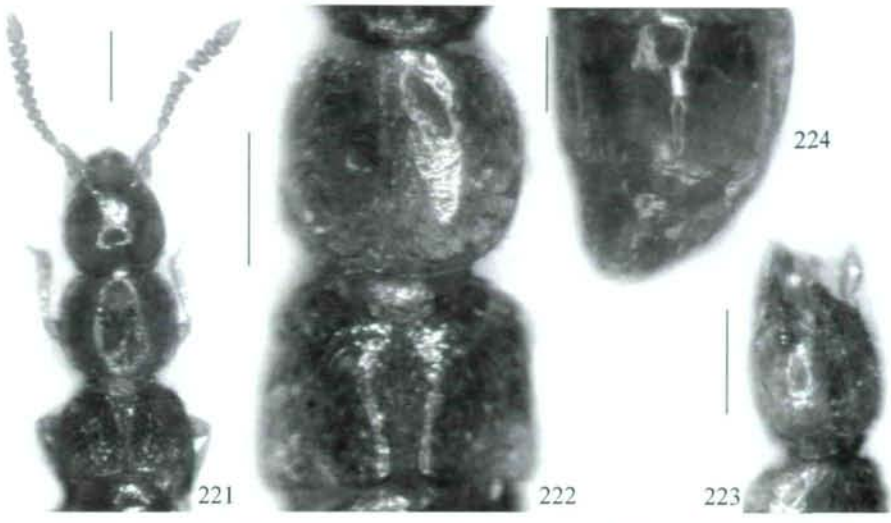
Figs 173-188: *Geostiba stussineri* (BERNHAUER) **(173-179)** (173-176, 178-179: lectotype), and *G. bituberculata* (EPPELSHEIM) **(180-188)**: **173, 180** – habitus; **174, 177, 181** – ♂ forebody; **175, 182** – head in lateral view; **176** – ♂ elytra in lateral view; **178, 185, 186** – median lobe of aedeagus in lateral and in ventral view; **179** – apical lobe of paramere; **183** – ♂ tergite VII; **184** – ♂ sternite VIII; **187** – ♀ sternite VIII; **188** – spermatheca. Scale bars: 173-174, 177, 180-181: 0.5 mm; 175-176, 182-184, 187: 0.2 mm; 178, 185-186, 188: 0.1 mm; 179: 0.05 mm.



Figs 189-204: *Geostiba carinicollis* (EPPELSHEIM) (**189-192**) (189: lectotype; 191: holotype of *G. medea*), *G. krzysztofi* (ROUBAL) (**193-201**), *G. kobrisensis* PACE, holotype (**202-203**), and *G. cingulata* (EPPELSHEIM) (**204**): **189, 194, 202** – ♂ forebody; **190, 198** – median lobe of aedeagus in lateral view; **191** – ♀ tergite VIII; **192, 201** – spermatheca; **193** – ♂ habitus; **195** – head in lateral view; **196** – ♂ abdominal segments IV-VII; **197** – ♂ tergite VIII; **199, 204** – apical lobe of paramere; **200** – posterior margin of ♀ sternite VIII; **203** – ♂ tergites VI-VII. Scale bars: 193-194: 0.5 mm; 189, 191, 195-197, 202-203: 0.2 mm; 190, 192, 198-199, 201, 204: 0.1 mm.



Figs 205-220: *Geostiba dinarica* sp.n.: **205** – ♀ forebody; **206-207** – ♂ forebody; **208** – ♂ elytra in lateral view; **209** – head in lateral view; **210** – ♂ tergite VII; **211-212** – posterior part of ♂ tergite VIII; **213-214** – median lobe of aedeagus in lateral and in ventral view; **215** – internal structures of aedeagus; **216** – apical lobe of paramere; **217** – ♀ sternite VIII; **218** – ♀ tergite VIII; **219-220** – spermathecae of two ♀♀ Scale bars: 205-207, 209: 0.5 mm; 208, 210-212, 217-218: 0.2 mm; 213-216, 219-220: 0.1 mm.



Figs 221-224: *Geostiba zerchei* PACE, holotype (**221**) and *G. rhilensis* (RAMBOUSEK) (**222-224**, holotype of *G. bulgarica*): **221** – ♂ forebody; **222** – ♂ pronotum and elytra; **223** – head in lateral view; **224** – ♂ tergite VII. Scale bars: 0.2 mm.

5. Key to the species of *Geostiba* and *Paraleptusa* of the Eastern Mediterranean and the Caucasus region

The following key includes all the species reported from the study region (Map 1). Since the species of the genus *Paraleptusa* PEYERIMHOFF are highly similar to those of *Geostiba*, they, too, are incorporated. One species of doubtful identity from Iran, *G. huberi*, is omitted from the key; two further species dubiae from Romania (*G. bernhaueri*) and Georgia (*G. zerchei*) are tentatively incorporated mainly based on geographic information and by inferring certain male secondary sexual characters from closely related species. In most cases, a reliable identification requires an examination of the male primary and secondary sexual characters, the latter of which are the key characters for the subgeneric concept currently in use. It should be taken into account that the male secondary sexual characters, often the most important distinguishing characters, are subject to pronounced intraspecific variation in many species, and may be reduced to various degrees, especially in the species of the subgenus *Tropogastrosipalia*. The key below generally relies on the character states realised in males with fully developed secondary sexual characters. Since many - but not all! - *Geostiba* species have more or less restricted distributions, geographic information is incorporated in the key in order to facilitate identification.

The references to maps and to illustrations of distinguishing characters in the literature are abbreviated as follows: A99 = ASSING (1999), A00a = ASSING (2000a), A00b = ASSING (2000b), A00c = ASSING (2000c), A01a = ASSING (2001a), A01b = ASSING (2001b), A03 = ASSING (2003), A04a = ASSING (2004a), A04b = ASSING (2004b), P83a = PACE (1983a), P83b = PACE (1983b), P84 = PACE (1984), P96 = PACE (1996), P02 = PACE (2002); Z88 = ZERCHE (1988); Z02 = ZERCHE (2002).

1 Mesotarsus four-jointed. Eyes small, but with ommatidia and pigmentation. ♂: elytra and abdominal tergites III-VIII unmodified. Species from Greece. Genus ***Paraleptusa*** PEYERIMHOFF 2

- Mesotarsus five-jointed or, if with partly or completely fused fourth and fifth tarsomere, eyes reduced to minute rudiments (without ommatidia and pigmentation). ♂: elytra and abdominal tergites III-VIII often modified. Genus ***Geostiba*** THOMSON 3

2 Body entirely testaceous. Aedeagus and spermatheca as figured in A00a. Evritania, Oros Timfristós ..... ***P. wunderlei*** ASSING

- Body darker, preapical abdominal segments infuscate. Kefallinía ..... ***P. graeca*** (BERNHAUER)

3 Eyes reduced to minute rudiments, without ommatidia and pigmentation 4

- Eyes sometimes small, but always with ommatidia and pigmentation. For two species with barely noticeable ommatidia, predominantly yellowish coloration, and a smooth, oblong, broad median elevation on the ♂ tergite VII follow this alternative 19

4 Colour of body entirely testaceous. Mesotarsus five-jointed or with partly or completely fused fourth and fifth tarsomere. Species from the Middle East and southern Anatolia 5

- Colour of body in most species yellowish red to reddish. Species absent from the Middle East and southern Anatolia. Mesotarsus always five-jointed 11

5 Species from central southern Anatolia 6

- Species from the Middle East (Lebanon, Israel) 10

6 Male abdominal tergite VII modified (note: these modifications may be more or less reduced, especially in smaller ♂♂). 7

- Male abdominal tergite VII unmodified 9

7 Mesotarsus 5-jointed. ♂: tergite VII with pair of posteriorly converging carinae; elytra with more or less circular tubercle shortly behind the middle (Fig. A04a: 57); median lobe of aedeagus as in Figs A04a: 60-61. ♀: spermatheca as in Fig. A04a: 64. Kahramanmaraş ..... ***G. tuberosa*** ASSING

- Mesotarsus 4-jointed, i. e. fourth and fifth tarsomere fused (Fig. A04a: 80). ♂: tergite VII with median process posteriorly (occasionally reduced in *G. confusa*); elytra with different modifications. Primary sexual characters different 8

8 ♂: elytra with pair of circular tubercles near apex of scutellum and (mostly) with carina in the middle of lateral margin (Fig. A01a: 105); tergite III with more or less extensive median elevation; tergite VII at posterior margin with or without long and acute, weakly erect median process (Fig. A01a: 104); aedeagus with ventral process of median lobe in lateral view almost straight (Fig. A01a: 98-99). ♀: spermatheca as in Fig. A01a: 101. East of Adana province ..... ***G. confusa*** ASSING

- ♂: elytra posteriorly with weakly elevated suture, otherwise unmodified; tergite III with rather large, dorsally smooth and shining median elevation in posterior half (Fig. A04a: 77); tergite IV with minute median elevation; posterior margin of tergite VII with stout, short, and erect spine-like median process (Figs A04a: 81-82); median lobe of aedeagus as in Figs A04a: 83-84. ♀: spermatheca as in Figs A04a: 87-88. Gaziantep (Map A04a: 2) ..... ***G. occaecata*** ASSING

9 ♂: elytra unmodified; aedeagus with ventral process of median lobe in lateral view distinctly curved (Figs P83b). ♀: spermatheca as in Fig. A04a: 66. Southern Nur Dağları (Antakya) (Map A04a: 2) ..... ***G. seleucica*** PACE

- ♂: elytra with distinctly elevated suture, this elevation smooth, broader and higher anteriorly than posteriorly; disc of elytra with extensive impression (Fig. A04a: 68); median lobe of aedeagus as in Figs A04a: 72-73. Kahramanmaraş (A04a: Map 2) ..... ***G. giaurica*** ASSING

10 Species from Lebanon. ♂: elytra and apical abdominal tergites unmodified ..... ***G. scheerpeltziana*** (FAGEL)

- Species from Israel (Mt. Hermon). ♂: elytra with pronounced (i. e. strongly elevated and extending over full length of suture) sutural carinae; tergites VII and VIII each with pair of carinae near posterior margin. Aedeagus and spermatheca as figured in P84 ..... ***G. loebliana*** PACE

11 Species from the Caucasus region 12

- Species from the Balkans 15

12 ♂: elytra with extensive diagonal impressions and with pronounced sutural carinae extending over full length of suture; tergite VII with pair of not very pronounced, but long and posteriorly distinctly converging carinae; median lobe comparatively broad in ventral view (Figs P96: 90-91). ♀: spermatheca with relatively long and slender duct (Fig. P96: 94). Georgia: surroundings of Batumi ..... ***G. batumiensis*** PACE

- ♂: elytra with less pronounced impressions; tergite VII with shorter carinae. Primary sexual characters and distribution different 13

13 Forebody with pronounced microsculpture. Pronotum slender, not distinctly transverse (Fig. 181). ♂: elytra with distinct impressions and with pronounced, distinctly elevated sutural carinae extending over full length of suture, these carinae broad anteriorly and rather narrow posteriorly, their dorsal surface smooth, i. e. without aggregations of granula (Fig. 181); tergite VII posteriorly with pair of moderately pronounced, posteriorly converging carinae (Fig. 183); median lobe of aedeagus relatively large and broad in ventral view, internal sac with long and partly somewhat sclerotised flagellum (Fig. 185-186). ♀: spermatheca as in Fig. 188. Likhskiy Khrebet, N Khashuri, Georgia .... ***G. bituberculata*** (EPPELSHEIM)

- Pronotum usually at least weakly (about 1.05 ×) transverse. ♂: aedeagus smaller and with shorter flagellum in internal sac. Distribution different 14

14 ♂: elytra with rather broad and long sutural carinae, extending over full length of suture (Fig. 202); tergite VII posteriorly with pair of relatively long carinae, these carinae more than half the length of tergite and narrower posteriorly than anteriorly (Fig. 203); median lobe of aedeagus as in Figs P96: 96-97. ♀: spermatheca as in Fig. P96: 98. Georgia: southern slopes of central Caucasus north of Tiflis .... ***G. kobrisensis*** PACE

- ♂: elytra with narrow sutural carinae (especially anteriorly) (Fig. 189); pair of carinae on tergite VII weakly pronounced, occasionally confluent; median lobe of aedeagus as in Figs 190. ♀: spermatheca as in Fig. 192. Eastern Caucasus: Daghestan .... ***G. carinicollis*** (EPPELSHEIM)

15 ♂: elytra with pronounced - i. e. broad, long, and distinctly elevated - carinae near scutellum (Figs 174, 176-177) and with shallow impressions; abdominal tergite VII with pair of weakly pronounced carinae in posterior half, separated from each other by about 1/4-1/5 the width of tergite; tergite VIII posteriorly with very sparse pubescence; median lobe of aedeagus rather slender and of distinctive shape in lateral view (Fig. 178). Southern Montenegro (Map 10) ..... ***G. stussineri*** (BERNHAUER)

- ♂: elytra without or with much less pronounced carinae 16

16 Very small species, 1.6-1.8 mm. Body of uniformly testaceous coloration. Eye rudiments minute. ♂: tergite VII unmodified; median lobe of aedeagus as in Figs A01b: 20-21. ♀: spermatheca as in Fig. A01b: 22. SW-Macedonia: Bučova planina..... ..... ***G. excaecata*** ASSING

- Larger and usually darker species. Eye rudiments less minute. ♂: tergite VII mostly with pair of carinae 17

17 Eye rudiments slightly larger. ♂: elytra and tergite VII unmodified; median lobe of aedeagus as in Figs A00a: 27-28. ♀: spermatheca with shorter duct (Fig. A00a: 30). SW-Macedonia: Galičica ..... ***G. galicicana*** ASSING

- Eye rudiments smaller. ♂: elytra and tergite VIII often modified; median lobe of aedeagus smaller. ♀: spermatheca with longer duct 18

