Formulation Development Containing Beta-Caryophyllene and Evaluation of Its Antitumoral Activity

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Approximately 12 million people worldwide are diagnosed with cancer every year, with 2/3 of the victims living in developing countries, and 8 million of them do not survive. The search for alternative ways of treatment using medicinal plants has grown significantly in the last 10 years, due to the antitumoral activity present in those plants' essential oils. Beta-Caryophyllene has been considered a major compound in essential oils from different plants and seeds which have shown toxicity against different types of tumor. However, beta-Caryophyllene is not found in any pharmaceutical formulation on the market, because of its physicochemical characteristics. This project presents an optimization of beta-Caryophyllene characteristics to provide the insertion of the coumpound in the pharmaceutical market. Possible cytotoxic effects of beta-Caryophyllene were detected by MTT in vitro assays. The formulation development was based on three procedures: (1) Preparation of inclusion complexes containing beta-Caryophyllene and Cyclodextrines (Beta and Hydroxypropyl-beta) and analysis of its solubility by spectrophotometry (Ultraviolet-visible and Infrared); (2) Microparticles formation using Poly(e-caprolactone); (3) Making of topical formulations based on the brazilian pharmacopoeia. The MTT assay showed beta-Caryophyllene's antitumoral activity agains tumor cells and its selectivity, and the spectrophotometry, the increase of the compound's solubility with the use of Cyclodextrines, having Hydroxypropyl-beta as the most promising one. Based on its cytotoxic and solubility results, beta-Caryophyllene shows evidence so as to be considered a potential antitumoral agent and thus its formulation, a potential future pharmaceutical product.

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