

## **An Inventory of Reptiles and Amphibians on the Koh Man Islands and in the Coastal Prasae Estuaries, Rayong Province, South-eastern Thailand**

**Tanya Chan-ard\* and Sunchai Makchai**

*Natural History Museum, National Science Museum, Thailand,  
Technopolis, Khlong 5, Khlong Luang, Pathum Thani 12120 Thailand*

**ABSTRACT:** An inventory of reptiles and amphibians on the Koh Man Islands and in the coastal Prasae estuaries in Rayong Province, South-eastern Thailand, was compiled by the general survey technique, mainly by captures along nature trails on the three islands: Koh Man Ni, Koh Man Klang and Koh Man Nok, and in the coastal area at the mouth of the Prasae River. 19 species of reptiles and four species of amphibians were collected and identified.

**KEY WORDS:** inventory, reptiles, amphibians, Koh Man Islands.

### **INTRODUCTION**

The diversity of herpetofauna in the insular regions of the inner gulf of Thailand was unknown until the scientific paper of Malcolm Smith and Bolden Kloss was published in 1915. The inventory at that time was done only on the large islands: Koh Chang, Koh Kut, Koh Mehsi, Laem Nguab and Klong Manao, 36 species of reptiles and 8 species of amphibians were reported (Smith and Kloss, 1915). This recent study was done with cooperation between the National History Museum and the Center of the Eastern Coast of the Gulf of Thailand.

### **Study Areas**

The Koh Man Islands are situated about seven kilometres from the coast in the Klaeng District of Rayong Province, South eastern Thailand. This island group is made up of Koh Man Ni, Koh Man

Klang and Koh Man Nok arranged in a straight line from north to south. The group receives sediments from the Prasae River which is 10 km away. Koh Man Ni is the largest island and closest to the shore. It is located by the Sea Turtle Conservation Station under the Fishery Department which has now become a sub-unit of the Marine and Shorelines Development and Research Center of the Eastern Coast of the Gulf of Thailand under the Department of Marine and Shorelines Resources. There is one resort on Koh Man Klang and another on Koh Man Nok. Koh Man Nok is a reservation area, managed by the Royal Thai Navy. The main vegetation on the islands is beach and dry evergreen forest. There are sandy beaches at the mouth of the Prasae River and there are mangroves along the river banks. Part of the area contains a park with the Royal Navy frigate Prasae and the headquarters of the Centre of the Eastern Coast of the Gulf of Thailand.

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\*Corresponding author.  
E-mail: tanya@nsm.or.th

## MATERIALS AND METHODS

The inventory was done by general collecting. Most specimens were caught by hand while actively searching during the day and at night, particularly along nature trails and their vicinities. Cruising collecting was carried out in the mornings, afternoons and in the early evening. In addition, randomly located quadrats were searched by four people. Five quadrats were examined each 5 x 5 m, in the dry evergreen forest in the middle of each island. Collecting in the quadrats was done only during daylight hours.

Selected specimens were preserved in 10% buffered formalin and later transferred to 70% ethanol. Comparative material was examined at the Thailand Natural History Museum (THNHM), Pathum Thani, Thailand.

Measurements were made with dial callipers to the nearest 0.1 mm. All species, whether preserved specimens, observed animals, or animals reported by local people have been included.

The classification follows Taylor (1962, 1963, 1965 & 1970). The taxonomic names used are those updated by Frost *et al.* (2006) and Uetz (2006).

## SYSTEMATIC ACCOUNT

A total of 23 species of herpetofauna were found or collected during the course of this work. Four of the 23 were amphibians, and 19 were reptiles.

### Class Reptilia

#### Order Testudines

##### Cheloniidae

##### *Chelonia mydas* (Linnaeus, 1758)

The Green Turtles in Koh Man Island waters come from Koh Kram where they build nests and lay eggs. Numbers of eggs were collected from that place for breeding purposes.

##### *Eretmochelys imbricata* (Linnaeus, 1766)

The Hawksbill Turtles which are kept on Koh Man Ni were rescued from fishing nets and are kept for some time before release.

##### *Caretta caretta* (Linnaeus, 1758)

There is no nesting site of the Loggerhead Sea Turtle in Thailand but some individuals are found in Koh Man waters. A recent radio-telemetric study of this species found that they came from Australian waters.

#### Dermochelyidae

##### *Dermochelys coriacea* (Linnaeus, 1716)

There is a specimen of the Leatherback Sea Turtle on Koh Man Ni, which was found on the 4 July 1991 in a fishing net. It died three hours after the rescue. Its body weighed 200 kg with a carapace 190 cm in length and 90 cm wide.

