

Chapter-II

Review of Literature

REVIEW OF LITERATURE

Review of literature indicates that throughout the world enormous data is available on taxonomy of mosquitoes. Theobald (1901a) published a monograph of the Culicidae of the world. Theobald (1901b) erected one subgenus *Mucidus* and described one new species from Burma. Coquillett (1901) described three new species of subgenus *Anopheles* from West Indies. Theobald (1902) gave classification of the genus *Anopheles*. Coquillett (1902) described six new species of subgenus *Culex* from America

Theobald (1904a) erected one new genus *Hodgesia* from Culicidae from Uganda. Theobald (1905^d) erected a new subgenus *Lophoceratomyia* and describe one new species *Culex (Lophoceratomyia) fraudatrix* from New Guinea. James and Liston (1905) described five new species of subgenus *Culex* from Ceylon. Grabham (1906) described four new species of subgenus *Culex* from Jamaica, West Indies. Coquillett (1906) described five new species of subgenus *Aedes* from the West Indies. Banks (1906a) published a checklist of Philippine mosquitoes and described four new species of subgenus *Culex* from Philippines. Banks (1906b) erected one new genus and described ten new species of the genus *Culex* from Philippine.

Banks (1909) described four new species of subgenus *Banksinella* from the Philippines. Carter (1910) described one new species of *Anopheles* from South Africa. Idem (1910)

published a monograph of the Culicidae of the world. Newstead and Carter (1910) erected one new genus *Dactylomyia* and described three new species of genus *Anopheles* from Uganda. Theobald (1911) erected new subgenus *Diceromyia* and described two new species of the same from Sudan.

Carter (1911) described one new species of genus *Mansonia* from Uganda. Brunetti (1912) published a annotated catalogue of Oriental Culicidae. Edwards (1912) published key to the Australasian species of *Ochlerotatus* genus. Edwards (1913) published new synonymy in Oriental Culicidae. Brunetti (1914) gave a critical review of genera in Culicidae. Banks (1914) described one new species of *Anopheles* from Philippine. Strickland (1916) described *Myzorhynchus hunteri* a new species from Malaya. Edwards (1916) described eight new species of subgenus *Culex* from British Museum collection. Edwards (1920) published catalogue of Oriental and South Asiatic Nematocera. Edwards (1921^b) published a synonymic list of the mosquitoes and described key to determining the genera and species of mosquito from Sweden. Evans (1931) described one new subspecies *Anopheles funestus* Giles from Southern Rhodesia. Edwards (1932) reported 30 genera, 89 subgenera, 1,400 species, 146 varieties and 1,286 species synonyms. Marsh (1933) described one new species of subgenus *Myzomyia* from Southwest Persia.

Hackett and Lewis (1935) reported new variety of *Anopheles maculipennis* from Southern Europe. Baker (1936) described one new species of subgenus *Orthopodomia* from China. Mulligan and Puri (1936) described *Anopheles (Anopheles) habibi* new species from Quetta, Baluchistan. Salem (1938) described two new species of genus *Topomyia* from Sinia peninsula, Egypt. Keshishian (1938) described *Anopheles sogdianus* new species from Tadjakistan. Bates (1940) gave nomenclature and taxonomic status of the mosquitoes of the *Anopheles malulipensis* complex. Belkin and Schlosser (1944) described one new species of *Anopheles* from Solaman Island. Belkin (1945) described *Anopheles nataliae* new species from Guddal Canal, New Georgia. Stone (1945) published a mosquitoes synonym. Bohart (1946) published key to the Chinese Culicidae mosquito. King and Hoogstraal (1946) described two new species of subgenus *Finlaya* from New Guinea. De Meillon (1947) published key to the *Anophelini* of the Ethiopian geographical region. Stone and Penn (1948) erected one new subgenus and described two new species of the genus *Culex* from China. Bohart (1950) described one new species of subgenus *Orthopodomyia* from California. Bohart (1953) described one new species of *Culex* from Okinawa. Reid (1953) reported *Anopheles hyrcanus* group in South-east Asia. Pringle (1954) published key to the adult *Anopheline* mosquitoes from Iraq and neighbouring territories. Thurman (1954) erected *Ayurakitia* new genus

