(II)

HIMALAYAN NEWT (*TYLOTOTRITON VERRUCOSUS*) IN NAMDAPAHA NATIONAL PARK, ARUNACHAL PRADESH, INDIA

Salamanders are amphibians of the order Caudate (also called urodela). This taxon includes the newts, a group of rough-skinned species in family Salamandridae. Salamander are differentiated from other amphibians (frogs and caecilians) conspicuously by the presence of a tail in all stages including larvae, juveniles and adults, and by having limbs set at right angles to the body with forelimbs and hind limbs of approximately equal size. Salamanders are distinguished from frogs and caecilians also by numerous characteristics of their skeleton and musculature. The Himalayan newt, (*Tylototriton verrucosus*), has been reported from the mountainous region of Nepal, India, Bhutan, Burma, Vietnam, Thailand, Southwest China and Okinawa in Japan (Zhao *et al.*, 1988). This species is the only representative of the order Caudata in the Indian subcontinent. Given the size of the distribution area it is plausible that T. verrucosus can differ, depending on the geographical origin. Because of the large distribution the habitat is not the same everywhere. In the southern part of its range it is generally an upland species occurring at the elevations between 1,000 - 3,000m amsl. In the northern part of its range it is reported from low hills below 1,000m msl. In Darjeeling district, West Bengal, India, there were 10 documented populations in 1994 (Shrestha (1987). The habitats included rice fields, swamps and drains of tea gardens, terrestrial meadows near ponds and vernal pools, and woodland areas. *T. verrucosus* is considered a complex encompassing many variable forms, some of which may eventually become subspecies or even species of their own.

The Namdapha National Park lies in between the latitude 27°23'30" to 27°39'40"N and longitude 96°15'2" to 96°58'33"E (Fig.1) in North-east India, Arunachal Pradesh. The site harbours some of the northernmost tropical rainforests in the world (Proctor *et al.,* 1998) and extensive dipterocarp forests. The elevation ranges from 200 to 4571 m amsl. The authors found the Himalayan newt in the Namdapha tiger reserve in Gandhigram range, Arunachal Pradesh. The species was observed from the 1126m and 1177m elevation (Table 1). Recommendations for the future conservation plans include collecting data on population reduction and extent of occurrence for the Indian range of the Himalayan newt outside the Namdapha tiger reserve, and their evaluation on the basis of the new IUCN criteria for getting a more reliable prioritisation of this taxon.

In spite of being listed in the Schedule I of Wildlife Protection Act, habitat loss because of dwindling of wetlands, land use change practices, rural development and regular human induced forest fires are some of the serious threats facing this species. Water pollution from agrochemicals and domestic detergents, and the extraction of water for irrigation are also degrading its habitat. The species is considered a bad omen and thus killed in certain areas. It is also being used as bait for fishing in Manipur extensively. Although more than a century has passed since the description of the species by Anderson (1871), the ecology of this rare and sporadically distributed animal is poorly known. *T. verrucosus* has the largest range of all species in the genus, which extends from the Yunnan Province in southeast China, through northern Vietnam, northern Thailand (Wongratana, 1984), northern Myanmar, Bhutan, eastern Nepal, and north-eastern India (Sikkim, Darjeeling, Manipur, Arunachal Pradesh and Meghalaya). The distributions formerly acknowledged in Yunnan province, China are now considered *T. shanjing*, with the exception of those found in the extreme west of the province. It probably occurs more widely than current records suggest, especially in areas between known sites (Zhao 1998). The Himalayan newt (*Tylototriton verrucosus*) is listed as Least Concern in view of its wide distribution, tolerance of a broad range of habitats, presumed large population, and because it is unlikely to be declining fast enough to qualify for listing in a more threatened category (IUCN, 2006). However, In

Table 1

Occurrence of Himalayan Newt at Namdapha Tiger Reserve.

No	Region	Location	Coordinate	Alt(m)	No. of individuals	Date	Time
1	East	77 miles	27°18'21.4" 96°54'16.0"	1126	2	8th August	11:00am
2	East	65 miles	27°23'32.4" 96°45'02.6"	1177	3	14th August	9:00 am

Fig. 1

Photographs oh Himalayan Newts

India the species is legally guarded by highest level of protection by being placed in Schedule-I category of Wildlife protection Act, 1972.

