

NOTES ON TWO EAST AFRICAN VENOMOUS SNAKE POPULATIONS -
ECHIS CARINATUS PYRAMIDUM (Geoffroy), EGYPTIAN SAW-SCALED VIPER
 AND VIPERA HINDII Boulenger, MONTANE VIPER.

By

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Opportunities for intensive regional snake study are unfortunately rare, but when possible the results can be surprising. The density of a population is dependent on environment and climate and, most important, on food supply.

For a number of years Ionides (see Puku 4, in press) has been engaged in the intensive collection of two highly venomous species of snakes Dendroaspis angusticeps (A. Smith), Green Mamba and Bitis g. gabonica (Dumeril and Bibron), Central African Gaboon Viper in southern Tanganyika and with occasional excursions to the southern extremity of Lake Tanganyika for Boulengerina annulata stormsi Dollo, Tanganyika Water Cobra. He has also visited the arid Northern Frontier region of Kenya for Echis and Kenya's Aberdare highlands for Vipera hindii Boulenger.

His carefully compiled records inevitably create the impression that snake-catching, even of large deadly species, is just too easy, but what is really impressive is the extent of populations in these localities; their abundance can be astonishing.

Ionides has a rigid rule that no one but himself is allowed to tackle a deadly species - a wise precaution - thus obviating the possibility of unfortunate incidents to others. He has had many misadventures with poisonous species, but he has never had an accident to himself in the course of catching operations, and the only time an African was bitten - luckily not fatally - was through misunderstanding an order.

Generous rewards provide the necessary information and then direct action is the responsibility of Ionides who, however, always has available African assistance, adept through long experience. Successfully handling deadly species is scarcely an acquired art, it is inherent, and Ionides is a master of his craft.

ECHIS CARINATUS PYRAMIDUM (Geoffroy), Egyptian Saw-scaled Viper.

DESCRIPTION: This is a relatively small snake, rarely attaining a length of two feet, which has a somewhat slender cylindrical body and on the head the typical viper scalation of imbricate, keeled scales.

The colour is light or dull brown with fairly large dark edged spots, and paler below, and a wavy yellowish flank line.

A ♀ measuring 23½ ins. (tail 2¼ ins.) - the largest collected - had a girth of 2½ ins. and weighed 90 grammes.

Two East African Snake Populations

According to Ionides (in litt.) none of the Echis carinatus bore resemblance in bodily shape to a Puff Adder, all being much more slender, although the local Samburu in the Northern Frontier Province seemed to think that Echis are ♀ Puff Adders, and they call both these snakes by the same name ndurububwa which suggests an onomatopoeic origin, the Puff Adder being differentiated as the large ndurububwa. It is worth mentioning that in some parts of Nigeria Echis is believed to be the young of the Puff Adder, and in one vernacular it is called kububua which bears a certain resemblance to its Samburu name. At a rough guess the average length of the numerous adult Echis he captured was about 17 inches.

Breeding. During the three days 16th, 19th and 20th August 1961 eight juveniles (2 ♂♂, 6 ♀♀) were captured, but during the four days 16th to 18th February 1962 no small juveniles were seen; they had presumably all grown up. On 20th August 1961 in two separate localities a pair was found coiled together, and again in August/September 1962 on four occasions a ♂ and ♀ were found beneath the same log. Yet it seems from the results of another trip Ionides made in fourteen days during August-September 1962, when out of 218 captured, no less than 113 were juveniles under 10 inches (and at least another 50 juveniles were seen but not taken), that August-September is the season for Echis bearing young.

Food. No stomachs were examined in August 1961 or February 1962 as all specimens caught were sent away alive, but on 17th February an adult when captured disgorged a partially digested, unidentifiable lizard. Small rodents are said to be common. Over one hundred stomachs examined in August-September 1962 indicated that in this region lizards - 12 specimens each had a Southern Long-tailed Lizard, Latastia longicaudata revoili (Vaillant) in its stomach, one contained a Savanna Variable Skink, Mabuya varia varia (Peters) and in another unidentified lizard remains - are perhaps the main item in its diet. Two others contained unidentified rodent remains, and one had consumed a scorpion (this has also been recorded in India).

