

Reptile and Amphibian Diversity in Phang-nga Province, Southern Thailand

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ABSTRACT.—A list of the reptile and amphibian species recorded to date from Phang-nga Province, southern Peninsular Thailand, is provided. Six species are here added to its fauna: *Amyda cartilaginea*, *Typhlops muelleri*, *Ahaetulla fasciolata*, *Oligodon purpurascens*, *Ptyas fusca* and *Maticora intestinalis lineata*. The list thus presently includes 39 Amphibian species (38 toads and frogs, one caecilian) and 110 Reptile species (13 turtles, one crocodile, 36 lizards, 60 snakes), and is by far the longest one currently established for any province in Thailand. Nevertheless, the number of species will undoubtedly still much increase with future field studies.

KEY WORDS: Biodiversity; herpetofauna; Phang-nga; Thailand

INTRODUCTION

The long-term research project on the batracho- and herpetofaunas of Phang-nga Province was initiated in 1997 by two of us (OL and OSGP). In a short period, this project has already brought amazing results, which were reported by Pauwels et al. (1999, 2000a-c). Independently from our research project, a German team has since worked in Khao Lak National Park and added some new species records for the province (Grossmann and Til-lack, 2000, 2001a-b).

In the frame of our own project, we here add six original new records, based on our field trips conducted in 2000. Furthermore, new references have been examined, which contained previously overlooked data on the fauna of the province.

As a consequence, the species list for Phang-nga Province has recently been subject to a dramatic increase during the last years. Before additional field work is undertaken, we feel it appropriate to publish here a synthesis of our results so that they become easily available to Thai researchers and students. In the present paper, a complete, up to date list of the Reptile and Amphibian species is thus given hereafter.

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MATERIALS AND METHODS

The list is based on field observations, examination of museum collections, available literature data, and new material collected in the course of our official research project sponsored by the Royal Forest Department (RFD) and the National Research Council of Thailand (NRCT). For details concerning the institutions where the voucher material was deposited, please consult Pauwels et al. (1999, 2000a and c). The five new snake records are based on specimens collected by us during the rainy season (August-September) of the year 2000. These specimens are presently included in the zoological collection of the RFD in Bangkok. The specimens are identifiable by the label with their field number.

RESULTS

Recent additions are based both on new bibliographical references and on recent fieldwork, which are detailed below.

Literature

To the bibliographies presented by Pauwels et al. (2000a) and Grossmann and Tillack (2001), some references must be added. Grossmann and Tillack (2000) and Pauwels et al. (2000) overlooked the record of *Leiolepis belliana belliana* from Ko Yao Noi (Amphoe Ko Yao) by Mertens (1961), and that of *Bungarus flaviceps* from Sri Phang-nga N. P. by Round and Treesucon (1989). Grossmann and Tillack (2000, 2001b) overlooked the records of *Limnonyx cancrivorus*, *L. limnocharis* and *Polypedates leucomystax* by Anonymous (1996) and that of *Kaloula pulchra* by Schmidt (1978). Furthermore, four recent Thai works could not be included in the previous list by Pauwels et al. (2000a): that of Niyomwan (1999) mentioning *Ramphotyphlops albiceps* from the Similan Islands, those of Lauprasert (1999) and Lauprasert and Thirakhupt (2001) mentioning *Varanus rudicollis* from Sri Phang-nga N. P. and Khao Lak Lamru Marine N. P., and *V.*

bengalensis nebulosus and *V. s. salvator* from those two parks and Ao Phang-nga N. P., and that of Prathumthong (2001) recording *Cuora amboinensis* from Phra Thong Island, Amphoe Khura Buri. The mention of *Leptobrachium pullus* (sic) by Grossmann and Tillack (2000) based on Inger (1983) has been corrected to *L. smithi* according to Matsui et al. (1999: 24).

New material

The new material collected or examined during the 2000 field study period of our research project contains the following specimens, representing new species records for Phang-nga Province: the softshell turtle *Amyda cartilaginea* (several specimens of which being included in the zoological collection of the Phang-nga Agriculture and Technology College, PATC), and the snakes *Typhlops muelleri* (1 specimen collected in Phang-nga Wildlife Breeding Station, Amphoe Mueang, field number P237; another specimen observed at Raman Forest Park), *Ahaetulla fasciolata* (1 specimen collected in Raman Forest Park, field number P268), *Oligodon purpurascens* (1 specimen from Sang Mahnora Forest Park, Amphoe Mueang, field number P245), *Ptyas fusca* (1 specimen from Raman Forest Park, field number P243), and *Maticora intestinalis lineata* (1 specimen from Phang-nga Wildlife Breeding Station, field number P280). Moreover, we here mention a second provincial record for *Dendrelaphis caudolineatus* (1 specimen from Raman Forest Park, field number P240).

