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Three new species of Depressariinae (Lepidoptera) from Europe and Western Asia and establishment of three new synonyms

Peter Buchner [1]

Abstract: *Agonopterix lidiae* sp.n., *Depressaria gaalhaszlerae* sp.n. and *Depressaria urtsadzorensis* sp.n. are described. *Agonopterix cluniana* Huemer & Lvovsky, 2000 **syn.nov.** becomes a synonym of *Agonopterix subtakamukui* Lvovsky, 1998, *Agonopterix flurii* Sonderegger, 2013 **syn.nov.** becomes a synonym of *Agonopterix ivinskisi* Lvovsky, 1992, *Agonopterix tripunctaria* Buchner, 2015 **syn.nov.** becomes a synonym of *Agonopterix ligusticella* (Chrétien, 1908).

Agonopterix lidiae sp.n. has been collected from 5 different places, all in Province Udine, Italy. Externally it is extremely similar to *A. abditella* Hannemann, 1959, but genitalia are clearly different and p-distance of barcode is more than 8 %, indicating that they are not closely related.

Depressaria gaalhaszlerae sp.n. A series of nine small *Depressaria* specimens was collected in Derbend, Iran. One worn female had been dissected by H.J. Hannemann and determined as *Depressariodes* spec. (*Depressariodes* Turati, 1924, now valid as *Exaeretia* Stainton, 1849), one male he had also dissected and determined as *D. daucivorella* Ragonot, 1889, like the rest of this series, due to external similarity. Later it was realised that the whole series except the dissected male belong to a new species which is described here. It is closely related to *D. kondarella* Lvovsky, 1981, male genitalia and external appearance are very similar, while female genitalia are remarkably different. It is found in Turkey and Iran.

Depressaria urtsadzorensis sp.n. One female was collected in year 2019 in Armenia. Closest species based on genitalia comparison is *Depressaria gaalhaszlerae*, this is confirmed by DNA-barcode. It is the third species of *D. kondarella*-group known so far.

Keywords: Lepidoptera, Depressariidae, *Agonopterix, Depressaria*, Italy, Turkey, Iran, new species, DNA barcoding, new synonyms.

Introductory remarks

In the collection of Lucio Morin (RCLM) a single male of an unnamed *Agonopterix* from Italy, Province Udine, 22.VIII.2003, was found in year 2016. External appearance corresponds with *A. abditella* Hannemann, 1959, so the first idea was that this species - so far known predominantly from Asia and just reaching Europe in the westernmost part of its range - had been introduced to Italy. However, comparison of genitalia and barcodes immediately showed that this specimen was not *A. abditella* and not even closely related to it. Searching for further specimens was successful in MFSN, where one additional male was found. As no females were available, description was postponed in the hope of finding females, otherwise it was scheduled to be described in the volume "Microlepidoptera of Europe: Depressariinae", which was in preparation, but far from being in a final stage at that time. When checking the Depressariidae collection of

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TLMF in year 2020, 6 specimens of this undescribed species were found, including one female, opening the way for the description as *Agonopterix lidiae* sp.n., which is presented here. Several details remain unresolved. Neither the biology nor the phenology are known, nor was it possible to find the closest relatives of this remarkably isolated species.

In the collection of NHMW nine specimens of a *Depressaria* sp. are stored, all collected in Iran, Derbend, in years 1962 and 1963. One male, reared from an Apiaceae, had been dissected by H.J. Hannemann and determined as *Depressaria daucivorella* Ragonot, 1889, a species extremely similar to *D. libanotidella* Schläger, 1849 (possibly conspecific but this question is not considered in this paper), and genitalia of the dissected specimen left no other option than to determine it as one of these two species. Seven further specimens, all in good condition and extremely similar to the dissected male both in remarkable small size and wing pattern, had been determined by him as *D. daucivorella* without dissection. The ninth specimen, a female in poor condition he had dissected and labelled as *Depressariodes* spec., which was published in Hannemann (1976) including a drawing of the genitalia, but without species description. In years 2017 - 2019 the author dissected 2 males and one female and DNA-barcoded 6 specimens of this series, finding them conspecific to the female dissected by Hannemann, but not to *D. daucivorella* and also not to genus *Depressariodes* Turati, 1924, now valid as *Exaeretia* Stainton, 1849. It is described as *Depressaria gaalhaszlerae* sp.n. here. Apart from this series only one further specimen of this sp.n. has been found, collected in Turkey, Sivas Province. Both external appearance and male genitalia are very similar to *D. kondarella* Lvovsky, 1981, while female genitalia are remarkably different. Based on genitalia it is most closely related to another undescribed species from Armenia, described in this paper below, the second closest relative is *D. kondarella*, this estimation is also supported by barcodes.

Among Depressariidae collected in year 2019 in Armenia by H. Roweck and N. Savenkov, a female with *Depressaria*-appearance was found, outstanding in its small size. Dissection showed genitalia so strange, that at first, its placement in *Depressaria* was considered doubtful. Subsequently it was DNA-barcoded, the sequence showed it to be closely related to *D. gaalhaszlerae* and *D. kondarella*. Since then, it has been possible to recognise that structures of genitalia also are closest to that of *D. gaalhaszlerae*, nevertheless remarkable different, it is described as *Depressaria urtsadzorensis* sp.n. here.

So far only one specimen is present. Generally, it is not recommended to describe a species based on a single specimen, because there is the risk it belongs to a well known species, and genitalia features, judged as diagnostic differences, are caused by malformation in this specimen. But with barcode sequence as additional information, this option can be excluded. A further reason to publish this species without an attempt to find more specimens is that the actual travel restrictions caused by Covid dramatically lowers the chance to collect there in the near future. And if a male of this species is found, the knowledge that there exists a further species in *D. kondarella* group can be essential, because it is likely, male genitalia are very similar to that of *D. gaalhaszlerae* or *D. kondarella*, and without this knowledge the differences could be overlooked. Finally, this specimen had been collected in an area, which is recognized as Prime Butterfly Area, so this description intends to underline its importance due to its high biodiversity.

Methods

Morphological examination: genitalia preparations followed standard techniques (Robinson, 1976). Male preparations were stained with mercurochrome and females with chlorazol black, which brings a better result than using the same stain for both sexes.

Photographic documentation: photos of set specimens were taken with Canon EOS 5D Mark III and Canon lens EF 100mm 2.8 L IS USM at 1:1, illuminated with two external flashes and using a third flash to set the background whiteness, alternatively (if a photo had to be taken in a museum) with Canon EOS 50D and Sigma lens 50mm 2.8 Macro at 1:1.2, using ring flash. Photos of specimen details were taken with Canon lens MP-E 65 at 2:1, using ring flash. Genitalia photos were taken with microscope (Wild Heerbrugg) using a 10x objective and a 2.5x ocular. Photos were edited using the software Helicon Focus 4.80 and Adobe Photoshop 6.0.

Abbreviations

DEEUR "Depressariinae of Europe", prefix for specimen-number of Depressariinae studied by P. Buchner. This unique number is pinned to all those specimens for certain identification, also inserted to the figures of this paper.
ECKU Collection of Ecology-Centre, Kiel University, Kiel, Germany
HNHM Hungarian Natural History Museum, Budapest, Hungary
MFSN Museo Friulano di Storia Naturale, Udine, Italy
NHMW Naturhistorisches Museum Wien, Vienna, Austria
NMBE Naturhistorisches Museum Bern, Switzerland
NMPC National Museum, Prague, Czech Republic
MNHN Muséum National d'Histoire Naturelle, Paris, France
RCCS Research Collection of Cs. Szaboky, Hungary
RCAM Research Collection of Anton Mayr, Feldkirch, Austria
RCLM Research Collection of Lucio Morin, Monfalcone, Italy
RCRD Research Collection of Frédéric Rymarczyk & Monique Dutheil, Nice, France
RCWS Research Collection of Willibald Schmitz, Bergisch Gladbach, Germany
RCZK Research Collection of Zoltan Kovacs, Romania
TLMF Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria
ZIN Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
ZMUC Zoological Museum, University of Copenhagen, Denmark
ZSM Zoologische Staatssammlung München, Germany

Agonopterix lidiae sp.n.

http://zoobank.org/NomenclaturalActs/60BF0CD9-0B90-4276-B7A9-559414E914AF

Description

Imago (figs 1-9): Wingspan 17–20 mm. Scales of head pale yellow, interspersed with medium reddish brown scales on lateral edges of frons, forming a narrow band on either side (fig. 9). Labial palp: second and third segment pale yellow, outer side of second segment with a tendency to be somewhat darker in basal half, interspersed with reddish scales in different proportion near the middle, inner side whitish (figs 7-9). Antenna greyish brown, slightly more stout in males than in females, which is the only sex-associated difference. Thorax without posterior crest, ground colour pale yellow to pale reddish brown with 3 narrow longitudinal stripes of somewhat darker colour, one in the centre and one on each lateral edge (fig. 1); tegulae similar to the paler parts of the thorax. Forewings pale yellowish buff with medium reddish brown scales forming fine, irregular transverse bands, in some specimens in distal 1/3 also interspersed with dark grey scales in low, but variable numbers, area along costa somewhat darker, basal field not distinctly different from rest of forewing, in one specimen a weak diffuse blackish dash is developed in rear half of forewing where it touches the basal field (fig.2); one blackish dot in cell at one-third (invisible in some specimens, but this is likely a result of age and not of intraspecific variability), one blackish dot at three-fifths, both dots without whitish elements, in between and somewhat nearer to costa a diffuse dark grey spot up to 1 mm diameter, a diffuse dark grey stripe starts in centre of forewing, running obliquely outwards towards dorsum, gradually curving towards tornus; blackish interneural dots present, but indistinct; fringe similar to ground colour of forewing, darker near base, forming a fringe line, a second fringe line appears near tips of fringes, but the available specimens are too worn to show this clearly; lower side of forewing uniformly medium buff, somewhat paler along distal half of costa (fig. 6). Hindwing grey, with a tendency to be more pale and translucent at base and becoming darker toward apex, interneural dots not developed, fringe similar to ground colour, darker near base, forming a distinct fringe line. Legs predominantly pale yellowish buff, but forelegs dark greyish brown on inner side with interspersed red scales in different proportion on

tibia (fig. 7). Abdomen greyish on upper side, underside pale buff, each segment laterally with one or two indistinct darker spots, invisible in distal half of abdomen in some specimens.
Variation: One specimen differs by showing a dark dash where basal field touches ground colour of forewing, within the 8 examined specimens no further variability had been found, which is clearly not only result of age.

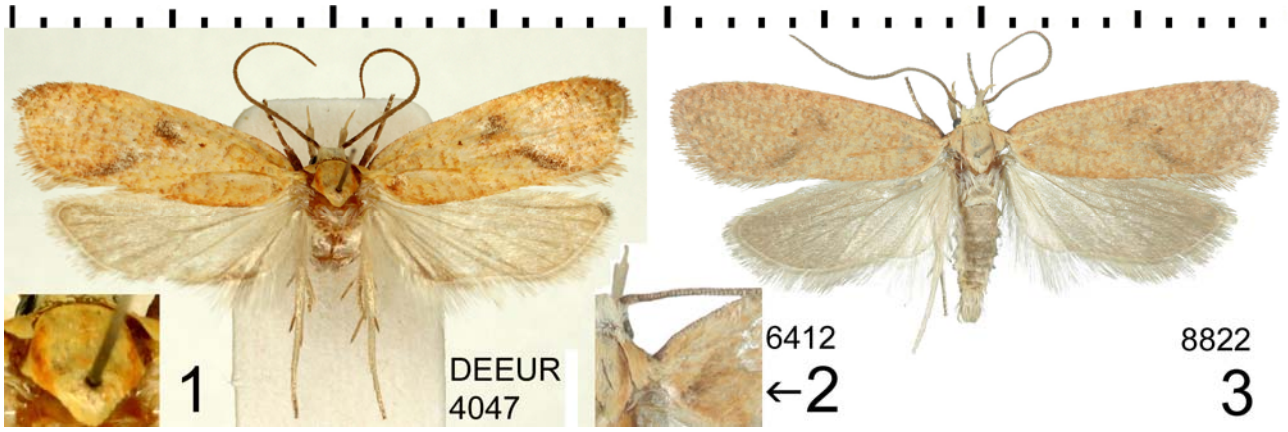
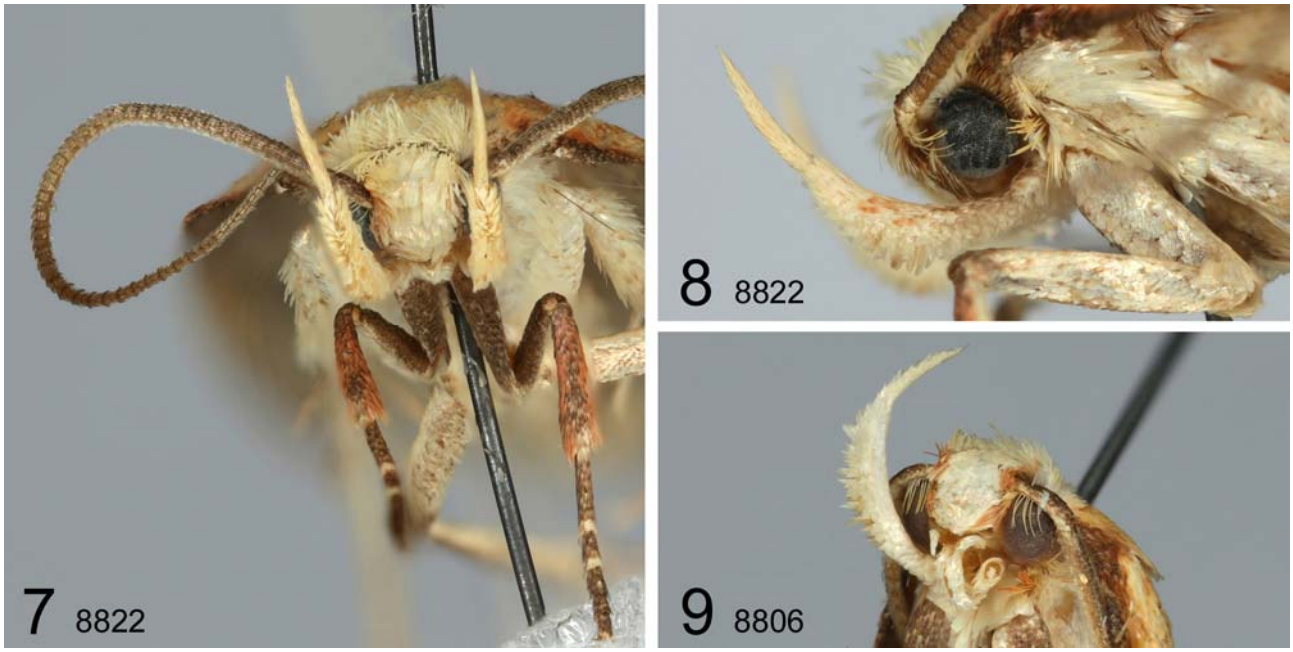


