

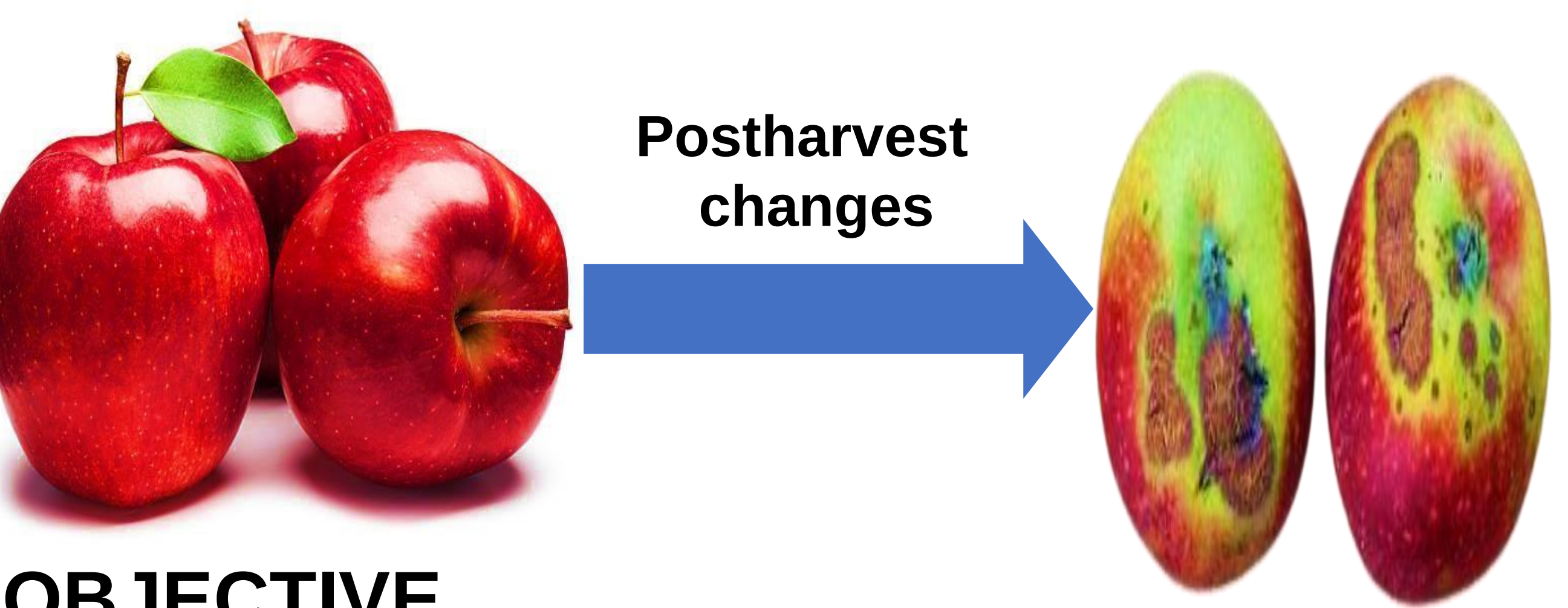
Utilizing the fungal strains *Trichoderma asperellum* for fermentative extraction of polyphenolic compounds from *Larrea tridentata*

Muyideen O. Bamidele¹, Sandoval J. Cortés¹, María L. Flores-López², Olga Berenice Álvarez Pérez³, Mónica L. Chávez¹ and Cristóbal N. Aguilar^{1*}

¹Bioprocesses and Bioproducts Research Group. School of Chemistry. Universidad Autónoma de Coahuila, Saltillo, México., ²Centro de Investigacion e Innovacion Científica y Tecnológica. Universidad Autónoma de Coahuila, Saltillo, México. ³Greencorp Biorganiks de México S.A. de C.V. **Email: cristobal.aguilar@uadec.edu.mx*

INTRODUCTION

Fungi cause fruit spoilage, which has harmful effects on the environment and human health. Recent investigations have focused on the use of plant-derived bioactive compounds to control pre- and postharvest pathogens ^{1, 2}.



OBJECTIVE

This study aimed to extract bioactive molecules from *Larrea tridentata* stems and leaves and test their efficacy against phytopathogenic fungi to increase fruit shelf life.

