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Physical Sciences Section

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GAMMA-GAMMA DIRECTIONAL CORRELATIONS IN ^{154}Gd

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(Received December 15; revised October, 21, 1984)

Gamma-gamma directional correlation measurements have been made for the following cascades in ^{154}Gd : 723-873 keV, $A_2 = -0.101(8)$, $A_4 = 0.006(10)$; 723-(873)-123 keV, $A_2 = -0.049(11)$, $A_4 = 0.004(16)$; 873-123 keV, $A_2 = -0.002(6)$, A_4 (attenuated) $0.246(6)$; 1274-123 keV, A_2 (attenuated) $0.188(7)$, and A_4 (attenuated) $0.005(12)$. Multipole mixing parameters consistent with the experiments are: $\delta(723) = 0.00 \pm 0.04$, $\delta(873) = -10.2 \pm 0.8$.

[RADIOACTIVITY ^{154}Eu ; measured $\gamma\gamma(\theta)$; deduced, δ .]

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TRANSALKYLATION AND TRANSARYLATION OF QUATERNARY PYRIDINIUM SALTS

— Conversion of Primary Amines into Alkyl and Aryl Bromides

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(Received September 21, 1982; revised September 16, 1984).

Primary alkyl, aryl, and heteroaryl amines are converted both by tricyclic and pentacyclic pyrylium bromides into the corresponding tricyclic and pentacyclic pyridinium bromides in good yields. The latter when subjected to solvolysis by refluxing in 1,4-dioxane gave the required alkyl, aryl, and heteroaryl bromides.

SOME NEW DERIVATIVES OF ISOXAZOLE WITH EXPECTED ANTIMICROBIAL AND ANTICONVULSANT PROPERTIES

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(Received January 1, 1984 ; revised September 16, 1984)

Several new amide derivatives of 5- isoxazole have been prepared by condensing the appropriate amines with isoxazole carboxylic acid. In the case of ethyleneimine it gave a novel hydrochloride of isoxazole ethyleneimide. Their structures were assigned on the basis of analytical studies. All these compounds showed poor antimicrobial activity, while compounds 1 and 2 gave good protection against leptazol convulsions.

IRRADIATION OF POLY (VINYL CHLORIDE) IN VARIOUS MEDIA

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(Received March 1, 1983; revised September, 25, 1984)

The radiolysis of poly (vinyl) chloride (PVC) in chloroform, carbon tetrachloride and dimethyl formamide was studied in air. A few samples without solvents were also studied under similar conditions to serve as blanks. A continuous decrease in intrinsic viscosity was noted in blank samples. Samples irradiated in carbon tetrachloride showed decrease in intrinsic viscosity upto 3.5 megarads. On further irradiation an increase was noted. In chloroform the intrinsic viscosity first increased gradually up to 5 megarads and later on the increase was very fast. Colour development in samples irradiated alone and in solvents was observed and this was attributed to conjugated structures. Thermal gravimetric study revealed better heat resistance in samples irradiated in chloroform and in carbon tetrachloride, the former being more thermally stable than the latter at lower dosages.

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SURVEY OF CORN FOR AFLATOXIN CONTAMINATION IN SOUTH WEST PAKISTAN

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(Received July 12, 1984; revised September 13, 1984)

Two hundred and thirty-nine samples of corn collected from sixty locations in the Sind and Baluchistan provinces showed aflatoxin B₁ contamination in 28.8% of the samples analysed. Among the positive samples, 31 contained aflatoxin at less than 20 µg/kg, 28 between 21 to 100 µg/kg while only 8 samples had aflatoxin B₁ in excess of 100 µg/kg. The highest amount of aflatoxin B₁, 487 µg/kg, was found in a sample collected from Hyderabad city. The samples were analysed by the CB method as laid down in Association of Official Analytical Chemists and estimation was made by comparison with standards on thin-layer chromatography and confirmed by derivative formation, etc.

