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Temporal evolution of a post-Rodinian rift inverted during the formation of the Kaoko Belt in NW Namibia

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The Neoproterozoic Kaoko Belt in NW Namibia is built of two major tectonic units. The eastern part of the belt is represented by the Congo Craton basement covered by a (meta)sedimentary succession with an estimated span of sedimentation between c. 800 and 550 Ma. The western part is represented by the Coastal Terrane, a volcanosedimentary unit without exposed pre-Neoproterozoic basement migmatized during early period of the Kaoko Belt evolution at c. 650 Ma. The clastic (meta)sedimentary successions of both tectonic units bear layers of metamorphosed volcanic rocks. U-Pb SIMS zircon dating of these volcanics, as well as the LA–ICP–MS dating of detrital zircons from the surrounding clastic lithologies alow reconstruction of the dynamics and time span of the rifting preceding the formation of the Kaoko Belt.

The Coastal Terrane volcanics present in the lower part of the succession were dated at 818 $\pm$ 3 – 784 $\pm$ 4 Ma and surrounding metasediments show detrital zircon populations derived from the Congo Craton basement. The upper part of the succession shows detrital zircons dominated by a population with ages similar to those of the underlying volcanics.

The syn-sedimentary volcanics in the lower part of the succession covering the Congo Craton gave ages between 739 $\pm$ 5 and 708 $\pm$ 3 Ma, and accompanying metasediments contain detrital zircons with ages known from the underlying basement. The upper part of the craton cover contains significant proportion of detrital zircons with ages of c. 650 Ma representing eroded Costal Terrane after its migmatization and uplift during early period of the Kaoko Belt compressional evolution.

We interpret the Coastal Terrane as a central part of the post-Rodinian rift developed along the western edge of the Congo Craton with the oldest record of sedimentation and volcanism at c. 820 Ma. The Congo Craton margin is interpreted as a rift shoulder that records the rifting-related sedimentation and volcanism at c. 740 Ma and beyond. Earlier volcanosedimentary units were probably eroded during uplift of the rift shoulders and deposited in the rift centre as the upper part of the Coastal Terrane succession. Our data suggest at least 110 Ma duration of the rifting period between c. 820 and 710 Ma. The upper part of the Congo Craton cover dominated by c. 650 Ma detrital zircons must represent an early orogenic molasse deformed and metamorphosed during thrusting of the Coastal Terrane over the Congo Craton margin between c. 580 and 550 Ma.

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