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### PRELIMINARY STUDIES ON THE PRE-METAMORPHIC GROWTH OF *BUFO MELANOSTICTUS* [SCHN.]

T. A. BALAKRISHNA\*  
and KATRE SHAKUNTALA

Department of Zoology, Bangalore University,  
Bangalore 560 056, India.

\* Present address: Department of Zoology,  
Vijaya College, Bangalore 560 004, India.

THE post-embryonic developmental cycle of a typical anuran involves three phases; (i) a growth phase characterised by rapid growth and little morphological changes (also called as the phase of pre-metamorphosis), (ii) a prometamorphic phase with reduced body growth and with morphological changes proceeding at a progressively accelerated pace and (iii) a phase of metamorphic climax in which body growth ceases and differentiative changes proceed with extreme rapidity<sup>1</sup>. The classic scheme of metamorphosis put forth for anurans is largely drawn from observations from ranids, where the normal pre-metamorphic growth is known to be completed in about 50 days<sup>2</sup>. However, various biotic and abiotic factors are known to influence the duration of metamorphosis in ranids<sup>3</sup>. Deviations from the classical scheme, in terms of the duration of total metamorphosis have also been reported in several anurans<sup>4-6</sup>. Presently some interesting observations on the pre-metamorphic growth of the bufonid *Bufo melanostictus*, Schneider, are described.

During October 1980 to January 1981, fertilized eggs collected from four different mating pairs were

observed for their development. The spawns were separately maintained in experimental field tanks at a water temperature of  $19.3 \pm 0.8^\circ\text{C}$  and an air temperature of  $21.4 \pm 0.8^\circ\text{C}$ . From the day of hatching (which occurred within a week after spawning) measurements of total length (L in mm) and live weight (W in mg) of the tadpoles were recorded, once in every ten days.

Figure 1A and B represent the linear and quantal growth respectively of the tadpoles of *Bufo melanostictus* in relation to time. Regression of body weights of tadpoles on respective body lengths indicated that the growth pattern during the period was exponential<sup>7</sup>. However, in spite of this and the fact that water temperature during the period of study was uniformly high and the variation in temperature was also not marked, none of the tadpoles indicated completion of the pre-metamorphic growth in the observed period of 107 days. Eruptions of the hindlimbs were also not noticed. This is in marked contrast to the observations on species of *Rana*<sup>1,8</sup> and *Rhacophorus*<sup>7</sup>, where a significantly shorter duration has been reported to be required for completing metamorphosis. The present

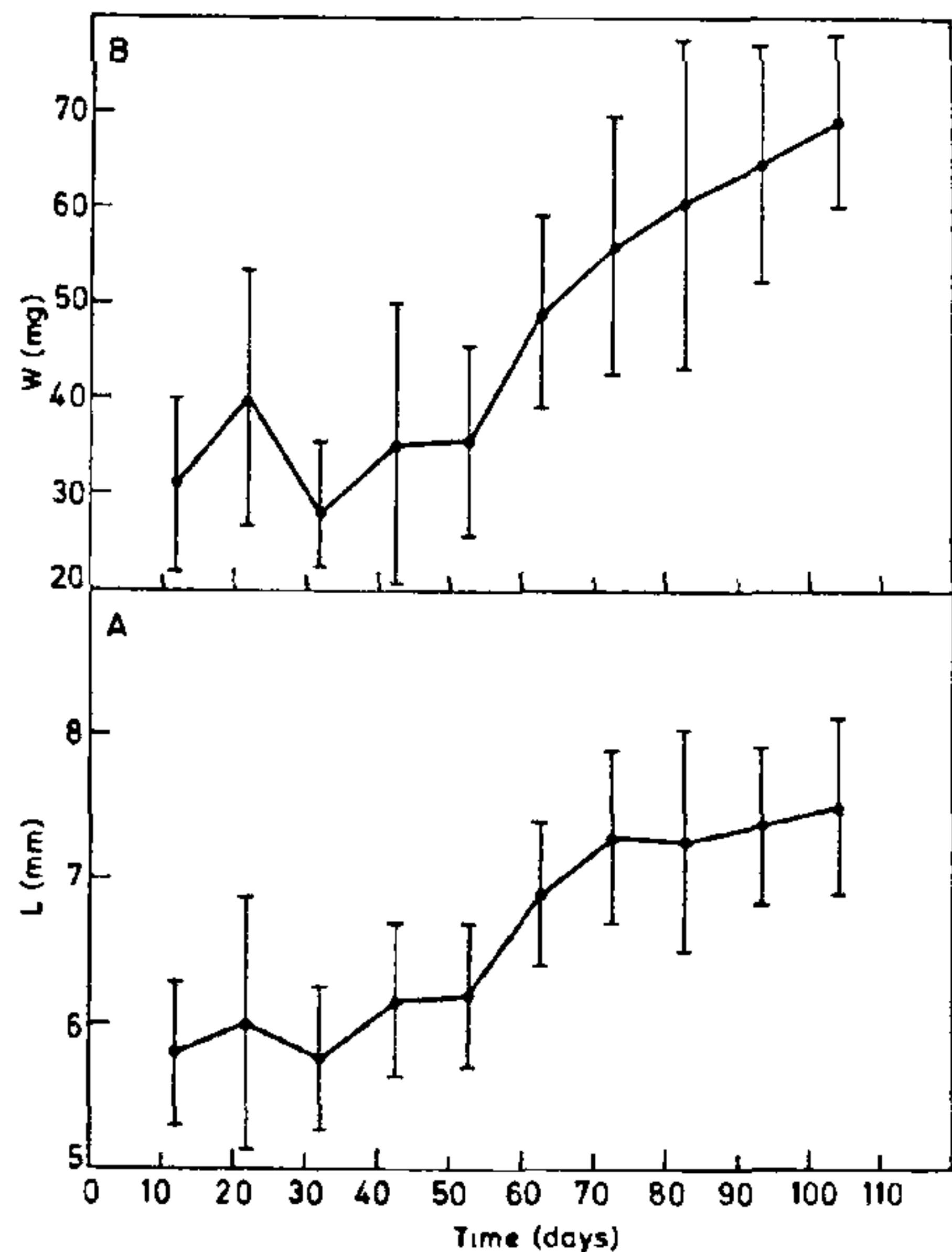


Figure 1. *Bufo melanostictus*: Linear (A) and quantal (B) growth during the pre-metamorphic period.

observations suggest that in nature, the pattern of metamorphosis in bufonids may be different from that of other anurans.

During the present observations, throughout the period of study, there was considerable mortality of tadpoles and this could not be attributed to any conspicuous variation in the chemistry of water. Probably crowding may be one of the factors for heavy mortality<sup>9</sup>.

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