Anthropogenic Pollution in Polar Regions

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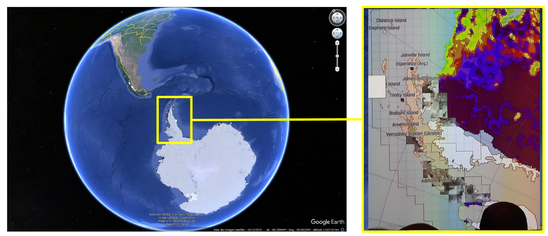
This preliminary action aims to provide information on the level of plastic pollution and chemical contaminants in regions that are most often considered as pristine. It will also provide the necessary scientific and technical basis for further studies and possible long-term monitoring

Scientific team

Commandant Charcot

Antarctic and Arctic exploration



Antarctic sampling zone

Arctic

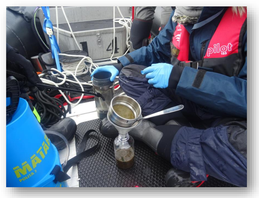
Surface seawater samplings using a “manta net” for microplastics analysis

Manta net

Floating microplastics are sampled using a Manta net with a 330 µm mesh and a 60 cm opening. A collector is placed at the end of the net to trap the particles.

Sample conditioning

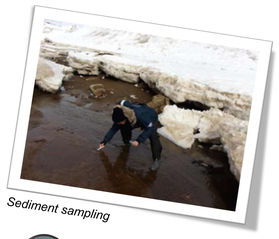
A ferry box was also deployed (material from Taltech: Tallinn University). It is a water filtration system, pumped directly on board the boat during transits, which helps retain microplastics.



Biota and surface sediment samplings for trace metals and microplastics analysis

Van Veen core

Sampling for microplastics and trace metals analysis in sediments have been carried out using several technics (grabs operated from light boat, telescopic poles, sampling spatulas…) depending sampling site characteristics (conformation, bathymetry…)
The shrimp were also sampled for analysis of the microplastics in the biota.

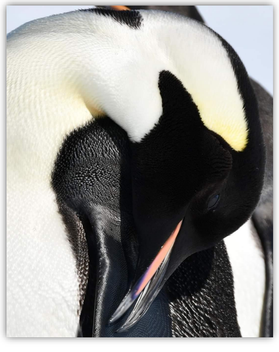


Sediment sampling

Shrimps sample

Beach litter and interaction with fauna *(ei : entanglement)*

On each trip, no beach litter or interaction were found during the antarctic mission.



Implementation of passive sampling technique (DGT) for measuring concentrations of trace metals and rare earths in seawater

Passive samplers (PS) accumulate contaminants continuously during the deployment time, enabling time weight averaged concentrations (TWA) of contaminants to be determined.

Microplastics in terrestrial and marine ice

Ice sampling

The ice samples were taken from ice free of all traces of animal and human contamination, either at sea on small icbergs or on land far from boats and passengers. Only the superficial layer of the ice is taken (the first centimeter) on approximately one square meter. The samples are taken with suitable equipment for the study of chemical contamination (metal and calcined bottle).

Ponant is an incredible scientific opportunity to explore and learn about an inaccessible environment which are the polar regions

To summarise :

Manta net samples : 14
Sediment samples : 7
Biota samples : 2
Ice samples : 36
Passive samples: 7

The samples were returned to land in May 2023. They are currently being processed in the various partner laboratories.

The scientists who embarked on the Ponant missions thank the two coordinators Daniel Cron and Geoffroy De Kersauson for accompanying them during these two missions. They also thank Commander Etienne Garcia.

Photo credit : O.Gérigny, M.Ourgaud, F.Galgani, F.Claro