

A revision of the genus *Heinzia* Korge, 1971 (Coleoptera: Staphylinidae: Quediina), with description of a new species and its probable larva

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Abstract

Palearctic genus *Heinzia* Korge, 1971 is revised. Redescription and illustrations are provided for distinguishing the genus *Heinzia* from other genera of the subtribe Quediina Kraatz, 1857. *Heinzia caucasica* Gusarov & Koval, **sp. nov.** from the Caucasus, commonly found in caves, is described. A key to species of *Heinzia* is provided. Probable larva of *H. caucasica* is described.

Key words: Coleoptera, Staphylinidae, Quediina, *Heinzia*, taxonomy, new species, cave fauna, identification key, larva

Introduction

The genus *Heinzia* was described by Korge (1971) to accommodate a new species, *H. variabilis* Korge, from Turkey. Korge proposed a key to distinguish *Heinzia* from related genera, among them *Beeria* Hatch, 1957 and *Strouhalium* Scheerpeltz, 1972.

Smetana (1977) provided a key for identification of Holarctic genera of the tribe Quediini Kraatz, 1857.

Solodovnikov (1998) reported *H. variabilis* from the Western Caucasus. This record is considered here to be a misidentification.

In this paper we describe a new species of *Heinzia* from the Caucasus, redescribe the genus and provide a key to species. We also describe the larva which probably belongs to *H. caucasica*.

Depositories

AKCS – collection of Dr. Alexander Koval (St. Petersburg)
ASCC – collection of Dr. Alexey Solodovnikov (Chicago)
ASCO – collection of Dr. Aleš Smetana (Ottawa)
HKCB – collection of Dr. Horst Korge (Berlin)
KSEM – Snow Entomological Collection, University of Kansas, Lawrence
SPSU – Department of Entomology, St. Petersburg State University, St. Petersburg
ZINAS – Zoological Institute, St. Petersburg

***Heinzia* Korge, 1971 (Figs. 1-48)**

Heinzia Korge, 1971: 33.

Heinzia: Smetana, 1977: 181.

Heinzia: Coiffait, 1978: 284.

Heinzia: Smetana, 1995: 131.

Heinzia: Herman, 2001: 3054.

Diagnosis. *Heinzia* can be distinguished from other genera of the subtribe Quediina by the combination of the following characters: head on disc with dense punctation; antennae filiform with all segments longer than wide, first article shorter than second and third combined, penultimate article 1.3 times as long as wide (Fig. 12); segments of labial palpus glabrous, last segment cylindrical, 1.5 times as long as second (Fig. 5); pronotum on disc with numerous scattered punctures (Figs. 10-11), with 3 (in some specimens 2 or 4) punctures in dorsal row; prothoracic hypomera inflected and invisible in lateral view; female abdominal tergum 10 is split in two lateral lobes devoid of setae and bears sclerotized and setose medial process protruding posteriorly beyond posterior margin of the lateral lobes (Figs. 33-35).

Heinzia is most closely related to *Strouhalium* Scheerpeltz, 1962 and *Beeria* Hatch, 1957 (Korge 1971; Smetana 1977, 1995).

Heinzia differs from *Beeria* in having prothoracic hypomera invisible in lateral view, numerous punctures in lateral portions of pronotum, protarsi equally dilated in both sexes, entire paramere, and modified female abdominal tergum 10.

Heinzia differs from *Strouhalium* in having glabrous segments of labial palpus (Smetana 1995) and modified female abdominal tergum 10.

Description. Length 8.5-11.5 mm. Body from brownish black to black, legs brown with lighter tarsi and black inner surface of tibia, mouthparts and bases of antennal segments brown to brownish red.

Head as long as wide, on disc with dense punctation except in anterior impunctate portion (Figs. 8-9), eyes slightly shorter than temples; infraorbital ridge absent; gular sutures

separate. All antennal articles longer than wide, first article shorter than second and third combined, article 10 - 1.3 times as long as wide, last article 1.7-1.8 times as long as wide (Fig. 12). Labrum strongly transverse, with deep medial emargination and strong setae at anterior margin (Fig. 2). Adoral surface of labrum (epipharynx) densely covered with very fine setae, at anterior margin with dense row of long setae (Fig. 1). Mandibles slender with double tooth at inner margin (Fig. 3). Fourth segment of maxillary palpus fusiform, 5.5 times as long as wide, and 1.8 times as long as third (Fig. 4). Ligula with apical emargination, labial palpus glabrous, third segment 1.5 times as long as second (Fig. 5). Lateral area of prementum with three pores and single spinose pore (Fig. 5). Hypopharyngeal lobes as in Fig. 6. Mentum strongly transverse, with slightly concave anterior margin (Fig. 7).

Pronotum on disc with dense scattered punctation (Figs. 10-11). Dorsal rows with 3 (in some specimens 2 or 4) punctures, hard to distinguish from scattered punctures. Prothoracic hypomera inflected, invisible in lateral view. Proepisterna large. Mesosternal process sharp, 0.4-0.5 times as long as mesocoxal cavity. Tarsi shorter than tibiae. All tibiae spinose. Tarsal formula 5-5-5, tarsal segments setose dorsally. Protarsal segments 1-4 dilated equally in both sexes. First segment of metatarsus as long as second and third combined, last segment much longer than first (Fig. 13). Two long empodial setae present. Wings fully developed.

Abdominal tergum 7 with wide white palisade fringe. Male sternum 8 with medial emargination (Figs. 14-17). Female tergum 10 split into two broad lateral lobes (LL; Figs. 33, 35), the lobes poorly sclerotized and devoid of setae. Long sclerotized and setose medial process (MP; Figs. 33, 35) attached at basis of tergum where the lobes meet and extended posteriad beyond margin of the lobes (Figs. 33-35).

