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Correlation and Regression Analyses for Cane and Sugar Yields Across Their Components under Bud Chips and Conventional Planting Methods in SugarCane.

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Abstract

The present study was carried out in a private farm in El-Shaghap Region, South Esna of Luxor Governorate, Egypt (latitude of 25.30°N and longitude of 32.30°E). The work was conducted during the two plant-crop seasons of 2017/2018 and 2018/2019 to study the sugarcane planting using bud chips and conventional methods. Four sugarcane varieties G.T.54-9, G.84-47, G.2003-47 and C.57-14 were tested in this study. The experimental design was a split plot design with four replications. The four varieties were randomly distributed to the main plots and the two planting methods (conventional method and bud chips) assigned as sub-plot (42 m²). Each plot contains six rows with the length of seven meters/row and one meter of row width.

The results indicated that unique and high positive estimates of correlation coefficients were recorded between seeding survival % and each of millable cane length, millable cane weight, cane yield/ fed, brix, sucrose content, purity %, sugar recovery %, pol and sugar yield/fed across bud chips planting method. Otherwise, the previous results were not found for conventional planting method, reflecting the remarkable effect of bud chips planting method on correlation coefficients corresponding to the seeding survival produced using that method. Brix recorded high and positive correlation with each of sucrose %, purity %, sugar recovery %, pol % and sugar yield/ fed across both planting methods.

It is remarkable results that the correlation coefficients between 2 of sucrose %, purity %, sugar recovery % and pol % were equal or close to unity, reflecting the very strong genetic make-up of those traits.

Regression analysis revealed that the predictors traits, i.e., sugar yield/fed., millable cane diameter, millable cane length, seedling survival%, millable cane weight and number of millable cane/fed. could be used as powerful selection criteria for high cane yield/fed. Moreover, the predictors traits, i.e., cane yield/fed, stalk length elongation, millable cane length, millable cane diameter, number of millable cane/fed, stalk survival%, pol%, brix% and sucrose% could be used as powerful selection criteria for high sugar yield/fed.

Key Words: Correlation coefficient, Regression analysis, Sugarcane transplanting, bud chips.

Synthesis of Oxalic from Sugarcane Molasses by Oxidation-reduction Reactions using Permanganate Ion as Oxidant

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Abstract

Oxalic acid in alkaline medium was quantitatively synthesized using sugarcane molasse oxidation (SCM) by potassium permanganate as oxidizing agent. The produced compound was identified using Fourier Transform Infrared (FT IR), mass spectra and with by reaction with 2,4-dinitrophenyl hydrazine and hydroxylamine reactions have been identified as the oxidation product (oxalic acid), which gives negative results in 2,4-dinitrophenyl hydrazine and hydroxylamine. It has been found that the oxidation portion has a strong chelation affinity with most

mono- and divalent complexes that provide stable high chelating agents and therefore one of the most abundant organic acids in the plant. Again, the formic acid was prepared from the result of oxidation (oxalic acid) and by FT IR.

Keywords: *Sugarcane molasse; Oxalic acid; Formic acid; Chelating agent; Permanganate; Kinetics.*

Cellulase and Xylanase Production by Sugarcane Bagasse Mycobiota

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Abstract

Lignocelluloses of sugarcane represent a precious and cheap source for enzyme production by several fungal species. In the present study 25 samples of sugarcane bagasse were analyzed for their fungal content. The growing fungal strains were then screened for their abilities to produce cellulolytic and xylanolytic enzymes in solid and broth cultures. A total of 62 fungal species belonging to 31 genera were identified from the tested samples. The most prevalent genera were *Aspergillus* and *Fusarium* being isolated from 96% of the tested samples. *Mucor*, *Penicillium* and *Talaromyces* colonized 45% - 52% of bagasse samples. The most prevalent species were *A. flavus*, *A. niger* and *F. oxysporum*. Internal trans. Spacer (ITS) sequences of rDNA confirmed the identification of two new records (*Ceratocystis adiposa*, *Phaeoacremonium viticola*) in addition to *Sarocladium kiliense*, *Stachybotrys chartarum* and *S. elegans*. Cellulolytic activities were detected in solid cultures of 73.7% of fungal strains with the most active being *Aspergillus tamarii*, *Exserohilum rostratum* and *S. chartarum*. Xylanolytic activities were exhibited by 59.8% of fungal strains and the

active xylanase producers were *A. niger*, *A. tamarii*, *A. tubingensis*, *C. adiposa* and *E. rostratum*. Spectrophotometric measurements using dinitrosalicylic acid (DNS) reagents showed high cellulase concentration in broth cultures of *S. chartarum* followed by *A. niger*, *C. adiposa* and *S. elegans* (10.2- 52.0 IU/ml). The relative activity of fungal cellulase ranged from 0.2-1.7 IU/ml/min whereas the specific activity fluctuated between 2.471-14.590 IU/mg protein. Xylanase concentration, relative and specific activities were markedly high especially in cultures of *A. niger* (360.6 IU/ml, 32.0IU/ml/min. and 64.611 IU/mg protein, respectively).

