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Эта книга является репринтом оригинала, который мы создали специально для Вас, используя запатентованные технологии производства репринтных книг и печати по требованию.

Сначала мы отсканировали каждую страницу оригинала этой редкой книги на профессиональном оборудовании. Затем с помощью специально разработанных программ мы произвели очистку изображения от пятен, клякс, перегибов и попытались отбелить и выровнять каждую страницу книги. К сожалению, некоторые страницы нельзя вернуть в изначальное состояние, и если их было трудно читать в оригинале, то даже при цифровой реставрации их невозможно улучшить.

Разумеется, автоматизированная программная обработка репринтных книг – не самое лучшее решение для восстановления текста в его первоизданном виде, однако, наша цель – вернуть читателю точную копию книги, которой может быть несколько веков.

Поэтому мы предупреждаем о возможных погрешностях восстановленного репринтного издания. В издании могут отсутствовать одна или несколько страниц текста, могут встретиться невыводимые пятна и кляксы, надписи на полях или подчеркивания в тексте, нечитаемые фрагменты текста или загибы страниц. Покупать или не покупать подобные издания – решать Вам, мы же делаем все возможное, чтобы редкие и ценные книги, еще недавно утраченные и несправедливо забытые, вновь стали доступными для всех читателей.

I. ON SEA SNAKES FROM THE COASTS OF THE MALAY PENINSULA, SIAM AND COCHIN-CHINA.

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

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INTRODUCTION.

This paper is based upon collections made during the past seven years. The total number of specimens examined amounts to nearly 900. In addition to those obtained in or near the Gulf of Siam, I have been permitted to study, through the courtesy of the Director of the F.M.S. Museums, several fine collections made in the Straits of Malacca, chiefly off the coast of Perak. I have thus been able to compare large series of several different species from two entirely different localities, and the results have been of great interest.

Most of the specimens have been obtained by native collectors, working in conjunction with the fisher people. Nearly all have been caught at river mouths, where the water is slightly brackish, either by visiting the fishing stakes set a short distance out to sea, at the time of the daily haul, or by obtaining them from the nets or baskets placed within the river mouth. The collections from Pulau Angsa, off the coast of Selangor, from Bangnara, Patani, from Hua Hin, and a small one made at the head of the Gulf of Siam are exceptions to this. They were made in purely salt water, the snakes being caught while trawling, or in an ordinary hand net as they lay on the surface of the water.

Other means than the above of obtaining sea snakes are less productive. Some species are attracted by a light at night, and can be speared or netted. *Enhydris hardwickii* I have often known caught on a hook and line; and a certain number are to be found left on the beach by the receding tide.

Sea snakes can be conveyed long distances alive if attention is paid to their method of transport. They are best kept in a jar or basket and, if not overcrowded and placed in a cool spot with enough water to keep them moist, they will lie almost motionless and live for a week or more. In water they are continually on the move, jostling and disturbing one another. The advantage of obtaining fresh specimens, and of being able to prepare them one's self is considerable, and adds greatly to their value for study purposes.

Out of their native habitat sea snakes are helpless and usually extremely sluggish and unaggressive. Although I have examined many hundreds of them alive, I have never seen one make any attempt to bite except under great provocation. The fishermen in the Gulf, although well aware of the dangerous nature of their bite, have little dread of them, and those that happen to get into their boats with the fish, are picked up by the tail and flung back into the water.

Judging by the numbers of sea snakes that can be seen in the Gulf of Siam and Straits of Malacca when travelling by steamer along the ordinary trade route, it is possible that many new and interesting forms will be found by deep sea collecting. In certain localities, when the sea is calm, they may often be seen in hundreds, chiefly in the early morning and late afternoon, as they lie on the surface of the water, apparently to bask in the sun. As soon as they feel the wash of the steamer, they dive almost vertically downwards and disappear.

At the head of the Gulf where the coast is well sheltered, sea snakes abound; farther down the Peninsula, where it is exposed to the full force of the N. E. monsoon, they appear to be less numerous. Two sheltered spots are an exception to this, namely, the mouth of the Inland Sea, Singgora, and the Bay of Patani.