METHODOLOGY

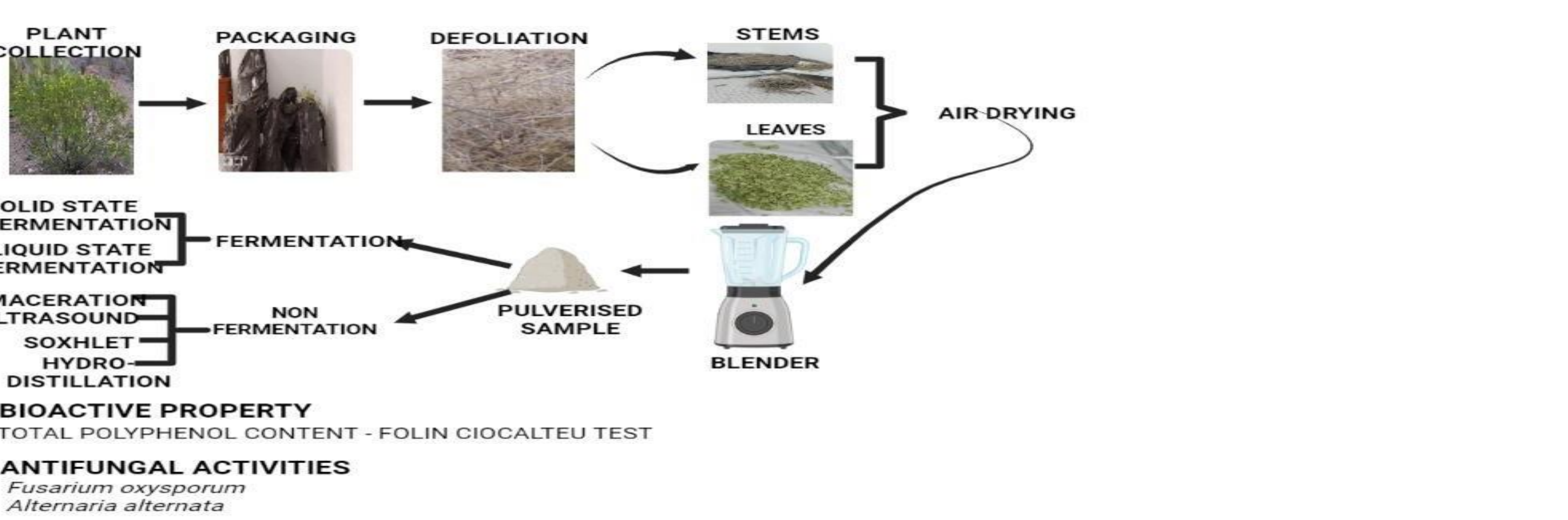


Figure 1. *Larrea tridentata* plant.

RESULTS AND DISCUSSION

The polyphenolic content of the liquid-state fermentation extracts was higher than that of the solid-state fermentation extracts, with stems peaking at 36 h and leaves peaking at 60 h, measuring 0.575 and 0.742 mg GAE/g, respectively. The values for the ethyl acetate Soxhlet extracts of stems and leaves were 1.141 and 3.42 mg GAE/g, respectively. When tested, *in vitro*, ethyl acetate extracts from both stems and leaves inhibited *F. oxysporum* growth by 72.8 % and 79.5 %, respectively (Fig. 2).

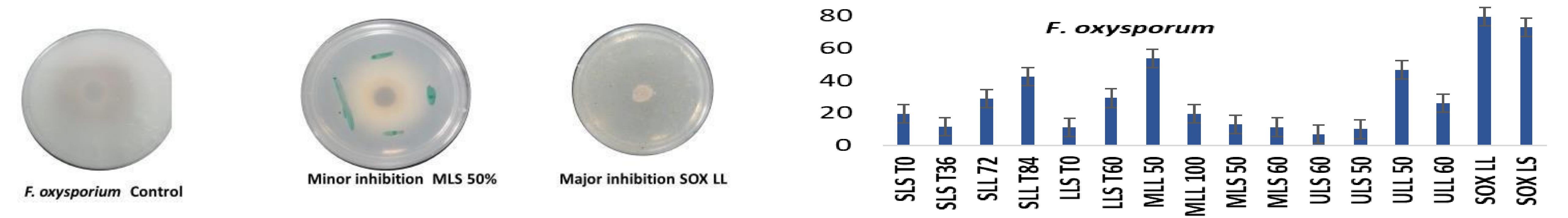


Figure 2. Inhibitory potential of extracts against *F. oxysporum*

Similarly, the growth of *A. alternata* was inhibited by 64.18% and 68.22%, respectively (Fig. 3). The extracts contained nordihydroguaiaretic acid, luteolin, quercetin, and caffeic acid 4- O-glucoside, according to the HPLC-MS analysis

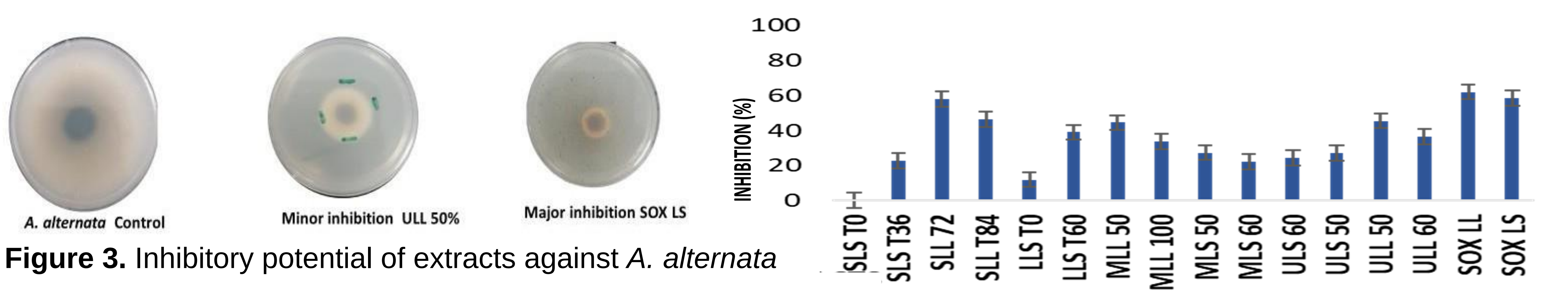


Figure 3. Inhibitory potential of extracts against *A. alternata*

CONCLUSION

The leaves of contained higher levels of hydrolyzable tannins, which inhibited the growth of *F. oxysporum* and *A. alternata* and showed potential as a source of antifungal agents against phytopathogenic fungi.

REFERENCES

- Thambugala, K. M., Daranagama, D. A., Phillips, A. J. L., Kannangara, S. D., & Promputtha, I. (2020). Fungi vs. Fungi in Biocontrol: An Overview of Fungal Antagonists Applied Against Fungal Plant Pathogens. *Frontiers in Cellular and Infection Microbiology*, 10.
- Gutiérrez-Cortés, C., Suárez, H., Buitrago Hurtado, G., & Díaz-Moreno, C. (2017). Isolation and evaluation of the antagonist activity of lactic acid bacteria in raw cow milk. *Agronomía Colombiana*, 35(3), 374–381.