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# Physical Sciences Section

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## STUDIES ON THE ISOPROPYLATION OF ADENOSINE-5'-MONOPHOSPHATE

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(Received January 6, 1988; revised November 23, 1988)

The isopropylation of 5'-AMP **1** under strongly alkaline conditions using isopropyl iodide gave 3'-isopropyl 5'-AMP **2** as the major product, the minor alkylation product from this reaction has been isolated in 6.2% yield and characterised as the 5'-AMP-isopropylester **3**. Isopropylation of 5'-AMP using DMSO and potassium carbonate gave N<sup>1</sup>-isopropyl-5'-AMP **4** in 18.7% and N<sup>1</sup>-isopropyl-5'-AMP isopropylester **5** in 28.9% yield, while the same reaction using potassium tert-butoxide and DMSO gave the N<sup>1</sup>-isopropyl-5'-AMP **6**. The structure of the product has been assigned using ultraviolet spectroscopy proton NMR and mass spectrometry. In some isopropylated nucleotides described in this paper, it is possible to get useful structural information using a combination of FAB and E.I. mass spectrometry.

*Key words:* 5'-AMP, Isopropylation, NMR.

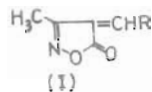
# ORGANIC REACTIONS IN AQUEOUS SOLUTION SYNTHESSES OF 4-ARYLIDENE-3-METHYLISOXAZOL-5-ONES

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(Received August 10, 1987; revised November 30, 1988)

The syntheses of various 4-substituted arylidene-3-methyl-isoxazol-5-ones, have been described in the aqueous medium and their structures established using combustion analysis and spectroscopic techniques. The comparison of previous methods on the subject reveals that the present method offers simple route for the syntheses of arylidene isoxazolones and this widens the scope of reactions in the aqueous medium.



R = C<sub>6</sub>H<sub>4</sub>OH-2; C<sub>6</sub>H<sub>4</sub>OH-3; C<sub>6</sub>H<sub>4</sub>OH-4;  
C<sub>6</sub>H<sub>4</sub>OCH<sub>3</sub>-2; C<sub>6</sub>H<sub>4</sub>OCH<sub>3</sub>-4; C<sub>6</sub>H<sub>5</sub>-CH = CH

**Key words:** Arylidene, Isoxazolones, Syntheses in water.

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## ISOLATION OF A NEW ISOMER OF URSOLIC ACID FROM FRUITS AND LEAVES OF *CARISSA CARANDAS*

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(Received February 23, 1988, revised October 22, 1988)

Our studies in the chemical investigations in *Carissa carandas* had led to the isolation of a new triterpenic alcohol which had already been reported [13]. Further studies in this respect resulted in the isolation of a new isomer of ursolic acid.

*Key words:* *Carissa carandas*, Apocynacea, Triterpenoid.

## A SCANNING ELECTRON MICROSCOPICAL STUDY ON THE MICROSTRUCTURE OF DOMIATI CHEESE

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(Received July 20, 1988; revised November 27, 1988)

Domati cheese made by the conventional method, and from recombined cow's and buffalo's milk concentrated by ultrafiltration were examined by scanning electron microscopy at different periods of storage in pickle. Fresh cheese showed an open loose network of aggregated micelles, that changed to a network with considerable fusion of casein micelles. The cheese from UF recombined milk showed a matrix of small particle size which grew larger during pickling. The pickled Domiati cheese from UF buffalo's milk showed crystal shaped materials at the junctions of protein particles probably made of calcium lactate.

*Key words:* Domiati cheese, UF, Microstructure.

**MASS SPECTRA OF 2-BENZIMIDAZOLE- AND 2-BENZOXAZOLE-METHANOL,  $\alpha$ ,  $\alpha$ -DIPHENYL**

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(Received April 2, 1986; revised November 11, 1988)

2-Benzimidazole-methanol,  $\alpha$ ,  $\alpha$ -diphenyl and 2-benzoxazole-methanol,  $\alpha$ ,  $\alpha$ -diphenyl have been synthesised and their mass spectra studied. The study has shown some characteristic breakdown ions, and the absence or presence of these ion indicates clearly, if 1NH in a benzimidazole nucleus is substituted or not, and this information could be useful in the study of chemical constituents of natural products.

*Key words:* Mass spectra, Benzoxazole-methanol.

