



# IV ROSS SEA CONFERENCE 2023

Università degli Studi di Napoli "Parthenope"

Via Amm. F. Acton, 38 - 80133 Napoli, ITALY

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**Topic:** Emerging chemicals and pollutants



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**ABSTRACT Subject :**

Coupled influence of ice melting and feeding habits on bioaccumulation of trace elements in Antarctic fish.

**Abstract** 09/02/2023 14:54:29

Despite its remoteness, Antarctica is affected by environmental contamination due to global and local factors. Furthermore, it is among the most fragile and susceptible areas to climate change. Ocean warming is altering the seasonal dynamics of sea-ice melting, affecting the release of contaminants into the water column and their transfer to the biota. Endemic non-migratory fish are considered excellent bioindicators of trace element (TE) contamination over time. Here, the benthic emerald rockcod *Trematomus bernacchii* and the demersal icefish *Chionodraco hamatus* were sampled in Terra Nova Bay, within the Ross Sea, in winter and austral summer (2017/2018), to investigate the influence of ice melting on TE bioaccumulation patterns. The muscle and liver of both fish were analysed for TE concentration (As, Cd, Cr, Cu, Hg, Mn, Pb, Zn). Stable isotopes ( $d^{13}C$ ,  $d^{15}N$ ) were also analysed to assess the influence of trophic role and position on the observed patterns. Results highlighted that sea-ice melting plays a major role in modulating the accumulation of As, Cd, Mn, and Zn in the fish tissues. This can be explained by the release of trace elements into the water column as the sea ice melts, increasing the availability and the transfer to fish directly through gills or indirectly through diet. The occurrence of species- and tissue-specific patterns of TE accumulation was also relevant. Specifically, *T. bernacchii* showed higher TE concentration than *C. hamatus*, reflecting different habitat use and feeding strategy. Moreover, higher TE concentration was found in the liver than in muscle, indicating detoxification processes. The only exception was represented by Hg, which was more concentrated in muscle, especially in *C. hamatus*, due to its higher position in the food web and biomagnification processes. These results represent baseline data for monitoring TE contamination levels in the Sea Ross Marine Protected Area under the climate change scenario.

Antarctica where unpredictable changed home ranges of species may affect the trophic relationships.

