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RESEARCH ARTICLE

Taxonomic notes on five species of the family Depressariidae (Lepidoptera: Gelechioidea), described by Aristide Caradja from the Russian Far East

Замечания по систематике пяти видов семейства Depressariidae (Lepidoptera: Gelechioidea), описанных Аристидом Караджа с Дальнего Востока России

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Abstract. The type material of five species of the flat moths described by Aristide Caradja from the Russian Far East and originally placed within the genus *Depressaria* Haworth, 1811 were examined. Four of these species now belong to the genus *Agonopterix* Hübner, [1825] and one to *Exaeretia* Stainton, 1849. Three new synonyms are established: *Agonopterix pallorella* (Zeller, 1839) = *Depressaria divergella* Caradja, 1920, **syn. nov.**; *Agonopterix multiplicella* (Erschoff, 1877) = *Depressaria sutschanella* Caradja, 1926, **syn. nov.**; and *Exaeretia exquisitella* (Caradja, 1920), **comb. nov.** = *Exaeretia amurella* Lvovsky, 1990, **syn. nov.** A new systematic status is proposed for *Depressaria rimulella* Caradja, 1920 as *Agonopterix liturosa rimulella* (Caradja, 1920), **comb. nov.**, **stat. demotus.**

Резюме. Исследованы типовые материалы по пяти видам плоских молей, описанных Аристидом Караджа с Дальнего Востока России в роде *Depressaria* Haworth, 1811. Из них четыре вида ныне находятся в составе рода *Agonopterix* Hübner, [1825], а один вид – в роде *Exaeretia* Stainton, 1849. Установлены три новых синонима: *Agonopterix pallorella* (Zeller, 1839) = *Depressaria divergella* Caradja, 1920, **syn. nov.**; *Agonopterix multiplicella* (Erschoff, 1877) = *Depressaria sutschanella* Caradja, 1926, **syn. nov.**; *Exaeretia exquisitella* (Caradja, 1920), **comb. nov.** = *Exaeretia amurella* Lvovsky, 1990, **syn. nov.** Для *Depressaria rimulella* Caradja, 1920 предложен новый таксономический статус: *Agonopterix liturosa rimulella* (Caradja, 1920), **comb. nov.**, **stat. demotus.**

Key words: types, Russian Far East, Lepidoptera, Depressariidae, *Agonopterix*, *Exaeretia*, new synonyms, new combination

Ключевые слова: типы, Дальний Восток России, Lepidoptera, чешуекрылые, Depressariidae, *Agonopterix*, *Exaeretia*, новые синонимы, новая комбинация

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Introduction

At the beginning of the 20th century, Aristide Caradja (1861–1955), at that time already a reputed Romanian entomologist, received a large number of micromoths collected in the Russian Far East by different collectors, of which the most important was the German lepidopterist Max Korb. Other valuable specimens came for study from the collection of Thomas de Grey, 6th

Baron Walsingham, probably also with the support of John Hartley Durrant, former secretary and in charge with lord Walsingham's collection. Although he never travelled himself in the Russian Far East, working on such a novel, rich and diverse material, Caradja was able to describe a fairly large number of species (Caradja, 1920, 1926a, 1926b). Among them eight species were from the genus *Depressaria* Haworth, 1811, a common choice at that time, which later prove to be the representatives of the genera *Agonopterix* Hübner, [1825], *Exaeretia* Stainton, 1849 and *Odites* Walsingham, 1891. All descriptions were quite brief and lacking any colour drawings of imago and the genitalia structures. Therefore, not surprisingly, difficulties arose in the correct identification of these species in the subsequent works. Given that the types of the species described by Caradja are deposited in the National Museum of Natural History "Grigore Antipa", Bucharest (MGAB) (Popescu-Gorj, 1992), an opportunity came up to accomplish a comparative analysis for each of them, with the examination and illustration of their genital structures.

The genus *Agonopterix* Hübner, [1825] comprise about 250 described species, distributed mainly in the northern hemisphere (Hannemann, 1953, 1976; Lvovsky, 2001, 2006, 2016a, 2018). Of these, 39 species can be found in the Russian Far East (Lvovsky, 2016b). This genus includes many similar species, and a correct identification is usually possible only following a careful examination of their external appearance and genitalia structures. This is also true for to the closely related genus *Exaeretia* Stainton, 1849 with 56 species worldwide, of which seven are distributed in the Russian Far East. At his time, Caradja did not investigate the genital structures of these moths, relying their descriptions solely on external features, which soon proved to be insufficient. This study provided the circumstances for provisional reassessing the systematic position of the five species described by Aristide Caradja. Another two species, *Agonopterix rubrovittella* (Caradja, 1926) – *Agonopterix mutuurai* Saito, 1980 and *Agonopterix lacteella* (Caradja, 1920) = *Depressaria pallidior* Stringer, 1930, were examined some earlier (Dubatolov et al., 2014; Buchner, Stanescu, 2018, 2019). One more species *Depressaria ussuriella* Caradja, 1920 was turned out as representative of the genus *Odites* Walsingham, 1891, family Lecithoceridae (Lvovsky, 2013).

