

Trapping of Air-borne Insects on Ships on the Pacific¹

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As a phase of the project "Zoogeography of Pacific Insects" a start was made during the summer of 1957 in trapping of air-borne insects at sea. Through the cooperation of officials of the U. S. Navy and the Military Sea Transportation Service, traps have been placed on military transport ships sailing from Honolulu to San Francisco and to Guam and Manila. The object of this phase of the program is to test the theories of natural air dispersal of insects to isolated Pacific islands and to coordinate data with information on present and past air currents in the Pacific area. We acknowledge the assistance and advice of Roy L. Fox and David Blumenstock of the U. S. Weather Bureau at Honolulu, and Kenneth L. Maehler and Ivan Rainwater of the federal plant quarantine at Honolulu. We are also indebted to the California Spray Chemical Corporation and the Tanglefoot Company for sample materials of "deadline" and "tanglefoot," respectively. Harold Toba assisted with the work during part of the period reported, as did Carl Isenberg.

The type of trap used was planned to catch insects travelling passively in air currents or dropping from higher air currents. Each trap consists of a metal frame in form of a cube, with five removable aluminum screens, each one-fifth of a square meter in area, and fitting in the top and four sides, respectively of the cubical frame, so that all sides and top are effective trapping surfaces for all types of weather. The five screens are painted with an adhesive material such as a resin-castor oil (see Glick, U. S. DEPT. AGR. TECH. BULL. 673, 1939), "deadline," or "tanglefoot," and new screens are substituted every 24 hours during cruises, except for cruises to the Philippines in which screens are exposed for 48 hours. Resin-castor oil mixture was used for the first 2 cruises to San Francisco, but for all other cruises a mixture of "deadline" and resin-castor oil was used since the latter proved a better adhesive. Each trap is accompanied by a metal box containing 45 extra screens fitting into slots to keep them separate, so that the screens may be searched for adhering insects when the ship returns to Honolulu. The 50 screens permit operating the trap for ten 24-hour, or 48-hour, periods during a single cruise. The trap is not put into operation until the ship is approximately 18 to 24 hours out of port,

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Records of ship trappings of air-borne insects
Arrows indicate that trapping was done going in both directions on each cruise.

TABLE I

24-hr. periods of trapping at sea					
HONOLULU					SAN FRANCISCO
	→	→	→	→	→
	←	←	←	←	←
W. Longitude (av. of 4 cruises)	152°-147°	147°-141°	141°-135°	135°-129°	129°-122°
Corrodentia	1				1
Thysanoptera		1			
Diptera					
Tendipedidae					2
Coleoptera					
Anthribidae			1 ¹		
Hymenoptera					
Formicidae	1				

¹ The anthribid taken midway between Honolulu and San Francisco presumably came from inside the ship

TABLE II

48-hr. periods of trapping at sea					
PHILIPPINE IS. (via Guam)					HONOLULU
	←	←	←	←	←
	→	→	→	→	→
E. Longitude (av. of 2 cruises)	124°-139°	139°-150° ¹	150°-165°	165°E-178°W	178°W-161°W
Araneida	1	1			
Corrodentia		1		1	
Diptera					
Heleidae	15	68+		1	
Sciaridae		19			
Phoridae		2			
Drosophilidae (?)		4			
Chloropidae		2			
Scatopsidae		1			
Lauxaniidae		2			
Coleoptera					
Chrysomelidae		1			
Coccinellidae		1			
Staphylinidae		1			
Family (?)					1
Hymenoptera					
Chalcidoidea	7	19			
Formicidae		1			
Family (?)		1			

¹ Column 2 includes trappings while in port at Guam.

but this was apparently overlooked for Guam on the long cruises. Three sets of traps and screen-boxes have been in operation, besides a check trap operated on the roof of the Bishop Museum at Honolulu.

One microlepidopteran was recorded between Longitude $162^{\circ}08'W$ and $168^{\circ}33'W$ from a trap which was set on a separate cruise to Kwajalein Atoll.

From a brief examination of the Corrodentia by E. L. Mockford, the specimen found on the screen near the port of San Francisco appears to be a species present on the coast of California, and the other specimen recorded near the port of Honolulu appears to be a Hawaiian form.

The data thus far at hand are very meager, and some years of trapping will be required before much significant data can be accumulated. The records to date show a higher representation of small, weak-flying insects, and more records closer to land, as was expected.