Survey of Sylvatic Rodents for Serological Evidence of Rabies Virus Infection

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OBJECTIVE : To capture sylvatic rodents in selected forested areas of Thailand and to test their serum for rabies neutralizing antibodies.

BACKGROUND : On several occasions investigators at SEATO Medical Research Laboratory have examined wild rodents to determine if they were infected with rabies virus. In the first reported survey, Smith, *et al.*, 1967-68, rabies virus was found in six different species of rodents in Thailand (1, 2). Subsequent surveys have yielded negative results. In the Annual Report of 1971, Hickman, *et al.*, reported that the negative results obtained during the four year period since rodents were implicated as a possible sylvatic reservoir of rabies virus infection, suggests that the hypothesis of a rodent reservoir of rabies in Thailand is false. In all of these surveys the basis for evaluating rodents for rabies virus infection was by examination of brain tissue using a fluorescent antibody test. Positive specimens were confirmed by intracerebral inoculation of weanling mice.

In this study we screened select wild rodent populations for evidence of exposure to rabies virus by testing their serum for rabies neutralizing antibodies. Similar serological monitoring procedures has been used by other investigators to determine the incidence of rabies in a wildlife population. There are no records which indicate this type of survey has been performed in Thailand.

METHODS : Surveys were conducted primarily in seven areas (Figure 1). Trapping sites at Sakaeraj, Saiyok, and Ban Bu Pai were woods and secondary forest. Sites around Chieng Mai were woods and scrub. Sites at Rayong, Cha Choeng Sao, and Bangkok were rice fields, scrub, and urban. Rodents were trapped in metal basket traps which were baited with peeled ripe banana and then set along a trial or near a burrow. Trapped rodents were given an accession number and caged separately at the field site. The capture site, genus, species, age, and sex were recorded. Rodents were transported live to the laboratory. Approximately one ml. of ketamine hydrochloride was given intramuscularly for anesthesia, and blood was collected via heart puncture or from the medial canthus of the eye. Serum was subsequently harvested and stored at -60 C. Assay for rabies serum neutralizing antibodies was performed by the serum dilution test procedure using three week old mice. Serum was screened at both 1:5 and 1:25 dilutions. Any test in which serum tested positive at a 1:5 dilution was re-tested at least once.

RESULTS : One mongoose and 675 rodents were trapped. Except for a single rat trapped in a private residence in Bangkok, all were from forested and rural regions (Table 1). Thirteen rodents were trapped in northern Thailand around Chieng Mai. The remainder were from central and southeastern Thailand near Bangkok.

With one exception, the rabies serum neutralizing antibody titer of all animals was less than 1:5. The single exception was an adult *R. surifer*. Both a serum collected shortly after capture 22 December, and a second serum collected 24 January was tested. In two separate tests, the serum first collected had a titer of 1:5 and 1:8, respectively, and the later serum had a titer of 1:8. On the basis of FA testing and mouse inoculation, rabies virus could not be demonstrated in brain tissue of the *R. surifer*.

Since the first reports of rodent rabies in 1966-69, brain tissue has been examined from not less than 1,217 rodents. Rabies virus has not been detected in a single instance. Test procedures used for virus detection have been uniform throughout the entire survey period. Confirmation of laboratory findings obtained in 1966-69 is not possible because both the original brain tissue and the virus isolates have been lost.