FIGURE 1: *A. lidiae*, holotype, general view, with thorax enlarged as an insert
FIGURE 2: *A. lidiae*, paratype, wingbase
FIGURE 3: *A. lidiae*, paratype, general view

FIGURES 4-5: *A. lidiae*, paratypes, unset
FIGURE 6: *A. lidiae*, paratype, underside



FIGURES 7-9: *A. lidiae*, paratypes, frontal view / outer side of labial palp / frons and inner side of labial palp

Male genitalia (figs 10-13):

Socii small, elliptic, 0.15 mm wide and 0.2 mm long, uncus distinct, semi-elliptic, obtuse, transverse diameter 0.05-0.07 mm at base, 0.05 mm long, distinctly overtopping socii in standard preparation, gnathos narrow elliptic, medium-sized, 0.08 mm wide and 0.25 mm long, overtopping socii in standard preparation by about a half of its length. Transtilla moderately narrow, not widened medially with a width of about 0.02 - 0.03 mm, transtilla lobes semi-elliptic, about 0.1 mm wide and 0.15 mm long, caudal margin just reaching transtilla in standard preparation. Anellus medium-sized, length/width 0.25/0.15 mm, with protruding and thickened edges laterally at distal 4/5, gap to transtilla 0.15-0.17 mm, caudal margin with V-shaped incision which is filled with a rather thick membrane, therefore the incision becomes indistinct and the outline of anellus including membrane appears elliptic, anellus lobes medium-sized, length/width about 0.2/0.07 mm, semi-elliptic. Valva of average *Agonopterix* shape, median length about 1.2 mm, 0.5–0.6 mm broad at base, lower edge slightly convex until it reaches area of origin of cuiller, here - at about 1/3 - concave for a short section, continuing convex until 2/3 to continue rather straight to blunt tip of valva. Cuiller rather slender (width about 0.03-0.05 mm) and long (length 0.5-0.6 mm), outcurved in its middle or rather straight (its bend is much affected by preparation details), near its tip more or less club-shaped, blunt-ended or with a small beak-like tip, clearly exceeding costa of valva (if strongly bent outward when pressed to valva during preparation, it may not exceed costa, fig. 13 and right cuiller in fig. 10). Aedeagus 0.6–0.7 mm long, nearly straight, diameter 0.07-0.08 mm nearly over its whole length except the slightly swollen basal part, abruptly tapering to a moderately sharp tip in its terminal 1/10; sclerotised basal parts with a total length of about 0.2 mm, free section trapezoid, 0.07 mm long, 0.07 mm wide at its base, expanding to about 0.1 mm and terminating nearly straight, cornuti numerous, tiny, indistinct

FIGURE 10: *A. lidiae*, holotype, with uncus and distal half of left cuiller as inserts, 2x enlarged
FIGURE 11: *A. lidiae*, paratype, with distal half of aedeagus in lateral view as insert, 2x enlarged

FIGURES 12-13: *A. lidiae*, paratype, 12: free floating, unopened, lateral; 13: standard preparation, but bristles not removed, not stained

Female genitalia (fig. 14):
Papilla analis about 0.7 mm long, width 0.2 mm in lateral view (fig. 14a), posterior apophysis 0.7 mm. Sternite VIII 0.3 mm long, maximum width 0.8 mm in standard preparation, anterior apophysis 0.5 mm. Proximal edge of sternite VIII evenly convex, without distinct folds. Ostium slightly distal to middle of sternite VIII, round, diameter 0.1 mm, area of slightly stronger sclerotisation around ostium with lateral diameter of 0.2 mm, reaching proximal and distal edge of sternite VIII, distal edge of sternite VIII distinctly excavated in its middle. Ductus bursae starting with a width of about 0.1 mm without distinct structures apart from numerous tiny dots, after about 0.5 mm the tiny dots disappear and ductus continues without remarkable structures, widening gradually to 0.4 mm when it meets corpus bursae after a total length of nearly 4 mm, here it rather abruptly widens to corpus bursae with length/width of about 0.9/0.8 mm in standard

preparation; signum in its centre, consisting of sclerotised transverse elliptic part (longitudinal/transverse expansion 0.05/0.25 mm) with numerous triangular teeth predominantly on margin, in longitudinal axis it continues on either side with a narrow triangular process consisting of more stout bursa wall, but without sclerotisation and teeth, total longitudinal expansion of this structure including sclerotised central part 0.25 mm. Ductus spermathecae originates slightly distal of proximal edge of sternite VIII and ends with about 4 turns.

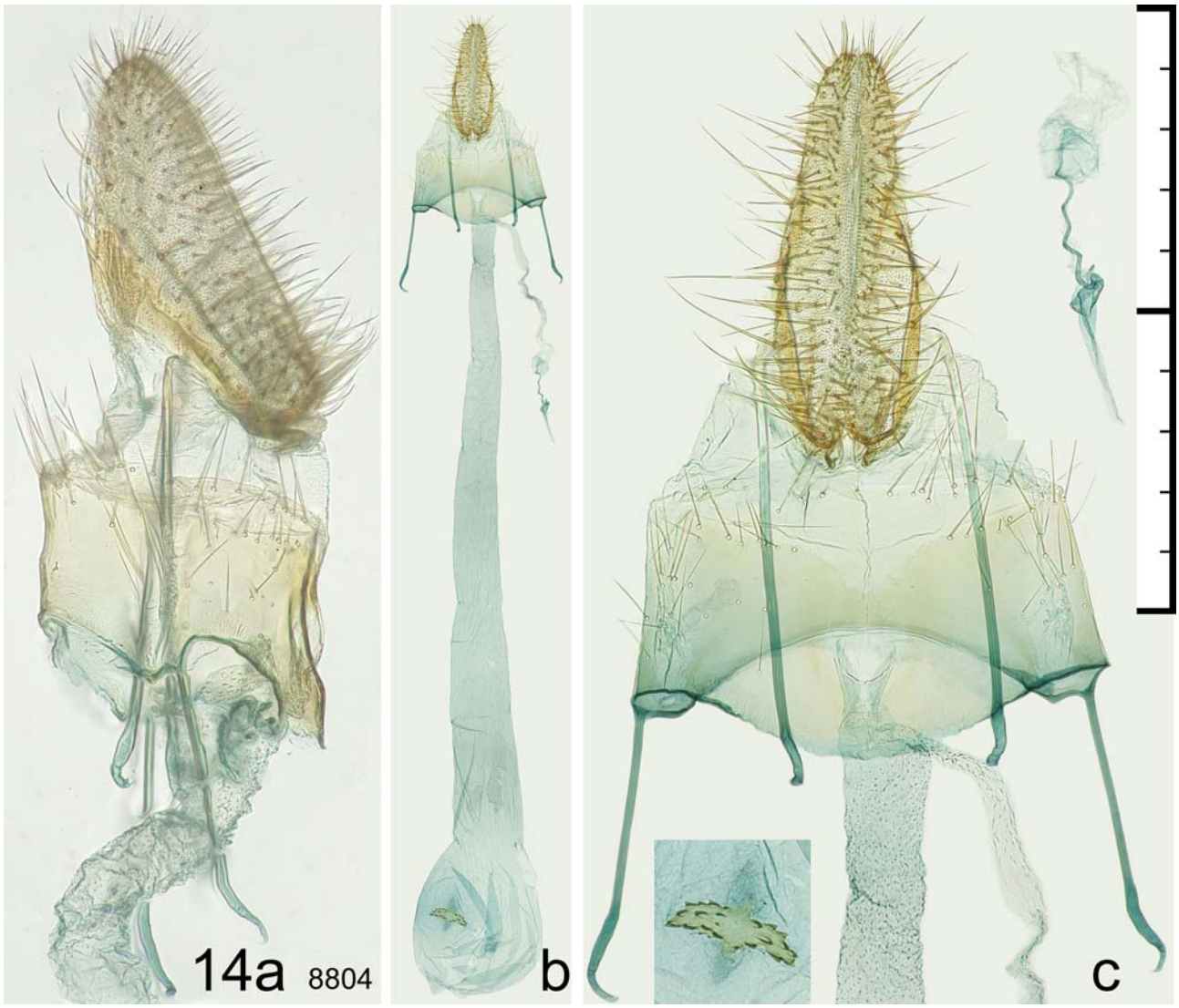


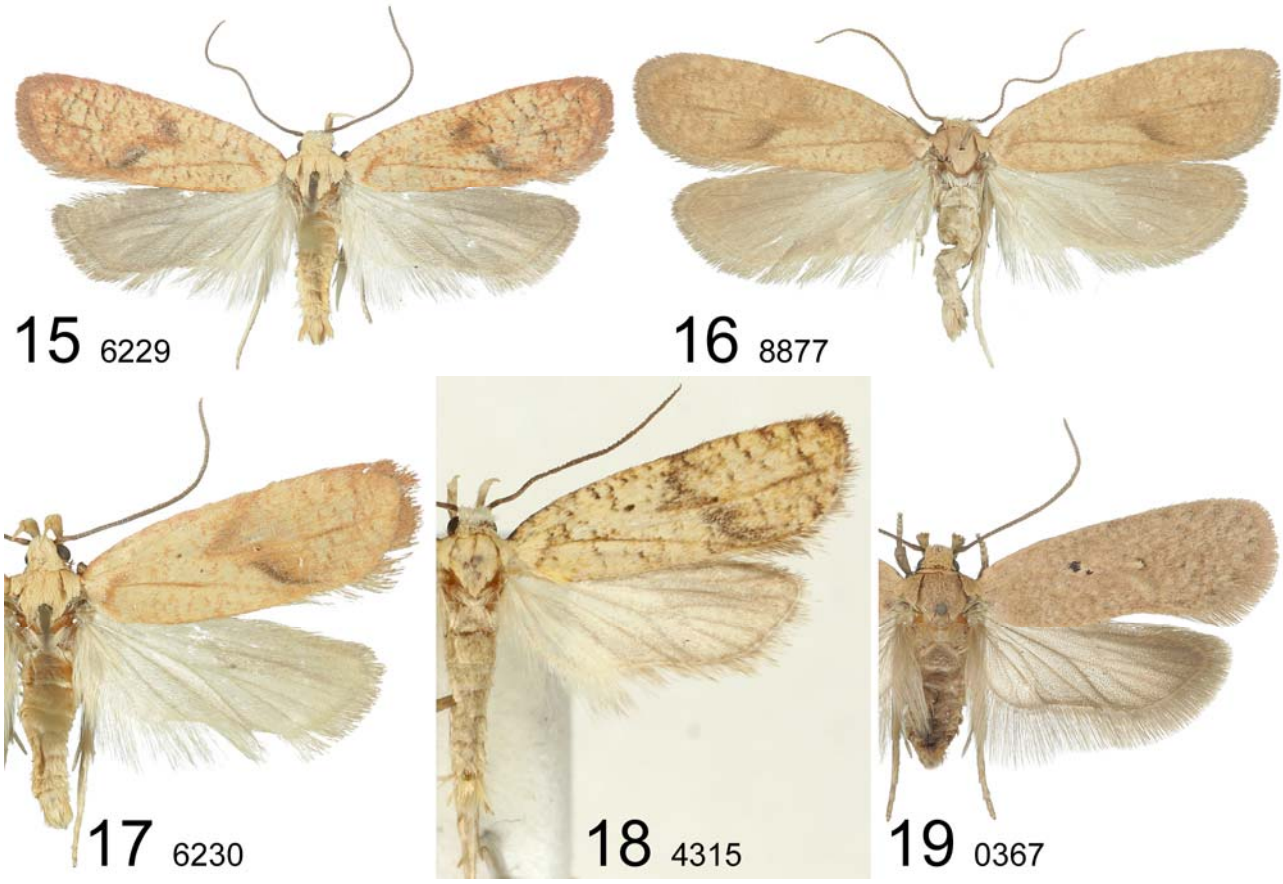
FIGURE 14: *A. lidiae*, paratype; 14a: details of distal parts, free floating, lateral, 14b-c: standard embedding, ventral (b: general view, c: details of distal parts and signum)

