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## NOTES ON SOME NOTEWORTHY SNAKE SPECIMENS DEPOSITED IN THE COLLECTIONS OF EASTERN REGIONAL STATION OF THE ZOOLOGICAL SURVEY OF INDIA

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### INTRODUCTION

The collection of snakes deposited in the Eastern Regional Station of the Zoological Survey of India, Shillong, (below referred to as ZSI/ERS) holds 303 specimens (as on December 1<sup>st</sup>, 2002). This collection was dealt with by Mathew (1983). Most specimens originating from the State of Meghalaya were also cited by Mathew (1995) in an in-depth survey of the herpetofauna of this state, which was shown to hold 56 snake species. Although the herpetological survey of this state is far from complete, especially in hilly tracts, this state is herpetologically rich. Besides specimens from Meghalaya, the collection of the ZSI/ERS contains also a good number specimens from other States of Northeast India, especially from Arunachal Pradesh.

A recent re-examination of the snake collection by the authors revealed a few inaccuracies in the determination of some specimens reported by Mathew (1983, 1995), or the occurrence of specimens in Meghalaya and other states of India which were not in the recorded works cited, but which are of taxonomical and biogeographical importance. In the present paper, these additional/missing specimens are discussed, their identification corrected where necessary and most importantly they are adequately described.

Abbreviations are as follows :

*Morphology* : SVL : snout-vent length; TaL : tail length; TL : Total length; TaL/TL : ratio tail length/total length (all measures being in millimeters).

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*Scalation* : Ate : anterior temporals; Cep : cephalic scales, intersupraocular scales (counted on a straight line between the two supraoculars); DSR : dorsal scale rows (number of DSR counted at one head length behind head, at midbody [i.e. at the level of the ventral plate corresponding to half of the total ventral number], and at one head length before vent, respectively); IL : infralabials; InN : internasal scale; KSR : keeling of dorsal scale rows (0 : none, + moderately, ++ strongly); Lor : loreal scale; MSR : number of dorsal scale rows at midbody (see above); PoO : postocular; PrO : preoculars; PSR : number of dorsal scale rows before vent (see above); SC : subcaudals; SL : supralabials; SL/Or : Numbers of SL entering orbit; Te : temporals; VEN : ventrals.

*Museums and Institutions* : BMNH : Natural History Museum, London, UKI; NHMW : Naturhistorisches Museum Wien, Wien, Austria; ZSI/ERS : Zoological Survey of India, Eastern Regional Station, Shillong, India.

## SYSTEMATIC ACCOUNT

Order SQUAMATA

Suborder SERPENTES

Family COLUBRIDAE

### 1. *Amphiesma parallelum* (Boulenger)

1890. *Tropidonotus parallelus* Boulenger, *F.B.I.*, p. 345.

1999. *Amphiesma parallelum* (Boulenger), David *et al.*, *J. Taiwan Mus.*, 15(2) : 92.

*Material examined* : ZSI/ERS 3077, Risa Colony, Shillong, Meghalaya; ZSI/ERS 9059, Tripura Castle Road, Shillong, Meghalaya; ZSI/ERS 9060, Selbelgiri, Garo Hills, Meghalaya; ZSI/ERS 9070, a stream near Fruit Garden, Shillong.

*Amphiesma parallelum*, described as *Tropidonotus parallelus* by Boulenger (1890 : 345; Type locality : Sikkim, now State of Sikkim, India, by lectotype designation [Kramer, 1977 : 728]) has largely been confused with several other members of the genus *Amphiesma*. The taxonomy of this group, which includes also *Amphiesma bitaeniatum* (Wall, 1925), *Amphiesma octolineatum* (Boulenger, 1904), *Amphiesma platyceps* (Blyth, 1854) and *Amphiesma sieboldii* (Günther, 1860), and their respective diagnostic characters will be addressed in another paper (David *et al.*, in prep.). It should be noted that the gender of the genus *Amphiesma* being neutral, the specific epithet should appear as *parallelum* (see David *et al.*, 1999).

