Leafminers in vegetables, ornamental plants and weeds in Indonesia: surveys of host crops, species composition and parasitoids

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Abstract

Extensive surveys of vegetable, ornamental and weedy plant species were conducted in highland and lowland vegetable production areas in Indonesia with the aim of recording leafminer species present and their associated natural enemies. The most common dipterous species reared from samples was the pea leafminer, *Liriomyza huidobrensis* (Blanchard) (Diptera: Agromyzidae). This introduced pest was particularly serious in highland vegetables in Java, Sumatra and South Sulawesi, causing yield losses as high as 60-70%. Another alien species, the vegetable leafminer, *Liriomyza sativae* Blanchard, contributed to problems in lowland areas on the north coast of West Java, where cucumbers were heavily damaged. An Asian leafminer species, *Chromatomyia horticola* Goureau, was more common in snow peas (*Pisum* sp.). Intensive sampling of leafminer-infested leaves from surveyed host plants yielded 11 species of hymenopteran parasitoids: 10 eulophids (*Asecodes* sp., *Chrysocharis* sp., *Cirrospilusambiguus* (Hansson and LaSalle), *Closterocerus* sp., *Hemiptarsenusvaricornis* (Girault), *Neochrysocharis formosa* (Westwood), *Neochrysocharis* sp., *Pnigalio* sp., *Quadrastichus* sp., *Zagrammosoma* sp.) and 1 eucoilid (*Gronotoma* sp.). The most abundant parasitoid species was *H. varicornis*. Levels of parasitism varied among crops and growing seasons, but were usually low, especially on potato (< 3%). Surveys revealed that most farmers (63%) attempted to control leafminers by applying insecticides twice weekly although these applications were neither effective nor economical according to responses of about 72% of the farmers. An integrated pest management approach is suggested that emphasizes IPM training for vegetable farmers and includes reductionor elimination of broad spectrum chemicals that would adversely affect parasitoids that may already be present as well as those that may be introduced. The initiation of a classical biological control programme is recommended to enhance the limited parasitoid complex present in Indonesia and increase levels of biological control.

Keyword : Leafminers; Indonesia; Vegetables; Ornamental; Plants; Weeds; Parasitoids; Surveys