

**A revision of the *Aphthona gracilis* species group
(Coleoptera: Chrysomelidae)**

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**Ревизия видов группы *Aphthona gracilis*
(Coleoptera: Chrysomelidae)**

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Abstract. The *Aphthona gracilis* group of species is reviewed. Three new species are described and illustrated: *A. glebi* sp. n. – Uzbekistan (Ferghana Valley) and Iran; *A. olegi* sp. n. – Azerbaidzhan (Ordubad); and *A. taniae* sp. n. – Kyrgyzstan (Alaiskii and Kirgizskii mountain ranges, Bishkek), Afghanistan (Badakhshan), Kazakhstan (Chelkar), and Uzbekistan (Ustyurt). A key to all species of the *A. gracilis* group is provided.

Key words. New species, *Aphthona*, Palaearctic Region.

Резюме. Выполнен обзор видов группы *Aphthona gracilis*. Приведены описания и рисунки 3 новых видов: *A. glebi* sp. n. – Узбекистан (Ферганская долина), Иран; *A. olegi* sp. n. – Азербайджан (Орду-бад) и *A. taniae* sp. n. – Кыргызстан (Алайский и Киргизский хр., Бишкек), Афганистан (Бадахшан), Казахстан (Челкар), Узбекистан (Устюрт). Дана определительная таблица всех видов группы *A. gracilis*.

Ключевые слова. Новые виды, *Aphthona*, Палеарктическая область.

Introduction

Among recently revised Palaearctic *Aphthona* Chevrolat, *A. gracilis* Faldermann and *A. wiseana* Konstantinov constitute a well defined group (Konstantinov, 1998). They share a unique “spoon-shaped” median lobe of the aedeagus (Figs 2–6) and a short vaginal palpus with unique posterior sclerotization being longer than anterior sclerotization (Figs 16, 26, 32, 37) (with the exception of *A. glebi* sp. n., see Fig. 11). Study of *Aphthona* specimens in various collections revealed three more species that belong to this group. These new species are described below and compared to previously known species in the key that follows the descriptions.

Material and methods

Morphological terminology follows Konstantinov (1998). The following are abbreviations for the collections: National Museum (Natural History), Prague, Czech Republic – NMPC; National Museum of Natural History, Smithsonian Institution, Washington DC, USA – USNM; Staatliches Museum für Tierkunde, Dresden, Germany – SMTD; Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia – ZMAS.

Aphthona glebi Konstantinov, sp. n. (Figs 1, 2, 7–13)

Diagnosis. *Aphthona glebi* undoubtedly belongs to the *A. gracilis* group since it shares a unique “spoon-shaped” median lobe of the aedeagus. It is nearly indistinguishable from other members of the group in body shape and colour. However it can be easily recognized by the median lobe having sides of its posterior part curved rather than straight as it occurs in all other species of the group. Specimens of this species from Ferghana Valley were identified as *A. armeniaca* Weise by I.K Lopatin and included under that name in the treatment of leaf beetles of Kazakhstan and Middle Asia (Lopatin, 1977).

Description. Body length 1.94–2.32 mm, width 1.02–1.24 mm.

Black to dark brown; metafemur brown, last five antennomeres dark at apices, rest of legs and antennae amber-yellow.

Vertex moderately dull, finely shagreened, flat above antennal calli. Frontal ridge moderately narrow, with sides nearly parallel. Antennal calli slightly convex, with wrinkles, contiguous, forming obtuse angle to each other. All sulci sharply outlined and deep. Supracallinal sulcus slightly uniformly curved. Anterofrontal ridge low, concave with well defined denticle in middle. 2nd antennomere as long as 3rd and slightly shorter than 4th, 5th antennomere 1.5 times as long as 4th and 6th.

Pronotum shiny, convex in lateral view. Base wider than apex. Lateral margin more or less narrowly explanate. Anterolateral callosity moderately long, with acute denticle, straight. Posterolateral callosity long. Punctures fine. Basal part of pronotum with same density of punctures as apical part.

Scutellum nearly as wide as long, narrowly rounded at apex. Elytron with well developed humeral callus, widest at apical 1/3. Side of elytron slightly convex in basal 2/3. Apical margin slightly convex and angulate at apex. Punctures forming irregular striae on disc, mostly 1.5 times as large as interspaces, larger than punctures on pronotum.

Metatibia moderately long and wide, curved distally in lateral view, gradually widening apically, flat dorsally in apical 1/3. In male, 1st protarsomere 1.33 times as long as wide; 4th protarsomere 5.5 times as long as wide; 1st metatarsomere flat dorsoventrally, bent ventrally, 2.28 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.8 times as long as wide. In female, 1st protarsomere 2.33 times as long as wide; 4th protarsomere 5.1 times as long as wide; 1st metatarsomere nearly cylindrical, straight, 4 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.3 times as long as wide.

Last abdominal sternite of female with widely obcordate apex, with sides before apex slightly sinuous (Figs 8, 10).

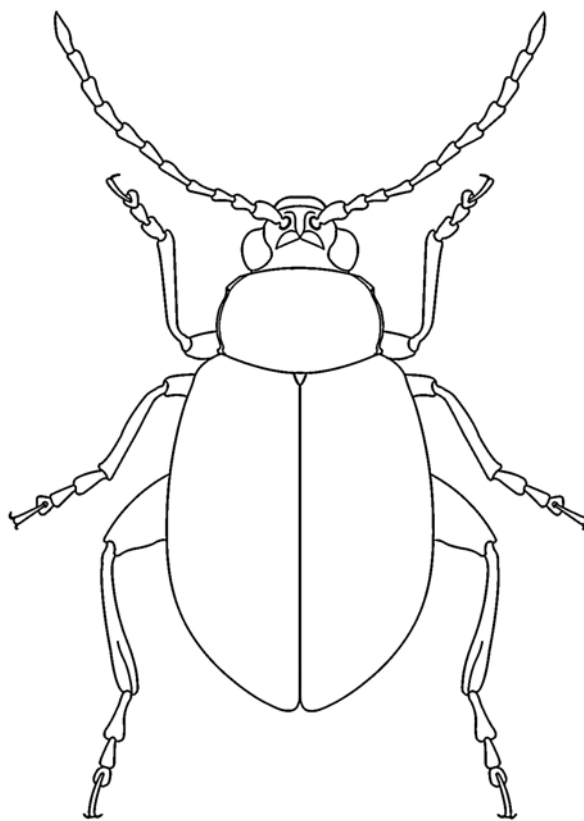


Fig. 1. *Aphthona glebi* sp. n., dorsal habitus.

