

Oviposition and Feeding Preferences of Adult *Toxorhynchites rutilus rutilus* (Diptera: Culicidae): Implications for Vector Management Strategies

Abstract

Toxorhynchites rutilus rutilus (Coquillett) is a mosquito species that in the larval stage preys on other mosquito larvae. Adult *Tx. rutilus* do not feed on blood unlike most other mosquito species. Therefore, *Tx. rutilus* is being explored as a possible biological control agent in vector management strategies. In addition to its role as a predator, *Tx. rutilus* is also a model organism for the study of several mosquito behaviors.

Toxorhynchites rutilus adults may perform skip oviposition behavior and take nectar meals frequently. Management strategies are in development to exploit skip oviposition behavior and nectar feeding behavior in mosquitoes that transmit pathogens which can cause disease. These strategies include lethal ovitraps and attractive toxic sugar baits. However, little is known on what factors influence these behaviors in mosquitoes. A study was performed to examine the effects of larval habitat quality on skip oviposition behavior in *Tx. rutilus*. *Toxorhynchites rutilus* performed skip oviposition and oviposited in significantly fewer containers when presented containers holding only high quality larval habitat compared to the egg deposition pattern when presented only low quality larval habitats. Our results indicate *Tx. rutilus* females have the ability to perform skip oviposition and that larval habitat quality significantly impacts how this behavior is performed. In addition, studies were completed to examine nectar feeding and flower preference of *Tx. rutilus*. *Toxorhynchites rutilus* was found to be capable of acquiring a nectar meal from butterfly bush (*Buddleja davidii* Franchett cultivar 'Guinevere'), lantana (*Lantana camara* L. cultivar 'Confetti'), and tropical milkweed (*Asclepias curassavica* L.). However, in choice assays butterfly bush was significantly preferred (7.8 feeding events/hour) over lantana (1.2 feeding events/hour) and tropical milkweed (0.4 feeding events/hour). This is the first study to demonstrate a plant feeding preference in *Tx. rutilus*.

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