

# Heterogeneity of mosquitoes species in Gondia region of Maharashtra, India

Sonal P. Varma

Department of Zoology, Dhote Bandhu science college, Gondia

[Sonalvarma99@gmail.com](mailto:Sonalvarma99@gmail.com)

## Manuscript Details

Available online on <https://www.irjse.in>  
ISSN: 2322-0015

### Cite this article as:

Sonal P. Varma. Heterogeneity of mosquitoes species in Gondia region of Maharashtra, India, *Int. Res. Journal of Science & Engineering*, 2023, Special Issue A13: 61-64.

<https://doi.org/10.5281/zenodo.10516320>

Article published in Special issue of National Conference on "New Frontier of Biological Sciences (NCNFB-2023) jointly organized by Internal Quality Assurance Cell (IQAC) and Biological Society, Shri. Shivaii Education Society Amravati's Science College, Pawani, Dist. Bhandara, Maharashtra, India, date, April 26, 2023.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

## ABSTRACT

A study on heterogeneity of Mosquito (*Culicidae: Diptera*) has been carried out in Gondia (Maharashtra). In Gondia, there is lack of proper drainage system, because of stagnation of water and deposition of garbage mosquito breeding occur in drains. This is mainly due to inadequate supply of garbage disposal facilities coupled with insufficient use and improper maintenance of these facilities. The distribution of divergent species of mosquito and seasonal patterns of its abundance in Gondia City was also studied. The site selection for the current survey was mainly based on water stagnation, population density and poor garbage management site with unplanned drainage systems.

The study was carried out during the time interval of March 2021-2022 in which 8 species of mosquitoes belong to genera *Anopheles*, *Aedes* and *Culex* were reported. The *Anopheles* species found to be generous followed by *Culex* and *Adese*. In the current study primacy is given on the morphological description of the species.

Keywords: Mosquitoes, Heterogeneity, Morphology, Gondia

## Introduction

The mosquitoes are a family of small, midge-like flies: the *Culicidae*. In spite of the fact some species are harmless or even useful to humanity, most are irritant as they are blood suckers of vertebrates, while feeding on blood, various species of mosquitoes impart some of the most harmful human and livestock diseases [1]. Some authorities proclaim accordingly that mosquitoes are the most dangerous animals on Earth [2].

Mosquitoes undergo four stages in their life cycle: egg, larva, pupa, and adult. Adult mosquitoes are familiar insects, but we rarely observe them intently [3]. Mosquitoes are small, ranging from 0.3 to 0.4 inch in length. They bear a single pair of narrow wings that have a fringe of scales on the margins and veins. They have three pairs of long, slender legs, Mouthparts are an elongate beak [4, 5]. Several species of mosquitoes are responsible to impart various types of infection to more than 700 million people annually in Africa, South America, Central America, Mexico, Russia and much of Asia, with millions of resultant demises. At the minimum two million people annually die because of these infections spread by mosquitoes, and the morbidity rates are many times higher until now [6,7]. Yellow fever and malaria are two of the destructive diseases that mosquitoes transmit worldwide [7].

## Methodology

The current study comprises mosquito collection from distinct places of Gondia region from artificial and natural breeding sites. During the time interval march 2021-2022. The mosquitoes were collected by hand picking, insect collecting net and suction tube.

After collection every mosquito kept on slide with forceps and with the help of magnifying glass and microscope morphologically studied and identified.

## Results and Discussion

The current study gives a clear idea on the composition of mosquito fauna in the Gondia. A total of 974 mosquitoes belonging to 3 genera and 8 species were collected during the time of collection. In the current study a total of 3 genera of mosquitoes namely *Anopheles*, *Culex* and *Aedes* were noted from the study area. Genus *Anopheles* was represented by 3 species, followed by genus *Culex* with 3 species, and *Aedes* with 2 species. Among the three genera, *Anopheles* was the predominant genus followed by *Culex* by *Aedes*, and was represented by percentages of the total mosquitoes collected.

