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POZZOLANIC PROPERTIES OF BURNT CLAYS

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Some surface clays from the areas surrounding Lahore and some clays from Mianwali have been investigated for producing pozzolanic materials. Differential thermal analysis was carried out to determine the nature of clay mineral. Optimum burning temperature for each clay was determined through a series of firing tests and subsequent checking for pozzolanic properties by lime-reactivity test. Compressive strength values were compared with Portland cement mortars.

Key words : Pozzolana, Burnt clays, Pozzolanic cement.

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THE EFFECT OF THE SUBSTITUENTS ON THE CARBONYL ABSORPTIONS OF 2H-PYRID-2-ONES AND 2H-THIOPYRAN-2-ONES

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(Received June 11, 1986; revised November 25, 1987)

The infrared spectra of a number of substituted 2H-pyrid-2-ones and 2H-thiopyran-2-ones have been measured in the carbonyl stretching vibration region and interpreted in terms of the chemical effect of the substituents. In general, the presence of electron withdrawing substituents at the 1 - or 3 - or 3, 5-positions and electron donating substituents at the 1 - or 4 - or 5-positions of the 2-pyridone have been found to raise and lower the carbonyl absorption respectively. The substituted 2H-thiopyran-2-ones show an appreciable decrease in their carbonyl absorptions as compared to the corresponding 2-pyridones.

Key words : Effect, Substituents, Carbonyl absorptions, 2-Pyridones.

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LIPID STUDIES ON *CANDIDA BOIDINII* GROWN ON METHANOL

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(Received July 3, 1986; revised December 21, 1987)

The carbon source for aerobically grown culture of *Candida boidinii* influenced the lipid content and the fatty acid composition of the lipid components. Effects of nitrogen source were observed with different concentrations of ammonium sulphate. Cells grown in glucose and methanol in the presence of ammonia nitrogen respectively produced 22.1 % and 12.0 % total lipids. TLC results revealed that the major components of the total lipids were phospholipids (58-60 %). Among the non polar lipids the major components were triglycerides and free fatty acids. The GLC analysis showed that the lipid principally consisted of unsaturated acids with both carbon sources.

Key words: Candida boidinii; Phospholipids; Triglycerdies; Ammonium sulphate; Methanol.

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A STUDY OF THE RING EXPANSION REACTIONS OF PYRAZOLES AND SUBSTITUTED PYRAZOLES WITH CARBON TETRACHLORIDE AT HIGH TEMPERATURE IN THE VAPOUR PHASE

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(Received September 20, 1986; revised December 27, 1987)

The ring expansion reactions of trichloromethyl radicles, generated in the vapour phase from carbon tetrachloride in a flow system at 550° with pyrazoles and N-substituted pyrazoles specially those cases where the diazoles have some similarity with N-and C-substituted pyrazoles, have been investigated. [8]. Unchlorinated ring expansion compounds were the major products obtained from N-substituted pyrazoles while pyrazoles yielded chlorinated products as the major components of the reaction mixture. The products obtained from the reaction of pyrazoles and N-carbon tetrachloride were also compared with those obtained from the reactions of pyrazoles and chloroform [8] under identical conditions.

Key words: Pyrazoles and Carbon tetrachloride.

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AN ELECTROLYTIC REDUCTION METHOD FOR THE DETERMINATION OF FENITROTHION AND METHYL PARATHION

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(Received September 7, 1987; revised December 15, 1987)

Fenitrothion or methyl parathion may be determined by polarography in an ethanolic solution at pH=7.0 using a Sorensen's buffer solution as supporting electrolyte and 0.5% gelatin as maximum suppressor at 25±1°. The method can be well adopted even in the presence of malathion, where other analytical techniques are inapplicable.

Key words: Pesticides, Homologues, Reduction.

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CONTENTS OF SELECTED MACRONUTRIENTS IN VARIOUS MARINE FISH FROM THE ARABIAN SEA

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(Received September 2, 1987; revised December 22, 1987)

Twelve marine fish species from the Arabian Sea were selected for the estimation of calcium, sodium, potassium and magnesium by atomic absorption technique. The species included in the study were salmon, tuna, pomfret black, pomfret silver, longtail tuna, Indian oil-sardine, toli shad, giant catfish, talang queen fish, silver grunt and gold lined seabream. The macronutrient estimation was performed in the edible muscle of these species to check their nutritional quality on the basis of recommended dietary allowances laid down internationally. The observed clacium range was 95-210 μg/g (wet weight basis) with an average of 131.5 μg/g for all species. The potassium content ranged from 1648 to 3015 μg/g, while the levels of magnesium ranged from 150 to 330 μg/g. Similarly, sodium levels were averaged at the extremum values of 350 and 1210 μg/g. On the whole, almost all the fish species were found to be potential sources of the macronutrients.