Keywords: *Sugarcane bagasse, fungi, cellulases, xylanases, enzymes*

Utilization of Sugar Beet Industrial filter cake waste for removal of direct red 81 from aqueous solution

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Abstract

A low cost adsorbent has been tested for its adsorption ability to remove a hazardous dye from textile wastewater. The paper assess the results pertaining to the investigation conducted on the removal of the azo sulphonated dye, direct red 81 by adsorption on the filter cake waste as adsorbent. Adsorption studies were carried out in batch mode to examine the influence of various parameters affecting the removal

efficiency of the adsorbent. Isotherm data were found to fit well with the Freundlich adsorption mode. From the estimated mean adsorption energy of 3.8 kJmol^{-1} according to the D-R isotherm model and fitting with the pseudo second-order rate equation, we concluded that the adsorption process of the dye onto filter cake is a physical process with some contribution from chemical adsorption.

Keywords: Adsorption, Direct red 81, Filter cake, Isotherm, Kinetics.

دراسة اقتصادية للتغيرات الموسمية لأسعار السكر العالمية والمحلية

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مقدمة

في الوقت الذي قد يكون من المرغوب فيه الوصول إلي تصور عام لطبيعة التحركات السعرية خلال السنوات المتتالية لسلمة معينة، نجد أنه من المرغوب فيه أيضاً تحديد الكيفية التي تتم بها التغيرات السعرية خلال مواسم معينة لارتباط ذلك بالقرارات المتعلقة بتجارة تلك السلع في الحاضر والمستقبل، وفي ضوء ذلك تعتبر دراسة التغيرات الموسمية للأسعار ذات أهمية خاصة لدي منتجي ومصدري السلع في التخطيط لعملياتهم الإنتاجية والتصديرية لتحقيق بعض الوفورات الناشئة عن استغلال ارتفاع الأسعار في فترات زمنية معينة دون غيرها، الأمر الذي يستلزم بالضرورة دراسة النمط الموسمي لأسعار السكر للتعرف علي أفضل الأوقات المناسبة للتصدير والإستيراد علي حد سواء.

الكلمات الدالة: الأسعار المحلية للسكر ، الأسعار العالمية للسكر، التغيرات الموسمية.

Execute of Cooling Vacuum Crystallization (CVC) in Place of C-Cooling Crystallizers for White Sugar Production and Energy Saving in the Beet Sugar Industry

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Abstract

This article reports the development at Al-Khaleej sugar company AKS between 2016 and 2020 in low-temperature sugar crystallization and incorporating of CVC technology in the new AKS beet sugar project in Egypt, Online 2021. The new project includes three continuous vacuum crystallizers followed by CVC, to be used in place of C-cooling crystallizers. All details, features, and results of the new sugar house crystallization scheme have been listed in the paper.

Keywords: Crystallization, Industrial process design, Food industry, Process development, manufacturing.

Nile River Freshwater Quality Assessment at Assiut Governorate

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Abstract

The Nile River is the longest in Africa and is one of the most important sources of freshwater. Water specifications vary along the course of the river, which represents the main source of drinking water in Egypt, with depends on the treatment of raw freshwater by conventional plants to get rid of the main pollutants of freshwater, such as suspended particles (turbidity) and microorganisms, therefore assessment of the characteristics of freshwater of the river over long period and studying it opens many horizons for establishing of new techniques for treating the freshwater.

The main objective of this study is to monitor the Nile River over a period at the study area Assiut-Egypt, as this study shows that the Nile

River contains large quantities of bacteria with an average 1645 CFU/ml throughout the year in different seasons those affects the numbers of these bacteria, in addition to the river contains moderated concentrations of total dissolved solids with an average 216 ppm, and the average turbidity is about 4.7 NTU, while the average value of pH was 8.2, as well as confirming the low concentrations of iron as the average was 0.04 ppm, moderate concentrations of chloride as its average was 15 ppm, and low concentrations of ammonia as the average was 0.06 ppm. Therefore, this study is an assessment of the Nile River water specifications to prove that the freshwater required to be treated of the non-complied values of bacteria and turbidity concerning the Egyptian drinking water standards.

Keywords: *Freshwater quality, Nile river water, Drinking water treatment, Freshwater bacterial count.*

Egyptian Organo-Kaolinite / Chitosan Nano composite for Effective Removing Sulfate Ions from Groundwater

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Abstract

In Upper Egypt, especially in the limestone carbonates scarp, groundwater is contains sulfate salts, which are considered more difficult to remove by conventional treatment plants for freshwater, used for drinking, domestic and industrial purposes. The study aims to prepare a

reasonable adsorbent composite from Egyptian organo-kaolinite and prepared chitosan to remove the excess of sulfate ions from Assiut groundwater wells. Therefore, the modified organo-kaolinite was treated with prepared modified chitosan as a composite media filtration to treat groundwater. In this study, the prepared chitosan was characterized by using X-ray diffraction (XRD). FTIR and scanning electron microscopy (SEM) and its efficiency for removing sulfate have been tested through batch and experimental column studies.

The results revealed that the adsorption of sulfate ions is optimum at pH range 4–8. The maximum sulfate ions adsorption capacities were found 2.88 mg/g, after about 65 min contact time. The regeneration study illustrated that the prepared composite could be used up to 5 times with maximum sulfate ions percentage removal of 62.33%, achieved after the 5th cycle. The Chitosan modified kaolin clay mineral showed higher adsorption capacity towards sulfate ions with other adsorbents as in the literature.

Keywords: Groundwater, Sorted Sand, Organo kaolinite, Chitosan, Composite, Sulfate, Egyptian, Assiut.