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Virtual reconstruction and description of the lower face definition of STW498- a Sterkfontein: australopithecus

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ABSTRACT

On the 30th of September 1988, a team directed by Alun Hughes and Phillip Tobias excavated portions of a skull of an *Australopithecus* (StW 498) from square P/41 at Sterkfontein Member 4. The fossil was found at a depth of 17'9" to 19'9" ft below datum. StW 498 consists of cranial vault fragments, relatively complete left and right maxillae, and relatively complete left and right mandibles. While the mandibular and maxillary dentition is complete, the right mandible and right maxilla are fragmentary and anatomically displaced. Because of its fragile condition, a physical reconstruction was not advisable. The primary purpose of this research was to virtually reconstruct StW 498 using high resolution image data acquired from microCT scanning and to describe the morphology of the specimen. The reconstruction of StW 498 provided a valuable opportunity to conduct quantitative analyses and qualitative observations in order to place it within a framework of hominid cranio-dental variation, focusing in particular on *Australopithecus africanus*, *Australopithecus prometheus* and *Paranthropus robustus*. Based on the internal morphology and size of the dental arcade, StW 498 is a young adolescent male. The specimen exhibits dental pathology, specifically crowding of the maxillary dentition which resulted in the atypical eruption and position of the left maxillary canine. However, contra to the suggestion by Schwartz and Tattersall (2005), the right lower canine reflects taphonomic disruption of the intact anatomy rather than an eruptive anomaly. The results of this research indicate that StW 498 is morphologically more similar to specimens attributed to *A. prometheus*, such as MLD 9, StW 252, and StW 573, than *A. africanus* and *P. robustus*.

Keywords: *Australopithecus*, Sterkfontein, Virtual reconstruction