18 ♂: median lobe of aedeagus smaller and with more pronounced lateral folds (Figs A01b: 13-14). ♀: spermatheca as in Figs A01b: 16-17. N-Macedonia: Šar planina .... ***G. samai*** PACE

- ♂: median lobe of aedeagus larger and with less pronounced lateral folds (Figs A00a: 21-22). ♀: spermatheca as in Fig. A00a: 24. N-Albania ..... ***G. sculpticollis*** (APFELBECK)

19 ♂: tergite VII at posterior margin with pronounced median tubercle or with distinct spine-like process 20

- ♂: tergite VII at posterior margin unmodified, or with pair of more or less pronounced carinae, or with broad, smooth, oblong median elevation (Fig. 208), or with sparse granula in posterior half, or with indistinct median tubercle (2 species from the Caucasus and Greece (Taygetos)) 87

20 ♂: elytra with very dense granulose puncturation, almost mat, and anteriorly each with subcircular tubercle; tergite VII with apically rounded median tubercle (not spine-like process) at hind margin (Fig. A01a: 9); tergite VIII with median pair of short carinae at posterior margin (Fig. A01a: 10); median lobe of aedeagus without cristal process. Subgenus *Geostiba* 21

- ♂: elytra with less dense, though granulose puncturation, more shining, and anteriorly without subcircular elevation (but often with carinae near scutellum); tergite VII in large ♂♂ of most species with distinct process of variable shape, rarely with oval elevation; tergite VIII unmodified or, rarely, with dentate posterior margin. Median lobe of aedeagus with cristal process. Subgenus *Tropogastrosipalia* 22

21 On average larger species. Coloration of body usually lighter, pronotum and elytra yellowish to reddish brown. ♂: aedeagus larger, median lobe with base of ventral process in lateral view bulging, and ventral process in ventral view broader (Figs A01a: 1-2). ♀: spermatheca with longer and proximally wider duct (Fig. A01a: 4). Widespread wing-dimorphic species, Palaearctic region; in southern Balkans and Turkey very rare ..... ***G. circellaris*** (GRAVENHORST)

- On average smaller species, 2.6-3.2 mm. Coloration of body darker, pronotum dark brown to blackish brown, elytra brown. ♂: aedeagus smaller, median lobe with base of ventral process in lateral view straight, and ventral process in ventral view more slender (Figs A01a: 5-6). ♀: spermatheca with shorter and more slender duct (Fig. A01a: 8). Northeastern Anatolia ..... ***G. sororcula*** ASSING

22 Species from Iran and Caucasus region (including Armenia, but excluding NE-Anatolia) 23

- Distribution different 25

23 Species from Iran. ♂: posterior margin of pronotum in the middle indistinctly pointed and with minute shining tubercle; elytra at suture with pronounced, distinctly elevated, relatively narrow, and rather long sutural carinae, which are highest near apex of scutellum and gradually slope down posteriad, almost reaching posterior margin (Figs 81-82); abdominal tergite VII with short, weakly erect, and narrow process (Fig. 83); median lobe of aedeagus as in Figs P83a: 2-3 ..... ***G. sengleti*** PACE

- Species from the Caucasus region 24

24 Eyes very small, less than 1/3 the length of postocular region in dorsal view. ♂: pronotum relatively large in relation to head, posterior margin obtusely pointed; tergite VII with short, wide-based, suberect process; median lobe of aedeagus in lateral view with relatively stout cristal process (Figs P96: 57, 61). Georgia: surroundings of Tiflis ..... ***G. tiflisensis*** PACE

- Eyes larger. ♂: pronotum large in relation to head, in large ♂♂ distinctly oblong, about 1.10-1.15 times as long as wide, posteriorly distinctly projecting caudad and covering scutellum, posterior margin in the middle with distinct concave excision; elytra with short, narrow, and weakly elevated sutural carinae (Fig. 71); abdominal tergite VII with rather long, slender, apically acute, suberect process (Figs 72-73); aedeagus as in Figs P83a: 6-7. Armenia ..... ***G. khnzoriani*** PACE

25 Species from Ukraine. ♂: pronotum in large ♂♂ distinctly elongated posteriad, projecting over scutellum, and large in relation to head; posterior margin in ♂♂ with strongly elongated pronotum weakly concave in the middle, in ♂♂ with less distinctly modified pronotum more or less truncate to weakly convex; elytra without distinct sutural carinae, but with carinate lateral margins, these lateral fold highest near posterior margin and somewhat flexed mediad (only in ♂♂ with pronounced secondary sexual characters) (Fig. 75-76); process of tergite VII moderately long, somewhat flattened, suberect, and apically rounded in antero-dorsal view (Fig. 77); median lobe of aedeagus with moderately long and slender cristal process. Crimean peninsula ..... ***G. winkleri*** (BERNHAUER)

- Distribution and male sexual characters different 26

26 Species from the Balkans and southeastern Central Europe 27
- Species from Turkey 66
27 Species from the region to the north and northwest of Greece and Bulgaria 28
- Species from Greece and Bulgaria 39
28 Species from Romania 29
- Species absent from Romania 30
29 ♂: pronotum (in large ♂♂) up to 1.40 times as wide as head and about 1.1 times as long as wide; posteriorly sharply convex (not distinctly pointed) and projecting over scutellum (Figs 13, 15); elytra in anterior half of suture with weakly to distinctly elevated sutural carinae, these carinae narrow and parallel in normal ♂♂, broader and anteriorly diverging in very large ♂♂ (Figs 13, 15); tergite VII at posterior margin with short suberect process, this process apically rounded or obtuse in antero-dorsal view (Figs 16-17); posterior margin of tergite VIII of variable shape, often in the middle projecting posteriad and with pair of (sometimes fused) tooth-like processes (Figs 18-21); median lobe of aedeagus with minute and slender cristal process (Figs 22-23). W- and SW-Romania ..... ***G. mihoki*** (BERNHAUER)
- Species of doubtful identity from E-Romania. ♂ sexual characters unknown ..... ***G. bernhaueri*** (BREIT)
30 ♂: pronotum (in large ♂♂) elongated, its posterior margin distinctly truncate or concave in the middle 31
- ♂: pronotum (in large ♂♂) unmodified or elongated, its posterior margin convex or pointed in the middle 32
31 Head and pronotum with distinct shine, microsculpture very shallow (Fig. 36). ♂: pronotum (in large ♂♂) distinctly oblong, its posterior margin projecting over scutellum, broadly concave, and with pronounced posterior angles; lateral margins in very large ♂♂ weakly sinuate anterior to posterior angles; lateral margin of elytra more or less distinctly elevated (Fig. 36); process of segment VII moderately long and distinctly erect, apically acute in antero-dorsal and in lateral view, not flattened dorso-ventrally (Fig. 37); median lobe of aedeagus with slender and relatively short cristal process (Fig. 38). NE-Italy, N-Croatia (Map 3) ..... ***G. armicollis*** (BREIT)
- Pronotal microsculpture more pronounced (Fig. 62). ♂: posterior margin of pronotum truncate in the middle (Fig. 62), process of male tergite VII apically obtuse (Figs 63-64); median lobe of aedeagus as in Fig. 65. Croatia: Mosor planina (Map 3) ..... ***G. mosorica*** sp.n.
32 Posterior margin of ♂ pronotum pointed or abruptly convex in the middle 33
- ♂ pronotum posteriorly broadly convex 36
33 ♂ pronotum with posterior margin obtusely or convexly pointed in the middle; elytra without impressions (Fig. 30), along anterior two thirds of suture with weakly elevated narrow sutural carinae (Figs 31-32); process of segment VII distinctly erect, apically acute in antero-dorsal view, and rather flattened dorso-ventrally (Fig. 33); median lobe of aedeagus with moderately long and slender cristal process (Fig. 34). N-Serbia: Fruška Gora (Map 2) ..... ***G. hummleri*** (BERNHAUER)
- ♂ pronotum more distinctly pointed in the middle. Distribution different 34
34 Smaller species, 2.0-2.3 mm. Antennae very short (Fig. 56). ♂: pronotum approximately as long as wide, moderately projecting caudad over scutellum; elytra without impressions and with weak sutural carinae near apex of scutellum (Fig. 54); process of segment VII relatively short, slender, and erect, apically acute both in lateral and in antero-dorsal view (Fig. 55); aedeagus as in Fig. P90: 8. Croatia, Bosnia-Herzegovina (Map 4) ..... ***G. biokovensis*** PACE
- On average larger species. Antennae longer and more massive. ♂ sexual characters different 35

35 ♂: pronotum large in relation to head, in large ♂♂ moderately oblong, about 1.10 times as long as wide and approximately 1.35 times as wide as head; elytra usually with very shallow extensive impression, along anterior two thirds of suture with moderately elevated narrow sutural carinae (Fig. 25); process of segment VII distinctly erect, apically convex in antero-dorsal view, and rather flattened dorso-ventrally (Figs 26-27); median lobe of aedeagus with short and slender cristal process (Fig. 28). SE-Austria, Slovenia, Croatia (Map 2) ..... ***G. spinicollis*** (KRAATZ)

- ♂: pronotum very weakly oblong, about 1.05 times as long as wide and approximately 1.20 times as wide as head; elytra without impressions and without sutural carinae (Fig. 50). Process of tergite VII acute and slender (Figs 51-52); aedeagus as in Fig. 53. Croatia: Korčula (Map 4) ..... ***G. curzolae*** (BERNHAUER)

36 Pronotum without appreciable sexual dimorphism and distinctly (1.3-1.4 ×) wider than head; posterior margin broadly convex (Fig. 57). ♂: elytra in anterior half with short, but distinctly elevated and moderately narrow sutural carinae (Figs 57-58); process of tergite VII slender, dorso-ventrally somewhat compressed, and apically acute both in lateral and in antero-dorsal view (Figs 59-60); median lobe of aedeagus as in Fig. P96: 20. Central Albania (Map 4) ..... ***G. winkleriana*** PACE

- Pronotum with sexual dimorphism. Modifications of ♂ elytra different 37

37 ♂: elytra near scutellum with carinae of distinctive shape and arrangement: anteriorly diverging and at some distance from suture (Fig. P96: 25); pronotum in large ♂♂ weakly oblong, up to about 1.10 times as long as wide and up to approximately 1.30 times as wide as head; posterior margin of pronotum broadly convex (Fig. P96: 25), in ♂♂ with very pronounced secondary sexual characters weakly concave in the middle; process of segment VII long and slender, distinctly erect, and apically acute both in lateral and in antero-dorsal view; median lobe of aedeagus as in Fig. 48. S-Montenegro, NW-Albania (Map 4) ..... ***G. spizzana*** (BERNHAUER)

- ♂ elytra with carinae of different shape and orientation. Species from Bosnia-Herzegovina 38

38 On average larger species. ♂: pronotum large in relation to head, in large ♂♂ distinctly oblong, about 1.15 times as long as wide, posterior margin usually moderately convex, rarely slightly concave in the middle; elytra often with extensive transversely diagonal impression, along anterior half of suture with distinctly elevated, but very narrow sutural carinae (Figs 39-41); process of segment VII distinctly erect, apically acute both in antero-dorsal and in lateral view; aedeagus as in Figs 42-43 and Fig. P96: 14. Surroundings of Sarajevo (Map 3) ..... ***G. apfelbecki*** EPPELSHEIM

- Smaller species, 1.8-2.3 mm. Pronotum with less pronounced microsculpture and rather weak sexual dimorphism. ♂: elytra near apex of scutellum with small, weakly defined, indistinct elevation, without distinct carinae and without impressions (Fig. 44); segment VII posteriorly only with oblong median tubercle, not with erect or suberect process (Fig. 45); aedeagus with rather massive cristal process (Figs 46). Surroundings of Sarajevo (Map 4) ..... ***G. paganettiana*** (BERNHAUER)

39 Species from Bulgaria 40

- Species from Greece 43

40 Pronotum without distinct sexual dimorphism, in both sexes about as wide as long 41

- Pronotum with distinct sexual dimorphism, in large ♂♂ 1.05-1.10 times as wide as long, about 1.35-1.40 times as wide as head, and with broadly truncate posterior margin almost or completely covering scutellum 42

41 ♂: elytra shallowly impressed and with short, narrow, and moderately elevated sutural carinae extending from apex of scutellum to middle of suture or slightly beyond (Fig. 66); process of tergite VII relatively short, slender, and apically acute (Figs Z02: 5-6); cristal process of median lobe of aedeagus rather variable (Figs Z02: 11-17). Slavianka range and adjacent parts of Pirin (Map 5) ..... ***G. slaviankaensis*** ZERCHE

- ♂: elytra with sutural carinae even shorter and less distinctly elevated, anteriorly usually not reaching scutellar apex (Fig. 67); process of tergite VII shorter, even in specimens with fully developed ♂ secondary sexual characters (Figs Z02: 27-28); median lobe of aedeagus with very slender cristal process (Figs Z02: 21-22). SW-Bulgaria: Ossogovska planina (Map 5) ..... ***G. ossogovskensis*** ZERCHE

42 ♂: posterior margin of pronotum broadly convex; elytra with more or less diagonal impressions, with posteriorly somewhat elevated lateral margins, and with short sutural carinae extending from scutellar apex to middle of suture or slightly beyond (Figs 68-69); process of tergite VII rather short and stout (Figs Z02: 31-32); median lobe of aedeagus with straight and moderately stout cristal process (Figs Z02: 37-38). SW-Bulgaria: Maleshevska planina (Map 5) ..... ***G. ilievi*** ZERCHE

\- ♂: posterior margin of pronotum weakly concave and with more pronounced posterior angles; elytra with similar modifications, but puncturation denser and on average more distinctly granulose (Fig. 70); process of tergite VII similarly short, but apically acute (Figs Z02: 41-42); median lobe of aedeagus with more slender cristal process (Figs Z02: 47-48). SW-Bulgaria: Belasiza planina (Map 5) ..... ***G. belasizaensis*** ZERCHE

