

REPTILES OF KAENG KRACHAN NATIONAL PARK, WESTERN THAILAND

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ABSTRACT

On the basis of original field observations, the examination of preserved museum specimens and available reliable literature, we here provide a list of the reptile species currently known to inhabit the largest Thai protected area, Kaeng Krachan National Park (Phetchaburi and Prachuap Khiri Khan provinces), western Thailand. The list includes 63 species (5 chelonians, 2 crocodylians, 30 lacertilians and 26 ophidians) distributed in 14 families and 46 genera. The range of several species is extended in the country, either northwards (*Sphenomorphus* cf. *tersus*) or southwards (*Lycodon fasciatus*, *Xenochrophis piscator*, *Sinomicrurus m. maccllellandi*), suggesting that Kaeng Krachan is situated in a zoogeographical transition zone between the Sundaic and Indo-Himalayan reptile faunas. The park is thus currently known to harbour a fifth of the Thai reptile species, but is predicted to host up to a third.

INTRODUCTION

With 2,915 square kilometers, Kaeng Krachan National Park is the largest protected area in Thailand. It is mainly situated in Kaeng Krachan District, Phetchaburi Province, but it also encroaches on Nong Ya Plong and Tha Yang districts of the same province, and in the southern part of the park the Pala-U waterfall site is situated in Hua Hin District, Prachuap Khiri Khan Province. The park was established in 1981 by His Majesty King Bhumipol Adulyadej. In its eastern part, it includes the Kaeng Krachan reservoir, where the Huay Mae Prakon and the Phetchaburi River flow. The southern part of the park is drained by the Pranburi River. Most of the park is covered with mixed deciduous forest, dry dipterocarp forest and evergreen forest. The highest peaks are Khao Phanoen Thung (1,207 m asl) and Khao Sam Yot (871 m asl), both belonging to the Tenasserim Range which crosses north-south over the park.

Detailed descriptions of the park and its fauna have been published (see a.o. ANONYMOUS, 2000), and its high richness in bird and mammal species has been emphasised. In contrast, the park's herpetofauna remained still largely unknown, although at least 30 species have been recorded from the park in the literature since 1987 (see species accounts in the Results). PAUWELS *ET AL.* (2003), based on the general distribution and ecological requirements of Thai reptiles, suggested that the number of species known from Phetchaburi Province would be greatly increased through field research in Kaeng Krachan National Park.

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Recently new field research was made possible through an initiative by the Wildlife Conservation Society and the Department of National Parks, Wildlife and Plants of Thailand to host a regional field herpetology training course in the park (ANONYMOUS, no date), in which we participated as instructors. The trainees, mainly forestry officers, originated from Cambodia, Lao P.D.R., Myanmar and Thailand, and during their training in December 2002, many new observations were gathered. Other new observations were made by TC in July 2004 during a workshop organized by the Department of National Parks, Wildlife and Plants at the Forestry Training Center 4 (Cha-am). These recent observations, combined with our study of the preserved material known in museum collections, give us the opportunity to provide here a synthesis of the current knowledge on the park's herpetofauna.

MATERIALS AND METHODS

New field observations were made during the herpetology training course (13–22 Dec. 2002) and during the workshop at the Forestry Training Center 4 (20–31 July 2004). The preserved museum collections that we studied mainly originated from four localities: Ban Krang Camp (12° 47' 46" N–99° 27' 22" E), Huay Mae Prieng Subdistrict, Kaeng Krachan District, Phetchaburi Province; Kaeng Krachan National Park's headquarters (12° 31' 49" N–99° 29' 56" E), Kaeng Krachan District, Phetchaburi Prov.; Kaeng Krachan Dam (near the headquarters): banks and islands in the reservoir, Kaeng Krachan District, Phetchaburi Prov.; and Pala-U waterfall (ca. 12° 32' 16" N–99° 27' 41" E), Hua Hin District, Prachuap Khiri Khan Prov. Some material that we examined was reported by one of us in NABHITABHATA *ET AL.* (2004) as originating from "Phetchaburi: Kaeng Krachan", without reference to preserved material. This material studied by our team is still considered to be firstly recorded in the present work, in order to better quantify our global contribution to the herpetological knowledge of the park. Only one new record (*Cylindrophis ruffus ruffus*) presented by NABHITABHATA *ET AL.* (2004) concerns a species that we did not encounter during our recent surveys, and is thus not regarded here as a first record.

Main diagnostic scale characters were recorded from every preserved squamate specimen, and compared with the morphological data available in the literature, a.o. COX (1991), HIKIDA *ET AL.* (2001), LANG & BÖHME (1990), MANTHEY & GROSSMANN (1997), POPE (1935), SCHULZ (1996), TAYLOR (1963), and VOGEL *ET AL.* (2004). For the sake of brevity, scale counts will not be presented here, except for the species for which the known range is here extended, or if they differ from the known meristic variation, or concern rare species or taxa of difficult identification. Snake ventral scales were counted according to DOWLING's (1951) method; the terminal pointed scute of the tail is excluded from the number of subcaudals. The numbers of snake dorsal scale rows are given respectively: at one head length behind head, at midbody (above the ventral corresponding to half of the total number of ventrals), and at one head length before vent. Paired meristic counts are given left/right.

