

ON A COLLECTION OF REPTILES AND BATRACHIANS FROM
PENINSULAR SIAM.

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The following species of Reptiles and Batrachians from Peninsular Siam, have been obtained mainly in three separate localities:— (1) in the state of Patiyu, about 60 kilometres north of the Isthmus of Kra; (2) in the hills of Nakon Sitamarat; and, (3) in Patani, near the sea coast.

For the majority of the snakes from the last named locality, I have to thank Mr. C. J. Aagaard, who, from time to time during the past three years, has sent me for examination all the specimens which he has collected upon the rubber estate at Bangnara, where he resides.

The collection as a whole is of interest, not only for the addition which it makes to our knowledge of the herpetology of the northern part of the Peninsula, but also because it has been made, for the most part, in that region where the true Siamese fauna meets with that of the Malay Peninsula.

It was unfortunate that no collecting could be done at high elevations in the mountains of Nakon Sitamarat, but our men were handicapped for want of transport and were only able to ascend one of the lower hills. In spite of this, the results obtained there were of considerable interest, and of sufficient promise to justify further exploration of that range.

The following 12 species are not included in Mr. Boulenger's volume upon the Reptiles and Batrachians of the Malay Peninsula. Three of them, however, (marked with an *), are from just north of the Isthmus of Kra.

LIZARDS:—*Gymnodactylus oldhami*, *Lygosma tersum*, *L. herberti*, *L. melanosticum*, *L. anguinoides*.*

SNAKES:—*Tropidonotus nigrocinctus*,* *Amblycephalus carinatus*.

BATRACHIANS:—*Rana humeralis*, *R. alticola*, *R. limborgi*, *Microhyla pulchra*,* *Bufo macrotis*.

The tadpole of *Rana limnocharis*, for reasons which are given, is redescribed.

A full synonymy of most of the species mentioned in this article, has already been given in Mr. Boulenger's volume, and there is no need to repeat them all here. I have only quoted an author, when the species is not included in that work, or when the reference bears directly upon some point which is discussed under that species.

The following localities are referred to : —

MAPRIT and KLONG BANG LAI. Maprit, a new station on the Southern Railway, about 15 kilometres inland from, and due West of, Patiyu. Klong Bang Lai, a camp made on the banks of a stream of that name, about 12 kilometres to the North-west of Maprit, and close to the hills.

KHAO WANG HIP and KLONG WANG HIP. The former, a hill, 800—900 metres high, about 10 kilometres to the North-east of Tung Sawng, in Nakon Sitamarat. From the "lower camp," the lower slopes of the hill were worked, from the "upper camp," the summit and higher portions of the hill. Klong Wang Hip, a slow-running stream near the base of the hill.

BANGNARA and TANGJONG MAS. In Patani, near the sea coast.

In conclusion I should like to express my most sincere thanks to Mr. G. A. Boulenger of the British Museum of Natural History, for his invaluable help in connection with many difficult points of identification.

REPTILES.

CHELONIA.

1. TESTUDO EMYS Schleg. & Müll.

A single specimen of this large tortoise was obtained on Khao Wang Hip, Nakon Sitamarat.

2. GEOEMYDA GRANDIS Gray.

Maprit, Patiyu, and Bangnara, Patani.

In the specimen from Maprit, a half-grown female, the plastron is entirely yellow, no dark rays being present at all.

Five young specimens were sent me from Bangnara in June. The smallest had a length of shell of 80 mm. only, and was probably not long out of the egg.

3. GEOEMYDA SPINOSA (Gray).

1 adult from the top of Khao Wang Hip, Nakorn Sitamarat. Total length of shell, mm. It was found at a considerable distance from any water.

4. *CYCLEMYS AMBOINENSIS* (Daudin).

Bangnara, Patani.

5. *BELLIA CRASSICOLLIS* (Gray).

Bangnara, Patani.

LACERTILIA.

GECKONIDÆ.

6. *GYMNODACTYLUS PULCHELLUS* (Gray).

Khao Wang Hip (upper camp), Nakon Sitamarat, 5 specimens.

Largest, snout to vent, 110 mm., tail 130. The yellow border to the dark bars across the back, is in the half-grown specimens complete, but in the two adults, this colour has entirely disappeared, except upon the enlarged tubercles that are situated along the edge of the bars.

7. *GYMNODACTYLUS PEGUENSIS* Bouleng.

Annandale, Rec. Ind. Museum, IX, p. 323 (1913).

Khao Wang Hip (upper camp), Nakon Sitamarat, 3 adults, 1 young.

The largest is considerably bigger than any previously recorded being 80 mm. from snout to vent. The tail is unfortunately broken off. No lateral fold can be seen in any of the specimens, and allowing for the position in which it would be, there appear to be only about 36 ventral scales across the middle of the belly.

Colour (in spirits). Above, light brown, with dark brown, black-edged markings. In the largest specimen, the spots are confluent across the hinder part of the back, and in all of them, the U-shaped mark across the nape is broken up, either by a division at each side of the head, so as to form three spots, or in the middle, to form two.

8. *GYMNODACTYLUS OLDHAMI* Theobald.

Bouleng, Fauna Brit. Ind., p. 67; Annandale, Journ. As. Soc. Bengal (n.s.) I, p. 83 (1905); idem. Records Ind. Museum, p. 320, pl. XVII, fig. 2 (1913).

Maprit and Klong Bang Lai, P. Siam. 3 specimens.

As already pointed out by Annandale (1905), there is no real evidence that this lizard occurs in Southern India as given in the Fauna. The locality of the type specimen is unknown, but it has since been discovered in the Tavoy district, Tenasserim.

