

Three new *Anchoscelis* GUENÉE, 1839 species for Albania and two for the Republic of Macedonia

(Lepidoptera, Noctuidae)

by

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Abstract: *Anchoscelis rupicapra kresnaensis* RONKAY & MÉSZÁROS, 1982, *A. litura* (LINNAEUS, 1758) and *A. luteogrisea* (WARREN, 1911) are reported for the first time for Albania. *Anchoscelis rupicapra kresnaensis* RONKAY & MÉSZÁROS and *A. luteogrisea* (WARREN) are new for the Republic of Macedonia as well. Illustrations of specimens including ♂ and ♀ genitalia with everted vesicas and some taxonomical notes on *A. litura* (L.) and *A. luteogrisea* (WARREN) are presented in this article.

Introduction: There are only few articles dealing with Albanian Noctuidae, in which however the data for the autumn species are very scarce. In October 2017 we collected in Albania at several nights. For lamp collecting were chosen mostly places with deciduous oak trees. Reason for this choice was that even a common *Agrochola* (sensu lato) species have never been reported for Albania. During that trip we found almost all *Agrochola* (s. l.) species which we expected to find in that country. Part of the results are published in another article (BESHKOV & NAHIRNIĆ, in press). In addition three more species are reported here. Reliable identifications of *A. litura* (L.) and *A. luteogrisea* (WARREN), both new for Albania were possible only after examination of genitalia. On the way from Bulgaria to Albania in 2016 and 2017 we also spent a couple of nights collecting in the Republic of Macedonia. In Ohrid district both, *A. litura* (L.) and *A. luteogrisea* (WARREN), were found to be sympatric after examination of genitalia. In Demir Kapija district in October 2017 *A. rupicapra kresnaensis* RONKAY & MÉSZÁROS was found as new for the Republic of Macedonia, and the next day it was found as new for Albania also.

Collecting methodology involved 2-3 portable light traps with an 8 watt actinic (368 nm) and 8 watt “Blacklight” luminescent tubes, both powered by 12 volt batteries, as well as a Finnish “tent trap” with a 160 watt MV bulb at the top of the pole and a 20 watt (368 nm) black light lamp over the catching pot below. An additional 20 watt (368 nm) lamp was also positioned about 70 m from the tent trap. All traps ran throughout the night.

All genitalia slides were photographed by S. BESHKOV with a Zeiss stereo microscope Stemi 2000-C with axioCameRc 5s. Genitalia slides are fixed on glass in Euparal, solitary everted vesicas and ♀ genitalia were photographed in Euparal-essenz before mounting on glass. All genitalia were stained with Merbromin solution 2%. Insects are photographed with Sony DSChX400v digital camera. Trips were self-financed by the authors and undertaken in their spare time.

Anchoscelis rupicapra (STGR.) is a Ponto-Mediterranean species, the nominate *A. r. rupicapra* (STAUDINGER, 1879) occurs in Turkey (T.L.: Taurus), Iraq, Armenia, Transkaukasias and Cyprus (HACKER, 1990, RONKAY, RONKAY, GYULAI, & VARGA, 2017). *Anchoscelis rupicapra* (STGR.) was found as a new for Europe in SW Bulgaria, Kresna Gorge (RONKAY & MÉSZÁROS, 1982; MÉSZÁROS et al., 1984, HERCZIG & SZABÓKY, 1984, BESHKOV, 2000). In Bulgaria it is known also from SW Bulgaria, „Rupite“ near Volcanic Hill Kozhuh, Petrich district (GANEV, 1984, BESHKOV, 2000). *Anchoscelis rupicapra kresnaensis* RONKAY & MÉSZÁROS (Type locality: SW Bulgaria, Kresna Gorge) is a Balkan endemic taxon, till now known only from SW Bulgaria as mentioned above, from NW Greece (WEGNER, 2011, RONKAY, RONKAY, GYULAI, & VARGA, 2017) and from NE Greece and Peloponnesus (HACKER, 1989). It was expected to be found in the Republic of Macedonia and Albania as well. Perhaps it was not found before due to the late flight period (second half of October and the beginning of November).

