



Late Paleozoic glacial valleys? underneath the Albert Lake (Uganda-RDC) How they can be replaced in the Gondwana ice cap paleogeography

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Seismic revealed the occurrence of non-fault-controlled deep incisions ranging from 600m up to 1400m into the basement underneath the Albert Lake in Uganda and in Democratic Republic of Congo (DRC) which could be of glacial origin. They can be imaged with 3D seismic and mapped by the way of 2D seismic profiles. Their profiles are not perfectly typical of glacial valleys but they don't show the classical V-shape fluvial cross-section neither. Moreover, sedimentary infilling is observed to be passive and truncated seismic-reflector terminations are observed by the base of well-calibrated Cenozoic series. Their age is still questionable due to the fact that no deep well penetrates this part of the stratigraphic succession to date. The deepest dated horizon being early Miocene (17Ma, Simon et al. 2017) belonging to the Cenozoic rift series. Hence, these glacial valleys can be:

- Precambrian in age, taking into account that slightly metamorphosed tillites occurs within the Bunyoro Series in the Hoima Hills (Davis 1939, Harris 1943 and BjØrlykke 1973) immediately eastward of the lake within the basement.

- Late Ordovician considering the known extension of this glacial event covering the entire Gondwana.

– or finally Late Paleozoic, which is our working hypothesis considering; first their very good preservation below Tertiary rift series, second because of the occurrence of others evidences of Karoo glacial deposits such as Kirukuma river Tillites exposed in SW Uganda (Westerhof et al. 2014) as well as the Katonga River Fm. (Bradley et al. 2010) and also some others spotty outcrops located along the northern shore of Victoria Lake such as in Entebbe peninsula suggesting that the whole Uganda was beneath the Karoo ice cap and third because thermochronological analysis suggests a very strong denudation during Carboniferous

This is also in agreement with glacial deposits reported in DRC (Cahen & Lapersonne 1981, Linol et al. 2013) westward and north westward, and post-glacial black-shales and coaliferous series (Lukuga Fm.) occurring in Congo Basin (Sachse et al. 2012, Linol et al. 2016). Our valleys network which are pointing toward the NW are on trend with the DRC deposits. Therefore, we can assumed that the glacial flow lines run, in this particular area toward the W-NW; this orientation significantly differs from these measured on striated pavements in Ethiopia and Mozambique which points toward the NE suggesting that a divide may occur somewhere in Uganda. This interpretation fits quite well with the possible location of the polar pole at 340Ma as suggested by López-Gamundí & Buatois (2010) which assume that it is precisely in Uganda.