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## CONTAINER SURVEY OF MOSQUITO BREEDING SITES IN AN UNIVERSITY CAMPUS IN CHENNAI, TAMILNADU

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**Abstract:-** The Container survey was conducted from 15<sup>th</sup> – 19<sup>th</sup> October 2013 for a period of five days in the University Campus of Chennai, Tamilnadu. The campus has an area of 175 acres (0.71 km<sup>2</sup>) and most of the main administrative buildings and faculties are located here. The surroundings of the campus have been planted with vegetation and trees, providing ideal resting sites for mosquitoes. A total of 60 containers were identified as potential breeding sites, However, more than 50% (32) containers were found containing larvae, with Tyers being the most dominant (number of containers =25), followed by plastic container (5), natural containers (2). Among all types of containers, 42% of the total surveyed Tyers were positive with mosquito larvae, followed by plastic containers (33%) and natural containers (20%), especially tree holes, were the dominant breeding sites for mosquitoes in the campus. The collected mosquito larvae were *Aedes aegypti* (100%).

**Keywords:** Container Survey, University Campus, *Aedes aegypti*, Tyres, Chennai.

### INTRODUCTION:-

Developmental activities, especially urban development associated with rapid growth of townships, have accentuated the problem of vector-borne diseases, especially dengue, which is basically an urban disease. [1] With regard to dengue vector proliferation, human ecology is responsible for the creation of a mosquitogenic environment. Man is directly or indirectly creating such a situation. [1] Containers are probably the most important factor determining the breeding of *Aedes* spp. since artificial containers are the major larval habitats in and near human habitation. [2]. Dengue is one of the most important emerging tropical diseases [3]. Dengue epidemics have been reported in over 100 countries and 2.5 billion people live in areas where dengue is endemic [4].

The dengue viruses are spread and maintained by *Aedes aegypti*, the principal vector of dengue. *Ae. aegypti* is an anthropophilic mosquito, which has evolved intimate relationship with humans and exhibits several behavioural traits like oviposition in man-made and man-used natural and artificial containers [5].

Chennai, a coastal, metropolitan city, is the study area, having an area of 216 km<sup>2</sup>, with 5.9 million populations. Dengue cases are reported every year and there was a dengue outbreak in 2001[6]. The city receives rains from June onwards, however, mainly from northeast monsoon (September to November) with an average annual rainfall of 1245.7 mm. Chennai city experiences the highest temperature (varies between 38°C to 42°C) in May and June, and the monsoon failures and shortage in the collection of water in reservoirs lead to irregular and interrupted potable water supply. Householders are compelled to store water in permanent/temporary containers to meet their hardship.

The present study was therefore conducted to determine the container breeding preferences of mosquitoes by larval survey in the University Campus in Chennai. Such information can be used to design an effective control programme for campuses.

### MATERIALS AND METHODS:

The Container survey was conducted from 15<sup>th</sup> – 19<sup>th</sup> October 2013 for a period of five days in the University Campus of Chennai, Tamilnadu. The campus has an area of 175 acres (0.71 km<sup>2</sup>) and most of the main administrative buildings and faculties are located here. The surroundings of the campus have been planted with vegetation and trees, providing ideal resting sites for mosquitoes. During the survey, all the containers and reachable tree holes were examined. Larvae collection was

carried out indoors and outdoors by dipping, using pipette or dipper depending on container type and location. In this study, “indoors” refers to the interior of the building while “outdoors” refers to the outside of the building but confined to The number, type and water condition of containers that may serve as potential breeding sites were examined and recorded. The collected larvae and pupae were kept in the laboratory for adult emergence. The merged adult mosquitoes were then pinned and identified.

**RESULTS & DISCUSSION:**

The Table (1) presents the container preferences and water quality in containers found positive with mosquito larvae, while the Figure shows the percentage of different types of containers that were positive.

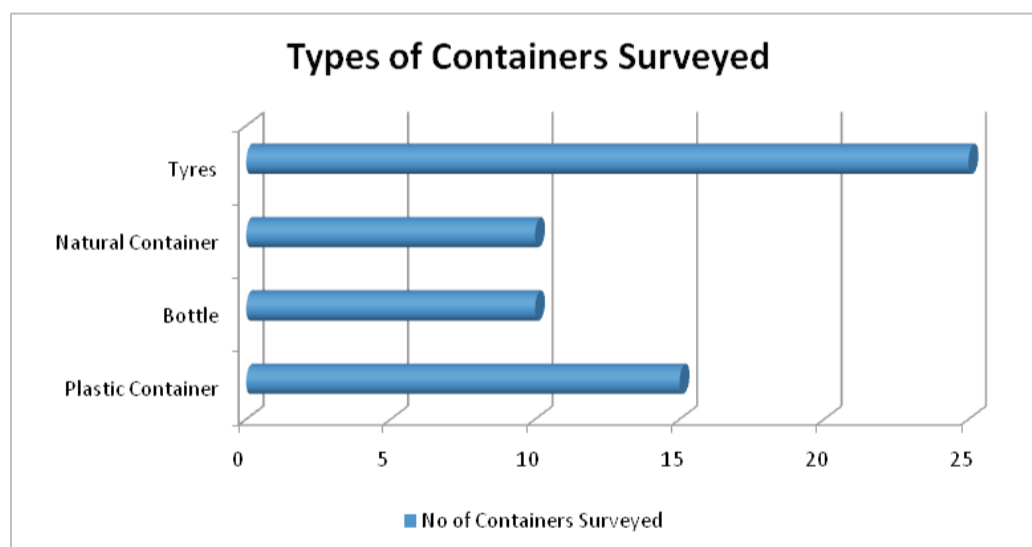
A total of 60 containers were identified as potential breeding sites, of which 45 were outdoor and 15 were Indoor containers. However, more than 50% (32) containers were found containing larvae, with Tyers being the most dominant (number of containers =25), followed by plastic container (5), natural containers (2). Out of the total number of positive containers, 93.75% were outdoors while only 6.25% were indoors, indicating thereby that containers stored with water indoors were seldom found positive and containers found outdoors were probably filled with rainwater, thus providing ideal breeding sites for mosquitoes.

