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## On new carabids of the genus *Carabus* L. (Coleoptera, Carabidae) from the Caucasus. 3rd contribution

by A. S. Zamotajlov

Abstract: Three new subspecies of the genus *Carabus* L. from the Caucasus are described: *C. (Archiplectes) Komarowi vediensis* n. ssp. (W Svanetia), *C. (Archiplectes) kratkyi solodovnikovi* n. ssp. (NW Caucasus), and *C. (Archiplectes) juentheneri atchibachi* n. ssp. (Abkhazia).

Key words: Coleoptera Carabidae – Caucasus – *Carabus* – new subspecies – taxonomy.

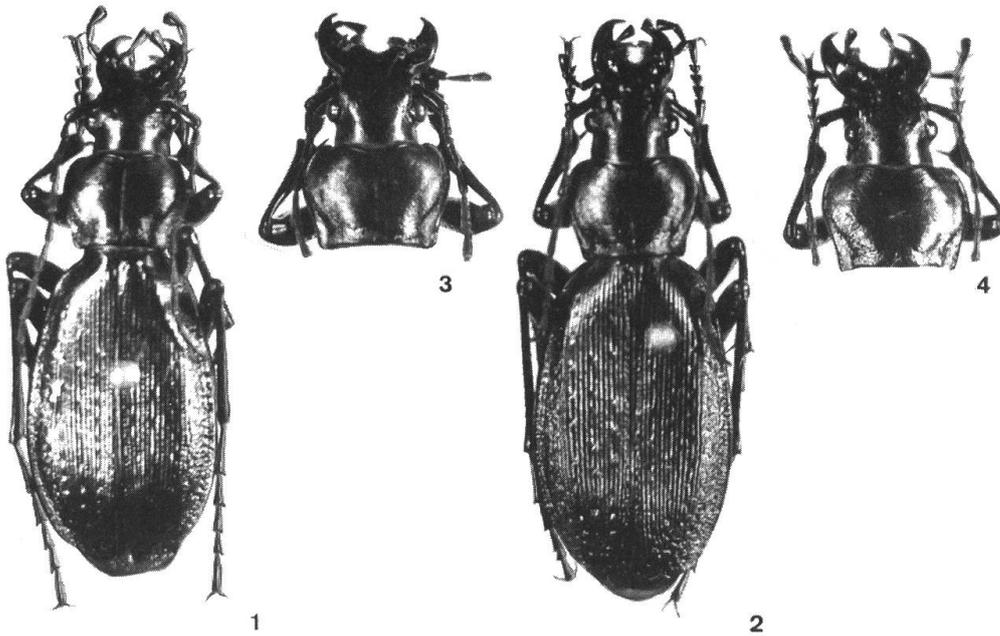
Below I give a description of three hitherto unrecognized *Carabus*-subspecies from Krasnodar Province (Russian Federation) and Republic of Georgia, basing on the materials collected chiefly by the members of the section of the Entomological Society in Krasnodar in 1991. I acknowledge the assistance of my colleagues Dr A.I. Miroshnikov, Mr A.Yu. Solodovnikov, and Mr V.I. Shchurov, all of Krasnodar, who collected the materials during expeditions to the mountains together with me. I am grateful to Dr I.A. Belousov of St. Petersburg for the possibility to study his materials on *Carabus* and highly appreciate his advice, and I am also grateful to Mr V.V. Grebennikov of Rostov-on-Don for borrowing me some specimens of *Carabus* from Abkhazia. The materials treated herein have been shared with the collections of the Zoological Institute of the USSR Academy of Sciences, St. Petersburg (ZISP), the Natural History Museum, Basel (NHMB), A. S. Zamotajlov and A.I. Miroshnikov, Krasnodar (AZ & AM), I.A. Belousov, St. Petersburg (IB), and V.V. Grebennikov, Rostov-on-Don (VG).

### 1. *Carabus (Archiplectes) komarowi vediensis* n.ssp.

Figs 1, 2, 5, 13, 20, 21, 31.

Habitus (Figs. 1, 2). Length 22.6 – 32.1 mm. Black, elytra, pronotum, and head bronze, greenish bronze or bronze-violet.

Body slender. Pronotum cordate, 1.18 – 1.33 times as long as wide. Elytra oblong-oval, 1.69 – 1.81 times as wide as long, interspaces usually fine, almost equally elevated, sometimes the primary and secondary interspaces overhung stronger than the tertiary ones; elytral apex nearly rounded in males and angulate in females; epipleura emarginate at apex in females (Fig. 13). Aedeagus (Figs 20, 21) resembles greatly that of nomynotypical subspecies, copulatory pieces (Fig. 31)



Figs 1 – 4: 1, 2. General view of *Carabus komarowi vediensis* n. ssp.: 1, paratype, male. 2, paratype, female. 3, 4. Head and pronotum of *C. komarowi komarowi* Reitt.: 3, male from the valley of Inguri near Khaishi. 4, female, same locality.

composed of two rather broad sclerites of the normal for the *komarowi*-complex shape.

