



Comparative Morphometric Study Between Male and Female *Sitana Ponticeriana*

KEYWORDS

Morphometric, *Sitana ponticeriana*

Puspanjali Parida

Deepali Bindhani

P. G. Department of Zoology, North Orissa University, Baripada, Odisha, 757003 INDIA.

P. G. Department of Zoology, North Orissa University, Baripada, Odisha, 757003 INDIA

ABSTRACT Different body parts such as total length (TL), snout-vent length (SVL), femur length (FL), tibio fibula length (TFL), foot length (FOL) of each *Sitana ponticeriana* were measured and compared between male and female. Males were usually longer in size (TL) than the female. Maximum number of female was found in the month of September and minimum in July. The sex ratio of female and male *Sitana ponticeriana* were varies throughout the year.

INTRODUCTION

Ecomorphological theory suggests that there is a relationship between the morphology, ecology, and behaviour of organisms (Losos, 1990a). Lizard locomotion has become a particular focus of ecomorphological studies because lizards occupy a wide diversity of habitats that place different demands on the mechanics of the locomotor system (Aerts *et al.*, 2000; Herrel *et al.*, 2002). For example, the biomechanics of organisms that climb are purported to be different from those that are solely ground-dwelling (Zaaf and Van Damme, 2001). Various investigators have attempted to correlate limb proportions and habitat use in lizards and have explored whether or not morphological characteristics are adaptations to the demands of the animals' microhabitats. Such studies have yielded a variety of conclusions. According to biomechanical predictions, ground-dwelling lizards should have long hind limbs with a high tibia:femur ratio (Zaaf and Van Damme, 2001). This high-gear system of locomotion is believed to enhance the acceleration produced by the hind limbs during running (Zaaf and Van Damme, 2001), as well as permit longer strides and decrease friction by raising the body from the ground (Van Damme *et al.*, 1997)

It is widely assumed that amphibians and reptiles show indeterminate growth and that body size and age are therefore positively correlated (Duellman and Trueb, 1985). The major morphometric data available for most of the lizards is the size, which sometimes provides answer to separation of mature individuals of some species from the immature. Review of growth studies in reptiles indicate that size at first reproduction and growth thereafter are both potentially important determinates of adult size (Andrews, 1982; Rand and Bock, 1992), while age and size in adult reptiles are often poorly correlated (Halliday and Verrill, 1988). Sex ratio plays an important role in natural population of any sexually breeding species. In lizards, several studies report variable sex ratio (Singh and Thapliyal, 1962 and Church, 1962; Subba Rao and Rajabai, 1972a; Koul and Duda, 1977). In the present study different body parts such as total length (TL), snout vent length (SVL), femur length (FL), tibio fibula length (TFL) and foot length (FOL) were measured and compared in both male and female *S. ponticeriana*. The number, size and sex ratio of *S. ponticeriana* found in different month of a year are measured.

MATERIALS AND METHODS

Sitana ponticeriana, a small lizard, easily distinguished by the presence of only four as against five toes in all other agamids. The fan like throat appendage in male is an additional distinguishing character. Body is covered with equal keeled scales. Olive- brown, above with a series of dark rhomboidal spots along the middle of the back (Daniel, 2002).

About 450 number of animals of various length (TL) were collected randomly from the open fields during the early morning hours as they are active in that period, over the year from Khurda and Puri district of Odisha. After capture the animals were brought to the laboratory. The animals were tentatively sexed by the presence (male) or absence (female) of gular pouch of *S. ponticeriana*. All the animals were caught in the field (monthwise) and measured immediately by exposing the animal to chloroform the help of anesthesia.

Different parts were measured such as snout-vent length (SVL), femur length (FL), tibio fibula length (TFL), foot length (FOL) by the dial caliper whereas total length (TL) was measured by the help of thread and scale). After measurement the animals were released into different place far away from collection site.

RESULTS AND DISCUSSION

It is found that TL of both female and male *S. ponticeriana* gradually increases from month of January-July and maximum size found around the month of June and July. But in August and September average length or TL of collected animal are found to be decreased. However, in the month of October to December TL slightly increases in comparison with September (Fig. 1). In otherwords, average length of male is larger than the female. It is known that the breeding season of *S. ponticeriana* is April-October and egg laying mostly occur in July-October (Daniel, 2002). So it may be the reason, that hatchling and juveniles are found in more number in month of August and September. Similarly the size of SVL, FL, TFL and FOL of both male and female *S. ponticeriana* increases and decreases in the similar manner like TL. (Fig.2, 3, 4 and 5).

