LOS ANOFELINOS DE LA REPUBLICA DEL ECUADOR. Roberto Levi Castillo. 170 pp., 49 illus., 15 plates of anopheline taxonomic characters, and 5 maps giving the geographical distribution of the 11 anophelines known in Ecuador. Published by Artes Graficas Sentefelder C. A. Ltda., Guayaquil, Ecuador.

This volume gives the geographical distribution, relative importance, and something of the ecology in Ecuador of *Anopheles bathanus* Dyar, *A. pseudopunctipennis levicastilloi* Levi-Castillo, *A. p. rivadeneira* Levi-Castillo, *A. eiseni* Coq., *A. punctimacula* Dyar and Knab, *A. apicimacula* Dyar and Knab, *A. mediopunctatus* Theo., *A. albimanus* Wied., *A. aquasalis* Curry, *A. neivai* How., Dyar and Knab, and *A. boliviensis* Theo.

The author believes *Anopheles bathanus,* first discovered in Guayaquil in Ecuador by Komp, will be found sooner or later in the five coastal provinces of Ecuador and that no doubt other species of this genus will be discovered in Ecuadorian territory. Larvae were taken in small pools of still water on the road from Guayas province to Manabi province. The author thinks that this anopheline occurs no further south than Ecuador.

According to Dr. Levi-Castillo there exist two autochthonous races of the *Anopheles pseudopunctipennis* complex in Ecuador—*A. p. rivadeneirai,* the main vector of malaria in the warm highland valleys of Ecuador, and *A. p. levicastilloi,* which has never been found naturally infected, and does not occur above an average altitude of 300 meters above sea level. *A. p. rivadeneirai,* however, reaches a maximum of 2,500 meters above sea level, the highest point, according to the author, ever achieved by any anopheline in the Western Hemisphere.

Anopheles eiseni is a wild and seldom seen species. It breeds in shaded streams and on the rocks in pools of water containing abundant *Spirogira.* It is found in most of the Andean and all of the coastal provinces of Ecuador at altitudes of 86 to 2,100 meters above sea level.

Anopheles punctimacula occurs in the five coastal provinces, Esmeraldas, Manabi, Los Rios, Guayas, and El Oro. It is mostly zoophilous and breeds in shady pools in the jungle.

Anopheles apicimacula is also zoophilous and can only be found deep in the jungle of all the coastal provinces. From a taxonomic standpoint, it is similar to *A. punctimacula* except that in the latter species the scales are predominantly black and yellowish whereas in *A. apicimacula* they are mostly white.

Anopheles mediopunctatus, the ecology of which is little known, is a very rare anopheline in the interior of the coastal provinces.

Anopheles albimanus is considered the main vector of malaria of coastal Ecuador and is the species most generally distributed in that region.

Anopheles aquasalis is the only anopheline breeding in brackish waters in Ecuador, and, according to the author, it may be *A. albimanus* that has adapted itself to such a habitat.

Anopheles neivai is found in the five coastal provinces and breeds only in Bromeliads from sea level to 1,000 meters in elevation.

Anopheles boliviensis was captured in Mera in the Amazon region of Ecuador. This species is a suspected vector of malaria.

Taxonomic characters of adults, larvae, and eggs are given. H. H. STAGE

DDT WATER EMULSION IN RICE FIELDS AS A METHOD OF CONTROLLING LARVAE OF ANOPHELES QUADRIMACULATUS AND OTHER MOSQUITOES. Frederick L. Knowles and Frank W. Fisk. United States Public Health Service Reports. Vol. 60, No. 35, pp. 1005–1019. Aug. 31, 1945.—The extensive areas used for rice cultivation, the susceptibility of growing rice to injury, and the necessity of continually flooding, providing an ideal habitat for Anopheles larvae as well as added insecticidal difficulties, present a total problem of no mean proportions to the malariologist. The authors have attempted to find a practical solution to this perplexing problem in the use of DDT. Their experiments were made in the Stuttgart area of Arkansas where water pumped from deep wells or reservoirs is used for flooding the rice fields. A 100-acre field of rice plus 30 plots of 1/20 acre in size were made available for experimental purposes. The DDT water-miscible larvicide was prepared as follows: DDT (degree of purity not given)—*1 part;* solvent—*3 parts* (xylene or Culicide Oil B, Socony Vacuum Oil Co. or dendrol, Standard Oil of Indiana); Triton X-100 (emulsifier made by Rohm & Haas)—*1 part.* The stock solution was diluted with water to the desired concentration. The larvicide was dispensed at a predetermined rate in the flooding water at the pump by means of an applicator pump (ordinarily used for chlorination). Larval sampling stations were set up. DDT was applied individually to each of the 30 small plots. In general the larval counts in the larger field increased with the distance from the pump, indicating a gradual loss in the toxicity of the DDT-treated water as it flowed through the canals and rice fields. The factor of distance from point of application was of course, eliminated in the 30 small individually treated plats. In comparison with an untreated rice field, two plots of the larger treated field contained 50 per cent fewer *A. quadrimaculatus* larvae and 72 per cent fewer culicine larvae. In the smaller (1/20 acre) plots complete control of anopheline and culicine larvae was obtained at concentrations of 1.0 p.p.m. and 0.2 p.p.m. DDT respectively. The authors point out that although the application of DDT to the flooding water as it enters the rice fields results in a reduction, it by no means eliminated production of larvae. Yields of harvested rice in the DDT-treated 100-acre field were higher than the average or highest yields for previous years from untreated fields. The authors report that numerous *Gambusia* were seen in the untreated fields and none in the treated fields.

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