Seasonal Prevalence Of *Aedes Aegypti* (Diptera; Culicidae) In Some Areas Of Dehradun , Uttarakhand.

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Abstract

Surveys on the seasonal fluctuation of *Aedes aegypti* were under taken in some areas of Dehradun during January to December 2023. The *Aedes aegypti* population was present to be prevalent in all the sites in Dehradun. Water containers, over head tanks, discarded tires, tin cans, bucket, flower pots Coolers were found to be the preferred breeding habitats of *Aedes* mosquitoes in these areas. The adult mosquitoes prefer to rest shaded place such as under furniture, laundry areas, ceilings, cupboards etc. Out of 2465 houses surveyed for immature stages of *Aedes* 439 houses were positive and a total 1652 containers were search out of them 338 containers were reported positive for *Aedes aegypti*. The house, container and breteau index were increased during the post- monsoon season. The House Container and Breteau indices was very high (40.91%, 48.07% and 22.73%) in ISBT locality during September 2023.

Keywords: *Aedes aegypti*, Dehradun, , house index, container index,Breteau index

Introduction

Dengue fever (DF) and Dengue haemorrhagc fever (DHF) are re-emerging fast as a major public health problem (Sharma et al., 2000). Dengue infection is very important viral disease that passes through mosquitoes to humans. Today it infects 125 countries. This disease is a serious public health issue in the tropical and sub tropical areas and an affects estimated 2.5 billion people are living in areas. Mattingly (1957) suggested that the breeding habitats used by *Aedes aegypti* are rock holes, then shaded rock holes, then horizontal fallen tree and finally holes in vertical standing trees. Brett (1938) proved that dark coloured clothing was preferred by *Aedes aegypti*. Black colour is the most attractive colour for *Aedes aegypti* followed by red which also has a similar low reflectance factor. White colour was avoided because of its high reflection factor and yellowish khaki

showed to be more repellent than white. Globally Aedes has 950 species out of which 115 species of Aedes has been reported from India. Aedes albopictus also has similar area of distribution in Asia and played vector for Dengue and Chikunguniya (Soper, 1967). as far as the availaility of Aedes species from this region Pemola and Jauhari (2004 and 2008) reported first time the existence of *Aedes aegypti* in Garhwal region includng Distt Dehradun and adjoining areas.

Materials and Methods

The study were carried out during January to December 2023 in selected localities of district Dehradun irrespective of the risk for dengue/ DHF. Different selected areas were Doiwala, Raipur and ISBT locality of District Dehradun. The entomological indices like House Index (HI), Container Index (CI), and Breteau Index (BI) were used for measuring the larval population. The data on larval collections were recorded in the pre-arranged and pre-planned survey forms. The larval Identification was done by using taxonomic Keys. The data were examined and different indices like house index (HI) container index (CI) and Breteau index (BI) as per WHO (2003) guideline. In the present study followng formulae were used to calculated the indices.

House Index(HI) = No. of house positive /No. of house inspected X 100

Container Index (CI) = No. of container positive / No. of container inspected X 100

Breteau Index (BI) = No. of container positive/No. of house inspected X 100

Results and Discussions

The data for *Aedes* mosquitoes in different selected localities during the pre-monsoon, Monsoon and Post - Monsoon season is shown n Table 1,2,3. Various mosquitoes breeding containers like overhead tanks, coolers, discarded tyres cement tanks etc were searched for immature forms of mosquitoes. Out of 2465 houses surveyed, 439 houses and total 1652 containers were search for immature stages and 338 containers were reported positive for *Aedes aegypti*. The house index, container index and breteau index were increased during the post-monsoon season. The container indices was very high (48.07%) in the ISBT area in September 2023. The entomological indices viz. house index, container index and breteau index for the number of *Aedes aegypti* increase from July to October and declined afterwards. The increase in breeding indices during the post-monsoon period was due to the increased quantity of potential breeding areas due to the rains in these months. Dewan Chand et al. (1961), Krishna Marthy et al. (1965) , Katyal et al. (1996), Sngh et al., (2013) suggested higher densities of *Aedes aegypti* in the month of October. In Southeast Asia, strong correlation was amongst dengue vectors and rainfall has been well established (Gould et al. , 1970). *Aedes albopictus* were also reported in Dehradun district in present study.

