

Systematics and Biology of Fern-feeding Musotimines (Crambidae: Pyraloidea)

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Pteridophagy, or fern-feeding, is rare among Lepidoptera. In Pyraloidea there are unique examples of fern feeders in the Spilomelinae (Crambidae), but recent research indicates that Musotiminae may harbor more undiscovered fern-feeders. It is comprised of 18 genera and about 200 species worldwide; 50 + more species and 5-7 genera from Asia and the South Pacific are still undescribed. The current classification of this group is in its infancy, and the placement of Musotiminae is in doubt.

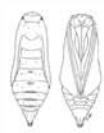
Musotiminae Genera of the World (*on fern species)

Nearctic/ Neotropical	Palaearctic/ Oriental/ Indo-Australian	Ethiopian
Barisoa	Aeloptera	Cilaus
Cymoriza	Ambia	Panotima*
Malleria	Baeoptila	
Midilambia	Drosophantis	
Undulambia*	Elachypteryx	
Neurophyseta	Euagaria*	
Parthenodes	Musotima*	
	Neomusotima*	
	Uthinia	

Larvae may be leaf miners or external feeders with a prognathous or semi-prognathous head, and



Euagaria



Pupa



Adult Head

bodies round or dorsoventrally flattened depending on their habit. Pupae may have a smooth head, a medial dorsoventral depression, or horned eye caps, a pair of dorsolateral processes present on prothorax, spiracles normal or protruded on A1-A4, or cone-shaped on A5 to A7, and cremaster present, usually with spines. Proposed synapomorphies of adult Musotiminae are: antennae laterally compressed with flattened segments, R2 stalked with R3+R4, reduced coecum, and tympanal cases enlarged (Minet 1981,1985; Yoshiyasu 1985; Yen 1996).



L. microphyllum N. conspurcatalis larva "C." camptozonale adult

From 1998 to 2001 exploration for biological control of *Lygodium microphyllum*, the Old World climbing fern, has been conducted in Australia, New Caledonia, China, Indonesia, Malaysia, Singapore, and Thailand by the ARS Australian Biological Control Laboratory in Brisbane, Queensland. John Goolsby and T. Wright conducted the field exploration and preliminary host range tests. This fern is an invasive weed in south Florida where it threatens many wetland communities in the Everglades, and new evidence



"Cataclysta" camptozonale

New Genus
New species

Neomusotima conspurcatalis

indicates that it may also threaten the citrus and timber industries. Three musotimines, "Cataclysta" camptozonale, Neomusotima conspurcatalis, and a new genus, new species were discovered.



Eggs Larvae Mined frond of E. conspersum

In the Western Hemisphere the only known musotiminae fern-feeder was *Undulambia polystichalis* on *Rumohra adiantifolius*, commonly known as leather-leaf fern by florists in Florida, U.S.A. (Kuitert & Dekle, 1962).

Recently, in January 1998, Don Davis discovered a new genus & species of Musotiminae at Cerro de la Muerte in the San José Province of Costa Rica mining in a fern, *Elaphoglossum conspersum* Christoph. (Lomariopsidaceae).

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Pupal exit holes Pupa Adult