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 a 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. 1) species which we expected to find in that country. Part of the results are published in another article (Beshkov & Nahrnđ, 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 axioCamRe 5x. 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, Transkaukasia and Cyprus (Hacker, 1990, Ronkay, Ronkay, Gvulaj, & Varga, 2017). Anchoscelis rupicapra (Stgr.) was found as a new for Europe in SW Bulgaria, Kresna Gorge (Ronkay & Mészáros, 1982; Mészáros et al., 1984, Herzczg & 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, Gvulaj, & Varga, 2017) and from NE Greece and Peloponnesus (Hacker, 1989). It was expected to be found in 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 Town on the ground road from Demir Kapija Town to Besvia Village, 244m, N41°22'58“; E022°11'45“, 17.X.2017, S. Beshkov & A. Nahrnđ 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, Oxycedrus, Pistacia terebinthus, Piliurus spina-christi, Phyllirea latifolia, Platanus orientalis, Quercus pubescens etc. Some synchro- nistic and sympatric species at our collecting locality are: Eriogaster rimicolus ( denen & Schiffmüller, 1775), Lemony striigata Arogeot & Vichte, 1978, Saturnia caucigena Kupido, 1825, Peribatodes coretraria (Zeller, 1847), Idaea campanaria (Herrich-Schäffer, 1852), Amphiplura effusa (Bosidval, 1828), Meganepria binaculosa (Linnaeus, 1767), Caradina kadenii Freyer, [1836], Caradina flavirena Guenee, 1852, Tiliaeae cypreago christiani (Fibiger, 1992), Rhizodra lutosa (Hübner, [1803]), Episema korsakovi (Christophy, 1885), Lithophane lapidea (Hübner, [1808]), Dryobotodes labevala (Esper, [1788]), Dichonia aregruenia (Hübner, [1808]), Dryobotodes carbonis (Wagner, 1931), Dryobotodes tenebrosa (Esper, [1789]), Anthocnistis senex (Geyer, [1828]), Polyminis serpentina (Tieptschke, 1825), Agrotis trux (Hübner, [1824]), Noctua turrincia Biebing, Speidel & Hanigk, 1983.

In Albania A. rupicapra kresnaensis Ronkay & Mészáros was found near Prespa Lake, Pustec Municipality, vicinity of Zrnoško (= Zrnoshke) 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 Thati Mts (in Macedonia known as Galičica Ms). 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 & Nahrnđ (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 foregoing 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 valves 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 genitalia, including everted vesica and of the 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. Finger et al. (2010) also express the opinion, that the genital structures of the genitalia-line are highly conservative, and the differences in the genitalia are much smaller, sometimes subtle. Most important feature of the 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.

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Sample number</th>
<th>Vesica (main tube + terminal cornutus base)</th>
<th>Aedoeagus</th>
<th>Terminal cornutus</th>
<th>Spiculi field</th>
<th>Juxta-a</th>
<th>Juxta-b</th>
<th>Juxta-c</th>
<th>Juxta proportion a:b</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. luteogrisea</td>
<td>n = 5</td>
<td>1.60 - 1.80</td>
<td>1.40 - 1.42</td>
<td>0.80 - 0.82</td>
<td>0.86 - 0.90</td>
<td>0.19 - 0.24</td>
<td>0.16 - 0.19</td>
<td>0.25 - 0.24</td>
<td>1.0 : 0.7</td>
</tr>
<tr>
<td>A. litura</td>
<td>n = 2</td>
<td>1.70 - 1.80</td>
<td>1.40 - 1.60</td>
<td>0.76 - 0.80</td>
<td>0.70 - 0.76</td>
<td>0.20</td>
<td>0.20</td>
<td>0.25 - 0.26</td>
<td>1.0 : 1.0</td>
</tr>
</tbody>
</table>

Table 1: Measurements of the ∆ genitalia.

The ∆ genitalia of both taxa are illustrated in Derra & Schreier (1990) and in Ronkay et al. (2017). Differences in the ∆ 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 apendix 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 ∆ 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 ∆ genitalia is the length of the ductus bursae, length of the apophyses anterior, height of the sclerotrized plate of the antrum and perhaps the distance antrum-sclerotized apical part of apendix 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.

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

Table 2: Measurements of the ∆ genitalia.

