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DISTRIBUTION OF AEDES AEGYPTI AND AEDES ALBOPICTUS FROM HANUMANGARH DISTRICT RAJASTHAN

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Abstract: The current study was under taken in the urban area of Hanumangarh district Rajasthan during April, 2022 to March 2023. The result of the study shows that distribution of *Aedes* mosquitoes from Hanumangarh district. Indoor and outdoor sites of mosquitoes were reported in two localities. Cattle sheds and dwellings were reported to indoor study sites. Although six categories of tyres, mud pot, jerrican, bird water pots, cattels water pots, plastic drum, pipe leakage and stagnant water etc.in outdoor. In this period of sampling an account numbers of 101 adult dengue vectors were reported from two localities (locality I and locality II) of Hanumangarh district. The percentage of *Aedes albopictus* at cattle sheds was (40%) followed by *Aedes aegypti* (76.79%) and in human dwellings, *Aedes albopictus* (60.00%) followed by *Aedes aegypti* (23.21%) was recorded during 2022-2023.When we compared the different resting habitats of outdoor. In the rainy season, the numbers of vector mosquitoes were higher than other seasons.

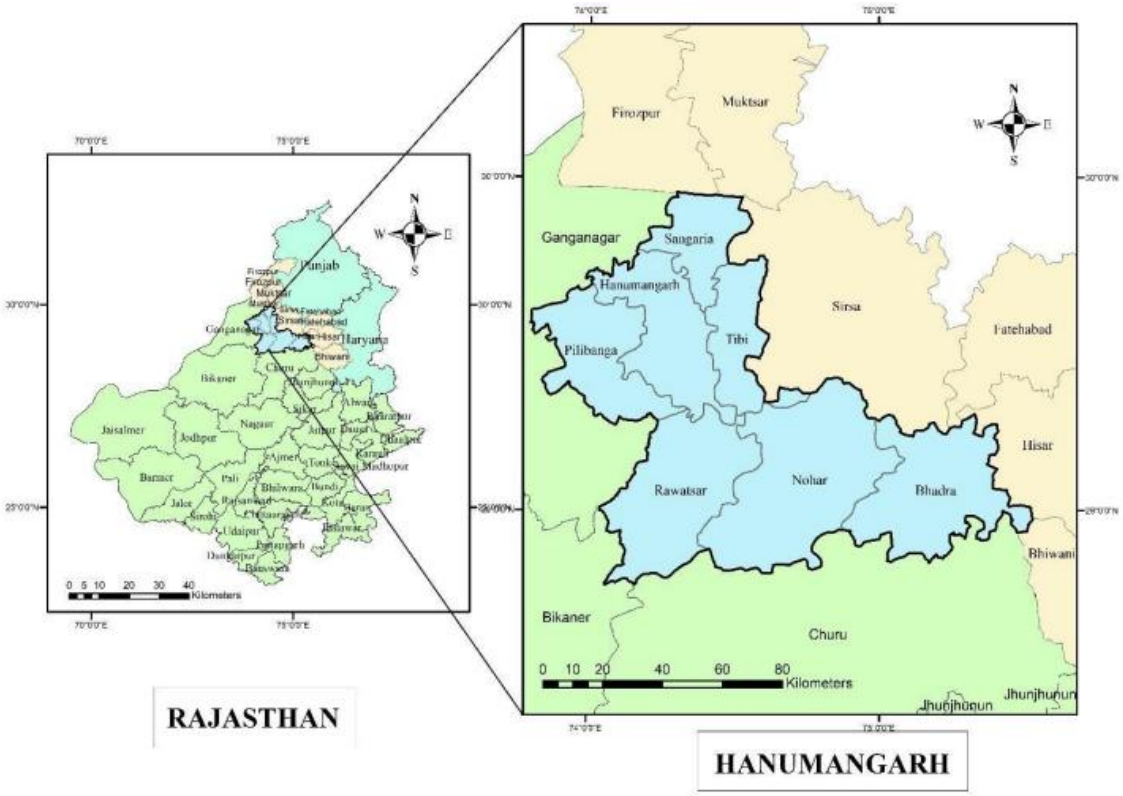
KeyWords: - *Aedes aegypti*, breeding site, arboviral, dengue.

