



Epinotia cinereana (Haworth, 1811) *bona* sp., a Holarctic tortricid distinct from *E. nisella* (Clerck, 1759) (Lepidoptera: Tortricidae: Eucosmini) as evidenced by DNA barcodes, morphology and life history

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Abstract

DNA barcodes of European tortricid moths identified as *Epinotia nisella* (Clerck, 1759) were found to comprise two genetically distinct clusters. These coincided with *E. nisella* and *E. cinereana* (Haworth, 1811) (**sp. rev.**), the latter having been considered a synonym of the former for several decades. Comparing these DNA barcodes with those of North American *Epinotia* showed that both species are Holarctic. The North American *Proteopteryx criddleana* Kearfott, 1907 is a new junior synonym of *E. cinereana* (**syn. nov.**). The two species also show distinct differences in male and female genitalia. North American populations of both species show moderate differences in barcodes from their respective European populations but there are no morphological differences correlated with the intraspecific barcode clusters. *Tortrix petrana* Hübner, 1813 is considered as a junior synonym of *E. cinereana* (**syn. rev.**). *Epinotia nisella* has several synonyms reflecting its highly variable forewing colour pattern. We discuss its variation and the status of the names associated with it. The biology of both species in Europe and North America is summarized. Adults and genitalia are illustrated.

Key words: cryptic species, DNA barcoding, *Epinotia criddleana*, holarctic distribution

Introduction

The use of refined morphological methods can confirm that suspected sibling species really are distinct. Recent examples in Lepidoptera are *Heliozela hammoniella* Sorhagen, 1885 and *H. resplendella* (Stainton, 1851) in Heliozelidae (Mutanen *et al.* 2007), and *Leucoptera lathyrioliella* and *L. orobi* (Kaila & Wikström 2004) in Lyonetiidae. In both these cases the siblings have different, though closely related host plants, but previous workers had been unable to find morphological characters to prove their specific distinctness. By careful study of the genitalia, small, but constant differences were discovered. Many taxonomists studying Lepidoptera during the 20th century considered male genitalia to afford better diagnostic value than female genitalia at the species level. This was especially true for the family Tortricidae where species previously considered distinct were synonymized due to similar male genitalia. In recent years careful examination of female genitalia has, in several cases, shown that these may possess diagnostic characters as good as those of the male genitalia, with the result that some long-standing synonyms have been restored as distinct species. Examples on this are *Eucosma fulvana* (Stephens, 1834) and *E. hohenwartiana* (Denis & Schiffermüller, 1775) (Agassiz & Langmaid 2004), and *Acleris emargana* (Fabricius, 1775) and *A. effractana* (Hübner, 1799) (Karsholt *et al.* 2005).