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Geology and tectonic evolution of Palaeoproterozoic basins of the eastern Capricorn Orogen, Western Australia

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Abstract

The Palaeoproterozoic Yerrida, Bryah, Padbury, and Earraheedy Basins extend for about 700 km along the northern margin of the Yilgarn Craton and are part of the Capricorn Orogen. The basins developed between ca. 2.2 and 1.8 Ga, recording periods of sedimentation, volcanism, rifting, accretion and passive-margin tectonism. The oldest is the 2.17 Ga Yerrida Basin, which began as an intracontinental sag within which siliciclastics and evaporites accumulated. At about 2.0 Ga convergence of the Yilgarn Craton and the Glenburgh terrane closed an oceanic arm, resulting in the accretion of oceanic crust and plateaux onto the Yilgarn margin and the western side of the Yerrida sag basin. This accretion produced the Narracoota Formation, which together with the clastic and chemical (banded iron-formation) sedimentation that followed, forms the Bryah Basin. Continuing collision resulted in the establishment, around 1.96 Ga, of the

Padbury foreland basin, developed on top of the Bryah Basin rocks. The ca. 1.83 Ga convergence and collision of the Pilbara and Yilgarn Cratons (Capricorn Orogeny), resulted in deformation of the Bryah–Padbury Basins and orogenic uplift with coarse clastic sedimentation accompanied by the eruption of flood basalts into the Yerrida Basin. To the east of the collision zone, and possibly postdating collision, a passive margin was present. Sedimentation along it consisted of clastic and chemical sediments (granular iron-formation), which form the Earahedy Basin. During the ca. 1.79 Ga Yapungku Orogeny, due to the convergence of the North Australian and Western Australian cratons, the northern margin of the Earahedy Basin was deformed (Stanley Fold Belt). This last deformation event concludes the Palaeoproterozoic history of the eastern Capricorn Orogen basins.



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Keywords

Palaeoproterozoic basins; Capricorn Orogen; Tectonic evolution; Accretion; Oceanic crust; Continental volcanism

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