EVALUATION OF THE ANTITUMOR POTENTIAL OF THE ETHANOLIC EXTRACT FROM SEVEN PLANTS FOUND IN THE ATLANTIC RAIN FOREST FOR THE TREATMENT OF ORAL SQUAMOUS CELL CARCINOMA (OSCC)

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Introduction

Oral cancer is the 8th most prevalent in Brazil, constituting a public health problem. The most common form of this type of cancer is oral squamous cell carcinoma (OSCC), whose main cause is smoking. Platinum-based chemotherapeutic agents are the most commonly used for the treatment of OSCC[1]. However, these cause a range of adverse effects in addition to being a high-cost treatment. For this reason, it is necessary to search for new substances to treat OSCC[2]. Several drugs used in cancer treatment have active ingredients derived from or inspired by substances from plant metabolism, which are safe and highly effective. The Atlantic Rain Forest is known for its vast diversity of species, presenting great potential for exploring bioactive compounds for therapeutic and biotechnological purposes[3]. The "Area de Proteção Ambiental (APA)" Macaé de Cima, located in Nova Friburgo-RJ city, represents a preserved area within this biome. Therefore, the objective of this study is to evaluate the cytotoxic potential of extracts from plant species collected in this region: *Alchornea triplinervia, Senna multijuga, Sapium glandulosum, Guapira opposita, Gaultheria eriophylla, Mollinedia cf. longicuspidata* and *Goeppertia colorata* on the OSSC9 Oral Squamous Cell carcinoma line and gingival fibroblasts in order to obtain the selectivity index (SI).

Material and Methods

The plant leaves were collected in the APA Macaé de Cima and later identified. They were then ground, and the powder was added to 100% ethanol for maceration. After 24 hours, the mixture was filtered to obtain a concentrated extract of substances, which was subjected to rotary evaporation. The dry extract (crude extract) was suspended in DMSO. After this step, OSCC9 cells and fibroblasts maintained in culture were grown to confluence in a 96-well plate. They were then treated with the crude plant extract at different concentrations (OSCC9 - 250 µg/mL to 7.812 µg/mL and fibroblasts - 800 µg/mL to 70.23 µg/mL), in duplicates and three independent experiments. Subsequently, the cell viability test was performed using the MTT method, and absorbance was read to obtain data for statistical analysis. The IC_{50} was calculated through a nonlinear regression curve in the GraphPad Prism 5 software[4]. After this step, the selectivity index was determined using the formula: SI = IC_{50} of the pure compound in a normal cell line (fibroblast) / IC50 of the same pure compound in the cell line.

Results and Discussion

Only the extracts of *Alchornea triplinervia* and *Sapium glandulosum* were cytotoxic and selective (S.I ≥ 2), as seen in **Table 1**. The latter was tested at lower concentrations for fibroblasts, ranging from 250 to 21.95 µg/mL, due to high cytotoxicity. Previous studies have already shown that both species

exhibited cytotoxicity when 100 µg/mL of crude leaf extract was tested on the HT29 (colon adenocarcinoma) and NCI-H460 (lung carcinoma) cell lines[5] . The other extracts showed IC50 values higher than the tested concentration.

Table 1 – IC_{50} values and selectivity index of plant extracts

	IC_{50} OSCC9 (µg/ml)	IC_{50} Fibroblast (µg/ml)	S.I
Alchornea Triplinervia	**87.74±0.9129**	**261.9± 0.8156**	**2.98**
Senna multijuga	**>250**	**>800**	**-**
Sapium glandulosum	**43.04±0.9237**	**111.4±0.9543**	**2.59**
Guapira opposita	**>250**	**>800**	**-**
Gaultheria eriophylla	**>250**	**>800**	**-**
Goeppertia colorata	**>250**	**>800**	**-**
Mollinedia cf. longicuspidata	**>250**	**>800**	**-**

Conclusion

The ethanolic extract of the species *Sapium glandulosum* and *Alchornea triplinervia* were cytotoxic and selective for the OSCC9 oral squamous cell carcinoma cell line at the tested concentrations and will be submitted for chemical partitioning.

Acknowledgments

CAPES (Finance Code 001), FAPERJ, PROPPI-UFF and CNPq

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