

THE POISONOUS LAND SNAKES OF SIAM.

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WITH PLATE 6.

[Adapted from a lecture given before the Society on Dec. 19th. 1922.]

It may be said, and with considerable certainty, that the poisonous species of land snakes which inhabit Siam are now all known. They are 14 in number, out of a total of about 108 species of all kinds which are to be found in the country.

The sea snakes, about 16 species, all of which are poisonous, are not discussed in this article. They are extremely common round the coasts of Siam, but are seldom known to bite anyone. They can be recognized at once from land snakes, by having a broad, vertically flattened, paddle-shaped tail, instead of the usual rounded one. In addition, the ventral scales are, with most species, extremely small or absent, and their powers of locomotion on land feeble in consequence. All snakes found at sea are not sea snakes, several species of harmless water snakes being common inhabitants of the sea coast.

Bangkok itself out of a total of 34 species of snakes has 4 which are poisonous. They are:—The Common Asiatic Cobra, the Banded Krait, Russell's Viper and the Common Green Pit Viper.

Many attempts have been made to draw up some kind of key whereby poisonous snakes in general can be distinguished from harmless ones. None however, are satisfactory, for the reason that there are no special characters by which the two groups can be distinguished. To attempt even to decide the point by examining the teeth is unreliable unless one is experienced, for in some species (*Doliophis*, *Callophis*) the poison fangs are so small that it is not easy to discover them. In other species, the Vipers in particular, the fangs are very large and can be seen at once.

The poison fang of a snake is simply a channelled tooth which serves to convey the poison. The poison is contained in a modified salivary gland, situated on the side of the head, and is conveyed to the tooth by a duct. It is forced there by compression of the muscle over the gland, and in some snakes this compression

can be so strong that the poison is squirted out for a distance of several feet. The fangs are in the upper jaw, on either side in front, and, in the Vipers, are moveable, that is to say they can be erected and depressed at will. When depressed they are covered by a fold of skin and partly hidden from sight.

Snake's teeth are not set in sockets like those of mammals, but are merely attached to the bone. They are continually being shed and renewed, and most poisonous snakes if examined carefully will be found to have two or three fangs on either side in different stages of growth, which will eventually mature and replace the fangs that fall out. For this reason it is impossible to deprive a snake of its teeth for more than a short time, as new ones will always grow up again and succeed those that are taken out. It is often said that snake-charmers extract the fangs of their captives before exhibiting them. This is certainly not true of them all, for I have on several occasions examined their snakes and seen the fangs *in situ*. These men trade probably a good deal upon their knowledge that the Cobra is not really a vicious snake, that it bites more in fear than in anger, and if handled frequently loses that fear. They run risks it is true, but familiarity breeds contempt, and they do not always escape. The snake charmer who came to Bangkok about ten years ago is an instance in point. He was bitten by a Hamadryad or King Cobra, and died in about 6 hours, in spite of his own remedies which he assured everyone were infallible.

The amount of venom which a snake can inject at one bite varies according to circumstances. If the snake has not bitten anything for several days the glands are fully charged. It has been estimated that an adult Cobra, with its glands full, can inject at one bite enough poison to kill ten ordinary people. It follows, that if it is called upon to bite a second time before the glands can be recharged, the dose of venom given will be less, and so on with each successive bite. In illustration of this, there is the remarkable story recorded by Sir Joseph Fayrer of four men who allowed themselves to be bitten by an Indian Krait in the belief that it would do them no harm. They were bitten at night and the snake was goaded on

to do so by hitting it with a stick. The man who was first bitten died before the night was out, the second and third died in the course of the next morning, while the last man to be bitten, after being seriously ill, recovered.

It does not necessarily follow, therefore, that because one is bitten by a poisonous snake that one will die, even if no treatment is given. It has been stated that, as regards the Cobra, some 30 per cent of those bitten do not receive a lethal dose. It has also been shewn, for reasons which cannot be clearly explained, that it is possible to be bitten by a poisonous snake and yet have no signs of poisoning.


