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The *Liriomyza* (Agromyzidae: Schizophora: Diptera) of California

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Abstract

The Californian species of *Liriomyza* Mik are revised, including descriptions, illustrations, photographs and a key to species. Sixty-three species are now known to occur in the state, 12 of which are described here as new: *L. bispinula*, *L. conclavis*, *L. cunicularia*, *L. merga*, *L. miserabilis*, *L. nebulosa*, *L. parabella*, *L. phyllodes*, *L. projecta*, *L. salpingion*, *L. tricornis* and *L. trixivora*. *Liriomyza virginica* Spencer is included as a junior synonym of *L. helianthi* Spencer, and *L. similis* Spencer is included as a synonym of *L. artemisiae* Spencer. Two species are newly recorded in the United States: *L. equiseti* Meijere, previously known from Canada and Europe, and *L. montana* Sehgal, previously known from Canada. A number of specimens of *L. brassicae* (Riley) have been identified as potential new host “races” or species. Morphological characters are provided to diagnose the sister species *L. huidobrensis* (Blanchard) and *L. langei* Frick, previously recognizable only on the basis of molecular data. Numerous new state, county and host records are also presented, and hosts are compared for five of the most common North American agricultural pests: *L. brassicae*, *L. huidobrensis*, *L. langei*, *L. sativae* Blanchard and *L. trifolii* (Burgess). California contains the highest diversity of *Liriomyza* known to occur in North America, containing approximately 70% of all described species known from the lower 48 states.

Key words: Agromyzidae, *Liriomyza*, Diptera, California, agriculture, plant miners, plant hosts

Introduction

Liriomyza Mik (Agromyzidae: Diptera) is a diverse genus of minute acalyptrate flies encompassing hundreds of described species from all biogeographic regions. The larvae feed in the tissue of living plants as leafminers. A few species are known to mine in horse-tails (Equisetaceae), but the majority have been reared from monocots (15 families are known hosts) and/or dicots (all subfamilies attacked) (Spencer 1990, Benavent-Corai *et al.* 2005). While most species are host specialists (Scheffer *et al.* 2007), a fraction are known to feed across plant genera, or in some cases, across families, attacking dozens to hundreds of host species. Several of these polyphagous species are common on agricultural crops, not just in California but across North America and the rest of the World, and can cause significant economic damage. In California, these include *L. brassicae* (Riley), *L. langei* Frick, *L. sativae* Blanchard and *L. trifolii* (Burgess), all of which are found throughout the state, and *L. huidobrensis*, a worldwide pest of major concern that was collected in California approximately 40 years ago (see below). *Liriomyza huidobrensis*, a very close relative of *L. langei*, is unlikely to have become established since, but additional future introductions are to be expected considering California’s leading role in international agricultural trade and the apparent ease by which this pest has been introduced into other countries. Host genera are listed for these five species below (Table 1), separating previously confused records for *L. huidobrensis* and *L. langei*, which were treated as the same species in a number of publications.

The *Liriomyza* of California was last directly treated in Spencer’s (1981) revision of the Californian Agromyzidae, and although the entire agromyzid fauna of the lower 48 States was revised only five years later by Spencer & Steyskal (1986), no new Californian records were provided. The Californian *Liriomyza* included 48 species at that time. The Californian fauna is here represented by 63 species, including 12 species new to science and two species new to the United States. Thirty-two species—half of the Californian fauna—are known only from the state, although focused collecting in nearby states will almost certainly uncover at least some of these taxa elsewhere. California is currently the center of *Liriomyza* diversity in the North America, with approximately 70% of all described species known to occur in the lower 48 states. There is little doubt that additional species will be found in California, but most will likely prove to be infrequently encountered host specialists living at higher elevations. Described species may also contain cryptic or less easily identified taxa or specialized host “races”, as is outlined