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## Research Article

# MORPHOMETRIC STUDIES ON *EUPHLYCTIS* *CYANOPHLYCTIS*(SCHNEIDER, 1799)

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## ABSTRACT

Statistical analysis with traditional morphometry was performed to analyse the intra population variation in *Euphlyctiscyanophlyctis*(Anura:Dicroglossidae) from Pearl valley(N 12°41'E 77°39') of Anekaltaluk, Bangalore Urban district. Random samples (N=10) of individuals were collected from different sites to measure 11 morphometric parameters. Significant correlation was obtained between the parameters viz., snout vent length, head length, head width, eye diameter, tympanic diameter, eye- nasal distance, inter-orbital distance, thigh length, foot length, first finger length and first toe length. Regression analysis were performed for two morphometric variables viz., head length and the Snout vent length and fitted regression equation  $y=0.477x - 0.670$  ( $R^2 =0.302$ ) was obtained for the species.

**Key Words:** Morphometry, *Euphlyctiscyanophlyctis*, Bangalore

## INTRODUCTION

The Indian Skipper frog, *Euphlyctiscyanophlyctis*(Anura:Dicroglossidae) (Figure 1) is an aquatic frog distributed throughout India including urban water bodies (Dinesh *et al.* 2009). Their common name is in reference to their instinct skip into water when disturbed. Externally adults of the species are brown – olive with distinct black spots on back and limbs with white belly. They have a distinct white stripe along sides and on rear side of thighs (Hegde, 2012). Perusal of literature revealed scanty data available pertaining to anuran ecology and species diversity from Bangalore. Further, any data on *E. cyanophlyctis* is lacking. Hence, an attempt to fill this lacuna through a short term study encompassing diversity and morphometry of anurans was undertaken. The present study analyzes the morphometric sampling of *E. cyanophlyctis* population in Pearl Valley, Bangalore Urban district.

## MATERIAL AND METHODS

### Study area

The present study was undertaken in Pearl valley (Figure 2), Anekaltaluk of Bangalore Urban district. The region is a hilly segment of the Eastern Ghats continuous with the Bannerghatta National Park. The



**Figure 1.** An adult *Euphlyctiscyanophlyctis*.



**Figure 2.** The sampling area, Pearl valley of Anekaltaluk, Bangalore Urban district

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field work was carried out in the study sites during the months of January to March of 2012 during early hours of the day. Three visits were made to the selected study sites. During the course of survey 3-5 hours of “time-constrained search” for frogs in the study sites was undertaken following Daniels (2005). Survey was carried out near water bodies and micro-habitats such as, on the floor, rocks, leaves, under leaf litter, under logs, under the soil, among dried leaves, among weeds, near termite mounds etc.

### **Morphometric Measurements**

Eleven types of morphometric measurements (Table 1) were taken using a thread and centimetre scale and recorded in centimetres (cm). Random sampling of the specimens in the study area was collected and measured.

**Table 1. Eleven morphometric parameters were considered in the present study**

S. No.	Morphometric parameter	Explanation
1	Snout Vent length (SVL)	The distance between the anterior tip of the snout and the posterior tip of the vent
2	Head length (HL)	The distance between the tip of the snout and the posterior margin of the tympanum including the tympanic annulus.
3	Head width (HW)	The greatest width of the head, at the level of the tympanum.
4	Eye diameter (ED)	The greatest distance between the anterior and posterior margins of the eye
5	Tympanic diameter (TD)	The longitudinal distance between the outer margins of the tympanic annulus.
6	Eye- nasal distance (END)	The distance between the anterior margin of the eye and the posterior margin of the naris.
7	Inter-orbital distance (IOD)	The distance between the outer margins of the two eyelids at the middlepoints.
8	Thigh length (THL)	Length between the lateral tip of the vent and the convex surface of the condyle (the knee was held at the flexed position).
9	Foot length (FL)	The distance between the posterior margin of the outer metatarsal tubercle and the tip of the fourth toe (longest toe).
10	First finger length (1FL)	The distance between the inner corner of the finger and the tip of the finger.
11	First toe length (1TL)	The length between the outer margin of the inner metatarsal tubercle and the tip of the 1 <sup>st</sup> toe.

Morphometric measurements of the samples (N=10) randomly collected during the survey were taken in the field conditions and animals were released after recording the observations. Care was taken to ensure no stress on the animals during the course of the measurements. The data was used to analyze the correlation between the morphometric parameters of the randomly collected individuals. Regression analysis was performed for two morphometric variables only viz., head length and the Snout vent length for all the samples. The statistical analysis, correlation and linear regression were performed using SPSS software (11.5 version).

