



Combined application of *Stratiolaelaps scimitus* and *Beauveria bassiana* granules for control of soil-dwelling stage of *Frankliniella occidentalis**

SHENGYONG WU¹, WEINAN SUN, XINGRUI ZHANG, XUENONG XU & ZHONGREN LEI

State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, P.R. China

¹ wushengyong@caas.cn; <https://orcid.org/0000-0002-8403-6443>

*In: Zhang, Z.-Q., Fan, Q.-H., Heath, A.C.G. & Minor, M.A. (Eds) (2022) *Acarological Frontiers: Proceedings of the XVI International Congress of Acarology (1–5 Dec. 2022, Auckland, New Zealand)*. Magnolia Press, Auckland, 328 pp.

Western flower thrips, *Frankliniella occidentalis* (Pergande) (Thysanoptera: Thripidae), is a pest of global importance in agricultural and horticultural crops. *F. occidentalis* populations comprise of all different life stages (egg, larvae, prepupae, pupae and adults) under natural conditions. This thrips species typically pupates and spends about one-third of their life cycle in the soil. Their cryptic habit and high reproductive rate make them difficult to control. Compared to attempts to control thrips on the foliage, there is a new idea to control thrips when their pupal stage is still underground, thereby interrupting the thrips life cycle before they have the chance to emerge as adults.

Stratiolaelaps scimitus, a soil inhabiting predatory mite, preys on pupae of thrips and has been used for thrips control in greenhouse crops. Likewise, the entomopathogenic fungus *Beauveria bassiana* used as granules have shown great potential for control of soil-dwelling stages of thrips. Our study was conducted in laboratory and greenhouse to evaluate the compatibility between *S. scimitus* and the granular formulation of *B. bassiana* (fungal isolate GZGY-1-3) and their combined efficacy against *F. occidentalis* on greenhouse eggplants. The laboratory bioassays and potted plant tests indicated that *B. bassiana* granules had no impact on the survival, reproduction, longevity and density of *S. scimitus* (Sun *et al.* 2018). The greenhouse trials showed that *B. bassiana* granules, *S. scimitus* and their combination resulted in the reductions of thrips adults by 53.62%, 66.11% and 82.18% respectively (Zhang *et al.* 2021). Thus, our study demonstrated that the combined application of *B. bassiana* granules and *S. scimitus* significantly improved control of *F. occidentalis* and can be an effective strategy to manage this species of thrips.

References

- Sun, W.N., Sarkar, S.C., Xu, X.N., Lei, Z.R., Wu, S.Y. & Meng, R.X. (2018) The entomopathogenic fungus *Beauveria bassiana* used as granules has no impact on the soil-dwelling predatory mite *Stratiolaelaps scimitus*. *Systematic and Applied Acarology*, 23(11), 2165–2172.
<https://doi.org/10.11158/saa.23.11.9>
- Zhang, X.R., Wu S.Y., Reitz, S.R. & Gao, Y.L. (2021) Simultaneous application of entomopathogenic *Beauveria bassiana* granules and predatory mites *Stratiolaelaps scimitus* for control of western flower thrips, *Frankliniella occidentalis*. *Journal of Pest Science*, 94(1), 119–127.
<https://doi.org/10.1007/s10340-020-01227-5>