43 Species occurring in the Pelopónnisos 44

\- Species absent from the Pelopónnisos 51

44 ♂: anterior abdominal tergites III, III-IV, or III-V modified, i. e. with median tubercle, keel, or impression either in anterior transverse impression or in posterior half. (These modifications are occasionally indistinct especially in smaller ♂♂.) 45

\- ♂: anterior abdominal tergites unmodified 50

45 Pronotum with pronounced sexual dimorphism, i. e. in ♂ posteriorly distinctly tapering, elongated and (in normal position) covering most or all of scutellum 46

\- Pronotum with weak sexual dimorphism, in ♂ not distinctly elongated posteriorly; scutellum visible 48

46 ♂: elytra with aggregation of granula or small tubercle near apex of scutellum, lateral margins in or near the middle elevated, almost folded; tergite III with transverse or crescent-shaped median impression near hind margin 47

\- ♂: elytra with deep subcircular impressions, without granula or tubercle near apex of scutellum, lateral margins unmodified; tergites III and IV with round or oblong median tubercle in anterior impression, that of tergite IV often indistinct; aedeagus as in Figs A99: 130-131. Parnon Oros (SE-Pelopónnisos) ..... ***G. parnoniensis*** ASSING

47 Larger species. ♂: pronotum 0.45 mm wide and 0.54 mm long, more strongly elongated posteriorly (ca. 1.18 times as long as wide); aedeagus with cristal process as in Fig. A99: 153. Taygetos (SW-Pelopónnisos) ..... ***G. taygetana*** (BERNHAUER)

\- Smaller species. ♂: pronotum in larger specimens 0.40-0.42 mm wide and 0.44-0.47 mm long, less strongly elongated posteriorly (1.10-1.15 times as long as wide); aedeagus with cristal process as in Figs A99: 137-140. Erimanthos (NW-Pelopónnisos) ..... ***G. zercheana*** ASSING

48 ♂: elytra with longitudinal tubercle near apex of scutellum, deeply and extensively impressed; tergites III and IV with smooth central elevation in anterior impression, that of tergite IV often very indistinct; aedeagus as in Figs A99: 121-124. Killini (N-Pelopónnisos) ..... ***G. killiniensis*** ASSING

\- ♂: elytra without tubercle near apex of scutellum; primary and secondary sexual characters different. Species absent from the Killini range 49

49 ♂: tergites III-IV with median keel, tergite V with weak median elevation in anterior impression; process of tergite VII more slender (Figs A99: 119-120); aedeagus as in Figs A99: 113-115. Menalon Oros ..... ***G. menalonensis*** ASSING

\- ♂: tergites III-V with subcircular or oval median elevation in anterior impression, those of tergites IV and V often indistinct; process of tergite VII in antero-dorsal view broader (Fig. A99: 112); aedeagus as in Figs A99: 104-107. Aroania, Panahaiko (N-Pelopónnisos) ..... ***G. meschniggiana*** (BERNHAUER)

50 ♂: elytra with long sutural carina; process of tergite VII and aedeagus as in Figs A99: 98-99, 102-103. Taygetos (S-Pelopónnisos) ..... ***G. meschniggi*** PACE

\- ♂: elytra with weak to moderately long sutural carina; process of tergite VII and aedeagus as in Figs A99: 146-148, 151-152. Erimanthos (NW-Pelopónnisos) ..... ***G. acifera*** ASSING

51 Species from Evvoia 52

- Species from mainland Greece 53

52 Large species, width of pronotum >0.4 mm. ♂: elytra with extensive and deep impressions; process of tergite VII and aedeagus as in Figs A99: 71-74. Likhás peninsula (NW-Evvoia) ..... ***G. aculeata*** (COIFFAIT)

- Small species, width of pronotum <0.4 mm. ♂: elytra weakly impressed; process of tergite VII often more or less reduced; cristal process of aedeagus very thin (Figs A99: 77-78). Dirfys Oros (central Evvoia) ..... ***G. matsakisi*** (COIFFAIT)

53 ♂: anterior abdominal tergites III-IV modified, i. e. with median elevation either in or just behind anterior transverse impression. (These modifications are occasionally indistinct especially in smaller ♂♂.) 54

- ♂: anterior abdominal tergites unmodified. (Extremely weak, barely noticeable median elevations may be present in *G. siculifera* from the Pangéo.) 56

54 Shape of pronotum with moderate sexual dimorphism, hind margin more convex. ♂: elytra without sutural carinae, dorsal surface with weak impression; tergites III and IV with subcircular tubercle behind anterior impression; process of tergite VII shorter (Figs A99 16-17); cristal process of aedeagus of characteristic shape (Fig.A99: 13). Pilion Oros (Thessalía) ..... ***G. moczarskii*** (SCHEERPELTZ)

- Shape of pronotum with weak sexual dimorphism. ♂: elytra with sutural carinae and distinct impression; tergites III and IV with oval or circular median elevation in anterior impression; tergite VII (in large ♂♂) with longer process. Distribution different 55

55 ♂: elytra with - in larger ♂♂ - longer, but less strongly projecting sutural carinae; tergites III and IV with oblong median elevation in anterior impression; process of tergite VII and aedeagus as in Figs A99: 1-4, 8-9. Makedhonía, Thessalía, Ipiros ..... ***G. armata*** (EPPELSHEIM)

- ♂: elytra with shorter, but more strongly projecting sutural carinae; tergites III and IV with subcircular median elevation in anterior impression; process of tergite VII and aedeagus as in Figs A99: 28-29, 32-33. Pangéo (NE-Greece); one doubtful record also from Áthos peninsula ..... ***G. pangeoensis*** ASSING

56 Head and pronotum with extremely weak microsculpture and very shiny. ♂: elytra without carinae, tubercle or elevation at suture, but with fold-like elevations near exterior hind angles; process of tergite VII long and acute (Figs A99: 87-88); aedeagus as in Figs A99: 82-83. Vermion (Makedhonía) ..... ***G. vermionensis*** ASSING

- Head and pronotum with less shine. ♂: elytra with carinae, tubercle or elevation at suture, exterior hind angles unmodified. Primary sexual characters and distribution different 57

57 Pronotum with pronounced sexual dimorphism, in ♂ distinctly tapering and elongated posteriorly, in normal position covering most or all of scutellum (larger ♂♂!) 58

- Pronotum with weak sexual dimorphism, in ♂ not distinctly tapering and elongated posteriorly, scutellum visible 62

58 ♂: posterior margin of pronotum concave in the middle (large ♂♂) 59

- ♂: posterior margin of pronotum not concave 60

59 ♂: posterior concavity of pronotum shallower and narrower; pronotum more strongly tapering posteriorly; process of tergite VII more narrow-based (antero-dorsal view); aedeagus as in Figs A99: 63-64. Pilion Oros (Thessalía) ..... ***G. pauli*** ASSING

- ♂: posterior concavity of pronotum deeper and broader; pronotum less strongly tapering posteriorly (Fig. A01b: 12); process of tergite VII more wide-based in antero-dorsal view (Fig. A01b: 6); aedeagus as in Figs A01b: 1-2. Thessalía: Oros Othris (Map A01b: 1) ..... ***G. othrisensis*** ASSING

60 Species known from eastern Evritania and western Fthiotis (Map A01b: 1). ♂: posterior margin of pronotum obtusely angled in the middle (Fig. A00a: 6); process of tergite VII more slender; aedeagus as in Figs A00a: 1-2 ..... ***G. obtusicollis*** ASSING

- Species from northeastern Greece. ♂: posterior margin of pronotum not angled, but rounded in the middle; process of tergite VII broader 61

61 ♂: elytra with short tubercle at some distance behind apex of scutellum; process of tergite VII apically rounded in antero-dorsal view (Fig. A99: 41); aedeagus with cristal process of distinctive shape (Figs A99: 35, 37). Pangéo ..... ***G. siculifera*** ASSING

\- ♂: elytra with long sutural carinae; process of tergite VII apically acute in antero-dorsal view (large ♂♂!) (Fig. A99: 51); aedeagus with cristal process of different shape (Figs A99: 44, 46). Falakró..... ***G. falakroensis*** ASSING

62 ♂: elytra without distinct sutural carinae..... 63

\- ♂: elytra with distinct sutural carinae..... 64

63 ♂: process of tergite VII in large ♂♂ short (Figs A99: 59-60); elytra less transverse, without distinct depression, and with distinctly oblong elevation near apex of scutellum; aedeagus with short and slender cristal process (Figs A99: 53-56). Menikio, Vrontóus (NE-Greece)..... ***G. menikioensis*** ASSING

\- ♂: process of tergite VII in large ♂♂ much longer (Fig.. A04b: 45-46); elytra distinctly transverse, with extensive depression, and with ill-defined (but not distinctly oblong) elevation near apex of scutellum (Fig. A04b: 43); aedeagus with relatively massive cristal process (Fig. A04b: 48). Thessalia: Ossa Oros..... ***G. ossaica*** ASSING

64 ♂: process of tergite VII very long, not distinctly erect, almost horizontally projecting caudad (Figs A00a: 11-12); elytra without distinct impressions, sutural carinae long and broad, not closer to apex of scutellum than to posterior elytral margin; aedeagus as in Figs A00a: 7-8. Northern Greece (Flórina, Kozani)..... ***G. torisuturalis*** ASSING

\- ♂: process of tergite VII distinctly erect; elytra with or without impressions, sutural carinae shorter and narrower, closer to apex of scutellum than to posterior elytral margin. Distribution different..... 65

65 ♂: elytra with distinct impressions; process of tergite VII slender and apically rounded (Figs A99: 25-26); aedeagus with cristal process much broader in lateral view (Figs A99: 20, 22). Ipiros: Xerovuni Oros..... ***G. xerovuniana*** (SCHEERPELTZ)

\- ♂: elytra at most with very weak impressions; process of tergite VII with broader base and apically acute (Figs A99: 96-97). Fthiótis, Fokis (Map A01b: 1)..... ***G. itiensis*** ASSING

66 ♂: posterior margin of pronotum broadly truncate or (broadly or narrowly) concave in the middle (large ♂♂). (Note that in small ♂♂ of *G. kastamonuensis*, a species with a distinctive cristal process of the median lobe of the aedeagus, the pronotal hind margin is smoothly convex.)..... 67

\- ♂: posterior margin of pronotum weakly to distinctly pointed or smoothly convex, not truncate or concave. For one species from central southern Anatolia with enormous sutural carinae and without appreciable sexual dimorphism of the pronotum, in which the pronotal hind margin is of intermediate and variable condition (*G. lunata*), follow this alternative..... 72

67 ♂: abdominal tergites III and IV each with smooth subcircular tubercle near anterior impression. Species from southern or eastern Anatolia..... 68

\- ♂: abdominal tergites III and IV unmodified. Species from northern Turkey (Thrace, northern Anatolia) or from Konya..... 69

68 Pronotum with distinct microreticulation and subdued shine; abdomen with very fine and sparse puncturation. ♂: posterior margin of pronotum broadly concave; elytra with wider sutural carinae (Fig. A00b: 10); elytra with weakly granulose and sparser puncturation; aedeagus larger and with more slender cristal process (Figs A00b: 11-12). Southern Anatolia (Antalya)..... ***G. brachati*** ASSING

\- Pronotum shiny, microreticulation very shallow; abdomen with denser puncturation. ♂: posterior margin of pronotum indistinctly concave to smoothly convex (Fig. A01a: 44); elytra with distinctly granulose and denser puncturation; aedeagus smaller and with stouter cristal process (Figs A01a: 40-41). Eastern Anatolia (Bitlis)..... ***G. bitlisensis*** ASSING

69 ♂: pronotum (in large ♂♂!) distinctly oblong, more or less extensively depressed, strongly projecting posteriorly, and with broadly and distinctly concave hind margin (Fig. P83b: 1); elytra with distinctly elevated (bulging) lateral margins; process of tergite VII wide-based, apically rounded, and in lateral view rather slender; aedeagus: Figs P83b: 2-3. Southern Anatolia (Konya)..... ***G. iconiensis*** PACE

- ♂: pronotum not depressed, either less oblong or with posterior margin of different shape; lateral margins of elytra not distinctly elevated. Species from northern Turkey (Thrace, northern Anatolia) 70

70 ♂: pronotum (in large ♂♂!) distinctly oblong and strongly projecting posteriorly, its posterior margin in the middle narrowly concave (Fig. A00b: 1); elytra with relatively long sutural carinae; process of tergite VII in antero-dorsal view slender and apically rounded, in lateral view more massive (Figs A00b: 3-4); aedeagus with cristal process of median lobe of characteristic shape (Figs A00b: 2, P83b: 25-26). Northern Anatolia (Kastamonu) ..... ***G. kastamonuensis*** PACE

- ♂: pronotum with posterior margin broadly concave or truncate; aedeagus with cristal process much smaller or of different shape 71

71 ♂: pronotum (in large ♂♂) slightly more strongly projecting posteriorly and with weakly concave lateral margins near posterior angles (Fig. A01a: 14); abdomen less finely punctate; process of tergite VII wide-based and apically rounded or obtuse (Fig. A01a: 19); cristal process of aedeagus much longer and larger (Figs A01a: 12-13). Northeastern Anatolia (Artvin) ..... ***G. artvinensis*** ASSING

- ♂: pronotum in large ♂♂ less strongly projecting posteriorly, lateral margins near posterior angles not distinctly concave, hind margin in the middle truncate or broadly concave; abdomen very finely punctate; process of tergite VII more slender and apically more acute; aedeagus with cristal process of median lobe very short and thin. Thrace (surroundings of Istanbul) ..... ***G. turcica*** (BERNHAUER)

72 ♂: abdominal tergites III-IV or III-V each with median tubercle 73

- ♂: tergites III-V unmodified, tergites III-IV in two species from Antakya and Kahramanmaraş with very indistinct and ill-delimited elevations 76

