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Analysing the occlusal wear of the hominins of Sima de los Huesos

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The occlusal surface of a tooth can provide evidence of past behaviour. In general terms, occlusal wear decreases through time, with industrialised modern humans having low occlusal wear because of the greater reliance upon processed foods. Neanderthals are thought to have exceptionally heavy occlusal wear, due to high mechanical loading from paramasticatory and masticatory behaviour.

Here, we compare occlusal wear of hominins from Sima de los Huesos (SH, n=19) to Neanderthals (n=21) and modern humans (Middle Palaeolithic, n=5; Upper/ Early Epi-Palaeolithic, n=26; Igloodik Inuit n=79; 19th-20th-century Madrileños individuals, CMH, n=14). The SH are thought to either be early Neanderthals or closely related to them, and share a number of cranial and dental traits with both Neanderthals (e.g. shovel-shaped incisors) and modern humans (e.g. frequent absence of the hypoconulid). Results deviate from the general and expected trend. The SH group had more wear on their upper I1 compared to Neanderthals ($p=0.022$), but not modern humans ($p>0.05$). We found that SH upper P3 is more worn than all other groups ($p<0.05$), except CMH ($p=0.201$), potentially pointing to masticatory behavioural differences. The mandibular dentition of the SH was significantly more worn compared to Neanderthals (C-M2, $p<0.05$), Inuit (I1-M2, $p<0.05$), and CMH (M2, $p=0.030$). It may be that SH were using their mandibular dentition less for paramasticatory activities or that the lower age range of the SH hominins used in the mandibular group meant that they generally had less wear.

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