



BIOACTIVITY EVALUATION OF THE ORGANIC EXTRACTS PRODUCED BY A *Pseudomonas* sp., STRAIN 1AC, ASSOCIATED TO *Magnolia dealbata* Zucc.

Diana Lemus, Silvia Guzmán, Beatriz Ruíz & Sergio Sánchez; Departamento de Biología Molecular y Biotecnología, Instituto de Investigaciones Biomédicas, UNAM, Mexico City, 04510; noencontre@gmail.com

Key words: Pseudomonas, plant associated.

Introduction. Historically, natural products have been employed for human kind for different purposes, specially in medicine. Since the discovery of Penicillin, people started to use microorganism as a source of natural products with medical applications (1). Secondary metabolites production and ecological environments are closely related, and occasionally, competition for resources and interactions, drives to the generation of chemical diversity. Microorganisms associated with plants are one of the best resources to new pharmaceutical compounds discovery.

The objective of this work is to evaluate three biological activities of the organic extracts of a *Pseudomonas* sp., strain 1AC associated to *Magnolia dealbata* Zucc.

Methods. 1AC strain was obtained from previous work(2). Molecular identification was realized through 16S DNA, *rpoD*, and *gyrB*, as described elsewhere (5). Two liter fermentation were conducted in Nutrient Broth with 0.5% of glucose, and the medium/biomass extracted (V/V) with CH₂Cl₂ and AcOEt. Solvents were evaporated to dryness, and the microbial minimal inhibitory concentration, determined (4). Parasitical and cytotoxic effects were determined by Neubauer camera counting and MTT assay, respectively.

Results.

Antibiotic activity against *Micrococcus luteus* and *Bacillus subtilis* was detected (Table 1).

Table 1. MIC for biomass and supernatant extracts from 1AC and some microbial controls (four ATCC microorganisms). * = Not inhibition observed until 3.2 mg/mL

Microorganism	Extract	MIC (µg/mL)
<i>M. luteus</i> ATCC 9341	Biomass	25
	Supernatant	25
	Erytromycin	0.8
<i>B. subtilis</i> ATCC 6633	Biomass	12.5
	Supernatan	12.5
	Erytromicin	0.8
<i>E. coli</i> ATCC 11229	Biomass	*
	Supernatant	*
	Nalidixic acid	3
<i>S. cerevisiae</i> ATCC 9763	Biomass	*
	Supernatant	*
	Cycloheximide	0.8

Cytotoxicity was observed from AcOEt supernatant extract for two cell lines (HeLa and HaCaT) at a IC₅₀ of 121 µg/mL and 99 µg/mL, respectively.

Antiparasitic activity of the supernatant and biomass extracts was reported in table 2 and compared to geneticin (G418).

Table 2. IC₅₀ observed against *Trypanosoma cruzi*.

Extract	IC ₅₀ (µg/mL)
Biomass*	280±32
Supernatant*	97±13
G418	142±92

Blast of 16S rDNA, *rpoD* and *gyrB* sequences revealed that *Pseudomonas* strain 1AC, belong to the fluorescens group of Pseudomonads and is closely related with *Pseudomonas protegens* Pf-5, in all cases with max identity of 90%.

Conclusions. The organic extracts of *Pseudomonas* strain 1AC show a wide antibacterial spectrum of bioactivities, and also shown and inhibitory effect to eukaryotic cells. It is important to assay the effect of the purified components from the extracts in order to determinate the number of active compounds and their novelty.

Acknowledgements. Silvia Guzmán was recipient of a postgraduated Fellowship from CONACYT, México.

References.

- [1]. Strobel G, Daisy B, Castillo U, Harper J. (2004). *J Nat Prod.* 67(2): 257-268.
- [2]. Guzmán, S. (2012). Master thesis. Facultad de Ciencias, UNAM.
- [3]. Bérdy, J. (2005). *J. Antibiot.* 58(1): 1-26.
- [4]. Wiegand I, Hilbert K, Hancock R. (2008). *Nat Protoc.* 3(2): 163-175.
- [5]. Mulet M, Lalucat J, García E. (2010). *Environ Microbiol.* 12(6): 1513-1530