

Distribution and Classification of Anopheles Mosquitoes Larvae in Aseer region, Kingdom of Saudi Arabia



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ABSTRACT

The study of Prevalence and classification of Anopheline mosquitoes larvae (*Diptera: Culicidae*) was carried out in 8 sites in Aseer region , Saudi Arabia (Seryan, Baeid, Dalae, Almufajir, A racan Aleulyaniu, Eihlali alawset, Raida and Ramlan) Twice entomological survey per month were conducted in each study sites. survey undertaken from May 2017- June 2017, the larva species was carry out in vector control laboratory to identify the different species of Anopheles larvae in Aseer region by standard identification keys. 431 larvae were collected from eight breeding sites. Four species were identified: *An. thali*, *An. sergenti*, *An. arabiensis*, and *An. multicolor*. *An. Dthali*.. The *An. arabiensis* was more prevalent in the Dalae area, and *An. Sergenti* was more prevalent in the Ramlan area. More studies on distribution and classification are required before embarking control measures.

Key words: Mosquito, Anopheles, larvae, Breeding site, Aseer region.

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I. INTRODUCTION

Mosquitoes are important vectors of several tropical diseases, including malaria, filariasis, and numerous viral diseases, such as dengue Japanese encephalitis and yellow fever [1]. All mosquitoes require water to complete their life cycle, (eggs, larva, pupa, and adult) [1]. Anopheles mosquito's larvae breed in natural water collections, (Bottles, tins, tender coconut shells, buckets, tyres, ponds, water tanks, paddy fields etc) [1]

Mosquito larvae are legless and having an enlarged thorax that is wider than both the head and the abdomen. There are four active larval instars [2]. Only mosquitoes of the genus Anopheles transmit the parasites causing human malaria [2]. The parasites are transmitted from person to person by Anophelines mosquitoes [3]. Malaria is one of the most serious health threats at national and international levels and is responsible for more than one million deaths annually among 3.2 billion people living in 107 countries [4]. Today, 34 countries, including the Kingdom of Saudi Arabia, are actively attempting to eliminate malaria [5]. In Saudi Arabia, malaria persists in the provinces of Aseer and Jazan both bordering the Republic of Yemen [6]. Although malaria is endemic to southwestern Saudi Arabia, the number of indigenous malaria cases fell from 467 in 2006 to 58 cases in 2009, with a reduction of 88% [7].

Distribution of mosquitoes (*Diptera: Culicidae*) in Saudi Arabia has been investigated by many workers [8] studied the distribution of mosquito larvae in the Arabian Peninsula and recorded 46 species and subspecies. In the Eastern Region of Saudi Arabia, [9] collected many species of Anopheles mosquitoes.

II. MATERIALS AND METHODS

Cross sectional Entomological survey study was conducted from May 2017 to June 2017 in Aseer Region. Aseer Region located in the southwest in Saudi Arabia sharing a short border with Yemen. It has an area of 81,000 km², mountain, highlands, lowland, two rainy seasons and low-level temperatures [10].

The study included a total of eight study sites in two localities in Aseer region these sites are (Seryan, Baeid, Dalae, Almufajir, A racan Aleulyaniu, Eihlali alawset, Raida and Ramlan), WHO standard scoop was used in each site to collected Anopheles mosquito larvae. Then larvae was carry out to laboratory of vector control center, the different species of Anopheles larvae were identify by standard identification keys [7 &11] and insectary microscope. The natural characteristics of the breeding water valley were recorded as present or absent, included: algae, heat, aquatic vegetation, shade, turbidity due suspended particles and movement. The inspection team was informed vector control administration about existence of any breeding site to carry out the control measures , we take permission from vector control center to collected and classification larva in lab.

The frequency of occurrence (%) of each reported species related to the presence or absence of such characters were examined and analyzed by SPSS 22 software for analysis

III. STATISTICAL ANALYSIS and GRAPHICAL PRESENTATION

Results

Collected *Anopheles* Larvae in Aseer Region

A total of 431 of *Anopheles* larvae belonged to four species were collected (*Anopheles dtali*), (*Anopheles sergenti*), (*Anopheles multicolor*) (*Anopheles arabiensis*) table (1)

Anopheles dtali was the most abundant species 364 (84.45%), followed by *Anopheles sergenti* 37 (8.58 %), *Anopheles multicolor* 25 (5.8 %), and *Anopheles arabiensis* 5 (1.16 %) showing in table (1).

