NOTES ON THE HIMALAYAN PIT VIPER, *AGKISTRODON HIMALAYANUS* (GÜNTHER).

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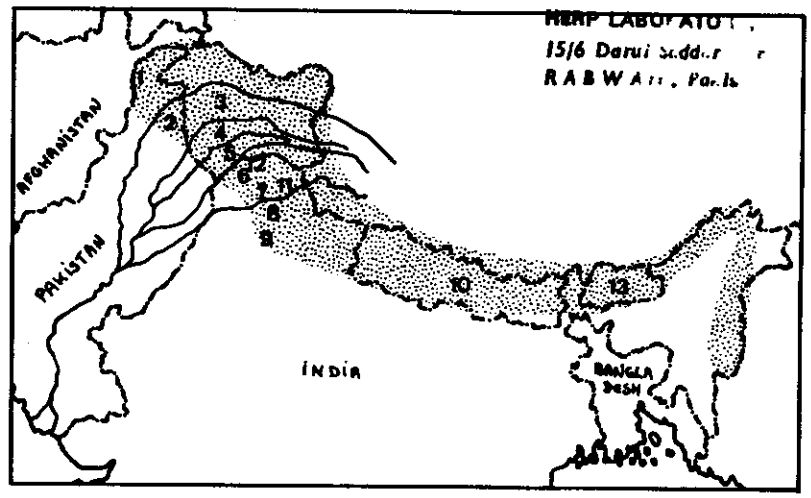
Contents: Distribution - Description - Ecology - Tail luring - Venom - Taxonomic notes - References.

DISTRIBUTION

One rarely reported snake of Pakistan is the highland Himalayan pit viper *Agkistrodon himalayanus*. Günther (1864) described *Halys himalayanus* from Garhwal, Himalayan East Punjab, India (not Pakistan as wrongly noted by Leviton, 1968). In 1890, Boulenger assigned it to its present nomenclature. Since then this snake has been reported from Simla, India (Anderson, 1871); Chitral, northwestern Pakistan (Wall, 1911); Kulu District, India (Acharji & Kirpalani, 1951 and Constable, 1949); Ambala, India (Constable, 1949); Darakyia Mountains in Pir Panjal (not Punjab as wrongly noted by Minton, 1966) range; Lidda Valley, Srinagar, Kashmir (Wall, 1899 and Dattatri, 1985); Poonch, Kashmir (Murthy & Sharma, 1976) and Nepal (Swan & Leviton, 1962 and Kramer, 1977). Except for Lidda Valley, Kashmir and Chitral, where it is reported to be very common (39 and 33 specimens respectively) it appears to be rare at the recorded localities.

Agkistrodon himalayanus is found from an altitude of 2100 to 3000 m. In 1979 this laboratory received a small collection of snakes from Nathia Gali (2600 m), south-east North Western Frontier Province, Pakistan, through the curtesy of our

1986: Litteratura Serpentium. (Eng. Ed.) 6: 46-55.



Map 1. Distribution of Himalayan pit viper *Agkistrodon himalayanus* in the Indo-Pakistan subcontinent. Granulated area shows the extent of the Himalayan Mountain Range.

Localities:

1. Chitral
2. Nathia Gali
3. Srinagar
4. Punch
5. Jammu
6. Chamba
7. Dhramsala
8. Simla
9. Ambala
10. Nepal
11. Kulu
12. Pir Panjal Range
13. Sikim

student Dr. Idrees Munir. The collection contained a young female *Agkistrodon himalayanus* (MSK 0171, author's personal collection) whose pholidosis and measurements are as follows.

DESCRIPTION

Body stocky and robust. Head distinct from neck, longer (24.5 mm) than broad (12 mm), head top flat, broad with symmetrical shields. Rostral

