

New records of *Liriomyza* Mik (Agromyzidae: Diptera) leafminers from Indonesia

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ABSTRACT

Two species of *Liriomyza* Mik (Agromyzidae), *L. katoi* Sasakawa and *L. yasumatsui* Sasakawa, collected from *Chrysanthemum* L. (Asteraceae) hosts, are newly recorded from Sulawesi, Indonesia. The taxonomic features that distinguish these 2 species from each other and from the major pest species, *L. trifolii* (Burgess), are discussed.

Key words: *Liriomyza katoi*, *Liriomyza trifolii*, *Liriomyza yasumatsui*, *Chrysanthemum*, Asteraceae

Introduction

The large agromyzid genus, *Liriomyza* Mik, with over 300 species worldwide (Spencer, 1973), is poorly represented in the Oriental region (Sasakawa, 1972). Fifteen species have been recorded from Taiwan (Shiao & Wu, 1995; Shiao & Wu, 2000) and at least twenty-five species from Japan (Sasakawa, 1992; 1993a, b, 1994; Iwasaki, 1993; Iwasaki *et al.*, 2000). Several of the species, including *L. huidobrensis* (Blanchard), *L. trifolii* (Burgess) and *L. sativae* Blanchard, are among the most destructive pests of horticultural crops, particularly vegetables and ornamentals (e.g. Spencer, 1973).

Liriomyza species currently known to occur in Indonesia include *L. brassicae* (Riley), *L. caulophaga* (Kleinschmidt), *L. chinensis* (Kato), *L. compositella* Spencer, *L. huidobrensis* and *L. sativae* (A. Rauf unpublished data; Shepard *et al.*, 1998; Spencer, 1961; Spencer, 1989). The pea leafminer, *L. huidobrensis*, has become a serious pest in highland vegetables in Java, Sumatra and South Sulawesi, causing yield losses as high as 60-70%. Another alien species, vegetable leafminer, *L. sativae*, has contributed to problems in lowland areas of Indonesia (Rauf *et al.*, 2000).

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funded project on management and control of *Liriomyza* leafminers in Indonesia and Australia, a review of major pest species of leafminers present in different provinces and on different host plants in Indonesia is being conducted. A major aim of the review was to assess whether or not *L. trifolii* occurred in Indonesia. Leafminers collected on *Chrysanthemum* L. (Asteraceae) hosts at various localities in North Sulawesi, suspected to be *L. trifolii* based on major external morphological characters, were examined with emphasis on male genitalia which provide the most reliable diagnostic characters (Spencer, 1973). They were found not to belong to *L. trifolii* but to *L. katoi* Sasakawa and *L. yasumatsui* Sasakawa, both minor pest species hitherto unknown from Indonesia. A detailed redescription of these species is found in Shiao *et al.* (1991). Until now at least seven species of *Liriomyza* had been recorded from *Chrysanthemum* hosts, viz. *L. analis* (Rondani) from Italy, *L. spencerella* Valladares from Argentina, the widely distributed *L. huidobrensis*, *L. strigata* (Meigen) and *L. trifolii* (Spencer, 1990), *L. katoi* from Taiwan (Shiao *et al.*, 1991) and *L. ptarmicae* de Meijere from Europe, Canada, U.S.A. and Japan (Sasakawa, 1994).

All specimens examined in this study are deposited in the Victorian Agricultural Insect Collection, Department of Primary Industries, Knoxfield, Australia.

Taxonomy

Liriomyza katoi Sasakawa

Liriomyza katoi Sasakawa, 1961: Pac. Ins. 3: 400.

Diagnosis:

Face yellow; occiput black, black contiguous to ocellar triangle and eyes; antenna yellow with 3rd segment rounded; both vertical bristles on yellow background. Mesonotum shiny black; scutellum

yellow with both angles slightly brown-tinged; legs with coxae and femora yellow, tibiae and tarsi brown; wing length 1.5 mm in male, 1.6 mm in female, costa extending to M1+2. Abdominal tergites mostly shiny black. Male genitalia with phallus with characteristic large process on mesophallus and with rounded endophallus (Fig. 1), other details as in Shiao *et al.* (1991).

This species was until now recorded from Japan (on *Artemisia princeps*), Malaysia (on *Artemisia*), Taiwan (on *Chrysanthemum* sp.) (Shiao *et al.*, 1991; Sasakawa, 1994) and, in the present study, is newly recorded from Sulawesi (Indonesia) on *Chrysanthemum* sp.

Materials examined:

INDONESIA. North Sulawesi. 1 male, 3 females, Modinding, 16-IX-2002, D.T. Sembel, on *Chrysanthemum*; 4 males, 2 females, Tomohon, 4-V-2003, D.T. Sembel, on *Chrysanthemum* sp.; 1 male, 3 females, no specific locality, 29-VI-2001, on *Chrysanthemum* sp.

Liriomyza yasumatsui Sasakawa

Liriomyza yasumatsui Sasakawa, 1972, Sci. Rep. Kyoto Univ. Agri. 24: 69.

Diagnosis:

As *L. katoi* except - occiput, ocellar triangle and arista brown, rest of head mainly yellow. Wing length 1.2 mm in male, 1.5 mm in female. Abdominal tergites brown. Male genitalia with phallus with characteristic large process on mesophallus, endophallus with sclerotised tubes narrowed (Fig. 2), other details as in Shiao *et al.* (1991).