**SYNTHESIS OF TRISUBSTITUTED PYRAZOLES WITH POSSIBLE ANTIMICROBIAL ACTIVITY**

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(Received on February 2, 1988; revised on December 8, 1988)

Reaction of ketone of [5] with acylhydrazined afforded the hydrazones [6], whereas with arylhydrazines it gave the hydrazones [7], which on boiling with ethanolic HCl produced the pyrazolines [8]. Oxidation of [8] with bromine water furnished the brominated pyrazoles [9]. The reaction [5] with ethyl oxalate gave the ethyl hexenoate [10] which with hydroxylamine afforded the isoxazole ester [11], whereas, with *o*-phenylenediamine gave the oxyquinoxaline [12]. Ester [10], with acylhydrazines afforded the hydrazones [13] which were converted to the *N*-acylpyrazoles [14]. With hydrazines, compound [10] produced the pyrazole-3-esters [15] which were hydrolysed to the acids [16].

*Key words:* Synthesis. Trisubstituted pyrazoles. Antimicrobial activity.

# Biological Sciences Section

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## CHANGES IN TOTAL COUNTS, BACTERIAL GENERA, TRIMETHYLAMINE AND TOTAL VOLATILE BASES OF LOBSTER (*PANULIRUS POLYPHAGUS*) MUSCLE DURING ICE STORAGE

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(Received October 18, 1988)

Quantitative and qualitative changes in bacterial flora of twelve lobster *Panulirus polyphagus* tail muscle samples during ice storage for 16 days were studied. The total bacterial population increased from an initial count ranging from  $1.0 \times 10^2$  –  $3.7 \times 10^6$  CFU/g (median  $1.0 \times 10^5$  CFU/g) to  $3.8 \times 10^5$  –  $4.3 \times 10^9$  CFU/g (Median  $1.8 \times 10^8$  CFU/g) after 16 days storage in ice. In summary, the bacterial flora of fresh lobster in order of predominance was composed of *Moraxella*, *Micrococcus*, *Vibrio*, *Pseudomonas*, Group II and III, *Bacillus*, *Flavobacterium* and *Alteromonas*. At the end of storage period the flora in order of predominance was composed of *Alteromonas*, *Moraxella*, *Pseudomonas* Group II, *Micrococcus*, *Bacillus* and *Pseudomonas* Group III. Bacterial flora in individual samples was also studied in relation to trimethylamine (TMA) and total volatile bases (TVB) production during storage. In most of the samples where a single or at the most two genera of organisms dominated, significant correlation was obtained between dominant flora and the values of TMA and TVB. While no correlation, between bacterial flora and TMA and TVB values was obtained in other samples particularly where mixed flora or heterogenic bacteria of the same genus dominated during storage.

**Key words:** Bacterial genera, Trimethyl amine.



EVALUATION OF THE ANTIEMETIC ACTION OF *PRUNUS DOMESTICA* – LINN

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(Received July 7, 1988; revised November 23, 1988)

*Prunus domestica*-Linn was investigated for its antiemetic action. The crude extract was found effective in controlling centrally induced emesis by apomorphine in dogs. Its action was comparable to the action of metoclopramide (Maxolon) and chlorpromazine (Largactil).

*Key words:* *Prunus domestica*-Linn; Emesis apomorphine.

**PROTEIN AND AMINO ACIDS OF *GREWIA ASIATICA***

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(Received April 20, 1988; revised November 30, 1988)

The chemical composition of falsa fruit *Grewia asiatica* including the seed was determined. Crude protein percentage, its amino acid composition were evaluated. Electrophoretic pattern of proteins revealed the presence of two major proteins having molecular weights as 19,100 and 89,200 dalton. The quantity of phosphoserine was found to be higher in pulp as compared to other free amino acids (FAA), while the hydrolysate contained aspartic acid, glycine and tyrosine in excess. The specific amino acid profile may be used as an index for judgement of adulteration in pure juice. The significant quantity of sodium, potassium and calcium makes the fruit juice more palatable and nutritious.

*Key words:* Protein, Amino acids, *Grewia asiatica*.

## PATH COEFFICIENT ANALYSIS IN RICE

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(Received February 14, 1988; revised November 28, 1988)

Twelve varieties/mutants of rice were studied for genetic correlations and path coefficients for grain yield and a few agronomic characters. Grain yield showed positive correlations with number of productive tillers per plant and grain-straw ratio. Plant height indicated negative correlations with number of productive tillers per plant, grain-straw ratio and grain yield while it was positively correlated with the distance from flag leaf collar to panicle neck node. The analysis further revealed that plant height, number of productive tillers per plant and grain-straw ratio had great effect on grain yield directly as well as indirectly through other characters.

*Key words:* Rice, Genotypic correlation, Coefficient of determination.

