

**ZERO-INFLATED COUNT MODELLING OF INSECT DATA:
A CASE STUDY OF *THAUMASTOCORIS PEREGRINUS* SPECIES**

BY

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ABSTRACT

Insect behaviour has become an important issue in the study of ecology. Statistical models have wide applications in various biological field as they help scientists to describe the phenomena under which variables are applied with specific assumptions. Ecological data sets have a tendency to contain overdispersed and excess zeros that could lead to inaccurate statistical inference on the model coefficients due to misclassification of the zeros in the model which could lead to biased parameter estimates of interest. In this study, statistical concerns were addressed to improve the insight of the phenomenon of *Thaumastocoris (T.) peregrines* count distributions. The models compared in this study for suitability are; Poisson, Negative Binomial (NB), Zero-inflated Poisson (ZIP) and Zero-inflated Negative Binomial (ZINB). To determine the appropriate model for modeling overdispersed and excess zeros data sets for accurate statistical inference on *T. peregrines* Nymphs and Adults counts, Akaike information criterion (AIC) provided a means for model selection. Both Zero-inflated Poisson (ZIP) and Zero-inflated Negative Binomial (ZINB) were fitted to *T. peregrines* Nymphs and Adults counts. The ZINB and ZIP models provide parsimonious fit of Nymphs and Adults distribution over time on *T. peregrines* Nymphs and Adults count to measure count distributions study.