Data for Macedonia: SE Macedonia, Vardar River Valley, Demir Kapija Gorge, on the ground road from Demir Kapija Town to Besvica Village, 244m, N41°22'58"; E022°11'45", 17.X.2017, S. BESHKOV & A. NAHIRNIĆ leg., 1 ♀ (fig. 1). Collecting locality near Demir Kapija (fig. 2) is similar to Kresna Gorge in Bulgaria with *Acer monspessulanum*, *Carpinus orientalis*, *Juniperus excelsa*, *J. oxycedrus*, *Pistacia terebinthus*, *Paliurus spina-christi*, *Phyllirea latifolia*, *Platanus orientalis*, *Quercus pubescens* etc. Some synchronic and syntopic species at our collecting locality are: *Eriogaster rimicola* ([DENIS & SCHIFFERMÜLLER], 1775), *Lemonia strigata* ROUGEOT & VIETTE, 1978, *Saturnia caecigena* KUPIDO, 1825, *Peribatodes correptaria* (ZELLER, 1847), *Idaea camparia* (HERRICH-SCHÄFFER, [1852]), *Amphipyra effusa* (BOISDUVAL, [1828]), *Meganephria bimaculosa* (LINNAEUS, 1767), *Caradrina kadenii* FREYER, [1836], *Caradrina flavirena* GUENÉE, 1852, *Tiliacea cypreago christiani* (FIBIGER, 1992), *Rhizedra lutos* (HÜBNER, [1803]), *Episema korsakovi* (CHRISTOPH, 1885), *Lithophane lapidea* (HÜBNER, [1808]), *Dryobota labecula* (ESPER, [1788]), *Dichonia aeruginea* (HÜBNER, [1808]), *Dryobotodes carbonis* (WAGNER, 1931), *Dryobotodes tenebrosa* (ESPER, [1789]), *Ammoconia senex* (GEYER, [1828]), *Polymixis serpentina* (TREITSCHKE, 1825), *Agrotis trux* (HÜBNER, [1824]), *Noctua tirrenica* BIEBINGER, SPEIDEL & HANIGK, 1983.

In Albania *A. rupicapra kresnaensis* RONKAY & MÉSZÁROS was found near Prespa Lake, Pustec Municipality, vicinity of Zrnosko (= Zrnoshkë) Village, 878 m, N40°46'27"; E020°54'09", 18.X.2017, 1 ♂ (fig. 3) at light trap. This locality is close to the borderline to the Republic of Macedonia, but in distance of about 130 km straight line from the locality near Demir Kapija. The locality there (fig. 4) is a small hill with *Quercus* spp.- *Carpinus orientalis* trees between Prespa Lake and Mali i Thatë Mts (in Macedonia known as Galičica Mts). This seems to be the highest locality of *A. rupicapra kresnaensis* RONKAY & MÉSZÁROS in Europe. *Anchoscelis luteogrisea* (WARREN) is also collected there (see below). Some other species collected there, together with *A. rupicapra kresnaensis* RONKAY & MÉSZÁROS, are mentioned in BESHKOV & NAHIRNIĆ (in press).

According to HACKER (1990) and BESHKOV (2000) *A. rupicapra kresnaensis* RONKAY & MÉSZÁROS is a synonym of the nominate species because of no important differences, either in genitalia or external from the population from Asia Minor and the Balkans. RONKAY et al. (2017) revised the status of *A. r. kresnaensis* RONKAY & MÉSZÁROS as a valid subspecies on the base of the forewing ground colour.

