

First contribution to the reptile fauna of Quang Ngai Province, central Vietnam

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ABSTRACT

Based on recent field surveys, we provide a first preliminary list of reptiles from Quang Ngai Province, central Vietnam, comprising 35 recorded species, including 16 species of lizards (Agamidae: 6, Gekkonidae: 2, Lacertidae: 1, Scincidae: 6, Anguinae: 1), 18 species of snakes (Xenodermatidae: 1, Colubridae: 14, Viperidae: 3), and 1 species of turtle (Geoemydidae: 1). The taxonomic status of *Fimbrios* cf. *klossi* from Quang Ngai needs further examination.

KEY WORDS

herpetofauna; taxonomy; distribution; Kon Tum Plateau.

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INTRODUCTION

According to the checklist of Nguyen et al. (2009) 368 species of reptiles are known to occur in Vietnam. In the following year 16 species were added to the country's reptile fauna (see overview in Ziegler & Nguyen, 2010), thus increasing the number of Vietnamese reptile species to 384. Since then new country records and new species descriptions of reptiles were regularly published from Vietnam (e.g., Nguyen et al., 2011a, b; David et al., 2012; Nazarov et al., 2012; Luu et al., 2013), showing that the Vietnamese reptile fauna is still little understood. One of the most poorly studied regions in terms of herpetodiversity is Quang Ngai Province at the south central coast of Vietnam (Fig. 1). Only recently, a first preliminary list of amphibians oc-

curing in this province has been published by Tran et al. (2010) comprising 16 species of anurans. Nguyen et al. (2009) listed only two terrestrial reptile species with definite records from Quang Ngai Province, i.e., the lizard *Leiolepis guentherpetersi*, and the snake *Oligodon ocellatus*. We herein provide a first preliminary reptile inventory for Quang Ngai Province, based on recent field research in particular in the evergreen forest in a transitional area between the Kon Tum Plateau and the lowlands.

MATERIALS AND METHODS

Preliminary field work was conducted by Quyet Khac Le (QKL) and Khoi Le Vu (KLV) in the ever-

green forest in the vicinity of Mo Nit Village, Son Ky Town, Son Ha District, Quang Ngai Province, Vietnam (14°51'N, 108°31'E, elevation 800 m a.s.l.), from 12 to 21 July 2008 (Fig. 2). The survey site is located in a transitional area between the Kon Tum Plateau and the lowlands.

Additional surveys were conducted by Khoi Vu Nguyen, Paul Moler, Randall Babb, Ab Abercrombie, Chris Hope, and Wayne Van Devender (hereafter KVN and others) in Ba To District, during May and June 2011 (camp site 14°39'36.7"N, 108°36'27.0"E, elevation 750 m), in March 2012 (camp site 14°37'10.2"N, 108°35'04.2"E, elevation 920 m), and from May to June 2012 (camp site 14°37'05.9"N, 108°30'10.6"E, elevation 1,025 m). The only specimens which were not collected at the camps in the highlands are *Hemidactylus frenatus* (derive from human environment in lowlands), *Leiolepis guentherpetersi* and *Lygosoma bowringii* (collected at the beach east of Quang Ngai), as well as *Enhydryis subtaeniata* (fished in lowlands). Specimens were photographed in the field. A few individuals were collected by hand for subsequent proper identification. Collected specimens were anaesthetised and euthanized with ethyl acetate, fixed in 80-90% ethanol and subsequently stored in 70% ethanol. Specimens were deposited in the following collections: Institute of Ecology and Biological Resources (IEBR), Hanoi, Vietnam; Zoological Museum, Vietnam National University (VNUH), Hanoi, Vietnam; Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Bonn, Germany.

Taxonomic determination followed Pope (1935), Smith (1935, 1943), Bourret (1936, 2009), Gressitt (1937), Taylor (1963), Musters (1983), Darevsky & Kupriyanova (1993), Murphy & Voris (1994), Manthey & Grossmann (1997), Ziegler & Vogel (1999), David et al. (2001, 2007), Ziegler (2002), Leviton et al. (2003), Orlov et al. (2006), Vogel & David (2006), Ziegler et al. (2006, 2007, 2010), Fritz et al. (2008), Rösler et al. (2008), Green (2010), Grismer & Grismer (2010), Karns et al. (2010), Nguyen et al. (2009, 2010, 2011a, b), and Hartmann et al. (2013). Morphological characters were given based on the recorded specimens, deviations from literature or in between literature records were presented under remarks. Sex was identified by examination of external characters such as hemipenis swellings or through dissection



Figure 1. Map showing the survey site in Quang Ngai Province, central Vietnam.

(inspection of gonads, retracted copulatory organs). Scientific and common names (in English and Vietnamese) as well as distribution records (except otherwise noticed) followed Nguyen et al. (2009) and David et al. (2011).

Measurements were taken with callipers to the nearest 0.1 mm. Dorsal scale row formula is given as dorsal scales around body at one head length behind head : at midbody : one head length before cloaca.

ABBREVIATIONS. HD = head depth at the pari-et al region; HL = head length (from the posterior edge of the corner of jaw to the snout tip); HW = head width at the level of tympanum; O = diameter of the orbit; SnL = snout length (from the anterior edge of the orbital cavity to the snout tip); SVL (snout-vent length) = distance between tip of snout and vent; T = tympanum diameter; TAL = tail length (measured from posterior margin of cloaca to tip of tail; + = tail reduced or regenerated).

RESULTS

SQUAMATA SAURIA AGAMIDAE

Acanthosaura lepidogaster (Cuvier, 1829) Scale-bellied tree lizard; O ro vay

EXAMINED MATERIAL. Specimens examined (n = 2). One adult male collected by QKL and KLV (ZFMK 94265), SVL: 74.1 mm, TAL: 119.6 mm); one adult female coll. by KVN and others (IEBR 3277, SVL: 75.7 mm, TAL: 108.7 mm) (Fig. 3).

MORPHOLOGICAL CHARACTERS. Body laterally compressed; head about 1.5 times longer than wide; snout shorter than orbit; frontal region deeply concave; scales on upper head unequal, obtusely keeled, much smaller in size in posterior region; canthus rostralis and supraciliary edge strongly projecting; a spine present at the end of the supercilium; another one on the nape, mid-way between the tympanum and the nuchal crest, with enlarged scales at the base; ear opening distinct, visible; supralabials 10-12; infralabials 11 or 12; gular sac absent, gular scales strongly keeled, smaller than ventrals; a strong oblique fold present in front of the shoulder, almost extending across the throat; nuchal crest composed of long, narrow, compressed spines, with two rows of shorter ones at the base; dorsal crest not continuous with the nuchal crest, forming a prominent ridge, composed of broad, triangular scales; dorsal scales very small, keeled, intermixed with much larger, strongly keeled ones, upper scales pointing upwards, lateral scales pointing backwards and upwards, sometimes downwards; hind-limbs reaching or almost reaching to snout tip; third and fourth fingers equal or nearly so, fourth toe distinctly longer than third; femoral pores absent; tail feebly compressed, subtriangular at the base, covered with equally keeled scales above, strongly keeled and elongated scales below; ventrals as large as the largest dorsal, strongly keeled (determination after Smith, 1935; Ziegler, 2002; Bourret, 2009).

The colouration of the preserved specimens is olive grey or reddish brown, with light and dark lateral marbling; a large dark diamond-shaped patch on the neck, the rest of the head being light brown; tail alternately barred with light and dark; belly whitish, uniform, or spotted with black; for colouration in life see figure 3.

DISTRIBUTION. Vietnam: from the Chinese border southwards to Lam Dong, Binh Phuoc, and Dong Nai provinces (this is the first record of the species from Quang Ngai Province); elsewhere: South China (Guangdong, Guangxi, Yunnan, Fujian, Hainan Island), southern Myanmar, Laos, Thailand, Cambodia.

REMARKS. There are some discrepancies regarding morphological characters given in the literature. According to Smith (1935) the head is shorter (less than one and a half time its width), whereas Bourret (2009) mentioned the head being $1\frac{3}{4}$ longer than broad. Smith (1935) stated that the dorsal crest forming a prominent ridge, whereas such feature is absent in the description of Bourret (2009). Whether this is due to imprecise descriptions, individual variation or points to cryptic taxa within *A. lepidogaster* (e.g., Wood et al., 2010) must be dealt with in detail elsewhere.

NATURAL HISTORY NOTES. The testicles of the male measured 7.3 x 4.7 mm (left side) and 7.5 x 4.9 mm (right side).

Acanthosaura nataliae Orlov, Nguyen et Nguyen, 2006 Natalia's tree lizard; O ro na-ta-li-a

EXAMINED MATERIAL. Specimens examined (n = 3). One adult female collected by QKL and KLV (ZFMK 94266, SVL: 120.1 mm, TAL: 212.1 mm); one adult male collected by QKL and KLV (ZFMK 94267, SVL: 148.4 mm, TAL: 276.5 mm); one adult male coll. by KVN and others (IEBR 3276, SVL: 120.5 mm, TAL: 234.6 mm) (Figs. 4, 5).

