

ASSESSMENT OF THE DIVERSITY OF TERRESTIAL INSECT SPECIES IN  
TERERRESTRIAL HABITATS OF BUSITEMA UNIVERSITY NAGONGERA CAMPUS,  
TORORO DISTRICT UGANDA.

BY

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A RESEACH REPORT SUBMITTED TO THE DEPARTMENT OF BIOLOGY IN PARTIAL  
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## **Abstract:**

The research study was conducted in Busitema University Nagongera Campus in Tororo Uganda and it covers a total land area of 850 acres (340 hectares). This research was purposely done to assess the diversity, insect richness and abundance of insect species in Forested and Grass land area. Sampling was done after every three days using pitfall, sweep net and quadrat and hand picking for a period of three weeks. Insects collected were first killed using 70% ethanol, counted and then representative samples taken to the Biology laboratory for pinning, drying, identification and preservation. A total of 487 insects which belonged to 9 orders and 30 families were recorded. The most dominant order was Orthoptera with a relative abundance of (26.02%) and, the least was Mantodea (1.23%). The most dominant insect family was Termitidae (14.37%) followed by both Gryllidae and Corambycidae (5.95%), followed by Nabidae (5.54%), followed by both Tettigoniidae and Tetrigidae (4.52%), followed by Pyrgomorphidae (4.31%), followed by Carabidae (4.11%) and Tettigoniidae (3.70%). Families such as Pieridae and Pompilidae (0.62%) and Margarodidae (0.82%), Mantidae (1.23%), both Lygacidae and Nymphalidae (1.44%), both Shcedidae and Blattidae (1.64%) had a small relative abundance table 3. The highest species diversity was observed in the order Orthoptera (Shannon,  $H' = 3.105$ ) while Mantodea (0.013) and Dictyptera (0.019) had the least. However, the habitat with the highest species richness and evenness was observed in the Forested land (20.841) and (0.126) respectively.

In this study, I assessed the insect species of Busitema University Nagongera Campus in relationship to their diversity, abundance and distribution with respect to human development processes and from the results obtained, Forestland had a high insect richness, diversity and abundance compared to Grassland area.

However, Environmentalists should regulate agriculture and other human activities like deforestation as it was observed near the river stream of Forestland and more research should be conducted using more sampling techniques, expanding the geographical scope of the study and also during the rainy season to compare the differences in the seasons on the diversity and abundance of insects since the research study was carried

out only during the dry season.

## DECLARATION

I, TAGOOLE WILSON hereby declare that this research proposal entitled **“Diversity of terrestrial insect species in grassland and forested area of Busitema University Nagongera Campus, Tororo District Uganda”** is entirely original, genuinely done by myself and it has never been presented at any university or academic institution for any award.

Signed.....

Date.....

TAGOOLE WILSON

## APPROVAL

This research proposal titled **“Diversity of terrestrial insect Species in grassland and forested area of Busitema University Nagongera Campus, Tororo District Uganda”** has been submitted with our approval as the students’ University supervisors.

Signed.....

Data.....

Dr. EDWARD ANDAMA

Signed.....

Data.....

Ms. NAMUSANA HELLEN

## ACRONYMS AND ABBREVIATIONS:

GPS: Global Positioning System.

RCBD: Randomized Complete Block Design.

NFA: National Forest Authority.

Spp: Species.

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## DEDICATION

This dissertation is dedicated to my sponsor HESFB and my mentors Dr. Hokello Joseph, Dr. Andama Edward, Madam Namusana Hellen, Mr. Kifuko Richard, Mr. Olowo Moses and Mr. Wamboga Emma, My Parents Mr. Goboola Moses and Mrs. Goboola Edinance, Brothers, Sisters, Relatives and Friends for their efforts rendered to me towards completion of my course at Busitema University.

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## 1.0 CHAPTER ONE.INTRODUCTION

Insects are the largest group of animal Species and make up more than 75% of all described global species diversity (Adjaloo, 2012) and (Nazir, 2014).

Insects have also populated almost every type of habitat from the equator to the arctic and from sea level to the snowfield of highest mountains, on land, in air, water and almost everywhere (Belamkar, 2012). Insects are known to be either beneficial or harmful organisms (Belamkar, 2012). They play an important role in the ecology of Grassland and Forestland habitats (Balasubramanian, 2005). For example, insects such as termites and wood borers, especially the larvae of beetles or moths that feed on dead trees or wood or other decaying organic material play a significant role in nutrient

cycling. Insects also form an important part of the food chain, especially for many amphibians, birds, mammals and reptiles because they are found on almost in each habitat (Contreras, 2008). Recycling nutrients, pollinate plants, disperse seeds, maintain soilstructure and fertility, control populations of other organisms, provide a major food source for other taxa Insects also maintain the structure and composition of ecosystem (Adjaloo, 2012), they are parasites or disease vectors like house flies for many other organisms including human being (Khadijah, 2013). However a large number of insect species continue to become extinct from their native habitats worldwide . The abundances and diversities of many insect species can change by several orders of magnitude on a periodic or annual time scale between environmental changes and population adjustment to new conditions (Belamkar, 2012). The abundance, diversity and species richness of insects also represent an equivalent variety of adaptations to variable environmental conditions. (Balakrishnan, 2014)

Despite Busitema University Nagongera campus having large areas of Grassland and Forestland, little is known about the diversity and type of insect species living in these habitats. This study has been done to document insect diversity, abundance and even establish different species of insects present in the study area. However many human activities like agriculture, bush burning and deforestation seem to disturb the habitats of insects within the study areas. These activities have greatly decreased the abundance, diversity and species richness of insects. An insect survey was carried out with the aim to understand the ecological significance of the Forestland and Grassland habitat in relation to insect abundance, diversity and species richness. Specifically, it was to determine whether the composition of insect assemblages can differ in the two communities. The objectives of this study were to determine and establish different insect species present at Busitema University Nagongera Campus, to analyze and compare the diversity, abundance and species richness of the two sampling abitats.

## 1.2. PROBLEM STATEMENT

There is a greater global interest to assess the diversity, insect richness and abundance of insect species of an ecosystem. This can aid in the development of insect species conservation methods and this can be more effective if it is targeted at local or regional scales (Kehinde, 2014). There is also the need to have an understanding of the variation in insect species composition and relative abundance between different habitats

expanding the geographical scope of the study and also during the rainy season to compare the differences in the seasons on the diversity and abundance of insects since the research study was carried out only during the dry season due to the short time given.

Forestland and Grass land habitats should be given conservation priority so that to promote biodiversity of insects since insect play very important roles in the ecosystem as discussed in the research study.

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