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**RESULTS AND DISCUSSION**

The descriptive statistics data along with the correlation analysis are tabulated sequentially (Table 2&3).Regression plots of the morphometric parameters along with fitted regression equations are also depicted(Figure 3).

**Table 2: Descriptive statistics of morphometric parameters of *Euphlyctiscyanophlyctis*(N=10) in Pearl Valley, Anekal region.**

Parameter	Min.	Max.	Mean	SD
HL	.40	1.50	.8900	.3984
HW	.70	1.70	1.1900	.3414
ED	.20	.40	.2800	.0632
TD	.10	.40	.2100	.0737
END	.30	.70	.5300	.1251
SVL	2.70	4.20	3.2700	.4595
IOD	.20	.40	.3100	.0567
THL	.40	1.50	1.0400	.3373
FL	1.00	2.00	1.4300	.3301
1FL	.30	.80	.4600	.1429
1TL	.20	.60	.3400	.1264

**Legends:** Head Length (HL), Head Width (HW), Eye Diameter (ED), Tympanic Diameter (TD), Eye and Nostril Distance (END), Snout Vent Length (SVL), Interorbital distance (IOD), Thigh length (THL), Foot length (FL), 1st finger length (1FL), 1st toe length (1TL).

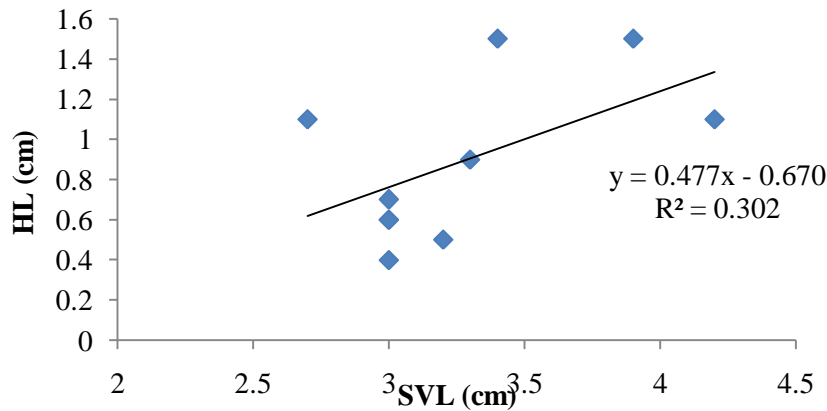
**Table 3: Correlation coefficient (r) values for parameters of *Euphlyctiscyanophlyctis*collected from Pearl Valley, Anekal region.**

	HL	HW	ED	TD	END	SVL	IOD	TL	FL	1FL	1TL
HL	1	.93**	.47	.23	.54	.55	.69*	.25	.36	.40	.73*
HW		1	.504	.445	.580	.749*	.636*	.322	.476	.674*	.70*
ED			1	.76*	.225	.589	.371	.458	.511	.516	.389
TD				1	.445	.698*	.239	.696*	.716*	.779**	.190
END					1	.326	.735*	.837**	.702*	.323	.337
SVL						1	.439	.302	.505	.859**	.386
IOD							1	.499	.457	.192	.402
THL								1	.86**	.359	.063
FL									1	.617	-.085
1FL										1	.221
1TL											1

\*\* Correlation is significant at the 0.01 level (2-tailed).\* Correlation is significant at the 0.05 level (2-tailed).

**Legends:**as mentioned above

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**Figure 3: Regression analysis plots for two parameters of *Euphlyctiscyanophlyctis* with fitted regression equation**

Overall, positive and in many cases significant positive correlation is obtained between the morphological parameters considered barring a single exception of negative correlations (Table 3). With regard to percentage predictions for selected populations as obtained from regression analysis was found to be 30% ( $R^2 = 0.302$ ). The present findings are compared with already available literature for the species. In the present sample the maximum Snout vent length (SVL) was 42 mm, while Singh and Prakash(2007) reported 47mm and Hegde (2012) 70 mm of maximum SVL for the species. On the other hand reports outside India indicate a maximum SVL of 58.25 (female) and 52.6 (male) (Shaikh et al., 2012). Although, the present findings contribute to the morphometric data for the population of the species from the region, the variation is attributed to the off-season random sampling and regional differences compared to the available literature. However it is worth considering the data owing to its uniqueness viz., first time reporting from the study region contributing to the understanding of ecological impacts on morphometry in future.

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