Differential diagnosis. Although *A. lidiae* is so similar to *A. abditella* that it is not possible to distinguish every specimen based on external features, there are tendencies: the blackish transverse lines in distal half of forewing are usually distinct in *A. abditella* (figs 15, 18, but specimens without these lines exist: figs 16, 17), usually indistinct or absent in *A. lidiae*, and the basic pattern in forewing is less fine in *A. abditella*. But the fact that *A. abditella* is widespread and shows a wide range of intraspecific variability, while only 8 specimens of *A. lidiae* are known, all collected in a rather small area in Province Udine, this comparison must be considered provisional.
Male genitalia: In sharp contrast to the external similarity, male genitalia of *A. lidiae* and *A. abditella* are clearly different, and since genitalia throughout the genus show more or less the same basic pattern, they are indeed extremely different. Here only the most distinct details are mentioned: in *A. abditella* (fig. 20) cuiller is short, just reaching 2/3 of valva width, straight and sharply hooked at its tip, socii are of normal *Agonopterix* shape, i.e. rather large and not

overtopped by the indistinct uncus, gnathos overtopping socii by its whole length and aedeagus of normal *Agonoperix* shape, i.e. evenly curved in lateral view and gradually tapering to a sharp tip. In *A. lidiae*, cuiller is very long, clearly longer than width of valva, not hooked at the tip, socii very small, uncus unusually large for the genus and overtopping socii in standard preparation, gnathos exceeding socii by less than half of its length, aedeagus nearly straight and abruptly tapering to its tip in distal 1/10.

Male genitalia as in *A. abditella* are only found in its sister species, *A. sinevi* Lvovsky, 1984 (the small differences are not discussed here, because this would touch another topic). Genitalia features in the combination present in *A. lidiae* the author has not seen in any other *Agonopterix*-species so far, although single components like in *A. lidiae* can be found in some species. As one example, *A. ligusticella* (Chrétien, 1908) has very similar cuiller (fig. 21), but the other details of male genitalia do not correspond, also not external appearance (fig. 19).

Female genitalia: comparison with *A. abditella* is not possible because no female of this species is available. But the absence of *A. abditella* females must not seen as a problem here, because female genitalia are generally very similar in genus *Agonopterix* and therefore of low value for species determination. For this reason, also no detailed comparison with other *Agonopterix* species is presented here. The combination of these features may be specifically distinct for female genitalia of *A. lidiae*: the deeply notched distal edge of sternite VIII, the sclerotisation around the ostium which reaches both proximal and distal edge of sternite VIII, the rather small, globose corpus bursa and the signum with longitudinal processes not sclerotised. With only one female available, it must remain open if these features are constant throughout the species.



FIGURES 15-18: *A. abditella*, 15+17: Russia, Altai mts., Kosh Agach, Krasnja Gorka, 1870 m, 4.VII.2014, M. Dvorak leg., coll. NMPC; 16: Russia, Altai mts., Kosh Agach, Kurai mts., 2150 m, P. Huemer & B. Wiesmair leg., coll. TLMF; 18: Russia, Cheljabinsk Oblast, Ustinovo, 16.VII.2015, H. Roweck & N. Savenkov leg., coll. ECKU

FIGURE 19: *A. ligusticella*, Italy, Lake Garda, 4.VIII.1963, K. Burmann leg., coll. TLMF

FIGURE 20: *A. abditella*: Russia, Altai mts., Kosh Agach, Kurai mts., Tabozhok river, 4.VIII.2016, P. Huemer leg., coll. TLMF

FIGURE 21: *A. ligusticella*: valva complex (DEEUR 1556): Italy, Friuli-Venezia Giulia, Redipuglia, 4.IV.2001, L. Morin leg., coll. RCLM; aedeagus (DEEUR 8142): Romania, Muntii Trascaului, Piatra Secuilor, Rimetra, 5.VII.2000, Z.&S. Kovacs leg., coll. RCZK

Type Material

Holotype :

♂, Italy, Friuli-Venezia Giulia, Province Udine, Tugliezzo, 500 m, 22.VIII.2003, gen. prep. DEEUR 4047 P. Buchner, DNA barcode id. TLMF Lep 23601, Lucio Morin leg., will be deposited in coll. RCLM

Paratypes (arranged according to collection date):

1 ♂, Italy, Friuli-Venezia Giulia, Province Udine, Venzone, Mt. Plauris southern part, 13°13´E 46°21´N, 1300 m, 17.VIII.2006, DEEUR 8822, DNA barcode id. TLMF Lep 28700 (in process), P. Huemer leg., will be deposited in coll. TLMF

4 ♂, Italy, Friuli-Venezia Giulia, Province Udine, Musi, Albergo Ciclamini eastern part, 13°20´E 46°18´N, 820 m, 19.VIII.2006, P. Huemer leg., will be deposited in coll. TLMF [specimen DEEUR 8748 with DNA barcode id. TLMF Lep 28695 (in process), specimen DEEUR 8803 with gen. prep. P. Buchner & specimens DEEUR 8805, 8806]

1 ♀, Italy, Friuli-Venezia Giulia, Province Udine, Valle di Musi, Casera Tanatcason, 13°18´E 46°18´N, 750 m, 14.IX.2006, gen. prep. DEEUR 8804 P. Buchner, DNA barcode id. TLMF Lep 28699 (in process), P. Huemer leg., will be deposited in coll. TLMF

1 ♂, Italy, Friuli-Venezia Giulia, Province Udine, Valle di Musi, Torrente Mea, 700 m, 15.VIII.2007, DEEUR 6412, DNA barcode id. TLMF Lep 23389, H. Deutsch leg., will be deposited in coll. MFSN

Genetic data

2 specimens have been sequenced, here only mentioned with DEEUR-number, sample ID, sequence length and quality.

DEEUR 4047: TLMF Lep 23601, 658[89n]bp
DEEUR 6412: TLMF Lep 23389, 658[0n] bp

Details concerning collecting place are found in the type list (paragraph “Type Material”). Further data are accessible via the public dataset DS-DEEUR384 (http://www.boldsystems.org/index.php/Public_SearchTerms?query=DS-DEEUR384)

In 3 further specimens, sequencing is in process:
DEEUR 8748: TLMF Lep 28695
DEEUR 8804: TLMF Lep 28699
DEEUR 8822: TLMF Lep 28700

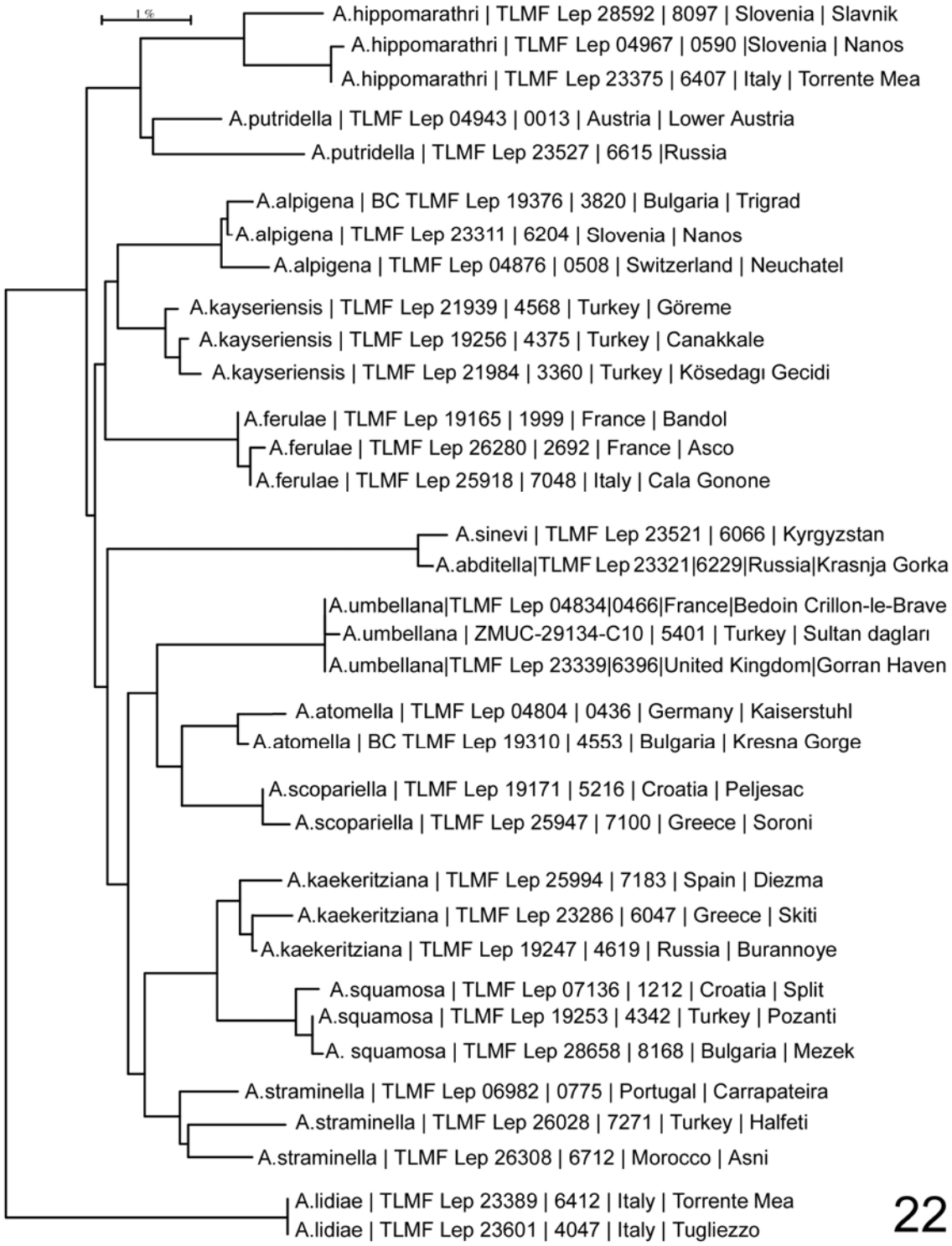


FIGURE 22: Neighbour-joining tree of *Agonopterix lidiae*, *A. abditella* and selected species and specimens from *A. alpigena* group (*A. alpigena* (Frey, 1870), *A. ferulae* (Zeller, 1847), *A. kayseriensis* Buchner, 2020), *A. putridella* group (*A. putridella* (Denis & Schiffermüller, 1775), *A. hippomarathri* (Nickerl, 1864)), *A. pallorella* group (*A. kaekeritziana* (Linnaeus, 1767), *A. squamosa* (Mann, 1864), *A. straminella* (Staudinger, 1859)) and from the group of Fabaceae feeding species (*A. atomella* (Denis & Schiffermüller, 1775), *A. scopariella* (Heinemann, 1870), *A. umbellana* (Fabricius, 1794)).

Related species

A determination request, using all full length sequences in BOLD database, showed *A. yomogiella* Saito, 1980 as nearest neighbour with p-distance of 4.42% and *A. straminella* as second nearest neighbour with p-distance of 4.79%. But a critical look at this result is necessary. Firstly, this request does not select only really full length sequences (658 bp), but selects sequences above 640 bp. More problematic is the fact that the system treats sequences with a gap in between as full length. The mentioned *A. yomogiella* sequence is part of the author's project "DEPAL" (Depressariidae of the Palearctic region), it is a NGS-sequence with a gap of 200 bp in its centre. The same is the case with the single *A. straminella* sequence, which appears so close to *A. lidiae*, while the numerous really full length sequences of *A. straminella* from the author's project do not appear among the first 100 matches. It is likely, the differences in the part of the sequence which is lacking in the mentioned *A. yomogiella* and *A. straminella* sequences is greater than the average of the hypothetical full length difference. Since this method brings a wrong result, it is therefore simply useless. A barcode gap analysis, using only all really full length sequences from project DEPAL shows *A. carduncelli* Corley, 2017 as nearest neighbour with a p-distance of 5.21 %. Such distances are commonly found between quite unrelated species, and the conclusion which must be drawn is that *A. carduncelli* is nothing more than one of the unrelated species which by coincidence is the closest in the numeric result. But this coincidence has a background, which must be kept in mind when these results are interpreted: a NJ-tree constructed from all *Agonopterix* sequences (not displayed in this paper) shows that there are a few species with unusually short horizontal branches, *A. carduncelli* is one of them. That means, such sequences represent a kind of basic pattern of *Agonopterix* barcode, and such species tend to be the nearest neighbour of many species, not necessary closely related. Its position in a tree supports misinterpretation, so for this reason, *A. carduncelli* has been excluded from the displayed tree. The tree demonstrates well the outline given above: the selected examples of the groups - based on external and genitalia features and biology - are grouped together, while *A. lidiae* appears as outgroup, and also *A. abditella* is placed remarkably distant from all other species, especially from *A. lidiae,* p-distance between *A. lidiae* and *A. abditella* is 8.24 %. The result of the search for the closest related species of *A. lidiae* is that it is very isolated, no species close to it could be detected.

