

RRST-Zoology

# Density of Urban Malaria Vector *An. stephansi* in Parbhani, (M. S.) India

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Article Info	Abstract
<b>Article History</b> Received : 16-02-2011 Revised : 22-03-2011 Accepted : 22-03-2011	In arthropods mosquito play a vital role as vector of many deadly diseases and <i>Anopheles stephansi</i> is main urban malaria vector parasite in India except North-East region. Recent paper deals with the study of density and distribution of <i>An. stephansi</i> from Parbhani urban. The result shows that the <i>An. Stephansi</i> abundantly found in Sinchan Nagar i. e. 46.28 % and few percent in Pardeshwar Colony (Mandir) locality i. e. 09.25%. Average of <i>An. Stephansi</i> density in Parbhani urban is 27.91% of total anopheline population. Study area also shows very poor awareness about mosquito and mosquito born diseases. These results necessitate further epidemiological surveillance and implicate regular strict monitoring of <i>An. Stephansi</i> in Parbhani to overrule the possibility of <i>An. Stephansi</i> establishment in study area.
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**Key Words:** *An. Stephansi*, Density, Parbhani and Monitoring

## Introduction

Climate change, infrastructural disabilities and availability of breeding beds result in surveillance of mosquitoes [10, 4, 11], it provides favorable condition for mosquito distribution and density, and it is main cause for spreading and outbreak of infectious disease like Malaria, Chikungunia and Dengue. Malaria is caused by some female species of *Anopheles* mosquitoes.

Vector born disease is one of the leading causes of sickness. It is reemerging as the number one infectious killer and it is the number one priority tropical disease (WHO- 2002). WHO reported 300 – 500 million people suffered in Africa and South Sahara and 1.1 to 2.7 million people is killed because of it. Epidemiological scenario of malaria differs from state to state and region to region in India [5]. India contributes 1282 deaths of world's scenario, including 7.12% death from Maharashtra of Indian scenario [17]. Now Marathwada region as well as Maharashtra is endemic for mosquito disease Anurag Bharagav [1]. There is also report on increase in the proportion of *P. falciparum* malaria cases from central India [5].

Now a day's number of government institution and workers are involved in control of mosquito and mosquito born disease strategy, but till today we fail to control outbreak of Malaria, Dengue and Chikungunia because of failure of vector control. In India including Maharashtra four states have reemerged with Chikungunia and spend billion rupees to recover it in 2005 – 06. It affect not only on economy but also development and farming practices in rural area. According to WHO tropical countries are facing 30 new emerged diseases since last three decades. In the urban Maharashtra *An. stephansi* is the main vector responsible for transmission of

malaria to human beings. Hence here is the need to the monitoring of malaria vector, malarial infection and climate change. There is no documentation till date from Parbhani related to *An. stephansi* and other mosquito vector.

## Methodology

The study was carried out in Parbhani from June – Nov 2007. Both larvae and adult mosquitoes were collected from 19 localities which covers whole urban area. Overall random sample of Mosquito and mosquito larvae were collected in six months of 2008 from the study area. Collections of mosquito were carried out indoor as well as outdoor by aspirator and Net method WHO [15]. For larvae dipping method is used and the sample was carried out immediately to laboratory for identification and fixed in insect preservative. Each locality was sampled at least once in each month.

Identification of adult and larvae were carried out with the help of Identification key [2, 8] for *An. stephansi* we used also electronic key developed by NIMR Delhi.

## Study Area

Parbhani is one of the eight districts in the Marathwada region of central India. Parbhani city is district head quarter. It lies between 18°59'42" and 20°15' north Latitudes and 76°13' and 73°39' East Longitude [18]. It is well connected with rail and road transport systems with Andhra Pradesh and Karnataka. Parbhani is also known as a store of Jawar in Marathwada [19]. The maximum temperature of Parbhani is 42.6 °C and minimum 10.6 °C. The average rainfall is 957.2 mm.

Table 1. Mosquito born disease cases and death in the Maharashtra.

Disease	2008			2009		
	S	C	D	S	C	D
Dengue	---	743	22	---	385	02
Chikungunia	853	238	--	291	19	--
	C	Pf	D	C	Pf	D
Malaria	67321	22238	164	55234	10682	106

Source: NVBDCP India

(S- Suspected Cases; C- Confirmed Cases; Pf- *Plasmodium falciparum*; D- Death due to disease:)

