



## **Stratigraphy of early Pliocene volcanic and hominid-bearing sedimentary rocks, southern Afar Depression, Ethiopia**

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Our research describes the stratigraphic context of early Pliocene volcanic rocks and hominid-bearing sediments exposed on the eastern rift shoulder of the northernmost Quaternary, N-S striking Sabure-Hertale-Adado graben, southern Afar Depression, Ethiopia. The ~220 m thick succession of sedimentary and volcanic rocks is formally grouped into the Mount Galili Formation which consists of six members. The members in ascending stratigraphic order are Lasdanan, Dhidinley, Godiray, Shabeley Laag, Dhagax and Caashacado. The predominant volcanic rocks within the Lasdanan and Shabeley Laag members comprise thick fissure basalt flows whereas the other members are characterized by thick tuff and ignimbrite layers. Sedimentary rocks comprise fluvial and lacustrine sandstones to mudstones. Hominid fossils were recovered from the Lasdanan, Dhidinley and Shabeley Laag members.

The time range of the formation based on two Ar/Ar dates and paleomagnetic measurements of volcanic and sedimentary rocks. Feldspars from a surge layer from the base of the Dhidinley member were dated to 4.38 Ma whereas feldspars from an ignimbrite on top of this member provided an age of 3.92 Ma. These two dates are used as tie-points for paleomagnetic data. From the base of the formation to its top, eight successive polarity zones ranging from C3n.3n Sidufjall normal to C2An.3n Gauss normal have been recorded.

The combination of these two data sets provide a time range for the Mount Galili Formation of ~4.89 to ~3.5 Ma.

Based on this data, the deposits of the Lasdanan, Dhidinley and Godiray members are time equivalent with the Sagantole Formation at Gona and Middle Awash, Ethiopia. The Godiray, Shabeley Laag, Dhagax and Caashacado members can be correlated with the basal member of the Hadar Formation, Ethiopia.