The ZSI/ERS collection holds nine specimens of *Amphiesma parallelum*. While working on a revision of several subgroups of the genus *Amphiesma*, the senior author examined four specimens, which proved to be typical specimens of *Amphiesma parallelum*. As detailed descriptions of specimens of *Amphiesma parallelum* are not well known, we give in Table 1 the major morphological features of the specimens under discussion.

**Table 1.** : Main morphological characters found in four specimens of *Amphiesma parallelum*.

Nr	Sex	SVL	TAL	TaI/T	VEN	SC	MS	KS	SL	SL/O	Pr	Po	AT	IL
3077	M	346	118	0.254	168	72	19	+++	8/8	3-5	2/2	3/3	2/1	2/1
9059	M	416	144	0.257	161	74	19	+++	8/8	3-5	2/2	3/3	1/1	1/1
9060	F	440	147	0.250	160	74	19	+++	8/8	3-5	2/2	3/3	2/2	2/2
9070	F	583	154	0.209	163	72	19	+++	8/8	3-5	2/2	2/3	2/2	2/2

It is noteworthy to mention that specimen ZSI/ERS 9070 is by far the longest known individual, with a record total length of 737 mm. The maximal size cited by Smith (1943), who did not distinguish *Amphiesma parallelum* from *Amphiesma bitaeniatum*, was 635 mm.

The specimen ZSI/ERS 3077 and some others from the Khasi Hills deposited in the ZSI/ERS collection have a rather pale background colour, very light beige brown, with a well-defined light, black-edged dorsolateral stripe, whereas the three other specimens cited above, as well as most of those from the Eastern Himalaya regions are quite dark, with a more subdued dorsolateral pattern (David *et al.*, in prep.). All ZSI/ERS specimens show the prominent black lateral stripe interrupted at the level of the neck, (Wall (1925)), and in three of the specimens for which the dental formula was examined, the diastema between the two enlarged posterior maxillary teeth and other teeth was clearly visible.

## 2. *Boiga ocellata* Kroon, 1973

1973. *Boiga ocellata* Kroon, *Copeia*, 1973(3) : 581; Figs. 1-2.

*Material examined* : ZSI/ERS 8135, Nampong, Arunachal Pradesh; male.

This species was described by Kroon (1973) to accommodate northern populations previously referred to as *Boiga cynodon* (Boie, 1827), restricted to Indonesia, West Malaysia and South Thailand, with a northern limit located in provinces of Phang Nga and Prachuap Khiri Khan, on the Isthmus of Kra (Pauwels *et al.*, unpublished). As a consequence, Indian populations of "*Boiga cynodon*" cited by previous authors (for example Smith, 1943; Das, 1996) should be referred to *Boiga ocellata*.

The collection of the ZSI/ERS contains one specimen from India. As the examples of *Boiga ocellata* are rarely reported from India, a full and detailed account of the species is presented below.

TL 1579 mm, SVL 1201 mm, TaL 378 mm. Ratio TaL/TL : 0.239.

DSR : 23-23-15, all smooth.

VEN 249 (plus 1 prefrontal), strongly angulate; SC 124, all paired : anal shield entire.

Teeth : 3 posterior maxillary teeth strongly enlarged.

Rostral wider than high; nasal entire, subrectangular;  $\frac{1}{2}$  Lor (a large pentagonal scale at left, two superposed small scales at right); 8/8 SL, 1-2/1-2 in contact with nasal, 3-6/3-6 entering orbit; no subocular, 1/1 PrO; 2/2 PoO; 2+3/2+3 Te; 12/14 IL, 1-4/1-5 in contact with anterior chin shields.

The background colour of the body and tail is brownish grey, with a complex and intricate pattern made up of dark oblique crossbars on the anterior part of body, turning as dark blotches posteriorly, separated by light, diffuse, interrupted irregular blotches; dark blotches at mid-height of flanks and conspicuous white ocelli on half of the underside. The top of the head and temporal regions are dark grayish-brown, strongly vermiculated with brown; supralabials and lower sides of head are rusty brown; a very well defined black postocular streak extends from the eye to the angle of the mouth.

The chin, throat and anterior part of the underside are lead grey and paler posteriorly.

The specimen agrees perfectly with the description given by Kroon (1973).

