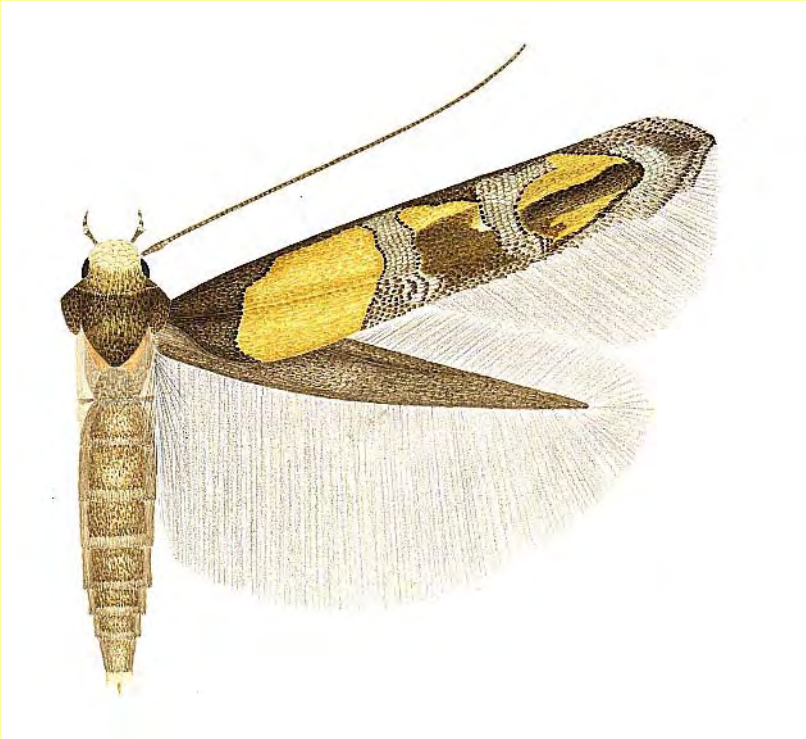
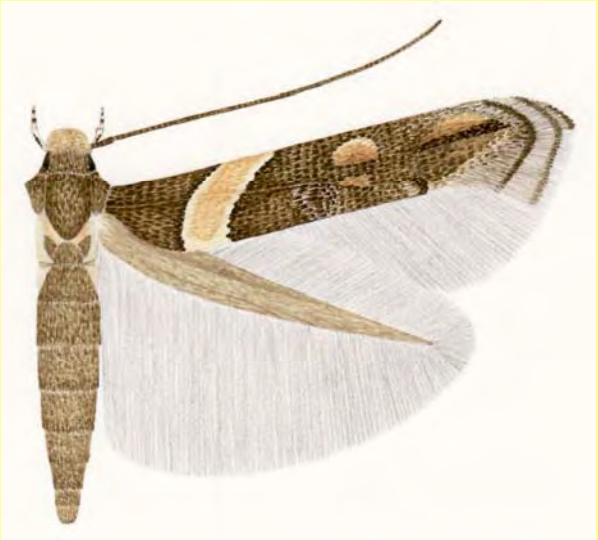
Two species of the Mompha trithalama-complex as possible biological control of Koster's curse and Velvet tree

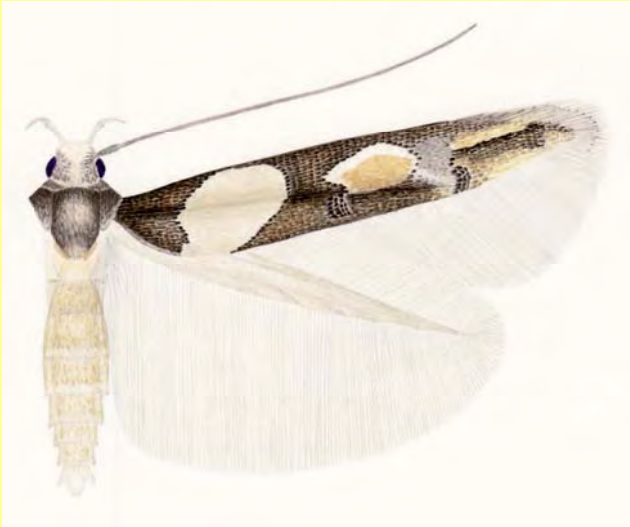
Sjaak Koster, Manuel Alfaro Alpízar, Francisco R. Badenes-Pérez & Kenji Nishida



