

SEATO Medical Research Study on Migratory Animals Pathological Survey (MAPS)

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Period of Report: 1 April 1965 - 1 May 1966

Objectives:

A. Major objectives are:

1. To determine the migratory habits and the seasonal, altitudinal and ecological distribution of all the species of birds known in Thailand.
2. To study the incidence of ectoparasites and blood parasites for all species of Thai birds on a survey basis.

B. Secondary objectives are:

1. To develop a representative collection of birds to be used for a faunal study of the birds of Thailand and to aid in the more difficult field identifications, esp. subspecies.
2. To make a complete formalin preserved collection of the bird genera of Thailand to aid in taxonomic studies now in progress in the United States.
3. To derive data (i.e. habits, habitat, behavior) useful in increasing the knowledge of the taxonomic relationships of the birds of Thailand.
4. To derive the field data necessary for the production of a complete faunal study of the birds of Thailand wherein emphasis will be on identification and distribution.
5. To study the distribution of bats and their blood parasites and ectoparasites.

Correlation of the major objective data derived will yield information on the distribution and relative abundance of bird ectoparasites and blood parasites in Thailand. The survey is designed to provide a broad basis for further more specialized research important diseases or disease vectors are found. The data derived could have important medical implications internationally as well as in Thailand because of the large number of northern migratory birds which migrate through and/or winter in Thailand. Although emphasis is placed on migratory birds because of their capability of carrying disease or disease vectors long distances, resident birds are considered important as possible reservoirs for diseases or disease hosts which could be transmitted to man and/or migratory birds. Resident birds also provide data on the resident parasite fauna.

METHODS: It has been the policy of this project to survey birds by making trips to the highest mountains of each of the major zoogeographical regions of Thailand. By working at various elevations of the highest mountain of an area and also in the different habitats of the surrounding lowlands, most of the altitudinal strata and habitats and thus most of the birds of an entire region can be studied on one extended field trip. It is the objective of the project to band as many birds of as many species as possible. The field trips are made, for the most part, during the periods of heaviest migration, i.e., October-December and February-April. Fall migration periods are spent in North Thailand because of the greater possibility of getting ectoparasite "hitch-hikers" from other countries on migrating birds. Spring migration periods are utilized to check migration in other parts of the country.

Birds are captured alive using mist nets. Birds which cannot be caught with mist nets are either snared or shot. Live birds are identified, banded, measured, bled for smears, checked for ectoparasites and released. Birds which cannot be identified are made into study skins. Dead birds are measured, checked for ectoparasites and either pickled or made into study skins. The carcasses of skinned birds are pickled. Bats are either captured in mist nets or shot. All are bled for smears, checked for ectoparasites and pickled. Other mammals are shot and occasionally caught in mist nets. They are processed the same as the bats. Some snakes, lizards and amphibians are captured. All are pickled.

The bird study skins are added to the SEATO Lab reference collection. The pickled bird and carcasses are forwarded either to MAPS HQ in Tokyo for pathological study or to the U.S. National Museum for taxonomic study. Pickled bats, other mammals and reptiles are sent to Tulane University for identification and for histological and taxonomical studies now in progress. Ectoparasites are turned over to the SEATO Lab Entomology Department for sorting and forwarding to cooperating scientists for identification. The blood smears are turned over to SEATO Lab Parasitology Department for study. Endoparasites are given to Dr. Swasti Daengsvang for identification.

The first 25 birds of each species in each area worked are measured. Measurements taken are: total length, wing, tail, tarsus length, tarsus diameter, gape, and culmen. These measurements may help to substantiate the hypothesis that the plains and mountain populations of wintering species have different origins. The measurements will also assist in subspecific identifications.

PROGRESS:

Swallow Banding: 5-12 April 1965 and 4 January-11 February 1966

A flock of approximately 150,000 House Swallows, *Hirundo rustica*, winters in the Bangkok area annually from the end of October until early May. They roost on telephone wires in Bangkok's Jaward District at night and range out daily as far as 30 kilometers to feed. In the period 5-12 April 1965, 6,517 swallows were banded. Of these about 50 were bled for virus study. Ectoparasites and blood smears were taken from a few. Thus far, 9 recoveries of 1965 banded swallows have been reported, 7 by the bird Ringing Bureau of the USSR Academy of Sciences in Moscow and by the MAPS team in Korea.