A. luteogrisea (WARREN) (figs 5-10) in habitus is very similar to *A. litura* (L.) (figs 11-12), sometimes only with slight differences in the wing colouration. For reliable identification, an examination of the genitalia is necessary, as the shape of the valvae (figs 13-16) is more informative than that of the everted vesica (figs 17-20). Main and easier differences between both species can be seen in the apical part of the valves and in the size of the terminal cornutus of the vesica (RONKAY et al., 2017). Differences in the σ genitalia, including everted vesica and of the φ genitalia as well are described also in DERRA & SCHREIER (1990) and in RONKAY et al. (2001). According to RONKAY et al. (2001) and to RONKAY et al. (2017), genital differences between *A. litura* (L.) and *A. luteogrisea* (WARREN) are easily recognizable but rather slight, with a certain amount of variation, and are the main cause for uncertainty in the taxonomic interpretation of these two taxa. FIBIGER et al. (2010) also express the opinion, that the genital structures of the *litura*-line are highly conservative, and the differences in the genitalia are much smaller, sometimes subtle. Most important feature of the σ genitalia are the shape of the valvae: curved distal part, more pointed apex and more dentate ventral margin before the tip of *Anchoscelis luteogrisea* (WARREN) (figs 13-15), whether in *A. litura* (L.) valvae are with more straight distal part, less pointed and with less dentate ventral margin (fig. 16). In the vesica of *A. luteogrisea* (WARREN) (figs 17-19) and that of *A. litura* (L.) (fig. 20) shape and the size of the terminal cornutus is specific (RONKAY et al., 2017).

What we found, in addition, is the length of the spiculi field and the shape of the juxta. There are significant differences in the size of the spiculi field, between both species, as they do not overlap. In *A. luteogrisea* (WARREN) it is 1.13-1.30 times longer than that of *A. litura* (L.). Juxta of *Anchoscelis luteogrisea* (WARREN) is with deltoid part visible shorter than the apical process, whether in *A. litura* (L.) they are equal. Measurements in mm are presented below; a, b, c - measurement of black line from one to another white line as figured in fig. 21.

Taxon	Sample number	Vesica (main tube - terminal cornutus basis)	Aedoeagus	Terminal cornutus	Spiculi field	Juxta - a	Juxta - b	Juxta - c	J u x t a proportion a:b
<i>A. luteogrisea</i>	n = 5	1.60 - 1.80	1.40 - 1.42	0.80 - 0.82	0.86 - 0.90	0.19 - 0.24	0.16 - 0.19	0.25 - 0.24	1.0 : 0.7
<i>A. litura</i>	n = 2	1.70 - 1.80	1.40 - 1.60	0.76 - 0.80	0.70 - 0.76	0.20	0.20	0.25 - 0.26	1.0 : 1.0

Table 1: Measurements of the σ genitalia.

The φ genitalia of both taxa are illustrated in DERRA & SCHREIER (1990) and in RONKAY et al. (2017). Differences in the φ genitalia as well are described in RONKAY et al. (2001). The differences in the literature sources quoted above are in the sclerotized plate of the antrum, lateral fold of the ductus bursae and the sclerotized apical part of the appendix bursae. This however is not always visible and depends on the time of boiling in KOH and the way of mounting the genitalia on slides. Lateral fold depends also on the compression of the genitalia on the slide. The φ genitalia illustrated here were inflated with syringe as injected with isopropanol through the ductus bursae and then photographed in Euparal-essenz before mounting on glass. What we noticed in the φ genitalia is the length of the ductus bursae, length of the apophyses anterior, height of the sclerotized plate of the antrum and perhaps the distance antrum-sclerotized apical part of appendix bursae which are larger in *A. litura* (L.), but this have to be proved statistically in more dissected specimens from both species. Measurements in mm along the structures as shown in fig. 22 are presented in the table below. Most important feature for copulation is the size of the ductus bursae, which seems to correlate to the size of the aedoeagus, but with the number of the specimens we dissected can not prove statistically this argument.