By systematically collecting at every available spot, it has been possible in course of time to search the whole of the Gulf very thoroughly. The result of this has been to bring out one noteworthy fact, namely, the curiously local distribution of many of the species. Certain forms will be more or less abundant along a small stretch of coast, at one or more river mouths, and almost or entirely absent in other parts of the Gulf. The Perak coast collections shew this same peculiarity, but as they have been made over a much smaller coast line, it is not so marked. It is difficult to assign a reason for this phenomenon. The natural conditions at the mouths of these rivers, generally mud-flats, are apparently identical, so that it would not in any way appear to be governed by the food requirements of these species. It may be that they are estuarine in their habits, and that when they get carried out to sea, as must frequently happen, they perish, either from want of suitable nourishment, or by being devoured by fish or other enemies.

Some good collections made well away from the coast would be of value in helping to elucidate this interesting problem.

This eccentricity of distribution, as well as minor variations in scalation and colour which I have found confined to certain localities only, confirms the view that I have held for some time, namely, that although the range of a species may be very great, that of the individuals comprising it is inclined to be extremely local.

It follows from this that we may expect to find among sea snakes a considerable number of geographical forms. No attempt has yet been made to define races for any of the species, for the reason that few herpetologists have had sufficient material to work upon. Yet it is clear, when a good series can be obtained from one locality, and compared with a series from another, sufficiently remote, that differences can be found. In many cases the difference is not great, and is confined merely to slight variation in the number of scales round the neck and body. A few shew more distinct changes, not only in the number of scale rows but in the relationship of the head shields to one another. Owing to the wide variation which the individuals of a species may exhibit in any one locality, large series are naturally required before the range of variation of any particular race can be defined. It is imperative also, if satisfactory results are to be obtained, that the same methods of examination should be used. For, according to the way in which the scale rows and ventral shields are counted, so will the results differ.

In counting the body scales I have endeavoured to find the minimum and the maximum number of rows. This necessitates several counts at each spot. The minimum is upon the neck, usually from two to three, but sometimes as much as from four to five, heads-lengths behind the head. The maximum is at mid-body or posterior to it. In certain forms, such as *Enhydris*, *Thalassophis*, *Hydrus*, the maximum is usually attained by mid-body, but in most of them, and particularly in the small headed forms, it is not reached until well past mid-body. The ventrals are counted from the first bituberculated shield that can be discovered upon the neck, and all missing ones are allowed for as if they were present.

The range in the number of ventral shields varies considerably. It is greatest in that group of species which are at present defined under "head very small, body very long and slender anteriorly." It will be seen however, upon inspection of the tables given, that while the range of the majority in a series is comparatively limited, a few individuals at either end string it out and add greatly to its number. It is disturbing, after having examined a large series, and obtained what appears to be the range of variation of these shields, to find another example which upsets one's figures to the extent of twenty, thirty, or even more. Some specimens in my collection differ in this respect so

markedly from what appears to be the normal, that I have refrained for the present from making any diagnosis of them. A good illustration of this anomaly will be found under *Hydrophis viperina*, a snake possessing so many unique features that there can be no doubt of its identity.

The measurements of length given are in many cases approximate only. It is impossible with a specimen coiled up and hardened by alcohol to be exact. Where total lengths are concerned a slight discrepancy is of little importance, but in connection with the sexual variation in the length of the tail, it is of considerable value.

A full list of all the specimens examined has not been given in every case. In dealing with large numbers of a common form this has seemed unnecessary. In other instances the specimens had been given away to various Museums before a register of them was undertaken.

The following places are mentioned as having been collected in :—

IN THE GULF OF SIAM.

Meklong or *Meklawng*, *Tachin*, *Bangpakong*, *Chantabun*, *Ban Yao*,—fishing villages at the mouths of the rivers of those names at the head of the Gulf. A reference such as Chantabun implies the mouth of the Chantabun river, not Chantabun town.

