PICTORIAL KEYS TO THE MOSQUITOES OF MEDICAL IMPORTANCE[1]

VII. SPAIN AND PORTUGAL

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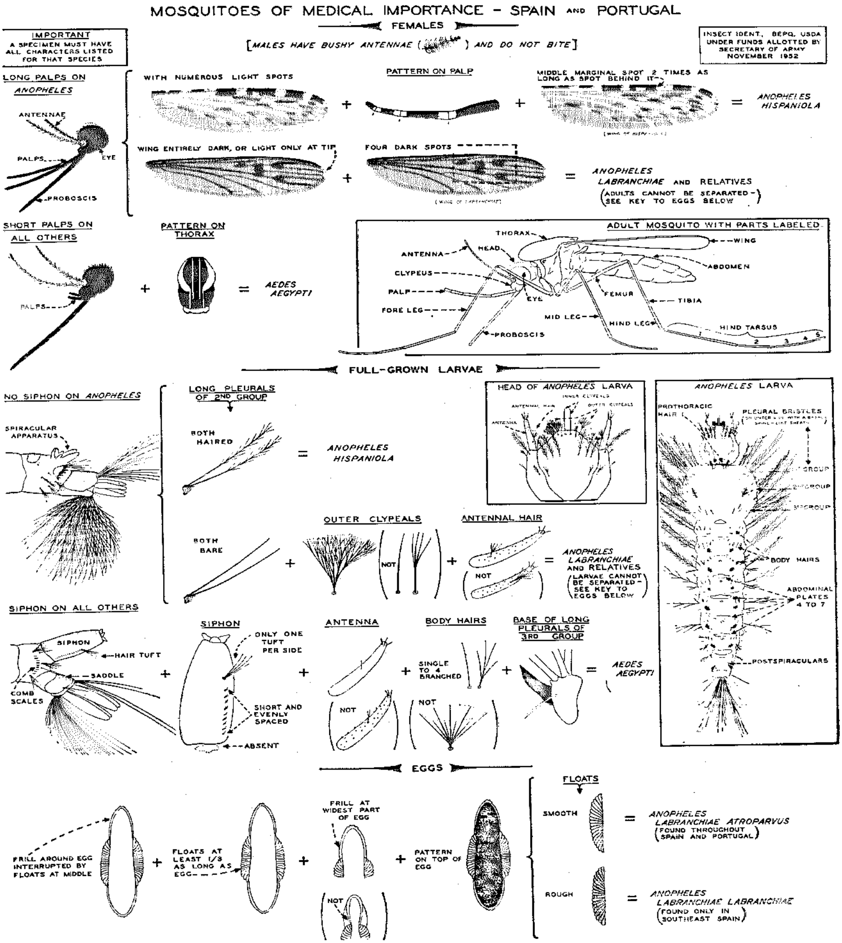
The Department of the Army, through a transfer of funds to the Entomology Research Branch, is developing a series of pictorial keys to the mosquitoes of primary medical importance in various areas throughout the world. The keys are designed primarily to assist public health workers in rapidly separating and identifying mosquito species, and are so constructed that they separate the important species not only from each other but also from all other species known to occur, or suspected of occurring, in the area. Keys for several areas have appeared in past issues of *Mosquito News* (vol. 13, nos. 1, 2 and 4; vol. 14, nos. 1 and 2); those appearing below continue this series. Suggestions and comments will be welcomed, especially from those who have firsthand information of the faunas of the various areas, since there are serious gaps in our knowledge of the occurrence and ability as vectors of disease of mosquitoes in many areas.

The species of *Anopheles* known definitely to occur in Spain and Portugal or thought to occur in this area, are: *algeriensis, claviger, hispaniola, hyrcanus* (variety not known with certainty), *labranchiae atroparvus, labranchiae labranchiae, maculipennis maculipennis, marteri, melanoon melanoon, melanoon subalpinus, multicolor, plumbeus, sergentii* and *superpictus*. Of these, only three are of primary importance in the transmission of malaria. One of these, *A. hispaniola,* occurs throughout the southern half of the peninsula and the Canaries, and has been incriminated principally by epidemiological evidence. In Tenerife and the Gran Canaries it has been the only *Anopheles* occurring in the presence of intens malaria. The larvae prefer clear, sunli water in either small pools or slov streams, nearly always in association wit *Spirogyra*. Little is known of the bitin habits of the females. By far the mos important vectors in Spain and Portugal however, are *A. labranchiae labranchia* and *A. labranchiae atroparvus*. Th former species, an important vector i many parts of Europe, is restricted to th southeast corner of Spain. In this area i occurs in the almost complete absence o other species of *Anopheles* and transmit a malaria whose endemicity is muc higher than in other parts of Spain Larvae occur in numerous habitats, in cluding fresh water of rice fields an streams as well as brackish coasta marshes. Females enter houses in larg numbers to engorge on human blood. I contrast to *A. labranchiae labranchiae* often stated to be a vector of "intense malaria, *A. labranchiae atroparvus* is on of "extensive" malaria, being the mos widespread mosquito in Spain and Port ugal. Larvae typically occur in brackis water along coastal areas, but may b found in fresh water further inland a well. Adults may feed on sheltered ani mals but prefer the blood of man and ar responsible for so-called "winter hous malaria."

Aedes aegypti is the only one of the 2 non-anopheline mosquitoes occurring i this area known to be a disease vector. I transmits urban yellow fever and pro liferates in close proximity to man, breed

[1] Keys were drawn by Sally D. Kaicher.


