

Review of the amphibian and reptile diversity of Phong Nha – Ke Bang National Park and adjacent areas, central Truong Son, Vietnam

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Abstract. We provide an updated review of the herpetofauna of the Phong Nha – Ke Bang National Park including adjacent areas within the Quang Binh province, central Vietnam. Beside confirmation of species and specific allocation of previously undetermined taxa, we herein add 19 species (2 Megophryidae, 1 Dicroglossidae, 2 Ranidae, 2 Rhacophoridae, 2 Geomydidae, 1 Gekkonidae, 1 Lacertidae, 1 Scincidae, and 7 Colubridae) which were not known from the region before. For each of these we provide information about distribution, natural history and characteristic features. Meanwhile, 140 amphibian and reptile species are known from the karst forests of the Phong Nha – Ke Bang National Park, representing more than 30 percent of the herpetofauna currently known for the country.

Introduction

Since 1999 the Zoological Garden Cologne engages in a German-Vietnamese cooperation project concerning nature conservation and biodiversity research in a unique karst forest area in central Vietnam, the Phong Nha Nature Reserve. In the meantime this protected area has been extended to the Phong Nha - Ke Bang National Park, which was recently declared by the UNESCO as world heritage site. This region is part of the central Indochina limestone, which stretches along the Lao-Vietnamese border and is one of the largest ranges of contiguous limestone karst in Indochina and certainly the largest within protected areas (Baltzer et al., 2001). With respect to diversity research, we have focused on

the amphibian and reptile fauna of this wet evergreen and semi-evergreen forest on limestone for nine years. Six years ago, we published a first, preliminary list of the area's herpetodiversity, based on own fieldwork and first Vietnamese reports, comprising 96 amphibian and reptile species (Ziegler & Herrmann, 2000). Some years later, we could bring the total number of amphibian and reptile species known for the area as a result of further field work to 128 (Ziegler et al., 2004), of which approximately 20 % were listed in the Red Data Book of Vietnam. Herein, we present our recent findings and additions to the herpetofauna of the Phong Nha – Ke Bang National Park including adjacent regions in the northwest of the Quang Binh province.

Materials and Methods

Specimens collected by Le Khac Quyet, Vu Ngoc Thanh and Thomas Ziegler are deposited in the following collections: Collection of the Science Research Centre, Phong Nha – Ke Bang National Park, Quang Binh province, Vietnam; Muséum National d'Histoire Naturelle (MNHN), Paris, France; Collection of the Zoological Museum of the Vietnam National University, Hanoi (VNUH), Vietnam; Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Bonn, Germany.

Systematics followed Campden-Main (1970), Zhao & Adler (1993), Ota et al. (1995), David & Vogel (1997), Inger et al. (1999), Chou et al. (2001), Ziegler (2002), Ohler (2003), Bain & Nguyen (2004), Orlov et al. (2004), Rösler et al. (2004), Stuart & Platt (2004), Tillack et al. (2004), Ziegler & Le (2005), Ziegler et al. (2004; 2005), Ohler & Delorme (2006), as well as the online reference "Amphibian species of the world, 3.0" by the American Museum of Natural History (see <http://research.amnh.org/herpetology/amphibia/index.php>) and the most recent overview by Frost et al. (2006). Common English and Vietnamese names generally follow Nguyen et al. (2004). Abbreviations are as follows: SVL: snout-vent length (from snout tip to end of urostyle in amphibians, and from snout tip to cloaca in reptiles); TaL: tail length (from cloaca to tail tip).

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Figure 1. Impressed tortoise (*Manouria impressa*).

Specific allocation of previously undetermined taxa listed for the Phong Nha – Ke Bang National Park

Amphibia
Anura
Microhylidae

Microhyla marmorata Bain & Nguyen, 2004: Marble pigmy frog / Nhai bau hoa cuong
(= *Microhyla* cf. *annamensis* / *Microhyla* sp. n. in Ziegler *et al.*, 2004)

Distribution. Bain & Nguyen (2004) described the species based on specimens from Ha Tinh, Quang Binh, and Quang Nam (see also Nguyen *et al.*, 2005; Orlov, 2005), including one paratype from Phong Nha - Ke Bang.

Natural history notes. The paratype ZFMK 76192, an adult female, was collected in the forest of Phong Nha - Ke Bang in about 800 m altitude above sea level. Six additional female specimens from Phong Nha - Ke Bang have been collected in the dry season (May-June) 2004: ZFMK 82893-82898 (SVL 15.7-21.0 mm, mean 18.3 mm).

Characteristic features. This species is characterized by a marbled belly, two metatarsal tubercles, expanded discs at the tip of the digits with dorsal median longitudinal grooves producing the appearance of two scutes, finger I less than one-half the length of finger II, and extensive webbing on feet: on toe IV web full to distal subarticular tubercle (determination followed Bain & Nguyen, 2004).

Rhacophoridae

Polypedates mutus (Smith, 1940): Burmese whipping frog / Chau chang Myanma

(= *Polypedates* sp. in Ziegler, 2002; 2004; Ziegler & Herrmann, 2000; Ziegler *et al.*, 2004)

Distribution. According to Orlov *et al.* (2001; 2002) the species occurs throughout northern Vietnam, from the Chinese border to Nghe An province of the northern Annam mountains (see also Nguyen *et al.*, 2005). It has also been observed in Ben En National Park (Thanh Hoa Province) in summer 1997 (Ohler, unpublished data) and in the Ke Go area (as *Polypedates* sp. in Ziegler, 2002) in Ha Tinh province. Thus, our records represent not only the first definite records for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the southernmost locality known for the species in Vietnam.

Natural history notes. For detailed information about the ecology of this forest dwelling species including tadpoles, mating calls, morphology, coloration, pattern and body proportions see Ziegler (2002); voucher specimens from Phong Nha - Ke Bang are listed in Ziegler & Herrmann (2000) and Ziegler *et al.* (2004); two additional specimens have been collected in early July 2004 (MNHN 2005.0236-0237).

Characteristic features. *Polypedates mutus* is a member of the *leucomystax* group as it has co-ossified skin on the head (Dubois, 1987). It has a larger body size than *P. leucomystax* and *P. megacephalus* and relatively longer tibia than these species. It shows only one kind of dorsal pattern, a series of longitudinal stripes whereas the two other species show stripes and hourglass patterns. The posterior surface of the thigh is dark brown and exhibits large sized round spots. These spots are of small size forming a reticulum in *P. leucomystax* and *P. megacephalus*. *P. mutus* males have no vocal pouches which does not render them mute: their call is quite distinct from *P. leucomystax*. *P. mutus* can sympatrically occur with *P. leucomystax* and *P. megacephalus* whereas sympatry of the latter two species has not been observed.