Median lobe of aedeagus with distal part in ventral view lanceolate, convex at sides; in lateral view, slightly curved ventrally (Fig. 2). Apex relatively widely rounded, without well developed denticle.

Receptacle of spermatheca longer than pump (Fig. 7), widest in middle. Inner and outer sides equally convex. Apex slightly wider than base of pump. Vertical part of pump shorter and wider than horizontal, latter slightly curved. Spermathecal duct short, making small or no loop away from receptacle. Posterior sclerotization of tignum widely rounded, anterior sclerotization abruptly widening anteriorly (Fig. 9). Vaginal palpus with posterior sclerotization nearly as long as posterior one (Fig. 11).

Material. Holotype: ♂, Uzbekistan, "Fergana dol., g. Skobelev, 11.V.[1]920, I. Ivanov" (ZMAS). Paratypes. 1 ♂, 1 ♀, same labels as in holotype (USNM); 1 ♂, 4 ♀, "Namangan, Prov. Fergana", "W.H. Muche, Rodeberg, Ankauf", "Staat. Museum für Tierkunde Dresden" (3 SMTD, 2 USNM); 1 ♂, "Iran, Zergende, 12–15.II.1935, Filippov" (USNM).

Etymology. This species is named in honour of Gleb Sergeevich Medvedev, renowned coleopterist and explorer of Middle and Central Asia, on the occasion of his 75th birthday.

***Aphthona gracilis* Faldermann, 1837 (Figs 3, 14–20)**

Aphthona gracilis Faldermann, 1837: 344. Type locality: Khosrov, Armenia. Neotype (ZMAS) designated by Konstantinov (1998).

Diagnosis. For full description see Konstantinov (1998). It can be separated from the other species of the group by the following characters: median lobe of the aedeagus straight in lateral view, sides of wider part of the median lobe parallel, and the apex of the last abdominal sternite slightly concave.

Type material examined. Neotype: ♂, "Armenia, Khosrov, 17.V.1988, leg. A. Konstantinov", "Neotype *Aphthona gracilis* Faldermann, des. A. Konstantinov, 1996" (ZMAS).

***Aphthona olegi* Konstantinov, sp. n. (Figs 4, 21–26)**

Diagnosis. *Aphthona olegi* can be recognized by the wide distal part of the median lobe of the aedeagus being as long as basal part. For other characters see key.

Description. Body length 2.27–2.54 mm, width 1.21–1.35 mm.

Black to dark brown, metafemur brown, antennomeres gradually darken starting with antennomere 6, rest of legs and antennae amber-yellow.

Vertex moderately dull, finely shagreened, flat above antennal calli. Frontal ridge moderately narrow, with sides nearly parallel. Antennal calli slightly convex, with wrinkles, contiguous, forming obtuse angle to each other. All sulci sharply outlined and deep. Supracallinal sulcus slightly uniformly curved. Anterofrontal ridge low, concave with well defined denticle in middle. 2nd antennomere longer than 3rd and slightly shorter than 4th. 5th antennomere 1.5 times as long as 4th and 6th.

Pronotum convex in lateral view. Base wider than apex. Lateral margin more or less narrowly explanate. Anterolateral callosity moderately long, with acute denticle, straight. Posterolateral callosity long. Punctures fine. Basal part of pronotum with same density of punctures as in apical part.

Scutellum nearly as wide as long, narrowly rounded at apex. Elytron with well developed humeral callus, widest in apical 1/3. Side of elytron slightly convex in basal 2/3. Apical margin slightly convex and angulate at apex. Punctures forming irregular striae on disc, mostly 1.5 times as large as interspaces, larger than punctures on pronotum.

Metatibia moderately long and wide, curved distally in lateral view, gradually widening apically, flat dorsally in apical 1/3. In male, 1st protarsomere 1.75 times as long as wide; 4th protarsomere 5.00 times as long as wide; 1st metatarsomere flat dorsoventrally, bent ventrally, 2.27 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.71 times as long as wide. In female, 1st protarsomere 2.33 times as long as wide; 4th protarsomere 5.1 times as long as wide; 1st metatarsomere nearly cylindrical, straight, 3.7 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.83 times as long as wide.

Last abdominal sternite of female with nearly straight apex, sides before apex slightly sinuous (Figs 22, 24).

Distal part of median lobe oblong in ventral view, with straight sides. Apex relatively narrowly rounded, without well developed denticle. Wide distal part as long as basal part. Median lobe in lateral view curved ventrally (Fig. 4).

Receptacle of spermatheca longer than pump, widest at middle (Fig. 21). Inner side nearly straight, outer side convex. Apex slightly wider than base of pump. Vertical part of pump much shorter and wider than horizontal part; latter short, slightly curved. Spermathecal duct short, making small or no loop away from receptacle. Posterior sclerotization of tignum narrowly rounded, anterior sclerotization abruptly widening anteriorly (Fig. 25). Vaginal palpus with posterior sclerotization much longer than anterior. Median side of vaginal palpus straight (Fig. 26).

