PICTORIAL KEYS TO THE MOSQUITOES OF MEDICAL IMPORTANCE

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, hyscensus (variety not known with certainty), labranchiae atrapavus, 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 intense malaria. The larvae prefer clear, sunlit water in either small pools or slow streams, nearly always in association with Spirogyra. Little is known of the biting habits of the females. By far the most important vectors in Spain and Portugal, however, are A. labranchiae labranchiae and A. labranchiae atrapavus. The former species, an important vector in many parts of Europe, is restricted to the southeast corner of Spain. In this area it occurs in the almost complete absence of other species of Anopheles and transmits a malaria whose endemicity is much higher than in other parts of Spain. Larvae occur in numerous habitats, including fresh water of rice fields and streams as well as brackish coastal marshes. Females enter houses in large numbers to engorge on human blood. In contrast to A. labranchiae labranchiae, often stated to be a vector of "intense" malaria, A. labranchiae atrapavus is one of "extensive" malaria, being the most widespread mosquito in Spain and Portugal. Larvae typically occur in brackish water along coastal areas, but may be found in fresh water further inland as well. Adults may feed on sheltered animals but prefer the blood of man and are responsible for so-called "winter house malaria."

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

1 Keys were drawn by Sally D. Kaicher.
VIII. WEST INDIES

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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, the most common anopheline of the cocoa raising areas of Trinidad, is unusual in that its larvae live in epiphytic bromeliads. Females of this species will enter house to gain blood meals, but unlike most other anthropophilous anophelines, return immediately to their resting places in the forest, thus making collections of engorged adults very difficult. Adults of this species, like A. crucians, will bite outdoors at night.

In addition to the Anopheles discussed above, 16 other species also occur, or are suspected of occurring, in the West Indies. There are: albitaris, apicimacula, atropos, argyritarsis, cioni, graham, homunculus, maculipes, mediopunctatus, neomaculipalpus, nimbus, oswald, pseudopunctipennis, punctimacula, range, and vestitipennis.

Jungle yellow fever is not known to occur in any of the islands of the West Indies. Urban yellow fever, on the other hand, has raged throughout the chair transmitted by Aedes aegypti. This mosquito breeds in all kinds of artificial containers close to human habitations, and is the only one of approximately 117 nor anopheline mosquitoes occurring in the area that is known to be a vector of disease. A. aegypti is also a vector of dengue fever, the exact distribution of which is not known with certainty in this area.

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