



Antiproliferative properties of Ethanolic and Aqueous Graviola leaf extracts on tongue Squamous Cell Carcinoma cell line-25

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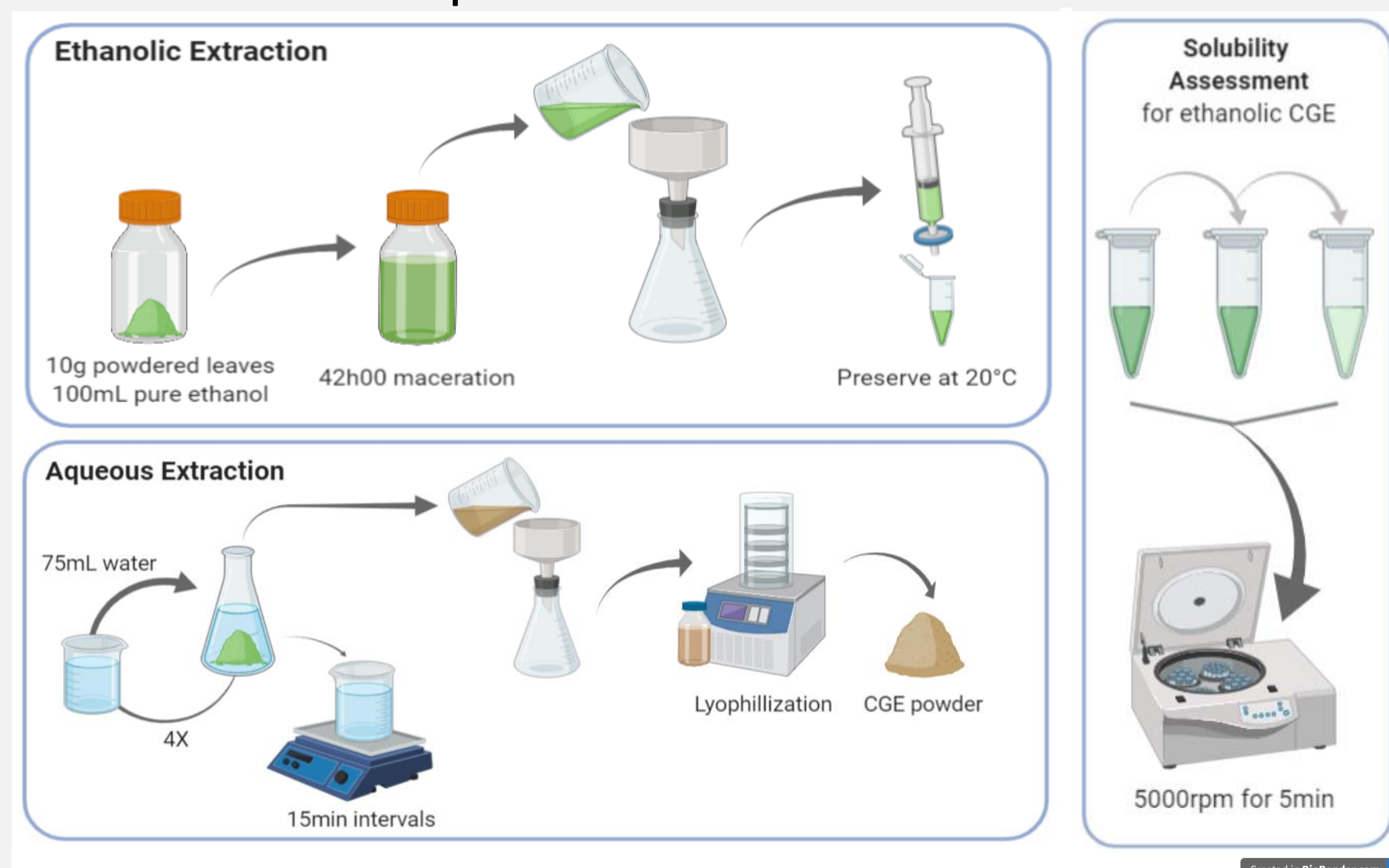


Introduction

Head and Neck cancer (HNC) is a group of cancers which arise in the mouth, nose, throat, larynx, sinuses, or salivary glands. Squamous Cell Carcinoma HNC (HNSCC), accounts for over 90% of all HNC and represents the seventh most common type of cancer worldwide. Due to their tendency to inhibit cancer-specific pathways such as increased glycolysis, ATP production, and uncontrolled cell proliferation, plant-extracted molecules are considered excellent potential therapeutic alternatives to classical chemotherapeutic treatments. *Annona muricata*, also known as Graviola or soursop, is an evergreen tree native to the tropical regions of the Americas and the Caribbean which antiproliferative properties have been reported in a variety of cancer cell types and models. Here we report the antiproliferative/anticancer properties of ethanolic and aqueous crude Graviola leaf extracts (CGEs) on an *in vitro* model for HNSCC. Our results show that the ethanolic CGE significantly inhibits the growth of the Squamous Cell Carcinoma cell line-25 (SCC-25), a property that could be exploited for therapeutic benefits against HNC.

