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BUTTERFLIES AND CONSERVATION IN THE NATIONAL PARKS OF THAILAND

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ABSTRACT.— The conservation of natural areas and butterflies in Thailand is discussed. Thailand has one of the largest national park and forest reserve systems in Asia, yet protection is poor, partially due to protective laws favorable to forest exploitation. Several areas in Thailand were visited, producing a varied sample of the rich Thai butterfly fauna.

KEY WORDS: Amathusiinae, *Amathuxidia*, *Anthene*, *Appias*, *Arhopala*, Asia, *Atrophaneura*, behavior, *Bhutanitis*, Burma, Cambodia, *Cepora*, *Cethosia*, China, *Cupha*, *Cyrestis*, Danainae, *Danaus*, *Delias*, *Discophora*, *Dysphania*, *Eurema*, *Euthalia*, *Everes*, Geometridae, *Graphium*, Hesperidae, *Hypolimnas*, *Idea*, India, *Jamides*, *Labadea*, *Lamproptera*, *Lethe*, Lycaenidae, Malaysia, mimicry, *Neptis*, Nymphalidae, Oriental, *Pantoporia*, *Papilio*, Papilionidae, photography, Pieridae, *Prioneris*, Satyrinae, Southeast Asia, *Stichophthalma*, *Tagiades*, *Tanaecia*, *Teinopalpus*, *Troides*, *Ypthima*, zoogeography.

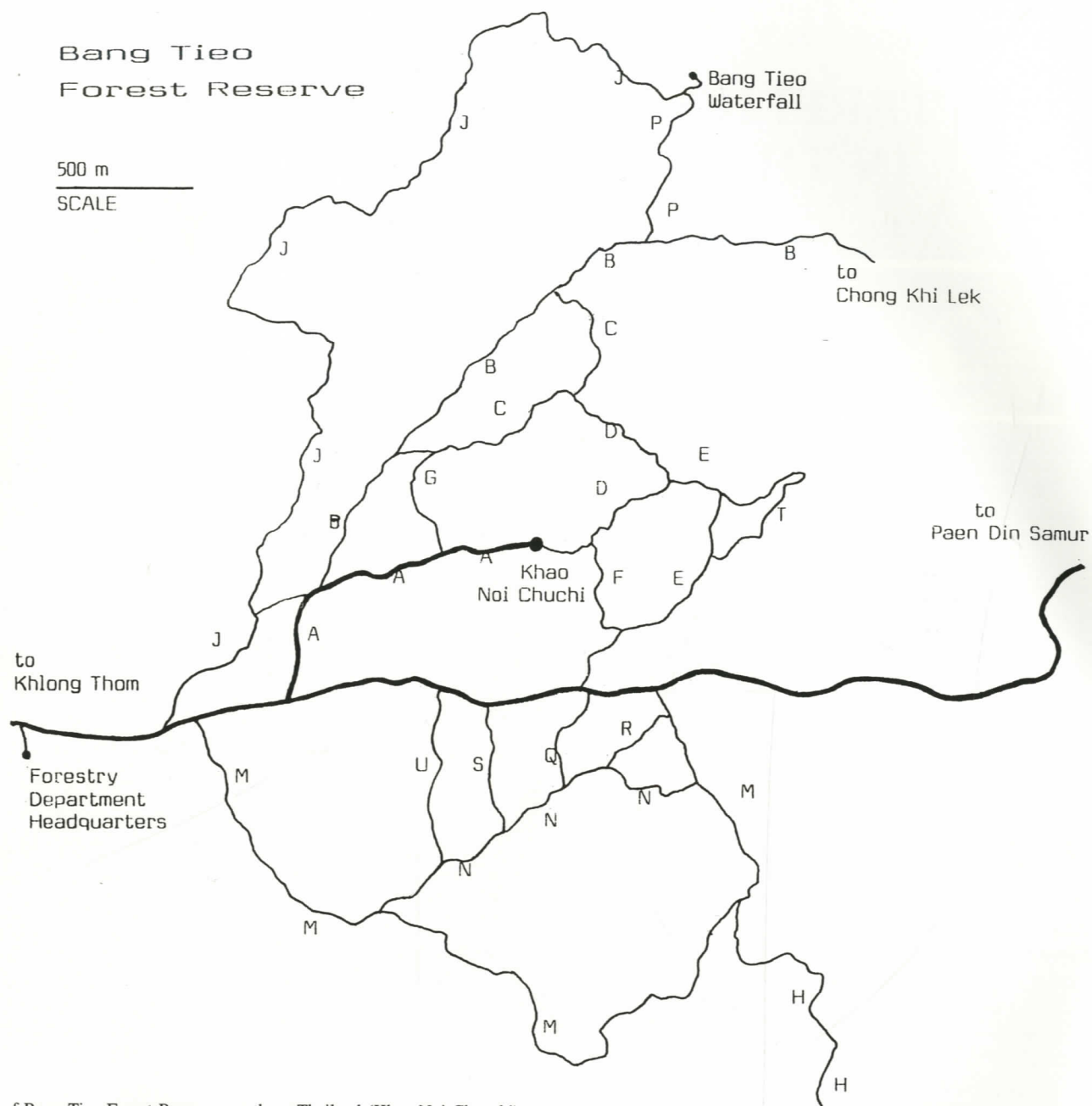
During the first half of this century, Thailand's butterfly fauna remained relatively little explored compared to that of adjoining British territories in Asia, such as India and Malaya. E. I. Godfrey was a key pioneer for Thai lepidopterology. In 1916, he listed about 600 species. Intensive collecting during recent decades has permitted the knowledge of Thai butterflies to improve, and hundred of new species have been discovered. The most comprehensive work on Thai butterflies to date, the 6-volume compendium, *Butterflies in Thailand*, by Brother Amnuay Pinratana (1977-92), includes about 1,000 species. The author continues to update the books and add additional species to the list for Thailand.