Similar type of mosquito biodiversity (*Culicidae*, *Diptera*) have been studied in 2001-2002 in Kolhapur district of Maharashtra where nine species of mosquitoes belonging to genera *Anopheles*, *Aedes* and *Culex* have been reported [5].

The same type study was done in the Chilika lake area, Orissa, India during 2011 in which they found 22 species of mosquitoes belonging to six genera (*Anopheles*, *Aedomyia*, *Aedes*, *Armigers*, *Culex* and *Mansonia*) [2].

### 1. Genus:-*Anopheles*

From the genus *Anopheles* three species were reported, these are *Anopheles culicifacies*, *Anopheles subpictus* and *Anopheles annularies*. The genus was specified by the wing spotted with white and black coloured dots and palpi as long as proboscis. In male the scutellum is hairy and shaped like halfmoon, Abdomen is scaleless, Anal cerci are very small.

#### 1.1) *Anopheles culicifacies*

Body colour is gray. Palpi with yellow spot over it. Hind leg and forelegs are equal in length. Vein no.3 of a wing is of black colour. Wings are decorated with white and black spots. Scutellum is semicircle with presence of hair. Abdomen is lacks scale.

#### 1.2) *Anopheles subpictus*

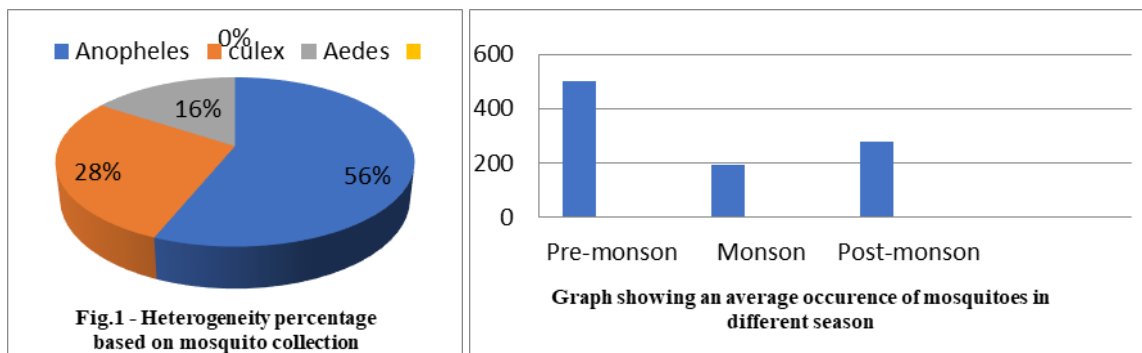
Gray coloured body. These are recognized by broad pale band on their front tibia. Palpi have a white band in between the two yellow bands. The wings are spotted. All veins of wings are similar.

#### 1.3) *Anopheles annularies*

Body is brownish black coloured. Palpi having similar yellow and white bands. Vein no.5 of wing is dark black as compared to others. Tarsi of hind legs are totally white. Hind legs are quite up-worded.

### 2) Genus:-*Culex*

From the genus *Culex* three species namely *Culex quinquefasciatus*, *Culex vishnui* and *Culex mansonia* are observed. The genus is characterized by having hairy palpi. In male the palpi is plumose, brushy and longer than proboscis. Claws are simple. Wings are unspotted having dark scales. Scutellum trilobed with three luff of hair on the lobe. Anal cerci are very small.



### 2.1) *Culex quinquefasciatus*

Body is brownish black colored. Proboscis dark often with pale scaling midway on underside. Scutum with golden and bronzy narrow scale. Wings are dark scaled all over. Hind legs with femur pale almost to the tip other legs are dark scaled except for pale patch at typical tarsal joint.

