

The Rediscovery of Angel's Stream Snake, *Paratapinophis praemaxillaris* Angel, 1929 (Reptilia: Serpentes: Natricidae)

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ABSTRACT.— *Paratapinophis praemaxillaris* was described by Angel (1929) on the basis of two neonate specimens from Xieng-Khouang in northern Laos. Pope later placed the genus in the synonymy of *Opisthotropis* Günther, 1872. We collected five adult specimens along the Nan River, in northern Thailand. Here we describe the adults of Angel's Stream Snake, discuss the monotypic genus, its distribution, habitat, and diet. Based upon morphology we remove *Paratapinophis* Angel, 1929 from the synonymy of *Opisthotropis*. An identification matrix is provided for identifying snakes in the genera *Opisthotropis*, *Parahelicops*, and *Paratapinophis* Bourret, 1934, all have been considered *Opisthotropis* at one time or another, and we comment on the status of *Opisthotropis*.

KEY WORDS: *Paratapinophis*, *Opisthotropis*, Thailand, China, Laos, stream snakes

INTRODUCTION

Paratapinophis praemaxillaris was described by Angel (1929) on the basis of two neonate specimens from Xieng-Khouang (ca 1094 m asl) in northern Laos. Pope (1935) synonymized the genus with *Opisthotropis* Günther, 1872 when he discovered that the external process Angel believed to be a premaxillary structure, was indeed an egg tooth. Rasmussen (1982)

reported a third specimen, also a small juvenile, collected by Lomholdt at Doi Saket (991 m), Chang Mai Province, in northern Thailand. A fourth specimen was reported on by Mo et al. (1984) from Jindong, Yunnan Province, China, it was collected at 1400 m and was an adult female with a total length of 782 mm.

Despite the fact that Pope (1935) placed this snake in the genus *Opisthotropis*, he wrote, that Angel's species "...is quite distinct in possessing unusual characters for the genus, namely, well-developed posterior chin-shields, smooth scales and large size."

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Pope's comment about the large size is probably based on the fact that the neonates were 214 and 210 mm in total length, and Pope assumed that the species must grow to a large size, since most *Opisthotropis* have adult sizes in the 400-600 mm range. Taylor and Elbel (1958) recognized the heterogeneous nature of *Opisthotropis* and they commented on the breadth of variation that Pope (1935) and Smith (1943) had allowed within the genus. "There are smooth and keeled forms; forms with maxillary teeth varying from 20 to 40, equal or 'subequal' or having two or three much enlarged fanglike posterior teeth; groups with 19, 17, or 15 scalerows at midbody, groups with or without suboculars, etc. The one common character present is the presence of a single prefrontal." The last sentence about a single prefrontal is in error; *O. rugosus* (Lidth de Juede, 1890), *O. typicus* (Mocquard, 1890), and *O. alcalai* Brown and Leviton, 1961 have divided prefrontal scales (Appendix 1). Brown and Leviton (1961) noted that Boulenger (1891, 1893), Pope (1935), and Smith (1943) had placed eight species, described as types of new genera by various authors, in the synonymy of *Opisthotropis*.

In addition, *Parahelicops* Bourret, 1934 was described on the basis of a Vietnam specimen and later placed in the synonymy of *Opisthotropis* by Smith (1943). It seems probable that *Parahelicops* is a valid genus, distinct from *Opisthotropis*, and it is included in Appendix 1 only because it has been considered *Opisthotropis* in the literature.

Another, more fundamental problem with *Opisthotropis* exists. Günther (1872) erected the genus on the basis of a single specimen, *O. ater*, reportedly from West

Africa. This problem is treated in the Discussion of this paper.

Here we report on five additional specimens of *praemaxillaris*, resurrect the genus *Paratapinophis* from the synonymy of *Opisthotropis*, provide new information on its morphology and diet, and discuss its distribution.

