



## A review of *Erebomyia* (Diptera: Dolichopodidae), with descriptions of three new species

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### Abstract

The genus *Erebomyia* is reviewed and a key is provided for the four known species, three of which are described here: *Erebomyia aetheoptera* n. sp., *E. akidoptera* n. sp., and *E. ramseyensis* n. sp. The type species, *E. exalloptera* Runyon & Hurley, is redescribed and the male genitalia illustrated. *Erebomyia* is known from Arizona (3 spp.) and California (1 sp.), and males are notable for their modified wings, most exceptionally those of *E. exalloptera* whose left wing is of a different shape and size than the right wing. The occurrence of directional wing asymmetry in insects is reviewed to place the unique wings of *E. exalloptera* in context. Observations of *Erebomyia* courtship behavior are provided, and the potential adaptive significance of asymmetrical and modified wings of *Erebomyia* is discussed.

**Key words:** Nearctic, Sympycninae, wings, directed asymmetry, courtship display, long-legged flies, *Erebomyia*, Dolichopodidae

### Introduction

During trips to southern Arizona in April 2001–2003 we collected three species belonging to a new genus of sympycnine dolichopodids from dark rock cavities in or near streams. Remarkably, we found that the wings in males of one species were directionally asymmetrical – the right wing was smaller and a different shape than the left wing (Fig. 1). The genus *Erebomyia* was erected for that species, *E. exalloptera*, and a courtship function for its asymmetrical wings was proposed (Runyon & Hurley 2004). The purpose of this paper is to describe three additional species of *Erebomyia* and to provide a more detailed description of *E. exalloptera*. The wings of the new species described here are symmetrical, but are variously modified in shape and adorned with hairs. The directed asymmetry displayed in wings of *E. exalloptera* is contrasted with such asymmetry reported in other insects. The courtship behavior of *E. exalloptera* and *E. ramseyensis* is described, and suggests a possible role for their wing modifications as sexual signals.

### Materials and methods

Material from this work is housed in the following institutions: CAS = California Academy of Sciences, San Francisco; CNC = Canadian National Collection, Ottawa; FSCA = Florida State Collection of Arthropods, Gainesville; MTEC = Montana Entomology Collection, Montana State University, Bozeman; EMEC = University of California, Essig Museum of Entomology, Berkeley; USNM = National Museum of Natural History, Smithsonian Institution, Washington, D.C.