Holotype: ♂ (ZISP), Svanetia, valley of the river Vedura n. Zeda Vedi, 1000-1200 m, 10. V.– 3. VII. 1991, A. Zamotajlov & A. Miroshnikov. Paratypes, 4 ♂ & 6 ♀ (NHMB); 2 ♂ ♀ (ZISP); 17 ♂ 34 ♀ (AZ & AM); 4 ♂ ♀ (IB), same locality, together with holotype. 1 ♀ (AZ & AM), same locality, 1200 m, 10. V. 1991, A. Zamotajlov. 12 ♂ & 6 ♀ (AZ & AM), same locality, 1100 m, 11.V. 1991, A. Zamotajlov & A. Miroshnikov.

The new subspecies differs from the nomynotypical one in comparatively smaller and more slender body (Fig. 5), usually less transverse pronotum (Figs 1-4), stronger emarginate apical part of epipleura in females (Figs 12, 13), in relatively shorter and broader apical lamella of aedeagus (viewed laterally, s. Figs 18-21), and somewhat broader, usually fairly divergent towards apex copulatory pieces with broader median membranous desclerotized stripe (Figs 30, 31).

According to the materials examined by the author, *C. komarowi komarowi* Reitt. occurs strictly northwards or westwards of the valley of Inguri (from Utwir Mt Range to the valley of Nenskra), at Extremity of Svanetian Mt Range being substituted by the form *rebelis* Reitt. (NO-

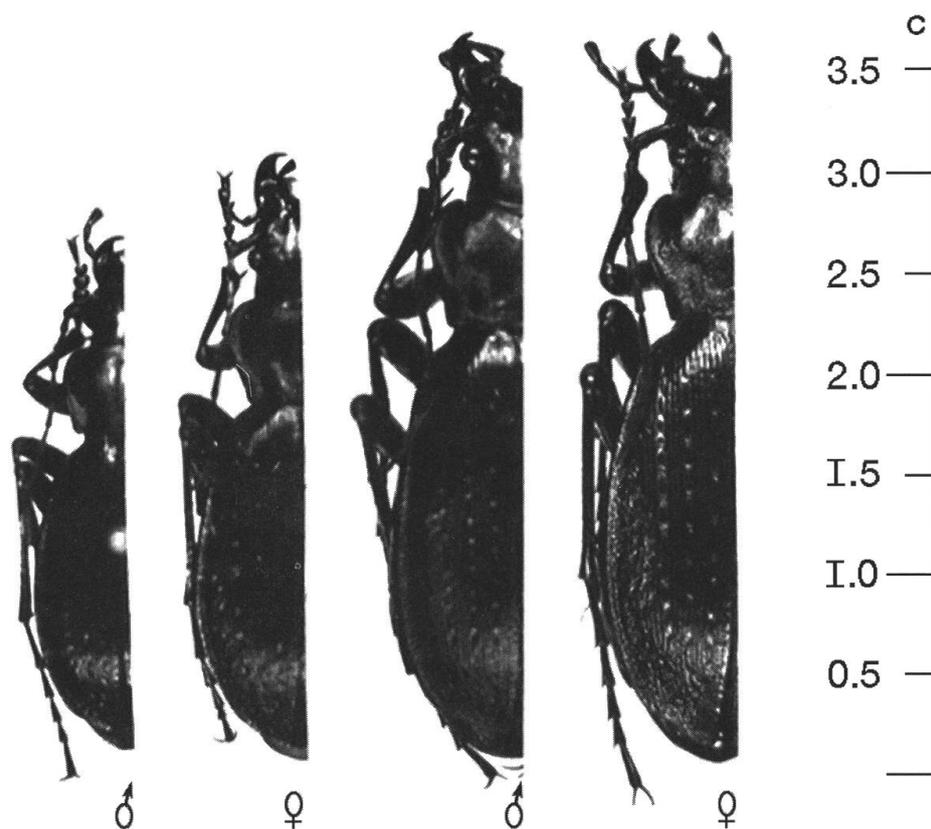


Fig. 5. Differences in average body sizes of *Carabus komarowi* Reitt. –subspecies from W Svanetia.