Distribution

So far known only from Italy, province Udine.

Biology

Foodplant unknown. Moths have been collected in August and September, the one female 14.IX., which sugggests that the species hibernates either as imago or as egg.

Derivation of name

The name is derived from Lidia, the first name of the wife of the holotype collector.

Depressaria gaalhaszlerae sp.n.

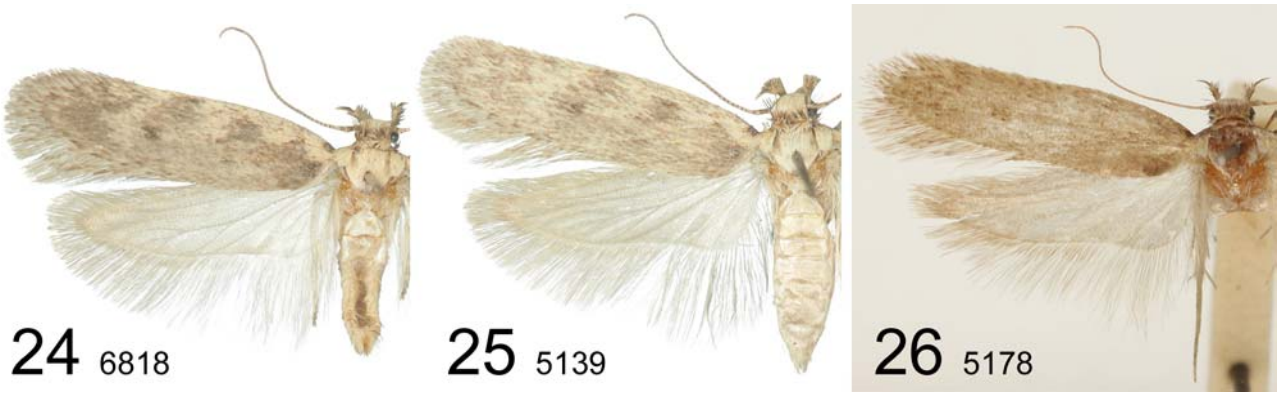
http://zoobank.org/NomenclaturalActs/F83C43C2-58F8-41E9-A265-17984195B046

Description

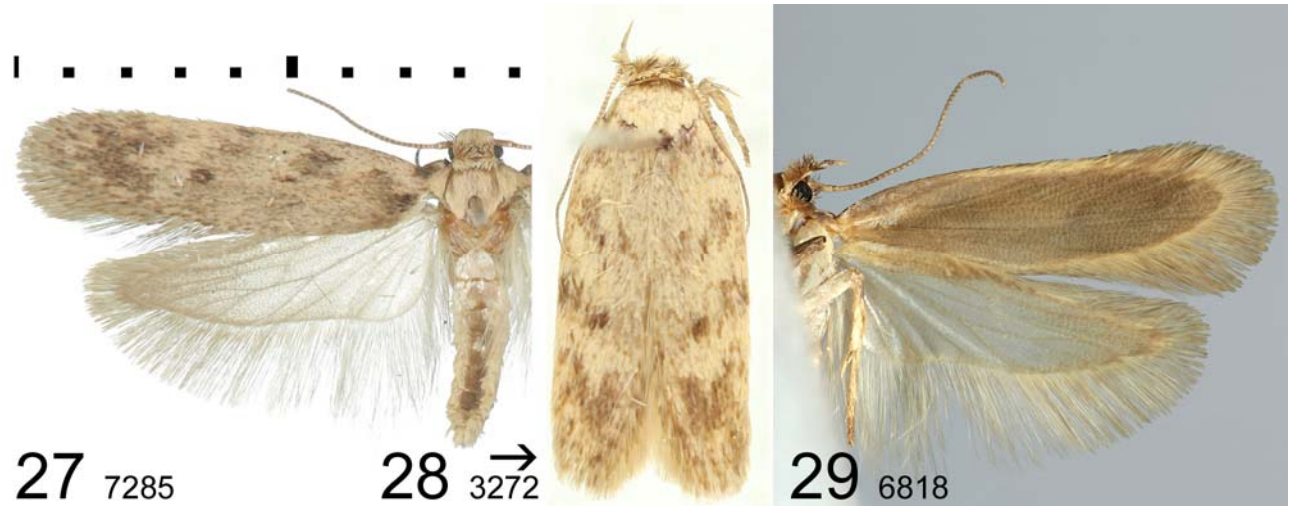
Imago (figs 23-34): Wingspan 15-17 mm. Head and face pale buff, neck and crown with raised red-brown scales, tips buff. Labial palp segment 3 three-fifths length of segment 2; segment 2 with predominantly medium brown, spreading scales on ventral side, on outer and inner side scales adpressed, pale buff, but medium to dark brown in basal part of outer side, segment 3 with adpressed scales, medium greyish brown in basal half, gradually turning to pale buff toward tip; thorax narrowly greyish brown anteriorly and laterally, otherwise pale buff, tegulae pale buff. Antenna light to medium brown, in basal ¼ segments distinctly ringed on upper side, this pattern becoming indistinct in distal part. Forewing rather narrow with width/length ratio of 1:3.5 - 1:4,

ground colour pale buff, with darker elements consisting of three small blackish spots (one at very base of costa and two central dots - one elongate at 1/3 and one roundish at 3/5), three larger, more diffuse, grey-brown patches (one at base of dorsum with tendency to extend beyond fold, one between costa and inner central dot somewhat nearer to base than this dot and one between costa and outer central dot somewhat nearer to base than this dot) and a broad curved subterminal band; interneural dots indistinct or absent; fringe grey-brown, without distinct fringe line; underside medium greyish-brown, somewhat darker near termen and costa, fringe along distal 2/3 of costa pale buff. Hindwing light greyish brown, darker posteriorly; fringe light grey-brown with an indistinct fringe line near base. Legs pale buff, only forelegs predominantly dark greyish brown, especially on tibia and tarsus. Abdomen greyish on upper side, pale buff on underside.
Variation: ground colour of forewing varies from very pale buff to medium greyish, the dark elements vary in size, in some specimens they are small and appear isolated in the pale ground colour, in others they are larger and confluent.

FIGURE 23: *D. gaalhaszlerae*, holotype

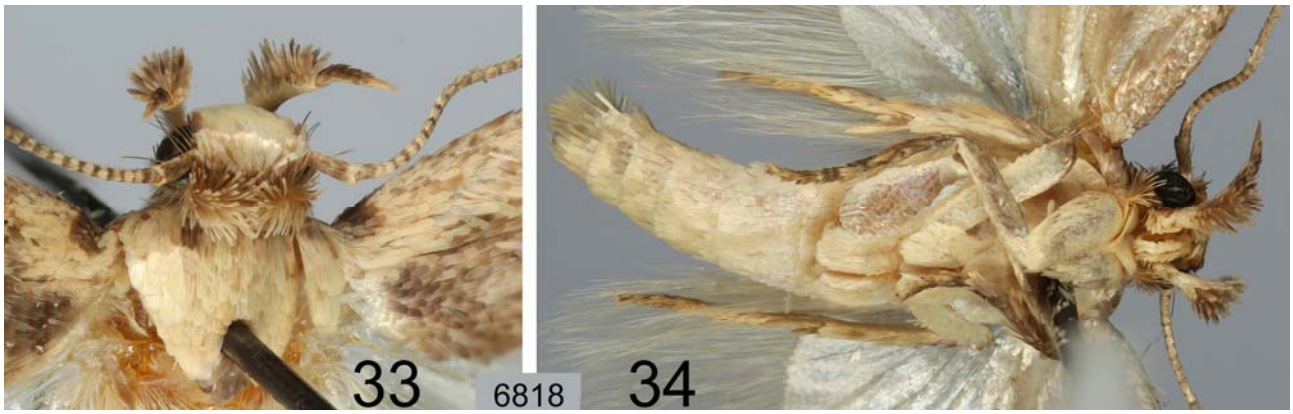


FIGURES 24-26: *D. gaalhaszlerae*, paratypes



FIGURES 27-29: *D. gaalhaszlerae*, paratypes, general view (27-28) and underside (29)

FIGURES 30-32: *D. gaalhaszlerae*, paratypes, head and labial palp

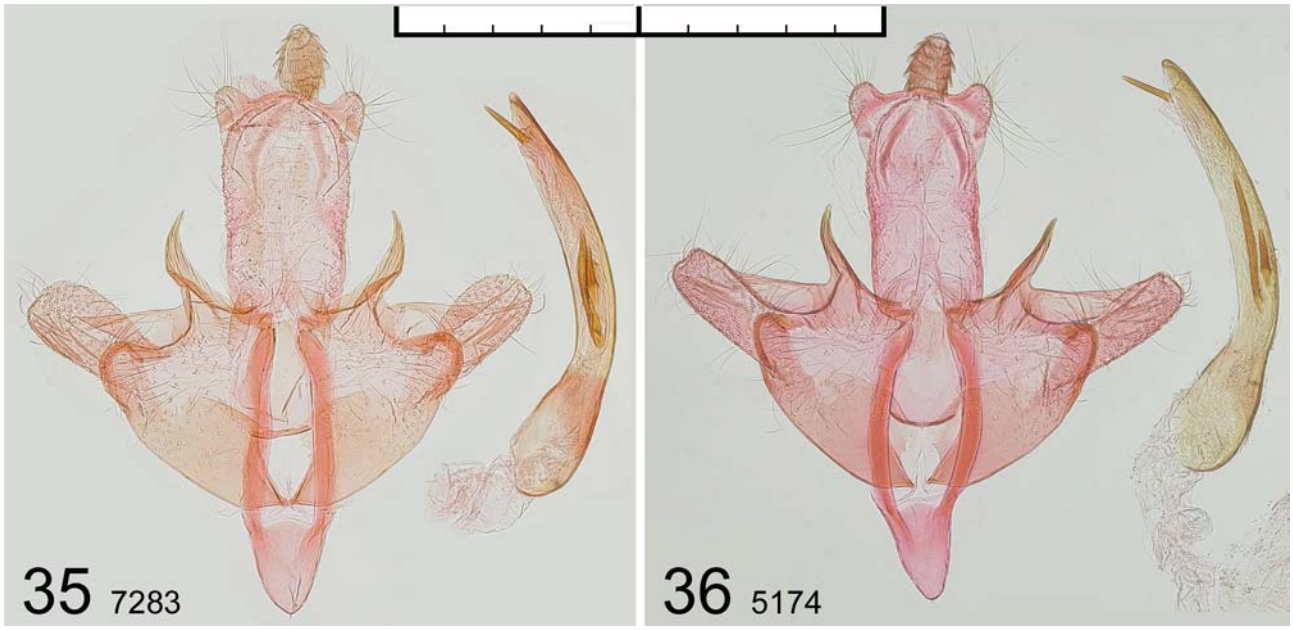


FIGURES 33-34: *D. gaalhaszlerae*, paratype, details of head and thorax (33) and underside (34)

Male genitalia (figs 35-36):
Socii semi-elliptic, 0.07 mm wide and 0.1 mm long, about 0.15 mm apart, gnathos elliptic with 5 - 6 distinct rows of spinulae, rather small with width/length of 0.1/0.15 mm, overtopping socii in standard preparation by most of its length. Tegumen with unusual shape for *Depressaria*, parallel-sided in basal 3/4, rather narrow with width/length of 0.2/0.45 mm. Transtilla broad, transtilla lobes small, indistinct, anellus pyriform, slightly excavated distally. Valva with narrow, sharply pointed process of about half of tegumen length near base of costa, protruding obliquely, from base

of this process a curved fold runs into valva, here nearly touching distal end of sacculus and continues turning back to costa ending shortly before distal end of cucullus, the part of valva between this fold and costa with structure different from cucullus by being more membranous; sacculus broad, distally ending in a semielliptic structure with thickened outer edge reaching half of cucullus width, cucullus nearly parallel-sided, ending obtuse to truncate; saccus triangular, slightly longer than wide; aedeagus moderately curved in lateral view (about 55°), diameter 0.1 mm except the slightly swollen base, 0.8 mm long, moderately tapering in its distal 1/5 to a blunt tip, 3 stout cornuti, one with about 1/3 and two with about 1/6 aedeagus length, the longer and one shorter forming a group near middle, one shorter near distal end of aedeagus.

Remark on measurements: the absolute size of the parts may be different in genitalia of exceptional small specimens. Since relative size of all structures is expected to be very constant throughout a species, the measurements are also to be understood as information about this, without need to point out the ratio separately.



