MORPHO-SEDIMENTARY FEATURES OF THE SOUTH-WESTERN SCOTIA SEA

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The opening of the Drake Passage, occurred most likely, at the Late Oligocene-Early Miocene boundary, has triggered a series of palaeogeographic and palaeoclimatic events on a global scale (Barker, 2001). These are associated to the profound modifications of the oceanic water masses circulation responsible of the formation of the Antarctic Circumpolar Current, and its interaction with the Weddell Gyre (Fig. 1A) (Lodolo & Tassone, 2010). These bottom currents have been responsible for the distribution, shape and size of widespread contouritic drift deposits (Maldonado *et al.*, 2006). The studied area includes the sector located to the north of the South Scotia Ridge, and comprises the two continental/transitional blocks of the Terror Rise (TR) and the Ona Platform (OP). These blocks probably resulted from left-lateral transcurrent motion which took place along the South Scotia Ridge (SSR) since the early development of the western part of the Scotia Sea (Lodolo *et al.*, 2006; Civile *et al.*, 2012). Since the Late Miocene onwards, this area remained mostly tectonically silent, but the sedimentary processes might have been affected by the transpressional uplift of the Shackelton Fracture Zone (SFZ) and the separation of the South Shetland Islands Block (SSIB) due to the incipient subduction of the SFZ (Barker, 2001; Maldonado *et al.*, 2006; Civile *et al.*, 2012).
The interpretation and integration of seismic profiles and available bathymetric information allowed us to identify and map a variety of sedimentary morphologies developed above the sea-floor in the south-western

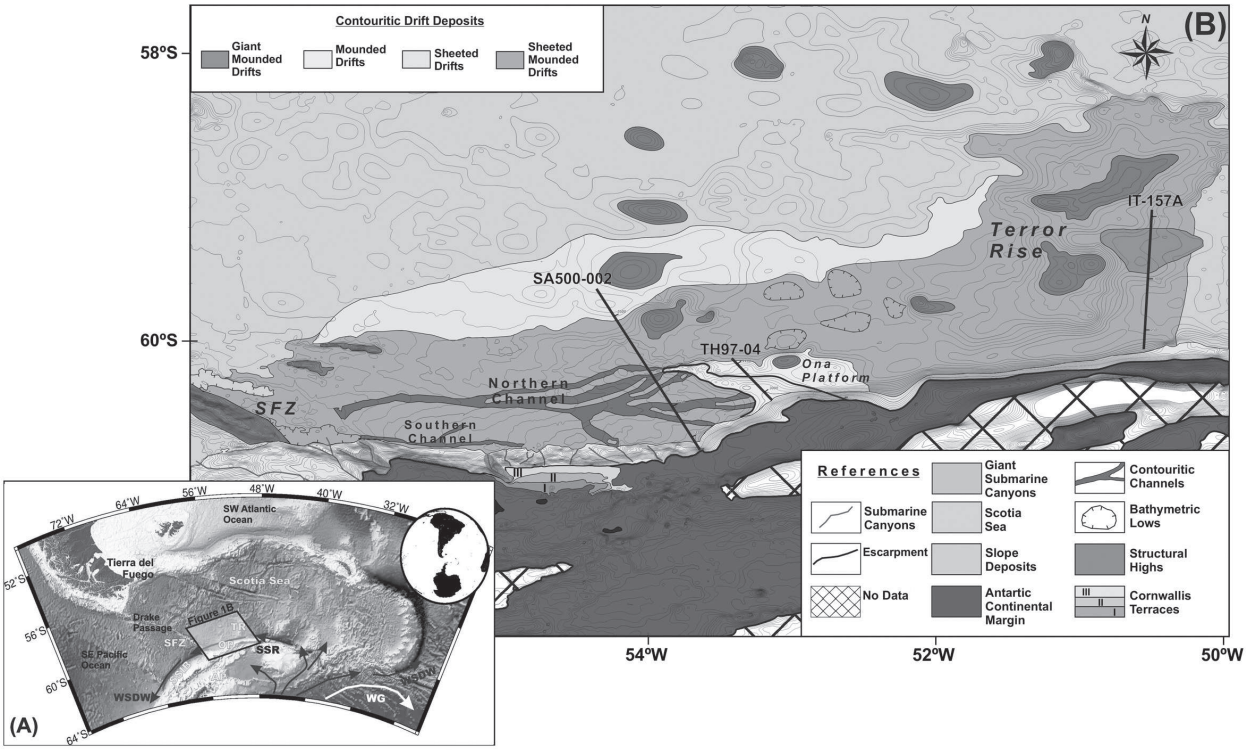

Fig. 1 - (A) Regional location map, modified from Lodolo & Tassone (2010). (B) Morphosedimentary map showing the position of the seismic sections and the planimetric distribution of the identified deposits. Reference: AP, Antarctic Peninsula. SFZ, Shackleton Fracture Zone. SSR, South Scotia Ridge. OP, Ona Platform. SSIB, South Shetland Island Block. TR, Terror Rise. WSDW, Weddell Sea Deep Water. WG, Weddell Gyre.