MORPHOLOGICAL CHARACTERS. A large-sized *Acanthosaura*, postorbital spine present; spine on occiput between tympanum and nuchal crest absent; both sexes with well-developed gular pouch; lateral and dorsal surface of body with large keeled scales intermixed with small scales; hindlimbs with heterogeneous imbricate scales intermixed with larger scales; 2 or 3 distinct rows of papillary scales present on the midline of belly (determination after Orlov et al., 2006).

The colouration of the preserved specimens is brownish grey, reddish brown, or bluish; upper head light or dark brown; orbital region blackish brown, a dark stripe extending from behind the eye to the tympanum; labial region lighter; tail with broad, al-

ternating dark and light bands; belly yellowish white; for colouration in life see figures 4, 5.

DISTRIBUTION. Vietnam: Thanh Hoa, Nghe An, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, Kon Tum, and Gia Lai provinces (this is the first record of the species from Quang Ngai Province); elsewhere: southern Laos (Saravane and Xe Kong provinces).

REMARKS. Enlarged scales in the cloacal region as described by Orlov et al. (2006) were not seen in the specimens from Quang Ngai.

NATURAL HISTORY NOTES. A total of 8 small and 10 larger oocytes were found in the female (ZFMK 94266), of which the larger eggs measured 6.5-7.9 mm (left side) and 6.6-8 mm (right side). Testicle sizes in the male (ZFMK 94267) were 14.2 x 9.5 mm (left side) and 16.8 x 8.3 mm (right side).

Calotes mystaceus Duméril et Bibron, 1837
Blue-crested lizard; Nhung xam

EXAMINED MATERIAL. Specimens examined (n = 2). One adult was photographed by RB (Fig. 6); another adult female, collected by KVN and others (IEBR 3278, SVL: 82.7 mm, TAL: 206 mm; see Fig. 7).

MORPHOLOGICAL CHARACTERS. Body compressed; head more than 1.5 times longer than wide (ratio HL/HW=1.8); snout distinctly longer than the orbit (10.9 versus 8 mm); frontal region feebly concave; upper head-scales unequal, smooth or keeled; canthus rostralis and supraciliary edge sharp; postorbital spine absent; two short, separated spines present on each side of the nape, the lower one separated from the tympanum by 4 or 5 scales; a row of 3 or 4 enlarged scales between the eye and the tympanum; tympanum diameter about half of the orbit (ratio T/O=0.4); supralabials 11; infralabials 10 or 11; gular pouch small, gular scales strongly keeled, mucronate, larger than ventrals; an oblique fold present in front of the shoulder, covered with small granular scales; dorsal scales strongly keeled, pointing backwards and upwards, nearly twice as large as ventrals; scales around midbody 54; limbs moderate; third and fourth fingers nearly equal; fourth toe distinctly longer than third toe; hind-limb reaching to the posterior corner of orbit; tail feebly compressed, covered with subequal, keeled scales; ventrals strongly keeled (determination followed Smith, 1935, compared with Hartmann et al., 2013).

The colouration of the preserved specimen is greyish blue on body with six large chocolate-coloured spots along the vertebral line; head brownish, with thin dark lines radiating from the eye; fold in front of the shoulder black; an eponymous whitish stripe on upper lip extends from between nostril and eye to the neck; tail pale blue; dirty whitish below; for colouration in life see figures 6, 7.

DISTRIBUTION. Vietnam: from Son La, Lang Son, and Nghe An provinces in the North southwards to Kien Giang Province (this is the first record of the species from Quang Ngai Province); elsewhere: India, China, Myanmar, Laos, Thailand, and Cambodia.

Draco indochinensis Smith, 1928
Indochinese flying lizard; Than lan bay dong duong

EXAMINED MATERIAL. Specimen examined (n = 1). One adult female collected by QKL and KLV (ZFMK 94268, SVL: 110.7 mm, TAL: 205.5 mm) (Figs. 8, 9).

MORPHOLOGICAL CHARACTERS. Body large; patagial ribs 5; head moderate (HL/SVL 0.21 and HD/HL 0.44); snout length 0.44 times of the head length; snout longer than the diameter of the orbit; nostrils directed almost straight upwards; ear opening distinct; upper head-shields unequal, strongly keeled, compressed and more or less erected over the canthus rostralis; supralabials 10 or 11; two median teeth present on upper jaw; no thornlike scale on the supraciliary edge, but a rounded tubercle; gular appendage 0.76 times of the head length, with enlarged scales; dorsal scales 173, unequal, smooth or faintly keeled, smaller than the ventral scales; ventrals strongly keeled; a series of enlarged scales present on the border between body and patagium, widely separated from each other, strongly keeled; subdigital lamellae under the fourth finger 28 or 29, keeled, under the fourth toe 33-35; hindlimbs 0.5 times of the snout-vent length; fore-limb reaching to beyond the snout, hindlimb nearly reaching to the axilla; fringelike scales present on posterior edge of thigh and on base of tail; tail length 1.86 times the snout-vent length; ventrals 144, keeled, larger than dorsals (determination after Smith, 1935; Musters, 1983; Bourret, 2009).

The colouration of the preserved specimen is greyish or bronze and bluish above, with numerous small black spots; wing-membranes reddish-brown



Figure 2. Primary forest in Quang Ngai Province, photo. Q.K. Le. Figure 3. *Acanthosaura lepidogaster*, adult female, photo R. Babb. Figure 4. *Acanthosaura nataliae*, adult male, photo R. Babb. Figure 5. *Acanthosaura nataliae*, portrait of adult male, photo Q.K. Le. Figure 6. *Calotes mystaceus*, uncollected adult, photo R. Babb.

above, with four distinct, light-bordered, curved transverse black bands which bifurcate as they approach the body; ventral surface of patagium with a black stripe along the outer margin; chin spotted with black; throat blue, with a broad, black, transverse bar extending to the inner sides of the wattles; belly yellowish grey; for colouration in life see figures 8, 9.

DISTRIBUTION. Vietnam: Khanh Hoa, Kon Tum, Lam Dong, Dong Nai, and Tay Ninh provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Cambodia.

REMARKS. The specimen from Quang Ngai differs from the description provided by Musters (1983) in some aspects: 10 or 11 instead of 8-10 supralabials, 28 or 29 instead of 25 or 26 subdigital lamellae under fourth finger, 33-35 instead of 29-32 subdigital lamellae under fourth toe, 144 instead of 123-129 ventrals, and 173 instead of 189-210 dorsals; however, it must be taken into account that the description of *D. blanfordii indochinensis* in Musters (1983) was based on only two specimens.

NATURAL HISTORY NOTES. The female contained one egg on the left side (15.8 mm) and two eggs on the right side (14.8-15.7 mm).

Leiolepis guentherpetersi Darevsky et Kupriyanova, 1993
Peter's butterfly lizard; Nhung cat soc

EXAMINED MATERIAL. Specimen photographed (n = 1): one adult was photographed by RB (Fig. 10).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimen is based on characteristic body shape and colour pattern (determination after Darevsky & Kupriyanova, 1993; Nguyen et al., 2009; Grismer & Grismer, 2010).

DISTRIBUTION. Vietnam: Thua Thien-Hue, Da Nang, Quang Nam, and Quang Ngai provinces; elsewhere: this species is currently known only from central Vietnam.

Physignathus cocincinus Cuvier, 1829
Indochinese water dragon / Rong dat

EXAMINED MATERIAL. Specimens photographed (n = 2): two subadult to adult specimens were photographed by QKL and RB (Fig. 11).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimens is based on character-

istic body shape and colour pattern, such as dorsal scales small; distinctly enlarged scale row present below infralabials; some scattered enlarged scales present behind mandible; transverse skin fold present in posterior gular region; nuchal, dorsal and tail crests well developed; tail laterally compressed; toes without distinct lobes (determination after Ziegler, 2002).

DISTRIBUTION. Vietnam: entire country (however, this is the first documented record of the species from Quang Ngai Province); elsewhere: Southern China, Myanmar, Laos, southeastern Thailand, and Cambodia.

GEKKONIDAE

Cyrtodactylus pseudoquadrivirgatus Rösler, Vu, Nguyen, Ngo et Ziegler, 2008
Pretended four-striped forest gecko; Thach sung ngon gia bon vach

EXAMINED MATERIAL. Specimens examined (n = 3): two adult males (IEBR 3270, SVL: 67.4 mm, TAL: 54.7 mm; IEBR 3272, SVL: 65.4 mm, TAL: 6.5+ mm); one adult female collected by KVN and others (IEBR 3271, SVL: 57.4 mm, TAL: 61.3 mm).

