



# IV ROSS SEA CONFERENCE 2023

Università degli Studi di Napoli "Parthenope"

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**Topic:** Emerging chemicals and pollutants



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**ABSTRACT Subject :**

Textile microfibers in wild specimens of the Antarctic scallop *Adamussium colbecki* (Smith, 1902), from Terra Nova Bay, Ross Sea Antarctica

**Abstract** 15/02/2023 15:48:10



Plastic pollution has reached the most remote regions of our planet including the Southern Ocean and coastal Antarctica whose biodiversity is already under threats associated with an increasing human pressure. From global long-range transport as well as local sources, a wide range of microplastic concentration (0.002-0.1 m<sup>-3</sup>) having various shape (fibers, beads, films) and polymer composition (cellulose and synthetic polymers) has been documented in Antarctic sea-ice, snow, water, sediments and biota. Microfibers (MF) have been recognized among the most frequent in terms of amount and distribution and mostly made of natural cellulose (~80%) and polyethylene terephthalate as prevalent synthetic polymer. Although fabric MF made of cellulose or wool can be considered not harmful being natural biodegradable polymers, toxic additives have been shown to resist washing and to remain attached to the released MF with serious consequences for marine species. Recently, we demonstrated that textile (semi-)synthetic/composite MF (polyethylene terephthalate and cellulose-polyamide composites; length range: 0.25–4.98 mm) found in specimens of Antarctic whelk *Neobuccinum eatoni* collected from Terra Nova Bay in the Ross Sea matched those of outdoor technical clothing in use by the personnel of the Italian "Mario Zucchelli" station. A most recent study analyzing wild specimens of the Antarctic scallop *Adamussium colbecki* collected in 2004 and 2019 from the same location further confirms microplastic contamination in Ross Sea benthic fauna. Two main target organs as gills and mantle were analyzed as main entrance of microplastics from water filtration and revealed that 91.6 % of individuals tested were contaminated by microplastics with a total of 79 MF and 20 fragments (74.68% and 25.31% respectively) and in number of  $6.6 \pm 1.94$  microplastics in each individual. MF (length 0.06 – 9.2 mm) were classified by colors as black 47.45 %, blue 38.98 % and red 13.55 % while fragments were of different shapes and mainly blue and black. Scallop's mantle resulted more contaminated than gills (total amount 41 vs 28) and specimens collected in 2004 resulted all contaminated by microplastics (positive 100%) and in higher amount compared to those from 2019 (total amount 48 vs 31 and  $8 \pm 1.75$ /individual and  $5.17 \pm 2.09$ /individual respectively). The polymer characterization of the microplastics and microfibers has been done by Raman and FTIR. Overall findings further confirm that Terra Nova Bay benthic organisms are interested by microplastic contamination and local source as well long-range transport are indeed responsible for such treat. Therefore, future studies addressing either origin but more important ecological risks posed by microplastic and in particular MF on Antarctic marine coastal biodiversity are mandatory.

