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Download date	2026-03-08 21:07:28
Link to Item	https://hdl.handle.net/20.500.14694/7675

Sexual Dimorphism in First Maxillary and Mandibular Molar of Humans

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Introduction: Sexual dimorphism is an indicator of gender differences that can be observed in several aspects of the human skeleton, such as the pelvis, cranium, femur, humerus, canines, and other structures. The purpose of this study was to indicate whether sexual dimorphism also exists in the first maxillary and mandibular molar of humans.

Method: In this study, the mesiodistal (the distance of the tooth's surface pointed towards the anterior and posterior of the mouth) and buccolingual (the distance of the tooth's surface direct towards the cheek to the tongue) measurement on the first maxillary and mandibular molars of a sample of humans from the Georgia Bureau of Investigation were measured using digital calipers to identify whether sexual dimorphism exists in these dimensions. A total of 56 individuals were measured, including 31 males and 25 females. The right side was preferred unless it was damaged or missing and t-tests were utilized to identify significant differences.

Results: Only the buccolingual measurements differed significantly between males and females ($p = 0.008$ for the maxilla; $p = 0.001$ for the mandible). When the product of mesiodistal and buccolingual measurements was obtained, only the mandible showed significant differences between the sexes ($p = 0.018$). Females have smaller first molar dimensions than males by approximately 10% corroborating previous studies of sexual dimorphism of the first molar.

Conclusion: The results of the study indicated only a significant gender difference in the buccolingual measurements of the first molar in the mandible. Females have smaller first molars in the mandible compared to males. Investigators can use this method to help signify gender of a human skeleton. This work is important because of its utility in assisting crime scene investigation by identifying the sex characteristics of unknown individuals at the Georgia Bureau of Investigation.

Acknowledgement: It is with much gratitude to the Georgia Bureau of Investigation for allowing me to conduct my research at their facility. Without their professional help and cooperation this research could not have been completed.