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1. RANA AENEA. 2. NATRIX GROUNDWATERI.

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NOTES ON REPTILES AND BATRACHIANS FROM SIAM AND
INDO-CHINA, (No. 1).

By MALCOLM A. SMITH, F. Z. S.

WITH PLATE 8.

Testudo impressa = *Testudo latinuchalis*.

Natrix nigrocinctus = *Tropidonotus eisenhoferi*.

Natrix groundwateri, sp. nov.

Holarchus longicauda = *Simotes longicauda joysoni*.

Lygosoma vittigerum kronfanum, ssp. nov.

Rana aenea, sp. nov.

Rana nigrovittata = *Rana mortenseni*.

Microhyla butleri = *Microhyla latastii*.

The present article contains descriptions of three new forms:—

(1) A new snake (*Natrix groundwateri*) from the extreme south of Siam, obtained by the Robinson and Kloss expedition to that part of the country in 1919, (2) a new race of the small but handsome scink, *Lygosoma vittigerum*, obtained by myself on the Langbian plateau, S. Annam, in 1918, and (3) a new frog, *Rana aenea*, found by my native collector when accompanying Messrs. Carthew and Godfrey on a trip to the extreme north of Siam early in 1921.

Judging by the results of expeditions which have been undertaken in Siam during the last few years, it would seem as if the herpetological survey of the country was nearing completion. New forms will still no doubt be found upon the higher hills, particularly in the Nakon Sritamarat range and along the Burma frontier, where many peaks still remain unexplored. The genus *Philautus*, in particular, should repay investigation. The small frogs included under this group confine themselves almost entirely to mountain streams, and in Siam, are seldom found below the 700 metre level. Their diminutive size, protective colouration and nocturnal habits, make them extremely difficult to find, and unless a definite search is made for them they are seldom seen. They are best found by hunting for

them at night with a lamp, when their shrill cries reveal their presence among the foliage in which they live, and they can be easily tracked down and caught.

I have also included in the paper certain changes in nomenclature which I believe to be correct. These conclusions have been reached only after the study of a considerable amount of material, in most cases of living specimens as well as of preserved ones.

Testudo impressa Günther.

Geoemyda impressa, Günther, P. Z. S. 1882, p. 343, figs. 1-3.

Testudo emys, Boulenger, Ann. Mus. Civ. Genova, 1893, (2) xiii, p. 312.

Geoemyda latinuchalis, Vaillant, Bull. Soc. Philom. Paris, 1894; (8) vi., p. 68; id., Mocquard, Rev. Colon., Rept. Indo-chine, 1907, p. 10.

Testudo pseudemys, Bouleng., Fascic. Malay., Zool., 1903, i. p. 144. pl. ix, and text fig. 1. (skull); Annandale, Journ. Proc. Asiat. Soc. Bengal, 1906, (2) ii. p. 204.

Testudo latinuchalis, Siebenr. Zool. Jahrb., Suppl. 1909, x, p. 520; Bouleng., Fauna Malay Penin., Rept. 1912, p. 15.

Testudo impressa was described by Günther from a single shell received from Siam. It was subsequently referred by Boulenger to *Testudo emys* Schleg. & Mull., and of late appears to have been forgotten.

While working with Mr. Boulenger in the British Museum prior to his retirement, we took the opportunity of examining this shell, and of comparing it with a series of tortoises that I had collected in Siam. There was no doubt whatever that it was not *T. emys* at all, but was identical with the species now recognized as *Testudo latinuchalis* (Vaillant).

Boulenger's separation of *T. emys* from *T. latinuchalis* (Faun. Malay Penin., p. 14) on the relative proportions of the vertebral shields is not a sufficient one, owing to the variations in size which are found in different individuals. In several other characters, however, the two are so distinct that there can be no doubt as to their specific identities.