Taxon	Apophyses anterior- aa	Apophyses posterior- ap	Ductus bursae- db	Antrum-apical part of appendix bursae- a-ab	Sclerotized plate of the antrum- pa
<i>A. luteogrisea</i>	1.24	2.10	0.44	0.98	0.34
<i>A. luteogrisea</i>	1.14	2.12	0.40	1.16	0.30
<i>A. luteogrisea</i>	1.18	2.38	0.40	1.04	0.28
<i>A. luteogrisea</i>	1.26	2.04	0.42	1.12	0.28
<i>A. luteogrisea</i>	1.26	2.00	0.42	1.00	-
<i>A. luteogrisea</i>	1.16	2.02	-	0.84	0.28
<i>A. luteogrisea</i>	1.22	1.84	0.44	1.10	0.34
<i>A. litura</i>	1.38	2.10	0.62	1.20	0.42

Table 2: Measurements of the φ genitalia.

The range of *A. luteogrisea* (WARREN) is restricted to Island of Samos, Turkey, Northern Syria, Northern Iraq and Armenia (FIBIGER et al., 2010; FRITSCH et al., 2014), Azerbaijan and NW Iran (RONKAY et al., 2017). It is also confirmed for Northern Greece: Kosani and Alexandroupoli District (WEGNER, 2011). Recently it was reported as new for Bulgaria from Kresna Gorge and for Serbia from Vranje Region, Mt. Starac (BESHKOV, 2016).

Data for *A. luteogrisea* (WARREN) for the Republic of Macedonia: Petrina Planina - Galičica, between Ohrid and Velesovo, 1005 m, N41°05'26", E020°49'38", 15.X.2016, S. BESHKOV & A. NAHIRNIĆ leg., 2 $\sigma\sigma$ (figs 5-6), Gen. preps. 2./25.IV.2018 (figs 13, 17) and 2./26.IV.2018, S. BESHKOV, genitalia (figs 14, 18) with everted vesica on glass in euparal. In this locality *A. luteogrisea* (WARREN) is sympatric and synchronic to *A. litura* (L.) (fig. 11), Gen. prep. 1./26.IV.2018, S. BESHKOV, σ genitalia with everted vesica on glass in Euparal (figs 16, 20).

In Albania *A. luteogrisea* (WARREN) was collected in four localities, two of which are very close to each other: Prespa Lake, Pustec Municipality, vicinity of Zrnosko (= Zrnoshkë) Village, 878 m, N40°46'27", E020°54'09" (fig. 4), 18.X.2017, S. BESHKOV & A. NAHIRNIĆ leg. on light traps, 1 ♂ (fig. 7), Gen. prep. 1./25.IV.2018, S. BESHKOV, genitalia with everted vesica on glass in euparal (figs 15, 19) and 3 ♀♀ (figs 8-9), Gen. preps 3-4./27.IV.2018 (figs 23, 24) and 2./28.IV.2018, S. BESHKOV, genitalia on glass in euparal; Prespa Lake, Pustec municipality, vicinity of Zrnosko (= Zrnoshkë) Village, 849 m, N40°46'14", E020°54'32", 18.X.2017, S. BESHKOV & A. NAHIRNIĆ leg. lamps on generator, 1 ♀, Gen. prep. 2./27.IV.2018, S. BESHKOV, genitalia on glass in euparal; Korçë County, Mt. Kuq, Qarrit Pass, below Pepellash Village, 1187 m, N40°28'54", E020°40'32", 19.X.2017, S. BESHKOV & A. NAHIRNIĆ leg., 2 ♀♀, Gen. preps 1-2./29.IV.2018, S. BESHKOV, genitalia on glass in Euparal (figs 25-26); Tirana County, Mt Dajti, near Shkallë Village, 893 m, N41°19'49", E019°57'55", 24.X.2017, S. BESHKOV & A. NAHIRNIĆ leg., 1 ♀ (fig. 10); Gen. prep. 1./28.IV.2018, S. BESHKOV, genitalia on glass in Euparal (fig. 27). The presence of *A. luteogrisea* (WARREN) in other places of Macedonia and Albania seems very possible. More likely it was overlooked in the Balkans and in Europe due to confusion with *A. litura* (L.) and misidentification.