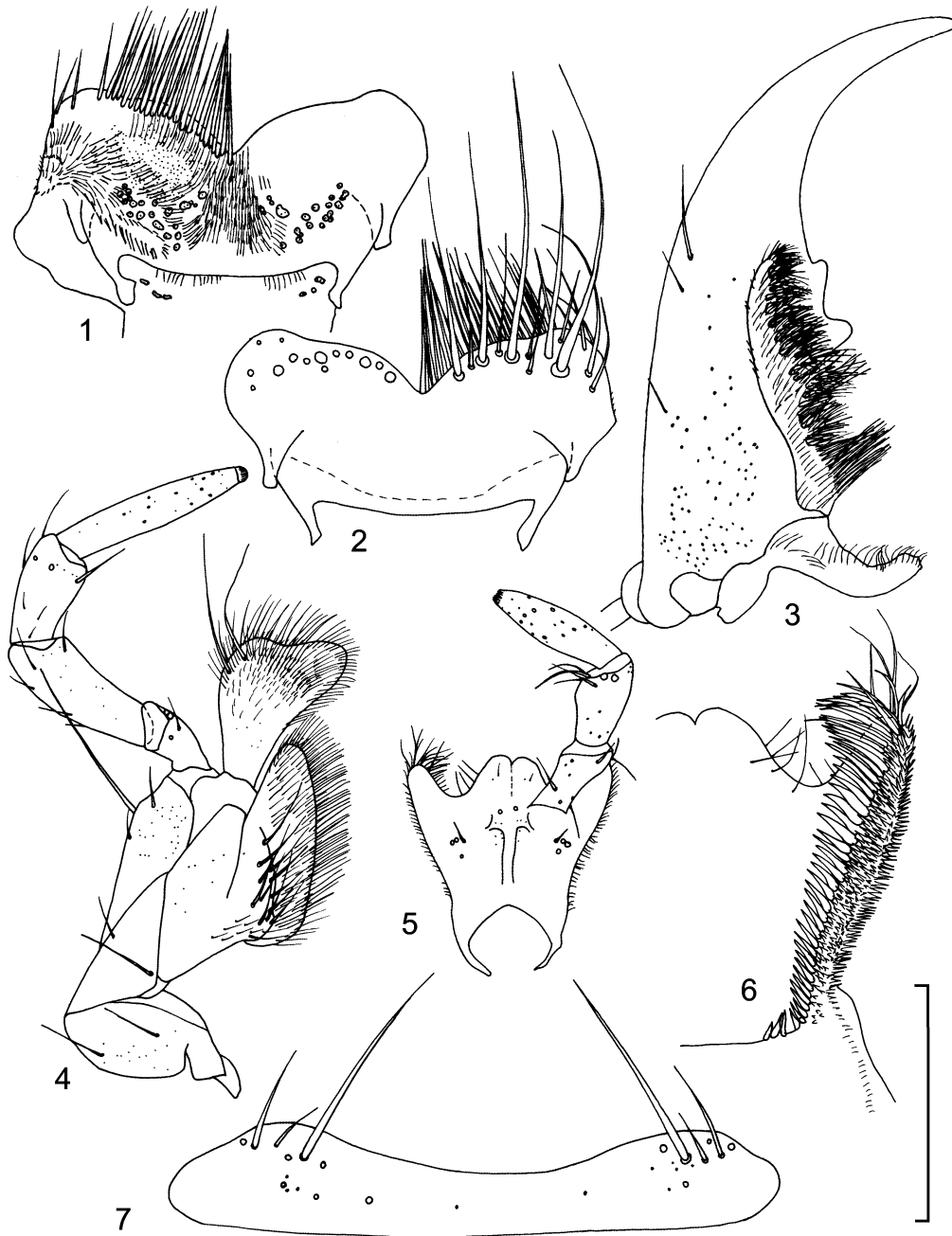
Median lobe of aedeagus straight (in lateral view) (Figs. 21, 23), with single subapical tooth on ventral surface (Figs. 24, 26). Paramere with 15-20 peg-like setae (Figs. 25, 27). Internal sac with single basal diverticulum (Figs. 21, 23). Aedeagus at rest with basal orifice facing left.

Type species. *Heinzia variabilis* Korge, 1971, by original designation.

Key to species of *Heinzia*.

- 1(2) Pronotum with denser punctation and without extensive impunctate areas (Fig. 10). Impunctate area on head restricted to anterior margin of the disc (Fig. 8). Median lobe of aedeagus with more obtuse subapical tooth (in lateral view) (Figs. 28-31). Female abdominal tergum 10 with shorter medial process (Fig. 33). Known from the Caucasus..... 1. *H. caucasica* Gusarov & Koval, **sp. nov.**
- 2(1) Pronotum with less dense punctation and with extensive impunctate areas (Fig. 11). Impunctate area on head extended posteriorly to the center of the disc (Fig. 9). Median lobe of aedeagus with sharper subapical tooth (in lateral view) (Fig. 32).

Female tergum 10 with longer medial process (Fig. 34). Known from North-Eastern Turkey 2. *H. variabilis* Korge



FIGURES 1-7. Mouthparts of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (paratype from Baribana cave). 1 – epipharynx; 2 – labrum; 3 – left mandible, dorsal view; 4 – right maxilla, ventral view; 5 – prementum; 6 – hypopharynx, left portion not shown; 7 – mentum. Scale bar 0.4 mm (1-5), 0.2 mm (6-7).

1. *Heinzia caucasica* Gusarov & Koval, sp. nov. (Figs. 1-8, 10, 12-14, 16, 18, 20-21, 24-25, 28-31, 33, 35)

Heinzia variabilis: Solodovnikov, 1998: 16 (misidentification).

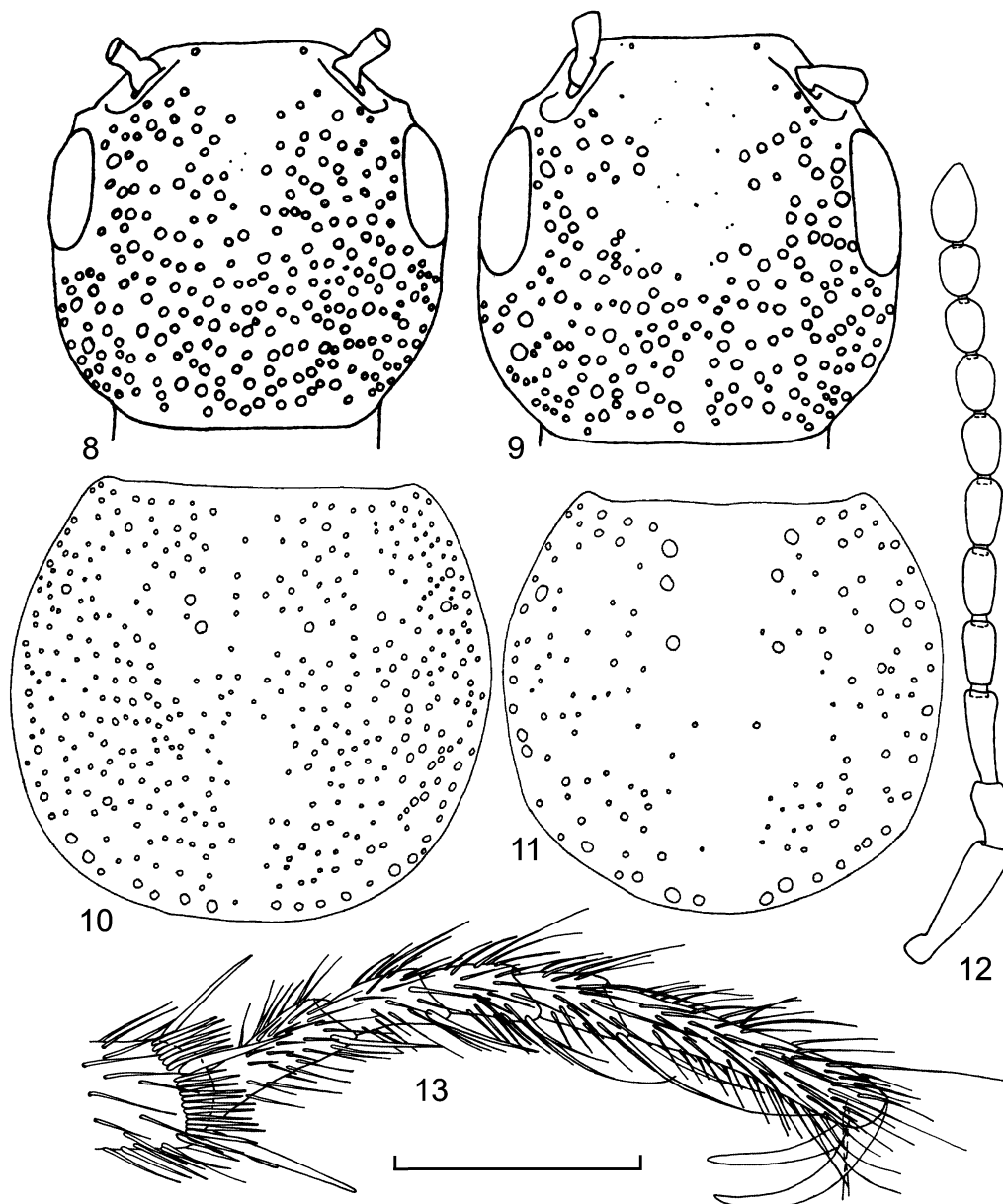
Type material. Holotype: Russia: Krasnodar Terr.: ♂, Sochi, Alek Mountain Ridge, Baribana Cave, 740 m (A.G.Koval) 22.viii.1996 (ZINAS).

