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Preliminary Evaluation of the Cytotoxic Potential of North-West Romanian Propolis

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Abstract

The propolis broad spectrum of therapeutic properties is documented by the literature[1]. Development of propolis based products requires a comprehensive evaluation of both efficacy and safety[2]. This research was aimed to evaluate the *in vitro* potential toxicity of North-West Romanian propolis ethanolic extracts previously studied for antimicrobial properties[3]. The cytotoxic potential was investigated considering propolis biocompatibility on human fibroblasts cell culture (cell line HFL-1) using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay and evaluating the cell morphology and attachment level. The MTT results expressed as optic density were further used to calculate the viability percentages by dividing the absorbance reading of cells under different propolis concentrations by the absorbance reading of cells under normal growth. The differences between values were analyzed using ANOVA post hoc, followed by Dunnett test (against the control) or by Bonferroni test (against different dilutions). Propolis samples were also characterized using spectrophotometric assays for the quantitative determination of flavonoids (flavones/flavonols, flavanones/dihydroflavonols) and total phenolics (Folin Ciocalteu method).While the spectrophotometric methods indicated the typical poplar composition profile with flavonoids and phenolic acids as main biological active compounds (total phenolics of 38.02% ±2.34%, high amounts of total flavonoids 9±0.3%, with 1.74-9.22% flavones/flavonols and 1.96-4.01% flavanones/dihydroflavonols), MTT test data suggested concentration dependence of propolis-induced effect. The highest dilutions stimulated cell viability (125-131.58%) and did not significantly impact the cell morphology and attachment levels, while the highest tested concentrations had moderate expressed cytotoxicity. Further *in vitro* and *in vivo* studies are intended to complete the cytotoxicity profile of the tested propolis samples.

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