The range of A. luteogrisea (Warren) is restricted to Island of Samos, Turkey, Northern Syria, Northern Iraq and Armenia (Fischer 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 (Wegeiner, 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 Velestovo, 1005 m, N41°05'26", E20°49'38", 15.X.2016, S. Beshkov & A. Nahirnic ‡, 2 ∆ ∆ (figs 5-6), Gen. prep. 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 synchronous to A. litura (L.) (fig. 11), Gen. prep. 1/26.IV.2018, S. Beshkov, ∆ genitalia with everted vesica on glass in Euparal (figs 16, 20).
In Albania *A. lutegrisea* (WARREN) was collected in four localities, two of which are very close to each other: Prespa Lake, Pustec Municipality, vicinity of Zrñosko (= Zrnoshkë) Village, 878 m, N40°46'27", E020°54'09" (fig. 4), 18.X.2017, S. BESHKOV & A. NAHRNÍČ 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. prep.s 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 Zrñosko (= Zrnoshkë) Village, 849 m, N40°46'14", E020°54'32", 18.X.2017, S. BESHKOV & A. NAHRNÍČ leg. lamps on generator, 1♀, Gen. prep. 2.27.IV.2018, S. BESHKOV, genitalia on glass in euparal; Korčë County, Mt. Kuq, Qarrë Pass, below Pepellash Village, 1187 m, N40°28'54", E020°40'32", 19.X.2017, S. BESHKOV & A. NAHRNÍČ leg., 2♀, Gen. prep.s 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. NAHRNÍČ leg., 1♀ (fig. 10); Gen. prep. 1.28.IV.2018, S. BESHKOV, genitalia on glass in Euparal (fig. 27). The presence of *A. lutegrisea* (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. litoralis* (L.) and misidentification.

Anchoscelsis littura (L.) is also a new species for Albania, collected in one locality together with *A. lutegrisea* (WARREN). Collecting data are: Prespa Lake, Pustec municipality, vicinity of Zrñosko (= Zrnoshkë) Village, 849 m, N40°46'14", E020°54'32", 18.X.2017, S. BESHKOV & A. NAHRNÍČ leg. lamps on generator, 1♀, Gen. prep. 1.27.IV.2018, S. BESHKOV, genitalia on glass in euparal (fig. 28). Very possible *A. litoralis* (L.) is not a rare species in Albania, although it was not reported before from this country.

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References


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

Fig. 4: Collecting locality of *Anchoscelis rupicapra kresnaensis* Rónkay & 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 Galičica Mts.
Fig. 1: *Anchoscelis rupicapra kresnaensis* Ronkay & Meszár, 1982, ♂. Macedonia, Demir Kapija- Bosnica, 17.X.2017.

Fig. 3: *Anchoscelis rupicapra kresnaensis* Ronkay & Meszár, 1982, ♀. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017.

Fig. 5: *Anchoscelis luteogrisea* (Warren, 1911), ♀. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2/25.IV.2018.

Fig. 7: *A. luteogrisea*, "m". Albania, Prespa Lake, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 2/27.IV.2018.

Fig. 8: *Anchoscelis luteogrisea* (Warren, 1911), ♀. Albania, Pustec Lake, near Pustec Village, 849m, 18.X.2017, Gen. prep. 2/27.IV.2018.

Fig. 9: *Anchoscelis luteogrisea* (Warren, 1911), ♀. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 4/27.IV.2018.

Fig. 10: *Anchoscelis luteogrisea* (Warren, 1911), ♀. Albania, Tirana Region, Dajti Mt, Shkallë Village, 24.X.2017, Gen. prep. 1/28.IV.2018.

Fig. 11: *Anchoscelis litura* (Linnaeus, 1758), ♂. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 1/26.IV.2018.

Fig. 12: *Anchoscelis litura* (Linnaeus, 1758), ♂. Albania, Pustec Lake, near Pustec Village, 849m, 18.X.2017, Gen. prep. 1/27.IV.2018. Scale bars: 1 cm.


Fig. 15: *Anchoscelis luteogrisea* (Warren, 1911), ♀ genitalia. Albania, Pustec Municipality, vicinity of Zrnosko village, 878m, 18.X.2017, Gen. prep. 1/25.IV.2018.

Fig. 16: *Anchoscelis litura* (Linnaeus, 1758), ♀ genitalia. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 1/26.IV.2018.

Fig. 17: *Anchoscelis luteogrisea* (Warren, 1911), ♂ everted vesica. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2/25.IV.2018.

Fig. 18: *Anchoscelis luteogrisea* (Warren, 1911), ♀ everted vesica. Macedonia, between Ohrid and Velestovo, 15.X.2016, Gen. prep. 2/26.IV.2018.

Fig. 19: *Anchoscelis 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 Velestovo, 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.