Paratypes: **Russia:** Krasnodar Terr.: 3♂♂, 5♀♀, 1 specimen (with missing abdomen), Sochi, Alek Mountain Ridge, Baribana Cave, traps, 740 m (A.G.Koval), 4.vi.1995-7.v.1996 (AKCS, ASCC, SPSU); 2♂♂, 5♀♀, ditto but 19.viii.1997-9.v.1998 (SPSU); ♂, ♀, ditto but 19.viii.1998-18.viii.1999 (SPSU); 3♀♀, ditto but 21.viii.2000-16.viii.2001 (AKCS, SPSU); ♂, ditto but (I.A.Solodovnikov), 16-27.vi.1999 (ASCC); ♀, Sochi, Alek Mountain Ridge, Sokolova (=Atsinskaya) Cave, traps, 300 m (A.G.Koval), 11.v-21.viii.1998 (SPSU); 2♂♂, ♀, ditto but 21.viii.1998 (SPSU); ♂, ♀, 1 specimen (with missing apex of abdomen), Sochi, Dolgaya Cave, traps, 720 m (A.G.Koval), 3.v-19.viii.1998 (SPSU); 11♂♂, 40♀♀, ditto but 19.viii.1998-11.vi.1999 (AKCS, ASCO, KSEM, SPSU, ZINAS); ♂, ditto but 11.vi-16.viii.1999 (SPSU); 3♀♀, Sochi, Vorontsovskaya Cave Complex, Labirintovaya Cave, traps, 550 m (A.G.Koval), 13.viii.1994-20.v.1995 (SPSU); ♂, 5♀♀, 1 specimen (without mesometathorax and abdomen), ditto but 20.viii.1996-17.viii.1997 (SPSU); 4♀♀, ditto but 17.viii.1997-2.v.1998 (SPSU); ♂, Mezmay (E.A.Khachikov), vii.1991 (SPSU); ♂, SE Krasnaya Polyana, Western portion of Aïbga Mountain Ridge, 1400-1800 m (V.Savitsky) 23.viii.1995 (ASCC); Daghestan: ♂, SSW Akhty, W of Shalbudzagh (V. & M.Savitsky), 3-4.vii.1994 (ASCC); **Georgia:** ♂, Lagodekhi Nature Reserve, 800 m (M.Kozlov), 1.viii.1989 (SPSU).

Diagnosis. In comparison with *H. variabilis*, in *H. caucasica* the disc of pronotum has denser punctation and no extensive impunctate areas (Figs. 10, 11); on head impunctate area is restricted to anterior margin of the disc (Fig. 8) and does not extend posteriorly to the center of the disc as in *H. variabilis* (Fig. 9). Additionally, *H. caucasica* differs from *H. variabilis* in having more obtuse subapical tooth of median lobe of aedeagus (Figs. 28-31, 32) and shorter medial process of female tergum 10 (Figs. 33, 34).

Description. Length 8.5-11.5 mm. Body from brownish black to black, legs brown with lighter tarsi and black inner surface of tibia, mouthparts and bases of antennal segments brown to brownish red.

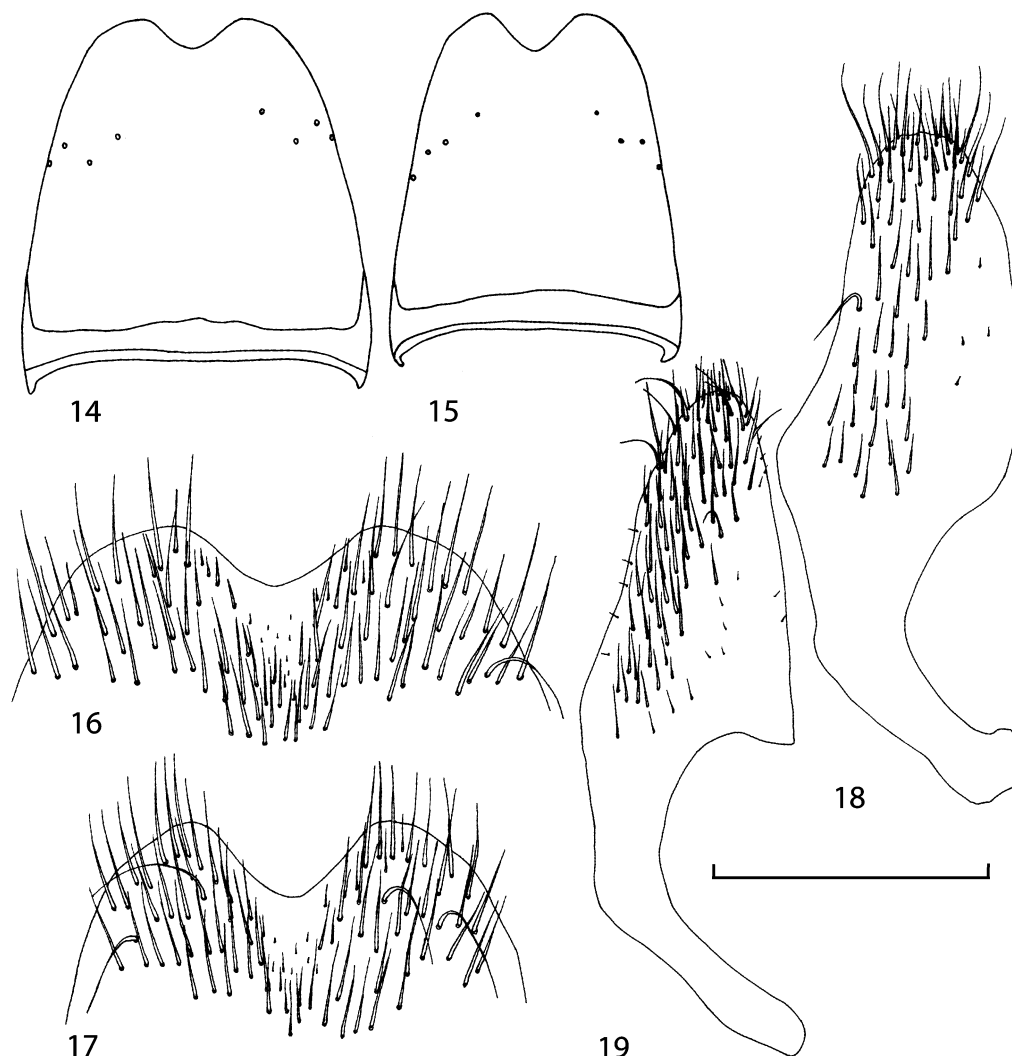
Head as long as wide; on disc with dense punctation except impunctate area near anterior margin (Fig. 8); with microsculpture consisting of strongly transverse meshes, medially meshes weakly transverse or isodiametric. Posterior frontal puncture closer to posterior margin of eye than to posterior margin of head. Temples 1.1-1.2 times longer than eyes (in dorsal view). All antennal articles longer than wide, first article shorter than second and third combined, second twice as long as wide, third 2.8 times, 4th-6th 1.9-2.0, 7th 1.7, 8th-9th 1.4, 10th 1.3, last article 1.8 times as long as wide (Fig. 12).