Material. Holotype: ♂, Azerbaijan, "Ordubad [Ordubad], Dr Veselý 14" (NMPC). Paratypes: 1 ♂, 1 ♀, same labels as holotype (♀ NMPC, ♂ USNM).

Etymology. This species is named after my brother Oleg.

***Aphthona taniae* Konstantinov, sp. n.** (Figs 5, 27–32)

Diagnosis. *Aphthona taniae* can be recognized by the median lobe of the aedeagus being strongly curved in lateral view. Specimens of this species from Ustyurt and Chelkar were identified as *A. gracilis* by I.K Lopatin and included under that name in the treatment of leaf beetles of Kazakhstan and Middle Asia (Lopatin, 1977).

Description. Body length 1.72–2.37 mm, width 0.94–1.29 mm.

Black to dark brown, metafemur brown, antennae gradually darkened starting with antennomere 6, rest of legs and antennae amber-yellow.

Vertex moderately dull, finely shagreened, flat above antennal calli. Frontal ridge moderately narrow, with sides nearly parallel. Antennal calli slightly convex, with wrinkles, contiguous, forming obtuse angle to each other. All sulci sharply outlined and deep. Supracallinal sulcus slightly uniformly curved. Anterofrontal ridge low, concave with well defined denticle in middle. 2nd antennomere as long as 3rd and slightly shorter than 4th, 5th antennomere 1.5 times as long as 4th and 6th.

Pronotum convex in lateral view. Base wider than apex. Lateral margin more or less narrowly explanate. Anterolateral callosity moderately long, with acute denticle, straight. Posterolateral callosity long. Punctures fine. Basal part of pronotum with same density of punctures as apical part.

Scutellum nearly as wide as long, narrowly rounded at apex. Elytron with well developed humeral callus, widest at apical 1/3. Side of elytron slightly convex in basal 2/3. Apical margin slightly convex and angulate at apex. Punctures forming irregular striae on disc, mostly 1.5 times as large as interspaces, larger than punctures on pronotum.

Metatibia moderately long and wide, curved distally in lateral view, gradually widening apically, flat dorsally in apical 1/3. In male, 1st protarsomere 1.71 times as long as wide; 4th protarsomere 3.75 times as long as wide; 1st metatarsomere flat dorsoventrally, bent ventrally, 2.85 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.08 times as long as wide. In female, 1st protarsomere 2.50 times as long as wide; 4th protarsomere 5.71 times as long as wide; 1st metatarsomere nearly cylindrical, straight, 4.20 times as long as wide; 2nd metatarsomere much longer than 3rd, shorter than 4th, 2.43 times as long as wide.

Last abdominal sternite of female with concave apex, sides before apex slightly sinuous (Figs 28, 30).

Distal part of median lobe oblong in ventral view, with sides straight. Apex with well developed denticle. Wide distal part longer than narrow basal part. Median lobe in lateral view strongly curved ventrally (Fig. 5).

Receptacle of spermatheca longer than pump (Fig. 27). Inner side slightly convex, outer side strongly convex. Maximum width of receptacle close to pump. Apex slightly wider than base of pump. Vertical part of pump much shorter and slightly wider than horizontal part. Horizontal part relatively short, slightly curved. Spermathecal duct short, making no loop away from receptacle. Posterior sclerotization of tignum narrowly rounded, anterior sclerotization gradually widening anteriorly (Fig. 29). Vaginal palpus with posterior sclerotization much longer than posterior one. Median side of vaginal palpus sinusoidal (Fig. 32).

Etymology. This species is named after my wife Tania.

Material. Holotype: ♂, Kyrgyzstan, "Alaiskii khrebet [mountain range], Gul'cha, 21.VII.1961, 2000 m, leg. V.F. Palij" (USNM). Paratypes: Kyrgyzstan: 1 ♂, same labels as holotype (USNM); 1 ♂, "Kirgizskii khrebet [mountain range], 7.VII.64, I.K. Lopatin" (USNM); 1 ♂, "Frunze (= Bishkek), Karag.[achyovaya] Roscha [= Elm Grove], 18.VII.1945, A. Lubischev", "*Aphthona gracilis* Fald. A. Lubischev" (ZMAS); 1 ♂, "Turkestanskii khrebet, Kshemysh. 19.VII.1963, Lopatin leg." (USNM); 1 ♂, 3 ♀, Afghanistan, "NO. Afghan[istan] 1953, J. Klapperich", "Badakhschan, Warduschtal", "Tschakaran, 1850m 6.VII" (2 ZMAS, 2 USNM); 2 ♀, "NO. Afghan[istan] 1953, J. Klapperich", "Badakhschan, Kokscha-Tal", "Tschakaran, 1850m 6.VII" (ZMAS, USNM); 3 ♂, Kazakhstan, "Chelkar, 30.VI.32, on *Chondrilla*", "*Aphthona gracilis* Fald. I. K. Lopatin det. 1970" (ZMAS, USNM); 1 ♂, Uzbekistan, "Plato [= Plateau] Ustyurt, Karakon, 13.VI.1964, polyn' [= wormwood], Kulenova", "*Aphthona gracilis* Fald. I.K. Lopatin det. 1970" (USNM).

Host plant. *Chondrilla* sp. (Asteraceae).

***Aphthona wiseana* Konstantinov, 1998** (Figs 6, 33–38)

Aphthona wiseana Konstantinov, 1998: 228. Type locality: Turkmenistan, Kara-Kala. Holotype in ZMAS.

