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.

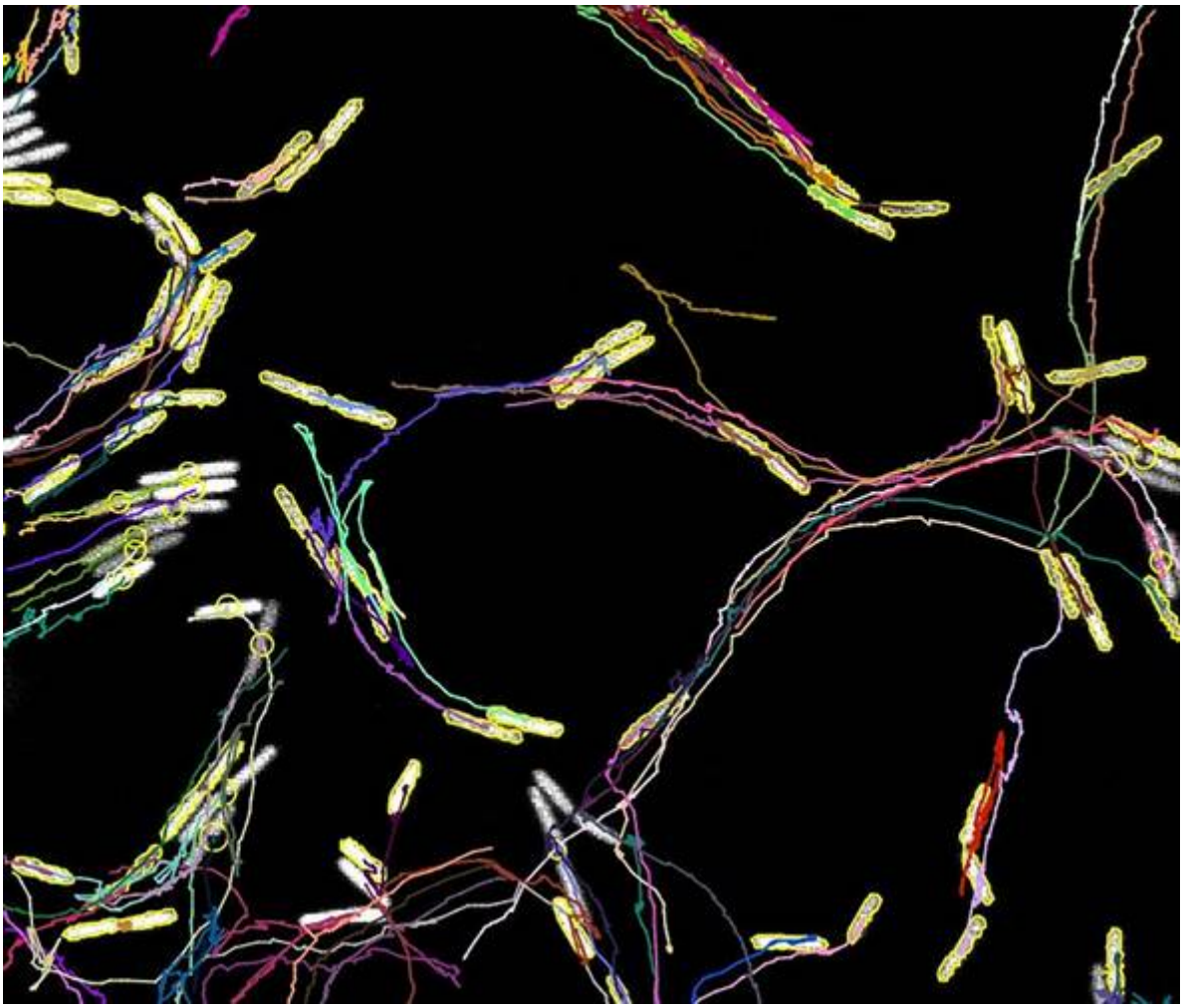

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

EVALUATION OF THE "*IN VITRO*" PROBIOTIC POTENTIAL OF A *Kluyveromyces marxianus* STRAIN USED IN ANIMAL NUTRITION

Bottaro, Nicolás [1]- Prieto Fabre, Federico [1]- Soldano, Anabel [1]- Mattio, Mónica [1] - Morelli, Matías [1]- Ermilio, Alejo [1]- Marchisio, Martín [1]- Zacarías, Silvia Mercedes [2]

1) FBCB-UNL, Santa Fe, Santa Fe, Argentina.
2) IBB, CONICET-UNER, Paraná, Entre Ríos, Argentina.
Contacto: asoldano@santafe-conicet.gov.ar

Kluyveromyces marxianus is a rapidly growing thermotolerant yeast well known for its probiotic properties, promoting intestinal health and improving digestion in animals and humans. It also stands out for secreting a variety of lytic enzymes and fermenting different sugars, particularly those rich in lactose, such as whey. In Argentina, one of the world's leading cheese producers, dairy companies generate residual liquid fraction known as cheese whey, which represents approximately 90% of the milk employed. Giving away those goods without treatment or valorization has a considerable environmental impact and a significant economic loss. *K. marxianus* can potentially convert this byproduct into a high-value input for animal feed, turning waste into a valuable resource for producing probiotic food for livestock. The probiotic attributes of microorganisms are specie and strain specific. Therefore, the present study aimed to explore the functional properties of K. marxianus Up810 in vitro and determine its potential use as a probiotic. To assess its effectiveness, we conducted co-aggregation and antagonism assays using spot tests to determine if the yeast could inhibit the growth of pathogens such as *Escherichia coli* and *Salmonella Typhimurium*. Additionally, we investigated its resistance to acidic conditions (pH 2 and pH 3) and its tolerance to bile salts, which are important factors for its survival in the gastrointestinal tract. We also evaluated its ability to form biofilms on polystyrene plates. The results showed that the evaluated *K. marxianus* strain had significant co-aggregation ability with the studied pathogens, demonstrating 63.8 % co-aggregation with *E. coli* and 50.7 % with *S. Typhimurium*. However, no antagonism was observed in the spot test against these pathogens. The strain exhibited remarkable resistance to acidity and bile salts, maintaining its viability without significant reduction in counts. Additionally, *K. marxianus* demonstrated a consistent aptitude to develop biofilms at all assessed time points, reaching its maximum at 48 hours of cultivation. *K. marxianus*'s ability to co-aggregate with *E. coli* and *S. Typhimurium*, along with its biofilm formation capacity which could facilitate its adhesion to the intestinal mucosa, highlights the probiotic potential of this strain. Its resistance to acidic conditions and high concentrations of bile salts suggests that this yeast could survive the restrictive conditions of the gastrointestinal track, positioning it as a microorganism with a great probiotic potential for developing products intended for animal feed.

Palabras clave: Kluyveromyces marxianus - yeast - probiotic - fermentation