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RELICS OF MOZAMBIQUE OCEAN IN EASTERN AFRICA OROGEN: EVIDENCE FROM PETROGRAPHY & GEOCHRONOLOGICAL, GEOCHEMISTRY AND THERMO-BAROMETRIC DATA.

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ABSTRACT

The largest segment of the Neoproterozoic Mozambique belt in Kenya occurs east of the north-south oriented Rift system. Geological works carried out in the country during the last few decades have progressively revealed the complexity of the geology, structures and tectonics of the Mozambique belt in the region. Important high grade tectono-thermal events in the belt took place between about 845 and 715 Ma. The tectono thermal events attained P/T conditions of 5.5 - 7.1 kbars and 500 - 750°C. The subsequent cooling and uplift has been traced by K-Ar dates on biotites, which range between 528 and 438 Ma. New lithological units established in the last two decades include widespread granitoid, anorthositic, gabbroic to ultramafic intrusions and limited andesitic volcanics in the central region of this eastern segment of the Mozambique belt (EMBS).

The Vohibory Block of south-western Madagascar is part of the East African Orogen, the formation of which is related to the assembly of the Gondwana supercontinent. It is dominated by metabasic rocks, which have chemical compositions similar to those of recent basalts from a mid-ocean ridge, back-arc setting and island-arc setting. The age of formation of protolith basalts has been dated at 850–700 Ma by U–Pb SHRIMP analysis of magmatic cores in zircon, pointing to an origin related to the Neoproterozoic Mozambique Ocean. The metabasic rocks are interpreted as representing components of an island arc with an associated back-arc basin. In the early stage of the Pan-African orogeny, these rocks experienced high-pressure amphibolite to granulite facies metamorphism (9–12 kbar, 750–880°C), dated at 612 ± 5 Ma from metamorphic rims in zircon. The metamorphism was most likely related to Accretion of the arc terrane to the margin of the Azania micro continent (Proto-Madagascar) and closure of the back-arc basin. The main metamorphism is significantly older than high-temperature metamorphism in other tectonic units of southern Madagascar, indicating a distinct tectonometamorphic history.

Key words: East African Orogen; Gondwana assembly; Mozambique Ocean; Pan-African; suture zone; Mozambique belt (MB).