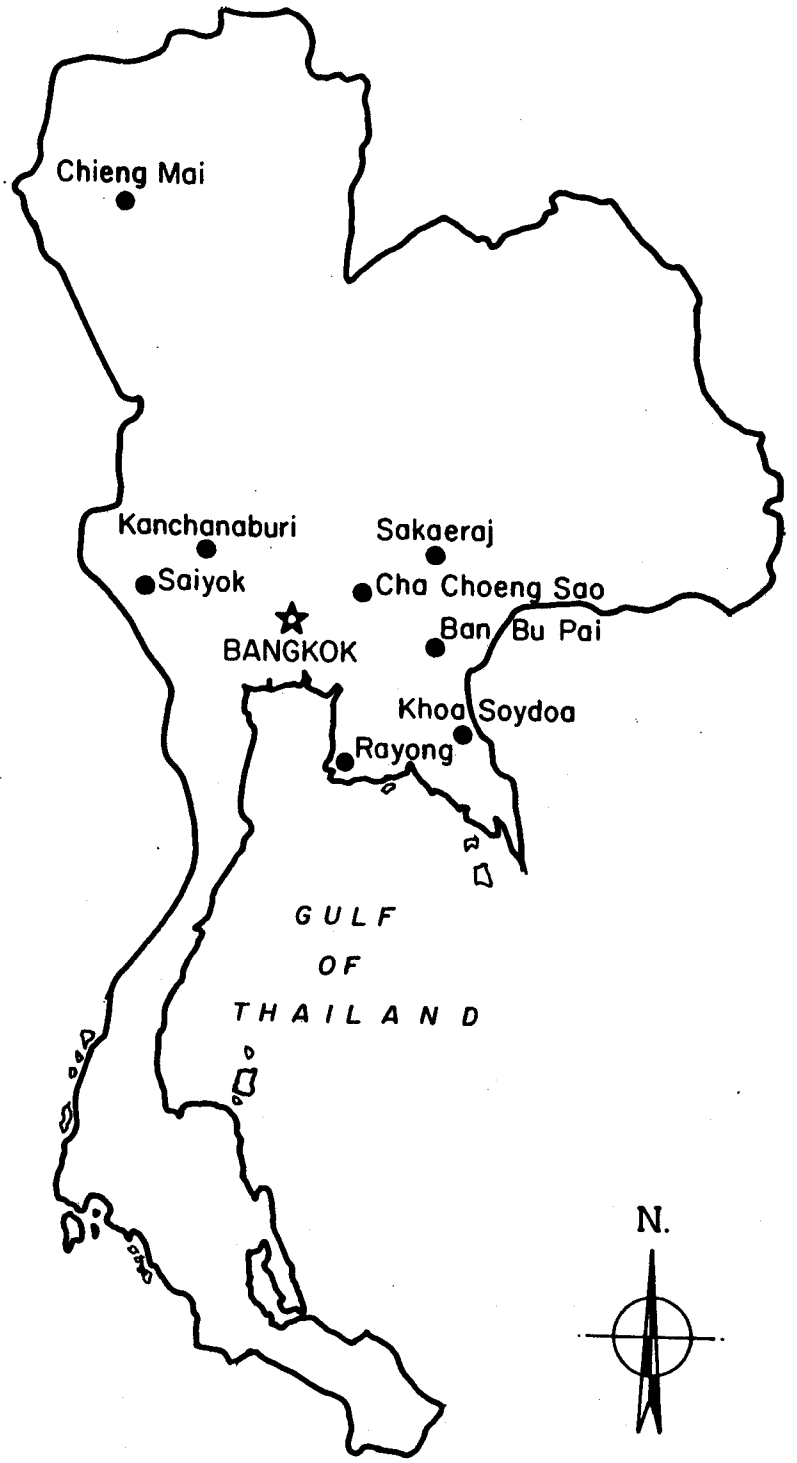
REFERENCES :

1. Smith, P.C., Lawhaswasdi, K., Stanton, J.S., and Vick, W.E. : The Prevalence of Sylvatic Rabies in Thailand. SEATO Medical Research Laboratory Annual Report (1967): 487-488.

2. Smith, P.C., Lawhaswasdi, K., Vick, W.E. and Stanton, J.S. : Enzootic Rabies in Rodents in Thailand, Nature, 217, (1968): 954-955.

Table 1. Listing of animals trapped for serology survey in 1977-78

Trapping Site	Sakaeraj	Chieng Mai	Sai Yok	Rayong	Kanchana-buri	Ban Bu Pai	Bangkok	Cha Cherng Sao	Total
Month	Jul-Aug 77	Sep 77	Oct 77	Nov 77	Nov 77	Dec 77	Dec 77	Jan 78	
Rattus rattus	24		8	26	10	16	-	55	139
Rattus koratensis	1	-	-	-	-	-	-	-	1
Tupaia glis	18	1	4	-	2	5	-	-	30
Menetes berdmorei	1	4	8	-	5	1	-	-	19
Rattus sabanus	6	-	-	-	-	17	-	-	23
Rattus surifer	77	-	6	-	4	63	-	-	150
Bandicota indica	-	5	-	51	1	-	-	219	276
Rattus bukit	-	1	-	-	-	-	-	-	1
Mongoose (*Herpestes javanicus*)	1	-	-	-	-	-	-	-	1
Rattus exulans	-	1	-	-	-	-	-	-	1
Rattus berdmorei	-	-	-	2	1	-	-	-	3
Rattus rapit	8	-	1	-	-	1	-	-	10
Rattus norvegicus	-	-	-	-	-	-	1	-	1
Rattus losea	-	-	-	-	-	4	-	-	4
Bandicota savilei	-	-	7	-	10	-	-	-	17
Total	135	13	34	79	33	107	1	274	676


Chieng Mai
Kanchanaburi
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Saiyok
Cha Choeng Sao
BANGKOK
Ban Bu Pai
Khoa Soydoa
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