

FURTHER STUDIES ON THE MOSQUITO FAUNA OF PUNJAB, INDIA

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ABSTRACT

A total of thirty species of mosquitoes have been collected and identified from Punjab. A list of these species alongwith their first reference, material examined and distribution is given in this manuscript. Three species have been reported as new records from this state.

KEYWORDS

India, Mosquito, Punjab, checklist

Negligible information has been added to the mosquito fauna of Punjab since the publication of the monographs on Indian anophelines by Christophers (1933) and culicines by Barraud (1934), except for two short communications by Sagandeep *et al.* (1994) and Kirti and Kaur (1999). Moreover, the outbreaks of dengue in Ludhiana District during 1996 and 1999 and Japanese encephalitis in Fatehgarh District warrant the study of mosquito fauna in the changed scenario of this agricultural state. The present communication is intended to place on record the information collected on mosquito fauna during intensive and extensive surveys in various districts of Punjab during 1997-2000.

MATERIAL AND METHODS

Immature as well as mature mosquito specimens were collected from cattlesheds, human dwellings, water pools, ponds, rivulets, tree holes and domestic containers. The immature stages were reared up to the adult emergence stage. Adult specimens were killed with ethyl acetate vapours. The freshly killed specimens were pinned and preserved in air tight insect cabinets. As many as 1,551 adult representatives of mosquitoes belonging to 30 species referable to six genera of subfamilies Anophelinae and Culicinae were collected and identified. The identification of various species was done with the help of relevant literature (Christopher, 1933; Barraud, 1934; Puri, 1954; Watal & Kalra, 1961).

RESULTS

Genus *Anopheles* Meigen

Meigen, 1818, Syst. Besch., 1: 10

Type species: *Anopheles claviger* Meigen

1. *Anopheles (Anopheles) paraliae* Sandosham

Material examined: Nine females, 8.iv.2000, Harike, Amritsar, coll. J. Kaur.

2. *Anopheles (Anopheles) peditaeniatus* (Leicester)

Material examined: 10 females, 2.v.1997, eight females, 25.ix.1997, Mohie, Ludhiana; 10 females, 3.ix.1997, 10 females, three males, 21.ix.1997, one female, three males, 8.xi.1998, Patiala, coll. J. Kaur.

3. *Anopheles (Anopheles) nigerrimus* Giles

Material examined: One male, 21.ix.1997, Patiala; one female 25.ix.1999, Mohie, Ludhiana, coll. J. Kaur.

Subgenus *Cellia* Theobald

Theobald, 1903, Monog. Culic., 3: 107

Type species: *Anopheles pharoensis* Theobald

4. *Anopheles (Cellia) stephensi* Liston

Material examined: Four females, 30.iv.1997, Patiala; two females, 5.vii.1997, Mullanpur, Ludhiana; seven females, 17 males, 21.vii.1997, Bangsipur; 37 females, 16 males, 6.vii.1998, Mohie, Ludhiana; four females, 29 males, 23.vii.1999, Handiaya, Barnala, coll. J. Kaur.

5. *Anopheles (Cellia) pulcherrimus* Theobald

Material examined: One female, 1.vii.1998, Patiala; three females 13.vii.1998, Mohie, Ludhiana; two females, 21.vii.1998, Bangsipur, coll. J. Kaur.

6. *Anopheles (Cellia) annularis* Van der Wulp

Material examined: 12 Females, 3.vii.1997, five females, one male, 8.vii.1998, Patiala; one female, 11.viii.1998, Bela Dhiani, Nangal; seven females, 7.vii.1999, Rahon, Nawan Shahr, coll. J. Kaur.

7. *Anopheles (Anopheles) subpictus* Grassi

Material examined: One female, 11.vii.1998, Nangal, coll. J. Kaur.

8. *Anopheles (Cellia) culicifacies* Giles

Material examined: One female, 21.vii.1997, Bangsipur, Ludhiana; 31 females, 11.viii.1998, Nangal; 11 females 12.viii.1998, Anandpur Sahib, coll. J. Kaur.