There are no praeanal pores in the only male (a half-grown one) in my possession. One scale bears a slight impression, but it is not perforated. The question as to what is the correct number of pores in this species has already been discussed by Annandale (1913), but it would appear from my specimen, as well as from his own remark upon the type, that this character is not a constant one. A similar peculiarity may occur in *Gonatodes kendalli*, under which heading this point is again referred to.

9. *GYMNODACTYLUS MARMORATUS* (Fitz.).

Bangnara, Patani, 2 specimens.

The species has not been met with north of this locality.

10. *GONATODES KENDALLI* (Gray).

Khao Wang Hip (upper camp), Nakon Sitamarat, 2♂, 2♀
Maprit and Klong Bang Lai, Patiyu, 6♂, 4♀.

Previously known only from as far north as Perak, the range of this gecko is now considerably extended, as in addition to those obtained from the above mentioned localities, I have since found it at Chantabun, and on Khao Sebab, a hill close by, in South-eastern Siam.

Gonatodes kendalli is described as having no praeanal or femoral pores, and the presence of these (6-8 praeanal pores in an obtuse-angled series, interrupted mesially) in the males from some localities, and the absence of them in those from others, was extremely puzzling. In the two specimens from Nakon Sitamarat, they were present, but in the six from Maprit and Klong Bang Lai they were absent, whilst in two other males, one from Chantabun and another from Khao Sebab, they were again present. A larger series is required, however, before one could definitely say whether the character was constant in each locality, and so ascribe it to local conditions, or whether it was dependent upon some other factor. In all other respects the specimens entirely agreed with each other. Mr. Boulenger tells me that since he wrote his description of *G. kendalli*, he has also seen a specimen

from Penrissen Mt., Borneo, with an angular series of praeanal pores.

None of my specimens, either from the Peninsula, or from S. E Siam, are mature, the largest one measuring only 40 mm. from snout to vent.

11. *HEMIDACTYLUS PLATURUS* (Schneid.).

Maprit and Klong Bang Lai, Patiyu.

12. *MIMETOZOOM CRASPEDOTUS* (Mocquard).

Rob. and Kloss. Journ. Fed. Malay St. Mus., V, p. 153.

A single specimen of this rare gecko was obtained at Bangnara, Patani. Robinson and Kloss appear to have found it fairly abundant upon Koh Samui, but the only other record of its occurrence in the Peninsula is the single specimen obtained by Flower at Penang.

13. *GEHYRA MUTILATA* (Wieg.).

Bangnara, Patani.

14. *GECKO VERTICILLATUS* Laur.

Klong Wang Hip, Nakon Sitamarat.

15. *GECKO MONARCHUS* (Dum. & Bib.).

Bangnara, Patani. 1 young specimen.

Has not been met with elsewhere in Siam. Further north it is replaced by *G. verticillatus*.

AGAMIDÆ.

16. *DRACO VOLANS* Linn.

Tanjong Mas and Bangnara, Patani, many specimens; Nakon Sitamarat, 2 specimens.

17. *DRACO MACULATUS* (Gray).

Klong Wang Hip, Nakon Sitamarat; 1 specimen.

D. maculatus is to Siam, what *D. volans* is to the Malay Peninsula, the common flying lizard of the country. *D. volans* has not been met with north of Nakon Sitamarat, and although *D. maculatus* is recorded from as far south as Singapore, it appears to be extremely rare in the Peninsula.

18. *DRACO FIMBRIATUS* Kuhl.

Bangnara, Patani, 9 ♂, 3 ♀; Cheup Valley, Tanjong Mas, Patani, 1 ♀; Khao Wang Hip (lower camp), Nakon Sitamarat, 1 ♀.

The species is said to be rare in the Peninsula, but from the

number of specimens obtained at Bangnara, it was apparently not uncommon there. The caudal crest is well marked in most of the males, but in all the females it is absent. Nearly all the specimens have some scattered patches of enlarged scales upon the dorsal surface of the body, the most constant one being a large patch at the base of the tail. In the individual from Nakon Sitamarat, these patches were extremely numerous, and occupied nearly half the dorsal surface of the body.

Dimensions of the largest, a ♂ from Bangnara; head and body, 110 mm., tail 175.

Colouration of the Bangnara specimens (in spirits); light grey above, with small scattered spots of intense black; some with faint but regular wavy transverse markings.

19. DRACO PUNCTATUS Bouleng.

A single ♂ specimen of this little known Draco was obtained at Bangnara, Patani. It agrees entirely with the description. The specimen was obtained almost at sea level, at the foot of some low hills to the west of Bangnara. The other two specimens obtained in the Peninsula, were both found at a considerable altitude.

20. DRACO BLANFORDI Bouleng.

Khao Wang Hip (upper and lower camps), Nakon Sitamarat, 5 ♂, 1 ♀.

The specimens obtained upon this hill were unusually fine. The largest, a ♂, measured 140 mm. from snout to vent, with a tail of 245 mm. The single ♀ was considerably smaller; snout to vent 115, tail 190.

21. DRACO FORMOSUS Bouleng.

Tanjong Mas and Bangnara, Patani, 10 ♂, 1 ♀; Khao Wang Hip, Nakon Sitamarat, 1 ♂, 4 ♀; Maprit, Patiyu, 14 ♂, 2 ♀.

On Khao Wang Hip they were obtained at all elevations. In all the specimens from that locality the black bars upon the parachute are much more distinct than in those obtained from the other three localities.

