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Physical Sciences Section

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SYNTHESIS AND BIOLOGICAL ACTIVITY OF SOME NEW SUBSTITUTED QUINOLINE AMINO ACID DERIVATIVES

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(Received June 29, 1991; revised October 31, 1991)

The synthesis of a series of 8-hydroxyquinoline-5-sulfonamido acids and some of the corresponding methyl esters and hydrazides (II-XIX) is described. Coupling of 8-hydroxyquinoline-5-sulfonamido acids with amino acid methyl ester hydrochloride in THF- Et_3N medium by the N, N'-dicyclohexylcarbodiimide method yield the desired dipeptide methyl esters (XX-XXV). Most of the compounds synthesised (II-XXV) were found to be highly active against a number of microorganisms and fungi.

Key words: Biological activity, Quinoline, Amino acid derivatives.

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HEAT CAPACITY AND LOW-FREQUENCY VIBRATIONAL STATES OF SPECTROSIL-WF

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(Received February 6, 1991; revised September 5, 1991)

The heat capacity measurements of Spectrosil-WF (vitreous silica containing $< 20\text{ppm}$ of OH) in the temperature range of 1.5K – 17K are presented. An approach which can be used to determine the low-frequency ($\nu < 3\text{THz}$) density of lattice vibrational states $g(\nu)$ from heat capacities of vitreous materials has been briefly discussed. It has been found that the form of $g(\nu)$ at low-frequencies determined from the low temperature heat capacities of Spectrosil-WF is non-quadratic. Using the $g(\nu)$ values determined from heat capacities and the Raman measurements, the Raman coupling constant $C(\nu)$ has been determined. It is observed that $C(\nu)$ cannot be interpreted using Martin-Brenig theory.

Key words: Spectrosil-WF, Heat capacity, Neutron scattering, Raman scattering,

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PALLADIUM-CATALYZED SYNTHESIS OF 5-HETEROARYLPYRIMIDINE NUCLEOSIDES

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(Received March 3, 1990; revised February 26, 1991)

A new and direct method for the facile synthesis of 5-heteroarylpyrimidine nucleosides, a potential inhibitor of thymidylate synthetase, is described. The approach is based on a palladium catalyzed reaction between halo heteroarenes and mercurated pyrimidine nucleosides.

Key words: Nucleosides, Heteroarylpyrimidines, Palladium catalysis.

Introduction

A promising palladium catalyzed unsymmetrical biaryl

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NICKEL-FRUCTOSE CHELATE COMPLEX

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(Received August 5, 1990; revised October 16, 1991)

Chelate complexes of nickel with fructose and fructose high syrup have been prepared and characterized. These chelates are not homogenous. Nickel fructose contains three species of molecular weight 68,000, 37,000 and 20,000, while Ni-high fructose contains two molecular species of 66,000 and 50,000.

Key words: Nickel, Fructose and Chelate complexes.

Introduction

MICROBIAL DESULPHURIZATION OF LAKHRA COAL IN ETHANOL AMINO OLEATE SOLUTION

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(Received September 29, 1987; revised July 20, 1991)

Studies on microbial desulphurization of Lakhra coal (less than 100 mesh size) were conducted, with mixed culture, by continuous agitation and under pH value of 1.8, in 0.004% ethanol amino oleate solution, resulting in 92.4% pyrite removal.

Key words: Coal, Desulphurization and Microbial technique.

Short Communication

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**Investigation of Lipase Activity from *Cajanus*
Cajan Seeds**

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Biological Sciences Section

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ABUNDANCE AND CORRELATIONS OF HELMINTH PARASITES WITH AGE AND SEX OF PIGEON (*COLUMBA LIVIA*) IN BANGLADESH

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(Received May 26, 1991; revised October 28, 1991)

A total of one hundred male and female pigeon of different age groups were examined for prevalence of helminth parasites. Male and female pigeons were divided into three groups. Out of the one hundred pigeons examined, 52 were male and 48 were female. All the male pigeon were found to be infected by any one or more of the 10 different species of parasites. *Ascaridia columbae* was found only in one male pigeon but not in female pigeon.

Key words: Abundance, Correlation, Helminth parasite, Age, Sex, Pigeon.

GENOTYPIC VARIATION, COVARIATION AND PATH COEFFICIENT ANALYSIS IN MAIZE

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(Received February 28, 1990)

Variability, heritability, genetic advance, interrelationships and path coefficients were estimated for grain yield and eight other agronomic traits in 21 maize genotypes. The genotypes differed significantly for all traits studied. High genotypic coefficient of variation was exhibited by ear height and 1000-kernel weight. Broad sense heritability was high for days to silk, plant height, ear height and 1000-kernel weight; moderate for ear diameter and number of kernels per row; and low for ear length, kernel rows per ear and grain yield. High genetic advance in percentage of mean was observed in ear height and 1000-kernel weight. Grain yield showed positive and significant genetic correlation with days to silk, plant height, ear height, ear diameter and 1000-kernel weight. Days to silk, plant height, number of kernels per row and 1000-kernel weight had strong positive direct contribution towards grain yield. Thousand kernel weight seemed to be most effective for selection in improving towards high grain yield.

Key words: Maize, Variability, Path analysis.