from Northern Thailand. Carpenter and Lacasse (1955) described one new species of *Culex* from North America. Bohart (1956) described one new species of subgenus *Coquillettidia* from Southern Ryukyu Island. Barr (1957) described one new species of *Culiseta* from North America. Stone *et al.* (1959) published a synoptic catalogue of the mosquitoes of the world. They reported 31 genera, 95 subgenera, 2,401 species and 208 varieties, 1,286 species synonyms. Colless (1960) described four new species of subgenus *Culex* from New Guinea. Shahgudian (1960) published key in the *Anophelines* mosquitoes from Iran. Stone (1961) published a synoptic catalogue of the mosquitoes of the world. Services (1962) published a key to the West African *Anophelini*. Stone (1963) published a synoptic catalogue of the mosquitoes of the World. Baisas and Dowell (1965) published key to the adult females and larval anopheline mosquitoes of the Philippines. Colless (1965) erected a new subgenus *Lophoceraomyia* in Malaya. Stone (1967) published a synoptic catalogue of the mosquitoes of the world. Scanlon *et al.* (1968) published an annotated check-list of the *Anopheles* mosquitoes from Thailand. Reid (1968) published key to the *Anopheline* mosquitoes from Malaya and Borneo. Stone and Barreto (1969) erected one new subgenus and described one new species of genus *Culex* from Colombia. Cagampang-Romas and Darsie (1970) published key to the *Anopheles* mosquitoes of the Philippines Island.

Postiglione *et al.* (1970) reported *Anopheles maculipennis* complex from Turkey. Lee and Lein (1970) published pictorial key to the mosquitoes of Korea. Stone (1970) published a synoptic catalogue of the mosquitoes of world. Stone and Delfinado (1973) published a catalogue of the Diptera of the Oriental region. White (1975) published notes on a catalogue of Culicidae of the Ethiopian region. Knight and Stone (1977) published a catalogue of mosquitoes of the world. White (1985) described *Anopheles bwambae* new species from Semliki valley, Uganda. Shidrawi and Gillies (1987) described *Anopheles paltrinierii* new species from Sultanate, Oman. Peyton and Ramalingam (1988) described *Anopheles (Cellia) nemophilous* new species from peninsular Malaysia. Wilkerson and Strickman (1990) published key to the female *Anopheles* mosquitoes from Central America and Mexico. Zaim and Javaherian (1991) reported *Anopheles culicifacies* species from Iran. Click (1992) published key to the female *Anopheles* mosquitoes from Southwestern Asia and Egypt. Ward (1992) published a catalogue of the mosquitoes of the world. Nguen *et al.*, (2000) described *Anopheles (Anopheles) nimpe* a new species in coastal area of Southern Vietnam. Darsie and Shroyer (2004) described *Culex (Culex) declarator* a new species from Florida. Sallum *et al.* (2005) described six new species from *Anopheles leucosphyrus* group from oriental region.

In India, Giles (1901a) described six new species of genus *Culex*. Giles (1901b) described four new species of genus *Anopheles* from India. Bentley (1902) described one new species of genus *Anopheles* from Tezpur district, Assam. James and Liston (1904) published a monograph of the *Anopheles* mosquitoes of India. James and Liston (1910) gave new classification of the genus *Anopheles*.

Theobald (1910) erected four new genera and described twenty new species of genus *Anopheles* and one new variety of *Anopheles* from India. James and Liston (1911) published a monograph of *Anopheles* mosquitoes of India and enlisted thirty species of mosquitoes. Christophers (1911) described one new species of genus *Anopheles* from Simla.