It is stated in the description of this species that the throat of the female is dark green. I have not had the opportunity of examining any of my specimens during life, but have been able to see them, in most cases, soon after their immersion in spirit, and whilst the

colours were still quite fresh. In all of the females the throat was maroon or crimson, as in the male, a little paler perhaps, but not much, and certainly never green. The gular pouch in the female is represented by a short tag.

22. *DRACO MELANOPOGON* Bouleng.

Khao Wang Hip, Nakon Sitamarat, 7 ♂, 2 ♀.

Largest, a ♂, head and body 80 mm., tail 170. The neck, shoulders, and upper surface of the limbs of all these specimens have a handsome slate-blue lustre. The species is not known north of this latitude.

23. *DRACO QUINQUEFASCIATUS* Gray.

Tanjong Mas and Bangnara, Patani. 5♂, 2♀.

It is noticeable in the series of *Dracos* just named, that the number of males obtained is considerably in excess of the females. Whether this is due to the more active habits of the former, whereby it comes more frequently under notice, or to the actual preponderance of one sex over another, it would be of interest to find out.

24. *ACANTHOSAURA ARMATA* (Gray).

Smith, Journ. Nat. Hist. Soc. Siam, II, p. 53.

Bangnara, Patani; Khao Wang Hip (upper and lower camps), Nakon Sitamarat; Maprit and Klong Bang Lai, Patiyu.

Numbers of this common and very variable jungle-loving lizard were obtained from the localities above mentioned. On Khao Wang Hip it was evidently quite common, as no less than 19 specimens were obtained there, and the variations in the length of the post-orbital and nuchal spines in this large series have already been recorded (*antea* p. 53). With these before one, all of which were from the same locality, it was evident that *A. crucigera*, which had been separated from *armata* by Mr. Boulenger on account of the length of these spines, was not a separate species, but merely an individual variation of the latter. I have referred this point to Mr. Boulenger, and he quite agrees with the decision.

In colouration these specimens were also extremely variable. Grey, brown, sometimes almost black, with dark marblings and patches on the back and sides, the most constantly present of these being a large diamond-shaped one across the back between

the shoulders, and a triangular patch on either side of the head, enclosing the eye. Upper surface of the head in most of them, light greenish-yellow, with, or without dark cross-bars. Usually some light green or grey patches on the flanks. Some with a strong tinge of red upon the back. Belly in some, spotted with black. Tail alternately barred with light and dark.

The nuchal crest in one, is continuous with the dorsal. Some of the specimens, both from Nakon Sitamarat and from Patiyu, have a slight but distinct gular sac.

25. *CALOTES CRISTATELLUS* (Kuhl).

Bangnara, Patani, and Klong Bang Lai, Patiyu, 3 specimens.

I have obtained this lizard along the Western boundary of Siam as far north as Lat. $14^{\circ} 50'$, but it is evidently rare in the northern part of the Peninsula.

26. *CALOTES VERSICOLOR* (Daud.).

Bangnara, Patani, and Klong Wang Hip, Nakon Sitamarat.

27. *CALOTES EMMA* Gray.

Patani and Nakon Sitamarat.

28. *LIOLEPIS BELLIANA* (Gray).

Bangnara, Patani.

VARANIDÆ.

29. *VARANUS NEBULOSUS* (Gray).

Patani, Nakon Sitamarat and Patiyu.

30. *VARANUS SALVATOR* (Laur.).

Patani and Nakon Sitamarat.

LACERTIDÆ.

31. *TACHYDROMUS SEXLINEATUS* Daud.

Maprit and Klong Bang Lai, Patiyu, Klong Wang Hip, Nakon Sitamarat, and Bangnara, Patani.

The sexes in adult life can be easily distinguished, the male being more strongly coloured than the female. The light dorso-lateral band, with its black edging, is inconspicuous or almost absent in the female, and the general colour is distinctly paler. Young ones resemble the female in colouration.

In captivity these lizards soon become tame. I have not found the tail brittle, as has been stated.

SCINCIDÆ.

32. *MABUIA MACULARIA* (Blyth).

Bangnara, Patani, 5 specimens; Nakon Sitamarat, 5 specimens; Maprit and Klong Bai, 6 specimens.

This lizard appears to be not uncommon in the northern part of the Peninsula, although it is rare further South. Elsewhere in Siam it is quite common. One of the specimens was taken near the top of Khao Wang Hip, but it is unusual to find this species ranging at any elevation.

33. *MABUIA MULTIFASCIATA* (Kuhl).

Specimens of this common skink were obtained at all the localities visited.

34. *MABUIA PRAESIGNE* (Bouleng.).

Smith, Journ. Nat. Hist. Soc. Siam, II, p. 55 (1916).

Khao Wang Hip (upper camp), Nakon Sitamart, 2 adults, 1 young one.

In all three specimens there is a small extra shield interposed between the frontal and the frontoparietals. In one, the parietals are not in contact.

35. *LYGOSOMA TERSUM* M. A. Smith.

Journ. Nat. Hist. Soc. Siam, II, p. 44.

Khao Wang Hip (lower camp), Nakon Sitamarat, 2 specimens.

36. *LYGOSOMA MACULATUM* (Blyth).

Maprit and Patiyu, 4 specimens.

38 scales round the body. The lateral band is broad and jet black, interrupted, in one of the specimens, by white spots.

37. *LYGOSOMA OLIVACEUM* (Gray).

Bangnara, Patani, 1 specimen.

38. *LYGOSOMA BOWRINGI* (Günth.).

Bangnara, Patani, 3 specimens.

39. *LYGOSOMA HERBERTI* M. A. Smith.

Journ. Nat. Hist. Soc. Siam, II, p. 45.