FIGURES 35-36: *D. gaalhaszlerae*, paratypes

Female genitalia (figs 37, 40):
Papilla analis about 0.45-0.5 mm long, width 0.2 mm in lateral view (fig. 40), posterior apophysis 0.55-0.6 mm. Sternite VIII 0.3 mm long, maximum width 0.7-0.75 mm in standard preparation, anterior apophysis very short, about 0.15 mm. Distal edge of sternite VIII straight or very slightly concave, proximal edge of sternite VIII straight or very slightly convex, sternite VIII distinctly less sclerotised in an area near middle of proximal edge with slightly irregular outline, about 0.3 mm wide and 0.1 mm long, here two indistinct protuberances on inner wall, directed inward and touching with inner edges (red arrow in insert of fig. 37). Ostium located in an elliptic, less sclerotised and therefore paler area with width/lengh of about 0.15/0.1 mm, its centre in distal ¾ of sternite VIII, ductus bursae starting with a width of about 0.07-0.1 mm, its first part distinctly sclerotised predominantly laterally, but with narrow unsclerotised area ventrally, appearing as two lateral stripes in ventral view, this sclerotisation ends shortly before it crosses proximal edge of sternite VIII, after a short (about 0.2-0.3 mm) unsclerotised section again gradually a more irregular sclerotisation including dots and small spinulae starts, reaching a total length of about 0.7 mm (longitudinal folds may produce the impression of triangular or deltoid structures, which are at least in part produced by coincidence during preparation), followed by a section with rather thick, but unsclerotised wall with longitudinal folds for about 0.3 mm, followed by a section of thinner wall with tiny irregular and/or transverse folds for about the next 0.6-0.7 mm, in this section a loop is developed (but it may get lost during preparation!), finally ductus widens to bursa copulatrix with width/length of about 0.5/0.7 mm (but size and shape may change when a female

mates) with rather large signum (width/length 0.25/0.37 mm) located slightly proximal of its middle, evenly covered with numerous small teeth; ductus spermathecae originates slightly proximal of proximal edge of sternite VIII, ending with about 5-6 turns.

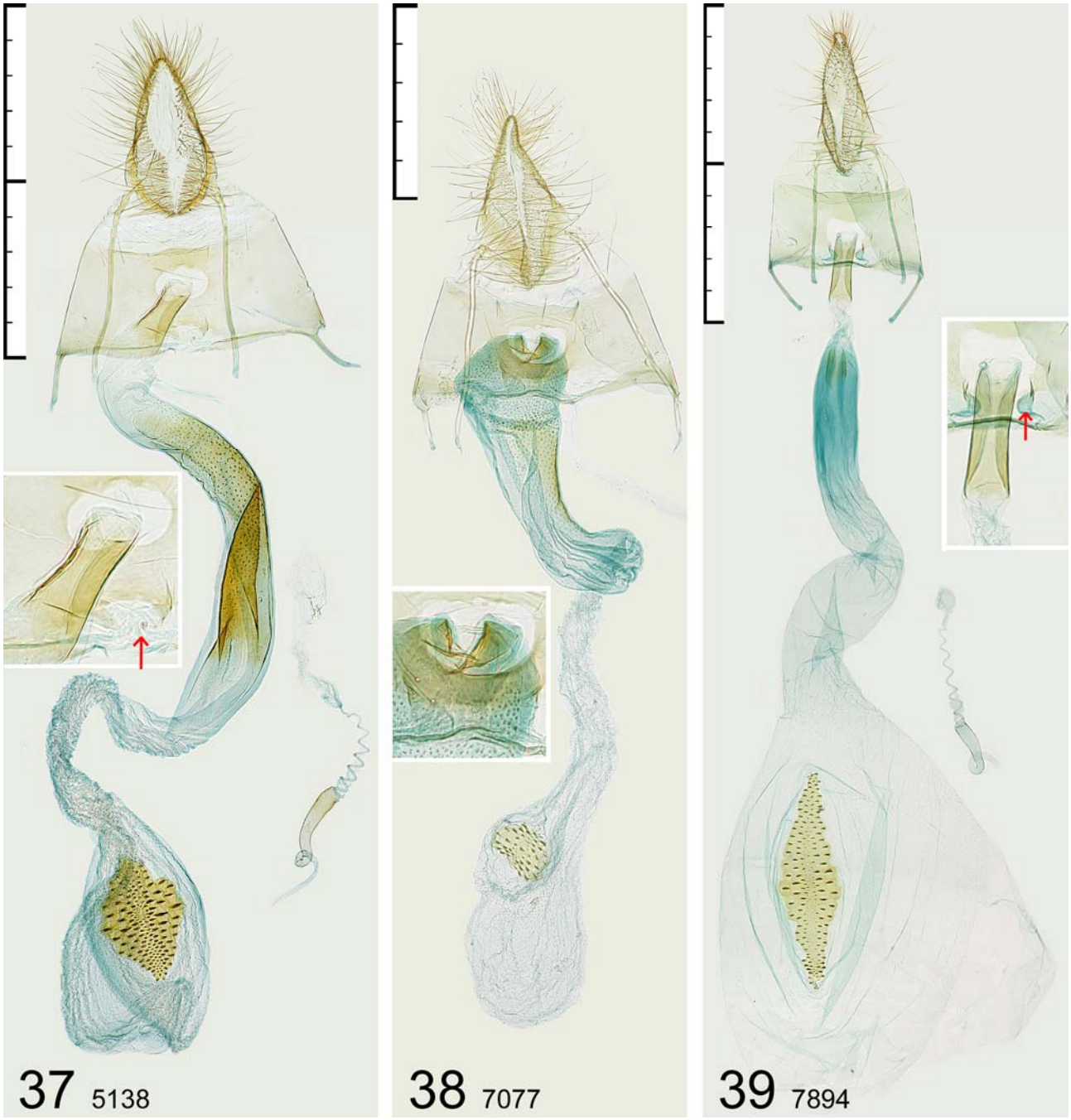
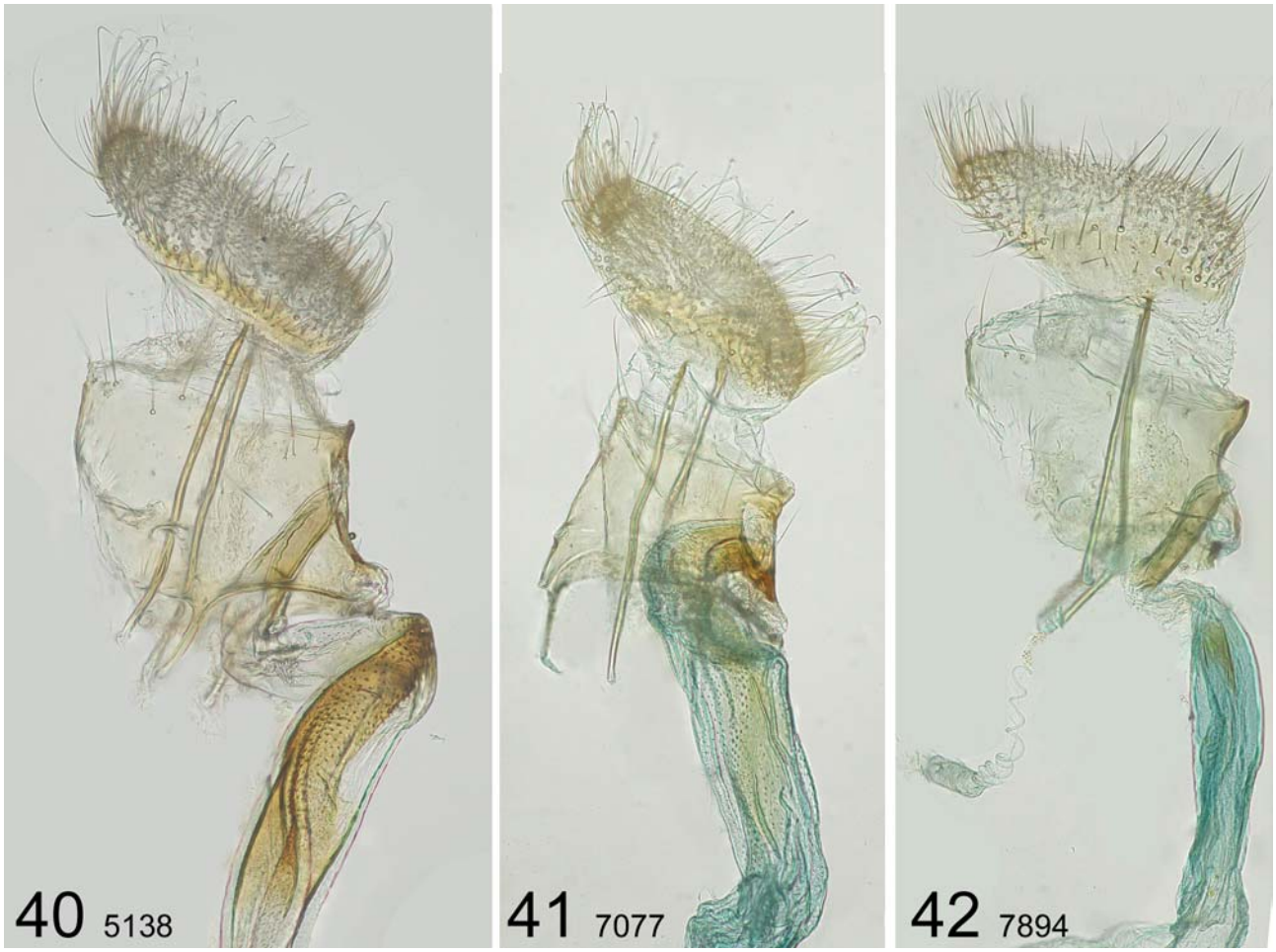


FIGURE 37: *D. gaalhaszlerae*, holotype
FIGURE 38: *D. kondarella*, Tadjikistan, Kondara, Varzob, 2.VIII.1976, A. Lvovsky leg., coll. ZIN
FIGURE 39: *D. urtsadzorensis*, holotype, for details see description of this species in this paper below

Note the slightly different scale of the genitalia in figs 37-39; ostium region as inserts 2x enlarged.



FIGURES 40-42: female genitalia, free floating, lateral

FIGURE 40: *D. gaalhaszlerae*, holotype
FIGURE 41: *D. kondarella*, Tadjikistan, Kondara, Varzob, 2.VIII.1976, A. Lvovsky leg., coll. ZIN
FIGURE 42: *D. urtsadzorensis* sp.n., holotype, for details see description of this species in this paper below

Differential diagnosis. Externally *D. gaalhaszlerae* is very similar to *D. kondarella*, 7 and 5 specimens in condition sufficient for comparison are available respectively, these differences could be found: in *D. kondarella* dark patch at base of dorsum large, confluent with dark patch adjacent to inner central dot, outer side of second segment of labial palp in distal half with a small, blackish section, sharply contrasting against paler area distal to it (figs 43-45), in *D. gaalhaszlerae* dark patch at base of dorsum not as large, not confluent with dark patch adjacent to inner central dot, second segment of labial palp without this sharp contrast. But these are more tendencies than clear differences, additionally only few specimens of each species are available, therefore determination should not be based on external features only.
A further species, also rather small but usually with clearly darker forewings, may cause determination problems if exceptional pale specimens are compared: *D. marcella* Rebel, 1901 (fig. 46). For safe determination dissection is recommended, genitalia are so different, that a verbal comparison appears unnecessary, see figs 52 and 54.
Surprisingly to distinguish this sp.n. from *D. daucivorella* (questionably distinct from *D. libanotidella*) also may cause problems, this needs some more detailed comments. This species (or species pair) usually shows different wing pattern and is remarkable large, clearly over average size in this genus. But the one dissected male from the series of 9 small *Depressaria* sp. collected in Iran, Derbend in years 1962 and 1963 has a wingspan of 16 mm, just like the rest of this series, and also external appearance is extremely similar (the worn female, dissected by Hannemann and determined as *Depressariodes* sp. is excluded from this comparison here). With the knowledge that there are two species present, it is possible to find external differences: in *D. gaalhaszlerae*, antenna is clearly ringed in basal 1/4, thorax is predominantly uniformly yellowish and on

underside of forewing pale buff ciliae along costa are restricted to distal 2/3, while in this one *D. daucivorella* (figs 47-49) antenna is indistinctly ringed, thorax is mixed with brownish scales and on underside of forewing pale buff ciliae along costa extend to base. Without the knowledge that there are two species present, it is unlikely these features would have been noticed, and even if someone had seen it, it is likely these subtle differences would have been assumed to be intraspecific variability. So Hannemann's determination of these 7 specimens as *D. daucivorella* is understandable, nevertheless therefore this sp.n. remained undescribed so far. Genitalia of *D. daucivorella* (*D. libanotidella*) are so different, that a verbal comparison appears unnecessary, see figs 50 and 53.

