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Surveillance of mosquitoes vectors in Ajumoni Estate Ogun State, Nigeria

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ABSTRACT

The study was carried out in Ajumoni Estate, a peri urban area Ogun state, Nigeria to provide baseline information on the mosquito vectors responsible for the diseases transmission in the area. The mosquitoes were collected indoor using mechanical aspirator from ten randomly selected houses (5 netted and five un-netted) between March and August 2004. The mosquitoes were identified morphologically using standard keys. A total of 1308 mosquitoes comprising Anopheline (18.85%), Culex (62.7%) and Aedes (18.5%). The abundance of Culex species was significantly higher ($p<0.05$) than the Aedes and Anopheles species throughout the period of the study but the variation in abundance of Aedes and Anopheles species was not statistically significant ($p>0.05$). The mosquito abundance was higher in un-netted flies as compared with the netted flies but the difference in mosquito population in both types of sampled houses was not statistically significant ($p>0.05$). The study therefore showed the need for constant surveillance on transmission indices of the mosquitoes so as to reduce the risk of the residents to mosquito borne diseases including malaria.

Key words: Mosquitoes, species composition, Nigeria.

INTRODUCTION

Mosquitoes are widely distributed worldwide with utilization of various breeding sites [1], this is directly or indirectly influenced by climactic and various environmental conditions and factors [2]. Ecological and environmental modifications due to agricultural and urbanization contribute to the breeding of various mosquitoes species [3].

Mosquitoes are important vectors of several human diseases such as malaria, yellow fever, filariasis, dengue and haemoraphagic fever [3]. These diseases rank among the world's greatest scourges, despite earlier hope that these parasitic infections might be eradicated they still infect more than 500million people annually [4].

In Nigeria mosquitoes-borne diseases constituted a major health problem, as in other parts of sub-Saharan Africa, it is statistically shown that malaria alone accounts for >300,000 deaths from >20 million clinical cases annually with about 10-20% of the hospital admissions being due to malaria[5], apart from this, other mosquito-borne diseases has accounted for a lots of economic loss, social disgrace, low productivity, absenteeism, sleeplessness and others.[6].

It has been identified that the radical approach to combat mosquitoes today is equally linked to the effective ways of controlling mosquito-borne diseases [7], it is therefore pertinent that emphases have to be placed on effective and integrated vector control studies such as species compositions, biting behaviours of local vectors in different localities.

This study was therefore designed to investigate the species composition and polulation dynamics of mosquito vectors and their public health importance in Ajumoni Estate, Ogun State Nigeria.

MATERIALS AND METHODS

Study Area

The study was carried out in selected houses in Ajumoni Estate, a semi-urban area of Ogun State. The estate has approximately 2000 people mainly of Yoruba ethnic group. Most of the roads at the study area are still under construction and mostly water lodged during the wet season. The air temperature during usually range from $20^{o}C$ – $35^{o}C$, with a mean relative humidity of about 78% (March – August)

Mosquito Collection

Indoor resting mosquitoes were collected from ten randomly selected houses (five netted and five un-netted) once every month using flash light and mechanical aspiratory technique from March to August, 2004.

Mosquito Identification

Mosquitoes were identified using standard morphological keys [8].

Statistical Analysis

The analysis of the data was carried out using Analysis of variance.

RESULTS

A total of 1308 mosquitoes were collected out of which 246(18.8%) were morphologically identified as female *Anopheles* mosquito while 820(62.7%) and 242(18.5%) were *Culex* and *Aedes* species respectively. The abundance of *Culex* species was significantly higher ($p<0.05$) than the *Aedes* and *Anopheles* species throughout the period of the study but the the variation in abundance of *Aedes* and *Anopheles* species was not statistically significant ($p>0.05$). The abundance of the mosquitoes showed three peaks during the six months of the study with general fall in April, June and August with the exception of *Anopheles* species which showed bimodal peaks with fall in June and August (Figure 1).

Taking the data as a whole, Figure 2 shows a comparison of mosquitoes in netted and un-netted buildings. The mosquito abundance was higher in un-netted flies as compared with the netted flies throughout the period of the study except in April and June when equal number was collected in both categories and in August in which the un-netted houses recorded lower

abundance. However, the difference in mosquito population in both types of sampled houses was not statistically significant ($p>0.05$).