Anchoscelis litura (L.) is also a new species for Albania, collected in one locality together with *A. luteogrisea* (WARREN). Collecting data are: Prespa Lake, Pustec municipality, vicinity of Zrnosko (= Zrnoshkë) Village, 849 m, N40°46'14", E020°54'32", 18.X.2017, S. BESHKOV & A. NAHIRNIĆ leg. lamps on generator, 1 ♀, Gen. prep. 1./27.IV.2018, S. BESHKOV, genitalia on glass in euparal (fig. 28). Very possible *A. litura* (L.) is not a rare species in Albania, although it was not reported before from this country.

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Fig. 2: Collecting locality of *Anchoscelis rupicapra kresnaensis* RONKAY & MÉSZÁROS, 1982 in the Republic of Macedonia: Demir Kapija -Besvica, 18.X.2017.



Fig. 4: Collecting locality of *Anchoscelis rupicapra kresnaensis* RONKAY & MÉSZÁROS, 1982 and one of *Anchoscelis luteogrisea* (WARREN, 1911), pointed with arrow in Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X. 2017. In the foothill of Galiciča Mts.

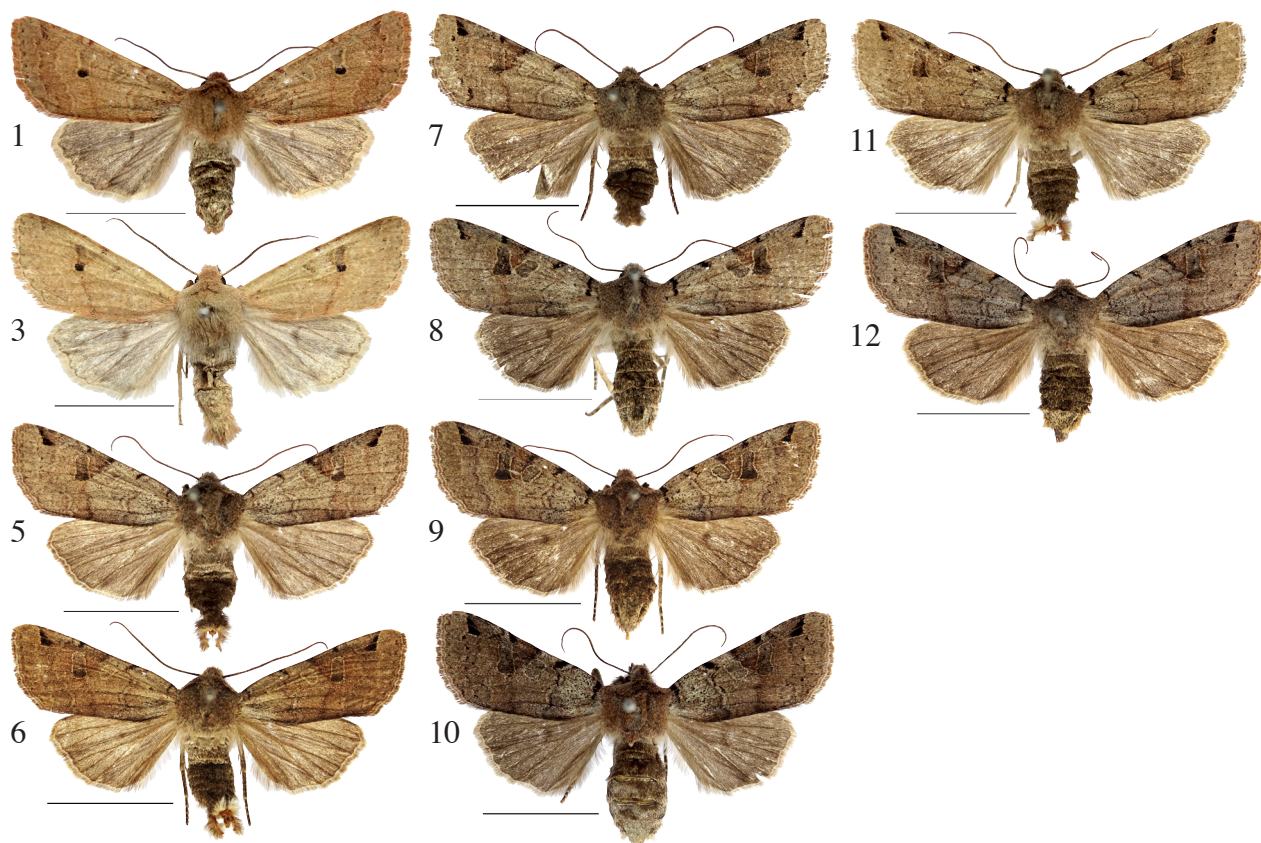


Fig. 1: *Anchoscelsis rupicapra kresnaensis* RONKAY & MÉSZÁROS, 1982, ♀. Macedonia, Demir Kapija- Besvica, 17.X.2017.