slightly broader than deep, turned up and concave beneath. Due to sharp canthus, sides of head not visible from above. Internasals paired, narrow, meeting behind rostral shield, extending backwards on the sides coming in contact with the supraloreal or canthal scale, slightly shorter than internasals. Prefrontals paired, as broad as long, in contact with internasals, supraloreal, first preocular, supraocular and frontal. Frontal broad anteriorly and pointed posteriorly, one and a half times longer than broad, and as long as supraocular. Parietals, paired, longer than broad. Supraoculars flat, a short anteriorly directed appendage at posterior lateral margin. All head scales slightly concave on dorsal aspect with raised and distinct margins. Preoculars 3, second and third thin and concave forming posterior margin of loreal pit, while first preocular reaches to head top, and in contact with prefrontal. Postoculars 3, third the lowest, extend subocularly so hardly allowing third supralabial to come in contact with eye. Nasal shield broad, partially divided along lower midline. Nasal orifice small hardly visible, directed upward and placed just below the centre of nasal shield. Loreal thin, lining anterior margin of loreal pit. Orifice of loreal pit broad, lined by nasal, second and third supralabials, loreal, second and third preoculars. Supralabials 7, second smallest, fifth narrowest, sixth and seventh broadest (fused with temporals ?), third narrowly entering eye, fifth and sixth narrowly in contact with each other, due to enlarged first lower temporal.
Infralabials 9, first meeting its fellow behind mental. Anterior pair of infralabials elongate and narrow, posterior about half the size of first, separated from its fellow by a pair of elongated scales. Anterior temporals unequal in size, upper small and lower much large. Posterior temporals 3, temporal region of head swollen. Two rows of

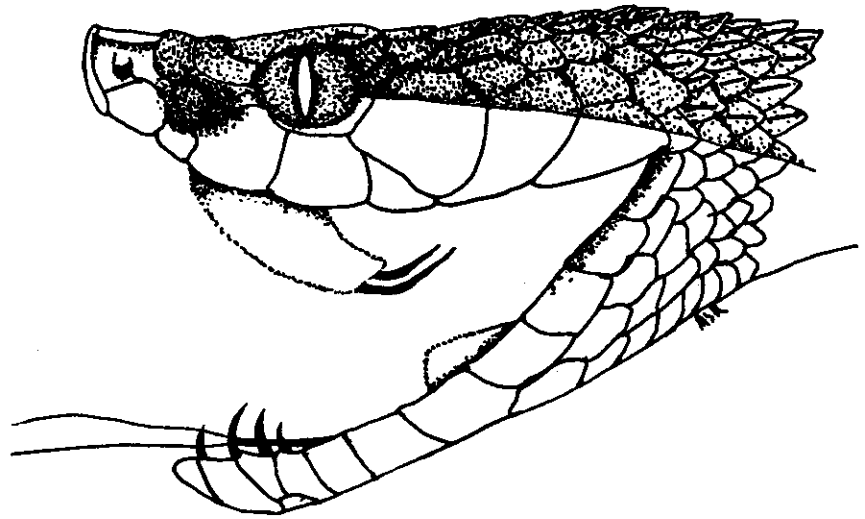


Fig. 1. *Agkistrodon himalayanus*, MSK 0171, lateral view of head.

1 cm

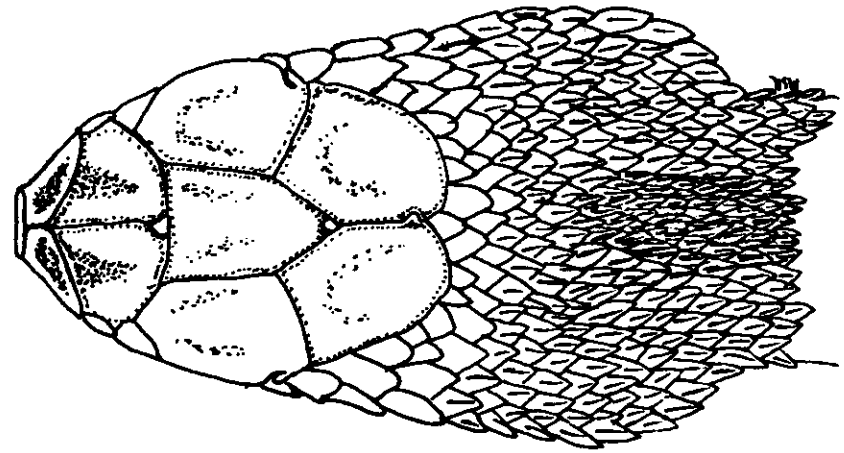


Fig. 2. *Agkistrodon himalayanus*, MSK 0171, dorsal view of head.

smooth nuchals. A pair of large curved, sheathed fangs on each side of upper jaw. Bifurcated part of tongue extraordinarily thin and long. Eyes large with black iris and vertical pupil. Midbody scales 21, reducing to 17 at vent. Except for the last row of scales all dorsal scales strongly carinated, and with a pair of pits at posterior and of each scale. Anal glands, yellow, extending to tenth subcaudal. Tail tapers gradually into a 4 mm long sharp curved terminal spine. Greyish brown body with wavy cross bars on sides. An indication of round blotches on dorsal median anterior part of body. A sharp temporal dark line separates head latrum from head top. Rostral, loreal, supra- and infralabials, light and speckled with minute black to light brown dots. Ventrals and subcaudals dotted and pollished. Snout vent length 455 mm, caudal length 20 mm.

