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The "*colchicus*" group of *Pterostichus* (Coleoptera, Carabidae)

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A b s t r a c t : The type material of *Pterostichus colchicus* (CHAUDOIR 1850), *P. platyderus* (CHAUDOIR 1850), and *P. stomoides* (CHAUDOIR 1868) is revised and lectotypes for these species are designated. Data for the type series, figures and description of male genitalia, taxonomic remarks and possible relationships are given for each species. The three species belongs to subgenus *Oreoplatysma* JACOBSON 1907, and not to *Cryobius* CHAUDOIR 1838. They do not form monophyletic group and should be considered as valid species.

K e y w o r d s : Carabidae, *Pterostichus*, Georgia.

Introduction

In terms of the number of species, *Cryobius* CHAUDOIR 1838 is presently the most numerous subgenus of *Pterostichus* BONELLI 1810. BOUSQUET (1999) lists 23 species for the Nearctic. According to BOUSQUET (2003), the group includes 101 species in the Palaearctic, but this work do not counts several taxa described from Siberia and Mongolia as well recent taxonomic changes published in two little known papers in Russian (SHILENKOV 2000a, 2000b). Regarding the World fauna of Carabidae, LORENZ (2005) enlists 123 species distributed in four groups of species; one of the groups consists of the taxa of *Parahaptoderus* JEANNE 1969 (which is treated as synonym of *Cryobius*). However, LORENZ (op. cit.) does not take into consideration the works of BALL & CURRIE (1997) and SHILENKOV (2000a, 2000b), and in addition omitted *Pterostichus carinthiacus* MESCHNIGG 1946 (a species inquirenda, according to VIGNA TAGLIANTI 2004). Considering all aforementioned sources, *Cryobius* (incl. *Parahaptoderus*) should now contain 131 valid species with a significant number of subspecies, as 115 species occur in the Palaearctic. But, according to the author's own knowledge several species from Asia Minor, the Caucasus and the Transcaucasus do not belong to *Cryobius*, and a few other ones from the same area possess characters intermediate between this subgenus and other subgenera of *Pterostichus*.

In 2007, the author visited the Muséum National d'Histoire Naturelle, Paris where studied material of Palaearctic Pterostichini, among them the type material of the taxa from the group "*colchicus*" (in the sense of KIRSCHENHOFER 1987). Purpose of the present report is thus to announce results of this work as well as to announce lectotypes designation of very rare species which so far were neither recorded nor collected, except the type material.

Historical notes

An especial object of taxonomic interest within *Cryobius* is the species from the so called group "colchicus". This group includes *P. colchicus* (CHAUDOIR 1850), *P. platyderus* (CHAUDOIR 1850), and *P. stomoides* (CHAUDOIR 1868). In the original and subsequent descriptions these taxa were, directly or indirectly, compared with *P. pulchellus* (FALDERMANN 1836) (CHAUDOIR 1846, 1850, 1868, MARSEUL 1880) and placed right after this species under *Lyrothorax* CHAUDOIR 1838 (MARSEUL 1880: 271-272; MARSEUL 1882: 44). GANGLBAUER (1891: 35) included only *P. caspius* MÉNÉTRIÉS 1832 under *Lyrothorax* and put the species in question close to *Haptoderus* CHAUDOIR 1838, in a group with *P. pulchellus* leading. After the number of the basal impressions on pronotum (four or two), REITTER (1896) referred *P. colchicus* and *P. platyderus* to *Haptoderus*, and put *P. pulchellus* in *Agonodemus* CHAUDOIR 1838. But, the last subgenus was created by CHAUDOIR 1838 for *P. picimanus* (DUFTSCHMID, 1812), a junior synonym of *P. macer* (MARSHAM, 1802), which belongs to groups structurally different from that of *P. pulchellus*, so that *Agonodemus* CHAUDOIR 1838 and *Agonodemus* REITTER 1896 (unavailable name for *Oreoplatysma* JACOBSON 1907) have been after that used for distinct subgenera of *Pterostichus*. Next, HEYDEN et al. (1906: 87-88) put *P. colchicus* and *P. platyderus* in *Haptoderus*, and *P. stomoides* – in *Agonodemus* REITTER, and WINKLER (1924: 164) and CSIKI (1930: 648-651) placed the three species under *Haptoderus* and thus the Reitter's point of view has been followed by the subsequent authors. In 1987, KIRSCHENHOFER (1987) differentiated the three species in their own group "colchicus" from the other Balkan-Anatolian and Caucasian taxa of *Haptoderus*. This decision has been taken into account without study of type or any material from *P. colchicus*, *P. platyderus*, and *P. stomoides*. It is worthy of note that, lastly Belousov (KRYZHANOVSKIJ et al. 1995: 102 note 206) expressed the opinion that the "colchicus" group is a "highly disjunct group" and that the validity of the taxa from this complex requires confirmation.

