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## REVIEW OF THE GENUS *CRYPTOPHAGUS* HERBST, 1863 (COLEOPTERA CRYPTOPHAGIDAE) FROM GEORGIA

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Lyubarsky G., Otero J.C., Barjadze S., Arabuli T. – Review of the genus *Cryptophagus* Herbst, 1863 (Coleoptera Cryptophagidae) from Georgia.

*Cryptophagus axillaris* Reitter, 1875 from Savekuo Cave is recorded for the beetle fauna of the Caucasus for the first time, while *C. lycoperdi* (Scopoli, 1763) from Bichvinta (=Pitsunda) is a new record for Georgian beetle fauna. Twenty five species of the *Cryptophagus* beetles are recorded in Georgia. Sampling data and distribution map for the genus *Cryptophagus* species are given. Identification key to the genus *Cryptophagus* in Georgia is provided.

KEY WORDS: Silken fungus beetle, new record, sampling sites, identification key, Caucasus.

### INTRODUCTION

The family Cryptophagidae (silken fungus beetles) is a group of small beetles with about 800 described species represented in all biogeographic realms. Both adults and larvae of silken fungus beetles are commonly found on mold, fungi, under bark, as well as in decaying vegetation (LYUBARSKY and PERKOVSKY, 2011). Genus *Cryptophagus* Herbst, 1863 belongs to the family Cryptophagidae. The genus comprises approximately 200 species in the world (LESCHEN, 1996).

Investigation of the above mentioned genus has been started from the 1890s in Georgia (LYUBARSKY, 1992). Before our investigation twenty three species of the genus *Cryptophagus* have been recorded from Georgia (BRUCE, 1936; LYUBARSKY, 1992; JOHNSON *et al.*, 2007). *Cryptophagus axillaris* Reitter, 1875 was sampled by the third and fourth authors in Savekuo Cave (Western Georgia) in 2014, while *C. lycoperdi* (Scopoli, 1763), sampled in Bichvinta (=Pitsunda), was found in the collection of Zoological Museum of Moscow State University (ZMMU) by the first author.

### MATERIALS AND METHODS

Based on literature and new data sampling sites of *Cryptophagus* beetles found in Georgia were included in the map (Fig. I). Newly recorded species - *Cryptophagus axillaris* Reitter, 1875 was sampled in the twilight zone of Savekuo Cave by Sh. Barjadze and T. Arabuli in 11.ii.2014, while *C. lycoperdi*, was sampled in Bichvinta (=Pitsunda) by V.B. Semenov in 19.ix.1991. *Cryptophagus* beetles were

determined by the first and second authors. The first author investigated and determined beetle species from different depositories: Zoological Museum of St. Petersburg (ZIN), Zoological Museum of Moscow State University (ZMMU), Museum für Naturkunde (Berlin) (MNB), V.A. Tsinkevich's private collection and S.A. Kurbatov's private collection. Acronyms for countries in species distribution were given according to JOHNSON *et al.* (2007). Distribution map of the beetles is compiled in ArcGIS 9.3 version.

Note: “unpublished locality” – this is locality for species, which were listed in JOHNSON *et al.* (2007) without indicating of locality; “unpublished” - this is locality for species, which were recorded from Georgia before with indicating of locality.

### RESULTS AND DISCUSSION

#### LIST OF *CRYPTOPHAGUS* SPECIES

##### *C. axillaris* Reitter, 1875

DISTRIBUTION IN GEORGIA: Savekuo Cave, Twilight zone, 11.ii.2014, leg. Sh. Barjadze & T. Arabuli, det. J.C. Otero, Entomological collection of Institute of Zoology, Iliia State University.

DISTRIBUTION IN THE WORLD: E: AL, MD, RO, UK (JOHNSON *et al.*, 2007).

COMMENT: New record for the beetle fauna of the Caucasus.

##### *C. bruckii* Reitter, 1875

DISTRIBUTION IN GEORGIA: Vashlovani Reserve, 10.v.1983, leg. A.B. Ryvkin, det. G. Lyubarsky, ZMMU

