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Nutraceutical potential of *Tessaria absinthioides* combined with *Camellia sinensis* in controlling tumoral growth

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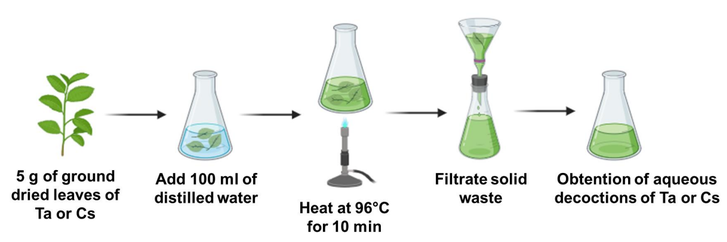
INTRODUCTION & AIM

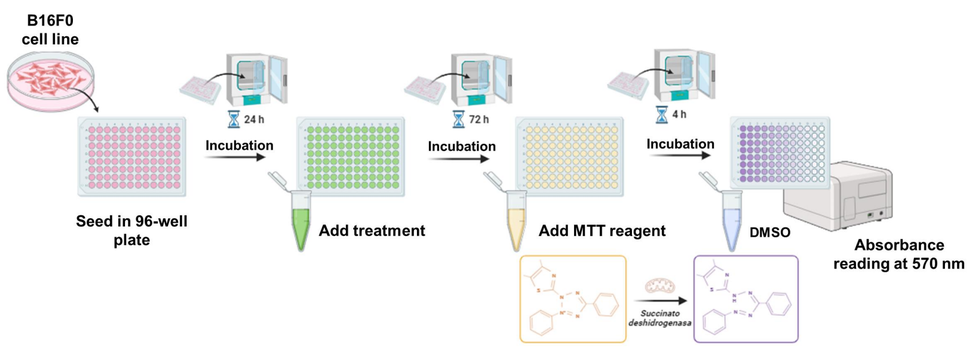
The development of plant-derived nutraceuticals is an increasingly important area of research, driving the exploration of well-known medicinal plants through bioprospection. *Tessaria absinthioides* (Ta) is a native South American plant with demonstrated anticancer activity (1). *In vitro*, studies have shown that Ta is cytotoxic against glioblastoma, breast adenocarcinoma and colorectal cancer cell lines, while *in vivo*, its oral administration has affected the progression of melanoma, colorectal and breast cancers (2). On the other hand, *Camellia sinensis* (Cs), or green tea, is recognized for its potent antioxidant and anticancer properties (3, 4). This work evaluates the combination of Ta with Cs to develop nutraceutical preparations with antitumoral effects.

METHODS

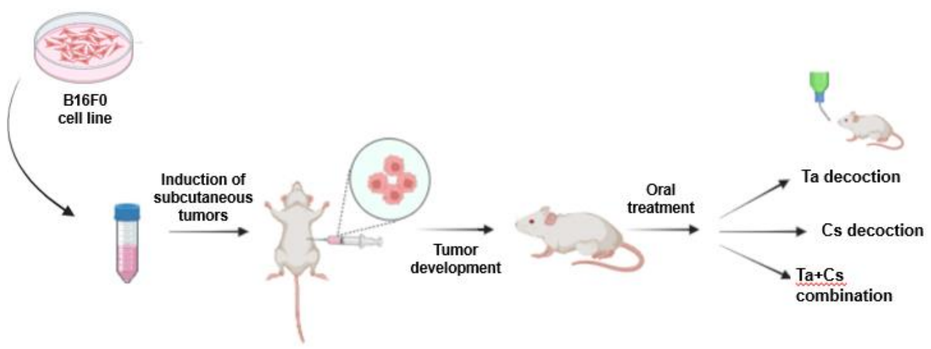
Decoction preparation



In vitro assay



In vivo assay



RESULTS & DISCUSSION

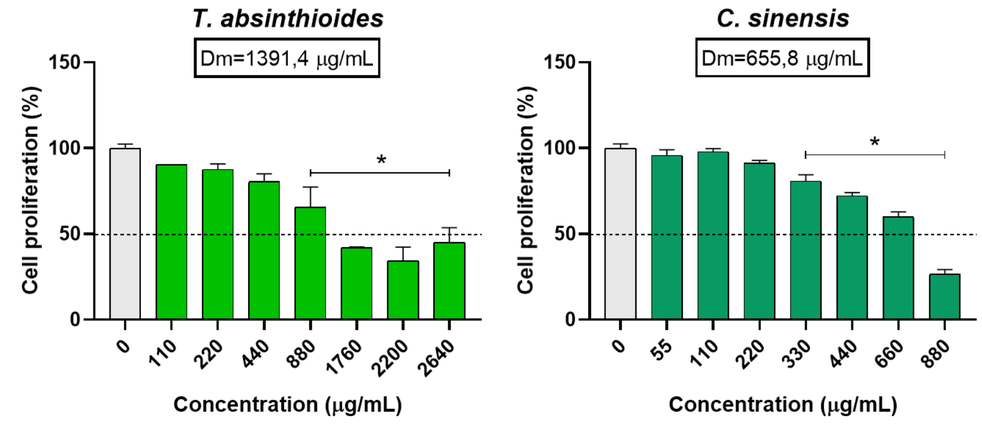


Fig. 1. *In vitro* cytotoxic effect of Ta and Cs decoctions on the proliferation of B16F0 cell line at 72 h. Dm indicates the median effective dose (µg/mL). Asterisk indicates a significant difference compared to the control non-treated cells (ANOVA followed by Bonferroni's Test, $p < 0,05$)