Material and methods

The figures were made in glycerine with the aid of a drawing tube mounted on a transmitted-light microscope. After that, the aedeagus and parameres were embedded in Euparal (details for the concrete example of attaching are given under each species).

Recent taxonomic papers on the subgenus *Oreoplatysma* (KIRSCHENHOFER 1987, 1991, 1992, KRYZHANOVSKIJ 1988, 1989, BELOUSOV 1991, WRASE & KIRSCHENHOFER 1991, DVOŘÁK 1995) were used for identifications and searching for the taxonomic position of each species. The concept of *Cryobius* is that proposed by BOUSQUET (1999). The intra-group division of *Oreoplatysma* follows the Belousov's view (KRYZHANOVSKIJ et al. 1995).

The studied material could be traced in the following collections

DEI.....Deutsches Entomologisches Institut, Müncheberg, Germany
 MNHNMuséum National d'Histoire Naturelle, Paris, France
 MNHUB.....Museum für Naturkunde der Humboldt Universität zu Berlin, Berlin, Germany
 NMNHSNational Museum of Natural History, Sofia, Bulgaria

***Pterostichus (Oreoplatysma) colchicus* (CHAUDOIR 1850) (Figs 1-5)**

Feronia colchica CHAUDOIR 1850: 137.

Type material. 1♂ syntype (lectotype by present designation), relatively well preserved (only segments 6-11 of left antenna and segments 2-11 of right antenna missing), and without attached label under. Close to the specimen, the following handwritten label is pinned on the bottom of box: "*colchica* Chaud. Monts Taurus 48. Nordman." (MNHN, "Collection Chaudoir", box no 216 "*Argutor*"). As the original description does not implies that there are one or more syntypes, a lectotype by inference of "holotype" for this species is designated following [Article 74.6](#) of the International Code of Zoological Nomenclature (ICZN 1999).

Type locality. "Adjara" (CHAUDOIR 1850: 78). As far as the choice of type locality was based on a presumption of Chaudoir, we have doubt about the real place of finding the holotype and thus about the actual distribution of this species. In the last paragraph of the description, CHAUDOIR (1850: 78) write: "M. de Normann l'a rapportée de son voyage en Abkhasie, en Mingrélie et dans le Gouriel; je presume qu'il l'a trouvé sur le plateau de l'Adjara, car évidemment un insecte alpin." The supposition for inaccurate type locality is also supported by the label data of the syntype (e.g. "Monts Taurus...") and by data of the morphology and distribution of the related taxa; see below.

Male genitalia. Median lobe of aedeagus in lateral view (Figs 1-2) with ostium deflected to left; apical and basal parts equal in length, apical one with slanting dorsal and straight ventral margin, so that apex became pointed at tip; basal part with strongly developed and prominent ventral process; internal sac in apical position inside, with single strongly chitinised piece (visible in left lateral position). Apex of median lobe dorsally (Fig. 3) with tip deflected to left. Left paramere (apical part broken) (Figs 4-5) with apical and basal parts bent each other almost at right angle.

After drawing, the genitalia were placed in Euparal on the same label on which the specimen is glued.

Taxonomic notes and relationships. The presence of scanty pubescence on the distal part of left antennomere 3, dense and continuous punctuation on the basal part of pronotum (which also prolongs forward along the lateral margins and reaches the anterior part of pronotum), absence of medial setiferous punctures on the hind coxae, glabrous ventral side of onychium, and presumable sickle-shaped left paramere demonstrate that this species belongs to *Oreoplatysma*, and do not to *Cryobius*. The following transfer is proposed: *Pterostichus (Oreoplatysma) colchicus* (CHAUDOIR 1850), new assignment of *Pterostichus (Cryobius) colchicus* (CHAUDOIR 1850).

Details in the external morphology and morphology of both the aedeagus and of the left paramere suppose that this species is allied to several representatives of the group "*koenigi*", like *P. cecchiniae* (JAKOBSON 1907), *P. rousianus* KIRSCHENHOFER 1987, and *P. strasseri* REITTER 1898. But, according to the best of our knowledge, no *Oreoplatysma* species with pubescent distal part of antennomeres 3 lives in the territories south of the Caucasus Major (except *P. colchicus* and *P. kadleci* DVOŘÁK 1995), and especially in the area of Adzaria. *P. kadleci* from the Kop Daği (NE Turkey) is distinct from *P. colchicus* in the very thin and long apex of aedeagus.