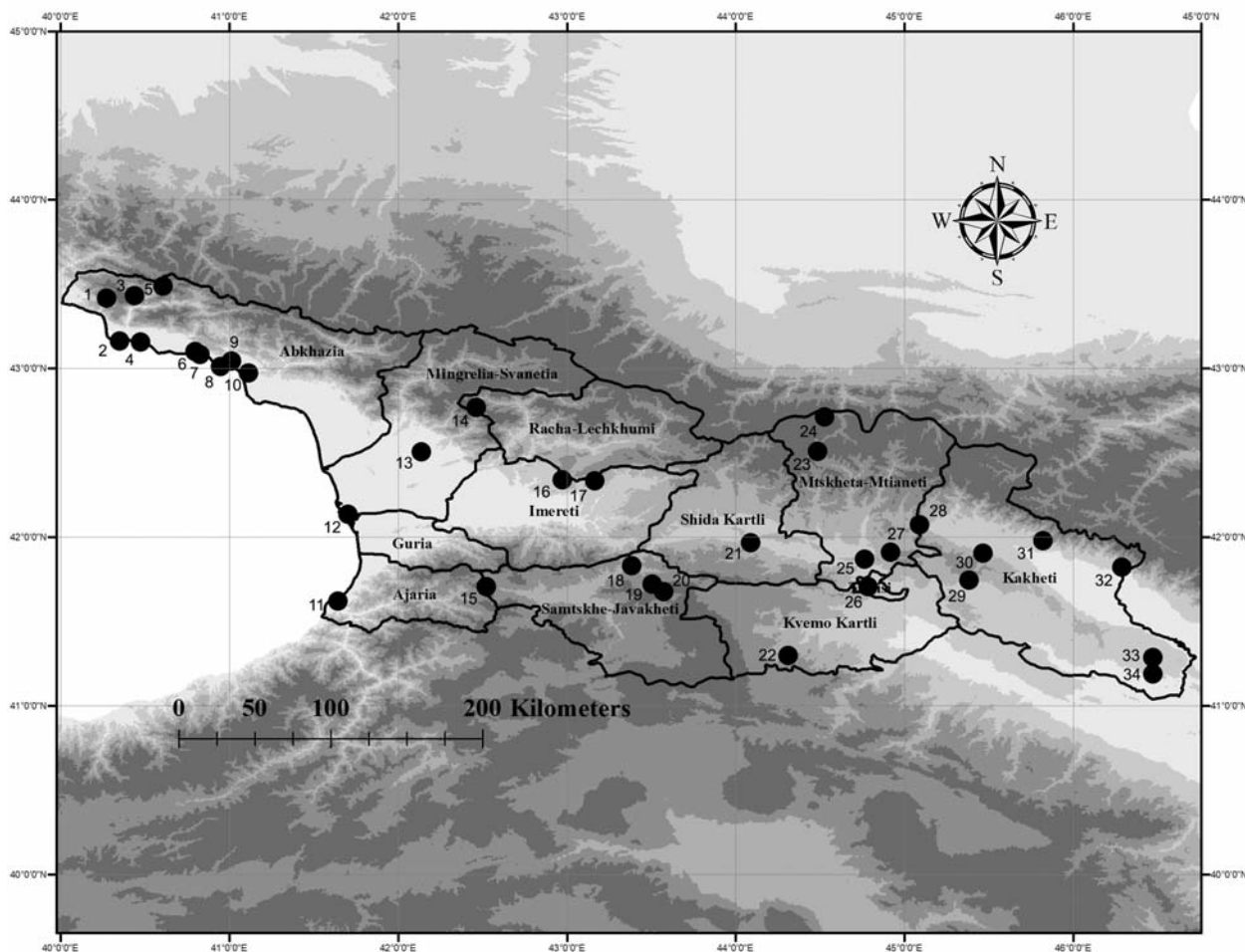


Fig. I – Sampling sites of the *Cryptophagus* beetles in Georgia.

#### Sampling localities

- |                                      |                                    |                                  |
|--------------------------------------|------------------------------------|----------------------------------|
| 1. Zont Mountain;                    | 13. Savekuo Cave;                  | 25. Zedazeni;                    |
| 2. Bichvinta (=Pitsunda);            | 14. River Tekhuri;                 | 26. Tbilisi;                     |
| 3. River Gega;                       | 15. Adigeni;                       | 27. Sabaduri;                    |
| 4. Miusera;                          | 16. Near Tkibuli;                  | 28. Between Akhmeta and Tianeti; |
| 5. Road between Ritsa and Avadkhara; | 17. 15 km east to Tkibuli-Mukhura; | 29. Mariamjvari Reserve;         |
| 6. Orkhara;                          | 18. Borjomi;                       | 30. Telavi;                      |
| 7. New Athos;                        | 19. Bakuriani;                     | 31. North of Kvareli;            |
| 8. River Gumista;                    | 20. Tskhratskaro Pass;             | 32. Lagodekhi;                   |
| 9. Sokhumi;                          | 21. Gori;                          | 33. Kasris-tskali;               |
| 10. Kashtak;                         | 22. Saparlo;                       | 34. Vashlovani.                  |
| 11. Batumi;                          | 23. Gudauri;                       |                                  |
| 12. Poti;                            | 24. Devdorak Glacier;              |                                  |

(LYUBARSKY, 1992); Vashlovani Reserve, 16.v.1983, leg. A.B. Ryvkin, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992).

DISTRIBUTION IN THE WORLD: **E:** AB, AR, BH, GG, SP, ST (Kavkaz); **A:** AF, FE, IN, IS, JO, PA, SY, TM, TR (JOHNSON *et al.*, 2007).

#### *C. cellaris* (Scopoli, 1763)

DISTRIBUTION IN GEORGIA: Tbilisi, Sampling date and collector's name are not on the label, det. G. Lyubarsky, ZIN (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AB, AU, BE, BH, BY, CR, CT, CZ, DE, FI, FR, GB, GE, GG, GR, HU, IR, IT, LA, MA, MD, NL, NR, NT, PL, PT, RO, SK, SL, SP, ST

(Kavkaz), SV, SZ, UK; **N:** AG, AZ, CI, EG, MO, MR, TU; **A:** AF, FI, IN, IQ, IS, JA, JO, KZ, NC, SA, SD, SY, UP, UZ **COS** (JOHNSON *et al.*, 2007).

#### *C. circassicus* Reitter, 1888

DISTRIBUTION IN GEORGIA: Stepantsminda (=Kazbek), Devdorak glacier, 21.vi.1902, leg. D.B. Borodin, det. N. Bruce, ZIN (BRUCE, 1936); New Athos, vi.1987, leg. S. Skrypnik, det. G. Lyubarsky, ZMMU (unpublished); Egrisi range, Upper part of riv. Tekhuri, 2200 a.s.l., 22.viii.1991, leg. A.G. Koval, det. G. Lyubarsky, V.A. Tsinkevich's collection (unpublished).

DISTRIBUTION IN THE WORLD: **E:** GG, ST (Kavkaz) (JOHNSON *et al.*, 2007).

*C. confusus* Bruce, 1934

DISTRIBUTION IN GEORGIA: Kashtak, 11-15.v.1979, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (unpublished locality); Sokhumi, 11-15.v.1979, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (unpublished locality); Trialeti range, Bakuriani, 1800-2200 m a.s.l., 15-20.vi.1987, leg. D.W. Wrase & M. Schulke, det. G. Lyubarsky, ZMMU (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AR, AU, CT, CZ, EN, FI, GB, GE, GG, HU, NR, NT, PL, SK, SP, SV, SZ, UK; **A:** FE, UZ (JOHNSON *et al.*, 2007).

