ABSTRACT

***Gyranusoidea indica* Shafee, Alam and Agarwal (Hymenoptera: Encyrtidae): Studies on its biology and use in biological control of *Maconellicoccus hirsutus* (Green) (Homoptera: Pseudococcidae) in Trinidad.**

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Gyranusoidea indica Shafee, Alam and Agarwal (Hymenoptera: Encyrtidae), a parasitoid of the hibiscus mealybug *Maconellicoccus hirsutus* was accidentally introduced into Trinidad five years after the pest was first confirmed as present. Exotic natural enemies, *Cryptolaemus montrouzieri* Mulsant (Coleoptera: Coccinellidae), *Scymnus coccivora* Aiyar (Coleoptera: Coccinellidae) and *Anagyrus kamali* (Hymenoptera: Encyrtidae) were used in a classical biological control programme against the pest soon after its discovery on the island. A dearth of information on *G. indica* led to studies to determine (i) its basic biological parameters under laboratory conditions of 28 ± 2 º C, relative humidity of 70 ± 10 % and 8L:16D photoperiod (ii) its impact on the pest alone and with *A. kamali* under semi field conditions and (iii) the impact of all four natural enemies on selected non-target species.

Studies did not reveal direct nontarget effect on mealybugs by the exotic natural enemies. The developmental biology and life table parameters for *G. indica* on *M. hirsutus* were determined. The net reproductive rate, R_o was 1378.25 females/female/generation, the innate capacity for increase, r_m was 0.3289 eggs/female/day. The generation time was 21.98 days and doubling time

was 2.10 days. *G. indica* is synovigenic and the third instar female *M. hirsutus* was the optimum stage for production of a large female population. Male and female longevity were 16.08 ± 1.75 and 28.65 ± 1.35 days respectively. G. *indica's* potential to reduce *M. hirsutus* infestation is more efficient than if used with *A. kamali.* Results are essential for mass production, timing of field releases of *G. indica* and development of an effective biological programme for *M. hirsutus*.

Keywords**:** *Gyranusoidea indica*, biology, life-tables, non-target effect, *Maconellicoccus hirsutus, Cryptolaemus montrouzieri*, *Anagyrus kamali*, *Scymnus coccivora*