PICTORIAL KEYS TO THE MOSQUITOES OF MEDICAL IMPORTANCE

VI. PHILIPPINE ISLANDS [1]

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The accompanying keys continue a eries being prepared under a transfer of unds from the Department of the Army o the Entomology Research Branch. They are designed primarily to assist ublic health workers in rapidly separat- ng and identifying the mosquito species f primary medical importance. The keys re so constructed that they separate the mportant species not only from each ther, but also from all other species nown to occur in the area. The author vill welcome any suggestions and com- nents, particularly from persons having nformation on the faunas of the countries nvolved. Other keys have been published n *Mosquito News,* vol. 13, nos. 1, 2 and 4, nd vol. 14, no. 1.

Anopheles minimus flavirostris, a mos- quito found throughout the Philippines, s by far the most important and danger- ous vector of malaria in the islands. It ccurs primarily in foothill areas, and does ot usually breed at altitudes over 2000 eet. Larvae are found in slowly running water along the shaded edges of rivers and streams, commonly in association with roots and floating twigs of bamboo. Adults frequently enter houses at night, ut leave soon after they become engorged nd rest during the day beneath eroded stream banks, under buildings, and along stone walls. *Anopheles mangyanus,* closely related in morphology and biology o *A. minimus flavirostris,* likewise breeds n clear, slowly running water in foothill regions at altitudes not exceeding 2000 feet. Larvae are found in both shaded nd sunlit situations. The importance to malarial transmission of this species is still somewhat in doubt, since little is yet known of the biting habits of the adults. *Anopheles filipinae,* another close relative of *A. minimus flavirostris,* breeds in either sunny or shaded, clear or muddy water in rivers, flowing irrigation ditches, pools and lakes. This species may be a vector of malaria in the Philippines, for it has been found in large numbers in northern Luzon in the presence of abundant malaria. Neither *Anopheles maculatus* nor *Anopheles leucosphyrus* is known definitely to transmit malaria in the Philippines. The former species, commonly encountered breeding in various situations at altitudes up to 5000 feet, is included in the key because of its potential importance as a malaria vector, since it is a dangerous one in Malaya and certain areas in the Netherlands Indies. The larvae of *A. leucosphyrus* are often found in temporary collections of water such as wheel ruts and foot prints in open shade, and the adults bite man readily. This species is a proven vector in parts of Assam, Burma and North Borneo.

In addition to the species already mentioned, the following *Anopheles* have been recorded from the Philippines, or are suspected of occurring there: *aconitus, aitkenii aitkenii, aitkenii bengalensis, annularis, baezai, barbirostris, cristatus, gateri, gigas formosus, hyrcanus pseudosinensis, insulaeflorum, kochi, kolambuganensis, karwari, lesteri, leucosphyrus balabacensis, leucosphyrus leucosphyrus, leucosphyrus riparis, lindesayi benguetensis, litoralis, ludlowii, minimus minimus, nigerrimus, parangensis, philippinensis, pseudobarbirostris, subpictus subpictus, subpictus indefinitus, sundaicus, tessellatus* and *vagus.*

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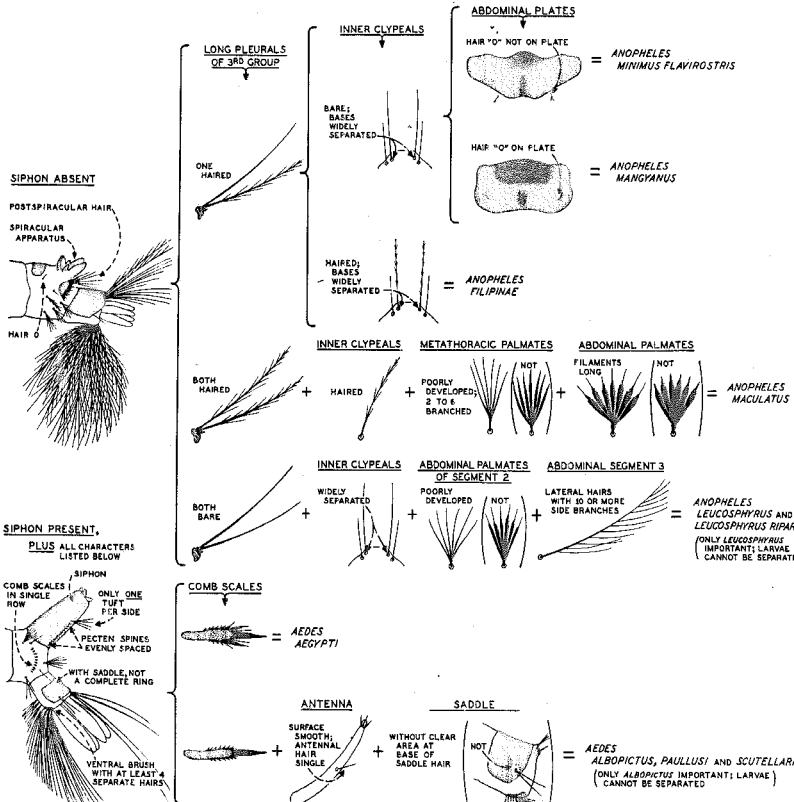
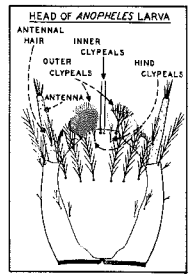
MOSQUITOES OF MEDICAL IMPORTANCE — PHILIPPINE ISLANDS

