

THE FOOD OF THE HIMALAYAN NEWT *TYLOTOTRITON VERRUCOSUS* (ANDERSON): A PRELIMINARY STUDY¹

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The present study investigates the diet of the Himalayan Newt *Tylototriton verrucosus* (Anderson) based on the specimens collected from Ukhrul and Senapati districts of Manipur. Barring sporadic reports on the occurrence of this species in this region, no detailed studies have been reported. The present study aims at examining the types of food material consumed by this animal on the basis of their gut contents. The food items of the specimens collected between April and October 1996 consisted of insects, insect larvae, millipedes, spiders, scorpions, molluscs, plant and inorganic matter, including pebbles, sand and mud, which are incidentally ingested along with the food.

Key words: gut, mollusc, *Lengva*, pebble, swampy area, chara

INTRODUCTION

The Himalayan Newt *Tylototriton verrucosus* (Anderson) (*Lengva* in Tangkhul) is found in Ukhrul and Senapati, the hill districts of Manipur (including the Siroi-Kasom Hill range of Ukhrul district, which extends up to Mao of Senapati district), at altitudes from 1,500 to 2,200 m above msl.

T. verrucosus is found in small numbers in small water pools and swampy areas of the northern and eastern hills of Manipur. Except Nair (1996), who stated that it feeds on aquatic vegetation, insect larvae, tadpoles and earthworms, no detailed information on the food items of this animal is available. This paper, therefore, aims to investigate the food items of *T. verrucosus* collected from Ukhrul (Hundung, Siroi, Kasom) and Senapati districts (Oinam Ching) of Manipur.

MATERIAL AND METHODS

Analysis of the gut (stomach and large intestine) content of *T. verrucosus* was carried out between April and October 1996. During this period, the animals were collected and stored in plastic bottles, containing 10 ml chloroform and thereafter 5% formaldehyde solution was injected into the stomach of each animal to preserve the organs and to check further mixing of the food particles with gastric juice. In the laboratory, the specimens were grouped on the basis of the month of collection. The stomach and the large intestine of each animal were removed and preserved separately in 70% alcohol.

The guts were later dissected longitudinally and their contents transferred to a petridish containing 70% alcohol. The contents were examined under a microscope, and later

photographed and grouped as follows: 1. Insects: (a) Insect fragments, namely head, dissociated legs and wings, (b) Larvae of different types of insects; 2. Nematodes; 3. Millipedes; 4. Scorpions; 5. Spiders; 6. Molluscs; 7. Eggs of Himalayan Newt. They were further identified using diagnostic taxonomic characters.

RESULTS

The number of Himalayan Newts collected between April and October 1996 and the prey recorded are given in Table 1.

The primary food item of the newt was insects, which were identified using Richards and Davies (1977), Riley (1977) and Zanetti and Adriano (1977). The guts of the dissected newts contained scorpions, spiders (6 spiders were found in one individual), nematodes, millipedes, molluscs, and eggs of Himalayan Newts (Table 1). 25 Himalayan Newt eggs were found once in the gut of an individual, and 21 eggs were found in another. The eggs per gut range between 6-10. The newts start consuming eggs from June (see Table 1). No egg was found in the gut contents after August.

Materials found in the guts other than those described above are plants such as Blue Green Algae, pieces of straw and chara (Table 1). The newt feeds on a variety of insects belonging to different orders; Honey Bees (Table 2) were consumed in large numbers (22.29%) (Fig. 1).

The food items consumed by *T. verrucosus* (Anderson) appear to be dependant on the availability of insects and other organisms in the area during a specific period of the year. April marks the beginning of the warm season, which is usually punctuated by sporadic rains. Before the onset of heavier monsoon rains in June, the flowering of the number

Table 1: Month-wise number of Himalayan Newts and their prey

Sl. No.		April	May	June	July	Aug.	Sept.	Oct.	Total number of newts
1	Total No. of Newts examined	14	17	23	18	11	5	3	91
2	Guts with contents	9	15	19	17	8	4	2	74
3	Empty guts	5	2	4	1	3	1	1	17
4	Guts containing pebble, sand and mud	-	-	-	-	-	-	1	1
5	Guts containing plant materials	-	1	1	1	-	2	-	5
6	Guts containing eggs	-	-	1	4	3	-	-	8
7	Gut containing scorpion	-	-	-	-	-	-	1	1
8	Guts containing spider	-	1	1	-	-	-	-	2
9	Gut containing nematodes	-	-	-	-	-	1	-	1
10	Guts containing molluscs	-	2	2	-	-	-	-	4
11	Guts containing mixed items	-	-	4	6	1	-	-	11
12	Guts containing insects	9	11	10	6	4	1	-	41

of shrubs and many fruit-bearing plants of the area attracts a large number of insects. With the onset of heavy rains aquatic plants and insects are plentiful in the habitat. Many of these insects form the food items of the newt.