Thailand owes the richness of its butterfly fauna to its geographical position, being at the junction of three major Oriental zoogeographical subregions: Malayan, Indo-Burmese, and Indo-Chinese. During my travels in Thailand during October to November 1990, and again in February 1991, I visited localities situated in all these subregion zones.

Khao Noi Chuchi (Krabi Prov.) and Khlong Nakha (Ranong Prov.) lie in the Malayan zone. The typical feature of the fauna of this zone is a great diversity of species in the families Amathusiidae and Lycaenidae, especially the *Arhopala* group of lycaenid genera. The predominance of the Malayan elements ends approximately at 10°N latitude on the Isthmus of Kra. North of this area extends the Indo-Chinese zone, embracing the center and the east of Thailand. The fauna of Khao Sai Dao National Park, situated a few kilometers from the Cambodian border, belongs to that zone. Its typical representatives include *Stichophthalma cambodia* (Hewitson), *Prioneris thestylis* (Double-day), and *Atrophaneura laos* ((Riley & Godfrey). The fauna of Nam Tok Sai Yok, which is situated in the Erawan National Park, 200km west of Bangkok, is transitional between the faunas of



1. Zoogeographical subregions of Thailand and the five national parks and forest reserves visited.



2. Map of Bang Tiew Forest Reserve, southern Thailand (Khao Noi Chuchi).

the Indo-Chinese and the Indo-Burmese zones. The latter zone embraces north-western Thailand: the fauna of this area is characterized by the abundance of such genera as *Neptis*, *Lethe*, and *Delias*. In the highlands of the Chiang Mai, Mae Hong Son, and Chiang Rai, many typical sub-Himalayan species reach the southeasternmost limits of their range. Among them, the most exciting discoveries in recent years have been *Teinopalpus imperialis* (Hope) and *Bhutanitis lidderdallii* (Atkinson). The only place I had the opportunity to explore in this zone was at Sopkai, on the southern mountain slopes of the Doi Chiang Dao range, maximum elevation 2175m.

Thailand is the leading Southeast Asian country having protected natural areas. By 1990, Thailand had established around 60 national parks, forest reserves and wildlife sanctuaries, covering 6.2% of the total land area of Thailand. Samples of all existing biotopes are included: tropical highland and lowland forest, savanna, mangrove, coral reefs, and marine. They are

distributed equally in the three zoogeographical zones. The area within the largest national park, Kaeng Krachen National Park, includes 250,000 square kilometers. Most of the protected areas, however, do not exceed 100,000 square kilometers. The oldest and most famous national park in Thailand is the Khao Yai National Park, situated 200km northeast of Bangkok. It is a world-renown reserve for tigers and wild elephants. Fifty more national parks, covering 4.8% of Thailand, have also been proposed for the future. Among them, 45 are being reviewed by the Judicial Council and the National Parks Committee, and 5 of them are awaiting the final approval of the Thai Cabinet. This is a huge legislative effort. On the other hand, the creation of more and more "paper" protected areas is not followed by any specific adjustments in other areas by the legislative system, and unfortunately, the protectionist laws are not enforced by effective means of control.



PLATE 1. Forest scenes in Thailand: A, C-D) Khao Noi Chuchi; B) Khao Sai Dao; E) Sopkai.