Khao Wang Hip (lower camp), Nakon Sitamarat, 1 specimen.

40. *LYGOSOMA VITTIGERUM* Bouleng.

Smith, Journ. Nat. Hist. Soc. Siam, I, p. 154.

Klong Bang Lai, 2 specimens.

In these specimens, as in all those that I have seen from other parts of Siam, there is a pale dorso-lateral stripe in addition to the vertebral one. It commences above the eye, and terminates near the posterior part of the body. It is narrower than the vertebral stripe and is less clearly defined, its outer border of black being distinct only anteriorly.

41. *LYGOSOMA MELANOSTICUM* Bouleng.

Fauna Brit. Ind. Reptiles, p. 199.

Khao Wang Hip Hip (upper camp) Nakon Sitamarat, 7 specimens.

The type specimens of this lizard are from hills in Northern Tenasserim, between 3,300 and 4,000 ft. high. My specimens differed from them in several small details, and the following remarks supplement Mr. Boulenger's original description of this species.

Praefrontals separated or forming a median suture. Frontal shorter than the frontoparietal and interparietal together. Nuchals small or absent. 36 to 38 (36 in one specimen only) scales in mid-body. 16 to 20 subdigital lamellae.

Colour (in spirits). Above, light or dark brown, with small black spots which are mostly collected in the mid-line. Starting from the nostril and continued above the tympanum along the upper half of the flank to the base of the tail, is a black band, indented and spotted with very light brown; lower half of the flank, white, with small black specks; below, white. Limbs and sides of tail, speckled with whitish. Lips with dark bars at the sutures.

42. *LYGOSOMA CHALCIDES* (Linn).

Nakon Sitamarat, 1 specimen; Bangnara, Patani, 8 specimens.

43. *LYGOSOMA ANGUINOIDES* Bouleng.

Journ. Nat Hist. Soc. Siam, I, p. 67.

Maprit and Kang Lai, Patiyu, 4 specimens.

All of them were taken beneath fallen timber. Largest, head and body, 69 mm., tail 64.

To Mr. Boulenger's original description of this species which

was drawn up from a single specimen, the following may be added. Rostral in contact with the frontonasal, or shut off by the nasals. Three or four supraoculars, five or six upper labials. The type is from Bangtaphan, but neither in a second specimen from this locality, nor in any of the four from Patiyu, is the 1st supraciliary in contact with the frontal. One specimen has only 22 scales round the middle of the body.

OPHIDIA.

TYPHLOPIDÆ.

44. *TYPHLOPS LINEATUS* Boie.

Bangnara, Patani.

This species has not been met with farther north.

45. *TYPHLOPS NIGROALBUS* Dum. & Bib.

Bangnara, Patani, 4 specimens.

Three of them have 25 scales in mid-body, the other, 24.

XENOPELTIDÆ.

46. *XENOPELTIS UNICOLOR* Reinw.

Bangnara, Patani, and Klong Wang Hip, Nakon Sitamarat.

COLUBRIDÆ.

47. *POLYDONTOPHIS GEMINATUS* (Boie).

Bangnara, Patani.

The largest specimen measures 460 mm. in total length, tail 185. A still larger one is 320 mm. in body length, but has the tail broken. Mr. Aagaard tells me it is a common snake upon the estate. North of the Peninsula it is replaced by *P. collaris*.

48. *TROPIDONOTUS PISCATOR* (Schneid.).

Bangnara, Patani and Klong Wang Hip, Nakon Sitamarat.

49. *TROPIDONOTUS SUBMINIATUS* Schleg.

Bangnara, Patani, and Klong Wang Hip, Nakon Sitamarat.

This snake, appears to rare in the Peninsula, but is very common further North.

50. *TROPIDONOTUS CHRYSARGUS* Schleg.

Maprit and Klong Bang Lai, Patiyu, 2 specimens; Khao Wang Hip (upper and lower camps), 3 specimens.

A very variable snake in colouration. Not one of the specimens obtained was exactly like the others.

51. *TROPIDONOTUS TRIANGULIGERUS* Boie.

Khao Wang Hip (lower camp), Nakon Sitamarat. Klong Bang Lai, Patiyu.

This snake, common in the Peninsula, has not been found north of Patiyu.

52. *TROPIDONOTUS NIGROCINCTUS* Blyth.

Günther, Rept. Brit. Ind., p. 269 (1864); Blgr. Fauna Brit. Ind. Rept., p. 346 (1890); idem, Cat Sn. Brit. Mus., I, p. 255 (1893); Smith and Kloss, Journ. Nat. Hist. Soc. Siam, I, p. 244 (1915).

Klong Bang Lai, Patiyu, 1 half-grown specimen.

Colour (in spirits). Above, olive-green anteriorly, brownish-green posteriorly, with narrow black cross bands (33 upon the body) which are often interrupted vertebrally. Nape with a broad pale (? pink) band extending on to the sides of the head as far as the eyes, and succeeded by an equally broad band of black; an oblique streak below the eye and another behind it. Below whitish; hinder part of belly and tail thickly powdered with grey.

The pale (? pink) band across the nape is a juvenile character; in half-grown individuals it may be still well marked, but disappears entirely in adult life. Günther mentions the presence of this band in his description, but in the Fauna of British India, and in the Catalogue, it is omitted.

53. *TROPIDONOTUS INAS* Laidlaw.

Khao Wang Hip (upper camp), Nakon Sitamarat, 1 ♂ specimen.

The type and hitherto only known specimen of this snake was obtained by the Skeat expedition to the Malay Peninsula in 1899-1900.

