A STUDY ON THE, SEX RATIO, AND BREEDING BEHAVIOUR IN THE RANA CURTPES

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Abstract

Some local moor frog populations (Rana arvalis) from the south of the ranges were compared to the Moscow Area in terms of size, age, and morphological traits. The mean body size and age of the Indian populations vary considerably, despite their relatively near proximity (less than 40 kilometers). As a result, the Indian population's mean estimate for these variables was less. In comparison to the Indian population, females are more likely than males to reproduce for the first time in the winter, and mature specimens older than two years are more common in both sexes, albeit their percentage of older specimens is lower. The specimens from the southern populations have a somewhat lower mean age and body size as a result of this regional variation in the composition of the age. Despite the fact that operations last longer in India than in the Moscow area, frogs from southern populations develop more slowly as they get older, with only four years old being higher as India population samples. In the case of women and men from southern populations, stronger reproductive activities are what causes these discrepancies.

Key Word: Sex Ratio, Frogs, Populations, Rana CurtipesJerdon

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1. INTRODUCTION

Amphibians were the earliest class of vertebrates to evolve adaptations for both a terrestrial and aquatic lifestyle. Amphibians hold a unique place in the evolutionary heritage of vertebrates since they initially evolved to live on land (Anderson, 2008; Frost et al., 2008). Amphibians are a transitional group between totally aquatic fishes and true land amniotes. Amphibian species were effectively maintained, and this was due to the development of novel reproductive techniques for the improved terrestrial environment, as well as the development of their limbs, lungs, and numerous anatomical alterations (Shine, 1979; Prado et al., 2005). Sperm, ovulation, oviposition, fertilisation, development, and transformation are all components of an amphibian's reproductive function (Brown and Cai, 2007). According to the history of amphibians, evolution has continued from the triassic to the mid-jura period (Anderson, 2008; Boisvert, 2009). According to Marjanov and Laurin (2007), who phylogenetically positioned modern amphibians similarly to the Batrachians' inconsistencies (Anderson, 2008; Frost et al., 2008), the genesis of present amphibians may have occurred between 351 and 266 Mya (the Liss amphibians: frogs, salamanders and limbless caveans, but not amniots, 2007). Rajesh Kumar across time K. H. Iboral Singh, M.D. As a consequence of contacts with nature, two distinct reproductive strategies—oviparity, ovo-viviparity (for example, in Pipa pipa), and viviparity (for example, in Salamandra salamandra)—were discovered (Wake, 1998). Contrary to other terrestrial vertebrates (such as reptiles, birds, and mammals), amphibians seem to have radiated a wide array of reproductive strategies (Diwan, 1996). Because most amphibians are poikilothermic and depend on water for reproduction, the continually shifting climatic elements like air and water have a significant impact on their reproductive activity. Temperature (Delgado et al., 1992; Sumida et al., 2007). (Delgado et al., 1992; Sumida et al., 2007). Daylength, relative humidity, and rainfall.

Anura, urodela, and apoda are the three species of amphibian fauna found in India. The reproductive biology of amphibians from India, however, is not well understood. Numerous of them are exclusive to the Western Ghats and have unexplored life histories, mating tendencies, and habitats. The Indian frog Rana curtipes (Jerdon, 1853) is found in Karnataka, Kerala, and Tamil Nadu (Inger and Dutta, 1986; Daniel and Sekar, 1989). Between 600 and 2000 m high hills, the West Ghats range pretty regularly from 8 to 2loN latitude [Daniels, 1992]. Daniels (2002).

The annual reproductive patterns of temperate and subtropical amphibians have been thoroughly investigated. Less tropical investigations of the Western Ghats, however, have been conducted in India [Ingber and Greenberg, 1956, 1963; Ramaswami and Lakshman, 1959; Basu and Mondel, 1961; Basu, 1968; and Agarwal, 1978]. They also happen less frequently.

One of the little-studied Indian anuran species is Rana curtipes. Little is known about its reproductive biology. The initial knowledge about the morphology of Rana curtipes was provided by Boulenger (1890). Rao (1914) gathered a few stages of tadpoles from Coorg (Karnataka) in May and June and initially described their morphology. Abdulali conducted the research (1962). Adults gathered from Karnataka have the typical sluggish actions. The overall anatomy of adults and their regional dispersion were reported by Daniel and Sekar in 1989.

Ravichandran also provided a few remarks on the anatomy and dispersion of adult Rana curtips (1993). Hence, a thorough study of Rana curtipes' reproductive biology is currently lacking. The population of the northern Ghat is the subject of numerous following succinct statistics. The Rana, however, which

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avoids individuals in the southern Western Ghats area, is a mystery. Therefore, in order to contribute information on Rana Curtin's reproductive biology from the southern population of the Western Ghats, this study was carried out. The endocrinological function of this amphibian in its development required a thorough examination.

