

**DISCOVERY OF MALE *ECTOEDEmia ARGYROPEZA*
(ZELLER) (LEPIDOPTERA: NEPTICULIDAE) IN
SOUTH-WEST IRELAND**

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The nepticulid moth *Ectoedemia argyropeza* (Zeller, 1839) is reported to be the only *Ectoedemia* species with parthenogenetic reproduction (Emmet, 1976; Wilkinson & Newton, 1981; Van Nieuwerkerken, 1985). Male genitalia of *E. argyropeza* illustrated by Beirne (1945) have been shown to refer to *E. albifasciella* (Heinemann), while males reported and illustrated by Petersen (1930) were previously considered to be misidentifications of *E. klimeschi* (Skala) (Van Nieuwerkerken, 1985). In this paper we record the discovery of males of *E. argyropeza* and present a description and diagnosis of the male, which completes the treatment of this species by Van Nieuwerkerken (1985).

On 12th November 1984, eight tenanted leaf mines of *E. argyropeza* were found on aspen (*Populus tremula* L.) at Kilbarry, West Cork (Irish Grid Reference W254683) in south-west Ireland by KGMB. This find constituted the first record of this species from Ireland (Agassiz, 1985). However, no moths emerged from these mines.

On 7th May 1985, two nepticulids were beaten from a small, isolated *P. tremula* at Muckcross, North Kerry, about 33 km north-west of the Kilbarry site. Reference to Emmet (1976) indicated that the specimens were probably examples of *E. argyropeza*, but in order to confirm their identities, genitalia slides were prepared. Surprisingly, both specimens proved to be males with genitalia showing similarity to other species of the *Ectoedemia populella* group (Van Nieuwerkerken, 1985).

During a further visit to the Muckcross site on 8th May 1986, no moths were observed, probably due to delayed emergences resulting from the unseasonably late spring. A sample of leaf litter was taken from this site, and a further one beneath a group of larger *P. tremula* found at Dinish, about 2 km to the south-west of the Muckcross site. One male and three females emerged from the Dinish sample. The external appearance of all four specimens and the female genitalia agreed with the descriptions of *E. argyropeza* in Emmet (1976) and Van Nieuwerkerken (1985), and the male genitalia with the specimens from Muckcross. Since no other *Ecto-*

edemia species with similar genitalia occur in Ireland, we are satisfied that the males from both Muckross and Dinish belong to *E. argyropeza*.

E. argyropeza is a monophagous species on *Populus tremula*, so that its distribution in Ireland depends on the distribution of this host. *P. tremula* is somewhat local in Ireland, and it is stated by Webb (1977) to be found mainly in the north and west of the country. The Dinish and Muckross sites are located in Killarney National Park. This area is largely dominated by mature oak woodland, but several small patches of *P. tremula* occur, and at least some of these are probably of natural origin, although the single tree at Muckross is almost certainly a planted specimen. It has not yet proved possible to check other Irish *P. tremula* sites for the occurrence of *E. argyropeza*.

Ectoedemia argyropeza (Zeller, 1839)

Lyonetia argyropeza Zeller, 1839, *Isis, Jena*, 1839: 215. Lectotype selected by Van Nieuwerkerken (1985: 35).

Nepticula argyropeza; Petersen, 1930: 78, fig. 122 [listed by Van Nieuwerkerken, 1985: 34 as misidentification of *klimeschi*].

Ectoedemia (Ectoedemia) argyropeza; Van Nieuwerkerken, 1985: 35–37, figs 48, 165, 166, 434, 521.

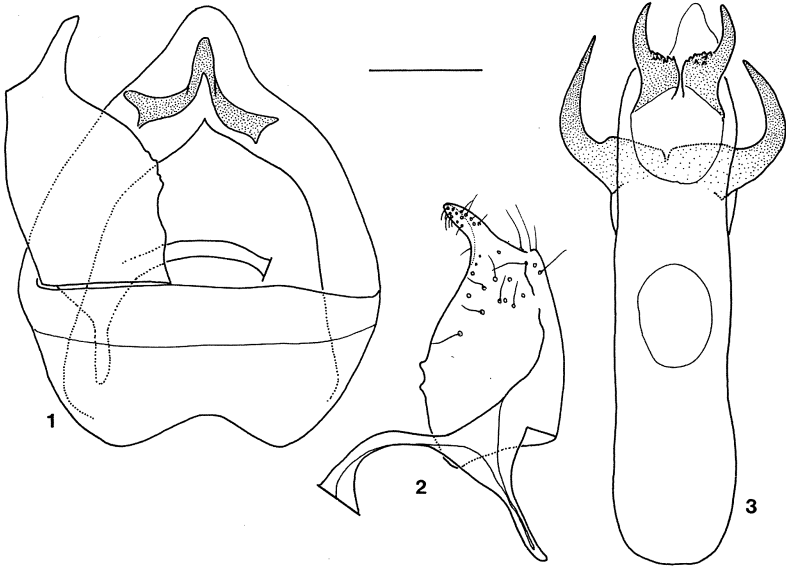
Description of male

Male. Forewing length 3.0–3.2 mm (2), wingspan 6.6–7.2 mm. Antenna with 44–45 segments. Hindwing with yellowish hair-pencil of about one-quarter to one-fifth hindwing length. Further as female (Van Nieuwerkerken, l.c.: 35).