#### Family CROTALIDAE

#### 3. *Trimeresurus medoensis* Djao in Djao & Jiang, 1977

1977. *Trimeresurus medoensis* Djao in Djao & Jiang, *Acta Zool. Sinica*, **23**(1) : 66; Pl. 2 : Figs. 9-1 to 9-5.

2002a. *Trimeresurus medoensis* Djao in Djao & Jiang : David *et al.*, *Hamadryad*, **26**(2) : 210.

*Material examined* : ZSI/ERS 468, "70 km from Zero Point towards Sebla, Kameng District, NEFA", now in East Kameng District, State of Arunachal Pradesh; female.

The presence in India of this species described in Djao & Jiang (1977) from Medog (or Motuo), Xizang Province, People's Republic of China, was confirmed by David *et al.*, (2002a). The first definitely known locality in India is Gandhigram village (also known as Shidi), at 27°26'27" N, 96°54'55", in Changlang district, state of Arunachal Pradesh. Literature records this species from northern Myanmar and China. The specimen under discussion is, therefore, certainly the second record from India.

Description follows :

TL 615 mm, SVL 501 mm, TaL 114 mm, Ratio TaL/TL 0.185.

DSR : 17-17-13, moderately keeled, smooth on the first outer row.

VEN 146 (plus 2 preventrals), SC 61, all paired : anal shield entire.

Rostral wider than high; nasals entire, subrectangular; 1 pair of enlarged InN, separated each from another by 2 small scales; scales on upper snout surface smooth, juxtaposed, distinctly enlarged; 1/1 triangular loreal between upper preocular and nasal; 2/2 PoO; 1 entire SpO on each side, short and broad, wider than InN; 8 Cep in a line between SpO, small, irregular, juxtaposed, smooth and flat; occipital scales flat, slightly keeled backward; temporals large, unequal, in 3 rows, smooth,

the lower row much larger than others; one thin, elongated, crescent-like subocular; 9/9 SL, 1<sup>st</sup> SL, short, totally separated from the nasal, 2<sup>nd</sup> SL high, forming the anterior border of loreal pit, 3<sup>rd</sup> SL larger than the other SL, high and long, in contact with subocular on both sides, 4<sup>th</sup> SL as high as 3<sup>rd</sup>, in contact with subocular on both sides; 10/10 IL, those of the first pair in contact with each other, the first three pairs in contact with the chin shield.

The overall colour is uniformly dark green; a well defined bicoloured ventrolateral stripe extends from the angle of the mouth to the base of the tail; on the first and second dorsal scale rows, rusty red on its lower half, mainly on lower half of 1st dorsal scale row, whitish-yellow above, on upper half of 1<sup>st</sup> and lower third of second dorsal scale rows. The tail surface is same coloured as dorsum, with the whole length of its upper part irregularly marked with reddish-brown.

The top of the head and temporal regions are of the same colours as the dorsum; no postocular streak; supralabials paler than upper head surface.

The belly, chin and throat are green but slightly lighter than the dorsum.

The present specimen extends the known range of *Trimeresurus medoensis* by about 350 airline kilometers southwestwards from Medog and about 375 airline km westwards from the previously known Indian locality. It is likely to occur in other parts of Arunachal Pradesh, Nagaland and Bhutan as well.

#### 4. *Trimeresurus gumprechtii* David, Vogel, Pauwels & Vidal, 2002

2002. *Trimeresurus gumprechtii* David, Vogel, Pauwels & Vidal, *Nat. Hist. J. Chulalongkorn Univ.*, 2(1) : 7; Figs. 1-8.

*Material examined* : ZSI/ERS 486, "Arbuthnot Rd., in front of Assam Fiffles Office, Shillong" Meghalaya; male.

This specimen was reported by Mathew (1995) as *Trimeresurus stejneri*. David *et al.*, (2002b) described *Trimeresurus gumprechtii* from northern Thailand, a species closely related to *Trimeresurus stejneri* Schmidt, 1925. These authors suggested that the populations from India and Myanmar referred in literature to *Trimeresurus stejneri* or *Trimeresurus yunnanensis* with 21 MSR, cited for example, by Smith (1943), should in fact be referred to *Trimeresurus gumprechtii*. The examination of the ZSI/ERS specimen, a typical specimen of *Trimeresurus gumprechtii*, undistinguishable from Thai specimens, confirms the occurrence of *Trimeresurus gumprechtii* both in the state of Meghalaya and in India. The species is described below :

TL 583 mm, SVL 486 mm, TaL 97 mm, Ratio TaL/TL 0.166.