Koh Kong, a small island off the coast of Cambodia, just beyond Siamese territory.

Hua Hin, a fishing village on the west side of the Gulf, 80 km. south of the mouth of the Meklawng river, the nearest fresh water to this village being at

Pran, 20 km. south.

Chumpon, *Langsuan*, *Bandon*, *Singgora*, on the east coast of the peninsular portion of Siam.

Bangnara in Patani, and *Trengganu*, on the east coast of the Malay Peninsula.

IN THE STRAITS OF MALACCA.

Kuala Kurau, *Kuala Larut*, *Londang*, on the coast of Perak.

Bagan Datoh, in the estuary of the Perak river.

Pulau Angsa, 8 km. off the coast of Selangor, a purely salt water islet.

Bernam River, Selangor.

Trang, 120 km. south of the island of Puket (Junk Seylon).

IN COCHIN CHINA.

Cap St. Jacques, at the mouth of the Saigon river.

Preliminary diagnoses of *Hydrophis lamberti*, *H. siamensis*, *H. consobrinus* and *H. rostralis* appeared in the Journal of the Natural History Society of Siam, ii, p. 340 (1917). Further study of these forms in the light of additional specimens obtained since that date, have obliged me to modify considerably the remarks I made at that time. The

types of all the species here described will be presented to the British Museum of Natural History, together with a selection from the type series.

In the preparation of this paper I have, above all, to thank Mr. G. A. Boulenger, F.R.S., for the generous help by correspondence which he has so freely given me at all times.

I have to thank also Mr. H. C. Robinson, Director of F.M.S. Museums, and Mr. C. Boden Kloss, for the valuable collections made under their direction, and sent to me from time to time.

I am indebted also to Dr. Nelson Annandale of the Indian Museum, to Messrs. N. B. Kinnear and W. S. Millard of the Bombay Natural History Society, and Dr. Hanitsch of the Raffles Museum, Singapore, for the loan of specimens in their charge on various occasions.

Mr. C. L. Groundwater I have to thank for his careful drawings of the heads of snakes, and Mr. J. R. Bell for the map.

Hydrus platurus (Linn.).

↪ Boulenger, Cat. Sn. B. M., II, p. 267 (1896) ; idem, Fauna Malay Pen., Rept. and Batr. p. 181 (1912) ; Stejneger, Herpet. Japan, p. 439 (1907) ; Wall, Mem. Asiat. Soc. Bengal, II (8), p. 248 (1909) ; idem, Journ. Bombay N.H.S., XXVI, p. 808 (1919) ; Barbour, Mem. Mus. Comp. Zool. Harvard, XLIV, p. 129 (Nov. 1912) ; N. de Rooij, Rept. Ind. Aust. Archipel., II, p. 224 (1917).

Pelamydrus platurus, Stej., Proc. U. S. N. Mus., 38, p. 111, (May, 1910).

Gulf of Siam, 20 exs. ; Straits of Malacca, 9 exs.

This snake appears to be a strictly marine species. All the specimens referred to above were taken in purely salt water. The Gulf series was caught with a dip net while lying on the surface of the water, and was taken one morning while off the coast between Hua Hin and Koh Lak. Altogether some 50 individuals were seen. With the exception of a few specimens of the common *Enhydris hardwickii*, they were the only snakes noticed. Although I spent the succeeding week in cruising down the same coast, going as far South as Lat. 9° (Bandon) for the express purpose of collecting sea snakes, I did not meet afterwards with more than half a dozen snakes of any kind. The weather conditions were the same throughout.

Colouration.—(Gulf series). Black above, yellow to dark brown on the sides and below, the two colours meeting in a clear line of demarcation. Tail with black dorsal and ventral bars ; sometimes with a few spots as well. Upper lip the same colour as the sides of the body.

Some of the darker examples have a yellow stripe separating the black of the back from the brown of the under parts. The amount of black upon the back is variable in width, occupying from 11 to 18 scales, but in no instance is it narrow enough to deserve the name of vertebral band. All of this series belongs to Boulenger's vars. D and E, and they are merely variations of the same

colour form (*bicolor*), the yellow merging by every degree of intensity into brown.