#### Geoemydidae

##### *Cuora amboinensis* (Daudin, 1802)

There is a pair of Malayan Box Turtles in a small freshwater pond on Koh Man Ni. They were introduced from the mainland by one of the staff of the research centre.

### Order Squamata

#### Suborder Sauria

##### Gekkonidae

##### *Gehyra mutilata* (Weigmann, 1835)

Koh Man Ni: field no. 11824; SVL 44 mm.; tail 40 mm. (newly regenerated), 17 May 2007. Found along nature trails.

##### *Gekko gecko* (Linnaeus, 1758)

Individuals were found on trees on Koh Man Nok and Koh Man Ni. Eggs were found in hollow trees.

##### *Hemidactylus platyurus* (Schneider, 1792)

Koh Man Ni: THNHM 12387; SVL mm.; tail 41 mm. (regenerated), 19 September 2007. Found on the three islands and in mangroves at the mouth of the Prasae River.

***Hemidactylus frenatus* (Dumeril and Bibron, 1836)**

Koh Man Ni: THNHM 14278-79, 14280; SVL 40-55 mm.; tail 40-51 mm., 18 Feb. 2008. They are abundantly distributed on all three islands and in coastal areas. Usually found on rotten logs along nature trails at night.

**Agamidae*****Calotes versicolor* (Daudin, 1802)**

Only found on coastal areas.

**Leiolepididae*****Leiolepis belliana* (Gray, 1827)**

Koh Man Ni: THNHM 11831, male, SVL 130 mm.; tail 300 mm.; THNHM 11433, male, SVL 150 mm.; tail 320 mm., 21 May 2007.

Eight Butterfly Lizards were introduced from Koh Kram to Koh Man Ni. They established very well in the beach forest and along the edge of the dry evergreen forest and are now abundant.

**Scincidae*****Eutropis multifasciata* (Kuhl, 1820)**

Koh Man Ni: THNHM 11829, female, SVL 110 mm., tail 150 mm., 19 May 2007. They are found on the three islands and in mangroves on the Prasae River banks. They are commonly seen around the houses.

***Lygosoma bowringii* (Günther, 1864)**

Koh Man Ni: THNHM 14269-70, 14274 SVL 55-62 mm., tail (regenerated) 38-65 mm., 18-20 Feb. 2008. This species lives on the three islands, being commonly found on the forest floor which is covered with dry litter and rotten logs.

**Varanidae*****Varanus salvator* (Laurenti, 1768)**

Found on the three islands, they may swim from the mouth of the Prasae River. Water Monitors often hunt juvenile turtles on Koh Man Ni, and peafowl on Koh Man

Nog, so they are killed when the local people find them. Two juveniles of the Water Monitor were found on Koh Man Ni indicating that they may have become establish there.

**Suborder Ophidia****Typhlopidae*****Ramphotyphlops braminus* (Daudin, 1803)**

Koh Man Ni: THNHM 11135, total length 116 mm.; THNHM 14282 total length 155 mm., 21 Feb. 2008. Found in the rotten trunk of a coconut tree which was full of ants and ant eggs.

**Pythonidae*****Broghammerus reticulatus* (Schneider, 1801)**

One snake was found on Koh Man Nok by the staff of the resort.

**Acrochordidae*****Acrochordus granulatus* Schneider, 1799**

Reported by local people to be occasionally found in the river and canals.

**Colubridae*****Chrysopelea ornata* (Shaw, 1802)**

Koh Man Ni: THNHM 11827, SVL 625 mm., tail 212 mm., 17 May 2007. Three snakes were found in Koh Man Ni. One was captured.

***Cerberus rynchops* (Schneider, 1799)**

Found in water long the river and in canals in mangroves in the high tide zone.

**Class Amphibia****Order Anura****Bufonidae*****Duttaphrynus melanostictus* (Schneider, 1799)**

Found once in the vicinity of a house on Koh Man Ni. No tadpoles were found but many tadpoles were located in rainwater pools on the west bank of the Prasae River.

### Microhylidae

#### *Kaloula pulchra* (Gray, 1831)

Koh Man Ni: THNHM 11832, SVL 70 mm., 21 May 2007. Seen around houses on Koh Man Ni. Tadpoles were also found in rainwater pools on the island. Mass breeding of this species was observed on the bank of the Peasae River in June, 2008.

