VIPERA RUSSELLII

ITS ZOOGEOGRAPHICAL RANGE AND LOCAL DISTRIBUTION IN INDONESIA

by

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Among the many problems regarding the distribution of animals in the Indonesian and adjacent Archipelagoes, none is perhaps so interesting as the problem concerning this dangerous, gigantic viper. Examining the spread of vipers (Viperidae) generally, we may say that they present a very curious distribution over the earth and this applies to the pit-vipers (Crotalinae) as well as to the typical ones (Viperinae).
Whereas the former have their chief areas in America (with the outstanding genus *Crotallus*), we find two strayed genera (*Trimeresurus* and *Agkistrodon*) far from this centre in South-East Asia and adjoining islands. The latter group of typical vipers display a similar extraordinary discontinuity.
Their chief area of distribution lies in Africa, but especially one prominent genus (*Vipera*) dominates in Europe and among them there are some species that penetrate into the Asiatic regions, of which only *Vipera lebetina* reaches the north-eastern parts of India. But the stoutest and most dangerous member of this genus, *Vipera russellii,* start its range in India, where it has its headquarters; southward it reaches Ceylon; northward it extends to the Himalayas and eastward we can find subspecies of this remarkable snake in Burma, Siam and Kwantung Province of China, moreover up till now new subspecies have been described from Taiwan (Formosa) and Indonesia. During the 19th and the first quarter of the 20th century the occurence of this viper in Indonesia was a very doubtful question.

In 1917 de Rooy (11) published a complete systematical account of the then known snakes of Indonesia. She stated: "About the occurence of *Vipera russellii* (Shaw) belonging to the Viperinae, in Sumatra and Java no certainty exists. In Boulenger's Catalogue III p. 490 this species is mentioned from those islands, Java with a ?; in Duméril and Bibron VII 1854 p. 1435 a specimen from Java is mentioned. Other records could not be found and as it is missing in Borneo and the Malay Peninsula, this viper probably does not belong to the fauna of the above-named islands."
Ten years later (1927) *Vipera russellii* was discovered in the Lesser Sunda Isles. Two specimens were collected by the American expedition under the guidance of W. Douglas Burden on Komodo while searching for the well-known *Varanus komodoensis.*

This discovery was published by Dunn (3). In the same year 1927 Mertens (8) got a specimen that had been captured in Endeh-island south of Flores. In spite of this recent discovery and the above-mentioned preserved specimens, its spread in Java was slightly doubted by such a prominent herpetologist as Kopstein. In his popular book about the poisonous snakes of Java (5), published in 1930, he expressed his doubt in the following words (p. 109):
"Een groot vraagteken hoort achter de naam van een zeer gevaarlijke gifslang; de *Vipera russellii*. In de oudere literatuur wordt ze wel van Java genoemd door Duméril en Bibron in het jaar 1854 en door Boulenger in 1896. Ieder van deze schrijvers zou een exemplaar van Java in bezit gehad hebben. Een Engels onderzoeker, Ditmars, vermeldt nog een andere van Sumatra. Later werden zij echter nooit meer gevonden en de oude opgaven daarom sterk in twijfel getrokken.

In Br. Indië en Siam moet nu een groot deel der dodelijke ongevallen op haar rekening komen! Nu werd ze in de laatste jaren op Bali (??? a slip of the pen perhaps; obviously Mertens' record of Endeh was meant by Kopstein) en Komodo ontdekt! Op het laatste eiland door de Amerikaansche expeditie onder leiding van W. Douglas Burden, die er op uitging om de Komodovaraan te zoeken. Daar ze echter op een goede dag toch nog ergens opduiken kan, wil ik haar in mijn lijst opnemen."
After summing up the pit-vipers of Java, he continues (p. 113) :
"Daarbij komt misschien nog de gevaarlijke *Vipera russellii*; naar mijn weten echter heeft tot nu toe nog geen enkel museum een exemplaar, dat met zekerheid van Java afkomstig is. Ik zelf heb haar nooit gezien en ook nimmer van haar gehoord en zo blijft haar voorkomen op de kleine Soenda-eilanden voorlopig een onopgelost raadsel."

