

Chapter 10

Amphibian Fauna of Na Haeo: a preliminary overview

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Introduction

Recent evidence of declining populations of amphibians all around the world led to an increasing interest for frogs and toads within the scientific community as well as in the public. Amphibians appear to be experiencing a global decline due to five main factors: habitat destruction, introduced predators, habitat pollution, human consumption (including collection for the pet trade) and climatic change effects. Most declines have occurred in forest-dwelling species. Very sensitive to their environment, amphibians are interesting indicators of environmental conditions. They constitute a large proportion of animal biomass in many habitats, especially in forested areas where they can even exceed the combined weight of all the vertebrates (BLAUSTEIN *et al.*, 1994 and BURTON & LIKENS, 1975). They are often the first species to disappear when habitats are degraded. Facing all these serious threats, it is urgent to provide reliable information about species distribution, abundance and habitat requirements for effective conservation planning and management. In 1998 we undertook, under the auspices of the Royal Belgian Institute of Natural Sciences and in collaboration with the Srinakharinwirot University (SWU), an amphibian survey of the Srinakharinwirot University Field Research Station in Na Haeo (SWU-FIRS) and its direct surroundings.

The main goal of this survey was to establish a preliminary checklist of the species present in Na Haeo putting together the few literature information and our own field observations. Thailand has a very rich and diversified batrachofauna. The country is known to be home to more than 140 species of amphibians (CHAN-ARD *et al.*, 1999). To date, only 18 of them, belonging to 5 families, have been recorded with certitude from the Na Haeo area (TAYLOR, 1962, TAYLOR & ELBEL, 1958, MATSUI *et al.*, 1999 and this paper).

Methods

The survey took place in November (11th to 26th), a period which corresponds to the beginning of the dry season in the area. Two different methods of investigation were used:

Manuscript received in 2001

Chapter published in: *The Environment of Na Haeo, Thailand. Biodiversity, non-timber products, land use and conservation*. L. Ampornpan and S. S. Dhillon (Editors). Craftsman Press Ltd., Bangkok, Thailand, 2003. ISBN 974-91734-1-4

systematic sampling survey and visual encounter survey (HEYER *et al.*, 1994 for details). Locals helped while bringing to us specimens found during their activities in the fields or in the surrounding forest.

General distributions are based on CHAN-ARD *et al.* (1999), FROST (1999), MANTHEY & GROSSMANN (1997) and TAYLOR (1962). Specific names follow the most recent revision (DUELLMAN, 1993, FROST, 1999).

Results and Discussion

Because the studied area is now nearly exclusively composed of cultivated areas and secondary or degraded forests, the great majority of the species observed were non-forest species and /or anthropophilic species.

The species recorded include one Bufonid (Bufonidae, True Toads): the Common Toad (*Bufo melanostictus*, Fig. 1) which is one of the most common species (hence its common name) encountered during the survey. Widespread in Thailand, the Common Toad is mainly observed in gardens, cultivated and disturbed areas and often enters in houses in search of insects, providing a valuable service to humans in eliminating pests. This species is known to occur from southwestern China throughout southern Asia to Borneo and Bali.

One Megophryid (Megophryidae, Short-legged Toads) is reported from Na Haeo (MATSUI *et al.*, 1999: 26): *Leptobrachium smithi*, but we were unable to observe this species during our short survey. This species was recently described, and occurs in all parts of Thailand.

Six Microhylids (Microhylidae, Narrow-mouthed Frogs) were found: the Common Bullfrog (*Kaloula pulchra*), the Berdmore's Narrow-mouthed Frog (*Microhyla berdmorei*), the Heymons' Narrow-mouthed Frog (*Microhyla heymonsi*), the Ornate Narrow-mouthed Frog (*Microhyla ornata*), the Marbled Narrow-mouthed Frog (*Microhyla pulchra*), and the Brown Pigmy Frog (*Micryletta inornata*).