To Mr. Laidlaw's original description the following may be added:—Frontal longer than its distance to the end of the snout; 3 post-oculars; 9 upper labials, fourth to sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior; scales keeled, the outer row not quite as strongly as the others. Ventrals 148, subcaudals 103. Total length 380 mm., tail, 120. Maxillary teeth, 24 in number.

Colour (in spirits). Above, very dark olive brown, with in-

distinct black spots, and a series of small yellow spots on either side in the anterior part of the body. Lips white, with black spots; a yellowish-white streak from the gape to the lateral yellow spots. Below white, with a squarish black spot at the outer margin of each ventral shield, these spots being more or less confluent with each other and with the colour upon the flanks. Head above, light brown, with lighter and darker variegations. Tongue black, with a yellow bar at the fork.

54. *MACROPHISTODON RHODOMELAS* (Boie).

Khao Wang Hip (lower camp) Nakon Sitamarat, 1 specimen.

This species has not been found north of this locality.

55. *LYCODON LAOENSIS* Günth.

Bangnara, Patani and Klong Wang Hip, Nakon Sitamarat.

Ventral count of the Bangnara specimen, 170.

56. *LYCODON SUBCINCTUS* Boie.

Mocquard, *Les Reptiles de L'Indo-Chine*, p. 47 (1907).

Bangnara, Patani, 1 specimen.

I have not met this species further north, nor does Boulenger mention that it occurs north of the Peninsula. Mocquard, however, records it from Indo-China, and if this is so, it should be found elsewhere in Siam.

57. *ZAOCYS CARINATUS* (Günth).

Bangnara, Patani, 2 specimens; Khao Wang Hip (lower camp), Nakon Sitamarat, 1 specimen.

Previously recorded in the Peninsula only from Singapore and Perak, the range of this fine snake is now considerably extended.

58. *ZAMENIS KORROS* (Schleg.).

Patani and Nakon Sitamarat.

59. *COLUBER MELANURUS* Schleg.

Günther, *Rept. Brit. Ind.*, p. 245 (1864).

Bangnara, Patani, 1 specimen.

The distribution of this snake is stated to be from S. China and Burma to the Malay Peninsula and Archipelago. In the Peninsula it is generally distributed, but I have never met with it in Siam, in spite of constant collecting all over the country, except in the locality above mentioned. In the Catalogue of Snakes in the British

Museum there is a specimen labelled China, presumably the one referred to by Günther as "said to be from China." All the others in the collection are from the Malay Peninsula and Archipelago. Mocquard does not mention it in his list from Indo-China. Unless, therefore, other specimens have since been obtained to support the statement, it would appear probable that this snake does not range north of the Malay Peninsula.

60. *COLUBER RADIATUS* Schleg.

Bangnara, Patani, Singgora.

61. *COLUBER OXYCEPHALUS* Boie.

Bangnara, Patani, 1 specimen.

62. *DENDROPHIS PICTUS* (Gmel.).

Patani and Nakon Sitamarat.

63. *DENDROPHIS FORMOSUS* Boie.

Bangnara, Patani, 1 specimen.

64. *DENDRALAPHIS CAUDOLINEATUS* (Gray).

Cat. Snakes. Brit. Mus., II, p. 90 (1894); Wall, Poison. Terrest. Snakes Brit. Ind. Domin., p. 17 (1913), footnote.

Bangnara, Patani, 1 specimen.

It has not been obtained elsewhere in Siam. The distribution which is recorded of this snake, as having been found in Southern India, but otherwise not outside the Malayan region, is remarkable. The Indian record is based, I believe, on Col. Beddome's specimen from Wynad, Malabar, but as Wall has now shown, quite a number of snakes recorded by the Colonel as coming from S. India, do not belong there.

65. *SIMOTES PURPURASCENS* (Schleg.).

Bangnara, Patani, 4 specimens.

All of them have 19 rows of scales in mid-body. I have not met with this snake in any other part of Siam.

66. *PSEUDORHABDIUM LONGICEPS* (Cantor).

Bangnara, Patani, 9 specimens.

Mr. Aagaard tells me it is a common snake upon the estate. A female obtained in July contained 2 eggs, narrow and much elongated. The species is not known further north.

67. *CALAMARIA VERMIFORMIS* Dum. & Bib.

Bouleng. Cat. Snakes, II, p. 333 (1894).

Colour. Above, very dark purplish-brown, the colour ending in a clear line of demarcation two rows of scales above the ventrals. Upper labials, throat and belly, yellow, with broad dark transverse bars, which commence behind the neck, and are confined to the ventral scales. This presumably is Var. D. of the Catalogue.

The only other recorded locality for this snake in the Peninsula is the Larut Hills, Perak, at 4,000 ft. and the three specimens in the Selangor Museum from this locality, also belong to Var. D.

Var. F. is a further development of Var. D., in which the yellow interspaces between the transverse bands have been filled in, so as to make the belly entirely dark. This form in the process of making is shown in one of my specimens, as well as in two of those in the Selangor Museum, by a certain amount of dark mottling in each yellow interspace.

HOMALOPSINÆ

68. *HYPSIRHINA PLUMBEA* (Boie).

Bangnara, Patani.

69. *HYPSIRHINA ENHYDRIS* Schneider.

Bangnara, Patani.

70. *HOMALOPSIS BUCCATA* (Linn.).

Bangnara, Patani.

DIPSADOMORPHINÆ

71. *DIPSADOMORPHUS DENDROPHILUS* (BOIE).

Bangnara, Patani, 2 specimens; Khao Wang Hip (lower camp), Nakon Sitamarat, 1 specimen.