MATERIALS AND METHODS

We reviewed the literature that discusses the genera *Opisthotropis*, *Paratapinophis*, and *Parahelicops*; and examined eight museum specimens (Laos: MNHN 1928.0063-0064. Thailand: FMNH 271443-271447; ZMU 601134) of *Paratapinophis praemaxillaris* for external morphology. These had been fixed in formalin and stored in 70% ethanol. Scale counting methodologies generally follow those presented by Peters (1964) with some minor exceptions (dorsal scales were counted on the neck at about the 10th ventral, at midbody, and about 10 ventral scales anterior to the vent, and they were counted on the diagonal). Dorsal scale rows expressed here as 19-19-17 refers to the number of rows on the neck, at midbody, and at posterior body respectively. Scale counts and scale measurements on most specimens were done under a dissection microscope. Measurements were taken with a meter stick, metric tape, and dial calipers. Snake sizes are given in mm. Scale counts separated by an en dash (-) represent a range taken from different individuals, the exception being the dorsal scale row counts, and counts with multiple scales (i.e., upper labials at loreal). Scale counts separated by a slash (/) represent scale



FIGURE 1. A female *Paratapinophis praemaxillaris* (FMNH 271447) collected at the Wang Pian Waterfalls, Huia Gon Subdistrict, Chaloeprakiat District, Nan Province, Thailand.

counts taken from a single individual; the number on the left is the number of scales on the snake’s left, and the number to the right is the number of scales on the specimen’s right side. Frequencies of character states are given in parentheses using the shorthand convention of “(3 of 16)” to represent the presence of a character state on 3 of 16 sides, 8 individuals were examined. Stomachs of adult specimens were examined for remains of food. Sex was determined by probing, tail shape, dissection, and visual inspection of the hemipenes, testes, and ovaries.

Hemipenes structural terminology follows Dowling and Savage (1960). Many of the citations in the Literature Cited section are cited in Appendix 1. Museum acronyms follow McDiarmid et al. (1999) and they can be found in the acknowledgments.

RESULTS

Five specimens (FMNH 271443–271447) were collected at Wang Pian Waterfalls, Huia Gon Subdistrict, Chaloeprakiat District, Nan Province, Thailand. The Nan River collection (about 19° 31' N/ 101° 05' 11.8" E, 475 m asl) was made between 2000–2100 h on 9 March 2007. We compared these five specimens to the syntypes of *Paratapinophis praemaxillaris* Angel (MNHN 1928.0063–0064) from Laos, the Thai specimen (ZMUC-R 601134) reported by Rasmussen (1982), and to the written description of the Chinese specimen described by Mo et al. (1984). The morphometrics of these specimens are given in Table 1.

TABLE 1. A comparison of scale characters for 8 specimens of *Paratapinophis praemaxillaris*. Also included is the data presented in Mo et al. (1984) for a 9th specimen from China, which we have not examined.