VOTNÝ & VOŘIŠEK, 1988). The new subspecies inhabits SW periphery of the *komarowi*-complex range; as it has been collected at both banks of Vedura, it seems possible this form to be distributed at W extremity of Svanetian Mt Range and northern slopes of W Egriss Mt Range. Southwards it is substituted by the forms of the *protensus*-complex; eastwards transitional populations between the new and nomynotypical subspecies (or probably *C. rebelis* Reitt.) can be found.

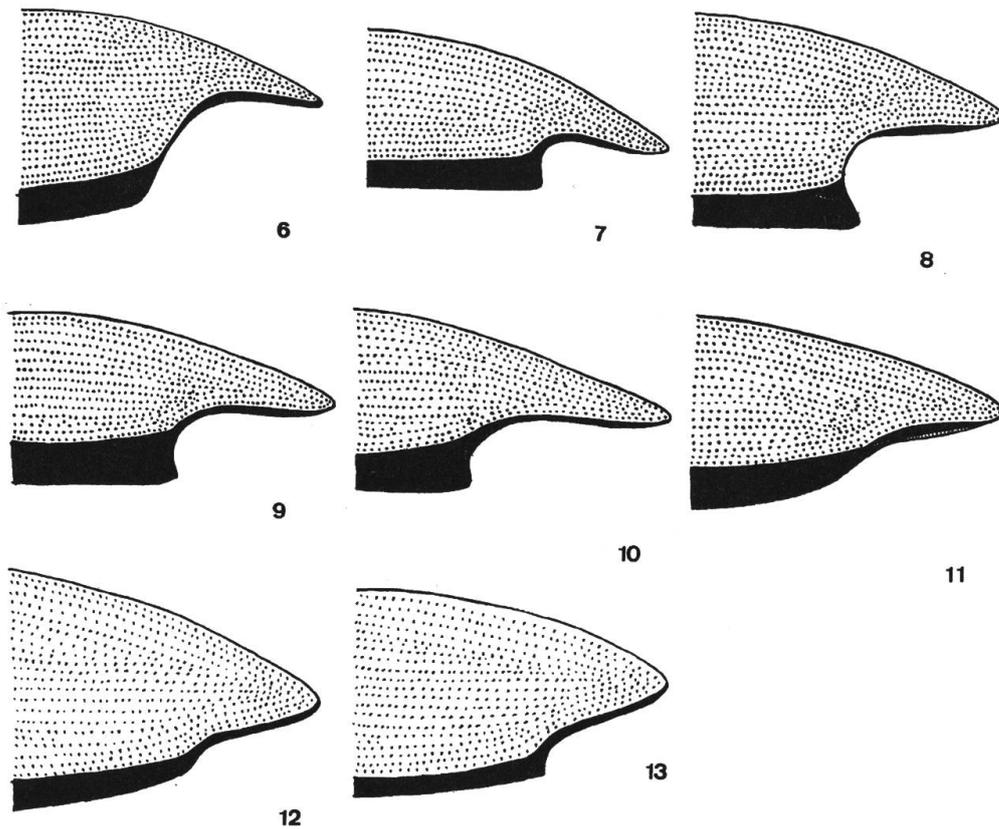
Type series was collected in the beech or fir-mixed forest.

## 2. *Carabus (Archiplectes) kratkyi solodovnikovi* n. ssp.

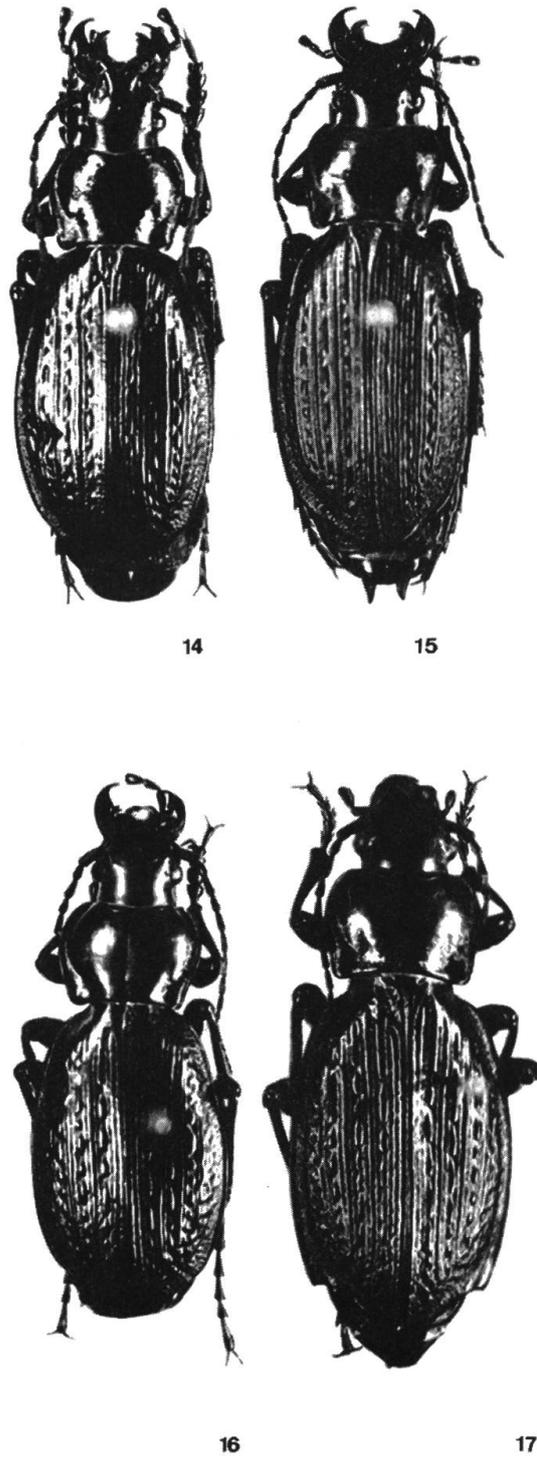
Figs 11, 14, 15, 33.