### 2.2) *Culex vishnu*

Medium sized species .Body is dark brown in colour. Proboscis is slightly longer than the fore femur. Wings are dark in colour and completely scaled . Legs are darkly scaled.

### 2.3) *Culex mansonia*

Medium to small sized species. Body is brown in colour. Mansonia adults are differentiated from all other mosquitoes by the presence of their unique broad, asymmetrical scales on the wings, that are mixed dark and pale. Females are longer than the males.

### 3) Genus:-*Aedes*

From the genus *Aedes* two species are reported i.e. *Aedes aegypti* and *Aedes albopictus*. The genus *Aedes* is characterized by having elongated slender body. In male palpi longer, tapering and curl upthward. Hind leg with dark and white band, on tarsal region. Claw on fore and hind legs are toothed.

#### 3.1) *Aedes aegypti*

Body colour is light black. Abdomen is having white band. They are having slender body. Hind legs are slightly up-worded. The males are smaller compared to females. In majority it found in Maharashtra. Its body is parallel to surface while sitting.

#### 3.2) *Aedes albopictus*

Body colour is black .Proboscis dark scaled, palpus with white scales on apical half. Antenna is slightly shorter than proboscis. Scutum with narrow dark scales and a prominent median stripe of similar white ones. Wings are dark coloured .Legs with the white bands.

Climatic condition affects the density of the mosquito among the total 974 adult mosquito 713 were collected pre monsoon while 215 collected during monsoon season and remaining 417 adult mosquitos were collected post monsoon. The population of mosquito increases during post monsoon season due to availability of favorable condition for breeding.

## Conclusion

A study on heterogeneity of mosquitoes was carried out in Gondia region. In this region there is lack of appropriate drainage system because of which mosquito breeding occurs in drains. Based on the morphological studies, total eight species of mosquitoes of genera *Anopheles*, *Aedes* and *Culex* were identified. The study revealed that the population of mosquito increases during post monsoon season due to availability of favorable condition for breeding. The findings of the present investigation may play important role in the diagnostic processes and the epidemiology of various mosquito borne diseases.

### Acknowledgement

The author is thankful to the Dhote Bandhu Science College for its support to carry out present research work.

**Conflicts of interest:** The authors stated that no conflicts of interest.

## References

1. Sathe TV and Ghire BE. Biodiversity of mosquitoes in Kolhapur district, Maharashtra parasitology, 2002, vol xviii (Lxii).
2. Dash S and Hazra RK. Mosquito diversity in the Chilika lake area, Orissa, India, 2011.
3. Kouchere A, Hamadjam A, Damakoa. Analysis of Mosquito life cycle Model, 2021.
4. Ralph Harbach. Family Culicidae Meigen (1818) & Mosquito, 2008. Taxonomic inventory. <http://mosquito-taxonomic-inventory.info/family-culicidae-meigen-1818>.
5. Wasserman, H. A., Singh, S. & Champagne, D. E. (2004). "Saliva of the Yellow Fever mosquito, *Aedes aegypti*, modulates murine lymphocyte
6. Wasserman HA, Singh S & Champagne DE. Saliva of the Yellow Fever mosquito, *Aedes aegypti*, modulates murine lymphocyte, 2004.
7. World Health Organisation. Flooding and communicable diseases fact sheet. [http://www.who.int/hac/techguidance/ems/flood\\_cds/en/](http://www.who.int/hac/techguidance/ems/flood_cds/en/)

---

### Publisher's Note

IRJSE remains neutral with regard to jurisdictional claims in published maps and institutional affiliations

Submit your manuscript to a IJLSCI journal and benefit from:

- ✓ Convenient online submission
- ✓ Rigorous peer review
- ✓ Immediate publication on acceptance
- ✓ Open access: articles freely available online
- ✓ High visibility within the field

Submit your next manuscript to IRJSE through our manuscript management system uploading at the menu "Make a Submission" on journal website

---

Email your next manuscript to IRJSE  
editor@irjse.in

---