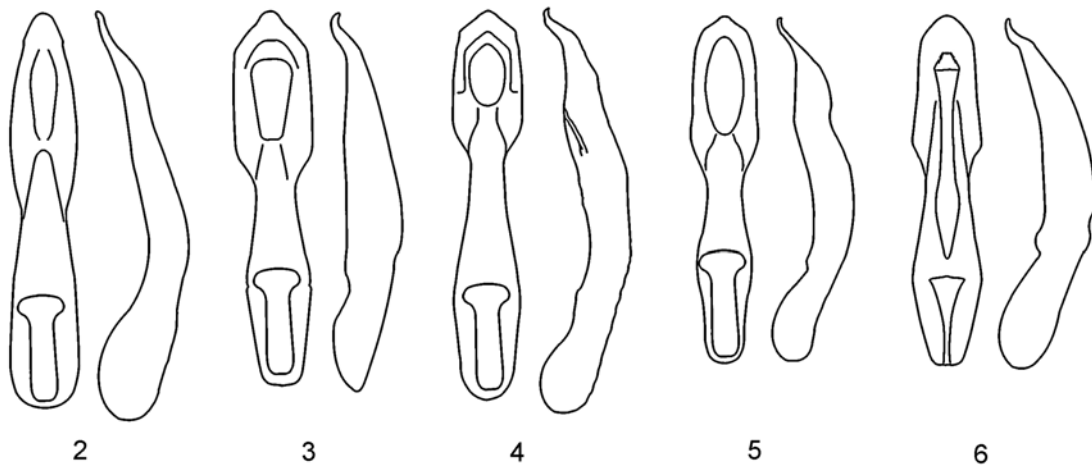
Diagnosis. For full description of *A. wiseana* see Konstantinov (1998). It can be separated from the other species of the group by the following characters: median lobe of the aedeagus evenly curved

in lateral view, sides of wider part of the median lobe converging posteriorly, and the apex of the last abdominal sternite slightly concave.

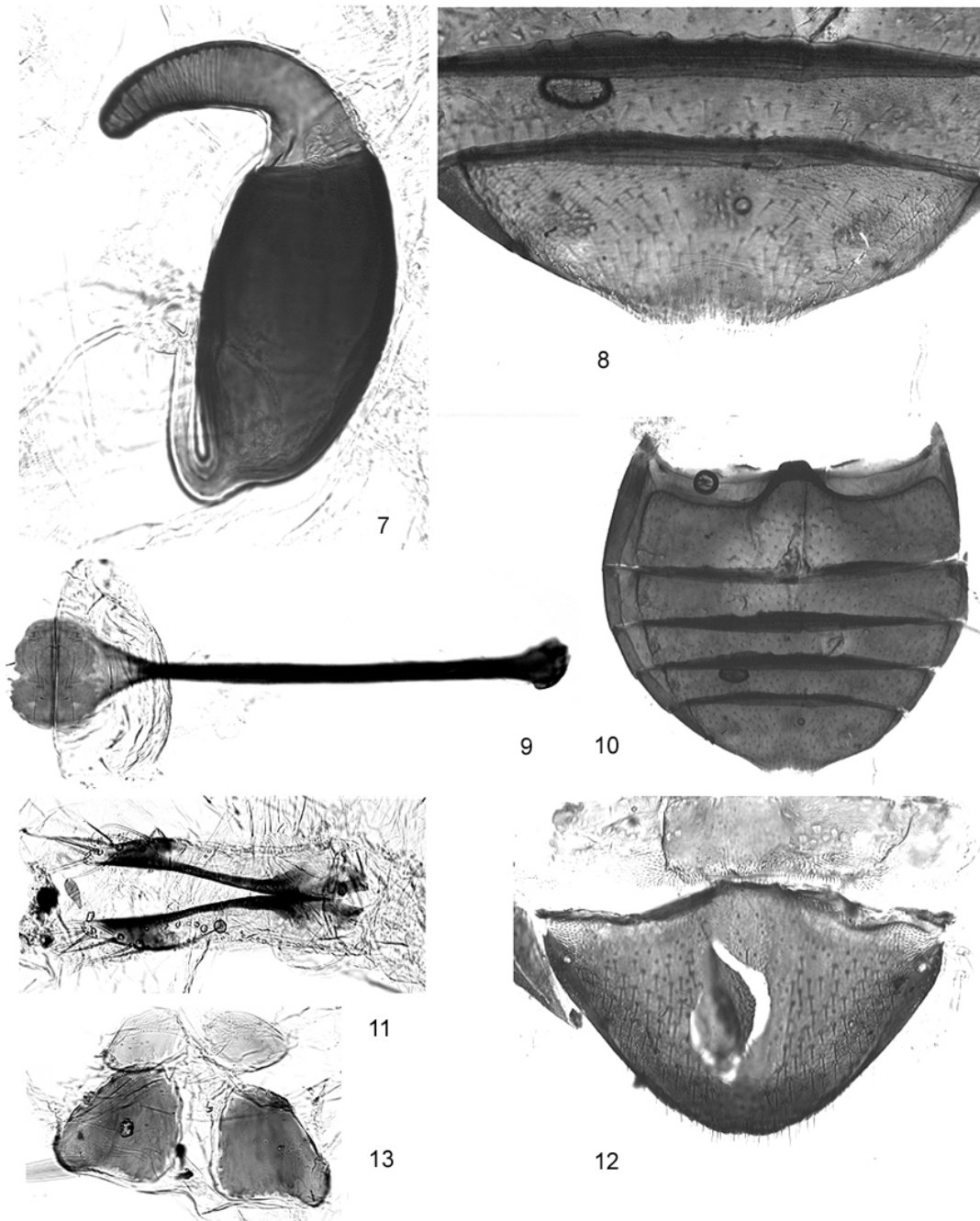
Material. Holotype: ♂, Turkmenistan, Kara-Kala, 29 V 1953. leg. Garnovskaya (ZMAS). 1 ♀, “S. Iran, Kushk, N. Masiri, 1800m, 12 VI 1973; loc # 237, Exp. Nat. Mus. Praha” (USNM).