For the generic allocation of the skink species formerly included in the genus *Mabuya* Fitzinger, 1826, we follow MAUSFELD *ET AL.* (2002). We adopt the view of BÖHME & ZIEGLER (1997) on the taxonomy of the *Varanus bengalensis* group. For the generic and familial allocation of snake taxa, we follow the most recent species list available for Thailand by DAVID *ET AL.* (2004), except for the species formerly included in the genus

Trimeresurus s.l., for which we follow MALHOTRA & THORPE (2004). According to AULIYA ET AL.'s (2002) subdivision of *Python reticulatus*, we attribute the Kaeng Krachan population to the nominal subspecies. We follow PAUWELS ET AL. (2005) for the use of the binomen *Boiga siamensis*.

Abbreviations: BLS: Bryan L. STUART (FMNH, Chicago); CUMZ: Chulalongkorn University Museum of Zoology, Bangkok; FMNH: Field Museum of Natural History, Chicago; KKNP: Kaeng Krachan National Park; QSMI: Queen Saovabha Memorial Institute, Thai Red Cross Society, Bangkok; RFD: Royal Forest Department, Bangkok; SVL: snout-vent length; THNHM: Thai Natural History Museum, National Science Museum, Pathumthani; YC: Yodchai CHUAYNKERN (National Science Museum, Pathumthani).

RESULTS

CHELONII

Trionychidae

Dogania subplana (Geoffroy Saint-Hilaire, 1809)

TC and YC caught and released two specimens in a stream (Huay Pran) near Ban Krang Camp in July 2004. The skull (THNHM 3250) belonging to a dislocated carcass was found at the same locality. The posterior part of the skull is cut perfectly straight, suggesting it was killed by a human.

Pelochelys cantorii Gray, 1864

The species was mentioned by PAUWELS ET AL. (2003) on the basis of the examination of the carapace of an adult specimen that was killed in the dam and eaten by fishermen about twenty years ago. The current presence of this species in the park requires confirmation, since no recent record is available.

Testudinidae

Manouria emys phayrei (Blyth, 1853)

This species was recorded from Khao Phanoen Thung by PAUWELS ET AL. (2003) on the basis of the examination of the carapace of a specimen (CUMZ(R) 2002.01.14.1) collected and eaten by farmers in the 1980s. The photograph of a large adult taken along the Phetchaburi River in KKNP was presented by KEKULE (2004: 44).

Bataguridae

Cyclemys dentata (Gray, 1831) species group

PAUWELS ET AL. (2003) recorded the species from Khao Phanoen Thung. It was independently mentioned from the park by NABHITABHATA ET AL. (2004). *Cyclemys* is a highly diverse and complex genus, probably including a number of undescribed taxa, and its adequate taxonomical study will require much additional sampling (GUICKING ET AL., 2002). The taxonomic status of the populations of KKNP area was not yet specifically addressed.

***Malayemys macrocephala* (Gray, 1859)**

Several specimens were caught and released near the headquarters in Nov. 2002 by WCS staff during the workshop. This species was previously reported from Phetchaburi Province as *Malayemys subtrijuga* (SCHLEGEL & MÜLLER, 1844) by PAUWELS *ET AL.* (2000a, 2003) and SRINARUMOL (1995), but BROPHY (2004) recently showed that the correct name to apply to Western Thai population is *M. macrocephala*. The KKNP specimen illustrated on Figure 1 shows the typical head color pattern of *M. macrocephala*: wide infraorbital stripes and two nasal stripes.

CROCODYLIA**Crocodylidae*****Crocodylus siamensis* Schneider, 1801**

The species was mentioned from the park by NABHITABHATA & TANTIWITHAYAPHITHAK (1987: 60), KREETIYUTANONT (1993: 136), KEERATIYUTANON (1994: 177), ANONYMOUS (2000: 27, 49, 147) and PLATT *ET AL.* (2002). Photographs of a presumed indigenous *C. siamensis* was also presented by KEKULE (2004: 71, 198). It was taken in 2003 along the Phetchaburi River. From the recent reports, there is no evidence for more than one individual surviving in the park. Assessing the present status of this species in the park should be a priority action. Genetic samples should be taken and compared with *Crocodylus porosus* and *C. porosus* x *C. siamensis* hybrids to determine if the individuals are not escapees from breeding centers.

***Tomistoma schlegelii* (Müller, 1838)?**

There are three literature records of this species from KKNP (ANONYMOUS, 1991: 217; SUWANNAPAK, 1999: 99; ANONYMOUS, 2000: 27, 49). OSGP moreover interviewed many old villagers in Phetchaburi Province, who told that the *takhong* (the Thai common name used to designate *Tomistoma*), which they distinguish well from the *djorake nam tjut* (*Crocodylus siamensis*) by its elongated mouth, was still common a few decades ago in the swamps and slow-moving rivers of several districts. Zoogeographically, the presence of that species in KKNP would not be surprising, but it would be very appropriate to dedicate surveys to the confirmation of its presence, still too poorly documented.