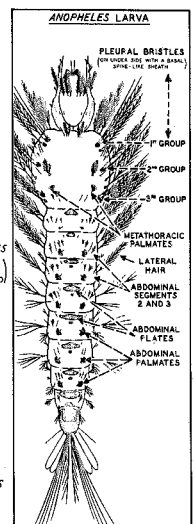
FULL-GROWN LARVAE

IMPORTANT
A SPECIMEN MUST HAVE ALL CHARACTERS LISTED FOR THAT SPECIES

INSECT IDENT., BEPQ, USDA UNDER FUNDS ALLOTTED BY SECRETARY OF ARMY NOVEMBER 1953







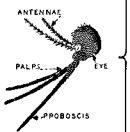
IMPORTANT
A SPECIMEN MUST HAVE ALL CHARACTERS LISTED FOR THAT SPECIES

FEMALES

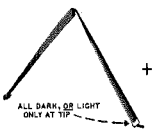
[MALES HAVE BUSHY ANTENNAE ( ) AND DO NOT BITE]

INSECT IDENT., BEPQ, USDA
UNDER FUNDS ALLOTTED BY
SECRETARY OF ARMY
NOVEMBER 1953

LONG PALPS ON *ANOPHELES*



PATTERN ON HIND FEMUR



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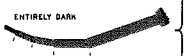
PATTERN ON PALP

PATTERN ON FORE TARSUS



= *ANOPHELES MINIMUS FLAVIROSTRIS*

= *ANOPHELES MANGYANUS*

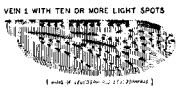
= *ANOPHELES FILIPINAE*

+

PATTERN ON HIND TARSUS

= *ANOPHELES MACULATUS*

+



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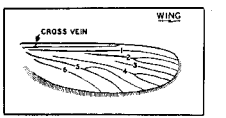
PATTERN ON HIND TARSUS

= *ANOPHELES LEUCOSPHYRUS LEUCOSPHYRUS*



SHORT PALPS ON ALL OTHERS

PATTERN ON TOP OF THORAX

+

PATTERN ON SIDE OF THORAX

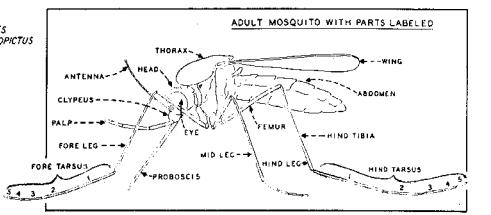
+

PATTERN ON HIND TARSUS

= *AEDES ALBOPICTUS*

= *AEDES AEGYPTI*

ADULT MOSQUITO WITH PARTS LABELED



Approximately 164 non-anopheline mosquitoes are known definitely to occur in the Philippines. Of all these, only *Aedes aegypti* and *Aedes albopictus* are of importance as vectors of disease. Both species transmit dengue fever on the island o Luzon, where the disease appears to b confined to the lowlands. Urban yello fever, transmitted by *A. aegypti,* has neve made an appearance in the Philippines.

OBSERVATIONS ON THE BITING HABITS OF *CULICOIDES CREPUSCULARIS* MALLOCH IN WESTERN NEBRASKA, WITH NOTES ON OTHER SPECIES COLLECTED IN LIGHT TRAPS (DIPTERA, HELEIDAE)

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A small blood-sucking gnat, *Culicoides crepuscularis* Malloch, occurs in large numbers in the irrigated North Platte Valley of western Nebraska. In certain localities populations of this heleid cause a great deal of annoyance to humans. The bite produces a sharp pain followed generally by irritation. The swellings or small red weals with intense itching sensation may persist for several days. These gnats, sometimes called "Punkies" or "no-see-ums," are most annoying to people out of doors in the evening, and, owing to their small size and attraction to light, frequently pass through screens and are troublesome within homes. The bites of these small gnats are often mistaken for those of mosquitoes.

During the summer of 1953, while studies were being made on biting habits of mosquitoes, severe annoyance from *C. crepuscularis* was experienced. The heleids were first noted on May 27; and when the adult populations persisted, more detailed studies were initiated in the vicinity of Mitchell, Nebr. Beginning in July adults were collected, with a chloroform tube, as they attempted to bite exposed surfaces of the legs below the knees. Biting activity was recorded for eight consecutive 15-minute periods (2 hours) following sunset on 18 evenings from July 24 to Oct. 1 Air temperatures were recorded durin each 15-minute period.

The seasonal averages of biting collec tions of females for successive 15-minut periods during the two hours followin sunset, from July 24 through October 1 1953, were as follows, in chronologica order: 120, 278, 305, 179, 53, 33, 28, 3 Average temperatures during the collec tions periods varied from 51° to 76° F

A total of 1,035 adults of *C. crepuscu laris* was collected; individual collection ranged in numbers from 9 to 166 pe night, with an average of 57.5. Bitin activity reached a peak in September; th largest numbers were taken on Septembe 8 and 9. Although a complete seasona picture was not obtained for *C. crepuscu laris* in the Mitchell area, James (1943 found, from light trap studies on Heleida in northern Colorado, that the populatio of this species remained fairly constan throughout the season.

C. crepuscularis was not found bitin during the bright daylight hours. Bitin activity started generally a few minute preceding sunset, reaching a peak durin the second and third 15-minute period following sunset (15 to 45 minutes). O August 6, 1953, collections of *C. crepus*