

Some New Records of Mosquitoes Occurring in Sri Lanka

by

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ABSTRACT. Four mosquito species that occur in the Oriental and Southeast Asian regions are reported for the first time from Sri Lanka. They are *Aedes (Diceromyia) periskelatus* (Giles), *Aedes (Verrallina) yusafi* Barraud, *Culex (Culiciomyia) scanloni* Bram and *Uranotaenia (Pseudoficalbia) gouldi* Peyton & Klein. Brief notes on the biology of these species are provided. Another species, *Culex (Culex) hutchinsoni* Barraud, is provisionally identified as occurring on this island.

INTRODUCTION

The most recent catalogue of the mosquito fauna of Sri Lanka lists 131 species in 16 genera as occurring in this country, together with several species records that are listed as being misidentifications or of doubtful validity (Jayasekera and Chelliah, 1981). Subsequently two of the records listed as doubtful have been confirmed as occurring on this island, namely, *Aedes w-albus* and *Ae. novalbopictus* (Amerasinghe and Alagoda, 1982; Amerasinghe, 1983). Further field studies on the mosquito fauna of this country enable us to confirm the occurrence of four more culicine species that have not been recorded previously, as well as provisionally identifying a fifth species. Notes on the occurrence of these species in Sri Lanka, together with a review of their biology and distribution in the Oriental and Southeast Asian regions, as recorded in the literature, are presented below.

METHODS

Both field collected and reared adults were preserved by mounting on pins. Whole immatures were preserved in 70% ethanol. Unstained larval and pupal skins, as well as adult male and female terminalia dissections were mounted on slides in euparal, after dehydrating in glacial acetic acid and clearing in clove oil.

Reference specimens, with associated slides, have been deposited at the Walter Reed Biosystematics Unit of the United States National Museum of Natural History in Washington D.C. Other specimens are preserved in the collections of the first author, at the Department of Zoology, University of Peradeniya, Sri Lanka.

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TAXONOMIC RESULTS AND DISCUSSION

1. *Aedes (Diceromyia) periskelatus* (Giles) 1902. Material examined: 3 females. Collection locality: Dehiattakandiya (Amparai District, Eastern Province), in dry zone secondary forest. Collection Method: Nocturnal human bait catch (2 females), CDC light trap (1 female). Collectors: N. K. Jayawardena, N. B. Munasinghe and F. P. Amerasinghe.

This species was originally described as "*Stegomyia periskelata*" by Giles from a single adult male collected in Central India. Barraud (1934) assigned it to subgenus *Diceromyia* of *Aedes* but misnamed it "*periskeletus*," the name used by subsequent workers such as Khokhar and Tariq (1966). The correct nomenclature, however, is used by Reinert (1970) and Knight and Stone (1977). Descriptions of the adults and immature stages were made by Khokhar and Tariq (1966) from larvae collected from a mango tree hole near Lahore, Pakistan.

There is no information on the disease relationships of this or related species of the subgenus from the Oriental and Southeast Asian regions, but two African species of the *furcifer-taylori* group of species have been implicated as potential vectors of yellow fever and chickungunya viruses (Reinert, 1970).

2. *Aedes (Verrallina) yusafi* Barraud 1931. Material examined: 8 females. Collection locality: Dehiattakandiya (Amparai District, Eastern Province), in dry zone secondary forest. Collection Method: Diurnal human bait catch, between 1400 - 1600 hours. Collectors: N.K. Jayawardena and F. P. Amerasinghe.

The type locality of this species is India, and it has also been recorded from Thailand (Reinert, 1974), being collected biting man during the daytime as in the present study. Its breeding habits are unknown - the immature stages described by Reinert (1974) being reared from eggs laid in the laboratory from wild-caught blooded females. There is no information on the disease relationships of this species. However, other species of the subgenus have been implicated in the carriage of the filarial worms *Brugia malayi* and *Dirofilaria* sp., as well as arboviruses (MM-2021 virus and a Group A virus), and are suspected, on epidemiological grounds, as possible vectors of Japanese Encephalitis and Dengue (see review by Reinert, 1984).

3. *Culex (Culiciomyia) scanloni* Bram, 1967. Material examined: 8 males, 14 females, 22 1, 22 p, 270L, 56P, 03 male terminalia. Collection locality: Dehiattakandiya (Amparai District, Eastern Province), in dry zone secondary forest. Collection method: Immatures, from breeding sites. Collectors: N. B. Munasinghe and H. M. Gunaratne Banda.

The type locality of this species is Thailand, and it has also been recorded from the Philippines, N. Borneo, S. Vietnam, Malaysia and Sulawesi (Bram, 1967; Ramalingam and Pillai, 1973; Lein *et al.*, 1977). The present record from Sri Lanka extends its distributional range from the Southeast Asian to the Oriental region.

The adults of this species are indistinguishable from those of another species, *Cx. fragilis*, present in the Oriental and Southeast Asian regions (including Sri Lanka). The 4th instar larva, however, is diagnostic. Immatures have been recorded from rock pools, stream pools, puddles and elephant footprints (Bram, 1967). The collections from Sri Lanka also came from similar breeding habitats (9/17 samples) as well as from tree hole habitats (8/17 samples). Adult females of *scanloni/fragilis* were collected from CDC light traps in the vicinity of breeding sites but not from human bait catches. The biting habits and disease relationships of *scanloni* are unknown.