Introduction

(cm), kernel rows per ear, number of kernels per row, 1000

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EFFECT OF DIFFERENT TYPES OF DIET OF CASTOR AND CASSAVA LEAVES ON THE REARING OF ERI-SILK WORM, *SAMIA CYNTHIA RICINI* (BOISD.)

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(Received April 2, 1991; revised November 21, 1991)

Ten experimental treatments (Treatments A to J) were conducted to find out the effect of different types of diet of cassava and castor leaves on the growth, development and yield of eri-silkworm, *Samia cynthia ricini* (Boisduval). The treatments A and I showed significantly higher larval and pupal growth, cocoon recovery including shorter larval and pupal period and adult longevity than the other treatments. Lower growth, slower development of larvae, pupae and poor cocoon recovery expressed by longer larval and pupal period and adult longevity were observed in treatment G and J. The present experiment revealed that castor leaves were suitable for better rearing of eri-silkworm. The castor leaves might contain better growth promoting and silk producing nutritive elements.

Key words: Cassava and castor plant, Types of diet, Eri-silkworm.

Short Communication

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Fatty Acid Composition of Seeds of the *Ageratum Conyzoides* Linn.

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(Received December 13, 1990; revised November 24, 1991)

Ageratum conyzoides seed oil (14%) has been examined for its physico-chemical characteristics and fatty acid composition. Thin layer of the oil into lipid classes resulted into polar lipids (3.5%) and neutral lipids (96.5%). Column chromatography of the oil afforded hydrocarbons (0.5%), wax esters (1.8%), triglycerides (88%), F. F. A. and diglycerides (5.7%) and monoglycerides (4%). The fatty acid composition of various lipid classes ranged from C₁₄ to C₂₂ acids in different amounts.

Short Communication

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The Lac Insect, Its Wild and Cultivated Species

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Short Communication

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Laboratory Evaluation of Six Systemic Fungicides for the Control of Root-rot in *Duboisia Leichhardtii* F. Muell

NAHEED ANWAR, S. IFTIKHAR AHMED AND ABID ASKARI
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Short Communication

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**The Bisexual form of a South Indian Lac
Insect**

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So far only two ways are known by which insects

Technology Section

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EGYPTIAN SILICA FUME IN PORTLAND CEMENT

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(Received August 27, 1990; revised February 24, 1991)

The influence of silica fume which emerges as a by-product of the production of ferro-silicon (Edfo – Kom Ombo, Co., Egypt) on the properties of blended cement pastes has been studied. Percentages of 5, 10, 15 and 20% by weight of cement of silica fume were mixed with ordinary portland cement. It is concluded that the addition of silica fume to portland cement enhances the hydration kinetics, i.e. increases the chemically combined water and decreases the liberated $\text{Ca}(\text{OH})_2$ contents. It was also found that 5% silica fume improved the mechanical properties of cement paste in tap water as well as in MgSO_4 and Na_2SO_4 solution.

Key words: Silica fume, Portland cement, Ferro-silicon.

SHELF-STABLE PRESERVES AND CANDIES FROM SELECTED FRUITS AND VEGETABLES

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(Received April 2, 1991; revised October 31, 1991)

Study was conducted in Bangladesh for preparing preserves and candies from pineapple, mango, watermelon, papaya, radish and carrot. Fruits and vegetables cubes were treated with preservatives and firming agents, blanched and pricked before processing to preserves and candies. Moisture ranged between 28 to 31 and 16 to 19% respectively for preserves and candies while the respective sugar percentage was 67-70 and 79-83 %. Sensory evaluation data revealed that mango and pineapple preserves were of excellent quality while those prepared from watermelon and papaya were of good quality. The candies of pineapple, mango and papaya was categorized as "good product". The preserves and candies were shelf-stable upto 12 months under ambient temperature (23-38°). Study indicated a good scope for preparing preserves and candies from pineapple, mango, watermelon, papaya and carrot grown under Bangladesh agro-climatic conditions.

Key words: Fruits, Vegetables, Candies.

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EFFECT OF FILM PACKAGING ON POST-HARVEST STORAGE OF FRESH PERSIMMON

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(Received September 16, 1990; revised November 17, 1991)

Effect of packaging materials such as newspaper (0.093 mm thick) and polyethylene (PE) of different thicknesses (0.013-0.043 mm) on the quality of fresh persimmon during ambient storage for 6 weeks was studied. The tested quality parameters included weight loss, firmness (texture), ascorbic acid, acid content and sensoric tests. Packaging materials and storage time significantly influenced the tested parameters. The results revealed that storage mean losses in weight were highest in control (12.7%), intermediate in newspaper (9.5%) and lowest in PE packaged samples (less than 1%). Similarly, losses in ascorbic acid were greater in control samples (49.4%) followed by newspaper lining (47.7%) and PE lining (35.4-48.0%). Acidity was little affected with advanced storage. The PE lined fruits were rated best (6.8-7.2) followed by newspaper (4.8) and control persimmon (3.5) for overall acceptability scores. There was a strong negative correlation ($r = -0.97$) between weight-loss and firmness (texture) of the fruit. PE packaging was found significantly better ($P < 0.05$) than newspaper and this extended the shelf-life of persimmon 2 weeks over the control.

Key words: Shelf-life, Film packaging, Ascorbic acid, Weight loss, Persimmon.