Reptilia
Squamata: Sauria
Gekkonidae

Gekko scientiaventura Rösler, Ziegler, Vu, Herrmann & Böhme, 2004

(= *Gekko* sp. / *Gekko* sp. n. in Ziegler *et al.*, 2004; Ziegler, 2004)

Distribution. Known only from its type locality in Phong Nha - Ke Bang (see Rösler *et al.*, 2004; Ziegler *et al.*, 2004; Ziegler, 2004).



Figure 2. Annam spadefoot toad (*Brachytarsophrys intermedia*).

Natural history notes. All records were made at night in primary forest areas directly or in the immediate neighbourhood of the karst limestone outcrops that were partly overgrown with vegetation. The geckos were mostly seen on the vegetation in low height rather than on the bare rocks or on the ground. Eggs have been found from the dry season (June) until the beginning rainy season (September) on mass egg-laying sites or as single eggs or pairs of eggs in karst rock crevices (Rösler et al., 2004; Ziegler, 2004).

Characteristic features. The small-bodied species is the only known Vietnamese *Gekko* without dorsal tubercles. Furthermore, *G. scientiadventura* is characterized by its slender habitus, a distinctly depressed body in combination with considerably enlarged dorsal scales, and a depressed head that is distinctly broader than neck; unregenerated tail always longer than head-body length, slightly depressed, not constricted at its base and not thickened; lateral fold weak; digits and toes slightly webbed at the base, only interspace between toes 4 and 5 not webbed, all digits and toes, except the inner ones, clawed; 14-17 subdigital lamellae below fourth toe; 5-8 preanal pores, nostril touches rostral, no internasals, and posterior ciliaries spiny; dorsum yellowish to brownish in life, seven large light spots dorsally that may be expanded to lateral narrow wavy bands, and tail with 7-10 light crossbands; gular region as well as parts of venter marbled.

Squamata: Serpentes
Viperidae

Trimeresurus truongsoneis Orlov, Ryabov, Bui & Ho, 2004: Truong Son pitviper / Ran luc Truong son (= *Trimeresurus* sp. in Ziegler et al., 2004)

Distribution. Known only from its type locality in



Figure 3. Hansi's narrow mouthed horned toad (*Ophryophryne hansii*).



Figure 4. Johns' frog (*Rana johnsi*).



Figure 5. Annam flying frog (*Rhacophorus annamensis*).



Figure 6. Giant Asian pond turtle (*Heosemys grandis*).

Phong Nha - Ke Bang (see Orlov *et al.*, 2004; Ziegler *et al.*, 2004; Nguyen *et al.*, 2005). We recorded further specimens (photographs only) adjacent to the northern border of the Phong Nha - Ke Bang National Park from Thuong Hoa to Dan Hoa communes.

Natural history notes. We collected one adult female (ZFMK 82914: SVL 488 mm, TaL 94 mm) in the dry season (May-June 2004). The specimen was found at daytime on a branch in primary limestone forest at an altitude of 600 m above sea level. This record represents the first collected female specimen, as the type series consisted of males only. The folded oviducts indicate that reproduction already took place; maximum egg diameter measured 4.4 mm in the partly dissected specimen.

Characteristic features. Slender, small pitviper, with small, triangular head; 11 supralabials, with first supralabial clearly divided from large nasal; 13 infralabials, 167 ventrals, anal scale entire, 61 divided subcaudals, and 21 (dorsally keeled) scales across the midbody; about 72 dark bands on dorsum of neck, body and tail (determination after Malhotra & Thorpe, 2004b; Orlov *et al.*, 2004).

Remarks. Nguyen *et al.* (2005) list *Trimeresurus kanburiensis* (= *Cryptelytrops kanburiensis* sensu Malhotra & Thorpe, 2004a) for Phong Nha - Ke Bang, Quang Binh province. This is most probably due to the paper by Orlov *et al.* (2003) in which *Trimeresurus kanburiensis* (cover, page 237) and *T. cf. kanburiensis* (pp. 219, 224) are listed for Phong Nha - Ke Bang; however, these specimens were described as *T. truongsongensis* by Orlov *et al.* (2004). Thus, *Cryptelytrops kanburiensis*, which can easily be distinguished from *Trimeresurus truongsongensis* e.g. by its lower (19) midbody scale count (Malhotra & Thorpe, 2004b), must be deleted from the herpetofaunal list of Phong Nha - Ke Bang as well as from Vietnam in general. Orlov *et al.* (2004) found it difficult to refer the new taxon to any group proposed by Malhotra & Thorpe (2004a) and therefore described *truongsongensis* still in the genus *Trimeresurus*.

Confirmation of species previously recorded only by Le *et al.* (1997) and Nguyen *et al.* (1997) for the Phong Nha – Ke Bang area

Reptilia
Testudines
Testudinidae

Manouria impressa (Günther, 1882): Impressed tortoise / Rua nui vien

Natural history notes. We found one specimen in montane forest (Fig. 1). It was discovered in April 2004 at noon on the forest floor.

Characteristic features. The species is characterized according to Stuart *et al.* (2001) by its distinct coloration and pattern, in combination with the carapace flattened on top, rounded legs with large scales, and by having solid, elephant-like feet.

Squamata: Serpentes
Typhlopidae

Ramphotyphlops braminus (Daudin, 1803) Common blind snake / Ran giun thuong

Natural history notes. In July 2004, a juvenile specimen was found at night below a stone in the vicinity of a rice field. The specimen was caught but could escape afterwards into a small hole in the dry ground below a shrub.

Characteristic features. Although scalation features could not have been recorded, the specimen was very similar to the species description provided by Ziegler (2002).

New herpetofaunal records for the Phong Nha – Ke Bang National Park

Amphibia
Anura
Megophryidae

Brachytarsophrys intermedia (Smith, 1921): Annam spadefoot toad / Coc mat trung gian

Distribution. The species was known only from the southern Vietnamese provinces Lam Dong, Dac Lac, Gia Lai and Kon Tum (Orlov *et al.*, 2002; Nguyen *et al.*, 2005); Orlov (2005) lists it in general as endemic for the plateaus of the central highland in Vietnam. Thus, our new record represents not only the first record for the

Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the northernmost locality known for *B. intermedia*, more than 300 km air distance from the northernmost border of Kon Tum province.

Natural history notes. A single specimen was discovered on the ground of the primary karst forest in the cold season (early November) 2004.

