



The Protector Basin opening: age and implications in the development of the central Scotia Sea

J. Galindo-Zaldívar (1), F. Bohoyo (2), A. Maldonado (3), A. Schreider (4), E. Suriñach (5) and J.T. Vazquez (6)

(1) Departamento de Geodinámica, Universidad de Granada, Spain, (2) Instituto Geológico y Minero de España, Spain, (3) Instituto Andaluz Ciencias de la Tierra. CSIC/Universidad Granada, Spain, (4) P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Russia, (5) Departament de Geologia Dinàmica i Geofísica. Universitat de Barcelona, Spain, (6) Facultad de Ciencias del Mar, Universidad de Cádiz, Spain.

The Protector Basin, located in the southern Scotia Sea, is a good example of a small oceanic basin developed between two thinned continental blocks, the Pirie Bank and the Terror Rise, poorly studied up to now. A new set of multibeam bathymetry, multichannel seismic reflection, and gravity and magnetic anomaly profiles obtained on the SCAN01 cruise led us to determine that the Protector basin probably opened during the period comprised between C5Dn (17.4 Ma) and C5ACn-C5ABr chrons (13.8 Ma), forming a N-S oriented spreading axis. The end of spreading is slightly younger to the North. The start of spreading is clearly diachronous, with the most complete set of chrons up to C5Dn in the southern profile, C5Cn in the middle section and only up to C5ADn in the northern part of the basin. The spreading axis propagated northwards during the basin development, producing the wedge shape of the basin. In addition, at the NE part of the basin, a reverse fault developed in the border of the Pirie Bank after basin opening accentuates the sharp northern end. Moreover, the northwestern part of the Pirie Bank margin is an extremely stretched continental crust with N-S elongated magnetic anomalies related to incipient oceanic southward propagating spreading axes.

The Protector Basin shows the oldest evidence of E-W continental stretching and subsequent oceanic spreading during Middle Miocene, related with the eastward development of the Scotia Arc that continues up to Present. The relative rotation of continental blocks during the development of small sized oceanic basins by continental block

drifting favoured the opening of wedge shape basins like the Protector Basin and conjugate propagating rifts. The Protector Basin oceanic spreading period is included in the longer time span that corresponds to the activity of the West Scotia Ridge, responsible for the development of the Drake Passage.

Spain's Comisión Interministerial de Ciencia y Tecnología (CYCIT) supported this research through Projects: REN2001-2143/ANT.