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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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was determined by monitoring the absorbance at 475 nm. Results and conclusions: The initial molasses pH value was an important factor for the biosorption process. In the primary screening step, the inactivated biomass of B. agri grown in liquid medium showed the highest decolorization capacity (47 %) when a molasses at pH 3 was used. Interestingly, the total amount of reducing sugar did not significantly change. In addition, the production of an extracellular lipase from B. agri was significantly increased when this treated molasses was used as carbon source. On the other hand, the best decolorization capacity obtained with either A. niger or S. cerevisiae was detected with viable biomass growing on agarized medium and using molasses at initial pH 9. These results show the ability of microbial biomass to remove colored substances from sugar cane molasses. This work was supported by grands PIP-CONICET 297 and CIUNT 26/D409.

BF P03. A RAPID-BOD BIOASSAY BASED IN lyophilized klebsiella pneumoniae

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A microbial amperometric bioassay where Klebsiella pneumoniae strain employs ferricyanide as the last electron acceptor while degrading organic compounds has been developed in order to replace the established BOD_5 determination method when active interventions for environmental monitoring and control process are needed. The ferricyanide-mediated approach has been proposed years ago to overcome O_2 low solubility and long incubation times. Higher solubility of ferricyanide enables the increase of microbial load reducing determination times from days to hours.

The traditional BOD_5 test correlates biodegradable amounts of organic matter with dissolved oxygen consumed by microorganisms in samples after 5 days of incubation. Instead, our bioassay correlates easy biodegradable amounts organic matter with ferrocyanide concentrations, ferricyanide oxidized form, employing electrochemical techniques as amperometry. The used strain has been isolated from a commercial non-pathogenic consortium and identified by 16S rDNA sequencing process and BLAST sequence alignment tool as Klebsiella pneumoniae strain K30 or Klebsiella pneumoniae strain K8, both originally isolated from rhizosphere. Issues as replacement of centrifugation by the use of formaldehyde and avoidance of N_2 sparging of the samples, procedures usually made in ferricyanide-mediated approaches have already been successfully reached using freshly harvested cultures and a Pt electrode in order to develop a field dispositive to determine BOD values in-situ. This bioassay has given accurate $BOD_{K.\ pneumoniae}$ values of real municipal wastewater samples compared with the BOD_5 method. Now, the last improvements to the final dispositive is the employment of a disposable vibratory screen-printed Au electrode using freeze-dried bacteria suitable for a commercial bioassay mass production.

Several lyophilization methods have been assayed. Trehalose 100 mM used as lyoprotectant drove to a bioassay as sensitive as freshly harvested cultures (the slope of a GGA calibration curve was similar in both cases 10.4 and 9.6 -nA L mg^{-1} respectively) even when the growth rate decreased to 96%. These results enable the design of a disposable microbial bioassay for rapid BOD determination in wastewaters, treatment waters and water natural sources samples. Even when our Klebsiella pneumoniae is an environmental strain, these were the last assays done using it given the existence of pathogenic, antibiotic resistant strains of this species.

BF P04. DETERMINING BIOMASS IN SOLID STATE FERMENTATION CULTURES OF ASPERGILLUS TERREUS DURING LOVASTATIN PRODUCTION

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Lovastatin, a class of secondary metabolite typically produced by Aspergillus terreus strains, has become the focus of great attention due to its ability to block the de novo synthesis of endogenous cholesterol, which is nearly 2/3 of human total body cholesterol. Additionally, statins present potential applications for the treatment cancer, Parkinson and Alzheimer diseases, as well as viral and fungal infections, because of their capability to inhibit mevalonate derivatives biosynthesis. High lovastatin production yields may be microbiologically obtained by implementing culture systems in solid state. Since biomass levels are closely related to lovastatin productivity, appropriate methods for the determination of fungal growth are usually required. However, one of the main drawbacks is that the direct analysis of biomass by dry weight determination is not possible in solid state fermentation systems. Therefore, this work was aimed at comparing two indirect methods for biomass determination: one based on the N-acetylglucosamine content, a component of the fungal cell wall, and the other one, based on the ergosterol content, a fungal cell membrane steroid. N- acetylglucosamine was assessed by the colorimetric method with MBTH reagent, after sample acid hydrolysis. Extracted ergosterol, previous sample saponification, was analyzed by RP-HPLC with a photodiode array detection (PDA) system. A high correlation coefficient (r^2: 0.98) was found between fungal biomass dry weight and the ergosterol content as determined by HPLC, confirming the validity and reliability of this standardized technique. Additionally, the ergosterol method showed to be highly reproducible and time-efficient. On the other hand, the obtained results according to the N-acetylglucosamine method denoted that this technique would not be applicable to any solid culture system due to the false positive reactions (interference) observed for abiotic controls in complex systems with certain solid substrates.