This species was until now recorded from Taiwan (on *Artemisia* sp.) (Shiao *et al.*, 1991), Japan (on *Artemisia princeps*) (Sasakawa, 1994) and, in the present study, is newly recorded from Sulawesi (Indonesia) on *Chrysanthemum* sp.

Materials examined:

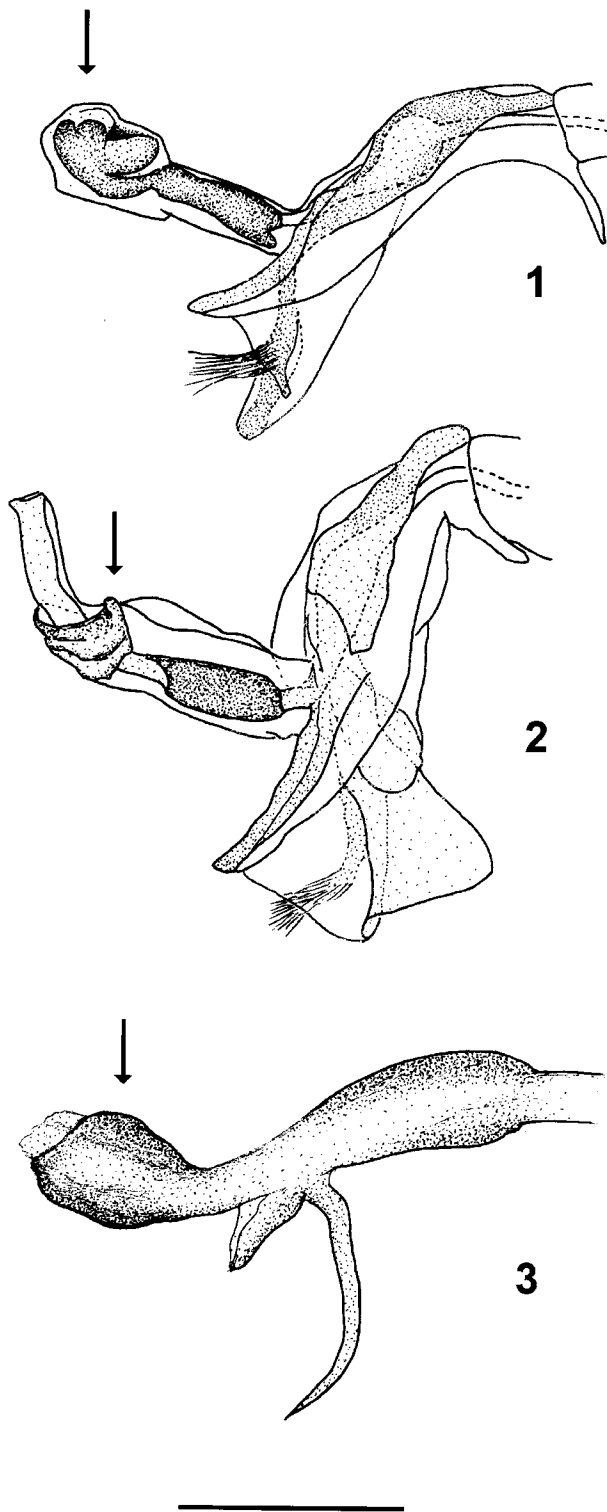


Fig. 1-3. Male genitalia of *Liriomyza* spp., lateral views; (1) *L. katoi*, (2) *L. yasumatsui*, (3) *L. trifolii*. Arrows indicate distiphallus. All figures to same scale. Scale line = 0.1 mm.

INDONESIA. North Sulawesi. 3 males, Modinding 16-IX-2002, D.T. Sembel, on *Chrysanthemum* sp.

Notes

Both these species may be readily confused with *L. trifolii* in characters such as yellow frons, yellow background under inner and outer vertical bristles, yellow hind margin of eye, yellow and rounded 3rd antennal segment, yellow scutellum and femora, and apex of costa extending to vein M1+2. However the latter differs from these species in having matt black mesonotum (shiny black in *L. katoi* and *L. yasumatsui*), and a characteristic male genitalia, particularly the structures of the phallus (Fig. 3).

Discussion

Correct identification of pest agromyzids has important implications for quarantine programs. Because male genitalia provide the most reliable taxonomic characters, identification of leafminers based on external morphological characters alone can lead to false identification of *L. trifolii*. When no adult males are available, it is valuable to complement morphological diagnoses with biochemical and molecular diagnoses, such as those developed by Central Science Laboratory in the United Kingdom (Central Science Laboratory, UK 2004) and in Japan (Miura *et al.*, 2004).

It is likely that there are more species of *Liriomyza* and other agromyzids waiting to be discovered in Indonesia, particularly in a poorly collected region such as North Sulawesi. Therefore there is a need for more detailed survey of agromyzid fauna of Indonesia on *Chrysanthemum* spp. (Asteraceae) hosts.

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摘 要

兩種斑潛蠅 *Liriomyza katoi* 斑潛蠅 和 *L. yasumatsui* 斑潛蠅被從菊花寄主(菊科 Asteraceae) 中採獲。這是印度尼西亞 Sulawesi 地區的全新記錄。兩種斑潛蠅的檢測以及與主要害蟲非洲菊斑潛蠅 *L. trifolii* 的外部形態的相似之處,都進行了討論並作了文獻記載。

關鍵詞 : *Liriomyza katoi*, *Liriomyza trifolii*, *Liriomyza yasumatsui*,
Chrysanthemum, Asteraceae