P. colchicus should be valid species, but further investigation looking for eventual synonymy between it and subsequently described species and for the true area of distribution is needed.

Distribution. ? Adzaria (KRYZHANOVSKIJ et al. 1995: 102).

***Pterostichus (Oreoplatysma) platyderus* (CHAUDOIR 1850) (Figs 6-10)**

Feronia laticollis CHAUDOIR 1846: 146 [junior secondary homonym of *Pterostichus (Badistrinus) laticollis* (MOTSCHULSKY 1844)].

Feronia platydera CHAUDOIR 1850: 136, replacement name for *Feronia laticollis* CHAUDOIR 1846: 146.

Type material. 2♂♂, 2♀♀ syntypes (male lectotype and paralectotypes by present designation), all well preserved, and without attached labels under. Close to the four specimens, the following handwritten label is pinned on the bottom of box: "*platydera* Chaud. Caucas centr. 8000. i." (MNHN, "Collection Chaudoir", box no 216 "*Argutor*"); 1♂ syntype (paralectotype by present designation), well preserved, labelled: "2700" [handwritten grimy label] / "*laticollis* Chaud. Caucas..." [handwritten grimy label] / "SYNTYPUS *Feronia laticollis* Chaudoir 1846 labelled by MNHUB 2005" [red typeset label] (MNHUB).

Type locality. "Imérétie, près de Glola" (CHAUDOIR 1848: 147).

Other material examined. 1♂ of *P. platyderus*, labelled: "Coll. Germar-Schaum" [typeset white label] / "*platyderus* Chaud. Caucas occid." [handwritten grimy label] (DEI); 1♀ paratype of *P. abishirensis* BELOUSOV 1991 (NMNHS).

Male genitalia. Median lobe of aedeagus in lateral view (Figs 6-7) with ostium deflected to left; apical part longer than basal part, with ventral margin slightly concave distally and apex somewhat bent downwards; basal part with strongly developed and prominent ventral process; internal sac (non-inverted state) with indistinct chitinised piece. Apex of median lobe dorsally (Fig. 8) straight with tip slightly deflected to left. Left paramere (Figs 9-10) sickle-shaped; basal part longer than apical one, forming widened bulb; apical part with pointed tip.

The genitalia of the two males from MNHN have been examined. After drawing, the genitalia of the lectotype were placed in Euparal on separate transparent label pinned under the specimen, from whom they were extracted; that of the paralectotype were also put in Euparal, but placed on the same label on which the specimen is glued. The genitalia of the male from DEI are identical with those of the specimens from MNHN while these of the specimen from MNHUB have not been extracted.

Taxonomic notes and relationships. The presence of pubescence on the distal part of antennomeres 3, missing scutellar pore of the elytra, dense and continuous punctuation on the basal part of pronotum (which is also detectable along the lateral margins in the anterior part of pronotum), absence of medial setiferous punctures on the hind coxae, glabrous ventral side of onychium, and sickle-shaped shape of left paramere demonstrates that this species is member of *Oreoplatysma*, and do not of *Cryobius*. The following transfer is proposed: *Pterostichus (Oreoplatysma) platyderus* (CHAUDOIR 1850), new assignment of *Pterostichus (Cryobius) platyderus* (CHAUDOIR 1850).

This species seems related to the species of the group "*abishirensis*" (BELOUSOV 1991, KRYZHANOVSKIY et al. 1995: 103), above all in the missing scutellar pore of elytra and shape of aedeagus. The group in question includes two vicarious species, e.g. *P. asinubas* DAVIES 2004 (replacement name for *P. abasinus* BELOUSOV 1991) and *P. abishirensis* BELOUSOV 1991. *P. platyderus* differs easily from both species in the longer and rounder right paramere and in the different shape of aedeagus. By the shape of the pronotum, aedeagus and right paramere, *P. platyderus* resembles more several species of the group "*koenigi*", as *P. satyrus* KURNAKOV 1962, *P. krivensis* BELOUSOV 1991 and *P. rousianus*. In the lateral margin of pronotum rather concave towards posterior angles and median lobe of aedeagus (dorsal view) bent to the left, the species is close to *P. rousianus*, but the former is distinct in aedeagus (lateral view) with concave ventral margin before apex