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PHYSICAL CHARACTERISATION OF THE NEW BIS (BENZYLPIPERIDINES)^{††}

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(Received November 25, 1982; revised September 24, 1984).

1, 4-dichloromethylbenzene; 1,4-dichloromethyl-2, 5-dimethylbenzene; 1,3-dichloromethyl-4,6-dimethylbenzene and 1,4-dichloromethyl-2, 3, 5, 6-tetramethylbenzene were condensed with a saturated heterocyclic amine, 4-benzylpiperidine in absolute ethyl alcohol. Compounds listed below were prepared:

- a', a' -Bis(benzylpiperidino)-p-xylene,*
- a, a' -Bis(benzylpiperidino)-2, 5-dimethyl-p-xylene,*
- 1, 3 -Bis(benzylpiperidino)-4, 6-dimethyl-m-xylene*
- a, a' -Bis(benzylpiperidino)-2, 3, 5, 6-tetramethyl-p-xylene*

An attempt has been made to characterise these compounds through physico-chemical studies.

Biological Sciences Section

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RESPONSE OF *DIPLACHNE FUSCA* (KALLAR GRASS) TO N,P, AND Mg ON A SALINE SODIC SOIL

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(Received May 28, 1984 ; revised October 20, 1984)

Data on the response of kallar grass to N, P, and Mg and the absorption of these mineral elements from a salinized sodic soil in pots are presented and discussed with respect to the salt relations of 'Kallar' grass.

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STUDIES ON THE PRESERVATION OF OYSTER MUSHROOMS (*PLEUROTUS SAPIDUS*)

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(Received February 2, 1984; revised November 13, 1984)

Pleurotus sapidus was preserved using different methods. The prepared products were subjected to analytical analyses and organoleptic evaluations. Analytical studies on the preserved materials have revealed that the basic composition of the mushrooms remains, by and large, unaltered. Organoleptic evaluations have shown a fair to good acceptability of the products.

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**EFFECT OF SEED STERILIZATION AND SOIL TREATMENT ON THE
GERMINATION AND GROWTH OF TOMATO
(*LYCOPERSICON ESCULENTUM* MILL)**

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(Received June 6, 1984; revised September 19, 1984)

Seed sterilization with 20% HCl for 30 min. increased the germination percentage of tomato seeds in soil irrespective of soil treatment. Seeding with sterilized seeds showed increase in the number of fruits and fruit weight as compared to transplants in the treated and untreated soils. Treatment of soil with Formalin, Furadan and plastic mulching improved the germination of sterilized seeds. Soil treatment with formalin also increased the number and weight of tomato fruits.

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DRESSING OF BANANA RHIZOMES FOR PROTECTION DURING CRITICAL GROWTH PERIOD

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A mixture of polyvinyl alcohol and *Tenekil* (polychlorinated petroleum hydrocarbon) in a ratio of 99:1 was used for dressing of banana rhizomes in order to provide them protection from the soil inhabiting plant parasitic nematodes during critical growth period.

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UTILIZATION OF BLUE-GREEN ALGAE AS BIOFERTILIZER FOR PADDY CULTIVATION

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(Received June 2, 1983; revised, November 13 1984).

The paper examines the possibility of employing blue-green algae (Cyanophyceae) as a biofertilizer for the cultivation of rice, particularly as improved yield of the crop is not adversely affected from the salinity problem. BGA or blue-green algae are also self-perpetuating.

**PATHOGENICITY AND EFFECT ON GERMINATION CAUSED
BY *ASPERGILLUS* AND *PENICILLIUM* SPECIES ON WHEAT
RICE, BARLEY AND CORN**

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(Received July 29, 1984)

Pathogenicity of several molds known to cause damage in storage was determined on selected varieties/types of stored food grains. Seeds almost free from fungi were inoculated separately with *Aspergillus flavus*, *A. amstelodami* and *Penicillium cyclopium* and a mixture of two *Aspergillus* species and then stored for three months. Seeds yielded the inoculated organisms in 90% of cases when surface disinfected and plated on PDA. Germinability of the grains was also reduced considerably. Control seeds remained free of fungi and had a high germination percentage.

