Density of Urban Malaria Vector An. stephansi in Parbhani, (M. S.)
India
Laxmikant V. Shinde¹* and Hema Makne²
¹Department of Zoology, J. E. S. College Jalna (M. S.) - 431 203
²Department of Zoology, B. Raghunath College Parbhani (M. S.); India

Abstract
In arthropods mosquito play a vital role as vector of many deadly diseases and Anopheles stephansi is main urban malaria vector parasite in India except North-East region. Recent paper deals with the study of density and distribution of An. stephansi from Parbhani urban. The result shows that the An. Stephansi abundantly found in Sinchan Nagar i.e. 46.28 % and few percent in Pardeshwar Colony (Mandir) locality i.e. 09.25%. Average of An. Stephansi 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 An. Stephansi in Parbhani to overrule the possibility of An. Stephansi establishment in study area.

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 become 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 18º59’42” and 20º15’ north Latitudes and 76º13’ and 73º39’ 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 ºC and minimum 10.6 ºC. The average rainfall is 957.2 mm.
Table 1. Mosquito born disease cases and death in the Maharashtra.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue</td>
<td>---</td>
<td>743</td>
<td>22</td>
<td>---</td>
<td>385</td>
<td>02</td>
</tr>
<tr>
<td>Chikungunia</td>
<td>853</td>
<td>238</td>
<td>--</td>
<td>291</td>
<td>19</td>
<td>--</td>
</tr>
<tr>
<td>Malaria</td>
<td>673</td>
<td>222</td>
<td>164</td>
<td>552</td>
<td>106</td>
<td>106</td>
</tr>
</tbody>
</table>

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 [9], 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.

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