DSR : 21-21-15, distinctly keeled, smooth on the first outer row.

VEN 159 (plus 2 preventrals), SC 59, all paired; anal shield entire.

Hemipenis short and strongly spinose, extending in situ up to 15<sup>th</sup> SC (presence of spines checked by dissection).

Rostral wider than high; nasals entire, subrectangular; 1 pair of enlarged internasals, separated each from another by 3 scales (2 enlarged and a smaller central one); scales on upper snout surface smooth, juxtaposed, distinctly enlarged; 1/1 triangular loreal between upper preocular and nasal; 2/2 PoO; 1 entire SpO on each side, long and narrow, not wider than InN; 10 Cep in a line between SpO, small, irregular, juxtaposed, smooth and flat; occipital scales flat, slightly keeled backward; temporals unequal, in 3 rows, smooth, the lower row larger than others; one thin, elongated, crescent-like subocular; 9/9 SL, 1<sup>st</sup> SL, short, totally separated from the nasal, 2<sup>nd</sup> SL high, forming the anterior border of loreal pit, 3<sup>rd</sup> SL the largest, high and long, in contact with subocular on both sides, 4<sup>th</sup> SL shorter, separated from subocular by 1 scale; 11/11 IL, those of the first pair in contact with each other, the first three pairs in contact with the chin shield.

The background colour is dark green. A well defined bicoloured ventrolateral stripe, red or chocolate red below, white above, extends on the 1<sup>st</sup> DSR from the angle of the mouth up to first third of the tail (at about 20<sup>th</sup> SC). The tail surface is of the same colour as that of the dorsum, with the whole length of its upper part irregularly mottled with reddish-brown, which forms backwards a continuous stripe. The underparts, chin, and throat are grass green.

The top of the head and temporal regions are of the same colour as that the dorsum; slightly paler in the region of supralabials. A bicoloured; red above, white below postocular streak extends on 2<sup>nd</sup> and 3<sup>rd</sup> rows of temporals from behind the eye to the corner of the mouth; the upper red part is wide and broad, the lower white part is narrow and paler.

If this specimen confirms the occurrence in India of *Trimeresurus gumprechtii*, other recently examined specimens originating from Northeast India, Myanmar and northern Thailand – recently collected or long preserved but erroneously identified – largely extend or/and confirm the range of *Trimeresurus gumprechtii*. This data will be presented elsewhere (David *et al.*, in prep.). As explained in David *et al.*, (2002b), *Trimeresurus stejnegeri* is not definitely known from India, which is inhabited by both *Trimeresurus yannanensis* and *Trimeresurus gumprechtii*. Nevertheless, Malhotra & Thorpe (2004) suggested the occurrence of *Trimeresurus stejnegeri* in Northeast India. We examined three specimens listed by these authors (BMNH 60-3-19-1121, BMNH 1907.12.16.27 [incorrectly listed as 107.12.16.27] and NMW 23805). On the basis of the morphology and scalation, we identify all of them as *Trimeresurus gumprechtii*.

## CONCLUSION

The records published earlier (Mathew (1983, 1995)) should be modified deleting *Trimeresurus stejnegeri* from both Meghalaya and Arunachal Pradesh and including *Trimeresurus gumprechtii* in the fauna of the state of Meghalaya and of India.

It is noteworthy that the sole specimen of *Amphiesma khasiense* (Boulenger, 1890) cited by Mathew (1995) as present in the ZSI/ERS collection (ERS/ZSI 400), proved to be in fact a misidentified specimen of *Xenochrophis piscator* (Schneider, 1799). As a matter of fact there does not exist a representative of this species in the ophidian collection of the ERS/ZSI. The paucity of the material might suggest either that populations are very localized, occurring in the higher elevations of the Khasi Hills, or that this species is very secretive. It may also be due to the lack of intensive investigations of the areas.

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