LACERTILIA**Gekkonidae*****Cnemaspis* cf. *kandianus* (Kelaart, 1852)**

THNHM 1345–47, THNHM 1438: Ban Krang (caught on the leaf litter); THNHM 1443–49: Pala-U (caught by day on tree buttresses in evergreen forest). Locally very common. This population with spinose flanks seems morphologically closer to *C. kandianus*. However, this species was not included in the revised list of *Cnemaspis* species in Thailand by DAS & LEONG (2004), who announced that this species is actually composed of several taxa and is currently being reviewed. New species record for Phetchaburi and Prachuap Khiri Khan provinces.

***Cnemaspis siamensis* (Smith, 1925)**

THNHM 1336–37: Pala-U. Found under logs on forest floor. Locally common. PAUWELS *ET AL.* (2003) reported the species from Huay Mae Sa Rieng (or Huay Mae Saliang), west of Ban Krang Camp, on the base of a specimen (CUMZ (R) 2000.294) that was found dead under the bark of a Siamese sal tree (*Shorea obtusa* Wallich ex Blume). The gecko had been unintentionally squashed by a wild elephant.

***Cosymbotus platyurus* (Schneider, 1792)**

Numerous specimens were observed by TC, YC and BLS on buildings at Ban Krang Camp in December 2002 and July 2004.

***Cyrtodactylus brevipalmatus* (Smith, 1923)**

THNHM 3121–23, THNHM 3125: Khao Phanoen Thung Camp. These four specimens were found in the roof of a bungalow and on a nearby tree in forest. The species was already mentioned from the park by ULBER (1993) and NABHITABHATA *ET AL.* (2004).

***Cyrtodactylus cf. oldhami* (Theobald, 1876)**

THNHM 1247–48: along Pala-U waterfall; THNHM 1256–57, THNHM 1283–84: Khao Phanoen Thung. All specimens were caught at night on tree trunks, often near streams. The species was mentioned by ULBER (1993) who showed how unusual the colour pattern of KKNP specimens was. It was mentioned again from the park by MANTHEY & GROSSMANN (1997: 224). The species was cited from Pala-U and from the part of the park situated in Kaeng Krachan District by NABHITABHATA *ET AL.* (2004). The taxonomic status of Phetchaburian populations is currently under study by Aaron M. Bauer and the first author.

***Dixonius siamensis* (Boulenger, 1898)**

THNHM 1282: island in Kaeng Krachan reservoir. Found by day under rotten log. Another specimen was caught and released by OSGP at the Headquarters; it was active at dusk on rocks near the car park.

***Gehyra mutilata* (Wiegmann, 1834)**

Several specimens were observed by TC in July 2004 under bark of dead trees in forest and on buildings at Ban Krang Camp. The species was cited from Pala-U by NABHITABHATA *ET AL.* (2004).

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

The species was mentioned by STANNER *ET AL.* (1998) and OTA *ET AL.* (1999: 665). We observed the species during both surveys; it is abundant in all types of habitats, from human settlements to primary forest.

***Hemidactylus frenatus* Duméril & Bibron, 1836**

PAUWELS *ET AL.* (2003) reported a case of predation on *H. frenatus* by *Chrysopelea ornata ornatissima* at the general headquarters of KKNP. The species was cited from Pala-U by NABHITABHATA *ET AL.* (2004). The species was found on all buildings in the park.

***Hemidactylus garnotii* Duméril & Bibron, 1836**

THNHM 3243: Pala-U. It was found by night under the bridge. It is the sole specimen so far recorded from the park.

***Ptychozoon lionotum* Annandale, 1905**

THNHM 1253–54: Khao Phanoen Thung, Kaeng Krachan D. Both specimens were caught on a bungalow roof at night. Another *Ptychozoon* individual, presumably of the same species, was observed in Dec. 2004 by day under a roof at Ban Krang Camp by B. Kheowyo and T. Chimsunchart (pers. comm. to OSGP). New genus and species record for Phetchaburi Province.

Agamidae***Acanthosaura crucigera* (Boulenger, 1885)**

PAUWELS *ET AL.* (2003) reported the species from Ban Krang Camp. Several specimens were observed at Pala-U and Ban Krang Camp in December 2002 (TC and BLS) and July 2004 (TC and YC). The record of *Acanthosaura lepidogaster* from KKNP by NABHITABHATA *ET AL.* (2004) was based only on an observation, and given the taxonomic complexity of *Acanthosaura* in western Thailand, a voucher specimen is needed to verify identification.

***Bronchocela cristatella* (Kuhl, 1820)**

PAUWELS *ET AL.* (2003) reported a single specimen from near Than Tip (or Thanthip) waterfall, which is still the sole known record from the park.

***Calotes emma emma* Gray, 1845**

Many specimens were caught and observed by TC and YC in July 2004 at Ban Krang. Specimens were found in primary forest, active by day or asleep on trees by night. The species was cited from Pala-U by NABHITABHATA *ET AL.* (2004). New species record for Phetchaburi Province.

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

Several specimens collected and released at Pala-U Camp in December 2002 by TC and BLS. Additional specimens were observed by TC and YC in July 2004 along roadsides near the main KKNP headquarters.