On the contrary, Brongersma (1), who composed his dissertation in 1934 before the publishment of the rediscovery of *Vipera russellii* in Java (Neuhaus, 1935), did not doubt its distribution in Andalas: "In the older literature *Vipera russellii* (Shaw) was mentioned from Java (Duméril, Bibron and Duméril, 1854, p. 1436) and Sumatra (Strauch, 1869, p. 87), but later it was assumed that these records were erroneous and that the species was restricted to the Asiatic continent; recently, however, the species was discovered on the Lesser Sunda Islands (Dunn 1927, p. 4; Mertens, 1927, p. 182); this makes the occurrence on Java and Sumatra more probable, and I do not see any reason to doubt the correctness of the locality Sumatra for the specimen in the Leiden Museum (Herp. no. 1608) on which Strauch based his record."

Vipera russellii sublimitis Kopstein

Phot. Huysmans

As I have noted already, its complicated puzzle of distribution in Java was solved by Neuhaus (10), who received his first specimen in December 1933, caught near Balasklumprik, a village five miles from Surabaia. Later on he supplied Dr Kopstein with two other specimens, coming from the same village, on which the latter based his new subspecies: *sublimitis* (6). West of Surabaia *Vipera russellii* is surely not a rare snake. Mr. A. M. R. Wegner of the Musseum Zoologicum Bogoriense informed me that before the war an Indonesian snake-collector caught many specimens at Simo and Drio, two small villages bordering on Surabaja. Mr. Wegner told me that many specimens were caught in behalf of the late Dr. Essed, then working at the Bacteri-

ological Institute in Surabaia. Within a very short time Mr. W e g n e r himself got 8 specimens from the same snake-dealer.
The records of the Lesser Sunda-Isles and of Java justify the supposition, that this remarkable snake will also turn up in Indo-China, the Malay Peninsula and in other regions of the Greater Sunda Isles in spite of eventual disastrous reduction of members or even local extinction owing to calamaties or cultivation. But how to explain the fact that such a notorious, venomous animal could prevent its detection for so many years even under the smoke of such so busy town as Surabaia, which surroundings have repeatedly and thoroughly been investigated by numerous biologists and collectors ! In my opinion three reasons may be suggested:

1. This chiefly nocturnal viper may easily escape from the keen eye of any even trained observer on account of the fact that in the daytime it lies motionless among the foliage or fallen leaves, concealed by its adaptive coloration. Here I had better quote W a l l ' s remarks, which were also cited by S m i t h (12) : "Russell's viper is met with almost anywhere, but prefers open country. During the day-time it is quiet, but is, nevertheless, on the alert for any incautious animal that strays within its reach. In the evening and during darkness it wanders about."
2. It is locally abundantly met with, whereas totally absent in other neighbouring districts. This is also stated by S m i t h (12) : "Its distribution is capricious, being abundant in some districts, rare or absent in others." According to L o v e r i d g e (7) in one Indian district 471 specimens had been brought to one office for rewards in a single day.
3. The third but most important reason is, that undoubtedly the news about its having been seen or caught, does not reach herpetological circles, owing to lack of knowledge of the common population. How are they to know, wheather a certain animal is a rarity or a quite common type of animal that has already been described a century ago for that district ! So quite accidentallly many records enter the scientific publications. If M e r t e n s had not got his specimen from Endeh and if there had not been such a rare animal as the *Varanus komodoensis*, no doubt we should not have known anything about this viper's occurrence in the Lesser Sunda-Island. This is the reason why often our knowledge of zoögeographical distribution in remote districts is merely a matter of coincidence. I am quite sure that any Indonesian farmer meeting this viper, will look at it in quite the same way, as he will regard the numerous other (common) species that cross his way.