MORPHOLOGICAL CHARACTERS. A medium-sized *Cyrtodactylus*; lateral fold narrow, with enlarged lateral tubercles; interorbital scales 34-45; tubercles present on dorsum of head, body, limbs and tail; dorsal tubercles in 18 to 20 rows; lamellae under first finger 11-13, lamellae under first toe 11-13, lamellae under fourth toe 18-23; ventral scales at midbody in 39-46 longitudinal rows; precloacal pores 7 or 8, in angular series in males, absent in adult female; enlarged precloacal scales 8-11, behind angular pore series; enlarged femoral scales absent; femoral pores and a precloacal groove absent; transversely enlarged subcaudals absent (determination after Rösler et al., 2008).

Colouration of the preserved specimens: dorsal surface brown, mottled in dark brown; neck band medially interrupted; tail with dark and light bands; for colouration in life (uncollected specimens from Quang Ngai Province) see figure 12.

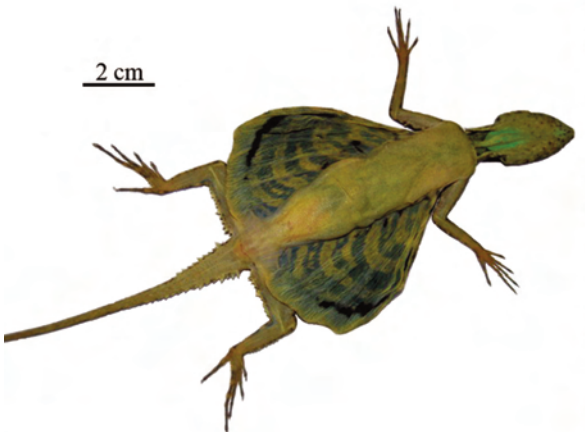
DISTRIBUTION. Vietnam: Quang Tri, Thua Thien-Hue, Da Nang, and Kon Tum (this is the first record of the species from Quang Ngai Province); elsewhere: this species is currently known only from Vietnam.



7



8



9



10



11



12

Figure 7. *Calotes mystaceus*, female, photo R. Babb. Figure 8. *Draco indochinensis*, adult female in dorsal view, photo Q.K. Le. Figure 9. *Draco indochinensis*, adult female in ventral view, photo Q.K. Le. Figure 10. *Leiolepis guentherpetersi*, photo R. Babb. Figure 11. *Physignathus cocincinus*, photo R. Babb. Figure 12. *Cyrtodactylus pseudoquadrivirgatus*, photo Q.K. Le.

Hemidactylus frenatus Schlegel, 1836
Common house gecko; Thach sung duoi san

EXAMINED MATERIAL. Specimens examined (n = 2): two adult males collected by KVN and others (ZFMK 94660, SVL: 49.6 mm, TAL: 56 mm; ZFMK 94661, SVL: 44.8 mm, TAL: 9.1+ mm).

MORPHOLOGICAL CHARACTERS. Head large; snout obtusely pointed, longer than the distance between eye and ear-opening; snout with large scales, posterior part of head covered with small granules; dorsum with small granules intermixed with scattered, rounded tubercles; nostril surrounded by rostral, first labial, and three or four small scales; rostral distinctly broader than high, quadrangular, with median groove; supralabials 11 or 12; infralabials 9; ear-opening oval, oblique, less than half of the eye diameter; mental large, subtriangular; postmentals two pairs, well-developed, outer pair slightly smaller than the inner; gular region with small granular scales; fingers and toes free of webbing; lamellae medially forked, 4 or 5 (some missing) under the first toe, 10 under the fourth toe; hind-limb not reaching to the axilla; tail feebly depressed, oval in section, verticillate, dorsal surface covered with small scales and series of six enlarged pointed tubercles; ventrolateral skin fold absent; belly with smooth, rounded, imbricate scales; ventrals in 35 and 37 rows; males with 28-32 precloacal-femoral pores, in continuous series; postcloacal tubercles 2; ventral tail with a median series of transversely enlarged scales (determination after Smith, 1935; Manthey & Grossmann, 1997; Ziegler, 2002; Bourret, 2009).

The colouration of the preserved specimens is greyish-brown above, with indistinct darker markings; a bright line along the side of the head; yellowish white below.

DISTRIBUTION. Vietnam: entire country; elsewhere: worldwide in tropical and subtropical regions.

REMARKS. The examined specimens differ from the description by Manthey & Grossmann (1997) in the number of ventral scales (35-37 versus 28-36).

LACERTIDAE

Takydromus sexlineatus Daudin, 1802
Asian grass lizard; Liu diu chi

EXAMINED MATERIAL. Specimen examined (n =

1): one adult male collected by KVN and others (ZFMK 94659, SVL: 63.5 mm, TAL: 253.7 mm).

MORPHOLOGICAL CHARACTERS. Head narrow and elongate, pointed anteriorly; nasals just touching each other behind the rostral; fronto-nasal single, as long as wide; prefrontals in contact with each other; supraoculars 3, in contact with the supraciliaries, the first two the largest, anterior in contact with posterior loreal; supraciliaries 3; interparietal about half the size of fronto-parietals, larger than the occipital; anterior loreal smaller than the posterior; temporal scales strongly keeled, upper ones bordered with parietal, enlarged; fifth supralabial in contact with subocular; chin shields 3 pairs, the first pair in contact, third pair largest in size; collar indistinct; gular scales 23, in a line between chin shield and collar, scales on the anterior half of the gular region more elongate and considerably smaller than those on the posterior half; dorsal plates truncate and shortly mucronate behind, in 6 rows across the nape, in 4 across the back; lateral scales small, more or less granular, bordered above and below by larger ones, 10 in a vertical series between the dorsal and ventral plates; tail very long; caudal scales as large as dorsal plates, strongly keeled and mucronate; ventral scales strongly keeled and mucronate, in 12 longitudinal series; scales between collar and groin 29; a single femoral pore present on each side; precloacal scale single (determination after Smith, 1935; Manthey & Grossmann, 1997; Bourret, 2009).

The colouration of the preserved specimen is brown to bluish-brown above, with metallic gloss; a light, dorso-lateral stripe starting from above the eye and extending on to the base of the tail, edged above with black spots, below with a black line; flanks with a series of white black-edged ocelli; brown colour terminated half way down the flank and bordered by a thin black stripe, starting from the nostril to above the ear; upper head and tail brown; venter and upper lip yellowish and bluish-white.

DISTRIBUTION. Vietnam: from the Chinese border southwards to Dong Nai, Tay Ninh and Binh Duong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: India, southern China, Taiwan, Myanmar, Laos, Thailand, Cambodia, Malaysia, and Indonesia.

REMARKS. The specimen matches the description of Smith (1935) except for only one pair of temporal scales bordering the parietal being larger than the

others; also only the first pair of chin shields is in contact in the examined specimen instead of the first two pairs, as was mentioned by Smith (1935).

SCINCIDAE

Eutropis longicaudatus (Hallowell, 1856)
Long-tailed mabuya; Than lan bong duoi dai

EXAMINED MATERIAL. Specimen photographed (n = 1): one individual was photographed by RB (Fig. 13).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimen is based on characteristic body shape and colour pattern, such as dorsal scales with two weakly developed longitudinal keels; well developed limbs with five fingers and toes each overlapping when laterally adpressed to the body; ear opening immersed, visible; supranasals present, touching each other; postnasal present on each side (determination after Ziegler, 2002).

DISTRIBUTION. Vietnam: entire country; elsewhere: Southern China, Taiwan, Laos, Thailand, Cambodia, and Malaysia.

Eutropis multifasciatus (Kuhl, 1820)
Many-lined sun skink; Than lan bong hoa

EXAMINED MATERIAL. Specimen examined (n = 1): one juvenile specimen collected by KVN and others (ZFMK 94662, SVL: 39.5 mm, TAL: 33.1+ mm).

MORPHOLOGICAL CHARACTERS. Supranasals just touching each other; fronto-nasal broader than long; postnasal 1; anterior loreal as large as posterior loreal; supraoculars 4, large; parietals divided by a large interparietal; lower eyelid scaly, without disc; supralabials 7, the fifth below the eye; infralabials 7; temporal scales smooth or feebly keeled; ear-opening visible, moderately large, subcircular, sunken, with small, pointed lobules anteriorly; nuchals in 1 pair; dorsal scales with 3, more or less strongly keeled, lateral scales feebly keeled; scales around the midbody 30; vertebrals between parietals and tail base 45; digits moderately long, with smooth lamellae, 19 beneath the fourth toe; limbs well developed, hind-limb reaching to elbow when adpresses along body; preloacals not enlarged (de-

termination after Smith, 1935; Manthey & Grossmann, 1997; Ziegler, 2002; Bourret, 2009).

The colouration of the preserved specimen is uniform olive-brown above; upper parts of flanks dark brown with white spots; light dorso-lateral stripe present.

DISTRIBUTION. Vietnam: entire country; elsewhere: India, China, Taiwan, Myanmar, Laos, Thailand, Cambodia, Malaysia, Indonesia, Philippines, and New Guinea.

