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## Multivariate Path Analysis of Body Dimensions of Khaki Campbell and Pekin Ducks in Nigeria

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### Abstract

The study aimed at describing objectively the interdependence between body weight (BWT) and morphometric traits in Khaki Campbell and Pekin ducks using multivariate path analysis technique. Measurements were taken on one hundred and ninety seven (197) randomly selected 10-week old Khaki Campbell and Pekin ducks of both sexes in Plateau State, Nigeria. The body parts measured were, body length (BDL); thigh length (THL); thigh circumference (THC); breast circumference (BTC); bill length (BLL); neck length (NKL); neck circumference (NKC); shank length (SHL); shank width (SHW); total leg length (TLL) and wing length (WL). General linear model was used to study genotype and sex effects. Pekin ducks had a superior advantage ( $p < 0.05$ ) over their Khaki Campbell counterparts in all the body parameters estimated. Sexual dimorphism ( $p < 0.05$ ) was in favour of male ducks. Pairwise phenotypic correlations between BWT and morphometric traits were positive and significant ( $p < 0.01$ ), ranging from 0.38–0.95 and 0.35–0.92 for Khaki Campbell and Pekin ducks, respectively. Path analysis revealed that BDL was the variable of utmost importance directly influencing BWT in male Khaki Campbell and Pekin ducks (path coefficient= 0.535 and 0.508, respectively;  $p < 0.01$ ) while BTC and SHL were the most responsible parameters affecting BWT in female Khaki Campbell and Pekin ducks [path coefficient= 0.594 ( $p < 0.01$ ) and 1.197( $p < 0.05$ ), respectively]. However, the optimum regression models for the prediction of BWT in Khaki Campbell ducks included BDL, SHL, BTC and NKC (male) and BDL, WNL and BTC (female); while in their Pekin counterparts, BDL, BLL and BTC (male) and BDL and SHL (female) were incorporated. These morphometric traits could be used in breeding programmes as a measure of direct selection for ducks with better BWT traits for improved egg and meat production, although this should be consolidated with a genetic study to provide information about the heritability and genetic correlation of these variables with BWT.

**Keywords:** Exotic ducks, morphometric traits, multivariate analysis, Nigeria, phenotypic correlation