*Carabus kratkyi kratkyi* GAN GLBAUER, ZAMOTAJLOV, 1991, Ent. Bas. 14: 33 (partim).

Habitus (Figs 14-15). Length 21.1 – 18.1 mm. Black, elytra, pronotum, and head bronze, greenish bronze, rarely dark violet.



Figs 6 – 13: Elytral apex of ♀ in left lateral view of: 6, *Carabus shachgireii* Zamot. from the valley of Imeretinka, Aλους Mt Range. 7, idem from vicinities of Lake Nasti, Aλους Mt Range. 8, *C. kratkyi kratkyi* Ganglb. from the valley of Urushten, vicinities of Mastakan Mt Range. 9, idem from the valley of Kiafar, Abishira-Akhuba Mt Range. 10, idem from Chilik, Abishira-Akhuba Mt Range. 11, *C. kratkyi solodovnikovi* n. ssp., paratype. 12, *C. komarowi komarowi* Reitt. from the valley of Inguri near Khaishi. 13, *C. komarowi vediensis* n. ssp., paratype.



Figs 14 – 17: *Carabus*, general view. 14, *C.kratkyi solodovnikovi* n. ssp., paratype, male 15, idem, paratype, female. 16, *C.kratkyi kratkyi* Ganglb., toptype, male labelled «Kuban, Kratky, 1888». 17, idem, female from the valley of Urush-ten, vicinities of Mastakan Mt Range.

in males and females, without distinct engraving (Fig. 11). Aedeagus of the same shape as in the nomynotypical subspecies, copulatory pieces (Fig. 33) composed of two elongate sclerites, rather slender and narrow, dorsal carinate processes narrow, slightly curved at apices only.

Holotype: ♂ (ZISP), NW Caucasus, Malyi Bambaki Mt Range, 2000-2300 m, 12. VI.- 22. VII. 1991, A. Miroshnikov & A. Solodovnikov. Paratypes 15♂ ♀ (NHMB); 10 ♂ ♀ (215 p); 225 ♂ & 221 ♀ (AZ & AM); 10 ♂ & 10 ♀ (IB), same locality, together with holotype. 12 ♂ 10 ♀ (AZ & AM); 2 ♂ & 2 ♀ (IB), same locality, 13. VI. - 31. VII. 1990, A. Zamotajlov & A. Miroshnikov.

