Anopheles breeding sites in the river bank pools during summer season in 2019

Dr. Eltayeb Idris Omer[1]

المستخلص

أجريت هذه الدراسة الوصفية في محلية الخرطوم لتوضيح دور برك شاطئ النيل في خلق أماكن توالد بعوض الأنوفليس في فصل الصيف في فترة ثلاث أشهر , مارس ,أبريل و مايو للعام 2019 . البيانات المستخدمة في الدراسة هي من تقارير مكتب مكافحة الملاريا بالمحلية حيث تم تحليلها بواسطة برنامج الكمبيوتر حيث بينت الدراسة أن برك شاطئ النيل هي أكثر أماكن لتوالد بعوض الأنوفلس في فصل الصيف بمتوسط نسبة 73.2% من مجموع أماكن توالد بعوض الأنوفلس بالمحلية. وهذا يعبر مهما في تحديد أماكن توالد بعوض الانوفلس لبرنامج مكافحة الملاريا بالتركيز عليها خلال هذا الفصل من العام

Abstract

This is a rhetorical/critical study of Badi' al-Zaman al-Hamadhani'sMakamat .It aims at elucidating the different artifices of ornamentation and embellishment included in al-Hamadhani'sMakamat and explaining the basic aspects which are characteristically in common with the Makama art such as the style, language,purposes and others . Likewise it aimed at highlighting the main literary and artistic characteristics of al-Hamadhan'sMakamat. The study also investigated the extent of the linkage of Makamat with the rhetorical ornaments and the varied literal embellishments.

This study found that al-Makamat art is an all-inclusive one bringing together most of the varied literary genres ,as it combined between prose, verse ,the story and others .,The study

[*] **Delta College for science and technology- medicine and general surgery program –community medicine department**

also concluded that the science of the figures of speech is of extensive fields and manifold sections and hence it is difficult to enumerate or monitor it .

.1 Introduction

There are currently more than 3,000 mosquito species in the world grouped in 39 genera and 135 subgenera (Clements 1992, Reinert 2000, 2001). Malaria is transmitted among humans by female mosquitoes of the genus Anopheles. Female mosquitoes take blood meals to carry out egg production, and such blood meals are the link between the human and the mosquito hosts in the parasite life cycle. The successful development of the malaria parasite in the mosquito (from the "gametocyte" stage to the "sporozoite" stage) depends on several factors. The most important is ambient temperature and humidity (higher temperatures accelerate the parasite growth in the mosquito) and whether the Anopheles survives long enough to allow the parasite to complete its cycle in the mosquito host ("sporogonic" or "extrinsic" cycle, duration 10 to 18 days). Differently from the human host, the mosquito host does not suffer noticeably from the presence of the parasites .

The epidemiological profiles of vector-borne diseases, such as malaria, are strongly associated with environmental conditions. An understanding of the effect of the climate on the occurrence of malaria may provide indirect insight into the anopheles mosquito vectors endemic to a particular region. (Asarco, C., Hanf, M., Han-Sze, R. et al,2011(

Malaria may be seen as the combination of a Plasmodium, an Anopheles mosquito, and a human host. Factors modifying the presence, survival, or abundance of any one of these actors are likely to favour the maintenance or breaking of the parasite cycle. Environmental conditions are among the factors likely to affect this parasite cycle. The temperature of the water collecting in

hollows, the presence of vegetation or predators and altitude may all favour Anopheles mosquitoes or limit their development within a given geographic zone. (Tangad MC, 2010(

Life Stages

Like all mosquitoes, anophelines go through four stages in their life cycle: egg, larva, pupa, and adult. The first three stages are aquatic and last 5-14 days, depending on the species and the ambient temperature. The adult stage is when the female Anopheles mosquito acts as malaria vector. The adult females can live up to a month (or more in captivity) but most probably do not live more than 1-2 weeks in nature.

Eggs

Adult females lay 50-200 eggs per oviposition. Eggs are laid singly directly on water and are unique in having floats on either side. Eggs are not resistant to drying and hatch within 2-3 days, although hatching may take up to 2-3 weeks in colder climates.

Larvae

Mosquito larvae have a well-developed head with mouth brushes used for feeding, a large thorax, and a segmented abdomen. They have no legs. In contrast to other mosquitoes, Anopheles larvae lack a respiratory siphon and for this reason position themselves so that their body is parallel to the surface of the water. Larvae breathe through spiracles located on the 8th abdominal segment and therefore must come to the surface frequently.

The larvae spend most of their time feeding on algae, bacteria, and other microorganisms in the surface micro layer. They dive below the surface only when disturbed. Larvae swim either by jerky movements of the entire body or through propulsion with the mouth brushes. Larvae develop through 4 stages, or instars, after which they metamorphose into pupae. At the end of each instars, the larvae molt, shedding their exoskeleton, or skin, to allow for further growth. (CDC, 2015)

.2Materials and methods

A descriptive study to comparing number of breeding sides of anopheles mosquitoes in River Nile banks pools with other nine items, sewerage system. Water bowls, ice shop, bricks ambush, animals barn, farms, pools, homes and others, which included in malaria control program in summer season three months (march, April and may) 2019 Data collected from the records in the Khartoum locality for malaria control, which daily activities, by teams who are covered the all locality in week, every day covered area called ' cycle' and 5 cycles covered weekly ' called sector' and collected reports, daily, weekly, and monthly .

Study area

Al-Khartoum Locality

This starts from the Mugran (or Almogran), the confluence of the Blue Nile and White Nile, and extends southward between them to the boundaries of Gezira state. The block is characterized by Sundus and Soba agricultural schemes in both the Gabal Owlia and Khartoum localities, along with a three major drinking water plants, the main in Almogran and other plant in Alshagarah and Soba to supply the locality .

.3 Results and discussions

Figure 1: Number of Anopheles mosquitoes breeding sites in others items except River bank pools in summer season 2019 at Khartoum locality.

All breeding sites of anopheles mosquitoes find in many poling as deferent places, in Khartoum locality program mentioned for ten categories River bank pools one of them, and the all nine items have a low share in anopheles breeding sites from all breeding sites, in this season (summer ,(

Figure 2: Number of Anopheles mosquitoes breeding sites in River bank pools in summer season 2019 at Khartoum locality .

In this figure the river banks pools are high breeding sites in March and gradually reduce to May due to environmental factors as temperature, and in this dry season another breeding sites are few comparison with rainy season and winter, which river is flood. In summer season a suitable breeding of anopheles mosquitoes the river banks, because it is a good environment a humidity and temperature.

Table 1: percentage of Anopheles mosquitoes breeding sites in River bank pools and other items in summer season 2019 at Khartoum locality

percent	total	percent	may	percent	April	percent
march	breeding					
%26.80	103	%15	12	%6..21	25	%35.10
66	others					
%73.20	281	%85	68	%78.40	91	%64.90
122	banks					
%100.00	384	%100	80	%100	116	%100 188 total

Despite of a low breeding sites in May than others months as total 80 the target river bank pools breeding sites is the highest percentage (85%), showed the breeding of anopheles percentage in April higher than March, (table- 1), in my opinion the summer season is the weak point of mosquito cycle, because the environmental factor such as high temperature and dry weather for that it is the easy and cheep intervention of control more than other seasons.

.4 Conclusion

A better understanding of the ecology of the anopheles mosquitoes endemic to the environment should make it possible to concentrate human and material resources more effectively in vector control programmes. In the absence of entomological and behavioral data, analyses of the incidence of malaria over time has provided information about the transmission of malaria in the summer season, and this information may be useful for the prevention and control of the future.

5 .References

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