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Stable isotopes of crocodilian teeth reveal the diversity of freshwater environments and climate over the past million years in the Turkana Depression (eastern Africa).

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During the last few million years, the Turkana Depression, in eastern Africa, has undergone dramatic environmental and hydrological changes (e.g. aridification, landscape opening, lake level fluctuation), and previous models have been recently challenged by new sedimentological studies. The aquatic environments associated with the regions having yielded hominid remains are still poorly studied or are described in a more simplistic way than the terrestrial environments. The Shungura Formation (Plio-Pleistocene, southwestern Ethiopia) is no exception to this observation, with its aquatic environments being described only from sedimentary data and invertebrate assemblages. However, the aquatic component of landscapes and ecosystems is important to characterize and understand, because water availability is the most constraining factor in the distribution of fauna and flora. Its study is crucial to access complete palaeoenvironmental reconstructions because (1) it results directly from regional and local hydrography (climate and physiography of watersheds and water, geodynamics), and (2) it provides alternative information on in situ conditions via the aquatic fauna. Reconstructing past environments thus requires considering both terrestrial and aquatic components of ecosystems.

We present a new interpretative model of the geochemical record of stable oxygen isotopes ($\delta^{18}O$) in the teeth of crocodilians. As aquatic and ectotherm vertebrates, the use of $\delta^{18}O$ of crocodilians is mainly constrained by environment and climate. By integrating a thorough understanding of crocodilian physiology, development, and ecology, in a known paleoenvironmental context, we can gain new insight into the evolution of the diversity of freshwater habitats (lakes, rivers, ponds) they occupied at a local scale and into climate. This contribution will present the results obtained on the fossil crocodilian teeth in the context of the Shungura Formation. Crocodilian teeth being abundant in African sites since the Neogene, we will open the discussion on the possibility to apply this approach to other comparable sites.