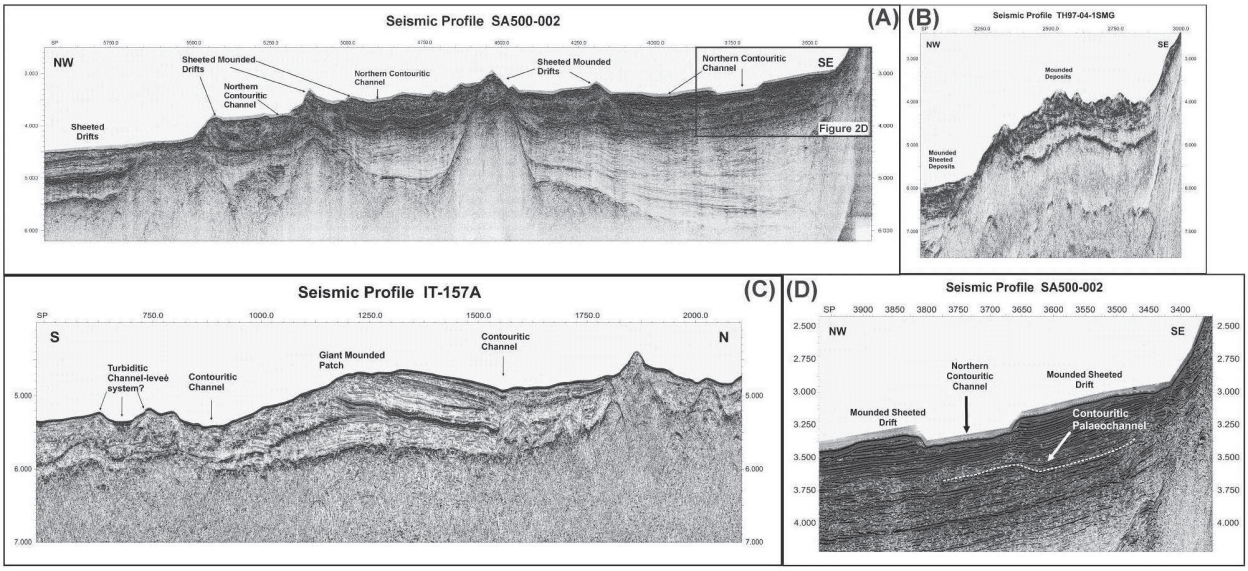

Fig. 2 - Seismic profiles showing representative examples of described morphologies. (A) Seismic Profile SA500-002 shows the observed morphosedimentary geometries in the eastern and central region. (B) Seismic Profile TH97-04-1SMG shows the observed deposits above Ona Platform. (C) Seismic Profile IT-157A shows the identified morphologies in Terror Rise area. (D) Detailed area of the Southeastern extreme of Seismic Profile SA500-002, showing the relationship between the Northern Contouritic Channel and the surrounding deposits.

corner of the Scotia Sea. As seen in Figs. 1 and 2, the studied area is characterized by sheeted, mounded sheeted and mounded contouritic deposits. According to Faugères *et al*. (1999), these sedimentary bodies would derive from marine currents influenced by the existing bathymetric setting.

In general, data show that moving away from the Antarctic Peninsula (AP), and as the distance from this supply area increases and the amount of bathymetric obstacles decreases, the sedimentary bodies decrease in thickness and geometries show a sheeted morphology. In the eastern part of the studied area, the occurrence of a giant mounded patch, showed in Fig. 2C is possibly related to the structural highs of TR. Is possible that between these two highs, the current might have been forced to greatly reduce energy and deposited an anomalously large amount of sediment. Towards the central area, above the OP block, the appearance of small, mounded sedimentary bodies might be indicative of an adverse morpho-structural barrier for the circulation of the bottom current. In this context, the OP block could have acted as a dam which led the current to lose sedimentary load while ascending and deposit these smaller bodies above it.

The development of the contouritic channels, indicated in Figs. 2A and 2D, and located in the western sector analyzed, could be conditioned to its current bathymetric setting. SFZ incipient subduction beneath the AP may have induced western tilting of the sea-floor and consequent acceleration of the bottom currents. This process could be responsible for the generation of stream bottom currents which dissected previously developed contouritic deposits.

Acknowledgements

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FIRST EVIDENCE OF A DINOSAUR FROM UPPER CRETACEOUS LEVELS OF THE DOROTEA FORMATION, SIERRA BAGUALES, SOUTHERNMOST CHILE

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Introduction

Upper Cretaceous dinosaur remains from southern South America have been recorded exclusively from Argentinean Patagonia (Coria and Salgado, 1996; Coria and Calvo, 2002; Calvo *et al*., 2007; Martínez, 1998; Novas *et al*., 2004, and references therein). With the exception of Upper Jurassic records in Aysén (Salgado *et al*., 2008) no dinosaur records were known in the Chilean Patagonia. This contribution presents the first remains of a dinosaur recovered in the Magallanes Region, southernmost Chile. Although fragmentary, the material has narrow morphologic affinities with the Ornithopoda. This is one of the few bony remains referable to the Ornithopoda found in Chile and extends latitudinally the record of the group previously reported from the Upper Cretaceous of southern Argentina.

Locality and Geological Setting

The W-E profile exposed at latitude 50°44'S, between the 72°33'W and 72°23'W includes a thick sedimentary section ranging from the Late Cretaceous to the Neogene, with older levels exposed to the W becoming younger to the E. The studied section is exposed in the western part of the Sierra Baguales (Fig. 1), about 40 km NE from Torres del Paine National Park. Lower levels include frequent ammonoids of the species Hoplitoplacenticeras plasticum. The dinosaur sample here studied was recovered together with abundant but non-diagnostic bone remains, all of them slightly transported. Its stratigraphic provenance is interpreted from a level comprised by reddish to grey sandstones, with intercalated lenses containing marine fauna of the bivalvian Panopea sp. and ichnofossils referred to Teredolites isp., as well as teeth of the cartilaginous fish Carcharias sp. Beds with similar lithology are better exposed in upper levels of the section that crops out 2.7 km to the S, hosting frequent teeth of Carcharias sp., rostral spines of the sclerorhynchid fish Ischyrhiza chilensis (Philippi), and isolated teeth of marine reptiles. The roof of the unit is covered by