*C. dentatus* (Herbst, 1793)

DISTRIBUTION IN GEORGIA: tkh r, 11.v.1956, leg. V. Kurnakov, det. G. Lyubarsky, ZMMU (unpublished locality); tkh r, 30.iv.1957, leg. V. Kurnakov, det. G. Lyubarsky, ZMMU (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AB, AL, AN, AR, AU, AZ, BE, BH, BU, BY, CR, CT, CZ, DR, EN, FI, FR, GB, GE, GG, GR, HU, IR, IT, LA, LS, LT, MD, NL, NR, NT, PL, PT, RO, SK, SL, SP, ST, SV, SZ, TR, UK, YU; **N:** AG, AZ, CI, EG, LB, MO, MR, TU; **A:** FE, IN, TM, DR, UZ **NAR** (JOHNSON *et al.*, 2007; OTERO and JOHNSON, 2013).

*C. denticulatus* Heer, 1841

DISTRIBUTION IN GEORGIA: Borjomi, XIX century without exact date, leg. G. Sievers, det. G. Lyubarsky, ZIN (LYUBARSKY, 1992); Tbilisi, XIX century without exact date, leg. G. Sievers, det. G. Lyubarsky, ZIN (unpublished); Sokhumi, iv.1891, no data about collector, det. G. Lyubarsky, ZIN (LYUBARSKY, 1992); Lagodekhi, 1893, leg. L. Mlokosevich, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Surroundings of Tkibuli, 10.v.1895, leg. Kisliakov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Batumi, 6.v.1928, leg. D. Romashov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Otkhara, 30.iv.1957, leg. V. Kurnakov, det. G. Lyubarsky, ZMMU (unpublished); Kasris-tskali, 7.v.1983, leg. V.V. Yanushev, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Vashlovani Reserve, 9.v.1983, leg. A.B. Ryvkin, det. G. Lyubarsky, ZMMU (unpublished); Tskhratskaro, Pass South of Bakuriani, 13.v.1983, leg. S.I. Golovatch, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Mariamjvari Reserve, 13-14.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Gudauz (probably Gudauri), 3000 a.s.l., information about sampling date and collector is not included on the label, det. G. Lyubarsky, ZMMU- N.I. Fursov's collection (unpublished).

DISTRIBUTION IN THE WORLD: **E:** AB, AR, AU, BE, BH, BU, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GG, GE, GR, HU, IR, IT, LS, MC, MD, NL, NR, NT, PL, RO, SK, SL, SP, ST (Kavkaz); SV, SZ, UK; **N:** MO; **A:** ES, FE, IN, IS, TR, UZ **AFR, AUR, NAR** (JOHNSON *et al.*, 2007).

*C. dilatipennis* Reitter, 1888

DISTRIBUTION IN GEORGIA: Kashtak, 23.viii.-04.ix.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, 23.viii.-04.ix.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); 14 km east to Adigeni, near river, between stones, 1500 m a.s.l., 15.v.1983, leg. A.B. Ryvkin, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Gori, 8.vi.1983, leg. S.A. Kurbatov, det. G. Lyubarsky,

ZMMU (LYUBARSKY, 1992); Bichvinta (=Pitsunda), 11-17.iii.1988, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (unpublished); Miusera, 11-17.iii.1988, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (unpublished); Riv. Gumista, 11.iv.1990, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (unpublished).

DISTRIBUTION IN THE WORLD: **E:** AR, GG, ST (Kavkaz); **A:** KZ, TR (JOHNSON *et al.*, 2007).

*C. dilutus* Reitter, 1874

DISTRIBUTION IN GEORGIA: Batumi, 09.v.1928, leg. D. Romashov, det. G. Lyubarsky, ZMMU (unpublished); Vashlovani Reserve, 22.v.1977, leg. A.G. Kireichuk, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Vashlovani Reserve, 9-10.v.1983, leg. A.B. Ryvkin, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); road between Ritsa-Avdkhara, 1300 m a.s.l., 7-9.v.2012, leg. S.A. Kurbatov, det. G. Lyubarsky, S.A. Kurbatov's collection (unpublished).

DISTRIBUTION IN THE WORLD: **E:** AB, AR, AU, BH, BU, CR, CT, GB, GE, GG, GR, HU, IT, MD, PL, PT, SL, SP, ST (Kavkaz), TR, UK, YU; **N:** AG; MO, TU; **A:** AF, FE, IN, IQ, GUX, HEI, KI, KZ, JA, JO, MG, NMO, NC, NP, SA, SHA, SY, TD, TM, TR, UZ, YUN **NAR** (JOHNSON *et al.*, 2007).

*C. distinguendus* Sturm, 1845

DISTRIBUTION IN GEORGIA: Tbilisi, sampling date and collector – unknown, det. G. Lyubarsky, ZIN (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AB, AR, AU, BE, BH, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, GR, HU, IC, IR, IT, LT, MD, NL, NR, NT, PL, RO, SK, SL, ST (Kavkaz), SV, SZ, UK, YU; **N:** CI, MO, TU; **A:** AF, CY, ES, FE, IN, KI, KZ, **AFR, NAR** (JOHNSON *et al.*, 2007; OTERO, 2013).

*C. dorsalis* C.R. Sahlberg, 1819

DISTRIBUTION IN GEORGIA: Gori, 25.v.1907, collector – unknown, det. G. Lyubarsky, ZMMU, (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AU, BE, CR, CT, CZ, DE, EN, FI, FR, GE, GG, IT, LT, NL, NR, NT, PL, RO, SK, SP, ST, SV, SZ; **A:** UZ (JOHNSON *et al.*, 2007).