Approach

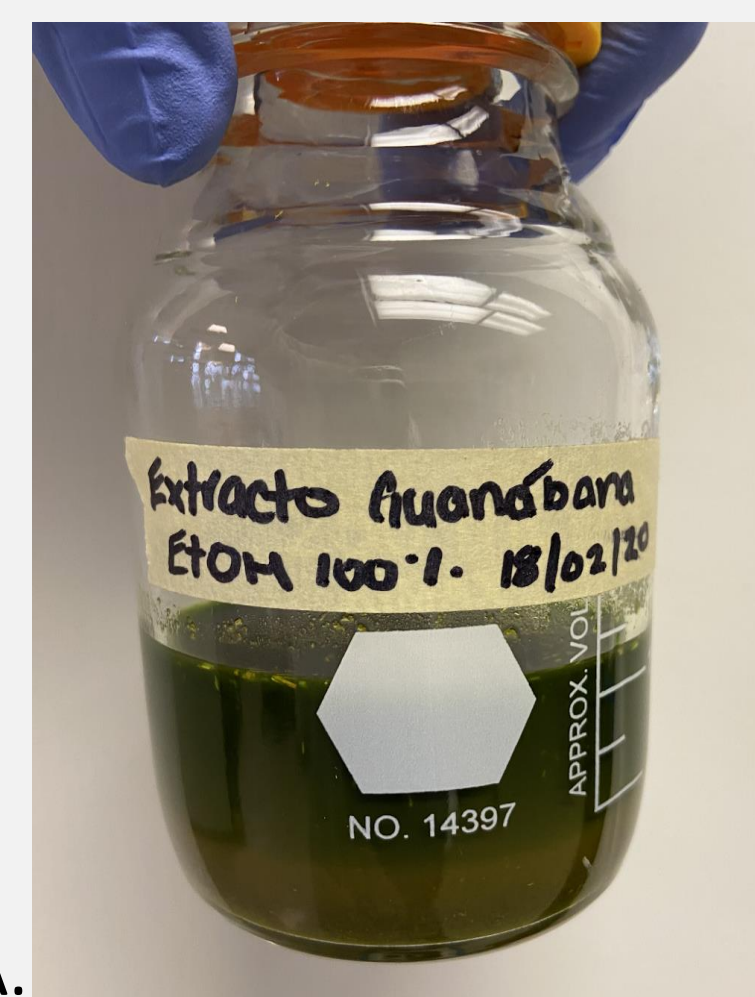
Preparation of ethanolic and aqueous CGEs



