NON-TOXIC EFFECTS OF *Smallanthus sonchifolius* LEAFS AND ITS MAIN ACTIVE COMPOUND, ENHYDRIN.

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INTRODUCTION

*Smallanthus sonchifolius* [Poepp. & Endl.] H. Robinson or yacon is a native specie of South America belonging to the Asteraceae family. In recent work we have demonstrated that leaves decoction and enhydrin, the major sesquiterpene lactone of yacon leaves, was effective to reduce post-prandial glucose and useful in the treatment of diabetic animals (1). For this reason, in order to continue assessing their potential antidiabetic use, it is necessary to investigate their safety through toxicity studies. We evaluated the toxicity both, “*in vivo*” using Wistar rats and “*in vitro*” with cultured cells.

MATERIALS AND METHODS

Preparation of decoction and isolation and purification of enhydrin: was carried out as described previously Aybar et al (2) and Genta et al.(1)

“*In vitro*” toxicity assay: Cell proliferation rates were determined by citotoxicity test based on MTT assay (3) using CHO-K1, HEP-G2 and COS cells culture. The results were expressed as a percentage of the control.

“*In vivo*” toxicity assay: adult Wistar rats of both sexes weighting 200–220 g were selected for all the experiments. The animals were divided into groups of 6 rats each and were given daily, distilled water, 10% yacon decoction (140 mg/Kg) or enhydrin (0.8 and 8 mg/kg b.w.), using an intragastric tube during a 60 days period. General conditions, biochemistry parameters and histopathology examination of the main organs were performed.

Statistical analysis: The statistical significance was assayed using analysis of variance (ANOVA). A *p* value <0.05 was considered statistically significant.

RESULTS

Cells culture toxicity Studies: The citotoxicity on the three cell lines was dose-dependent. The concentration at which the number of viable cells (CHO-K1, HEP-G2 and COS cells) was reduced to 50% of the control (IC$_{50}$) was 50±5, 160±12 and 200±13 µg/ml for yacon decoction and 0.75±0.08, 0.15±0.02 and 1.5 ±0.12 µg/ml for enhydrin.

Rats toxicity Studies: The administration of 10% yacon decoction or enhydrin did not cause mortality in any rats group. There were no abnormal clinical signs and haematological and biochemical parameters during the experimental period. Body organs weights in treated animals had no difference with the control group. The weight, size, shape or histological characteristics of various organs (liver, kidney, and gastrointestinal tract) showed no significant difference between treated and control animals. The results presented clearly demonstrated that yacon decoction and enhydrin was safe without any toxicity and side effects at the doses used.

DISCUSSION

In our laboratory we found that enhydrin, the high yielding chemical constituent of yacon leaves, decreases blood glucose levels at minimum dose of 0.8 mg/kg body weight. “*In vitro*” citotoxicity assays were used as screening test. The disadvantage of this test is that the homeostatic mechanisms and pathways found in animals are not present. “*In vivo*” studies in rats demonstrated that enhydrin is safe in the therapeutic dosage range (0.8 and 8 mg/kg/day).

REFERENCES