



Sabrina Coast (East Antarctica) depositional processes highlighted through stratigraphic and paleoenvironmental diatom analysis

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The systematic survey of Antarctic margin sedimentary sequences offers, especially in poorly investigated areas, the opportunity to obtain a wide range of information on glacio-eustatic, climatic, and tectonic events. Multi-disciplinary datasets resulting from geophysical surveys and scientific coring and drilling are needed to address questions regarding the orbital forcing and the global response of the hydrosphere (oceans and atmosphere), cryosphere, and biosphere. The PNRA Tytan Project, embedded into the Australian project “Interactions of the Totten Glacier with the Southern Ocean through multiple glacial cycles” (Australian National University), aims to understand how the Totten Glacier behaved during past Holocene and Pleistocene times of warmer climate. Insights for reconstructing the depositional and hydrodynamic environments of the continental margin off the Totten Glacier, a large outlet glacier located on the Sabrina Coast of East Antarctica, are addressed through micropaleontological efforts. The micropaleontological research group focused on identification of diatom biostratigraphic markers and assemblage analyses in sediment cores collected from the Sabrina Coast continental slope during the RV Investigator mission IN2017_V01 in order to reconstruct paleoenvironments and to place age constraints on the sedimentary sequences.

All but one of the piston cores recovered late Pleistocene sediments, documenting MIS 9 – MIS 1, with interglacial intervals characterized by diatomaceous sediments dominated by the open water taxon *Fragilariopsis kerguelensis*. Glacial intervals have much lower diatom concentrations and a higher proportion of reworked forms. A single piston core, IN2017_V01_PC03, recovered a more complicated sedimentary sequence. This sequence, targeted for an older and more condensed coring location, was selected for coring based on the sub-bottom geophysical data that indicated thinning of the upper stratigraphic section, and greater access to the underlying section. The results suggest a very dynamic sediment delivery system in a context of Pliocene–Recent Antarctic continental margin. The basal section of the core is marked by Eocene-Oligocene reworked taxa while the mid section is characterized by almost barren sediments. The silty top section of the PC03 core, had diatom assemblages similar to the other kasten and piston cores; this section is characterized by modern diatom assemblages dominated by Circum Antarctic Current and open water taxa with a variable presence of sea ice associated forms. Glacial slumping, perhaps facilitated by the presence of biogenic silica, and reworking may have removed or prevented deposition within this condensed sedimentary sequence.

The presence or absence of *F. kerguelensis* versus *F. barronii* and also the presence of transitional forms between these two species, confirms the much older nature of the sediments in this core as compared to the other piston cores. In addition, *Denticulopsis simonsenii* much more common at the basal part of the core, may reflect erosional contributions from Miocene-aged sediment, while the significant contribution of *F. barronii*, *Thalassiosira lentiginosa* and *Thalassiosira oliverana* (var. *sparsa*?) versus intervals dominated by *D. simonsenii* may suggest different sources of material.