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Full Length Article

Distribution *of Aedes aegypti* and *Aedes albopictus* from Jalna District (MS) India

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ABSTRACT

The present study was under taken in six tehsil of Jalna District during June – 2011 to May – 2012. The results of the study indicate that distribution of *Aedes aegypti* and *Aedes albopictus* from Jalna District. Out of six localities except Ghansawangi *Aedes aegypti* reported from remaining five localities and *Aedes albopictus* reported only from one locality i. e. Ghansawangi. Overall study indicate that population density of *Aedes aegypti* was abundant in compare with *Aedes albopictus,* it clearly shows that *albopictus* was rare in this District.

Key words: Distribution, *Aedes aegypti, Aedes albopictus.*

INTRODUCTION

In the 120 years since arthropods were shown to transmit human disease hundreds of viruses, bacteria, Protozoans and helminthes have been found to require a hematophagus vertebrate hosts, historically Malaria, Dengue, Yellow fever, Filariasis, and other vector born diseases were responsible or more human disease and deaths in the 17th through the early 20th centuries than all other causes. The Mosquitoes had evolved by the Jurassic period, approximately 210 million years ago (Edwards, 1932). Mosquito are diversified taxonomical group of insects. The mosquito is a highly effective and deadly vector for human disease. The tiny insect has played a powerful role in spreading communicable diseases like Dengue, Maleria, and Chikungunya etc. For the control of mosquito vector and transmission of diseases are essential to continuous survey, monitoring of biodiversity, density, ecology, habitat etc. Basically all mosquitoes expand their range of distribution from forest to human habitat. Now a day's two third population of world have under risk of dengue and malaria.

Industrialisation and Urbanisation has also resulted in mosquitoes switching hosts—from monkeys to human beings, from cattle to human beings and vice versa. "It was bound to happen—people have occupied many areas which were once habitats of monkeys. So, mosquitoes have quickly changed hosts," says Sujatha Sunil, senior scientist with the International Centre for Genetic Engineering and Biotechnology, New Delhi. Globally in 2010 there were 96 million apparent dengue infections and India alone contributed 34% (22-24) million infections of the global total. This scenario shows that mosquitoes play an important role in epidemiology as they cause fatal diseases (Gubler, 1998; Tewari *et al.,* 2004; Sharma, 2006; and Shinde, 2010; 2011,).

During 19th and 20th centuries vector borne diseases presented the development of large areas of the tropic especially in Africa, it was not until these diseases were controlled (Duane J. Gubler, 1998). But in between 20 – 21st century we are applied number of control strategies for mosquito population. We got benefit for few years later on reemerges mosquito borne diseases.

Presently Dengue is second serious arboviral disease of Asia, South and Central America, and Africa. Although it has a low mortality, it has very debilitating symptoms. *Aedes aegypti* and *Aedes albopictus* are the common vectors of dengue. They can easily adapt and proliferate in new areas, resulting in the wide spread of dengue worldwide.

Aedes aegypti and *Aedes albopictus* has been identified to be vectors that transmit the dengue virus from one host to another. Now day's world scenario reported distribution of *Aedes aegypti* and *Aedes albopictus* more than 100 countries except Antarctic poles.

Globally *Aedes* reported 950 species, India contribute 115 species of Aedes. Out of them in India two are major vector for viral diseases i. e. *Aedes aegypti* and *Aedes albopictus.* Basically *Aedes aegypti* is tree whole breeder in Africa, owes its world – wide distribution to its adaptation to human habitation, to breeding in artificial water containers and to travelling with man (F. L. Soper, 1967). *Aedes albopictus* is Asian mosquito is known as Asian tiger mosquito. *Aedes albopictus* also expands its range of distribution from Asia to all around the world and played vector for Dengue and Chikungunya. Day to day this phenomenon's much more complexes and difficult to control mosquito population as well as mosquito born diseases. Recently some advances of science is developed some techniques regarding molecular biology, genetically sterilization of mosquito population, genetic control of mosquito born diseases but till today we are not getting satisfactions.