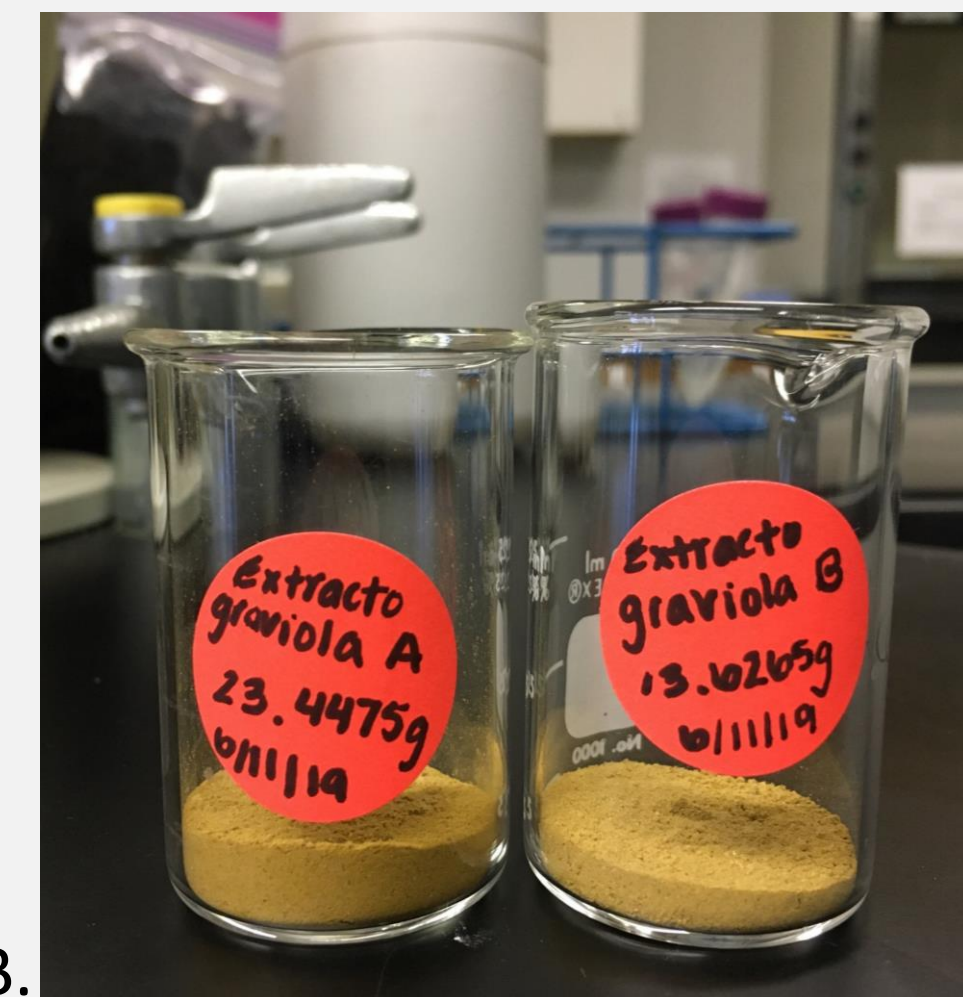
Cell viability Assays

SCC-25 cells were treated with increasing concentrations of CGEs for 24h. The half-viability CGEs doses (GI_{50}) were graphically determined and compared to Camptothecin, a positive antiproliferative control. SCC-25 growth inhibition was also assessed microscopically after a 24h treatment with 100 μ g/mL of the CGEs.

Results

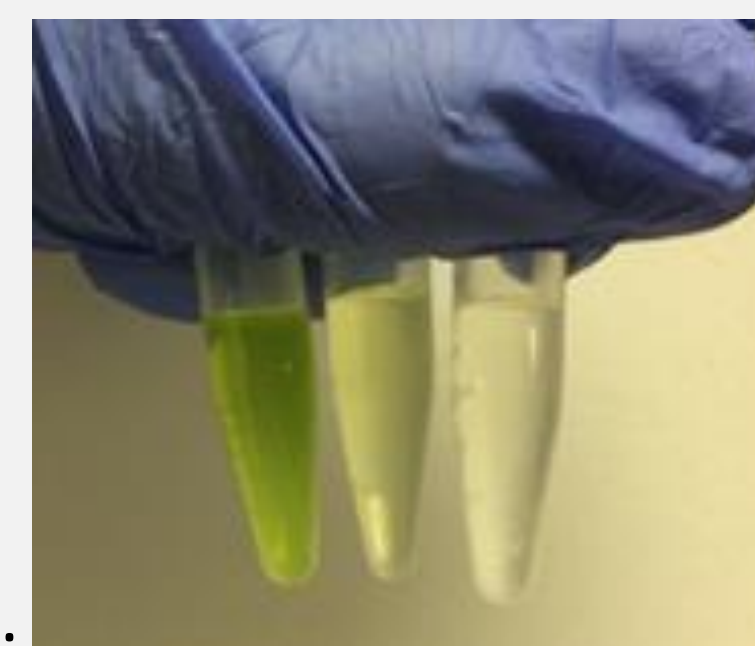


A.



B.

A Graviola maceration extraction using pure ethanol as a solvent. B Graviola pulverized aqueous extract after lyophilization process.

