

Association Between Body Weight and Dimensional Shell Traits of Snails (*Archachatina marginata* and *Achatina achatina*)

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Abstract

This study evaluated the association between the body weights and dimensional shell parameters of two snail breeds (*Archachatina marginata* and *Achatina achatina*). Two hundred (200) sexually mature snails, one hundred (100) each of *A. marginata* and *A. achatina* sorted out of a base population purchased from snail vendors in Calabar were used for the study. Their weights ranged from 127.6 – 443.4 g for *A. marginata* and 85.43 – 249.08 g for *A. achatina*. Each of the snail breed constituted a treatment and was replicated ten (10) times with ten (10) snails per replicate in a completely randomized design (CRD) for ease of data collection. Traits measured on each snail included shell length (cm), shell width (cm), aperture length (cm), aperture width (cm), spiral length (cm), spiral width (cm), diagonal length (cm), length between aperture and first spiral (cm) and body weight (g). Data collected were subjected to correlation and regression analyses to establish relevant associations among the traits. Results of correlation among traits showed that all the pairs of traits investigated in *A. marginata* expressed medium to high positive and significant ($P < 0.05$) correlation values. Whereas some pairs of traits investigated on *A. achatina* expressed low to high positive and significant ($P < 0.05$) correlation values, other pairs expressed negative correlation values. The two snail breeds had high coefficient of determination (r^2) values, ranging from 69 to 84 % for *A. achatina* and 95 to 98 % for *A. marginata*. The results of regression models revealed that live weight of *A. achatina* was best predicted with multiple linear regression models, while with live weight of *A. marginata* was best predicted with simple linear regression model and multiple linear regression models. A test of accuracy of the linear regression models showed that the models with three, four, six and seven traits best predicted body weight in *A. achatina*, whereas the models with one and models with two and six traits best predicted bodyweight in *A. marginata*. This implies that snails body weight and dimensional shell traits are positively correlated and the variability in live weight of these snail breeds can be explained by changes in other phenotypic traits.

Keywords: Association, *A. achatina*, *A. marginata*, body weight, shell traits

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Target Audience: Researchers, Snail breeders, Snail farmers, Animal Scientists