### Dicroglossidae

#### *Fejervarya cancrivora* (Gravenhorst, 1829)

Estuary of the Prasae River: THNHM 14252, 14255, 14256, males, SVL 55-63 mm.; 14254, female, SVL 78 mm., 16 Jun. 2008. Young frogs were found on mud flats at low tide during heavy rain. Adults were found in rainwater pools at night during rain storms.

#### *Fejervarya limnocharis* (Gravenhorst, 1829)

Estuary of the Prasae River: THNHM 14266-67, males, SVL 35-38 mm., 16 Jun. 2008. Found in beach forest: breeding in rainwater pools.

## DISCUSSION

Smith and Kloss (1915) reported on a collection of amphibians and reptiles from the large islands, Koh Chang and Koh kut, including the nearly shorelines on the eastern side of the Inner Gulf of Thailand. The Forestry Research Center (1995) and Polsena (2001) reported species listed from Khao Ang Rue Ni Wildlife Sanctuary, Chachoengsao, Sa Kaeo, Chanthaburi, Rayong and Chon Buri Provinces. Sukprakan and Nabhitabhata (2003), reported similar data from Namtok Plieu National Park, Chanthaburi Province. In addition, Nabhitabhata *et al.* (2003) published a checklist of amphibians and reptiles of Thailand with localities.

All this information details the diversity of these animal groups in the south-eastern mainland region of Thailand.

This inventory of 19 species of reptiles and four species of amphibians indicates that the small area of the Koh Man Islands, and the barrier provided by salt water in the strait between the coast and the islands impacts the diversity of herpetofauna on the islands. Excluding the aquatic animals, the terrestrial lizards are of limited distribution on the islands. Only *Lygosoma bowringi* and *Eutropis multifasciata* are native and were possibly distributed from the mainland during the time that the land-bridge appeared, 250,000-170,000 years ago (Voris, 2000). Some species such as *Cuora amboinensis* and *Leiolepis belliana* were deliberately introduced to the islands and some species, such as *Duttaphrynus melanostictus*, *Kaloula pulchra*, *Gekko gecko*, *Ramphotyphlops braminus* and *Chrysopelea ornata* may have been introduced by accident *Varanus salvator* is thought to swim from the mangroves at the mouth of the Prasae River.

Compared to the large islands: Koh Chang and Koh Kut, where there are suitable habitats for large reptiles: *Varanus nebulosus*, *Physignathus cocincinus*, *Coelognathus radiatus* etc., there are very few species on the smaller islands. The larger islands contain freshwater bodies, streams and waterfalls which provide good habitats, breeding sites and shelter for various small animals. In contrast there are no freshwater bodies on the Koh Man Islands except for a man-made reservoir on Koh Man Ni, so it is not surprising that there is a very low diversity of terrestrial reptiles and amphibians on these small islands.

**Table 1.** Reptile and amphibian species in the study sites compared with that of the larger islands and southeastern mainland.

	The Prasae River banks	Koh Man Ni	Koh Man Klang	Koh Man Nok	Koh Chang and Koh Kut *1	SE Mainland*2
<b>Reptiles</b>						
<b>Trionychidae</b>						
<i>Amyda cartilaginea</i>						X
<b>Geomydidae</b>						
<i>Cuora amboinensis</i>		X				X
<i>Cyclemys atripons</i>					X	X
<i>Hieremys annandalei</i>						X
<i>Malayemys macrocephala</i>						X
<b>Cheloniidae</b>						
<i>Chelonia mydas</i>		X				
<i>Eretmochelys imbricata</i>					X	
<i>Caretta caretta</i>		X				
<b>Dermochelyidae</b>						
<i>Dermochelys coriacea</i>		X				
<b>Testudinidae</b>						
<i>Indotestudo elongata</i>						X
<b>Gekkonidae</b>						
<i>Cnemaspis chanthaburiensis</i>					X	X
<i>Gehyra mutilata</i>		X			X	X
<i>Gekko gecko</i>	X		X		X	X
<i>Hemidactylus frenatus</i>	X	X	X	X	X	X
<i>Hemidactylus platyurus</i>	X	X	X	X	X	X
<b>Agamidae</b>						
<i>Acanthosaura crucigera</i>					X	X
<i>Bronchocela cf. smaragdina</i>						X
<i>Calotes emma</i>					X	X
<i>Calotes versicolor</i>	X				X	X
<i>Draco maculatus</i>					X	X
<i>Draco taeniopterus</i>					X	X
<i>Physignathus cocincinus</i>					X	X
<i>Pseudocalotes floweri</i>						X
<b>Leiopeltidae</b>						
<i>Leiopeltis belliana</i>		X			X	X
<b>Varanidae</b>						
<i>Varanus nebulosus</i>					X	X
<i>Varanus salvator</i>	X	X	X	X		X
<b>Lacertidae</b>						
<i>Takydromus sexlineatus</i>						X