Characteristic features. Although the specimen was not collected and only photographed (Fig. 2), the genus is morphologically well discernible and the specific allocation of that endemic species for Vietnam seems to be justified by the following features: a single projection on the upper eyelid whereas *B. carinensis* (Boulenger, 1889) has several projections on each eyelid, the anterior back and head of the specimen from Quang Binh is light grey, almost whitish, and the warts which form longitudinal lines on the back are well developed skinny flaps.

Ophryophryne hansii Ohler, 2003: Hansi's narrow mouthed horned toad

Distribution. Known only from the type locality, Buon Luoi in Gia Lai province (Ohler, 2003). According to Orlov (2005) an endemic species of the plateaus of Vietnam's central highlands. Our finding represents the first record for the Phong Nha - Ke Bang National Park, the first record for the Quang Binh province and in general the northernmost species record known.

Natural history notes. We found two specimens: one adult female (ZFMK 83674: SVL 43.5 mm), collected on 14 June 2005 during the dry season at night in primary karst forest. The frog (Fig. 3) sat between some branches on the forest ground near a small pond (ca. 3 m diameter). The second specimen was an adult male (ZFMK 82916: SVL 38.6 mm) that was collected in June 2003 during the dry season in the northwestern border area of the National Park.

Characteristic features. The male is of dark coloration and its dorsal skin is densely covered with tubercles and spines; the female is much lighter in aspect and the tubercles and spines are less developed. The general dorsal pattern as well as the spots on the rear part of the thigh is similar in both specimens and corresponds to the coloration of the type series (Ohler, 2003).

Ranidae

Rana johnsi SMITH, 1921: Johns' frog / Hiu hiu

Distribution. Known from numerous localities in southern, central and northern Vietnam (Nguyen & Ho, 1996; Orlov et al., 2002; Ziegler, 2002). Former records

of *R. sauteri* from Phong Nha - Ke Bang most probably were confused with *R. johnsi* (Ziegler et al., 2004; Nguyen et al., 2005).

Natural history notes. An adult female specimen (ZFMK 82887, SVL 53.0 mm) was found at the beginning of July 2004, throughout dry season. The specimen (Fig. 4) jumped at night in the leaf litter near a small primary karst forest stream. Further three specimens (SVL 22.8-25.3 mm) had been collected at daytime in the dry season (May-June 2004) on the forest ground and were subsequently deposited in the collection of the Science Research Centre of the Phong Nha - Ke Bang National Park.

Characteristic features. This species can easily be recognized among the brown hylaranas by its yellowish to reddish back and its distinct dark brown temporal triangle; on the dorsum, distinct and continuous, narrow dorso-lateral glandular ridges and a v-shaped and anteriorly pointed fold between shoulders is present; finger tips are slightly enlarged but without distinct lateral grooves; hind legs are long, shanks are 5-6 times longer than broad and adpressed hind limbs reach far beyond snout tip (determination followed Bourret, 1942; Inger et al., 1999).

Rhacophoridae

Rhacophorus annamensis Smith, 1924: Annam flying frog / Ech cay Trung bo

Distribution. Known only from the South of Vietnam northwards to Thua Thien - Hue province (Inger et al., 1999; Orlov et al., 2002; Nguyen et al., 2005; Orlov, 2005). Thus, our new record represents not only the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the northernmost locality known for the species.

Natural history notes. Two adult males (SVL 59.2-62.2 mm) were found in the dry season (May-June 2004); ZFMK 82900 and the other specimen being deposited in the collection of the Phong Nha - Ke Bang National Park Science Research Centre (Fig. 5). Both frogs were collected during daytime on the ground of primary limestone forest in elevations of about 400 m above sea level.

Characteristic features. Habitus stocky, snout pointed, nostrils slightly closer to tip of snout than to eye, and tympanum distinct, less than half diameter of eye; discs of fingers rounded, those of outer fingers wider than tympanum; dark webbing, web reaching edge of subarticular tubercle of first finger, to disc of three outer fingers; subarticular tubercle conspicuous, toes webbed

to base of discs, and low inner, but no outer metatarsal tubercle; heel with small, bluntly pointed projection, and infra-anal area with long tubercles; color in life brown dorsally and laterally, with irregular light spots on the back and faint dark crossbars on limbs; lower half of sides white with dark marbling, and venter white with small dark spots on throat and chest (determination according to Inger *et al.*, 1999).

Remarks. This species is one of the brown colored *Rhacophorus* with full webbing on hands as have *R. pardalis* Günther, 1859 and *R. robinsoni* Boulenger, 1903. *R. annamensis* is larger than *R. pardalis*, and *R. annamensis* has dark grey webbing, which is orange in *R. pardalis*. The poorly known *R. robinsoni* can be distinguished from the two species by its shorter snout (Bourret, 1942).

Reptilia
Testudines
Geoemydidae

Heosemys grandis (Gray, 1860): Giant Asian pond turtle / Rua dat lon

Distribution. The species was known from some lowland and hill areas of central and southern Vietnam (Stuart *et al.*, 2001). Our finding represents not only the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the northernmost record known for Vietnam (Nguyen & Ho, 1996; Nguyen *et al.*, 2005).

Natural history notes. A single specimen (carapace length about 26 cm), that was caught by local people, was recorded on 3 July 2004 in the local market (Nguyen, 2005: 30, 34).

Characteristic features. Although the specimen was not collected and only photographed (Fig. 6), determination was possible due to the well discernible characteristic features: carapace with spikes on back edge, and a pale vertebral keel on the midline of carapace; plastron yellow with black lines radiating outward from a black blotch on each scute, and underside of marginals yellow with radiating black lines, head pale orange with faint black spots and streaks; straight seam between femoral and anal scutes, and lack of a plastron hinge (determination followed Stuart *et al.*, 2001).

Ocadia sinensis (Gray, 1834): Chinese striped-neck turtle / Rua co soc

Distribution. The species was known from some provinces in central and northern Vietnam (Nguyen

& Ho, 1996; Ziegler, 2002; Nguyen *et al.*, 2005). Our finding represents the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province.

Natural history notes. A single, subadult specimen (carapace length about 14 cm) was recorded on 3 July 2004 in the local market (see also Nguyen, 2005: 31-32, 34).

Characteristic features. Although the specimen was not collected and only photographed (Fig. 7), determination was possible due to the well discernible characteristic features: top of head black, with many thin black and yellow-green lines on the sides of the head and throat, and legs striped same as head; carapace dark brown to blackish, and plastron pale with dark blotch on each scute (determination followed Stuart *et al.*, 2001).

Squamata: Sauria
Gekkonidae

Gekko palmatus Boulenger, 1907: Palmated gecko / Tac ke chan vit

Distribution. Known only from the northern provinces Lang Son and Vinh Phuc as well as from the offshore island Cu Lao Phon Vong (Ota *et al.*, 1995; Nguyen *et al.*, 2005). Thus, our new record represents not only the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the southernmost locality known for the species.