Table 1 : Prevalence indices of *Aedes* species in Doiwala locality (L-1) during January to December, 2023.

Months	No. of house visited	House positive	Container searched	Container positive	HI (%)	CI (%)	BI (%)
Jan.	16	0	20	0	0	0	0
Feb.	27	0	25	0	0	0	0
Mar.	30	1	28	1	3.33	3.53	3.33
April	45	2	25	2	4.44	8.00	4.44
May	53	4	32	2	7.55	6.25	3.77
June	65	6	35	4	9.23	11.42	6.15
July	80	8	36	5	10.00	13.88	6.25
Aug.	95	12	42	8	12.63	19.05	8.42
Sep.	110	16	52	10	14.55	19.23	9.09
Oct.	120	18	60	16	15.00	26.66	13.33
Nov.	102	20	75	12	19.61	16.00	11.76
Dec.	55	10	53	8	18.18	15.09	14.55
Total	798	97	483	68	12..15	14.80	8.52

Table 2: Prevalence indices of *Aedes* species in Raipur locality (L-2) during January to December, 2023

Months	No. of house visited	House positive	Container searched	Container positive	HI (%)	CI (%)	BI (%)
Jan.	30	0	25	0	0	0	0
Feb.	25	0	25	0	0	0	0
Mar.	35	3	35	4	8.57	11.43	11.43
April	55	6	40	7	10.91	17.50	12.73
May	65	10	52	10	15.38	19.23	15.38
June	80	16	65	15	20.00	23.07	18.75

July	95	22	74	20	23.16	27.03	21.05
Aug.	112	30	80	22	26.78	27.05	19.64
Sep.	118	38	88	26	32.20	29.55	22.03
Oct.	115	35	65	22	30.43	33.85	19.13
Nov.	92	20	60	15	21.74	25.00	16.30
Dec.	52	10	40	6	19.23	15.00	11.54
Total	874	190	649	147	21.74	22.65	16.82

Table 3: Prevalence indices of *Aedes* species in ISBT locality (L-3) during Jan. to Dec., 2023

Months	No. of house visited	House positive	Container searched	Container positive	HI (%)	CI (%)	BI (%)
Jan.	26	0	28	0	0	0	0
Feb.	28	0	30	0	0	0	0
Mar.	30	1	28	1	3.33	3.57	3.33
April.	40	2	37	4	5.00	10.81	10.00
May	56	6	42	8	10.71	19.05	14.28
June	65	8	45	12	12.31	26.66	18.46
July	80	20	56	15	25.00	26.78	18.75
Aug.	95	32	42	20	33.68	47.62	21.05
Sep.	110	45	52	25	40.91	48.07	22.73
Oct.	120	18	60	18	15.00	30.00	15.00
Nov.	98	15	60	12	15.31	20.00	12.24
Dec.	45	5	40	8	11.11	20.00	17.77
Total	793	152	523	123	19.17	23.52	15.51

HI = House Index, CI = Container Index, BI = Breteau Index

Conclusions

The *Aedes aegypti* population was present to be prevalent in all the sites in Dehradun. Water containers like Coolers, discarded tires, cement taks, underground tanks, tin cans, bucket, flower pots were found to be the preferred breeding habitats of *Aedes* mosquitoes in these locality. The adult mosquitoes rest in cool shaded place such as under furniture, laundry areas and cupboards. Out of 2465 houses surveyed 439 houses and out of 1652 containers 338 containers were reported positive for *Aedes aegypti*. The house, container and breteau Index were increased during the post- monsoon season. The containers indices was very high (48.2%) in the ISBT locality in September 2023. The House index is also high (40.91%) in same locality. It is due to may breeding places developed after monsoon and post monsoon months.

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