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Highland vegetation for Hominids at Melka Kunture, 1.7 to 0.4 Ma

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In this presentation we analyze the pollen results obtained during the first exploration of the Melka Kunturé archaeological site. Indeed, a re-examination of these data is justified on the basis of new $^{40}Ar/^{39}Ar$ dates recently obtained from different volcanic ashes and providing better chronological constrains for the pollen samples. Moreover, improved knowledge of the Ethiopian flora and vegetation now available, allows a more straightforward interpretation of the fossil pollen record.

Pollen data were obtained from twenty-two distinct strata collected along the Garba, Gombore and Kella sections, including archaeological horizons excavated at Gombore I and Garba I, and close to Garba IV. Altogether, significant pollen counts concern a total of 114 distinct pollen taxa, among which 69 can be attributed to trees and shrubs. At the exception of one of them, all the pollen taxa refer to plants nowadays found in the modern flora from Ethiopia. More than 80 % of the plant taxa can be attributed to the “Dry evergreen Afromontane forest and grassland vegetation” defined by new vegetation mapping of the Shoa province. Together, grassland and forest are part of such a “vegetation complex”, covering land distributed between 1800 to 3000 m of elevation on the Northern Ethiopian Plateau. Within the different pollen assemblages, variations in the percentages of tree pollen reflect variations in the tree cover density of the past vegetation, in response to fluctuations in humidity/rainfall through time. During the time span of the pollen record from 1.7 to 0.4 Ma, several fluctuations have been evidenced. But they remained within the range of the “Dry evergreen Afromontane forest and grassland vegetation complexe”. We could not established any significant trend, notably no significant progressive aridity trend such as often postulated by isotopic studies performed on sediment from hominid sites located at lower elevation, in the Ethiopian Rift. In contrast, at Melka Kunture, several fluctuations between low and high tree cover densities indicate that the past vegetation fluctuated between shrubland, wooded grassland of evergreen vegetation close to mountain forest. The “Afromontane character” of the past flora, similar in its composition to the present day vegetation, was already in place since the early hominids established themselves at Garba IV and Gomboré I. The pollen results show that early hominids occupying the Melka Kunturé region had to be adapted to mountain tropical climatic conditions, including great daily temperature range between days and nights, as soon as ca 1.7 Ma ago, before any evidence of fire domestication.