Taxonomy

Family **Depressariidae** Meyrick, 1883

Agonopterix archangelicella (Caradja, 1920) (Figs 1, 2, 11)

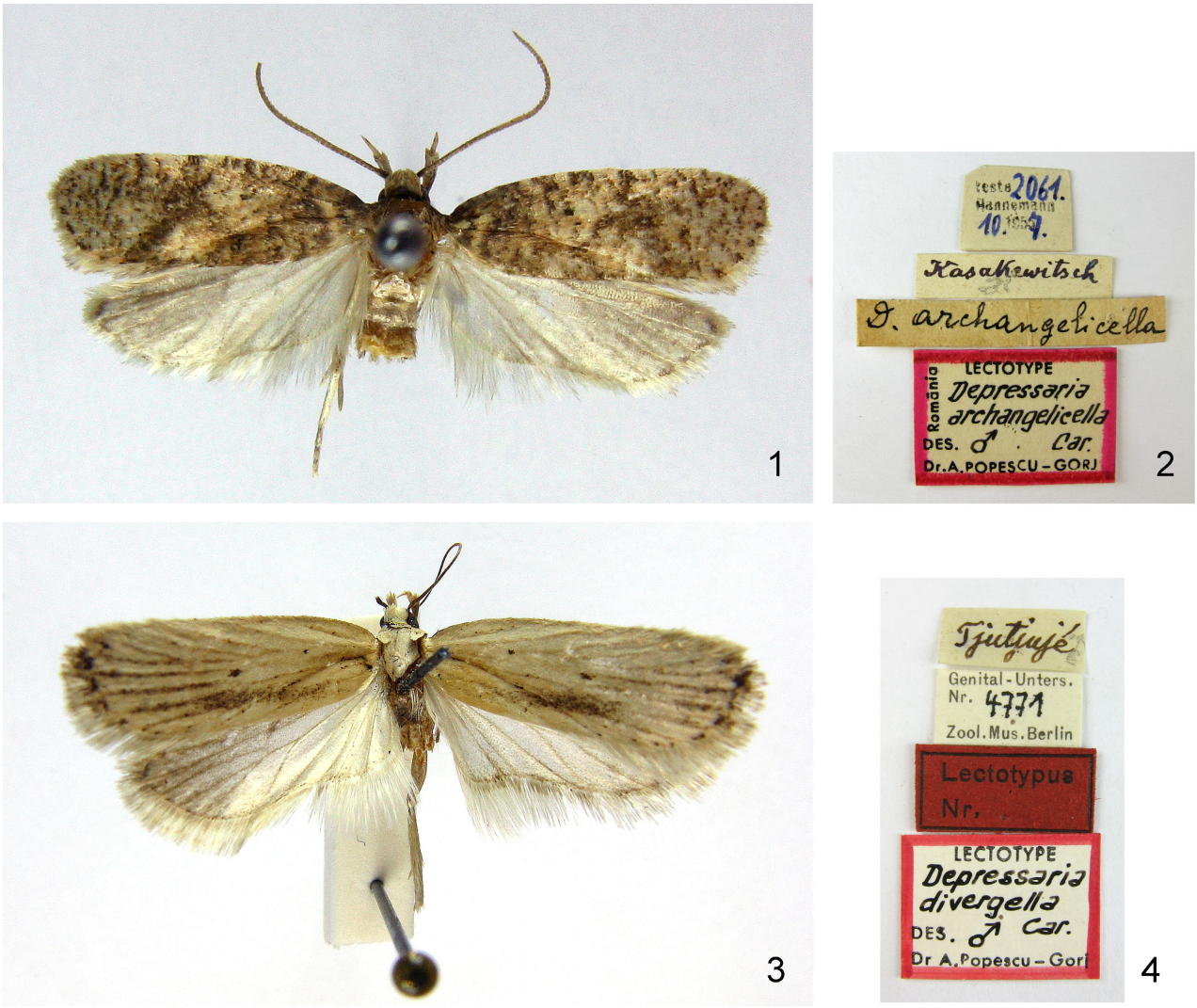
Depressaria archangelicella Caradja, 1920: 131–132.