Key words: Macronutrients in fish, Marine fish analysis.

Short Communication
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HYDROLOGICAL STUDIES OF LYARI RIVER

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Biological Sciences Section

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PRODUCTION OF BACITRACIN BY *BACILLUS LICHENIFORMIS*

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(Received July 5, 1987; revised January 26, 1988)

The production of antibiotic bacitracin was studied in starch-glucose-soybean meal medium by *Bacillus licheniformis* PCSIR-72 in shake flasks. The effect of the replacement of (i) soybean meal by sunflower or pharmamedia and (ii) glucose by mannose, sucrose, lactose or beet molasses was investigated. The production of the antibiotic, however, was found to be maximum in the presence of soybean meal and sucrose or mannose. The pH near neutral was optimum for maximum bacitracin production. The effect of aeration by changing the volume (25-100 ml) of the basal medium in 250 ml flask was studied. The antibiotic titre was maximum in flasks containing 25 ml basal medium. Scaled up production of antibiotic in 10 litre glass-stainless steel fermenter was very fast and reached maximum in 28 hr. after inoculation instead of 44 hr. in shake flasks.

Key words: Bacitracin, *Bacillus licheniformis*, Antibiotic.

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POND CULTURE OF PENAEID SHRIMPS IN THE INDUS DELTA AREA

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(Received October 20, 1987; revised January 13, 1988)

Preliminary investigations were conducted in an experimental pond having an area of 50 m x 50 m x 2.5 m. 5000 juveniles of *Metapenaeus affinis,* 2000 of *Penaeus indicus* and 40 juveniles of *P. semisulcatus* were stocked at 2.5 to 5 cm size. After feeding for 80 days the shrimps were harvested on 25 November, 1987. The catch was 70 kg shrimps. 1.06 mm/day growth and 0.15 g/day increase in weight for *p. indicus* and 1.0 mm/day growth and 0.14 g/day increase in weight for *M. affinis* were observed. A very high 1.86 mm/day growth rate and 0.81 g/day increase in weight was recorded for *Penaeus* semisulcatus.

Key words: Wood cutting, Stocking, Maturation, Growth rate.

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COMPARATIVE MORPHOLOGY OF ALIMENTARY ORGANS OF SOME PYRRHOCOROIDS (HEMIPTERA: TRICHOPHORA)*

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(Received January 26, 1987; revised January 7, 1988)

Comparative accounts of alimentary organs and salivary glands of *Antilochus* sp., *Dysdercus koenigii* (Fabr.), *Pyrrhocoris apterus* (Linn.) and *Scantius* sp., are given and compared in a tabular form with those of other pyrrhocoroids reported in the literature.

Key words: Comparative morphology, Alimentary structures, Pyrrhocoroidea.

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SOME PYRENOMYCETOUS FUNGI FROM LAHORE

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(Received December 13, 1986; revised December 10, 1987)

Four ascomycetous fungi, viz *Podospora curvicola* (Wint.) Niessl., *P. badia* sp. nov., *P. trichomanes* Lundq. and *Poronia minuta* petch have been described from Badian, a salt affected area of Lahore.

Key words: Pyrenomycetous fungi.

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MONITORING OF FRESH MILK FOR ORGANOCHLORINE PESTICIDE RESIDUES IN KARACHI

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(Received September 2, 1986; revised December 29, 1987)

Milk supplies in the Karachi Cattle Colony were monitored for organochlorine pesticide residues in the year 1984. A total of 79 samples of milk were analyzed out of which approximately 40% of the samples were found to be contaminated with either BHC isomers, pp′-DDT, pp′DDE, heptachlor epoxide, aldrin or dieldrin. The most frequently occurring pesticide was γ-BHC. The presence of aldrin residues in milk indicates that this product is still being used in Pakistan although its sale was banned in the 1970's. Recovery studies of pesticides added to milk are also included.

Key words: Chlorinated hydrocarbon residues, Fresh milk, Karachi.

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ORGANOCHLORINE PESTICIDE RESIDUES IN CATTLE DRINKING WATER

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(Received August 25, 1987; revised December 28, 1987)

Seventy-nine samples of cattle drinking water drawn from the Karachi Cattle Colony were monitored for organochlorine pesticides in 1984. Nearly 13% of the samples were found to be contaminated with different chlorinated pesticides or their metabolites. Recovery studies of thirteen pesticides at different spiking levels are also included in the paper. It ranged between 76 and 107% for different compounds.