From random collection of *S. ponticeriana* from January-December, it is found that maximum number of female is found in month of September (i.e, 62) and minimum in the month of July (i.e, 3) whereas maximum male found in the month of October (i.e, 57) and minimum in the month of August (i.e, 7). In September, April and August number of female is greater than male while in rest of the months number of male is greater than female. The sex ratio of female and male *S. ponticeriana* is varies from month to month. (Fig.6)

When TL, SVL, FL, TFL and FOL of female and male *S. ponticeriana* were correlated it is found that TL ($R^2 = 0.9424$), SVL ($R^2 = 0.9355$), FL ($R^2 = 0.9518$), TFL ($R^2 = 0.9564$) and FOL ($R^2 = 0.9331$) which shows all the parameters of female and male are highly correlated throughout the year (Fig.7, 8, 9, 10 and 11).

When the SVL of male is compared with that of female, it is

found that SVL of male is significantly varies ($P > 0.05$) from that of female through the year (January to December).

From the mean value of different parameters (SVL, TL, FL, TFL and FOL) measured and their ratio from January-December compared with SVL. In female the ratio of SVL:TL:FL:TFL:FOL is 1:3.0:0.31:0.34:0.47. It is found that in female TL is about thrice of SVL, FL and TFL are near about 1/3rd of SVL and FOL is near about 47/100th of SVL.

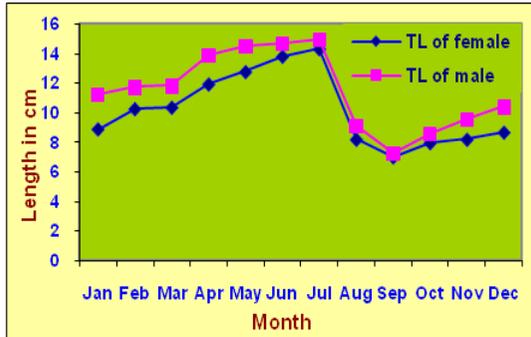


Fig.1: Comparison of TL between female and male Sitana ponticeriana from Jan-Dec

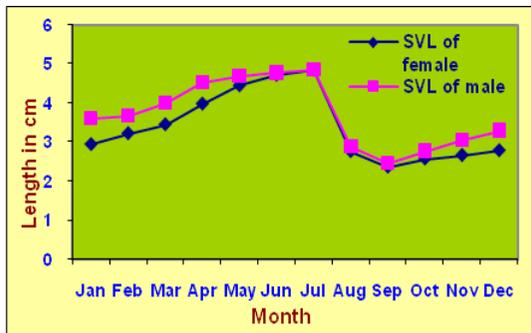


Fig.2: Comparison of SVL between female and male Sitana ponticeriana from Jan-Dec

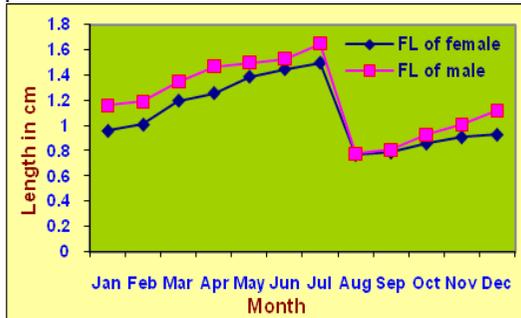


Fig.3: Comparison of FL between female and male Sitana ponticeriana from Jan-Dec



Fig.4: Comparison of TFL between female and male Sitana ponticeriana from Jan-Dec

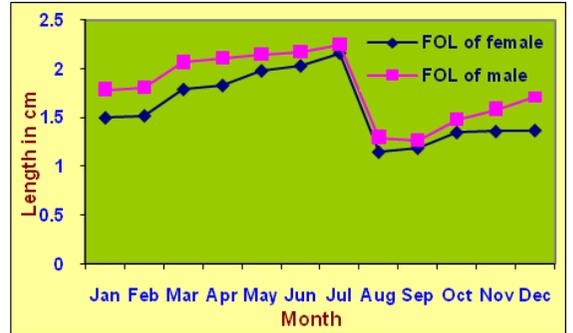


Fig.5: Comparison of FOL between female and male Sitana ponticeriana from Jan-Dec

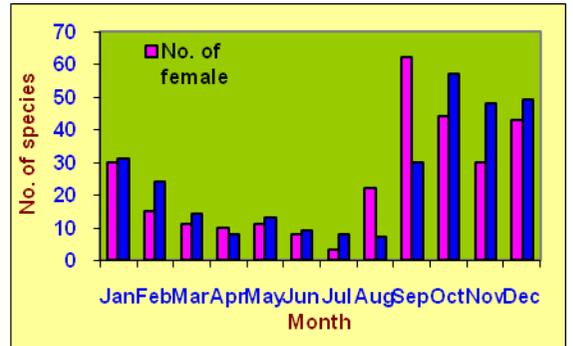


Fig.6: Comparison of number of Sitana ponticeriana from Jan-Dec

Where as in case of male the ratio of SVL:TL:FL:TFL:FOL is 1:3.09:0.32:0.35:0.48. It is found that in male TL is slightly more than thrice of SVL, FL and TFL are near about 1/3rd of SVL and FOL is about half of SVL.