Lectotype. Male (Fig. 1), **Russia**, "Kasakewitsch" [= Kazakevichevo, Khabarovsk Terr.]; the specimen also has an identification label handwritten by Caradja "*D. archangelicella*", Hannemann's genitalia label "teste 2061. Hannemann 10.1957", and the assignment label by Aurelian Popescu-Gorj (Fig. 2).

Paralectotypes. 4 males and 2 females, the same collecting data.

Distribution. Russia (the south of Khabarovsk Territory and Primorskiy Territory).

Remarks. At the beginning of his original description, Caradja compares this species with *Agonopterix angelicella* (Hübner, [1813]), primarily directed by the wingspan and the external appearance, especially the pattern on the forewings. At the end of the description, however, Caradja is more reluctant in associating his newly described species with *A. angelicella* showing some uncertainty in the correct placement of it. After examining the lectotype, Hannemann compares it with *A. rotundella* (Douglas, 1846), apparently without taking into account the obvious differences in the ground colour and especially the pattern on the forewings (Hannemann, 1958). However, giving both the external appearance and the structure of the genitalia, Caradja's types appear very similar to *A. septicella* (Snellen, 1884), a relatively common species in the Russian Far East. It is worth noting that, in his original description, P.C.T. Snellen points out the dark broad cloud marking the outer end of the cell on the forewings, with a well-defined black-edged white discal eyespot, as being similar with the one found at *A. angelicella*. Snellen describes and evaluate this specific feature of the pattern on the forewings in a manner similar to that latter used by Caradja in the opening of his original description. The external appearance of *A. archangelicella*, *A. septicella* and *A. angelicella* is rather similar. The first two species differ



Figs 1–4. Lectotypes of *Agonopterix* spp., habitus (1, 3) and labels (2, 4). **1**, **2**, *A. archangelicella* (Caradja), male; **3**, **4**, *A. divergella* (Caradja), male.

well from the *A. angelicella* by narrow gnathos. As concern *A. archangelicella* and *A. septicella*, the small differences between these two species are in the shape of cuiller (Figs 11, 12).

Agonopterix pallorella (Zeller, 1839)
(Figs 3, 4, 13)

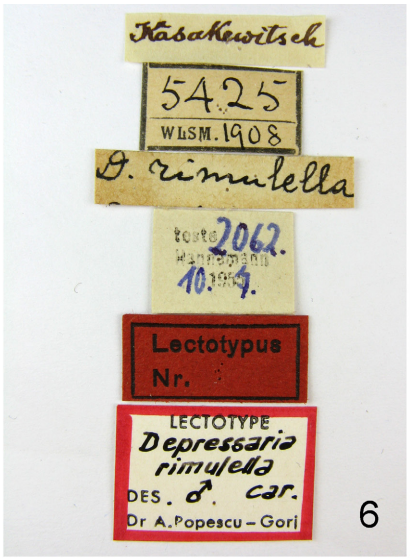
Depressaria divergella Caradja, 1920: 128, **syn. nov.**

Lectotype. Male (Fig. 3), **Russia**, "Tjutjujé" [= Dalnegorsk, Primorskiy Terr.]; the specimen also has a red label with the note "Lectotypus nr.", Hannemann's genitalia label "Genital-Unters.[uchung] Nr. 4771, Zool. Mus. Berlin", and the assignment label by Popescu-Gorj (Fig. 4).

Paralectotype. 1 male, same collecting data.

Distribution. Europe, Russia (Southern Siberia and Far East), Middle Asia, Mongolia, North-West China.

Remarks. In his original description, Caradja compared this species with *A. umbellana* (Fabricius, 1794). However, external appearance and the structure of genitalia (Fig. 13) at this species entirely matches with *A. pallorella* (Zeller, 1839). Hannemann designated and examined Caradja's types and dissected the genitalia of lectotype, but he left no comments on it, leading to the assumption that he did not notice and was not aware of the similarities between these two species.



Figs 5–10. Types of *Agonopterix* and *Exaeretia* spp., habitus (5, 7, 9) and labels (6, 8, 10). **5**, **6**, *A. liturosa rimulella* (Caradja); **7**, **8**, *A. sutschanella* (Caradja); **9**, **10**, *Exaeretia exquisitella* (Caradja).

Agonopterix liturosa rimulella (Caradja, 1920), **comb. nov., stat. demotus**
(Figs 5, 6, 14)

Depressaria rimulella Caradja, 1920: 128–129.