Key for identification of species of *Aphthona gracilis* group

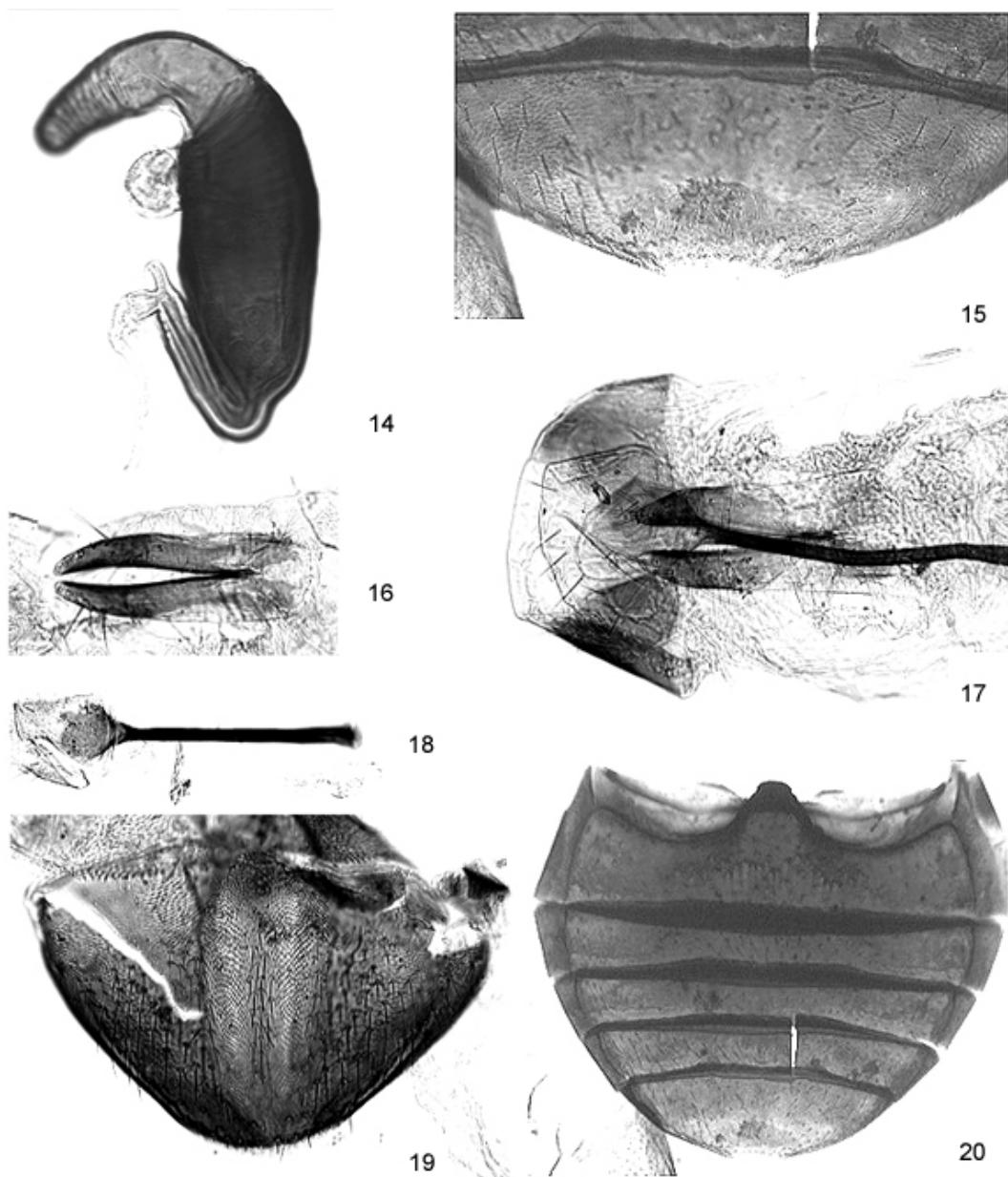
1. Median lobe of aedeagus with distal part lanceolate in ventral view, in lateral view slightly curved ventrally (Fig. 2). Vaginal palpus with posterior sclerotization longer than anterior one (Fig. 11) *Aphthona glebi* sp. n.
- Median lobe of aedeagus with distal part parallel-sided in ventral view, in lateral view strongly curved ventrally or straight (Figs 3–6). Vaginal palpus with posterior sclerotization nearly as long as anterior one (Figs 16, 26, 32, 37) 2
2. Apical part of median lobe of aedeagus with sides converging. Basal part of median lobe with longitudinal groove ventrally (Fig. 6). Spermatheca with widest part of receptacle close to pump (Fig. 33) ... *Aphthona wiseana* Konstantinov
- Apical part of median lobe of aedeagus with sides parallel. Basal part of median lobe convex, without longitudinal groove ventrally (Figs 3–5). Spermatheca with widest part of receptacle close to middle (Figs 14, 21) (except for *A. taniae*: Fig. 27) 3
3. Median lobe of aedeagus straight in lateral view (Fig. 3). Vaginal palpus curved medially in distal part (Fig. 16) *Aphthona gracilis* Faldermann
- Median lobe of aedeagus curved ventrally in lateral view (Figs 4, 5). Vaginal palpus straight medially in distal part (Fig. 26) (curved medially in *A. taniae*: Fig. 32) 4
4. Wide distal part of aedeagus as long as the narrow basal part (Fig. 4). Spermathecal receptacle widest in middle (Fig. 21). Vaginal palpus straight medially in distal part (Fig. 26) *Aphthona olegi* sp. n.
- Wide distal part of aedeagus longer than the narrow basal part (Fig. 5). Spermathecal receptacle widest near pump (Fig. 27). Vaginal palpus curved medially in distal part (Fig. 26) *Aphthona taniae* sp. n.



Figs 2–6. *Aphthona* spp., median lobe of aedeagus, ventral and lateral views. 2 – *A. glebi* sp. n., 3 – *A. gracilis* Fald., 4 – *A. olegi* sp. n., 5 – *A. taniae* sp. n., 6 – *A. wiseana* Konst.