Lygosoma bowringii (Guenther, 1864)

Bowring's supple skink; Than lan chan ngan bao-ring

EXAMINED MATERIAL. Specimen photographed (n = 1): one individual was photographed by RB (Fig. 14).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimen is based on characteristic body shape and colour pattern, such as ground colouration being brown above; each dorsal scale generally with a darker spot forming more or less continuous longitudinal lines; dark brown or black dorsolateral stripe of variable thickness, edged in light above; sides of neck and body usually thickly spotted with black and white; white longitudinal stripe across supralabials until ear opening; yellow below; sides of neck, body and tail often red in life; fifth supralabial longest, below the eye; ear opening subcircular, about half as large as the eye, with one very small projecting lobule anteriorly (determination after Smith, 1935; Manthey & Grossmann, 1997).

DISTRIBUTION. Vietnam: from Hai Duong Province in the North to Kien Giang Province in the South (this is the first record of the species from Quang Ngai Province); elsewhere: India, China, Myanmar, Laos, Thailand, Cambodia, Malaysia, and Philippines.

Scincella melanosticta (Boulenger, 1887)

Black-spotted smooth skink; Than lan co dom den

EXAMINED MATERIAL. Specimens examined (n = 2): one adult female collected by QKL and KLV (ZFMK 94391, SVL: 51.3 mm); one adult male collected by KVN and others (IEBR 3274, SVL 37.4 mm, Fig. 15).

MORPHOLOGICAL CHARACTERS. Size small, tail regenerated in both specimens; prefrontals in contact

with each other; supraoculars 4; nuchals absent; supralabials 7; infralabials 6; primary temporals 2; secondary temporals 2, lower one overlapped by upper one; external ear opening present, without lobes on anterior margin; tympanum deeply sunken; midbody scales in 34 rows; dorsal scales smooth, in 8 rows across the dorsum; paravertebral scales 67, not widened; subdigital lamellae under fourth toe 14-15 (determination after Smith, 1935; Taylor, 1963).

The colouration of the preserved specimens is bronze brown on back and dorsal tail base with a row of large black spots; a dark stripe running from snout to anterior corner of eye and from posterior corner of eye to shoulder; upper lateral zone with large black spots from axilla to tail base; chin with some dark dots, throat and belly cream.

DISTRIBUTION. Vietnam: Quang Binh, Lam Dong, and Ba Ria-Vung Tau provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Myanmar, Laos, Thailand, and Cambodia.

REMARKS. Specimens from Quang Ngai also resemble *S. rupicola*, however, they were assigned to *S. melanosticta* by having a higher number of midbody scale rows (34 vs. 30) and vertebral row of dark spots unpaired anteriorly (see Taylor, 1963).

Sphenomorphus indicus (Gray, 1853)

Indian forest skink; Than lan phe-no an do

EXAMINED MATERIAL. Specimens examined (n = 3): one adult male collected by KVN and others (ZFMK 94663, SVL: 65.4 mm, TAL: 125.1 mm, Fig. 16); one adult female collected by QKL & KLV (ZFMK 94269, SVL: 75.6 mm, TAL: 56 + mm); one subadult collected by QKL & KLV (ZFMK 94393, SVL: 43.4 mm).

MORPHOLOGICAL CHARACTERS. Size large; nostril in a big nasal; supranasals absent; prefrontals separated from each other; supraoculars 4; loreals 2; supraciliaries 8 or 9; lower eyelid scaly; primary temporals 2; supralabials 7 or 8; external ear present, with 2 or 3 small lobules on anterior margin; tympanum deeply sunken; nuchals absent; midbody scales smooth, in 30-34 rows; paravertebral scales 69, not widened; limbs pentadactyl; lamellae under fourth toe 16-19 (determination after Smith, 1935; Taylor, 1963; Ziegler, 2002; Nguyen et al., 2011b).

The colouration of the preserved specimens is bronze-brown above with irregular black dots; light

dorsolateral stripe present on neck and shoulder; upper lateral zone with a dark stripe from behind eye to tail base; lower lateral zone with light bars; ventral surface cream; for colouration in life see figure 16.

DISTRIBUTION. Vietnam: from Lao Cai, Cao Bang, and Bac Kan provinces in the North southwards to Dong Nai Province (this is the first record of the species from Quang Ngai Province); elsewhere: India, Bhutan, China, Taiwan, Myanmar, Laos, Thailand, Cambodia, Malaysia, and Indonesia.

NATURAL HISTORY NOTES. The adult female contained 17 oocytes, 0.5-1.8 mm in size.

Tropidophorus cocincinensis Duméril et Bibrón, 1839

Cochinchinese water skink; Than lan tai nam bo

EXAMINED MATERIAL. Specimens examined (n = 3): three adult specimens collected by QKL and TNV (ZFMK 94270, SVL: 87.5 mm, TAL: 81.6+ mm; ZFMK 94271, SVL: 76.3 mm, TAL: 73.3+ mm; ZFMK 94272, SVL: 73.4 mm, TAL: 114 mm), see figure 17.

MORPHOLOGICAL CHARACTERS. Upper headshields strongly striated; frontonasal undivided; prefrontals in broad contact, touching each other or with a small azygous shield in between loreals 2 (posterior loreal fused with frontonasal on right side in one specimen), separated from supralabials by a series of small scales; superciliaries 7, superciliary row not completed along the entire length of lateral edge of supraoculars; supralabials 7 (8 in one specimen), fifth largest, below the eye; infralabials 6-8; postmental undivided; nuchals in 3 or 4 pairs; dorsals strongly keeled; paravertebral scales 41-44; midbody scales in 30 or 32 rows; ventrals in 46 or 47 transverse rows; enlarged precloacal shields 2; scale rows at position of tenth subcaudal on tail 14 or 15; dorsal keels on the tail forming strong ridges; two series of moderately elevated spines along middle of tail dorsum, continuous with those on back; subdigital lamellae under fourth toe 18-20 (determination after Nguyen et al., 2010).

The colouration of the preserved specimens is reddish-brown above with indistinct black spots or transverse markings on back; large white spots starting behind the head, extending over the flanks, paler on the tail, arranged in 1 or 2 longitudinal rows; belly brownish-white.



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Figure 13. *Eutropis longicaudata*, photo R. Babb. Figure 14. *Lygosoma bowringii*, photo R. Babb. Figure 15. *Scincella melanosticta*, photo R. Babb. Figure 16. *Sphenomorphus indicus*, photo R. Babb. Figure 17. *Tropidophorus cocincinensis*, photo Q.K. Le. Figure 18. *Dopasia gracilis*, photo Q.K. Le.

DISTRIBUTION. Vietnam: Quang Binh, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, and Kon Tum provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Laos, Cambodia, and Thailand (see also Nguyen et al., 2010).

REMARKS. One specimen from Quang Ngai shows 8 instead of 7 supralabials. Compared with the diagnosis of *T. cocincinensis* in Nguyen et al. (2010), the Quang Ngai specimens have 3 to 4 pairs of nuchals (versus 1-3), and the number of scale rows at position of tenth subcaudal on tail is 14 or 15 (versus 13 or 14).

NATURAL HISTORY NOTES. The females (ZFMK 94270-94271) contained about 10-20 follicles of up to 2.1 cm in size on the left side and about 13-20 follicles of up to 2.6 cm in size on the right side, respectively.

ANGUIDAE

Dopasia gracilis Gray, 1845
Asian glass lizard; Than lan ran

EXAMINED MATERIAL. Specimens examined (n = 2): one subadult male collected by QKL and KLV (VNUH 2008.7.10, SVL: 105.0 mm, TAL: 212.0 mm) (Fig. 18).

MORPHOLOGICAL CHARACTERS. Body cylindrical, without limbs; ear opening 2 times greater than nostril; nasal separated from frontonasal by 3 scales; supraoculars 5; supraciliaries 6; supralabials 10, first and second bordering nostril; infralabials 9; dorsal scales strongly keeled; longitudinal scale rows between lateral folds 18; number of scales along lateral fold 81–87; ventral scales in 10 longitudinal rows; vertebrae from atlas to remnants of hind limb bones 47 (determination after Nguyen et al., 2011a).

The colouration of the preserved specimen is brown or grey brown dorsally with longitudinal series of small brown spots on anterior part of back; two dark stripes present on each side of body: dorsolateral stripe from one head-length behind ear opening to tail tip, progressively broader posteriorly; ventrolateral stripe narrower but more distinct than dorsolateral stripe, from angle of jaw to vent, changing to a series of small spots on tail; for colouration in life see figure 18.

DISTRIBUTION. Vietnam: Cao Bang, Ha Giang, Yen Bai, Quang Binh, and Quang Ngai provinces (see Nguyen et al., 2011a); elsewhere: India, China, Myanmar, Laos, and Thailand.

SQUAMATA SERPENTES XENODERMATIDAE

Fimbrios cf. klossi Smith, 1921
Kloss' snake; Ran ma

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (IEBR 3275, SVL: 203.1 mm, TAL: 51.3 mm; Fig. 19), ratio TAL/TL: 0.25.

