

**SUSTAINABLE AND INTEGRATED
USE OF AGAVE**

**USO INTEGRAL Y
SUSTENTABLE DEL AGAVE**



International
Symposium on Agave

ISA

**NOVIEMBRE 3-5, 2016
GUADALAJARA, JALISCO.**

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**THIRD INTERNATIONAL SYMPOSIUM ON AGAVE
SUSTAINABLE AND INTEGRATED EXPLOTATION OF AGAVE**

November 3-5, 2016

Once again CIATEJ gives you a warm welcome to Guadalajara, Jalisco, México, the Tequila Country and land of beautiful agaves, good food, good tequila and good people. A good place and opportunity to share knowledge and experiences for people working on diverse scientific and technical fields of agaves.

This year the focus topics of the III International Symposium on Agave are recent advances in:

- Scientific trends on *Agave*.
- Science and technology of Agave beverages and other derivatives.
- Biological effects of Agave fructans and other by-products.
- Industrial processing of Agave wastes and subproducts
- Socio-cultural aspects of Agave

The program will consist of plenary lectures, oral presentations and poster sessions, however, the most important activity will be the opportunity to share knowledge face to face with colleagues from different specialties working in Mexico and other countries, with agaves and their products.

We would like to thank our official sponsors for the great help which makes possible to have this important gathering in Guadalajara: Secretaría de Desarrollo Rural del Estado de Jalisco, Secretaría de Innovación del Estado de Jalisco, Secretaría de Cultura del Estado de Jalisco, COECYTJAL, Waters Corporation, Labtech, Euro Horticultura integral, S.A. de C.V., ACTUM Business Strategy & Solutions S.C., Clarke, Modet & Co, Evolutel, Pulcatta, Casa Orendain, Agared y el Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, A.C.

We, at CIATEJ hope you have a nice and productive stay in Guadalajara.

Sincerely

Dr. Inocencio Higuera Ciapara

General Director CIATEJ, A.C.



EVALUATION OF TEQUILA VINASSES AS A SUBSTRATE FOR THE FERMENTATIVE PRODUCTION OF INHIBITORS OF *Phytophthora infestans*

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Keywords: Tequila Vinasses, *Trichoderma harzianum*.

Introduction. Vinasses are the effluent of ethanol distillation, and are also known as thin stillage, distillery wastewater and distillery slop (KUUSISTO, 2013). These wastes are dark brown due to the presence of melanoidins also have low pH (between 3 to 5), and a high concentration of BOD and COD, ranging from 35,000 to 50,000 mg and 100,000 to 150,000 mg, respectively; the latter being generally toxic and recalcitrant (Vania Robles González, 2011). However, some vinasses as the tequila factories could be used as culture medium to growth microorganism to produce metabolites interesting in industrial level. The aim of this work was to evaluate vinasses from the tequila factories for the production of inhibiting metabolites of *Phytophthora infestans* (plant pathogen).

Methods. Nutrients in vinasses (V), including N, Ca, Mg, Mn, K, Cu, Zn, Fe, Ni, P, and sugars were measured. The results obtained were compared to the weidling medium nutrients and missing nutrients were added. The vinasses were inoculated with *Trichoderma harzianum* and incubated at 120 rpm and 28°C. Samples were taken every 24 h to measure glucose and biomass. After seven days vinasses fermented (VF) produced were recovery by centrifugation. *Phytophthora infestans* were inoculated in petri dishes containing the PGA medium and the VF. Fungi growth was measured every 24 hours and the results were compared to the weidling medium fermented.

Results and discussion. Vinasses from different processes such as masonry oven, autoclave and diffuser, were inoculated with *Trichoderma harzianum*, to evaluate the potential to generate phytopathogens inhibitors. The *T. harzianum* could growth in all vinasses, but the better growth was obtained using the diffuser vinasses Fig.1. Was surprised that in the unfermented vinasses showed better inhibition than the fermented with *T. harzianum* (fig.2) it could be, because the vinasses contain inhibitors as the furfural and 5-hydroxymethyl furfural, and during the fungus growth those compounds could be metabolized in other lower inhibitor compounds.

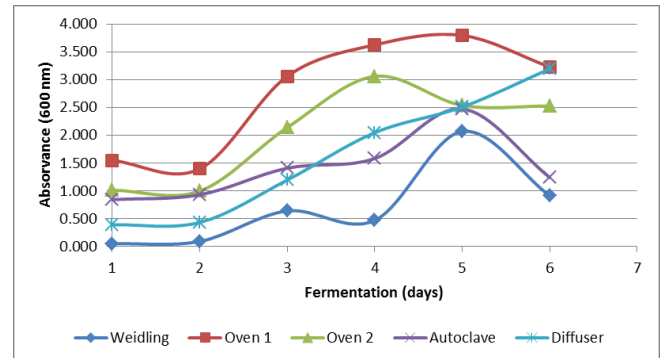


Fig. 1. *Trichoderma harzianum* growth in vinasses.

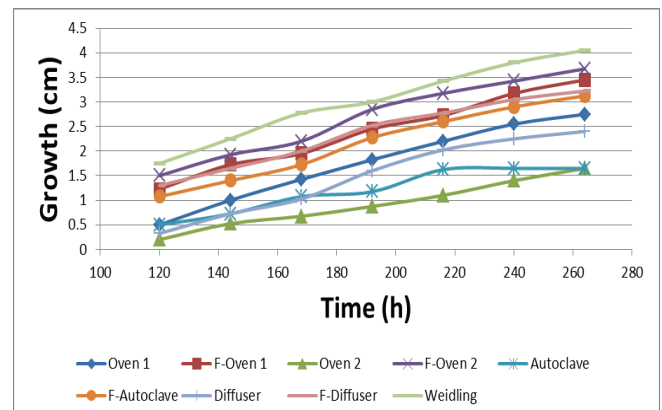


Fig. 2. Inhibition comparison of *Phytophthora infestans* (F=Fermented).

Conclusions. Tequila stillage could be used to grow microorganisms of industrial interest. Diffuser vinasses showed better growth conditions for *Trichoderma harzianum*. Both fermented and unfermented vinasses showed higher inhibition characteristics than the weidling medium.

References

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