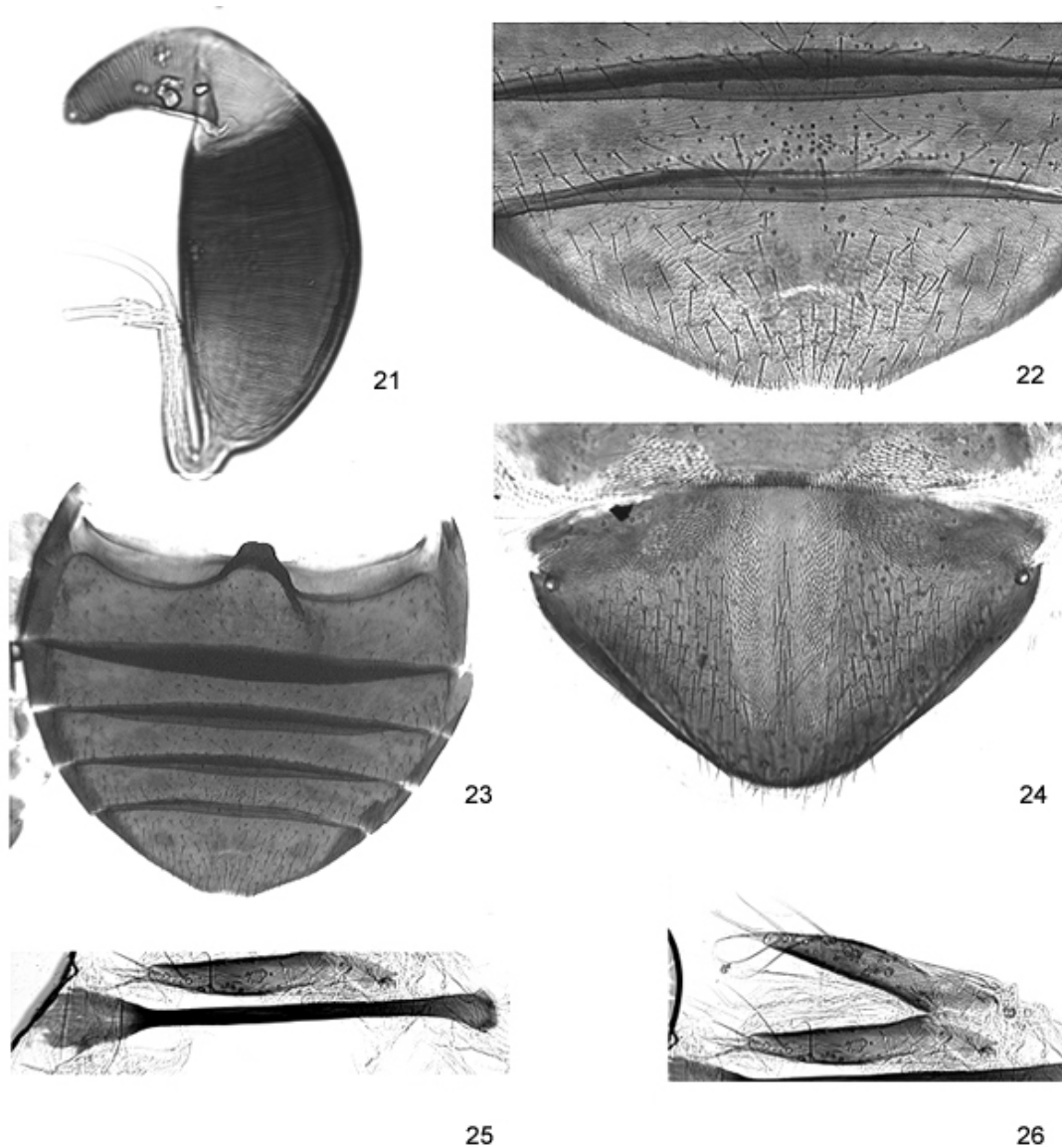
Figs 7–13. *Aphthona glebi* sp. n., female genitalia and abdomen. 7 – spermatheca, 8 – apical abdominal sternite, 9 – tignum, 10 – abdominal sternites, 11 – vaginal palpi, 12 – apical abdominal tergite, 13 – tergites 8 and 9.



Figs 14–20. *Aphthona gracilis* Fald., female genitalia and abdomen. 14 – spermatheca, 15 – apical abdominal sternite, 16 – vaginal palpi, 17 – tergites 8 and 9, 18 – tignum, 19 – apical abdominal tergite, 20 – abdominal sternites.