 Fig. 3: *Anchoscelsis rupicapra kresnaensis* RONKAY & MÉSZÁROS, 1982, ♂. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017.
 Fig. 5: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./25.IV.2018.
 Fig. 6: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./26.IV.2018.
 Fig. 7: *A. luteogrisea*, "m". Albania, Prespa Lake, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 1./25.IV.2018.
 Fig. 8: *Anchoscelsis luteogrisea* (WARREN, 1911), ♀. Albania, Prespa Lake, near Pustec Village, 849m., 18.X.2017, Gen. prep. 2./27.IV.2018.
 Fig. 9: *Anchoscelsis luteogrisea* (WARREN, 1911), ♀. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 4./27.IV.2018.
 Fig. 10: *Anchoscelsis luteogrisea* (WARREN, 1911), ♀. Albania, Tirana Region, Dajti Mt, Shkallë Village, 24.X.2017, Gen. prep. 1./28.IV.2018.
 Fig. 11: *Anchoscelsis litura* (LINNAEUS, 1758), ♂. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 1./26.IV.2018.
 Fig. 12: *Anchoscelsis litura* (LINNAEUS, 1758), ♀. Albania, Prespa Lake, near Pustec Village, 849m, 18.X.2017, Gen. prep. 1./27.IV.2018. Scale bars: 1 cm.

