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A new species of *Gladiovalva* Sattler, 1960 from Central Asia (Lepidoptera: Gelechiidae)

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Abstract

Re-examination of museum's vouchers of *Gladiovalva igorella* Falkovitsh & Bidzilya, 2003 resulted in the discovery of new, hitherto undescribed species, which is in this paper described as *Gladiovalva arevika* Bidzilya & Šumpich, sp. n. Photographs of its adults and genitalia of both sexes are presented as well as the comparison with those of *G. igorella*.
Keywords: Lepidoptera, Gelechiidae, *Gladiovalva igorella*, Armenia, Iran, Turkmenistan.

Una nueva especie de *Gladiovalva* Sattler, 1960 de Asia Central (Lepidoptera: Gelechiidae)

Resumen

El reexamen del estudio de los ejemplares de museo de *Gladiovalva igorella* Falkovitsh & Bidzilya, 2003, dio como resultado el descubrimiento de una nueva especie, hasta ahora no descrita, que en este trabajo se describe como *Gladiovalva arevika* Bidzilya & Šumpich, sp. n. Se presentan fotografías de los adultos y de la genitalia de ambos sexos, así como la comparación con los de *G. igorella*.
Palabras clave: Lepidoptera, Gelechiidae, *Gladiovalva igorella*, Armenia, Irán, Turkmenistán.

Introduction

The genus *Gladiovalva* Sattler, 1960 initially comprised three species - *G. rumicivorella* (Millière, 1881) (type species), *G. pseudodorsella* Sattler, 1960 and *G. badidorsella* (Rebel, 1935) (Sattler, 1960), and two additional species have been described: *G. aizpuruai* Vives, 1990 (Spain) and *G. igorella* Falkovitsh & Bidzilya, 2003 (SE Kazakhstan and Uzbekistan).

Acetosa scutata (L.) Mill. and *Acetosa pratensis* Mill. are host plants for *G. rumicivorella,* and *G. aizpuruai* respectively, whereas larvae of *G. igorella* are known feeding on *Atraphaxis spinosa* L. (Polygonaceae).

The genus can be identifiable from weakly sclerotised uncus, reduced gnathos, very short sacculus and bulbus ejaculatorius with long, coiled, strongly sclerotised lamina in the male genitalia. The female genitalia of *Gladiovalva* are rather variable, but a combination of shape of signum and antrum can be considered as characteristic. Externally species of *Gladiovalva* are recognizable by dark forewing with light dorsal 1/3-1/4. In this respect *Gladiovalva* resembles some species of *Ornativalva* Gozmány, 1955, but latter are usually less contrasting and has longer brush of modified scales on underside of segment 2 of labial palps. Within Gelechiidae the genus was placed in the subfamily Anomologinae

near to *Ornativalva* (Elsner et al. 1999; Huemer & Karsholt, 2020). Bidzilya & Karsholt (2008) indicated some affinity of *Gladiovalva* to *Spiniductellus* Bidzilya & Karsholt, 2008.

In this present contribution we describe additional new species from Central Asia that is extremely similar to *G. igorella* in wing pattern but well distinguishable in genitalia of both sexes. A particularly significant difference is evident in the structure of the male genitalia where *G. arevika* Bidzilya & Šumpich, sp. n. has phallus with distinct medial process on dorsal side, which is unique within the genus.

Material and methods

The present study based on material from the following collections:

MNCN	Museo Nacional de Ciencias Naturales, Madrid, Spain
NHMW	Naturhistorisches Museum, Wien, Austria
NMPC	National Museum, Prague, Czech Republic
SMNK	Staatliches Museum für Naturkunde Karlsruhe, Karlsruhe, Germany
ZIN	Zoological Institute, Russian Academy of Sciences, Sankt-Petersburg, Russia
ZMKU	Zoological Museum, Kyiv Taras Shevchenko National University, Kyiv, Ukraine

Study material collected by the second author was attracted at ultraviolet light (8W/12V tubes) installed in portable light traps.