(Straits of Malacca series). Two out of the nine examples obtained (Nos. 3903, 3915) are coloured as above, but the remaining seven are quite different. They have a narrowish black dorsal band occupying about ten scales, while the rest of the body is yellow, thickly spotted with black. In the fore-part of the body the upper spots have coalesced to form a narrow stripe, so that there is alternately a dorsal band, a narrow yellow stripe, and then a black one. The dorsal band in the hinder part of the body is sinuous in out-line or is broken into large spots. Tail thickly spotted, with the central or ventral part entirely black. In some examples the whole head is dark brown or black.

I regard these as Boulenger's form B (*Jan's maculata*). They shew no tendency whatever to intergrade with the previous form.

In addition to the difference in colour, the Straits series shews a higher average number of scale rows round the neck and body, than those from the Gulf. The variation is as follows : —

GULF OF SIAM.

39 to 50 round the neck ; 48 to 60 round the body.

STRAITS OF MALACCA.

44 to 55 round the neck ; 52 to 68 round the body.

The question of racial distinction in this widely distributed snake is a complex one. Boulenger describes seven colour varieties, but does not attempt to connect them in any way with geographical areas. Barbour, with the additional material available in the Harvard College Museum says "nine easily distinguishable color phases may be recognized." Six of these, he adds, occur in and about the Bay of Panama.

I do not think he has sufficiently proved that his *Hydrus platurus ornatus* is entitled to subspecific rank. Its habitat he defines as the East Indian Archipelago, and his own specimen (No. 938) came from Singapore. But, as shewn by my two series, we may expect to find in the same locality at least three other colour forms, namely, Boulenger's B. D. and E.

Hydrophis lamberti Smith.

Journ. N. H. S. Siam, ii, p. 340 (1917).

Description of the type.—Head rather large, neck thick, body moderately elongate. Eye a little larger than its distance from the mouth ; rostral considerably broader than deep, the portion visible above equal to one-third the length of the internasal suture ; frontal once and a half as long as broad, much shorter than its distance from the

rostral ; one prae- and two postoculars ; two superposed anterior temporals ; eight supralabials, the 2nd in contact with the praefrontal, 3rd and 4th touching the eye ; three or four infralabials in contact with the anterior chin-shields ; no distinct posterior pair. 45 scales round the neck, 55 round the thickest part of the body, * those anterior feebly imbricate, elongate, with truncated apex, and feebly keeled, those posterior, hexagonal and subimbricate, with a short central keel ; ventrals distinct throughout, 281, bicarinate ; subcaudals, 43.

Pale yellowish-grey above, whitish below, with 30 dark dorsal rhombs on the body, tapering to a point on the sides ; tail with 4 bars and a dark tip. Head above pale olivaceous.

Dimensions.—Total length, 860 ; tail, 80, depth of neck, 18 ; of body, 42 mm.

Dentition.—Posterior maxillary, 10 ; palatine, 10 ; pterygoid, 23 or 24 ; mandibular, 22, (1 specimen examined).

Type.—Female, author's number, 1112. Collected at the mouth of the Meklawng river, Inner Gulf of Siam, in Sept., 1916.

Variation.—By fragmentation of the upper extremity of the 3rd supralabial on one side, it is prevented from touching the eye. There are no small scales interposed between the infralabials.

A second specimen of this snake, No. 4010, a juvenile, total length 335 mm., differs from the type in the following particulars :—Portion of rostral visible above equal to nearly half the length of the internasal suture ; 7 upper labials ; posterior chin-shields small, separated by four scales ; 302 ventrals ; 38 dark dorsal rhombs.

It was collected at Hua Hin, near the type locality by Mr. S. G. Lambert, after whom I have much pleasure in naming it.

This snake is closely allied to *H. ornatus* (Gray) from which it differs chiefly in the greater number of scale rows round the neck and body.

Hydrophis godeffroyi Peters.

