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The simplest way to rearing and collection of mosquito larvae and pupa

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Abstract

For a number of reasons, rearing *Aedes* mosquitoes is challenging and complex. Temperature, density, and the amount of food available to *Aedes* larvae affect their mating; it is not always accomplished naturally. The mosquito climate chambers, where they are maintained, are hot and humid. Because of these tropical conditions, the larvae grow quickly and require regular attention. The Dau Shri Vasudev Chandrakar Kamdheni Vishwavidyalaya has successfully cultured several populations of various vectors. In this study, we cover various characteristics of mosquito rearing that have an impact on mosquito health and are crucial for the quality of basic and applied research.

Keywords: Rearing technique, mosquito, larvae, pupa

Introduction

Major human health problems are caused by mosquito-borne disease in all tropical and subtropical nations. Malaria, ilariasis, yellow fever, Japanese encephalitis, and dengue fever are among the diseases spread (Murthy and Rani, 2009) ^[10]. The most prevalent tropical disease, caused by the possible lymphatic ilariasis vector *Culex quinque fasciatus*, affects over 120 million people worldwide, 44 million of whom have a common chronic presentation (Bernhard *et al.*, 2003) ^[14]. Because of the high rate of reproduction and the emergence of drug resistance, controlling such severe diseases is getting more and more difficult (Imam *et al.*, 2014) ^[6].

Synthetic insecticides have been widely employed to reduce mosquito populations by killing adult mosquitoes, stopping them from biting people, or killing mosquito larvae at vector breeding grounds (Ahire, 2016) ^[2]. However, its negative effects on non-target populations and the emergence of resistance spurred researchers to look for other, straightforward, and long-lasting mosquito control strategies. Due to toxicity issues and the rise in insect resistance, it is important to examine the need for the creation of effective insecticides (Miro specos *et al.*, 2010) ^[15].

The majority of the world's population still uses synthetic chemical larvicides to keep mosquitoes under control, but many of these chemicals are poisonous to people, animals, and plants, and resistance to them can make control difficult. In order to suppress mosquito larvae, researchers are presently utilizing natural substances as pesticides (Rani *et al.*, 2013; Mukherjee and Ghosh, 2020) ^[12, 9]. These formulas have the highest level of mosquito repulsion and are secure, inexpensive, eco-friendly, and simple to use. Consequently, an effort was made to create natural mosquito repellent using cow dung (Gupta *et al.*, 2016; Raja *et al.*, 2021) ^[4, 11].

The study

The mosquito rearing at Dau Shri Vasudev Chandrakar Kamdheni Vishwavidyalaya, Anjora, Durg takes place in culture rooms that simulate natural climatic conditions. Collection of larvae and pupa culture from different location of Durg, Rajnandgaon and Bhilai for mass multiplication of mosquito for study. All artificial (tank, trays) and natural water containers (small ponds) in and around each household were inspected for mosquito larvae and pupae. At least more larva (second, third, and/or fourth instars) and pupae (if any) from each positive container were collected with 500ml beaker and tea strainers. Water from large containers was first removed with a water hose and then sieved with tea strainers (Kawada *et al.*, 2009; Robert

et al., 2002)^[7, 13]. Larvae or pupae were then collected on a plastic tray immature stages were pipetted and placed in a plastic clip with water, labelled and taken to the field laboratory.

This corresponds to the single larva method routinely implemented for mosquito monitoring (Adeleke *et al.*, 2008)^[1]. For the rearing method, immature mosquitoes (pupae and larvae) were reared in 10ml plastic container mouth connected with mosquito cages (mesh size 1.2mm and cages size 1.5'x1.5'x1.5'x1.5'). Under room temperature (25-27°C and humidity 70-75%) and no extra nutrition or food add. Mosquitoes from different households or different species were pooled together. Controls over temperature and humidity are likely the most crucial elements in the proper raising of mosquitoes. The simplest way to provide controlled heat and humidity is to cover the cage with a hand towel and a small electric light bulb. Numerous publications have been written on how the photoperiod and light intensity influence how the different phases of the mosquito's life cycle develop. A cycle of 14 hours of light and 10 hours of darkness seems to promote the best and most consistent development in the insectary. 900-1000 larvae and pupae are kept in a cage (1.5'x1.5'x1.5'x1.5'). Every day, a small amount of water from the rearing tray was removed and replaced with fresh water in the water container. This was done to stop scum from accumulating on the edge of the water. From day 7 to day 15, pupae were collected, and they were then put in emergence cages where they emerged. The plastic container's cover is put back on once every adult has emerged. Additionally, adults of both sexes need diets high in carbohydrates (Mokany and Shine, 2003)^[8]. Typically, carbohydrates are given as sugar solution soaked cotton balls. Although quantities of sucrose and glucose ranging from 3% to 20% have been employed, 10% sucrose produced by combining 100g of regular table sugar with 1 L of water seems to yield the best results (Hashmat, 2002; Asahina, 1964)^[5, 3]. For a cage that is (1.5'x1.5'x1.5'x1.5'), typically 4 cotton balls are sufficient. Every day, the cotton balls must be replaced.

Conclusion

The biology, physiology, anatomy, genetics, taxonomy and ecology of the insect must be studied in order to learn about the proper control of mosquitoes and diseases spread by them. Investigations on integrated control, biological, chemical and insecticide resistance are necessary. It takes a lot of mosquitoes to use them as screening tools for insecticides or chemotherapeutic substances. Individual or mass rearing of mosquitoes is typically used in all stages of mosquito research. In the near future, mass-producing mosquitoes for pest management may become as common as mass-producing pesticides.

This paper aims to inform viewers about mosquito breeding practices. There is no guaranteed way to raise mosquitoes. The ability to pay attention to detail is maybe the most crucial skill for successful mosquito rearing. For mosquito rearing to be successful, care must be taken. Successful mosquito rearing requires care 7 days a week, twenty-four hours a day. The fundamental recommendations are to prevent pesticide contamination, avoid overfeeding larvae and overcrowding of mosquitoes, follow temperature and humidity requirements, standardise rearing techniques, and steer clear of non-standardized food.

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