In the period 4 January-11 February 1966, 52,715 swallows were banded by the MAPS team. Of these, 200 were processed for ectoparasites and blood smears. The plumage condition and age of another 200 were checked so that when they are recaptured some notion of progressive plumage changes to adulthood may be noted. This will enable more accurate aging in future banding. Over 3,000 swallows banded in 1965 were recaptured at this time indicating that approximately half (10,000) of the 20,641 swallows banded in 1965 had returned. The swallows were captured with mist nets hung between high buildings.

A large number of the swallows were seen during the period 10-18 August 1965 in Chonburi, Rayong, Chanthaburi and Trat Provinces apparently following a coastal migration route. It was hoped that swallows banded in Bangkok could be collected in the S.E. during spring migration. However, during the period 14-30 April 1966 no migration of swallows in those provinces was noted. Only wintering birds were seen.

Khao Luang: 19 April-12 June 1965.

Situated in Nakhon Si Thammarat Province, Khao Luang (5,800 ft.) is the highest mountain in peninsular Thailand. 1535 birds of 116 species were banded. All species (about 1,200 individuals) were processed. About 80% of the birds had ectoparasites. Most common were feather mites on about 60% of the birds, followed by Mallophaga, 40-50%. A few ticks, mites, chiggers, and Hippobosids were found.

Camps were made at 450, 1,300, 2,900, 4,300 and 5,000 ft. South of the isthmus of Kra, evergreen forest is generally dominant throughout the peninsular. Thus, the most productive netting is in the lowlands where the rain forest is patchily broken up by cultivation. The upper reaches of Khao Luang were covered with dense scrub in which it was difficult to set up nets. Further, the bird population and variety at high elevations was very low.

The technicians of the SEATO Lab bird virus team assisted the MAPS team for the duration of the expedition. They took about 150 blood samples for virus work. Dr. Norman Negus' technician assisted the MAPS team for the entire trip, concentrating on mammal collection and preparation. He checked all mammals for ectoparasites. A large number of mammals, especially bats, were collected, several of which were new to Thailand. These will be reported elsewhere.

A wealth of new bird distributional data was obtained. One species new to Thailand, Harpactes orrhophaeus, was found. New records for peninsular Thailand are: Harpactes erythrocephalus, Enicurus schistaceus, and Phylloscopus trochiloides. New area records are Batrachostomus javensis and Glaucidium brodiei. Ticks of the genus Haemaphysalis were found on 1 bird each of the following species: Chloropsis cochinchinensis, Trichastoma tickelli, Stachyris nigriceps, Myophonus caeruleus, Muscicapa solitarius. Unusual on birds were ticks, Amblyomma geomydae found on 1 specimen each of Pitta caerulea and Lacedo pulchella. Members of the tick genus Amblyomma are known to carry Spotted Fever Rickettsiae in the new world.

Three very interesting recoveries of Arachnothera longirostra were made.

Date banded	Altitude	Date recovered	Altitude	Distance from area banded
16 May 1965	2,900 ft	21 May 1965	1,300 ft	1½ miles
16 May 1965	2,900 ft	2 June 1965	450 ft	2½ miles
27 May 1965	1,300 ft	6 June 1965	450 ft	1½ miles

The three areas involved were at different elevations in the same valley. These recoveries suggest an hitherto unknown post breeding movement to lower elevations. This movement coincides with the advent of the rainy season, in this case, the southwest monsoon.

A new species of Mallophaga, Strigiphilus marshalli, was described by Dr. Teresa Clay from a specimen of Phodilus badius.

Saraburi: 2-8 August 1965.

A MAPS team technician accompanied Dr. Marshall's bird virus team on a field trip to Phu Nam Tok and collected parasites and blood smears from 61 birds of about 35 species. Ticks, Haemaphysalis wellingtoni, were found on a specimen of Pitta moluccensis.

Chanthaburi: 10-18 August 1965.

Three trips into the mangroves and 4 trips to islands off Trat, Rayong and Chonburi Provinces were made. A total of 38 birds of 22 species were collected and processed. On the islands, nestlings of 2 species of terns, Sterna anaethetus and Sterna sumatrana, were banded, and processed. Both species were infested with ticks, Ornithodoros capensis.

Samut Prakan (Coastal): Late August and September.

Twelve 1 day field trips were made to the coastal areas of Samut Prakan Province to study the movements of shorebirds and to find good areas for trapping them. 129 birds of 48 species were collected. 44 of the birds were bled for virus study by a technician from Dr. Marshall's virus team. Mallophaga infestation was over 90% for the shorebirds. Larval stage ticks, Argas persicus were found on a specimen of Pelecanus philippensis.