MORPHOLOGICAL CHARACTERS. Nostril in the anterior part of a large concave nasal; rostral triangular, not visible from above; suture between internasals shorter than that between prefrontals; internasals separated from rostral by a horizontal skin fold; frontal broadly truncate in front, broader than long, as long as its distance from the tip of snout, much shorter than parietals, about three times as broad as the supraoculars; preocular small, just touching the frontal; large quadrangular loreal in contact with eye; postoculars 3; subocular 1; temporals 5; supralabials 9 or 10, first 5 very small with strongly raised edges, the last one more elongated; infralabials 11, first 7 very small with raised edges like supralabials; mental absent; a pair of large chin shields, in contact with the first ventral; dorsal scales in 28 or 29 rows at anterior part of body; dorsal scale rows: 28 or 29 : 30 : 31; interstitial skin partly visible between anterior scales, scales feebly imbricate posteriorly; ventrals 161; cloacal scale undivided; subcaudals 62, unpaired (determination after Bourret, 1936; Smith, 1943; Ziegler et al., 2008).

The colouration of the preserved specimen is black above, brighter ventrally; edges of ventrals and of subcaudals tinged with dark grey.

DISTRIBUTION. Vietnam: Quang Tri, Thua Thien-Hue, Kon Tum, Gia Lai, Dak Lak, and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Cambodia.

REMARKS. The collected individual differs from previous descriptions (Bourret, 1936; Smith, 1943; Ziegler et al., 2008) by a lower number of infralabials

(11 versus 12), a higher number of temporals (5 versus 2-3) and subcaudals (62 versus 43-60), a less developed scale imbrication, no mental shield, and a different TAL/TL ratio (0.25 versus 0.126 to 0.2).

COLUBRIDAE

Ahaetulla prasina (Boie, 1827)

Oriental whip snake; Ran roi thuong

EXAMINED MATERIAL. Specimen examined (n = 1): one specimen collected by KVN and others (ZFMK 94664, SVL: 584.3 mm, TAL: 319.2 mm; Fig. 20).

MORPHOLOGICAL CHARACTERS. Head shields large; pupil horizontal; snout pointed, projecting, without dermal appendage, snout more than twice as long as eye diameter; canthus rostralis sharp; nostrils lateral, not valvular; nasal in contact with the labials; loreals 3, small; frontal followed by two symmetric parietals of size equal to frontal; preocular 1, in contact with frontal; postoculars 2; temporals 1 or 2 + 2; supralabials 9, fourth to sixth touching the eye, entire; infralabials 8, first 4 in contact with anterior chin shields, shorter than the posterior; mental groove present; dorsals smooth, slightly keeled in the sacral region; dorsal scale rows at midbody 15; ventrals 196; cloacal scale divided; subcaudals 168, divided (determination after Bourret, 1936; Smith, 1943; Manthey & Grossmann, 1997; Ziegler, 2002).

The colouration of the preserved specimen is bluish-green above, with a yellowish-white line on both sides of the ventral part; interstitial skin in the neck region black and white.

DISTRIBUTION. Vietnam: entire country; elsewhere: India, Bangladesh, Bhutan, China, Myanmar, Laos, Thailand, Cambodia, Malaysia, Singapore, Brunei Darussalam, Indonesia, and Philippines.

Amphiesma boulengeri (Gressitt, 1937)

Boulenger's keelback; Ran sai bau-len-go

EXAMINED MATERIAL. Specimens examined (n = 2): one subadult specimen collected by KVN and others (ZFMK 94665, SVL: 107.2 mm, TAL: 46.6 mm; see Fig. 21); one adult male collected by QKL and KLV (ZFMK 94273, SVL: 370 mm, TAL: 179 mm).

MORPHOLOGICAL CHARACTERS. Nostrils lateral; internasals truncated; preocular 1; postoculars 2; temporals 1 + 2, anterior at least twice as long as posterior; supralabials 9, fourth to sixth touching the eye, seventh to ninth very large; infralabials 9 or 10, first five in contact with anterior chin shields; anterior chin shields two-thirds as long as posterior pair; outermost dorsal scale row smooth, remainder finely keeled; dorsal scale rows 19 : 19 : 17; ventrals 140-145; subcaudals 89-98, divided (determination after Gressitt, 1937; David et al., 2007).

The colouration of the preserved specimen is black dorsally; head brown above; anterior supralabials white, posterior black with a median elongated cream colored streak, forming a postocular stripe extending on the neck, followed by white dorsolateral spots extending to the anterior part of the tail; venter white.

DISTRIBUTION. Vietnam: Vinh Phuc, Thua Thien-Hue, Dak Lak, and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: China.

REMARKS. Both specimens differ from the original description by Gressitt (1937) in the number of posterior temporals (2 instead of 1). The adult specimen moreover shows a slightly lower number of ventrals (140 vs. 143-147).

Boiga quangxiensis Wen, 1998

Guangxi cat snake; Ran rao quang Tay

EXAMINED MATERIAL. Specimen photographed (n = 1): one adult specimen was photographed by KVN (Fig. 22).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimen is based on characteristic body shape and colour pattern; single loreal; postoculars 2; temporals 3 + 3; supralabials 8, third to fifth touching the eye; dorsal scales smooth (determination after Ziegler et al., 2006, 2010).

DISTRIBUTION. Vietnam: from Lao Cai, Cao Bang and Lang Son in the north southwards to Dong Nai Province (this is the first record of the species from Quang Ngai Province); elsewhere: southern China, Laos.

Calamaria pavementata Duméril, Bibron et Duméril, 1854

Collared reed snake; Ran mai gam lat

EXAMINED MATERIAL. Specimen examined (n = 1): one adult female collected by KVN and others (IEBR 3292, SVL: 231.1 mm, TAL: 18.6 mm; Fig. 23).

MORPHOLOGICAL CHARACTERS. Head covered with large shields; pupil round; nostrils lateral, not valvular; rostral wider than high, partly visible from above, 0.6 times as long as interprefrontal suture; supranasals absent; frontal longer than broad, shorter than parietals, 2 times wider than supraoculars, followed by two symmetrical parietals; loreal absent; preocular 1; postocular 1; temporal absent; supralabials 4, second and third touching the eye, second and fourth largest; first pair of infralabials in contact with each other behind the mental; mental groove present; chin shields in 2 pairs, in contact with each other, anterior longer than posterior; middorsal scale rows 13, smooth; tail pointed; ventrals 151, more than twice as broad as adjacent dorsals; ventrals and subcaudals without notches; cloacal scale entire; subcaudals 20, divided (determination after Bourret, 1936; Smith, 1943; Ziegler, 2002; Ziegler et al., 2007).

The colouration of the preserved specimen is reddish-brown above, with six dark dorsolateral lines and three paler ones, consisting of small spots; neck dark brown; belly yellowish; tail ventrally yellowish, with a dark line medially across the subcaudals.

DISTRIBUTION. Vietnam: From Lao Cai and Son La in the West eastwards to Quang Ninh and southwards to Quang Nam, and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: China, Myanmar, Laos, Cambodia, Thailand, Malaysia, Indonesia, and Japan.

Dendrelaphis ngansonensis (Bourret, 1935)
Nganson bronzeback; Ram leo cay ngan son

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (IEBR 3287, SVL: 728.5 mm, TAL: 392.2 mm; Fig. 24), ratio TAL/TL: 0.35.

MORPHOLOGICAL CHARACTERS. Eye as long as its distance from the nostrils; pupil round; nostrils lateral, not valvular; rostral much broader than high, visible from above; internasals a little shorter than prefrontals; frontal 1.4 times longer than broad, as long as its distance from the tip of snout, shorter than symmetrical parietals; loreal elongated;

preocular 1; postoculars 2; temporals 2 + 2; supralabials 9, fourth to sixth touching the eye; first five infralabials in contact with anterior chin shields, anterior chin shields shorter than the posterior; dorsals smooth, dorsal scale rows 15 : 15 : 11; vertebral scales enlarged, variable in width, not broader than the outermost scale row at midbody, posterior margin rounded; ventrals 177, keeled; cloacal scale divided; subcaudals 148, divided (determination after Bourret, 1936; Smith, 1943; Ziegler & Vogel, 1999; Ziegler, 2002).

The colouration of the preserved specimen is bluish and bronze-brown above; interstitial skin black and white; dorsal head bronze brown; a black stripe present along the side of the head, strongly marked on the temple and extending to the neck; supralabials yellow; cream below; for colouration in life see figures 24, 25.

DISTRIBUTION. Vietnam: From Ha Giang and Cao Bang provinces in the North southwards to Quang Nam Province (this is the first record of the species from Quang Ngai Province); elsewhere: Laos (Xieng Khouang Province).

Enhydris subtaeniata (Bourret, 1934)
Mekong mud snake; Ran bong me-kong

EXAMINED MATERIAL. Specimen examined (n = 1): one adult collected by KVN and others (IEBR 3289, SVL: 300 mm, TAL: 56.6 mm; Fig. 26), ratio TAL/TL: 0.16.