4. *Uranotaenia (Pseudoficalbia) gouldi* Peyton and Klein, 1970. Material examined: 3 males, 8 females, 11 l, 11 p, 81 L, 2 P, 1 male terminalia, 1 female terminalia. Collection locality: Sinharaja Forest, 5km from Kudawe (Ratnapura District, Sabaragamuwa Province). Collection method: Immatures, from breeding sites. Collector: V. L. Kulasekera.

The type locality of this species is Thailand, and it has also been recorded from Cambodia (Peyton, 1977). With the present record, its range is now extended westwards, into the Oriental region. Immatures have been recorded breeding in swamps, seepage pools and stream pools (Peyton, 1977). In Sinharaja, the immature habitats were turbid-water seepage pools in a marshy area under heavy forest cover. The adult biting habits and disease relations of this species are unknown, though Peyton (1977) reports a single un-engorged female from a "bait collection" - presumably human bait. There have been few observations on the biting habits of members of this genus, but they indicate possible hosts as being reptiles, birds, bovids and man (Peyton, 1977). In Sri Lanka, a member of this genus, *Uranotaenia (Pseudoficalbia) srilankensis* Peyton 1974, has been observed feeding on the Anuran Amphibian *Rana (Tomopterna) breviceps* Schneider, 1799, at the edge of a marsh in a dry zone forest at night, both the engorged mosquito and its host being collected and preserved (N. B. Munasinghe and F. P. Amerasinghe, unpublished observation). A group-B arbovirus (Jugra) has been isolated from *Uranotaenia* spp. in Malaysia (Berge, 1975), but there are apparently no other reports of pathogen carriage by members of this genus.

In addition to the above 4 species, we have also collected a single 4th instar larva from a tree hole in the dry zone secondary forest near Dehiattakandiya (Amparai District, Eastern Province) that can be positively ascribed to *Culex (Culex) hutchinsoni* Barraud 1924 - a species whose larval structures are diagnostic. However, in the absence of associated pupae and adults, this identification is regarded as being provisional, and subject to confirmation when additional material becomes available.

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REFERENCES

- Amerasinghe, F. P. (1983). A note on *Aedes (Stegomyia) noalbopictus* Barraud from Sri Lanka, including first descriptions of the female and egg. *Journal of Natural History*, 17:203-212.
- Amerasinghe, F. P. and T. S. B. Alagoda 1982. Occurrence of *Aedes (Stegomyia) w-albus* in Sri Lanka. *Mosq. Syst.*, 14:86-87.
- Barraud, P. J. 1934. The fauna of British India, including Ceylon and Burma. Diptera V, Family Culicidae. Tribes Megarhinini and Culicini. Taylor & Francis. 463 pp.
- Berge, T. O. (Ed.) 1975. International catalogue of arboviruses including certain other viruses of vertebrates. U. S. Department of Health Education & Welfare, DHEW Publication No. (CDC) 75-8301, 789 pp.
- Bram, R. A. 1967. Contributions to the mosquito fauna of Southeast Asia (Diptera: Culicidae) II. The genus *Culex* in Thailand. *Contr. Am. Entomol. Inst.* 2:1-296.
- Jayasekera, N. and R. V. Chelliah. 1981. An annotated checklist of mosquitoes of Sri Lanka, UNESCO: Man and the Biosphere National Committee of Sri Lanka. Publication No. 8, 16 pp.
- Khokhar, R. R. and Z. K. Tariq. 1966. A redescription of *Aedes (Diceromyia) periskeletus* (Giles, 1902) (Diptera: Culicidae). *Pakistan J. Sci.* 18:117-123.
- Knight, K. L. and A. Stone. 1977. A catalogue of the mosquitoes of the World. Thomas Say Foundation. Vol. VI, 611 pp.
- Lien, J. C., B. A. Kawengian, F. Partono, B. Lami and J. H. Cross. 1977. A brief survey of the mosquitoes of South Sulawesi, Indonesia, with special reference to the identity of *Anopheles barbirostris* (Diptera: Culicidae) from the Margolemo area. *J. med. Entomol.* 13:719-727.
- Peyton, E. L. 1977. Medical Entomology Studies - X. A revision of the subgenus *Pseudoficalbia* of the genus *Uranotaenia* in Southeast Asia (Diptera: Culicidae). *Contr. Am. Entomol. Inst.* 14:1-273.
- Ramalingam, S. and A. G. Pillai. 1973. Ten new records of mosquitoes occurring in West Malaysia. *Southeast Asian J. Trop. Med. Pub. Hlth.* 4:271-272.

- Reinert, J. F. 1970. Contributions to the mosquito fauna of Southeast Asia - V. genus *Aedes*, subgenus *Diceromyia* Theobald in Southeast Asia. Contr. Am. Entomol. Inst. 5:2-43.
- _____. 1974. Medical Entomology Studies - I. A new interpretation of the subgenus *Verrallina* of the genus *Aedes* (Diptera: Culicidae). Centr. Am. Entomol. Inst. 11:1-249.
- _____. 1984. Medical Entomology Studies - XVI. A review of the species of subgenus *Verrallina*, genus *Aedes*, from Sri Lanka and a revised description of the subgenus. (Diptera: Culicidae). Mosq. Syst. 16:1-130.