FIGURES 8-13. Details of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (8, 10, holotype; 12-13, paratype from Baribana cave) and *H. variabilis* Korge (9, Kalkanlı Dağları; 11, holotype). 8-9 – head; 10-11 – pronotum; 12 – left antenna; 13 – right metatarsus. Scale bar 1 mm (8-12), 0.4 mm (13).

Pronotum 1.1 times as wide as long; on disc with dense scattered punctation without extensive impunctate areas (cf. Figs. 10 and 11); dorsal rows with 3 (in some specimens 2 or 4) punctures; punctures of sublateral rows indistinguishable from scattered punctures;

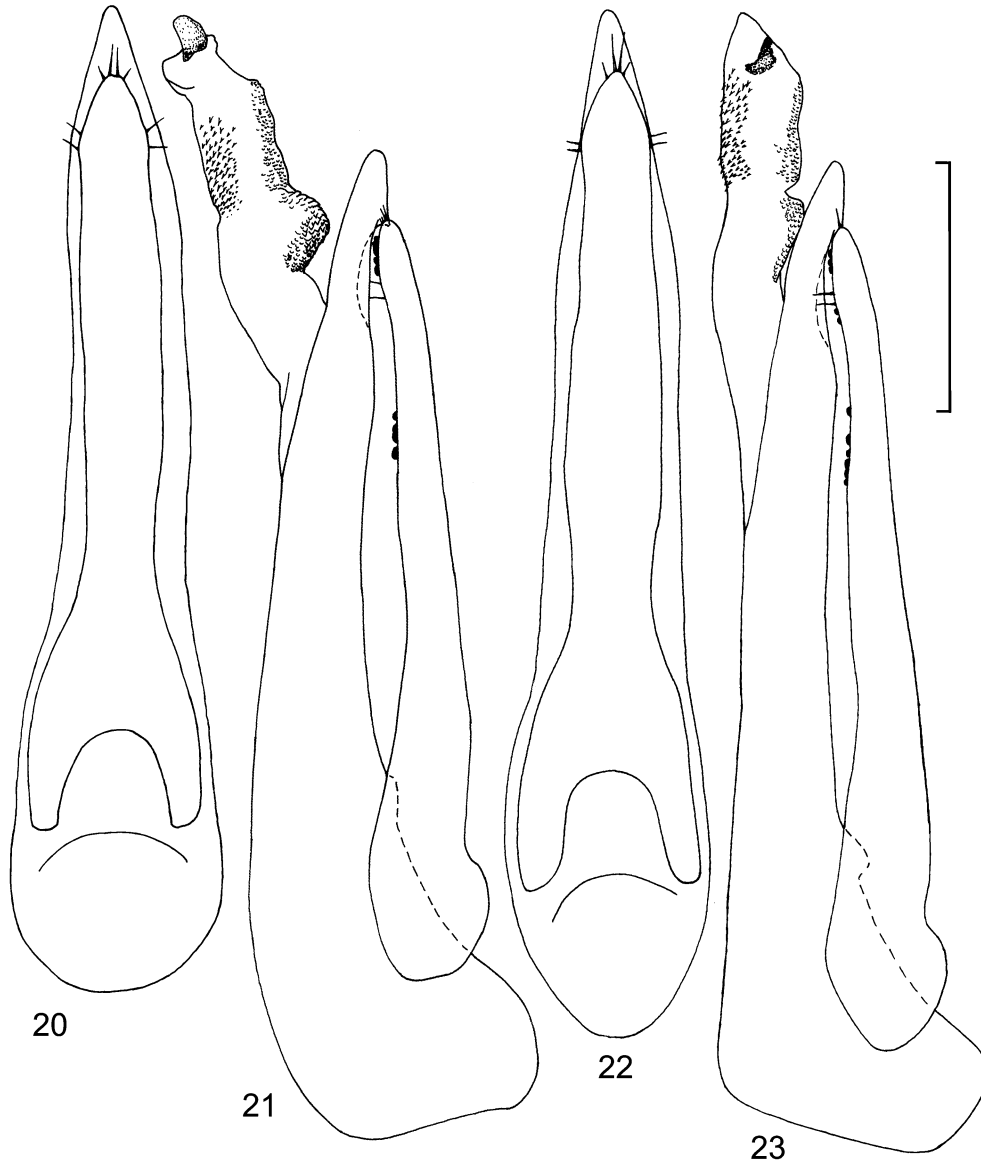
microsculpture consists of isodiametric or slightly transverse meshes. Elytra (measured from humeral angle) 1.4 times as long as pronotum, 1.1 times as long as wide; punctation as on pronotum, distance between punctures equal to their diameter; without visible microsculpture (at 70x). Wings fully developed.



FIGURES 14-19. Details of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (14, 16, 18, paratype from Dolgaya cave) and *H. variabilis* Korge (15, 17, 19, Kalkanlı Dağları). 14-15 – male sternum 8; 16-17 – apex of male sternum 8; 18-19 – male sternum 9. Scale bar 1 mm (14-15), 0.5 mm (16-19).

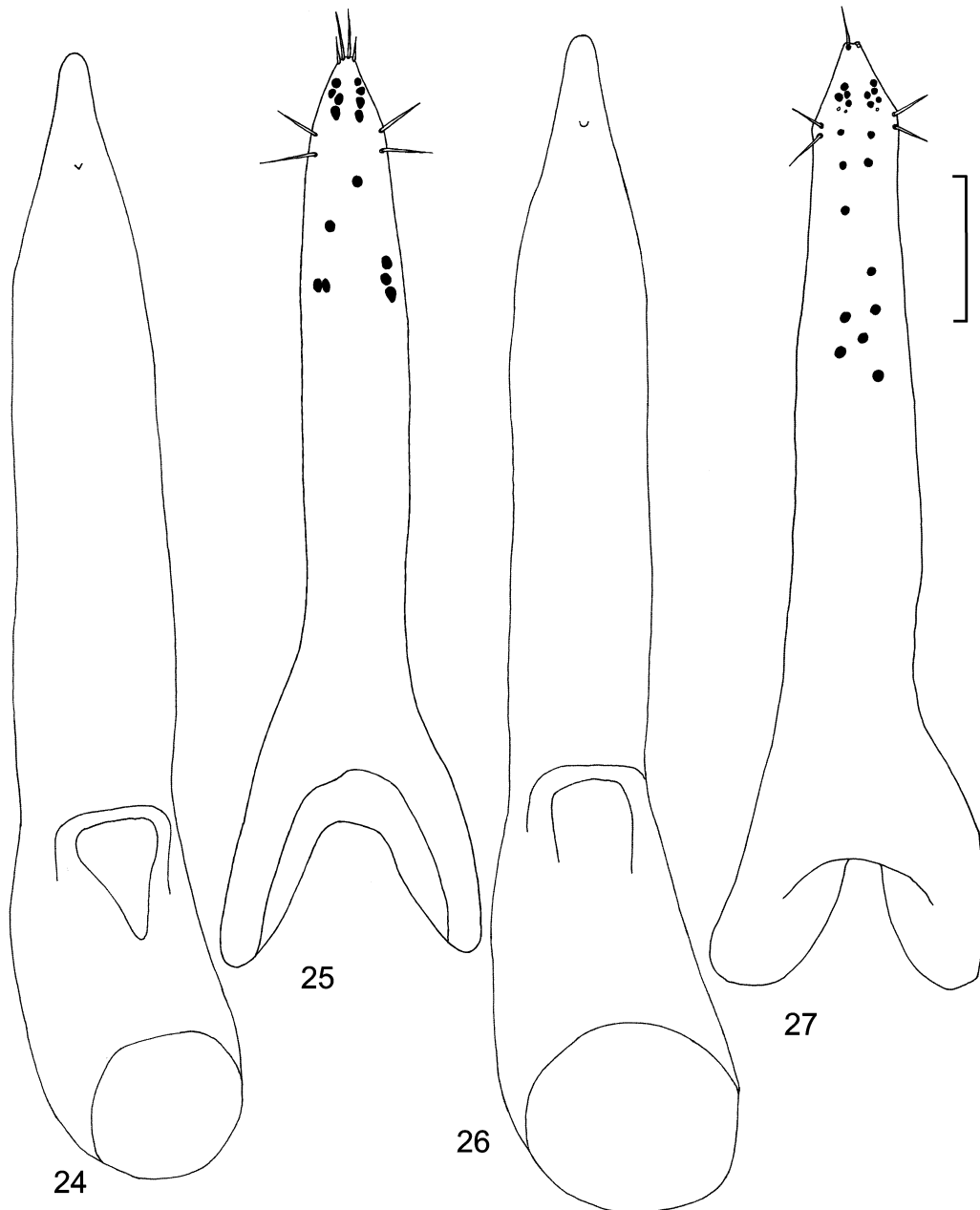
Abdominal terga covered with black semierect microsetae; with very fine microsculpture consisting of transverse waves; punctation finer than on elytra, distance between punctures equals 1-3 times their diameter. Abdominal tergum 7 with wide white palisade