K. pulchra is by far the most common and widespread Microhylid in Thailand but was rarely seen in the studied area. Interviews with locals revealed that the species is locally intensively hunted for food. *K. pulchra* is found in a wide variety of habitats, from forests to cultivated areas and towns. It has a large distribution in Asia, from Nepal and southern China to Singapore and east to Sulawesi.

M. berdmorei (Figure 2) was commonly found in large numbers around water (small streams and pools) in secondary forest. Widely distributed in Thailand, its whole distribution range includes Yunnan (China), Myanmar, Thailand, Laos, central Vietnam, Cambodia to Malaya, Sumatra and Borneo.

M. heymonsi (Figure 3) was found in disturbed areas, most specimens being found during the day under rocks or in the leaf litter. Distributed throughout the country, this species is also known from southern China through southeast Asia to Malay Peninsula and Sumatra.

M. ornata (Figure 4) was found from the garden surrounding the station to secondary forests and cultivated areas of Na Haeo. This species, known from southern China to the Malay Peninsula, is widespread in Thailand.

M. pulchra (Figure 5) was uncommonly observed along water, under rocks or on sandy stream banks in secondary forest and cultivated areas. Present throughout the country, its whole distribution extends from Hong Kong, China, to Cambodia and Vietnam.

Micryletta inornata is another widespread species found from Myanmar and southern China to Malaya and Sumatra. We found only a single specimen between rocks along a stream in a disturbed area composed of cultivated fields and secondary forest.

Nine Ranids (Ranidae, Typical Frogs) were found in the Na Haeo area: the Chinese Bullfrog (*Hoplobatrachus rugulosus*), the Paddy Frog (*Limnonectes limnocharis*), the Caped Frog (*Limnonectes pileatus*), the Common Floating Frog (*Occidozyga lima*), the Martens' Floating Frog (*Occidozyga martensii*), the Dark-eared Frog (*Rana cubitalis*), the Green Paddy Frog (*Rana erythraea*), the Yellow Frog (*Rana lateralis*) and the Dark-sided Frog (*Rana nigrovittata*).

H. rugulosus (Figures 6-7) seems to be limited to disturbed areas and open forest. It is commonly seen on markets where it is sold for food. This species is found throughout the country and its whole distribution ranges from Myanmar and southern China to Thailand and Peninsular Malaysia. *H. rugulosus* has been introduced in Borneo (INGER & STUEBING, 1997: 113-115).

L. limnocharis (Figure 8) is very abundant in disturbed wet areas such as paddy fields. It is often found near human habitations. Furnishing considerable food for human consumption and being the major food for certain animals (TAYLOR, 1962: 383), it is significantly important in the country. This species occurs everywhere in Thailand. Widely distributed, the species is found from China to Nepal, Pakistan, India, Sri Lanka, southern Japan, Philippines, Greater Sunda Islands and the Lesser Sundas. It should be noted that this taxon probably harbours more than one species.

L. pileatus (Figures 9-10) was found associated with water in secondary forest and disturbed areas. This species should be found throughout the country but is unknown outside Thailand.

O. lima (Figure 11) was found in ponds in open forest or in disturbed wet areas such as paddy fields. The species probably occurs in all the provinces of Thailand. Outside the country, it is known from India through Myanmar, Laos to southern China, Vietnam, western Malaysia and Java.

O. martensii (Figure 12) was observed in the same habitat that *O. lima* but was less commonly seen. Its whole distribution is Thailand to Vietnam and southern China.

R. cubitalis was not observed during our study, but it has been quoted from Na Haeo by TAYLOR & ELBEL (1958: 1058). This species is found from the Karen Hills of Myanmar to Thailand (Na Haeo and mountains of Nakhon Si Thammarat).

R. erythraea (Figure 13) was found in the vicinity of slow-moving streams, ponds and rivers in disturbed areas. Widely distributed in Thailand, the species is also known from West Bengal and Orissa (India) through Myanmar to southern Vietnam, Java, Borneo and the Philippines.

