

WESTWARD EXTENSION OF THE RANGE OF HAEMAGOGUS  
SPEGAZZINII FALCO KUMM ET AL. INTO COSTA RICA

(DIPTERA, CULICIDAE)<sup>1,2,3</sup>

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During the past two years the writers have been engaged in a study of the forest mosquito population of the Isthmus of Panama following an outbreak of sylvan yellow fever in this area at the end of 1948. The first studies were initiated in the Canal Zone and portions of the Republic of Panama adjacent

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to it, in the general region where the yellow fever fatalities occurred, and have been reported on in part (Galindo, Trapido and Carpenter, 1950; Galindo, Carpenter and Trapido, 1951). Particular attention has been concentrated on the attempt to locate, and the study of the ecology of, the known vectors of sylvan yellow fever in South America, *Haemagogus spegazzinii falco* Kumm *et al.* and *Aedes leucocelaenus* Dyar and Shannon, to obtain a better understanding of the possibility of the spread of yellow fever westward through the Isthmus into Central America. The status of the species of the aedine subgenus *Finlaya*, which includes *leucocelaenus*, involves special problems which will be considered in a separate paper. The finding that *Haemagogus spegazzinii falco* occurs not only in Panama (Galindo, Carpenter and Trapido, 1949) but also extends into Costa Rica seems a matter of particular importance worthy of preliminary notice here.

*Haemagogus spegazzinii falco* is predominantly an arboreal species and this possibly explains why Kumm, Komp and Ruiz (1940) did not find it in the course of their mosquito survey of Costa Rica, as they did not collect in the forest canopy and were primarily interested in the anopheline fauna. During 1950 we set up a number of stations in western Panama and in Puntarenas Province on the Pacific coast of southern Costa Rica adjacent to Panama. At these stations human subjects were exposed on the forest floor and on platforms in the forest canopy from June to December, the rainy season months during which we knew *Haemagogus* mosquitoes would be most abundant, from our previous year-long study in the Canal Zone and central Panama. In Costa Rica we operated four tree platform stations, two of which were located in the forest near Esquinas and two near Jalaca. Two females of *H. spegazzinii falco* were captured while feeding on human bait on a platform 95 feet above the ground at the station designated as "L" in the forest about 75 feet above sea-level, near the Esquinas Experiment Station of the United Fruit Company, which is located about 20 kilometers north-northwest of Golfito. These were collected on June 26th and August 21st 1950. Three additional females were taken on a platform 64 feet above the ground at Station "N", located at an elevation of 300 feet above sea-level on the slopes of the Cordillera Brunquena, approximately 40 kilometers northwest of Golfito, on June 28th, July 19th, and August 9th, 1950. Eggs were obtained from blood engorged females captured alive, and larvae, pupae and males obtained by which the identifications were confirmed.

It might be assumed from the fact that so few specimens were taken during this six month period, that the species is

rare and near the western limit of its distribution. This may or may not be true, in the light of the following considerations. First, we have learned from our experience in making forest canopy collections of tree-hole breeding mosquitoes in Panama, that these species may be exceedingly local in occurrence. Thus, at one locality in Panama where four tree platforms were located within a radius of not more than 100 yards, to capture as many *Haemagogus* mosquitoes as possible in the effort to recover virus following a human yellow fever fatality, it was found that one of the platforms, seemingly located in a situation as favorable as the others, captured less than a tenth as many *H. spegazzinii falco* as were taken at a closeby platform. Second, it is difficult to determine whether a particular area in the forest will provide abundant opportunity for the breeding of *H. spegazzinii falco*, as we are as yet uncertain of the favored breeding places of the species. Third, this area of Costa Rica is one of very high and consistent rainfall, with perhaps little opportunity for the periodic flooding and drying of tree-holes required for the hatching of *Haemagogus* eggs. Areas of more intermittant rainfall in this region might well have proven more productive of *Haemagogus* mosquitoes in general, and demonstrated larger populations of these mosquitoes. A review of the data on the other species of *Haemagogus* taken at the four Costa Rican tree stations shows that these species of the genus were also not particularly abundant in the area, with only 1.0 *H. equinus* and 2.3 *H. lucifer* and/or *iridicolor* being taken per ten man-hours of collecting on tree platforms, rates very much lower than those obtained at favorably located stations in central Panama (see Galindo, Trapido and Carpenter, 1950).

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