Museum Number	FMNH 271443	FMNH 271444	FMNH 271445	FMNH 271446	FMNH 271447	MNHN 192863	MNHN 192864	ZMU 601134	Mo, et al. 1984
character									
sex	m	m	m	f	f	?	?	?	f
SVL (mm)	568	545	504	665	770	166	161	214	620
tail (mm)	144+	134+	125+	153+	210+	50	47	63	162
total (mm)	712	671	629	818	980	216	208	277	782
tail/SVL	damaged tail tips					0.3	0.29	0.29	0.26
dorsal scale rows	19/19/17	19/19/17	19/19/17	19/19/17	19/19/17	19/19/17	19/19/17	19/19/17	19/19/17
ventrals	155	154	154	149	152	149	149	145	153
subcaudals	58/58+	58/57+	57/56+	55/54+	53/53+	67	63	67	58
anal plate	divided								
rostral	Broader than tall- about 1.4 times, arch-like, but pentagonal								
nasal scales	Elongate, with nare in middle, nasal groove very short, but scale semi-divided with groove contacting second labial.								
internasal	Paired, separate nasal scales completely								
nasal valve	Appears to be lobed with two parts, can close nare completely.								
upper labials	9/9	9/9	9/8	9/9	9/9	9/9	9/9	9/9	nd
upper labials at loreal	3/3	3/2-3	2-3/2-3	3/3	3/3	2-3/2-3	2-3/2-3	2/3-2/3	nd
loreal	Small, quadrangular, and single. Contacts prefrontal								
prefrontal	A single, large, broad scale.								
frontal	Frontal pentagonal, about 1.6 times the length of the prefrontals								
parietals	About 1.3 times longer than the frontal								
upper labials under orbit	4-5/4-5 with small subocular on right side only	5/4-5 with small subocular on both sides	4-4/5 with small subocular on both sides	5/4-5 with small subocular on both sides	4-5/5 with small subocular on right side only	4/5-4/5 no subocular	4/5-4/5 no subocular	5-4/5 small subocular on left, none on right	nd
supraocular	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	nd
preocular	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	nd
postocular	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	nd
subocular	1/0	1/1	1/1	1/1	0/1	0/0	0/0	1/0	nd
temporal formula	2+3/2+3	2+3/2+2	2+3/2+3	2+2/2+2	2+3/2+2	2+3/2+3	2+3/2+3	2+3/2+3	nd
lower labials	9/10	10/10	11/10	10/10	10/10	10/10	10/10	10/10	nd

nd = No Data; SVL = snout-vent length

Morphology of *Paratapinophis praemaxillaris* Angel, 1929

The head is distinct from the neck, the body is quadrangular in cross section and robust (Fig. 1) in the females and more slender in the males, and the tail is laterally compressed. The eyes are lateral and are

larger than the eye-mouth distance in the neonates and about equal to the eye-mouth distance in adults. The rostral is slightly visible from above, about 1.4 times longer than tall, and forms an arch with a shallow notch; it is pentagonal, but distinct sides are obscure. The nasal scale is oblong and quadrangular, with the nare in the center, a

nasal groove completely divides the scale, and the nasals are usually in contact with the first 2 upper labials, rarely (1 of 8) the third contacted the nasal scale. The nares are more lateral than dorsal, and are regulated by a bi-lobed valve. A pair of internasal scales separates the nasal scales. The single prefrontal contacts the nasal, loreal, preocular, and supraocular scales. The frontal is single, pentagonal, and longer than the supraocular. The parietals scales are large and about 1.3 times longer than the frontal. The loreal is single, and contacts the prefrontal and upper labials 2/3 (9 of 16) or 3/3 (7 of 16). There is one supraocular; one preocular; two postoculars; and one small subocular (9 of 16), the subocular is absent on some (7 of 16) sides. Neither of the syntypes have a subocular scale. The temporal scale formula can be 2+2 (4 of 16) or 2+3 (12 of 16). The upper labial(s) entering the orbit can be 4–5 (11 of 16), or 5 (5 of 16). Upper labials number 9 (15 of 16) or 8 (1 of 16), the largest is usually 7 (15 of 16). Lower labials number 9–11, 9 (1 of 16), 10 (14 of 16), or 11 (1 of 16); the first 5 (14 of 16) or 6 (2 of 16) contact the anterior pair of chin shields. There is one pair of anterior chin shields, and two pairs of posterior chin shields; the anterior pair is larger in area, but equal in length to the second, outer posterior pair; the third, inner posterior pair are slightly smaller. The presence of two pair of posterior chin shields is not found in any other known species of *Opisthotropis* or *Parahelicops*.

The dorsal scales are smooth in females. However, while males have mostly smooth scales, those above row 2 on the posterior body have 3–4 rows of small tubercles (these form short raised folds) in the middle of the scale that look like keels when not

viewed with a microscope. This sexually dimorphic scale ornamentation is discernable in one of Angel's syntypes (MNHN 1928.0063) which is a neonate with an umbilical scar. A survey of the literature and examination of several species of *Opisthotropis* and *Parahelicops* suggests that this type of scale ornamentation is not present in other species (although some do have serrated keels). Dorsal scales are in 19–19-17 rows. Scales in first rows tend to be ovate and become more lanceolate toward the vertebral line.