fringe. Posterior margin of male sternum 7 concave. Male sternum 8 with medial emargination (Figs. 14, 16). Female tergum 10 split into two broad lateral lobes (Fig. 33), the lobes poorly sclerotized and devoid of setae. Long, sclerotized and setose medial process attached at basis of tergum where the lobes meet, and extends posteriad beyond margin of the lobes (Fig. 33).



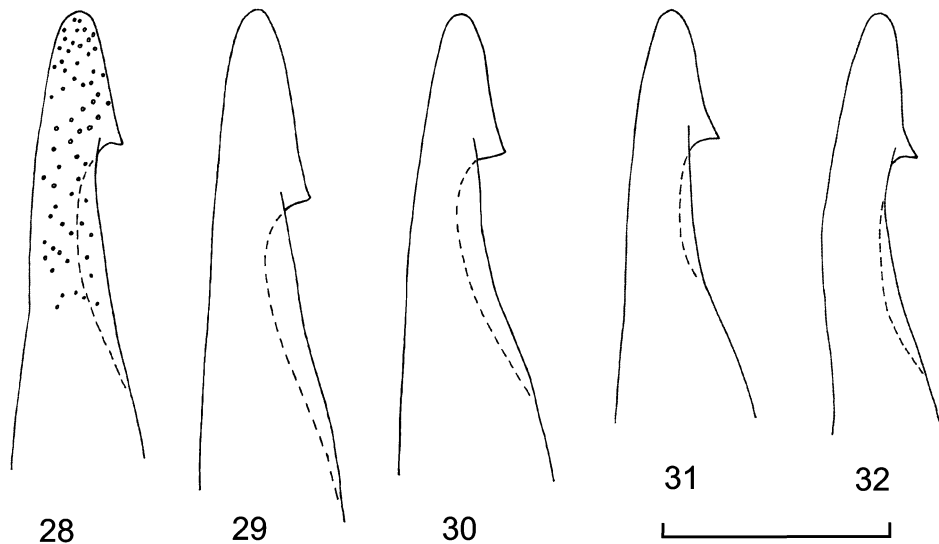
FIGURES 20-23. Aedeagus of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (20-21, paratype from Mezmay) and *H. variabilis* Korge (22-23, Kalkanlı Dağları). 20, 22 – ventral view; 21, 23, lateral view. Scale bar 0.4 mm.

Median lobe of aedeagus with single subapical tooth on ventral surface (Figs. 21, 24, 28-31). Paramere with 15-20 peg-like setae (Fig. 25). Internal sac with single basal diverticulum (Fig. 21).



FIGURES 24-27. Details of aedeagus of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (24-25, holotype) and *H. variabilis* Korge (26-27, holotype). 24, 26 – median lobe, ventral view; 25, 27, paramere. Scale bar 0.2 mm.

Discussion. In most groups of staphylinids the characters of genitalia are more useful for distinguishing close species than external characters. Our examination of available series of *H. caucasica* demonstrated that in this species the aedeagus is subject to significant variation. The shape of paramere, the arrangement of peg-like setae and the distance between the apex of median lobe and the subapical tooth (see Figs. 28-31) vary, like in some species of the genus *Quedius* Stephens, 1829. The only difference in male genitalia between the two species of *Heinzia*, that we were able to find, is somewhat sharper subapical tooth of median lobe of aedeagus in *H. variabilis*. On the other hand, the density of punctation of the head and pronotum displays relatively little variation and allows to distinguish between *H. caucasica* and *H. variabilis*. The presence of the clear gap in punctation between the beetles from the Caucasus and Turkey implies that these allopatric populations represent different species.



FIGURES 28-32. Apex of median lobe of aedeagus (lateral view) of *Heinzia caucasica* Gusarov & Koval, *sp. nov.* (28, paratypes from Mezmay; 29-30, Baribana cave; 31, Akhty) and *H. variabilis* Korge (32, Kalkanlı Dağları). Scale bar 0.2 mm.

Distribution. *Heinzia caucasica* is known from the Caucasus (Main Caucasian Ridge (Glavnyy Kavkazskiy Ridge) from Krasnodar Territory in the West to Daghestan in the East; altitudes 300-1800 m) (Fig. 48).

Natural History. Big series of *H. caucasica* were collected in caves by the second author who used pitfall traps, as described by Barber (1931), but with some modifications. The traps were filled with 1:1 solution of ethylene-glycol and beer, and baited with old cheese and sausage suspended above the liquid.

As a cave dweller, *H. caucasica* apparently belongs to the group of troglophiles, defined by Racovitza (1907) as inhabitants of caves and different kinds of large and small subterranean caverns, including hollows under big boulders. Unlike troglobiontic species, the troglophiles occasionally occur outside.

The four caves where the specimens of *H. caucasica* were collected are situated in the Sochi area of the Western Caucasus and have plenty of water. Three caves (Sokolova, Dolgaya and Labirintovaya Caves) are remarkable for having subterranean brooks or even a river (Sokolova Cave). Baribana Cave has no brooks but it is still very moist and has many pools as a result of water dripping from the ceiling and trickling down the walls and the floor. It is in the wettest parts of the caves that the specimens of *H. caucasica* were collected. The air temperature in the four caves is similar and fluctuates annually between 8.0 and 11.5 °C.

Despite intensive sampling no specimens of *H. caucasica* were collected in other visited caves of the Sochi area (Partizanskaya, Muzeynaya, Kolokolnaya and Beloskalskaya Caves). These caves are relatively dry, have no subterranean brooks or strong drippings, and apparently do not provide suitable habitats for hygrophilous *H. caucasica*.