73 ♂: abdominal tergite III with tubercle at posterior margin and tergite IV with median tubercle; elytra with pronounced impression and with very dense and coarsely granulose puncturation (Fig. A01a: 32); aedeagus with stouter cristal process (Figs A01a: 27-28). ♀: elytra with shallow impression and with dense and distinctly granulose puncturation (but less so than in ♂). Central southern Anatolia (Mersin) ..... ***G. granulipennis*** ASSING

- ♂: abdominal tergite IV with median tubercle near anterior impression (additional tubercles may be present on tergites III and V); elytra with sparser and less distinctly granulose puncturation; aedeagus with more slender cristal process 74

74 ♂: abdominal tergites III-V with tubercle; process of tergite VII wide-based and short (Fig. P96: 49); elytra with sparser puncturation; median lobe of aedeagus at base of ventral process not strongly excavate in lateral view; cristal process slightly bent dorsad (Figs P96: 50-51). Northeastern Anatolia (Rize) ..... ***G. pontica*** PACE

- ♂: abdominal tergites III-IV with tubercle; median lobe of aedeagus with cristal process of different shape. Species from southern or eastern Anatolia 75

75 ♂: posterior margin of pronotum weakly convex to indistinctly concave (Fig. A01a: 44); process of tergite VII short and wide-based (Fig. A01a: 43); median lobe of aedeagus smaller, at base of ventral process not strongly excavate in lateral view; cristal process of median lobe stouter (Figs A01a: 40-41). Eastern Anatolia (Bitlis) ..... ***G. bitlisensis*** ASSING

- ♂: posterior margin of pronotum pointed (Fig. A01a: 39); process of tergite VII long and slender (Fig. A01a: 38); median lobe of aedeagus larger, at base of ventral process strongly excavate in lateral view; cristal process very slender (Figs A01a: 33-34). Central southern Anatolia (Mersin). (Similar to this species is *G. marasica* from Kahramanmaraş, which sometimes has weakly modified tergites III-IV; see couplet 85.) ..... ***G. balkarensis*** ASSING

76 ♂: tergite VII posteriorly only with oval tubercle, without distinct process; cristal process of median lobe of aedeagus long and thin (Figs A03: 13-14). Muğla: Ak Dağlar ..... ***G. cingarae*** ASSING

- ♂: tergite VII (in large ♂♂) posteriorly with process; cristal process of aedeagus of different shape. Distribution different 77

77 ♂: elytra with fold-like elevation or tubercle near posterior angles, or with bulging lateral margins. Species from southern Anatolia (Antalya, Mersin) 78

- ♂: elytra without such fold-like elevation or tubercle, lateral margins not bulging. Species from NW-Turkey or from central southern Anatolia 80

78 Forebody very shiny; microsculpture almost obsolete. ♂: pronotum posteriorly distinctly pointed, but only weakly projecting (Fig. A00b: 5); elytra with shallower impressions and with sutural carinae near apex of scutellum (Fig. A00b: 5); process of tergite VII in antero-dorsal view wide-based and of triangular shape; aedeagus: Figs A00b: 6-7. W-Mersin, north of Anamur ..... ***G. taseliensis*** ASSING

- Forebody with distinct microsculpture. ♂: pronotum (in large ♂♂) distinctly oblong and posteriorly projecting over scutellum; elytra, including suture, deeply impressed..... 79

79 ♂: middle of posterior margin of pronotum not bent ventrad; elytra with sutural carina and with broadly bulging lateral margins (Fig. A03: 1); process of tergite VII as in Figs A03: 2-3; cristal process of median lobe of aedeagus short and thin (Fig. A03: 4). E-Antalya, surroundings of Akseki ..... ***G. attaleensis*** PACE

- ♂: middle of posterior margin of pronotum bent ventrad (Fig. A01a: 26); elytra without sutural carinae near apex of scutellum, lateral margins with long sinuate folds (Fig. A01a: 26); aedeagus with longer cristal process (Figs A01a: 20-21). Mersin, Akçeli Dağları..... ***G. akceliensis*** ASSING

80 ♂: elytra with enormous, in lateral view crescent-shaped sutural carinae 81

- ♂: elytra near apex of scutellum only with tubercles or with short sutural carinae 83

81 ♂: elytra with sutural carinae in lateral view abruptly sloping down posteriorly (Figs A04a: 28-29) ; process of tergite VII as in Fig. A04a: 30; aedeagus as in Fig. A04a: 33. Gaziantep: Kartal Dağı ..... ***G. kartalana*** ASSING

- ♂: elytra with sutural carinae evenly and smoothly rounded posteriorly (lateral view) ... 82

82 ♂: elytra with sutural carinae extending from apex of scutellum to posterior elytral margin (or nearly so) (Fig. A01a: 50); process of tergite VII almost vertically erect, very long and apically acute (Fig. A01a: 49); aedeagus as in Figs A01a: 45-46. Mersin .... ***G. lunata*** ASSING

- ♂: elytra with sutural carinae not reaching posterior elytra margin (Figs A04a: 16-17); process of tergite VII as in Figs A04a: 18-20; aedeagus as in Fig. A04a: 23. Gaziantep: Northern Nur Dağları..... ***G. sinuosa*** ASSING

83 Larger species; pronotum without appreciable sexual dimorphism. ♂: process of tergite VII short and very weakly erect; aedeagus with cristal process of median lobe extremely short. Facies and aedeagus: Figs P83b. Northwestern Turkey (Istanbul)..... ..... ***G. arganthonia*** PACE

- Smaller species; pronotum without or with very weak sexual dimorphism. ♂: process of tergite VII either hook-shaped or very long, slender, and apically acute (shaped like a sharp spine); aedeagus with cristal process of median lobe of different shape. Central southern Anatolia (Antakya)..... 84

84 Pronotum with weak to moderate sexual dimorphism. ♂: pronotum obtusely pointed posteriorly; process of tergite VII not hook-shaped..... 85

- Pronotum without sexual dimorphism. ♂: posterior margin of pronotum broadly and weakly convex (Fig. A03: 5); elytra with sutural carinae near scutellum; process of tergite VII relatively short, in lateral view hook-shaped..... 86

85 Pronotum with weak sexual dimorphism. ♂: elytra with pair of small, weakly elevated tubercles (not carinae) near apex of scutellum, separated by a distance approximately equal to their diameter; process of tergite VII very long, slender, and apically acute (shaped like a sharp spine). Facies and aedeagus: Figs P83b: 12-14 ..... ***G. simulans*** PACE

- Pronotum with moderate sexual dimorphism (Fig. A04a: 36). ♂: elytra in large ♂♂ with short sutural carinae near apex of scutellum and with deep and extensive impression (Fig. A04a: 36); process of tergite VII erect, long, apically bluntly pointed (Figs A04a: 37-38); median lobe of aedeagus with long, slender, and apically acute cristal process (Fig. A04a: 41). Kahramanmaraş ..... ***G. marasica*** ASSING

86 ♂: elytra with short sutural carinae (Figs A03: 5-6); process of tergite VII relatively short, in lateral view hook-shaped and in antero-dorsal view broadly triangular (Figs A03: 7-8); median lobe of aedeagus as in Fig. A03: 9. Southern Nur Dağları ..... ***G. hamata*** ASSING

- ♂: elytra with more slender and tightly contiguous sutural carinae in dorsal view (Figs A04a: 6-7); process of tergite VII much more slender (antero-dorsal view) and dorso-ventrally not flattened (Figs A04a: 8-9); aedeagus as in Fig. A04a: 12. Kahramanmaraş ..... ***G. adunca*** ASSING

87 ♂: tergite VII near hind margin with pair of longitudinal carinae or impressions..... 89

- ♂: tergite VII unmodified, or with sparse granula in posterior half, or with distinct oblong median elevation, or with small subcircular median granulum near posterior margin; elytra unmodified, or on either side of suture weakly elevated and with dense, coarsely granulose puncturation 105

88 Pronotum with pronounced sexual dimorphism. ♂: pronotum large and oblong, in large ♂♂ at least 1.10 times as long as wide; median lobe of aedeagus with cristal process (e. g. Fig. 7). ♀: posterior margin of sternite VIII with very weakly modified marginal setae; spermatheca similar to that illustrated in Figs 8, 10. Subgenus *Tropogastrosipalia* 89

- ♂: pronotum not oblong; median lobe of aedeagus without cristal process. ♀: posterior margin of sternite VIII usually with distinctly modified marginal setae; spermatheca of different morphology. Subgenus *Sibiota* 90

89 Eyes usually approximately half the length of postocular region in dorsal view, but occasionally distinctly smaller, always with clearly more than 20 ommatidia (Fig. 2-3). ♂: pronotum (in large ♂♂) up to 1.20-1.25 times as wide as head and distinctly elongated, up to 1.20 times as long as wide and projecting over scutellum, posterior margin weakly convex to almost truncate (Fig. 2); elytra often with more or less pronounced transverse impression, and in anterior two thirds of suture with distinctly elevated sutural carina of characteristic shape (lateral view) (Figs 2, 4); tergite VII in posterior half with pair of posteriorly converging carinae (Fig. 5); tergite VIII near hind margin generally with rudiments of such carinae (Fig. 6), in large ♂♂ usually projecting beyond posterior margin in the form of minute dents; median lobe of aedeagus with relatively large spear-shaped cristal process (Fig. 7). Slovakia, Hungary (Map 2)..... ***G. chyzeri*** (EPPELSHEIM)

- Eyes strongly reduced, composed of about 15 ommatidia. ♂: pronotum approximately 1.10-1.15 times as long as wide, posterior margin broadly convex (Fig. 9); elytra near apex of scutellum with weakly pronounced narrow sutural carina; tergite VII in posterior half with pair of diagonal (posteriorly converging), weakly pronounced carinae; aedeagus as in Figs P90: 29). Bulgaria: northern Rodope mountains. ..... ***G. rodopensis*** PACE

90 Eyes larger, composed of distinctly more than 20 ommatidia..... 91

- Eyes of reduced size, composed of less than 20 ommatidia (e. g. Fig. 195). ♂: elytra otherwise modified, carinae usually longer and more pronounced; carinae of tergite VII in most species longer and/or converging posteriad 93

91 Coloration of body dark, brown to dark brown. Eyes relatively large, slightly more than half the length of postocular region in dorsal view. Elytra more than 0.7 times as long as pronotum (Figs 168-169). ♂: elytra without sutural carinae, with dense and coarsely granulose puncturation especially near suture (Figs 168-169); tergite VII in posterior half with pair of straight and conspicuously parallel carinae, the latter not reaching the middle of tergite (Fig. 170); aedeagus as in Figs P83A: 39-41. Bosnia-Herzegovina, Croatia (Map 10) ..... ***G. zoufali*** (RAMBOUSEK)

- Body usually of lighter coloration, more or less reddish brown. Eyes mostly less than half the length of postocular region in dorsal view. ♂: elytra with short carinae near scutellum; aedeagus of different morphology..... 92

92 Elytra longer, at suture usually >0.7 times as long as pronotum. ♂: aedeagus: Figs A99: 158-161. ♀: spermatheca of distinctive morphology, S-shaped, duct relatively short, wide, and untwisted (Figs A99: 163-165). Widespread species: Albania, Bulgaria, Macedonia, Greece (including Crete, Rhodos, and smaller islands), and Turkey (Map A04a: 1) ..... ***G. oertzeni*** (EPPELSHEIM)

- Elytra about 0.6 times as long as pronotum. ♂: aedeagus as in Figs A00a: 13-14. ♀: duct of spermatheca more slender, and twisted. SW-Macedonia.... ***A. kasyi*** (SCHEERPELTZ)

93 Species from the Caucasus region 94

- Distribution different 95

94 ♂: elytra with extensive diagonal impressions and with long, well-defined, distinctly elevated, narrow, but anteriorly somewhat dilated sutural carinae extending over full length of suture; puncturation indistinctly granulose (Fig. 194); tergite VII with pair of short, but well-defined, posteriorly distinctly converging carinae in posterior half (Fig. 196); tergite VIII posteriorly broadly concave (Fig. 197); median lobe of aedeagus and apical lobe of paramere as in Figs 198-199. ♀: spermatheca with short helicoid duct (Fig. 201). Karatchay-Tcherkessia ..... ***G. krzysztofi*** (ROUBAL)

- ♂ sexual characters unknown. ♀: spermatheca as in Fig. P96: 165. Georgia: Caucasus minor ..... ***G. zerchei*** PACE

95 Species from Turkey 96

- Species from the Balkans 101

96 ♂: elytra with suture elevated, forming a narrow carina; carinae on tergite VII relatively long and converging posteriad; median lobe of aedeagus with very long flagellum 97

- ♂: elytra with long carinae or oblong elevations on either side of suture; median lobe of aedeagus with short flagellum 98

97 ♂: elytral suture more strongly elevated; carinae on tergite VII fold-like (i. e. acute in cross-section) and (in large ♂♂) meeting posteriorly; median lobe of aedeagus with shorter flagellum (Figs P83a: 23-24). ♀: spermatheca: Fig. P83a: 25. Northwestern Anatolia (Map A01a: 2) ..... ***G. uhligi*** PACE

- ♂: elytral suture weakly elevated; carinae on tergite VII wider, in cross-section convex, and not meeting posteriorly; median lobe of aedeagus with longer flagellum (Figs P02: 82-83). Konya: Aladağ ..... ***G. lycaonica*** PACE

98 ♂: elytra near apex of scutellum and along anterior 2/3 of suture each with more or less strongly elevated carina of variable breadth parallel to suture; tergite VII with pair of subparallel carinae, in large ♂♂ extending over posterior 2/5 of tergite and separated by a distance approximately equal to their width or greater; tergite VIII posteriorly more or less convex, weakly to distinctly emarginate in the middle, and with pair of flat, sometimes indistinct tubercles (Figs A01a: 68-70); aedeagus as in Figs A01a: 61-62. ♀: spermatheca of highly variable shape (Figs A01a: 64-67). Central southern Anatolia: Nur Dağları and adjacent mountain ranges (Map A04a: 2) ..... ***G. helvetiorum*** PACE