The species has not been met north of the last named locality. Like *D. cyaneus*, it will devour other snakes. One of the individuals from Bangnara, had eaten a *Chrysopalearia ornata* some 4 inches longer than itself.

72. *DIPSADOMORPHUS CYNODON* (Boie).

Bangnara, Patani, 1 specimen.

It accords very closely with var. B. in the Catalogue.

73. *PSAMMODYNASTES PULVERULENTUS* (Boie).

Patani and Nakon Sitamarat.

74. *DRYOPHIS PRASINUS* Boie.

Bangnara, Patani.

75. *CHRYSOPELEA ORNATA* (Shaw).

Bangnara, Patani, 1 specimen.

Found, as already mentioned, in the stomach of *D. dendrophilus*.

ELAPINÆ

76. *BUNGARUS FASCIATUS* Schneid.

Bangnara, Patani, 2 specimens.

One of them is interesting in that it shows, in most of the yellow bands, a slight amount of subdivision by central mottling, similar to that which may be found in the allied *B. candidus*.

77. *NAIA TRIPUDIANS* Merrem.

Bangnara, Patani.

78. *NAIA BUNGARUS* (Cantor).

Bangnara, Patani.

79. *DOLIOPHIS BIVIRGATUS* (Boie).

Bangnara, Patani, 1 specimen.

80. *DOLIOPHIS INTESTINALIS* (Laur.).

A single specimen of this snake (var. *trilineatus*), was found dead on the summit of Khao Wang Hip.

AMBLYCEPHALIDÆ.

81. *AMBLYCEPHALUS MOLLENDORFFI* (Boettg.).

Bangnara, Patani.

Mr. Aggaard tells me it is a common snake upon the estate. One specimen has 57 sub-caudal shields only.

82. *AMBLYCEPHALUS CARINATUS* Boie.

Blgr. Cat. Snakes Brit Mus., III, p. 445; Barbour, Mem. Mus. Comp. Zool. Harvard, XLIV, p. 138 (1912).

This snake has already been recorded from Cochin-China, Burma, and Java, and its occurrence in Siam and the Peninsula was to be expected.

Ventrals in one specimen, 190; subcaudals in another, 82. In other respects they agree entirely with the description. Barbour's

suggestion that this species would be found to be a highland form is not supported by its distribution in Siam.

83. *ANCISTRODON RHODOSTOMA* (Boie).

Smith, Journ. Nat. Hist. Soc. Bombay, XXIII, p. 788.

Klong Wang Hip, Nakon Sitamarat ; Bangnara, Patani.

Mr. Aagard tells me this snake is one of the commonest upon the estate. It is so numerous he says, that on some occasions, when weeding, the coolies have killed as many as eight or ten in the course of a day. It is much feared by them on account of its sluggish habits, as it will not move out of the way when disturbed, and if approached too closely, bites readily. From the accounts which he has given me of men who have been bitten, I gather that the poison is entirely local, and very similar in its action to that of *Lachesis gramineus*. It is perhaps somewhat more powerful, for whereas in many cases of bite from the latter, the symptoms are so trivial as not to require any treatment, in all the cases quoted by Mr. Aagaard, there has been considerable pain and swelling for some days afterwards.

The largest specimen I know of is one he obtained, a female, measuring 920 mm. in total length.

84. *LACHESIS WAGLERI* (Boie).

Bangnara, Patani, 1 specimen.

I have not heard of this snake being found further North.

85. *LACHESIS GRAMINEUS* Shaw.

Bangnara, Patani.

BATRACHIANS.

RANIDÆ.

1. *OXYGLOSSIS LIMA* (Gravenh.)

Klong Wang Hip, Nakon Sitamarat.

2. *OXYGLOSSIS LAEVIS MARTENSI* Peters.

Klong Wang Hip, Nakon Sitamarat, 1 specimen ; Maprit and Klong Bang Lai, Patiyyu, 4 specimens ; Bangnara, Patani, 4 specimens.

The reasons for considering the continental form of this frog to be entitled to rank as a distinct race from the Archipelagic one, have been given elsewhere in this number of the Journal.

3. *RANA DORIAE* Bouleng.

This frog was fairly common on Khao Wang Hip, and was obtained both at the foot of the hill, as well as at varying elevations on the hill.

4. *RANA LIMBORGI* W. Slater.

P. Z. S., 1892, p. 344

Maprit and Klong Bang Lai, 13 specimens; Klong Wang Hip, Nakon Sitamarat, 1 specimen.

The type specimen of this frog, a solitary one, was obtained in Tenasserim. In Patiyu it was apparently fairly common, as evidenced by the number of specimens obtained there; and I have since examined others from the hills near Prae, in Northern Siam, where it also appears to be common.

My specimens differ from the original description in the following points:—Canthus rostralis, although obtuse, distinct, loreal region oblique and slightly concave, nostril nearer the tip of the snout than the eye, tympanum $\frac{2}{3}$ to $\frac{3}{4}$ the diameter of the eye, the tips of the fingers and toes dilated into small, but very distinct, discs. No lateral fold.

Colour. Greyish or brownish, usually with black specks and larger, dark markings. A dark band passing through the nostril, the eye, and along the supra-tympanic fold. Hind limbs with narrow cross-bars. Some with a yellow vertebral line. Lips with dark vertical bars. Below, whitish or yellowish; throat sometimes speckled with brown. Largest, from snout to vent, 33 mm.

5. *RANA MACRODON* Dum. & Bib.

Khao Wang Hip (upper and lower camps), 5 specimens; Maprit and Klong Bang Lai, Patiyu, 17 specimens.