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CHEMICAL CONTROL OF *ASPERGILLUS FLAVUS* AND *PENICILLIUM CYCLOPIUM* IN STORAGE

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(Received July 29, 1984.)

Effect of chemicals to inhibit storage fungi was investigated. Grains inoculated separately with *Aspergillus flavus*, *Penicillium cyclopium* and a mixture of the two species were treated with 1% Luprosil (99.9% propionic acid). After three months, storage, gains yielded almost no inoculated fungi when surface disinfected and plated on media. Grains inoculated but not treated yielded the inoculated fungi in more than 90% of cases. One percent acetic acid when applied to the inoculated grains was relatively less effective than Luprosil in inhibiting the fungi.

Technology Section

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FOOD QUALITY PRESERVATION BY MEANS OF PACKAGING

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(Received, November 12, 1984)

Food quality preservation studies were carried out on five traditional sweets of Japan for a period of 15 days. These sweets were packaged in KOP/PE (a laminate of polyvinylidene-coated oriented polypropylene and polyethylene) and PE (polyethylene) pouches, with or without Free Oxygen Absorber (FOA) and stored for a period of 15 days at 25° with Relative Humidity = 70-95%. Physical examination of the pouches was carried out daily. Head-space gas analysis was carried out at regular intervals of five days. KOP/PE pouches with oxygen absorber were found to be the best packaging system. Oxygen was totally removed from the pouches. Microbial growth was either totally inhibited or slight microbial growth was visible only after 13 days of storage. The pouches kept their shapes, the only exception being the package containing "Mizuyokan", which swelled up due to the formation of large volumes of carbon dioxide by anaerobic fermentation. In the absence of oxygen absorber, the KOP/PE pouch was not found preferable to the PE pouch. Swelling was caused in most of the samples due to the retention of carbon dioxide formed inside the pouch. However, KOP/PE packaging delayed the onset of microbial growth in some cases. Use of oxygen absorber in PE pouches caused extensive shrinkage of the pouches due to the absorption of oxygen and the elimination of nitrogen from the pouches due to its higher partial pressure than ambient.

CHARACTERISTICS OF KENAF FIBRES

Part II. Chemical Characteristics

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(Received, September 1981; revised, November 12, 1984)

Samples of kenaf, *vulgaris* and *viridix*, collected at four different stages of maturity, viz., pre-flowering, flowering, small pod and seed maturity, and obtained through several different methods of retting, were subjected to analyses for hollocellulose, cellulose, lignin, pentosans and ash contents as well as for solubility losses due to alcohol, α -hydrolysis, β -hydrolysis and acid purification. Various trends and relationships were examined.

EFFECTS OF RETANNING FOR BETTER UTILISATION OF LOW GRADE SHEEPSKINS

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(Received March, 19, 1983)

Generally 20-25% of all available skins are of poor hide-substance. Investigations were made to convert the inferior skins into quality leather of high Ts with considerable tensile and bursting strength rendering them fit for case, wallet and glove leather. Two different processes were followed. The first process comprises polymerisation-tannage followed by chrome retannage. The second process is based on the principle of retanning of combination tanned leather. The products in each case were compared with their corresponding (chrome tanned) sides of the same skins. In the first case, thickness of the product was seen to increase by 50% with diminished surface having Ts between 98-110°. Weight-gains, of course, were not above 25%. In the second case, Ts of the product ranged from 115-128° with weight-gains and thickness-increase by 60% and 63% respectively when compared to straight chrome tanned sides of about 3.5% chromic oxide content. Tensile and bursting strength were nominally less than that of the straight chrome tanned sides.