The specimen of *Ptyas fusca*, collected at about 15.00 h on a steep wooded slope bordering the stream of Raman Forest Park, Amphoe Takua Thung, represents the first precise locality for this species in Thailand.

Systematic list

We provide the current list of Amphibians and Reptiles of Phang-nga Province, classed by family. This list must be considered to be up to date as of January 1st, 2002.

Furthermore, as an indicator for future researches, we give between brackets, for each family, firstly the number of species recorded

to date from Phang-nga Province, then the approximative total number of species which we expect to occur in southern Peninsular Thailand. Expected Reptile species and the number thereof were discussed by Pauwels et al. (2000a).

Amphibians

Anura

Bufonidae (5/9 species):

Ansonia malayana, *Bufo asper*, *Bufo macrootis*, *Bufo melanostictus*, *Bufo parvus*.

Microhylidae (8/9 species):

Kalophrynus pleurostigma, *Kaloula baleata*, *Kaloula pulchra*, *Microhyla berdmorei*, *Microhyla butleri*, *Microhyla heymonsi*, *Microhyla ornata*, *Micryletta inornata*.

Pelobatidae (4/8 species):

Leptobrachium smithi, *Megophrys aceras*, *Megophrys longipes*, *Megophrys* sp. (see Grossmann and Tillack, 2000, 2001b).

Ranidae (19/30 species):

Amolops larutensis, *Hoplobatrachus rugulosus*, *Hoplobatrachus tigerinus*, *Ingerana tasanae*, *Limnonectes blythii*, *Limnonectes cancrivorus*, *Limnonectes doriae*, *Limnonectes limnocharis*, *Occidozyga lima*, *Phrynoglossus laevis*, *Phrynoglossus martensii*, *Rana alticola*, *Rana chalconota*, *Rana erythraea*, *Rana hosii*, *Rana miopus*, *Rana nicobariensis*, *Rana nigrovittata*, *Taylorana hascheana*.

Rhacophoridae (2/13 species):

Nyctixalus pictus, *Polypedates leucomystax*.

Gymnophiona

Ichthyophiidae (1/4 species):

Ichthyophis aff. *supachaii* (see Grossmann and Tillack, 2001b).

Reptiles

Chelonii

Bataguridae (4/10 species):

Cuora amboinensis kamaroma, *Cyclemys oldhami*, *Heosemys spinosa*, *Siebenrockiella crassicollis*.

Cheloniidae (4/4 species):

Caretta caretta, *Chelonia mydas*, *Eretmochelys imbricata*, *Lepidochelys olivacea*.

Dermochelyidae (1/1 species):

Dermochelys coriacea.

Testudinidae (2/3 species):

Indotestudo elongata, *Manouria emys phayrei*.

Trionychidae (2/4 species):

Amyda cartilaginea, *Dogania subplana*.

Crocodylia

Crocodylidae (1/3 species):

Crocodylus porosus.

Lacertilia

Agamidae (8/20 species):

Acanthosaura crucigera, *Bronchocela cristatella*, *Calotes emma emma*, *Calotes versicolor*, *Draco blanfordii*, *Draco maculatus*, *Draco t. taeniopterus*, *Draco volans sumatranus*.

Gekkonidae (13/24 species):

Cnemaspis siamensis, *Cosymbotus platyurus*, *Cyrtodactylus oldhami*, *Cyrtodactylus penguensis zebraicus*, *Cyrtodactylus pulchellus*, *Dixonius siamensis*, *Gehyra mutilata*, *Gekko gecko*, *Gekko monarchus*, *Gekko smithii*, *Hemidactylus frenatus*, *Hemiphyllodactylus typus*, *Ptychozoon lionotum*.

Lacertidae (1/1 species):

Takydromus sexlineatus ocellatus.

