



## Systematics and biology of mites associated with neotropical hispine beetles in unfurled leaves of *Heliconia*, with descriptions of two new genera of the family Melicharidae (Acari: Mesostigmata: Gamasina: Ascoidea)

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### Abstract

Two new genera *Makarovaia* and *Hispiniphis* are described from adults and immatures of newly described species associated with hispine beetles of the genera *Chelobasis* and *Cephaloleia*, respectively, occupying unfurled leaves of *Heliconia* in lowland rainforest of Costa Rica. The new genera share a suite of unique morphological attributes, but are tentatively assigned to the family Melicharidae. While all instars of the mites can be found under the elytra of their adult beetle hosts, adult mites also move freely on and off the beetles. A new form of laboulbeniaceous fungus of the genus *Rickia* is frequently associated with adult mites of *Makarovaia* as well as their beetle hosts, yet evidently rarely with mites of a species of *Hispiniphis* or its beetle hosts which may co-occupy the same host leaves. Limited data suggest considerable host specificity between mites and their beetle hosts. Whether the association of these mites with hispine beetles may be ancient, prior to the beetles' adaptation to living in unfurled leaves of host plants, or is a more recent invasion and partitioning of the rolled leaf beetle fauna, is discussed.

**Key words:** Melicharidae, *Rickia*, *Chelobasis*, *Cephaloleia*, *Heliconia*

### Introduction

This is the sixth of a series of papers centered on description of highly distinctive new taxa of mites found to exist in just one small area of lowland tropical rainforest of the La Selva Biological Station in Costa Rica (Lindquist & Moraza 2008, 2010, 2012, 2014; Moraza & Lindquist 2011), and the second to deal with the remarkable diversity of mesostigmatans that coexist with hispine beetles in unfurled leaves of *Heliconia* there.

Here we describe two new species of mites, each undergoing its life history under the elytra of hispine beetles of a different genus. Yet, beetles of these genera, *Chelobasis* and *Cephaloleia*, often coexist and sometimes

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