

University of Florida Book of Insect Records

Chapter 38 *Smallest Adult*

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*Based on overall length, the smallest adult insect is a parasitic wasp, *Dicopomorpha echmepterygis* (Hymenoptera: Mymaridae). Males of this species are blind and wingless and measure only 139 μm in length. This newly described species recently replaced *Megaphragma caribea* (Hymenoptera: Trichogrammatidae), which measures 170 μm , as the smallest adult insect.*

The intent of this paper is to identify the smallest adult insect. For holometabolous insects, an adult insect is defined as an individual that has emerged from the pupa and/or is capable of reproduction. Insects which undergo hemimetabolous or ametabolous development are considered adults when growth and/or molting ceases or when the insect becomes sexually mature.

Methods

A preliminary review of the secondary literature and advice from entomologists who are experts in Coleoptera and parasitic Hymenoptera yielded several candidates. In particular, the ENTOMO-L bulletin board and the Internet proved to be very useful. Agricola was used to investigate the primary literature of the candidates.

Results

Obviously, wasps that parasitize the eggs of other insects are quite small. Wasps of the egg-parasitic family Mymaridae not only represent some of the smallest known Hymenoptera, but are also among the smallest of all insects. A mymarid, *Dicopomorpha echmepterygis*, holds

the record as smallest adult insect. The males of this minute wasp are wingless and measure as little as 139 μm in length. Females of this species are approximately 40% larger than the males.

Discussion

Mockford (1997) described *Dicopomorpha echmepterygis*, and its discovery displaced a trichogrammatid species, *Megaphragma caribea*, as smallest adult insect (Delvare 1993). At 170 μm in length, *M. caribea* is only about 20% longer than *D. echmepterygis*. Adult feather-winged beetles in the family Ptiliidae also rival the small size of both species of parasitic wasps described above. Some feather-winged beetles measure as small as 250 μm in length (Borror & White 1970).

Mockford (1997) provided a complete physical description as well as a brief biological observation of *D. echmepterygis*. When parasitized by *D. echmepterygis*, an egg of its psocid host, *Echmepteryx hageni* (Psocoptera: Lepidopsocidae), typically yields 1 to 3 males and a female of the parasite. The male of *D. echmepterygis* is blind and wingless but possesses long legs that it uses to attach itself to a female wasp that is emerging from the egg of its host. The diminutive males of *D. echmepterygis* require less nourishment to develop and are relegated to perform their primary responsibility, mating. On the other hand, vigorous females of this species are winged and possess compound eyes suited to aid in dispersal (Mockford 1997). Mockford (1997) also suggests that the great degree of sexual dimorphism in this species may

be attributed to the limited nutritional value provided by the egg of the psocid host.

Diminutive males such as those of *D. echmepterygis* may often be overlooked by researchers (Mockford 1997). Tiny male wasps that parasitize eggs in families such as Mymaridae and Trichogrammatidae may be present in species with females that are thought to reproduce parthenogenetically. Therefore, males smaller than those of *D. echmepterygis* may exist among parasitic wasps, especially those that parasitize eggs of other insects.

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