- ♂: elytra with sutural carinae extending over whole length of suture; carinae on tergite VII either separated by a distance greater than their width or converging posteriad; tergite VIII without pair of tubercles; aedeagus of different morphology. Species from northern or western Anatolia 99

99 Colour of body entirely testaceous. ♂: elytra with narrow, distinctly elevated, anteriorly only weakly widened sutural carina; each elytron with extensive, but rather shallow impression; tergite VII with very narrow, distinctly elevated, relatively long, straight, and posteriorly weakly converging pair of carinae at hind margin, separated (even posteriorly) by a distance greater than their width; posterior margin of tergite VIII convex, in the middle with distinct emargination; aedeagus as in Figs P83b: 68-69. ♀: spermatheca as in Fig. P83b: 70. Western Anatolia (surroundings of Izmir) ..... ***G. smyrnensis*** PACE

- Colour of body testaceous to ferrugineous; preapical abdominal segments often infuscate. ♂: primary and secondary sexual characters different; posterior margin of tergite VIII without central emargination. Species from northeastern Anatolia..... 100

100 ♂: elytral impressions shallower, sutural carinae anteriorly narrower, less strongly elevated, and without coarse puncturation or sculpture; tergite VII with usually pronounced, though relatively short pair of carinae, these carinae separated by a distance distinctly less than their width and posteriorly merging (Fig. A01a: 56); median lobe of aedeagus apically more acute (ventral view) and less slender (Figs A01a: 51-52). ♀: spermatheca as in Figs A01a: 54-55. Northeastern Anatolia: Artvin. ..... ***G. fabaeformis*** ASSING

- ♂: elytral impressions more pronounced; sutural carinae anteriorly very wide and strongly elevated, decreasing in width and elevation posteriad, coarsely and granulosely sculptured, and mat; pair of carinae at posterior margin of tergite VII almost straight and parallel, separated by a distance greater than their width (Fig. A01a: 59); median lobe of aedeagus with ventral process less acute (ventral view) and more slender (lateral view) (Figs P83b: 90-91). ♀: spermatheca as in Fig. A01a: 58. Northeastern Anatolia: Rize, Trabzon ..... ***G. rizensis*** PACE

101 ♂: elytra with pronounced longitudinal elevation along suture, extending almost from apex of scutellum to hind margin, laterad of this elevation with deep and large impression extending from just behind the shoulder to hind margin; tergite VII with pair of impressions; chaetotaxy of tergite VIII as in Fig. A99: 192; median lobe of aedeagus as in Figs A99: 188-189; apical lobe of paramere broader and with three long setae (Fig. A99: 190). Greece: Timfristós (Fthiótis) ..... ***G. cassagnaui*** (COIFFAIT)

- ♂: modifications of elytra different; tergite VII with pair of carinae; chaetotaxy of tergite VIII and aedeagus different; apical lobe of paramere more slender and with one long seta. Distribution different 102

102 Rather small species, 2.0-2.6 mm. ♂: elytra each with subcircular tubercle near scutellum (Figs 206-207); carinae on tergite VII weakly elevated, sharply folded, and widely separated (Fig. 210); posterior margin of tergite VIII shaped as in Figs 211-212; median lobe of aedeagus with weakly pronounced crista apicalis and crista proximalis, and with distinct long spines in internal sac (Figs 213-215); apical lobe of paramere slender (Fig. 216). ♀: spermatheca as in Figs 219-220. Dinaric Alps (Croatia), near the border to Bosnia-Herzegovina. ..... ***G. dinarica*** sp.n.

- ♂: elytra without subcircular tubercle, but with oblong carinae; carinae on tergite VII of different shape; posterior margin of tergite VIII of different shape and chaetotaxy; primary sexual characters of different morphology.. 103

103 Larger species of slightly darker coloration, body reddish. ♂: elytra with pair of short well-defined sutural carinae near apex of scutellum and with extensive impressions; carinae on tergite VII more widely separated (Fig. P02: 67); posterior margin of tergite VIII in the middle more or less distinctly concave (Fig. 171); aedeagus as in Fig. 172 and Figs P02: 68-69. ♀: spermatheca as in Fig. A03: 17. Bosnia-Herzegovina (Map 10) ..... ***G. meixneri*** (BERNHAUER)

- Smaller species of paler coloration, body predominantly yellowish to yellowish red. ♂: elytra with broad, posteriorly tapering sutural elevation immediately behind apex of scutellum, the elevations of both elytra together forming a ± triangular elevation only narrowly interrupted by the suture; posterior margin of tergite VIII not distinctly concave in the Middle. Primary sexual characters of different morphology. Greece and Bulgaria 104

104 ♂: elytra with long sutural carinae, the two carinae forming a ± distinct keel usually extending over the full length of the suture, and with weak to moderate, often ± diagonal impression; posterior margin of tergite VIII crenulate and with more setae (Fig. A99: 186); aedeagus with 4 large spines in internal sac (Figs A99: 180-181). ♀: duct of spermatheca proximally more dilated (Figs A99: 183-184). NE-Greece: Falakró; S-Bulgaria: Pirin ..... ***G. weiratheri*** PACE

- ♂: elytra with shorter, posteriorly tapering sutural elevation immediately behind apex of scutellum, the elevations of both elytra together forming a ± triangular elevation only narrowly interrupted by the suture; remainder of elytral surface with usually shallow, ± extensive impression; posterior margin of tergite VIII not crenulate and in the middle with only two short setae (Fig. A99: 178); aedeagus without spines in internal sac (Figs A99: 172-173). ♀: duct of spermatheca proximally more slender (Figs A99: 175-176). Kato Olympos (Thessalía) ..... ***G. schuelkei*** ASSING

105 Coloration of body usually more or less yellowish to yellowish red. ♂: tergite VII with distinct smooth, broad, oblong median elevation. Subgenus *Typhlusida* 106

- ♂ tergite VII unmodified or with small subcircular median tubercle near posterior margin 107

106 ♂: elytra on either side of suture with broader long oblique elevation (Fig. 222); abdominal tergite VII in posterior half with less well-defined smaller elevation or tubercle (Fig. 224); median lobe of aedeagus and apical lobe of paramere as in Figs P83b: 45, 46, 48). ♀: spermatheca with long and slender duct (Fig. P84b: 47). Bulgaria (Map 11) ..... ***G. rhilensis*** (RAMBOUSEK)

- ♂: elytra with suture forming a narrow carina; abdominal tergite VII with larger, more strongly elevated, and more well-defined oblong tubercle; aedeagus as in Figs A00c: 1-3. ♀: spermatheca with shorter duct (Figs A00c: 4-5). SE-Austria, Slovenia ..... ***G. flava*** (KRAATZ)

107 ♂: tergite VII near posterior margin with - often weakly defined - subcircular median tubercle (Fig. 162 and Fig. A99: 200), which may be reduced to various degrees; elytra with distinct microsculpture and almost or completely matt. Species confined to the Taygetos range (Greece: Pelopónnisos) or the Caucasus region 108

- ♂ tergite VII unmodified 109

108 On average larger species. Eyes approximately half the length of postocular region in dorsal view. Pronotum with pronounced microreticulation and almost matt (Figs 160-161). ♂: elytral puncturation finer, denser, and not coarsely granulose (Fig. 160); aedeagus as in Figs 164-165. ♀: spermatheca as in Fig. 166 and Fig. P96: 167. Caucasus region (Map 9) ..... ***G. cingulata*** (EPPELSHEIM)

- On average smaller species. Eyes distinctly less than half the length of postocular region in dorsal view. Pronotum with shallow microsculpture and some shine. ♂: elytral puncturation coarsely granulose and sparser; aedeagus as in Figs A99: 196-197. ♀: spermatheca as in Fig. A99: 199. Greece, SW-Pelopónnisos: Taygetos range ..... ***G. ulcerifera*** ASSING

109 Dark-coloured wing-dimorphic species; head and most of abdomen usually blackish brown, pronotum and anterior abdominal segments only slightly lighter, dark brown; elytra brown to dark brown. Macropterous morph somewhat resembling species of *Atheta* THOMSON, with the elytra at suture approximately as long as pronotum and hind wings fully developed. Brachypterous morph with elytra at suture approximately 0.85 times as long as pronotum. Abdominal tergite VII with palisade fringe. ♂: aedeagus as in Figs A01a: 89-90. ♀: spermatheca as in Figs A01a: 92-94. Widespread species, recorded from southern Anatolia (Muğla to Antakya), Greece, and Austria (Maps A03: 1 and A01a: 4) ..... ***G. lucens*** (BENICK)

- Predominantly light-coloured and, except for *G. leucadiae* from Levkás, brachypterous species with distinctly shorter elytra. If similarly dark (1 species from Ukraine), tergite VII without palisade fringe 110

110 Small, slender, and dark-coloured species with testaceous legs and antennae (Fig. 151); head and abdomen blackish, pronotum and elytra brown to dark brown. Head and pronotum with very shallow microsculpture and distinctly glossy (Fig. 152). ♂: aedeagus as in Figs 155-156. ♀: spermatheca as in Fig. 158. Ukraine ***G. gontarenkoi*** sp.n.

- Body either distinctly paler or, if dark brown, with weak shine and broader 111

111 Species from the Carpathians 112

- Distribution different 113

112 Forebody with shallow microsculpture. Elytra with sexual dimorphism. ♂: elytra with rather dense and distinctly granulose puncturation, surface almost completely matt (Figs 84-85); median lobe of aedeagus as in Fig. 88. ♀: sternite VIII posteriorly convex (Figs 89-90); spermatheca as in Figs 91-92. Southern Carpathians (Romania) (Map 7) ..... ***G. deubeli*** (BERNHAUER)

- Elytra without sexual dimorphism, in both sexes finely punctate (Fig. 93). ♂: aedeagus with larger median lobe (Figs 95-97). ♀: posterior margin of sternite VIII in the middle often concave (Figs 100-101); spermatheca as in Figs 102-106. Widespread in the Carpathians (Slovakia, Poland, Ukraine, Romania) (Map 6) ..... ***G. infirma*** (WEISE)

113 Species from NE-Italy and the southeast of Central Europe 114

- Distribution different 115

114 Larger and darker species. Forebody with pronounced microreticulation and almost matt. Antennae much more massive. ♂: elytra usually with some granulose punctures; median lobe of aedeagus with distinctly bent ventral process in lateral view (Figs A00c: 8-9). ♀: spermatheca with shorter, less twisted, and in the middle stouter duct. Slovenia, NE-Italy (Map 6) ..... ***G. matajurensis*** (SCHEERPELTZ)

- Smaller and paler species. Forebody with shallow microsculpture and some shine (Figs 108-110). Antennae shorter and less massive. Elytra very finely punctured in both sexes (Figs 108-110). ♂: median lobe of aedeagus with almost straight ventral process in lateral view (Figs 114-118)). ♀: spermatheca with longer, more strongly twisted, and in the middle more slender duct (Fig. 121). Slovakia, Hungary (Map 6) ..... ***G. cuneiformis*** (KRAATZ)

115 Species from the Balkans (exclusive of Rhódos) and Cyprus 116

- Species from Turkey, Rhódos, and Lebanon 130

116 Elytra with sexual dimorphism. ♂: elytra usually with more or less pronounced impression, puncturation more or less granulose, near scutellum and suture usually more or less elevated and with aggregations of coarse granulose punctures (Fig. 144); tergite VIII posteriorly truncate and with very sparse marginal setae (Fig. 145); median lobe of aedeagus as in Figs 146-147. ♀: elytra with fine sparse puncturation, without aggregations of granulose punctures near scutellum and near suture; spermatheca as in Fig. 150. Southern Croatia, Bosnia-Herzegovina, Montenegro (Map 8) ..... ***G. arida*** (EPPELSHEIM)

- Mostly without sexual dimorphism of elytra. Absent from the Balkans to the north of Greece and Bulgaria 117

117 Species from Bulgaria 118

- Species from Greece and Cyprus 119

118 Coloration darker, body on average slightly larger. ♂: posterior margin of tergite VII at most weakly concave in the middle (Fig. 122); median lobe of aedeagus larger and with less pronounced crista proximalis (Figs 123-127). ♀: duct of spermatheca proximally enlarged and distally comparatively slender (Figs 129-133)). Widespread: Vitoša, western and central Stara Planina, Maleschevska Planina (Map 7) ..... ***G. bulbifera*** ZERCHE

- Coloration of body paler, on average smaller. ♂: posterior margin of tergite VIII more or less distinctly concave in the middle (Fig. 125); median lobe of aedeagus smaller, with crista apicalis of different shape and with more strongly projecting crista proximalis (Figs 136-138). ♀: spermathecal capsule shorter, with longer and more acute apical cuticular intrusion, and with somewhat shorter duct (Figs 141-142). Eastern Stara planina (Map 7) ..... ***G. incognita*** sp.n.