*C. labilis* Erichson, 1846

DISTRIBUTION IN GEORGIA: Kashtak, 27.viii.1975, leg. V.V. Belov, det. G. Lyubarsky, ZMMU, (unpublished locality); Sokhumi, 27.viii.1975, leg. V.V. Belov, det. G. Lyubarsky, ZMMU, (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AU, BE, BH, BY, CT, CZ, DE, EN, FI, FR, GB, GE, GG, GR, HU, IT, LA, LT, NL, NR, NT, PL, RO, SK, SL, SV, SZ, UK, YU; **A:** ES (JOHNSON *et al.*, 2007; OTERO, 2013).

*C. lapidicola* Reitter, 1880

DISTRIBUTION IN GEORGIA: 15 km west to Adigeni, *Abies*, *Picea*, *Fagus* forest, 1500-1700 m a.s.l., 14-15.v.1983, leg. S.I. Golovatch, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Gori, 02.vi.1983, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Between Akhmeta & Tianeti, *Fagus* & *Carpinus* forest, 1200 m, litter & under bark, 06.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Mukhura, ca. 15 km East to Tkibuli, 7-9.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Batumi, 20.v.1987, leg. S.V.



- Kazantsev, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Saguramo State Reserve, North-East to Mtskheta, Zedazeni, 1100-1200 m a.s.l., 20.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); New Athos, 9.v.1990, leg. N. Potapov, det. G. Lyubarsky, ZMMU (unpublished); Riv. Gega, 5 km above junction at Riv. Bzyb, 700 m a.s.l., 4-6.v.2012, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (unpublished); Svanetien (=Svaneti) without exact locality, sampling date – unknown, leg. H. Leder & E. Reitter, determinator and depository – unknown (BRUCE, 1936).
- DISTRIBUTION IN THE WORLD: **E:** AB, AR, GG, SP, ST (Kavkaz); **A:** TR (JOHNSON *et al.*, 2007; OTERO, 2011).
- C. laticollis* P.H. Lucas, 1846
- DISTRIBUTION IN GEORGIA: Bakuriani, 30.vii.1928, leg. D. Romashov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Tbilisi, sampling date and collector – unknown, det. G. Lyubarsky, ZIN (unpublished).
- DISTRIBUTION IN THE WORLD: **E:** AB, AR, AU, BE, BH, CR, CT, CZ, DE, FI, FR, GB, GE, GG, GR, HU, IC, IR, IT, LA, LT, MA, NL, NR, NT, PL, PT, RO, SK, SP, SV, SZ, UK, YU; **N:** AG, AZ, CI, EG, LB, MO, MR, TU; **A:** AF, FE, HP, IN, IS, IQ, JO, KA, KI, LE, NP, SY, TM, TR, UP, UZ, XIN **AFR, AUS, NAR, ORR** (JOHNSON *et al.*, 2007).
- C. lycoperdi* (Scopoli, 1763)
- DISTRIBUTION IN GEORGIA: Bichvinta (=Pitsunda), 19.ix.1991, leg. V.B. Semenov, det. G. Lyubarsky, ZMMU.
- DISTRIBUTION IN THE WORLD: **E:** AN, AU, BE, BH, BU, BY, CR, CT, CZ, DE, FI, FR, GB, GE, GR, HU, IR, IT, LA, LT, MD, NL, NR, NT, PL, RO, SK, SL, SP, ST (Kavkaz), SV, SZ, UK, YU; **N:** TU; **A:** TR **NAR** (JOHNSON *et al.*, 2007).
- COMMENT: New record for beetle fauna of Georgia.
- C. pallidus* Sturm, 1845 (= *C. Thomsoni* Reitter, 1875)
- DISTRIBUTION IN GEORGIA: Kashtak, 22.viii.1975, leg. N.B. Nikitsky, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, 22.viii.1975, leg. N.B. Nikitsky, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Kashtak, 27.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, 27.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sapiro near Dmanisi, 1000-1050 m a.s.l., 21.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Upper part of river Tekhuri 2300 m a.s.l., 15.viii.1990, leg. A.G. Koval, det. G. Lyubarsky, ZMMU (unpublished); Bichvinta (=Pitsunda), 15.ix.1991, leg. V.B. Semenov, det. G. Lyubarsky, ZMMU (unpublished).
- DISTRIBUTION IN THE WORLD: **E:** AB, AR, AU, BE, BH, BU, CR, CT, CZ, FR, GE, GG, GR, HU, IT, MD, NL, PL, RO, SK, SL, SP, ST (Kavkaz), SZ, TR, UK; **N:** AG, LB, TU; **A:** IN, IS, LE, TR (JOHNSON *et al.*, 2007; OTERO, 2013).
- C. punctipennis* C.N.F. Brisout de Barneville, 1863
- DISTRIBUTION IN GEORGIA: Batumi, 06.v.1928, leg. D. Romashov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Vashlovani Reserve, 09.v.1983, leg. V.V. Yanushev, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Vashlovani Reserve, 10.v.1983, leg. .B. Ryvkin, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Gori, 02.vi.1983, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Tiflis (=Tbilisi), sampling date and collector – unknown, det. G. Lyubarsky, ZIN (LYUBARSKY, 1992).
- DISTRIBUTION IN THE WORLD: **E:** AB, AL, AN, AR, AU, BEM, BH, BU, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, GR, HU, IC, IR, IT, LA, LS, LT, MD, NL, NR, NT, PL, PT, RO, SK, SL, SP, ST (Kavkaz), SV, SZ, UK; **N:** AG, AZ, CI, MO, MR, TU; **A:** AF, ES, FE, IN, JA, KI, KZ, MG, NC, TM, TR **AUR, NAR** (JOHNSON *et al.*, 2007).
- C. quadrimaculatus* Reitter, 1877
- DISTRIBUTION IN GEORGIA: Gori, 8-14.vi.1983, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Zedazeni, Saguramo Reserve, North-East to Mtskheta, 1000-1200 m a.s.l., 20.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Kratliskij Chreb. (=Kartli range), Sabaduris tre, 1800 m a.s.l., 08.vi.1987, leg. D.W. Wrase & M. Schulke, det. G. Lyubarsky, MNB (unpublished); Tiflis (=Tbilisi), sampling date and collector – unknown, det. G. Lyubarsky, ZIN (unpublished).
- DISTRIBUTION IN THE WORLD: **E:** AB, AR, CT, FI, GG, ST (Kavkaz), UK; **A:** ES, FE, IQ, KI, KZ, MG, NMO, SY, TD, TM, UZ, WS **NAR** (JOHNSON *et al.*, 2007).
- C. reflexus* Rey, 1982
- DISTRIBUTION IN GEORGIA: Kashtak, viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Miusera near Gudauta, 23-29.ix.1982, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Gori, vi.1983, leg. S.A. Kurbatov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Miusera near Gudauta, 4-11.x.1986, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); North of Kvareli, 700-750 m a.s.l., 4.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Saguramo State Reserve, NE of Mtskheta, 1200 m a.s.l., 20.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Egrisi range, upper part of riv. Tekhuri, 2300 m a.s.l., 15.viii.1990, leg. A.G. Koval, det. G. Lyubarsky, ZMMU (unpublished); Bichvinta (=Pitsunda), 15.ix.1991, leg. V.B. Semenov, det. G. Lyubarsky, ZMMU (unpublished).
- DISTRIBUTION IN THE WORLD: **E:** AB, AL, AR, AU, BE, BH, BU, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, GR, HU, IR, IT, LT, MC, MD, NL, NR, NT, PL, RO, SK, SL, SP, ST (Kavkaz), SV, SZ, TR, UK, YU; **N:** LB, MO, TU; **A:** FE, IN, IS, KI, LE, MG, NMO, TD, TR, WS (JOHNSON *et al.*, 2007).
- C. saginatus* Sturm, 1845
- DISTRIBUTION IN GEORGIA: Poti, 2.v.1971, leg. N.B. Nikitsky, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Batumi, 19.ix.1974, leg. V.V. Yanushev, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Kashtak, 26.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, 26.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Miusera – near Gudauta, 23-29.ix.1982, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Surroundings of Bichvinta (=Pitsunda), 11-17.iii.1988, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (unpublished); Telavi, sampling date – unknown, leg. N.I. Fursov, det. G. Lyubarsky, ZMMU (unpublished).
- DISTRIBUTION IN THE WORLD: **E:** AB, AU, BE, BH, BU, BY,

CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, HU, IR, IT, LA, LT, MC, MD, NL, NR, NT, PL, RO, SK, SL, SP, ST, SV, SZ, UK, YU; **N:** AG, AZ, CI, MR, TU; **A:** ES, FE, **TRAUS, NAR, NTR** (JOHNSON *et al.*, 2007).

*C. scanicus* (Linnaeus, 1758)

DISTRIBUTION IN GEORGIA: Batumi, 6.v.1928, leg. D. Romashov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Sokhumi, 22.viii.1975, leg. N.B. Nikitsky, det. G. Lyubarsky, ZMMU (unpublished).

DISTRIBUTION IN THE WORLD: **E:** AB, AL, AR, AU, BE, BH, BU, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, GR, HU, IC, IR, IT, LA, LT, MD, NL, NR, NT, PL, RO, SK, SL, ST, SV, SZ, UK, YU; **N:** MR, TU; FE, **A:** IN, TR, WS **AFR, NAR** (JOHNSON *et al.*, 2007).

*C. schmidti* Sturm, 1845

DISTRIBUTION IN GEORGIA: Gagra range, mt. Zont, 2100 m a.s.l., 17-30.vii.1988, leg. A.G. Koval, det. G. Lyubarsky, ZMMU (unpublished locality); Gagra range, mt. Zont, 2100 m a.s.l., 1-28.viii.1988, leg. A.G. Koval, det. G. Lyubarsky, ZMMU (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AU, BE, CT, CZ, FR, GB, GE, GG, HU, IR, IT, LA, NL, PL, RO, SK, SL, SP, ST (Kavkaz), SV, SZ, UK; **A:** FE, KZ, SY (JOHNSON *et al.*, 2007; OTERO, 2011).

*C. scutellatus* Newman, 1834

DISTRIBUTION IN GEORGIA: This species was recorded for Georgia in JOHNSON *et al.* (2007) without indicating any detailed information.

DISTRIBUTION IN THE WORLD: **E:** AR, AU, BE, BH, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, HU, IC, IT, IR, LS, LT, MD, NL, NR, NT, PL, PT, RO, SK, SL, SP, ST (Kavkaz), SV, SZ, UK; **N:** MO; **A:** IN, TR **NAR** (JOHNSON *et al.*, 2007).

*C. skalitzkyi* Reitter, 1875

DISTRIBUTION IN GEORGIA: Mukhura, ca. 15 km East of Tkibuli, 7-9.v.1987, leg. S.I. Golovatch & K.Y. Eskov, det. G. Lyubarsky, ZMMU (unpublished locality).

DISTRIBUTION IN THE WORLD: **E:** AB, AR, CR, CZ, FR, GE, GG, GR, IT, SP, ST (Kavkaz); **A:** AF, ES, IN, KA, KI, KZ, PA, TD, TM, TR, UZ (JOHNSON *et al.*, 2007).

*C. subdepressus* Gyllenhal, 1827

DISTRIBUTION IN GEORGIA: Kashtak, 27.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992); Surrounding of Sokhumi, 27.viii.1977, leg. V.V. Belov, det. G. Lyubarsky, ZMMU (LYUBARSKY, 1992).

