

first larval collections of *Culex (Melanoconion) erraticus* were made in Hennepin County (Hennepin County, Golden Valley (T29-R24), Sec. 18, B.S. 9, IX-11-59; IX-9-59). Adult specimens of this species were taken in light traps at Wabasha in 1939 by Peters and Daggy and again in 1941 by Peters. These are the only previous records for the state.

This is a large mosquito control district (approx. 2850 sq. mi.) embracing six counties and, thereby, providing a very wide range and variety of habitats. As a result, from our combined larval, light trap, and biting collections we have, to date, obtained 38 of the 49 species known for this state.

References Cited

BARR, A. RALPH. 1958. The mosquitoes of Minnesota. Tech. Bull. 228, U. of Minn. Ag. Exp. Sta., St. Paul, Minn.

CARPENTER, STANLEY J., and LA CASSE, WALTER J. 1955. Mosquitoes of North America (north of Mexico). U. of Calif. Press, Berkeley and Los Angeles, Calif.

TWO ADDITIONAL CHARACTERS IDENTIFYING *Culex tarsalis* Coq.

B. CHANIOTIS and W. LITIS, Department of Entomology, University of California, Davis.

Within the genus *Culex* there is frequently confusion in separating the two closely related species *C. tarsalis* Coq. and *C. peus* (Speiser), especially when the specimens for identification are worn, mutilated, or covered with moth scales and dirt, as is usually the case when they are caught in light traps.

For differentiating these two species almost all systematic books and manuals utilize two conventional characters which are undoubtedly reliable. They are: (1) presence of white scales in a narrow line or in a row of spots on the outer surface of femora and tibiae (*C. peus* lacks these), and (2) presence of a dark inverted V on the venter of most abdominal segments (*C. peus* has rounded spots instead).

These characters have proved sufficient if the specimens for identification are in good condition, but in the case of mosquitoes obtained from light traps the separation sometimes is difficult and the decision must rest on guesswork, or in regard to males on examination of the genitalia, a time-consuming process.

The authors have utilized two additional characters which serve to differentiate the species in doubtful cases. These are: (1) white scales on the base of the costal vein of the wing, and (2) two prominent tufts of white scales on the inner margins of the antennal tori. Both of these char-

acters are present in *C. tarsalis* whereas they are lacking in *C. peus*; however the bushy development of the antennae in the males makes the antennal character inconspicuous.

Hundreds of specimens of both species from various parts of the state of California have been checked, and without exception have been found to conform with our findings. It should be said that these additional characters are not newly discovered. They are mentioned in the description of *C. tarsalis* (Howard, Dyar and Knab, 1915, v. 3, p. 232) but they have never been stressed for practical purposes.

A RECORD OF *Anopheles filipinae* IN NEPAL

SHREEDHAR PRASAD PRADHAN¹ and HAROLD W. BRYDON²

During 1959 the Nepal Malaria Eradication Organization sent survey teams into different parts of Nepal to collect pre-eradication epidemiological data. On December 17 in the village of Dharampani Kaymen in a remote hilly region of District West Number 3 (Fig. 1), S. P. Pradhan found that he had collected one adult female specimen of *Anopheles filipinae* in an early morning collection.

Dr. D. K. Viswanathan and Dr. D. R. Mehta of the World Health Organization, New Delhi, India further confirmed the identification of the species.

As far as can be determined, *A. filipinae* has not been previously reported from either Nepal or from India, which is closely related both geographically and climatologically to Nepal.

Manalang (1930) reported that adult *A. filipinae* had been collected and described from Bulacan, Philippine Islands. He further stated that the larval form of the species was found in impounded spring water, shaded or unshaded, clear or muddy streams, rivers, flowing irrigation ditches, pools and lakes in the locality of Ungkong Managa near Bulutong stream (Boyd, 1949). The larvae are also occasionally found in association with aquatic vegetation such as *Pistia*, *Ipomoea*, and water hyacinths. Very little is known about the habitats of adult *A. filipinae* (Foote, et al., 1959). However, D. E. Eyles (1944) has reported that experimental flight range tests have been performed upon the species and that specimens have been observed to travel as far as 3,300 feet from the point of release.

