

# SITUATION ANALYSIS OF MOSQUITO BORNE DISEASES IN PALWAL, HARYANA

**Omvir Singh Chechi,**

*Department of Zoology,  
Research and development centre Bharthiar,  
University Coimbatore  
TN-641046*

**Arvind Kumar,**

*PG Department of Zoology, Janta Vedic College  
Baraut, Baghpat*

## INTRODUCTION

Mosquitoes continue to pose major public health problems not only in India but in many tropical and subtropical countries around the globe. Besides many diseases transmitted by mosquitoes, malaria alone affects 36% of the world population in 97 tropical and subtropical countries. In 2014 alone, 3.3 billion people were at risk of malaria around the world (WHO 2015) causing 2.7 million deaths annually. In 1935 it was estimated that 100 million deaths occurred by malaria alone in India. Just after independence around 22.8% of Indian population suffered by malaria alone, leave aside other mosquito borne diseases. According to the Hates foundation, approximately 725000 people were killed by mosquito borne diseases in 2015 around the globe. In Haryana also, rampant development in the adjoining districts of Delhi have resulted in the development of suitable breeding grounds for mosquitoes, thereby increasing the frequency of mosquito borne diseases with each passing year. In the last five years, the number of malaria cases in Haryana has ranged from 18921 to 47077. For the last several years, other diseases like chickungunya and JE have also shown their presence in Haryana and are increasing by every passing year. In Haryana 1500 volunteers were engaged by the government to assess the seasonal breeding checking of

mosquito. A sum of Rs 175 crores were allocated for this purpose alone in the state.

## MATERIAL AND METHODS

District Palwal is one of the 21 districts of Haryana situated on Delhi Agra highway and is around 60 km from Delhi. The demography of the district is changing rapidly with growing population due to immigration, proximity and easy approach to Delhi. The district has broken parts of Aravalli range giving it the uneven terrain. The rapidly growing industries and real estate business in the district and its adjoining areas have resulted in the emergence of infectious diseases and zoonosis.

In the present study the data were collected from various government agencies and reports. The study is wholly based on the cases reported to the government agencies. There were four study areas namely Aurangabad, Hodal, Hathin, Dadhole and Palwal itself.

## RESULTS AND DISCUSSION

The data have been collected for several mosquito borne diseases but it was found that malaria was the predominant disease in the study area. Not much and concrete data could be available for other disease.

## The reported cases of Malaria in Palwal district during 2015 and 2016

Study area	2015					2016					Average
	BSC	BSE	Pv	Pf	Total	BSC	BSE	Pv	Pf	Total	
<b>GH Palwal</b>	14172	14172	1	0	1	19319	19319	8	0	8	4.5
<b>Aurangabad</b>	6938	6938	21	0	21	7692	7692	19	0	19	20
<b>Hodal</b>	11743	11743	68	0	68	14361	14361	150	0	150	109
<b>Hathin</b>	28821	28821	303	3	306	34133	34133	301	5	306	306
<b>Dudhole</b>	26612	26612	9	2	11	23501	23501	26	0	26	18.5
<b>Total</b>	88286	88286	402	5	407	99006	99006	504	5	509	458

The data show that out of the 407 cases of malaria reported from district during 2015, 402 cases belonged to *Plasmodium vivax* only leaving a little space to *Plasmodium falciparum*. The *Plasmodium vivax* cases were 98.77% while *Plasmodium falciparum* cases were 1.23% only. These data were recorded as 504 and 5 cases during 2016. During this year, a total of 509 cases of malaria were reported. As far as *Plasmodium falciparum* is concerned, it is restricted to Hathia and Dudhole only. However in 2016 Dudhole also did not report any case of *Plasmodium falciparum*. The maximum case of *Plasmodium vivax* was recorded in Hathia as 303 during 2015 and 301 during 2016. The Hodal reported as 68 and 105 cases during 2015 and 2016 respectively.

The study is analytical based on the reports submitted by various departments to the state and central government. The data were collected directly from dispensaries and primary health centres. In a similar study conducted by Naz et al, *Plasmodium vivax* infected cases were found to be 73.9% and *Plasmodium falciparum* 24.6%. Frequency of *P. Vivax* (73.9%) cases was remarkably high. While in a study conducted by Jamaiah et al., (2006) found that *Plasmodium falciparum* was the most common species (57%) followed by *Plasmodium vivax* (38%) and 5% were found by mixed infections. Various studies from different geographical areas have reported different patterns of mosquito borne

diseases in India. In some studies, more cases of *Plasmodium vivax* were reported while in others *Plasmodium falciparum* was the predominant infective agent. Madhu Muddaiah et al., in their study on malaria in South Canara, Karnataka states revealed that *Plasmodium vivax* constituted as highest; 52.54%, *Plasmodium falciparum* as 33.75% and mixed malarial infection was 13.69% (Muddaiah M et al., 2006). Swetha et al., reported in their study 95.83% cases of *Plasmodium vivax* 4.13% cases of *Plasmodium falciparum* (Swetha et al., 2015). The other studies conducted in different states of India in this regard also second the dominance of *Plasmodium vivax*. In others like Gauravi Mishra in her study of malaria in Ratnagiri district, reported that 59.09% of infection was due to *Plasmodium falciparum*. (Gauravi et al., 2003). Nadjm et al., in their study on 'Malaria an update for physicians' also supported that more infections happens due to *Plasmodium falciparum* because *Plasmodium falciparum* constituted 75% of infection while *Plasmodium vivax* occupied only 20% of infection (Nadjm et al., 2012).

In the adjoining regions of the study area *Plasmodium vivax* was reported as the most common parasite to cause malaria. Malaria was found to be most common in males than females. The age group factor has not been considered in this study but various other studies in this regard have shown 21 -30 years age group as the most suitable

infected group. Water stagnation & accumulation in rainy season plays an important role in mosquito breeding and subsequent spread of mosquito borne diseases. Poor sanitation in lower socioeconomic classes also results in maximum number of mosquito borne diseases.

The human behavioral pattern is also a major epidemiological factor that affects the transmission and progression of zoonoses. Important aspect for reducing the burden of morbidity and mortality by mosquito borne diseases includes more sensitive diagnostic tools and effective use of therapeutic drugs and improved personnel and community protection and mosquito control measures. In order to monitor the transmission of mosquito borne diseases and for their eradication strategies, in depth epidemiological knowledge of diseases are essential. There should be some policy and practice guidelines towards the factors that help in reducing the transmission of such diseases.

With help of our study on situation of mosquito borne diseases and their pattern, an awareness should be created at health sector, municipal corporation, Panchayat and at each individual level to take precautionary action specially in monsoon season to prevent stagnation of water in neighbourhood. Government authority should find out the possible breeding grounds of mosquitoes, slum areas, open drainage system etc. which have to be cleaned regularly and water accumulation and stagnation should be prevented in order to prevent mosquito breeding. Individual awareness can create a miracle to stop transmission of mosquito borne diseases. Active vector control programs of regular training, workshops and proper diagnosis and treatment should be encouraged to prevent the infection

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