Key words: Chlorinated pesticides, Water samples, Gas chromatography.

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CONSUMPTIVE USE OF WATER FOR POTATO

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(Received December 24, 1986; revised January 6, 1988)

Cordinal variety of potato was planted on ridges during three years of experimentation. Actual consumptive use (EtA) of water worked out by gravimetric method was 388, 365, 333 and 288 mm, respectively, and the values by irrigation method were 397, 389, 342 and 289 mm for 40, 55, 70 and 85 % depletion levels respectively.

Maximum tuber yield 19.47 tons ha^{-1} was observed under 40 % depletion level, followed by 17.45, 14.29 and 11.58 tons ha^{-1} respectively for 55, 70 and 85 % depletion of available moisture. Pan evaporation values were higher than EtP during initial stages of crop growth, then EtP exceeded for some time and Pan evaporation values were higher than EtP at the end of the season. The moisture depletion of 40 % was found to be the best level regarding EtA, tuber yield and crop water use efficiency for successfull potato production.

Key words: Potato, EtA, Consumptive use of water.

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INTERCROPPING OF WHEAT IN POTATO

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(Received September 20, 1987; revised January 19, 1988)

An experiment was carried out at the Agronomy Field Laboratory, Bangladesh Agricultural University, Mymensingh from December 1985 to April 1986 to determine the productivity of wheat potato intercropping at different planting arrangements. The spacings maintained between rows of potato were 40 x 25 cm; 50 x 25 cm; 60 x 25 cm and 70 x 25 cm where wheat was cultivated as intercrop. The results showed that the Income Equivalent Ratio (IER) was higher in all the treatments indicating the profitability of intercropping. Planting arrangement of potato having 50 x 25 cm + wheat appeared to be the best combination.

Key words: Wheat, Potato, Intercrop.

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EFFECT OF ROW SPACINGS ON THE EFFICIENCY OF TWO SAFFLOWER VARIETIES

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(Received January 21, 1985; revised January 19, 1988)

The Gila (spined) variety of safflower produced maximum number of branches, capitula per plant per hectare and per capitulam seed yield, whereas maximum plant height, seeds per capitula and 1000 seeds weight was recorded by the local (spineless) variety.

The maximum plant height, number of branches, capitula per plant and 1000 seeds weight was produced in 60 cm rows apart, while 90, 75 and 45 cm rows apart gave maximum seeds, seed weight per capitulam and per hectare seed yield respectively.

The treatment interaction in all the observations statistically were non-significant.

Key words: Capitula, Gila, Capitulam.

Short Communication
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CHROMIUM IN DIABETES AND IN CARDIOLOGY

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Technology Section

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THE INFLUENCE OF SOME FACTORS ON THE MANUFACTURE AND PROPERTIES OF "ZABADY"

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(Received December 6, 1987)

The present results showed that no pronounced changes were observed in titratable acidity and pH values during the manufacture of "zabady" as affected by the amount of starter added and homogenization. Heat treatments caused some effect in this respect.

The chemical composition of fresh "zabady" was slightly affected by homogenization and the heat treatments applied. Moreover, homogenization improved the physical properties of fresh and stored zabady.

Key words: Zabady, Manufacture and properties.

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ESTIMATION OF SULPHIDE IN LAKES/RIVERS WATER AND INDUSTRIAL EFFLUENTS

Kamin Khan, M. Amin and M.A. Khattak

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(Received June 3, 1987; revised October 11, 1987)

A colorimetric method has been developed for the determination of micro-gram amount of sulphide in water. The method is based on staining small strips of filter papers dipped in a concentrated solution of lead acetate and the formation of lead sulphide due to the evolution of the H_2S from the samples. The method was successfully applied for the micro-estimation of sulphide in water samples of the Kabul river, Kheshki lake and Industrial effluents. The detection limit was as low as 0.01 μg/ml and the effect of the interfering radicals on the method are also assessed.

Key words: Sulphides; Water; Effluents.

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PRODUCTION OF PURE ALUMINIUM SULPHATE FROM COMMERCIAL ALUM

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(Received April, 15, 1987; revised January 21, 1988)

Aluminium sulphate is produced within the country from imported hydrated alumina. The commercial grade alum, however, contains certain impurities due to which it cannot be used in paper and textile Industries. Iron is one of the major objectionable impurities which imparts undesirable stain on fibre and fabric even if present in traces. Efforts were made towards removal of traces of iron by oxidizing ferrous iron into ferric state, which is subsequently precipitated in acidic media. Parameters for quantitative oxidation and subsequent removal established.

Key words: Iron, Aluminium sulphate, Commercial alum.