The genus of newts *Tylototriton* was described by Anderson (1871) from Western Yunan. It is reported from high altitudes and cold climate of the Eastern Himalaya of West Bengal, Arunachal Pradesh, Sikkim, Manipur and Meghalaya (Kuzmin *et al.,* 1994; Frost, 1985, Devi, 2000). This species ranges from India (West Bengal, Sikkim and smaller, isolated populations in Manipur and Arunachal Pradesh) and Eastern Nepal through the Kachin and Shan Hills of Myanmar to western Yunnan (van Dijk *et al.*, 2004). Mansukhani *et al.* (1976) reported about the occurrence of newt from Arunachal Pradesh and he provided some interesting notes about the habitat of this tailed amphibian. Life history aspects were studied in Darjeeling by Shrestha (1987). The occurrence of the newt in Megahalaya was first observed in Shillong by Das (1984). A preliminary food habit analysis carried out in Manipur (Devi, 2005) showed preference of insects, insect larvae, millipedes, spiders, scorpions, molluscs, plant and inorganic matter, including pebbles, sand and mud in their diet. Dasgupta (1990a) described in detail the habitat requirements for the newt in Darjeeling and their conservation problem. Annadele (1908) studied the breeding habits of the newt in captivity. Detailed taxonomic review was provided by Nussbaum et al., (1995). Anders *et al.* (1998) in his review on the newts describes it as an uncommon species and worries about the lack of information on breeding behaviour, reproduction mode and state wise distribution. Roy and Mushahudinabbil (2001) described the breeding biology of 46 pairs of the newts with descriptions on courtship, mating and egg laying from Darjeeling district. Studies conducted in Nepal and India showed a difference in courtship and mating behaviour (Shrestha, 1984; Roy and Mushahudinabbil, (2001). Discontinuous through Southeast Asia (China, Yunnan, Myanmar, Nepal, Thailand, Vietnam, presumably also Laos of Bhutan). Chanda (1994) has recorded 54 species of anurans from north east India.

When we were working on status and distribution of Malayan sun bear project funded by Wildlife Institute of India and International Bear Associations which was carrying out in Namdapha Tiger Reserve we observed a newt like creature along our transect line. According to Boulenger (1890) and Tikader (1983), the creature having a dark brown newt, a long, tubercular, scale less body, depressed head, two pairs of limbs and a vertically flattened tail, as long as head and body or a little longer. Mid-dorsal vertebral ridge and cranial ridges prominent. Two rows of knob-like porous glands present on either side of vertebral ridge. Each row has 14-18 glands (Boulenger, 1890; Tikader, 1983). The last three being located behind the hind limbs. The mid dorsal and ventral ridge is prominent and internally it is supported by neural process of the dorsal vertebral. Anal opening is a longitudinal slit with slightly swollen edge. Body three to three and a half times the length of the head, Head: Broader than long, depressed, a prominent inverted V shaped ridge on dorsal side, snout short and rounded, eyes small, inter orbital distance greater than the inner nasal distance. Both jaws provided with teeth, palantine series of teeth forming a commencing a little in front of the choannae. Above characters have led us to confirm that the creature was the Himalayan newt found in Namdapha Tiger Reserve. However, our literature reveals the occurrence of Himalayan newt only from some parts of North-east states except Namdpaha Tiger Reserve. Earlier, the Himalayan newt was reported from north-east (Sikkim, Meghalaya, Manipur, Darjeeling and Arunachal Pradesh) by Kuzmin *et al*. (1994), Frost (1985), Devi (2000), Mansukhani *et al*. (1976), Shrestha (1984), Dasgupta (1990), (Devi, 2005), Das (1984), Annadele (1908), Shrestha (1998) and Roy and Mushahudinabbil (2001). Present paper communicates presence and

confirmed its distribution in Namdapaha Tiger Reserve from Gandhigram range of Arunachal Pradesh. According to Daniel (1989) largely nocturnal newts were found in both clear and muddy water, swamp shrub areas but the authors recorded it during the morning time from leaf litter areas.

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