Preparations of genitalia slides followed standard techniques (Robinson, 1976). Pinned specimen were photographed with a camera Canon 750D in the combination of a Canon MP-E-65 mm lens (Jan Šumpich) or Canon EOS Rebel T5 equipped with a Canon EFS 60 mm f/2.8 Macro USN lens (Oleksiy Bidzilya). Slide-mounted genitalia were photographed with a Canon EOS 200D DSLR camera mounted on an Olympus CX-31 stereomicroscope (Jan Šumpich) or with a Canon EOS 600D DSLR camera mounted on an Olympus U-CTR30-2 trinocular head mounted on a Carl Zeiss compound microscope. For each photographs sets of 10-20 images were taken at different focal planes and focused-stacked using Helicon Focus 6 with the final image edited in Adobe Photoshop CS5.

Results

Gladiovalva arevika Bidzilya & Šumpich, sp. n.

Material examined: Holotype ♂, ARMENIA mer., Arevik National Park, 3,2 km NE of Meghri, Artsvakar gorge, 750 m, rocky steppe, 38º55’15”N, 46º16’17”E, 6-7-VI-2017, J. Šumpich leg. (NMPC).

Paratypes: ARMENIA: 42 ♂♂, 31 ♀♀, same data as for holotype (gen. slides 22022 and 22013, J. Šumpich); Arevik National Park, 2.3 km NW of Aygedzor, Lichtkvaz, 1355 m, mountain steppe, rocks, 38º59’25”N, 46º11’9”E, 1 ♀, 4-VI-2017, J. Šumpich leg.; Arevik National Park, 3 km NW of Meghri, Lehvaz env., 844 m, rocky steppe, 38º54’59”N, 46º13’12”E, 2 ♂♂, 5 ♀♀, 5-VI-2017, J. Šumpich leg.; Arevik National Park, Shvanidzor env., 780 m, rocky steppe, 38º56’34”N, 46º22’57”E, 7 ♂♂, 2 ♀♀, 8-VI-2017, J. Šumpich leg.; Areni env., Noravank monastery, 1330 m, rocky steppe, 39º41’44”N, 45º12’52”E, 3 ♂♂, 10-VI-2017, J. Šumpich leg.; Khosrov, 130 m, 8-9-VII-2009, D. Vacula leg., 1 ♀ (gen. slide 295/17, O. Bidzilya) (all NMPC, 1 ♂, 1 ♀, MNCN, 1 ♂, 1 ♀ ZMKU); Migry on Araks, 6-VII-1931, M. Rjabov leg., 1 ♂ (gen. slide 73/22, O. Bidzilya); 1 ♂, same data as for preceding but 8-VII-1931 (gen. slide 12/18, O. Bidzilya) (all ZIN). IRAN, Prov. Semnān, 30 km NW Dāmghān, Cheschme Ali, 36º15’07”N, 54º04’20”E, 1560 m NN, 1 ♂, 24-V-[20]05, R. Trusch, G. Petschenka, B. Müller leg. (SMNK E-Lep. 215) (gen. slide 88/18, O. Bidzilya) (SMNK). IRAN: mountains N of Semnan, 1 ♂, 18-VI-1963, Kasy & Vartian leg. (gen. slide Hendriksen 6388) (NHMW).

TURKMENISTAN: Kara-Kala, Chandyrskaya doroga, 1 ♂, 8-VI-1953, V. Kuznetzov leg. (gen. slide 72/22, O. Bidzilya); Central Kopetdagh, Germab, 780 m, 1 ♂, 22-VI-1982, M. Falkovitsh leg. (gen. slide 9/18, O. Bidzilya) (all ZIN).

Diagnosis: The new species is similar in wing pattern to *G. igorella* (Figures 4-5, 9-11) but differs in lighter, white with few brown scale's labial palps, head (predominantly black in *G. igorella*), and lighter and shiny hindwing (but see also under Remarks). The male genitalia are unique in *Gladiovalva* having medial process on dorsal side in the distal portion of the phallus. The female genitalia resemble those of *G. igorella* (Figure 17) having the serrate signum but differ in absent of long well sclerotised antrum that is characteristic for the latter species.

Description: Adult (Figures 2-3, 6-8). Wingspan 13.5-15.0 mm. Head covered with white grey to brown tipped scales. Labial palpus recurved, segment 3 white mixed with brown, diffuse brown belt before apex, underside with brush of long modified scales, segment 3 with few brown scales basally on upper side and near middle, 3/4 length and 1/2 width of segment 2; scape black with white apex, flagellomeres black with distinct wide white rings in basal 1/4-1/3, and unicolour brownish black in the rest part of antennae; thorax black with white caudal spot, tegulae black; forewing black with pale yellow undulated pattern from base of costa to dorsal margin and then extending along dorsal margin to 2/3 length and about 1/3 width of forewing, two white nearly connected spots at 3/4, cilia blackish brown; hindwing grey at basal 1/3, then light brown, darker along margins, with brown cilia.

