

# ABSENCE OF PLAGUE IN CERTAIN MAMMALS FROM JAVA AND KALIMANTAN (BORNEO)

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## INTRODUCTION

No human plague cases have been recorded from Indonesia for more than two years, and animal plague reportedly persists only in a small highland focus of Central Java (Turner *et al.*, 1974). Historically, however, the disease has caused considerable human morbidity and mortality, particularly on the island of Java (Baltazard and Bahmanyar, 1960).

Continued surveillance for the disease in Indonesian mammals is warranted according to World Health Organization recommendations (1970), and presently available serological techniques are adequate for this purpose (Cavanaugh *et al.*, 1970). The present paper reports negative findings from surveillance activities conducted during 1970-72 in presumed uninfected areas of Java and Kalimantan (Borneo).

## MATERIALS AND METHODS

Wild mammals were trapped or shot as described previously (Van Peenen *et al.*, 1974).

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Mammals were bled by cardiac puncture, and serum separated and stored at  $-20^{\circ}\text{C}$ . Spleens were removed aseptically and placed intact into vials of Cary-Blair medium (Cavanaugh *et al.*, 1967) at room temperature.

All specimens were sent to the U.S. Naval Unit, Fort Detrick, Maryland, U.S.A. and examined subsequently in the Department of Hazardous Microorganisms, Walter Reed Army Institute of Research. Sera were examined for antibodies against plague by the hemagglutination (HA) test described by Marshall *et al.*, (1972). Stable fraction 1 antigen of *Yersinia pestis* (Rust *et al.*, 1972) and tanned sheep red blood cells were used in the test. Spleens were homogenized and inoculated intraperitoneally into laboratory mice which were examined for morbidity or mortality for a minimum of 21 days.

## RESULTS

Mammals were collected from various localities in West and Central Java and from East and Central Kalimantan as shown in Fig. 1. Attempts were made to obtain samples from as many different mammalian species as possible, particularly ground-dwelling rodents and shrews. Table 1 lists numbers of each species of mammal examined serologically: 237 sera from 25 species from Java and 103 from 23 species from Kalimantan. Table 2 lists those from which spleens were examined:

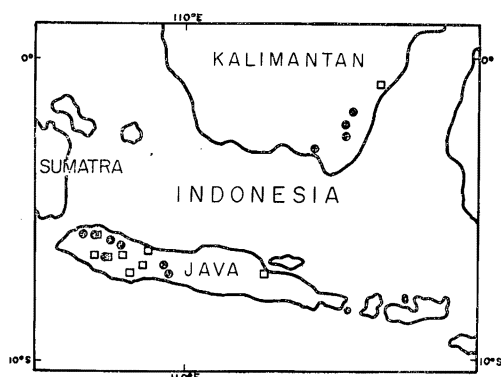


Fig. 1—Wild mammal collection sites in Java and Kalimantan.

114 spleens from 7 different Java species and 18 spleens from 7 Kalimantan species.

None of the serum specimens had antibodies against plague, and none of the spleens contained plague bacilli.

## DISCUSSION

The negative results reported here reinforce current opinions that animal plague is presently confined to a few rodent species in the Mt. Merapi- Mt. Merbabu focus of Central Java (Turner *et al.*, 1974). Plague has not

Table 1

Mammals examined for plague antibodies.

JAVA		KALIMANTAN	
Species	No. examined	Species	No. examined
<b>INSECTIVORA</b>		<b>INSECTIVORA</b>	
<i>Hylomys suillus</i>	1	<i>Suncus murinus</i>	1
<i>Suncus murinus</i>	10	<i>Tupaia tana</i>	1
<b>CHIROPTERA</b>		<b>CHIROPTERA</b>	
<i>Pteropus vampyrus</i>	1	<i>Eonycteris major</i>	3
<i>Chironax melanocephalus</i>	2	<i>E. spelaea</i>	8
<i>Cynopterus brachyotis</i>	8	<i>Cynopterus brachyotis</i>	23
<i>C. horsfieldi</i>	1	<i>C. horsfieldi</i>	10
<i>C. sphinx</i>	8	<i>Taphozous saccolaimus</i>	1
<i>Rousettus leschenaulti</i>	5	<i>Scotophilus temmincki</i>	2
<i>Macroglossus minimus</i>	4		
<i>Megaderma spasma</i>	2	<b>PRIMATES</b>	
<i>Scotophilus temmincki</i>	3	<i>Macaca fascicularis</i>	2
		<b>PHOLIDOTA</b>	
		<i>Manis javanica</i>	1
<b>RODENTIA</b>		<b>RODENTIA</b>	
<i>Petaurista elegans</i>	2	<i>Callosciurus notatus</i>	6
<i>P. petaurista</i>	1	<i>Rattus argentiventer</i>	2
<i>Rattus argentiventer</i>	16	<i>R. cremoriventer</i>	4
<i>R. bartelsii</i>	48	<i>R. diardii</i>	17
<i>R. cremoriventer</i>	5	<i>R. exulans</i>	6
<i>R. diardii</i>	38	<i>R. mülleri</i>	2
<i>R. exulans</i>	44	<i>R. surifer</i>	5

ABSENCE OF PLAGUE IN MAMMALS IN JAVA and KALIMANTAN

Table 1 (Continued)

JAVA		KALIMANTAN	
Species	No. examined	Species	No. examined
RODENTIA (Cont'd)		RODENTIA (Cont'd)	
<i>R. lepturus</i>	7	<i>R. whiteheadi</i>	1
<i>R. niviventer</i>	6	<i>Hystrix brachyura</i>	1
<i>R. norvegicus</i>	16	CARNIVORA	
<i>R. sabanus</i>	1	<i>Mydaus javanensis</i>	1
<i>R. tiomanicus</i>	3	<i>Paradoxurus hermaphroditus</i>	2
CARNIVORA		<i>Felis bengalensis</i>	2
<i>Melogale orientalis</i>	4	ARTIODACTYLA	
<i>Herpestes javanica</i>	1	<i>Tragulus napu</i>	2
Total	237		103

Table 2

Mammals from which spleens were examined for plague bacilli.

JAVA		KALIMANTAN	
Species	No. examined	Species	No. examined
INSECTIVORA		RODENTIA	
<i>Suncus murinus</i>	1	<i>Callosciurus caniceps</i>	1
RODENTIA		<i>C. notatus</i>	3
<i>Rattus bartelsii</i>	6	<i>Rattus cremoriventer</i>	1
<i>R. diardii</i>	54	<i>R. diardii</i>	6
<i>R. exulans</i>	36	<i>R. sabanus</i>	2
<i>R. niviventer</i>	10	<i>R. surifer</i>	2
<i>R. tiomanicus</i>	5	<i>R. whiteheadi</i>	3
<i>Mus musculus</i>	2		
Total	114		18

been recorded from Kalimantan, and animals examined from that island were negative. Mammals trapped in Java were not from the Merapi-Merbabu focus; however, 44 rodents and bats were from Wanajasa, West Java, which was the site of a human plague outbreak in the 1950s. Indeed, some of the rats were trapped on the grounds of an abandoned

hospital built with emergency funds for treatment of plague victims during the outbreak.

It is quite possible that undetected plague does exist in areas other than the known focus in Central Java. However, the HA test is considered an accurate method for detecting

infected mammals, and is of particular importance for detection of enzootic foci (Cavanaugh *et al.*, 1965).

### SUMMARY

Antibodies against plague were lacking in 237 wild mammal sera from Java and 103 from Kalimantan. Wild mammal spleens, 114 from Java and 18 from Kalimantan were negative for plague bacilli. A variety of mammalian species and areas was examined.

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