Edwards (1923) described five new species of genus *Finlaya* from India. Barraud (1923a) described five new species of subgenus *Stegomyia* from Assam. Barraud (1923b) described two new species of *Culex* from Assam. Barraud (1923c) published key to the Indian species of subgenus *Lutzia*. Senior White (1923) published a catalogue of Indian Culicidae. Barraud (1924a) described two new species of subgenus *Moththogenes* from Kashmir. Barraud (1924b) described four new species of subgenus *Finlaya* from the Western Himalaya. Barraud (1924c) described one new species from subgenus *Lophoceratomyia* from Himalaya.

Barraud (1924d) described two new species of genus *Culex* from Assam. Barraud (1924e) described three new

species of genus *Culex* from India. Barraud (1924f) described one new species of the subgenus *Culiciomyia* from India. Barraud (1924g) described two new species of subgenus *Lophoceratomyia* from India. Barraud (1924h) described five new species of genus *Culex* in Kashmir and North West frontier province. Christophers (1924) published a provisional list of mosquito and reference catalogue of the Anophelini in India. Barraud (1926) described five new species from *Uranotoenia* and *Harpagomyia* from India. Barraud (1927a) described two new species from genus *Aedomyia* and *Orthopodomyia* from Karwar. Barraud (1927b) described two new species from subgenus *Leicesteria* from Assam.

Barraud (1927c) described seven new species from subgenus *Aedimorphus* and *Finlaya* from India. Barraud (1927d) described one new species from subgenus *Mansonioides* from India. Strickland and Chowdhury (1927) described one new species of Anopheline from Bengal. Barraud (1928) described eight new species of genus *Aedes* from India. Puri (1929) described one new tree-hole breeding species of *Anopheles sintoni* from South India. Barraud (1931a) described one species from subgenus *Stegomyia* from Bihar. Barraud (1931b) described eight new species of Indian Culicine mosquitoes.

Barraud (1931c) described eight new species of subgenus *Aedes* from India. Barraud (1931d) described two new species from genus *Stegomyia* from India. Barraud (1932)

described one new species from genus *Anopheles* from India. Christophers (1933) published key to the family Culicidae and tribe *Anophelini*.

Barraud (1934) published key to the family Culicidae and tribes *Megarhinini* and *Culicini*. Puri (1935) published key to the fully grown larvae of Indian *Anopheline* mosquitoes. Puri (1941) published key to the Anopheline mosquitoes of India. Misra (1956) reported six species from Anopheline from Northeast frontier Agency. Wattal and Kalra (1961) published a regionwise pictorial key to the female Indian *Anopheles*. Reuben (1967) described one new species from subgenus *Diceromyia* from Southern India. Knight (1969) described one new species of the subgenus *Finlaya* from India. Sen *et al.*, (1972) reported fourteen species of *Anopheles* from Tirap district Arunachal Pradesh. Hussainy (1981) reported eighteen species of *Anopheles* and thirteen species of *Culex* from Bastar district of Madhya Pradesh. Reuben and Suguna (1983) published a morphological differences between sibling species of the *Anopheles subpictus* Grass from India. Rao (1984) published a key to the Anophelines mosquitoes of India. Tewari *et al* (1987) reported thirty one species of *Anopheles*, eleven belongs to subgenus *Anopheles* and twenty belongs to subgenus *Cellia* from Western Ghat of Tamil Nadu. Tewari and Hiriyan (1990) described male larva and pupae of *Aedes (Diceromyia) kanarensis* for the first time from Wynad district, Kerala.