2. REVIEW LITERATURE

The earliest efforts to ontogenically test an Indian anuron species for the Indian skipper Rana cyanophlyctis was made by Ramaswami and Lakshman in 1959. Shumway was just in the formative phases when it was first unveiled. Mohanty-Hejmadi and Dutta completed the final portion of the trials (1979). Later, it was stated that the tigresses Rana limnocharis (Roy and Khare 1977; Khare and Roy 1977) and Rhacophorus malabaricus (Secar, 1990) were in the early phases of development. [Bhati, 1969; Agarwal and Niazi 1977; Dutta and Mohanty-Hejmadi 1978] A significant portion of Mohanty-Hejmadi and Dutta's study focused on Bufo melanostictus and Polypedate maculatus developmental stages (1978, 1988).

Gesner (1960) simplified evolutionary charts and suggested a generic table modeled on the Rana pipiens (Shumway, 1940; Taylor and Kollros, 1946) and Bufo valliceps (Liambaugh and Volpes, 1957) tables that would encompass the entire period of maturation and metamorphosis. This generally applies to most anurans. However, according to Gesner (1960), owing to variations in sequencing and the presence of particular unique traits in distinct species, distinct growth tables for each species are required in order to make accurate judgments. The Rana curtipes tadpole has only been the subject of broad discussions on a few-stage feeding, ecology, and morphology in the literature that is currently accessible [Rao, 1914; Sekar, 1989]. In addition, a literature check revealed that the southern

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western Ghats zone did not contain any of the Karnataka area larvae obtained by Rao (1914) and Sekar (1989).

According to Etkin's (1964) theory, a rise in temperature quickens the process of transformation. Riis (1991) discovered a logarithmic association between temperature and period of embryo evolution in the Rana temporaria and Rana Dalmatina. Due to external (physiological) and internal (genetic) influences, the size and length of the larvae vary depending on the species. Since amphibians are poikilothermic, external forces have a significant effect on their development. We anchored our investigation on the effect of temperature on the growth and metamorphosis of a tropical anuran, Rana curtipes, which is a significant external variable, in a bid to corroborate this.

As a result, the research done in Savage (1955), Satel and Wassersug (1981), Ruibal and Thomas (1988), Echeverria, and others (Kamat, Inger, Laymanowitch, Lajmanovitch, Laymanovitscha, and Fernandez, 1983 and 1995) is an environmental analysis of research done on, among other things, morphological and anatomical features. One of the key components of reproductive wellness is food hunting (Nishimura 1999). Therefore, it is not surprising to learn that the bulk of group-liAong species can accurately divide up their feeding grounds based on the richness of their habitats (Godin and Keenleyside 1984; Talbot andKramer 1986).

It is helpful to refer to Taylor and Kollros (1936), Gesner (1960), and similar texts on the stage of amphibian tadpoles. However, at specific developmental phases, these systems rely on a few ambiguous physical traits. During the post-feeding stage, tadpoles maintain their form without significant morphological alterations. However, the overall tadpole length multiplies on several occasions, and this time period is often regarded as a developmental stage. Pro-metamorphosis, as well as variable maturation and evolution, come after this cycle of existence.

While T3 and T4 in pre-metamorphic tadpoles are below the detectable RIA, Frieda and Just (1970) demonstrated that exogenous T3 or T4 Adrenal sterosides are documented to increase thyroid hormone activity by boosting the thyroid hormone's nuclear binding potential in the target tissue. Tadpoles are given corticoids to delay metamorphosis during the pre-metamorphic phase of development. However, during mature development, transformation is sped up [Kobayashi, 1958]. injections of glucocorticoids or ACTH, which caused the pro-metamorphic or pre-metamorphic tadpole administered with thyroxines to produce and metamorphose [White and Nicoll 1981]. T3 or T4 adrenal hormones have been recognized as the regulating parameters for metamorphosis induction in Kaltenbach (1968) and Dodd and Dodd (1976).

3. EVIDENCE FOR HORMONE-MEDIATION OF SEX RATIOS

The sex ratios of adults or their progeny frequently deviate in reaction to societal or ecological shifts. Reactions to these factors must first be translated into a biological response that eventually affects the system of sex-determination for modifications in phenotypic or genetic sex to take place. Because the endocrine system as a whole controls physiological functions in patterns that promote viability in a continuously evolving world, hormones are great prospects for this transfer. In fact, there is proof that hormones play a role in sex ratio adjustment at each stage in every species of vertebrates where processes of sex ratio modification or reversal have been examined.

