An unexpected plume moth new to the fauna of Luxembourg: *Capperia celeusi* (Frey, 1886) (Lepidoptera, Pterophoridae)

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Abstract. The plume moth *Capperia celeusi* (Frey, 1886) is reported for the first time from Luxembourg. It has been found in August 2021 in the extreme south of the country, where it occurs together with its likely host plant, *Teucrium botrys*, in an abandoned iron ore quarry.

Introduction

The plume moths of the family Pterophoridae are characterised by their unusually formed wings and, due to their tiny size, used to be colloquially included with the "microlepidoptera", although they are now considered a part of the Apoditrysia where they range alongside the butterflies (Rhopalocera) and larger moths (Regier et al. 2013). Of this family, 32 species are currently known from Luxembourg (Hellers, unpubl.) whereas 46 species have been recorded in Belgium (Flemish Entomological 2022) and 31 in French Lorraine (Société Lorraine d'Entomologie 2022). A total of 48 species is known from Rhinehessen-Palatinate in Germany (Bettag & Bastian, 2003).

In this paper we relate the discovery of the plume moth *Capperia celeusi* (Frey, 1886), a species hitherto unknown from this country. It was found by the first author when studying the insect fauna of the former open-cast iron ore mines to the west of the town of Dudelange.

Material and Methods

Capperia celeusi (Frey, 1886) was discovered while surveying the Lepidopteran fauna of an area of former open-cast mining near the town of Kayl in the southwest of Luxembourg in August 2021 . This part of Luxembourg is well known for its many former iron ore mines, the majority of which used to be run as open-cast operations until the mid of the 1970ies. When they were eventually abandoned as their further exploitation was considered un-economic, what was left were places literally stripped of their natural vegetation and indeed their topsoil, exposing large areas of limestone rock, sheer rock faces and heaps of barren rock which were then re-colonized by vegetation quite quickly, creating a varied landscape of dry grassland rich in orchids, and birch-aspen secondary woodland, with drought-tolerant species growing in the most arid and rocky places (Cungs 1991).

When visiting the site near Kayl, locally known as "Perchesbierg", the first author noticed clumps of the cut-leaved germander *Teucrium botrys* growing on the lower reaches and up to the middle of a steep south-facing dry bank covered in loose scree-like calcareous rock. Upon closer inspection a brownish plume moth was seen darting from a clump of germander and settling almost immediately amidst the rocks where it was very difficult to spot owing to



Fig. 1. *Capperia celeusi*, "Perchesbierg", Kayl. Photo: R. Gerend, 19.8.2021.



Fig. 2. *Capperia celeusi*, "Perchesbierg", Kayl. Photo: R. Gerend, 22.8.2021.

its reddish-brown colour. More moths were seen and it quickly became clear that the species was quite abundant in an area of several square metres. Photographs were taken and a first attempt at identification showed that a species of plume moth hitherto unknown from Luxembourg – *Capperia celeusi* – was the most likely candidate (Figs 1 and 2). The first author revisited the place three days later in order to secure a couple of specimens which then were kept in the freezer until they could be submitted to the second author who corroborated the identification by examining the genitalia. The final identification is based on Gielis (1996).

Results

The new species was found at the following location:

Luxembourg, southwestern part, locally known as "Minett" (Red Lands) (geologically part of the deposits of oolithic iron ore of the Middle Jurassic that extend a long way into French Lorraine), Kayl "Perchesbierg", 49°27'57"N 6°02'27"E, elevation 337 m a.s.l. 19th August 2021: several specimens (ca. 6) seen and photographed, 22d August 2021: several specimens seen of which two males were collected (in coll. Marcel Hellers).

Discussion

Capperia celeusi is known from a large part of Europe although it seems to be absent from Scandinavia, the Netherlands, Poland and the UK. It is also known from Turkey, Iran and Morocco (Fazekas 1993, Sutter 1991). A search of the internet shows that, as far as we know, the species has a patchy distribution with records few and far between. In France, according to GBIF, *Capperia celeusi* is only known from a cluster of records, all located in the southeastern Provence-Alpes-Côte d'Azur area. More records are listed from southern Germany, Austria and Italy, as well as from southernmost Spain and Ukraine (www.GBIF 2022). The German "Lepiforum" website mentions the species from Thuringia (Kyffhäuser) and Lower Austria (www.lepiforum.de, accessed February 2022). There is an old record from central Belgium but the species is thought to be extinct in this country (https://projects.biodiversity.be/lepidoptera, acc. February 2022). As mentioned above, the species is not known from any of the French departments close to Luxembourg.

Capperia celeusi is only the third species of the genus *Capperia* to be found in Luxembourg, the other two species being *C. britanniodactylus* (Gregson, 1867) (on *Teucrium scorodonia*) and *C. fusca* (O. Hofmann, 1898) (on *Stachys* sp.).

Capperia celeusi feeds on plants of the genus *Teucrium* with both *T. chamaedrys* and *T. montanum* being mentioned in the litera-



Fig. 3. *Teucrium botrys*, the likely host plant of *Capperia celeusi*, "Perchesbierg", Kayl. Photo: R. Gerend, 19.8.2021.



Fig. 4. *Teucrium botrys*, detail of inflorescence, "Perchesbierg", Kayl. Photo: R. Gerend, 22.8.2021.

ture, whereas at the site discussed here, a third *Teucrium* species, *Teucrium botrys*, the cut-leaved germander (Figs 3 and 4) was the only representative of the genus. Larvae are known to feed on flowers and flower buds of the aforementioned germander species (Lepiforum 2022) but, although no caterpillars were observed as yet, it can be safely assumed from the constant number of adults present, that the Cut-leaved Germander is the host plant in this case. In Luxembourg *Teucrium botrys* is considered a vulnerable species with fragmented and declining populations (Colling, 2005) (as is *T.chamaedrys*, while *T. montanum* is believed to be regionally extinct). This germander clearly has its last stronghold in the "Minett" region along the border with France, with small and isolated populations left in the valleys of the Moselle and lower Sauer rivers (Recorder database, MNHNL). In the former iron ore quarries of the southwest, it finds favourable conditions on dry banks and rock heaps left by the extraction industry of bygone times.

The plume moth seems to be present in two short-lived generations a year, the first from the end of May till mid-June, the second on the wing from mid-July to early August (Flemish Entomological Society, 2022) although the latter must be qualified by our observation which seems to hint at a slightly longer flight period in summer.

Further exploration will show to what extent *Capperia celeusi* has colonised the mining areas of the southwest, where its host plant occurs, and whether its presence there will be permanent. As all three germander species still have extant populations in nearby Lorraine, the presence of the plume moth there is highly likely.

Acknowledgments

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