The ventrals are broad and rounded; they number 149–154 in two females and 155 in three males. Angel reported 149 ventrals in the syntypes and Rasmussen (1982) reported 145 ventrals, which agreed with our counts. The anal plate is divided. The subcaudal scales are divided and number 64–67 in snakes with complete tails. However, close inspection of our five adults showed all to have sustained damage to their tail tips; they have 53–54 subcaudals in the two females and 56–58 in three males. Angel (1929) reported 63 and 67 subcaudals in the two neonates, and Rasmussen (1982) reported 64 subcaudals in his juvenile, these numbers are supported by our counts.

The head is a uniform brown-grey, as are the upper labials (Fig. 1). Lower labials have some cream spots. Overall the dorsum is a uniform brown-grey. The edges of the ventral scales and dorsal rows are grey brown. On the anterior of the body there are indistinct inverted "V"s formed by light colored yellow scales as these extend toward the dorsum the yellow stops at about row 6 and they become indistinct blue-gray bands that extend across the back of the females. In the males the blue gray coloration is absent, but traces of the lateral pattern can

be detected. In females, between the yellow V's are blotches of darker pigment that extend to about scale row 4. The overall appearance of the snake's lateral surface is dark blotches outlined in yellow. Thus, the adult color pattern of this species is sexually dimorphic, with males having the narrow anterior cross bands, and the females having large lateral blotches, and a distinct blue-grey color. The neonates are a uniform dark brown above, and a uniform cream below. There is dark pigmentation on the labials of one of the juveniles, but they are otherwise relatively nondescript, small, brown snakes similar in overall appearance to many *Opisthotropis*.

Maxillary teeth number 18–20, the last three or four are slightly larger than the preceding ones and the last tooth has a posterior surface with a short, open groove with a blade-like surface below the groove opening.

Males are smaller than females, the three specimens examined had a mean SVL = 539 mm (504–568 mm) while the two adult females had a mean SVL of 717.5 mm (665–770 mm). The largest adult male had a total length of 712 mm, the largest adult female had a total length of 980 mm. All of the Nan River specimens had damaged tail tips, thus the total lengths are slightly less than they may actually have been with complete tails.

The hemipenes have a single, subcylindrical shape that is spinose, with two exceptionally large spines on the base; and they have a simple, oblique sulcus that terminates about three-fourths of the distance to the apex; and the distal portion ends in a slightly expanded T-shaped disc.

The similarities of scale counts and scale arrangements suggest that the Nan River

specimens, the Doi Saket specimen, and the syntypes of *P. praemaxillaris* are conspecifics, and represent specimens of *Paratapinophis praemaxillaris* Angel, 1929.

The Status of *Paratapinophis*

Considering Pope's (1935) statement quoted in the introduction and Taylor and Ebel's (1958) comments on the highly variable morphology of *Opisthotropis* we took a close look at several members of the genus *Opisthotropis* and its associated literature. To add to Pope's short list of distinctive character states in *Paratapinophis*, our observations suggest the two genera differ in the following ways: in *Paratapinophis* the head is distinct from the neck; the scale ornamentation (keels) is unique in that each scale has a middle row of tubercles (as opposed to a continuous keel or a serrated keel); the scale ornamentation is sexually dimorphic (they occur only on the posterior body of the males); the color and pattern is sexually dimorphic; the body is large and robust; the maxillary tooth count is low (18–20); and there are two pair of posterior chin shields. Based on our observations and the literature these character states are not found in *Opisthotropis* and *Parahelicops*. Therefore, we recommend recognizing *Paratapinophis* Angel, 1929 as a valid genus. For a comparison of other character states in all known species of these three genera see Appendix 1.