DISTRIBUTION IN THE WORLD: **E:** AU, BE, BH, BU, BY, CR, CT, CZ, DE, EN, FI, FR, GB, GE, GG, HU, IT, LA, MD, NL, NR, NT, PL, RO, SK, SL, ST (Kavkaz), SV, SZ, UK; **N:** AG; **A:** FE (JOHNSON *et al.*, 2007).

Based on literature and our data thirty four sampling sites of twenty four *Cryptophagus* beetles were found in Georgia (Fig. I). Beetle species frequency of occurrence is shown in Fig. II. *C. denticulatus* is found from 12 sampling sites, *C. lapidicola* – from 9 localities, *C. reflexus* – from 8 localities, 2 species – from 7 localities, one species – from 5 localities, 2 species – from 4 localities, 3 species – from 3 localities, 4 species – from 2 localities, while remaining 9 species, including newly recorded 2 species are known only from single locality (Fig. II). 1 species – *C. scutellatus* were recorded for the beetle fauna of Georgia without indicating sampling sites (JOHNSON *et al.*, 2007).

Species density in each sampling sites is shown in Fig. III. Maximum number of species – 9 species was collected in Sokhumi, while only single species were sampled in 20 sampling localities (Fig. III). Sampling localities for eight previously recorded species, which were listed in JOHNSON *et al.* (2007) without indicating sampling sites, are reported for the first time. Besides, twenty three sampling localities

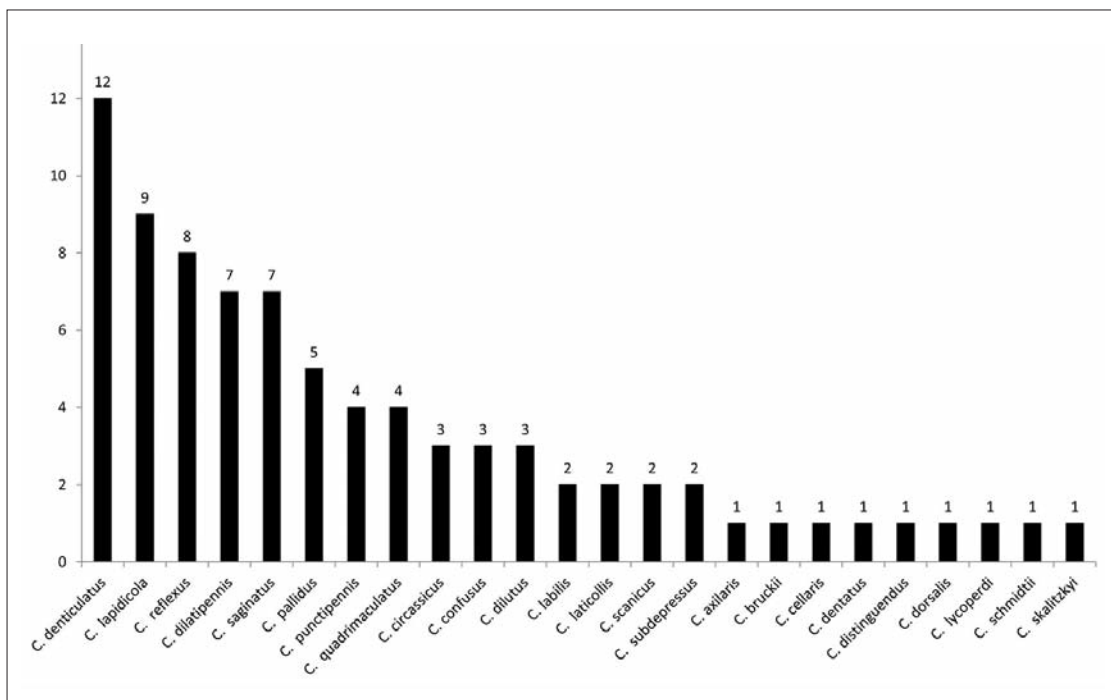


Fig. II – *Cryptophagus* species frequency of occurrence in Georgia.