Confirmation is also to be found in the cranial characters, the skull of one of my specimens of *T. latinuchalis* differing from

that of *T. emys*, but agreeing well with that of *T. pseudemys*, a species now recognised as *T. latinuchalis*.*

Testudo impressa Günther must therefore be revived, and *T. latinuchalis* placed under it. Apart from the skull, this species can be distinguished from *T. emys* by the following characters:—

<i>T. impressa.</i>	<i>T. emys.</i>
Pectoral shields always in contact.	Pectoral shields usually widely separated.
Margins of the carapace usually strongly reverted and serrated in the adult.	Margins of the carapace not usually strongly reverted or serrated in the adult.
Shell yellowish or pale brown, rich dark brown or black at the margins of the shields.†	Shell dark horn to blackish.
Maximum length of shell in a straight line 270 mm.	Maximum length 520 mm.

Natrix groundwateri, sp. nov.

PLATE 8, fig. 2.

Type ♂, Author's No. 3354, collected by Messrs. Robinson and Kloss at Tasan, 40 kilometres S. W. of Chumpon, Peninsular Siam, in March, 1919.

Description of the type. Maxillary teeth 30,† the last not abruptly enlarged; rostral much broader than deep; internasals narrowed anteriorly, as long as the prae-frontals; frontal once and a quarter as long as broad, as long as its distance from the end of the snout, much shorter than the parietals; loreal twice as long as high; two prae- and two or three post-oculars; temporals 1 + 2; 9 supralabials, 4th to 6th touching the eye; 5 infralabials in contact with the anterior chin-shields, which are as long as the posterior.

Scales in 19 rows anteriorly, reducing to 17 at mid-body, and so continued to the vent, smooth anteriorly, feebly keeled posteriorly. Ventrals 147; anal 1; subcaudals 120.

*. For a comparison of *T. emys*, *T. pseudemys* and *T. impressa*, see Boulenger in Fasciculi Malayenses, (1) Zool., p. 145 et seq.

†. A specimen from Dalat, S. Annam has handsome dark brown rays upon the plastron.

‡ It is unfortunate that only the type specimen is sufficiently adult to allow of a satisfactory examination of the teeth, and in this specimen also they are obscured by damage. It appears, however, to belong to *Natrix*.

Total length 450 mm; tail 165.

Black above with a dorso-lateral chain of yellow spots; outer two rows of scales with yellow centres; labials yellow with black sutures, and a yellow streak from the angle of the mouth on to the nape. Below yellowish, with a black spot at the outer edge of each ventral and subcaudal shield.

Variation. Four others (juveniles) taken in the same locality show no variation from the type specimen, except in the number of the ventral and caudal scutes, and in the colour of the head, which is light brown above with yellow vermiculations.

Natrix groundwateri is named after Mr. C. L. Groundwater, to whom I have been indebted on many occasions for illustrations which have appeared in this Journal. It is allied to *N. inas* (Laidlaw) from the hills of Perak and Peninsular Siam.

Measurements in mm.

Author's No.	Total length.	Tail.	Ventrals.	Caudals.
3354 (type)	450	165	147	120
3355	245	85	154	120
3356	185	75	154	126 ?
3357	180	70	151	?
4437	230	85	151	?

Type presented to the British Museum. Paratypes in my own collection.

The illustration is twice the natural size.

***Natrix nigrocinctus* (Blyth).**

Tropidonotus nigrocinctus, Blyth, Journ. Asiat. Soc. Bengal, 1856, xxiv., p. 717; Bouleng., Cat. Sn. B. M., 1893, i, p. 255; Smith, Journ. Nat. Hist. Soc. Siam, 1915, i, p. 244; id., ibid., 1916, ii, p. 159.

Tropidonotus eisenhoferi, Gyldenstolpe, K. Sv. Vet. Akad. Hand., 1916, Band 55, No. 3, p. 11, text fig.

A series of 19 examples of this snake from Siam shews it to be a very variable species. The collection includes examples from three well separated localities—from northern Siam nearest to the type locality (Pegu), from Peninsular Siam and from S. E. Siam.

Each region appears to have its own variation, which, with the material now available, may be chronicled as follows:—

NORTHERN SIAM.

1 praeocular; ventrals 161-168; subcaudals 85-96.

Adult with distinct black cross bands; posterior 2/3 of belly and tail thickly powdered with grey, or tail below entirely dark grey. (10 specimens).

Details of specimens of *N. nigrocinctus*.