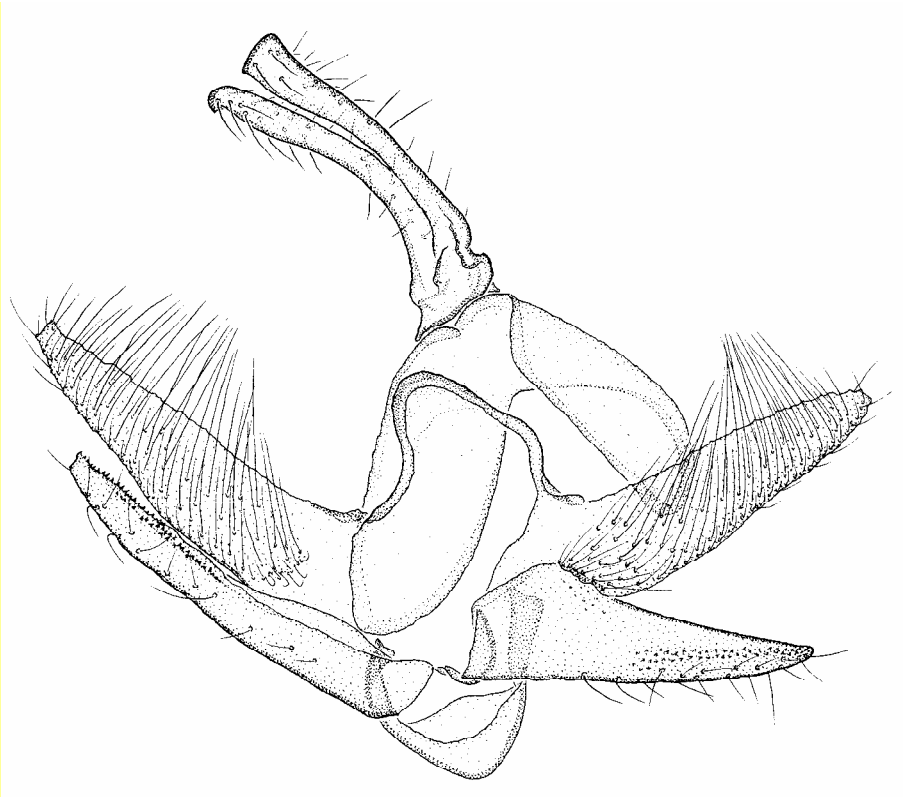
Mompha trithalama



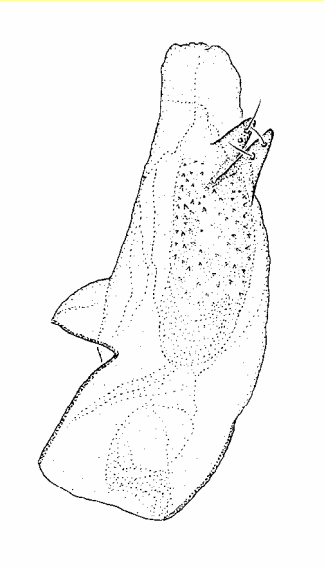
Mompha spec. A

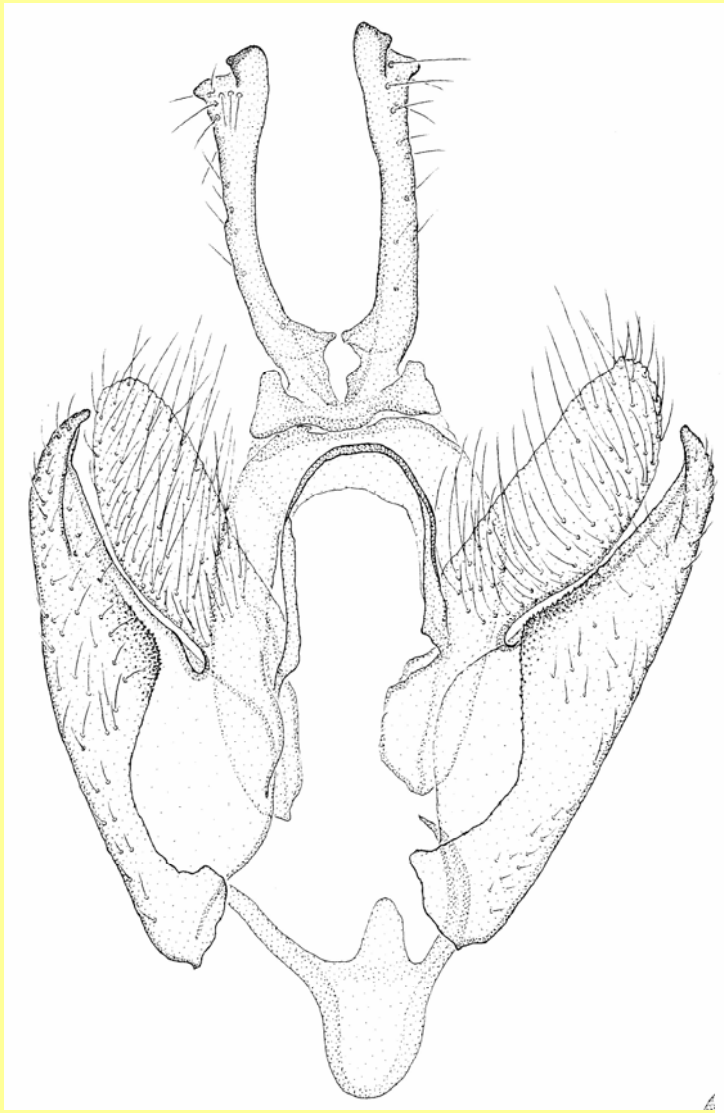


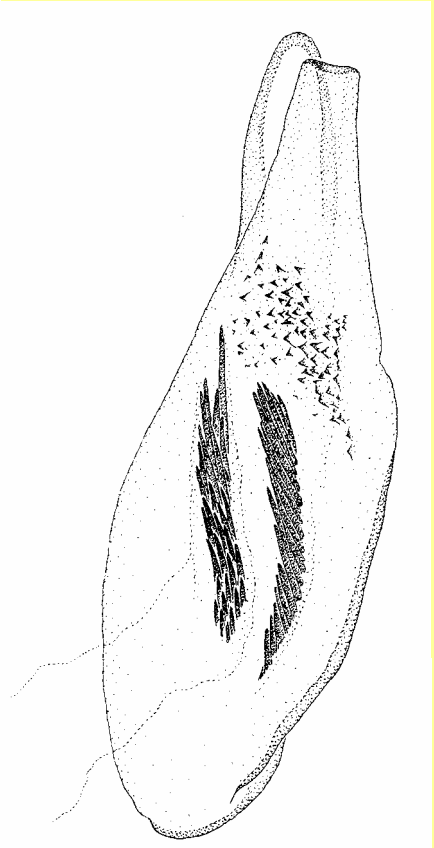
Mompha spec. B



Mompha trithalama

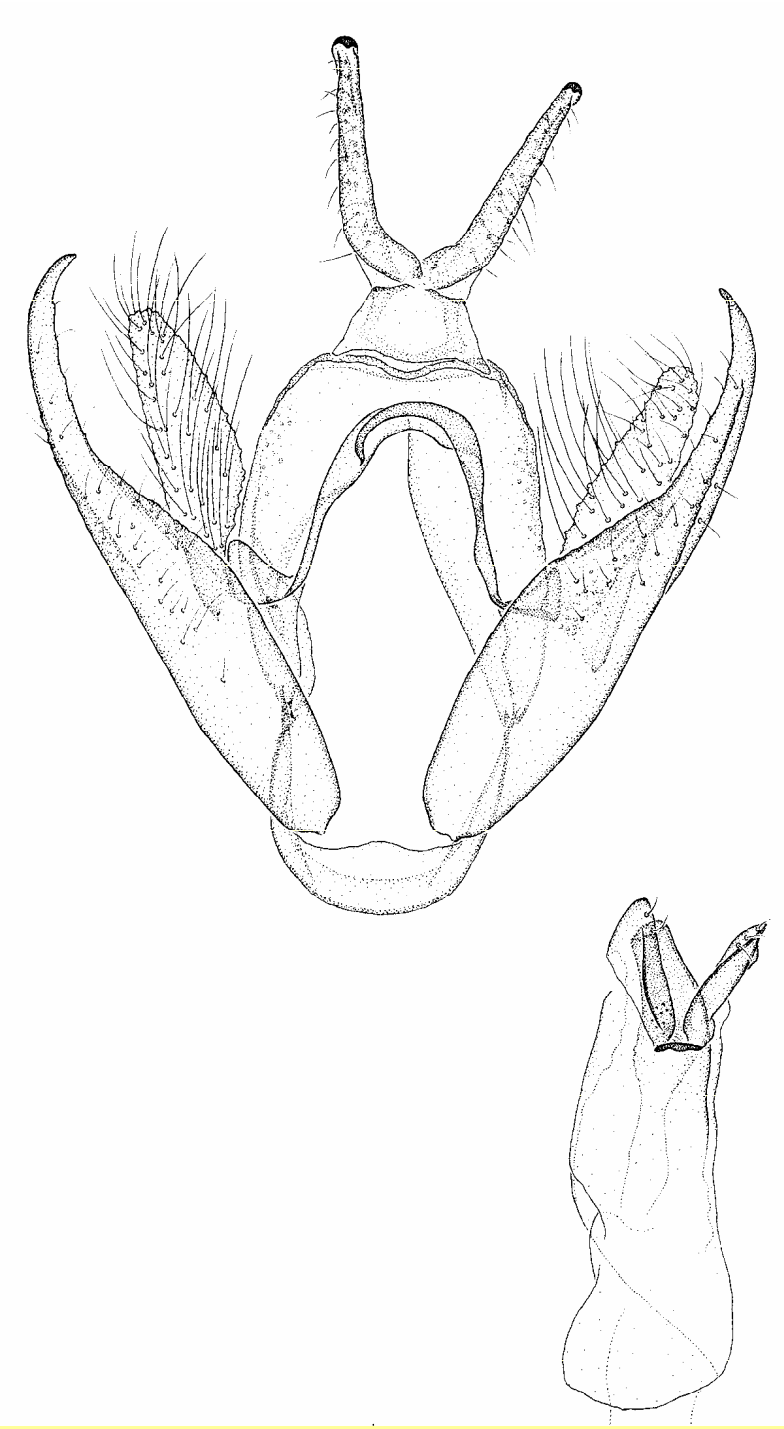


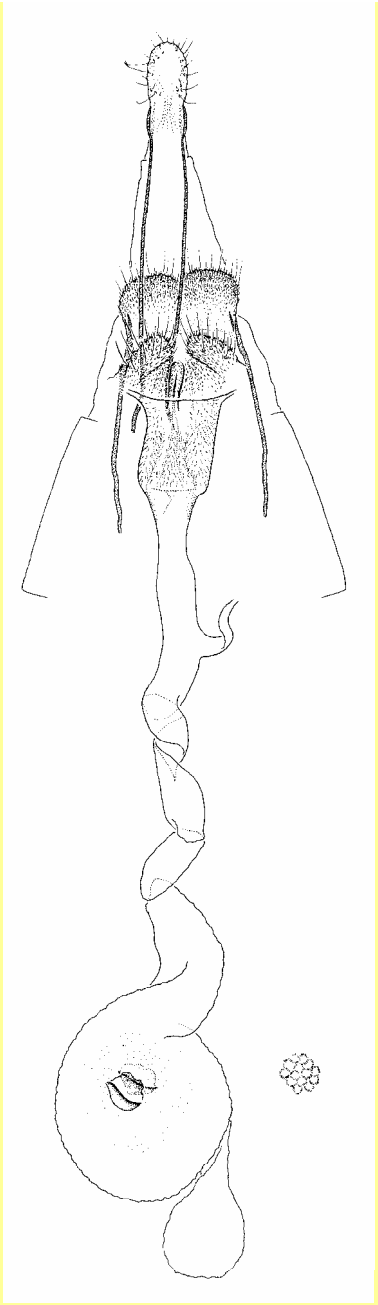




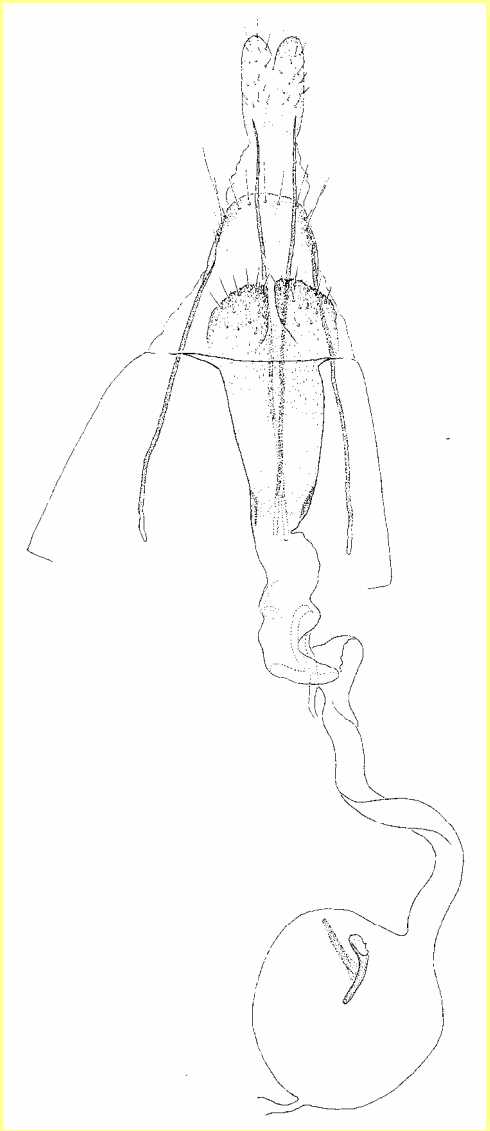
Mompha spec. A

Mompha spec. B





Mompha trithalama



