



## A morphological review of tribes in Larentiinae (Lepidoptera: Geometridae)

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### Abstract

Tribes of looper moths (Geometridae: Larentiinae) are reviewed. The tribe Dyspteridini Hulst is reinstated (previously synonymous with the Trichopterygini Warren). A new subtribe, Aplocerina, is separated from the Chesiadini Pierce, and the group Ortholithinae Pierce is dealt with as Scotopterygini Warren, the sister taxon to Xanthorhoini. Morphological traits for 22 of 23 larentiine tribes represented in the Holarctic fauna are listed and illustrated. A taxonomy of the subfamily Larentiinae is proposed and supported, using morphological data based on chemical communication structures and male genitalia. A new combination is presented: *Melanthia mandshuricata* (Bremer), transferred from *Mesoleuca* Hübner (Larentiini)

**Key words:** Geometridae, Larentiinae, tribes, comparative morphology.

### Introduction

The subfamily Larentiinae comprises more than 6000 species worldwide. The present taxonomic structure of the subfamily is more or less traditional (see elaboration below). Heppner (2005) lists 18 tribes for Larentiinae, and 20 tribes are listed in the Forum Herbulot homepage (<http://www.herbulot.com>) (Heterusiini and Erateinini are added to those listed by Heppner). Some of the tribes have never been described but characterized merely by names of their typical genera. Rapidly developing molecular systematics has yielded the first data to aid in larentiine taxonomy. Several representatives of larentiine tribes were used for outgroups in projects by Yanamoto and Sota (2007), Snäll et al. (2007), Strutzenberger *et al.* (2010), and Sihvonen *et al.* (2011) consider 38 taxa from 15 tribes (and five taxa unassigned to a tribe; any taxonomic analysis of southern hemisphere larentiines must be preceded by a description of genera). The aim of the analysis presented herein is to compare morphological characteristics of larentiine tribes and monophyletic groups at the genus level within family-group taxa, broadening the scope of study to all biogeographical regions by describing the spatial distribution of the male complex characters e.g., coremata, labides and valval ornamentation.

Family group names in *Geometridae* were introduced in the 19th and early 20th centuries, first by Hübner, followed by Duponchel (1845), Stephens (1850), Guenée (1858), and then by Meyrick (1892), Warren (1893, 1894) and other authors. The usage of genus-group and family-group names was at that time subjective (based on overall similarity of moths, or head, antennae, leg characters etc.) and not always consistent. For example, Stephens (1829) listed *Chesias* Treitschke with its two species as a genus among other geometrid genera. In a later work, Stephens (1850) used Hübner's genus name *Eucestia* Hübner for these species, synonymised *Chesias*, but introduced the family group name *Chesiadi* for three related genera. Pierce (1914) was the first to combine *Chesias* Treitschke and Chesiadini validly.

The family group name *Larentites* was introduced by Duponchel (1845). The subfamily Larentiinae was diagnosed by Holloway (1997: 99) according to the wing pattern, "each fascia in forewing tending to be multiple...and meeting the dorsum at right angle. ...the species rest with the forewing mostly or wholly covering the hind wing (Common 1990). Minet (1983) defined Larentiinae by the hammer-headed shape of the ansa but this trait characterizes tropical groups of Sterrhinae as well". The ansa is apically triangular-truncate rather than hammer-shaped in