Lectotype. Male (Fig. 5), **Russia**, "Kasakewitsch" [= Kazakevichevo, Khabarovsk Terr.]; the specimen also has a label proving the provenance from Walsingham's collection "5425, Wlsm., 1908", an identification label handwritten by Caradja "*D. rimulella*", a red label with the mention "Lectotypus nr.", Hannemann's genitalia label "teste 2062, Hannemann 10.1957", and the assignment label by Popescu-Gorj (Fig. 6).

Paralectotypes. 26 males and 1 female, same collecting data.

Distribution. Russian Far East (the south of Khabarovsk Territory, Amur Region, Primorskiy Territory, Kunashir Island), North-East China.

Remarks. Describing new species, Caradja compared it with *Agonopterix liturella* (Hübner, 1796) and *A. rutana* (Fabricius, 1794), of them the first one is synonymous with *A. liturosa* (Haworth, 1811). Hence, Caradja seems to have had a correct perception on the true identity of his specimens, even though he mistakenly overrated the differences between these two species in their external appearance. *A. liturosa rimulella* is very similar in external appearance with the nominative subspecies, from which it differs only through its dark brown head and thorax and the absence of short black stroke in the middle of the cell. The specimens from nominative subspecies have usually light head and thorax and the short black stroke in the middle of the cell. The genitalia structures are identical (Fig. 14), as well as the food plants of larvae (*Hypericum* L.). The nominative subspecies is distributed in Europe, North Africa, Central Asia; the ssp. *A. l. rimulella* in Russian Far East and North East China (Jilin Province).

Agonopterix multiplicella (Erschoff, 1877) (Figs 7, 8, 15)

Depressaria sutschanella Caradja, 1926a: 43, **syn. nov.**

Lectotype. Male (Fig. 7), **Russia**, "Sutschan, Ussuri" [now Partizansk, Primorskiy Terr.]; the specimen also has two identification label handwritten by Caradja "*D. sutschanella*" and "*Depressaria sutschanella* Typen Car.[adja]", handwritten identification label with the note "*Depressaria propinquella*", a red label with the note "Lectotypus nr.", Hannemann's genitalia label "teste 2064, Hannemann 10.1957", and the assignment label by Popescu-Gorj (Fig. 8).

Paralectotypes. 5 females, same collecting data.

Distribution. Eastern Europe, Russia (Southern Siberia and Far East), Korea, China, Japan.

Remarks. In his extremely brief original description, Caradja primarily focused on the external differences between his specimens and *Agonopterix propinquella* (Treitschke, 1835) that could explain the presence of the handwritten identification label, indicating mentioned species name. At the end of his description, Caradja stated that *A. multiplicella* (Erschoff, 1877) is another similar species, different from the one he described. Indeed, the most closely related species to *A. sutschanella* is *A. multiplicella*, from which it differs only by the lighter ground colour of its forewings, and this is not enough to reject the conspecificity of these taxa. Although Hannemann examined the lectotype and its genital structures (Fig. 15), he did mention nothing about its synonymy (Hannemann, 1958). The examination of genital structures of one paralectotype (female) showed that it belongs to *Agonopterix anticella* (Erschoff, 1877), a senior synonym of *A. abjectella* (Christoph, 1882).