Ectoparasites. None were found.

Temperament. Very quick and active when disturbed. Every specimen taken made determined efforts to bite when caught. Ionides draws particular attention to a very characteristic attitude when on the defensive, the body being placed in a sort of C shaped coil. This pose is very frequently adopted by an angry Echis and might even help to identify it.

Corkill (1: 255) refers to this "habit of coiling to a flank with the head threatening to the front" which has inspired one of its vernacular names in the Sudan. i.e. Um Ġenaib (Arabic Ġenab, meaning 'side'). Also, Cansdale (2: 52) "It has a peculiar way of coiling ready for attack; the main part of the body is held in a wide curve, with the neck doubled back."

Habitat. Semi-desert "nyika", with dry low thorny bushes and small, flat-topped, acacia thorn trees, Acacia tortilis (Forsk.) Hayne. The region in which this collecting was done is about 3,000 ft above sea level.

Habits. Nocturnal. The majority were found beneath or inside rotting Acacia tortilis logs. When disturbed, many demonstrated with a "side-winding" motion, at the same time rubbing their saw scales together

and thus producing a remarkably loud and threatening noise. Not all 'rustled' when caught, but the majority did. When annoyed, the head and anterior part of the body is sometimes slightly raised and pointing towards the object threatened, while the posterior part of the body moves from side to side, producing a loud 'rustling'. The strike is delivered and the head immediately returns to the original posture. But more often the strike is effected from the previously described stationary C shaped coil (or lateral loop) position. Ionides did not notice in any case that the anterior part of the body was inflated prior to striking and certainly not markedly so. But on several occasions the strike was so vigorous that the snake appeared to jump forward and upwards (mainly forward). Neither he, nor yet a National Parks Warden who was with him, ever heard Echis hiss, though the loud 'rustling' could render a hiss inaudible. When held by the neck this viper tries to use its fangs by depressing the head, but not by turning it. Owing to the relatively slender neck, it is much easier to hold than Atractaspis (burrowing viper). It should be held by the nape so that the mouth is forced open, for it is when the head is held too far on the neck that it will attempt to embed the fangs in one's finger, by depressing its head as Atractaspis does.

Ionides also mentions that in Northern Darfur, in the Sudan, in 1946, he collected a viper which he believed was an Echis, with part of the body buried in the sand. During his third collecting trip to the Northern Frontier Province of Kenya in August-September 1962, he found two Echis almost entirely buried in sand and several partially buried, but all were also under Acacia logs.

Method of collecting. Ionides was assisted by a couple of Europeans and a number of Africans who scattered and searched, turning over any logs they could find. When a snake was discovered Ionides was called to catch it.

On 16th August 1961, when in a car, a dead snake, an Echis, was observed on the road and an immediate search in the vicinity resulted in the capture of six specimens in about three-quarters of an hour.

Population. Judging from the results of his first two very brief expeditions, one of three days (41 snakes), the other four days (52 snakes) collecting respectively at different times of the year in three separate localities, and a third of a fortnight's duration (218), there must be an abundance of Echis in the regions visited - especially those localities which produced as many as 39, 38 and 32 respectively in one day. A. Duff-Mackay and Jonathan Leakey (in litt.) during the periods 27th October to 11th December, 1962 and 7th January to 13th March 1963 collected alive - the majority eventually released - a total of 6,933 Echis carinatus.

These figures are not so remarkable as would at first appear, for according to Wall (3: 49) Echis carinatus is extremely abundant in parts of what was formerly North-West India (prior to partition) and he refers to its prodigious numbers elsewhere in India as furnished by Vidal (3: 49). In the "Ratnagiri District alone during six years Government rewards were paid on an average of 225,721 Phoorsas (the vernacular name for Echis) per annum" --- "when the Government reward was raised tentatively from six pies to two annas per head, 115,921 were paid for in 8 days (December 2nd to 10th, 1862)". Again, Candy (3: 49) says that in Ratnagiri, in August and September, "the Mhars go out with long sticks to which forks are attached and catch them in

Two East African Snake Populations

thousands for Government rewards."