***Draco blanfordii blanfordii* Boulenger, 1885**

A specimen from Pala-U was used in a genetic study by HONDA *ET AL.* (1999: 547). The species was reported as common along Pala-U waterfall by PAUWELS *ET AL.* (2003). The species was cited from Pala-U by NABHITABHATA *ET AL.* (2004).

***Draco taeniopterus* Günther, 1861**

TC observed a male and a female in Ban Krang Camp in July 2004 by day on trees, and collected a specimen (currently housed in the RFD collections, Bangkok) at Pala-U waterfall in 1997. New species record for Phetchaburi Province.

Lacertidae

Takydromus sexlineatus ocellatus Cuvier, 1829

A few individuals were observed by BLS and TC in December 2002 on the grass by day at Pala-U Camp.

Scincidae

Eutropis macularia (Blyth, 1853)

THNHM 1249: Ban Krang. This specimen, caught in the leaf litter, shows 32 midbody scale rows and five keels per dorsal scale (TAYLOR, 1963 & CHUAYNKERN *ET AL.*, 2005 mentioned Thai specimens with 28, 30, 32, or 34 midbody scale rows). It is still the sole specimen recorded from the park. Due to the important differences in scalation and colouration of the various Thai populations which we examined, we strongly encourage a thorough revision of this species. New species record for Phetchaburi Province.

Eutropis multifasciata (Kuhl, 1820)

THNHM 1261–63: Khao Phanoen Thung Camp. Numerous specimens observed at Pala-U (TC and BLS, Dec. 2002) and Ban Krang Camp (TC, YC and BLS, Dec. 2002, July 2004). They were found along the streams active by day and sleeping at night.

Isopachys anguinoides (Boulenger, 1914)

THNHM 1258–60, THNHM 1313–14: Ban Krang; THNHM 1285–87, THNHM 1315–27: Pala-U. All specimens were caught by day in the leaf litter or under rotten logs in forest. All 21 specimens have 24 midbody scale rows (a variation of 21–24 was mentioned by LANG & BÖHME, 1990). Nasal scales are contacting in 4 specimens (widely in 3); nasals were said to be separated by LANG & BÖHME (1990). This species is locally very common.

Lipinia vittigera (Boulenger, 1894)

THNHM 3246–48: Pala-U Camp. These three specimens were active by day around the bungalows. One was caught while it came to eat boiled rice disposed on the ground. A single specimen was reported from the park by PAUWELS *ET AL.* (2003); that specimen was actually observed on a dead tree in forest near Huay Mae Saliang, west of Ban Krang Camp, Kaeng Krachan District.

Lygosoma quadrupes (Linnaeus, 1766)

A single specimen was caught and released by TC, BLS and OSGP at the main KKNP headquarters in Dec. 2002. It was found by day under a rock near a bungalow.

Riopa bowringii (Günther, 1864)

Several specimens were caught and released near the general headquarters in Nov. 2002 by WCS staffs during the workshop.

***Scincella melanosticta* (Boulenger, 1887)**

THNHM 1251: Ban Krang. Found by day along a stream on a rocky substrate, in strict syntopy with *Sphenomorphus maculatus mitanensis* (THNHM 1252). This specimen mostly agrees with the description provided by TAYLOR (1963); it has 68 dorsal scales between the parietals and a point situated above the vent, and 38 midbody scale rows. New species record for Phetchaburi Province.

***Scincella cf. punctatolineata* (Boulenger, 1893)**

THNHM 1265: Huay Sat Yai, Hua Hin Distr.; THNHM 1266–77: Huay Cholnard, Hua Hin Distr. All specimens were caught by day under rotten logs in evergreen forest. The species was locally very abundant. OUBOTER (1986) placed *S. tavesae* (SMITH, 1935), whose type-locality lies in Kanchanaburi Province, in the synonymy of *S. punctatolineata*, on the basis of a comparison of a single specimen of *S. tavesae* with 28 midbody scale rows and a single *S. punctatolineata* with 22. Our material from KKNP comprises 12 specimens whose dorsal scale rows numbers vary from 24 (3 specimens), 26 (5) to 28 (4), plus one specimen with obviously irregular dorsal scales (20 rows, THNHM 1265). In all our specimens but one (THNHM 1266) there is a contact, even sometimes weak, between the frontonasal and frontal scales. A few differences appearing from the comparison table in OUBOTER (1986: 49), especially the ratio SVL/hindlegs length, suggest a necessary re-examination of the available material and a re-evaluation of the status of *S. tavesae*, which might actually be a distinct species. New species record for Prachuap Khiri Khan Province.

***Sphenomorphus maculatus mitanensis* (Annandale, 1905)**

THNHM 1252: Ban Krang. A single specimen was recorded by PAUWELS *ET AL.* (2004) along Pala-U waterfall. The voucher specimen, which has a.o. 40 midbody scale rows, agrees with the diagnosis of this southern subspecies as provided by HIKIDA *ET AL.* (2001). The species is abundant at Ban Krang.