MATERIALS AND METHODS

Taxonomy:

The study was carried out from June 2011- May 2012. Adult mosquitoes were collected from eight places of six Tehsil. The study localities were fixed with their GPS location and visited once in a month for collection. Collection was done from indoor as well as outdoor at evening and resting time of mosquito. Species identification was done using taxonomic keys of Barraud (1934). For density and distribution simply used population dynamics study of collected mosquitoes.

Molecular Identification and Confirmation:

For the identified species confirmation must needed isolation of DNA, PCR confirmation, Electrophoresis and amplification of COI gene for sequencing. After sequencing these sequences send to NCBI and BOLD for confirmation and accession.

Study Area:

Jalna district is approximately situated at the centre part of Maharashtra state and in northern direction of Marathwada region. The Jalna district lies between 19°1 north to 21°3 North Latitudes and 75°4 East to 76°4 East Longitude. It covers an area of 7,612 Sq. Kms, which is 2.47% of the total state area. District boundaries are adjacent to Jalgaon at north, Parbhani & Buldhana at east, Beed at south and Aurangabad at west.

Table 1: Fixed collection sites and its GPS location

Sr. No.	Tehsil	GPS Location
01	Jalna	N 19° 82' 96": E 75° 88' 04"
02	Bhokardan	N 20° 15' 14": E 75° 54' 23"
03	Paradh	N 20° 24' 43": E 75° 55' 54"
04	Jafrabad	N 20° 11' 35": E 76° 00' 44"
05	Badnapur	N 19° 86' 59": E 75° 72' 50"
06	Ghansawangi	N 19° 31' 08": E 75° 09 17"
07	Partur	N 19° 34' 52": E 76° 12' 38"
08	Mantha	N 19° 38' 37": E 76° 23' 15"

