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# MOSQUITO AND OXYGEN- HYPOTHESIS (MOSQUITOES, WORLD'S MOST OXYGEN DEPENDENTS)

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**Abstract**— This research exposes us to the incredible survival of mosquitoes in an environment lacking oxygen. The mosquito depends a lot on oxygen for it's survival but if it is unable to obtain this, it develops other means of obtaining it. This paper tells us the potential of an individual to obtain diseases caused by the mosquito.

**Index Terms**— The mosquito is capable of obtaining oxygen from an environment lacking oxygen from substances such as the oxyhemoglobin and nectar.

## 1 INTRODUCTION

The mosquito is probably one of the insects which we would pay little attention to, however, I believe mosquitoes are one of man's major concerns if man is looking forward to reducing the spread of malaria, dengue fever, yellow fever and encephalitis which is due to the feeding habit in mosquitoes which cause hundreds of death everyday. Most scientists have studied these insects, whereas the world is growing everyday, there is a certainty that more discoveries would reveal itself as time goes by. And this is my little contribution.

From researches, I discovered that mosquitoes require oxygen more than any other insect. It has been discovered that male mosquitoes feed on nectar from flowers while reproducing females take in blood in order to provide protein for their eggs. Non-producing females rely also on nectar because they have no need for blood meal. I hereby do not contradict these facts but I would like to make some additions. My hypothesis is that mosquitoes cannot do without abundance of oxygen in their immediate environment. If this is not made available, the mosquito looks for other means of getting oxygen. An experiment could be conducted to prove that in the case of insufficient oxygen, the mosquito feeds more on blood, but actually requires the oxygen from oxyhemoglobin for its system's proper functioning while the rest of the blood is used for protein for its egg. For example, in an airtight tank where some female mosquitoes are kept (such as the Culistera melanura which feeds on birds most exclusively) if provided with a bird which is tied and obtains oxygen alone through an oxygen supply, it is observed that after some time, the mosquitoes begin to feed on the bird more frequently and longer than usual and this makes it keep alive longer. Whereas, a wasp kept in such a tank will be already dead within five minutes. This is an indication that oxygen derived from oxyhemoglobin helps to sustain the mosquito for a while until the mosquito can no longer hold on. The separation of oxygen from oxyhemoglobin, I would like to call "extraction". An enzyme should be responsible for this process and I would like to call the enzyme, "extracase".

Furthermore, when a male mosquito and a non-producing female mosquito is kept in that tank where they can neither obtain oxygen nor nectar, it is observed that some of the insects begin to adapt to their environment and start feeding on blood so as to obtain oxygen which is not made available normally. Those that fail to adapt, die in the process while most of them that adapt have longer life span which is determined by how much they strive to survive. Therefore, I am establishing the hypothesis that males and non-reproducing females rely on nectar but when conditions for obtaining nectar is made impossible, they can utilize oxyhemoglobin just as the reproducing females while the protein rather enriches their body. An experiment could be carried out on the nectar of hibiscus flower to find out if there is oxygen in it. The purpose is to prove that mosquitoes depend almost on oxygen all their lives. It will be observed that when the nectar is reacted with nitrogen (ii) oxide, brown fumes of nitrogen (IV) oxide is formed. This is an indication that nectar contains dissolved oxygen which male mosquitoes and non-reproducing females extract in order to obtain oxygen and the rest enriching its body. The mosquito is also able to recognize blood meal at about 75ft away when it perceives carbon (IV) oxide.

It has been observed that excess insulin in the blood aids the mosquito especially the females in the provision of protein for the eggs. Insulin also increases pathogenic development and is an important mediator of both the mitogen-activated protein kinase and phosphalidylinositol 3-kinase/Akt signaling branches of the 'mosquito insulin signaling cascade'. To throw more light on the nature of mosquitoes incredible need for oxygen, it is found out that the duration and openings of the spiracles of Aedes aegypti and Aedes triseriatus increases in a decrease of oxygen and this had no effect on frequency of spiracles opening when exposed to high level of oxygen, but the duration of the opening of the spiracles reduces. Mosquitoes, therefore, obtain some of their oxygen from what they take in, such as blood meal and nectar.

## MOSQUITO PATHOGENIC INFECTION FREQUENCY (mpif)

This is the ability whereby a pathogen (such as the malarial causing protozoan-Plasmodium spp.) transmittable by mosquito is able to survive and reproduce effectively in one's system. The frequency increases with an increase in insulin and also inversely with an increase in oxygen. It is given by the equation:

MPIF = Amount of insulin in percentage/ {(population of mosquitoes-number of mosquito bites) × amount of oxygen( in percentage)}

It determines the possibility of an individual to be ill as a result of a bite from a mosquito. Its S.I. unit (Internationalé systeme des unies) is Ivan (I). A person with a very high MPIF is liable to be very ill. Most people suffering from the oversecretion of insulin from the beta cells are most liable to be ill as a result of high insulin content in their blood that encourages pathogenic development. A person with average MPIF might not be ill if there is a strong immune system.

## CONCLUSION

The mosquito is very unique among other insects because it's body is capable of adapting to the conditions provided by it's unfavourable weather, i.e lack of ovygen, by extracting oxygen from oxyhemoglobin or nectar as the case may be in order to survive in such environment.

MPIF = Amount of insulin in percentage/ {(population of mosquitoes-number of mosquito bites)× amount of oxygen( in percentage)}