***Sphenomorphus cf. tersus* (Smith, 1916)**

THNHM 1460–62: Ban Krang. These specimens, caught in the leaf litter, agree in most details with the description of the species provided by TAYLOR (1963), except mainly that in all 3 specimens the prefrontals are separated by a scale. These new specimens have 37, 37 and 36 midbody scale rows respectively (TAYLOR, 1963: 1013 mentioned a variation of 34 to 36 rows). New species record for Phetchaburi Province. This Thai-Malay Peninsula endemic species was formerly unknown north of Chumphon Province (NABHITABHATA *ET AL.*, 2004; GROSSMANN & TILLACK, 2000), and our new record considerably extends its known distribution northwards. At a conservation point of view, the listing of this rare forest-dwelling species in KKNP is very important. A study of the morphological variation within this species is however necessary to confirm if the various known populations are conspecific.

Varanidae***Varanus nebulosus* (Gray, 1831)**

PAUWELS *ET AL.* (2003) cited the observation of a specimen near the headquarters at Pala-U waterfall.

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

A specimen was caught and released by TC and BLS at Pala-U Camp in Dec. 2002. Another was photographed by KEKULE (2004: 202) along Phetchaburi River. The species was also observed several times near Pranburi waterfall by C. Chimsuncharat who reported it as much more commonly seen than *V. nebulosus* in the park (pers. comm. to OSGP, Jan. 2005).

SERPENTES**Cylindrophiidae*****Cylindrophis ruffus ruffus* (Laurenti, 1768)**

The species was mentioned from the part of the park situated in Kaeng Krachan District by NABHITABHATA *ET AL.* (2004) but not found in the course of our recent surveys.

Pythonidae***Python brongersmai* Stull, 1938**

TC examined the photograph of a specimen that was encountered at Ban Krang in July 2004. The body and head shapes and lengths and the colour pattern of the specimen correspond to those of *P. brongersmai*. New species record for Phetchaburi Province. This new locality fills an important gap between the Phang-Nga records (PAUWELS *ET AL.*, 2000b, 2002; GROSSMANN & TILLACK, 2001) and the Kanchanaburi record (NABHITABHATA *ET AL.*, 2004). Voucher specimens should be necessary to confirm the identity of this northern population, but a conspecificity with *P. molurus bivittatus* or *P. r. reticulatus* is excluded.

***Python molurus bivittatus* Kuhl, 1820**

The species was reported only once from KKNP, by PAUWELS *ET AL.* (2003). In the park the species hence seems much less common than *P. reticulatus*.

***Python reticulatus reticulatus* (Schneider, 1801)**

The species was mentioned from the park by CHAIYAKHAM (1994: 115). The observation of several specimens along Phetchaburi River was reported by O'SHEA *ET AL.* (2004). A subadult specimen was caught and released by OSGP and BLS at Ban Krang Camp in Dec. 2002. It was found swimming by night in a forest stream. The species is commonly encountered in the park in and along Phetchaburi and Pranburi rivers (C. Chimsuncharat, pers. comm. to OSGP, Dec. 2004).

Colubridae***Ahaetulla prasina prasina* (Boie, 1827)**

SUWANNAPAK (1999: 97) reported that species as common in KKNP. PAUWELS *ET AL.* (2003) mentioned it from the dam area. TC and BLS caught and released a specimen in December 2002 at Pala-U. It was found by day in primary forest.

***Chrysopelea ornata ornatissima* Werner, 1925**

PAUWELS *ET AL.* (2003) reported the species from KKNP general headquarters (see above under *Hemidactylus frenatus*).

***Coelognathus radiatus* (Boie, 1827)**

Several specimens were observed by TC in Dec. 2002 and July 2004 near the main headquarters. The specimens were crossing over the road by day in a cultivated area.

***Dendrelaphis cyanochloris* (Wall, 1921)**

PAUWELS *ET AL.* (2003) reported the species from the road to Pala-U. The specimen from KKNP illustrated by SEESOOK (2000) and identified by him as *Dendrelaphis striatus* (Cohn, 1905) was reidentified by PAUWELS *ET AL.* (2003: 39) as *D. cyanochloris*. The erroneous record of *D. striatus* was nonetheless repeated by NABHITABHATA *ET AL.* (2004) on the basis of the same specimen.

***Enhydris plumbea* (Boie, 1827)**

FMNH 263428: collected in Dec. 2002 on a road near the main KKNP headquarters. It was found active at night while it was raining.

***Gonyosoma oxycephalum* (Boie, 1827)**

TC caught, photographed and released a green specimen at Ban Krang Camp in July 2004.

***Lycodon capucinus* Boie, 1827**

THNHM 1294: Ban Krang. Caught in evergreen forest.

***Lycodon fasciatus* (Anderson, 1879)**

THNHM 1250: Khao Phanoen Thung, Kaeng Krachan D. This adult specimen (see Figure 2), found active at night on the forest floor, has 2 prefrontals + 215 ventrals, a single anal, 78 divided subcaudals, 17–17–15 dorsal scale rows, 8/8 supralabials of which the 3–5 reach the eye, and 2nd and 3rd in contact with the loreal, 1/1 loreal contacting the eye, 1/1 preocular above loreal and separating eye from prefrontal, 2/2 postoculars, 2+2/2+2 temporals, 9/10 infralabials whose the first 4/5 contact the anterior sublinguals. The dorsals are keeled, except those of the 3–4 lowest rows on each side, and show two apical pits. The supracaudals, except those of the lowest row, are slightly keeled. Its ventrals and subcaudals are laterally keeled. The scale row reduction from 17 to 15 by fusion of the rows 3 and 4 occurs at the level of the ventrals 142/144. This specimen agrees with the current concept of the species, and represents a new species record for Phetchaburi Province and an extension southwards, its southernmost known locality being Khao Ang Ru Nai, Chachoengsao Province, in southeastern Thailand (NABHITABHATA *ET AL.*, 2004).