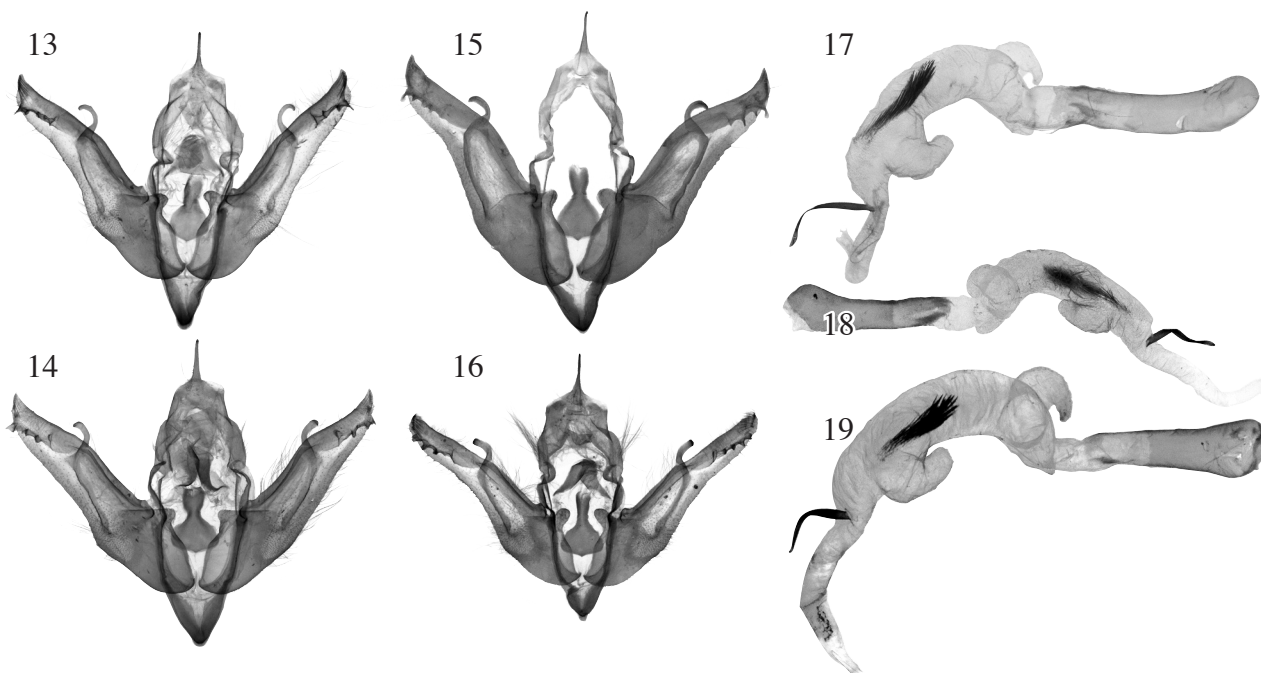


Fig. 13: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂ genitalia. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./25.IV.2018.
 Fig. 14: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂ genitalia. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./26.IV.2018.
 Fig. 15: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂ genitalia. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 1./25.IV.2018.
 Fig. 16: *Anchoscelsis litura* (LINNAEUS, 1758), ♂ genitalia. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 1./26.IV.2018.
 Fig. 17: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂, everted vesica. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./25.IV.2018.
 Fig. 18: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂, everted vesica. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2./26.IV.2018.
 Fig. 19: *Anchoscelsis luteogrisea* (WARREN, 1911), ♂, everted vesica. Albania, Prespa Lake, above Pustec Village, 878m., 18.X.2017, Gen. prep. 1./25.IV.2018, everted vesica in liquid before mounting on slide