No.	Sex.	Ttl.	Tail	Scales	Vent.	Caud.	Locality.
3091	♀	740	205	19.17	166	93	Me Wang, N. Siam.
3094	♀	875	155 ?	" "	166	44 ?	" "
3092	♀			" "	161	24 ?	" "
3095		400	105	" "	163	90	" "
3093	♀	880	250	" "	165	96	" "
3090	♂	800	220	" "	161	85	" "
1686	♂	495	135	" "	165	92	" "
3101	♂	370	100	" "	164	96	" "
2912	♀	Yg.		" "	168	92	Me Nga, "
3096	♂	"		" "	165	96	" "
<i>T. eisenhoferi</i> .		950	228	" "	160	73	M. Fang, "
*7481	♀			" "	167	86	Pegu (Burma).
4105	♀	Hf. gr.		" "	157	78	Tasan, P. Siam.
4104		Yg.		" "	152	82	" "
3238	♀	590	155	" "	153	77	Tapli, "
1684	♀	Yg.		" "	150	72	Chumpon. "
1685	♀	"		" "	153	79	Klong Bang Lai, "
1883	♀	Hf. Gr.		" "	164	74	Hup Bon, S. E. Siam.
1682	♀	635	120	" "	160	53 ?	Klong Yai, "
1681	♂	825	210	" "	156	84	" "
1713	♀	840	185	" "	159	65 ?	Khao Sabab, "

* Indian Museum number. One of the types which I have compared with my series.

PENINSULAR SIAM.

1 praeocular; ventrals 150-157; subcaudals 72-82.

Colour as above. (5 specimens).

S. E. SIAM.

2 praeoculars; ventrals 156-164; subcaudals 74-84.

Adult with cross bands hardly distinct or absent. Posterior 1/3 of belly and tail sparingly powdered grey. (4 specimens).

Other variations. The postoculars may be 3 or 4 in number; the temporals are usually 2 + 2, but in one example (No. 3090) are 1 + 2; 9 supralabials is the rule, but in two examples there are 8 on one side; the outer row of scales is variable as regards the strength of the keeling, which may be entirely absent.

I have no hesitation in placing under this species Gyldenstolpe's *Tropidonotus eisenhoferi* from N. Siam. Its separation from *Natrix nigrocinctus* upon 4 postocular shields and an outermost row of smooth body scales, is untenable with the series now shewn.

Holarchus longicauda (Boulenger).

Simotes longicauda, Bouleng., Ann. & Mag. Nat. Hist., 1903, (7) xii, p. 350.

Simotes longicauda joynsoni, Smith, Journ. Nat. Hist. Soc. Siam, 1917, ii, p. 276.

Last year when home on leave I was able to compare my *S. l. joynsoni* with Boulenger's type of *longicauda* in the British Museum. The difference in colouration between them was far less than I had gathered from the description, so much so that mine can no longer be recognised as a form apart.

Since Mr. Joynson obtained his specimens, I have examined four more from Siam, two from the Me Wang forest and two from Pak Jong in the Dong Rek mountains. They show well the great variability of the species with regard to colouration and markings.

Lygosoma vittigerum kronfanum,* subsp. nov.

Type, Author's No. 2417, collected at Daban, Langbian plateau, S. Annam, in March 1918.

* Named after the Kronfa river on the banks of which the specimens were obtained.

Total length 93 mm., head and body 34. Differs from the typical form described by Boulenger (Ann. Mus. Civ. Genova, 1895, (2) xiv. p. 615) in the greater average number of scales round the body, 28-32, in the average shorter legs, the hind limb reaching only to the digits or the elbow of the adpressed fore-limb, in the pre-frontal shields forming a broad suture, and in having 5 well-defined light stripes, instead of a single vertebral one.

Six specimens examined, all from the type locality, shew the very distinctive colouration of this new race, which is as follows:—

Black above, with 5 greenish-white dorsal stripes, namely, a vertebral one from the tip of the nose to the root of the tail, a dorso-lateral pair from the upper eyelid to above the thigh, and a lateral pair from the upper lip to the groin, the black edging to the latter being less clearly defined than in the others. Throat and belly greenish-white; tail light brownish with black dots along the sides.

I have not compared my specimens with any of the typical form from the Malay Archipelago, but have done so with a good series from Siam and the Malay Peninsula.

