

QUALITATIVE ANALYSIS OF FOOD SPECTRUM OF FIVE SPECIES OF ANURAN TADPOLES FROM ARUNACHAL PRADESH, INDIA

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Abstract

Anuran tadpoles were collected from amphibian habitats of Arunachal Pradesh during the breeding season from March to September. Taxonomic identification of the tadpoles was done with the help of existing literature (Sahu, 1981). Gut content analysis of five species of tadpoles was done to know the food consumed. Tadpoles between stage 30 to 38 (Gosner, 1960) were selected for the study. *Bufo melanostictus*, *Amolops afghanus*, *Euphlyctis cyanophlyctis*, *Rana danieli* and *Rhacophorus maximus* were studied. This is the first study on food habit of tadpoles in Arunachal Pradesh and will help in the study of habitat deterioration and floristic composition of amphibian habitats in future.

Keywords

Amphibians, anuran tadpoles, food spectrum, Arunachal Pradesh

Introduction

Knowledge of food and feeding behaviour of the tadpoles is very essential as early part of the life history of amphibia is dependent on the availability of the food items in the natural habitat. Degradation of aquatic habitat due to increasing anthropogenic stress is an universal phenomenon. Habitat loss is one of the important causes of the decline of amphibian fauna world over. During our exploration work in Arunachal Pradesh amphibian habitats were studied and an attempt has been made to know the food preference of these tadpole in the undisturbed habitat. Tadpoles were collected from these water bodies and gut content analysis was done in the laboratory. Study of food of tadpoles in northeastern India was earlier done by Sahu and Khare (1988) on *Rana alticola* tadpoles in Meghalaya. They observed that in the early part of life history, tadpoles are herbivorous which later changes to carnivorous in the post metamorphic stages.

Methodology

Tadpoles were collected from temporary and permanent water bodies of Arunachal Pradesh. They were collected with hand net and preserved in 10% formaldehyde solution soon after collection. Stage 30-38 (Gosner, 1960) tadpoles were selected for the study. Guts were removed, gut length recorded and 10mm from the fore gut and 10 mm from the hind gut were taken for analysis. The content was washed in 1.0ml distilled water and placed in a sedgwick rafter. Food items were identified with the help of standard literature.

Observation

Five species of anuran tadpoles were selected for the study on the basis of their availability in most of the amphibian habitats in Arunachal Pradesh. The species are *Bufo melanostictus*, *Rhacophorus maximus*, *Amolops afghanus*, *Rana danieli*, and *Euphlyctis cyanophlyctis*. The study has shown that the major food item preferred was phytoplankton. Species of zooplankton recorded could be chance intake as they were found only in one or two cases. Food items found in the gut content of ten tadpoles, each selected from stage 30 to 38 (Gosner, 1960), are as follows.

***Bufo melanostictus* Schneider, 1799 (Common Asian Toad)**

Body length: 9.8-10.7mm

Gut length: 116-144mm.

Gut contents:

Phytoplankton: Myxophyceae - *Oscillatoria* sp., *Anabaena* sp.
Chlorophyceae - *Ulothrix* sp., *Natrium* sp., *Cosmerium* sp.,
Closterium sp., *Oedogonium* sp., *Penium* sp., *Microspora* sp.,
Spirogyra sp., *Zygnema* sp.,

Diatoms - *Synedra* sp., *Cymbella* sp., *Navicula* sp., *Pinnularia* sp.,
Amphora sp., *Nitzschia* sp., *Diatoma* sp., *Surirella* sp.,
Tabellaria sp., *Melosira* sp.,

Zooplankton: Rotifera - *Lecane* sp., *Monostyla* sp., *Lepadella* sp.,

***Rhacophorus maximus* Günther, 1858 (Large Tree Frog)**

Body length: 9.5-11.5mm

Gut length: 53-87.4mm

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Gut contents:

Phytoplanktons: Cyanophyceae - *Microcystis* sp., *Oscillatoria* sp., *Anabaena* sp.

Chlorophyceae - *Closterium* sp., *Oedogonium* sp., *Scenedesmus* sp., *Desmidium* sp., *Staurastrum* sp., *Cylindrocystis* sp., *Cosmerium* sp., *Euastrum* sp., *Hydrodictyon* sp.

