Biology and Ecology of the Leafroller (*Sylepta derogata* Fabricius) on Okra (*Abelmoschus esculentus* (L.) Moench)

By

JOYCE IGUNMA IYAMU
B.Sc. (Zoo), M.Sc. (Entomology) Ibadan
Matriculation Number - 26215

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ABSTRACT

Sylepta derogata, Fabricius a major insect pest, defoliates and causes enormous yield loss in *Abelmoschus esculentus* (L) Moench. Control of the pest with chemicals and other methods have not been successful due to scanty information on the biology and ecology of the pest. This study was conducted to assess the biology and ecology of *Sylepta derogata* on *Abelmoschus esculentus.*

Abelmoschus esculentus was planted in early (March-June, 2009), mid (July-September, 2009) and late (November 2009-January,2010) seasons at the Crop Garden of the Department of Crop Protection and Environmental Biology, University of Ibadan, Nigeria. The experiment was laid out in Randomized Complete Block Design in four replicates. Larval population of *S. derogata* was estimated on 23 randomly selected plants/replicate. Data were collected on temperature, rainfall, relative humidity and percentage field infestation. Leaves of weeds around the experimental plot were observed for habitation and damage by *S. derogata*. Observations were made on the presence of natural enemies on *S. derogata* in the field and identified in the laboratory. The life cycle of *S. derogata* was investigated in the field under natural weather conditions of 22^{o}C-31^{o}C, 39-90% relative humidity and mean rainfall of 2.8 mm. In the laboratory, assessment was done under room temperature of 24^{o}C-28^{o}C and 79-92% relative humidity, on the reproductive biology, development and morphometrics of immature stages of *S. derogata*. Data were analysed using descriptive statistics, correlation and ANOVA at P=0.05.

The field population of *S. derogata* larvae was highest in November and December with 96.2% larval infestation while it was lowest in July and August with 16.1% and 11.3% infestation respectively coinciding with the highest fruit yield. A significant (P=0.05) inverse relationship was observed between *S. derogata* abundance; and each of rainfall (r = -0.80) and temperature only (r = -0.85) in early season, rainfall (r = -0.28) and temperature (r = -0.17) in mid-season and temperature (r = -0.73) in late season when rainfall receded. However, a significant (P=0.05) direct relationship was observed between *S. derogata* abundance and relative humidity at the late season planting (r = 0.18). The mean developmental period from egg to adult was 28 days. The life cycle consisted of egg, five larval stages, pre-pupa, pupa and adult stages. The mean oviposition period was

2 days. The head capsule width ranged from 0.2mm in the first instar to 2.1mm in the fifth instar. The growth index of 1.8 recorded did not conform to Dyar's rule of 1.4. The females were significantly larger in size than the males. The sex ratio was 1.5:1 (male: female). *Apanteles sp* was the natural enemy identified on *S. derogata* which could be used as biological control agent of the larval stages of *S. derogata*, while the alternative host plant was *Solanum nigrum.*

Late season planting of Okra requires control measures. *Apanteles sp* can be used in the control of *S. derogata* on okra. The short developmental period of *S. derogata* indicates the possibility of this pest completing two generations on okra during the growing season thereby increasing the larval population and leaf damage.

Keywords: *Sylepta derogata*, *Abelmoschus esculentus*, Plant host range, *Apanteles sp*.

WORD COUNT: 495

CERTIFICATION

I certify that this work was carried out by Joyce Igunma IYAMU in the Department of Crop Protection and Environmental Biology, University of Ibadan, Ibadan, Nigeria.

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Supervisor
F.K. Ewete
B.Sc., Dip C.P., M.Phil., Ph.D Ibadan
Professor of Entomology
Department of Crop Protection and
Environmental Biology
University of Ibadan.

DEDICATION

This work is dedicated to “I AM THAT I AM” in whom I can confidently say “I am what I am by Grace.

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