

Genotoxic activity of *Pteridium aquilinum* *in vivo* in *Drosophila melanogaster*

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The fern *Pteridium aquilinum* is distributed worldwide since millions of years ago, belonging to open forest communities since then. In the last decades, its prevalence has expanded considerably, partly due to changes in human land-use, but mostly because of the natural aggressiveness of this plant towards competing species. Furthermore, as found many years ago, this fern is the only known carcinogenic plant, through the action of its illudane glycoside metabolites, ptaquiloside, caudatoside and ptesculentoside, and their corresponding pterosins and dienone-like secondary metabolites. This carcinogenic activity, originated by the DNA damage induced by these chemicals, was found not only on livestock animals (sheep, horses and mainly cattle), but also in humans.

Although several studies have demonstrated that plants from different countries and continents present differences in their illudane glycosides contents, there is not information about the possible relationship between the metabolite content and the genotoxic potency of the plants. And there is not information about the genotoxic activity of this plant in Spain, despite its wide distribution in the north part of the country and also in Extremadura.

In this work we have studied the genotoxic activity of aqueous extracts of *P. aquilinum*, collected at different places, *in vivo*, using the eye-SMART assay of *D. melanogaster*, analyzing the effects of time in the preparation of the extracts, and of frond age. Additionally, we have studied the possible genotoxicity of water from fountains, troughs and wells surrounded by ferns.

The results show that: (i) all the extracts are potent genotoxins; (ii) there are differences between plants from different places; (iii) there are differences between the genotoxic activity of young and old fronds; (iv) the tested water samples show genotoxic activity, at least when concentrated (3-fold).

While the metabolite content of the several extracts and their relationship with genotoxic activity have still to be determined, these data demonstrate the threat represented by this fern *in vivo* and the necessity to widely spread information about the risk associated to its exposure.