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Evaluation of leaf quality on food search behavior of *Cryptolaemus montrouzieri* larvae (Coleoptera: Coccinellidae), a predatory beetle of mealybugs

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Several groups of insect pests such as mealybugs, whiteflies and scale insects are successfully controlled by the predatory beetle mealybug destroyer, *Cryptolaemus montrouzieri* (Coleoptera: Coccinellidae). Both adult and larvae of *C. montrouzieri* feed on all the stages of mealybugs. Food searching behaviour is a key aspect for a predator which is influenced by the morphological features of the leaves such as trichome density, waxy nature of leaf lamina. Hence, the objective of the study was to identify the variations in food searching behaviour of larval instars of *C. montrouzieri* with references to different leaf morphology characters of five different plant species; cassava (*Manihot esculenta*), guava (*Psidium guajava*), brinjal (*Solanum melongina*), crotan (*Codiaeum svariegatum*) and hibiscus (*Hibiscus rosa-sinensis*). Mealybug egg mass was attached to the underside of each detached leaf near to the apex and enclosed within a Petri dish. Each starved larval stages of *C. montrouzieri* was introduced to the prepared setup, 4 cm away from the egg mass and observed the behaviour. The time taken to detect the egg mass, feeding, walking and staying were recorded in every three minutes over a period of two hours under the laboratory conditions of 28 ± 2 °C and 55-85 % relative humidity. Each treatment was replicated 20 times. The initial larval instars shown variations among the observed time durations while the search behaviour of the L4 instar was not significantly affected by leaf types ($P>0.05$). The time spent on walking was not significantly affected by the leaf type ($F(4, 95) =1.167$ $P=0.33$). However, feeding time was significantly different among leaves ($F(4, 95) =2.945$ $P=0.024$) and the resting time of L4 larvae was significantly different among the leaf types ($F(4, 95) =2.86$ $P=0.027$). It was found that L4 larvae having longer feeding time duration on cassava leaves (75.5 ± 8.6 minutes) whereas feeding time on other leaves ranged between 37-55 minutes. However, the lowest resting time period was observed on cassava (26.1 ± 8 minutes) while other treatments ranged between 52–60 minutes. This study confirms the impact of leaf morphological features towards the behavioural variations of *C. montrouzieri* larvae.

Keywords: *Cryptolaemus montrouzieri*, Mealybugs, Predatory beetle, Search behavior, Trichome

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