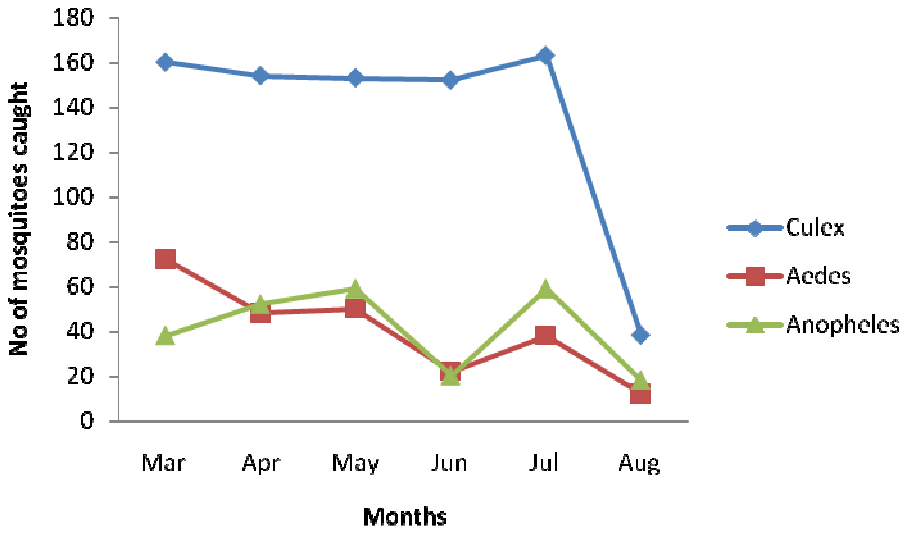

Figure 1: The monthly distribution of mosquito species during the period of the study

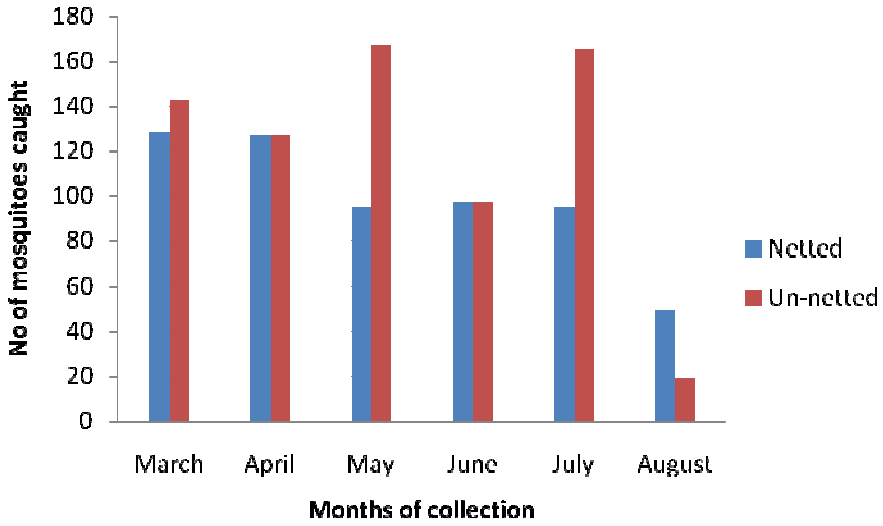

Figure 2: The mosquito abundance in both netted and un-netted houses during the period of the study

DISCUSSION

The results obtained of this study showed diversity in mosquito species present at the study area. The preponderance of *Culex* species over *Anopheles* and *Aedes* mosquitoes at the study area may not be unconnected to the variation in larval habitat requirements of the species. *Culex* species usually breed profusely in polluted gutters, blocked drains and other water retention habitats with organic matter unlike *Aedes* and *Anopheles* mosquitoes which prefer clean ground pools and man-made containers respectively [9, 10, 11]. The study area has many polluted drains and run-

offs which could have provided conducive environment for the prolific breeding of *Culex* species.

The dynamics in mosquito population at the study area may be associated to the variation in rainfall pattern. The mosquito population increased at the onset of rain and fell during heavy rainfall. The moderate rainfall usually provide amble habitats for mosquitoes to thrive while the heavy rainfall usually wash away the larval habitats and cause mechanical damages to aquatic stages of the mosquitoes and consequently resulting in reduction in adult populations [12]. The high abundance of mosquitoes in un-netted habitats is expected due to the unrestricted access of the mosquitoes to the habitats. However, the factors that accounted for the equal number of mosquitoes in both habitats in April and June and lower number in un-netted houses in August could not be specifically explained in the present study but may be as a result of other environmental factors not known to the study.

The present study examines human habitations only once in a month for the period of six months running from March to August. While such a design allowed us to focus on the distribution and species composition in the house hold habitats, it had many limitations; first, we collected only indoor resting mosquitoes, while aquatic habitats that contain mosquito's larvae were not examined. Secondly, key environmental variables that could determine the occurrence and relative abundance of these mosquitoes were not determined, therefore, to better elucidate the associations between these mosquitoes species, further research must examine more of such variables, including analysis of water chemistry and the ecology of the mosquito species.

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