ANALYSIS OF PECTINASES PRODUCTION BY *ASPERGILLUS FLAVIPES* FP-500 USING LEMON PEEL AS SUBSTRATE

Vicente E. Wolf-Márquez[1], Guillermo Aguilar Osorio[2], Mayola García Rivero[1] & María Aurora Martínez Trujillo[1].
1 División de Ingeniería Química y Bioquímica, Tecnológico de Estudios Superiores de Ecatepec, C.P. 55210.
2. Facultad de Química, Universidad Nacional Autónoma de México. Ciudad Universitaria
amartinezt@tese.edu.mx

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Introduction. Pectin has a complex chemical structure(1). Agroindustrial subproducts have high pectin contents that make them hard to degrade and consequently they are an important ambient contamination source. However, they also can be used as carbon source for specific microbial processes, from which several metabolites and enzymes of industrial importance can be obtained. Several *Aspergillus* species are capable of grow on a wide range of ambient conditions, which determine the type and quantity of produced enzymes, as much as their characteristics(2).

The objective of this work was to identify the effect of the initial pH and substrate concentration on the production of endo- and exopectinases by *A. flavipes* FP-500 on a submerged culture using lemon peel as the only carbon source.

Methods. Two initial pH conditions (4.2 and 3.5) or two substrate concentrations (1 and 3%, w/v) were used. All the experiments started with 1X10^6 spores/mL from five days old cultures of *A. flavipes* FP-500 and were incubated in an Applikon bioreactor at 37°C, 200 rpm and 3 vvm, during 130 h, obtaining samples every 24 h. Extracellular production of exo and endopectinases(4), microbial growth after an acidic hydrolysis(3) and substrate concentration by means of a mass balance after applying the dry weight technique were quantified. Kinetic analysis was developed with unstructured kinetic models(4).

Results. Fungal growth and exopectinases production were similar on both initial pH values (Fig 1A and 1C), but these conditions had great influence on endopectinases production, which was higher at initial pH of 3.5 (Figure1D).

The effect of carbon source concentration on μ_{max} was not significant, although biomass concentration was favored at the highest substrate concentration (Table 1).

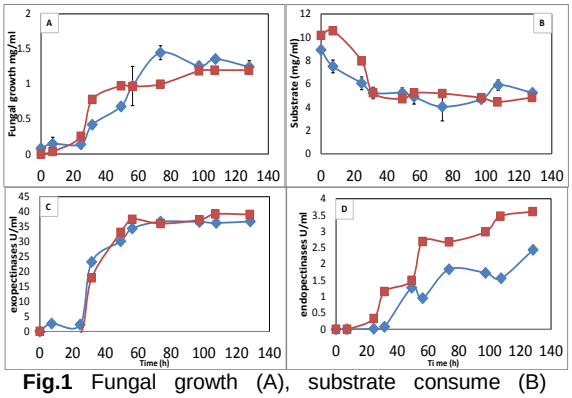

Fig.1 Fungal growth (A), substrate consume (B) exopectinases (C) and endopectinases (D) of *A. flavipes* FP-500 on submerged cultures with initial values of 3.5 (♦) and 4.2 (■) on 1% (w/v) lemon peel as the only carbon source.

Pectinases production is totally growth associated, although both enzymes are highly produced at the lowest substrate concentration (Table 2). So, the increase of the production at the highest substrate concentration can be attributed mainly to the effect of this parameter on fungal growth instead of on the activity production.

Table 1. kinetic parameters for *A. flavipes* FP-500 growing on several carbón source concentrations.

C.S.	μmax	Exopectinases		Endopectinases	
		α	Maximum activity	α	Maximum activity
1%	0.079 ± 0.0112	17.973 ± 0.54	39.04 ± 0.008	1.20± 0.128	3.60
3%	0.077 ± 0.0003	3.5674 ± 0.13	39.76 ± 1.99	0.15 ± 0.016	9.65

Conclussions. Our *Aspergillus* strain is an excellent endopectinases producer, which is favored only by acidic pH values, although this condition has a negative effect on the specific growth rate.

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