Male genitalia: although very similar, *D. kondarella* and *D. gaalhaszlerae* show several differences, sufficient for safe determination. Differences of diagnostic value in *D. kondarella* (fig. 51): socii narrower, gnathos only slightly overtopping distal edge of socii in standard preparation, membranous part between central part of costa and curved fold narrower, cucullus shorter and broader, end of sacculus only slightly curved, cornuti numerous (> 10), forming an elongate group of more than half of aedeagus length.

Female genitalia: in contrast to similarity of male genitalia, differences in females between *D. kondarella* (figs 38, 41) and *D. gaalhaszlerae* (figs 37, 40) are so distinct, that it is even difficult to see that they belong to the same species group, if only female genitalia are compared, therefore also here a verbal comparison appears unnecessary. For comparison with *D. urtsadzorensis* sp.n. (figs 39, 42), see description of this species below.

FIGURES 43-45: *D. kondarella*, Tajikistan, Kondara, coll. ZIN; 43, 45: 2.VIII.1976 rsp. 27.VII.1976, A. Lvovsky leg., 44: 16.IX.1991, P. Ustjuschanin leg.; figs 43, 45 with outer side of labial palp enlarged as an insert.

FIGURE 46: *D. marcella*, Italy, Sicilia, Caltanissetta, Babaurra, 10.I.1954, Parvis leg., coll. ZSM
FIGURES 47-50 (DEEUR 5175): *D. daucivorella,* Iran, Derbend 25 km N Teheran, 2000 m, leg. larva from an undetermined Apiaceae, e.l. 30.VI.1963, gen. prep. H.J. Hannemann (Hannemann id. 4408, museum id. 4875), Kasy & Vartian leg., coll. NHMW; 47: general view, 48: underside, 49: head and thorax, detail, 50: male genitalia

FIGURE 51: *D. kondarella*, Tadjikistan, Kondara, Varzob, 27.VII.1976, A. Lvovsky leg., coll. ZIN
FIGURE 52: *D. marcella*, Greece, Syvota, Igoumanitsa, 27.III.2011, J. Viehmann leg., coll. RCWS

FIGURE 53: *D. libanotidella*, Sweden, Uppsala, Valsgaerdet, 17.VI.1990, J.O. Bjoerklund leg., coll. ZMUC
FIGURE 54: *D. marcella*, Greece, Lakonia, Monemvasia, 16.VIII.1983, G. Christensen leg., coll. ZMUC

figs 53 and 54 in same scale, note the remarkable difference in size; the *D. libanotidella* slide split into two sections, the red bar shows how they had to be stitched

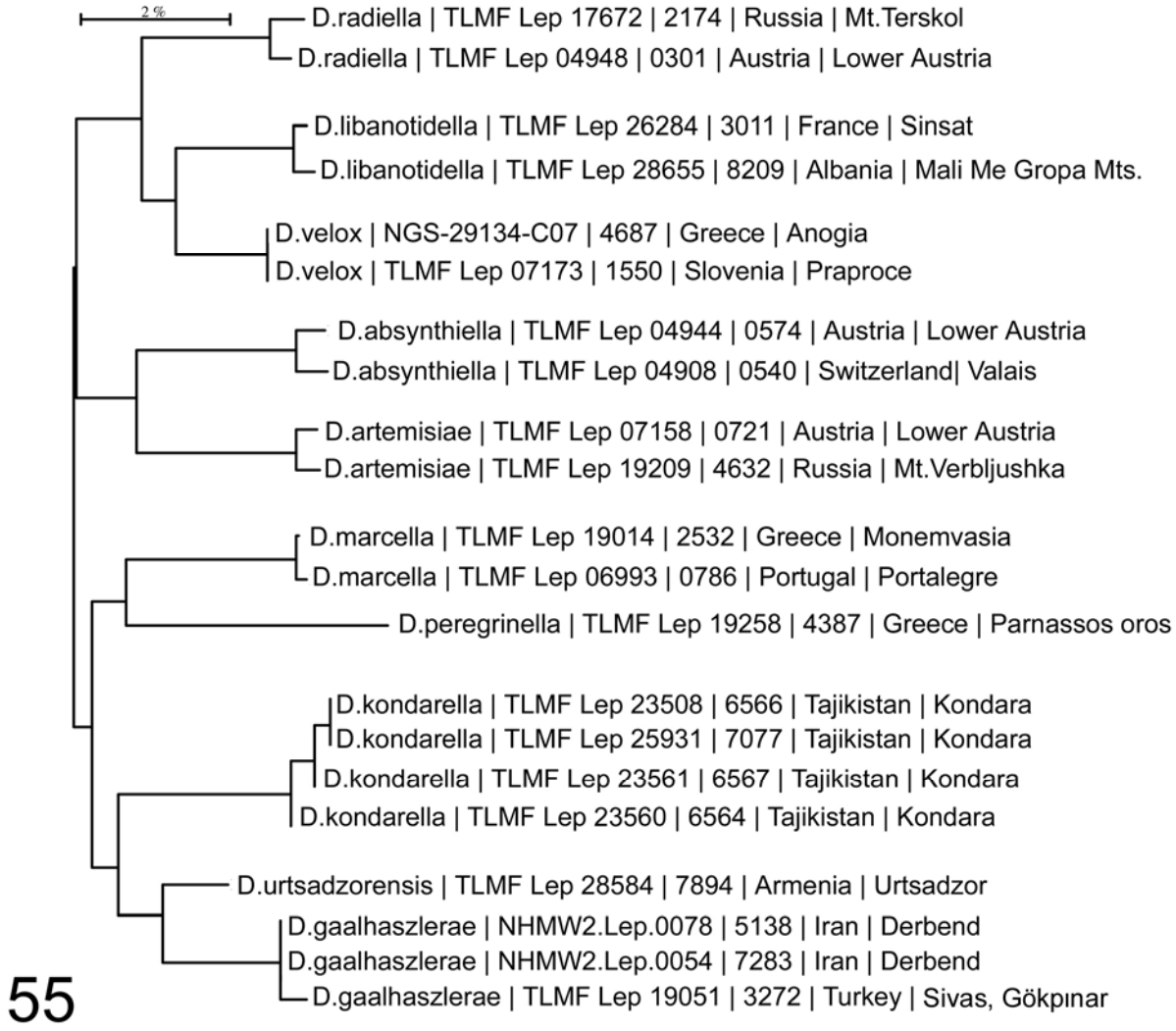


FIGURE 55: Neighbour-joining tree of *D. kondarella*-group *(D. gaalhaszlerae* sp.n., *D. urtsadzorensis* sp.n., *D. kondarella*) and further species groups with selected species: *D. radiella* group (*D. radiella* (Goeze, 1783), *D. libanotidella, D. velox* Staudinger, 1859), *D. artemisiae* group with *D. artemisiae* subgroup (*D. absynthiella* Herrich-Schäffer, 1865, *D. artemisiae* Nickerl, 1864) and *D. marcella* subgroup (*D. marcella*, *D. peregrinella* Hannemann, 1967)

Type Material

Holotype :

♀, Iran, Derbend 25 km N Teheran, 2000 m, 1. - 10.VII.1962, specimen DEEUR 5138 gen. prep. P. Buchner with museum id 19875, DNA barcode id. NHMW2. Lep. 0078, E. & A. Vartian leg., will be deposited in coll. NHMW

Paratypes (arranged according to collection date):

3 ♂, Iran, Derbend 25 km N Teheran, 2000 m, 1. - 10.VII.1962 (specimen DEEUR 5174 gen. prep. P. Buchner with museum id 19873; specimen DEEUR 7283 gen. prep. P. Buchner with museum id 19898, DNA barcode id. NHMW2. Lep. 0054; specimen DEEUR 7285 with DNA barcode id. NHMW2. Lep. 0078), E. & A. Vartian leg., will be deposited in coll. NHMW

2 ♀, Iran, Derbend 25 km N Teheran, 2000 m, 1. - 10.VII.1962 (specimen DEEUR 5139 with DNA barcode id. NHMW2. Lep. 0052; specimen DEEUR 6818 with DNA barcode id. NHMW2. Lep. 0086), E. & A. Vartian leg., will be deposited in coll. NHMW

1 ♂, Iran, Derbend 25 km N Teheran, 2000 m, 28. - 30.V.1963, specimen DEEUR 6821 with DNA barcode id. NHMW2. Lep. 0093, Kasy & Vartian leg., will be deposited in coll. NHMW

1 ♀, Iran, Derbend 25 km N Teheran, 2000 m, 28. - 30.V.1963, specimen DEEUR 5178 with gen. prep. H.J. Hannemann (Hannemann id. 4586, museum id. 5112), DNA barcode id. NHMW2. Lep. 0091, Kasy & Vartian leg., will be deposited in coll. NHMW.
1 ♀, Turkey, Sivas, Gökpınar 10 km S Gürün, 1500 m, 11.VII.2000, specimen DEEUR 3272 gen. prep. P. Buchner, DNA barcode id. TLMF Lep 19051, K. Larsen leg., will be deposited in coll. RCKL.

Genetic data

7 specimens have been sequenced, here only mentioned with DEEUR-number, sample ID, sequence length and quality. Details concerning collecting place are found in the type list (paragraph "Type Material").

DEEUR 3272: TLMF Lep 19051, 658[0n]bp
DEEUR 5138: NHMW2. Lep. 0078, 658[89n] bp
DEEUR 5139: NHMW2. Lep. 0052, 658[200n] bp
DEEUR 5178: NHMW2. Lep. 0091, 658[200n] bp
DEEUR 6818: NHMW2. Lep. 0086, 658[200n] bp
DEEUR 6821: NHMW2. Lep. 0093, 658[200n] bp
DEEUR 7283: NHMW2. Lep. 0054, 658[89n] bp

Details concerning collecting place are found in the type list (paragraph "Type Material"). Further data are accessible via the public dataset DS-DEEUR384 (http://www.boldsystems.org/index.php/Public_SearchTerms?query=DS-DEEUR384).

Related species

Closest species is *D. urtsadzorensis* sp.n. (described in this paper below), this is supported by similarity of genitalia and barcode with p-distance of 2.91%, second closest is *D. kondarella*, also supported by similarity of genitalia and barcode with p-distance of 4.6%. The position of the *D. kondarella* group within genus *Depressaria* is more difficult to estimate, members of both the *D. radiella* group and the *D. artemisia* group appear at p-distances of about 5 %, but distinct genitalia differences indicate that they are not closely related. But at least, barcodes show that the *D. kondarella* group is well nested in genus *Depressaria*.

Distribution

So far known from Turkey and Iran.

Biology

Foodplant unknown. Moths have been collected between end of May and first decade of July, the condition of the specimens suggests that the species hibernates as imago, but without knowledge of preimaginal stages, this must remain provisional.

Derivation of name

The species is named in honour of Dr Sabine Gaal-Haszler (NHMW) as a "thank you" for the long-term support, that was essential for the study of this and many other species from Vienna's collection.

Depressaria urtsadzorensis sp.n.

http://zoobank.org/NomenclaturalActs/72CA088F-E4DD-4392-A948-49CF25ACA8B0

Description

Imago (figs 56-60): Wingspan 13 mm. Head and face silvery, mixed with greyish brown scales near crown, neck and crown with raised brown to blackish scales. Labial palp segment 3 three-fifths length of segment 2; segment 2 with predominantly light brown, spreading scales ventrally, at 2/3

a group of blackish scales on outer side, segment 3 with adpressed scales, blackish in basal 3/4, pale buff toward tip; thorax medium brown frontally, becoming gradually pale buff toward rear edge, tegulae with the same pattern. Antenna light to medium brown, in basal ¼ segments distinctly ringed on upper side, this pattern becoming indistinct in distal part. Forewing rather narrow with width/length ratio of 1:3.5, a small blackish spot at very base of costa, further wing patterns indistinct due to age of the specimen; fringe grey, fringe line not visible; underside medium greyish brown, paler along costa in central part, this paler zone not extending to wing base. Hindwing pale, darker posteriorly; fringe grey, fringe line not visible. Legs pale buff, only forelegs predominantly darker greyish brown, especially on tibia and tarsus.
Remark: the state of preservation of this specimen shows that it generally corresponds with external appearance of *D. kondarella* and *D. gaalhaszlerae*, but does not allow a more detailed description.

