

Green tea kombucha is rich in phenolic compounds and exhibits cytotoxic potential against cancer cell lines

Udielle Vermelho LACERDA^{1*}, Carolina Vargas Pereira da COSTA¹, Rodrigo Rezende CARDOSO¹, Carolina Thomaz dos Santos D'ALMEIDA²; Laura da Silva Cruz³; Amanda Bubula de Souza³; Mariana Simões Larraz FERREIRA²; Luciana AZEVEDO³; Monique Renon ELLER¹; Frederico Augusto Ribeiro de BARROS¹

Department of Food Technology, Universidade Federal de Viçosa, Viçosa, MG, Brazil.

Department of Nutrition, Universidade Federal do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Department of Nutrition, Universidade Federal de Alfenas, Alfenas, MG, Brazil

*Corresponding author: Udielle Vermelho Lacerda– Laboratory of Bioactive Compounds and Carbohydrates Department of Food Technology, Universidade Federal de Viçosa. Av. Peter Henry Rolfs, s/n - Campus Universitário, Viçosa, MG, Brazil - CEP: 36576-900 - udielle.lacerda@ufv.br.

INTRODUCTION & AIM

Kombucha is one of the fastest-growing fermented beverages in popularity worldwide due to the health benefits its regular consumption may provide, such as reducing cholesterol and blood sugar levels and combating oxidative stress, among others. However, there are still few studies evaluating the *in vitro* cytotoxic potential of the beverage against cancer cell lines. Therefore, the objective of the present study was to investigate a possible cytotoxic action of kombucha against some cancer cell lines.

METHOD

Kombucha was produced using green tea cultivated in the city of Registro, Brazil (shown in Figure 1), characterized its phenolic profile using UPLC-MSE, and tested the cytotoxic potential of the beverage against lung adenocarcinoma epithelial cells (A549), human colon carcinoma cells (HCT8), human liver cancer cells (HepG2), human umbilical vein endothelial cells (HUVEC), and normal human lung fibroblast cell lines (IMR90).