Male genitalia (Figures 12-13): Uncus trapezoidal slightly longer than broad, weakly sclerotised; gnathos reduced; tegumen triangular to 3/4 length with distinct transition to distal 1/4 that is narrow, about as broad as uncus, subrectangular to ovate with distinctly sclerotised sides and sclerotised posterior margin, lateral lobes of tegumen two times longer than broad, subrectangular, anteromedial emargination triangular; valva of even width, weakly bent, apex rounded, densely covered with hairs in distal 1/3, far extending over posterior margin of uncus; sacculus very short, about 1/7 length of valva, weakly narrowed towards rounded apex; vinculum broadly emarginated in middle, membranous, covered with short dense setae, fused dorsally with membranous transtilla forming weakly sclerotised ring around phallus; saccus subtriangular, broad at base, apex pointed or rounded, far extending beyond top of pedunculus; phallus separated into weakly sclerotised subovate caecum and strongly sclerotised distal portion, the latter has gradually bent ventral margin with short extension before middle, and deeply excavated dorsal margin with elongated narrow subapical process, apex weakly broadened, bulbus ejaculatorius about five times as long as phallus, lamina in anterior 1/3 of bulbus ejaculatorius, distinct, strongly coiled.

Variation: Specimen from Turkmenistan differs in shorter and broader saccus and narrower distal process of phallus (Figure 13). These differences are considered as individual variations until molecular analysis data will not indicate otherwise.

Female genitalia (Figures 15-16). Papillae anales elongated, covered with setae; apophyses posteriores slender, rod-like, two times as long as segment VIII; segment VIII about as long as broad, tergum VIII with shallow anterior emargination, sternum VIII parallel-sided, subgenital plates weakly sclerotised laterally, with more distinct sclerotised medial patches in posterior 2/3 edged laterally and anteriorly with narrow distinct folds, medial membranous zone very slender, just weakly broadened before straight, strongly sclerotised anterior margin; apophyses anteriores slender, as long as segment VIII; very slender saber-shaped processes extending medially from base of apophyses anteriores to 1/3 of sternum VIII and nearly connected above ostium opening; ostium opening large, subovate, near anterior margin of sternum VIII, surrounded laterally with elongated sclerite; posterior part of ductus bursae funnel-shaped, membranous, without sclerotised antrum, ductus bursae short, slender, broadened towards large, rounded corpus bursae, signum plate large, subhexagonal, covered with short triangular thorns, margins distinctly serrate, medial ridge about 1/4 width of signum.

Biology: Host plant unknown. Adults have been collected from late May to mid-July up to 1550 m in rocky steppes (Figure 1).

Distribution: Armenia, Iran, Turkmenistan.

Figure 1. Artsvakar gorge near Meghri in Armenia, habitat of holotype *Gladiovalva arevika* Bidzilya & Šumpich, sp. n.

Etymology: The species name is derived from territory in south of Armenia protected in Arevik National Park, from where the larger part of type series was collected.

Remark: *Gladiovalva igorella* that is most similar to *G. arevika* sp. n. by the wing pattern has been described from male holotype from Karatau Mts in SE Kazakhstan (Figures 4, 14), three females from Aksu-Dzubagly Nature Reserve (SE Kazakhstan) and two males and four females bred from *Atraphaxis spinosa* L. in Kyzylkum desert of Uzbekistan (Falkovitsh & Bidzilya, 2003). Our study of the type series of this species indicated small differences in the shape of phallus between holotype and paratypes. Revisionary studies are necessary to confirm if two species are involved.