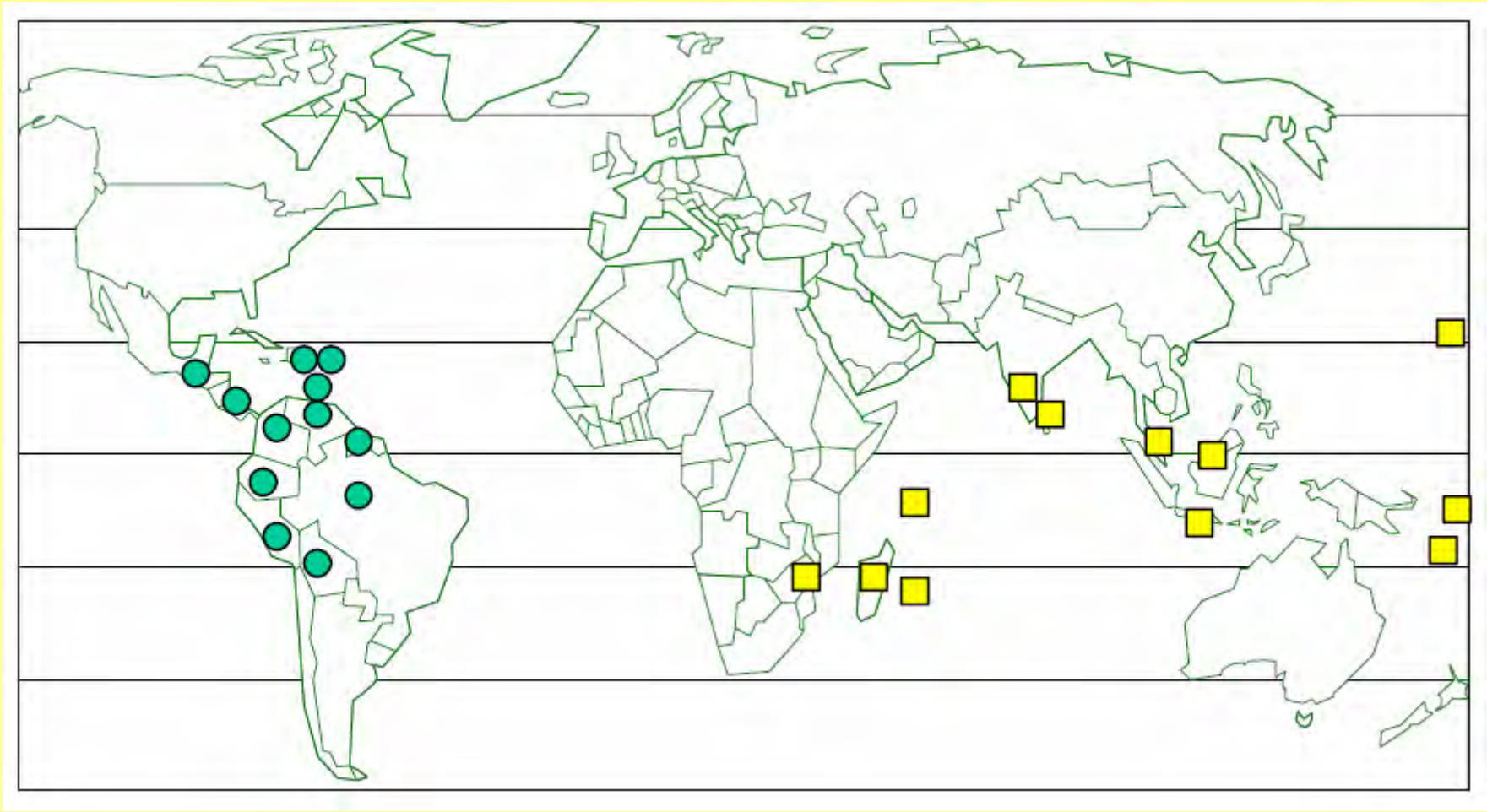
Mompha spec. A

Clidemia hirta (L.) D.Don (Melastomataceae)
Koster's curse or soap bush

Photo: www.cybertruffle.org.uk/vinales/esp/clidemia_hirta

Clidemia hirta (L.) D.Don (Melastomataceae)
Koster's curse or soap bush

Photo courtesy Konrad Englberger, © Secretariat of the Pacific Community



Geographical distribution of *Clidemia hirta* in areas where it is native (circles) and introduced (squaires) (DeWalt, 2003)