And now a request to all my readers ! Is it not possible to arouse the interest of the people, living in your neighbourhood and draw

their attention to this viper? This only, if the district may be thought a suitable habitat for this viper. I may add that *Vipera russellii*, though not a mountain-species, is often met with in hilly landscape, as was the case in the Lesser Sunda-Isles. In Smith's book (12) I read: "Russell's viper is not confined to the plains; it occurs plentifully in many upland regions and has been met with in the Palni Hills, Southern India at 7000 feet altitude." To make its identification and determination easier for an outsider, moreover for the sake of completeness some particulars concerning this viper are given below:

Its name:

Vipera russellii is called aftter the English biologist Russell who first described it in the year 1796. The Indian people use two names Daboia and Tic Polonga. The English usually call it Russell's viper. Kopstein (6) tells that the catcher of his two specimens of Surabaia used the name bandotan puspo. I could not find out if this name is a general one near Surabaia. [1])

Coloration and habitus:

Light-brown above with three longitudinal series of large, rounded or oval spots. Each spot is dark-brown in the centre and has a black margin and is edged again with yellowish white. The dorsal spots are larger than the alternating lateral ones. These three series of 24 to 26 spots grow gradually smaller backwards and fuse into stripes on the tail. Between these three series of large spots we find two other series of small black dots. The triangular shaped head, covered with small scales, has large symmetrical, dark-brown occipetal markings and a large black spot between the eyes.
Below a yellowish hue dominates, stained with darker dots and semilunar black spots. The length of an adult specimen is usually 120 to 150 cm, though longer individuals are recorded from India. It is a viviparous and very prolific snake, producing from 20 to 60 young at a time. According to Wall its chief food consists of small mammals, lizards, birds and frogs. Kopstein (6) observed, that one of his specimens devoured 44 young and adult mice and rats and 24 rice-eating birds in one year.

1) *WEGNER* told us that he too knows that *V. russellii* is called bandotan puspo by the Indonesians in that area. Vide this periodical 33: 6. (Red.)

Its frightful, uninterrupted hissing, which is caused by inhaling as well as by exhaling air, drew the special attention of many herpetologists. Mell, quoted by Kopstein (6) says, that this snake hisses loudest of all Asiatic-snakes and Kopstein himself could hear it at a distance of more than 15 meters. Wall declares: "The hiss is very loud and deep, and once heard is not easily forgotten."

Its poison:

Kopstein (6) observed that all his rice-eating birds died within a minute after the bite. Loveridge (7) after treating the mild character of the poison of *Vipera berus,* the widely spread "adder" or "Kreuzotter" of Europe and Siberia, continues: "It is a pity that we cannot say the same for Russell's viper, which unfortunately is considered as ranking third among the dead-dealing snakes in India." E. Grasset, M.D. and A. Zoutendijk from the serum Department of the South African Institute for Medical Research, Johannesburg, compared its poison with the venom of two African vipers (13). They stated, that the intravenous administration of Daboia-venom was of a much more potent nature than the venom of either of the principal African Viperidae, *Bitis arietans* (puff-adder) or *Causus rhombeatus* (night adder). A rabbit was killed in a few minutes by 0,2 mg desicated Daboia venom, whilst 1 mg venom of *Bitis arietans* was necessary to kill a rabbit in two hours. The minimum fatal dose of night adder venom was 10 mg. In that case the rabbits died after 8 to 24 hours.

Subspecies:

As usual with widely spread animals, *Vipera russellii* also shows some local races with slight differences in habitus and coloration. The common Indian type is called *Vipera russellii russellii* (Smith uses the more correct ending with only one "i"; for convenience' sake I agree with the notation of Kopstein and de Haas). The individuals of Southern Burma, Siam and China are placed in the subspecies *siamensis* (Smith 1917). From Formosa the variety *formosensis* has been described. The subspecies *limitis* of Mertens (8) is much more like *siamensis* than the Javanese race *sublimitis* of Kopstein (6), which is in coloration closely allied to the Indian type, though there are differences, which fully justify Kopstein's opinion to consider this Javanese form a new subspecies.

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