6. *RANA LIMNOCHARIS* Wiegman.

Ferguson, Journ. Nat. Hist. Soc. Bombay, XV, p. 502, pl. A (1903) tadpole.

Specimens of this common frog were obtained at all the localities visited, except upon the hill.

The tadpole has been described by Ferguson from specimens obtained in Southern India, and as such, it has been quoted by Boulenger in his volume on the Reptiles and Batrachians of the Malay Peninsula.

The tadpole, which I have bred out in Siam, however, is so entirely different from his, that I feel quite sure we cannot be referring to the same creature.

I have verified my own conclusions with specimens taken from widely separated localities, and have kept the young frogs until they were sufficiently big to avoid any mistake in their identification. The result is, I can only conclude that some error has crept into Mr. Ferguson's article, and that he has inadvertently described another species.

DESCRIPTION OF THE TADPOLE.

Head and body ; length one and a half, to one and three quarter times its breadth, snout rounded. Nostrils nearer the tip of the snout than the eye. Eyes towards the upper surface of the head, looking outwards and upwards, about twice as far apart as the nostrils *. Spiraculum sinistral, directed backwards and upwards, nearer the eye than the vent. Anal tube straight, moderately long, opening on the right hand side of the caudal membrane. Mouth, subterminal, beak edged with black, lips with short papillae at the sides, longer ones below, with a distinct gap in the mid-line. Two series of teeth in the upper jaw, the first long and uninterrupted, the second broadly interrupted ; below, three series of teeth, the lowest short, all uninterrupted. Tail nearly, or quite twice the length of the head and body, four times as long as high, tip obtusely pointed ; crests moderate, slightly convex, upper crest twice, or nearly twice, the depth of the lower, not extending on to the back. Toes webbed as in the adult.

Colour (in life). Above, olive, speckled with black ; posterior half of the tail usually with dark bars, or almost entirely black, sometimes reddish ; below white.

Dimensions :—Prae specimens (May). Total length, 33 mm., head and body 12 ; depth of tail 5.5.

Near Bangkok (July). Total length, 42 mm. ; head and body, 14 ; depth of tail, 6.

Rana limnocharis in Siam, breeds throughout the rainy season, and the tadpoles may be obtained in abundance from May to October. They are to be found in small, swampy patches of ground, where the water is quite shallow, and where usually there is plenty of grass and

* More than twice in one brood, less than twice in another.

rushes growing. They feed upon vegetable and dead animal matter. The prominent glandular folds in the skin develop with the protrusion of the fore-limbs, and the young ones on leaving the water resemble their parents in colouration.

7. RANA GLANDULOSA Bouleng.

Bangnara, Patani, where it appears to be not uncommon.

8. RANA MACRODACTYLA Günth.

Bangnara, Patani.

9. RANA ALTICOLA Bouleng.

Rana pipiens, Jerdon, Proc. As. Soc. Bengal, (1870.) p. 88 (name preoccupied).

R. alticola, Blgr. Cat. Bat. Sal. p. 62 (1882); idem. Ann. Mus. Genova (2) XIII. p. 334 1893)

R. tytleri (non Theob.), Blgr, Fauna Brit. Ind. Rept. p. 458 (1890).

R. nigrovittata, part., W. Slater, P. Z. S., 1892, p. 345.

Klong Bang Lai, Patiyu, 6 specimens.

Previously known from the Khasi Hills and Moulmein, this frog is new to the Peninsula.

Colouration. Above, from very light to dark brown; sides of the head and body, darker brown, most strongly marked in front. A white or pink stripe bordering the upper lip. Limbs without dark cross bands or only just apparent. Below whitish, the throat and chest more or less thickly powdered with dark grey. A white median line down the throat. Largest, snout to vent, 52 mm.

10. RANA HUMERALIS Bouleng.

Fauna Brit. Ind. Rept. p. 460.

Khao Wang Hip (lower camp), Nakon Sitamarat, 1 ad. ♂, 1 ad. ♀, 1 young one.

This frog is also new to the fauna of the Peninsula, being previously known only from Burma.

The young specimen is pink above, with dark brown flanks, the two colours meeting in a clear line of demarcation at the dorso-lateral fold, which is itself bright pink. The throat and breast have small dark spots. In the female there are large pinkish patches on the back, flanks and limbs. The male has no pink at all upon it, and agrees entirely with the description in colouration.

11. RANA ERYTHRAEA (Schleg.).

Klong Wang Hip and Bangnara.

12. *RANA NIGROVITTATA* (Blyth).

Smith and Kloss, Journ. Nat. Hist. Soc. Siam, I, p. 249 (1915);

Smith, Journ. Nat. Hist. Soc. Siam, II, p. 42 (1916) tadpole.

Klong Bang Lai. Patiyu, 10 specimens.

Although common in many parts of Siam, this frog appears to be rare in the Peninsula.

13. *RANA LABIALIS* Bouleng.

Khao Wang Hip (lower camp), Nakon Sitamarat, 2 specimens; Maprit and Klong Bang Lai, Patiyu, 4 specimens.

Previously known in the Peninsula as far north as Perak, the range of this frog is now considerably extended.

14. *RHACOPHORUS LEUCOMYSTAX* (Graven.).

Obtained at most of the localities visited.

ENGYSTOMATIDÆ

15. *CALOPHYRUS PLEUROSTIGMA* Tschudi.

A fine series of 28 specimens of this interesting Batrachian were obtained at Klong Bang Lai, in Patiyu. They were found on the banks of the stream, hiding beneath dead herbage or bits of drift-wood.

