

**MONITORING OF  $^{137}\text{CS}$ ,  $^{238}\text{PU}$ ,  $^{239+240}\text{PU}$ ,  $^{90}\text{SR}$  AND  $^{40}\text{K}$  ACTIVITIES IN VARIOUS ELEMENTS OF ANTARCTIC ECOSYSTEMS OF KING GEORGE ISLAND (SOUTHERN SHETLANDS)**

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The objective of the study was to estimate natural and antropogenic radioactivity levels as a part of Antarctic environment monitoring program. Samples were collected on different sites of King George Island during expeditions to the Henryk Arctowski Polish Antarctic Station in 1979/1978, 1998/1999 and 2001/2002. Initially we carried out measurements only for lichens (*Usnea* sp.) and mosses (*Sanionia uncinata*) from this area [1]. Later, other samples originated from both marine and terrestrial environments were included [2]. They were: bones, eggshells and feathers of penguin (*Pygoscelis papua*), bones and feathers of petrel (*Daption capense*), fur and bones of seal (*Mirounga leonina*), algae (*Himantothallus grandifolius* and *Desmarestia anceps*), fish (*Notothenia corriceps*), whole bodies of sea invertebrates (*Amphipoda*) and shells of limpet (*Nacella concina*) as well as vascular plants (*Deschampsia antarctica* and *Colobanthus quitensis*), mushroom (*Omphalina pyxidata*) and soil.

All samples were standardised and then activities of  $^{137}\text{Cs}$  and  $^{40}\text{K}$  were measured by means of low-background gamma spectrometry. Then samples were ashed in  $600^{\circ}\text{C}$  and measured using beta liquid scintillation (for  $^{90}\text{Sr}$  activities) or alpha spectrometry (for  $^{238,239+240}\text{Pu}$ ) preceded by appropriate radiochemical treatment [2].

Contamination of studied area is very low. The highest activity concentrations for all radionuclides were found for mosses and lichen samples, as was expected. It is mainly due to the bioconcentration processes they conduct.

#### References

- [1] J.W. Mietelski et al. *Journal of Radioanal. and Nuclear Chemistry*, 245 No.3, (2000), p.527-535
- [2] J.W.Mietelski et al. *Proc. from the 6<sup>th</sup> Internat. Conf. on Environ. Radioactivity in the Arctic and Antarctic* 2-6 Oct. 2005, Nice Eds. P.Strand, P.Borretzen, T.Jolle, NRPA Oesteras 2005, p. 130-133.