

Plague Occurrence in Wild and Domestic Rodents and their Fleas.

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OBJECTIVE: To assess the relative importance of domestic rodents and their fleas as related to plague in South Vietnam.

DESCRIPTION: Data concerning the occurrence of plague, fleas and urban and rural pest mammals were made available from the plague laboratory at the Institute Pasteur in Saigon (sponsored by Walter Reed Army Institute of Research Medical Team). Data were obtained from ongoing routine small mammal collections (surveys to detect plague) by the 20th Preventive Medicine group and the Ministry of Health. A large amount of data was also provided by the Korean Preventive Medicine Team. These data are the outgrowth of a project commenced by SEATO Medical Research Laboratory when a plague laboratory was set up at the Institute Pasteur in Nha Trang. The work of receiving small mammal collections in region II in coastal and highland areas has continued. Completion of the tabulation of these data is now underway at SEATO.

RESULTS: During the period from September 1967 through September 1969 a total of 14, 064 hosts belonging to the species Suncus murinus, Rattus norvegicus, R. rattus, R. exulans, Bandicota indica and B. bengalensis were submitted to the plague laboratory at Saigon. Occasional captures of other hosts (85 specimens) include such species as Tupaia glis, Herpestes javanica, Rattus rajah, R. diardi, R. jalorensis and R. argentiventer. From the period January 1967 through April 1969 a total of 1012 fleas from the 6 principal hosts submitted to the Saigon laboratory were identified. From the collections submitted to the plague laboratory in Nha Trang from October 1968 through January 1970 a total of 2463 hosts were examined and the majority of these belonged to the same 6 principal host species. During the same period a total of 5026 fleas were identified in the plague laboratory at Nha Trang.

Of the 1012 fleas identified at Pasteur Institute in Saigon 99.5% were Xenopsylla cheopis and 0.5% were other species (Ctenocephalides felis, C. canis and wild rodent fleas). The list of flea species other than X. cheopis is larger from data collected at the Nha Trang laboratory and the proportion of X. cheopis is less (nearly 90%). Wild rodent fleas continued to be identified and species are the same as were presented in the annual report of 1969. Published accounts indicate the proportion of X. cheopis to other species in Hanoi is only 68% so there appears to be a decrease in relative prevalence of X. cheopis from south to north.

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The mean number of X. cheopis per infested host (6 common hosts) is 1.50 for Saigon data. The preferred hosts for X. cheopis are probably Rattus norvegicus and Rattus rattus. For these rats the mean number of X. cheopis per infested host averaged 2.5 and 2.6 respectively, according to Saigon data. R. exulans had only 0.55 fleas per infested host which suggests R. exulans is less suitable host for X. cheopis. Suncus murinus had 1.2 fleas per infested host and Bandicota indica and B. bengalensis seldom had fleas. In a few rural areas bandicoots had numerous X. cheopis. In these places they averaged 2.0 and 4.6 fleas per host. From Nha Trang, mean numbers of fleas per host were nearly twice those from Saigon data indicating fleas to be more numerous farther north. In rural Delta areas the flea index was very low. This is consistent with the low human plague incidence in the Delta area as opposed to higher incidence in the Central Highlands and coastal area of south central Vietnam.

Populations of the 6 common host species fluctuate greatly, but no seasonal correlation was evident with this phenomenon. It is assumed that the animals replaced one another over periods of time. In Saigon the populations were more constant, with R. norvegicus predominant. In Cam Ranh Bay, R. norvegicus was replaced almost entirely by R. rattus over a long period of time starting in January 1969. The remaining 4 species (R. exulans, S. murinus, B. indica and B. bengalensis) also increased in proportion. In Tay Ninh, which is more rural, R. norvegicus appeared only occasionally and bandicoots assumed the predominant role, their numbers fluctuating in relation to populations of other mammals.