119 Winged species, elytra at suture 0.75-0.80 times as long as pronotum, hind wings present. ♂: hind margin of tergite VIII not emarginate (Fig. A99: 219); median lobe of aedeagus as in Figs A99: 214-215; apical lobe of paramere relatively short and broad (Fig. A99: 216). ♀: spermatheca as in Figs A99: 217-218. Levkás: Megan Oros ..... ***G. leucadiae*** (SCHEERPELTZ)

- Brachypterous species. (The wide range of *G. euboica* suggests that this species may be wing-dimorphic, but winged specimens have not yet been observed.) Elytra distinctly shorter, hind wings reduced. Primary and secondary sexual characters different 120

120 Colour usually darker, eyes larger. ♂: hind margin of tergite VIII convex (Fig. A99: 210); median lobe of aedeagus as in Figs A99: 203-204; apical lobe of paramere relatively slender (Fig. A99: 205). ♀: spermatheca as in Figs A99: 206-209. Widespread species: Albania, mainland Greece, Pelopónnisos, Zákinthos, Levkás, Kefallinía, Thessalía, Evvoia, Kárpathos (Map A01b: 2) ..... ***G. euboica*** PACE

- Colour usually lighter, eyes smaller. ♂: hind margin of tergite VIII at least shallowly concave in the middle; aedeagus of different morphology. ♀: spermatheca different. Species with more restricted areas of distribution 121

121 Species from mainland Greece and the Pelopónnisos 122

- Species from Crete and Cyprus 125

122 ♂: posterior margin of tergite VIII strongly emarginate in the middle (Fig. A99: 242); median lobe of aedeagus with slender ventral process (ventral view) (Fig. A99: 239); lateral aspect as in Fig. A99: 238. ♀: spermatheca as in Fig. A99: 240. Ipiros: Tsumerka ..... ***G. beieri*** (SCHEERPELTZ)

- ♂: hind margin of tergite VIII weakly emarginate in the middle; median lobe of aedeagus with broader ventral process (ventral view) and in lateral view of different shape. Distribution different 123

123 ♂: ventral process of median lobe of aedeagus broader in ventral view and more strongly bent in lateral view (Figs A00a: 34-35). ♀: spermatheca with very short untwisted duct, highly distinctive (Fig. A00a: 240). N-Greece: Voras Oros ..... ***G. breviuter*** ASSING

- ♂: ventral process of median lobe more slender in ventral view and less distinctly curved in lateral view. ♀: spermatheca with longer twisted duct, of completely different morphology. Southern mainland Greece and Pelopónnisos 124

124 Elytra with distinct sexual dimorphism, in ♂ with dense and coarsely granulose punctation. Aedeagus and spermatheca as in Figs A99: 229-233. Fthiotis: Iti Oros ..... ***G. fthiotisensis*** ASSING

- Elytra without sexual dimorphism. Aedeagus and spermatheca as in Figs A99: 222-225. NW-Pelopónnisos: Erimanthos Oros ..... ***G. ahaiaensis*** ASSING

125 Species endemic to Cyprus. ♂: aedeagus and spermatheca as in Figs A99: 269-272 ..... ***G. cyprensis*** PACE

- Species endemic to Crete 126

126 ♂: posterior margin of tergite VIII more or less strongly concave in the middle; aedeagus smaller and with distinct long spines in internal sac. Distribution: central or eastern Crete 127

- ♂: posterior margin of tergite VIII distinctly emarginate in the middle; aedeagus larger, without or with very indistinct spines in internal sac. Distribution: central or western Crete 129

127 ♂: posterior margin of tergite VIII strongly concave in the middle (Fig. A01b: 33-34); aedeagus with two long and distinctly sclerotized spines in internal sac (Figs A01b: 27-28); spermatheca: Figs A01b: 30-32. E-Crete: Thryptis range ..... ***G. thryptisensis*** ASSING

- ♂: posterior margin of tergite VIII less strongly concave in the middle; internal sac of aedeagus with more numerous and shorter spines. Absent from the Thryptis range, more western distribution 128

128 ♂: posterior margin of tergite VIII weakly concave in the middle (Fig. A99: 251); median lobe of aedeagus with more slender ventral process (Fig. A99: 247); apical lobe of paramere short and broad (Fig. A99: 248). ♀: spermatheca as in Figs A99: 249-250. Central Crete: Idhi Oros (= Ida) ..... ***G. idaea*** PACE

- ♂: posterior margin of tergite VIII on average more distinctly incised (Figs A00a: 47-48); median lobe of aedeagus as in Figs A00a: 42-43; apical lobe of paramere more slender (Fig. A00a: 44). ♀: spermatheca as in Figs A00a: 45-46. E-Crete: Dikti Oros ..... ***G. meybohmi*** ASSING

129 ♂: tergite VIII more strongly emarginate in the middle (Fig. A99: 259); median lobe of aedeagus with relatively longer and more slender ventral process (Figs A99: 254-255). ♀: capsule of spermatheca relatively smaller and less distinctly delimited from duct (Figs A99: 257-258). Central Crete: Idhi Oros (= Ida) ..... ***G. exsecta*** ASSING

- ♂: tergite VIII less strongly emarginate in the middle (Fig. A99: 266); median lobe of aedeagus with relatively shorter and broader ventral process (Figs A99: 262-263). ♀: capsule of spermatheca larger and more distinctly delimited from duct (Fig. A99: 265). W-Crete: Lefka Ori ..... ***G. icaria*** PACE

130 Elytra with sexual dimorphism. ♂: elytra on either side of suture slightly elevated and/or with dense and coarse punctures; tergite VII either with scattered granula in posterior half or with microreticulation distinctly contrasting with the more transverse microsculpture of the anterior tergites 131

- Elytra without or with weaker sexual dimorphism, in ♂ on either side of suture not distinctly elevated or more coarsely and more densely punctured than elsewhere 133

131 Larger species, 2.5-2.8 mm, and of darker coloration, reddish to brownish yellow. ♂: median lobe of aedeagus with long spines in internal sac (Figs A04a: 48-50). ♀: spermatheca as in Figs A04a: 54-55. Kahramanmaraş: Ahır Dağı..... ***G. ahirana*** ASSING

- Smaller species, 1.8-2.3 mm, and of paler coloration. Sexual characters different. More western distributions 132

132 Eyes small, about as large as antennomere IV in cross-section. ♂: elytra on either side of suture slightly elevated and with coarsely granulose punctures; tergite VII in posterior half with some distinct granula, its microsculpture similar to that of anterior tergites; aedeagus smaller and with spines in internal sac (Figs A01a: 77-78). ♀: unknown. Western central Anatolia: Emir Dağları (Afyon) ..... ***G. emirdaghensis*** ASSING

- Eyes distinctly larger than antennomere IV in cross-section. ♂: elytra on either side of suture not distinctly elevated, but with rather dense and coarsely granulose punctures, which (in large ♂) are denser and coarser near apex of scutellum than elsewhere; tergite VII without granula, but with isodiametric microreticulation distinctly contrasting with the more transverse microsculpture of tergite VI; aedeagus larger and more slender (Figs A01a: 82-83). ♀: spermatheca as in Figs A01a: 85-86. Southern Anatolia: Taşeli Yaylasi range, north of Anamur (western Mersin) ..... ***G. itschiliensis*** ASSING

133 Species from Lebanon. Antennae relatively short; preapical antennomeres more than twice as wide as long. Aedeagus and spermatheca as in Figs A03: 19-20 ..... ***G. libanensis*** PACE

- Species from Anatolia 134

134 Species from northeastern Anatolia 135

- Species from southern Anatolia 136

135 Eyes slightly larger, maximal diameter approximately equal to the length of antennomere III; antennomere III only slightly shorter than antennomere II. ♀: capsule of spermatheca distally enlarged (Figs P02: 36). Trabzon ..... ***G. macronorum*** PACE

- Eyes slightly smaller, maximal diameter shorter than antennomere III; antennomere III distinctly shorter than antennomere II. ♀: spermathecal capsule somewhat coniform (Fig. P83b: 173). Trabzon ..... ***G. euxina*** PACE

136 Abdomen relatively wider, 1.15-1.25 times as wide as elytra. Pronotum distinctly transverse, approximately 1.20 times as wide as head and 1.20 times as wide as long. ♂: aedeagus as in Figs A01a: 72-73. ♀: spermatheca of distinctive morphology, duct wide, short, and untwisted (Fig. A01a: 75). Adana ..... ***G. extorta*** sp.n.

- Abdomen more slender, less than 1.15 times as wide as elytra. Pronotum less transverse. Genitalia, especially spermatheca, of different morphology. Southwestern Anatolia eastwards to Mersin 137

137 Coloration uniformly testaceous to ferrugineous, preapical abdominal segments at most very indistinctly infuscate. Eyes very small, less than one third the length of postgenae (Fig. A03: 22). ♂: posterior margin of tergite VIII in the middle with distinct concavity, which is laterally delimited by carinae (Fig. A03: 23); aedeagus in lateral view more strongly bent (Figs A03: 27-29). ♀: spermatheca as in Figs A03: 31-32. W-Antalya: Bey Dağları ..... ***G. beydaghensis*** ASSING

- Coloration of body generally darker; preapical abdominal segments usually distinctly infuscate. Eyes larger, usually about half the length of postgenae, but length subject to some intraspecific variation. ♂: posterior margin of tergite VIII with shallower and laterally not delimited concavity; median lobe of aedeagus in lateral view weakly curved (Figs P83b: 159-160). ♀: spermatheca as in Fig. P83b: 163 (as *G. besuchetiana*). Widespread in southern and southwestern Anatolia (Muğla to Mersin) and in Rhódos (Map A03: 2) ..... ***G. rhodiensis*** PACE

6. Catalogue of the *Geostiba* species of the Eastern Mediterranean and the Caucasus region

Below, the species are listed by subgenus and in alphabetical order. The reference column indicates the revisionary parts where the respective species is treated; those parts that contain descriptive details and/or illustrations are given in bold print. "App" refers to the present paper; for explanations of the remaining abbreviations see the introduction to the key in the preceding section. *Geostiba angulata* ZERCHE 1988 is not included in the catalogue, because it is now a synonym of *Leptusa laevicauda* (SCHEERPELTZ 1958) (see ZERCHE 1999).

species/subgenus	distribution	references
***Geostiba* THOMSON 1858** = *Evanystes* GISTEL 1856		
circellaris (GRAVENHORST 1806) = *contigua* (STEPHENS 1832) = *inquinalis* (MANNERHEIM 1830) = *rufescens* (STEPHENS 1832) = *venustula* (HEER 1839)	Palaearctic region	**A01a**, App
sororcula ASSING 2001	Turkey: Erzincan, ?Adahan	**A01a**, A03
***Sibiota* CASEY 1906** = *Ditroposipalia* SCHEERPELTZ 1951 = *Callosipalia* COIFFAIT 1968 = *Tetratropogeostiba* PACE 1983		
batumiensis PACE 1996	SW-Georgia	**App**
bituberculata (EPPELSHEIM 1878)	Georgia	**App**
carinicollis (EPPELSHEIM 1878) = *medea* PACE 1996	E-Caucasus	**App**
cassagnaui (COIFFAIT 1968)	Greece: Timfristós (Fthiótis)	**A99**
dinarica sp.n.	Croatia: Dinaric Alps	**App**
excaecata ASSING 2001	Macedonia: Bučova planina	**A01b**
fabaeformis ASSING 2001	Turkey: Artvin	**A01a**
galicicana ASSING 2000	Macedonia: Galičica	**A00a**, App
giaurica ASSING 2004	Turkey: Kahramanmaraş	**A04a**
helvetiorum PACE 1983 = *helvetiorum humicola* PACE 1983 = *helvetiorum obscura* PACE 1983	Turkey: Antakya	**A01a**, A03, A04a
kasyi (SCHEERPELTZ 1959)	Macedonia: Pelister	**A00a**, App
kobrisensis PACE 1996 = *crucis* PACE 1996	Georgia	**App**
krzysztofi (ROUBAL 1913)	Russia: Karatchay-Tcherkessia	**App**
loebliana PACE 1984	Israel: Mt. Hermon	A04a
lycaonica PACE 2002	Turkey: Konya	**A03**
meixneri (BERNHAUER 1910) = *mostarensis* PACE 2002	Bosnia-Herzegovina	**A03**, App
oertzeni (EPPELSHEIM 1888) = *balcanica* ZERCHE 1988 = *dirfysensis* (COIFFAIT 1968) = *franziana* (COIFFAIT 1968) = *lichadensis* (COIFFAIT 1968)	southern Balkans, Turkey	**A99**, A00a, A01a, A01b, A04a, App

species/subgenus	distribution	references
= *kanellidis* (SCHEERPELTZ 1962) = *mandli* (SCHEERPELTZ 1963) = *minoica* PACE 1996 = *oertzeni cnidia* PACE 2002 = *oertzeni scyrosensis* PACE 2002 = *solitaria* (FAGEL 1968) = *solitaria aksekiensis* PACE 1996 = *solitaria ancyrensis* PACE 1983 = *solitaria tmola* PACE = *solitaria ulensis* PACE 1983 = *strongylensis* (COIFFAIT 1968) = *tenenbaumi* (BERNHAUER 1940)		
rizensis PACE 1983 = *trapezusensis* PACE 2002	Turkey: Rize, Trabzon	**A01a**, A01b, A03
samai PACE 1977 = *coiffaiti* PACE 1983	Macedonia: Šar planina	**A01b**, App
schuelkei ASSING 1999	Greece: Kato Olympos (Thessalía)	**A99**
sculpticollis (APFELBECK 1907) = *albanica* (BERNHAUER 1936) = *temporalis* (APFELBECK 1907)	N-Albania	**A00a**, App
seleucica PACE 1983	Turkey: Antakya	**A01a, A04a**
smyrnensis PACE 1983	Turkey: Izmir	**A01a**
stussineri (Bernhauer 1914)	Montenegro	**App**
tuberosa ASSING 2004	Turkey: Kahramanmaraş	**A04a**
uhligi PACE 1983 = *mysia* PACE 1983	Turkey: NW-Anatolia	**A01a**, App
weiratheri PACE 1984 = *behnei* ZERCHE 2002	Bulgaria: Pirin, Greece: Falakró (Makedhonía)	**A99**, A00a, A01b, App
zerchei PACE 1996	Georgia	**App**
zoufali (RAMBOUSEK 1915) = *optima* PACE 1983	Croatia, Bosnia-Herzegovina	**App**
***Sipalotricha* SCHEERPELTZ 1931** = *Lioglutosipalia* SCHEERPELTZ 1951		
ahaiaensis ASSING 1999	Greece: Erimanthos (Pelopónnisos)	**A99**
ahirana ASSING 2004	Turkey: Kahramanmaraş	**A04a**
arida (EPPELSHEIM 1881)	Croatia, Bosnia-Herzegovina, Montenegro	**A99**
beieri (SCHEERPELTZ 1959)	Greece: Tsumerka (Ipiros)	**A99**
beydaghensis ASSING 2003	Turkey: Antalya	**A03**
breviuter ASSING 2000	Greece: Voras (Makedhonía)	**A00a, A01b**
bulbifera ZERCHE 1988	Bulgaria	**App**
cingulata (EPPELSHEIM 1878) = *tbilisensis* PACE 1996	Caucasus region	**App**
cuneiformis (KRAATZ 1856) = *gyorffyi* (BERNHAUER 1929) = *hcejkai* (ROUBAL 1932) = *kocsii* (Bernhauer 1910)	Slovakia, Hungary	**App**
cyprensis PACE 1983	Cyprus	**A99**
deubeli (BERNHAUER 1909)	Romania	**App**