Scincidae (10/18 species):

Dasia olivacea, *Lipinia vittigera*, *Lygosoma quadrupes*, *Mabuya macularia*, *Mabuya multifasciata*, *Riopa bowringi*, *Riopa herberti*, *Sphenomorphus maculatus*, *Sphenomorphus tersus*, *Tropidophorus robinsoni*.

Uromastycidae (1/2 species):

Leiotelepis belliana belliana.

Varanidae (3/4 species):

Varanus bengalensis nebulosus, *Varanus rudicollis*, *Varanus s. salvator*.

Serpentes

Acrochordidae (1/2 species):

Acrochordus granulatus.

Colubridae (37/76 species):

Ahaetulla fasciolata, *Ahaetulla prasina*, *Aplopeltura boa*, *Boiga cyanea*, *Boiga cynodon*, *Boiga dendrophila melanota*, *Boiga drapiezii*, *Boiga jaspidea*, *Boiga nigriceps*, *Cerberus rynchops*, *Chrysopelea ornata ornatissima*, *Chrysopelea paradisi*, *Dendrelaphis caudolineatus*, *Dendrelaphis cyanochloris*, *Dendrelaphis formosus*, *Dendrelaphis pictus*, *Dendrelaphis striatus*, *Dryocalamus subannulatus*, *Elaphe flavolineata*, *Elaphe radiata*, *Elaphe taeniura ridleyi*, *Enhydris plumbea*, *Gonyosoma oxycephalum*, *Homalopsis buccata*, *Lycodon capucinus*, *Lycodon laoensis*, *Lycodon subcinctus*, *Oligodon purpurascens*, *Ptyas carinata*, *Ptyas fusca*, *Ptyas korros*, *Rhabdophis chrysargos*, *Rhabdophis nigrocinctus*, *Rhabdophis s. subminiatus*, *Sibynophis melanocephala*, *Xenochrophis flavipunctatus*, *Xenochrophis trianguligerus*.

Elapidae (9/26 species):

Bungarus candidus, *Bungarus flaviceps*, *Hydrophis ornatus*, *Hydrophis spiralis*, *Laticauda colubrina*, *Maticora intestinalis lineata*, *Naja kaouthia*, *Naja sumatrana*, *Ophiophagus hannah*.

Pythonidae (2/2 species):

Python brongersmai, *Python reticulatus*.

Typhlopidae (3/6 species):

Ramphotyphlops albiceps, *Ramphotyphlops braminus*, *Typhlops muelleri*.

Uropeltidae (1/1 species):

Cylindrophis ruffus.

Viperidae (6/11 species):

Calloselasma rhodostoma, *Trimeresurus borneensis*, *Trimeresurus hageni*, *Trimeresurus popeiorum*, *Trimeresurus purpureomaculatus*, *Tropidolaemus wagleri*.

Xenopeltidae (1/1 species):

Xenopeltis unicolor.

CONCLUSION

The above list of Amphibians and Reptiles is by far the largest one ever recorded for any province in Thailand. Although several of the snake species predicted by Pauwels et al. (2000a) as occurring in Phang-nga Province have now been confirmed (*Dendrelaphis caudolineatus*, *Enhydris plumbea*, *Oligodon purpurascens*, *Maticora intestinalis lineata*, *Naja sumatrana*), many others remain to be found, among them numerous Colubridae and marine Elapidae. The same is also true for toads and frogs, and turtles and lizards. We estimate the total number of Amphibian species occurring in southern Peninsular Thailand to be about 73, and that of Reptile species about 220 (Dibamidae included). This represents for each group about the double of the number of species that we already recorded for Phang-nga Province (i.e., 39 Amphibians and 110 Reptiles).

The actual number of species to be found in Phang-nga Province may be not so high. We nevertheless believe that we certainly still have to find several dozens of species (among them maybe some new to Science), mainly due to the fact that, thanks to the admirable efforts of the RFD, many protected areas exist in the province, subject to various microclimates and hence covering very various biotopes, from coral reefs and mangroves to dense hill rain-forest, where a high diversity of species could find refuge until present times.

