



HABITAT UTILISATION AND DEVELOPMENTAL DIFFERENCES BETWEEN TWO FAMILIES OF RANIDS AND RHACOPHORIDS IN SELECTED REGIONS OF NORTH ODISHA.

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ABSTRACT

Ranids are restricted to permanent ponds rich with hydrophytes or thick vegetation. *Polypedates maculatus* is arboreal in nature and frequently hidden near human habitation. Amplecting pairs of Ranids move and lay eggs in scattered manner which are adhered to aquatic plants. Foam nest is found in rhacophorid which is adhered to twigs above the water level. There is lack of correlation between body size and clutch size. Variation in pigmentation and nature of colouration are observed in tadpoles of ranids and rhacophorids.

KEYWORDS : Foam nest, Arboreal, Amplecting pairs.

INTRODUCTION

Out of 210 species of amphibians in India, ranids have 90 species and rhacophorids have 54 species. Liem (1970) classified three families: Ranidae, Rhacophoridae and Hyperoliidae. Inger (1966) demonstrated the close relationship of the families. Within ecological communities, environmental resources are partitioned on the basis of dimensional differences in comparative sizes of the organisms (Schoener, 1965). Brockelman (1975) and Brouce (1969) observed that both ranids and rhacophorids are wetland species. Literature is reviewed on habitat and breeding aspects of two ranids, *Euphlyctis hexadactylus* and *Rana taipehensis* and one Rhacophorid *Polypedates maculatus* to provide a comparative analysis of these groups. The present study is aimed at differences in developmental characteristics in allied families in more or less similar habitat. Difference in habitat utilization and developmental pattern are studied.

HABITAT

Ranids are found in restricted pockets where permanent source of stagnant water is observed. Liem (1970) and Taylor (1962) described that *Polypedates* live in trees and tree holes or among grass and weeds near water. McCann (1940) suggested this species lives near perennial water and in house where water is at hand and can be seen all the year round. Anurans found in Odisha are seasonal breeders and observed in areas with temperature and rainfall fluctuation.

CLUTCH SIZE

The term clutch stands for full complement of eggs of single female, irrespective of whether she lays them all at once or over longer period of time (Woodruff, 1976). Publication on clutch size of anurans have been made by Mohanty (1994) on *L. limnocharis* and Rath (1995) on *P. maculatus* to report no of eggs per clutch.

TADPOLE

The tadpoles are radiated into a variety of microhabitat and modes of life has been accompanied by modification of their ovoidal body form (Orton, 1953, Duellman and Trueb, 1986). Morphological structures of tadpoles show the differentiation between ranids and rhacophorids and in between two species of ranids. Comparative analysis of two Indian ranids and rhacophorids is done to access the similarities and dissimilarities in habitat utilisation and development. Cumulative data during the period of study reveal the correlation between body size and clutch size. Both ranids and rhacophorids of amphibian are Poikilothermic in nature so they are coming under seasonal breeders. Different morphological structures of tadpoles mark the differentiation between species. In similar habitat they show different reproduction capabilities.

METHODOLOGY

Distribution of species of both families was ascertained by visiting perennial water bodies at Bankati HSS campus and Mrugabadi in North Odisha during (July-Sept) in 2019. The regions are under Mayurbhanj districts of North Odisha located between 21.933 degree N and 733 degree E. Foam nest was collected from natural environment from the vicinity of Bankati HSS campus to study the clutch sizes. Amplecting pairs were collected during night time and

day time availability. Clutches were transferred in a rearing tray with conditioned water. Hydrilla plants are introduced in to the rearing tray of ranids (Mohanty- Hejmadi, P and Dutta, SK 1988). Tadpoles were collected from natural environment for laboratory studies.