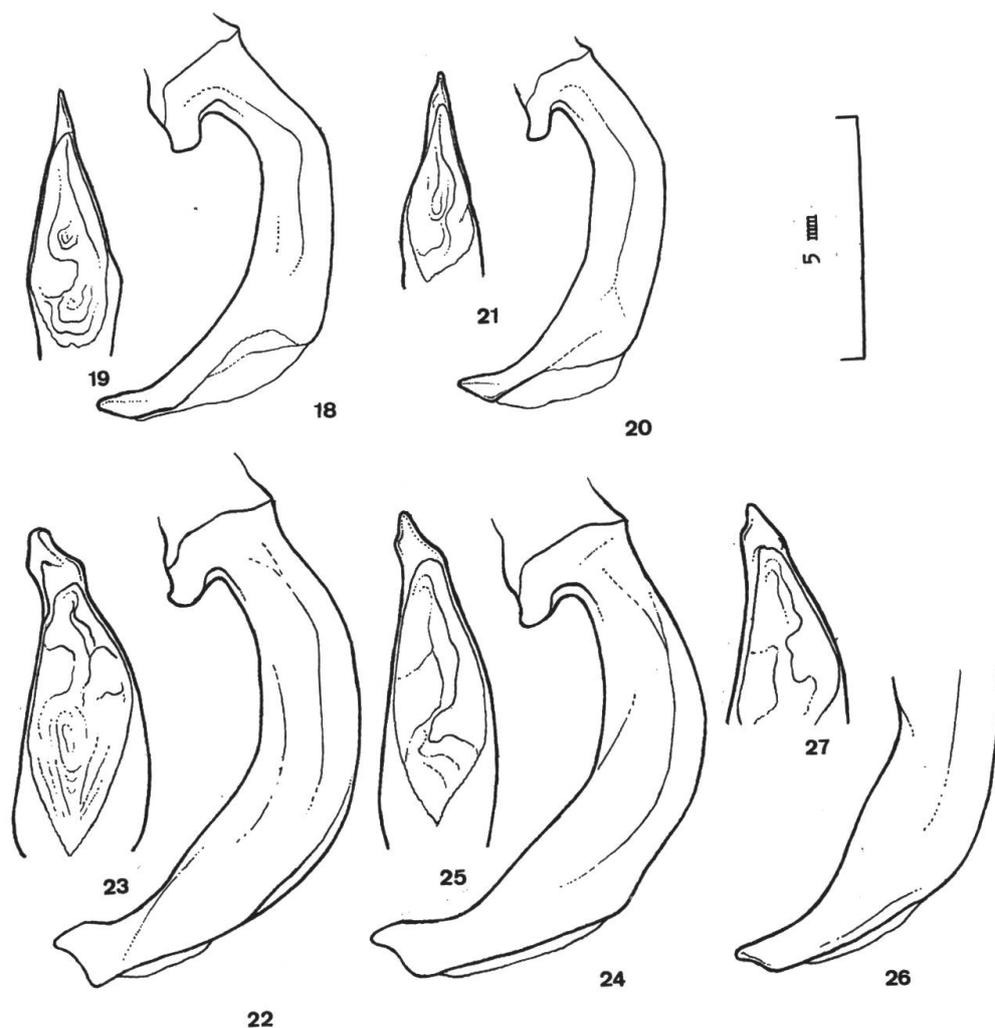
*C. kratkyi* Ganglb. was described basing on the materials, originated from the Sievers' collection and collected in «Kuban» without pointing a precise locality (GANGLBAUER, 1891). Examination of 3 males, topotypes, from the Sievers' collection (ZISP) revealed that they the most readily resemble populations inhabiting Mastakan Mt Range and its vicinities. This mountain system is deposited nearly equidistant from both Alous and Malyi Bambaki Mt Ranges, the type localities of *C. shachgireii* Zamot. and *C. kratkyi solodovnikovi* n. ssp., so it is not strange that the nomynotypical subspecies combines some features of these forms. On the other hand, populations from the vicinities of Mastakan Mt Range look very much like ones from Abishira-Akhuba Mt Range, situated eastwards. Thus *C. shachgireii* Zamot. and *C. kratkyi solodovnikovi* n. ssp. could be interpreted as results of divergence of the nomynotypical subspecies alike ancestor at the western extremity of its range.

Study of the extensive materials on *C. kratkyi* Ganglb. ascertained that elytral apices are always clearly angulate in males and emarginate in females (Figs 8 - 10), except for population from Malyi Bambaki Mt Range, i. e. above described subspecies. It resembles nomynotypical form in body size and elytral sculpture, although it is comparatively more slender, elytral apex somewhat rounded in males (in *C. kratkyi kratkyi* Ganglb. angulate) and faintly angulate in females (in *C. kratkyi kratkyi* Ganglb. strongly emarginate). From *C. shachgireii* Zamot. differs in larger body size, more elevated and heterodynamous elytral sculpture, and absence of apical elytral engraving in females (Figs 6, 7, 11). Copulatory pieces more slender than in both *C. kratkyi kratkyi* Ganglb. and *C. shachgireii* Zamot., dorsal processes very narrow, faintly developed (Figs 32, 33).

