

Sirivanakarn (1971, 1972) reclassified the species of *Mochthogenes* (three species) and *Neoculex* (two species) as members of subgenus *Eumelanomyia* and listed three additional species among the *Culex* fauna of Thailand (*Cx. kiriensis*, *Cx. otachati*, and *Cx. phangngae*). Sirivanakarn (1976) recorded three additional species (*Cx. edwardsi*, *Cx. infula*, and *Cx. murrelli*) and a new species (*Cx. longicornis*) of subgenus *Culex*. Sirivanakarn (1973a, 1977b) recorded two new species of subgenus *Culiciomyia* (*Cx. harrisoni* and *Cx. lampangensis*) and Sirivanakarn (1977c) added four new country records (*Cx. minutissimus*, *Cx. pilifemoralis*, *Cx. tuberis*, and *Cx. whartoni*) and three new species of subgenus *Lophoceraomyia* (*Cx. gracicornis*, *Cx. hirtipalpis*, and *Cx. paioji*) to the Thai fauna. These additions brought the total number of *Culex* species known to occur in Thailand to seventy-seven. Harrison *et al* (1991) revised the list of Culicidae found in Thailand. They added *Cx. jacksoni* and *Cx. mimeticus* of subgenus *Culex*, *Cx. sasai* and *Cx. viridiventer* of subgenus *Culiciomyia*, one new record (*Cx. richei*) and the new species, *Cx. oresbius*, of subgenus *Eumelanomyia* described from Thailand by Harbach and Rattananarithkul (1988).

Tanaka (2003) elevated *Lutzia* to generic status and introduced a new subgenus, *Metalutzia* for *Lt. fuscana* and *Lt. halifaxii*. Tanaka also elevated *Lt. vorax* from synonymy with *Lt. halifaxii*, and this species is included herein as a new country record.

Tanaka (2004) transferred the species of the Bitaeniorhynchus Subgroup of subgenus *Culex* to subgenus *Oculeomyia*, which he resurrected from synonymy with *Culex*. Consequently, the Bitaeniorhynchus Subgroup is no longer recognized as an informal category of classification. In this study, we add one undescribed species belonging to subgenus *Oculeomyia*. Eighty-five species of *Culex* and *Lutzia* are now known to occur in Thailand.

### **Habitats of the immature stages**

*Culex* have a worldwide distribution but more species occur in tropical and subtropical regions. These mosquitoes occur at altitudes ranging from lowland areas to high mountains. They are frequently associated with a variety of forest types, including primary and secondary tropical rain forests, wet to dry evergreen forests, and secondary evergreen and deciduous forests. Larvae are found both in temporary and permanent bodies of water. Specific habitats are located in lighting conditions ranging from direct sunlight to deep shade. In addition to a variety of ground water-habitats, many species inhabit artificial and natural containers. Most species occur in freshwater, but a few also

inhabit brackish water, eg, *Cx. (Cux.) sitiens*, and polluted water, eg, *Cx. (Cux.) quinquefasciatus*. *Lutzia* are found in freshwater habitats similar to those occupied by *Culex* species, however they occur principally in tropical regions of the world.

### Feeding behavior

Most records of *Culex* and *Lutzia* from Thailand refer to nocturnal feeding on mammals, eg, humans, cows, and dogs. The periodicity of nocturnal feeding varies greatly depending on the species. *Culex (Cux.) quinquefasciatus*, for example, are fairly abundant in urban areas throughout the year and are commonly found resting during the day in shade outdoors, and on walls, dark corners, in cabinets, bathrooms, and under chairs and tables in houses. Females are vicious biters at night indoors and outdoors and feed principally on blood of man and dogs from sunset until dawn. Many species of *Culex* have been collected in large numbers at night in cowsheds, in light traps or animal-baited traps, and biting cows, pigs, and occasionally humans. Infrequently, *Cx. (Eum.)* species, *Cx. (Lop.) infantulus*, *Cx. (Lop.) rubithoracis*, and other *Cx. (Lop.)* species, as well as *Lt. (Mtl.) fuscana*, are caught attacking humans. Little is known about the adult biology and medical importance of species in subgenera *Culiciomyia*, *Eumelanomyia*, *Lophoceraomyia*, and *Oculeomyia* of *Culex*, and *Metalutzia* of *Lutzia*.

## THE GROUPS, SUBGROUPS, COMPLEXES, AND SPECIES OF GENERA *CULEX* AND *LUTZIA*

A brief account of the classification and biology of the *Culex* and *Lutzia* in Thailand is given below. A complete listing of the species belonging to each species group, subgroup, and complex, and their distributions, is provided in Table 1. The known habitats of the Thai species are listed in Table 2.

### *Culex (Culex)*

Subgenus *Culex* is important because many species have been incriminated as vectors of Japanese encephalitis and filariasis. The species occur everywhere from cities and lowland tropical forests to higher elevations in mountains. Immature stages occur in a variety of ground-water habitats, and artificial and natural containers. Nineteen species belonging to eight subgroups occur in Thailand.

**Pipiens Group.** This group includes three species in Thailand, each belonging to a different subgroup.