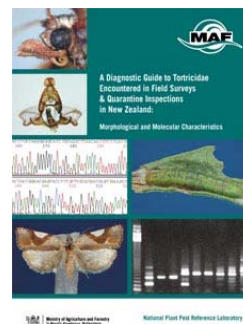


A Diagnostic Guide to Tortricidae Encountered in Field Surveys & Quarantine Inspections in New Zealand: Morphological and Molecular Characters

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Summary

The purpose of this guide is to facilitate reliable and practical determinations of the tortricid specimens collected in the execution of MAF's biosecurity functions (surveys, general surveillance, border interceptions and post-border detections).

The guide consists of a series of diagnostic keys, including keys to later instar larvae (integrated with a molecular key), male and female adults; a table of diagnostic characters for early instar larvae; and notes for all the species. There are 374 images, most of them in colour. The images are reproduced on a CD to allow closer examination, especially of the genitalia and improved search capacity.

A stand-alone molecular key was attempted using a PCR multiplex approach. However, the diverse range of taxa being encompassed resulted in the most robust characters being the raw DNA sequence data. We determined that the most effective means of molecular determination is to sequence a smaller region within the COI & II region, and to carry out a blast search for a sequence data match.

The list of species covered in this guide is restricted to 50 or so economically important Tortricidae species. These include taxa from New Zealand, as well as exotic Tortricidae species most likely to be introduced¹.

Australian leafrollers in the tortricine genera *Acropolitis*, *Cryptoptila*, and *Thrincochloa* have not been discovered either as natural introductions or intercepted on passengers effects or cargo, and so are not included in the keys. (cf. the olethreutines *Holocola* sp. cf. *triangulana*, *Zomariana doxasticana*) but are described in "Notes on species". The European species *Adoxophyes orana* and *Cacoecimorpha pronubana* are included in the keys as these species are abundant in their home range and thus have potential to enter New Zealand as trade in horticultural material between Europe and New Zealand increases in quantity and speed.

The subfamily Chlidanotinae is not covered, as there were no validated larvae available.

The descriptions and diagnoses are derived from a combination of molecular, genetic and morphological studies of the species listed below and some of their relatives. Nearly all taxa were interpreted anew.

¹ A full species list is given below

List of species

f = species not established in New Zealand

“ ” = common name not in Scott & Emberson (1999)

Olethreutinae:

Acroclita discariana Philpott, 1930, “matagouri tent-maker”
Bactra noteraula Walsingham, 1907, “sedge borer”
Crocidosema plebejana Zeller, 1847, mallow tip borer
Cryptasasma querula (Meyrick, 1912), “dingy seedborer”
Cryptophlebia ombrodelta (Lower, 1898) *f*
Cryptophlebia pallifimbriana Bradley, 1953, “ifi nutborer” *f*
Cydia pomonella (Linnaeus, 1759), codling (codlin) moth
Cydia succedana (Denis & Schiffermüller, 1775), gorse pod moth
Dudua aprobola (Meyrick, 1886) *f*
Grapholita molesta (Busck in Quaintance & Wood, 1916), oriental fruit moth (OFM)
Holocola emplasta (Meyrick, 1901) [larvae only]
Holocola zopherana (Meyrick, 1881)
Holocola sp. cf. *triangulana*, “pink wattle gouger”
Strepsicrates ejectana (Walker, 1863)
Strepsicrates infensa (Meyrick, 1911) [adult only]
Strepsicrates macropetana (Meyrick, 1881), “eucalypt leaftyer”
Thaumatotibia leucotreta (Meyrick, 1913), false codling moth *f*
Zomariana doxasticana (Meyrick, 1881), “green blackwood leaftyer”

Tortricinae:

Acleris comariana Leinig & Zeller, 1846, “goldminer’s leafroller” [adult only]
Acropolitis spp. *f*
Adoxophyes fasciculana (Walker, 1866) *f*
Adoxophyes privatana (Walker, 1863) *f*
Adoxophyes orana (Fischer von Roeslerstamm, 1834)
Apoctena s.s. spp.
Apoctena s.l. spp.
Archips spp. *f* (see also *Homona* spp. *f*)
Cacoecimorpha pronubana (Huebner, 1822), carnation tortrix *f*
Capua (*Sperchia*) *intractana* (Walker, 1869)
Capua s.l. *semiferana* (Walker, 1863)
Catamacta gavisana (Walker, 1863)
Catamacta spp. [*Catamacta alopecana* Meyrick, 1885 – larvae only]
Cnephasia s.l. *jactatana* (Walker, 1863), lyre moth
Cryptoptila spp. *f*
Ctenopseustis herana (Felder & Rogenhofer, 1875), “redbrown-headed leafroller”
Ctenopseustis “North Island herana” Dugdale, 1990 (as “Type II North Island”)
Ctenopseustis obliquana (Walker, 1863), “darkbrown headed leafroller”
Ctenopseustis servana (Walker, 1863)
Epalxiphora axenana Meyrick, 1881, “striped-headed leafroller”
Epichorista s.s. “Tapanui”
Epichorista s.l. *emphanes* (Meyrick, 1901), beech leafroller
Epichorista s.l. sp. cf. *tenebrosa* Philpott, 1917
Epiphyas postvittana (Walker, 1863) Light-brown apple moth (LBAM)
Eurythecta robusta (Butler, 1877) / *Eurythecta zelaea* Meyrick, 1905
Harmologa amplexana (Zeller, 1875)

Harmologa oblongana (Walker, 1863)
Homona spp.f (see also *Archips* spp.f)
Isotenes miserana (Walker, 1863)
Merophyas divulsana (Walker, 1863), lucerne leafroller
Merophyas leucaniana (Walker, 1863)
Planotortrix excessana (Walker, 1863), greenheaded leafroller
Planotortrix notophaea (Turner, 1926), black-legged leafroller
Planotortrix octo Dugdale, 1990, “milky greenheaded leafroller”
Pyrgotis plagiatana (Walker, 1863)
Pyrgotis pyramidias s.l. auct.
Thrincophora spp.f

Unavailable species: *Epiphyas liadelpha* (Meyrick, 1910) all stages; *Acleris comariana*,
Strepsicrates infensa larvae; *Holocola emplasta* adults.