DISCUSSION

This study indicates that *T. verrucosus* feeds on insects belonging to several Orders. The food items contained in the

Table 2: Types and quantity of insects found in the guts of Himalayan Newt

Sl. No.	Insect Order	Insect	Months							Total (%)
			April	May	June	July	Aug.	Sept.	Oct.	
1	Odonata	(a) Dragon fly	2	1	-	-	2	-	-	5 (3.18)
2	Orthoptera	(a) Grasshopper	2	1	1	1	1	-	-	6 (3.82)
		(b) Praying Mantis	1	2	-	2	-	-	-	5 (3.18)
3	Hemiptera									
	(a) Heteroptera	Plant bug	-	5	3	3	-	-	-	11 (7.00)
	(b) Homoptera	Plant hopper	-	7	2	3	1	-	-	13 (8.28)
4	Coleoptera	(a) Beetles								
		(adults and larvae)	-	6	3	-	5	2	-	16 (10.19)
		(b) Ground beetle larvae	1	-	-	-	-	-	-	1 (0.63)
5	Lepidoptera	(a) Caterpillar	-	-	7	12	-	-	-	19 (12.10)
		(b) Butterfly	3	-	-	-	-	-	-	3 (1.91)
		(c) Moth	-	4	2	-	-	-	-	6 (3.82)
6	Diptera	Flies	1	1	1	-	-	-	-	3 (1.91)
7	Hymenoptera	(a) Ants	3	7	2	6	-	-	-	18 (11.45)
		(b) Honey bee								
		(adult and larvae)	21	10	4	-	-	-	-	35 (22.29)
		(c) Wasps	6	9	1	-	-	-	-	16 (10.19)
		(adult and larvae)								

(Total number of insects contained in the guts of 41 Himalayan Newts from April to October 1996 = 157)

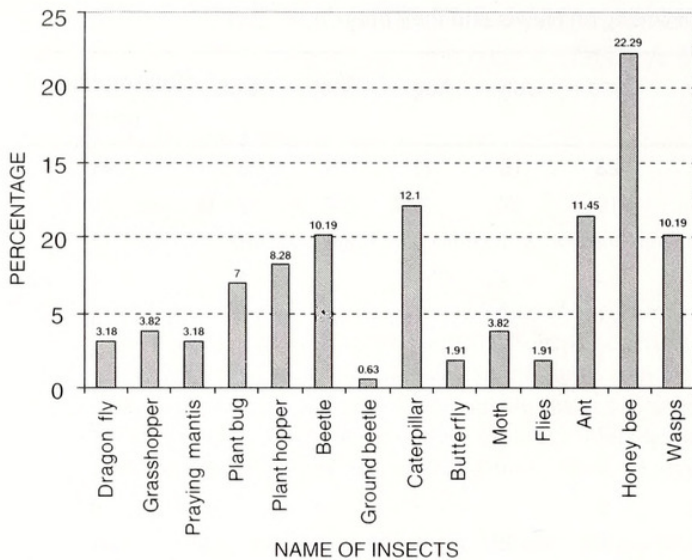


Fig. 1: Quantity of insects found in the guts of Himalayan Newt

gut of the newts collected between April and September are predominantly insects and insect parts. An interesting

observation is that it also consumes its own eggs.

The rate of food consumption is high in May, June and July, declining after August. The gut of the newt is devoid of food materials in October. Voracious consumption of food coincides with the onset of reproductive activities in June. Apart from insects, which constitute the main food items of the newts, fragments of plants, small pebbles and mud were found in their guts. These are perhaps ingested incidentally. The rainy season starts in May and continues up to July; during this period the newts consume the small molluscs, which abound in their habitat. The newts lay eggs from June to August.

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