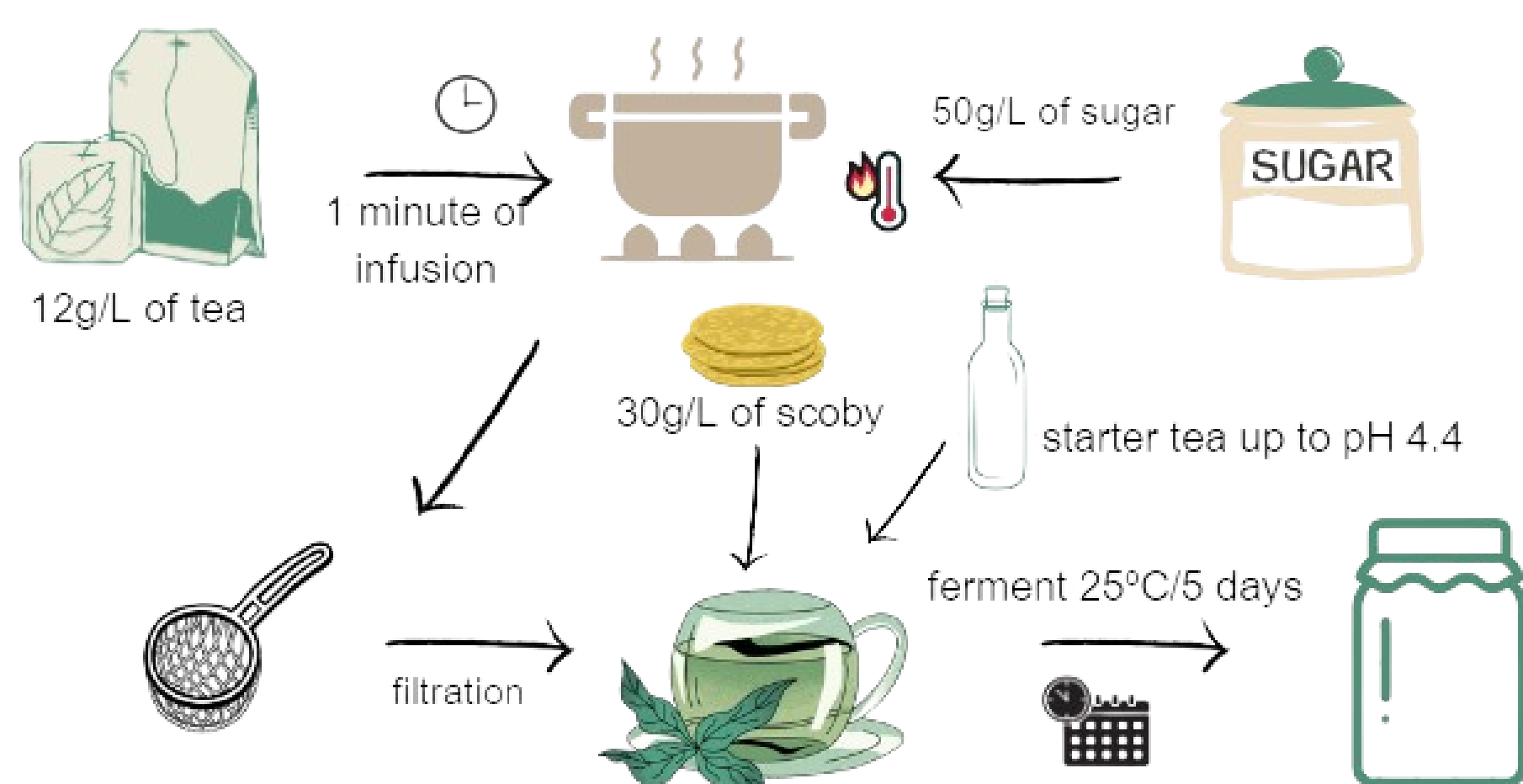


Figure 1 – Kombucha production

RESULTS & DISCUSSION

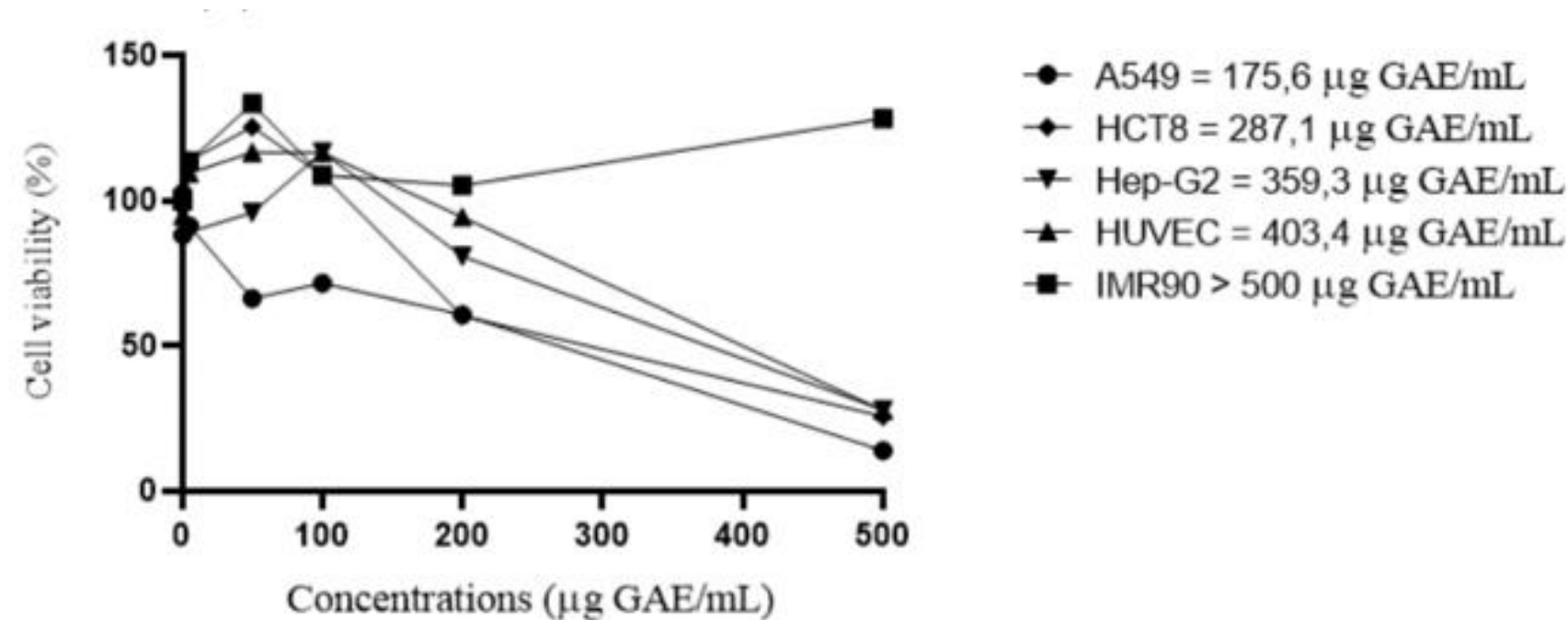


Figure 1 - IC₅₀ (50% cell viability inhibition) of green tea kombucha

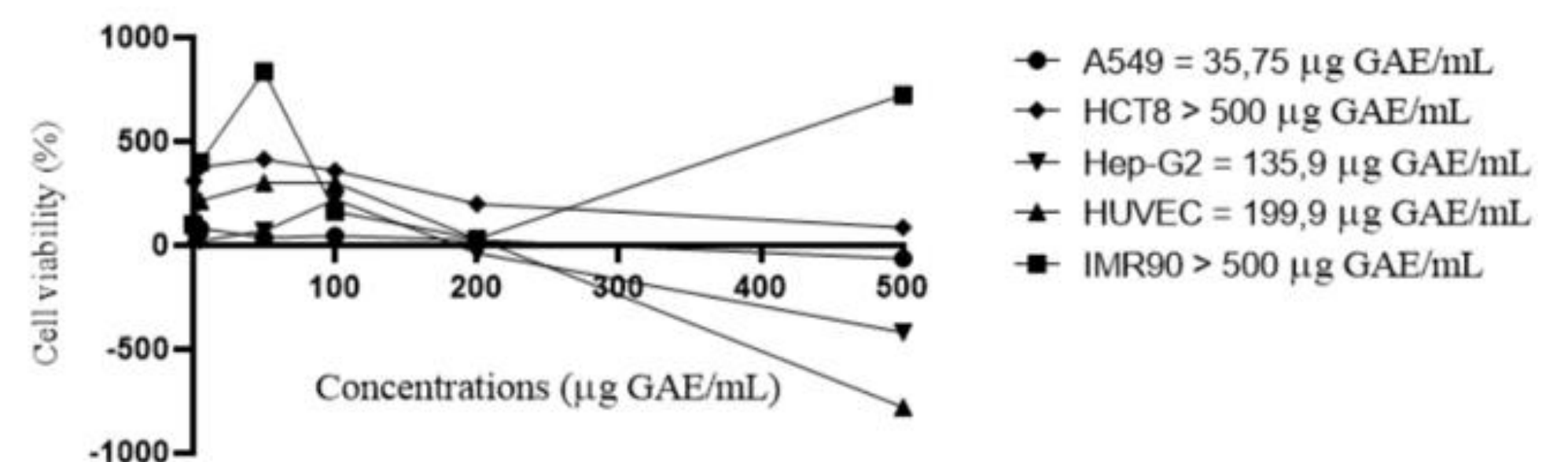


Figure 2 - GI₅₀ (50% growth inhibition) of green tea kombucha

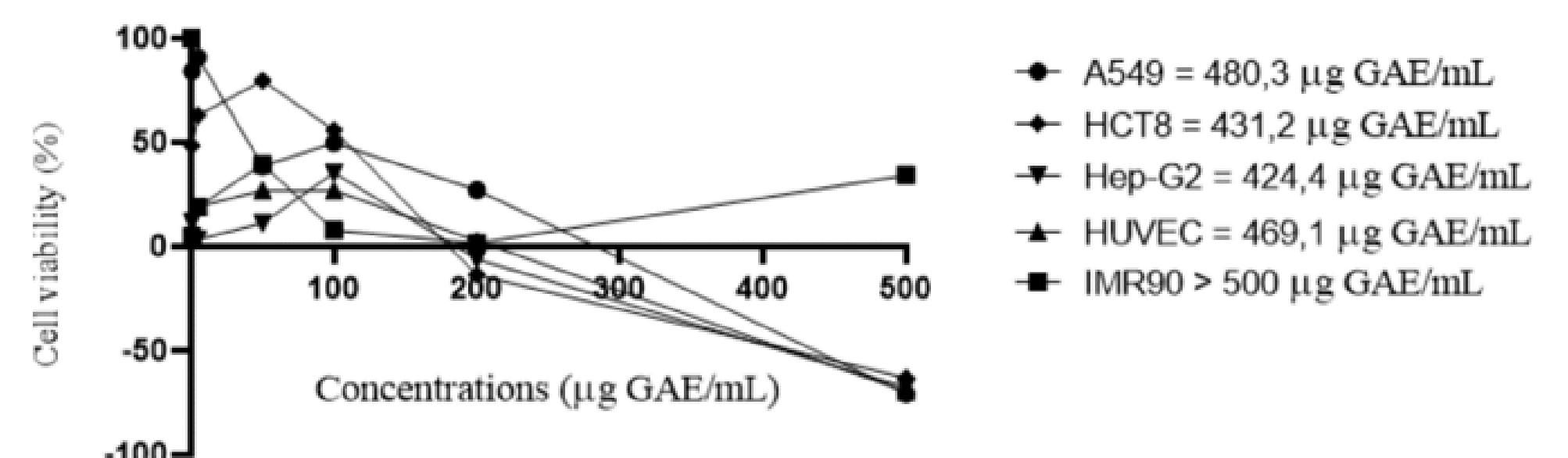


Figure 3 - LC₅₀ (50% cell death) of green tea kombucha

- Kombucha had 92 compounds phenolics (70% flavonoids);
- The kombucha demonstrated a cytotoxic profile in all tested cancer cell lines, evidenced by growth inhibition (GI₅₀), decreased cell viability (IC₅₀), and lethal concentration (LC₅₀).
- In line with this, we observed that the extract presented a selective index (A549 = 2.84; HCT8 = 1.74; HepG2 = 1.4; and HUVEC = 1.23) in relation to the normal cell line, as IMR90 was not affected by the treatment (IC₅₀, IG₅₀, and LC₅₀ > 500 µg GAE/mL).

CONCLUSION

The kombucha produced was effective in promoting cellular health *in vitro*, by combating the tested cell lines. However, additional studies with animal and human models will be important to validate these biological activities currently tested.

CONFLICTS OF INTEREST

There was no conflict of interest between the authors

FUTURE WORK / REFERENCES

CARDOSO, Rodrigo Rezende et al. Kombuchas from green and black teas have different phenolic profile, which impacts their antioxidant capacities, antibacterial and antiproliferative activities. *Food research international*, v. 128, p. 108782, 2020.

ACKNOWLEDGMENT