***Lycodon subcinctus subcinctus* Boie, 1827**

THNHM 1245: Ban Krang. Caught at night on the forest floor. New species record for Phetchaburi Province.



Figure 1. Live adult *Malayemys macrocephala* found in a pool near Kaeng Krachan N. P. headquarters. Specimen released. Photograph by John Thorbjarnarson.



Figure 2. Preserved *Lycodon fasciatus* (THNHM 1250) found on Khao Phanoen Thung, Kaeng Krachan N. P. Photograph by O.S.G. Pauwels.



Figure 3. Preserved *Sinomicrurus maclellandi maclellandi* (THNHM 1264) found at Ban Krang, Kaeng Krachan N. P. Photograph by O.S.G. Pauwels.



Figure 4. Live *Popeia fucata* (FMNH 263429) in situ along Huay Cholnard, Kaeng Krachan N. P. Photograph by John Thorbjarnarson.

***Orthriophis taeniurus* ssp.**

A peculiar *Orthriophis taeniurus* specimen from the dam area was mentioned and illustrated by SCHULZ (1996: 264). Unfortunately, no thorough study of the status of this specimen has so far been undertaken (K.-D. Schulz, pers. comm. to OSGP, Nov. 2004). This taxon is sympatric with, but clearly distinct from, *O. taeniurus ridleyi* (Butler, 1899) which was recently reported from Phetchaburi Province (PAUWELS ET AL., 2004, as *Elaphe taeniura ridleyi*). A taxonomic revision of the *O. taeniurus* complex is needed.

***Pareas carinatus* Wagler, 1830**

THNHM 1459: Ban Nong Pun Taek, Kaeng Krachan District. Caught while it was crossing the road at night. PAUWELS ET AL. (2003) mentioned another specimen collected at Km 16 on the road from Hua Hin to Pala-U.

***Pareas margaritophorus* (Jan in Bocourt, 1866)**

THNHM 1243–44: Ban Krang; THNHM 1255: Pala-U (found under a log in bamboo forest). PAUWELS ET AL. (2003) already reported the species from the park.

***Psammodynastes pulverulentus* (Boie in Boie, 1827)**

PAUWELS ET AL. (2003) reported the species from the park, on the base of specimens actually observed at three localities: Huay Mae Saliang, Pong Prom and Ton Nam Pran (C. Chimsunchart, pers. comm. to OSGP). All were found by day under leaves in the leaf litter of forest paths.

***Ptyas korros* (Schlegel, 1837)**

PAUWELS ET AL. (2003) recorded the species from near Ban Pala-U. Their other record from Kaeng Krachan District is more exactly from the road along the dam.

***Rhabdophis nigrocinctus* (Blyth, 1855)**

PAUWELS ET AL. (2003) reported the species from the park, actually based on the observation of two specimens from two localities: Huay Mae Saliang and Thothip waterfall. They were found active by day on the leaf litter, near water (C. Chimsunchart, pers. comm. to OSGP).

***Rhabdophis subminiatus subminiatus* (Schlegel, 1837)**

TC and BLS caught and released a specimen in December 2002 near the main KKNP headquarters. A specimen was also observed in 2004 by C. Chimsunchart at Khao Prakarang (pers. comm. to OSGP).

***Xenochrophis piscator* (Schneider, 1799)**

THNHM 3245: Pala-U stream. New species record for Prachuap Khiri Khan Province. This typically coloured adult male represents the southernmost record in western and peninsular Thailand (see NABHITABHATA ET AL., 2004) for this taxon which was long confused with *Xenochrophis flavipunctatus* (HALLOWELL, 1860). The latter species is the most abundant snake in Phetchaburi Province (PAUWELS ET AL., 2003) and can be easily distinguished from *X. piscator* which lacks transversal black bands on each ventral and shows much less marked dark postocular stripes. The KKNP specimen shows 2 preventrals

+ 129 ventrals (plus an additional half ventral on the left side just before the divided anal), an incomplete tail with 81 subcaudals, and 19–19–17 dorsal scale rows. The scale row reduction from 19 to 17 occurs through a fusion of rows 3 and 4 above the ventrals 77/75.

***Xenochrophis trianguligerus* (Boie, 1827)**

THNHM 3244: Pala-U stream. OSGP observed a second adult specimen in Dec. 2002 near Ban Krang Camp in a shallow forest stream. New species record for Phetchaburi Province.

Elapidae

***Ophiophagus hannah* (Cantor, 1836)**

PAUWELS *ET AL.* (2003) reported the species from near the dam and the main headquarters. TC found a shed skin on the road from the KKNP headquarters to Ban Krang Camp, 5 km before the latter station.