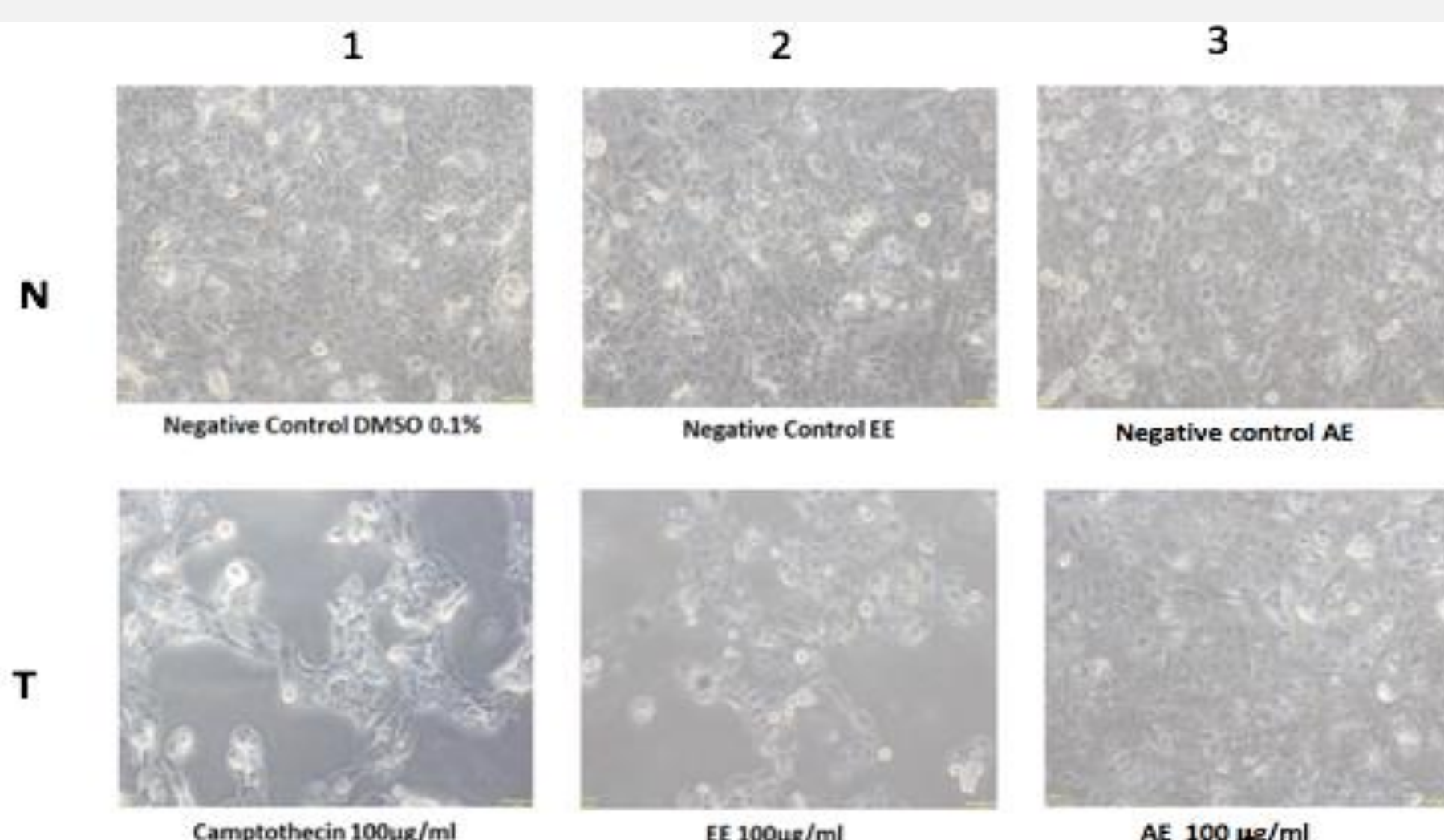


C.



D.

C Solubility tests of Graviola ethanolic extracts. D Dilutions after centrifugation. No pellet was observed for all three (0.1, 1 and 10%, v:v) dilutions, showing CGEs solubility in water.



E.

E Microscopy images of SCC-25 cells before (line N) and after (line T) treatment with Camptothecin (column 1), ethanolic CGE (column 2) or aqueous (column 3).

	Camptothecin	Ethanol CGE	Aqueous CGE
GI_{50} (μ g/mL)	30.0	61.7	274.6

F.

F Half growth inhibition doses for positive control Camptothecin, ethanolic, and aqueous CGE.

Conclusion

- Compounds extracted from pure ethanolic CGE were soluble in water at, and 0.1%, 1%, 10% (v:v) dilutions.
- Ethanolic CGE showed a 4 times higher antiproliferative activity than the aqueous CGE on SCC-25 cells.
- We hypothesize that the Graviola leaf contains organic phytochemicals with antiproliferative activities that are present only in the ethanolic extract.

Future steps

- To characterize and compare the chemical phytoprofiles of the CGEs.
- To test the antiproliferative activity of CGEs on other SCC cell line
- To compare the antiproliferative activity of CGEs on SCCs. vs. non-transformed human gingival fibroblast cells (HGF-1).

Acknowledgments

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Reference

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