4. HORMONAL MEDIATION OF SEX RATIOS IN HUMANS

Numerous studies conducted over the past century have shown that sex ratios are distorted as a result of various ecological and societal shifts, such as marital status, socioeconomic condition, natural catastrophes, as well as other traumatic occurrences involving wars and emotional trauma. Since the sex ratios of human kids are frequently recorded at birth, it is challenging to determine exactly when the affects occur. Both primary and secondary degrees of manipulation have been shown to be fraudulent.

In order for the primary adjustment of sex ratio to take place in humans or non-human mammals, there must either be an excess of X- or Y-bearing sperm or a difference in the sperm's ability to fertilise the egg as a consequence of the sperm's characteristic or the egg's receptivity depending on the sperm's sex chromosome status. It has been proposed that most of the distorted sex ratios observed in human societies are caused by variations in testosterone:gonadotropin ratios in men and women at the moment of conception. The discovery that endocrine-disrupting substances recognized to lower testosterone levels and stimulate testicular failure also trigger substantial alterations in the offspring's gender supports the idea that the testosterone:gonadotropin ratio in men and the sex-ratio of their offspring may be related. One pesticide that has estrogenic properties and reduces the testosterone:gonadotropin ratio in men, dibromochloropropane (DBCP), exposed men and produced substantially more daughters. Persistent organ chlorine pollution raised the percentage of Y-bearing sperm in ejaculates, and other trials have even shown shifts in the ratios of X-bearing sperm to Y-bearing sperm after exposure to endocrine-disrupting chemicals. Conversely, more female offspring are produced when men are exposed to stress at work, which raises glucocorticoid concentrations and lowers amounts of reproductive hormones overall. The effects of paternal stress may be handled by alterations in other downstream mediators, an increase in glucocorticoid levels, a decrease in sex steroid levels, or both.

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5. SIZE FREQUENCY DISTRIBUTION

Callinectes sapidus confirmed that in sea-going brachyuran, guys achieved maturation at larger in size than females when focusing on sexual challenge among male blue crab. Dotillasulcata from Elgharqana was taken into consideration when discussing the population framework and biology of crabs. She explained that in these crabs, when size recurrence histograms using 1mm class intervals of carapace length were constructed, it delineated that for both sexes, the populace constituted transcendently grown folks. The size recurrence appropriation of mud crabs, Scylla spp., was also analysed. This revealed that the amount of smaller crabs (less than 7cm CW) increased in May, June, and July and then slowly decreased from August to October before increasing once more for a significant portion of November. Based on these findings, he hypothesised that recruitment took place twice a year in these crabs, first from May to June and then again in November. He also examined the Thalamitacrebata crab population in Kenya and observed that females were more diverse than males in smaller sizes, such as those between 40.5 and 55.44 mm. The bigger size classes for men range from 55.4 to 80.44 mm. Ali et al. (2014) conducted research on size recurrence dissemination in Scylla serrate of Bangladesh and reported that in guys, the most exceptional size (130mm CW) was observed in the period of May and the least size (47mm CW) in the month of August, with the module class size being 81-90mm. Females' sizes ranged from the largest (100 mm CW) in June to the smallest (32 mm CW) in July. The most significant recurrence in females was documented at 71-80mm CW, whereas in men, it was viewed as supplementary from class sizes 41-50 mm CW up to 81-90 mm CW and less from that point.

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6. CONCLUSION

It is clear from the review of the literature that endocrinological impacts on the growth and transformation of Rana curtipes, as well as their life history and breeding behavior, have received minimal consideration. In order to demonstrate the effects of temperature and hormones on growth and transformation, as well as to familiarise scientists with this little-known tropical species.

According to the findings of the current research, Rana curtipes are nocturnal by nature, lethargic in their motions, and uneasy in the water. Only during the breeding season do they enter the water. A thorough examination of the reproductive cycles of the Rana curtipes is believed to be a seasonal breeder with a protracted reproductive phase connected to the south-west and north-east monsoons. Although the active breeding season lasts from May to October, the exact timing of its start and end changes from year to year depending on the amount of rain that is available. The oviposition occurs when the temperature is low, either in the morning or in the hours following a strong downpour.

In the population of Rana curtipes in the south Western Ghats, gender ratio assessment shows that there are more males than females. This study also reveals a definite variation in size between males and girls. Generally speaking, males are smaller than females. The present research demonstrates that Rana curtipes has larger tadpoles than any other tropical anuran species and that its growth and metamorphosis are significantly lengthy. The size and length of the Rana curtipes tadpoles' growth are significantly influenced by temperature.

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