**STRATEGIES FOR THE CONTROL OF INDIAN CRESTED PORCUPINE, *HYSTRIX INDICA***

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(Received May 7, 1988; revised November 30, 1988)

The four different poisons namely compound 1080, temik, warfarin and endrin were used to prepare the bait mixtures. The highest killing percentage was obtained with baits prepared from compound 1080 as poison and chopped mango stones as substrate. Temik was the second most effective poison followed by warfarin and endrin. Trapping and netting was ineffective whereas fumigation gave the promising results.

*Key words:* Crested porcupin, *Hystrix indica*, Controlling strategies bait mixtures.

**CHARCOAL ROT RESISTANCE IN SUNFLOWER CULTIVARS AT VARIOUS PLANT DENSITIES**

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(Received November 15, 1987; revised October 29, 1988)

A field experiment was conducted on six sunflower cultivars to study the effects of four plant densities (28 405, 42 978, 56 810 and 85 956 plants/ ha) on the incidence of charcoal rot. The results indicated that plant density within the commercial range is not a significant factor affecting disease incidence. None of the sunflower cultivar were completely resistant to the disease. However, two commercial sunflower hybrids, NK-212 and SF-100, had a lower plant mortality of 15.55 and 16.18%, respectively. The sunflower hybrid, Cargill 204 was the most susceptible with 48.25% plants killed.

*Key words: Macrophomina phaseolina, Plant density, Resistance to charcoal rot.*

**PHENOTYPIC VARIATIONS AMONG PROGENY OF BASMATI SOMACLONES**

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(Received September 7, 1988; revised November 30, 1988)

This study was undertaken on  $M_2$  progeny of three rice (*Oryza sativa* L.) var. Basmati-370 *in vitro* regenerants named Bas-87-1, Bas-87-2, and Bas-87-3. Bas-370 was used as control. It was noted that the germination frequency in the progenies of all the three regenerants was lower in comparison with the control, being lowest in Bas-87-2. Visually, three types of chlorophyll variations i.e. albino (lacking chlorophyll), viridis (light green), and striated (whitish streaks) were observed. Some agronomic data is also reported in this paper which reveals that short statured Basmati lines resistant to lodging and high yielding can be selected through tissue culture.

*Key words:* Somaclonal variant, Basmati rice, Chloroplast.

## RESIDUES OF MERCURY ON WHEAT TREATED WITH METALLIC MERCURY

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(Received July 17, 1986, revised July 31, 1988)

Treatment of wheat at 4 and 8 ppm of metallic mercury provided 87.5 and 90 percent respective control against four insect pest species tested i.e. *Tribolium castaneum*, *Trogoderma granarium*, *Sitophilus oryzae* and *Rhizopertha dominica*, over a storage period of 4 months. No significant difference in the insecticidal activity of mercury, applied either by mixing or placed in cloth packets was observed. Mercury residues on wheat treated at 4 and 8 ppm of mercury were detected to range from 0.25 to 0.29 ppm. The possible hazards involved in mercury treatment of foodgrains are discussed.

*Key words:* Residues, Mercury, Wheat, Storage, Village-level.

## PESTICIDE RESIDUES IN THE RIVER NILE WATER, EGYPT

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(Received July 14, 1988; revised November 22, 1988)

Duplicate water samples of El-Abbasa drinking water station were collected monthly before and after purification treatments during the period February through June, 1986. Organochlorine pesticide residues were determined in the collected samples using electron-capture gas chromatographic detector. Residue analysis revealed that the pesticides detected in purified and nonpurified water were  $\alpha$ -BHC, Lindane, Aldrin, Dieldrin, Endrin and P,P'-DDT. It was noticed that the mean value of  $\alpha$ -BHC, Lindane and Aldrin were comparatively higher in purified water than in nonpurified water. Moreover, the average levels of dieldrin, endrin and P,P'-DDT in drinking water were less than in surface water. The average levels of pesticides detected in purified and nonpurified water were below the maximum permissible levels. No residues of Chlordane were detected in water samples before and after purification treatments.

*Key words:* Pesticides, Residues, River Nile.