Hydrophis godeffroyi, Peters, Mon. Berl. Ac., 1872, p. 856, p. 1, fig. 3.

Distira godeffroyi, Boulenger, Cat. Sn. B. M., III, p. 291 (1896).

Disteira godeffroyi, Stejneger, Herpet. Japan, p. 430 (1907).

Distira ornata, Wall, Mem. As. Soc. Bengal, II, (8), p. 234 (1909).

Cap St. Jacques, 2 exs.

I have referred these specimens to *H. godeffroyi* as they agree very well, both with Boulenger's description of this

* 35 and 45 scale rows, as given in my preliminary diagnosis, is an error, and is herewith corrected.

species in the Catalogue, and with Stejneger's description of his type from Ishigaki Shima.*

Wall has placed *godeffroyi* under *ornatus*, and in this he may be right. The only reliable character separating these two species appears to be the number of scales round the neck and body, *godeffroyi* having fewer. On the other hand, the only reliable character upon which I can separate my *lamberti* from *ornatus* is also upon the number of scale rows, *lamberti* having more. It is possible that *ornatus* is a very variable species, but it is hardly likely that the range would be so great in one locality. I have never yet seen any specimens of *ornatus* from the Gulf, although they have been recorded, but until I can fill in the large gap which separates my specimens of *lamberti* from *godeffroyi*, I leave all three as they stand. The accompanying table will shew the differences between them.

Variation.—The internasal suture is three times as long as the interpraefrontal in one of my specimens, only once and a half times as long in the other. Three postoculars on one side, two on the other, in each example. Two superposed anterior temporals, the lower one again broken into two by a vertical suture. Seven supralabials in one, eight in the other, the third and fourth touching the eye. Chin-shields subequal, the posterior pair, and also partly the anterior pair, separated by scales. Four infralabials in contact with the chin-shields.

Boulenger states that the scales on the posterior part of the body are juxtaposed. I should term mine feebly imbricate; they are certainly not juxtaposed as the word is meant when applied to such species as *H. gracilis* or *Enhydris hardwickii*.

Colour.—Buffy-white, with 58 and 68 darkish grey dorsal bars upon the body and tail. Head greyish-olive above, white below.

Dentition.—Posterior maxillary, 12 or 13; palatine, 8; pterygoid, 25 to 27; mandibular, 20, (2 specimens examined).

Hydrophis cyanocinctus Daudin.

Hydrophis cyanocinctus, Bouleng., Cat. Sn., B. M., III, p. 294 (1896); idem. Fauna Malay Pen., Rept. and Batr., p. 185 (1912); Wall, Journ. Bombay N. H. S., XXIII, p. 375 (1914), and XXVI, p. 433 (1919); N. de Rooij, Rept. Ind. Aust. Archipel., II, p. 237 (1917).

Disteira cyanocincta, Stej. Herpet. Japan, p. 428 (1907).

Distira cyanocinta, Wall, (part.), Mem. Asiat. Soc. Bengal, II, (8) p. 217 (1909).

40 specimens. Straits of Malacca, 11 ♂, 6 ♀; Gulf of Siam, 6 ♂, 7 ♀; Cap St. Jacques, Cochin China, 6 ♂, 4 ♀.

* I mention type because the tabulated list of the other three specimens given is somewhat confusing. The type has 34 scales round the neck and 43 round the body, an increase of 9. But the next two examples have an increase of only 5 and 1 respectively, while the last has none at all, the count for this individual being 33 for both neck and body. It looks like a misprint, but I have no means of knowing.

I have recently examined the type of *H. tuberculata* Anders., in the Indian Museum, and am in agreement with Wall (Monograph, p. 220) that it should be placed under *cyanocinctus*. It has 31 and 41 scale rows and 312 ventrals.

My largest specimen, a female from the mouth of the Tachin river, is considerably bigger than any previously recorded. It measures 1885 mm. in total length, tail 135.