Natural history notes. The adult female (ZFMK 82888, SVL 60.5, Tal 64.5 mm) was found at night of 3 July 2004 in a karst forest area. The specimen (Fig. 8) climbed on a big stone near a forest path.

Characteristic features. Characteristic are the nostril in contact with rostral, two internasals, smaller than nasorostrals, and tubercles present on dorsum of body, lacking on forelimb and thigh; body scales in 145 rows around midbody, webs well developed, and cloacal spur single; one pair of dark, roundish or somewhat elongated spots in occipital region, smaller but more distinct dark spot in nuchal region, and light broken middorsal stripe evident on body (determination followed Ota *et al.*, 1995).

Remarks. In contrast to Ota *et al.* (1995: their fig. 3), our specimen bears two small supranasals each, that are in addition not distinctly larger than the internasals. Furthermore, the rostral scale is posteriorly notched in the middle.

Scincidae

Tropidophorus noggei Ziegler, Vu & Bui, 2005

Distribution. Known only from its type locality in Phong Nha - Ke Bang (see Ziegler et al., 2005).

Natural history notes. The type series (one adult male, ZFMK 83668; two adult females, ZFMK 83669, VNUH 18.6.'05-1) was found throughout June 2005, at the end of the dry season, in a steep primary karst forest area. The skinks were discovered at night at the base of karst rock outcrops where they sat in front of narrow rock crevices near the forest floor into which they subsequently tried to escape. This depressed-bodied skink species seems to be adapted to karst rock crevices (Ziegler et al., 2005).

Characteristic features. The species is characterized by its distinctly depressed body in combination with considerably enlarged dorsal scales resulting in a very low (22) midbody scale count.

Squamata: Serpentes
Colubridae

Boiga guangxiensis Wen, 1998: Guangxi cat snake /
Ran rao Quang Tay

Distribution. According to Orlov et al. (2003) very common in North Vietnam ("Tonkin and Annam mountains"), but rarer in South Vietnam (see also Orlov, 2005; Nguyen et al.; 2005). Our finding represents the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province.

Natural history notes. We found one specimen, ZFMK 83673: an adult male (SVL 1240, TaL 421 mm), collected on 16 June 2005 during the dry season at night in primary karst forest. The snake (Fig. 9) was discovered when crawling in the branches about 0.3 m above a small stream.

Characteristic features. One loreal, two postoculars, and 2-3 anterior and three posterior temporals; eight supralabials (3-5 in contact with the eye), 11-12 infralabials, and 21 (dorsally smooth) scales across the midbody; 265 ventral scales and 144 divided subcaudal scales; remarkable are the anal plate, that is entire but with a median fold, and 1-2 preoculars (on the left side, two preoculars are present; on the right side the suture between "both scales" is not complete), with uppermost reaching top of head, but not touching frontal (determination followed Orlov et al., 2003; Tillack et al., 2004).

Remarks. Le et al. (1997) listed *Boiga cynodon* for Phong Nha - Ke Bang; as *B. guangxiensis* has often been



Figure 7. Chinese striped-necked turtle (*Ocadia sinensis*).



Figure 8. Palmated gecko (*Gekko palmatus*).



Figure 9. Guangxi cat snake (*Boiga guangxiensis*).



Figure 10. South China green snake (*Cyclophiops major*).

confused with *B. cynodon* or *B. siamensis* (formerly *B. ocellata*, see Pauwels *et al.* 2005) in the older literature and records of true *B. cynodon* from Vietnam are still missing (Orlov *et al.*, 2003; Tillack *et al.*, 2004), *B. cynodon* should be deleted from the National Park's herpetofaunal list.

Cyclophiops major (Günther, 1858): South China green snake / Ran dai lon

Distribution. Known only from some provinces in northern Vietnam (Bourret, 1936b; Nguyen & Ho, 1996; Zhao & Adler, 1993; Nguyen *et al.*, 2005). Thus, our finding represents not only the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province, but also the southernmost record in Vietnam.

Natural history notes. We found one adult specimen (SVL 635, TaL 200 mm), deposited in the collection of the Phong Nha - Ke Bang National Park Science Research Centre: the specimen (Fig. 10) was collected throughout daytime on the ground of primary limestone forest at an altitude of about 400 m above sea level.

Characteristic features. One loreal, eight supralabials (4-5 in contact with the eye), 15 scales across the midbody, 169 ventral scales, anal divided, and 76 divided subcaudal scales (determination followed Bourret, 1936b, who lists the species as *Liopeltis m. major*).

Pareas carinatus Wagler, 1830: Keeled slug snake / Ran ho may go

Distribution. Nguyen & Ho (1996) and Nguyen *et al.* (2005) mention records of *P. carinatus* (listed in Nguyen & Ho, l. c. in the genus *Dipsas*) from northern, central and southern Vietnam. Our findings represent the first record for the Phong Nha - Ke Bang National Park as well as for the Quang Binh province.

Natural history notes. We found two adult male specimens: ZFMK 82890 (SVL 365, TaL 123 mm), collected on 5 July 2004; VNUH 15.6.'05-1 (SVL 457, TaL 144 mm), collected on 15 June 2005. Both specimens were discovered during the dry season at night in primary karst forest near rock outcrops: the snake ZFMK 82890 (Fig. 11) was seen when crawling on the leaf litter and the specimen VNUH 15.6.'05-1 was found in the branches about 1.5 m above a small stream.

Characteristic features. Prefrontals not in contact with the eye, two preoculars, in contact with the single loreal, 1-2 suboculars between supralabials and eye, and 1-2

postoculars; 6-7 supralabials, and 15 (dorsally keeled) scales across the midbody; 176-177 ventral scales, 78-80 divided subcaudal scales, and anal plate entire (determination after Bourret, 1936a; b).

New herpetofaunal records from adjacent areas in Quang Binh province

Amphibia
Anura
Dicroglossidae

Limnionectes poilani (Bourret, 1942)

Distribution. Known only from Dong Tam Ve, Quang Tri province. The discovery of this species from Thuong Hoa commune, Minh Hoa district extends its range about 100 km to the north.

Natural history notes. We collected a male specimen (ZFMK 82904: SVL 37.9 mm) in the dry season (May-June 2004). The specimen (Fig. 12) was found at daytime, on the ground of a limestone valley nearby a stream at an altitude of 450 m above sea level.

