

Natural history of the Indian salamander

The only salamander known from the Indian subcontinent is *Tylototriton verrucosus*. This species inhabits the cool mountain streams and pools of the Himalayas and the hills of North Eastern India and a few other parts of South East Asia. The genus is considered to be amongst the most primitive of the living salamanders.

John Anderson, who described *T. verrucosus* in 1871, discovered it in the flooded rice-fields near the little Chinese town of Nanting. The species is known from altitudes between 1,000 and 2,000 m in Sikkim, the Darjeeling region in North West Bengal, Khasi hills in Meghalaya, Kamaleng valley and in Arunachal Pradesh and Manipur. Outside India, the species has also been recorded from eastern Nepal, Western Yunnan and Kakheh hills of upper Burma, Loei and Chiang Mai provinces in Thailand.

The species attains a total length of around 20 cm, has a large flat head and tubercular skin. A broad vertebral ridge is present and the tail, which is as long as the body, is laterally compressed with sharp edges. The colour is blackish-brown, paler on the undersurface of the limbs, lips, snout and throat. Ventrally, the tail is dull orange-yellow. Benthic organisms, insects and mushrooms are apparently taken as food in the wild. The salamander makes a low noise while snapping its jaws, possibly giving rise to its Nepali name *pani kukur* and one of the Thai names *mah nam*, both of which mean 'water dog'.

Most records of the Indian salamander are during the rains, between May and October, their breeding season, when the otherwise terrestrially-inclined species enters water. Sluggish, evidently inactive salamanders have been recovered during the month of December and the species is known to withstand temperatures of -20° C. Activities commence in March after emergence from hibernacula – perhaps under a decaying log or in dense

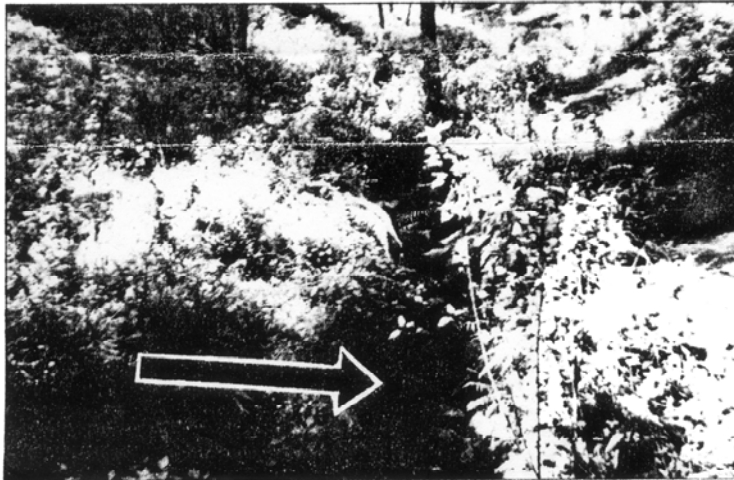


The Indian salamander (*Tylototriton verrucosus*)

vegetation, which may not always be in the vicinity of water.

Amplexus has been observed in late April in underground tunnels and burrows. Egg-laying commences in May and probably continues later into the year. The spherical, greenish-yellow eggs, measuring about 10 mm in diameter, are deposited singly, in pairs or in clusters, on the ground, in water, on blades of grass, and in one recorded instance, on the backs of toads. After egg-laying, female salamanders coil on or around the eggs, an example of parental care uncommon in amphibians. The larvae, which emerge some 20 days later, measure 9-11 mm in length, have large eyes and four external gills on each side. The body is grey with black reticulate patterns, except for the white belly.

Protected under Schedule I of the Indian Wildlife Protection Act, the future of this fairly widespread species remains uncertain, as forests topple, waterbodies are exploited and salamanders are collected for food, medicine and research. A number of zoology textbooks make remarks about the species, and many college laboratories have collections of this salamander, even though commoner amphibians may be poorly represented. Pesticide contamination of salamander habitats and overcollection are suspected to be the most significant threats to its survival. In the local markets of Shillong, salamanders are sold along with hill-stream fishes and are possibly caught with them in basket-traps set in hill streams or by nets. The Khasia tribesmen apparently eat the amphibian. In Nepal, the dried and smoked salamander is used as an alleged cure for typhoid and gastric ailments. The region around Darjeeling



Habitat of the Indian Salamander, in Shillong, Khasi Hills, Meghalaya. Arrow indicates a forest stream where the species was observed. (Photo: I. Das)

used to be, up until recently, a collection centre for supply to the biological product dealers in Calcutta and possibly elsewhere in the country. In Bangkok pet shops the animals are sold for 100-150 baht (about £4.00) each.

Efforts on the part of concerned government agencies and interested individuals and organizations are necessary to ensure the continued survival of the species. Status and distribution surveys in the north-eastern states of India are required. As a Schedule I species, enforcing authorities should give more attention to the prevention of capture, killing and contamination of breeding pools and streams. Finally, public education, especially in those areas where the Indian salamander is utilized as food or medicine, is recommended.

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Diamond back terrapin returns to urban New York

The northern diamondback terrapin *Malaclemys terrapin terrapin* is increasing its range and density within New York City (on the eastern coastline of the US), according to recent survey work co-ordinated by the Natural Resources Group of the New York City Department of Parks and Recreation.

Since April 1984, the Group has been carrying out a city-wide survey of habitats and a number of species that are known to be rare or declining in the area.

In recent times the loss of habitat through urban development and other factors has meant a general reduction in freshwater terrapin numbers. The situation has been partly alleviated by the decline in the numbers of terrapins taken for human food, and considerable increases have been observed locally. The increased frequency of sightings in the New York area suggests that the species whose natural habitat is sheltered and unpolluted brackish or salt water, near tidal flats, coves, estuaries and inner edges of barrier beaches, may become more familiar to the 20 million people who live in New York and its surroundings.

Illegal collectors expelled

Following the arrest of illegal collectors on the Greek Island of Milos, Western Cyclades (*Herpetofauna News*, November 1986), a number of members of the Deutsche Gesellschaft für Herpetologie und Terrarienkunde have been expelled from the Society. This decisive action was taken by the DGHT Council, and is a welcome step towards discouraging irresponsible and illegal collecting of wild herpetofauna in Europe.