FIGURES 56-57: *D. urtsadzorensis*, holotype, general appearance / details of head, thorax and wing base

FIGURES 58-59: *D. urtsadzorensis*, holotype, details of head and labial palp

FIGURES 60-61: *D. urtsadzorensis*, holotype, 60: underside, 61: female genitalia, free floating, detail of ostium region in ventral view; left one of the two protuberances marked with red arrow

Female genitalia (figs 39, 42, 61):
Papilla analis about 0.45 mm long, width 0.2 mm in lateral view (fig. 42), posterior apophysis 0.45 mm. Sternite VIII 0.25 mm long medially and 0.3 mm laterally, maximum width 0.5 mm in standard preparation, anterior apophysis 0.17 mm, rather short. Distal edge of sternite VIII straight, proximal edge of sternite VIII rather straight but slightly concave centrally, a less sclerotised dumb-bell-shaped area in sternite VIII along central part of proximal edge with total width/length of 0.2/0.05 mm, with a remarkable structure at its inner wall, consisting of two semi-elliptic protuberances with width/length of about 0.05/0.05 mm (red arrow in figs 39 and 61), directed inward, inner edges about 0.05 mm apart (this is the same in the free floating, uncompressed genitalia, fig. 61, therefore the position is obviously not a result of a preparation artefact). Ostium located in a less sclerotised, round but distally notched area with 0.1 mm diameter, its centre in the middle of sternite VIII, ductus bursae starting with a width of about 0.06 mm, its first 0.2 mm distinctly sclerotised predominantly laterally, but with unsclerotised area ventrally which is very narrow in the centre of this sclerotised section and expanding gradually toward distal and proximal end of it, proximal end about 0.1 mm exceeding proximal edge of sternite VIII, after a 0.15 mm long, thin-walled, unsclerotised section - here the origin of ductus spermatheca - the wall of ductus bursae gets markedly thick for the next 0.5 mm, but sclerotisation is only present as two indistinct stripes in distal ¼ of this section, further in its course the wall of ductus bursae gradually becomes thinner and widens to pyriform corpus bursae with length of about 1.5 mm, in its middle a remarkably large, rhombiform signum with width/length of 0.2/0.7 mm, evenly covered with numerous (about 100) small teeth, additionally tiny teeth in its centre; ductus spermathecae ending with about 6 turns.

Differential diagnosis. With a wingspan of 13 mm, *D. urtsadzorensis* is distinctly smaller than most other *Depressaria* spp. including the other species of *D. kondarella* group, which have a range of 15 - 17 mm. Apart from this not really solid feature, externally it is not distinguishable from *D. kondarella*, as far as it can be judged. Especially second segment of labial palp with blackish section in distal 2/3 on outer side and thorax and tegulae rather broadly greyish brown anteriorly correspond with this species, while in *D. gaalhaszlerae* in second segment of labial palp no distinct blackish section is present and thorax and tegulae are only narrowly greyish brown anteriorly. The modest preservation state of the type specimen does not allow a more detailed comparison, but since external features are of low value to distinguish these species, this is of minor importance for diagnosis, which mainly rests on female genitalia.

Female genitalia: differences in females between *D. urtsadzorensis* (figs 39, 42, 61) and *D. kondarella* (figs 38, 41) are so distinct that this can be seen at first glance, for this reason both figures are shown side by side and a verbal comparison appears unnecessary. Differences against *D. gaalhaszlerae* (figs 37, 40) are also distinct, but components can be found which are corresponding, different only in details: in *D. urtsadzorensis* ratio posterior/anterior apophysis 2.3:1, ostium in centre of sternite VIII, first part of ductus bursae with lateral sclerotisation exceeding proximal edge of sternite VIII by about half of its length, two very distinct protuberances near proximal edge of sternite VIII, its inner edges with clear gap in between, ductus bursae in central part with thickened wall but nearly without sclerotisation, signum narrow and long with width/length ratio of 1:3.5. In *D. gaalhaszlerae* ratio posterior/anterior apophysis 3.5:1, ostium distal of centre of sternite VIII, first part of ductus bursae with lateral sclerotisation not exceeding proximal edge of sternite VIII, two protuberances near proximal edge of sternite VIII present but indistinct and its inner edges touching, ductus bursae in central part with moderately thickened wall and distinct sclerotisation, signum broader and not as long with width/length ratio of 1:1.5.

Type Material

Holotype :

♀, Armenia, Ararat Province, Vedi river valley, Urtsadzor, light trapped near CRW Eco Lodge, 1250 m, 20. - 30.V.2019, DEEUR 7894, DNA barcode id. TLMF Lep 28584, H. Roweck & N. Savenkov leg., will be deposited in coll. ECKU

Genetic data

The type specimen has been DNA barcoded under id. TLMF Lep 28584 and brought a full length sequence with 658[on] bp. Further data are accessible via the public dataset DS-DEEUR384 (http://www.boldsystems.org/index.php/Public_SearchTerms?query=DS-DEEUR384).

For neighbour joining tree see fig. 55.

Related species

Closest species is *D. gaalhaszlerae*, this is supported by barcode with p-distance of 2.91% and also by similarity of genitalia, second closest is *D. kondarella* with barcode p-distance of 4.13%, but due to remarkable differences in female genitalia and the absence of males of *D. urtsadzorensis*, direct genitalia comparison is not able to confirm this. But with *D. gaalhaszlerae* as "connecting species" with males present, the position within the *D. kondarella* group can be confirmed by genitalia comparison also. The position of the *D. kondarella* group within genus *Depressaria* is more difficult to estimate, members of both the *D. radiella* group and the *D. artemisia* group appear in p-distances of about 5 %, but distinct genitalia differences in both sexes indicate that they are not closely related. But at least, barcodes show that the *D. kondarella* group is well nested in genus *Depressaria*.

Distribution

So far known from Armenia.

Biology

Foodplant unknown. The moth has been collected end of May, the condition of the specimen suggests that the species hibernates as imago, but without knowledge of preimaginal stages, this must remain provisional.

Derivation of name

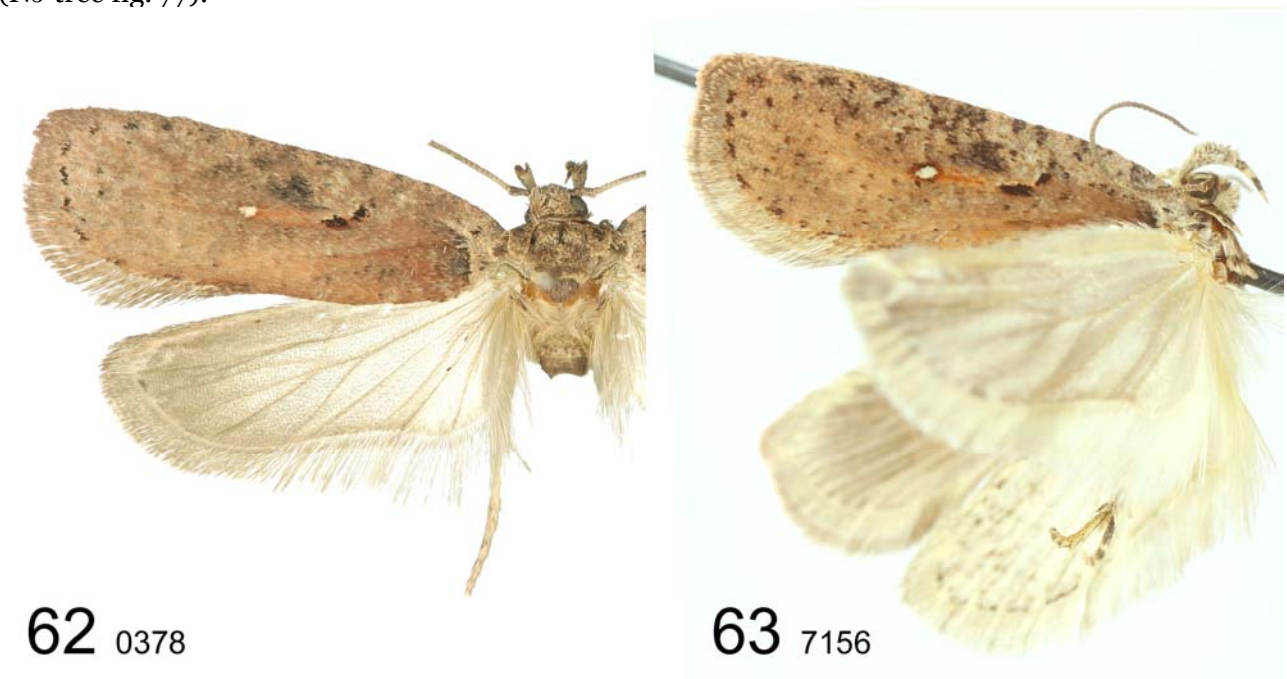
The name is derived from Urtsadzor, a village in Armenia, Ararat Province, Vedi river valley, where the type specimen was found. It is located in an area recognized as Prime Butterfly Area, so the choice of this name intends to underline its importance for biodiversity resarch and protection.

Establishment of 3 new synonyms in genus *Agonopterix*

***Agonopterix subtakamukui* Lvovsky, 1998**
(figs 62-68)

= *Agonopterix cluniana* Huemer & Lvovsky, 2000 **syn.nov**

During studies of Depressaridae in coll. ZIN, the holotype of *A. subtakamukui* (fig. 63) made the impression to be a well known European species, namely *A. cluniana* (fig. 62) and conspecificity appeared likely. Comparison of genitalia (figs 64-68) confirmed this. Legs of type specimens of *A. subtakamukui* were submitted to Guelph for DNA-barcoding, but sequencing failed. A non-type specimen from Primorskii Kraj was sequenced successfully, the result also confirms conspecificity (NJ tree fig. 77).



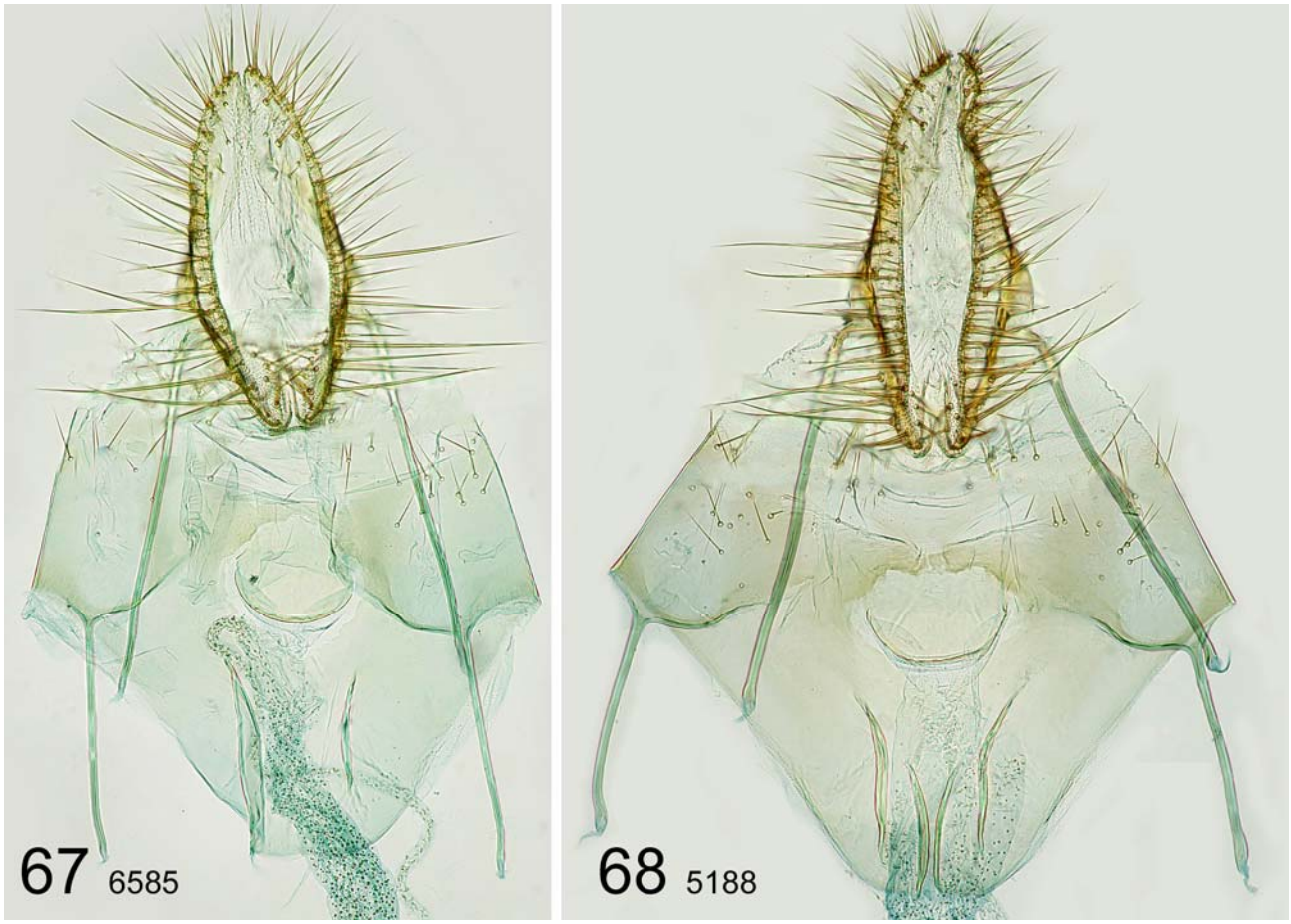
FIGURES 62-63: *A. subtakamukui*, imago

FIGURE 62: *A. cluniana* paratype, Austria, Vorarlberg, Koblach, 8.VIII.1999, P. Huemer leg., coll. TLMF
FIGURE 63: *A. subtakamukui* holotype, Russia, Primorskii Kraj, Barabash Levada, 5.VIII.1989, Omelko leg., male gen. prep. in glycerol with ZIN-number 17503, coll. ZIN

FIGURES 64-66: *A. subtakamukui*, male genitalia

FIGURE 64: *A. subtakamukui* paratype, Russia, Primorskii Kraj, 1.VI.1975, Jermolaev leg., coll. ZIN
FIGURE 65: *A. "cluniana"*, Austria, Vorarlberg, Bangs, 18.VII.2007, A. Mayr leg., coll. RCAM
FIGURE 66: *A. "cluniana"*, Austria, Vorarlberg, Bangs, 18.VII.2007, A. Mayr leg., coll. RCAM

Note intraspecific variability of cuiller: the specimens DEEUR 1900 and 1898 are from the same collection series.



