



## The *acasta* conundrum: Polymorphism and taxonomic confusion within the parasitoid genus *Melittobia* (Hymenoptera: Eulophidae)

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### Abstract

Seven of the 13 described species of this gregarious, polyphagous, polymorphic parasitoid have been placed in the *acasta* species group of *Melittobia* Westwood (Hymenoptera: Eulophidae: Tetrastichinae) based on ethological and morphological criteria, but taxonomic confusion remains. Based on field and laboratory studies of variability and polymorphism, current species descriptors for this group are called into question and *Melittobia femorata* Dahms is synonymized under *M. megachilis* (Packard). Biologically, *M. megachilis* distinctly differs from other *acasta* group species in several aspects of life cycle and host utilization. Although *M. acasta* (Walker) and *M. digitata* Dahms are clearly valid species, three others (*M. chalybii* Ashmead, *M. scapata* Dahms, *M. evansi* Dahms) are more enigmatic and may be temporal, nutritional, or host-based variants of *M. megachilis* that will require additional study. The “Virginia” type locality for *M. chalybii* of authors is properly Bladensburg, Maryland, USA. One of the 13 female syntypes of *Chrysocharis aeneus* Brues (previously synonymized under *M. megachilis*) is designated as Lectotype.

**Key words:** Eulophidae, *Melittobia*, parasitoid, polymorphism, synonymy, life history

### Introduction

Wasps in the genus *Melittobia* Westwood (Eulophidae) are small, gregariously developing, polyphagous, sib-mating pupal ectoparasitoids. Nearly ubiquitous, they attack a variety of (almost always solitary) wasps and bees—including some commercially important pollinators—and their parasites andinquilines (Dahms 1984b).

An integral part of *Melittobia* life history is extreme intrasexual and intersexual polymorphism (Fig. 1). Apparently all species appear in both short-winged (brachypterous, BF) and long-winged (macropterous, MF) female forms that differ in physical appearance and behavior (Schmieder 1933; Matthews *et al.* 2009). Yet despite early and widespread recognition of this phenomenon, *Melittobia* systematics has been based almost solely upon the long-winged females that typically comprise 95% of a clutch.

However, to one degree or another, all known *Melittobia* species have a partitioned life history, in that the same host harbors two temporally distinct clutches. Typically, and especially on large hosts, the first few (but sometimes 20–40) female offspring of a founding female are BF that develop rapidly and almost immediately after eclosion, begin to oviposit alongside their mother, whereas the foundress’s later female offspring (and those of BF) develop more slowly into MF that disperse after mating. All males are brachypterous, numerically rare (typically <5% of brood), and apparently do not disperse, but their morphology may sometimes differ in parallel with their brood group (Assem & Maeta 1980, Lapp 1994).

The early history of the taxonomy of *Melittobia* was summarized by Dahms (1984a), an Australian entomologist who provided the first and only generic revision of *Melittobia*, based on a limited number of pre-