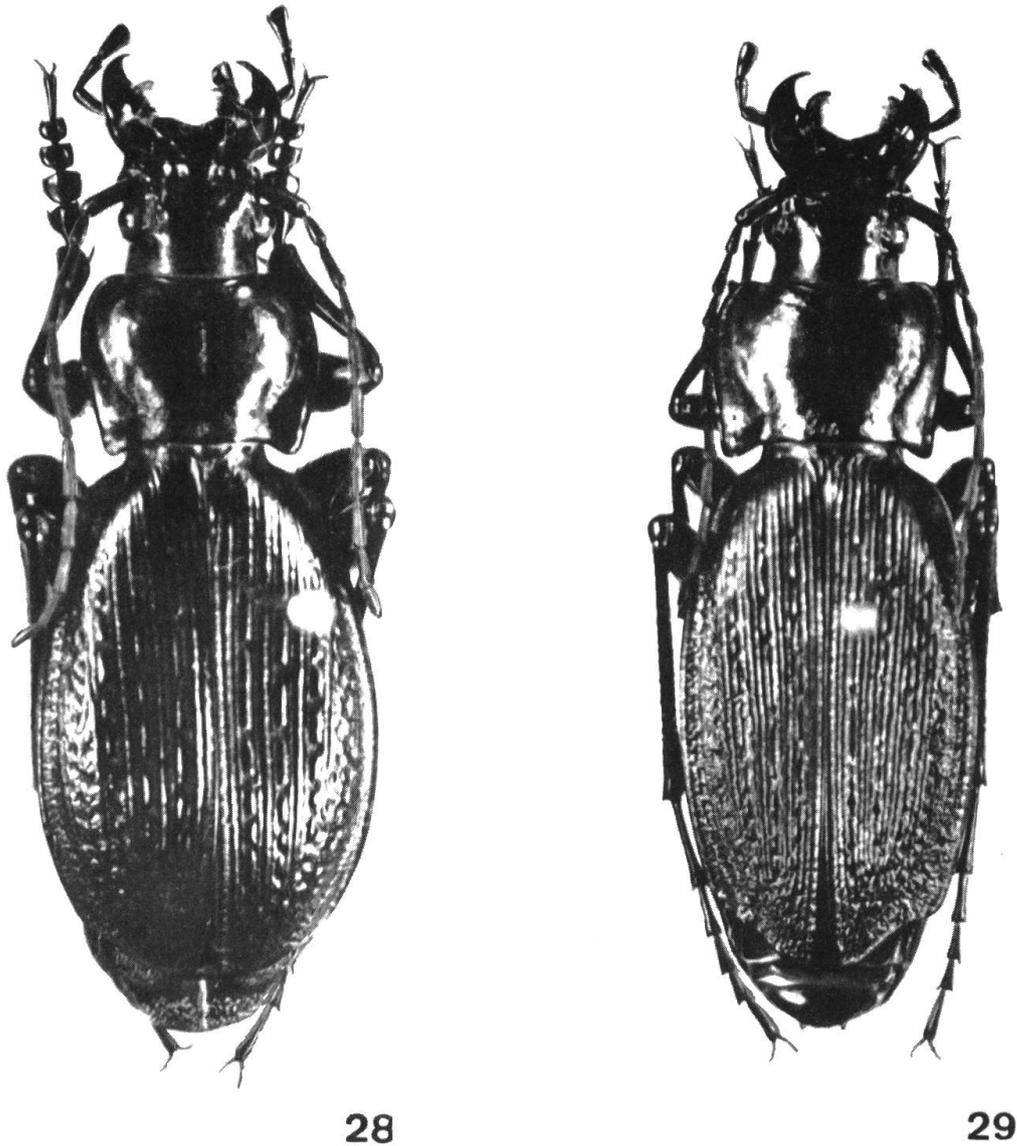
The type series was collected in the Alpine and Subnival zones.

This subspecies is named after my friend and colleague Mr A. Yu. Solodovnikov of Krasnodar.

Body comparatively slender. Pronotum transverse, subcordate, 1.28 – 1.42 times as long as wide. Elytra oblong-oval, 1.46 – 1.68 times as wide as long, elytral sculpture faintly heterodynamous, interspaces strongly overhung, the tertiary interspaces elevated only a little less than the secondary ones; elytral apex rounded or slightly angulate both



Figs 18 – 27: *Carabus*, aedeagus. 18 *C. komarowi komarowi* Reitt. from the valley of Inguri near Khaishi,<sup>1</sup> left lateral view. 19, idem, apex in dorsal view. 20, *C. komarowi vediensis* n. ssp., paratype, left lateral view. 21, idem, apex in dorsal view. 22, *C. juenthneri juenthneri* Reitt. from environs of Pskhu, left lateral view. 23, idem, apex in dorsal view. 24 *C. juenthneri atchibachi* n. ssp., paratype, left lateral view. 25, idem, apex in dorsal view. 26, *C. rousianus* Gottw. from the valley of Bzyb near Mt Adzaph, left lateral view. 27, idem, apex in dorsal view.