Outside caves the beetles were collected only occasionally (single specimens). It is possible that outside *H. caucasica* inhabits the caverns between stones in deeper layers of talus-like creek banks, the typical habitat of *Beeria* (Smetana 1977).

2. *Heinzia variabilis* Korge, 1971 (Figs. 9, 11, 15, 17, 19, 22-23, 26-27, 32, 34)

Heinzia variabilis Korge, 1971: 33.

Heinzia variabilis: Coiffait, 1978: 284.

Heinzia variabilis: Herman, 2001: 3054.

Type material. Holotype: ♂, **Turkey:** Kaçkar-Dağları near Iliça, valley of Ardesen (Ayder) 1000-1600 m (Korge & Heinz) (2.viii.1965) (HKCB). Paratype: ♀, the same data as the holotype (HKCB).

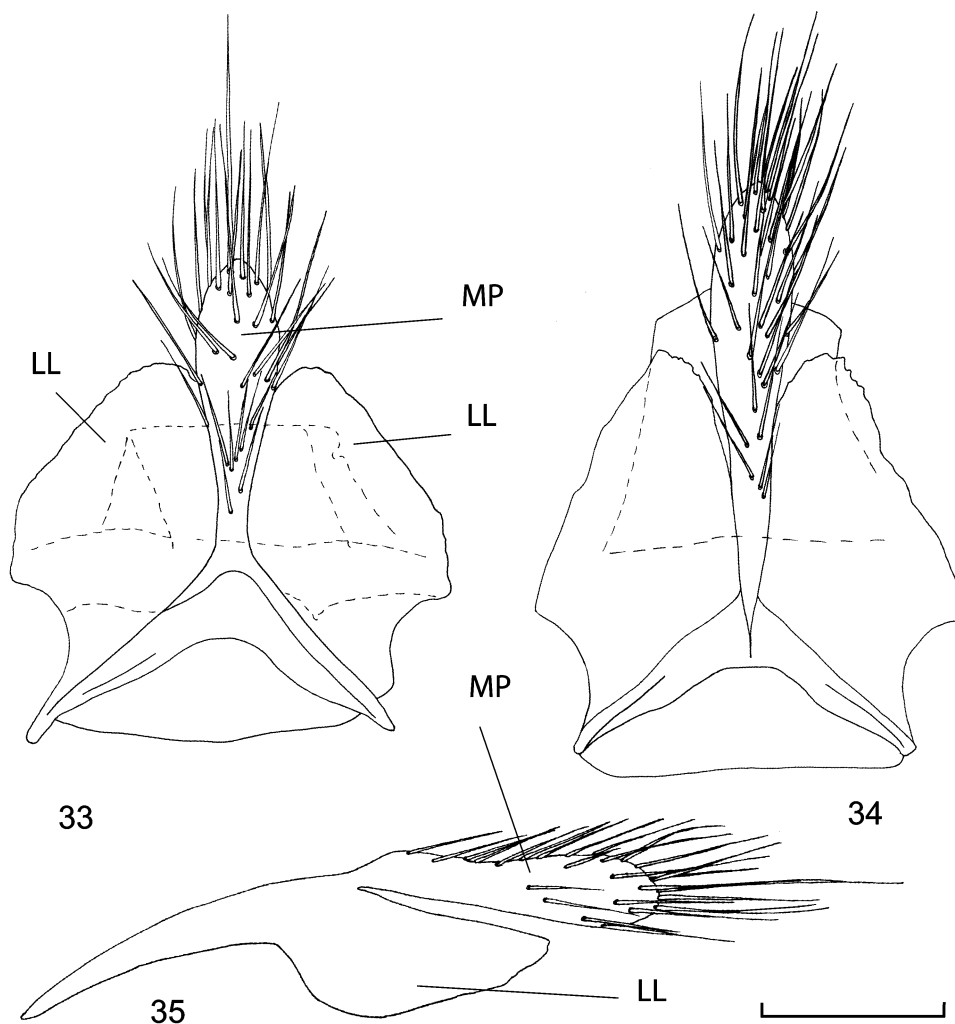
Additional material. **Turkey:** ♀, Palandöken-Dağ, S of Erzerum, 2200 m, under stone near a creek bank (Heinz), 27.vii.1967 (HKCB); ♀, Riza, valley of Firtina, 1400 m (Vít), vii.1976 (ASCO); ♂, Trabzon, Kalkanlı Dağları, NW slopes, 8 km E of Zigana Pass, 1900-2100 m, alpine zone (A.Solodovnikov), 9.vi.1999 (ASCC).

Diagnosis. *Heinzia variabilis* is very similar to *H. caucasica* and can be most reliably distinguished from the latter by less dense pronotal punctation and extensive impunctate areas of the disc (Figs. 11, 10). Additionally, in *H. variabilis* impunctate area on the head is more extensive, reaching the center of the disc (Fig. 9) (in *H. caucasica* the impunctate area is restricted mostly to anterior margin of the disc (Fig. 8)). *Heinzia variabilis* also differs from *H. caucasica* in having sharper subapical tooth of median lobe of aedeagus (Figs. 32, 28-31) and longer medial process of female tergum 10 (Figs. 34, 33).

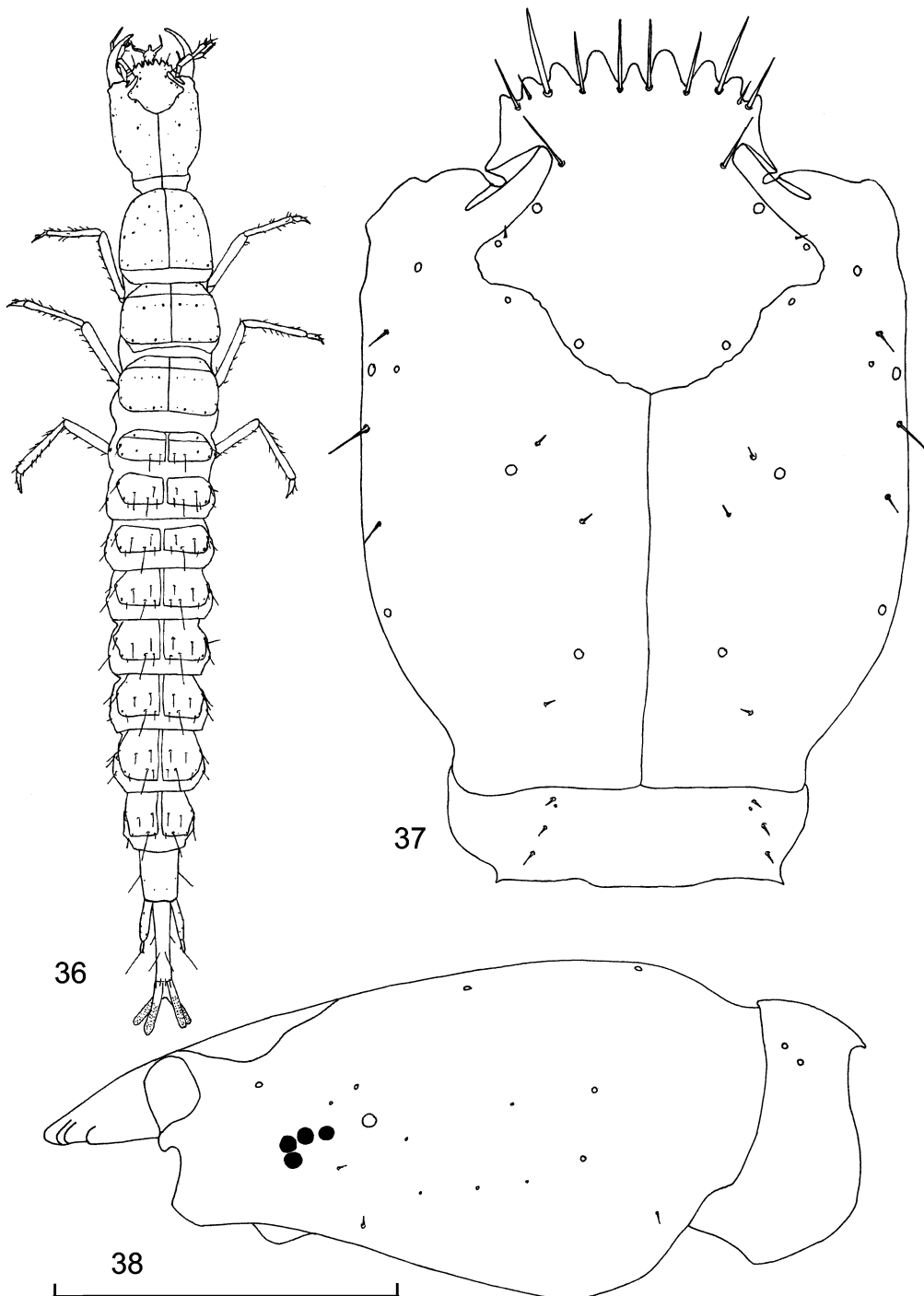
Discussion. Number and position of punctures in dorsal rows and distribution of scattered punctation on the disc of pronotum varies in both *H. variabilis* (Korge 1971) and *H. caucasica*. However, there is a significant gap in overall density of punctation between the two species (Figs. 10-11).