The fresh venom, as it comes from the snake, is a slightly thick, pale, yellowish fluid. It dries readily into crystals, and in that state, if kept in sealed bottles away from moisture, will retain its properties for many years.

The poisonous snakes of Siam, by reason of their relationship to one another, may be divided into 4 groups. These are:—

Cobras and Coral Snakes	...	5 species.
Kraits	...	3 species.
Vipers	...	6 species.
Sea Snakes	...	16 species.

The following key, used in conjunction with the description, should be sufficient to identify the species found in Siam. It is not framed to work in any other country. To count the number of scales across the body accurately requires a little practice, but can be easily learned. Illustrations of the most common species here mentioned have already appeared in this Journal (Vol. 1, No. 1 & 2).

Naja naja (The Common Asiatic Cobra).

Siamese.  (Ngu hao).

Colouration somewhat variable. Young specimens usually have the upper parts black, whilst adults are dark brown. Yellowish-brown or olive specimens, however, have been met with, chiefly in the north of Siam. The spectacle mark upon the hood is seldom seen in this country, the usual pattern being a single pale ring. In

KEY TO THE SPECIES.

I. HEAD SHIELDS LARGE; NO LOREAL SCALE; NO PIT IN SIDE OF FACE.

A. Vertebrae not enlarged; subcaudals paired ¹.

- | | | |
|--|----|---------------------------------|
| 25-31 scales across hood, 19-21 across body | .. | <i>Naja naja</i> 2. |
| 19-21 scales across hood, 15 across body | .. | <i>Naja hannah</i> 2. |
| 13 scales across body; subcaudals 21-32. Light brown above, with small black spots, belly in life red | .. | <i>Callophis maculiceps</i> . |
| 13 scales across body; subcaudals 34-53. Blackish-blue above with pale longitudinal lines; head, tail and lower parts red. | .. | <i>Doliophis biringatus</i> . |
| 13 scales across body; subcaudals 15-33. Dark brown above with longitudinal streaks, belly white or yellow, tail red | .. | <i>Doliophis intestinalis</i> . |

B. Vertebral scales enlarged.

- | | | |
|--|----|-----------------------------|
| Scales in 15 rows; subcaudals single. Annulate black and yellow | .. | <i>Bungarus fasciatus</i> . |
| Scales in 15 rows; subcaudals single. Black above with white cross bands; belly white or yellowish | .. | <i>Bungarus candidus</i> . |
| Scales in 13 rows; subcaudals single and double. Black above, head and tail yellow or orange. | .. | <i>Bungarus flaviceps</i> . |

II. TOP OF HEAD WITH SMALL SCALES, OR WITH A PIT IN THE SIDE OF THE FACE BETWEEN EYE AND NOSTRIL.

A. No pit; top of head with small scales, scales in 29-31 rows

.. *Vipera russelli siamensis*.

B. A pit in the side of the face.

a. Top of head with large scales

.. *Ancistrodon rhodostoma*.

b. Top of head with small scales.

Scales in 19-23 rows; ventrals 150-175; colour green.

.. *Trimeresurus gramineus*.

Scales in 25-27 rows; ventrals 160-182; colour purplish-brown

.. *Trimeresurus purpureomaculatus*.

Scales in 21-25 rows; ventrals 127-154; colour green with white or yellow bands.

.. *Trimeresurus wagleri*.

Colour brown with black spots

.. *Trimeresurus monticola*.

some examples this is well marked, in others it is almost entirely absent, or limited to the skin between the scales. Some young specimens have in addition, indistinct pale rings round the anterior part of the body.

The hood of the Cobra is a fold of skin supported by a series of elongated ribs, which are moveable and controlled by muscles.

¹ Except in *Naja hannah* where the anterior ones are usually single.

² Better known to readers of this Journal as *Naja tripudians* and *N. bungarus*. The names now used, however, have been shewn to have priority in nomenclature, and must replace those previously applied.