and apex bent downwards. *P. platyderus* and *P. krivensis* are very similar in the shape of pronotum and indistinct outer basal impression as well as in the shape of the aedeagus and of the left parameres. However, the former is distinct from the latter in the absence of distinct punctuation on the head, less protruding forward anterior angles of the pronotum, absence of scutellar pore, and somewhat shorter apical part of the left paramere. Based on the original description of *P. satyrus* (KURNAKOV 1962), we failed to find significant differences between this species and *P. platyderus*, save temporae gradually slanting backward and their length almost equal to diameter of eyes as well as elytral striae somewhat less punctured in the latter. Most probably *P. platyderus* occupies an intermediate position between the group "*abishirensis*" and the couple of species *P. satyrus* – *P. krivensis*, but is evidently closer to the last two.

P. platyderus should be valid species, but further taxonomic investigations should examine eventual synonymy between it and subsequently described species.

D i s t r i b u t i o n . Imeretia (KRYZHANOVSKIJ et al. 1995: 102).

***Pterostichus (Oreoplatysma) stomoides* (CHAUDOIR 1868) (Figs 11-14)**

Feronia stomoides CHAUDOIR 1868: 251.

T y p e m a t e r i a l . 1♂, 1♀ syntypes (male lectotype and female paralectotype by present designation), well preserved; male bears label "Touch  tie" [handwritten], and the female – label "Grusia 1870" [handwritten]. Close to both specimens, the following handwritten label is pinned on the bottom of box: "*stomoides* MOTSCH. Caucase Motschulsky" (MNHN, "Collection Chaudoir", box no 216 "*Argutor*").

T y p e l o c a l i t y . "Alpes de la Touch  tie (Caucase central et oriental)" (CHAUDOIR 1868: 251).

M a l e g e n i t a l i a . Median lobe of aedeagus in lateral view (Fig. 11) with ostium deflected to left, apical part longer than basal part and with straight ventral margin, tip of apex somewhat bent upwards; basal part with strongly developed and prominent ventral process; internal sac (inverted state) with single strongly chitinated piece. Apex of median lobe in dorsal view (Fig. 12) with tip deflected to left. Left paramere (Figs 13-14) sickle-shaped, regularly round in middle; basal part forming big widened bulb; apical part with round (not pointed) tip.

After drawing, the genitalia were included in Euparal and put on separate transparent label pinned under the lectotype.

T a x o n o m i c n o t e s a n d r e l a t i o n s h i p s . The presence of pubescence on the distal part of third antennomeres, dense and continuous punctuation on the basal part of pronotum, absence of medial setiferous punctures on hind coxae, glabrous ventral side of onychium, and sickle-shaped left paramere demonstrate that this species belongs to subgenus *Oreoplatysma*, and not to *Cryobius*. Therefore, the following transfer is proposed: *Pterostichus (Oreoplatysma) stomoides* (CHAUDOIR 1868), new assignment of *Pterostichus (Cryobius) stomoides* (CHAUDOIR 1868).

According to the external morphology and structure of the male genitalia, this species seems closer to the taxa from the group "*daghestanus*", and especially to *P. chefsuricus* REITTER 1896 and *P. kirschenblatti* KRYZHANOVSKIJ 1988. However, the apex of aedeagus distinctly bent to left and somewhat turn upwards and different shape of the left paramere suppose that *P. stomoides* is distinct from the other two species.

P. stomoides should be treated as valid species.

D i s t r i b u t i o n . Tushetia (KRYZHANOVSKIJ et al. 1995: 102).

Conclusion

The presence of pubescence on the distal part of antennomeres 3, dense, extensive and more or less continuous punctuation on the basal part of pronotum, absence of medial setiferous puncture on the hind coxae, glabrous ventral side of the onychium, and sickle-shaped form of the left paramere prove that *P. colchicus*, *P. platyderus*, and *P. stomoides* belong to the subgenus *Oreoplatysma*, and not to *Cryobius*. Furthermore, the group "*colchicus*" has represented an unnatural complex of species, which actually belong to at least two separate lineages of the former subgenus, e.g. the group of the group "*koenigi*" (*P. colchicus*, *P. platyderus*) and the group "*daghestanus*" (*P. stomoides*). At present, the status of each of the three species should be treated as valid on the next ground. None of them belong to the "*pulchellus*" species group, which includes both the two furthest back described members of *Oreoplatysma*, e.g. *P. pulchellus* and *P. rubripalpis* CSIKI 1930 (replacement name for *Feronia rufipalpis* CHAUDOIR 1846) and only species with glabrous antennomere 3.

