A SIMPLE TECHNIQUE FOR PREDICTING THE BIOMASS OF A PROSOBRANCH SNAIL*

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Abstract—1. A simple technique was developed for accurately predicting the biomass of the freshwater prosobranch *Viviparus contectoides* (Mesogastrapoda: Viviparidae) (Binney, 1865).
2. Regression of dry weight (biomass) on wet weight yielded a regression coefficient (r^2) of 0.99 with an associated $P < 0.001$.
3. Biomass, therefore, can be predicted by measuring wet weights without sacrificing specimens.

INTRODUCTION

The objective of this study was to develop an accurate method for predicting the biomass of live specimens of *Viviparus contectoides*. The method was developed so that further research related to biomass could be performed with live specimens.

MATERIALS AND METHODS

The 36 snails utilized in this study were collected in October of 1973 from a small freshwater stream in Livingston County, MI. Sex was determined and wet and dry weight was measured. Observations of the presence or absence of a penis indicated there were 19 females and 17 males. Superficial moisture was removed from the live snails utilizing absorbent paper toweling. Each snail was subsequently weighted to the nearest 0.01 g on a Mettler balance to determine wet weight. Dry weights were determined by placing each snail in a tared aluminum cup and drying in an oven at 60°C until constant weight was achieved. Dry weight as determined by this procedure is considered synonymous with biomass.

RESULTS

Three regression analyses were performed to determine the relationship between dry weight (Y) and wet weight (X) for the sexes separately and combined (Table 1). There were no significant differences between the coefficients of regression for the three

analyses. Ranges of wet weights for females and males were 0.55–8.82 g and 0.30–2.64 g, respectively. Although the ranges of weights for females and males differed, the intensity of the relationship between biomass and wet weight for both sexes combined was unusually high (Fig. 1). This was indicated by the correlation coefficient (r_1) and its associated probability level (Table 1).

DISCUSSION

It is now possible to accurately predict the biomass of *Viviparus contectoides* without sacrificing speci-

Fig. 1. Relationship between wet weight and dry weight (biomass) for 36 prosobranch snails (*Viviparus contectoides*).

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Table 1. Relationships between wet weight (wt) and dry weight for 36 freshwater snails (*Viviparus contectoides*)

Variates		Regression equation	r of X & Y	r ² of X & Y
Dependent (Y)	Independent (X)			
Dry wt ♀ & ♂	Wet wt ♀ & ♂	$\hat{Y} = 0.2733X(0.0051S.E.) + 0.0046(0.0158S.E.)$	$r_1 = 0.99\ddagger$	$r_1^2 = 0.99$
Dry wt ♀	Wet wt ♀	$\hat{Y} = 0.2724X(0.0080S.E.) + 0.0153(0.0326S.E.)$	$r_2 = 0.99\ddagger$	$r_2^2 = 0.98$
Dry wt ♂	Wet wt ♂	$\hat{Y} = 0.2526X(0.0069S.E.) + 0.0201(0.0095S.E.)$	$r_3 = 0.99\ddagger$	$r_3^2 = 0.99$

‡ Very highly significant ($P < 0.001$).

mens. The biomass can be predicted from measurements of wet weight utilizing the regression equation $\hat{Y} = 0.2733X(0.0051\text{S.E.}) + 0.0046(0.0158\text{S.E.})$. A similar relationship of biomass to wet weight may exist in other species of mollusks, particularly other proso-branches. Such an established relationship would allow physiological studies related to the biomass of known individuals over time (Fitch, 1975).

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