Characteristic features. The specimen is a member of the genus *Limnionectes* (*Elachyglossa*) as it has feet with moderate webbing and distinctly enlarged toe tips. As stated by Taylor (1962) specific allocation of females and juveniles of this group of frogs is very difficult. Nevertheless reliable allocation of adult male specimen lead to a discontinuous distribution pattern. Thus geographic origin can be used as a hint for species allocation. The specimen from Thuong Hoa lacks secondary sexual characters (head not strongly enlarged, tooth-like projection on lower jaw absent, no foldings and no dark coloration on throat) so we have to consider it being a subadult. The geographically closest species is *Limnionectes* (*Elachyglossa*) *poilani* (Bourret, 1942) (see Ohler *et al.*, 2002) which was described based on a specimen from Quang Tri province. The specimen ZFMK 82904 shares with the holotype MNHN 1948.0127 the color pattern of the back and the coloration of the tympanum which is dark in its upper part and light in the lower part. Both specimens show warts and spinules on the posterior back and elongated rather than dense glandular warts on the flanks. The web reaches toe IV near the distal subarticular tubercle and continues as a narrow fringe to the toe pad. The holotype of *Rana toumanoffi* Bourret, 1941 has quite a large sized tympanum. The rugosity of the dorsal skin is similar but

the flanks are much smoother and the color pattern of the back is quite uniform. *Limnonectes dabanus* Smith, 1922 has a tympanum of uniform color and the webbing of the feet extends to the distal phalange. The back of adult males is much more spiny in *L. dabanus* than in the specimen from Thuong Hoa.

Remarks. Both geographical pattern and morphology indicate this specimen being *Limnonectes poilani*. Thus new material can be allocated to another of the species discovered by Bourret. Ultimately only study of adult males would allow confirmation of this discovery.

Ranidae

Sylvirana maosonensis (BOURRET, 1937): Mao-son frog / Chang Mau Son

Distribution. Known from northern Vietnam, southwards to Ha Tinh province (Nguyen & Ho, 1996; Orlov et al., 2002; Ziegler, 2002; Nguyen et al., 2005). Thus, our new records from adjacent to Phong Nha - Ke Bang, Thuong Hoa commune, Minh Hoa district represent not only the first record for Quang Binh province, but also the southernmost locality known for *S. maosonensis*.

Natural history notes. We collected eight adult male specimens (SVL 35.1-43.7 mm) between May and June 2004 (Fig. 13): ZFMK 82905-82910 and two specimens deposited in the collection of the Science Research Centre of the Phong Nha – Ke Bang National Park. All specimens were discovered during the dry season at daytime on the ground of a large limestone valley nearby a stream at an altitude of about 450 m above sea level.

Characteristic features. Distinct but interrupted dorso-lateral glandular ridges, and larger glandular fields behind tympanum and above arm insertion; dorsum rough, warty, flanks with wart-like structures; legs dorsally with tubercles, finger and toe tips somewhat broadened, with marginal grooves, and first finger longer than second; external metatarsal tubercle, toes 3/4 webbed, fourth toe webbed somewhat beyond the median subarticular tubercle, and adpressed hind limbs reach snout tip (determination after Bourret, 1942; Inger et al., 1999).

Rhacophoridae

Philautus cf. *jinxuensis* Hu, 1978

Distribution. This species was originally described from Guangxi (China). Ohler et al. (2000) and Orlov et al. (2004) reported on this species from northern Vietnam.



Figure 11. Keeled slug snake (*Pareas carinatus*).



Figure 12. *Limnonectes poilani*.



Figure 13. Mao-son frog (*Sylvirana maosonensis*).



Figure 14. *Philautus* cf. *jinxuensis*.

The single specimen from adjacent to Phong Nha - Ke Bang, Dan Hoa commune, Minh Hoa district, Quang Binh province extends the range far to the south.

Natural history notes. The single specimen, ZFMK 82899, sat at night on a branch near a small stream (Fig. 14). The adult female (SVL 34.6 mm) was collected during the dry season (May-June 2004) in montane forest (750 m above sea level).

Characteristic features. It is a moderate sized *Philautus* with a triangular spot on the head which continues as band from the central shoulder region to the groin. The specimen is rather dark and densely mottled. It shows a slight web between fingers III and IV. The web of the feet is moderately developed. Dorsal skin shows numerous flat tubercles with whitish top. It has no tubercles on the external border of finger IV, toe V, and tarsus.

Remarks. Taxonomic allocation of this single female specimen is very difficult as male sexual characters cannot be used. The dorsal color pattern is present in other members of the genera *Philautus* and *Aquixalus*, but never in *Rhacophorus* (in species like *R. annamensis* the triangle on the head is followed by a more or less complete middorsal band). The species allocated to *Aquixalus* according to Delorme *et al.* (2005, but compare systematics in Frost *et al.* 2006) have rather complete webbing. However, the specific allocation of the present specimen is difficult and lack of data refrain us from describing it as a new species. Due to its general phenotype we allocate it to *Philautus jinxiuensis* but studies on larger samples are needed to confirm this. Furthermore, Orlov & Ho (2005) list their new species *P. truongsongensis* as occurring as well in Phong Nha - Ke Bang National Park. However, as this record by Orlov & Ho (2005) was based on a photograph only (that in addition differed somewhat from the *P. truongsongensis* type series), we refrained from listing this species in Table 1 until reference specimens are available for closer analyses.

Reptilia
Squamata: Sauria
Lacertidae

Takydromus hani Chou, Nguyen & Pauwels, 2001:
Green grass lizard / Liu diu xanh

Distribution. Known only from Ha Tinh, Thua Thien-Hue, Da Nang and Quang Nam provinces in central and southern Vietnam (Chou *et al.*, 2001; Nguyen *et al.*, 2005). Our specimen from adjacent to the border of the Phong Nha - Ke Bang National Park, Dan Hoa

commune, Minh Hoa district represents the first record for the Quang Binh province.

Natural history notes. The adult male (ZFMK 82919, SVL 78, Tal 255 mm) was collected at daytime in June 2003. The specimen (Fig. 15) was found on a large stream bank in about 250 m above sea level. In the original description it was stated that the species occurs in undergrowth by streams in primary subtropical forests; Kizirian (2004) reports the species being primarily a tree-canopy inhabitant with preference for riparian forest.

Characteristic features. Characteristic are the single postnasal scale, four pairs of chin shields, and six longitudinal rows of large dorsale scales between the hind legs, enlarged lateral scales on body absent, eight longitudinal rows of ventral scales, ventrals keeled, and seven femoral pores on each side (determination after Chou *et al.*, 2001).

Squamata: Serpentes
Colubridae

Amphiesma andreae Ziegler & Le, 2006: Andrea's keelback / Ran sai Andrea

Distribution. Known only from a single specimen from adjacent to Phong Nha - Ke Bang, Thuong Hoa commune, Minh Hoa district, Quang Binh province.