MOSQUITOES OF MEDICAL IMPORTANCE - SPAIN AND PORTUGAL
FEMALES
[MALES HAVE BUSHY ANTENNAE ( ) AND DO NOT BITE]
IMPORTANT
A SPECIMEN MUST HAVE ALL CHARACTERS LISTED FOR THAT SPECIES
INSECT IDENT., BEPQ, USDA UNDER FUNDS ALLOTTED BY SECRETARY OF ARMY NOVEMBER 1952
LONG PALPS ON ANOPHELES
ANTENNAE
PALPS
EYE
PROBOSCIS
WITH NUMEROUS LIGHT SPOTS
PATTERN ON PALP
MIDDLE MARGINAL SPOT 2 TIMES AS LONG AS SPOT BEHIND IT
ANOPHELES HISPANIOLA
WING ENTIRELY DARK, OR LIGHT ONLY AT TIP
FOUR DARK SPOTS
ANOPHELES LABRANCHIAE AND RELATIVES
(ADULTS CANNOT BE SEPARATED - SEE KEY TO EGGS BELOW)
SHORT PALPS ON ALL OTHERS
PALPS
PATTERN ON THORAX
AEDES AEGYPTI
ADULT MOSQUITO WITH PARTS LABELED
THORAX
WING
HEAD
ANTENNA
ABDOMEN
CLYPEUS
PALP
EYE
FEMUR
TIBIA
FORE LEG
MID LEG
HIND LEG
HIND TARSUS
PROBOSCIS
1 2 3 4 5
FULL-GROWN LARVAE
NO SIPHON ON ANOPHELES
SPIRACULAR APPARATUS
LONG PLEURALS OF 2ND GROUP
BOTH HAIRED
ANOPHELES HISPANIOLA
HEAD OF ANOPHELES LARVA
INNER CLYPEALS
ANTENNAL HAIR
OUTER CLYPEALS
ANTENNA
ANOPHELES LARVA
PROTHORACIC HAIR
PLEURAL BRISTLES
GROUP
2ND GROUP
3RD GROUP
BODY HAIRS
ABDOMINAL PLATES 4 TO 7
POSTSPIRACULARS
BOTH BARE
OUTER CLYPEALS
NOT
ANTENNAL HAIR
NOT
ANOPHELES LABRANCHIAE AND RELATIVES
(LARVAE CANNOT BE SEPARATED - SEE KEY TO EGGS BELOW)
SIPHON ON ALL OTHERS
SIPHON
HAIR TUFT
SADDLE
COMB SCALES
SIPHON
ONLY ONE TUFT PER SIDE
SHORT AND EVENLY SPACED
ABSENT
ANTENNA
NOT
BODY HAIRS
SINGLE TO 4 BRANCHED
NOT
BASE OF LONG PLEURALS OF 3RD GROUP
AEDES AEGYPTI
EGGS
FRILL AROUND EGG INTERRUPTED BY FLOATS AT MIDDLE
FLOATS AT LEAST 1/3 AS LONG AS EGG
FRILL AT WIDEST PART OF EGG
NOT
PATTERN ON TOP OF EGG
FLOATS
SMOOTH
ANOPHELES LABRANCHIAE ATROPARVUS
(FOUND THROUGHOUT SPAIN AND PORTUGAL)
ROUGH
ANOPHELES LABRANCHIAE LABRANCHIAE
(FOUND ONLY IN SOUTHEAST SPAIN)

ing in all kinds of artificial containers. Although this disease was last reported in 1890, its vector is included in the key because of the ever-present possibility of the re-introduction of the disease and the large numbers of *A. aegypti* present especially in the port cities. Dengue fever likewise transmitted by *A. aegypti,* i present but of an extremely lov endemicity.

VIII. WEST INDIES

DAVID R. COOK [2]

Of the 20 species of *Anopheles* occurring in the West Indies, only four are important as vectors of malaria. *Anopheles albimanus,* by far the most dangerous, occurs on most of the islands except those lying south of the island of Marie Galante. Larvae occur in a large variety of fresh or brackish water collections in sunlight, and often in tremendous numbers where thick mats of aquatic vegetation are present on the surface. The females of this species attack animals as well as man, but are usually domestic and account for most of the anophelines found in houses. *Anopheles aquasalis,* less important than *A. albimanus* in malaria transmission, occurs principally in the Lesser Antilles and Trinidad. Larvae are found in brackish water along the coast, in swamps, ditches and occasionally in fresh water accumulations. Adults are strong fliers and have appeared in huge swarms far from their breeding places. They definitely prefer the blood of man and enter houses to bite. *Anopheles crucians* is confined principally to Cuba, Jamaica and Puerto Rico. Larvae are found in either fresh or brackish, shaded or sunlit collections of water such as streams, seepages and ponds. Although females enter houses to feed, they will readily bite man out of doors at night. *Anopheles bellator,* th most common anopheline of the coco raising areas of Trinidad, is unusual i that its larvae live in epiphytic bromeliad Females of this species will enter house to gain blood meals, but unlike most othe anthropophilous anophelines, return im mediately to their resting places in th forest, thus making collections of engorge adults very difficult. Adults of thi species, like *A. crucians,* will bite out c doors at night.

In addition to the *Anopheles* discusse above, 16 other species also occur, or ar suspected of occurring, in the West In dies. There are: *albitarsis, apicimacul atropos, argyritarsis, eiseni, grabham homunculus, maculipes, mediopunctatu neomaculipalpus, nimbus, oswaldo pseudopunctipennis, punctimacula, range* and *vestitipennis.*

Jungle yellow fever is not known t occur in any of the islands of the We Indies. Urban yellow fever, on the othe hand, has raged throughout the chai transmitted by *Aedes aegypti.* This mos quito breeds in all kinds of artificial co tainers close to human habitations, and i the only one of approximately 117 nor anopheline mosquitoes occurring in th area that is known to be a vector of dis ease. *A. aegypti* is also a vector of dengu fever, the exact distribution of which i not known with certainty in this area.

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