FIGURES 67-68: *A. subtakamukui*, female genitalia

FIGURE 67: *A. subtakamukui*, Russia, Primorskii Kraj, Chasanskii R.N., Andreevki, 17.VIII.1985, S. Sinev leg., coll. ZIN
FIGURE 68: *A. cluniana* paratype, Austria, Vorarlberg, Satteins Ried, 7.VI.1981, P. Huemer leg., coll. TLMF

Remarks:
In the original description (Lvovsky, 1998) female genitalia are compared with that of *A. takamukui* (Matsumura, 1931), which is redescribed in this publication, about female genitalia is said "typical feature characterizing this species is the presence of 2 longitudinal folds on sternite VIII, proximal to antrum" In the drawing of these genitalia (p. 410 fig. 10), these folds are clearly depicted, but a further typical feature, the far protruding proximal edge of sternite VIII which is very unusual in genus *Agonoperix*, is not shown, in this drawing it appears like normal *Agonopterix*-sternite VIII. Apparently free floating genitalia were used as template for this drawing, where this striking feature in fact is not clearly visible. Female genitalia of *A. subtakamukui* are not depicted at all, only mentioned in the text with "About the same as in *A. takamukui*". The misleading drawing of the female genitalia may have been the reason why the species designated to be described as *A. cluniana* was not realised to be conspecific with *A. subtakamukui*.

When this species was found from Europe and described as *A. cluniana*, it has been put next to *A. ocellana* (Fabricius, 1775), due to red markings in centre of forewings in both species and also because it was found in habitats where willows (*Salix* sp.) are abundant, the well known hostplant of *A. ocellana*. If willow is in fact its hostplant is still unknown, as preimaginal stages have not yet been found. But genitalia and barcode contradict a close relatedness to *A. ocellana*.
The earliest specimen collected in Europe as far as known has been detected in HNHM, with data Hungary, Kaposvar, 12.VIII.1968, M.Nattan leg.

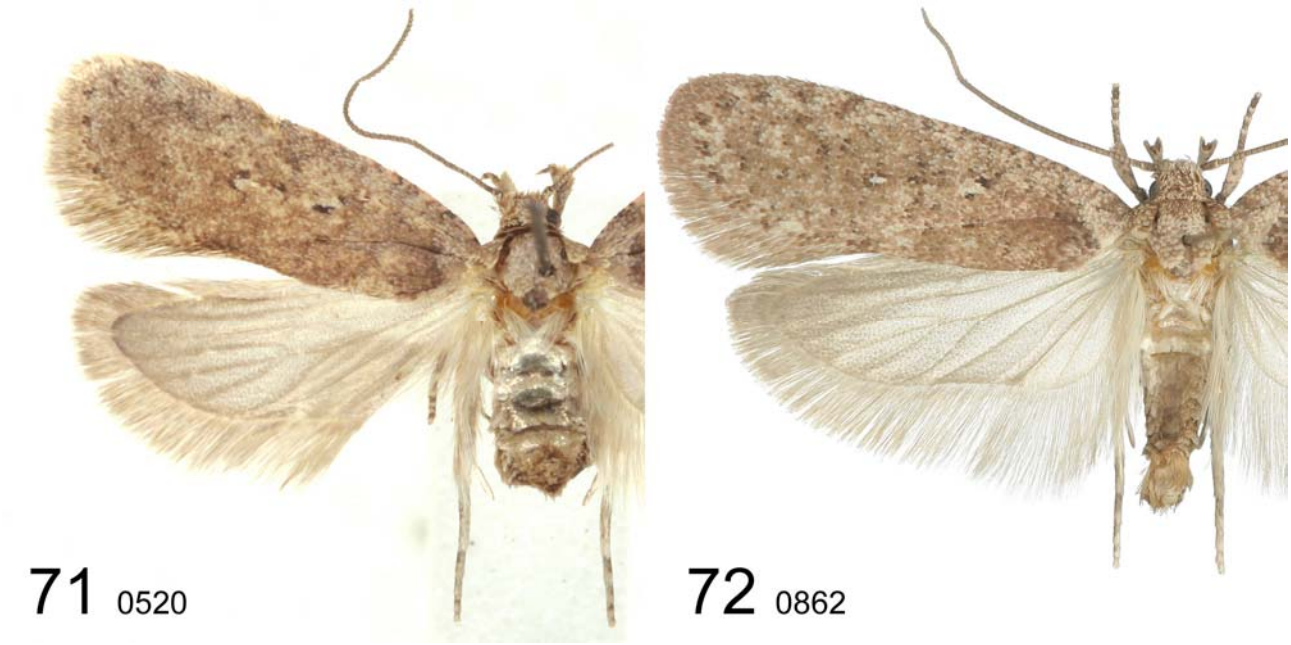
Agonopterix ivinskisi Lvovsky, 1992
(figs 69-74)

= *Agonopterix flurii* Sonderegger, 2013 **syn.nov**
(= *Agonopterix centaureivora* Rymarczyk, Dutheil & Nel, 2013)

A. ivinskisi was described based on a single male from Tajikistan, and during the author's studies of Depressariidae in ZIN, the type (fig. 70) was checked, but its genitalia slide was not accessible. DNA-barcoding brought a full length sequence, unexpectedly the sequence shows 99.39 % similarity with *A. flurii*. With help from A. Lvovsky, the original description (Lvovsky, 1992) was made accessible, and the drawing of the very distinct male genitalia left no doubt that *A. ivinskisi* and *A. flurii* are conspecific.
While conspecificity is without question at species level, things became more difficult when considering the recently described *A. ivinskisi* ssp. *daghestanica* Lvovsky, 2018 (holotype: fig. 69), based on several specimens from Russia (Daghestan) and Armenia. According to its original description, the differences are: central forewing dot without whitish elements, rather large (wingspan 19.5 mm), cuiller sharply pointed in the nominate ssp., central forewing dot with whitish elements, rather small (wingspan 14-16 mm), cuiller blunt in ssp. *daghestanica*.
Based on this features, the European specimens cannot be placed in one or the other ssp. without contradictions. Their size is found in the range of 16 - 18.5 mm, central forewing dot usually with whitish elements (figs 71, 72), cuiller variable, both pointed (figs 73a, 73b) and blunt (fig. 74) forms can be found.
The holotype of ssp. *daghestanica* has been DNA-barcoded also, the result makes clear, barcodes are not helpful to separate the ssp., e.g. the sequence differences within the population from Switzerland, Valais is larger than the difference between the nominate species holotype and the subspecies holotype. With the actual synonymisation the range of *A. ivinskisi* has seriously increased, likely also intraspecific variability is larger than seen before, so a revision of the status of the infraspecific taxa is recommended.

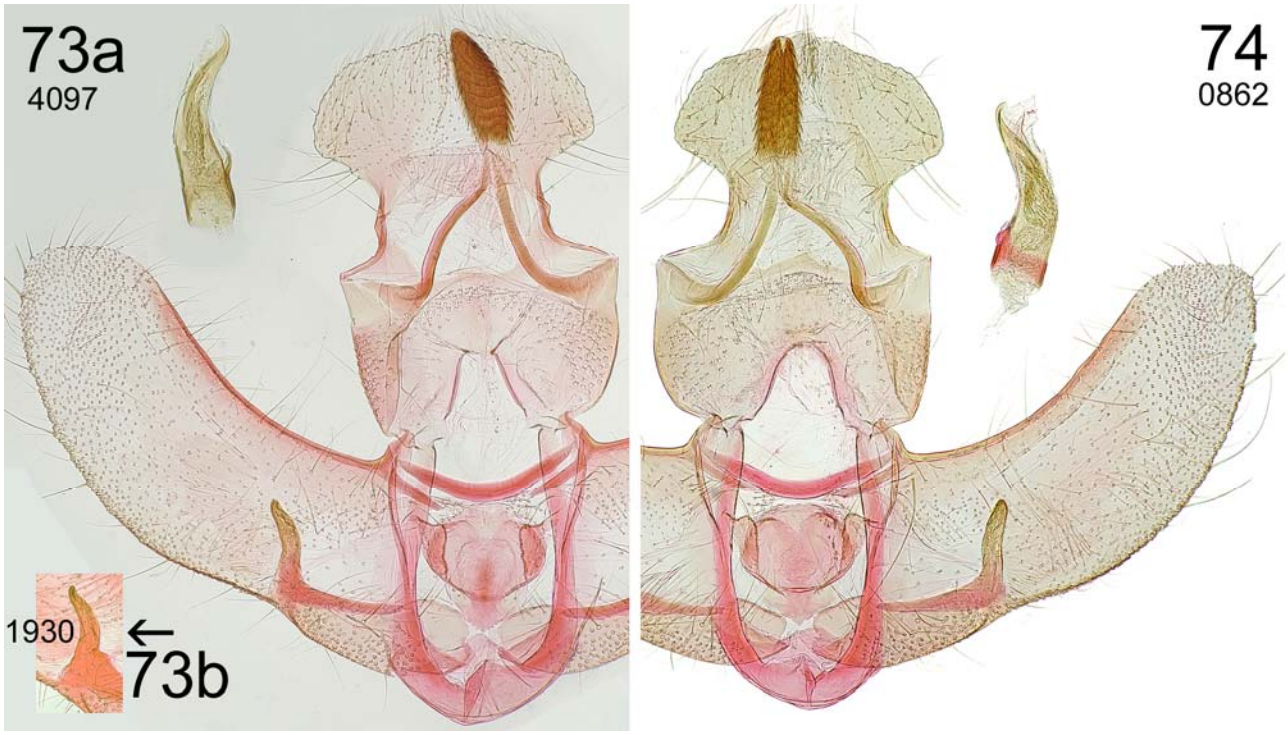
FIGURES 69-70: *A. ivinskisi*, imago

FIGURE 69: *A. ivinskisi*, ssp. *daghestanica* holotype, Russia, Daghestan, Lewaschi, 16.VI.1926, M.A. Ryabov [Рябов] leg., male gen. prep. with ZIN-number 17658, coll. ZIN
FIGURE 70: *A. ivinskisi* holotype, Tadjikistan, 28.VII.1986, P. Ivinskis leg., coll. ZIN



FIGURES 71-72: *A."flurii"*, imago

FIGURE 71: *A. flurii* paratype, Switzerland, Valais, Jeizinen, 1530 m, e.l. *Centaurea scabiosa* 9.IX.2010, P. Sonderegger leg., coll. NHMB with code GBIFCH00723242
FIGURE 72: *A. "flurii"*, Turkey Ankara Province, 20 km W Kızılcahamam, 30.VI.1970, J. Klimesch leg., coll. ZSM



FIGURES 73-74: *A."flurii"*, male genitalia

FIGURE 73a: *A. "flurii"*, Turkey, Ağrı Province, 15 km E Horasan, 13.V.1992, Cs. Szaboky leg., coll. RCCS
FIGURE 73b: *A. "flurii"*, left cuiller, Spain, Teruel, Moscardon, 1500 m, 14.IX.2007, J. Viehmann leg, coll. RCWS
FIGURE 74: data as in fig. 72

Agonopterix ligusticella (Chrétien, 1908)

(figs 75-76)

= *Agonopterix tripunctaria* Buchner, 2015 **syn.nov**

Type of *A. ligusticella* is lost, and comparison with original description gave the impression that it is specifically different from the species, which had been selected to be described as *A. tripunctaria*. Attempts to find specimens from type area and reared from *Coristospermum lucidum* (in the original description listed as *Ligusticum pyrenaeum*) failed at that time, even in MNHN no such specimens were present. During a visit to F. Rymarczyk and M. Dutheil in Nice in year 2018, specimens matching these criteria could be found and checked for the first time, from external appearance conspecifity appeared likely, comparison of genitalia confirmed this.
Barcode p-distance to specimens of *A. "tripunctaria"* is 1.83 %, not an unusual distance within *Agonopterix* species.

FIGURES 75-76: *A. ligusticella,* imago

FIGURE 75: *A. ligusticella*, France, Valcebollère, Els Llosers, 1360 m, leg. larva on *Coristospermum lucidum* (= *Ligusticum lucidum, L. pyrenaeum*) F. Rymarczyk & M. Dutheil 11.VII.2012, e.l. 18.VIII.2012, coll. RCRD

FIGURE 76: *A. tripunctaria* holotype, Italy, Lake Garda, Mt. Maderno, 250 m, leg. larva on *Ferulago nodiflora*, e.l. 25.VII.1963, K. Burmann leg, coll. TLMF

FIGURE 77: Neighbour-joining tree of *A. subtakamukui*, *A. ivinskisi* and *A. ligusticella* and their synonyms

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