Damage to the native flora

Photo courtesy Konrad Englberger, © Secretariat of the Pacific Community

Damage to the native flora

***Clidemia hirta* on Babeldaob, Palau**
Photo by Jim Space, PIER

Attempts for biological control so far

The fungus: *Colletotrichum gloesporioides* Penz. (Phyllachorales: Phyllachoraceae)

The thrips: *Liothrips urichi* Karny (Thysanoptera: Phlaeothripidae)

The beetle: *Lius poseidon* Napp (Coleoptera: Buprestidae)

The moths:
***Antiblemma acclinalis* Hübner (Noctuidae)**
***Carposina bullata* Meyrick (Carposinidae)**
***Mompha trithalama* Meyrick (Momphidae)**

Miconia calvescens

Photo's by The Nature Conservancy Archive, The Nature Conservancy

Photo’s Wikipedia and
http://pbin.nbii.gov/reportapest/maui/pestlist/miccal.htm

Mark that the larva made when it got into the berry

Photo Manuel Alfaro Alpízar

Larva inside the berry

Photo Manuel Alfaro Alpízar

Fruits of *Miconia calvescens* with the larva of *Mompha* spec. A

Photo Manuel Alfaro Alpízar

Different instars of larvae of Mompha spec. A

Photo Manuel Alfaro Alpízar

Construction of cocoon

Photo Manuel Alfaro Alpízar

Thank you for your attention

Abstract of my presentation held on the XV European Congress of Lepidopterology at Berlin from 8 – 12 september 2007.