Indications of this multiplication of the dorsal stripe are shown in some of my Siamese examples from as far south as Hat Sanuk (Koh Lak, Lat. 12° N.), the dorso-lateral pair being present, but with the dark edging outside indistinct, and that only in the anterior part of the body.

One juvenile from the north of Siam (No. 3169) has 3 well marked light stripes throughout the whole length of the body; and further collections from this region may establish a race with 3 light stripes only.

Another juvenile from Chet Ton (N. Siam), on the border of French Laos, is intermediate between this form and the one from Annam.

Details of *L. vittigerum kronfanum*.

			TYPE.								
No.	..	..	2417	2418	2453	2454	2455	2456		
Scales round body	..	..	30	32	30	28	28	30		
Leg reaches the	..	..	elbow	hand	wrist	hand	hand	elbow		
Locality	..	..	Daban	Daban	Daban	Daban	Daban	Daban		
OTHER SPECIMENS.											
No.	5909	3361	4514	2370	2371	2373	2372	3169	5529
Scales	30	28	28	28	30	28	32	30	30
Leg reaches the	elbow	elbow	..	axil	axil	elbow	axil	elbow	elbow
Locality	Gunong Tahan, F.M.S.	Tasan P. Siam.	Hat Sanuk P. Siam.	Sai Yok S. W. Siam.	Sai Yok. S. W. Siam.	Chantabun S. E. Siam.	Prae N. Siam.	Me Wang N. Siam.	Chet Ton. N. Siam.

In addition to the specimens here enumerated, two others only appear to be recorded from the Asiatic mainland, one from Ginting Bidai, and a second from Gunong Tahan in the Malay Peninsula. In all the specimens (example from Ginting Bidai not examined) the praefrontals form a broad suture.

The mainland form therefore appears to differ from the typical (archipelagic) one in the following particulars:—longer proportion of body, the distance from the snout to the fore-limb being once and one-sixth to once and one-third in distance from axil to groin, shorter limbs, praefrontals always in suture, and greater average number of scales round the body.

***Rana aenea*, sp. nov.**

PLATE 8, fig. 1.

Type ♀, collected on Doi Chang, N. Siam. at about 1500 metres altitude, in May 1920; Author's No. 5821.

Description of the type. Vomerine teeth in small, slightly oblique series, commencing from the level of the posterior borders of the choanae, equidistant from them and from each other. No bony prominences to the lower jaw. Head broader than long; snout rounded, slightly projecting beyond the mouth, as long as the orbit; canthus rostralis distinct, loreal region oblique, slightly concave; nostril equidistant from the eye and the tip of the snout; distance between the nostrils twice the interorbital width, which is less than that of the upper eyelid. Tympanum indistinct, less than half the diameter of the eye, $1\frac{1}{2}$ times its distance from the latter.

Fingers moderate, the tips simply swollen, 1st as long as 2nd, 3rd shorter than the snout; subarticular tubercles moderate. Hind limb long, the tibio-tarsal articulation reaching well beyond the snout; heels strongly overlapping when the limbs are folded at right angles to the body. Toes moderate, the tips dilated into small but very distinct discs, $\frac{2}{3}$ webbed, nearly 3 phalanges of the fourth toe free; no groove on the discs separating the upper from the lower surfaces; no tarsal fold; subarticular tubercles moderate, inner metatarsal tubercle moderate, $\frac{3}{5}$ the length of the inner toe; no outer tubercle.

Skin quite smooth; posterior half of upper eyelid warty; a glandular fold from the eye to the shoulder; a fine glandular dorso-lateral fold beginning behind the upper eyelid, converging towards its fellow on the shoulders and extending to the hip.

Brownish or greyish-black above, the sides with small rounded, jet-black spots; dorso-lateral fold indicated by a thin whitish line, edged outside with black on the forepart of the body; supratemporal fold with similar markings, the black band including the tympanum; lips black with white spots, limbs with black crossbars. Below yellowish white, the throat finely speckled with black, the belly and limbs with larger black spots.

Nasal bones large and widely separated.

A second female (No. 5822) collected in the same locality differs in that the vomerine teeth are slightly more prominent, the

tympanum more distinct, and the dorso-lateral fold present only half way down the back.