Now, *Oreoplatysma* is including 47 species from the Caucasus Major, the Northwest of Asia Minor, and the Transcaucasus. *Cryobius* remains yet the most numerous subgenus of *Pterostichus* with 127 species as 115 of them live in the Palearctic (106 endemic for this region), and 23 species occur in the Nearctic (13 of them endemic for this region).

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Zusammenfassung

Das Typenmaterial von *Pterostichus colchicus* (CHAUDOIR 1850), *P. platyderus* (CHAUDOIR 1850) und *P. stomoides* (CHAUDOIR 1868) (Coleoptera, Carabidae) wurde revidiert und es wurden Lectotypen festgelegt. Beschreibungen, Abbildungen und taxonomische Hinweise ergänzen die Arbeit. Alle drei Arten gehören der Untergattung *Oreoplatysma* JACOBSON 1907 an und nicht *Cryobius* CHAUDOIR 1838. Sie bilden keine monophyletische Gruppe und sollen als valide Arten betrachtet werden.

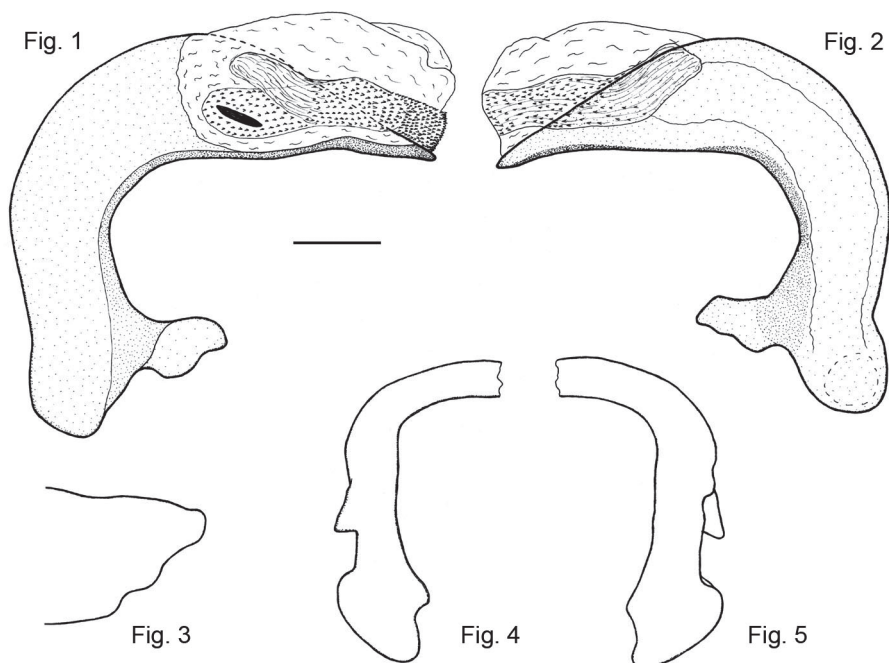
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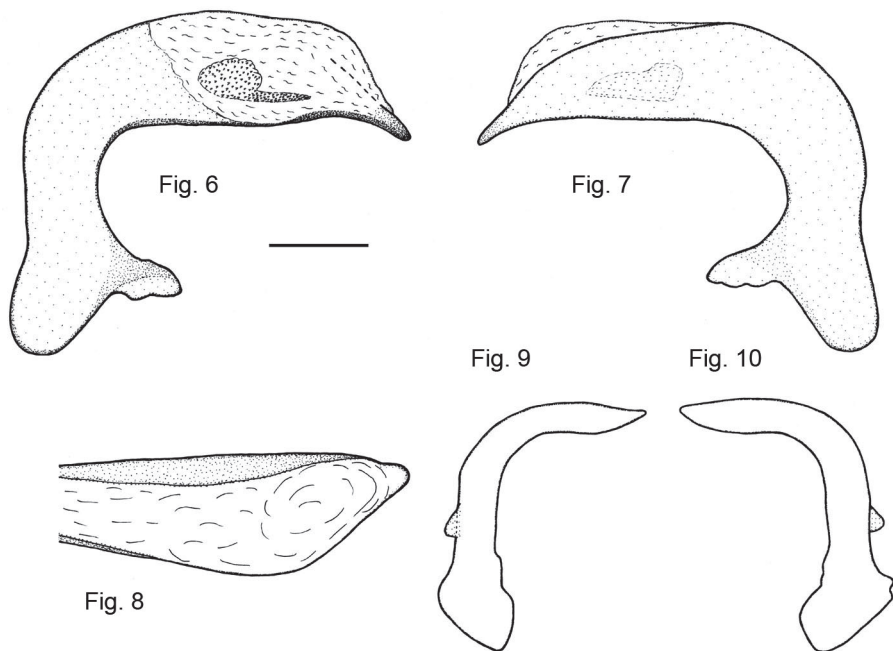