I had the opportunity to discuss this problem with a Thai naturalist, a member of the International Council for Bird Preservation, Mr. Uthai Treesucon, in relation to the example of the Bang Tiew Forest Reserve. Bang Tiew is a protected area founded through the efforts of the ICBP ornithologists: the main argument for its establishment was to save one of the remaining populations of an endemic bird species, the Guernsey Pitta. The reserve is a bit difficult to locate as it is not figured on recent maps. More confusion is added by the fact that it is known under three different names: Bang Tiew, which is the name of a waterfall in this area; Khao Pra Bang, a nearby village; and Khao Noi Chuchi, the name of the guard camp for the reserve. Bang Tiew is popular among ornithologists, as each week several bird watchers visit the area. On the other hand, it was totally unknown until 1991 among Thai entomologists. That fact is quite surprising, considering that this area covers a very interesting patch of tropical lowland rainforest which is very rich in plant

species. The reserve is traversed by a number of marked trails, and the most travelled of these are also marked with numbered plaques every 20 meters. This trail system facilitates research and sampling projects and, of course, prevents visitors from getting lost in the jungle. The biotopes of the reserve are diverse. The flatland along the M, N, and H trails is covered by a dense drier forest, composed primarily of low tree species, and is the preferred biotope of the Guernsey Pitta bird, although rather poor for butterflies. Patches of the higher primary forest are localized on the hills, especially along the E, D, and B trails. This is a very good biotope for deep-forest butterflies, such as Amathusiinae, Satyrinae, and such genera as *Euthalia*, *Atrophaneura*, and *Idea*. The G and F trails cross a forest inundated by a persistently overflowing stream. This is the best biotope for Lycaenidae, primarily of the genus *Arhopala*. Other genera of Lycaenidae, such as *Jamides* and *Anthene*, are more abundant in the secondary growths. The soil has been flushed along the D trail,





PLATE 2 (this page and opposite page). See text for species names (page 82).

exposing a calcareous, slightly sulphurized ground with a few dwarf trees surviving. It is possible to explore interesting caves at the top of the T trail, while the P trail leads to the lovely Bang Tio waterfall. Butterflies belonging to the genera *Graphium*, *Papilio*, *Troides*, and *Appias* usually are found along the wider trails: A and J. Khao Noi Chuchi guard camp is equipped to welcome visiting naturalists, with inexpensive accomodation provided by the park authorities. Special attractions at Khao Noi Chuchi include a natural pool of crystal blue water, where after a day of exploring, one can refresh oneself (and remove the leeches!).

Unfortunately, the actual state of Thailand's legislation allows easy abuse of the land use and tenure law. The specific law states that "the farmer can be prosecuted only in case he is caught in the very moment of destroying the forest, but never afterward, even if it can be proven that he is responsible for the damage." In this situation, peasants invade the reserves little by little. They burn the Bang Tio forest, especially along the main road and the marginal trails J, M, and H; on some occasions just in front of the forest guard headquarters, with total disinterest on the part of

the guards. Meanwhile, the Forestry Department claims the lack of people and funds to protect the forest effectively.

The situation in the other national parks is also alarming. French ornithologists, whom I met in Khao Noi Chuchi, reported that in the Khao Sam Roi Vot National Park (Prachuap Khiri Khan Prov.), the mangrove swamps are being transformed into lucrative shrimp farms. In the Khao Phanom National Park (Krabi Prov.), gibbons and other primates and birds are hunted to be sold in the neighboring Krabi resort pet shops. In the Kha Sai Dao National Park (Chantaburi Prov.) during several days while a fire was destroying a lovely forest, the officials of the park were very busy improving the recreational facilities just a few hundred meters away! Was not the real purpose of what a national park is being forgotten?

The very positive aspect of the national parks in Thailand, beyond their ecological value, are their eco-tourism capacities. Most of the parks have good infrastructure: trails, bungalows and restaurants. They usually have a carefully arranged education and information center: I visited such centers in the Laem Son National Park (Ranong Prov.) and the Khao Lak National Park

(Phangnga Prov.). On the other hand, some parks are so devastated that they have very little to offer to a naturalist, apart from the information center there. Some national parks were created first of all, if only solely, to safeguard the scenic beauty of a particular waterfall, since Thai people are very passionately enamored by their national waterfalls. They will spend an entire day enjoying the view, chatting, tasting their food, and so forth, at a waterfall, but unfortunately also leaving a huge amount of rubbish behind after they leave.