## Result and Discussion

Worldwide urbanization, industrialization and deforestation are growing phenomenon. It shows adverse affect on climate change [3, 11, 10,9]. Globally in the last three decades number of mosquito born diseases reemerged and resulted number of deaths WHO, [11]. In that phenomenon malaria is leading mosquito born disease in tropical and subtropical countries. It is also a burning problem of developing countries, only malaria kills a child every 40 second globally. According to WHO 300-500 million people in Africa and South Sahara between 1.1 to 2.7 million people are killed either with malaria or in contribution with other disease Vinod Joshi *et al.*, [14]. In India malaria is common killer in Kolkata [6], North East region [8], Orissa [12] but now it is widely spread in all the states of India. The year 2008 and 2009 recorded 4500 cases with 935 and 754 deaths respectively [20]. Simultaneously Maharashtra contributes 164 and 106 deaths on NVDBP web. Except north East region all over India *An. stephansi* is main urban malaria vector, keeping these in view the present entomological survey is conducted during 2008 in Parbhani (M. S.) India. Marathwada region has poor health, transport and irrigation facilities. Parbhani is adjoining district of

two geographical region i. e. Marathwad and Vidharba. Parbhani is well known place for education and agricultural development due to its well irrigation. The scenario of Parbhani urban shows that there is no proper development of city, low sanitation facilities, poor road constructions and sewage mismanagement. It gives abundant breeding sites for mosquito. Particularly in monsoon and post monsoon season, there is more chance to abundant survivals of *An. stephansi* in Parbhani because of abundant breeding beds. This survey and monitoring work was carried out in 19 localities with repeated visit to same collection sites. These spots were chosen from the view of residential, educational and public places. Here there were more chances of the transmission of mosquito born diseases. The density study of *An. stephansi* shows 46.25 % in Sinchan Nagar area and poorly recorded from 9.65 % in Pardeshwar Mandir (Colony) area. Study area shows 27.91 % population density of *An. stephansi* during study time. Area wise distribution and density of *An. stephansi* are tabulated in table No. 2 of results and discussion. It shows 22.46 in June, 18.42 in July, 34.68 in August, 28.95 in September, 29.92 in October and 32.85 percentages in November.

Table 2. Density of Anopheles stephansi at different localities in Parbhani.

Sr. No.	Location	Month of 2007						Total
		June	July	August	September	October	November	
01	Kalika Mata Mandir	42.85	37.50	40.00	40.00	38.88	60.00	43.20
02	Khandoba Bazar	50.98	19.23	32.00	18.42	25.71	44.00	31.72
03	Ambedkar Colony	33.33	---	12.50	25.62	11.76	33.33	20.09
04	In and around Bus stand	28.83	14.75	13.33	25.00	14.89	20.45	19.54
05	In and around railway station	15.09	06.15	23.52	14.75	16.66	21.15	16.18
06	Agriculture University	29.50	28.09	24.48	32.25	39.28	26.08	29.94
07	Civil Hospital area	53.33	24.44	25.00	44.44	42.85	66.66	42.78
08	Swami Samarth Mandir Area	----	22.22	67.74	55.17	44.00	33.39	37.07
09	Sinchan Nagar	53.57	----	100	53.12	40.00	31.03	<b>46.28</b>
10	Parabhavati School campus	26.08	40.38	----	----	40.00	27.77	22.37
11	Bhaji Mandi area	----	42.46	52.83	34.42	39.65	32.72	33.68
12	Talreja Cinema hall	----	43.54	34.48	30.76	34.28	32.14	29.20
13	Rajgopalachari Garden / Park	20.00	21.48	20.48	25.42	18.18	30.00	22.59
14	Jintur road	----	42.46	52.83	34.42	39.45	32.72	33.68
15	Ramabai Nagar	10.00	----	18.18	10.00	21.87	09.67	11.62

16	Shantiniketan Nagar	33.33	----	42.85	26.47	30.00	29.62	27.04
17	Pardeshwar Coloney	07.89	07.27	14.18	----	07.14	21.14	09.65
18	Khan area	----	----	37.50	26.86	17.24	26.19	17.96
19	Mahadev Mandir area	21.87	----	47.05	52.94	46.66	46.15	35.77
Total Population Density		22.46	18.42	34.68	28.95	29.92	32.85	27.91

(Value expressed in percent)

These results necessitate further epidemiological surveillance and implicate regular strict monitoring of *An. stephansi* to overrule of possibility of *An. stephansi* establishment in Parbhani.

Simultaneously a survey was carried out regarding mosquito knowledge in people from same area. We found that only 29.44% people were aware about mosquito and mosquito born diseases. They take care about mosquito biting using repellent and coils.

### Finding and Conclusion

1. Infrastructural disabilities like poor quality road construction, unplanned urbanization and mismanagement provides breeding beds in monsoon and post monsoon season.

2. There is lack of awareness in society.

3. Average density of *An. stephansi* were 27.91% from the study area.

4. Definitely in future it will be a big problem for urban people of Marathwada.

5. It affects not only economically but also socially as well as forming of Marathwada.

6. It is a serious phenomenon regarding health of people. In future it will take outbreaks of Malaria.

7. There is a need time to time monitoring of malaria vectors from Parbhani.

8. Our study reveals the relation between vector and malaria as well as climate change.

9. We showed create awareness among the people. It can help to control mosquito and mosquito born mosquito born diseases.

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