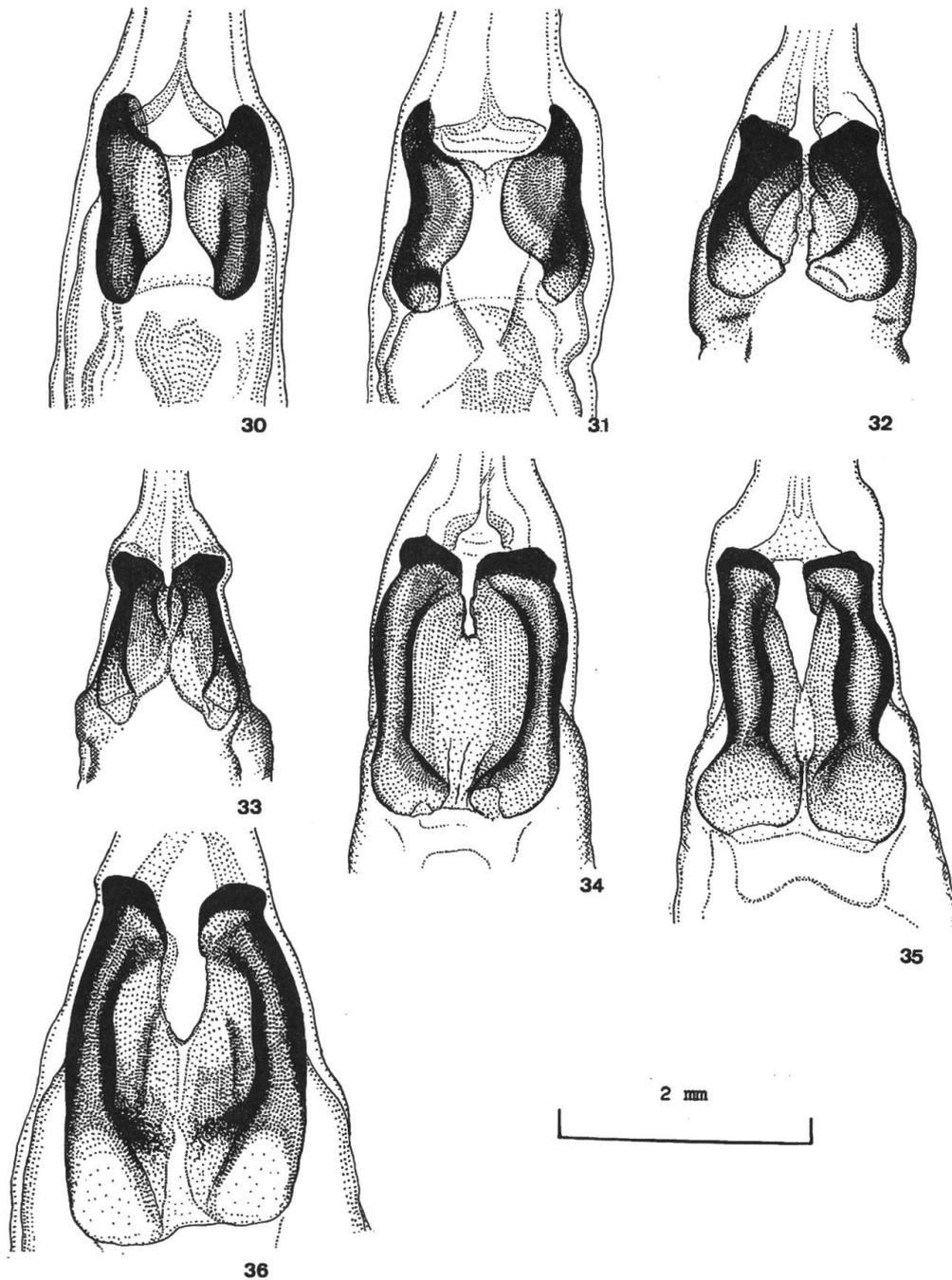
Figs 28 – 29 : *Carabus juenthneri atchibachi* n. ssp., general view. 28, paratype, male. 29, paratype, female.

**3. *Carabus (Archiplectes) juenthneri atchibachi* n. ssp.**

Figs 24, 25, 28, 29, 35.

Habitus (Figs 28, 29). Length 27.7 - 38.6 mm. Black, elytra, pronotum, and head golden, greenish bronze, dark blue or violet, with metallic lustre, rarely black.

Body rather robust to somewhat slender. Pronotum broad, transverse, subcordate to subquadrate, 1.15 - 1.37 times as long as wide, lateral sides completely slightly rounded or with a faint and inconspicuous sinuation before hind angles, widely explanate, especially in females.



