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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)"

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Milk samples were made with rehydrated (100gL $^{-1}$) powdered skimmed milk (La Serenisima, Arg.). Determination of bacteria in order to find a practical method to be used at dairy farms, where rapid identification could be an important advantage over traditional (culture) microbiological methods, were done. As a probe concept, two bacteria were used: Escherichia coli K12 (Gram-negative) and Bacillus cereus (Gram-positive). Microorganisms were growth in LB medium at 37 ºC. After centrifugation, the pellet was resuspended in rehydrated skimmed milk in order to simulate contaminated milk samples with an OD of 4.5 (± 0.1). Electrochemical experiments were performed with a standard three electrode systems using Au and a Pt WE. A saturated Ag/AgCl was used as reference electrode, and a stainless steel helicoidally electrode was used as counter electrode. Cyclic voltammetries were performed with a potentiostat (Gamry 300) under control of its own software. Measuring conditions were a scan rate of 10 mV/seg and potential window from -0.5 to 1 V. Direct observation of cyclic voltammetries shows mayor complexity (number of peaks) when Au WE was used. The anodic peak at ca. 680 mV is more important at Gram-positive bacteria. Cathodic peaks at ca. 0 mV shows more complexity is Gram-positive voltammogram. The anodic peak at ca 300 mV looks similar at both bacteria. When the data was analyzed by principal component both bacteria and milk control samples were separated in different groups. These preliminary results demonstrate that practical use of this method could be possible. More experiments with increasing number of Gram-positive and -negative strains will be accomplished to demonstrate and validate the suggested method.

BF P13. ANTIOXIDANT ACTIVITY OF SCLEROGLUCANS FROM Sclerotium rolfsii ATCC 201126

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Carbohydrate polymers have been reported to modulate in vitro and in vivo inflammatory responses. β-D-(1,3)-glucans, such as scleroglucan, may possess free radical scavenging activity. If glucans are free radical scavengers then, it might partly explain the ability of these ligands to modulate inflammatory responses. In the present work, the free radical scavenging activity of lab-fermenter scale produced scleroglucans from the filamentous fungus S. rolfsii ATCC 201126 (EPS I, EPS II and EPSi) and a commercial scleroglucan (LSCL) was examined. The study involved the use of the phycoerythrin/AAPH fluorescence assay based on the method of Glazer. The antioxidant properties of both triple and single helix scleroglucan conformations were also compared. The oxygen radical absorbance ability of these carbohydrate polymers in aqueous medium was compared and contrasted with commercial antioxidant agents (PDTC and Trolox). As a general rule, single helix conformation showed greater antioxidant ability than triple helix. With the exception of LSCL, all tested scleroglucans when treated with 0.2 N NaOH (corresponding to the single helix conformation) exhibited a variable degree of free radical scavenging activity (EPS I > EPSi > EPS II), and the antioxidant effect was concentration-dependent (optimal at 0.25 μg/mL). The lower values of EC_{50} (the dose that corresponds to a 50% antioxidant ability) exhibited by alkali-treated samples allowed to confirm their marked antioxidant activity (EC_{50}= 121-194 μg/mL). EPS I single helix conformation showed an antioxidant activity comparable to PDTC (equivalent to ~84%) and superior to Trolox (> ~160%). Meanwhile, the EC_{50} values obtained for native samples (EC_{50}= 805-5920 μg/mL) denoted the weak free radical scavenging activity exhibited by triple helix. Polysaccharide antioxidant effects have been already correlated with the monosaccharide composition. However, polymers are significantly better free radical scavengers than either of the monosaccharides. This fact would indicate that the polymeric structure confers additional free radical scavenging ability. According to our results, the antioxidant activity herein demonstrated for scleroglucans from S. rolfsii could be not only a consequence of their glycosidic composition but also a property associated to the conformational state of the polysaccharide. The demonstrated antioxidant ability would represent a further contribution to the great biological potential of the produced fungal polysaccharides.

BF P14. STUDY OF FOLATE PRODUCTION BY WILD-TYPE STRAINS OF LACTIC ACID BACTERIA FOR THE ELABORATION OF NOVEL BIO-ENRICHED FOODS

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Folate, an essential B-group vitamin, is involved in many metabolic pathways such as energy usage and DNA and RNA biosynthesis. Human beings cannot synthesize folate so an exogenous supply of this vitamin is necessary to prevent nutritional deficiency. Extensive researches have shown that many health benefits are associated with increased folic acid intakes. However, numerous studies have put into evidence that high intakes of this synthetic form of folate can cause adverse effects in some individuals, such as the masking of hematological alterations of vitamin B_{12} deficiency. This does not occur with natural folates present in foods or produced by microorganisms. Currently, many researchers are evaluating novel strategies to increase concentrations of naturally occurring folate in foods. The proper selection and use of folate-producing lactic acid bacteria (LAB) is an interesting alternative to increase "natural" folate levels in foods. Aim: To find and select wild-type LAB able to produce folate and to study its production. Experimental: Screening of 43 strains of Lactobacillus (Lb.) bulgaricus and 52 Streptococcus (St.) thermophilus was performed and different parameters were evaluated such as: a) growth in absence and presence of folate in a vitamin-deficient medium, b) total concentration of folate, c) concentration of secreted and intracellular folate, d) pH of the folate-free medium, e) absorbance at 580 nm, and f) UFC/ml of the selected folate-producing strains. Folate concentrations were estimated by using a Lb. rhamnosus NCIMB 10463 microbiological assay. Results: from the 95 analyzed LAB only 37 strains (5 Lb. bulgaricus and 32 St. thermophilus) produced varying amounts of folate (between 19.3 ± 0.1 to 144.4 ± 0.1 μg/l) when growing in absence of