According to Dr. J.R.H. Pasqual (in litt.), at Makurdi, in the Benue Valley, in Eastern Nigeria, in woodland savanna, Echis carinatus is also abundant, and hundreds were killed in the course of grass-slashing within the Government station. Grass grew rapidly in compounds, when officers were away on tour for a week or a fortnight, and they would then be found to harbour two or three dozen Echis.

Of the initial 93 Ionides captured, 39 or 42 per cent were ♂ and 54 or 58 per cent ♀. But according to the season the ratio of sexes taken varies considerably. During the three days in August 1961, in a total of 41, 14 were ♂ and 27 ♀, i.e. twice as many ♀ as ♂; also, only 15 were adult, and in addition, 9 were fair size, 9 half-grown and 8 juveniles. On the other hand, the 52 examples collected on four days in February are, with one fair size exception, adult. In August 1961 the maximum catch on one day totalled 32, and in February, 23. During the period 25th August to 7th September 1962, the sex ratio of the 218 specimens captured was 78 ♂ and 140 ♀, disparity which Ionides is unable to explain. But it confirms what has already been noted at this time of the year that the ♀ to ♂ are in the ratio of about two to one. Also, at this time of the year there is a preponderance of subadults and juveniles, for out of the 218 taken only 35 were fully adult, 70 were subadult and half grown (all over 10 inches) and 113 were juveniles under 10 inches. Ionides suggests that Echis probably attains adult size within six months, which would account for his February catch being almost entirely adult, in contrast to the very high proportion of juveniles and subadults taken in August - September.

Climate. Despite the intense heat which prevailed from about 9.0 a.m. till sundown, a strong cold wind blew from sundown till 9.0 a.m. or even later.

General. Owing to its exceptional size it is worth mentioning that in the course of searching for Echis, a ♀ Sitis arietans arietans (Merrem) was caught which measured 5 ft 1½ ins. (tail 4¼ ins), girth 12½ ins., and weighed (empty) 13 lbs. 4 ozs. Before weighing, a partially digested adult Springhaas or Jumping Hare, Pedetes surdaster Thomas was squeezed out of her stomach. In the course of the seven days intensive collecting when 93 Echis were obtained only two Puff Adders were found. Later, during a further fourteen days hard collecting, when 218 Echis were collected and at least another 50 seen but not taken, only two juvenile and two adult Puff Adders were found. One an adult, a ♀, measuring 37 ins., was taken from the stomach of a 72½ ins ♂, Common Spitting Cobra, Naja nigricollis Reinhardt.

In Kenya, and in Nigeria, wherever Echis is abundant the Puff Adder is uncommon or rare. Conversely, in a region of Northern Nigeria where Echis is scarce, a European snake-catcher - for commercial purposes - was, in 1937, said to be collecting 40,000 Puff Adders a month, none less than 4 feet long.

VIPERA HINDII Boulenger, Montane Viper.

Description. Small and slender with cylindrical body, and rarely attaining a length much in excess of 12 inches. Ionides' largest, a ♀, measured 13 ins., (tail 1.35 ins.). Head scalation typically viper,

with strongly keeled imbricate scales. Dull brown, with darker spots along the back and flanks, the general coloration blending well with the blackish soil on which it is found. Greyish below, speckled darker.

Breeding. Little is known about its breeding, though in the course of two brief expeditions (one in August and the other in February) very small juveniles were found in February, but in August all specimens taken were of good size.

Food. An adult ♀ taken on the 4th August 1961 had recently swallowed a fair sized Kenya Side-striped Chameleon, Chamaeleo bitaeniatus schubotzi Sternfeld. Lizards, which are not uncommon, are also preyed on. A half-grown ♀, taken on 7th February 1962, was forced to disgorge a frog - species not identified. Specimens in captivity took frogs freely. Pitman fed one on new born mice.