***Sinomicrurus maccllellandi maccllellandi* (Reinhardt, 1844)**

THNHM 1264: Ban Krang. Found by day under a log on the ground in forest. The meristic data (1 preventral + 209 ventrals, divided anal, 26 divided subcaudals, 13 dorsal scale rows throughout body, no loreal, 7/7 supralabials whose 3rd–4th reach the eye, 1/1 preocular, 2/2 postoculars, 1+1/1+1 temporals, 6/6 infralabials whose on each side the 4 first are in contact with the anterior sublinguals, two pairs of sublinguals) and colouration (an uncomplete nuchal collar, 31 complete dorsal rings, 6 complete caudal rings – see Figure 3 -, a few additional black spots on the belly, one under the tail) of this specimen agree with the detailed account provided by POPE (1935). New species record for Phetchaburi Province. This new locality constitutes an extension southwards, the previously southernmost known locality being Khao Ang Ru Nai, Chachoengsao Province, in southeastern Thailand (NABHITABHATA *ET AL.*, 2004).

Viperidae

***Cryptelytrops albolabris* (Gray, 1842)**

QSMI 730: Kaeng Krachan dam area (cited in PAUWELS *ET AL.*, 2003, as *Trimeresurus albolabris*); THNHM 1246: Ban Krang (caught on the road at night).

***Popeia fucata* (Vogel, David & Pauwels, 2004)**

FMNH 263429: Huay Cholnard, Hua Hin Distr., Prachuap Khiri Khan Province. This adult specimen (see Figure 4) shows 2 preventrals + 165 ventrals, a single anal, 71 divided subcaudals and 23–21–15 dorsal scale rows. The species was reported (as *Trimeresurus popeiorum*) from Ban Pala-U by WÜSTER (1992) (see VOGEL *ET AL.*, 2004).

DISCUSSION

Of the 63 species presently inventoried from KKNP, 32 (i.e., 51 %) were listed for the first time in the present work (and/or in NABHITABHATA *ET AL.*, 2004), and not less than 54 species (86%) were firstly recorded since 2000, most by PAUWELS *ET AL.* (2003). The total of sixty-three species recorded from the park represents just less than a fifth of the current estimation of 325 reptile species for Thailand (NABHITABHATA *ET AL.*, 2004). Ten of the species newly recorded from the park did not even figure in the list of reptiles to be still expected from Phetchaburi Province by PAUWELS *ET AL.* (2003), of which six were newly recorded in the present paper (*Hemidactylus garnotii*, *Ptychozoon lionotum*, *Calotes e. emma*, *Draco taeniopterus*, *Python brongersmai* and *Lycodon s. subcinctus*).

Among the 83 taxa recorded from, plus those predicted for, Phetchaburi Province but not yet inventoried from KKNP (PAUWELS *ET AL.*, 2000a, 2003, 2004; PAUWELS & KHEOWYOO, 2004), the following 49 are of highly probable occurrence in the park, given their respective known distributions and ecological requirements (those already recorded from Phetchaburi Province are marked with an asterisk): *Amyda cartilaginea** (Boddaert, 1770) (Trionychidae), *Indotestudo elongata** (Blyth, 1854) (Testudinidae), *Cuora amboinensis kamaroma** Rummmler & Fritz, 1991, *Heosemys annandalei* (Boulenger, 1903) and *H. grandis** (Gray, 1860), *Siebenrockiella crassicollis** (Gray, 1831) (Bataguridae), *Gehyra fehlmanni* (Taylor, 1962), *Hemiphyllodactylus typus* Bleeker, 1860 (Gekkonidae), *Calotes mystaceus** Duméril & Bibron, 1837, *Draco maculatus* Gray, 1845 (Agamidae), *Leiolepis b. belliana** (Gray, 1827) (Uromastycidae), *Dasia olivacea* Gray, 1839, *Eutropis longicaudata* (Hallowell, 1856), *Tropidophorus robinsoni* (Smith, 1919) (Scincidae), *Ramphotyphlops albiceps* (Boulenger, 1898) and *R. braminius** (Daudin, 1803), *Typhlops muelleri* Schlegel, 1839 (Typhlopidae), *Xenopeltis unicolor** Boie, 1827 (Xenopeltidae), *Ahaetulla nasuta** (Lacépède, 1789), *Boiga cyanea* (Duméril, Bibron & Duméril, 1854), *B. multomaculata** (Boie, 1827) and *B. siamensis** Nootpand, 1971, *Calamaria pavimentata* Duméril, Bibron & Duméril, 1854, *Dendrelaphis p. pictus** (Gmelin, 1789), *Dryocalamus davisonii** (Blanford, 1878), *Enhydryis enhydryis** (Schneider, 1799), *Homalopsis buccata** (Linnaeus, 1758), *Gongylosoma scriptum* (Theobald, 1868) (mentioned from “Phetchaburi River” by NABHITABHATA *ET AL.*, 2004 under *Liopeltis scriptus*), *Lycodon laoensis* Günther, 1864, *Oligodon fasciolatus** (Günther, 1864) and *O. mouhoti** (Boulenger, 1914), *Oreophis p. porphyraceus* (Cantor, 1839), *Orthriophis taeniurus ridleyi** (Butler, 1899), *Psammophis indochinensis** Smith, 1943, *Ptyas carinata* (Günther, 1858) and *P. mucosa** (Linnaeus, 1758), *Rhabdophis chrysargos* (Schlegel, 1837), *Sibynophis collaris* (Gray, 1853), *Xenelaphis hexagonotus* (Cantor, 1847), *Xenochrophis flavipunctatus** (Hallowell, 1860) (Colubridae), *Bungarus candidus* (Linnaeus, 1758), *B. fasciatus** (Schneider, 1801) and *B. f. flaviceps* Reinhardt, 1843, *Calliophis maculiceps* (Günther, 1858), *Naja kaouthia** Lesson, 1831 and *N. siamensis** Laurenti, 1768 (Elapidae), *Calloselasma rhodostoma** (Boie in Boie, 1827), *Ovophis monticola convictus* (Stoliczka, 1870) and *Cryptelytrops macrops* (Kramer, 1977) (Viperidae).