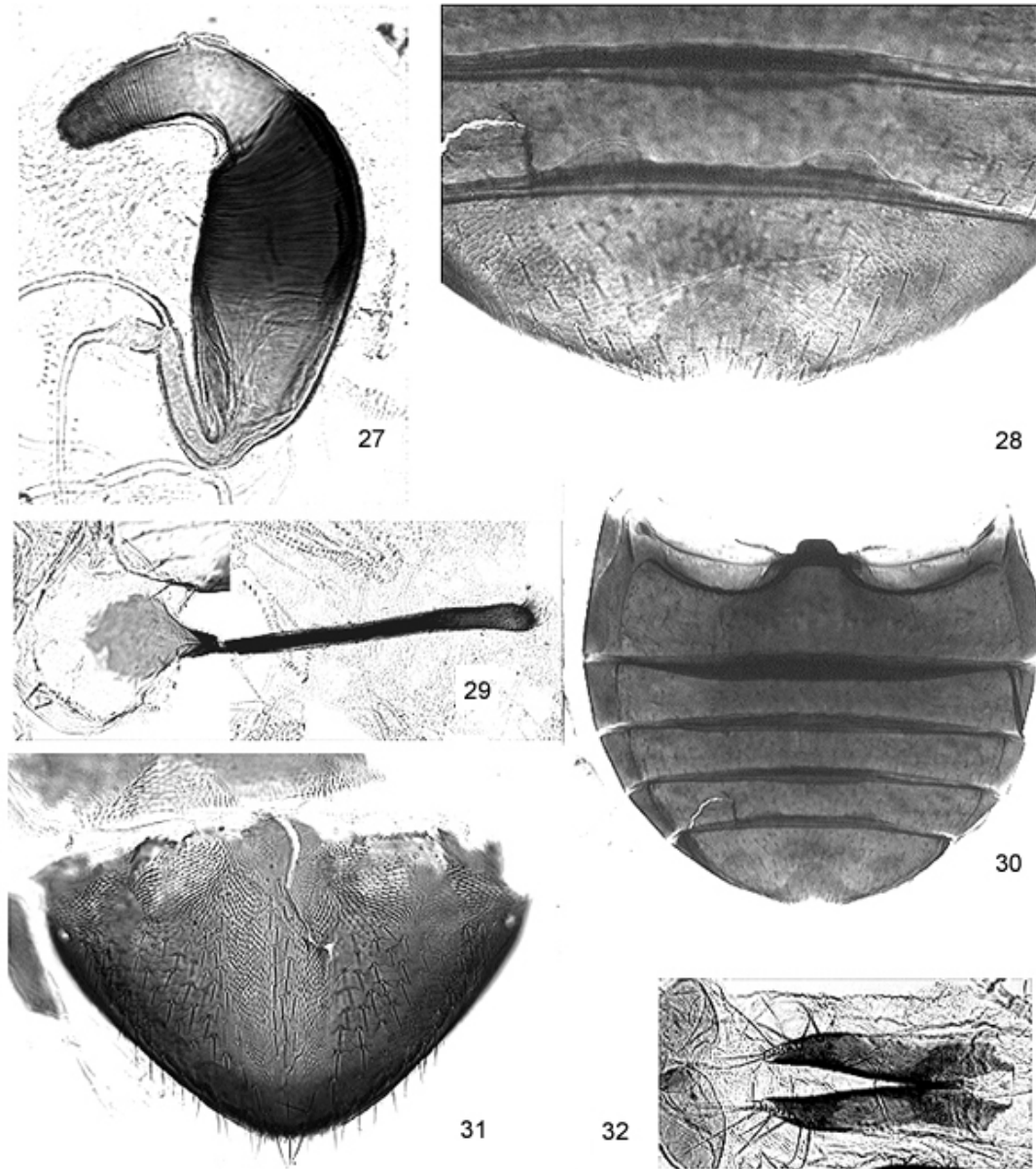
Discussion

Species of the *Aphthona gracilis* group are all distributed in the middle of the southern Palaearctic, from the Caucasus to southern Siberia. Southern Siberia is also the northern limit, with southern Iran being the southern (Fig. 39). Ranges of individual species differ dramatically in size and geographical position. Two species are endemic to relatively narrow areas: *A. glebi* sp. n. is known only from Ferghana Valley, and *A. olegi* sp. n., from Nakhichevan'. *A. gracilis* was mostly known from the Caucasus before it was found in the environs of Novosibirsk in southern Siberia (Konstantinov et al., 2001). *A. wiseana* is known from southern Iran and Turkmenistan. *A. taniae* has the largest range among newly described species, it includes northwestern Uzbekistan and Kazakhstan, Kyrgyzstan, and mountains of northern Afghanistan.

