

Precambrian evolution of the Sirwa Window, Anti-Atlas Orogen, Morocco

R.J. Thomas^{a,*}, L.P. Chevallier^a, P.G. Gresse^a, R.E. Harmer^b,
B.M. Eglinton^b, R.A. Armstrong^c, C.H. de Beer^a, J.E.J. Martini^b,
G.S. de Kock^b, P.H. Macey^d, B.A. Ingram^b

^a Council for Geoscience, P.O. Box 572, Bellville 7535, South Africa

^b Council for Geoscience, P. Bag X112, Pretoria 0001, South Africa

^c PRISE, Australian National University, Canberra, Australia

^d Council for Geoscience, P.O. Box 775, Uppington 8800, South Africa

Received 14 June 2001; accepted 18 April 2002

Abstract

We present the results of a field, geochemical and geochronological study of a ~ 5000 km² area of the Sirwa Window of the Anti-Atlas Orogen of Morocco. The region includes the northern edge of the Palaeoproterozoic (Eburnean) West African Craton (Zenaga Complex) and the southern margin of the Neoproterozoic (Pan-African) Anti-Atlas Orogen. The Zenaga Complex comprises medium grade supracrustal schists and intrusive granitoid orthogneisses, three of which gave within-error U–Pb SHRIMP zircon dates of ~ 2035 Ma. The Anti-Atlas Orogen contains a vast thickness of volcano-sedimentary rocks known collectively as the Anti-Atlas Supergroup. The oldest of these comprises three, probably coeval, sequences collectively known as the Bleida Group. The Bleida Group includes tectonic inliers of schists and orthogneisses which gave a SHRIMP date of 743 ± 14 Ma; medium-grade ophiolitic rocks in the central part of the area (Khzama and Nqob fragments) and a low-grade clastic-chemical volcano-sedimentary sequence (Taghdout Subgroup) along the northern margin of the Zenaga Complex. These rocks are interpreted as representing island-arc, fore-arc basin ocean-floor, and rifted continental margin sequences, respectively. The rocks developed north of the West African Craton during Neoproterozoic subduction of oceanic crust and the development of an arc/fore-arc complex.

The Bleida Group is overlain by the thick flysch-like volcano-sedimentary rocks of the Sarhro Group which were deposited before 615 Ma, according to the SHRIMP dates obtained from the oldest granitic bodies intruding them. The presence of glaciogenic diamictite units suggests a possible depositional age of ~ 700 Ma. It is thought that the Sarhro Group was deposited in the fore-arc basin which developed between the island arc and the cratonic continental margin to the south. A reversal of plate movement vectors during Sarhro Group times led to a change from turbidite to coarse clastic deltaic deposition. This culminated in closure of the fore-arc basin and collision of the island arc with the Craton margin, ophiolite emplacement and deformation of the Sarhro Group and older rocks during the Pan-African Orogeny,

* Corresponding author. Tel.: +27-21-9484754; fax: +27-21-9488788

E-mail address: bob@geobell.org.za (R.J. Thomas).