Distribution. *Heinzia variabilis* is known from North-Eastern Turkey (altitude of 1000-2200 m) (Fig. 48).

Natural History. One of the specimens of *H. variabilis* was found under stone near a creek (Korge 1971). Another specimen (from Zigana Pass) was collected under deeply immersed stone at a creek bank (Solodovnikov, personal communication).



FIGURES 33-35. Details of female tergum 10 of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (33, 35, Baribana cave) and *H. variabilis* Korge (34, paratype). 33-34 – dorsal view; 35 – lateral view; LL – lateral lobe of female tergum 10; MP – medial process of female tergum 10. Scale bar 0.3 mm.



FIGURES 36-38. Details of probable larva of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (Baribana cave). 36 – habitus, dorsal view; 37 – head, dorsal view, 38 – head, lateral view. Scale bar 5 mm (36), 0.8 mm (37-38).

Description of the larva which probably belongs to *H. caucasica* (Figs. 36-47)

Discussion. No rearing experiments have been conducted, but a few quediine larvae were regularly collected in the cave pitfall traps together with adults of *H. caucasica*. The following arguments support the hypothesis that these larvae belong to the same species as the adults.

1. These staphylinine larvae clearly belong to the subtribe Quediina because they have urogomphi shorter than pygopod (Figs. 36, 47) (Kasule 1970; Newton 1990). The larvae are similar to some described larvae of the genus *Quedius* (Beier 1928; Paulian 1941; Smetana 1957, 1962; Pototskaya 1967; Frank 1969; Kasule 1970) in having 2-segmented urogomphi (Figs. 36, 47) and protibiotarsus with a comb composed of split setae arranged in a row (Figs. 43-44) (Kasule 1970; Newton 1990).

2. The presumed last instar larvae are similar to adults of *H. caucasica* in body length (11.2-14.0 mm in L3, 8.5-11.5 mm in adults) and in average size of the head capsule (1.24 mm in L3, 1.45 mm in adults).

3. The larvae were repeatedly collected in the caves together with adults of *H. caucasica* during several years of continuous sampling with pitfall traps.

4. Some species of the genus *Quedius* are known to occur in caves and were indeed collected in caves by the second author, for example, *Q. fulgidus* (Fabricius, 1793) in the Crimea, and *Q. mesomelinus* (Marsham, 1802) in Moldavia. However, despite extensive sampling by the second author no adults of *Quedius* have ever been collected in the caves where adults of *H. caucasica* were found.

Because the larvae of *Heinzia* have never been described it seems useful to give a short description of the larvae found in association with adults of *H. caucasica*. Since, unfortunately, the larvae are not in the best condition and also many setae are missing, the chaetotaxy is not described in details. The setae and pores were drawn as far as visible, but it was often impossible to distinguish setal sockets with missing setae from asetose pores.

Material. Russia: Krasnodar Terr.: 3 last instar larvae, 1 second instar larva, Sochi, Alek Mountain Ridge, Baribana Cave, traps, 740 m (A.G.Koval), 19.viii.1997-9.v.1998; 1 last instar larva, ditto but 4.vi.1995-7.v.1996; 3 last instar larvae, Sochi, Vorontsovskaya Cave Complex, Labirintovaya Cave, traps, 550 m (A.G.Koval), 13.viii.1994-20.v.1995; 3 first instar larvae, Sochi, Dolgaya Cave, traps, 720 m (A.G.Koval), 19.viii.1998-11.vi.1999 (SPSU).

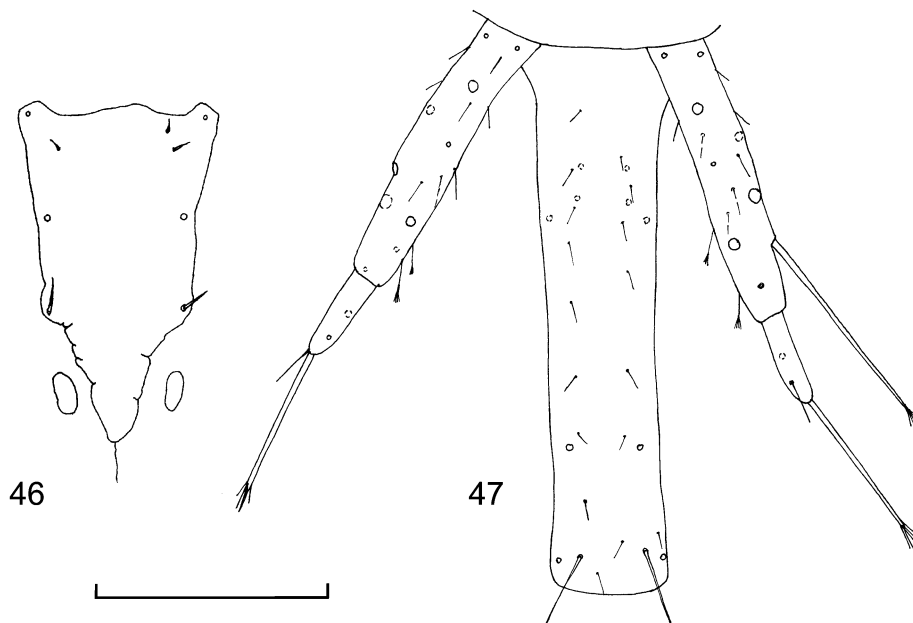
Diagnosis. The larvae found in association with *H. caucasica* are compared below with a few quediine genera for which the larvae are known. However, of all quediine genera recorded from the Western Caucasus the larvae of *H. caucasica* resemble in body size only *Quedius*.



FIGURES 39-45. Details of probable larva of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (Baribana cave). 39 – prementum; 40 – left mandible, dorsal view; 41 – left antenna; 42 – left maxilla, ventral view; 43 – protibiotarsus; 44 – apex of protibiotarsus; 45 – nasale. Scale bar 0.2 mm (39-43, 45), 0.1 mm (44).