Rajput and Kulkarni (1990) reported thirty eight species and four varieties of *Culex* from Bastar district of Madhya Pradesh. Rajput and Singh (1990) reported nineteen species of *Anopheles* from Manipur. Rajput and Kulkarni (1991) reported ten species from six genera of Bastar district of Madhya Pradesh. Tewari and Hiriyan (1991) described *Aedes (Rhinoskusea) protonovoensis* new species from South India. Pal and Dutta (1992) reported sixteen species of *Anopheles* from three district of Arunachal Pradesh. Rajput and Singh (1992a) reported twenty seven species of genus *Culex* from Manipur. Rajput and Singh (1992b) reported distributional records of nineteen species of *Aedes* from Manipur. Rajput and Singh (1992c) recorded eleven species from genus *Armigers* and single species from genus *Heizmannia* from Manipur. Tewari and Hiriyan (1992) described two new species of subgenus *Diceromyia* from South India. Reuben *et al* (1994) published key to the species of *Culex* in Southeast Asia. Tewari and Hiriyan (1994) described female pupa and larva of *Aedes (paraedes) Barraud* and the pupa and larva of *Aedes (paraedes) Menoni* for first time from Wynad district, Kerala. Rajavel (1996) reported *Culex (Lophoceraomyia) infantulus* Edwards for first time in Pondicherry, South India. Bhattacharyya *et al.*, (2000) reported *Armigeres joleoensis* a rare mosquito in Upper Assam. Rajavel *et al.*, (2001) reported fifteen species of mosquitoes in Mangrove ecosystem in South

India. These fifteen species belonging to the five genera and ten subgenera.

Recently, Sathe and Girhe (2001) studied biodiversity of mosquitoes in Kolhapur district, Maharashtra. Gire and Sathe (2001) described *Aedes sangiti* new species from Kolhapur district, Maharashtra. Sathe and Girhe (2002) described *Aedes kolhapurensis*, *Aedes sangiti*, *Aedes punchgangi* and *Aedes indica* new species and they also studied seasonal abundance and distributional records of fifteen mosquito from Kolhapur district, Maharashtra. Bhattacharyya *et al.* (2003) reported *Culex (Lophoceraomyia) quadripalpis*, *Culex (Lophoceraomyia) mammilifer* and *Uranotaenia (pseudoficalbia) novobscura* are the new records from Assam. Bhattacharyya *et al.* (2004a) described *Verrallina (Neomacleaya) assamensis* a new species from Assam. Bhattacharyya *et al.* (2004b) described a new species *Uranotaenia (pseudoficalbia) dibrugarhensis* from Dibrugarh district of Assam. Rajavel *et al.* (2004) published check-list of mosquitoes of Pondicherry. They reported sixty four species belonging to fourteen genera and twenty three subgenera. Sathe and Jagtap (2005) studied biodiversity of mosquitoes from Sangli city of Maharashtra.

Rajavel *et al.*, (2005a) reported forty three species of mosquitoes in mangrove forests of Bhitarkanik, Orissa. These forty three species are belonging to the thirteen genera and twenty one subgenera. Rajavel *et al.*, (2005b) reported *Culex*

(*Lophoceraomyia*) *pilifermoralis*, *Culex* (*Lophoceraomyia*) *wilfredi* and *Heizmannia* (*Heizmannia*) *chegi* for the first time from Jaypore hills of Orissa. Satishkumar and Vijayan (2005) reported twenty nine species of mosquitoes in the rural areas of Mysore and mandy district of Karnataka. These twenty nine species are belonging to the seven genera. Sathe and Tingare (2006) also studied biodiversity of mosquitoes in Solapur city, Maharashtra. Sathe and Tingare (2007) described one new species of the genus *Anopheles* Meigen from India. Rajavel *et al.* (2007) reported fourteen species of mosquitoes in chora mangrove of Goa. These fourteen species are belonging to the nine genera and nine subgenera. They also reported twelve species of mosquitoes in the mangroves of Vikhroli, Maharashtra. These species are belonging to the seven genera and nine subgenera. Bhattacharyya *et al.* (2007) reported *Topomyia* (*Topomyia*) *hirtusa*, *Topomyia* (*Topomyia*) *bifurcata* and *Topomyia* (*Suaymyia*) *crinata* for the first time in the northeastern state of Arunachal Pradesh. The review of literature clearly indicates that very little attention is paid on the taxonomy of mosquito from Maharashtra except the work of Sathe and his co-workers.