Introduction: - Dengue is a mosquito-borne viral disease occurring in tropical and subtropical areas which is spread by *Aedes aegypti*.Dengue fever infection is one of the most important arboviral diseases in humans. The main objective of the study was to detect breeding habitat diversity of *Aedes aegypti* in urban area of Hanumangarh.

Globally *Aedes* has 950 species out of which 115 species of *Aedes* has been reported from India. The mosquitoes had evolved in the Mesozoic era, nearly 210 million years ago by Jurassic period [1].Originating in Africa, *Aedes aegypti* probably invades other transcontinental via trading and transport ships that resupplied in Africa ports during the fifteen through seventeenth centuries [2, 3]. Currently *Aedes aegypti* is widespread in Asia [4] and following epidemic dengue activity experienced in south-east Asia [5]. Although *Aedes aegypti* currently has a wide distribution in maximum tropical and subtropical region. The current distribution on does not reflect the maximum range of its potential distribution as defined by historical records.

Urban areas with high-density of water storage receptacles are suitable for breeding of *Aedes* mosquitoes [6]. Mosquitoes breed in various kinds of containers, comparatively water storage containers water pots, animal feedings pits, ant-guards, water containers, and coconut shells [7,8,9,10]

Key containers in Philippines include plastic & metal drums and plastic containers [11] while it is roof gutters in Australia [12]. In India, cement tanks and plastic containers were identified as major breeding habitats of *Aedes aegypti* [13–14]. In the capital city Delhi, India overhead tanks and curing tanks were identified as key containers of *Aedes* breeding [15]. Current research has communicated that transmission of dengue fever occurs within defined special and temporal marking that depend on the mosquito's geographic dispersal range and variable capacity (GDCH, 2017) [16].



Courtesy-District Environment Plan - MNIT Jaipur, Rajasthan

Fig 1:- Area map of Hanumangarh

Research Methodology:

Study area

Periodic investigation were undertaken from April, 2022 to March 2023.During the survey of resting habitats of both cattle sheds and human dwellings, mosquitoes were collected with oral aspirators and light torch. At outdoor localities, mosquitoes were collected from tyres, mud pot, jerrican, bird water pots, cattels water pots and plastic drum. Indoor mosquito collection was carried out from cattle sheds and human dwelling using hand catch method between 6:00AM to 8:00AM and 6:00 PM to 9:00 PM. *Aedes* mosquito species were collected from cattle sheds and human dwellings during resting time. Collected mosquitoes were transferred to into plastic containers. The collected

mosquitoes were brought in a laboratory for further identification. *Aedes* mosquito's species were identified with the help of pictorial identification key [17].

The latitude of Hanumangarh, Rajasthan, India is 29.625996, and the longitude is 74.287491. Hanumangarh, Rajasthan, India is located at India country in the Cities place category with the GPS coordinates of 29° 37' 33.5856" N and 74° 17' 14.9676" E. Periodic investigation were undertaken from March 2022 to Feb 2022. The district headquarter Hanumangarh is situated on the bank of Ghaggar River which is the present form of the last mythological river Saraswati. Ghaggar River, which is called as 'Nali' in local dialect divides the district headquarter into two parts. In the north of Ghaggar River, Hanumangarh Town and in the south the habitation of Hanumangarh Junction is situated.

This study area was selected on the basis of their socio-ecological characteristics. This area has river and it streams standing water which is the main breeding habitats for *Aedes aegypti* and *Aedes albopictus***. Locality I**-This locality includes south area. This area mainly includes outer regions which is newly developing area *viz;* Hanumangarh junction **Locality II**-This locality includes mainly plain area of Ghaggar includes urban area *viz;* Ghaggar river area and Hanumangarh town.