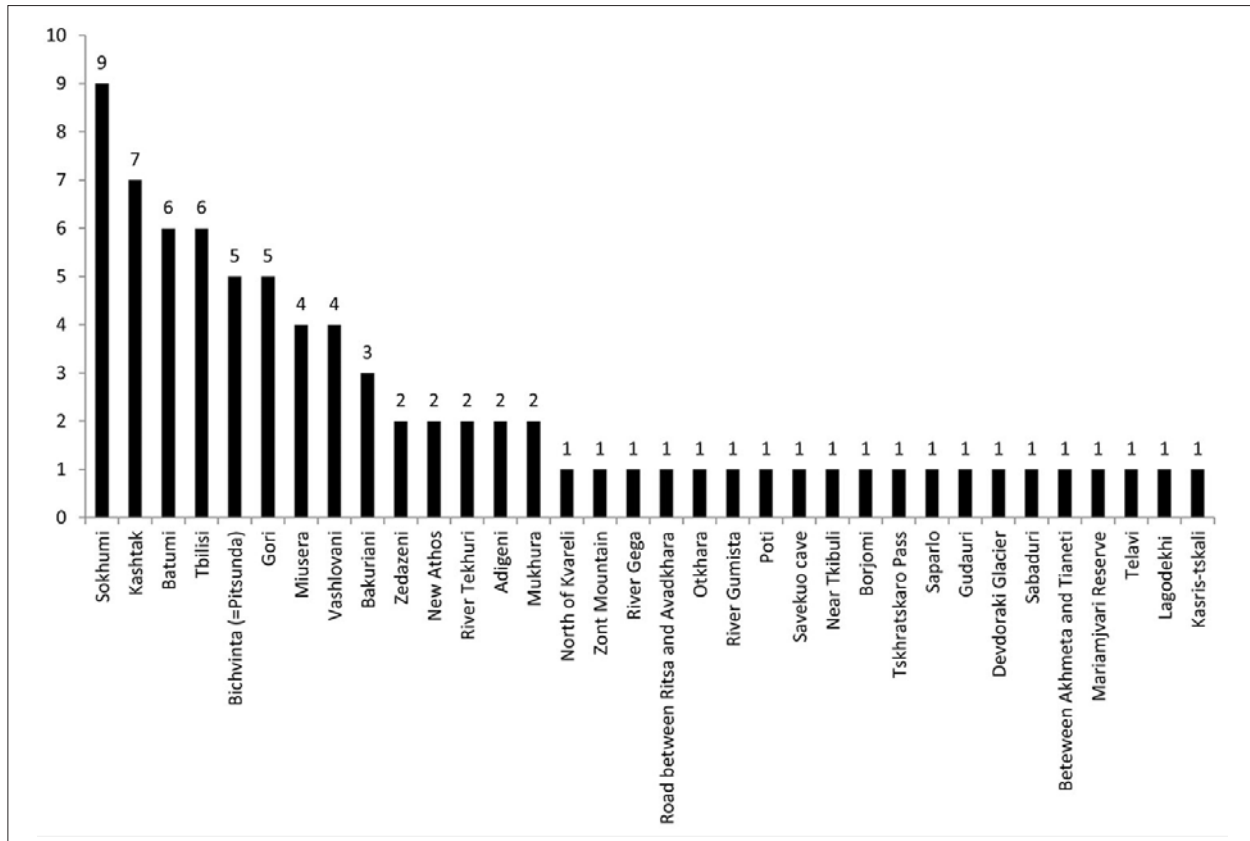


Fig. III – *Cryptophagus* species density in each sampling site in Georgia

for eleven species are given for the first time. Maximum number of beetle species (15) and sampling sites (10) were registered in Abkhazia, while only one species from one locality was registered in Kvemo Kartli Region (Table 1). *Cryptophagus* beetles were not investigated in Racha-Lechkhumi and Guria regions of Georgia (Table 1). *Cryptophagus axillaris* Reitter, 1785 was the first record in the beetle fauna of the Caucasus. *C. lycoperdi* (Scopoli, 1763) was the first records in the beetle fauna of Georgia. *C. lycoperdi* was sampled in Bichvinta, while *C. axillaris*-in Twilight zone of Savekuo Cave. Besides, mollusk – *Oxychilus sucinaceus sucinaceus* (Bottger, 1883) and spider – *Liniphia* sp. are inhabitants of Savekuo Cave (BARJADZE et al., 2015).

Table 1 – Number of sampling sites and beetle species in each region of Georgia.

| N  | Region             | Number of sampling sites | Number of species |
|----|--------------------|--------------------------|-------------------|
| 1  | Abkhazia           | 10 (1-10)                | 15                |
| 2  | Mingrelia-Svanetia | 3 (12-14)                | 4                 |
| 3  | Guria              | 0                        | 0                 |
| 4  | Ajaria             | 1 (11)                   | 6                 |
| 5  | Racha-Lechkhumi    | 0                        | 0                 |
| 6  | Imereti            | 2 (16-17)                | 3                 |
| 7  | Samtskhe-Javakheti | 4 (15, 18-20)            | 5                 |
| 8  | Shida Kartli       | 1 (21)                   | 5                 |
| 9  | Kvemo Kartli       | 1 (22)                   | 1                 |
| 10 | Tbilisi            | 1 (26)                   | 6                 |
| 11 | Mtskheta-Mtianeti  | 4 (23, 24, 25, 27)       | 5                 |
| 12 | Kakheti            | 7 (28-34)                | 7                 |

Key to the species of the genus *Cryptophagus* Herbst, 1863 recorded from Georgia

1. Hind wings present ..... 2  
-Hind wings reduced or absent ..... 22
2. Pubescence double ..... 3  
- Pubescence simple ..... 8
3. Elytral long adressed hairs set in rows. Diameter of eye facet more than 11 m. Length of body 2.2-2.7 mm ..... *C. cellaris*  
- Elytral pubescence not set in rows. Diameter of eye facet less than 11 m. .... 4
4. Anterior tibia dilated apically. Callosity of pronotum with apical point. Length of body 2.5-3.5 mm. Lateral tooth of pronotum located before the middle of lateral margin ..... *C. lycoperdi*  
- Anterior tibia not dilated apically. Callosity of pronotum usually without apical point. Lateral tooth of pronotum located in the middle or before the middle of lateral margin ..... 5
5. Size large, 2.6-3.3 mm. Callosity of pronotum not forms an angle with the lateral edge, fluently turning into lateral margin. Length of body 2.6-3.3 mm ..... *C. schmidtii*  
- Size small, 1.7-2.5 mm. Callosity of pronotum forms an angle with the lateral edge ..... 6
6. Eyes conical, usually asymmetrically prominent. Length of body 1.7-2.3 mm ..... *C. laticollis*  
- Eyes hemispherical, normal symmetrically prominent ..... 7
7. Lateral margin of pronotum thick, more than 1/3 of length of scutellum. Lateral tooth of pronotum located in the middle of length of lateral margin. Pronotum weakly narrowed basally. Eyes



normal in size, hemispherical, eye facets medium-sized, diameter of facet 8-10  $\mu$ m. Length of body 1.9-2.5 mm ..... *C. confusus*  
 - Lateral margin of pronotum thin, less than 1/3 of length of scutellum. Lateral tooth of pronotum located before the middle of length of lateral margin. Pronotum strongly narrowed basally. Eyes small, hemispherical or conical, eye facets small, diameter of facet less than 8  $\mu$ m. Length of body 1.7-2.3 mm