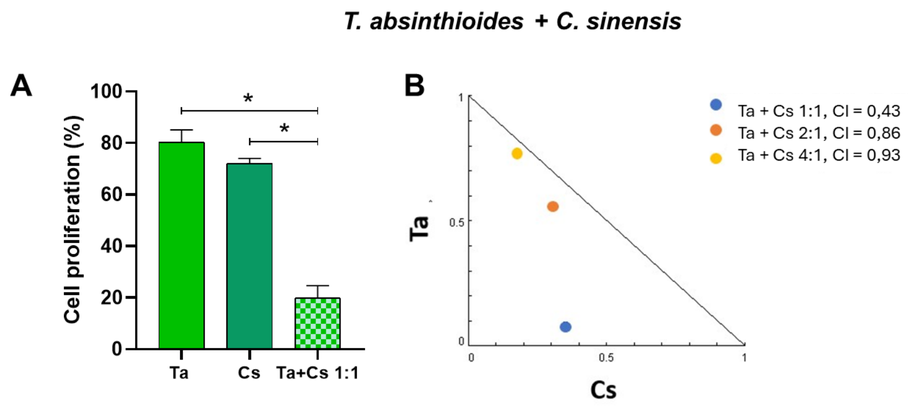


Fig. 2. *In vitro* synergism in the cytotoxic effect of the combination of Ta and Cs decoctions on the proliferation of the B16F0 cell line at 72 h. A) Comparison of the cytotoxic activity of the Ta + Cs 1:1 combination (lowest combination index) with the individual effects. Asterisks indicate significant differences between the individual treatments and the combination (ANOVA followed by Tukey's Test, $p<0,05$). B) Isobologram generated by CompuSyn Software for the different combinations of Ta and Cs, along with their respective combination index (CI). CI values <1 indicate synergism.

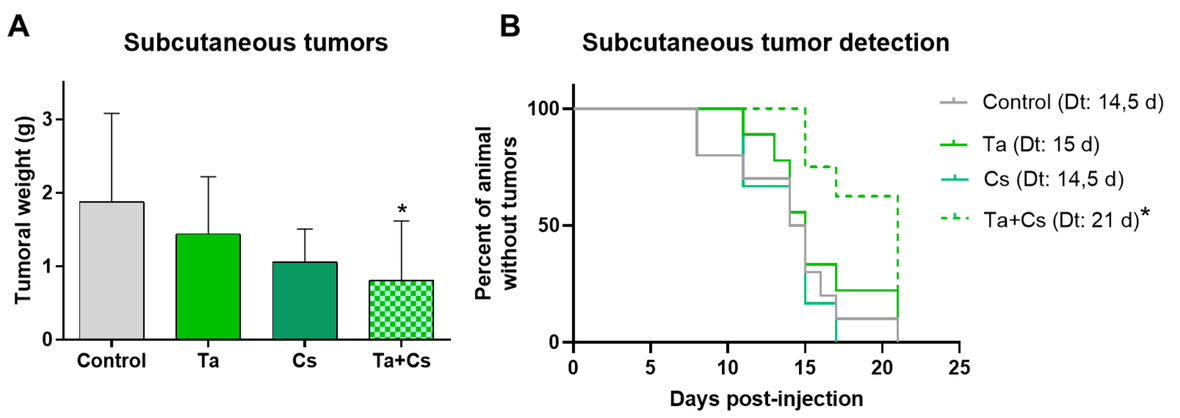


Fig. 3. *In vivo* antitumoral effect of aqueous decoctions of Ta, Cs and its combination on subcutaneous tumors induced with B16F0 cell line on C57BL/6 mice. A) Comparison of the final tumoral weight at day 22. Asterisk indicate a significant difference in the Ta+Cs group compared to the control non-treated group (ANOVA followed by Fisher LSD Test, $p < 0,05$). B) Comparison of the tumoral detection time (Dt). Asterisks indicate a significant difference in the Ta+Cs group compared to the control non-treated group (Log Rank (Mantel-Cox) Test, $p = 0,0088$).

CONCLUSION

The results obtained demonstrate that the combination of the aqueous decoctions of *T. absinthioides* and *C. sinensis* synergistically inhibits murine melanoma cell proliferation and exhibits promising *in vivo* antitumoral activity, supporting the development of nutraceutical preparations for the complementary treatment of cancer.

FUTURE WORK / REFERENCES

The prospects of this work are associated with the phytochemical characterization of the decoction of *T. absinthioides* in combination with *C. sinensis* and the elucidation of its molecular mechanism of action in relation to its antitumor activity.

References:

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(3) Hasan, M. R., *et. al.* (2023). DOI: 10.1016/j.heliyon.2023.e23514

(4) Neetu S., *et. al.* (2024). DOI: 10.1016/j.prmcm.2024.100484