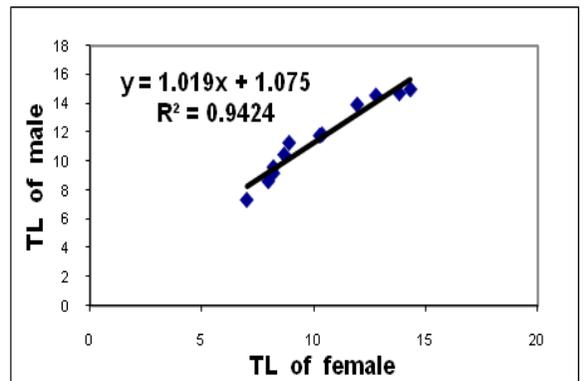


Fig. 7: Correlation of TL between female and male Sitana ponticeriana from Jan-Dec

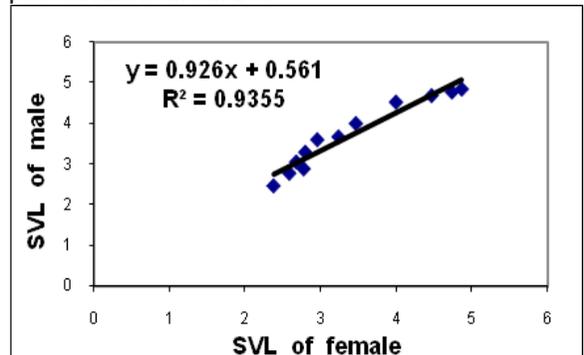


Fig. 8: Correlation of SVL between female and male Sitana ponticeriana from Jan-Dec

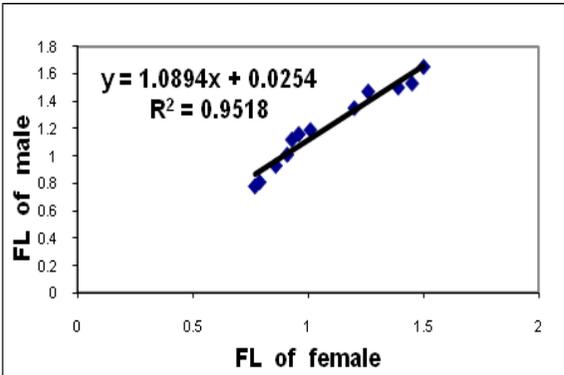


Fig. 9: Correlation of FL between female and male *Sitana ponticeriana* from Jan-Dec

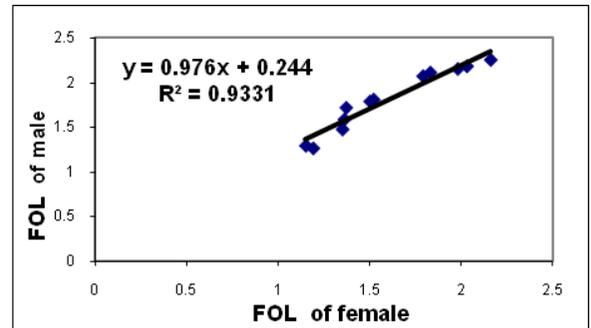


Fig. 11: Correlation of FL between female and male *Sitana ponticeriana* from Jan-Dec

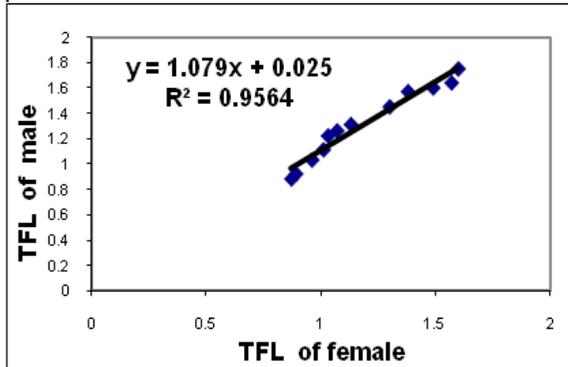


Fig. 10: Correlation of TFL between female and male *Sitana ponticeriana* from Jan-Dec

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