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When the snake is excited the hood is expanded, In moving about in the ordinary way, in search of food, or when the snake is dead, the ribs are folded down along the sides of the body and the hood is hardly visible.

The Common Cobra has a wide distribution over most of tropical Asia, and is equally at home in the jungle, the padi-field or the vicinity of towns. It may attain a length of 1900 mm., but average specimens seldom exceed 1500 mm.

Naja hannah (The King Cobra or Hamadryad).

Siamese. ช้างเผือก (Chong ang) or งูเห่า (Ngu hao dong).

Young examples are usually black or dark brown above, with conspicuous white or yellow cross-bars or chevrons. In adult life these bars are almost entirely lost and the snake is of a more uniform brown or yellowish colour. An infallible diagnostic point in the Hamadryad is the pair of large scales—the occipitals—which are to be found behind the normal head shields.

The Hamadryad is found throughout Assam, Burma, Siam, Indo-China and a large part of the Malayan region. It is a denizen of the jungle, and is seldom found in the open fields or near towns. It has been known to attain a length of 4650 mm.

THE CORAL SNAKES.

Three species are known in Siam, all of them rare and inhabitants of more or less hilly country. The genus *Doliophis* has a special interest, in that the species which comprise it have the poison glands situated about one-third down the body instead of in the usual position behind the eye.

Callophis maculiceps.

Light bay above, with a distant series of black dots along each side of the back; head and neck black with one or two yellow bands on each side; lower parts red; tail with two black rings.

A small snake, not exceeding 480 mm. in length.

Burma, Siam, Cochin China and Malay Peninsula.

Doliophis bivirgatus

Bluish-black above, highly iridescent; head, tail and lower parts coral-red in life; one or two pale blue lines along each side of the body. Total length 1800 mm.

Burma, Siam, Indo-China and Malay Peninsula.

Doliophis intestinalis.

This snake, as far as Siam is concerned, appears to be confined to the southern part of the Peninsula. The only example I have seen was obtained in the mountains of Nakon Sritamarat and was coloured as follows:—Dark brown above with a scarlet vertebral stripe broken up at regular intervals and bordered with black. Belly yellow, tail red, both with black cross-bars.

Variations from this colouration have been found further south, and three different colour forms are recorded from the Malay Peninsula.

The specimen mentioned above probably marks the northern limit of range of the species. It is found also in Tenasserim, and in the Malay Archipelago. Length up to 580 mm.

THE KRAITS.

Bungarus fasciatus (The Banded Krait).

Siamese. งูสามเหลี่ยม (Ngu sam liem).

Colouration. Broad bands of black and yellow, the bands of equal width and completely encircling the body and tail. Head yellow with a large black mark commencing between the eyes and extending on to the neck. In some Siamese examples the black bands are not always complete across the belly. In the adult snake the tip of the tail is bluntly swollen, not pointed as is usual with other land snakes.

Distribution. India to S. China and the Malay Archipelago. It is a common snake throughout Siam.

The second largest specimen on record was killed in the Bangkok Nursing Home and measured 2900 mm. in length.

The Banded Krait is of a quiet and timid disposition. In spite of its prevalence and wide distribution there is no authentic

record of its having bitten any human being and nothing is known about its poison.

Bungarus candidus.

Very closely allied to, if not identical with, *B. caeruleus* (The Common Indian Krait).

Blackish above with broad white cross-bands, 27-34 in number. Top of head black, the colour continuous with the first black mark on the back; lower parts white. The white dorsal bands may be pure or have a median stippling of black.

A very rare snake in Siam. I know of only one example, from Sriracha. Length up to 1 metre.

Distribution. Siam, Malay Peninsula and Archipelago.

Bungarus flaviceps (The Yellow-headed Krait).

Colouration. Dark brown or black above, head and tail yellow or orange; belly brown or yellowish. A yellow lateral streak may be present. Length up to 1800 mm.

Distribution. Tenasserim, Cochin-China, Peninsular Siam and Malayan region. The only Siamese example I know of was killed in the Nakon Sritamarat mountains. Nothing is known about the poison of this snake.