The larvae of *H. caucasica* are most similar to some larvae of the genus *Quedius*, especially of the subgenus *Microsaurus* Dejean, 1833. The larvae of *Heinzia* were com-

pared with the larvae of Nearctic *Quedius* (*Microsaurus*) *capucinus* (Gravenhorst, 1806) and with published descriptions of many Palearctic species of *Quedius* (Beier 1928; Paulian 1941; Smetana 1957, 1962; Pototskaya 1967; Frank 1969; Kasule 1970). Larvae of *Heinzia* and *Quedius* share the following characters: four stemmata (Fig. 38), protibiotarsus with well developed comb (Figs. 43-44), labial palpus with two segments (Fig. 39) and maxillary palpus with three segments (Fig. 42). The larvae of *Heinzia* can be distinguished from known larvae of *Quedius* by having third article of maxillary palpus 1.4 times as long as second (Fig. 42) (less than 1.4 in *Quedius*). The species of *Quedius* with relatively long last article of maxillary palpus (1.3 times as long as second) can be distinguished from *H. caucasica* as follows: in *Q. picipes* (Mannerheim, 1830) (Pototskaya 1967; Frank, 1969; Kasule 1970) stalk of gula is longer and more narrow (than in *H. caucasica*), tibiotarsal comb with 8-10 bifid spines (10-12 in *H. caucasica*), first segment of urogomphi 4 times as long as second (3 in *H. caucasica*); in *Q. longicornis* Kraatz, 1857 (Paulian 1941) tibiotarsal comb with 7 bifid spines, first segment of urogomphi 3.9 times as long as second; in *Q. plagiatus* Mannerheim, 1843 (Pototskaya 1967) medial denticle of nasale almost as long as adjacent denticles, tibiotarsal comb with 7 bifid spines, first segment of urogomphi 2.5 times as long as second; in *Q. alpestris* (Heer, 1839) (Smetana 1962) tibiotarsal comb with 4 bifid spines, first segment of urogomphi 4 times as long as second, stalk of gula is longer and more narrow; in *Q. boops* (Gravenhorst, 1802) (Kasule 1970) tibiotarsal comb with 4 bifid spines.



FIGURES 46-47. Details of probable larva of *Heinzia caucasica* Gusarov & Koval, **sp. nov.** (Barribana cave). 46 - gula; 47 - pygopod and urogomphi. Scale bar 1 mm (46), 0.5 mm (47).

The larvae of *Heinzia caucasica* differ from known larvae of the genus *Heterothops* Stephens, 1829 (Paulian 1941; Kasule 1970) in having tibiotarsus with well developed comb (absent in *Heterothops*), last segment of maxillary palpus longer than penultimate (shorter in *Heterothops*), larger body (11-14 mm in *Heinzia*, 6 mm in *Heterothops*).

The larvae of *H. caucasica* differ from known larvae of the genus *Velleius* Leach, 1819 (Paulian 1941; Kasule 1970) in having well developed tibiotarsal comb (absent in *Velleius*) and smaller body (11-14 mm in *Heinzia*, 17-20 mm in *Velleius*).

The larvae of *H. caucasica* differ from presumed larvae of the genus *Euryporus* Erichson, 1839 (Kasule 1970) in having 2-segmented urogomphi (1-segmented in *Euryporus*).

Description. Length of the last instar larvae 11.2-14.0 mm, average head width 1.24 mm (0.99 mm in L2, 0.79 mm in L1).

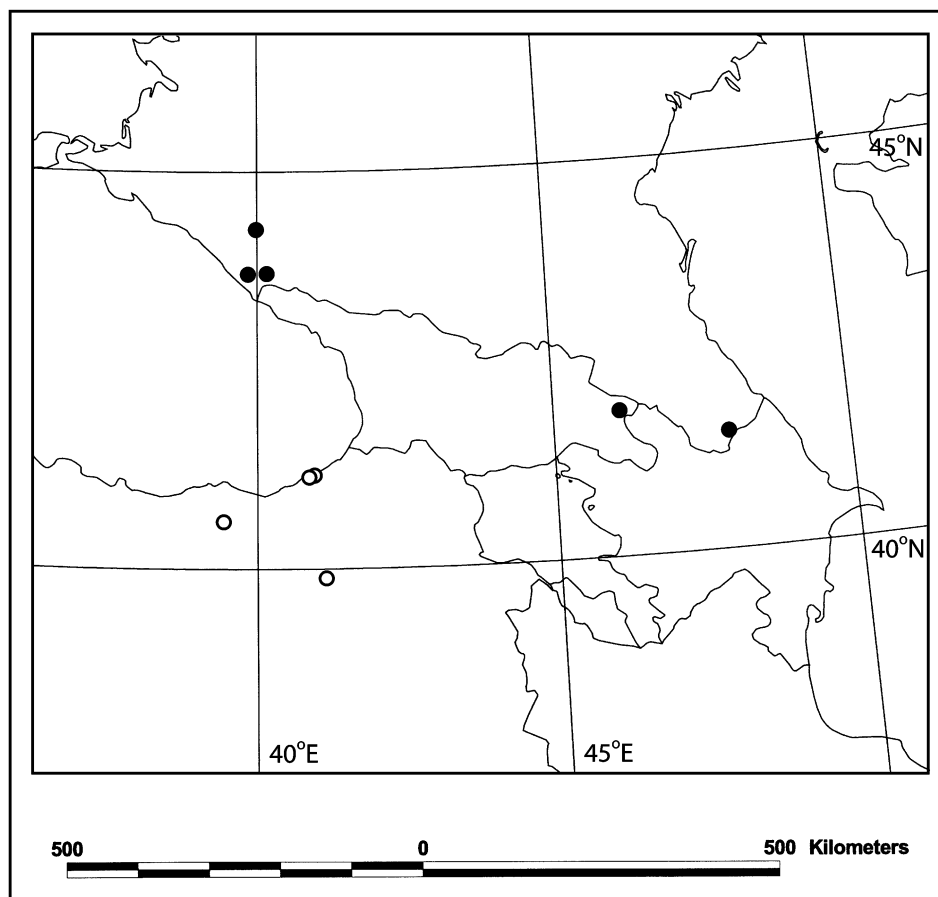


FIGURE 48. Geographical distribution of *Heinzia* Korge. Solid circles – *H. caucasica* Gusarov & Koval, *sp. nov.*; open circles – *H. variabilis* Korge.

Four stemmata (three forming horizontal line, and one below) (Fig. 38). Antennae with four articles, second and third almost equally long, twice as long as first and fourth (Fig. 41). Nasale with 9 denticles, medial denticle half as long as two adjacent ones (Figs. 37, 45). Gula as in Fig. 46. Mandibles falciform, with smooth inner margin (Fig. 40). Maxillary palpus with three segments, third segment 1.4 times as long as second, second 1.6 times as long as first (Fig. 42). Labial palpus with two segments, first segment 1.2 times as long as second (Fig. 39).

Protibiotarsus with comb consisting of 10-12 bifid spines (9-11 in close row and 1-3 somewhat isolated) (Figs. 43-44). Ungulus with 3 setae (Fig. 43).

Abdomen, urogomphi and pygopod with frayed setae. Pygopod 1.4 times as long as urogomphi (Fig. 47). First segment of urogomphi 3 times as long as second (Fig. 47).

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