



U–Pb detrital zircon and ^{39}Ar – ^{40}Ar muscovite ages from the eastern parts of the Karagwe–Ankole Belt: Tracking Paleoproterozoic basin formation and Mesoproterozoic crustal amalgamation along the western margin of the Tanzania Craton

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ARTICLE INFO

Article history:

Received 2 December 2014

Received in revised form 3 July 2015

Accepted 6 August 2015

Available online 18 August 2015

Keywords:

Karagwe–Ankole belt
Eastern Domain
Kagera Supergroup
Basin formation
Deformation

ABSTRACT

The Karagwe–Ankole belt forms part of a complex system of orogenic belts in Central–East Africa that record the amalgamation of Archaean and/or Paleoproterozoic continental kernels in the Proterozoic. The actual timing of tectonic processes, including initial basin formation and subsequent deformation, is only poorly constrained so that the geodynamic significance of the Karagwe–Ankole belt within the broader system of Proterozoic orogens in Central–East Africa is not well understood. This paper presents U–Pb ages of detrital zircons constraining the age of sediments of the eastern parts of the Karagwe–Ankole fold belt overlying the western Tanzania Craton and ^{39}Ar – ^{40}Ar muscovite ages from mylonites and phyllonites associated with the main phase of subsequent shortening and fold-and-thrust tectonics (D2).

^{39}Ar – ^{40}Ar muscovite ages from the main detachment between Archaean basement gneisses and imbricated cover rocks of the Kagera Supergroup in the eastern, frontal parts of the Karagwe–Ankole Belt constrain the timing of the main fabric forming event and thrusting (D2) to 1326 ± 10 Ma. This age is at the young end of the age range for the main phase of granite plutonism and mafic dyke emplacement that have previously been related to crustal extension and associated intracontinental rifting. If correct and representative for the main phase of deformation in the rest of the Karagwe–Ankole belt, the ages may rather point to a collisional event between the Congo and Tanzania Cratons west of the Karagwe–Ankole belt in Mesoproterozoic times, indicating a closer correlation with rocks of the Kibara Belt (*sensu stricto*) to the immediate south.

U–Pb detrital zircon ages for the older Muyaga and overlying Bukoba Group of the Kagera Supergroup confirm the Paleoproterozoic timing of sedimentation from ca. 1780 Ma, but before ca. 1568 Ma. The presence of a distinct group of ca. 1750–1790 Ma zircons in the Bukoba Group indicate uplift, erosion and subsequent reworking of sediments and volcanic units contained in the Lower Muyaga Group to the west. The ages also suggest a correlation between the Bwezigoro Group of SW Uganda and the Bukoba Group indicating the presence of a far more extensive Paleoproterozoic and/or Early Mesoproterozoic foreland basin overlying the western margin of the Archaean Tanzania Craton and Paleoproterozoic Uganda Block.

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1. Introduction

Archaean cratons of Central and East Africa (Fig. 1) are overlain by a series of Paleo-, Meso-, and Neoproterozoic sedimentary basins (De Waele et al., 2008). Basin evolution is commonly regarded to be in response to rift-related processes associated with subduction or collisional tectonics along the margins of the major cratonic blocks (De Waele et al., 2008) and/or intracratonic extensional and associated magmatic processes (Tack et al., 2010).

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