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Effects of different multifloral pollen extracts on the vital parameters of human epithelial cell lines

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Nutrition is a factor that plays a significant role in the resilience of honeybees to biotic and abiotic environmental stresses, particularly through pollen, a primary source of proteins and bioactive compounds. In this study, the impact of multifloral pollen-derived polyphenolic extracts on the vital parameters of human epithelial cell lines was investigated to assess their protective potential against microbial pathogens.
Pollen extracts were obtained from colonies of Apis mellifera ligustica, located at the CNR-IPSP experimental apiary. Pollen was collected with specific traps installed at the entrance of the hives for three consecutive days, then stored at low temperatures for subsequent analysis. The effect of these extracts was evaluated on HCT 116 and Caco-2 cell lines by means of MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay, Trans-Epithelial Electrical Resistance (TEER) and bacterial adhesion assays.
Preliminary findings indicate that pollen extracts, particularly at high concentrations, demonstrate a dose-dependent cytotoxic effect on HCT 116 cell lines and a positive influence on epithelial barrier integrity, as measured by TEER. Additionally, the extracts exhibited a capacity to inhibit bacterial adhesion of Salmonella Typhimurium, with variations in efficacy depending on the type of extracts and concentrations examined.
Although the potential antimicrobial and protective properties of these extracts have been observed, further studies are needed to clarify the molecular mechanisms behind these effects and to optimise the application of these extracts.