Diatoms - *Pinnularia* sp., *Gyrosigma* sp., *Eunotia* sp., *Navicula* sp., *Nitzschia* sp., *Synedra* sp., *Amphora* sp., *Cymbella* sp., *Stauroneis* sp., *Tabellaria* sp., *Surirella* sp.

Zooplankton: Copepoda - *Cyclops* sp.

Rotifera - *Lepadella* sp., *Platyias* sp.

***Amolops afghanus* (Günther, 1858) (Meghalaya Stream Frog)**

Body length: 9-13.00mm

Gut length: 46-76mm.

Gut contents:

Phytoplanktons: Cyanophyceae - *Oscillatoria* sp., *Anabaena* sp., *Lyngbya* sp.

Diatoms - *Achnanthes* sp., *Cyclotella* sp., *Synedra* sp., *Navicula* sp., *Meridion* sp., *Nitzschia* sp., *Cymbella* sp., *Tabellaria* sp., *Diatoma* sp., *Cocconeis* sp.

Chlorophyceae - *Cosmerium* sp., *Oedogonium* sp., *Microspora* sp.

Zooplankton: Rotifera - *Philodina* sp., *Lecane* sp.

***Euphlyctis cyanophlyctis* (Schneider, 1799) (Indian Skipping Frog)**

Body length: 13.2-18.9mm.

Gut length: 124-308mm.

Gut contents:

Phytoplanktons: Diatoms - *Cymbella* sp., *Synedra* sp., *Navicula* sp., *Gyrosigma* sp., *Pinnularia* sp., *Nitzschia* sp., *Surirella* sp., *Stauroneis* sp., *Diatoma* sp.,

Myxophyceae - *Anabaena* sp., *Oscillatoria* sp., *Merismopedia* sp.

Chlorophyceae - *Cosmerium* sp., *Spirogyra* sp., *Zygnema* sp., *Netrium* sp., *Euastrum* sp., *Ulothrix* sp., *Tribonema* sp., *Oedogonium* sp., *Scenedesmus* sp.

Zooplankton: Rotifera - *Lecane* sp., *Monostyla* sp.

Copepoda - *Cyclops* sp., *Cypris* sp.,

***Rana danieli* Pillai and Chanda, 1977 (Daniel's Frog)**

Body length: 13.5-19.5mm.

Gut length: 123-262mm.

Gut contents:

Phytoplanktons: Diatoms - *Navicula* sp., *Diatoma* sp., *Synedra* sp., *Pinnularia* sp., *Surirella* sp., *Gyrosigma* sp.

Chlorophyceae - *Spirogyra* sp., *Closterium* sp., *Mesotaenium* sp., *Cosmerium* sp., *Penium* sp., *Euastrum* sp., *Oedogonium* sp., *Netrium* sp., *Chydorus* sp., *Mougeotia* sp., *Staurastrum* sp., *Cylindrocystis* sp., *Scenedesmus* sp., *Docidium* sp., *Pleurotaenium* sp.

Cyanophyceae - *Oscillatoria* sp., *Anabaena* sp., *Lyngbya* sp., *Merismopedia* sp.

Discussion

Analysis of food spectrum of tadpoles is important in view of the considerable attention amphibian species have received because of the proposed role of amphibians as indicators of ecosystem deterioration (Wake, 1991). The flora and fauna of the wet land can determine the amphibian species the ecosystem can support. Knowledge of the food of tadpoles of various species can be of use in rearing the species with medicinal values under laboratory conditions. Altig and Kelly (1974) studied indices of feeding in anuran tadpoles as indicated by gut characteristics. Earlier record of study on food habit of tadpoles in the north eastern region is that of Sahu and Khare (1988) who studied food and feeding habits of *Rana alticola* tadpoles in Shillong.

The present study on the five species of tadpoles give a qualitative account of the food on which these tadpoles depend. All the species prefer Diatoms and Chlorophyceae. In case of the *Bufo melanostictus* and *Euphlyctis cyanophlyctis*, Cyanophyceae was not recorded at all showing absence of cyanophyceae in these habitats. Similarly Myxophyceae was not recorded in case of *R. danieli*, *A. afghanus* and *R. maximus*. The gut content analysis of tadpoles gives a clear idea of the food items present in their habitat.

Detailed investigation will lead to many interesting findings regarding amphibian habitat in this biodiversity hotspot area of the world.

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