Sexual Determination in Pacific Golden-Plover (*Pluvialis fulva*) Using Skeletal Measurements

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Introduction

Sexual dimorphism using skeletal measurements has been demonstrated in a variety of birds such as the Great Comorants (*Phalacrocorax carbo*), Dovekies (*Alle alle*), and Chatham Island Shore Plover (*Thinomis novaeseelandiae*) (Liordos and Goutner 2008, Jakubas and Katarzyna 2007, Dowding and Kennedy 1993). The objective of the study was to determine if skeletal measurements could be used to distinguish the sex in the Pacific Golden-Plover (*Pluvialis fulva*).

Materials and Methods

Fifty-one Pacific Golden-Plover skeletal specimens contained in the Brigham Young University-Hawaii Museum of Natural History collections were examined. Seven linear measurements of the cranial length, interorbital constriction, cranial width, sternum length, femur length, tibiotarsus length, and tarsusmetatarsus length were taken (Figures 1-3). All measurements were made with a digital caliper.

Of the 51 Pacific Golden-Plover available 39 had the skeletal elements necessary for this study. Of these 39 only 12 had been sexed using intact gonads prior to their preparation as a skeletal specimen (9 males and 3 females).

Results

Data of three females and three randomly chosen males were analyzed by a two-way ANOVA. There were significant (p=0.019) differences between genders in all seven measurements. Three bone measurements out of the seven examined showed the least amount of overlap in range and median. They were the external cranial width, tarsusmetatarsus length, and tibiotarsus length (Figures 4-6).

Tibiotarsus length showed the least amount of overlap in median and range out of the three bones chosen. Females had a median of 63.0 (range = 2.0) and males a median of 66.2 (range = 1.8). An additional 27 plover whose sex was not known at the time they were skeletonized were sexed using the tibiotarsus length resulting in the identification of 14 males and 13 females.

Discussion

Skeletal measurements can be used to determine sex in Pacific golden-Plover. The tibiotarsus is significantly longer in males. This fact can be used to identify the sex of Pacific Golden-Plover recovered in archeological sites if they contain an intact tibiotarsus. This information might indicate there was a hunting preference for one sex. Since male Pacific golden-Plover are brighter with distinct breeding plumage they may have been easier targets of subsistence hunters. Plover nearly double their weight by accumulating fat prior to their spring migration to the arctic. Presumably hunters would have focused their efforts during this time period. Sample size may have played a role in the outcome of this study. The median and range of each may have been smaller if more adult specimens were available to measure.

References


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