

# EFFECTIVENESS OF DISINSECTIZATION OF AIRCRAFT AND SHIPS IN THE SOUTH PACIFIC (NEW HEBRIDES-SOLOMON ISLANDS)<sup>1</sup>

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Little emphasis has been attached to the results obtained by malariologists and entomologists in their effort to prevent the dissemination of mosquitoes from base to base throughout the South Pacific during World War II.

Air and surface traffic brought many of the once distant island bases to within a matter of hours separation. Non-malarious bases became cloaked by the shadow of the anopheline mosquito, and in the minds of many, responsible for the protection of the health of Allied Forces in the Pacific, came visions of added death and great military loss as a result of possible infestation of new areas due to the stepped-up transport system of civilization.

New Caledonia, the Fiji Islands, Samoa, and New Zealand are non-malarious, and particular emphasis was made to keep these bases anopheline free, for they were used by military forces as training areas and as "demalarialization" and rehabilitation centers for troops recently evacuated from combat in malarious zones.

Directives issued by the Commander of the South Pacific Force were the legal basis for enforcement of regulations pertaining to disinsectization of ships and planes. The malariologist or entomologist

on duty at non-malarious bases routinely conducted surveys for the possible introduction of anopheline mosquitoes in and about the vicinity of airports and harbors. Aircraft taking off from malarious bases en route to non-malarious bases were sprayed either by crew members themselves or by members of special quarantine units attached to the various squadrons whose sole duty was to carry out an effective spray program. Before landing, these aircraft were again required by direction to have all cabins and compartments sprayed before permission could be granted for landing. Here again, ground crews of the malaria control organization on these non-malarious bases checked as completely as possible the proper fulfillment of these orders.

The author has observed on many occasions the presence of pest mosquitoes and anophelines resting in the cabins of aircraft that had remained open during the night for loading before early morning departures. Thorough spraying of cabins at take-off and landing is the only explanation of the failure of these mosquitoes to be introduced into new areas. Ample opportunities for establishment of mosquitoes in ideal breeding sites were provided at many of the airports on which planes were scheduled to land.

Even though ship inspections afforded

<sup>1</sup> Data collected while serving in the capacity of Area Entomologist, South Pacific Area.

many difficulties and frequent violations in disinfecting surface vessels occurred, the transport of adult mosquitoes between bases was kept at a minimum. Generally, the docking patterns and anchorages of ships and the absence of anopheline breeding near loading areas were compatible with malaria control efforts in accomplishing this. Constant favorable winds also aided greatly in keeping the adults away from the shore line and from blowing across open channels. The flight range of *Anopheles farauti* is limited to about one-half mile, and the consensus among entomologists is that this species does not by preference fly over bodies of water such as the typical inter-island anchorage channels in the Pacific. Evidence of this fact is the large number of small islands nestled within a mile of known highly-malarious islands that have never revealed any anopheline breeding.

Despite the difficulties involved in checking all water containers and in thoroughly spraying compartments on ships docking at non-malarious ports, commendable results were obtained in the fulfillment of an adequate quarantine and inspection system. However, several threats in the form of accidental introduction of mosquitoes presented themselves to survey and control operators on important military bases.

Spray crews boarding incoming ships at Noumea, New Caledonia, discovered hordes of adult *Aedes aegypti* in the holds of a freighter carrying salvaged tire casings to the continental United States. Although New Caledonia has more than its share of this important dengue transmitter, their release and subsequent establishment in non-*aegypti* areas would have presented an added burden to control operators on bases that were *aegypti* free.

It is not unreasonable to understand the difficulties involved in checking small amounts of water held in several thousand stacked tire casings for the presence of *Aedes aegypti*. These were favorite man-made breeding sites for this domesticated

species of mosquito, and the extent of the localized infestation of the island from which the ship sailed was determined by systematic survey. Thus, the presence of *Aedes aegypti* on a base previously known to be *aegypti* free was reported almost simultaneously by island entomologists and by disinsecticide crews separated by several hundred miles. Within six months the localized infestation was completely eliminated, and no *aegypti* were reported from the base as of 1945.

*Aedes vigilax* breeding in brackish water in tidal pools was discovered on Aeissi Island in the New Hebrides. This anopheline-free island was checked weekly for *Aedes aegypti* by inspection crews, and in the course of survey this localized infestation was reported. The small size of the island and the relatively few tidal pools available for establishment made control and complete eradication a simple matter. Although Daggy reported a single larva of *vigilax* collected in 1943 on Espiritu Santo (New Hebrides), no other specimens were collected until 1945. (The larvae closely resemble *Aedes vexans*, and there is a possibility that a mistake may have been made in the identity of the species.) Ships arriving in the New Hebrides for repair in dry docks could have rapidly transported the hardy species from New Caledonia. *Aedes vigilax*, like our own salt marsh mosquito of the Eastern coast, is one of the most vicious biters on New Caledonia, and sections of the Island are at times plagued by these persistent daytime biters.

No other instances of introduction of mosquitoes to bases with known insect faunas were reported or observed. Much credit is due the untiring efforts of Army and Navy Malaria and Epidemic Disease Control operators in maintaining the balance. Theirs was a job receiving little encouragement from most individuals, but through their efforts the important fact remains that *no anophelines were introduced as late as 1945 to the known non-malarious islands during the military occupation.*