It is interesting to note that the etymology of *Paratapinophis* apparently is derived from a suggestion by H. W. Parker at the BMNH. It is derived from the Greek "para" meaning along side or near, and the generic name *Tapinophis* Boulenger, 1899. *Tapinophis* is another genus that was synonymized with *Opisthotropis* by Pope



FIGURE 2. The map notes the four localities for *Paratapinophis praemaxillaris* is known from four localities: (1929) the type locality in Xieng-Khouang, Laos (about 19° 52' N, 103° 20' E); (1981) Doi Saket, Thailand (about 19° N, 99° 15' E); (1982) Jindong, Yunnan Province, China (about 24° 28' N, 100° 54' E); and (2007) the Nan River location in Nan Province, Chaloeprakait District, Huia Gon Subdistrict, at the Wang Pian Waterfalls, Thailand (about 19° 31' N/ 101° 05' 11.8" E).

(1935). Thus, Parker recognized some of the shared morphology between *Paratapinophis*, *Opisthotropis*, and *Tapinophis* Boulenger, 1899.

Distribution

Paratapinophis praemaxillaris is known from four localities: the type locality in Xieng-Khouang, Laos (about 19° 52' N, 103° 20' E); Doi Saket, Chang Mai

province, Thailand (about 19° N, 99° 15' E); Jindong, Yunnan Province, China (about 24° 28' N, 100° 54' E); and the Nan River location in Nan Province, Chaloeprakait District, Huia Gon Subdistrict, at the Wang Pian Waterfalls, Thailand (about 19° 31' N, 101° 05' 11.8" E). The elevation of these locations is between 475 and 1400 m asl (Fig. 2). Zhao and Adler (1993) considered *P. praemaxillaris* endemic to the Southwest



FIGURE 3. The environment along the Nan River. The river traverses mixed deciduous forest with bamboo scrub along the banks; and is about 5 m wide, and 1-2 m deep near the collection site.

China Region. This area includes the Hengduan Shan mountain area as well as the southern slope of the Himalayas. It is an area of high mountains with alpine vegetation and deep valleys with subtropical vegetation. The extreme topography of this area extends southward into Laos and northern Thailand where *Paratapinophis* also occurs.

Natural History

The Nan River traverses mixed deciduous forest with bamboo scrub along the banks (Fig. 3); and the river is about 5 m wide, and 1-2 m deep at the collection site. It flows from the Nan Mountain which has areas of rock outcrops near the collection site. The collection site was a

pool under small waterfalls which flows from a cliff along the Nan River. Between the waterfalls and the river the microhabitat includes a gravel and sand beach (Fig. 4). The snakes were collected after it was dark for a period of 1-2 hours. All snakes were in close proximity (ca. 40 m² area) and they were docile when handled. The river was surveyed almost continuously at and around the capture site while still light, at twilight and shortly after it was dark, but no snakes were seen. This suggests that *P. praemaxillaris* may be strictly nocturnal and this in turn may explain why so few have ever been collected. A sixth specimen escaped capture ca. 200 m distant from the collection site, this specimen was in a fast moving, rocky part of the river and dived under the water to escape. The specimen that evaded capture was moving against the current in the direction of the collection site. It is unknown why so many of this species appeared at the same time in such a small area, but a breeding aggregation seems a likely hypothesis. On land, this species appears sluggish, whereas in the water it appears much more agile; this suggests that this species is strictly aquatic. This habitat is similar to that described by Rasmussen (1982) for the specimen collected by Lomholdt. The juvenile snake was found in a "...fast flowing rocky stream (c. 2 m broad), which was running through forest and fringed by bamboo scrub."

Both Nan River females contained digested remains of fish (scales and a mandible), as well as numerous roundworms (Nematoda) while the three males' stomachs contained only roundworms.

The reproductive mode of this snake is unknown, however *P. praemaxillaris* is known to have an egg tooth suggesting it is



FIGURE 4. The microhabitat at the collection included waterfalls (seepage areas), a gravel and sand bar, and shallow water between the bank and the gravel bar.

oviparous. The two neonate syntypes have distinct umbilical scars 16–18 ventral scales anterior to the vent. The umbilical scars and the presence of an egg tooth suggest that these two animals likely hatched within a few days of collection. They are 210 and 214 mm in total length and most likely represent the size at hatching. The Lomholdt specimen also has an umbilical scar, but it is healed and the snake has a total length of 277 mm.