Natural history notes. The male specimen (ZFMK 83747, SVL 420, TaL 188 mm) was found during the late afternoon on the forest ground of a large limestone valley nearby a stream at an altitude of 450 m above sea level (Fig. 17).

Characteristic features. The recently described species (Ziegler & Le, 2006), is characterized by its distinct coloration and pattern, in combination with a slender body and tail (tail/total length ratio 0.31), large eyes, a single loreal and preocular, three postoculars, a single anterior and posterior temporal, nine supralabials (4-6 in contact with eye), nine infralabials, 179 ventrals (plus two preventrals according to Dowling, 1951), anal plate divided, 99 divided subcaudals, dorsal scales in 19-19-17 keeled rows, 34 maxillary teeth (the two posteriormost enlarged), and a simple spinose hemipenis, with undivided sperm groove.

Boiga bourreti Tillack, Ziegler & Le, 2004: Bourret's cat snake / Ran rao Bourret

Distribution. Known only from a single specimen from north-west to Phong Nha - Ke Bang, Minh Hoa district, Quang Binh province (see Tillack *et al.*, 2004).

Natural history notes. The adult female (ZFMK 82921: SVL 921, TaL 234 mm) was found in April 2004 in evergreen primary forest 550 m above sea level. The specimen was discovered at night on the forest ground between leaves.

Characteristic features. The species is characterized by its dorsal scales in 21:19:15 bent rows, 236 ventrals, 106 divided subcaudals, and a divided anal scute; 8 supralabials (3-5 in contact with eye), and 11/12 infralabials; one large loreal, 2/3 preoculars, with uppermost reaching top of head, but not touching frontal, two postoculars, and 3/4 anterior temporals with 3/3 posterior ones following; a blackish brownish, light-margined postocular stripe runs past the corner of the mouth towards the wide dark neck band; the body pattern consists of the dark band on the neck, two subsequent V-shaped bands and a chequered pattern of light and dark flecks that extends along the body and only dissolves on the dorsal side of the tail.

Calamaria thanhi Ziegler & Le, 2005: Thanh's reed snake / Ran mai gam Thanh

Distribution. Known only from a single specimen from adjacent to Phong Nha - Ke Bang, Dan Hoa commune, Minh Hoa district, Quang Binh province (see Ziegler & Le, 2005).

Natural history notes. The adult female (ZFMK 82920, SVL 424, TaL 31 mm) was found in June 2003 in a limestone cave of primary forest.

Characteristic features. The species is characterized by the following combination of characters: dark, iridescent body with four yellowish to beige zigzag shaped bands, light dorsal markings on base and tip of tail, and light venter; modified maxillary teeth; large size, tail tapering gradually to a point, reduction to five dorsal scale rows on tail; 198 ventral scales, 21 divided subcaudals, four supralabials (second and third entering orbit), and five infralabials; mental not touching anterior chin shields, and three gular scales in midline between posterior chin shields and first ventral; rostral wider than high, paraparietal surrounded by six shields and scales, and absence of a preocular scale.

Dryocalamus davisonii (Blanford, 1878): Bridle snake / Ran de

Distribution. Known only from southern and central Vietnam northwards up to Quang Tri province (Campden-Main, 1970; Nguyen & Ho, 1996; Nguyen et al., 2005). Thus, our specimen represents not only the first record for Phong Nha - Ke Bang and Quang Binh



Figure 15. Green grass lizard (*Takydromus hani*).



Figure 16. Bridle snake (*Dryocalamus davisonii*).



Figure 17. Andrea's keelback (*Amphiesma andreae*)

province, but also the northernmost record in Vietnam. *Natural history notes.* The subadult specimen (ZFMK 82913, SVL 211, TaL 65 mm) was found adjacent to the border of the Phong Nha - Ke Bang National Park in Ca Tap valley, Thuong Hoa commune, Minh Hoa district, Quang Binh province. The snake (Fig. 16) was discovered at the afternoon of 8 May 2004 in a secondary limestone forest valley in about 350 m above sea level. The specimen was in a hole between the roots of a big tree nearby a large but dry stream bed with dense vegetation and canopy, respectively. *Characteristic features.* Seven supralabials (3-4 in contact with eye), one loreal, lacking preocular, two postoculars, 13 dorsal midbody scale rows, 239 ventrals, 111 divided subcaudals, and anal scute entire (determination after Campden-Main, 1970; Bourret, 1936a; b).

Discussion

As already discussed in Ziegler *et al.* (2004), not all of the 128 amphibian and reptile records listed therein will consist in the future, as there are some doubtful records in the lists by Le *et al.* (1997), Nguyen *et al.* (1997) and Vassiliev (1999), which still have to be proven. One example is “*Naja naja*”, which was mentioned according to the old Asian cobra concept so that it still has to be clarified, which species was implied to occur. Thus, we herein recommend to delete *Naja naja* from the actual species list, as well as *Boiga cynodon*, as was pointed out before. Adding our eleven new herpetofaunal records (2 Megophryidae, 1 Ranidae, 1 Rhacophoridae, 2 Geoemydidae, 1 Gekkonidae, 1 Scincidae, and 3 Colubridae) to the remaining 126 species, we currently know about 137 amphibian and reptile species for Phong Nha – Ke Bang (Fig. 18). Herein, we do not consider