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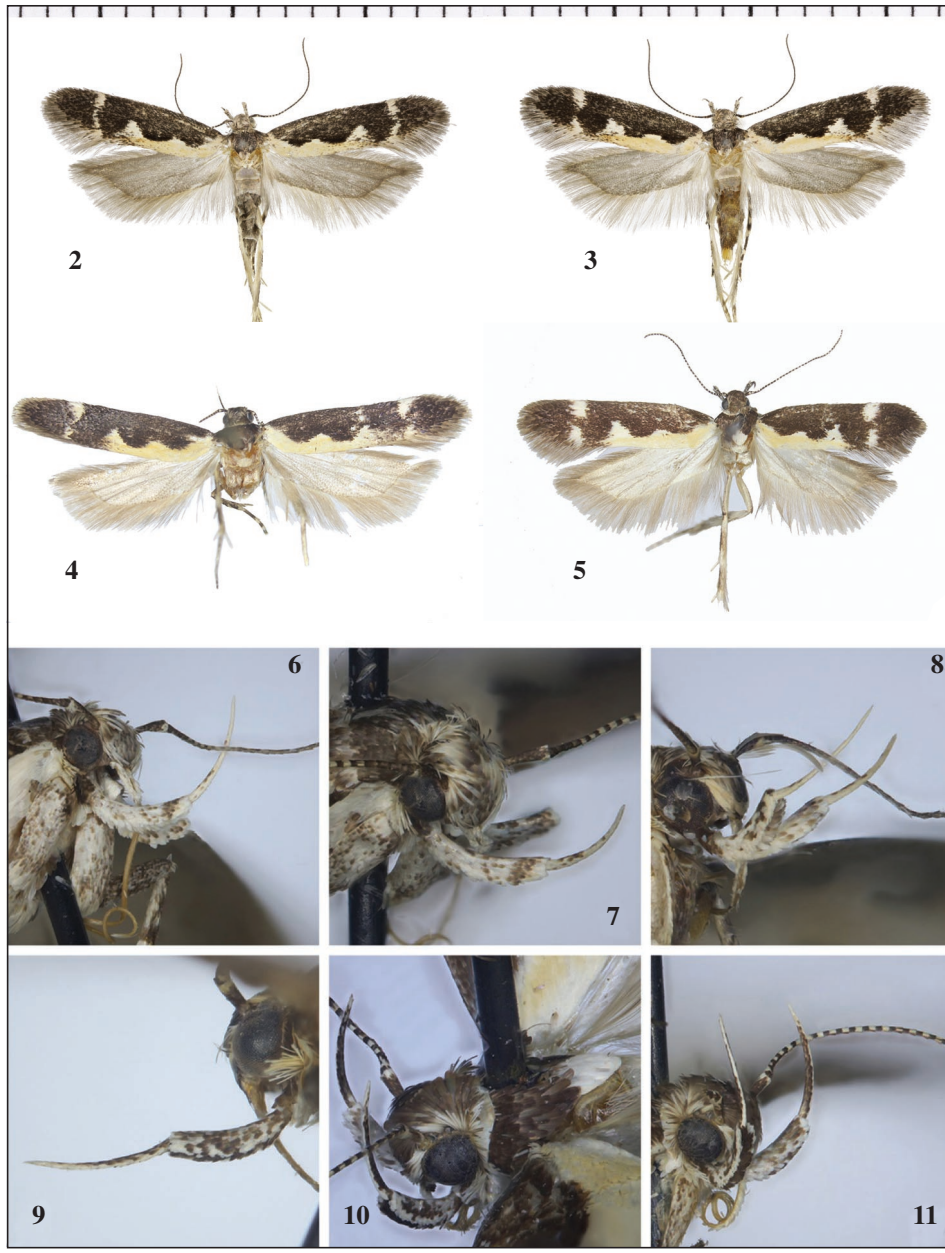