MORPHOLOGICAL CHARACTERS. Body stout; snout blunt, squarish; nasals contiguous; internasal 2 times wider than long, in contact with triangular loreal (loreal divided on left side); preocular 1; postoculars 2; temporals 1 + 2; supralabials 8, fourth in contact with eye; infralabials 3, in contact with anterior chin shields; posterior pair of chin shields longer than anterior pair, separated from each other by small scales; dorsal scale rows 21 : 21 : 21; ventrals 143; subcaudals 45, divided (determination after Bourret, 1936; Smith, 1943; Murphy & Voris, 1994; Karns et al., 2010).

The colouration of the preserved specimen is olive-grey above, with indistinct blackish spots; ventrals and 3 outer scale rows yellowish; outer margins of the ventrals and adjacent scale-rows heavily margined with dark grey; a series of dark spots forming a median ventral line at the posterior



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Figure 19. *Fimbrios* cf. *klossi*, photo R. Babb. Figure 20. *Ahaetulla prasina*, photo R. Babb. Figure 21. *Amphiesma boulengeri*, juvenile, photo R. Babb. Figure 22. *Boiga guangxiensis*, adult, photo K.V. Nguyen. Figure 23. *Calamaria pavimentata*, photo R. Babb. Figure 24. *Dendrelaphis ngansonensis*, photo R. Babb.

part of the body; a darker, continuous line medially across the subcaudals.

DISTRIBUTION. Vietnam: Kon Tum, Tay Ninh, Ho Chi Minh City, Soc Trang, Kien Giang, and Ca Mau provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Laos, Thailand, and Cambodia.

REMARKS. Murphy (2007) revalidated *Enhydryis subtaeniata*, which was originally described as a subspecies of *E. enhydryis* (Bourret, 1934) and subsequently synonymized with *E. jagorii* by Smith (1943). According to Nguyen et al. (2009), previous records of *E. jagorii* from Vietnam and neighbouring countries should be assigned to *E. subtaeniata*.

Oligodon chinensis (Günther, 1888)

Chinese kukri snake; Ran khiem trung quoc

EXAMINED MATERIAL. Specimens examined (n = 2): one adult male collected by QKL and KLV (ZFMK 94274, SVL: 514.2 mm, TAL: 115.7 mm); one adult male collected by KVN and others (ZFMK 94672, SVL: 557.6 mm, TAL: 126.2 mm, Fig. 27).

MORPHOLOGICAL CHARACTERS. Nasal divided; internasals 2; rostral partly visible from above, as long as its distance from frontal; suture of internasals shorter than sutures of prefrontals; frontal longer than its distance to the tip of snout, as long as parietals; loreal somewhat longer than broad; preocular 1; postoculars 2; subocular 1, temporals 1 + 2; supralabials 7 or 8, fourth and fifth touching the eye; infralabials 8 or 9, fourth in contact with anterior chin shields; anterior pair of chin shields longer than posterior ones; dorsal scale rows 17 : 17 : 15; ventrals 170 or 172; cloacal scale undivided; subcaudals 58 or 59 (determination after Bourret, 1936; Smith, 1943; Ziegler, 2002; Green, 2010).

The colouration of the preserved specimens is reddish-brown dorsally; with dark, rounded blotches; blotches on the back with dark margins, occupying about 3 to 4 scale rows along the vertebral line, descending laterally; several similar spots on the tail; the darker edges of the scales between these spots forming less visible equidistant fasciatures in each section; head olive brown with a dark brown stripe across the eyes, edged in black, running upwards to the posterior end of the rostral and the upper lip; a long arrowhead-shaped

dark brown spot, edged in black, tip of arrow at the posterior third of the frontal, the two rear ends extending to the side of the neck, almost up to the ventrals; temporal bars absent; ventral surface white, with a longitudinal row of quadrangular black blotches forming along each side, disappearing gradually at the tail base.

DISTRIBUTION. Vietnam: Lao Cai, Bac Kan, Lang Son, Vinh Phuc, Quang Ninh, Hai Phong, Hai Duong, Nghe An, Ha Tinh, Quang Binh, and Gia Lai provinces (this is the first record of the species from Quang Ngai Province); elsewhere: China.

Pareas hamptoni (Boulenger, 1905)

Hampton's slug snake; Ran ho may ham-ton

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (ZFMK 94666, SVL: 317.2 mm, TAL: 110.1 mm; Fig. 28), ratio TAL/TL: 0.26.

MORPHOLOGICAL CHARACTERS. Body elongated, strongly compressed; pupil vertical; snout short; rostral wider than high, visible from above; internasals about 0.6 times as long as prefrontals; prefrontals touching the eye; frontal somewhat longer than broad, longer than its distance from the snout tip; supraocular about half as wide as frontal; nasal complete; loreal small, higher than long, separated from the eye by 1 or 2 small preoculars; postocular 1, small; subocular 1, long and slender, separating the eye from the labials; temporals 2 + 3, anterior larger than posterior ones; supralabials 7, fourth and fifth below the eye, seventh very long; mental groove absent; chin shields in 3 pairs, large, anterior ones longer than wide; dorsal scales smooth, 15 rows at midbody; ventrals 189, more than 2 times as broad as adjacent dorsals; cloacal scale undivided; subcaudals 78, divided (determination after Bourret, 1936; Smith, 1943; Ziegler, 2002).

The colouration of the preserved specimen is light brown dorsally, with dorsolateral rows of alternating spots, forming a zigzag line, spots absent at the margin of the ventrals, not more than 2 scales in length; two parallel brown lines, starting from the posterior part of the supraoculars, bordering the head and ending at the nape; two other bands from behind the parietals forming a λ on the neck; a few larger spots forming a stripe from the eye to the oral commissure.

DISTRIBUTION. Vietnam: Lao Cai, Ha Giang, Bac Kan, Thai Nguyen, Vinh Phuc, Hai Duong, Ha Tinh southwards to Lam Dong and Dong Nai provinces (this is the first record of the species from Quang Ngai Province); elsewhere: China, Myanmar, Laos, and Cambodia.

REMARKS. In contrast to Bourret (1936) and Smith (1943), the vertebral scales of the examined specimen are not enlarged.

Pareas margaritophorus (Jan, 1866)

White-spotted slug snake; Ran ho may ngoc

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (IEBR 3294, SVL: 219.9 mm, TAL: 60 mm; Fig. 29), ratio TAL/TL: 0.21.

MORPHOLOGICAL CHARACTERS. Eye moderate, diameter equal to its distance from the mouth; preocular 1, triangular; postocular 1; subocular 1, long, crescentic, united with postocular on left side; temporals 2 or 3 + 1, elongated; supralabials 7, not touching the eye, fourth and fifth below the eye; infralabials 7; chin shields in 4 pairs, large; dorsal scale rows 15 at midbody, smooth, equal; vertebrals not enlarged; ventrals 144, more than twice as broad as adjacent dorsals; cloacal scale undivided; subcaudals 55, divided (determination after Bourret, 1936; Smith, 1943; Manthey & Grossmann, 1997; Ziegler, 2002).

The colouration of the preserved specimen is dark grey above with irregular transverse rows of black and white blotches, the scales white anteriorly and posteriorly; a white nuchal collar present; ventral surface yellowish white, densely spotted with black.

REMARKS. In contrast to the description of Bourret (1936), the specimen shows only 1 + 1 temporals on one side instead of 2 + 3, 4 pairs of chin shields instead of 3 pairs.

DISTRIBUTION. Vietnam: Vinh Phuc, Hai Duong, Hoa Binh, Ha Tay, Ninh Binh, Ha Tinh, Quang Binh, Quang Tri, Gia Lai, Lam Dong, Tay Ninh, Ho Chi Minh City, and Kien Giang provinces (this is the first record of the species from Quang Ngai Province); elsewhere: China, Myanmar, Laos, Thailand, Cambodia, and Malaysia.

Pseudoxenodon macrops (Blyth, 1854)

Big-eyed bamboo snake; Ran ho xien mat to

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (IEBR 3300, SVL mm: 587, TAL: 127.1 mm; Fig. 30).

MORPHOLOGICAL CHARACTERS. Nostril large, between two nasals; rostral slightly visible from above; suture between internasals half as long as suture between prefrontals; frontal 1.3 times longer than broad, shorter than its distance from the snout tip, shorter than parietals; loreal large, longer than high; preocular 1, not touching the frontal; postoculars 3; temporals 2 + 2 or 3; supralabials 8, fourth and fifth in contact with the eye, seventh highest; infralabials 9, first five in contact with anterior chin shields; first pair of chin shields a little shorter than the posterior; dorsal scales strongly keeled except the outermost row, scale rows 19 : 17 : 15; ventrals 151; cloacal scale divided; subcaudals 63, divided (determination after Bourret, 1936; Smith, 1943; Manthey & Grossmann, 1997).

The colouration of the preserved specimen is greyish-brown and reddish-brown above, with a vertebral series of large, pale-orange spots, edged in black, extending over the whole body and tail; neck with a yellowish white, chevron-shaped mark, the tip pointing forward; ventral surface yellowish-white, with large, blackish-brown, quadrangular blotches anteriorly, blotches paler posteriorly.

