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Aedes aegypti in the Western Pacific Region

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The following note is mainly based on the replies received to a circular letter sent out in March 1965 to Governments of countries and territories in the Western Pacific Region, inquiring about the present situation with regard to *Aedes aegypti*.

DISTRIBUTION

American Samoa

A. aegypti has not been found, according to the survey made in March 1965 by Dr C. R. Joyce, Entomologist of the Public Health Service, US Department of Health, Education, and Welfare.

Brunei

A survey has been started in the airport and in the towns by a team of malaria workers, but so far *A. aegypti* has not been collected.

British Solomon Islands Protectorate

The occurrence of *A. aegypti* in several islands was reported by J. N. Belkin, but in a survey carried out in February 1956 in Henderson and Munda airports by Dr R. Slooff, WHO Entomologist assigned to the malaria pre-eradication programme, *A. aegypti* was not found.

Cambodia

A. aegypti is common in the urban areas, while in the rural areas it coexists with *Aedes albopictus*.

China (Taiwan)

In an extensive survey carried out in March 1965 by the Taiwan Provincial Malaria Research Institute (TAMRI), *A. aegypti* was found only in Chiehting, Kaohsiung, Putai and Tainan around the western coast of the southern part of the island, and in Penghu (the Pescadores).

Gilbert and Ellice Islands

No recognized epidemic of dengue or haemorrhagic fever was noted. *A. aegypti* was first found in 1919. In February 1965, larvae of *A. aegypti* were found in drums containing water in the houses.

Fiji

A. aegypti is present.

French Polynesia

A. aegypti is widely distributed in Tahiti and other islands.

Guam

A dengue epidemic occurred in 1944. Control measures, using insecticides, were undertaken. In 1948, only one specimen of *A. aegypti* was found among 20 000 mosquitos trapped. Since 1951, *A. aegypti* has disappeared. Vigilance activities are being undertaken to watch for its recurrence.

Hong Kong

A. aegypti was not found.

Japan

It was learned that *A. aegypti* occurs in one locality in the southern part of Japan.

Korea

This species apparently does not occur in Korea.

Laos

A. aegypti occurs in the urban areas.

Malaysia

In Malaya, *A. aegypti* is established in most urban areas and is spreading into the rural areas. In Sabah, the WHO Entomologist assigned to the malaria eradication programme has not encountered any *A. aegypti* during the last seven years. However, no survey for this mosquito has yet been undertaken. *A. albopictus* is present.

New Zealand

A. aegypti does not occur.

Philippines

This species is common in urban areas, particularly in Manila.

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Ryukyus

A. aegypti has not been found in Okinawa since 1946.

Singapore

A small number of *A. aegypti* exist in limited localities.

Territory of Papua and New Guinea

Although no surveys have been carried out, it is believed that *A. aegypti* occurs in the urban areas.

Tonga

This species is common.

Trust Territory of the Pacific Islands

A. aegypti occurs in all districts of the Territory.

Viet-Nam, Republic of

This species occurs in urban areas, particularly in Saigon/Cholon.

DENSITY

Information on the study of *A. aegypti* density was received only from China (Taiwan) and Viet-Nam.

China (Taiwan)

During the survey carried out by TAMRI in March 1965, the *A. aegypti* index (based on larval surveys) in four towns was as follows :

Town	*Number of premises examined*	A. aegypti *index*
Chiehting	133	2.3
Kaohsiung	1 217	1.8
Putai	115	7
Tainan	544	5.3

Viet-Nam (Saigon/Cholon)

A. aegypti occurs in high density throughout the year in Saigon/Cholon. Results of adult collections in the daytime from October 1963 to September 1964 undertaken by Dr Do Van Quy of the Institut Pasteur in Saigon showed that the peak of *A. aegypti* density was in the period from July to October, which coincides with the rainy season of the year. Rain-water is used by a great number of people (more than a million) in the city, as the water supply is limited. The rain-water is stored in jugs and tanks, providing an ample facility for *A. aegypti* breeding.

VIRUS ISOLATIONS

Dengue-2 virus was isolated from *A. aegypti* in Singapore and Viet-Nam, and dengue-3 from the Philippines. Chikungunya virus was also isolated from *A. aegypti* in Viet-Nam.

INSECTICIDE-SUSCEPTIBILITY TESTS

Tests undertaken with WHO kits by Mr J. C. Lien of TAMRI in 1959 with *A. aegypti* collected from Kaohsiung showed that the LC_{50} of females was 1.8% DDT; the LC_{50} of larvae was 0.02 ppm DDT, 0.03 ppm HCH, and 0.01 ppm dieldrin.

Tests carried out by Dr Do Van Quy in Saigon showed that *A. aegypti* had developed a high resistance to DDT and, to a certain degree, to dieldrin. During a visit by the writer, tests were carried out with *A. aegypti* at the end of May 1965 with the assistance of the national malaria staff in Viet-Nam. Of 40 *A. aegypti* exposed to 4% DDT papers, only 7.5% mortality was obtained; of 34 mosquitos exposed to 0.1% dieldrin, 9% mortality was obtained, while 10 mosquitos exposed to 4% dieldrin papers were all killed. The results of tests of *A. aegypti* larvae were as follows :

Insecticide	*Number of larvae tested*	*Percentage mortality*
DDT (ppm)		
0.1	40	50
0.5	40	93
2.5	40	100
Dieldrin (ppm)		
0.004	17	88
0.02	20	85
0.1	40	98
0.5	20	100
Control	37	14

In Saigon, R. E. Hill carried out tests in November 1964 with *A. albopictus* larvae, and the LC_{50} of 227 larvae tested was 0.1 ppm DDT; of 39 tested with DDT (2.5 ppm solution), 90% were killed. The LC_{50} of dieldrin was 0.0015 ppm (98 larvae tested). Of the 90 larvae tested with 0.1 ppm dieldrin, the mortality was 100%.

In Guam, as well as in Tonga, it was mentioned that *A. aegypti* probably has developed resistance to DDT.

In Malaya, Malaysia, from a personal communication from Mr Cheong Weng Hooi, Entomologist at the Institute for Medical Research, it was learned that with adult *A. aegypti* exposed to 4% DDT papers, only 25%-35% mortality was obtained.

In the Philippines, the results of tests of a small number of adult *A. aegypti* collected from the vicinity of Manila showed that the mosquitos have also developed resistance to DDT.

It was reported that *A. aegypti* adults in Fiji were resistant to DDT.

CONTROL

No systematic control measure has been applied specifically for *A. aegypti* in most of the countries and territories in the region, except for international airports and harbours. However, *A. aegypti* has almost disappeared in most of the areas as a result of DDT residual spraying for antimalaria purposes. For example, in China (Taiwan), *A. aegypti* occurred in many localities in the islands before spraying, but at present it occurs in only the few localities mentioned above, where there were only one to three DDT residual sprayings; in other parts of the island, eight to nine annual sprayings were applied.

In Guam, DDT was used alternatively with dieldrin, diazinon and lindane for pest-control purposes.

In Hong Kong, pest insects, including *A. aegypti*, are well under control. When breeding-places of mosquitos are discovered, the householders are required to inform the urban council health authorities immediately; on failure to do so, the householders may be penalized.

In Tonga, DDT and dieldrin are both used for the control of *A. aegypti* in two ports of entry which have not been rid of this species, particularly during the wet season (January to June).