RESULT AND DISCUSSION:

A total of 101 mosquitoes from indoor and 34 mosquitoes from outdoor were collected in the urban environment of Hanumangarh district, outdoor and indoor collections recorded two species of *Aedes* mosquitoes viz; *Aedes aegypti* and *Aedes albopictus*. An *Aedes aegypti* was maximum 56 (55.44%) followed by *Aedes albopictus* 45 (44.55%). When we compared the different resting habitats of outdoor. It was observed that Bird water points was main outdoor resting sites for dengue vectors in the study area with 13 individuals followed by pipe leakage with 8 individuals and mud pot and cattle water point with 4-4 individuals and tyres with 5 individuals. There were no recorded of dengue vectors from jerrican. In the rainy season, the number of vector was higher than summer and winter seasons. We found higher number of *Aedes* mosquitoes in cattle sheds than human dwelling. These mosquitoes towards to live in shaded vegetation and cold water at outdoor habitat in urban area. Comparable results have been recorded. [18]

Table 1- Resting collection dengue vectors in two localities (April, 2022 to March 2023)

Localities	Dengue vectors	Indoor resting					Total	
		Cattle sheds		Human dwelling				
		Collected number	Occurrence %	Collected number		Occurrence %	Collected number	Occurrence%
Locality I	*Aedes aegypti*	22	78.57	6		21.43	28	100
	Aedes albopictus	9	47.37	10		52.63	19	100
	total	31	65.96	16		34.04	47	100
Locality II	*Aedes aegypti*	21	75.00	7		25.00	28	100
	Aedes albopictus	9	34.62	17		65.38	26	100
	Total	30	55.56	24		44.44	54	100
Locality I +II	*Aedes aegypti*	43	76.79	13		23.21	56	100
	Aedes albopictus	18	40.00	27		60.00	45	100
Grand total		61	60.40		40	39.60	101	100

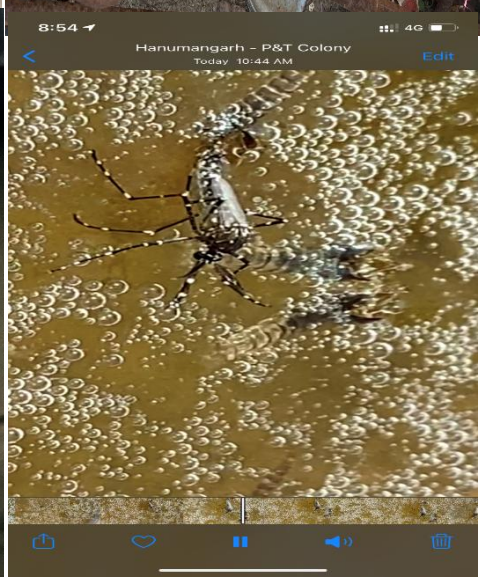
Aedes vectors of Chikungunya and dengue disease revealed preference to living in plastic containers, cement tank, tires and flower pots at outdoor same observation have been reported [19]. *Aedes albopictus* was leading in green urban regions. *Aedes albopictus* is known to be adapted to progression regions between urban and forest environment according to [20]. Culex mosquitoes vectors for Filariasis and Japanese encephalitis and like to live-in sewage canals, ditches, cattle sheds, rice fields and open drainage structure at outdoor habitats. It has been in conformance with the detail of [21].

Table 2-Outdoor resting collection of dengue vectors in two localities (April, 2022 to March 2023)

Localites	Season	Mosquitoes Collected	Mud pot	Jerrican and plastic drum	Pipe leakage	Cattle water point	Bird water point	Tyres	Total
Locality I	Rainy	*Aedes aegypti*	0	0	2	1	2	1	6
		Aedes albopictus	1	0	2	1	2	1	7
	Winter	*Aedes aegypti*	1	0	0	0	1	0	2
		Aedes albopictus	1	0	0	0	0	0	1
	Summer	*Aedes aegypti*	0	0	0	0	1	0	1
		Aedes albopictus	0	0	0	0	1	1	2
	Total		3	0	4	2	7	3	19
Locality II	Rainy	*Aedes aegypti*	1	0	2	1	2	1	7
		Aedes albopictus	0	0	2	1	0	0	3
	Winter	*Aedes aegypti*	0	0	0	0	1	0	1
		Aedes albopictus	0	0	0	0	1	1	2
	Summer	*Aedes aegypti*	0	0	0	0	1	0	1
		Aedes albopictus	0	0	0	0	1	0	1
	Total		1	0	4	2	6	2	15
Grand total			4	0	8	4	13	5	34



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