THE VIPERS.

These are divided into two distinct groups:—(1) The true Vipers, of which the only representative in this country is Russell's Viper, and (2) The Pit Vipers, so called because they have a pit in the side of the face between the eye and the nostril. The function of this pit is unknown.

The Pit Vipers can be recognized by the triangular head and very narrow neck. All are provided with large fangs, in order to enable them to inject their poison deeply into the bodies of their victims, chiefly mice and birds. The poison is almost entirely local in its action, but the shock produced in these small creatures by its entry into vital parts of the body results in almost instantaneous death. Human beings are commonly bitten in the extremities, and

the consequence is not severe. The affected part becomes swollen and painful, but general toxic effects do not occur in an ordinary healthy individual. Some persons experience nothing more than a transient smarting such as might occur from the sting of an insect.

The identification of the Pit Vipers—those with small scales on the top of the head—is often difficult, owing to their variability both in scalation and colouration. The author will be pleased to assist anyone in the determination of specimens, should difficulties present themselves.

Vipera russelli siamensis (Russell's Viper).

Siamese. งูหลามไฟ (Ngu maaw sao).

Colour. Light brown above with three longitudinal series—a dorsal and two lateral—of oval, brown or blackish spots, pale in the centre and edged with white. Between them two more series of small, elongated, seed-shaped spots, of similar colour. Belly white, with small crescentic black spots. Head with symmetrical dark markings, and two light streaks uniting on the snout and diverging behind.

This form of Russell's Viper is found in Central and Eastern Siam. It is not uncommon in the country round Korat, and extends eastwards as far as Formosa. Its southern limit is Bangkok, a specimen having been killed on the Sports Club grounds many years ago.

The largest specimen I know of measured 1320 mm. in total length. The Indian form may attain to 1700 mm. in length.

There is no authentic record of any one in Siam having been bitten by this snake. Death in India, where a fatal dose has been given, usually occurs in about 24 hours.

Ancistrodon rhodostoma.

Siamese. งูปากกะป (Ngu pak kapa).

Reddish, greyish, or pale brown above, with large angular, dark brown, black-edged spots disposed in opposite pairs or alternating; a dark brown vertebral line; lips yellowish or pink, powdered with brown; a broad dark brown, black-edged band, festooned below, from the eye to the angle of the mouth, with a light band above it;

yellowish beneath, uniform or powdered or spotted with greyish brown. Total length 900 mm.¹

Siam, Indo-China, Malay Peninsula, Java. Fairly common in Siam in sandy localities.

***Trimeresurus gramineus* (The Common Green Pit Viper).**

Siamese. งูเขียวหางไหม้ (Ngu khieo hang mai) or หางแดง (hang deng).

Also known as the Green Tree-Viper or Bamboo Snake, its habits being largely arboreal.

Green above, with or without ill-defined blackish cross-bands; usually a white, yellow, blue or red streak along the outer row of scales; end of tail usually brownish; below green, yellow or blue.

Total length 900 mm.

Widely distributed from India and S. China to the Malay Archipelago. Common throughout Siam, and equally at home at sea level or at altitudes of 5000-6000 feet.

***Trimeresurus purpureomaculatus*.**

Not definitely recorded from Siam, but will almost certainly be found along the western coast of the Peninsula.

Colour. Dark purplish-brown or blackish, uniform or variegated with pale green; sides usually pale green or spotted with pale green; olive or greenish-white below, uniform or spotted with black. Some specimens uniform green. Length 980 mm.

Distribution. From the E. Himalayas to the Malay Archipelago.

