

ABSTRACT

Duration to adulthood, survival, and growth on mixed and separate diets of preferred hosts. Reproductive rate, potential fecundity and biotic potential were also greater on the mixed diet. *Coscineuta virens* fed diurnally and sporadically, with daily feeding peaks between 1600-1900 hrs.

Life cycle and feeding ecology of the Moruga grasshopper *Coscineuta virens* (Orthoptera: Acrididae).

Parabolic regression model best fitted the data relating food consumption to indices of body size among nymphs. Overall ranking of indices in relation to consumption by r^2 gave the following hierarchy: dry weight (best at 0.91), head capsule width (best at 0.81), femur length (worst at 0.21). Similar results were obtained for relating faeces

This thesis examines the life cycle and feeding ecology of *Coscineuta virens* in relation to survival strategies, for management of the economically important grasshopper in Trinidad.

In the field, its univoltine life cycle is synchronized with seasonal rainfall, whereas in the laboratory bivoltinism is possible. Field collected egg pods withstood desiccation and remained viable for up to nine months although hatchability fell from 92% on collection to 47-62% after 6-8 months in storage. Hatchability of laboratory-laid eggs was at best 46%.

Duration to adulthood was shorter and survival better on mixed than separate diets of preferred hosts. Oviposition rate, potential fecundity and biotic potential were also greater on the mixed diet.

Coscineuta virens fed diurnally and sporadically, with daily feeding peaks between 1600-1800 hrs.

Although polyphagous, distinct preference for dicotyledonous plants was evident, with adults being more discriminate in food choice.

The parabolic regression model best fitted the data relating food consumption to indices of body size among nymphs. Overall ranking of indices in relation to consumption by r^2 gave the following hierarchy: dry weight (best at 0.96) > pronotum length > head capsule width > live weight = femur length (worst at 0.91). Similar results were obtained for relating faeces produced to body size. Among adults, regression equations relating consumption to body weight were significant among males only, with $r^2=0.78-0.80$ and $0.76-0.83$ for live and dry weights respectively.

Analysis of covariance showed that ingestion, digestion and growth rate were greater on the preferred diet of cassava (*Manihot esculenta*) than cowpea (*Vigna unguiculata*) leaves. The results are also discussed in relation to ratio-based indices which are widely reported in the literature. Consumption index was greater for nymphs than adults and greater on cassava

than cowpea leaves. Efficiency of conversion of ingested (ECI) and digested (ECD) food and growth rate were also greater for diets of cassava than cowpea leaves, and greatest among final instar nymphs. ECD among adults were similar for both diets during somatic growth.

Flexible feeding and life cycle strategies enabled *C. virens* to exploit available resources. New feeding opportunities and alternative shelter could be used advantageously to expand its range, where it can become a potentially serious pest. Drs Samuel Howard, Ernest Cheser and John Pegus gave invaluable support.

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