RESULT

E hexadactylus is large sized frog bright green or mid brown coloured, rudimentary webbed with snout vent length (SVL) 55-85 mm in male and 56-120 mm in female. A broad dark blotch is present along the middle of the back with elongated dark patches on either side. They frequently change colour from green to brown to protect from predator. *R taipehensis* is small sized frog and olive or yellow green coloured with two cream dorso lateral lines. SVL of male measures 20- 35 mm and female 18-45 m. *P maculatus* is a medium sized frog with two cream dorso lateral lines. SVL of male is 40-75mm and 43-84 mm in female. Head is longer than broad with bluntly pointed snout. Dorsal side is brownish, yellowish white or greenish with or without irregular dark brown patches. There is a large brown marking on the head, from behind the eyes, extending to the dorsum. They change colour to grey chocolate brown as to protect themselves.

HABITAT

E hexadactylus is restricted to permanent ponds rich with hydrophytes which are the major source of food for the species. *R taipehensis* is confined to permanent ponds or in thick vegetation nearby. They are nocturnal in nature and hide inside aquatic plants during breeding season. *Polypedates maculatus* like other rhacophorids is arboreal in nature and frequently encountered near human habitation. These rhacophorids are found in open fields during breeding season. This species is hidden in resting areas during day time.

CLUTCH SIZE

Smallest female (SVL- 56 mm) of *E hexadactylus* had more (4850) number of eggs than largest female (SVL-120 mm). The clutch size ranges from 2500- 9000. Clutch size ranges from 755-1600 in *R taipehensis*. Ranid female with more weight have less number of eggs in a clutch than number of eggs produced by female with less weight. Correlation between body size and clutch size is not established. Ranids are also associated with multiple clutch. Number of eggs in clutch varies between 115-670 with an average of 330 in case of *P maculatus*. The number of eggs in a clutch increases with size of the female Rhacophorids.

TADPOLE

Pigmentation is varied in dorsal, lateral part and tail of *E hexadactylus*. Pigmentation is more prominent in tail. Tadpole of *R taipehensis* are bottom dwellers and resemble with tadpoles of *P maculatus* except the characteristic colouration. At late tail bud stage of *P maculatus* first movement of embryo is marked inside foam nest. Embryos are released into water during external gill stage.

DISCUSSION

Habitat utilisation and developmental variations have been analysed between selected species of ranids and rhacophorids in North Odisha. During breeding season gravid females are found larger in size than mature males. Mohanty-Hejmadi and Dutta (1981) studied on *Rana*

tigerina and *Rana crassa* and reported the Snout vent length correlationship among males and females. The smallest size was considered in the present study attaining sexual maturity. The present study revealed that the smallest gravid female was 56 mm and male 55 mm for *E hexadactylus*, female 18 mm and male 20 mm for *R taipehensis* and female 73 mm and male 50mm for *P maculatus*. The present study explored that intergenetic, interspecific and intraspecific variation in size was found during SVL data comparison. Correlation between body size and clutch size was Terentjev (1960), Matsui and Ota (1984). Similar observation is seen in *P maculatus*. In *Rana limnocharis* smallest female (SVL 34 mm) lays 120 eggs was reported by Mohanty (1994). In case of *Rana tigerina* (Dutta and Hejmadi, 1976) and *Rana crassa* (Dutta et al., 1993) of ranids are having larger body size and clutch size than *Rana limnocharis*. The SVL and clutch size when compared with *Polypedates maculatus* the clutch size of latter is much smaller and eggs are larger. More eggs are seen in several microhylids. However small species are more prone to predation. Smaller species need a suitable adaptation to the annual uncertainty of the environment. They produce relatively larger clutch size in order to breed effectively (Kuramoto, 1978). The comparative study of clutch size of *Polypedates maculatus* with ranids concludes the others do not follow the specific pattern of more eggs for larger species as in case of *Polypedates maculatus*. In *Polypedates maculatus* the modes and sites of egg lying is more advantageous so we will get early development in well guarded environment thus ensuring high embryonic survival. Larger eggs are selectively advantageous than larger clutch size. Different in oral morphology was found in between *E hexadactyla* and *R taipehensis*. The keratinised cover is seen to adapt with scratch surfaces of the submerged vegetation. Overall the clutch sizes, structure of tadpole of both families depend on the adapted environment which varies according to the change in habitat utilisation, predation and natural calamities.

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