Figs 30 – 36: Copulatory pieces of: 30, *Carabus komarowi komarowi* Reitt. from the valley of Inguri near Khaishi. 31, *C. komarowi vediensis* n. ssp., paratype. 32, *C. kratkyi kratkyi* Ganglb., topotype labelled «Kuban, Kratky, 1888». 33, *C. kratkyi solodovnikovi* n. ssp., paratype. 34, *C. juenthneri juenthneri* Reitt. from environs of Pskhu. 35, *C. juenthneri atchibachi* n.ssp., paratype. 36, *C. rousianus* Gottw. from the valley of Bzyb near Mt Adzapsh.

Elytra oblong-oval, 1.59 - 1.79 times as wide as long, sculpture triploid heterodynamous, the secondary interspaces usually elevated stronger than the tertiary ones. Apical lamella of aedeagus (Figs 24, 25 ) rather narrow, with a fairly projected and small dorsal process and horned ventral one (viewed laterally); copulatory pieces (Fig. 35 ) composed of two fused sclerites, they only slightly approach each other at base, lateral sides subparallel, basal hollow large, median area with long membranous desclerotized stripe, usually reaching apex, apices of sclerites clavate; copulatory pieces often extremely narrow.

Holotype: ♂(ZISP), Abkhazia, valley of the river Bzyb n. Mt Achibakhu, 500-1500 m, 24. IV. – 6. VI. 1991, A. Zamotajlov & A. Miroshnikov. Paratypes, 15 ♂ & 15 ♀(NHMB) ; 10 ♂ & 10 ♀(ZISP9; 265 ♂ & 464 ♀ (AZ & AM); 3 ♂ & 3 ♀ (IB), same locality, together with holotype. 1 ♂ (AZ & AM), same locality, 22. IV. 1991, A. Zamotajlov. 2 ♀ (AZ & AM), same locality, 22.IV.1991, V. Shchurov. 1 ♂ 1 (AZ & AM), same locality, 23. IV. 1991, A. Miroshnikov. 1 ♀ (AZ & AM), same locality, 23. IV. 1991, A. Solodovnikov. 1 ♀ & 1 ♂ (VG), Abkhazia, confluence of the rivers Bzyb and Gega, 400 m, I. V. 1990, V. Grebennikov.

Habitually resembles populations of *C.juenthneri juenthneri* Reitt. from environs of Pskhu, although it is distinguishable by the more robust body, broader, less cordate pronotum with widely explanate lateral border, usually strongly heterodynamous elytral sculpture, and by the structure of male genitalia, i. e. apical lamella of aedeagus somewhat more narrow, with smaller, less extended dorsal process (Figs 22-25), copulatory pieces (Figs 34, 35) of different shape. In the structure of the armature of endophalls the new subspecies is almost identical to *C.juenthneri acheicus* Zamot., but prominently differs habitually. *C.juenthneri atchibachi* n. ssp. resembles in its general appearance also the northernmost populations of *C.rousianus* Gottw., particularly midaltitude one from the valley of Bzyb (Coll. I. Belousov). Noteworthy, some distinctive features of this species could be observed also in the structure of male genitalia: apical lamella of aedeagus rather narrow (Figs 24-27), basal hollow of copulatory pieces deep, longitudinal median desclerotized stripe present, apices of sclerites bloated (Figs 35, 36). Thus both in its distribution and morphology, *C.juenthneri atchibachi* n. ssp. seems to occupy a position nearly intermediate between *C. juenthneri* Reitt. and *C.rousianus* Gottw., indicating apparently a probable way of origin of the *polychrous*-lineage within Abkhazian *Archiplectes*-species.

At SW slopes of Mt Achibakhu (about 1600-1800 m a. s. l.) near NE

periphery of the range of the new subspecies, it is substituted by population with comparatively smaller and more slender individuals, combining both in habitus and structure of male genitalia some features of the new and nomynotypical subspecies (examined 67 ♂ 84 ♀ - AZ & AM) and likely representing the beginning of the intergradational zone between them.

Type series was collected in the oak-hornbeam, beech-hornbeam, beech, and beech-or fir-mixed forests, however the greatest populational densities were observed in different types of leafbearing forests (Table 1).

Plant community and altitude	Activity density, individuals per trap per 10 days
Fago-Carpinetum, 500 m	0.50
Querco-Carpinetum, 600 m	0.90
Fagetum, 1300 m	0.40
Fago-Abietum, 900 m	0.17
Abio-Fagetum, 1500 m	0.17

Table 1: Differences in abundance of *Carabus juenthneri atchibachi* n. ssp. in different types of forest societies.

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