Two Species of the *Mompha trithalama*-Complex (Lepidoptera: Momphidae) as Possible Biological Control Agents of Koster's Curse and Velvet Tree

Sjaak Koster, Manuel A. Alfaro-Alpízar, Francisco R. Badenes-Pérez & Kenji Nishida

Clidemia hirta (L.) D.Don and *Miconia calvescens* DC (Melastomataceae) are perennial plants native to the neotropics that are invasive in Fiji, Hawaii other locations in the Pacific. *Clidemia hirta*, commonly known as "Koster's curse, is a shrub 50–300 cm tall. The species has been transported around the world as a garden plant and seed contaminant, becoming a serious pest in at least 16 countries, especially Hawaii, Fiji and Indonesia (DeWalt, 1994; http://www.hear.org/pier/index.html). *Miconia calvescens* (Melastomataceae), commonly known as velvet tree, is a tree about 12-15 m tall. *Miconia calvescens* is particularly invasive in Hawaii and Tahiti, where it has replaced over 70% of the native forest of the island after being introduced to a botanical garden in 1937 (Medeiros et al, 1997; http://www.botany.hawaii.edu/faculty/cw_smith/mc_control.htm). Several expeditions to find biological control agents of *C. hirta* and *M. calvescens* have taken place in Brazil, Costa Rica, and Trinidad. A fungus, a nematode, and several insects have already been used or are currently being screened as biological control agents of these weeds, among them two species in the *Mompha trithalama*-complex (Lepidoptera: Momphidae). *Mompha trithalama* Meyrick, 1927 was first found in Brazil and later was also found in Peru and Trinidad. This species has been used for biological control of *C. hirta* in Hawaii (Conant, 2002). Two additional species in the *Mompha trithalama*-complex that will be described in the near future are *Mompha* sp. A and B. *Mompha* sp. A was reared from the berries of *Miconia calvescens* (Myrtales: Melastomataceae) in Costa Rica. This species is being studied as a biological control agent of *M. calvescens* (Alfaro-Alpízar, unpublished). *Mompha* sp. B (1 ♂: Argentina, Jujuy, P.N. Calilegua, Mirador, 800 m, 20.xi.1995, rainforest, Net.Ent.Exp.N-Arg., Sta. 14) was collected at light during the Netherlands Expedition to Northern Argentina. It is not clear whether *Mompha* sp. B has interest as biological control agent of *C. hirta* or *M. calvescens*.

References

Conant, P. (2002) Classical biological control of *Clidemia hirta* (Melastomatacea) in Hawaiiusing multiple strategies. In: *Workshop on biological control of invasive plants in native Hawaiian ecosystems. Technical Report 129* (eds. C. W. Smith, J. S. Denslow & S. Hight) pp. 13-20. Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Honolulu, HI.

DeWalt, J., 1994. The invasive tropical shrub *Clidemia hirta* (Melastomataceae) in its native and introduced ranges: tests of hypotheses of invasion. – A dissertation submitted to the graduate faculty of the Louisiana State University and Agricultural and Mechanical College.

Medeiros, A. C., Loope, L. L., Conant, P. & McElvaney, S. (1997) Status, ecology and management of the invasive plant *Miconia calvescens* DC (Melastomataceae) in the Hawaiian Islands. *Bishop Museum Occasional Papers* **48**, 23-36.

Pacific Island Ecosystems at Risk (PIER) Plant threats to Pacific ecosystems. – http://www.hear.org/pier/index.html.

The search for biological control of *Miconia calvescens*. – http://www.botany.hawaii.edu/faculty/cw_smith/mc_control.htm.

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