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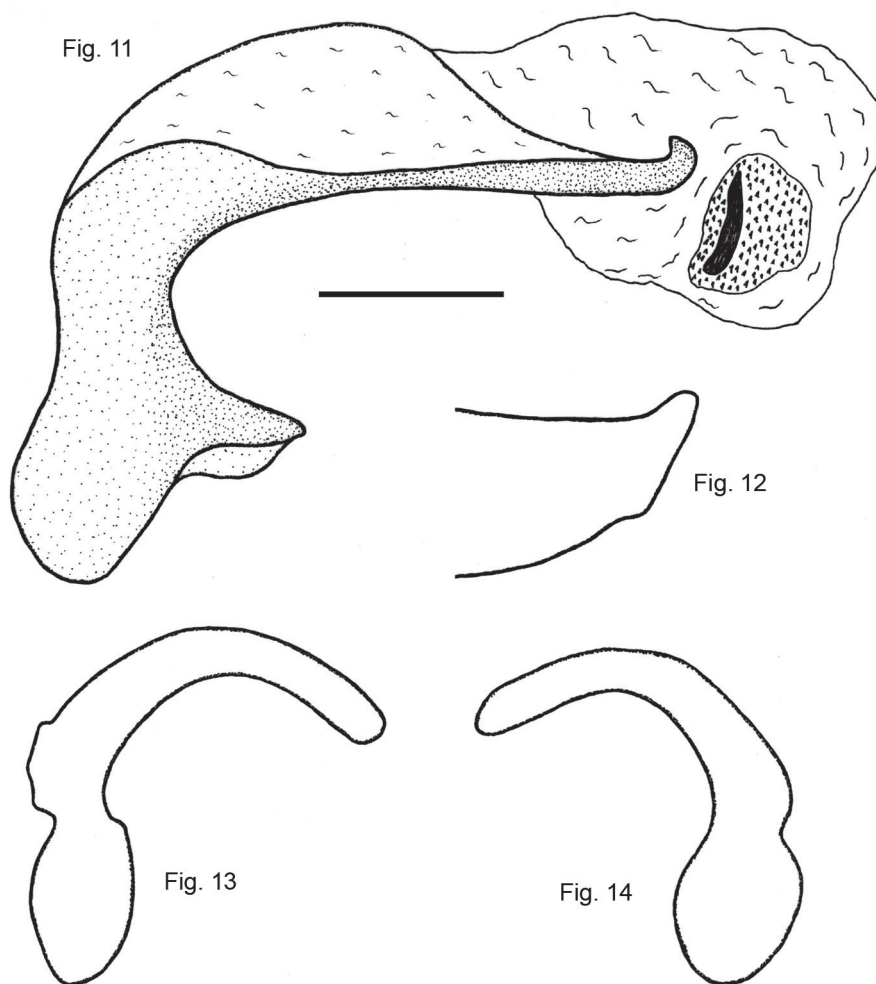
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Figs 1-5: *Feronia colchica* CHAUDOIR, lectotype: Fig. (1) aedeagus, left lateral view; Fig. (2) aedeagus, right lateral view; Fig. (3) apex of aedeagus, dorsal view; Fig. (4) right paramere, internal view; Fig. (5) right paramere, external view. Scale bar 0.5 mm (1-5).



Figs 6-10: *Feronia laticollis* CHAUDOIR, lectotype: Fig. (6) aedeagus, left lateral view; Fig. (7) aedeagus, right lateral view; Fig. (8) apex of aedeagus, dorsal view; Fig. (9) right paramere, internal view; Fig. (10) right paramere, external view. Scale bar 0.5 mm (6-10).



Figs 11-14: *Feronia stomoides* CHAUDOIR, lectotype: Fig. (11) aedeagus, left lateral view; Fig. (12) apex of aedeagus, dorsal view; Fig. (13) right paramere, internal view; Fig. (14) right paramere, external view. Scale bar 0.5 mm (11-14).

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