Male genitalia (Figs 1–3). Capsule length 300–370 μm . Tegumen produced into a triangular pseuduncus. Gnathos with relatively long, triangular central element. Valva (Fig. 2) length 200–210 μm , widest at base; tip curved inwards, pointed, clearly demarcated from valva. Aedeagus 420–450 μm , very long and stout, symmetrical, with two pairs of horn-like carinae: ventral pair at extreme posterior tip, basally connected, at base with small denticles; dorsolateral pair more anteriorly placed, longer than ventral pair, strongly curved, dorsally connected.

Remarks

Male *E. argyropeza* can be distinguished from males of species in the "*albifasciella*" group by the presence on the hindwings of a hair-pencil and by the position of the costal spot on the forewings (opposite the dorsal spot). In the genitalia it resembles closely *E. klimeschi* and *E. turbidella*. It is separated from *E. klimeschi* by the tip of the valva and the asymmetrical aedeagus in *E. klimeschi*. Also the valval tip of *E. turbidella* differs, in addition to external differences and a longer gnathos.



Figs 1-3. Male genitalia of *Ectoedemia argyropeza* (Zeller), slightly squashed. 1, capsule (one valva and aedeagus omitted); 2, valva; 3, aedeagus. Genitalia slides: KGMB 1192 (Fig. 2), 1200. Scale: 0.1 mm.

In a large part of its distribution range, *E. argyropeza* is a parthenogenetic species with only females present. This is not only proved by the absence of males in most localities, but also by breeding from single virgin females (Van Nieuwerkerken, l.c.). However, apparently *E. argyropeza* has bisexual populations locally, such as in Ireland. It is very unlikely that these only occur in the extreme western part of its large range (the species probably occurs also in north-eastern China (Van Nieuwerkerken, unpublished)), so we expect that bisexual populations can be found elsewhere. This is most likely the case in eastern Germany, where Petry reared males from aspen (Petersen, 1930: 78). The figure of the male genitalia by Petersen was earlier interpreted as a misidentified *E. klimeschi*, but the present evidence favours the interpretation as *E. argyropeza*, although the figure is too schematic to see the diagnostic characters clearly.

These findings also mean that Van Nieuwerkerken's assumption (l.c.: 88) that *E. klimeschi* might be the sexually reproducing ancestor of *E. argyropeza* is false. It seems more likely now that *E.*

argyropeza is the sister-species of *E. klimeschi*, but the relationships between these two species and *E. turbidella* are not yet solved, and seem more complex than supposed earlier.

In Lepidoptera there are several other examples of species which locally produce only parthenogenetically, but elsewhere bisexually, such as *Bohemannia pulverosella* (Stainton) in Nepticulidae (Van Nieuwerkerken, 1982; unpublished data) and several Psychidae (Hättenschwiler, 1985).

Keys

The discovery of male *E. argyropeza* makes it necessary to alter the keys of western Palaearctic *Éctoedemia* in Van Nieuwerkerken (1985) slightly.

In the key to the species based on external characters, couplet 34 (p. 12) can be changed as follows:

- 34 ♂ with 49–58 antennal segments, ♀ with 34–38, slightly darker species. Always bisexual species, males as common as females. On *P. alba* 12. *klimeschi*
 — ♂ with 44–45 antennal segments, ♀ with 26–32, paler species, usually more irrorate. Mostly parthenogenetic species, males are extremely rare. On *P. tremula*
 13. *argyropeza*

In the key to the male genitalia (pp. 13–14) the following alterations are necessary:

- 11 Aedeagus markedly asymmetrical (figs 363, 400, 402). Valva gradually narrowing towards tip 12. *klimeschi*
 — Aedeagus not or hardly asymmetrical (fig. 362, Fig. 3 of present paper). Valva with narrow, clearly demarcated, tip 11A
 11A Valval tip truncate. Gnathos with relatively short triangular central element. Forewing with scattered white scales
 11. *turbidella*
 — Valval tip pointed. Gnathos with longer central element. Forewing without scattered white scales 13. *argyropeza*

Material examined

Ireland: 2 ♂, Muckross, North Kerry, V969857, 7.v.1985; 1 ♂, 3 ♀, Dinish, North Kerry, V938851, 15–17.v.1986, emerged from leaf-litter collected 8.v.1986 (*Bond*) (Colls Bond, Rijksmuseum van Natuurlijke Historie, Leiden).

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