..... *C. skalitzkyi*

8. Callosity of pronotum with apical point ..... 9  
 - Callosity of pronotum without apical point ..... 13

9. Antennae long, with club reaching beyond base of pronotum. Lateral tooth of pronotum located in the middle or before the middle of length of lateral margin ..... 10  
 - Antennae short, with club not reaching beyond base of pronotum. Lateral tooth of pronotum located behind the middle of length of lateral margin. Length of body 1.6-2.3 mm

..... *C. distinguendus*

10. Pronotum weakly transverse, weakly narrowed basally. Length of body 2.0-2.5 mm ..... *C. labilis*  
 - Pronotum strongly transverse, strongly narrowed basally ..... 11

11. Eye facets medium-sized, diameter of facet 8-10  $\mu$ m. Pronotum strongly narrowed basally. Length of body 2.0-3.2 mm ..... *C. punctipennis*

- Eye facets small, diameter of facet less than 8  $\mu$ m. Pronotum weakly narrowed basally ..... 12

12. Lateral tooth of pronotum located in the middle or near before the middle of length of lateral margin. Paramere broad, with four long setae apically. Body sometimes bicolorous, usually red- or light-yellow, elytra more light. Length of body 2.1-2.7 mm ..... *C. dilutus*

- Lateral tooth of pronotum located in the middle of length of lateral margin. Paramere narrow, triangular, with two long setae apically. Body monochromous, yellow-brown. Length of body 2.0-2.4 mm ..... *C. bruckii*

13. Size small, lateral tooth of pronotum located before the middle of length of lateral margin. Length of body 1.2-1.7 mm ..... *C. scutellatus*

- Size large, lateral tooth of pronotum located in the middle or before the middle of length of lateral margin. Length of body 1.7-2.8 mm ..... 14

14. Elytra with transverse black band, and with dark strip along suture. Length of body 2.2-2.5 mm ..... *C. quadrimaculatus*  
 - Elytra without transverse black band ..... 15

15. Front bare surface of callosity of pronotum when viewed from above is not visible. Callosity of pronotum smaller, occupying 1/6-1/7 of length of lateral margin of pronotum. .... 16  
 - Front bare surface of callosity of pronotum when viewed from above is visible. Callosity of pronotum usually larger ..... 17

16. Callosity of pronotum flat, not forms an angle with the lateral edge, fluently turning into lateral margin. Lateral tooth of pronotum before the middle of lateral margin of pronotum. Body usually light-brown. Length of body 1.8-2.6 mm

..... *C. saginatus*  
 - Callosity of pronotum forms an angle with the lateral edge.

Angle between front bare surface of callosity and longitudinal axis of body 35-45°. Lateral tooth of pronotum in middle or behind the middle of length of lateral margin. Body usually dark-brown. Length of body 1.6-2.3 mm ..... *C. dorsalis*

17. Lateral margin of pronotum very thin. Antennae usually short, with club not reaching beyond base of pronotum. Eyes with facets in small size, less than 8  $\mu$ m. Length of body 2.0-2.6 mm ..... *C. pallidus*

- Lateral margin of pronotum ordinary thick. Antennae usually long, with club reaching beyond base of pronotum. Eyes with facets in medium size, more than 8  $\mu$ m ..... 18

18. Callosity of pronotum big, occupying 1/4 of length of lateral margin of pronotum ..... 19  
 - Callosity of pronotum small, occupying less than 1/4 of length of lateral margin of pronotum (1/5 of length of lateral margin) ..... 20

19. 3<sup>rd</sup> antennal joint longer than 2<sup>nd</sup>. Apodema of aedeagus dilated apically. Length of body 1.8-2.5 mm ..... *C. reflexus*  
 - 3<sup>rd</sup> antennal joint not longer than 2<sup>nd</sup>. Apodema of aedeagus not dilated apically. Length of body 1.5-2.8 mm ..... *C. scanicus*

20. Pronotum flat. Basal groove of pronotum reduced, basal pits slightly developed. Length of body 1.7-2.3 mm

..... *C. subdepressus*  
 - Pronotum convex. Basal groove of pronotum and basal pits normal developed ..... 21

21. Antennae usually short, with club not reaching beyond base of pronotum. Caudolateral angle of callosity of pronotum obtuse. Lateral margin of pronotum between callosity and lateral tooth straight or weakly concave. Lateral tooth of pronotum located before the middle of length of lateral margin. Aedeagus long, its length 1.2-1.7 times as long as its breadth. Paramere long, more than 0.7 time as long as length of aedeagus. Length of body 2.0-2.8 mm ..... *C. dentatus*  
 - Antennae long, with club reaching beyond base of pronotum. Caudolateral angle of callosity of pronotum right or acute angle. Lateral margin of pronotum between callosity and lateral tooth straight. Lateral tooth of pronotum often located in the middle of length of lateral margin. Aedeagus short, length less than 1.2 times as long as its breadth. Paramere short, 0.5-0.7 times as long as length of aedeagus. Length of body 2.0-2.8 mm ..... *C. denticulatus*

22. Pubescence double ..... 23  
 - Pubescence simple ..... 24

23. Size large, body very convex, wide. Pronotum strongly transverse. Body dark-brown. Length of body 2.1-2.8 mm

..... *C. lapidicola*  
 - Size small, body fairly flat, narrow. Pronotum weakly transverse. Body light-yellow. Length of body 1.7-2.3 mm

..... *C. skalitzkyi*

24. Callosity of pronotum with apical point ..... 25  
 - Callosity of pronotum without apical point. Length of body 1.6-2.1 mm ..... *C. dilatipennis*

25. Pronotum with cutting along the front edge. Length of body 1.7-2.4 mm ..... *C. circassicus*

- Pronotum without cutting along the front edge. Length of body 2.0-2.6 mm ..... *C. axillaris*

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