Two of the species collected, Crocethia alba and Phalaropus lobatus, were previously unknown from Thailand.

The carcasses of 16 of the birds from these collections were given to Dr. Swasdi Daengsvang for endoparasite study. Of 8 Corvus macrorhynchus checked, 5 contained 3rd stage larvae of Gnathostoma spinigerum. One Butorides striatus, 1 Pelecanus philippensis, and 1 Egretta garzetta also contained G. spinigerum. One each of Numenius phaeopus, Halcyon coromanda, Himantopus, himantopus, Sturnus sinensis and Sterna albifrons were not infested with this serious human parasite.

Some evidence of coastal migration of Apus pacificus and Accipiter sp. was noted.

Doi Pha Hom Pok: 11 October - 26 December.

This is the second highest mountain (7,500 ft) in Thailand and is situated astride the Burmese border in the Fang district of Chiangmai Province.

A total of 4,424 birds of 181 species were banded. An additional 100 species were observed, 50 of which were collected. Some 3,000 blood smears and ectoparasite collections were made from the 231 species banded and collected. Chiggers were found on 242 birds of 67 species. This is an overall average of 5.5%. Chigger infestation was much heavier at altitudes above 4,000 ft. Mites and Hippoboscids were found on a few birds. Mallophaga infestation was about 60% and feather mites were found on about 80% of the birds checked.

Fourteen species of birds previously unknown from Thailand were found:

Falco subbuteo (1 shot)
Carduelis spinoides (12 observed, 1 netted)
Aegithaliscus concinnus (15 observed, 10 netted)
Pycnonotus xanthorrhous (2000+observed, 200 netted)
Tesia castaneocoronata (10 observed, 7 netted or shot)
Phoenicurus frontalis (1 observed, 5 netted)
Aethopyga ignicauda (1 netted)
Carpodacus nipalensis (3 netted)
Paradoxornis atrasupersiliaris (5 netted)
Erithacus chrysaeus (2 shot, 1 netted)
Cinclidium frontale (1 netted)
Cettia brunnifrons (1 netted)
Cettia fortipes (3 shot, 5 netted)
Cephalopyrrus flammiceps (1 netted)

Two additional species new to Thailand, *Hieraetus fasciatus*, and *Haliaeetus leucoryphus*, were seen but could not be collected: About 40 species previously unknown from the Pha Hom Pok area were found. Some new altitudinal distribution data was obtained. Much new migration data accrued from the trip, i.e. arrival dates, relative abundance, etc.

Birds were netted at 1,500 ft, 1,800 ft, 3,000 ft, 3,300 ft, 4,000 ft, 4,200 ft, 5,000 ft, 6,200 ft, 6,800 ft, and 7,500 ft. As was shown on Doi Pui and Doi Inthanon, the evergreen areas above 4,000 proved to have a much greater number of birds of about twice the number of species as the adjacent lowlands. This is in strong contrast to peninsular Thailand where the richest fauna is in the lowland and submontane areas. About 160 bats were taken. Among them was 1 new species for Thailand.

Khao Soi Dao Tai: 22 February - 30 April.

Khao Soi Dao Tai (5,500 ft), situated in the Pong Nam Pon district of Chanthaburi Province, is the highest mountain in southeastern Thailand. The faunal affinities of the area are strongly Cambodian and little known. Of the 255 species found on this trip, 61 (25%) were previously unknown from S.E. Thailand. One of these birds, *Erithacus akahige*, was previously unrecorded west or south of coastal China. About 11 of the birds found represent new subspecies for Thailand. Nearly all of these races are Cambodian in origin. The abundance of the 61 species new to S.E. Thailand can be broken down as follows: 3 species abundant, 22 species common, 30 species uncommon, 5 species rare and 1 species accidental. 29 of the 61 species are known migrants and formed a very significant part of the migratory avifauna of the area.

Camps were maintained an average of about 9 days each at 850 ft, 1,200 ft, 2,500 ft, and 4,800 ft. 1531 birds of 73 species were banded.

In all, blood smears and ectoparasite collections were made from about 1,900 birds of 150 species. Highly significant collections of ticks were made at the upper elevations of Khao Soi Dao. Significant chigger collections were also made.

