

Distribution of *Micula murus* in the Late Maastrichtian southwestern Atlantic Ocean and its contribution to palaeoceanographic reconstructions

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During the Late Maastrichtian, evidence of a global warming episode was recorded on the Atlantic coast of northern Argentina (Salado, Colorado and Neuquén Basins). The recovered assemblages of marine invertebrates, dinoflagellates, foraminifera and nannofossils show affinities to coeval assemblages from northern Brazil and Africa, and Caribe (e.g. Guler et al., 2019). These nannofossil assemblages differ in taxonomic composition and relative abundance from the ones of southern Patagonia. In the Salado, Colorado and Neuquén Basins, the Late Maastrichtian nannofossil assemblages were dominated by *Micula* spp., with *M. staurophora* being the most abundant. The palaeoenvironmental significance of these *Micula*-dominated assemblages is not fully understood, but has long been discussed (e.g. Keller et al., 2007), and they seem to respond to high environmental stress. This acme of *Micula* spp. has proved to be useful in local biostratigraphic schemes (Pérez Panera et al., 2016). *Micula murus* is present in some localities in the Neuquén Basin (Scasso et al., 2005; Keller et al., 2007; Musso et al., 2012) and in four of the nine Salado and Colorado Basins wells. The relative abundance of *M. murus* is less than 1%, and was found in assemblages with high diversity indices. An exception was the Pejerrey Well (northeastern Colorado Basin), where *M. murus* constituted as much as 20% of the assemblage and was one of the most abundant species. Previous works have pointed out that this warm-water taxon migrated northwards and southwards during a mid-Cretaceous warming episode, and became abundant in the latest Maastrichtian (Thibault et al., 2010; do Monte Guerra et al., 2016; Thibault, 2016). The northeastern Colorado Basin area reflect the confluence of northern warm waters and southern cold waters, and the southern Colorado Basin may represent the boundary between mid-latitude and high-latitude realms in the southwestern Atlantic Ocean during the Late Cretaceous.

References

- do Monte Guerra, R., Concheyro, A., Wise, S.W., Kender, S. & Fauth, G. 2016. New latitude-based nannofossil zonation for the Campanian-Maastrichtian of the South Atlantic Ocean and its paleoceanographic implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **452**: 55–67.
- Guler, V., Gonzalez Estebenet, M.S., Navarro, E., Astini, R.A., Pérez Panera, J.P., Ottone, E.G., Pieroni, D. & Paolillo, M.A. 2019. Maastrichtian to Danian Atlantic transgression in the north of Patagonia: A dinoflagellate cyst approach. *Journal of South American Earth Sciences*. doi: <https://doi.org/10.1016/j.jsames.2019.04.002>
- Keller, G., Adatte, T., Tantawy, A.A., Berner, Z., Stinnesbeck, W., Stueben, D. & Leanza, H.A. 2007. High stress late Maastrichtian–early Danian palaeoenvironment in the Neuquén Basin, Argentina. *Cretaceous Research*, **28**: 939–960.
- Musso, T., Concheyro, A. & Pettinari, G. 2012. Mineralogía de arcillas y nanofósiles calcáreos de las formaciones Jagüel y Roca en el sector oriental del lago Pellegrini, Cuenca Neuquina, República Argentina. *Andean Geology*, **39**: 511–540.
- Pérez Panera, J.P., Ronchi, D.I., Angelozzi, G., Calvo Marcilese, L., Tórtora, L., Calaramo, N., Lovecchio, J.P. & Kress Frieling, P.R. 2016. Late Cretaceous–Cenozoic biostratigraphy and palaeoenvironmental reconstruction of the Salado and Punta del Este Basins, Southwestern Atlantic Ocean. 11° Congreso de la Asociación Paleontológica Argentina, General Roca, 2016: 132.
- Scasso, R.A., Concheyro, A., Kiessling, W., Aberhan, M., Hecht, L., Medina, F. & Tagle, R. 2005. A tsunami deposit at the Cretaceous/Paleogene boundary in the Neuquén Basin of Argentina. *Cretaceous Research*, **26**: 283–297.
- Thibault, N. 2016. Calcareous nannofossil biostratigraphy and turnover dynamics in the late Campanian-Maastrichtian of the tropical South Atlantic. *Revue de Micropaléontologie*, **59**: 57–69.
- Thibault, N., Gardin, S. & Galbrun, B. 2010. Latitudinal migration of calcareous nannofossil *Micula murus* in the Maastrichtian: Implications for global climate change. *Geology*, **38**: 203–206.