For the lepidopterist, Thailand offers a wealth of species of butterflies. Some of the more prominent are illustrated on the accompanying Plate 2:

A. *Danaus melaneus plataniston* (Fruhstorfer) (Nymphalidae)

My camera bag was a fine bait. A *Danaus* poses patiently while sucking sweat. (Khao Sai Dao)

B. *Neptis hylas papaja* Moore (Nymphalidae)

The smell, and possibly the color, of my Chinese-made shoes were irresistible to this *Neptis*, and to many blue *Graphium* species of the *G. doson* group. I will surely buy another pair for the next trip. (Khao Noi Chuchi)

C. *Pantoporia* sp. (Nymphalidae)

This *Pantoporia* will have its life spared for posing so gently. On the other hand, I will never find out what species exactly it was! (Sopkai)

D. *Lamproptera curius* (Fabricius) (Papilionidae)

This species is a very curious swallowtail, indeed. In flight it resembles somewhat a dragonfly: a protective measure? (Sai Yok Noi)

E. *Neptis harita* Moore (Nymphalidae)

Early in the morning, this *Neptis* was sunning safely behind dead leaves. (Khao Sai Dao)

F. *Neptis* sp. (Nymphalidae)

Another *Neptis*. (Khao Sai Dao)

G. *Cyrestis thyodamas* Boisduval (Nymphalidae)

This species was attracted to human (in fact, my own) urine. (Khao Sai Dao)

H. *Amathuxidia amythaon dilucida* (Honrath) (Nymphalidae)

This photograph is a story of half an hour of a crawling, sneaking, hide-and-seek game. I finally made this unique shot in the single moment when the wind pushed away the leaves, illuminating the beast! Using a flash would have spoiled the final effect. (Khao Sai Dao)

I. *Idea hypermnestra lineata* (Butler) (Nymphalidae)

Like a ghost, this huge butterfly glitters in the shade of the deep forest. Here, we see it feeding on tree sap, but I was unable to identify the plant. (Khao Noi Chuchi)

J. *Graphium antiphates itamputi* Butler (Papilionidae)

This swallowtail is exposing its green and yellow underside pattern in the entourage of green and yellow plants. This was the only occasion when I saw this species other than perched on mud. (Khao Noi Chuchi)

K. *Ypthima* sp. (Nymphalidae)

An unidentified *Ypthima* sp. drying after an early morning shower. (Khao Noi Chuchi)

L. *Hypolimnas bolina* (Linnaeus) (Nymphalidae)

Typical behavior of a *Hypolimnas*: on a tree trunk, head down, ready to chase away any intruder. (Khao Noi Chuchi)

M. *Cupha erymanthis lotis* (Sulzer) (Nymphalidae)

a) Sunning on a forest leaf. (Sopkai)

b) The same species, the same behavior, the same plant species, a thousand miles away. (Khao Noi Chuchi)

N. *Delias pasithoe parthenope* Wallace (Pieridae)

While drinking from a mountain stream, this butterfly would, from time to time, allow the water to carry it away, cruising like a boat for a considerable distance! (Sopkai)

O. *Anthene emolus* (Godart) (Lycaenidae)

In copula, the male just hangs in the air! (Khao Noi Chuchi)

P. *Everes lacturnus* Fruhstorfer (Lycaenidae)

This *Everes* obviously found exactly what was needed for lunch in this mixture of mud, animal urine and ashes. (Sopkai)

Q. *Neptis hylas kamarupa* Moore (Nymphalidae)

This species is one of the Palearctic representatives in the Thailand fauna. (Sopkai)

R. *Tanaecia julii odilina* (Fruhstorfer) (Nymphalidae)

A female sunning. Waiting for a partner? (Sopkai)

S. *Tagiades* sp. (Hesperiidae)

Sun-loving skippers are the most patient posers. (Khao Noi Chuchi)

T. *Dysphania militaris* (Linnaeus) (Geometridae)

This species is probably one of the most beautiful among the day-flying moths of Thailand. (Sopkai)

U. *Troides helena cerberus* (Felder & Felder) (Papilionidae)

A beautiful, freshly emerged female, sitting too high to take a closer look. (Khao Noi Chuchi)

V. *Labadea martha* (Fabricius) (Nymphalidae)

At 9 o'clock in the morning, the very best time to take a nice photograph. (Khao Sai Dao)

W. *Danaus aglea melanoides* (Moore) (Nymphalidae)

A lot of butterflies, including pierids, lycaenids, nymphalids, and others, visited this place; unfortunately, it was right in the middle of a very busy country road! (Sopkai)

X. *Cethosia hypsea hypsina* Felder & Felder (Nymphalidae)

When perched, this *Cethosia* is a rather poor mimic, but when it flies it looks confusingly like the model *Danaus*. (Khao Noi Chuchi)

Ya. *Delias, Cepora, Eurema* spp. (Pieridae)

Hundreds of butterflies demonstrating selectively gregarious behavior at mud. (Khao Sai Dao)

Yb. *Graphium sarpedon luctatius* (Fruhstorfer) (Papilionidae)

One of the common papilios in Thailand. (Khao Sai Dao)

Z. *Discophora sondaica* (Boisduval) (Pieridae)

Chased by an intruder off a rotten papaya, this *Discophora* shows an unrolled proboscis. (Khlong Nakha)

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