

Fornai, C., Benazzi, S., Gopher, A., Barkai, R., Sarig, R., Bookstein, F. L., Hershkovitz, I., Weber, G. W. (2016). The Qesem Cave hominin material (part 2): A morphometric analysis of dm 2-QC2 deciduous lower second molar. *Quaternary International*, 398, 175-189.

**Abstract:** The Qesem Cave Middle Pleistocene hominin site has yielded a well preserved lower second deciduous molar (dm<sub>2</sub>-QC2), among several other human dental remains. It has been previously described by Hershkovitz et al. using traditional methods. In this study, we used multiple approaches in order to characterize the outer and inner morphology of dm<sub>2</sub>-QC2, namely a descriptive investigation of the inner morphology, analysis of the dental tissues, and comparative 3D geometric morphometric investigation of various aspects of the dental crown based on data gathered from  $\mu$ CT images. Dm<sub>2</sub>-QC2 was compared to a sample of 44 specimens, including recent and fossil modern humans, Neanderthals, and *Homo erectus*. Our comprehensive quantitative investigation agrees with Hershkovitz et al. with regard to the mixed morphology of this specimen. Dm<sub>2</sub>-QC2 allies morphologically with Neanderthals and Skhul X for its squared cervical outline, but is intermediate between modern humans and Neanderthals for its mildly distally expanded crown outline. Dm<sub>2</sub>-QC2 falls within Neanderthal variability in having relatively high dentine horns with inwardly bent tips. It is peculiar for its mesio-distal elongation of the occlusal marginal ridge at the enamel–dentine junction. The relative enamel thickness delivers different results if measured at the mesial section (intermediate but closer to modern humans) or at the entire crown (close to the Neanderthal distribution). In terms of size, dm<sub>2</sub>-QC2 and Qafzeh 15 are among the largest specimens in our sample. Dm<sub>2</sub>-QC2 shows a mosaic of features, with a prevalence of those typical or at least frequent in Neanderthals. Among the latter, the mid-trigonid crest and taurodontism are only slightly expressed. On the basis of this isolated dental evidence, and considering the paucity of information available on human evolution in the Levantine Middle Pleistocene, we do not attempt a taxonomic classification of this single tooth. However, dm<sub>2</sub>-QC2 indicates that Neanderthal features were already present in the Middle Pleistocene Levant. We cannot rule out the

possibility that the dm<sub>2</sub>-QC2 population contributed to later Levantine or other Eurasian populations, but this is too speculative given the information currently available.