The number of *Anopheles* larvae varied among surveyed site. Half number of *Anopheles* larvae was reported in Dalae site 213 (50%) belonged to two species *Anopheles dtali* spp were the most abundant 209 (98.12 %) followed by *Anopheles arabiensis* spp 4 (1.8 %) showing in table (1)

In Almufajir site the surveyors was collected 43 (14%) *Anopheles* larvae belonged to *Anopheles dtali* spp table (1) followed by Arcane aleulyaniu site 57An. Larvae belonged to *Anopheles dtali* spp were identified.

In the study site Raida 62 (14.4 %) of anopheles larvae were identified and *Anopheles sergenti* spp were the most abundant followed by *Anopheles multicolor* app 25(5.8%)

The few number of *Anopheles dtali* species were found in the Eihlali alawsat site14 (3.3%) and in Ramlan site two species were identified belonged to *Anopheles dtali* spp 7 (87.5%) and 1 (12.5%) *Anopheles arabiensis* spp show Table (1) Only one study site named Baeid the surveyors did not report any *Anopheles* larvae species.

Table (1) Distribution of *Anopheles* larvae species collected from all visited site in Aseer region, Saudi Arabia.

Visited area	<i>An. Arabiensis</i>	<i>An. Sergenti</i>	<i>An. Dthali</i>	<i>An. Multicolor</i>	Total
Seryan	0	0	34	0	34(7.9%)
Baeid	0	0	0	0	0
Dalae	4	0	209	0	213(50%)
Almufajir	0	0	43	0	43(10%)
Arcane aleulyaniu	0	0	57	0	57(13%)
Eihlali alawsat	0	0	14	0	14(3.3%)
Raida	0	37	0	25	62(14.4%)
Ramlan	1	0	7	0	8(1.9%)
Total	5(1.16 %)	37(8.58 %)	364(84.5%)	25 (5.8 %)	431(100%)

Table 2 : Distribution of larvae species by type of breeding site and positive unit percent , in Aseer region , Saudi Arabia during study period.

Collection site	Larva species	Type of breeding site	Number of unit		Positive unit %
			examined	positive	
Seryan	<i>An. Dthali</i>	Stagnant	15	3	20 %
Baeid	0	Valley	27	0	0%
Dalaee	<i>An. Dthali</i>	water valley	24	2	8.3 %
	<i>An. Dthali + An. Arabiensis</i>	water valley	36	5	13.9 %
Almufajir	<i>An. Dthali</i>	water valley	10	1	10 %
	<i>An. Dthali</i>	Valley	10	1	10 %
Arcane aleulyaniu	<i>An. Dthali</i>	water valley	28	2	7.1 %
Eihlali alawsat	<i>An. Dthali</i>	water valley	17	3	17.6 %
Raida	<i>An. Sergenti &An. Multicolor</i>	Baskets	5	2	40 %
Ramlan	<i>An. Arabiensis &An. Dthali</i>	Valley	47	6	12.7 %

Figure 1 Distribution of breeding site for Anopheles larva in Aseer region , Saudi Arabia during study period .