Among all types of containers, 42% of the total surveyed Tyers were positive with mosquito larvae, followed by plastic containers (33%) and natural containers (20%), especially tree holes, were the dominant breeding sites for mosquitoes in the campus. The collected mosquito larvae were *Aedes aegypti* (100%).

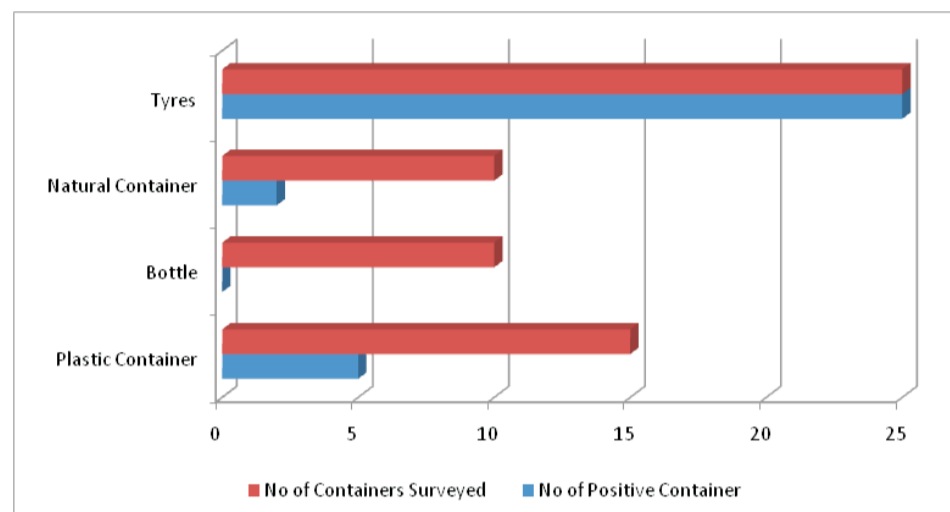
**Table: 1**

S.NO	Container Type	No of Containers Surveyed	No of Positive Container	Species of Mosquito Larvae	Water Quality in containers positive with Mosquito Larvae
1	Plastic Container	15	05	<i>Aedes aegypti</i>	Clear Water
2	Bottle	10	0	-	-
3	Natural Container	10	02	<i>Aedes aegypti</i>	Clear Water
4	Tyres	25	25	<i>Aedes aegypti</i>	Clear Water

**Figure: 1**



**Figure: 2**  
No of Container Surveyed VS Positive Container with Mosquito Larvae



Our Study Indicated that *Aedes aegypti* was capable of breeding in a wide range of container types. This Study showed that waste tyres are the common place for breeding of *Aedes aegypti*. *Aedes aegypti* is the principle dengue vector of urban areas [6]. Similar Study done in Tiruchirappalli District showed that waste tyres were potential breeding place for Mosquito *Aedes aegypti* [7]. This mosquito also plays an important role in the sylvatic cycle of dengue in Malaysia [8]. The species preference was not only for the vessels in question but also for the water quality they were found breeding in. In this study, water quality was categorized into three types: clear water, turbid water, and polluted water.

Clear water is defined as water free from opaqueness; turbid water as water having sediments and suspended foreign particles; and polluted water as water containing wastes and oily matter. The condition of water in all surveyed containers was clear (100%). This finding was similar to the findings reported by Lee and Hishamudin [9] and Chen et al. [10].

The source reduction is an effective way for the community to manage the populations of many kinds of mosquitoes [11-12]. The eradication of mosquito breeding containers or breeding sites in and around living, working areas should be taken into consideration, since the presence of water in tyres and containers are probably the most important factor in determining the breeding of Mosquitoes, especially *Aedes* species.

#### CONCLUSION:

Source reduction is an effective way for the community to manage the populations of many kinds of mosquitoes. The elimination of artificial and natural containers or alteration of breeding sites in and around living/working areas, such as university campuses, should be taken into consideration since the presence of water in containers is probably the most important factor in determining the breeding of mosquitoes, especially *Aedes*. Container management should be taken up as a priority by the campus community.

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