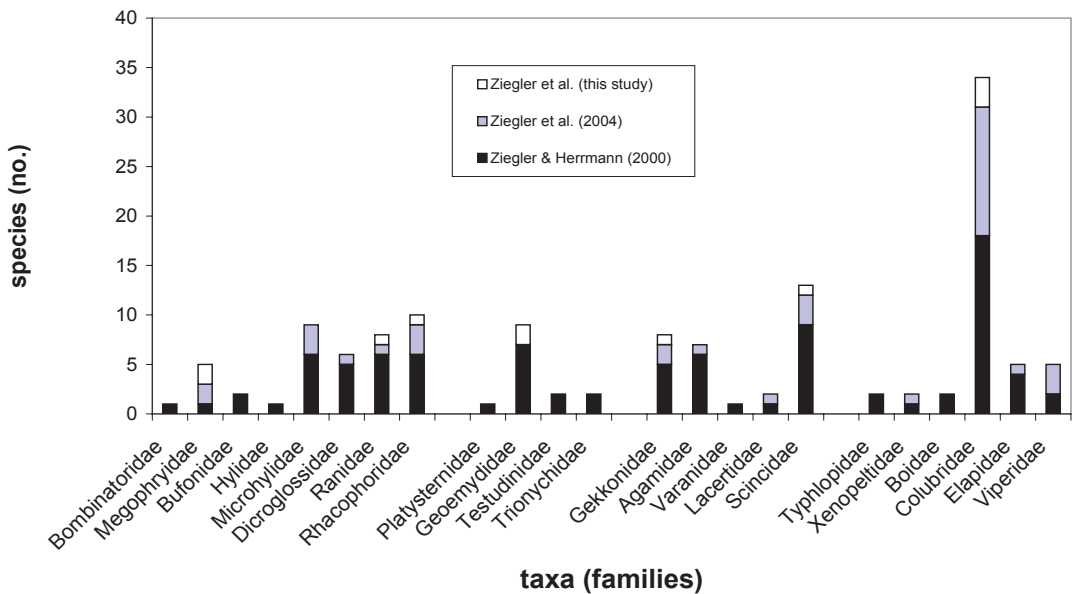


Figure 18. Amphibian and reptile species recorded for Phong Nha - Ke Bang based on the lists by Ziegler & Herrmann (2000) (black bars), Ziegler *et al.* (2004) (grey bars) as well as the findings of our recent surveys (this paper) (white bars).

Because the results (determinations) of several authors are treated together in Ziegler & Herrmann (2000) and Ziegler *et al.* (2004), double- or misidentifications cannot be excluded. The four species (*Occidozyga laevis*, *Rana sauteri*, *Cyrtodactylus pulchellus*, and *Takydromus wolteri*) that were recommended to delete from the herpetofaunal list of the National Park by Ziegler *et al.* (2004) are not included in this diagram, as well as *Boiga cynodon* and *Naja naja*, which we recommend for deletion from the list in this paper.

In this diagram we did not consider the eight species (1 Dicroglossidae, 1 Ranidae, 1 Rhacophoridae, 1 Lacertidae, and 4 Colubridae), which were recorded by us adjacent from the National Park’s border, although it can be expected, that they will be recorded also from inside the National Park in the near future; also the recent scincid records listed by Darevsky & Orlov (2005) are not included in the diagram (see discussion).

the eight species (1 Dicroglossidae, 1 Ranidae, 1 Rhacophoridae, 1 Lacertidae, and 4 Colubridae), which were recorded by us adjacent from the National Park's border, although it can be expected, that they will be recorded also from inside the National Park in the near future. In addition, Darevsky & Orlov (2005) recently listed as further herpetological records for the Phong Nha – Ke Bang National Park the following scincid species: *Eumeces elegans*, *Leptoseps tetradactylus*, “*Scincela cf. rupicolum*” (sic), and *Tropidophorus cf. baviensis*. Because the latter species most probably is conspecific with the recently described *Tropidophorus noggei*, this brings the total number of amphibians and reptiles known for the Phong Nha - Ke Bang National Park to 140 (see Table 1), representing more than 30 percent of the 458 amphibian and reptile species listed in the updated checklist for Vietnam by Nguyen et al. (2005).

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Appendix. List of amphibians and reptiles known for Phong Nha – Ke Bang according to Ziegler *et al.* (2004) and the results of this study (without the eight species being recorded by us adjacent from the National Park's border). Species whose presence was confirmed by the authors are marked with an asterisk, the remaining listed species are based on project reports and lists by Le *et al.* (1997), Nguyen *et al.* (1997), Vassiliev (1999), and Darevsky & Orlov (2005). Species, previously recorded by the latter authors that remain doubtful are marked with a question mark; undetermined records by Vassiliev (1999) were not considered (e.g., *Amolops* sp., *Sphenomorphus* sp.). *Bombina maxima* was replaced by *B. microdeladigitora*, *Megophrys lateralis* by *Xenophrys major*, *Microhyla* cf. *annamensis* / *Microhyla* sp. n. by *M. marmorata*, *Hoplobatrachus rugulosus* by *H. chinensis*, *Polypedates* sp. by *P. mutus*, *Rhacophorus reinwardtii* by *R. kio*, *Gekko* sp. / *Gekko* sp. n. by *G. scientiaventura*, *Tropidophorus* cf. *baviensis* by *T. noggei*, and *Trimeresurus* sp. by *T. truongsonensis*; nomenclature follows Ohler *et al.* (2000), Bain & Nguyen (2004), Malhotra & Thorpe (2004a), Orlov

et al. (2004), Rösler et al. (2004), Stuart & Platt (2004), Ziegler et al. (2004), Darevsky & Orlov (2005), Delorme et al. (2005), Utiger et al. (2005), Vogel & David (2005), Ohler & Delorme (2006), as well as the online reference «Amphibian species of the world, 3.0» by the American Museum of Natural History (see <http://research.amnh.org/herpetology/amphibia/index.php>) and the review by Frost et al. (2006). The most recent record of *Philautus truongsoneis* for Phong Nha - Ke Bang National Park by Orlov & Ho (2005) is not considered here, because it was based on a photograph only and further examinations of *Philautus* from that area are still outstanding (refer to the *P. cf. jinxiuensis* chapter within this paper).

AMPHIBIA

ANURA

Bombinatoridae

Bombina microdeladigitata? Liu, Hu & Yang, 1960

Megophryidae

*Brachytarsophrys intermedia** (Smith, 1921)

*Leptobrachium chapaense** (Bourret, 1937)

*Leptolalax cf. pelodytoides** (Boulenger, 1893)

*Ophryophryne hansi** Ohler, 2003

*Xenophrys major** (Boulenger, 1908)

Bufoinidae

*Duttaphrynus melanostictus** (Schneider, 1799)

*Ingerophrynus galeatus** (Günther, 1864)

Hylidae

*Hyla simplex** Boettger, 1901

Microhylidae

*Kalophrynus interlineatus** (Blyth, 1854)

*Kaloula pulchra** Gray, 1831

*Microhyla berdmorei** (Blyth, 1856)

*M. butleri** Boulenger, 1900

*M. heymonsi** Vogt, 1911

*M. marmorata** Bain & Nguyen, 2004

*M. ornata** (Duméril & Bibron, 1841)

*M. pulchra** (Hallowell, 1861)

*Micryletta inornata** (Boulenger, 1890)

Dicroglossidae

*Fejervarya limnocharis** (Gravenhorst, 1829)

*Hoplobatrachus chinensis** (Osbeck, 1765)

*Limnonectes hascheanus** (Stoliczka, 1870)

*L. kuhlii** (Tschudi, 1838)

Occidozyga lima (Gravenhorst, 1829)

*O. martensii** (Peters, 1867)

Ranidae

Amolops ricketti (Boulenger, 1899)

Huia andersonii (Boulenger, 1882)

*H. chloronota** (Günther, 1876)