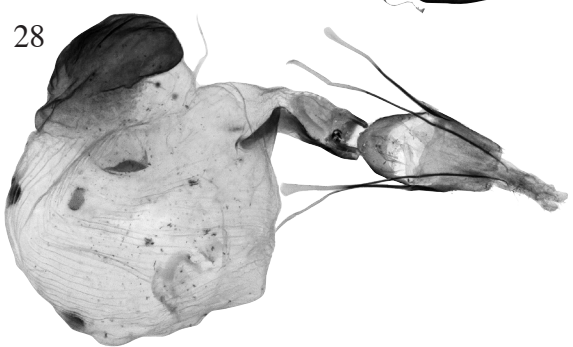
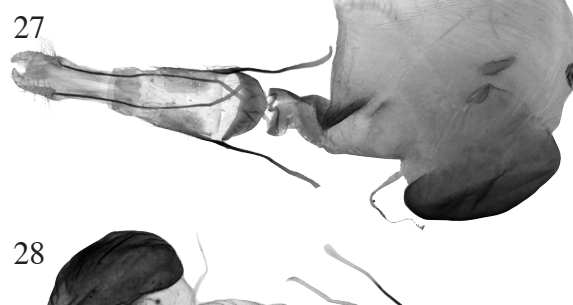
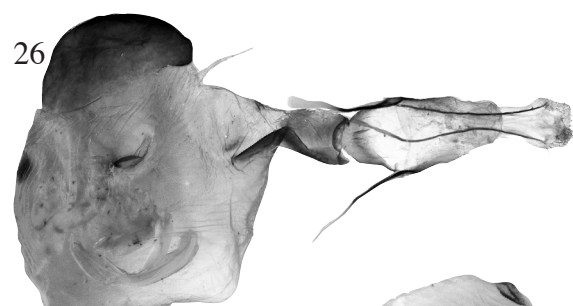
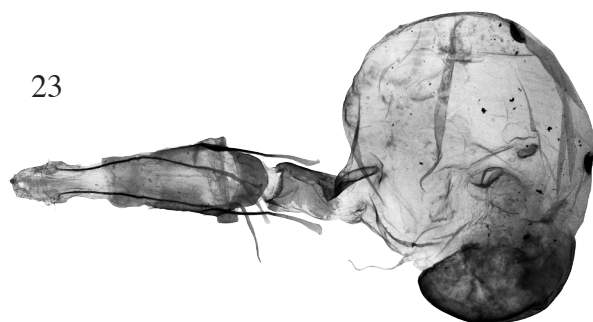
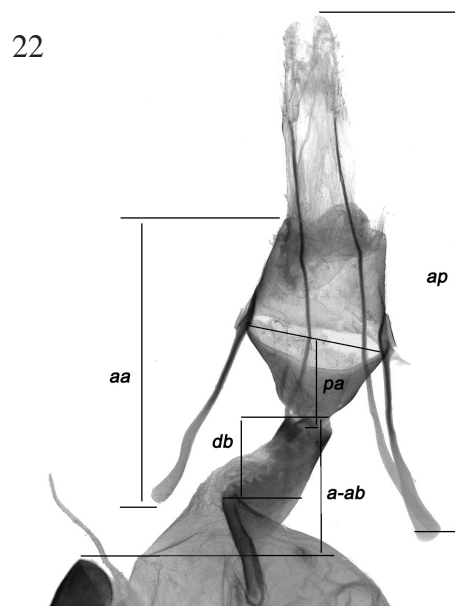
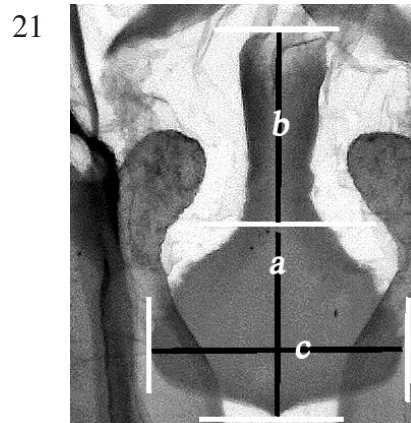


Fig. 20: *Anchoscelis litura* (LINNAEUS, 1758), ♂, everted vesica. Macedonia, between Ohrid and Velesovo, 15.X.2016, Gen. prep. 1./26.IV.2018.

Fig. 21: Legend for measurements of the juxta.

Fig. 22: Legend for measurements of the female genitalia.

Fig. 23: *Anchoscelis luteogrisea* (WARREN, 1911), ♀ genitalia. Albania, Prespa Lake, above Pustec Village, 878m., 18.X.2017, Gen. prep. 3./27.IV.2018.

Fig. 24: *Anchoscelis luteogrisea* (WARREN, 1911), ♀ genitalia. Albania, Prespa Lake, above Pustec Village, 878m., 18.X.2017, Gen. prep. 4./27.IV.2018.

Fig. 25: *Anchoscelis luteogrisea* (WARREN, 1911), ♀ genitalia. Albania, Korçë Region, below Pepellash village, 1187 m, 19.X.2017, Gen. prep. 1./29.IV.2018.

Fig. 26: *Anchoscelis luteogrisea* (WARREN, 1911), ♀ genitalia. Albania, Korçë Region, below Pepellash village, 1187 m, 19.X.2017, Gen. prep. 2./29.IV.2018.

Fig. 27: *Anchoscelis luteogrisea* (WARREN, 1911), ♀ genitalia. Albania, Tirana Region, Dajti Mt, Shkallë Village, 24.X.2017, Gen. prep. 1./28.IV.2018.

Fig. 28: *Anchoscelis litura* (LINNAEUS, 1758), ♀ genitalia. Albania, Prespa Lake, near Pustec Village, 849m., 18.X.2017, Gen. prep. 1./27.IV.2018.

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