**Table 1.** Continued.

	The Prasae River banks	Koh Man Ni	Koh Man Klang	Koh Man Nok	Koh Chang and Koh Kut *1	SE Mainland*2
<b>Scincidae</b>						
<i>Dasia olivacea</i>						X
<i>Eutropis longicaudata</i>						X
<i>Eutropis macularia</i>					X	X
<i>Eutropis multifasciata</i>	X	X	X		X	X
<i>Lipinia vittigera</i>						X
<i>Lygosoma corpulentum</i>						X
<i>Lygosoma bowringi</i>		X	X	X	X	X
<i>Scincella siamensis</i>						X
<i>Sphenomorphus maculatus</i>						X
<i>Sphenomorphus stellatus</i>						X
<i>Tropidophorus microlepis</i>						X
<b>Typhlopidae</b>						
<i>Ramphotyphlops albiceps</i>						X
<i>Ramphotyphlops braminus</i>		X				X
<i>Ttyphlops diardi</i>						X
<i>Typhlops muelleri</i>						X
<i>Typhlops siamensis</i>						X
<b>Pythonidae</b>						
<i>Python bivittatus</i>						X
<i>Broghammerus reticulatus</i>				X	X	X
<b>Acrochordiade</b>						
<i>Acrochordus granulatus</i>	X				X	X
<b>Colubridae</b>						
<i>Ahaetulla nasuta</i>						X
<i>Ahaetulla prasina</i>					X	X
<i>Boiga cyanea</i>					X	X
<i>Boiga multomaculata</i>						X
<i>Boiga siamensis</i>						X
<i>Boiga cyanea</i>					X	X
<i>Chrysopelea ornata</i>		X			X	X
<i>Coelognathus radiatus</i>					X	X
<i>Dendrelaphis pictus</i>						X
<i>Dendrelaphis ngansaoensis</i>						X
<i>Drylocalamus davisonii</i>						X
<i>Gonyosoma baliodeira cochranæ</i>						X
<i>Gonyosoma oxycephalum</i>						X
<i>Lycodon cadamomensis</i>						X
<i>Lycodon laoensis</i>						X
<i>Oligodon fasciolatus</i>					X	X

**Table 1.** Continued.

	The Prasae River banks	Koh Man Ni	Koh Man Klang	Koh Man Nok	Koh Chang and Koh Kut *1	SE Mainland*2
<i>Oligodon inornatus</i>					x	x
<i>Oligodon taeniatus</i>						x
<i>Ptyas mucosus</i>						x
<i>Ptyas korros</i>						x
<i>Sibynophis collaris</i>					x	x
<i>Cerberus rynchops</i>	x				x	x
<i>Enhydris bocourti</i>						x
<i>Enhydris enhydris</i>						x
<i>Enhydris plumbea</i>						x
<i>Homalopsis buccata</i>						x
<i>Rhabdophis chrysargos</i>					x	x
<i>Rhabdophis nigrocinctus</i>					x	x
<i>Rhabdophis subminiatus</i>					x	x
<i>Xenochrophis flavipunctatus</i>						x
<i>Xenochrophis piscator</i>					x	x
<i>Pareas carinatus</i>						x
<i>Pareas margaritophorus</i>						x
<b>Elapidae</b>						
<i>Calliophis maculiceps</i>					x	x
<i>Bungarus candidus</i>						x
<i>Bungarus fasciatus</i>						x
<i>Naja kaouthia</i>						x
<i>Naja siamensis</i>						x
<i>Ophiophagus hannah</i>						x
<b>Hydrophiidae</b>						
<i>Hydrophis cyanocincta</i>					x	
<i>Lapemis curtus</i>					x	
<i>Enhydrina schistosa</i>					x	
<b>Viperidae</b>						
<i>Calloselasma rhodostoma</i>						x
<i>Cryptelytrops albolabris</i>						x
<i>Cryptelytrops macrops</i>						x
<i>Viridovipera vogeli</i>						x
<b>Amphibians</b>						
<b>Ichthyophiidae</b>						
<i>Ichthyophis kohtaoensis</i>						x
<b>Megophryidae</b>						
<i>Xenophrys lekaguli</i>						x