R. lateralis (Figure 14) was uncommonly found around streams in secondary and degraded forest. It is an inhabitant of open forest such as dipterocarp forest with grassland and can be found far from water. In Thailand, this species is to be found in the northern, central and eastern parts of the country. It is also found in southern Myanmar and northern Vietnam.

R. nigrovittata (Figure 15) was commonly found along slow-moving and fast streams or small pools in secondary forest. The species is found throughout the country. Its whole distribution is from Nepal to Yunnan, Vietnam and northern Peninsular Malaysia. It should be noted that this taxon probably harbours more than one species.

One Rhacophorid (Rhacophoridae, Asian Tree Frogs) was recorded: the Common Tree Frog (*Polypedates leucomystax*, Fig. 16). This frog inhabits a wide range of habitats from houses and gardens to forest (rarely primary forest) and appreciates the human presence. Widespread in Thailand, this species occurs from Sikkim and Assam (India) to Philippines.

Conservation of amphibian populations in the studied area

It is evident that the major threat for the amphibians in Na Haeo is the modification or the destruction of their habitats. Nearly all the primary forest in the studied area has disappeared and is now replaced by agricultural landscapes (mainly paddy fields) and disturbed or secondary forest. Trees are cut and used, amongst other things, to produce charcoal. Unfortunately, these human activities have led to the disappearance of most of the forest species and strongly decreased amphibian diversity. Most of the species we

observed are hence anthropophilic species, mainly dependent on human activities and which may be observed in many places in Thailand. The second main threat to amphibians at Na Haeo appears to be human predation. Farmers actively hunt large frogs (*H. rugulosus* [Fig. 7] and *L. limnocharis*) a common food all over Thailand, but also Microhylids (largely neglected in Thailand except in the Northeast). *Kaloula* mostly disappeared from houses and gardens at Na Haeo for this reason, and we were even served soup of *Microhyla* tadpoles!

It is a dramatic problem because people clearly need to modify their environment according to their food needs. The aim of this short contribution is certainly not to find solutions but we think that education is the first step to conservation. People and especially children need to know why biodiversity is important, the importance of amphibians in the food chain and their major role in the regulation of pests. Frog harvests should be urgently regulated and, at least, restricted at spawning time; human pressure on environment should be regulated even outside national parks.

Acknowledgements

We are grateful to Dr. La-aw AMPORNAN and Prof. Shivcharn S. DHILLON for inviting us to participate to the biodiversity research project at Na Haeo. We warmly thank Dr. Georges LENGLET (IRSNB) for working facilities and Mrs Chuchee CHIMSUNCHART (Phetchaburi) and Dr. Georges COULON (IRSNB) for companionship in the field. Our field trip has been made possible thanks to a grant from the Fund King Leopold III through the IRSNB.



Fig 1 *Bufo melanostictus*



Fig 2 *Microhyla berdmorei*



Fig 3 *Microhyla heymonsi*



Fig 4 *Microhyla ornata*



Fig 5 *Microhyla pulchra*



Fig 6 *Hoplobatrachus rugulosus*



Fig 7 *H. rugulosus* on local market



Fig 8 *Limnonectes limnocharis*

Photographs by Philippe J. R. Kok

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Fig 9 *Limnonectes pileatus*



Fig 10 *Limnonectes pileatus*

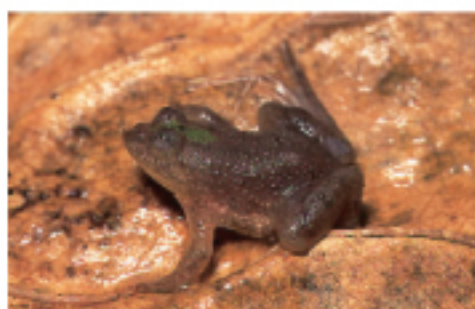


Fig 11 *Occidozyga lima*



Fig 12 *Occidozyga martensii*



Fig 13 *Rana erythraea*



Fig 14 *Rana lateralis*



Fig 15 *Rana nigrovittata*



Fig 16 *Polypedates leucomystax*

Photographs by Philippe J. R. Kok

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