Rana aenea is nearest to *R. palawanensis* Boulenger, from the Malay Archipelago. It differs from it in the smaller and less distinct tympanum, in the smaller digital discs and shorter 1st finger, in the convergence of the dorso-lateral folds and in colouration.*

Type presented to the British Museum; paratype in my own collection.

Measurements in mm.

	Type.	Paratype.
Snout to vent	35	38
Length of head	12.5	14
Width of head	14.5	15.5
Snout	6	6.5
Eye	5	5
Interorbital width	2.5	3
Tympanum	2	2
Fore limb	20	22
Hind limb	65	74
Tibia	22	25
Foot	20	22

Rana nigrovittata (Blyth).

Rana nigrovittata, Bouleng., Rec. Ind. Mus., 1920, xx, p. 144;
Smith, P. Z. S. 1921, p. 433.

Rana mortenseni, Bouleng., Rec. Ind. Mus., 1920, xx, p. 135.

In P. Z. S. 1921, I endeavoured to show that *R. nigrovittata* (Blyth) and *R. mortenseni* Boulenger were very closely related to each other. The chief point of distinction between them was, that while the male of the former had external vocal vesicles, that of the latter had internal. In many of my specimens of *nigrovittata* I had found a blackened patch of skin on either side of the throat at

*Compared with two specimens from N. Borneo.

the angle of the jaw, with fine longitudinal folds and an alteration in the character of the skin at that point. This did not appear in *R. mortenseni*.

Since then I have examined a further large series (over 50 examples) of *nigrovittata* from various parts of Siam. The collection moreover includes many full grown males, considerably larger than any previously available for examination, and quite as large as the *R. mortenseni* from Koh Chang.

In all the specimens of *nigrovittata* from Peninsular Siam (largest not over 55 mm. from snout to vent), and in most of those of equal size from N. and N. E. Siam, this condition of external vocal vesicles is evident, but in the larger specimens (65 - 70 mm.) the pigmentation has disappeared, and the skin has resumed its normal colour. The folds, however, still remain; they are more strongly marked in some than in others.

I have never seen any immature males of *R. mortenseni*; and in the few adults I have examined the skin of the throat appears unchanged.

Tadpoles obtained on Koh Chang, where *mortenseni* appears to be the only frog of this group in existence, do not differ from tadpoles of *R. nigrovittata* which I have obtained in other parts of Siam.

The other points of distinction between the two species which I had relied on, namely, the slight difference in the finger tips and the longer leg, disappear with the larger amount of material examined.

It would seem correct therefore, to unite *mortenseni* with *nigrovittata*, and, as regards the question of vocal sacs to describe the species as having internal or feebly developed external ones.

Although my series from different parts of the country intergrade completely with each other it is possible to correlate certain broad variations with geographical areas.

(1) From Peninsular Siam. Presuming my specimens to be fully grown, this is the smallest form. Its length from snout to vent does not exceed 55 mm. The vocal vesicles are feebly developed

externally. In colouration the frogs from this region are of a richer brown than those found further north, and there is often a clearly defined broad dark band along the side of the body. Below whitish. (30 specimens examined).

(2) From N. E. Siam and French Laos. A larger form, up to 70 mm. in length. Colouration greyer, and with the lateral band always broken up. Below often dappled or heavily powdered with grey. Vocal sacs feebly developed externally. (55 specimens examined).

(3) Koh Chang (*R. mortenseni*). A large form, 70 mm. in length. Males with internal vocal sacs. (7 specimens examined).

The types of *Rana nigrovittata* are in the Indian Museum, Calcutta. Type locality Pegu.

Microhyla butleri Boulenger.

Microhyla butleri, Bouleng., Faun. Malay Penin., Rept., 1912, p. 261.

Microhyla latastii, Bouleng., Ann. & Mag. Nat. Hist., July 1920, (2) vi, p. 106.

I have examined the types and only known specimens of *M. latastii* in the British Museum, but cannot distinguish them from examples of *M. butleri*.

This latter frog is widely distributed throughout Siam and Indo-China and I have examined numbers of specimens, both alive and dead. Its colouration is variable, but the dark, white-edged, 3-tiered mark on the back is usually more or less distinguishable.