Selection of fungal strains with hydrolytic potential to be used in *Jatropha curcas* cake and oil palm residues

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Introduction. Biomass utilization of bio-energetic plants as *Jatropha curcas* or *Elaeis guineensis* (africam oil palm) in bio-diesel production represents a source of residues that could be used to obtain added value products with biotechnological techniques. The *J. curcas* cake is used as fertilizier and it has a restricted use as feed animals (1). Generally, in the case of oil palm residues, this are thrown to the ground

Fungal hydrolytic enzyme production as cellulose and hemicelluse requires of some environmental conditions (2), mesophilic and thermophilic fungal strains could be used for the production of hydrolizates as olygosaccharides and monosaccarides, that are usefull to produce bio-ethanol in a second stage with a saccharification process (3).

The objective of this work is the selection of fungal strains with capacity of enzymatic hydrolysis of residues of *Jatropha curcas* and africam oil palm.

Methods. A total of 25 fungal strains were isolated and identified from different plant materials and were cultivated in Petri dishes with PDA medium. A mineral medium (4) was added with three sources: with brichwood xylan, celullose and residues of *J. curcas* and Africam oil palm, previously milled and saved.

A determination of hydrolysis halo was applied with each strains to obtain the power index (PI) by using a Lugol solution as indicator (5). PI was calculated as the relation of hydrolysis diameter halo (DH) and the diameter of colony (DC); PI= DH/DC. Radial growth rate was measure aditionally. Three replicates were applied in all cultures.

Results. Isolated fungal strains were autoctons of the State of Veracruz, México, it is the beginning of a culture collection and actually are maintained at 4 °C. In the case of 70% of strains belong to the genera *Aspergillus*. *Penicillium* and *Trichoderma*. The halo of hydrolysis was stained with lugol solution and cotton blue was used to distinguish the hiphal growth. The higher PI values were observed in the three substrates. *Aspergillus niger* UV-16 was the best strain with hemicellulose activity. In Figure 1 are shown results of the strains with the hemicellulose substrate.

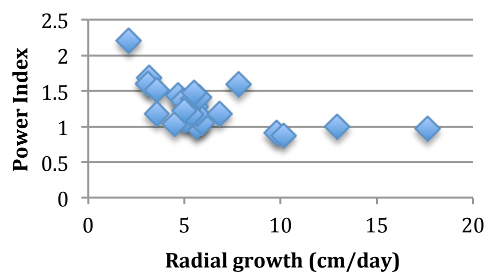

Fig.1 A Plot was use to represent the strains according to the capacity of growth and hydrolysis.

In Table 1 are shown the main genera of fungal isolates.

Table 1. Percentaje of strains with capacity of produce hydrolytic enzymes in the residues of Africam oil palm and *Jatropha curcas*

	Aspergillus	***Trichoderma***	***Penicillium***
Africam oil palm	60	32	12
Jatropha curcas	45	21	19

Conclusions. The culturing of *A. niger* and *Trichoderma* sp. proved to be an excellent source for the enzymes production. In the present study, these cultures produced an amount of hidrolytic capacity of 30 to 60% higher than other fungi. Further investigations are required to make use of the full potential of these organisms for cellulase production by employing genetic, biochemical, and microbial engineering techniques.

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