Stratigraphy and Sedimentological Evolution of the Neoproterozoic Ikorongo Group of Northeastern Tanzania.

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Abstract

On the northern side of the Ikorongo basin, the Neoproterozoic Ikorongo Group, comprising arenites, arkosic arenites, shales and siltstones, unconformably overlies the Archaean Nyanzian Supergroup of the Tanzania craton. In the study area, the Ikorongo Group is subdivided into three stratigraphic formations namely the Kinenge, Sumuji and Masati Formations. Two new stratigraphic members for the Sumuji Formation are proposed: The lower unit is the shale member which comprises of four alternating horizons of brown and green shales containing mudcracks and ripples and is here reported for the first time to overlie, through a tectonic contact, basement rocks. The upper unit above the shale member is the cross-laminated micaceous siltstone member.

Sedimentological studies reveal seven depositional litho-facies and highlight the possibility of hydrodynamic and wave energy fluctuations during deposition of the Ikorongo sedimentary units. The fining upwards trend from the Kinenge sandstones towards the overlying Sumuji shales suggests an energy reduction episode responsible for the deposition of these units whilst the coarsening in grain size, from the Sumuji siltstones upstratigraphy to the Masati sandstones attests to an energy increase. The color variations in the shale member reveal intermittent changes in redox conditions and/or depositional environments during when these strata were laid down. The presence of mud cracks and ripple marks in the rocks of the Sumuji Formation signifies deposition in shallow water environments which had experienced intermittent sub-aerial exposure and desiccation. Fluctuations in hydrodynamic energy, the presence of reddish brown beds and pristine palaeocurrent structures preserved both in space and time within the Ikorongo strata suggest an overall terrestrial depositional environment.