

Occurrence of a natural carcinogenic compound in soils and bracken ferns from Southern Italy

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The bracken fern *Pteridium aquilinum* (L.) Kuhn, one of the most common plant species on Earth, produces a wide range of secondary metabolites including the norsesquiterpene glucoside ptaquiloside (PTA). Several studies are present in literature about eco-toxicological aspects related to PTA, whereas results about the effect of growth conditions and soil properties on the production and mobility of PTA are sometimes conflicting and further investigations are needed. The aim of the present work is to investigate the occurrence and possible fate of PTA in soils showing different physical and chemical features, and collected in several areas of the South of Italy. The PTA content was determined in both soil and fern samples by GC-MS; both the extraction protocol and recovery were previously tested through incubation studies. Soils samples were also characterized from the physical and chemical point of view in order to correlate the possible influence of soil parameters on PTA production and occurrence. Besides temperature, PTA concentration in *Pteridium aquilinum* fern seemed to be significantly and positively affected by P availability and soil pH. At the same time, PTA concentration in soil samples was always undetectable, independently of the PTA concentration in the corresponding *Pteridium* samples and pedo-climatic conditions. This seems to suggest the degradation of the PTA by indigenous soil microbial community, whereas incubation studies underlined a certain affinity of PTA for both organic colloids and clay/silt particles.

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