

SAMIGE / Sociedad Argentina de Microbiología General

VII

CONGRESO ARGENTINO DE MICROBIOLOGÍA GENERAL "SAMIGE DEL BICENTENARIO"

"Dedicado a la presentación de trabajos de investigación básica sobre microorganismos (bacterias, arqueas, hongos y levaduras)"

SAMIGE

Sociedad Argentina de Microbiología General

18 al 20 de Mayo, Centro Cultural "Ing. Eugenio F. Virla"
Universidad Nacional de Tucumán,
San Miguel de Tucumán, Tucumán, Argentina
2011

EM P13. Differential expression of carotenoids under copper overload and H₂O₂ in *Rhodotorula mucilaginosa* RCL-11

Verónica V. Irazusta¹, María Eugenia M. Cabral¹, Lucas L. Michel¹, María Julia M. Amoroso^{1,2}, Lucía Inés L. Castellanos de Figueroa^{1,2}

¹ PROIMI-CONICET, Av. Belgrano y Pje. Caseros, Tucumán, Argentina ² Universidad Nacional de Tucumán, Tucumán, Argentina (veronicairazusta@hotmail.com)

There are enzymatic and not enzymatic systems involved in cells defense under diverse stresses. Superoxide dismutase (SODs) and catalase represent the primary enzymatic defense against ROS. Nonenzymatic antioxidants can be carotenoids, glutathione, ascorbate, tocopherol, flavonoids, and alkaloids. Carotenoids are isoprenoid membrane-protective antioxidant pigments with the capacity of to interact with reactive oxygen species. Organisms subject to routine metal exposure in their natural environments generally have had to develop resistance mechanisms. *Rhodotorula mucilaginosa* RCL-11, yeast isolated from a copper filter plant at the province of Tucumán, Argentina, has the ability of supporting high amounts of copper metal. Also, RCL-11 showed high carotenoids contents, obtained by absorption spectrum (330nm-600nm). We observed that copper overload and inhibition of carotenoids synthesis (by diphenylamine, DPA) have a negative effect in viability of *Rhodotorula mucilaginosa* RCL-11, in

addition combination of copper and DPA showed the lowest growth rate. We found that when the cells grow in 0.5mM copper, carotenoids synthesis is strongly stimulated. Accordingly, carotenoids content is triplicate in copper overload. Moreover, superoxide dismutase activity and catalase activity was assayed in the same copper concentration. We observed an increased in both antioxidants enzymes as a response of copper excess. Total carotenoids content, as well as its spectral characteristics differs when cells are exposed to copper or 5mM H₂O₂ (oxidant agent). A qualitative study was carried out using HPLC equipped with an online diode-array detector. Detection was performed at 490 nm, and UV-vis absorption spectra were recorded online with the photodiode-array detection system. We obtained quantitative and qualitative differences in carotenoids characteristics depending on the content of copper, hydrogen peroxide, both or neither in the culture medium. For example, in presence of H₂O₂ were mostly expressed torulene, alfa-carotene and beta-carotene, while copper stimulated production of torularhodin. The results obtained in the present work show that when exposing *R. mucilaginosa* RCL-11 to prooxidant agents as copper and/or H₂O₂ it is produced an antioxidant enzymatic response and a carotenoids synthesis stimulation.

EM P14. ANTIFUNGAL COMPOUNDS FROM *Zuccagnia punctata* LEAVES ACTIVE AGAINST CEREAL EAR OT PATHOGENS

Cristina M. Jiménez^{1,2}, Melina A. Sgariglia^{1,2}, José R. Soberón^{1,2}, Diego A. Sampietro^{1,2}, Marta A. Vattuone^{1,2}

¹ Instituto de Estudios Vegetales "Dr. R. A. Sampietro". Fac. de Bioqca., Qca. y Farmacia. UNT ² CONICET (mari_jimenez81@hotmail.com)

Argentina is both an important cereal producer and consumer. Diseases restrict the grain yields, specially ear rotting and grain mold caused by *Fusarium* species. These fungi also contaminate grains with mycotoxins which are a serious risk for human and animal health. We showed that the ethanolic leaf extracts from *Zuccagnia punctata* Cav. have antifungal activity against several phytopathogenic fungi, including *Fusarium* species. The aim of this work was to isolate and identify the bioactive compounds responsible for the antifungal activity of leaf extracts from *Z. punctata*. The dry residue of the ethanolic leaf extract from *Z. punctata* was sequentially extracted with diethyl ether, ethyl acetate, and

methanol. The obtained extracts were dried and assayed by the microdilution broth method on strains of *Fusarium* species isolated from cereals of Argentina (*F. thapsinum*, *F. verticillioides*, *F. graminearum sensu stricto*, *F. subglutinans* and *F. bothii*). Diethyl ether extract was the most fungitoxic. Their constituents were separated by thin layer chromatography (TLC) and visualized under short and long wave UV light, and after spraying with FeCl₃, NP-PEG, and vanillin-sulphuric acid. The detected bands were scraped from the TLC plates and assayed by bioautography. TLC visualization reagents, UV/Vis spectrophotometric analysis and gas chromatography coupled to mass spectrometry indicated that the most fungitoxic band was constituted by the known 2', 4'-dihydroxy-chalcone and a new compound (2', 6'-dihydroxy-4'-methoxy-chalcone). Further research is in progress to determine the antifungal activity of these compounds alone, in mixtures and as additives of commercial fungicides.

EM P15. STUDY OF THE BACTERICIDAL ACTION OF DIVERSE DISINFECTANTS ON *Alicyclobacillus acidoterrestris*

Julieta Loi¹, Beatriz Perez Camaño¹, Marcelo Perez¹

¹ CITRUSVIL S.A. (jloi@citrusvil.com.ar)

The exigency of the world-wide markets with respect to the presence of acidophilic termophilic bacteria such as *Alicyclobacillus* genus, potentially deteriorantes juices microorganisms originating of the ground, it has taken to the industry to the necessity to guarantee the quality throughout the producing chain. The objective proposed for the present work was to prove the bactericidal efficiency of 4 commercial disinfectants on a *Alicyclobacillus acidoterrestris* strain. In order to carry out the efficiency tests we work with the following biocides: Vortexx, Inspexx 200, Triquart BA y Bioplan Q122. The *Alicyclobacillus* strain used was yielded by the Malbran Institute of Buenos Aires. We work with the techniques of 1) agar diffusion: on a layer of YSG agar we deposit a 100 µl carpet of a culture of approximately 70000 CFU/ml of the issue

strain; in small cups, 30 µl of three concentrations of each biocide were applied : the recommended one by the manufacturer (0,1%), a concentration by above (1%) and one underneath (0,01%); 2) determination of the minimum bactericidal concentration (CBM) by dilution in YSG broth double concentration by means of serial dilutions to the half from a 1% solution of each disinfectant plus 100 µl of the inoculate and later count in plate and 3) count after application of the contact time indicated for each disinfectant: counts were realised in YSG agar before and after the contact of diverse dilutions of the strain culture in 0.1% peptone water along with the 4 biocides to the concentration indicated by each supplier of 0,1% to the times indicated for each of them (1 and 10 minutes). In the agar diffusion test, inhibition halos were only obtained when the bacterium was faced the Triquart BA disinfectant; until de 0.1% cocentration, a 19 mm halo were found, and a 39 mm halo for the 1% concentration