Fig: 1. Map of Maharashtra shows Marathwada region and Jalna District

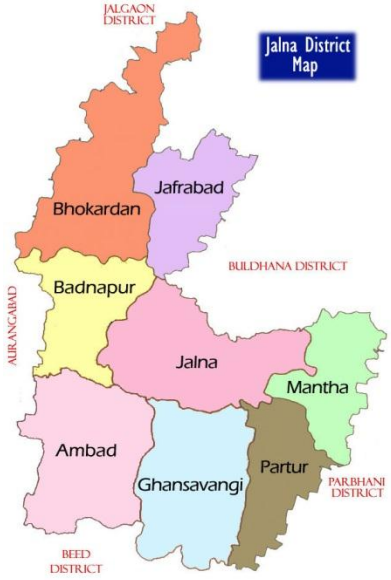

Fig: 2. Map shows collection Tahsil of Jalna District

RESULTS AND DISCUSSION

Mosquitoes are important vectors of organisms causing diseases to humans and animals, particularly malaria (plasmodia, i.e., *P. falciparum, P. vivax*, *P. malariae, P. ovale*), lymphatic filariases (filarial worms, i.e., *Wuchereria, Brugia*), arboviral encephalitides (viruses, i.e., Dengue, yellow fever, West Nile, Japanese, Eastern Equine, others) Notable among the earlier review of the distribution was that by Barraud (1934) who so for as the Indo-Pakistan subcontinent, Burma and Ceylon were provided an informative map indicating all localities were this species was known to be present, later an Christopher (1935), M. Qutubddin (1960) reported six species of *Ades* from Indian sub region; Kenneth L. Knight (1968), T. Ramachandra (1967) recoded *A. aegypti* from India, but no record from Maharastra; lateron H. N. Kaul and Geevarghese G. (1979) reported 22.6% *Ades* intensity in residential sites from Dehu town group Dis. Pune, Maharastra, prevalence of Aedes from Goa (Mahadev *et al.*, 2004), Kaul *et al.* (2002) are faund *Aedes aegypti* are competed distribution while A. albopictus and A. vittatus are confined to peripherals, in India is prefers human blood to that of cattle, Shriram and Sehal (1999) carried out survey from Portblair, Andman and Nichobar and all 21 localities are positive result for *A. aegypti,* Yadav and Sharma (1989); recorded 8 species of *Aedes* from Orissa, Rajavel *et al.* (2003, 2004, 2005) recorded six species of *Aedes* from Eastern coast (Orissa / Pondecherry) mangrove forest of the India, entomological study of S. C. Tewari et. al (2004) recorded 45.49% of albopictus and A. vittatus in rainy season, *A. aegypti* is significant in semiurban central area and *A. albopictus* recorded first time in rural area, N. Pemola Devi and R. K. Juhari (2004, 05, & 07) recorded 15 species of Aedes from north India, Mahir Pramanik et. al. (2007) studied prevalence of immature Aedes from Calcutta city are 1.12 & 11.4 during April and May, S. K. Sharma and K. K. Namzakoya (2001) recorded two species of Aedes in the Arabian Sea Islands and lakshdweep, Sharma (2005) seasonal fluctuation of dengue fever vector *A. aegypti* in Delhi. Yearly, an estimated 50-100 million cases of dengue fever (DF) and 250.000-500.000 cases of dengue hemorrhagic fever (DHF) occur worldwide (Gubler, 2002).

Dengue has been reported from Gujarat as early as in 2003 and more recently epidemics have been reported from Maharashtra, Gujarat, Calcutta, Rajasthan and Punjab. Dengue is the most important mosquito borne viral disease affecting humans. The tropical zone of the world having monsoon range is the usual habitat of this vector.

Table No. 2: Collection and its respective location

Sr. No.	GPS Location of Collection	No. of collected *An. subpictus*
01	N 19^0 82' 96": E 75^0 88' 04"	21
02	N 20^0 15' 14": E 75^0 54' 23"	10
03	N 20^0 24' 43": E 75^0 55' 54"	07
04	N 20^0 11' 35": E 76^0 00' 44"	09
05	N 19^0 86' 59": E 75^0 72' 50"	26
06	N 19^0 31' 08": E 75^0 09 17"	10
07	N 19^0 34' 52": E 76^0 12' 38"	11
08	N 19^0 38' 37": E 76^0 23' 15"	06

Table 3: Shows location wise monthly distribution of *Aedes aegypti* and *Aedes albopictus*

Sr. No.	Place	June - 2011 to May - 2012; Months											
		June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	Jalna	√	√	--	--	--	√	√	√	√	√	√	√
2	Bhokardan	√	√	--	√	--	√	--	--	√	+	--	√
3	Paradh	--	--	--	√	√	√	√	√	--	√	√	√
4	Jafrabad	√	--	√	√	√	√	√	√	--	√	√	√
5	Badnapur	--	--	--	--	--	--	--	--	--	--	--	--
6	Ghansawangi (*Aedes albopictus*)	√	--	--	--	√	√	--	√	--	√	√	√
7	Partur	--	--	√	√	√	--	+	+	--	√	√	√
8	Mantha	√	--	--	√	√	--	--	+	√	√	√	--

(Only one place reported *Aedes albopictus* and remaining location reported *Aedes aegypti.*)

The breeding of *Aedes aegypti* is highest during the pre and post monsoon periods. Dengue shock syndrome and Dengue haemorrhagic fever are severe clinical manifestations of the disease. Thus there is a pressing need for prevention, early detection and treatment of the disease an outbreak of febrile illness. Shereen Rachel Varghese (2006).

Overall, mosquito-borne diseases have re-emerged as a significant human health problem due to a number of factors, including the lack of progress in vaccine development, the emergence of drug resistance in pathogens and insecticide resistance in mosquitoes, and the decline in socioeconomic conditions in many countries that limit disease monitoring and mosquito control efforts (Gubler, 1998).

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