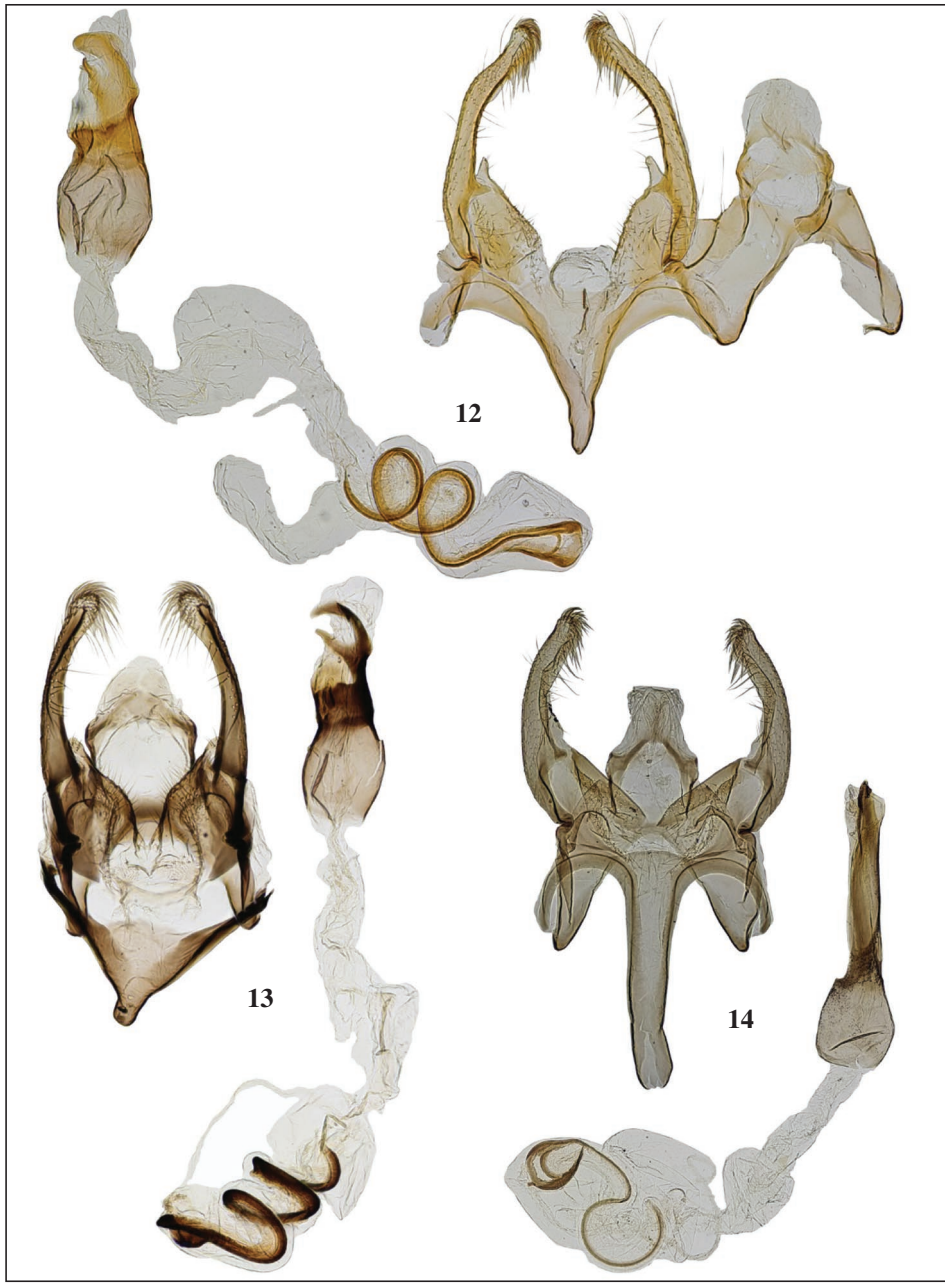
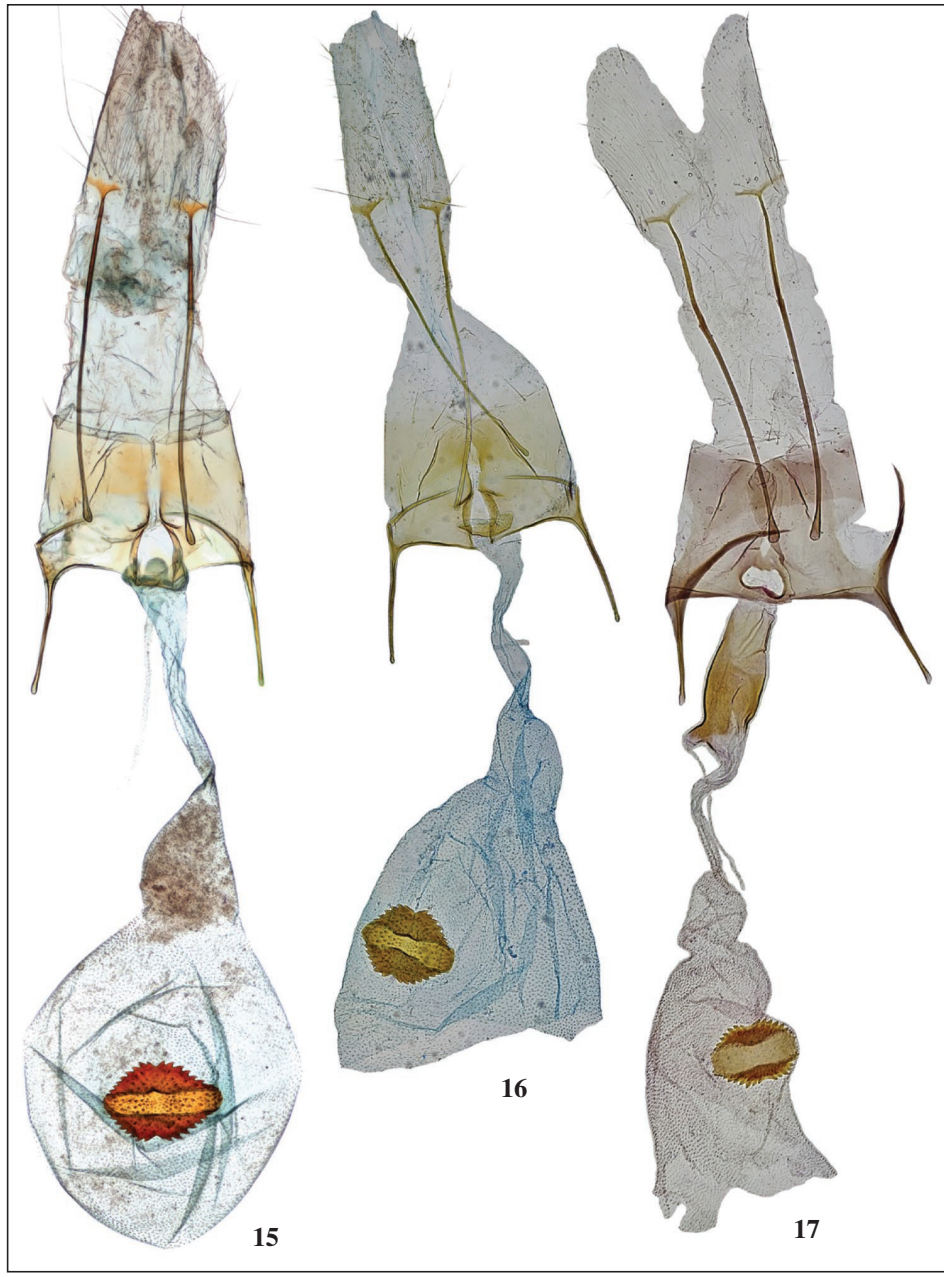