The hind limb in all these specimens is longer than stated, reaching to between the eye and the nostril, or to beyond the tip of the snout. The snout has a small, but distinct, tip. Toes, $\frac{1}{4}$ to $\frac{1}{3}$ webbed. A glandular fold, similar to the fold along the side of the body, passes along the back of the thighs above the anus.

Colour. Above, light or dark pinkish-brown or pinkish-grey. A dark mark upon the head, commencing between the eyes, and narrowing over the occiput, where it divides into two broad bands which travel backwards to the inset of the hind leg. These bands are beset with large black spots, and either the bands or the spots may be entirely absent, but never both together. A black spot at the inset of the thigh is constant. Sides of the head and body below the lateral fold, dark brown; canthus rostralis, lateral fold, and fold behind the thighs, light pink. Throat, chest, and upper part of abdomen, pink, more or less thickly powdered with grey, and with large white, black-edged spots, which are glandular in structure. Legs with dark cross-bars.

I have taken this frog also at the foot of Khao Seabab, S. E.

Siam, in situations similar to those in which they were obtained by my collectors at Klong Bang Lai. The secretion of their skin is very poisonous, and any other frogs put into a bag with them, rapidly succumb.

16. MICROHYLA INORNATA Bouleng.

Maprit and Klong Bang Lai, Patiye, 14 specimens.

Boulenger gives the length of this frog as 23 mm., and this is usual for Siam, where it is common. Some of the specimens from Patiye are unusually large, two of them measuring 27 mm., in length, and two others 25.*

17. MICROHYLA PULCHRA (Hallow).

Bouleng., Cat. Bat. Sal., p. 165 (1882); Smith, Journ. Nat. Hist. Soc. Siam, II, p. 39 (1916), tadpole.

Maprit, Patiye, 1 specimen.

This frog which is common throughout the greater part of Siam, has not been previously recorded from the Peninsula.

18. MICROHYLA ORNATA (Dum. & Bib.).

Maprit and Klong Bang Lai, Patiye, 4 specimens.

19. MICROHYLA ACHATINA (Boie).

Smith, Journ. Nat. Hist. Soc. Siam, II, p. 37 (tadpole).

Patiye and Patani.

20. MICROHYLA ANNECTENS Bouleng.

Klong Bang Lai, Patiye, 1 specimen.

The only other record of this frog in the Peninsula is from the Larut Hills at about 4,000 feet. My specimen is 20 mm. in length. The dark mark upon the back is hardly distinguishable; head in front of the transverse bar between the eyes, pale grey; there is a very thin, pale, vertebral line. The lips have dark spots, and a black streak runs from behind the eye, above the white one.

21. MICROHYLA BERDMORII (Blyth).

Maprit and Klong Bang Lai, 17 specimens.

22. BUFO MACROTIS Bouleng.

Fauna Brit. Ind., Rept., p. 502.

Muang Sai, Patani, 1 specimen.

* Since writing the above I have seen several more specimens from near Korat, quite as large as those from Patiye.

The distribution of this toad in Siam appears to be very local. Flower found it fairly numerous at Krabin, in S. E. Siam, in 1897, and my collectors who went there last year, found it still numerous. Mr. Gairdner obtained a specimen at Sai Yoke, on the western boundary, and the Patani specimen was found upon a small sandy hill, some 300 feet high, close to the sea-shore.

Colour (of the Patani specimen); dull brown, with irregular scattered black marks, and a few small spots of light yellow. Hind limbs with dark cross bars. Below dirty whitish, with brown speckles.

23. BUFO ASPER Gravenh.

Maprit, Patiyu, 5 specimens; Khao Wang Hip (lower camp), Nakon Sitamarat, 3 specimens.

All of them differ slightly from the description in that the first finger is a little longer than the second, and the toes have two subarticular tubercles. The young are stated to be lighter in colour than the adults, but two quite young ones obtained at Nakon Sitamarat are almost black above.

24. BUFO MELANOSTICUS Schneid.

Patani and Nakon Sitamarat.

25. BUFO PARVUS Bouleng.

Smith, Journ. Nat. Hist. Soc. Siam, II, p. 42 (tadpole).

Khao Wang Hip (lower camp) Nakon Sitamarat; Maprit and Klong Bang Lai, Patiyu.

In all three localities it appeared to be fairly common. The specimens were very variable in colouration. Some were very light brown, others very dark brown, one adult had a strong pink tinge all over the upper surface of the body and limbs. Black spots on the back present in some, cross bars on the limbs indistinct. Below yellowish white, more or less thickly spotted with dark grey. Largest 52 mm., in length.

26. MEGALOPHRYS MONTANA Kuhl.

Khao Wang Hip (upper camp), 2 specimens.

27. MEGALOPHRYS NASUTA (Schleg.).

Tanjong Mas, Patani, 1 specimen.

28. MEGALOPHRYS HASSELTII (Tschudi).

Klong Bang Lai, Patiyu, 2 specimens.

Length, 77 mm.

29. *ICTHYOPHIS GLUTINOSUS* (Linn.).

Klong Bang Lai, Patiye, 15 specimens.

Apparently common in this neighbourhood, being found in the earth along the banks of the stream. Boulenger records it as a hill species, and apparently not common anywhere, but its burrowing habits probably tend to make it appear less numerous than it really is. In Bangkok it is not uncommon. Throughout the rains, and particularly after a stormy night, I seldom fail to see one or more of these creatures lying in the road, having been killed under the impression that it was a snake. A friend of mine once undertook to get one of these creatures for every square metre of earth dug up in his grounds, choosing the land by the side of water. Only four metres were dug, but five specimens were obtained.