

Save Management of *Liriomyza* spp. on Tomato from Karachi

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ABSTRACT

The agricultural ecosystem is under significant pressure from pests due to the excessive use of synthetic pesticides. Therefore, Integrated Pest Management (IPM) strategies to naturally restore ecological balance in agricultural systems. The tomato leaf miner (*Liriomyza trifolii* Burgess) is one of the most destructive pests of vegetable crops. The bio-efficacy of (T₁) *Gliricidia sepium* (Jacq) and (T₂) *Aloe barbadensis* (Miller) extracts against the instars and adults of *L. trifolii*. T₂ showed the highest mortality in 3rd instars, with $R^2 = 76.96$, LC₅₀ at 3111 ppm, and LC₉₀ at 7111 ppm. T₃ (the combined extract solution) mixture demonstrated the highest mortality in adult leaf miners, with $R^2 = 75.69$, LC₅₀ at 1575 ppm, and LC₉₀ at 3575 ppm.

Keywords: Integrated Pest Management (IPM), *Liriomyza trifolii* Burgess, *Gliricidia sepium* (Jacq), *Aloe barbadensis* (Miller), Mortality.

INTRODUCTION

The American serpentine leaf miner (*L. trifolii*) is one of the most destructive vegetable leaf miner (Boucher & Pollet, 2025). Adults live about 13 to 18 days. The males are unable to puncture the leaves. Even so, they have been observed feeding behavior at the puncture created by females (Ghelani *et al.*, 2020). The most commonly observed reason for the outbreak of leaf miners is the inappropriate use or exploitation of insecticides and their impact on natural enemies (Mhatre *et al.*, 2022).

In Multan (Pakistan), leaf miner was observed in twenty different host plants in 2017. Although 24 host plants were found infected with *Liriomyza* species in 2022, i.e. 24% infestation on watermelon, 75% on long melon, 71 % on pumpkin, 70% on snake melon, 89% on long gourd, 89% on cucumber, 93% on mung bean and 60% eggplant and so on (Hamza *et al.*, 2023). The continuous use of insecticides harms environmental factors and plants and develops resistance to pests (Tudi *et al.*, 2021). Biological methods in which environment-friendly bio-pesticides are prepared and physical methods in which *L. trifolii* keep under control in tomato fields (Singh & Mourya, 2024).

OBJECTIVES

The aims of the present research are to enhance the agricultural crops through the effective management strategies of IPM to control the pests, and also study the development of biology under the influence of two different temperatures.

MATERIALS AND METHODS

The present research was conducted on tomato plants pest (*L. trifolii*) in the labs of Jinnah university for women, Karachi, Pakistan. Two samples were tested for the experiments, i.e., *Gliricidia sepium* (Jacq.) and Aloe Vera (*Aloe barbadensis* Miller) leaves powder extracts solution in the pest's developmental stages and on adults.

KEY FINDINGS

This study examined the effect of bio extract on the developmental biology of leaf miners (*L. trifolii*) and on adults. *Gliricidia sepium* (Jacq.) and *Aloe barbadensis* extract solution shows highest mortality in instar at 3111 ppm, and LC₅₀ at 7111 ppm. The combined extract solution of both at 1575 ppm, and LC₅₀ at 3575 ppm.

CONCLUSION

Bioactive compounds from *G. sepium* were extracted and tested in vitro. The combined extracts showed strong toxicity, effectively killing larvae and adults at 8000–10,000 ppm within 24–48 hours. *G. sepium* alone was most effective, while *A. vera* showed lower activity. Their mixture caused higher mortality at all stages, indicating a synergistic effect and supporting its use as an eco-friendly alternative to synthetic insecticides against *L. trifolii* in tomatoes.

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