

# The South African SIBEX I Cruise to the Prydz Bay region, 1984: VI. Preliminary report on the naturally-occurring radioactive nuclide $^{210}\text{Po}$ in the survey area

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*During the SIBEX I cruise seawater, phytoplankton, and zooplankton samples were collected in the survey area for subsequent Polonium-210 determinations. The determinations are not yet complete but some preliminary conclusions are drawn.*

*Tydens die SIBEX I-vaart is monsters seewater, fitoplankton en soöplankton in die opnamegebied versamel vir die latere bepaling van polonium-210. Die analises is nog nie voltooi nie, maar 'n aantal voorlopige gevolgtrekkings is gemaak.*

## Introduction

Radon emanated from the earth's crust decays in the atmosphere and gives rise to a natural radioactive fallout of its descendants  $^{210}\text{Pb}$ ,  $^{210}\text{Bi}$  and the alpha-emitter  $^{210}\text{Po}$ . The latter nuclide is particularly concentrated in marine organisms and has been shown to be a useful tracer of marine biological processes due to its extensive involvement in the oceanic biological cycle. (Cherry & Shannon 1974, Heyraud & Cherry 1979).

## Methods

Samples of seawater, phytoplankton, zooplankton and Antarctic krill *Euphausia superba*, were collected on the SIBEX I cruise of the SA *Agulhas* during March and April 1984.

Polonium-210 determinations were made by the standard technique of acid digestion, spontaneous deposition of  $^{210}\text{Po}$  onto a silver disc, and counting of the  $^{210}\text{Po}$  alpha radioactivity on the disc with Zns(Ag) scintillation phosphors. It should be emphasised that the technique involves a second count about 5 months later before an accurate determination can be made; the second counts have not yet been completed, and the data currently available are accordingly preliminary. For this reason, no figures can be provided at this stage although it is possible to draw some general conclusions.

## Results and Conclusions

The levels of  $^{210}\text{Po}$  found in seawater, phytoplankton and zooplankton (mainly copepod) samples from the SIBEX I survey area appear to be comparable with those previously reported in samples from other oceanographic regions (Cherry & Shannon 1974, Heyraud & Cherry 1979, Shannon *et al.* 1970, Heyraud *et al.* 1976). The published data for  $^{210}\text{Po}$  in phytoplankton are in fact very sparse, and the data from the 16 SIBEX I phytoplankton samples will thus be of particular importance. The  $^{210}\text{Po}$  levels in the SIBEX I krill samples appear to be somewhat higher than published values for euphausiids (Heyraud *et al.* 1976). Once the analyses are finalised, the results will be studied in detail in terms of animal size and of sample location on either side of the "oceanographic event", or front, detected at approximately 64°S. It is uncertain, at this stage, that the data obtained will provide any information on krill feeding habits as there is some overlap in the respective ranges of  $^{210}\text{Po}$  levels measured in phytoplankton and zooplankton.

It should be emphasised that as regards this work, SIBEX I was an investigatory exercise. An analysis of our data, when complete, should enable us to assess which avenues to explore in the future.

## References

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