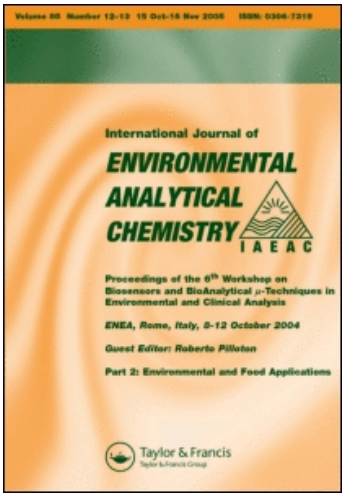

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Foreword

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FOREWORD

For 15 years, the Italian Antarctica Programme has been studying chemical contamination in the Antarctic, and has made a unique and global contribution to the knowledge of environmental quality, and the transport and diffusion processes of contaminants and other chemical substances of environmental concern.

This volume represents another contribution to knowledge acquired above all during the course of the XIII campaign (1997–1998) and those preceding it. The results are not complete, and further work being carried out regarding trace elements and micro-pollutants is not included. The research reported here looks at the most important environmental components and takes into consideration naturally occurring substances and anthropogenic micro-contaminants.

The processes regarding natural organic substances of environmental interest such as DMS and DMSP are being studied. The evolution over time of DMS and DMSP in Antarctic coastal waters has highlighted the role of marine ice in the cycle of sulphur, an element of great climatic interest.

This work is linked to the study of the enrichment of humic acids in the sea-surface microlayer where sulphated substances are found, derived from the photochemical reactions and the biological oxidation of DMS.

Humic acids were also studied in sediment cores sampled from various stations in the Ross Sea. Their distribution and structural characteristics along the core were determined and correlated with TOC and sedimentary data. The results highlighted the different sedimentation rates at different stations. Also studied in the Ross Sea during the 1997–1998 campaign were the vertical and horizontal distributions of biogenic substances (e.g. alcohols and fatty acids), the concentrations of which were well correlated with biological activity indices.

Moreover, the distribution of major, minor and trace elements was studied at various sites along the coast and 'offshore', by taking samples at various depths for an improved understanding of the biochemical cycles of metals. The sea-surface microlayer was also sampled at different phases of the Antarctic summer during several expeditions.

This volume also includes the study of the mechanism in the formation of nitrophenyls found in several Antarctic lakes. The photolysis of nitrogenous nutrients due to UV irradiation suggests several different reactions that may explain the presence of these compounds in Antarctic environmental conditions.

Also reported are studies conducted on the monitoring of persistent anthropogenic radioactivity over the period 1997–1998. Measurements in seawater, sediments, lake

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waters, lake algae and lichens were performed, and a comparison with those from the Mediterranean Sea is reported.

The presence of three chlorinated hydrocarbons has been confirmed in ice samples from the Rennick Glacier and in seawater samples from the Ross Sea. The data have been evaluated with respect to their global diffusion.

The study of ice cores has allowed us to obtain a global vision of the variation in space and time of the chemical composition of snow deposits from the last century.

Finally, the need to obtain reliable experimental data is being met by new work investigating the possibility of preparing a new certified reference material based on the marine organism *Adamusium colbeki*.

In conclusion, it can be said that the results reported in this volume represent a significant advancement of knowledge adding to the heritage of the Italian Antarctica Programme.

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