species/subgenus	distribution	references
emirdaghensis ASSING 2001	Turkey: Afyon	**A01a**
euboica PACE 1990 = *elatensis* PACE 1996 = *leucadiae* (SCHEERPELTZ 1959) = *samensis* PACE 1996 = *winkleri* (Bernhauer 1936)	Greece	**A99**, A00a, A01b, App
euxina PACE 1983	Turkey: Trabzon	**A01a**
exsecta ASSING 1999	Greece: Ídhi (Crete)	**A99**
extorta sp.n.	Turkey: Adana	**A01a** (as *medea*), **App**
fthiotisensis ASSING 1999	Greece: Fthiótis, Evritania	**A99**, A00a
gontarenkoi sp.n.	Ukraine	**App**
icaria ASSING 1999	Greece: Lefka Ori (Crete)	**A99**, A01b
idaea PACE 1996	Greece: Ídhi (Crete)	**A99**
incognita sp.n.	Bulgaria: Stara planina	**App**
infirma (WEISE 1878) = *ruthena* (ROUBAL 1924) = *pacei* ZERCHE 1988	Carpathians (SE-Poland, NE-Slovakia, Ukraine, Romania)	**App**
itschiliensis ASSING 2001	Turkey: Mersin	**A01a**
leucadiae (SCHEERPELTZ 1931)	Greece: Levkás	**A99**
libanensis PACE 1983	Lebanon	**A03**
lucens (BENICK 1970) = *glaberima* (BENICK 1981)	southeastern Central Europe, SE-Europe, Ukraine, Turkey	**A01a**, A01b, A03, A04a, App
matajurensis (SCHEERPELTZ 1957)	Slovenia, NE-Italy	**A00c**, App
macronorum PACE 2002	Turkey: Trabzon	**A03**
meybohmi ASSING 2000	Greece: Dikti (Crete)	**A00a**, A01b
rhodiensis PACE 1983 = *besuchetiana* PACE 1983 = *lyciorum* PACE 2002 = *taurica* PACE 1996	Greece: Rhodos; southwestern Anatolia	A99, **A01a**, A01b, A03
thryptisensis ASSING 2001	Greece: Thrypti (Crete)	**A01b**
ulcerifera ASSING 1999	Greece: Taygetos (Pelopónnisos)	**A99**, A00a, App
***Tropogastrosipalia* SCHEERPELTZ 1951** = *Chondrogastrosipalia* SCHEERPELTZ 1951		
acifera ASSING 1999	Greece: Erimanthos (Pelopónnisos)	**A99**
aculeata (COIFFAIT 1968)	Greece: Evvoia	**A99**
adunca ASSING 2004	Turkey: Kahramanmaraş	**A04a**
akceliensis ASSING 2001	Turkey: Mersin	**A01a**, A04a
apfelbecki EPPELSHEIM 1892 = *wunderlei* PACE 1996	Bosnia-Herzegovina	**App**
arganthonia PACE 1983	Turkey: Istanbul	**A00b**, A01b,
armata (EPPELSHEIM 1878) = *loebli* PACE 1983	Greece: Makedhonía, Thessalía, Ipiros	**A99**, A00a, A01b, A03
armicollis (BREIT 1917) = *tergestina* PACE 1988	NE-Italy, Croatia	**App**
artvinensis ASSING 2001	Turkey: Artvin	**A01a**
attaleensis PACE 1983	Turkey: Antalya	A00b, **A03**
balkarensis ASSING 2001	Turkey: Mersin	**A01a**
belasizaensis ZERCHE 2002	Bulgaria: Belasiza planina	**App**

species/subgenus	distribution	references
bernhaueri (BREIT 1912), sp.dub.	Romania	**App**
biokovensis PACE 1990 = *cribripennis* PACE 1990	Bosnia-Herzegovina, S-Croatia	**App**
bitlisensis ASSING 2001	Turkey: Tatvan	**A01a**
brachati ASSING 2000	Turkey: Antalya	**A00b**, A01b, A03
chyzeri (EPPELSHEIM 1883)	Slovakia, Hungary	**App**
cingarae ASSING 2003	Turkey: Muğla	**A03**
curzolae (BERNHAUER 1932)	Croatia: Korčula	**App**
falakroensis ASSING 1999	Greece: Falakró (Makedhonía)	**A99**, A00a, A01b
granulipennis ASSING 2001	Turkey: Mersin	**A01a**, A04a
hamata ASSING 2003	Turkey: Antakya	**A03**, A04a
huberi PACE 1983	Iran	**App**
hummleri (BERNHAUER 1932)	Yugoslavia: Fruška Gora	**App**
iconiensis PACE 1983	Turkey: Konya	**A00b**, A04a
ilievi ZERCHE 2002	Bulgaria: Maleschevska planina	**App**
itiensis ASSING 1999	Greece: Iti (Fthiotis)	**A99**, A01b
kartalana ASSING 2004	Turkey: Gaziantep	**A04a**
kastamonuensis PACE 1983	Turkey: Kastamonu	**A00b**
khnzoriani PACE 1983	Armenia	**App**
killiniensis ASSING 1999	Greece: Killini (Pelopónnisos)	**A99**, A00a
lunata ASSING 2001	Turkey: Mersin	**A01a**
marasica ASSING 2004	Turkey: Kahramanmaraş	**A04a**
matsakisi (Coiffait 1968)	Greece: Evvoia	**A99**, A00a, A01b
menalonensis ASSING 1999	Greece: Menalon (Pelopónnisos)	**A99**
menikioensis ASSING 1999	Greece: Menikio (Makedhonía)	**A99**, A00a, A01b
meschniggi PACE 1996	Greece: Taygetos (Pelopónnisos)	**A99**, App
meschniggiana (BERNHAUER 1936) = *pfefferi* (ROUBAL 1940)	Greece: Aroania, Panahaiko (Pelopónnisos)	**A99**, A00a
mihoki (BERNHAUER 1932) = *biharica* PACE 1990	Romania	**App**
moczarskii (SCHEERPELTZ 1951) = *peninsulaemagnesiae* PACE 1996 = *p. moczarskii* PACE 1996	Greece: Pilion (Thessalía)	**A99**
mosorica sp.n.	Croatia: Mosor planina	**App**
obtusicollis ASSING 2000	Greece: Evritania, Fthiótis	**A00a**, A01b
ossaica ASSING 2004	Greece: Ossa (Thessalía)	**A04b**
ossogovskaensis ZERCHE 2002	Bulgaria: Ossogovska planina	**App**
othrisensis ASSING 2001	Greece: Othris (Thessalía)	**A01b**
paganettiana (BERNHAUER 1936)	Bosnia-Herzegovina	**App**
pangeoensis ASSING 1999	Greece: Pangéo (Makedhonía)	**A99**, A00a, A01b, A03
parnoniensis ASSING 1999	Greece: Parnon (Pelopónnisos)	**A99**, A00a
pauli ASSING 1999	Greece: Pilion (Thessalía)	**A99**, A01b
pontica PACE 1996	Turkey: Rize	A00b
rodopensis PACE 1990	Bulgaria: Rhodope mts.	**App**
sengleti PACE 1983	Iran	**App**
siculifera ASSING 1999	Greece: Pangéo (Makedhonía)	**A99**, A00a, A01b
simulans PACE 1983	Turkey: Antakya	**A00b**, A03, A04a
sinuosa ASSING 2004	Turkey: Gaziantep	**A04a**, App

species/subgenus	distribution	references
slaviankaensis ZERCHE 2002	Bulgaria: Slavianka, Pirin	**App**
spinicollis (KRAATZ 1862) = *carinthiaca* (SCHEERPELTZ 1957) = *croatica* (EPPELSHEIM 1880) = *krapinensis* PACE 1990	SE-Austria, Slovenia, Croatia	**App**
spizzana (BERNHAUER 1932) = *maderi* PACE 1996	Yugoslavia: Montenegro	A03, **App**
taseliensis ASSING 2000	Turkey: Antalya	**A00b**
taygetana (BERNHAUER 1936)	Greece: Taygetos (Pelopónnisos)	**A99**, App
tiflisensis PACE 1996 = *amica* PACE 1996	Georgia	**App**
torisuturalis ASSING 2000	Greece: Vérno, Askio (Makedhonía)	**A00a**, App
turcica (BERNHAUER 1900)	Turkey: Istanbul	**A00b**, A01b, App
vermionensis ASSING 1999	Greece: Vermion (Makedhonía)	**A99**, A00a
winkleri (BERNHAUER 1915)	Ukraine: Crimea	A01b, **App**
winkleriana PACE 1996	Albania	A01b, **App**
xerovuniana (SCHEERPELTZ 1959)	Greece: Xerovuni Oros (Ipiros)[1]	**A99**
zercheana ASSING 1999	Greece: Erimanthos (Pelopónnisos)	**A99**
Typhlusida CASEY **1906** = *Tylosipalia* SCHEERPELTZ 1951		
flava (KRAATZ 1856) = *carnica* (SCHEERPELTZ 1958) = *ganglbaueri* (EPPELSHEIM 1887)	SE-Austria, Slovenia	**A00c**, App
rhilensis (RAMBOUSEK 1924) = *bulgarica* PACE 1983	Bulgaria	**App**
incertae sedis		
confusa ASSING 2001	Turkey: Adana	**A01a**, A03
occaecata ASSING 2004	Turkey: Gaziantep	**A04a**
scheerpeltziana (FAGEL 1966)	Lebanon	**A03**, App

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8 Zusammenfassung

Auf der Grundlage einer Untersuchung der Typen und weiteren Materials werden die bisher nicht revidierten *Geostiba*-Arten des ostmediterranen Raums, der Kaukasusregion und angrenzender Gebiete beschrieben bzw. redeskribiert und abgebildet. Fünf Arten werden erstmals beschrieben:

[1] According to ASSING (2000a), the type locality of *G. xerovuniana* is in Fthiotis. Recent queries, however, revealed that the Xerovuni Oros SCHEERPELTZ (1959) referred to is apparently in Ipiros (approximately 39°22N, 20°58E).

Geostiba (*Tropogastrosipalia*) *mosorica* **sp.n.** (Kroatien), *G.* (*Sipalotricha*) *incognita* **sp.n.** (Bulgarien), *G.* (*S.*) *extorta* **sp.n.** (Türkei), *G.* (*S.*) *gontarenkoi* **sp.n.** (Ukraine) und *G.* (*Sibiota*) *dinarica* **sp.n.** (Croatia). 21 Synonymisierungen werden vorgenommen: *Geostiba mihoki* (BERNHAUER 1932) = *G. biharica* PACE 1990, **syn.n.**; *Geostiba spinicollis* (KRAATZ 1862) = *G. croatica* EPPELSHEIM 1880, **syn.n.**, = *G. carinthiaca* SCHEERPELTZ 1957, **syn.n.**, = *G. krapinensis* PACE 1990, **syn.n.**; *G. armicollis* (BREIT 1917) = *G. tergestina* PACE 1988, **syn.n.**; *G. apfelbecki* EPPELSHEIM 1892 = *G. wunderlei* PACE 1996, **syn.n.**; *G. spizzana* (BERNHAUER 1932) = *G. maderi* PACE 1996, **syn.n.**; *G. biokovensis* PACE 1990 = *G. cribripennis* PACE 1990, **syn.n.**; *G. tiflisensis* PACE 1996 = *G. amica* PACE 1996, **syn.n.**; *G. infirma* (WEISE 1878) = *G. pacei* ZERCHE 1988, **syn.n.**; *G. cuneiformis* (KRAATZ 1856) = *G. gyorffyi* (BERNHAUER 1929), **syn.n.**, = *G. hcejkai* (ROUBAL 1932), **syn.n.**; *G. oertzeni* (EPPELSHEIM 1888) = *G. tenenbaumi* (BERNHAUER 1940), **syn.n.**; *G. zoufali* (RAMBOUSEK 1915) = *G. optima* PACE 1983, **syn.n.**; *G. samai* PACE 1977 = *G. coiffaiti* PACE 1983, **syn.n.**; *G. meixneri* (BERNHAUER 1910) = *G. mostarensis* PACE 2002, **syn.n.**; *G. weiratheri* PACE 1984 = *G. behnei* ZERCHE 2002, **syn.n.**; *G. carinicollis* (EPPELSHEIM 1878) = *G. medea* PACE 1996; **syn.n.**; *G. kobrisensis* PACE 1996 = *G. crucis* PACE 1996, **syn.n.**; *G. rhilensis* (RAMBOUSEK 1924) = *G. bulgarica* PACE 1983, **syn.n.**; *G. cingulata* (EPPELSHEIM 1878) = *G. tbilisensis* PACE 1996, **syn.n.** Die Identität von drei Arten bleibt zweifelhaft, da sie bisher nur durch Weibchen vertreten sind: *G.* (*Tropogastrosipalia*) *bernhaueri* (BREIT), *G. (T.) huberi* PACE und *G.* (*Sibiota*) *zerchei* PACE 1996. Für drei Arten ändert sich die Untergattungszugehörigkeit: *G. zerchei* PACE (ex *Lioglutosipalia* SCHEERPELTZ) wird zu *Sibiota* CASEY, *G. arida* (EPPELSHEIM) (ex *Trachyglutosipalia* SCHEERPELTZ) und *G. cingulata* (EPPELSHEIM) (ex *Chondridiosipalia*) werden beide zu *Sipalotricha* SCHEERPELTZ gestellt. Für folgende Namen werden Lectotypen designiert: *Homalota spinicollis* KRAATZ, *H. chyzeri* EPPELSHEIM, *H. croatica* EPPELSHEIM, *Leptusa arida* EPPELSHEIM, *L. bituberculata* EPPELSHEIM, *L. carinicollis* EPPELSHEIM, *L. cingulata* EPPELSHEIM, *Sipalia mihoki* BERNHAUER, *S. hummleri* BERNHAUER, *S. paganettiana* BERNHAUER, *S. spizzana* BERNHAUER, *S. deubeli* BERNHAUER, *S. kocsii* BERNHAUER, *S. stussineri* BERNHAUER, *S. bernhaueri* BREIT, *S. armicollis* BREIT, *S. hcejkai* ROUBAL, *S. carinicollis krzysztofi* ROUBAL, *S. carinthiaca* SCHEERPELTZ und *Geostiba apfelbecki* EPPELSHEIM. Zahlreiche weitere Nachweise bereits revidierter Arten werden aus dem Untersuchungsgebiet gemeldet. Insgesamt umfasst die derzeit bekannte *Geostiba*-Fauna des Gebiets 136 Arten; die mit Abstand höchste Diversität wurde für die Türkei (44 Arten) und Griechenland (42) festgestellt. Ein Katalog der Arten, eine Bestimmungstabelle sowie 11 Verbreitungskarten für ingesamt 27 Arten werden erstellt.