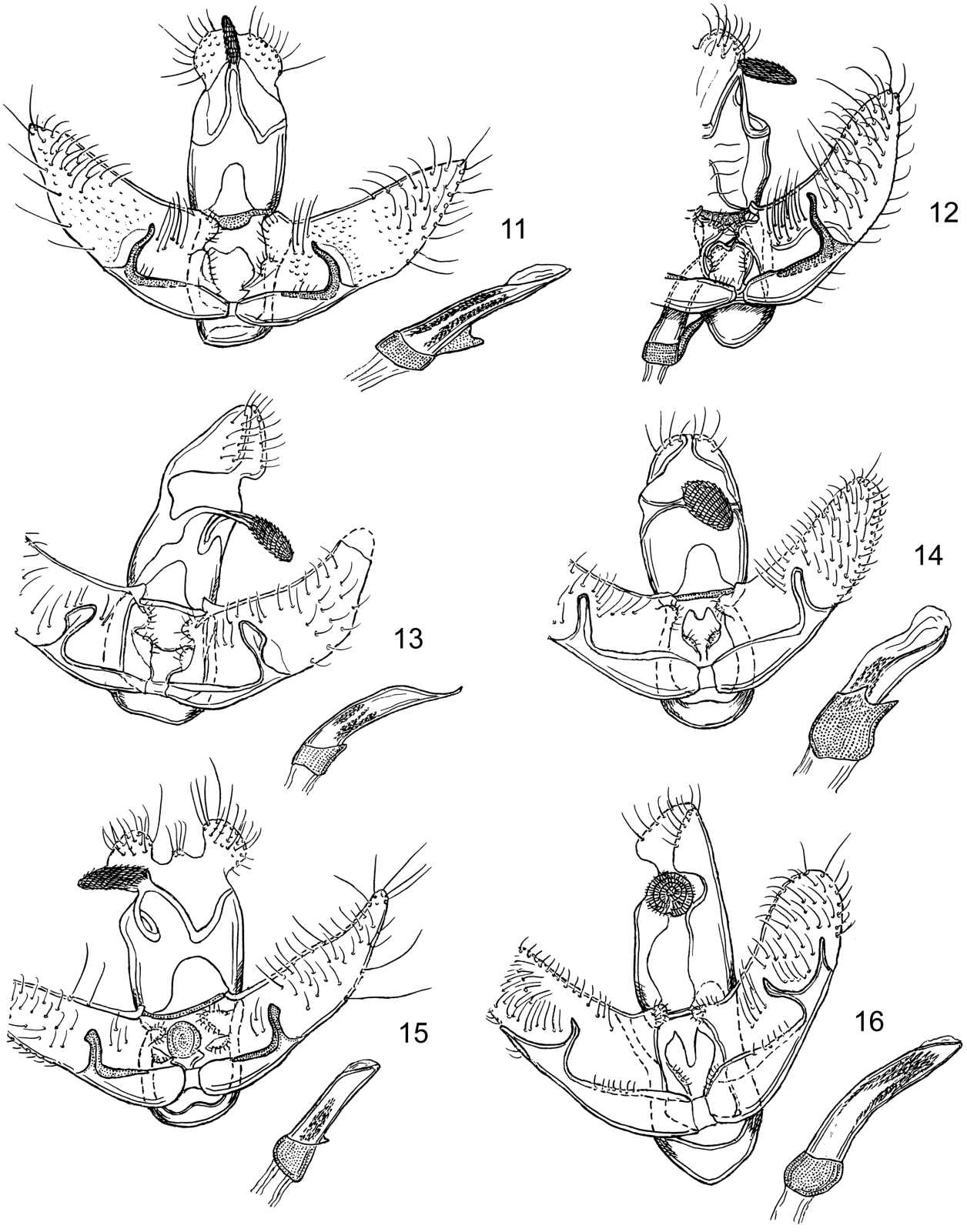
Exaeretia exquisitella (Caradja, 1920), **comb. nov.** (Figs 9, 10, 16)

Depressaria exquisitella Caradja, 1920: 132.
Exaeretia amurella Lvovsky, 1990: 644–645, **syn. nov.**

Holotype. Male (Fig. 9), **Russia**, "Kasakewitsch, Ussuri R., E. SIBERIA (Korb, ♂ 1907)" [= Kazakevichevo, Khabarovsk Terr.]; "Holotype *Depressaria exquisitella* Car." ♂; the specimen also has a red label with the note "Holotypus nr.", Hannemann's genitalia label "Genital-Unters.[uchung], Nr. 4773, Zool. Mus. Berlin", and the assignment label by Popescu-Gorj (Fig. 10).

Distribution. Russia: Siberia from the southern part of Krasnoyarsk Territory to Transbaikalia, Amur Region and the southern part of Khabarovsk Territory. Northern Mongolia.

Remarks. Caradja compared his new species with *Agonopterix angelicella* (Hübner, [1813]), seen as a having the same external appearance, only more delicate. Also, in his description, Caradja points out the lack of the dark rings on the apical joint of palpi, this character excludes conspecifity with *A. archangelicella* (Caradja, 1920). Hannemann examined Caradja's type and dissected its genitalia (Fig. 16) but left no comments on it, making us believe that he did not noticed the features that clearly indicates belonging of this specimen to another genus *Exaeretia*. Furthermore, the external appearance and genital structures of the species *Exaeretia amurella* Lvovsky, 1990 described much later correspond to those of *D. exquisitella* Caradja. The small differences in the external appearance and the shape of upper outgrowth of cuiller in the male genitalia structures are probably within the frame of individual variability.



Figs 11–16. Male genitalia of *Agonopterix* and *Exaeretia* spp. **11**, *A. archangelicella* (Caradja), lectotype; **12**, *A. septicella* (Snellen); **13**, *Agonopterix divergella* (Caradja), lectotype; **14**, *A. liturosa rimulella* (Caradja), lectotype; **15**, *A. sutschanella* (Caradja), lectotype; **16**, *E. exquisitella* (Caradja), holotype.

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