Ectoparasites. None recorded.

Temperament. Inscrutable and very ready to try to bite if interfered with, though inclined to be sluggish. None were actually found in a state of torpor, though one would imagine that in these bleak highlands these little vipers for two-thirds of every 24 hours are likely to be in a state of suspended animation.

Habitat. Moorland at high altitudes - 9,300 - 11,000 ft above the forest line, amongst huge tussocks of the fine, tufty grass Andropogon dummeri Stapf, and the coarse, tufty grass Andropogon amethystinus Steud., as well as among the low, thick, shrubby Alchemilla argyrophylla Oliv..

Habits. Usually found coiled up close to a tussock of grass, but may be found actually in a tussock, or, if the ground is warmish, on bare ground between tussocks, and sometimes in the scrub. Seen during periods of weak sunshine, or sometimes when no sun was visible if the ground was fairly warm. Some were in rather marshy ground, others where the ground was fairly dry. They are really only active and readily noticed during optimum conditions - which are few and far between - of maximum warm sunshine between about 10.0 a.m. and 4.0 p.m.

Method of collecting. Climatic conditions permitted but brief visits to this normally inclement highland region, and only limited African assistance was available. However, generous rewards produced good results, though careful search of the limitless tangle of tussocks is most arduous. Where there had been a grass (i.e. tussock) burn the task was easier. This viper can be held by the tail without risk of the holding hand being bitten, which cannot be done with Echis.

Population. In the course of two brief visits to Kenya's Aberdare Mountains, from 2nd to 7th August 1961 (and 23rd August) and 7th to 13th February 1962, 74 of these little vipers were collected. Ionides believes that this viper may become adult in a year. Of these 29 or 40 per cent. were ♂♂ and 45 or 60 per cent ♀♀. 51 or 70 per cent. were adult. The sex ratio of 10 fair size (5 ♂♂, 5 ♀♀) and 13 half-grown (7 ♂♂, 6 ♀♀) is even.

The proportion of adults in the total captures respectively in August (total 25, adult 17) and in February (total 49, adult 34), each 70 per cent., does not vary from that of the grand total. But the sex

Two East African Snake Populations

ratio of the adults taken was 7 ♂♂ and 10 ♀♀ in August, and 10 ♂♂ and 24 ♀♀ in February, which may or may not be significant.

Of the grand total of 51 adults, twice as many ♀♀ (34) were caught as were ♂♂ (17). The most taken in any one day was 23, on 11th February. Sixty per cent were caught before 1.30 p.m., a number of specimens were taken after 4.0 p.m., and some as late as 5.25 p.m..

Climate. In August, weather conditions were predominantly cloudy with periods of mist and light drizzle, and occasional intervals of weak sunshine. In February, conditions were better with much strong morning sunshine and mild or strong cold winds, also at times a good deal of cloud, and one wet afternoon. But it can be very hot, too, in September.

Conclusions

It would appear, from the evidence available, that the populations of these two East African venomous species, each with distinctive habits and frequenting a strikingly divergent habitat, are far more extensive than mere casual acquaintance is likely to indicate, and Ionides' catching operations conducted in strictly limited localities have thrown fresh light on a problem about which little is known; but it is probable that only a small proportion of the actual population was ever seen.

In Uganda, too, in Pitman's experience many snake populations are far more plentiful than one would credit, and in localities where one but occasionally sees a snake by chance, the incentive of an adequate reward will produce remarkable results.

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References.

- (1) CORKILL, N.L. "Snake Stories from Kordofan". Sudan Notes and Records, Vol. XVIII, Pt. 2, 1935.
- (2) CANSDALE, G.S. Reptiles of West Africa, Penquin Books, West African Series, 1955.
- (3) WALL, Major F. The Poisonous Terrestrial Snakes of our British Indian Dominions and How to Recognise them, 1907.
- (4) PUKU, No. 3. The Occasional Papers of the Department of Game and Fisheries, Northern Rhodesia.

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