DISCUSSION

Günther (1872) described the genus *Opisthotropis* on the basis of a single, gracile specimen with 17 scale rows at mid body; smooth scales on the anterior body and weekly keeled scales at mid body; a pair of internasals that separate the nasal scales;

dorsally oriented nares; small eyes and a divided anal plate and subcaudals. The type locality of Günther's *O. ater* was stated to be West Africa. Bogert (1940) and Zhao and Adler (1993) have commented on the unusual type locality, and apparently no one has followed up on the fact that this otherwise Southeast Asian genus has a type species from Africa. Günther's description fits many of the Southeast Asian species well and the possibility exists that the type locality is in error and that *O. ater* belongs with the Southeast Asian taxa. Or, *Opisthotropis* may actually be an African genus convergent with the Southeast Asian taxa, in which case the next available name for the small, brown, plain bellied, narrow headed, stream snakes of Southeast Asia is *Calamohydus* Boulenger, 1888. However, the origin and distribution of the type

specimen for the genus remains obscure after 135 years, and this issue remains unresolved at this writing.

It seems likely that as the Southwest China region (including Laos and parts of northern Thailand) are more carefully explored *P. praemaxillaris* will be shown to be more widespread than is currently suggested by the four localities from which it is currently known.

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APPENDIX 1

A comparison of snakes that have been placed in the genus *Opisthotropis*.

SPECIES	Total Length mm	Ventrals	Subcaudals	Upper Labials
SNAKES WITH 15 SCALE ROWS AT MIDBODY				
<i>Opisthotropis guangxiensis</i> Zhao, Jiang & Huang 1978 No type locality given. Known from Kwangsi, China. (Zhao and Adler, 1993)	455	166-174	51-58	9
<i>Opisthotropis jacobi</i> Angel & Bourret 1933. Type locality: Chapa, Vietnam. (Smith, 1943)	540	159-179	69-90	8-9
<i>Opisthotropis kikuzatoi</i> Okada & Takara 1958. Type locality: Kumejima Island, Okinawa Prefecture, Japan. (Toyama, 1983; Ota and Mori, 1985; Ota, 2004)	831	180-198	69-89	6
<i>Opisthotropis maculosus</i> Stuart & Chuaynkern 2007. Type locality: Nong Khai Province, Boong Klar District, Phu Wua Wildlife Sanctuary.	520	182	67	8
SNAKES WITH 17 SCALE ROWS AT MIDBODY				
SINGLE PREFRONTAL SCALE				
<i>Opisthotropis andersonii</i> (Boulenger 1888) Type Locality: Hong Kong. (Smith, 1943)	500	149-169	53-66	8-9
<i>Parahelicops annamensis</i> Bourret, 1934. Type locality: Bana, Annam, Vietnam. (Bourret, 1943; Smith, 1943; Campden-Main, 1970)	621	169	123	8
<i>Opisthotropis ater</i> Günther (1872). Type Locality: West Africa.	330	170	65	7
<i>Opisthotropis cheni</i> Zhao, 1999. Type Locality: Mt. Mang, China.	708	159-167	55-59	10
<i>Opisthotropis daovantieni</i> Orlov, Darevsky & Murphy 1998. Type locality: Gia Province, southern Vietnam.	578	189-194	39-47	8
<i>Opisthotropis lateralis</i> Boulenger 1903 Type Locality: Man-son Mts., Vietnam (also in southern China). (Smith, 1943; Pope, 1935)	437	159-173	49-56	9-11 (10)