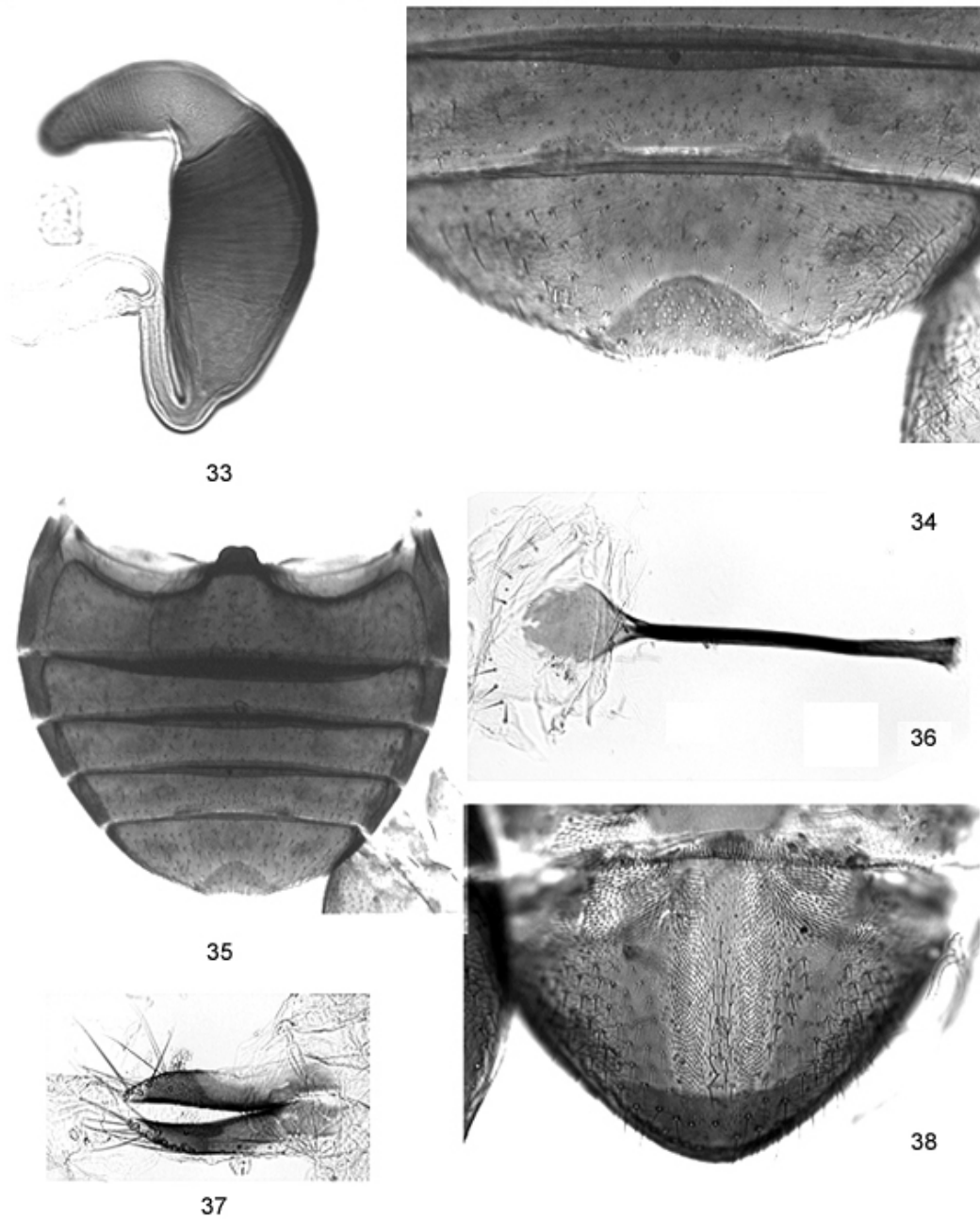


Figs 21–26. *Aphthona olegi* sp. n., female genitalia and abdomen. 21 – spermatheca, 22 – apical abdominal sternite, 23 – abdominal sternites, 24 – apical abdominal tergite, 25 – tignum, 26 – vaginal palpi.

Species of the *Aphthona gracilis* group occur at the variety of altitudes up to about 2000 m, however a habitat association is only known for *A. gracilis*. It was collected in a dry savanna type forest in Armenia and on an abandoned field in environs of Novosibirsk feeding on *Euphorbia virgata* Waldst. & Kit.



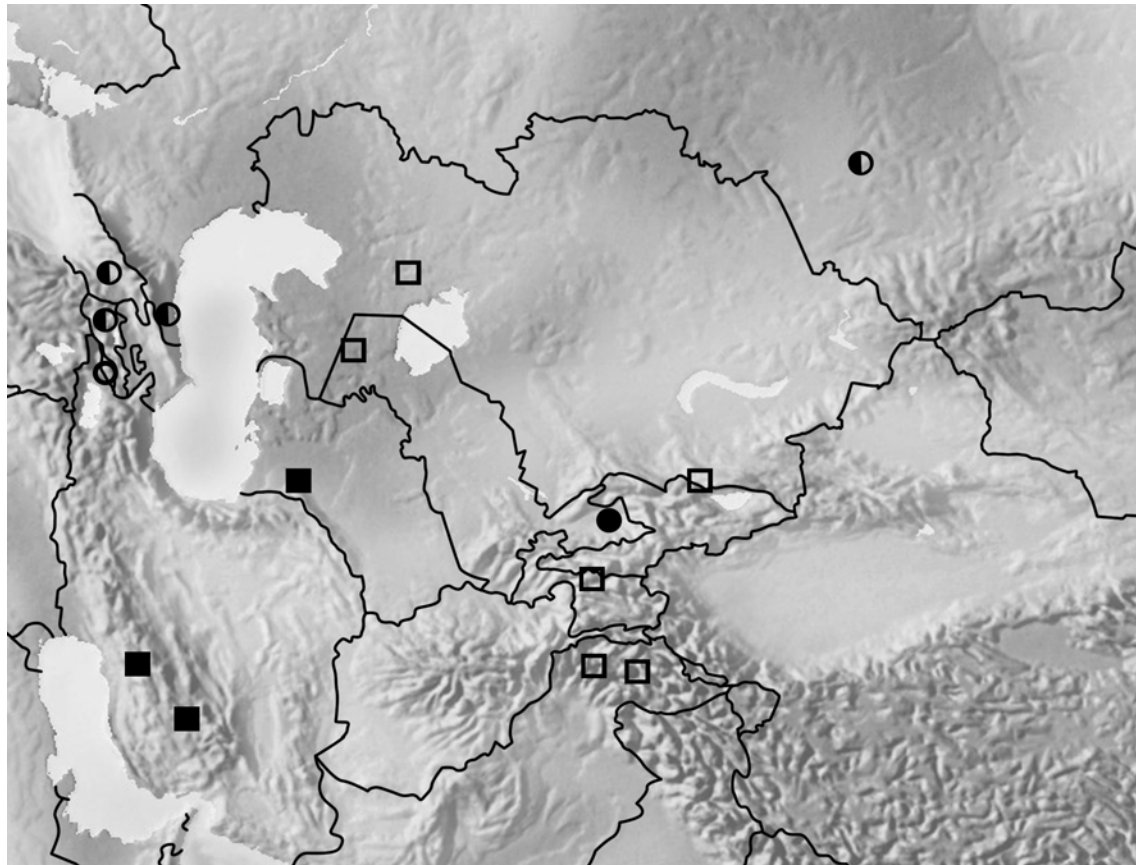
Figs 27–32. *Aphthona taniae* sp. n., female genitalia and abdomen. 27 – spermatheca, 28 – apical abdominal sternite, 29 – tignum, 30 – abdominal sternites, 31 – apical abdominal tergite, 32 – vaginal palpi.



Figs 33–38. *Aphthona wiseana* Konst., female genitalia and abdomen. 33 – spermatheca, 34 – apical abdominal sternite, 35 – abdominal sternites, 36 – tignum, 37 – vaginal palpi, 38 – apical abdominal tergite.

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● *A. glebi* ● *A. gracilis* ○ *A. olegi* □ *A. taniae* ■ *A. wiseana*

Fig. 39. Distribution of the *Aphthona gracilis* Fald. species group.

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