Host Range of Two Chrysomelid Beetles, *Zygogramma signatipennis* and *Z. piceicollis*, Biological Control Candidates for *Tithonia rotundifolia*

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Abstract

The weedy red sunflower *Tithonia rotundifolia* (Mills) S.F. Blake (Asteraceae: Heliantheae), originally from Mexico, has become invasive throughout the humid and sub-humid tropics of South America, South East Asia and tropical and subtropical Africa, including South Africa. In South Africa, *T. rotundifolia* is declared a category 1 weed, and was targeted for biological control in 2007. Host-specificity tests showed that the two leaf-feeding beetles, *Zygogramma signatipennis* Stål and *Z. piceicollis* Stål (Chrysomelidae: Chrysomelinae), were the most damaging and promising biological control agents for *T. rotundifolia*. During no-choice tests on 29 plant species in eight plant families, *Z. signatipennis* laid overwhelmingly on *T. rotundifolia*, with 79.67 eggs deposited on the target weed versus 33.5 and 2.5 deposited on its congener *Tithonia diversifolia* (Hemsl.) A.Gray and *Helianthus annuus* L. (Asteraceae), respectively. *Tithonia rotundifolia* was also found to be the most suitable host for the other chrysomelid, *Z. piceicollis*, during no-choice tests, depositing 56 eggs on this plant versus 29 and 7.5 eggs on *T. diversifolia* and *H. annuus*, respectively. Further larval survival tests showed that both *Zygogramma* species were able to complete development only on *T. rotundifolia* but not on *T. diversifolia* and *H. annuus*. During multi-choice tests including nine plants species in three plant families, both *Zygogramma* spp. strongly preferred *T. rotundifolia* to other plant species. Based on host-specificity tests and surveys conducted in the native range, the two *Zygogramma* spp. appear to be sufficiently host-specific to be released against *T. rotundifolia* in South Africa.