9. *Anopheles (Cellia) fluviatilis* James

Material examined: Three females, 11.viii.1998, Bela Dhiani, Nangal, coll. J. Kaur.

Genus *Mansonia* Blanchard

Blanchard, 1901, C.R. Soc. Biol., 53: 1045

Type species: *Culex titillans* Walker

10. *Mansonia (Mansonioides) uniformis* (Theobald)

Material examined: Five females, 1.x.1997, two females 22.ix.1999, Patiala; two females, 10.viii.1998, Anandpur Sahib; six females, 8.iv.2000, Harike, Amritsar, coll. J. Kaur and J. Singh.

11. *Mansonia (Mansonioides) dives* (Schiner, 1868).

Material examined: One female, 29.iv.1999, two females, 8.iv.2000, Harike, Amritsar, coll. J. Kaur and J. Singh.

Genus *Armigeres* Theobald

Theobald, 1901, Monog. Culic., 1: 322.

Type species: *Armigeres obturbans* (Walker)

12. *Armigeres (Armigeres) subalbatus* (Coquillett)

Material examined: Two females, two males, 21.vi.1997, 12 females, 30 males, 6.viii.1997, 14 females, 1.x.1997, three females, 10.xi.1997, 17 females, two males, 4.iv.1998, Patiala; two females, two male, 5.vii.1997, one female, 7.iv.1998, Mohie, Ludhiana; one female, two males, 1.iii.1998, Bassi Pathana, Fatehgarh Sahib; four females, 23.iv.1998, Mukeria, Hoshiarpur; one female, one male, 2.v.1998, Talwara, four females, 17.x.1998, Bhaiyan, Gurdaspur, three females, 12 males, 9.vii.1999, Hajipur; one female, one male, 8.v.1998, Anandpur Sahib, Ropar, coll. J. Kaur and J. Singh.

Genus Aedes Meigen

Meigen, 1818, Syst. Besch., 1: 13.

Type species: *Aedes cinereus* Meigen**Subgenus Stegomyia Theobald**

Theobald, 1901, Monog. Culic., 1: 283.

Type species: *Culex fasciatus* Fabricius**13. Aedes (Stegomyia) aegypti (Linnaeus)**Material examined: 10 females, four males, 5.ix.1999, Ludhiana; one female, 30.ix.1999, Patiala, coll. J. Kaur and J. Singh.**14. Aedes (Stegomyia) albopictus (Skuse)**Material examined: Six females, 18.viii.1997, five females, 27.viii.1997, 27 females, 10 males, 2.iv.1998, 17 males, 22.vii.1998, Patiala; 11 females, two males, 27.viii.1998, Chatbir, coll. J. Kaur.**15. Aedes (Stegomyia) gardnerii (Ludlow)**Material examined: One female, 2.iv.1998, Patiala; one female, 27.viii.1998, Chatbir, coll. J. Kaur.**16. Aedes (Stegomyia) w-albus Theobald**Material examined: One female, 2.iv.1998, Patiala; one female, one male, 27.viii.1998, Chatbir, coll. J. Kaur.**17. Verrallina (Neomacleaya) indica (Theobald, 1907).**Material examined: Four females, 3.ix.1997, five females, 26.ix.1998, Patiala, coll. J. Singh.**Subgenus Mucidus Theobald**

Theobald, 1901, Monog. Culic., 1: 268.

Type species: *Culex alternans* Westwood**18. Ochlerotatus (Mucidus) scatophagoides (Theobald, 1901).**Material examined: One female, 24.ix.1997, Patiala, coll. J. Kaur.**Subgenus Neomelanicion Newstead**

Newstead, 1907, Ann. trop. Med. Parasit., 1: 31

Type species: *Culex luteolateralis* Theobald.**19. Aedes (Neomelanicion) lineatopennis (Ludlow)**Material examined: Three females, one male, 21.ix.1997, Patiala, coll. J. Kaur.**Subgenus Aedimorphus Theobald**

Theobald, 1903, Monog. Culic., 3: 290.