The village of Dharampani Kaymen, from which the species was collected in Nepal, lies at

¹ Entomologist, Nepal Malaria Eradication Organization.

² Entomologist Advisor, International Cooperation Administration.

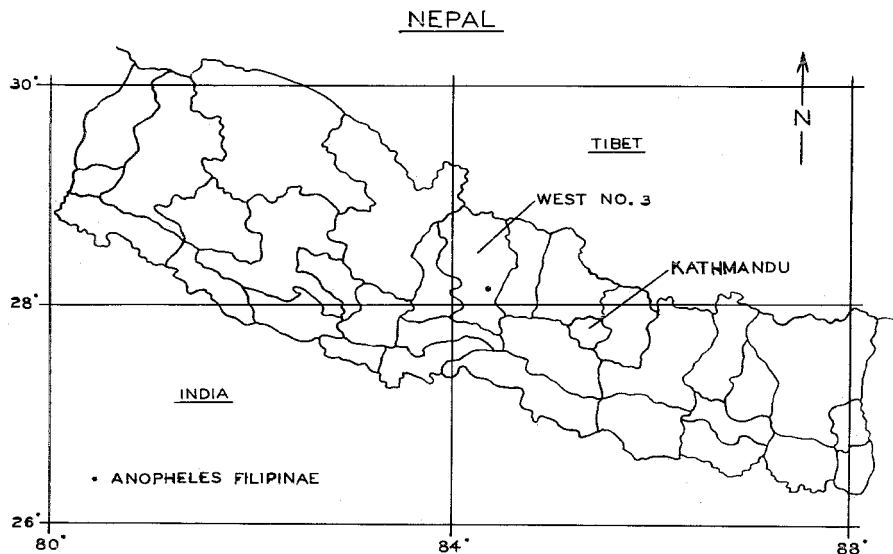


FIG. 1.—Map of Nepal showing District boundaries and the location of the *Anopheles filipinae* collection in District West No. 3 and its relation to the nation's capital, Kathmandu.

an elevation between 1,600 to 1,800 feet above sea level. The village is situated on the base of a hill near a small sparse forest and a clear spring-fed stream flows through the forest and next to the village. About one-half mile away the huge Seti Gandaki river runs toward the south. The adult specimen was collected from a building in which both humans and ruminants live.

A. filipinae is not common throughout the Philippine Islands; however, it may act as a vector in the Philippines where malaria occurs abundantly and wherever the population of the species is high. The species has been found naturally infected, but with a very low sporozoite rate. No known attempt has been made to infect the species experimentally under laboratory conditions (Foote, *et al.*, 1959).

Anopheles minimus is presently the main vector of malaria in Nepal and W. V. King (1932) states that *A. filipinae* falls in the so-called *funestus-minimus* subgroup of *Anopheles* and that it was originally known as a variety of *A. minimus*.

The literature indicates that the ecological conditions in the Philippine Islands from which *A. filipinae* was collected are apparently similar to those from which the species was collected in Nepal.

References Cited

- BOYD, MARK F. 1949. *Malaria*. Vol. 1 and 2. W. B. Saunders Co., Philadelphia, 1643 pp.
- EYLES, D. E. 1944. A critical review of the literature relating to the flight and dispersion habits of anopheline mosquitoes. *Pub. Health Serv. Bul.* 287, 39 pp.
- FOOTE, R. H. and COOK, D. R. 1959. Mosquitoes of medical importance. *Ag. Handbook* 152. U.S.D.A., 158 pp.
- KING, W. V. 1932. Three Philippine *Anopheles* of the *funestus-minimus* subgroup. *Philippine Jour. Sci.* 48:485-523.
- MANALANG, 1930. *Philippine Jour. Sci.* 43:258.

NOTE ON EFFECTS OF DROUGHT ON LARVAE OF *Aedes vexans* MEIGEN (DIPTERA: CULICIDAE)

H. G. JAMES, Entomology Research Institute for Biological Control, Research Branch Canada Department of Agriculture, Belleville, Ontario.

Gibson (1933) and Twinn and Hay (1935) indicated that in Ontario the floodwater mosquito *Aedes vexans* Meigen occurs only in comparatively small numbers in dry summers. When