Considering that the type *H. aspera* Günther, is said to have come from Singapore, a noteworthy feature about most of the specimens is the absence of strong keeling to the scales. The majority are quite smooth in the anterior portion of the body, faintly keeled on the dorsal rows in the posterior part. One example only, a well grown male, is very strongly keeled; on the other hand, another male, half grown, is entirely smooth throughout.

The eye is variable in size but in all the adults is less than its distance to the mouth. In two examples, Nos. 1315, 1318, it is extremely small.

The anterior temporal shields shew considerable variation. Normally there are two, placed one above the other, the suture between them being horizontal. But the suture may be obliquely placed, or even almost vertical, so that the two shields, instead of being superposed, are placed one behind the other. Cuneiform scales between the infralabials are present in all, usually a series after the second.

In the number of scales round the neck and body, the specimens from the Straits of Malacca shew a slightly higher variation than those from the Gulf of Siam. How far they differ, if at all, from the Indian form (type locality Bengal), can only be determined when more exact data from that region are available.

The variation (including 10 embryos), is as follows :—

29 to 35, usually 31 to 33, round the neck.

39 to 47, * usually 41 to 43, round the body.

Ventrals 292 to 377.

Excluding the embryos, the frontal shield is shorter than its distance to the rostral in 3 examples, equal to its distance in 10, greater than in 4. The posterior chin shields are in contact with each other in 4 examples, partly separated in 12, completely separated in 1.

Compared with these specimens, the series from the coasts of Siam and Cochin China shews a slight reduction in the number of scale rows, although in other characters, except possibly in the size of the frontal, it presents no differences. It is as follows :—

* Wall records a specimen with 49 scales at the thickest part of the body, but does not say from where it has come. Journ. N. H. S. Bombay, XXVI, p. 436 (1919).

28 to 33, usually 29 to 31, scales round the neck.

37 to 43, usually 39 to 43, round the body.

Ventrals, 321 to 389.

The frontal shield is as long as its distance to the rostral in 11 examples, longer than in 12, in 9 of these being as long as its distance to the end of the snout. The posterior chin shields are in contact with each other in 12 examples, partly separated in 11.

Colour.—All the young ones taken from the mother referred to below, belong to Boulenger's Var. A of the Catalogue. They are light olivaceous yellow, with from 65 to 80 blackish annuli, broadest on the back and joined together by a strong black stripe running along the belly. Head black, with or without a curved yellow band across the snout behind the nostril, and continued back along the sides of the head. Posterior half of tail, black.

A comparison of these juveniles with the other more grown individuals in the series, shows that the ventral part of the stripe and ventral band gradually disappear with age. In some of the younger specimens, one-quarter and one-third grown, these markings can still be traced, but in the adults they are entirely lost. All of these are best placed under C and D, but between the two no dividing line can be drawn. From the handsome individuals with bold, black or blue-black dorsal bars, to those in which the bars are so obscurely marked as to be hardly recognizable, every gradation can be seen. Head olivaceous or yellowish, sometimes mottled with blackish.

The adult form with complete jet black annuli and ventral stripe which is to be found along the Coasts of India, and which appears to turn up again in the seas around Formosa I have never seen in this region.

Dentition.—Posterior maxillary, 6 or 7; palatine, 7 or 8; pterygoid, 15 to 19; mandibular, 15 or 16, (7 specimens examined).

Breeding.—One pregnant female with 10 fully developed young was caught in May off the Coast of Perak.

Mother.—Total length 1690 mm.; 31 scales round the neck, 42 round the body, ventrals 337.

Young.—Total length, 360 to 380 mm.; 29 to 31 scales round the neck, 39 to 41 round the body. The ventrals could not be counted satisfactorily.

Two other gravid females with their embryos still in an early stage of development were obtained in January and May in the Gulf of Siam. Their broods were 5 and 11 respectively.

Hydrophis melanosoma Günther.

Hydrophis melanosoma, Günther, Rept. Brit. Ind., p. 367, pl. XXV (1864).

Distira melanosoma, Blgr., Cat. Sn. B. M., III, p. 291 (1896).

Distira wrayi, Blgr., Ann. and Mag. Nat. Hist., (7) V, p. 307, (1900).