DISTRIBUTION. Vietnam: Lai Chau, Lao Cai, Vinh Phuc, Nghe An, Ha Tinh, Quang Binh, Da Nang, Kon Tum, and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: India, Nepal, China, Myanmar, Laos, Thailand, and Malaysia.

Rhabdophis subminiatus (Schlegel, 1837)

Red-necked keelback; Ran hoa co nho

EXAMINED MATERIAL. Specimen examined (n = 1): one adult female collected by KVN and others (ZFMK 94667, SVL: 494.9 mm, TAL: 48.6 mm; Fig. 31), TAL/TL: 0.1.

MORPHOLOGICAL CHARACTERS. Body rather stout; eye large; pupil round; nostrils lateral, not valvular; mental groove present; rostral 2 times as wide as high, visible from above; internasals con-joint, a little broader than long, truncated at the

front, shorter than prefrontals; frontal 1.4 times longer than wide, longer than its distance from the snout tip, shorter than parietals; loreal as high as long; preocular 1; postoculars 3; temporals 2 + 3; supralabials 8, third to fifth touching the eye, seventh largest; infralabials 10, first 5 in contact with anterior chin shields, anterior chin shields a little shorter than posterior; dorsal scales in 19 rows at midbody, strongly keeled, the outermost row smooth; ventrals 161, more than twice as broad as adjacent dorsals; cloacal scale divided; subcaudals 23 (tail tip lost), divided (determination after Bourret, 1936; Smith, 1943; Manthey & Grossmann, 1997; Ziegler, 2002; Ziegler et al., 2007).

The colouration of the preserved specimen is bluish above, head and neck greenish; body with white, transverse spots; a black oblique bar radiated from below the eye; venter yellowish anteriorly, strongly spotted posteriorly.

DISTRIBUTION. Vietnam: From Cao Bang Province in the North westwards to Lao Cai and Son La provinces, eastwards to Quang Ninh and southwards to Tay Ninh, Ho Chi Minh City, and Kien Giang provinces (this is the first record of the species from Quang Ngai Province); elsewhere: India, Bangladesh, Nepal, Bhutan, China, Myanmar, Laos, Thailand, Cambodia, Malaysia, Singapore, and Indonesia.

Sibynophis collaris (Gray, 1853)

Common black-headed snake; Ran rong co den

EXAMINED MATERIAL. Specimen examined (n = 1): one male specimen collected by KVN and others (ZFMK 94668, SVL: 360 mm, TAL: 72 mm, Fig. 32).

MORPHOLOGICAL CHARACTERS. Preocular single, postoculars 2; loreal 1; fourth to sixth supralabials entering orbit, eighth very large, in contact with anterior temporal; temporals 1 + 2, lower posterior one divided vertically; parietal touching upper postocular only; dorsal scales smooth, in 17 rows at midbody; cloacal undivided (determination after Pope, 1935; Smith, 1943; Ziegler et al., 2007).

The colouration of the preserved specimen is greyish brown dorsally; venter whitish cream with a black dot on the edge of each ventral; head olive grey with dark markings in the snout region and two black transverse bars (one behind the eyes and an-

other across the occiput); a distinct dark neck band followed by a white transverse band; a black edged white horizontal line present along the supralabials.

DISTRIBUTION. Vietnam: from Dien Bien, Son La and Ninh Binh southwards to Lam Dong and Dong Nai provinces (this is the first record of the species for Quang Ngai Province); elsewhere: India, Nepal, China, Taiwan, Myanmar, Laos, Thailand, Cambodia, and Malaysia.

REMARKS. The specimen was damaged so that only the above mentioned scale counts could be taken.

Sinonatrix percarinata (Boulenger, 1899)

Mountain water snake; Ran hoa can van den

EXAMINED MATERIAL. Specimen examined (n = 1): one juvenile specimen collected by KVN and others (ZFMK 94671, SVL: 198.9 mm, TAL: 68.4 mm; Fig. 33), ratio TAL/TL: 0.26.

MORPHOLOGICAL CHARACTERS. Body stout; eye moderate; pupil round; nostrils directed slightly upwards, not valvular; rostral 2 times wider than high; nasal completely divided; internasals longer than wide, distinctly narrowed anteriorly, longer than the prefrontals; loreal as long as high; preocular 1; pos-toculars 3; suboculars 2; temporals 2 or 3 + 3; supralabials 9, fourth and fifth touching the eye; dorsal scale rows: 19 : 17 : 17, keeled, except outermost row; ventrals 136, more than twice as broad as adjacent dorsals; cloacal scale divided; subcaudals 76, paired (determination after Bourret, 1936; Smith, 1943; Ziegler, 2002).

The colouration of the preserved specimen is greyish brown above with 28 vertical black bars on each side, not symmetrical, getting wider towards the back, where all are confluent, dark bars in anterior part of body ending in the middle of ventrals, forming broken rings in width of 2 or 3 scale rows; upper head dark olive brown, supralabials white posteriorly; chin and venter white, except for the black rings.

DISTRIBUTION. Vietnam: From Lao Cai, Ha Giang, and Cao Bang in the North, southwards to Kon Tum, Gia Lai, and Dong Nai provinces (this is the first record of the species for Quang Ngai Province); elsewhere: India, China, Taiwan, Myanmar, Laos, and Thailand.

REMARKS. The colouration of the specimen is typical for young individuals (see Smith, 1943). Ac-



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Figure 25. Uncollected *Dendrelaphis ngansonensis*, 23.VI.2009, feeding on *Polypedates* sp., photo T. Geismann. Figure 26. Preserved *Enhydris subtaeniata* (IEBR 3289), photo R. Babb. Figure 27. *Oligodon chinensis*, photo R. Babb. Figure 28. *Pareas hamptoni*, photo R. Babb. Figure 29. *P. margaritophorus*, photo R. Babb. Figure 30. *Pseudoxenodon macrops*, photo R. Babb.

ording to the key of Ziegler et al. (2007), two supralabials entering the eye are typical for *Sino-natrix percarinata*, as well as vertical or Y-shaped black bars on the body sides, whereas the number of these dark body marks (fewer than 30) is typical for *Sinonatrix aequifasciata* (which, however, in contrast normally has not more than one supralabial entering the eye, and which has broad, rounded X-shaped dark marks on sides of body instead).

Xenochrophis flavipunctatus (Hallowell, 1861)
Yellow-spotted keelback; Ran nuoc dom vang

EXAMINED MATERIAL. Specimen examined (n = 1): one adult male collected by KVN and others (ZFMK 94669, SVL: 370 mm, TAL: 172.8 mm; Fig. 34), ratio TAL/TL: 0.32.

MORPHOLOGICAL CHARACTERS. Body stout; pupil round; eye shorter than its distance from the nostril; nostril slightly directed upwards, not valvular; rostral visible from above; contiguous internasals strongly narrowed towards the front, subtriangular, with the anterior angle truncated, nearly as long as prefrontals; frontal constricted in the middle, 2.3 times as long as broad, longer than its distance from the snout tip, a little shorter than pari-etals; loreal as long as high; preocular 1; postoculars 3; temporals 2 + 2; supralabials 9, third to fourth or to fifth touching the eye; infralabials 5, in contact with anterior chin shields; mental groove present; dorsal scales in 19 rows at midbody, more or less strongly keeled, 3 outermost rows smooth; ventrals 128, more than twice as broad as adjacent dorsals; cloacal scale divided; subcaudals 83, divided (determination after Bourret, 1936; Smith, 1943; Ziegler, 2002; Vogel & David, 2006).

The colouration of the preserved specimen is pale olive above, with black spots, spots larger laterally; a pale, dark V-shaped marking on nape; two well-defined subocular streaks present on neck, posterior one extending from the eye to the corner of the mouth; ventral surface yellow, ventral and subcaudal scales with entire, broad, dark margins.

DISTRIBUTION. Vietnam: entire country; elsewhere: Bangladesh, China, Myanmar, Laos, Thailand, Cambodia, Malaysia, and Indonesia.

VIPERIDAE

Protobothrops mucrosquamatus (Cantor, 1839)
Brown-spotted pitviper / Ran luc cuom

EXAMINED MATERIAL. Specimen examined (n = 1): one subadult specimen collected by KVN and others (ZFMK 94673, SVL: 437.3 mm, TAL: 90.6 mm; see Fig. 35), ratio TAL/TL: 0.17.

MORPHOLOGICAL CHARACTERS. Head elongate; upper head scales unequal, extremely small, granular, smooth; snout 2.75 times as long as eye diameter; rostral slightly broader than high; supraoculars long and narrow, entire; internasals separated from each other by 3 small scales, separated from supra-oculars by two enlarged scales; scales between the supraoculars 15; postoculars 4, small; subocular 1, separated from the labials by 2 scale rows; temporal scales 2 or 3 rows, enlarged, smooth; supralabials 10, the first completely separated from the nasal, the second forming the anterior margin of the loreal pit, the third largest; dorsal scales keeled; dorsal scale rows 31 : 28-30 : 24; ventrals 232; cloacal scale undivided; subcaudals 96, divided (determination after Bourret, 1936; Smith, 1943; Leviton et al., 2003).