Upper labials in Contact w/ Loreal	Lower Labials	Scale Ornaments	Internasal Contacts Loreal	Preoculars	Postoculars	Suboculars	Chin Shields**
nd	nd	nd	nd	nd	nd	nd	nd
2-3	8	smooth	yes	1	1	0	A
2-3	7	keeled posterior & tail	no	2	2	0	A
2-3	2-3	smooth	no	1	1	1*	B
2-4	9	weakly keeled above row 2	no	2	1	2	A
2-3	8-9	keeled	yes	2	3	1	B
2-4	nd	smooth, weakly keeled posterior	yes	1	2	0	B
nd	nd	nd	nd	nd	nd	nd	nd
2-3-4	10	smooth	yes	1	1	1	A
3-5	10	serrated keels	no	1	2	0	A

Appendix 1 continues

SPECIES	Total Length mm	Ventrals	Subcaudals	Upper Labials
<i>Opisthotropis latouchii</i> (Boulenger 1899). Type locality: Kuatun, China.	678	140-168	49-73	9
<i>Opisthotropis maxwelli</i> Boulenger 1914. Type Locality: southern Fukien, China. (Pope, 1935)	305	151-155	56	7
<i>Opisthotropis spenceri</i> Smith 1918. Type Locality: Muang Ngow, Thailand. (Deuve, 1970; Smith, 1943; Taylor, 1965)	600	183	55-89	7-8
DIVIDED PREFRONTAL SCALE				
<i>Opisthotropis rugosus</i> (Lidth De Jeude 1890). Type Locality: Kajutanam, Sumatra.	473	170	95	12 hzd
SNAKES WITH 19 SCALE ROWS AT MIDBODY				
SINGLE PREFRONTAL SCALE				
<i>Paratapinophis praemaxillaris</i> Angel 1929. Type Locality: Xiengkhouang, Laos. (Also in China, Laos and Thailand.). (Rasmussen, 1982; Mo et al., 1984)	980	145-155	75-67	9
<i>Opisthotropis balteatus</i> (Cope 1895) Type Locality: Hainan, China. (Also in s. China and Vietnam). (Deuve (1970) discussed this species as <i>O. bedoti</i> ; Smith, 1943)	1021	190-205	69-99	8-10 (9)
<i>Opisthotropis boonsongi</i> (Taylor & Elbel 1958) Type Locality: Ban Khok, Loei Province Thailand. (Taylor, 1965)	621	141	33+	9
<i>Opisthotropis kuatunensis</i> Pope, 1928. Type Locality: Chungan Hsien, Fukien, China. (Pope, 1935)	678	146-154	61-68	14-16hzd
DIVIDED PREFRONTAL SCALE				
<i>Opisthotropis alcalai</i> Brown & Leviton 1961. Type Locality: Mindanao, Philippines.	532	195	53	12/13
<i>Opisthotropis typicus</i> (Mocquard 1890). Type Locality: Mt. Kinabalu, Sabah, Malaysia (Borneo). (Steubing and Inger, 1999)	500	160-176	82-96	11/12

* Stuart and Chuaynkern report this subocular as a postocular. For consistency with other descriptions we consider it a subocular.

** Chin Shields (A) two pair, first pair longer than second (B) two pair, second pair longer than first (C) one anterior pair, two posterior pair

hzd = at least some labial scales horizontally divided

nd = no data

Upper labials in Contact w/ Loreal	Lower Labials	Scale Ornaments	Internasal Contacts Loreal	Precoculas	Postoculars	Suboculars	Chin Shields**
3-5	8-9	weakly keeled	no	0	2	0	A
?4-5	nd	smooth, keeled posterior	nd	2	2	0	A
?3-4	nd	smooth	nd	1	2	0	A
nd	nd	strongly keeled	nd	1	2	3	nd
2-3or 3	9-11 (10)	smooth in females, some keeled in males	no	1	2	none or 1	C
	9	smooth, keeled on tail	no	1	2-3	0	B
3rd	10	striated, strongly keeled	no	1	2-3	2	B
3-5	14-16 hzd	strongly keeled & tubercles	yes	2	2 or 3	1	A
3-4	11	smooth	yes	2	2-3	3	nd
3-5	10	serrated keels, and tubercles	yes	2	2	2	A