Figures 2-11. *Gladiovalva* spp. **2-5.** Dorsal view. **2-3.** *G. arevika* Bidzilya & Šumpich sp. n. **2.** Holotype, male. **3.** Paratype, female. **4-5.** *G. igorella* Falkovitsh & Bidzilya. **4.** Holotype, male. **5.** Paratype, female (gen. slide 53/07, OB). **6-11.** Head. **6-8.** *G. arevika* Bidzilya & Šumpich, sp. n. **6-7.** Female, Armenia. **8.** Male, Iran. **9-11.** *G. igorella* Falkovitsh & Bidzilya. **9.** Holotype, male, Kazakhstan. **10-11.** Paratype, female, Uzbekistan.



Figures 12-14. *Gladiovalva* spp., male genitalia. **12-13.** *Gladiovalva arevika* Bidzilya & Šumpich, sp. n. **12.** Paratype, Armenia (gen. slide 73/22, OB). **13.** Paratype, Turkmenistan (gen. slide 72/22, OB). **14.** *G. igorella* Falkovitsh & Bidzilya, holotype, Kazakhstan.



Figures 15-17. *Gladiovalva* spp., female genitalia. **15-16.** *G. arevika* Bidzilya & Šumpich, sp. n. **15.** Paratype, Armenia (gen. slide JŠ 22023). **16.** Paratype, Armenia (gen. slide 295/17, OB). **17.** *G. igorella* Falkovitsh & Bidzilya, paratype, Uzbekistan (gen. slide 53/07, OB).