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IMMUNOMODULATORY EFFECTS OF HONEY FROM STINGLESS BEES AND HONEY BEES ON BREAST CANCER CELLS

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Objective: The limitations of current cancer treatments and their side effects have led to a growing interest in the study of natural compounds and alternative therapies such as apitherapy. Honey has in its constitution several substances that contribute to neutralize free radicals, such as phenolic compounds of which stand out in flavonoids and phenolic acids, besides having important antimicrobial and antitumor activities. However, the mechanisms of the antitumor action of honey and how the characteristics of honey of different species influence this mechanism are poorly understood. The aim of this study was to verify the antitumor action of honey bees (*Apis mellifera*) and stingless bees (*Tetragonisca angustula*) honey in mammary adenocarcinoma cell lines (MCF-7). **Methods:** Cell viability analyses were performed using fluorescence and flow cytometry methods, and oxidative balance through the release of superoxide anion (O_2^-) and production of the enzyme superoxide dismutase (SOD) in human peripheral blood mononuclear (MN) cells, MCF-7, and coculture of both. **Results:** Viability analyses in MN cells showed that honey samples, at concentrations of 100 mg/mL, 100 ng/mL, and 100 pg/mL, do not present cytotoxicity to cells. But in MCF-7 cells, there was a decrease in viability with stingless bee honey (100 mg/mL), showing the highest cytotoxic action and reducing the viability of cancer cells by 30.4%. The same honey sample caused an immunomodulatory effect on both MN and cancer cells, stimulating greater release of O_2^- and SOD enzyme activity in these cells. While in the coculture, there was a greater release of O_2^- and a decrease in enzymatic activity. **Conclusion:** The results showed that especially stingless bee honey acts on the oxidative stress of cells, and this might be the mechanism related to its antitumor action. Thus, honey can play a potential role as a preventive agent and complementary therapy against breast cancer.

Keywords: Breast cancer. Antioxidant activity. Phenolic compounds. Immunomodulation.