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LITERATURE CITED

- Anonymous. 1996. Ao Phang-Nga National Park, Phang-nga Province. Marine National Parks Division, Natural Resources Conservation Office, Royal Forest Department. Interpretation and Recreation Subdivision, Bangkok. (Bilingual Thai-English Tourist leaflet)
- Grossmann, W. and F. Tillack. 2000. Bemerkungen zur Herpetofauna des Khao Lak, Phang Nga, thailändische Halbinsel. Teil I: Einführung; Amphibia; Reptilia: Sauria. *Sauria* 22(4): 23-38.
- . 2001a. Bemerkungen zur Herpetofauna des Khao Lak, Phang Nga, thailändische Halbinsel. Teil II: Reptilia: Serpentes; Testudines; Diskussion. *Sauria* 23(1): 25-40.
- . 2001b. Bemerkungen zur Herpetofauna des Khao Lak, Phang Nga, thailändische Halbinsel. Teil III: Ergebnisse der Jahre 1999 und 2000. *Sauria* 23(3): 21-34.
- Inger, R. F. 1983. Larvae of Southeast Asian species of *Leptobrachium* and *Leptobrachella* (Anura: Pelobatidae). In: A. Rhodin and K. Miyata (eds.), *Advances in Herpetology and Evolutionary Biology*, pp. 13-32. Museum of Comparative Zoology, Cambridge, Massachusetts.
- Lauprasert, K. 1999. Species Diversity, Distribution and Morphological Differences of Monitor Lizards (family Varanidae) in Southern Thailand. Master's Thesis, Department of Biology, Faculty of Science, Chulalongkorn University, Bangkok.
- Lauprasert, K. and K. Thirakhupt. 2001. Species diversity, distribution and proposed status of monitor lizards (Family Varanidae) in southern Thailand. *Nat. Hist. J. Chulalongkorn Univ.* 1(1): 39-46.
- Matsui, M., J. Nabhitabhata and S. Panha. 1999. On *Leptobrachium* from Thailand with a description of a new species (Anura: Pelobatidae). *Jpn. J. of Herpetol.* 18(1): 19-29.
- Mertens, R. 1961. Die Rassen der Schmetterlingssagame, *Leirolepis belliana*. *Senck. biol.* 42(5/6): 507-510.
- Niyomwan, P. 1999. Species Diversity, Morphology and Habitat Types of Blind Snakes (Family Typhlopidae) in Thailand. Master's Thesis, Department of Biology, Faculty of Science, Chulalongkorn University, Bangkok. (in Thai with English summary)
- Pauwels, O. S. G., O.-A. Laohawat, P. David, R. Bour, P. Dangsee, C. Puangjit and C. Chimsunchart. 2000a. Herpetological investigations in Phang-Nga Province, southern Peninsular Thailand, with a list of reptile species and notes on their biology. *Dumerilia*, Paris 4(2): 123-154.
- Pauwels, O. S. G., O.-A. Laohawat, P. David, P. Dangsee, C. Puangjit, C. Chimsunchart and R. Bour. 2000b. Zoogeographical affinities and richness of the Herpetofauna of Phang-Nga Province, southern Peninsular Thailand. Abstracts. Fourth Asiatic Herpetological Conference, p. 137. July 16-20, 2000. Chengdu, China.
- Pauwels, O. S. G., A. Ohler, A. Dubois, J. Nabhitabhata, O.-A. Laohawat and C. Chimsunchart. 1999. *Kaloula baleata* (Müller, 1836) (Anura: Microhylidae), an addition to the batrachofauna of Thailand. *Nat. Hist. Bull. Siam Soc.* 47(2): 261-264.

- Pauwels, O. S. G., V. Wallach, O.-A. Laohawat, C. Chimsunchart, P. David and M. J. Cox. 2000c. Ethnozoology of the «*ngoo-how-pak-pet*» (Serpentes: Typhlopidae) in southern peninsular Thailand. *Hamadryad* 25(1): 29-37.
- Prathumthong, D. 2001. Kwadjapen Uthayanhengchat Moo Ko Ra - Ko Phra Thong. *Advanced Thailand Geographic* 47: 187-213. (in Thai)
- Round, P. D. and U. Treesucon. 1989. A record of the Red-headed Krait, *Bungarus flaviceps*, in Ranong Province, southern Thailand. *Nat. Hist. Bull. Siam Soc.* 37(2): 255.
- Schmidt, A. A. 1978. Erst-Nachzucht des Indischen Ochsenfrosches *Kaloula pulchra* (Amphibia: Salientia: Microhylidae). *Salamandra* 14(2): 49-57.

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