Sociedad Argentina de Microbiología General

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

22 al 25 de octubre del 2024
Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.

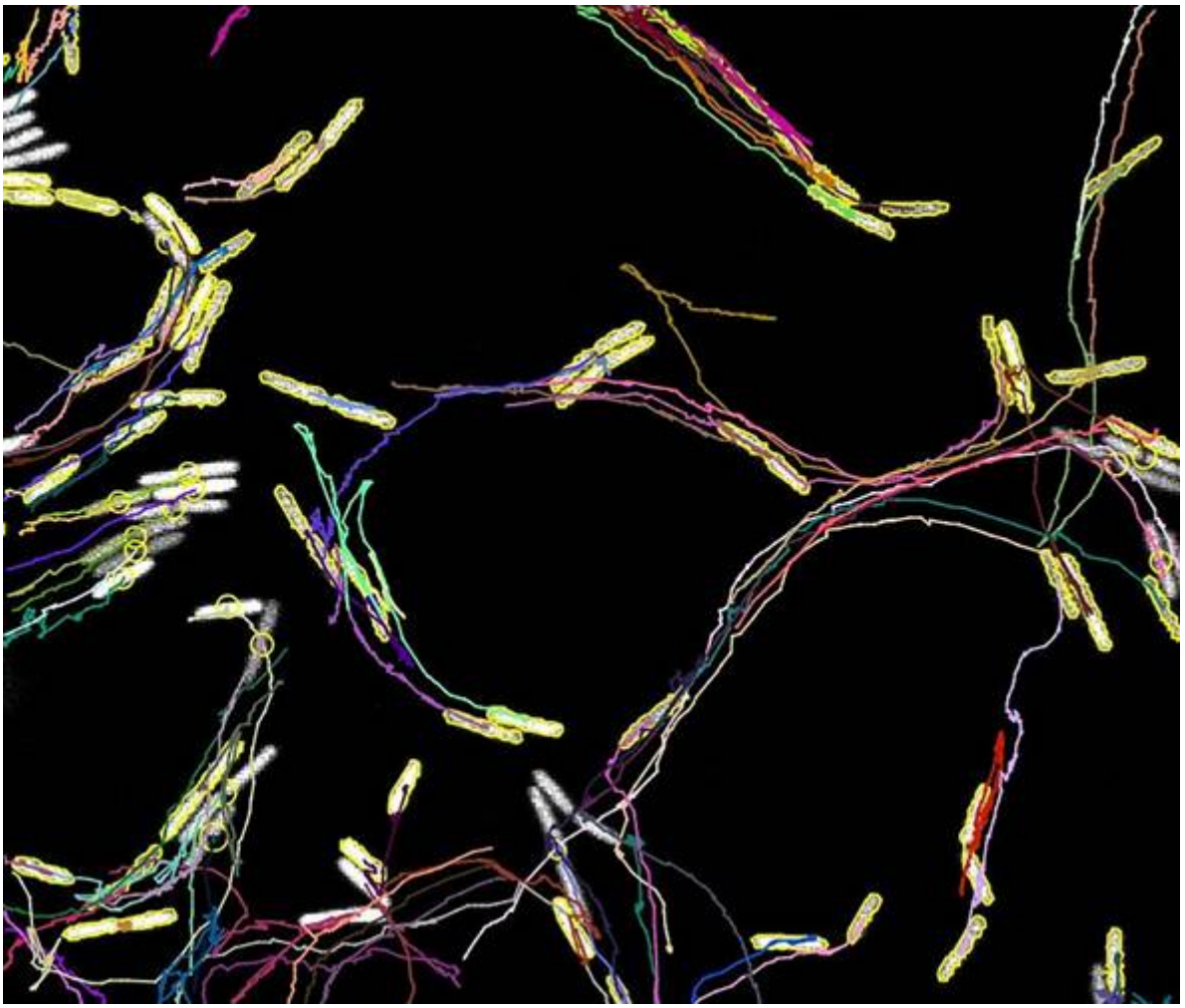

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

JOINT EFFECT OF THE *Prosopis ruscifolia* EXTRACT AND MONENSIN AGAINST LACTIC ACID BACTERIA FOUND AS CONTAMINANTS IN BIOETHANOL FERMENTATIONS

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The province of Tucumán is the leading producer of bioethanol in Argentina. Bioethanol production typically involves converting sugar substrates into ethanol using yeast, followed by distillation of the fermented must and dehydration to produce anhydrous ethanol. This process is usually carried out by lactic acid bacteria (LAB) generating latic acid accumulation that disrupts yeast fermentation. Additionally, LAB also reduces both the sugar available and the essential micronutrients necessary for optimal yeast growth. Contaminations are prevented by addition of antibiotics such as monensin (MO). However, antibiotics are expensive and had a negative impact on the environment. New strategies are needed to deal with the LAB contaminants. An alternative could be to diminish the use of antibiotics by incorporation of extracts from readily available plant sources such as Prosopis ruscifolia. This plant is abundant and hard to control in the Chaco and its ethanolic extract (EE-PrRu) showed a wide spectrum of antimicrobial activity. In this work, we investigated the joint action between EE-PrRu and MO against four different LAB previously isolated from the fermentation process. Tests were perfomed by the microdilution checkerboard assay. In brief, bacteria were cultured in MRS. The bacterial density was adjusted to 5×105 CFU/mL. EE-PrRu and MO were added in triplicate to individual wells of a flat-bottomed 96-well plate and 2-fold serial dilutions were performed, followed by the addition of the bacterial inoculum. The plates were incubated at 30°C overnight and then the optical density was measured at 630 nm in a microplate absorbance reader. Wells with no added drugs served as growth controls and wells with medium only served as background controls. The fractional inhibitory concentration index (FICI) was calculated from fractional concentration values obtained for EE-PrRu and MO when tested in mixtures. EE-PrRu synergized the antimicrobial activity of MO against all LAB tested, with FICI values varying in the range of 0.44-0.45. Our results suggest that a prototype

product based on mixtures of EE-PrRu/MO is a promising strategy to prevent LAB contaminations in bioethanol fermentation.

Palabras clave: plant extracts - lactic acid bacteria - fermentation - bioethanol - antibiotics