**Table 1.** Continued.

	The Prasae River banks	Koh Man Ni	Koh Man Klang	Koh Man Nok	Koh Chang and Koh Kut *1	SE Mainland*2
<b>Bufonidae</b>						
<i>Duttaphrynus melanostictus</i>	x	x			x	x
<i>Ingerophrynus macrotis</i>						x
<i>Ingerophrynus parvus</i>						x
<b>Microhylidae</b>						
<i>Calluella guttulata</i>						x
<i>Glyphoglossus molossus</i>						x
<i>Kaloula mediolineata</i>						x
<i>Kaloula pulchra</i>	x	x	x			x
<i>Microhyla annamensis</i>						x
<i>Microhyla berdmorei</i>					x	x
<i>Microhyla butleri</i>						x
<i>Microhyla fissipes</i>						x
<i>Microhyla heymonsi</i>						x
<i>Microhyla pulchra</i>						x
<i>Micryletta inornata</i>						x
<b>Dicroglossidae</b>						
<i>Occidozyga lima</i>						x
<i>Occidozyga martensii</i>					x	x
<i>Quasipaa fasciculispina</i>						x
<i>Fejervarya cancrivora</i>	x					x
<i>Fejervarya limnocharis</i>	x				x	x
<i>Hoplobatrachus rugulosus</i>					x	x
<i>Limnonectes gyldenstolpei</i>						x
<i>Limnonectes kohchangae</i>					x	
<b>Rhacophoridae</b>						
<i>Aquixplus bisacculus</i>						x
<i>Chiromantis doriae</i>						x
<i>Chiromantis hansenae</i>						x
<i>Chiromantis nongkhorensis</i>						x
<i>Philautus parvulus</i>						x
<i>Polypedates leucomystax</i>						x
<i>Rhacophorus cf. bipunctatus</i>						x
<i>Theloderma asperum</i>						x
<i>Theloderma stellatum</i>						x
<b>Ranidae</b>						
<i>Hylarana erythraea</i>					x	x
<i>Hylarana macrodactyla</i>						x
<i>Hylarana faber</i>						x



**Table 1.** Continued.

	The Prasae River banks	Koh Man Ni	Koh Man Klang	Koh Man Nok	Koh Chang and Koh Kut *1	SE Mainland*2
<i>Hylarana milletti</i>						x
<i>Hylarana mortenseni</i>					x	x
<i>Hylarana nigrovittata</i>						x
<i>Pelophylax lateralis</i>						x

\*1 source: Smith and Kloss (1915); \*2 source: Polsena (2001), Nabhitabhata *et al.* (2003), Sukprakan and Nabhitabhata (2003), Forestry Research Center (1995).

เต่าหับ *Cuora amboinensis*จิ้งจกหางแบน *Hemidactylus platyurus*กิ้งก่าไร่ *Calotes versicolor*ตุ๊กแกบ้าน *Gekko gecko*จิ้งจกหินสีจาง *Gehyra mutilata*จิ้งจกหางหนาม *Hemidactylus frenatus*เขี้ย *Leiolepis belliana***Plate I.** Reptiles of Koh Man Islands and Coastal Prasae Estuaries.



เหี้ย *Varanus salvator*



จิ้งเหลนริษาท้องเหลือง *Lygosoma bowringi*



งูดินบ้าน *Ramphotyphlops braminus*



จิ้งเหลนบ้าน *Eutropis multifasciata*



งูปากกว้างน้ำเค็ม *Cerberus rynchops*



งูเขียวดอกหมาก *Chrysopelea ornata*

**Plate II.** Reptiles of Koh Man Islands and Coastal Prasae Estuaries.



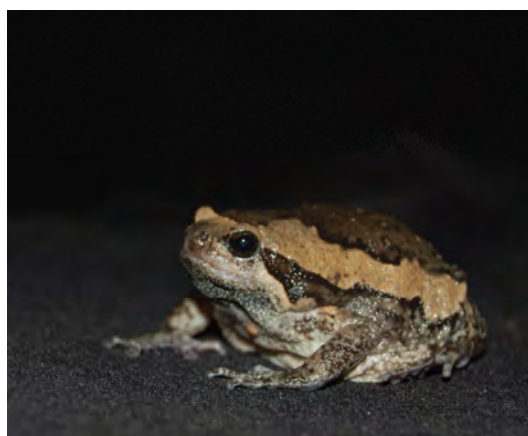
คางคกบ้าน *Duttaphrynus melanostitua*



กบน้ำเค็ม *Fejervarya cancrivora*



กบหนอง *Fejervarya limnocharis*



อีงอ่างบ้าน *Kaloula pulchra*

**Plate III.** Amphibians of Koh Man Islands and Coastal Prasae Estuaries.

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