*Hylarana guentheri** (Boulenger, 1882)

H. macrodactyla Günther, 1858

H. taipehensis (Van Denburgh, 1909)

*Rana johnsi** Smith, 1921

*Sylvirana nigrovittata** (Blyth, 1856)

Rhacophoridae

*Chiromantis vittatus** (Boulenger, 1887)

*Kurixalus verrucosus** (Boulenger, 1893)

*Polypedates leucomystax** (Gravenhorst, 1829)

*P. mutus** (Smith, 1940)

*Rhacophorus annamensis** Smith, 1924

*R. bipunctatus** Ahl, 1927

*R. demysi** Blandford, 1881

*R. kio** Ohler & Delorme, 2006

*R. orlovi** Ziegler & Köhler, 2001

*Theلودerma asperum** (Boulenger, 1886)

REPTILIA

TESTUDINES

Platysternidae

*Platysternon megacephalum** Gray, 1831

Geoemydidae

*Cuora galbinifrons** Bourret, 1939

*C. mouhotii** (Gray, 1862)

*C. trifasciata** (Bell, 1825)

*Cyclemys tcheponensis** (Bourret, 1939)

*Heosemys grandis** (Gray, 1860)

Malayemys subtrijuga? (Schlegel & Müller, 1844)

*Mauremys mutica** (Cantor, 1842)

*Ocadia sinensis** (Gray, 1834)

*Sacalia quadriocellata** (Siebenrock, 1903)

Testudinidae

Indotestudo elongata (Blyth, 1853)

*Manouria impressa** (Günther, 1882)

Trionychidae

*Palea steindachneri** (Siebenrock, 1906)

*Pelodiscus sinensis** (Wiegmann, 1834)

SQUAMATA: SAURIA

Gekkonidae

*Cyrtodactylus phongnhakebangensis** Ziegler, Rösler, Herrmann & Vu, 2003

*Gehyra mutilata** (Wiegmann, 1834)

*Gekko gecko** (Linnaeus, 1758)
*G. palmatus** Boulenger, 1907
*G. scientiadventura** Rösler, Ziegler, Vu, Herrmann & Böhme, 2004
*Hemidactylus frenatus** Duméril & Bibron, 1836
H. garnotii Duméril & Bibron, 1836
H. karenorum? (Theobald, 1868)

Agamidae

Acanthosaura crucigera? Boulenger, 1885
*A. lepidogaster** (Cuvier, 1829)
*Calotes emma** Gray, 1845
*C. versicolor** (Daudin, 1802)
Draco maculatus (Gray, 1845)
Leiopelis belliana? (Gray, 1827)
*Physignathus cocincinus** Cuvier, 1829

Varanidae

*Varanus salvator** (Laurenti, 1768)

Lacertidae

Takydromus sexlineatus Daudin, 1802
*T. kuehnei** van Denburgh, 1909

Scincidae

Eumeces elegans Boulenger, 1887
E. quadrilineatus (Blyth, 1853)
Eutropis chapaense (Bourret, 1937)
*E. longicaudata** (Hallowell, 1856)
*E. macularia** (Blyth, 1853)
*E. multifasciata** (Kuhl, 1820)
Leptoseps tetradactylus Darevsky & Orlov, 2005
Lygosoma quadrupes (Linnaeus, 1766)
*Scincella melanosticta** (Boulenger, 1887)
*S. reevesii** (Gray, 1838)
S. rupicola (Smith, 1916)
Scincella sp.*
Sphenomorphus buenloicus Darevsky & Nguyen, 1983
*S. indicus** (Gray, 1853)
*Tropidophorus cocincinensis** Duméril & Bibron, 1839
*T. noggeri** Ziegler, Vu & Bui, 2005

SQUAMATA: SERPENTES

Typhlopidae

*Ramphotyphlops braminus** (Daudin, 1803)
Typhlops diardi Schlegel, 1839

Xenopeltidae

*Xenopeltis hainanensis** Hu & Zhao, 1972
*X. unicolor** Boie, 1827

Boidae

*Python molurus** (Linnaeus, 1758)
*P. reticulatus** (Schneider, 1801)

Colubridae

*Ahaetulla prasina** (Boie, 1827)
Amphiesma khasiense (Boulenger, 1890)
Amphiesma sp. n.*
*A. stolatum** (Linnaeus, 1758)
*Boiga guangxiensis** Wen, 1998
*B. multomaculata** (Boie, 1827)
Calamaria pavementata Duméril, Bibron & Duméril, 1854
C. septentrionalis Boulenger, 1890
Chrysopelea ornata (Shaw, 1802)
*Coelognathus radiatus** (Boie, 1827)
*Cyclophiops major** (Günther, 1858)
*C. multicinctus** (Roux, 1907)
*Dendrelaphis ngansonensis** (Bourret, 1935)
D. pictus (Gmelin, 1789)
Dinodon cf. *rufozonatum** (Cantor, 1842)
D. septentrionalis (Günther, 1875)
*Enhydryis plumbea** (Boie, 1827)
*Lycodon fasciatus** (Anderson, 1897)
*L. paucifasciatus** Rendahl, 1943
*Oligodon chinensis** (Günther, 1888)
O. taeniatus (Günther, 1861)
*Oreocryptophis porphyraceus** (Cantor, 1839)
Orthriophis moellendorffi (Boettger, 1886)
*O. taeniurus** Cope, 1861
*Pareas carinatus** Wagler, 1830
*P. margaritophorus** (Jan, 1866)
*Psammodynastes pulverulentus** (Boie, 1827)
*Ptyas korros** (Schlegel, 1837)
*P. mucosus** (Linnaeus, 1758)
*Rhabdophis chrysargos** (Schlegel, 1837)
*R. subminiatus** (Schlegel, 1837)
Sibynophis collaris (Gray, 1853)
*Simonatrix percarinata** (Boulenger, 1899)
*Xenochrophis flavipunctatus** (Hallowell, 1860)

Elapidae

*Bungarus candidus** (Linnaeus, 1758)
*B. fasciatus** (Schneider, 1801)
Naja cf. *atra** Cantor, 1842
*Ophiophagus hannah** (Cantor, 1836)
Sinomicrurus maccllellandi (Reinhardt, 1844)

Viperidae

Cryptelytrops albolabris (Gray, 1842)
*Protobothrops cornutus** (Smith, 1930)
*Triceratolepidophis sieversorum** Ziegler, Herrmann, David, Orlov & Pauwels, 2000
*Trimeresurus truongsonensis** Orlov, Ryabov, Bui & Ho, 2004
*Viridovipera vogeli** (David, Vidal & Pauwels, 2001)