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Rajesh Kumar Gupta
Research Scholar and Malaria Officer, District Surguja, Chhattisgarh, India

Dr. P Visvanathan
Associate Professor Faculty of Science ISBM University Chhattisgarh, Chhattisgarh, India

Dr. Rajkishor Singh Baghel
Govt. Lahiri PG College Chirmiri District M.C.B. Chhattisgarh, India

Corresponding Author:
Rajesh Kumar Gupta
Research Scholar and Malaria Officer, District Surguja, Chhattisgarh, India

An entomological survey of breeding sites of dengue vectors in Ambikapur district Surguja Chhattisgarh

Rajesh Kumar Gupta, Dr. P Visvanathan and Dr. Rajkishor Singh Baghel

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Abstract
During the period from January 2022 to August 2022, various breeding sites of mosquitoes of Ambikapur urban area were surveyed, all the characteristics of the breeding sites were studied and analyzed. Mosquito larvae were collected from different selected breeding sites and identified. The lavae were found from breeding places belong to the *Culex, and Aedes genera*.

Keywords: Survey, breeding places, mosquitoes, larvae

1. Introduction
Ambikapur city is the headquarters of Surguja district located in the northern region of Chhattisgarh state. Geographically it is located at 23124.83°E. Ambikapur is governed by the Municipal Corporation Ambikapur. As of 2011 India census, it has a population of 264,575. Municipal Corporation Ambikapur city manages solid waste here 45 metric tons of solid waste is generated per day. The average annual rainfall in Ambikapur is 1399 (55.09) mm while the minimum and maximum temperature here is recorded at 0.9-44 ^{0}C respectively.

In such a situation, considering the environment and population, the study of mosquito-borne communicable diseases such as malaria, dengue, chicken pox and other health-related issues becomes important. Effectively control diseases caused by mosquitoes. To control it, it is very important to study the breeding places of mosquitoes [1]. In view of the changing ecological and environmental conditions, there is a need to continuously monitor and study the bionomics of disease vectors on a regular basis in the present context [2]. Wherever water is stored, the same place becomes the breeding ground of mosquitoes. Means the breeding sites where the eggs, larvae and pupae of mosquitoes are found. It is easier to control beetles and their larvae than to control adult vector mosquitoes. For this type of study, it becomes necessary to obtain the data of breeding places of mosquitoes [3]. Although Ambikapur city is one of the cleanest cities. Nevertheless, there are many such water sources here which are used for disposal of wastes Are there places too? And there is biological transport of wastes in them. Such places are prime breeding grounds for mosquitoes [4]. It is essential to analyze the mosquito breeding sites for all their characteristics like temporary or permanent type, water level, whether the water is clean or dirty, body posture of the larva, etc. That type of analysis is necessary for effective control of breeding sites and mosquitoes at the local level.

In this context, major breeding sites of pupae and larvae of dengue vector mosquitoes such as, *Aedes aegypti* and *Aedes albopictus* were surveyed in Juba, Cid City and Philippines [2] which was responsible for vector borne diseases there. Such study was significant for vector control programme there. In Thiruvananthapuram also study of breeding sites in containers with special reference to dengue vector *Aedes*(*Stegomyia) aegypti* and *Aedesal bopictus* was done similarly[3] entomological research of dengue outbreak was done in Bhilai Chhattisgarh.[11] Such studies are helpful in understanding mosquito-borne epidemic diseases here. Due to breeding habit of *Aedes* and *Culex* wide range of container, elimination of such containers or alteration of breeding sites is way to control [5].

2. Materials and Methods

Godhanpur Chowk located in Ambikapur urban area, and its nearby localities, Pratappur road nalla (stream) near forest office and Marine drive and its near by localties from these three sampling breeding sites Mosquito larvae were collected during the period of January 2022 to August 2022. The collected larvae were brought to the laboratory and preserved with 70% ethanol. First of all the larva of all the mosquitoes were counted. After that, the identification of mosquito larvae was done by Barraud P.J.1934 through pictorial key [5]. Larva of mosquitoes were identified through major diagnostic features such as head, antennae, thorax, abdomen, siphon and saddle. Morphological study of larva were done through using key of Barraud P.J. 1934 [5].

3. Results and Discussion

Larvae were collected from waste tires and containers of selected sampling sites during the entire study period. Out of which the larvae were found from all the breeding sites. Breeding sites mainly include stagnant water containing waste material, tires and plastic barrels. Sample site 1, which is a type of drain, keeps getting the waste material from the houses. The length of the drain is about 25 feet and the depth is 3 feet, water keeps increasing in it throughout the year. And there is biological transport of wastes in them. Such places are prime breeding grounds for mosquitoes. It is essential to analyze the mosquito breeding sites for all their characteristics like temporary or permanent type, water level, whether the water is clean or dirty, body posture of the larva, etc. That type of analysis is necessary for effective control of breeding sites and mosquitoes at the local level [6]. Mosquitoes breed in abundance in this drain. From the drain 40 larvae were collected from here, the clearly swollen mid-respiratory siphon has a short, fusiform these diagnostic feature resemblance with *Culex* genus. Out of these, only 36 were found of *Culex gelidus* and 04 of. *Culex tenuipalpis* Thus *Culex gelidus* was recorded as the dominant species in sampling site 1. The Plant vegetation in Sample Site 1 provides the highest compatibility for mosquito breeding by protecting them from enemies, predators and by stabilizing water flow [7, 8, 9].

The sample site 2 was Marine drive and its near by area due to the presence of a near by pond, moisture remains in the surrounding and due to the presence of a slaughter house near it, the waste material of the slaughter house gets accumulated in the nearby pits and becomes a breeding ground for mosquitoes. Larval samples were also collected from these pits during the study period. *Culex whitmorei, Aedes albopictus* were the dominant species in the collected samples. The third sample site was of Godhanpur Chowk and its adjacent locality. Larval samples were collected from water stored in old tyres, plastic containers, cooler tanks and pits near taps found in the houses of this locality. Only species *Aedes albopictus* and *Culex whitmorei* were found in the collected samples. *Aedes albopictus* is an important dengue vector that breeds in all natural and man-made habitats. It is primarily found in the forest areas, breeds in the crevices of rocks, axils of the leaves, the pits of the stems of trees and the cut holes of bamboo. Although they are dominant and breed in natural habitats, they effectively breed in containers and waste tires observed during the study period. *Aedes albopictus* primarily spreads dengue and chikungunya. Thus, for effective control of dengue and chikungunya in the study area, it is necessary to prevent water accumulation in potholes and old tires and containers, fill potholes, destroy containers and old tyres [10, 11].

4. Conclusions

Both *Culex gelidus* and *Aedes albopictus* species were found in ditches and Container but *Culex gelidus* was found predominantly in ditches. *Aedes albodictus* is mainly found in old tires and household containers, so its role in spreading dengue fever needs to be studied extensively.

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