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DNA barcoding and morphology support the division of *Elachista nuraghella* sensu auctorum (Lepidoptera: Elachistidae: Elachistinae) into two vicariant species

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Abstract

Elachista nuraghella sensu auct. (Lepidoptera, Elachistidae) is shown to display a striking division of haplotype groups in the DNA barcode sequence, one widely distributed in the western Mediterranean region, the other in the east: Bulgaria, Greece and Turkey. The haplotypes correspond with constant differences in both male and female genitalia, and generally also in outer appearance. *E. nuraghella* Amsel is thus considered to consist of two species displaying a vicariant distribution pattern. The eastern taxon is described as *Elachista grotenfelti* Kaila sp. nov.

Key words: barcodes, taxonomy, Elachistinae, *Elachista*, *Aphelosetia*, vicariant biogeography

Introduction

Elachista nuraghella Amsel, 1951 is a striking-looking elachistine species, being unicolorous, nearly white and, as an elachistine moth, very large-sized. It can only be confused with *E. argentella* (Clerck, 1759) with which it is not, however, known to co-exist, and *E. catalana* Parenti, 1978 which is usually a little smaller and more creamy white (see Kaila 2011a). In size it is also rivalled by *E. pollutella* Duponchel, 1843 which, unless worn, is scattered with grey scales on the forewings (cf. Kaila 2011b). *E. nuraghella* was originally described from Sardinia (Amsel, 1951), and has later been found to be widespread and often abundant in Mediterranean Europe and Turkey (Kaila 2009, and unpublished data). There are also hitherto unpublished records from Algeria and Tunisia in North Africa.

The author LK noted some variation in the genitalia of *E. nuraghella* from different areas, and samples from throughout its range were subjected to DNA barcoding. The resultant phylogram displays a deep divergence between specimens originating from the western half of Mediterranean up to Sicily and Malta in the east, and specimens originating from Bulgaria, Greece and Turkey. A closer scrutiny of male and female genitalia revealed constant differences between these populations, supporting the hypothesis that *E. nuraghella* actually consists of two species displaying a vicariant distribution pattern. The eastern taxon is here described as a new species, *Elachista grotenfelti* Kaila sp. nov.

Elachista nuraghella has been placed in the subgenus *Aphelosetia* of *Elachista* Treitschke, 1833 (Kaila 1999, Kaila & Sugisima 2011). The interrelationships within basal *Aphelosetia* are unclear; the original subdivision of *Elachista* by Traugott-Olsen & Nielsen (1977) was based on unreliable traits such as forewing colouration and wing venation (cf. Albrecht & Kaila 1997, Kaila 1997, 1999). Phenetically *E. nuraghella* is similar to *E argentella*, as both are large species with unicolorous white forewings, and share a general similarity in the genital structures. This similarity is, however, at least in part symplesiomorphic based on the arrangements of Kaila (1999) and Kaila & Sugisima (2011): these species, as well as the *Elachista pollinariella* assemblage (Kaila, 2012) lack a y-shaped sclerotization ventrad of female papillae anales, and a dorsally projected funnel- or tongue-shaped appendix in the median plate of the male juxta (Kaila & Junnilainen 2002, Kaila 2007). A striking feature of *E. nuraghella* complex is the shape of the uncus which is very large and fused as a single lobe. The very broad valvae are also charac-

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