ECOLOGY

Agkistrodon himalayanus is found between altitudes 2100 to 3000 m, with specimens reported from 4000 m in Kashmir and a specimen in Indian Museum is reported to have been caught at the foot of the Dharamsala Glacier, about 4900 m, the highest recorded altitude for a snake (Wall, 1910). *Agkistrodon himalayanus* takes refuge under fallen timber, clefts in rocks, beneath boulders, stones and fallen leaves. It may be found in fields and gardens, hiding in the marginal grass. This snake is nocturnal, though it may be seen basking in the sun close to its hiding place, slipping under cover on the slightest disturbance. In movements it is a lazy and timid snake, slowly moving from one place to another. Its food consists of millipedes, centipedes, skinks and small rodents. Adults are found to have their body laiden with fat before winter. Viviparous, giving birth to

five to seven young during August to September.

TAIL LURING

On encounter, *Agkistrodon himalayanus* flattens itself to the ground, lying still. On provocation, its movements do not quicken, instead it raises its tail tip, hooks and unhooks it alternately as described in other species of *Agkistrodon* (Ditmars, 1907; Henry, 1925; Pycraft, 1925 and Allen, 1949) and other snakes (Henderson, 1970; Green, 1973; Khan, in press). Tail movements are suggested to have prey fascination, prey luring function and are also said to have a warning function. *Agkistrodon himalayanus* moves its tail when sufficiently provoked and in excitement.

VENOM

A bite by *Agkistrodon himalayanus* results in local intense pain and swelling, which subsides within two or three days, leaving no dangerous effect on the victim with no real need for treatment (Wall, 1913, 1921; Acton, 1921). Locally this snake is not regarded as dangerous and in Kashmir it enjoys reverence of the local people (Dattatri, 1985).

TAXONOMIC NOTES

The genus *Agkistrodon* is holarctic in distribution. It is represented by 11 species and 16 subspecies (Klemmer, 1963), of which 9 species and 8 subspecies are reported from palearctic subregion (Leviton, 1968). Well known taxa of the nominated genus are polymorphic: Mexican *Agkistrodon bilineatus* is distinguished in two races; North American *Agkistrodon contortrix* and *Agkistrodon piscivorus*, 4 and 2 races respectively, whilst the east Asian

form *Agkistrodon halys* has 8 races (Gloyd & Conant, 1982). *Agkistrodon himalayanus* is distributed throughout the Himalayas but is not well known throughout its range. Few taxonomic reports exist which indicate differences in various pholidosis suggesting its possible polymorphic nature. These differences are in circumorbital scalation, midbody scale rows, elevation of snout shield on head top, at least some subcaudals divided or all entire, dorsal body pattern.

Agkistrodon himalayanus is peculiar amongst Pakistani snakes in having the first lower temporal and the sixth and seventh supralabials abnormally enlarged. Some authors regard this enlargement due to fusion of these scales with respective temporals (Boulenger, 1896; Smith, 1943 and Minton, 1966). We favour the view of Wall (1910) who regarded this enlargement as independent, since temporals are normal, distinct and viperid, and there is no evidence of their fusion with supralabials.

A second peculiarity is the presence of intercalated small scales between some of the head shields. In MSK 0171 a small scale lies between the posterior median suture of the prefrontals with a second at the posterior tip of the frontal shield (Fig. 2). Those on the parietals and supraoculars are not fully separated from their shields. Boulenger (1890, 1896) only illustrates these small scales between the prefrontals and along the lateral side of the supraorbital.

Midbody scales in 21 rows reducing to 17 just before the anal (Minton, 1966 and present specimen). Boulenger (1896) records 21 rarely 23, while Wall (1910) records 21 and could not find one with 23. Acharji & Kirpalani (1951) recorded an unusually low number of 15 midbody scales from a specimen from Kulu Valley, Himalayan East Punjab, India, but this is either an erroneous count or it represents an aberrant specimen. Postoculars are reported two or three (this article 3, Minton (1966)

2) lowest completely separating supralabials from orbit or third supralabial in orbit. Finally dorsal colouration blotched, striped or unicolour.

The Himalayas are lofty mountains with several complex ranges, well affording geographical as well as altitudinal barriers. *Agkistrodon himalayanus* is widely distributed in these ranges. Known specimens are from widely separated places, with some showing important morphological differences. For the present, however, incomplete data does not allow us to differentiate this snake into races. A study of *Agkistrodon himalayanus*, throughout its range may reveal a polymorphic nature.

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