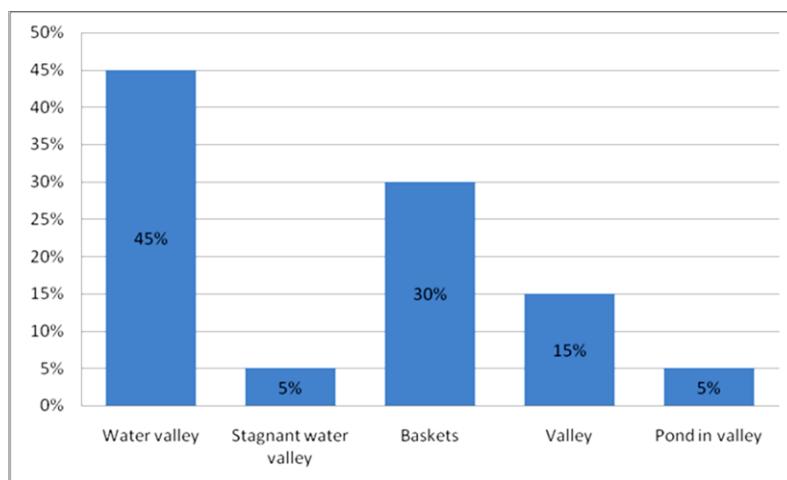
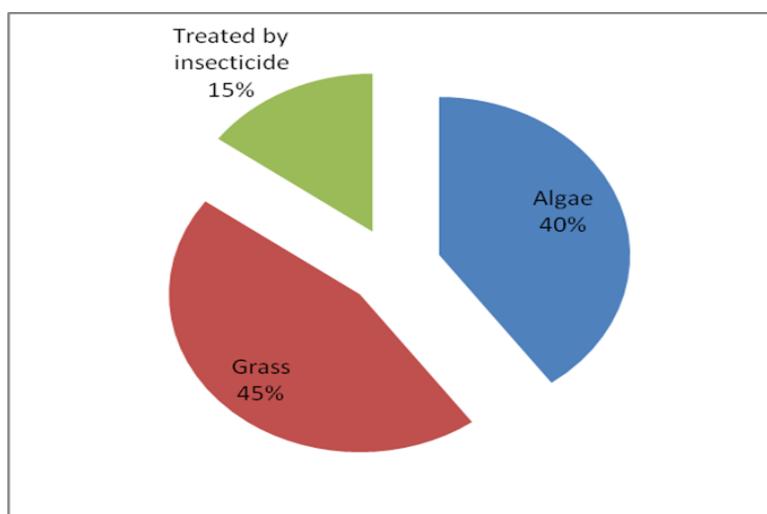


Figure 2 Description of larva breeding habitats in Aseer region, Saudi Arabia during study period



IV. DISCUSSION

In this study 431 of Anopheles larvae belonged to four species *Anopheles arabiensis*, *Anopheles dthali*, *Anopheles multicolor* and *Anopheles sergenti* (**Table 1 & 2**). were reported in eight site in aser region, which *Anopheles dthali* was the most abundant species followed by *Anopheles sergenti*, small proportion of *Anopheles multicolor* and *Anopheles arabiensis*.

Similar result was obtained by Abdoon and Alsharani (2003), A total of 7085 larval Anopheles spp were collected, *An. dthali* was common (40%), The number of larvae more due to that these sites were surveyed for long periods from June 1999-April 2001

Our study reported *An. arabiensis* and *An. sergenti* in small proportion and known as a vector of malaria in the aser region, Whereas *An. arabiensis* was more prevalent in the Dalae site and *An. Sergenti* was more prevalent in the Ramlan site. The wide spreading of *Anopheles* larvae may be due to the immature stages occur in a great variety of water bodies, of which the most important are small, shallow, completely or partially exposed to sunlight [8]. The *An. Dthali* species occurred in most sites in agreement with the findings Abdoon and Alshahrani (2003) in Asir and of Al Ahmad et al. (2011) in Abha. In Seryan and Dalae site there is no maintenance and treated in the valley 7.9% *An. Dthali* spp were collected. In the study site Baeid no anopheles larvae were identified because water valley treated by pesticide. The Prevalence of anopheles larvae in the Dalae and Almufajir regions are very high, there is no maintenance in the valley so were found high density of grass and algae.

Our study reported low Prevalence of anopheles larvae in the Arcane aleulyaniu, Eihlali alawsat, Raida and Ramlan respectively, the water valley and Baskets was clean, there are a few algae. Similar result was obtained by Abdoon and Alsharani (2003).

According to the literature Anopheles mosquitoes in general breed in clean and oxygenated water., in this study all species preferred water vally except *Sergenti & An. Multicolor* spp, Few Anopheles mosquitoes preferred stagnant water while other study in conducted Riyadh region found more species collected from stagnant water [12,13]. In this study the habitat of Anopheles larvae its differ, the most species preferred grass followed by alga while the few of them reported in treated insecticide,

V. CONCLUSION AND RECOMMENDATION

This entomological survey showed 431 of Anopheles larvae were collected. And four species (Anopheles arabiensis, Anopheles dthali, Anopheles multicolor and Anopheles sergenti) of Anopheles larvae were found in eight sites. The, *An. dthali* occurred in all sites and was the most abundant species (84.45 %).The majority Prevalence of anopheles larvae were collected from Dalae and Almufajir area .The study recommends proper environmental management through maintenance valleys to prevent algae and grass., drying the water in the valley and Regular surveillance to monitor the buildup of larval populations in the area in order to reduce disease transmission.

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