Elevation	No. of birds examined	% parasitised
4,800 ft	404	28% ticks 5% chiggers
3,700 ft	322	17% ticks 1% chigger
2,500 ft	318	7% ticks 2% chiggers
12,00 ft	190	3% ticks 11% chiggers
850 ft	405	2.5% ticks 4% chiggers

In addition to Khao Soi Dao Tai, 10 days were spent at the 100 ft level at the base of Khao Sa Bap which is about 10 km. S.E. of Chanthaburi. Netting was carried out in a area consisting mostly of rubber gardens and secondgrowth. Only about 1/3 of the individuals of about 1/2 the number of species of the lowest elevation of Khao Soi Dao Tai were caught and banded.

The SEATO Lab's Entomology Department mosquito collection team spent 3 weeks in March working in cooperation with the MAPS team on Khao Soi Dao Tai. Concurrently, Mr. Martin Woodcock, an English ornithologist and artist, spent a week with the MAPS team gathering background material for the plates he is preparing for a field guide to the birds of S.E. Asia.

RECOVERIES, FOREIGN

Hirundo rustica (House or Barn Swallow)

Banded (Bangkok)	Recovered	
26 March 1965	29 July 1965	Seoul, Korea
25 March 1965	21 June 1965	Chin Ki Ri, Korea
23 March 1965	19 July 1965	Leninskoe, Khabarovsk, U.S.S.R.
24 March 1965	15 June 1965	Shimanorsk, Amur, U.S.S.R.
24 March 1965	20 June 1965	Movokievka, Amur, U.S.S.R.
9 April 1965	28 July 1965	Oktyabrskii, Amur, U.S.S.R.

19 March 1965	18 May 1965	Blagoveshchensk, Amur, U.S.S.R.
8 April 1965	13 August 1965	El'ban, Khabarovsk, U.S.S.R.
10 March 1965	10 May 1965	Belogorsk, Amur, U.S.S.R.

Emberiza rufila (Chestnut Bunting)

Banded (Doi Pui, Chiangmai)	Recovered	
20 February 1965	17 August 1965	Near Seoul, Korea

RECOVERIES, LOCAL:

Anastomus oscitans (Open-billed Stock)

Banded (Wat Phailom, Bangkok)	Recovered	
10 February 1965	24 June 1965	Chainat Province
9 February 1965	6 May 1965	Chalyaphum Province

About 10 recoveries of Bangkok banded Hirundo rustica have been made in the vicinity of Bangkok in 1965 and 1966. None, however, is outside the daily feeding range of the birds

SUMMARY:

66,743 birds of 303 species were banded by the MAPS team. Cooperators added another 1364 birds of 120 species, including 41 species not banded by MAPS. Ectoparasite collections and blood smears were made from some 6,600 birds of about 450 species. About 300 bats were collected, all of which were checked for ectoparasites and most of which were bled for smears. About 1,200 bird skins were added to the SEATO Lab. collection. About 500 birds of 250 species were preserved in formalin. Measurements were taken from about 4,000 birds of about 475 species.

18 species of birds previously unrecorded in Thailand were collected during the year, bringing the 2 year MAPS total to 31 species. About 11 subspecies new to Thailand were found. Hundreds of new distribution records were made. Of the 255 species of birds found on the Khao Soi Dao Tai trip, 25% had been previously unrecorded in S.E. Thailand. Several new species of bats for Thailand were collected. A large amount of migration data was derived, i.e. arrival and departure dates, habitat of migrating birds, altitudinal ranges of migrants, relative abundance of migrants in different areas, distribution of migrants, suspected migration paths etc. A great deal of data useful to the projected faunal study of Thai birds was derived. Significant difference in bird populations in different regions were noted. Some evidence of altitudinal migration was obtained.

Ectoparasite collections were made in an ever broadening range of species and areas. A new Mallophaga and 2 new Hipposcids were described this year from MAPS and Dr. Marshall's collections. A spectacular tick infestation (28% of the birds at 4,800 ft and 17% at 3,700 ft) was found on Khao Soi Dao Tai. Significant chigger collections from birds were made on both Khao Soi Dao Tai and Doi Pha Hom Pok.

Swallows, Hirundo rustica, of which 73,363 have been banded by MAPS in 2 years, have produced the greatest number of foreign recoveries, 7 from S.E. Siberia and 2 from South Korea. A chestnut Bunting, Emberiza rutila, banded in Chiangmai was recovered near Seoul Korea. Two local recoveries of Open-billed Storks have been made as well as about 10 Hirundo rustica recoveries near Bangkok.