The colouration of the preserved specimen is pale brown above, with a series of large, dark-brown blotches; lower lateral with a series of smaller blotches, all edged in black; a dark brown line from the eye to the angle of the mouth, edged in black; ventral surface brownish with white blotches.

DISTRIBUTION. Vietnam: From Lao Cai, Ha Giang, and Cao Bang provinces in the North eastwards to Quang Ninh and southwards to Kon Tum, and Gia Lai provinces (this is the first record of the species from Quang Ngai Province); elsewhere: India, Bangladesh, China, Taiwan, and Myanmar.

REMARKS. In contrast to the descriptions of Smith (1943) and Leviton et al. (2003) all the head scales of the specimen are smooth. The number of dorsal scale rows, ventrals, and subcaudals is somewhat higher than in the previous descriptions. The ratio TAL/TL is smaller than in Smith's description (1943). The internasals are only 2 times, not 5 to 10 times longer than the adjacent scales (see Leviton et al., 2003).

Trimeresurus albolabris Gray, 1842
White-lipped pitviper / Ran luc mep trang

EXAMINED MATERIAL. Specimen examined (n =



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Figure 31. *Rhabdophis subminiatus*, photo R. Babb. Figure 32. *Sibynophis collaris*, photo T. Ziegler. Figure 33. *Sinonatrix percarinata*, photo R. Babb. Figure 34. Preserved *Xenochrophis flavipunctatus* (IEBR 3297), photo R. Babb. Figure 35. *Protobothrops mucrosquamatus*, photo R. Babb. Figure 36. *Trimeresurus albolabris*, photo R. Babb.

1): one adult male collected by KVN and others (ZFMK 94670, SVL: 485.2 mm, TAL: 135.9 mm; see Fig. 36), ratio TAL/TL: 0.22.

MORPHOLOGICAL CHARACTERS. Pupil vertical; snout 2.4 times as long as eye diameter; loreal pit between nostril and eye; canthus rostralis sharp, rostral wider than high; scales on top of head small, smooth, subequal, subimbricate; scales between supraoculars 12; internasals about 3 times larger than adjacent scales, in contact with each other; preoculars 3; postoculars 2, small; subocular 1, in contact with third labial; scale rows between subocular and labials 1-3; temporal scales feebly keeled; supralabials 9-10, not in contact with the eye, the first partially fused to the nasal, the second bordering loreal pit, the third largest; infralabials 12-13; dorsal scales keeled; dorsal scale rows 20 : 21 : 15; ventrals 166, more than twice as broad as the adjacent dorsals; cloacal scale entire; subcaudals 76, divided (determination after Bourret, 1936; Smith, 1943; Manthey & Grossmann, 1997; Ziegler, 2002; Leviton et al., 2003).

The colouration of the preserved specimen is blue above; supralabials pale blue; ventral surface yellowish blue.

DISTRIBUTION. Vietnam: From Lao Cai and Cao Bang provinces in the North southwards to Dong Nai, Tay Ninh, Kien Giang, and Ca Mau provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Northeast India, China, Myanmar, Laos, Thailand, and Cambodia.

Trimeresurus vogeli David, Vidal et Pauwels, 2001

Vogel's green pitviper; Ran luc von-gen

EXAMINED MATERIAL. Specimens examined (n = 2): one adult female collected by QKL and KLV (ZFMK 94275, SVL: 462 mm, TAL: 83 mm); one adult male collected by KVN and others (IEBR 3305, SVL: 508.8 mm, TAL: 119 mm; Fig. 37), tail average, ratio TaL/TL of 0.15 in the female.

MORPHOLOGICAL CHARACTERS. Dorsum green; a white lateral stripe, edged in red below in males, and a narrow yellow stripe without red in females; a constant lack of red color in the postocular streak in both males and females; not more than 25 % of tail tip rusty red; tail average, with a ratio TaL/TL of 0.15 in the female; labial region somewhat

lighter greenish than green head colouration; first supralabial totally separated from the corresponding nasal; internasals separated from each other by 0-2 scales; dorsal scales 21 rows at midbody, strongly keeled; ventrals 155-158, plus 2-3 preventrals; cloacal entire; subcaudals paired, 60-67; hemipenis short and strongly spinose (determination after David et al., 2001; Ziegler et al., 2007).

DISTRIBUTION. Vietnam: from Ha Tinh and Quang Binh southwards to Dak Lak and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: Laos, Thailand, Cambodia.

REMARKS. The specimens differ somewhat from the original description of David et al. (2001) by having a lower ventral count (155-158 versus 163-173); the head streak is not distinct; the eyes are greenish orange instead of greenish yellow to yellow; the internasals in the male IEBR 3305 are not separated (usually separated by 1-3 scales), and the dorsum bears no faint dark crossbands and no white vertebral spots.

TESTUDINES GEOEMYDIDAE

Cyclemys pulchristriata Fritz, Gaulke et Lehr, 1997

Striped leaf turtle; Rua dua soc

EXAMINED MATERIAL. Specimens photographed (n = 2): two subadults were photographed by QKL and RB (see Figs. 38-40).

MORPHOLOGICAL CHARACTERS. Identification of the photographed specimens is based on characteristic scalation and colour pattern, such as plastron entirely yellow or prevalent plastral colour yellow; femoral mid-seam shorter than cloacal mid-seam; cloacal notch small to wide and acute-angled to obtuse-angled; throat uniformly white coloured; light head and neck stripes (yellow to salmon in live specimens) wide; if black radiating pattern present on plastron, radiating lines short and stout (determination after Fritz et al., 2008).

DISTRIBUTION. Vietnam: Quang Nam, Gia Lai, and Lam Dong provinces (this is the first record of the species from Quang Ngai Province); elsewhere: according to Fritz et al. (2008) easternmost Cambodia.



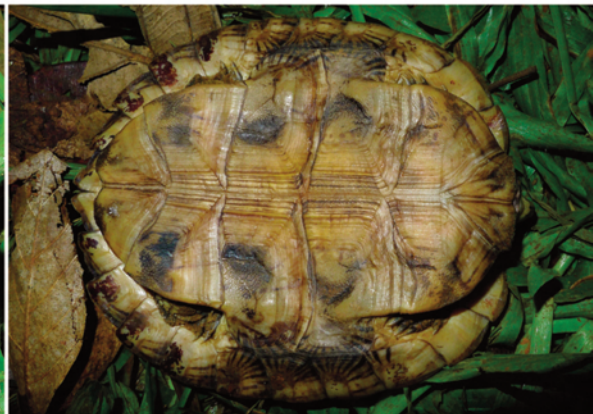
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Figure 37. *Trimeresurus vogeli*. Figure 38. *Cycllemys pulchristriata*. Figure 39. *Cycllemys pulchristriata*, portrait. Figure 40. *Cycllemys pulchristriata*, ventral view. Photos R. Babb.

DISCUSSION

We herein provide a list of 35 identified reptile species (16 lizards, 18 snakes, and 1 turtle) based on our recent field surveys in Quang Ngai Province. Fourteen of the recorded species belong to the family Colubridae, which is the most species-rich reptilian family in Quang Ngai, followed by 6 agamid and 6 scincid species. Nguyen et al. (2009) also listed *Oligodon ocellatus* as occurring in Quang Ngai Province, which brings the total reptilian number known from that province to 36. Nguyen et al. (2009) further list the terrestrial reptilian species *Gekko gekko*, *Coelognathus radiatus*, and *Enhydryis plumbea* as occurring in the whole country, so that there is high probability that they

also will be recorded from Quang Ngai Province in the future. Regardless, *G. gekko* from Vietnam recently has been revised, and it has not yet been determined whether *G. gekko* or *G. reevesii* is involved (see Rösler et al., 2011). A further number of species are listed in Nguyen et al. (2009) as occurring along Vietnam's central coasts, but without definite records for Quang Ngai Province. The data presented herein thus serve only as a preliminary reptilian list, which must be extended in the future based on further field research. Also the taxonomic status of *Fimbrios* cf. *klossi* from Quang Ngai needs further examination. There exist clear differences between the available specimen and known variation of *F. klossi*. The combination of the number of temporals, the lack of a mental, and the longer tail

would suggest a distinct species. However, because only one individual is available at this time, an anomalous specimen cannot be excluded with certainty. Together with the 16 amphibian species recorded from this area (Tran et al., 2010), the herpetofaunal list for Quang Ngai Province currently covers 52 amphibian and reptile species. Compared with the herpetofaunal composition of other central Vietnamese provinces, such as Quang Binh Province (see Ziegler & Vu, 2009), species numbers could easily be doubled to tripled in the near future. Such further research also will be essential for evaluating the conservation status of Quang Ngai forested areas, in particular as protected areas have not yet been established in this province until today.

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