9 References

ÁDÁM L. & G. HEGYESSY (2001): Adatok a Zempléni-hegység, a Hernád-vögly, a Bodrogköz, a Rétköz és a Taktaköz holyvafaunájához (Coleoptera). — Sátoraljaújhely: 249 pp.

ASSING V. (1999): A revision of the species of *Geostiba* THOMSON 1858 from Greece and Cyprus (Coleoptera, Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **31** (2): 845-928.

ASSING V. (2000a): A revision of the species of *Geostiba* THOMSON 1858 and *Paraleptusa* PEYERIMHOFF 1901 of Greece: Supplement I, including some species from Albania, Macedonia, Bulgaria, and Turkey (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **32** (2): 1007-1031.

ASSING V. (2000b): The Turkish species of *Geostiba* s. str. THOMSON 1858 (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **32** (2): 1033-1042.

ASSING V. (2000c): On some species of *Geostiba* THOMSON, 1858 from the eastern Alps (Coleoptera: Staphylinidae, Aleocharinae). — Koleopterol. Rundsch. **70**: 79-85.

ASSING V. (2001a): A revision of the Turkish species of *Geostiba* THOMSON 1858 and *Tropimenelytron* PACE 1983 (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **33** (1): 137-185.

ASSING V. (2001b): A revision of the species of *Geostiba* THOMSON of the Balkans and Turkey. V. New species, a new synonym, new combinations, and additional records (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **33**: 686-707.

ASSING V. (2003): A revision of the species of *Geostiba* THOMSON of the Eastern Mediterranean. VI. (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **35** (1): 103-129.

ASSING V. (2004a): A revision of the Turkish species of *Geostiba* THOMSON. V. New species and additional records (Coleoptera: Staphylinidae, Aleocharinae). — Linzer biol. Beitr. **36** (2): 615-638.

ASSING V. (2004b): New species and records of Staphylinidae from Greece (Insecta: Coleoptera). — Linzer biol. Beitr. **36** (2): 593-613.

BERNHAUER M. (1909): Beitrag zur Staphylinidengattung *Sipalia*. — Entomol. Bl. **5**: 102-104.

BERNHAUER M. (1910a): Beitrag zur Staphylinidenfauna des palaearktischen Gebietes. — Entomol. Bl. **6**: 256-260.

BERNHAUER M. (1910b): Zur Staphylinidenfauna des palaearktischen Gebietes. — Soc. Entomol. **25**: 71-72, 78-79.

BERNHAUER M. (1914): Beiträge zur Kenntnis der paläarktischen Staphyliniden-Fauna. — Münch. Koleopterol. Z. **4**: 1-10.

BERNHAUER M. (1915): Beiträge zur Kenntnis der paläarktischen Staphyliniden-Fauna. IV. — Münch. Koleopterol. Z. **4**: 262-270.

BERNHAUER M. (1929): Neue Kurzflügler des paläarktischen Gebietes. — Koleopterol. Rundsch. **14**: 177-195.

BERNHAUER M. (1932): Neuheiten der paläarktischen Staphylinidenfauna. — Koleopterol. Rundsch. **17** (1931): 232-245.

BERNHAUER M. (1936): Neuheiten der palaearktischen Staphylinidenfauna. 1. — Pubbl. Mus. Entomol. "Pietro Rossi" Duino **1**: 237-254.

BERNHAUER M. (1940): Neuheiten der palaearktischen Staphylinidenfauna (Col. Staph.). — Mitt. Münch. Entomol. Ges. **30**: 622-642.

BIRÓ L. (1883): Adatok Zemplén megye természetrajzi ismeretéhez. (II. Dr. Chyzer Kornél gyűjteményének bogarai.) — A magyar orvosok és természetvizsgálók 1882. aug. 23-tól aug. 27-ig Debreczenben tartott XXII. vándorgyűlésének történeti vázlata és munkálatai. Budapest: 195-232.

BREIT J. (1912): Beitrag zur Kenntnis der paläarktischen Coleopterenfauna. — Entomol. Mitt. **1**: 199-203.

BREIT J. (1917): Beitrag zur Kenntnis der europäischen Käferfauna. — Coleopterol. Rundsch. **10**/12: 68-73.

BURAKOWSKI B., MROCZKOWSKI M. & J. STEFAŃSKA (1981): Katalog fauny Polski Część XXIII, tom 8 (Nr. 37 Katalogu fauny Polski). Chrząszcze Coleoptera. Kusakowate – Staphylinidae, Część 3: Aleocharinae. — Warszawa: Państowe Wydawnictwo Naukowe, 330 pp.

EPPELSHEIM E. (1878a): Neue Staphylinen. — Stettiner entomol. Zeitschr. **39**: 417-424.

EPPELSHEIM E. (1878b): Staphylinidae. — In: SCHNEIDER O. & H. LEDER, Beiträge zur Kenntniss der kaukasischen Käferfauna. — Verh. naturforsch. Ver. Brünn **16** (1877): 90-131.

EPPELSHEIM E. (1880): *Homalota* (*Geostiba*) *croatica* EPPELSHEIM n. sp., pp. 208-209. — In: REITTER E.: Coleopterologische Ergebnisse einer Reise nach Croatien, Dalmatien und der Herzegowina im Jahre 1879. — Verh. zool.-bot. Ges. Wien **30**: 201-228.

EPPELSHEIM E. (1881): 4. *Leptusa arida* EPPELSHEIM n. sp., pp. 191-193. — In: REITTER E., Neue und seltene Coleopteren, im Jahre 1880 in Süddalmatien und Montenegro gesammelt und beschrieben. — Deutsche Entomol. Zeitschr. **25**: 177-229.

EPPELSHEIM E. (1883a): pp. 207-208 [description of *Homalota chyzeri*]. — In: BIRÓ L., Adatok Zemplén megye természetrajzi ismeretéhez. (II. Dr. Chyzer Kornél gyűjteményének bogarai.) — A magyar orvosok és természetvizsgálók 1882. aug. 23-tól aug. 27-ig Debreczenben tartott XXII. vándorgyűlésének történeti vázlata és munkálatai. Budapest: 195-232.

EPPELSHEIM E. (1883b): Neue Staphylinen der österreichisch-ungarischen Monarchie und der angrenzenden Länder. — Wiener Entomol. Z. **2**: 270-272.

EPPELSHEIM E. (1892): Neue Staphylinen der österreichisch-ungarischen Monarchie und der angrenzenden Länder. — Wiener Entomol. Z. **11**: 289-297.

FAGEL G.A. (1966): Contribution à la connaissance des Staphylinidae. XCII. Espèces nouvelles ou méconnues de la méditerranée orientale. — Bull. Ann. Soc. R. Entomol. Belg. **102**: 21-55.

JÁSZAY T. (1994): Rare and endangered species of beetles (Coleoptera) of Bukovske Vrchy Mts. in protected area in the Eastern Carpathians in Slovakia [translation of Slovakian title]. — Roczniki Bieszczadzkie **3**: 109-117.

JÁSZAY T. & J. KODADA (1997): Faunistic records from Slovakia. Coleoptera - Staphylinidae, Dryopidae. — Entomol. Problems **28**: 24-25.

KRAATZ G. (1856): Naturgeschichte der Insekten Deutschlands. Bd. 2. Staphylinii. — Berlin, 1-376.

KRAATZ G. (1862): Beiträge zur europäischen Käfer-Fauna. — Berl. Entomol. Zeit. **6**: 263-272.

MOTSCHULSKY V. (1858): Énumeration des nouvelles espèces de Coléoptères rapportés de ses voyages. — Bull. Soc. Imp. Nat. Moscou **31**: 204-264.

PACE R. (1983a): Nuove specie europee ed asiatiche del genere *Geostiba* THOMSON (Coleoptera Staphylinidae). — G. it. Entomol. **1**: 129-139.

PACE R. (1983b): Specie del genere *Geostiba* THOMSON raccolte dal Dr. C. Besuchet e collaboratori in Marocco, nella Penisola Iberica e Balcanica, e nel Medio Oriente (Coleoptera, Staphylinidae). — Revue suisse Zool. **90**: 3-46.

PACE R. (1984): Nuove Aleocharinae microftalme mediterranee e dell'Iran, del Muséum d'Histoire naturelle di Ginevra (Coleoptera Staphylinidae). — Arch. Sc. Genève **37**: 211-219.

PACE R. (1988): Nuove specie italiane del genere *Geostiba* THOMSON (Coleoptera, Staphylinidae). — Ann. Mus. Civ. Stor. Nat. G. Doria **87**: 9-29.

PACE R. (1990): Nuove specie e sottospecie del genere *Geostiba* THOMSON. 93° contributo alla conoscenza delle Aleocharinae (Coleoptera, Staphylinidae). — Mém. Mus. natn. Hist. nat. (A) **147**: 115-154.

PACE R. (1996): Descrizione di nuove specie e sottospecie del genere *Geostiba* (Coleoptera, Staphylinidae). — Boll. Assoc. Rom. Entomol. **50** (1995): 7-43.

PACE R. (2002): Nuove specie del genere *Geostiba* THOMSON (Coleoptera Staphylinidae) - 152° Contributo alla conoscenza delle Aleocharinae. — Boll. Mus. Civ. Stor. Nat. Verona **26**: 3-25.

RAMBOUSEK F.G. (1915): *Sipalia Zoufali* n. sp. — Coleopterol. Rundsch. **4**: 110-111.

RAMBOUSEK F.G. (1924-1925): Une espèce nouvelle de *Sipalia* de Bulgarie. — Čas. Čsl. Spol. Entomol. **21** (1924): 68; (1925): 69.

ROUBAL J. (1913): Przyczynek do fauny rodziny kusokrywków (Staphylinidae) północnego Kaukazu. — Kosmos, Lwów **38**: 477-487.

ROUBAL J. (1924): Zur Käferfauna der Ost-Karpathen (Čorná Hora). II. Staphylinidae. — Entomol. Blätter **20**: 244-247.

ROUBAL J. (1932): Eine neue *Sipalia*-Art aus der Slovakei: *Sipalia H. Čejkai* m. — Entomol. Nachrbl. **6**: 83-84.

SCHEERPELTZ O. (1951): Die neue Systematik der Gattung *Sipalia* Muls. Rey (Col. Staphylinidae). — Verh. Zool.-Bot. Ges. Wien **92**: 166-180.

SCHEERPELTZ O. (1957): Die Bodenfauna eines während der Eiszeit persistierenden Buchenwaldes am Südhang der Koralpe. II. Teil. Die von Major a. D. Emil Hölzel und Oberstleutnant a. D. Ludwig Strupi in den südlichsten Teilen des Koralpen-Massives aufgefundenen neuen Arten von Staphyliniden (Col.). — Carinthia II **67**: 127-139.

SMETANA A. (1973): Die *Leptusa*-Arten der Tschechoslovakischen Republik einschließlich Karpatorußlands (Col., Staphylinidae). — Stuttgarter Beitr. Naturk., Ser. A, **255**: 1-46.

SMETANA A. (2004): Aleocharinae; pp. 353-494. In: LÖBL I. & SMETANA A. (eds.): Catalogue of Palaearctic Coleoptera. II. Hydrophiloidea - Histeroidea - Staphylinoidea. — Stenstrup, 924 pp.

WEISE J. (1878): *Homalota infirma* Weise n. sp., pp. 38-40. In: REITTER E.: Beitrag zur Coleopteren-Fauna der Carpathen. — Deutsche Entomol. Zeitschr. **22**: 33-64.

ZERCHE L. (1988): Zur Taxonomie der Gattung *Geostiba* THOMSON, 1858 (Coleoptera, Staphylinidae, Aleocharinae). — Beitr. Entomol., Berlin **38**: 155-168.

ZERCHE L. (1999): Zur Identität von *Leptusa cuneiformis* KRAATZ, 1856 (Coleoptera, Staphylinidae, Aleocharinae). — Entomol. Blätter **95**: 65-69.

ZERCHE L. (2002): *Geostiba*-Arten aus Bulgarien (Coleoptera: Staphylinidae: Aleocharinae). — Beitr. Entomol., Keltern **52**: 205-224.

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