



THE AQUEOUS EXTRACT OBTAINED FROM *ABELMOSCHUS ESCULENTUS* (L.) MOENCH EXHIBITS ANTITUMOR EFFECTS WITHOUT CAUSING IMMUNOTOXICITY IN MICE WITH EHRLICH ASCITES CARCINOMA

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ABSTRACT

Introduction: The fruit of *Abelmoschus esculentus* (AE), commonly known as okra, is a medicinal plant that exhibits various pharmacological activities, including anti-inflammatory, antioxidant, and immunomodulatory effects (Chen et al., 2016; Xiong et al., 2021). Recently, lectin isolated from AE has been reported to have a cytotoxic effect on cancer cells *in vitro* (Musthafa et al., 2021), highlighting its potential as a promising candidate for the development of anticancer drugs. **Aim:** Therefore, the aim of this study was to investigate the antitumor activity and possible systemic effects of the aqueous extract of *Abelmoschus esculentus* (EAE) in animals bearing Ehrlich ascites carcinoma (EAC). **Methods:** After the chemical characterization of the extract, female Swiss mice aged 10 and 14 weeks were inoculated intraperitoneally (i.p.) with EAC cells (5×10^6) and randomly divided into groups: Tumor (0.1 mL/kg PBS i.p., TM), chemotherapy with 5-Fluorouracil (25 mg/kg i.p., 5-FU), and EAE (25 and 100 mg/kg i.p.). A group of healthy animals was used as a non-tumor control. On the sixth day after tumor induction, the animals were treated for five consecutive days. On days 1, 6, and 11 of the experimental protocol, photographic and radiographic images were captured, total leukocyte counts in peripheral blood (PB) were performed, and measurements of weight gain and abdominal circumference were recorded to monitor tumor development. On the 11th day, the animals were euthanized, and ascitic volume, as well as tumor fluid cellularity, were quantified. Organ collection was performed for histopathological analysis, and the total cellularity of lymphoid organs and bone marrow (BM) was recorded. In tumor cells from the peritoneal fluid, morphological parameters indicative of cellular damage were analyzed using optical microscopy, and cell death analysis was conducted using fluorescence microscopy. The area of blood vessels in the peritoneal region was quantified. In another experimental set, the survival analysis of the animals was performed. Results were considered significant when $p < 0.05$. **Results:** Treatment with EAE was able to reduce all parameters measured for tumor development, as reflected in the macroscopic imaging follow-up and the survival time, with a 30% increase in the lifespan of the animals. Mice treated with EAE showed a 39% reduction in total cell content. This reduction was associated with a lower number of tumor cells after treatment with EAE and an increase in the number of dead tumor cells, resulting in a tumor inhibition rate of 68% without altering the number of leukocytes present in the ascitic cavity. Analysis of the blood vessel area revealed a 21% reduction in animals treated with EAE compared to the TM group. These findings are likely due to the presence of lectins, flavonoids, and polyphenols found in the extract. Due to the toxicity associated with chemotherapeutics, the search for molecules that have antitumor effects without causing toxicity is a major challenge in chemotherapy. Therefore, we observed that treatment with EAE increased the quantity of bone marrow cells without altering the weight and macroscopic and histological aspects of the evaluated organs, as well as the cellularity of the lymphoid organs and peripheral blood (PB), indicating the absence of toxicity from EAE. It is noteworthy that treatment with 5-FU significantly attenuated tumor progression in the animals; however, it presented signs of hematological and immune toxicity, corroborating the known immune and systemic toxicity of 5-FU (Ghosh et al., 2019). **Conclusion:** Thus, these findings indicate that EAE is a natural product with potential antineoplastic efficacy without causing systemic and immune toxicity in the evaluated model. However, further studies are needed to assess the mechanisms by which EAE decreases tumor progression in this *in vivo* experimental model.

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