About half of those expected species thrive very well in degraded forest and cultivated lands, and are not of conservation concern (although some, like chelonians and *Ophiophagus hannah*, are hunted in the park – see PAUWELS *ET AL.*, 2003); many should be found in a near future in the main headquarters area. Most of the remaining expected species are large and conspicuous and might be found by active search and road cruising. However, four

“unexpected” terrestrial skinks were found during our field surveys, and a future survey using pitfall traps is highly recommended to sample possible additional cryptic species (especially among skinks, typhlopids and small terrestrial colubrids). The discovery of species new to Science is very likely through intensive pitfall trapping and through thorough taxonomic revisions of several groups (for example of the gekkonid genera *Cnemaspis* and *Cyrtodactylus*; see above), using the KKNP preserved material. For instance, the recent taxonomic revision of the pitviper *Popeia popeiorum* complex led, among others, to the description of *P. fucata* (VOGEL ET AL., 2004), a species now known to occur in KKNP.

A release of several terrapin species including the North American Emydid *Trachemys scripta elegans* (Wied, 1839) in Kaeng Krachan Dam was mentioned by THIRAKHUPT & VAN DIJK (1994a: 45, 1994b: 241). There is a real risk that the latter species, probably able to reproduce in Thailand, establishes a population in the dam which would compete with indigenous species. The current presence of four species of global conservation concern requires confirmation through vouchers: *Pelochelys cantorii*, *Crocodylus siamensis*, *Tomistoma schlegelii* and *Python brongersmai*. All the above listed expected species are known both north and south of KKNP, except *Tropidophorus robinsoni* which is sympatric with *Sphenomorphus tersus* in southern Thailand, and which inhabits forest streams in primary forest (PAUWELS ET AL., 2000b) very similar to those found in KKNP. Other widely distributed species (see NABHITABHATA ET AL., 2004) that could occur in KKNP include *Cyrtodactylus peguensis* (Boulenger, 1893) (Gekkonidae), *Varanus dumerilii* (Schlegel, 1839) (Varanidae), *Coelognathus flavolineatus* (Schlegel, 1837) and *Oligodon taeniatus* (Günther, 1861) (Colubridae).

PAUWELS ET AL. (2003) showed that the herpetofauna of Phetchaburi Province has strong Sundaic affinities, with 88% of its reptile species being also found south of the Isthmus of Kra. The additions to KKNP herpetofauna and the range extensions recorded in the present work still reinforce the Sundaic character of the herpetofauna of this area. KKNP represents the northernmost known locality for *Sphenomorphus* cf. *tersus*, *Popeia fucata* and, if its occurrence (past or extant) is confirmed, for *Tomistoma schlegelii*. However, it is also the southwesternmost locality for *Xenochrophis piscator*, and the southernmost locality for *Lycodon fasciatus* and *Sinomicrurus m. maccllellandi*, which are components of the Indo-Himalayan herpetofauna.

CONCLUSION

Although KKNP is now herpetologically one of the best known parks of Thailand, it is obvious that the inventory is still far from complete. Most reptile records from KKNP are situated at only four localities. Although these localities cover most of the biotopes to be found in the park, important sites were not yet surveyed, and might well harbour a number of unrecorded taxa, such as Kradangla waterfall (extreme north), Thanthip and Thohip waterfalls (west), and Wiman cave (southeast). The occurrence and population status of *Pelochelys cantorii*, *Crocodylus siamensis* and *Tomistoma schlegelii* should be verified. The highest peaks of the park certainly deserve dedicated herpetological expeditions, and might reveal a.o. additional northern taxa. Basing on their global distribution and ecological requirements, a total number of 110 reptile species is a very reasonable expectation for the global herpetological diversity of the park.

The further herpetological exploration of the park is of high conservation concern, since, due to its geographical situation, the park lies in an extremely rich confluence zone, and might possibly harbour up to near a third of the total number of reptile species currently known from Thailand. Should the park be already totally inventoried, its herpetofauna would already represent about a fifth of the whole Thai herpetofauna, including notably seven endemic or near-endemic reptiles.

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