Type species: *Uranotaenia domestica* Theobald**20. Aedes (Aedimorphus) jamesi (Edwards)**Material examined: One female, 8.x.1998, Patiala, coll. J. Kaur.**Genus Mimomyia Theobald**

Theobald, 1903, Monog. Culic., 3: 304

Type species: *Mimomyia splendens* Theobald**21. Mimomyia (Mimomyia) chamberlaini (Ludlow)**Material examined: Two males, 30.iv.1998, Mukerian, Hoshiarpur, coll. J. Kaur.**Genus Culex Linnaeus**

Linnaeus, 1758, Syst. Nat., 10: 602.

Type species: *Culex pipiens* Linnaeus.**22. Culex (Culex) epidesmus (Theobald)**Material examined: Two females, 3.ix.1997, Patiala, coll. J. Kaur.**23. Culex (Culex) gelidus Theobald**Material examined: One female, one male, 1.x.1997, two females,

one male, 16.x.1998, three males, 19.xi.1999, Patiala, coll. J. Singh.

24. Culex (Culex) whitmorei (Giles)Material examined: Two females, 5.vii.1997, Patiala; one female, 26.vii.1997, Mohie, Ludhiana, coll. J. Kaur.**25. Culex (Culex) tritaeniorhynchus Giles**Material examined: 52 females, five males, coll. J. Kaur, common species in Punjab from June to September.**26. Culex (Culex) pseudovishnui Colless**Material examined: 99 Females, 38 males, coll. J. Kaur, common species in Punjab from June to November.**27. Culex (Culex) vishnui Theobald**Material examined: 77 females, 24 males, coll. J. Kaur, common species in Punjab from June to September.**28. Culex (Culex) quinquefasciatus Say**Material examined: 438 females, 238 males, coll. J. Kaur, common species in Punjab from May to December.**29. Culex (Culex) bitaeniorhynchus Giles**Material examined: Six females, two males, 19.vii.1997, Mohie, Ludhiana; eight females, three males, 21.ix.1997, Patiala, coll. J. Kaur, J. Singh.**Subgenus Lutzia Theobald**

Theobald, 1903, Monog. Culic., 3: 155.

Type species: *Lutzia bigoti* Theobald**30. Culex (Lutzia) fuscus Wiedemann**Material examined: One male, 6.x.1997, one male, 21.xii.1997, three females, four males, 8.xi.1998, Patiala, coll. J. Kaur.**REFERENCES**

- Barraud, P.J. (1934).** *The Fauna of British India Diptera including Ceylon and Burma*, 5, Taylor and Francis, London, 463pp.
- Christophers, S.R. (1933).** *The Fauna of British India Diptera including Ceylon and Burma*, 4, Taylor and Francis, London, 371pp.
- Colless, D.H. (1956).** Notes on the Culicine Mosquitoes of Singapore. II. The *Culex vishnui* group (Diptera, Culicidae), with descriptions of two new species. *Ann. Trop. Med. Para.*, 51: 87-101.
- Kirti, J.S. and J. Kaur (1999).** Mosquitoes of Malwa region of Punjab (India). *Geobios New Reports* 18: 75-76.
- Puri, I.M. (1954).** Synoptic table for the identification of the Anopheline Mosquitoes of India. *Health Bulletin* 10: 1-57.
- Sagandeep, V.C. Kapoor and J.S. Grewal (1994).** Some mosquito (Diptera: Culicidae) species of Punjab and Himachal Pradesh. *Journal of Insect Science* 7: 48-50.
- Wattal, B.L. and N.L. Kalra (1961).** Regionwise pictorial keys to the female Indian *Anopheles*. *Bulletin of National Society Indo Malayan Mosquito Diseases* 9: 85-138.

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