



## **The Lorenyang lacustrine phase (early Quaternary) in the Omo Turkana basin (northern Turkana Depression, EARS): new insights on sedimentological signature and controlling factor**

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The Lower Omo Valley is a major site to understand Plio-Pleistocene vertebrate (including hominid) evolution and contemporary environmental changes through an exceptional array of data (radiometric chronology, faunal assemblages, early Oldowan stone tools and paleoecological markers). Due to exceptional exposure conditions and a well-constrained geochronological framework (120 tephra layers), the Shungura Formation allows investigating the sedimentary evolution of an axial system in a rift basin. This Formation is a 800 m thick succession deposited between 3.6 myr and 1 myr. It is made of clastic sediments deposited in a wide variety of continental depositional environments (fluvial, deltaic, and lacustrine).

Here we focus on a 220 meters thick succession covering the period between 2.27 Ma and 1.76 Ma, during which an important basin-scale lake highstand took place; this important highstand is referred to as the Lorenyang phase. Building upon a sequence stratigraphy approach, a detailed investigation of the depositional environments and a refining of its onset and termination, the sedimentary evolution of this lacustrine phase is proposed.

We delineate a first-order Transgressive Regressive (TR) sequence, which starts slightly after 2.27 Ma and interrupts at ca. 1.78 Ma (470 kyr long). It is characterized by the transition from meandering fluvial deposits laterally associated with overbank deposits to offshore lacustrine sediments (between to 2.27 Ma and 2.05 Ma). A maximal flooding interval is interpreted between 2.05 Ma and 2.0 Ma, and a consecutive deltaic progradation led to an emersion episode at ca. 1.78 Ma. During the long-term regressive phase, from 2.05 Ma to 1.78 Ma, several second-order T-R sequences are identified. This first-order sequence reflects the transgression and the successive regression related to the lake Lorenyang highstand. Second-order sequences reveal that the lake phase was modulated by superimposed shorter-term lake fluctuations.

In this contribution, origins of such long- and shorter-term lacustrine sequences are discussed regarding available regional paleo-hydrological reconstructions. Potential influence of local controlling factors (tectonic, change in basin physiography. . .) are also considered.

Finally, this study is part of the recent effort aiming at a better-constrained framework for understanding the relationship between climate and local environmental changes; therefore, it supplements paleogeographical reconstructions in the Omo Valley, and bring new information to better understand local faunal evolution (including that of human ancestors).