### EFFECT OF DIFFERENT WEEDICIDES ON THE NITRIFICATION OF $\text{NH}_4\text{-N}$ , ADDED IN THE SANDY CLAY LOAM SOIL

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(Received March 2, 1988; revised November 26, 1988)

Effect of four weedicides viz. N-(1-ethylpropyl)-2, 6-dinitro-3, 4-xylidine (stomp), N-(3-chloro-4-ethyl-phenyl)- N,N-dimethylurea (dicuran), 1-(2-benzothiazolyl)-I; 3-dimethylurea (tribunil) and 3-(4-iso-propyl-phenyl)-I, 1-dimethylurea (arelon) applied @ 0.0001 to 0.1% A.I. content, in the sandy clay loam soil, was studied on the nitrification process of 150 ppm.  $\text{NH}_4\text{-N}$  added as ammonium sulphate. All the four chemicals behaved similarly. At the dose 0.0001 to 0.001% no inhibitory effect was noticed and the nitrification was 85-90% in the first 16 days and the process was completed between 16-24 days. Further increase in dose showed adverse effect, depressing nitrification; being 27-38% in the first 32 days and completed between 32-64 days at 0.01% dose while 15-18% upto 32 days and only 36% till 64 days when the dose was increased to 0.1%.

**Key words:** Weedicides, Nitrification, Sandy clay loam soil.

*Short Communication*

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**YOUNG LAC INSECTS IN A MINIATURE ANT'S NEST**

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# Technology Section

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## LOW-POWER SOURCES FOR ELECTRONIC GADGETS USING *TRADESCANTIA* LEAF

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(Received June 5, 1988; revised November 17, 1988)

The low-power bio-emf-devices (BEDs) have been developed using the *Tradescantia* plant leaf. Different BED-parameters like open circuit voltage ( $V_{oc}$ ), short circuit current ( $I_{sc}$ ), internal resistance and the total energy density are obtained. The results suggest that the BEDs provide a new inexpensive and easily available non-conventional power sources for micro-electronic gadgets.

The results of the present investigation depend on the nature of the electrodes used. But the  $V_{oc}$  do not show any correlationship with the electrode potential possibly due to the involvement of bio-activities in energy generation and complexity of leaf system. A large variation in  $V_{oc}$  and  $I_{sc}$  obtained during discharge suggest a dominant role of the bio-chemical reactions in the operation of BED.

**Key words:** Bio-electropotential, Non-conventional energy sources, Bio-emf-devices.

## BATCH ALCOHOLIC FERMENTATION OF MOLASSES: EFFECTS OF pH, TEMPERATURE AND SUGAR CONCENTRATION

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The effects of pH, sugar concentration and temperature on the alcoholic fermentation of Nigerian molasses were studied. The various cultures were inoculated with yeast inoculum having 5.2 – 6.1 cells per ml. When pH values were in the region of 1.0 and 3.0, ethyl alcohol concentrations were below 1.0% v/v, whereas maximum ethyl alcohol concentration was produced between 4.0 and 5.0. The concentration of ethyl alcohol ranged from 7.9 to 8.7% v/v. However at a higher pH value of 6.0, the concentration of ethyl alcohol recorded was 7.8% v/v. Optimum sugar concentration ranged from 14.0 to 1.70% w/v, while that of ethyl alcohol lies between 7.32 to 9.06% v/v. The optimum temperature which gave the maximum ethyl alcohol concentration (8.2% v/v) was 28.0° . Nigerian cane molasses is quite suitable for industrial production of ethyl alcohol.

*Key words:* Sugar, Fermentation, Molasses.

## CONFECTIONERY FATS FROM TUCUM (*ASTROCARYUM VULGARE* MART) AND PINDO (*ARECASTRUM ROMANOZOFFIANUM*) KERNEL FATS

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(Received February 9, 1988; revised November 12, 1988)

Analytical characteristics, fatty acid composition and cooling characteristics of tucum fat, its fractions from acetone crystallization, and pindo fat have been determined. These characteristics have been compared with those of the palm kernel and coconut stearings.

Fractionation of tucum fat (slip point  $32.0^{\circ}\text{C}$ ) gave two fractions; a higher melting fraction (yield 36.7%, slip point  $34.0^{\circ}\text{C}$ ). Tucum fat and its fractions had slip points, saponification values and iodine values similar to those of palm kernel stearins while pindo fat had a lower slip point and saponification value.

Tucum fat fractions had faster solidification than whole tucum fat, pindo fat, palm kernel stearin and coconut stearin. Cooling characteristics of tucum kernel fat its fractions and pindo fat were similar to those of palm kernel stearin.

Tucum fat and pindo fat had fatty acid composition similar to that of palm stearin. Relative to the whole fat, tucum fractions had less lauric acid; the first fraction contained more myristic while the unsaturated fatty acids oleic and linoleic were enhanced in the second fraction.

*Key words:* *Astrocaryum vulgare*, *Arecastrum romanzoffianum* Fat.