***Trimeresurus wagleri*.**

Adults usually green above, the scales black-edged, with bright yellow, black-edged cross-bands, or black with yellow cross-bands; head black spotted with yellow; belly bright yellow or yellow and green, the shields black-edged; end of tail black. Young green above, with yellow or white cross-lines edged behind with blue

¹ *Ancistrodon blomhoffii* Boie is recorded from Siam, but I think on insufficient evidence, and it is therefore not included in this list. It is a Chinese species and may perhaps be found in the extreme north of this country.

or purple, or with two dorsal series of small spots or cross-bars of the same colour; a yellow or white line on each side of the head, passing through the eye, edged below with blue or purple; belly white or pale green, with or without black edges to the shields; end of tail usually red or reddish-brown. Total length 980 mm.

A Malayan species extending only into the extreme south of Siam. I have seen a specimen from Bang Nara in Patani.

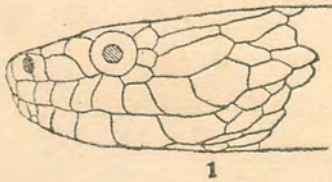
Trimeresurus monticola.

Brown or yellowish above, with one or two dorsal series of large squarish dark brown spots, and a lateral series of smaller spots; head dark brown above, pale brown or yellowish on the sides, with a dark brown temporal streak; lower parts whitish, powdered or spotted with brown, the brown spots sometimes confluent into two stripes. Total length 800 mm.

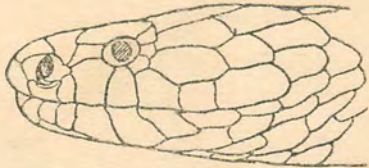
Widely distributed from the Himalayas to Indo-China and the Malay Archipelago. Recorded in Siam from Doi Chieng Dao, N. Siam, at 1750 m., and from the hills west of Chumpon.

EXPLANATION OF PLATE 6.

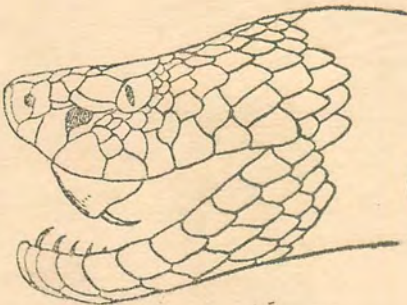
1. Side view of head of *Natrix piscator*, shewing loreal shield present.
2. Side view of head of *Naja hannah* (King Cobra), shewing loreal shield absent.
3. Side view of head of *Trimeresurus gramineus* (Pit Viper), shewing loreal pit.
4. Upper view of head of same shewing small scales on top of head.
5. Upper view of head of *Callophis maculiceps*, shewing normal, large head shields.
6. Section of skin of body of *Bungarus fasciatus* (Banded Krait) shewing enlarged vertebral scales and method of counting the scales across the body. Ventral shields shewn on either side.



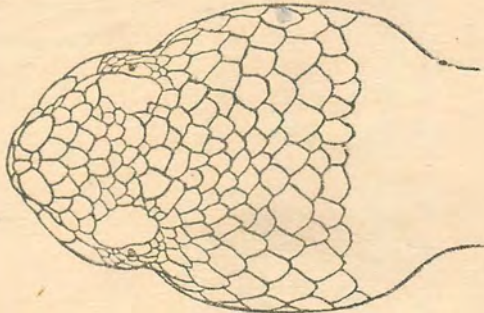
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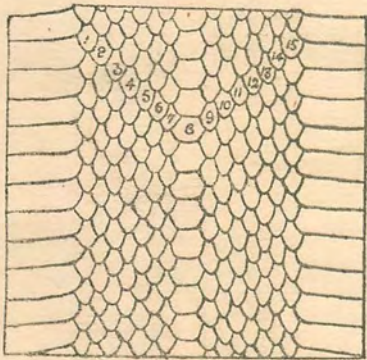
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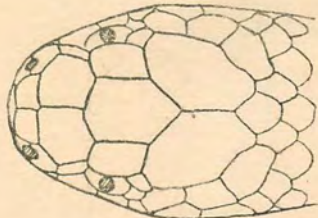
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TO ILLUSTRATE DR. SMITH'S PAPER ON THE POISONOUS LAND SNAKES OF SIAM.

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