

Physical Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

SYNTHESIS OF HETEROBICYCLIC COMPOUNDS

Part IV. Formation of 2H-1,3-Benzothiazine and 1,2,3,4-Tetrahydroquinazoline Derivatives

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(Received February 28, 1972; revised May 13, 1972)

Abstract. A general route towards the formation of 2 and 3-substituted 2H-1,3-benzothiazine and 1,2,3,4-tetrahydroquinazoline is described.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

FURTHER OBSERVATIONS ON SOLVENT EFFECTS IN THE EPOXIDATION OF CYCLOHEXENE

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(Received July 16, 1971; revised January 31, 1972)

Abstract. Epoxidation of cyclohexene with peroxybenzoic acid (PBA) in 2-methoxy-ethanol, n-propanol, acetone, ethanol, methanol, dimethylformamide, acetonitrile, carbon tetrachloride, benzene, *o*-xylene and toluene has been studied at $40^{\circ}(\pm 0.5^{\circ}\text{C})$. It has been observed that the rate constant is inversely proportional to the dielectric constant of the solvent employed.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

FURTHER STUDIES IN THE AJMALINE SERIES

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(Received April 21, 1972; revised July 26, 1972)

Abstract. The preparation of a number of new derivatives of ajmaline and isoajmaline with substitution in the aromatic ring of the two bases are described. NMR studies revealed that the electrophilic substitution in ajmaline takes place at C-10.

STUDIES ON HETEROCYCLICS**Part III. The IR Spectra of Some Quinoxaline N-oxides**

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(Received April 11, 1972; revised July 29, 1972)

Abstract. The IR spectra of several quinoxaline 1-oxides, quinoxaline 1,4-dioxides, quinoxalin-3-one 1-oxides and 1-hydroxyquinoxalin-2,3-diones (2,3-dihydroxyquinoxaline 1-oxides) have been determined. Assignments for ring stretching vibrations, carbonyl stretching frequencies and *N*-oxide vibrations have been suggested.

**AN ANALYTICAL METHOD FOR THE DETECTION OF FLUCTUATIONS IN THE
TEMPERATURE FUNCTION OF VARIOUS PROPERTIES OF WATER**

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(Received October 8, 1971)

Special Paper

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

CARBALKOXYNITRENES

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(Received March 20, 1972)

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

CLEAVAGES OF 1,2,3,5,6,11-HEXAHYDRO-3- OXOINDOLIZINO [8, 7-b] INDOL-4-IUM TETRAFLUOROBORATE

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(Received November 1, 1972)

REACTIONS OF HARMALINE AND ITS DERIVATIVES

Part. III¹

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(Received November 1, 1972)

Biological Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

USE OF Co⁶⁰ GAMMA IRRADIATION AGAINST SOME POSTHARVEST DECAY PATHOGENS OF CITRUS FRUIT IN TURKEY*

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(Received October 16, 1972)

Abstract. Investigations were carried out *in vivo* and *in vitro*, on some decay pathogens, to determine the possibility of using Co⁶⁰ gamma irradiation, to extend the shelf and storage life of citrus fruit. Tests *in vivo* showed that a dose of 200-300 Krad was effective for decay control incited by *Penicillium italicum*, *P. digitatum*, *Phytophthora citrophthora*, *P. parasitica*, and *Geotrichum candidum*. The problem of organoleptic changes was mostly encountered when exploiting the above determined dosages in case the quality of the fruit was poor, whereas in good quality fruit the dosages were efficient and remarkably increased the storage and shelf life. However, a low dose of 100-200 Krads has been suggested. In *in vitro* tests the germination of the spores of decay pathogens and their rates were correspondingly influenced with the increasing amount of gamma dose delivered. A higher dose caused a depletion in vitamin C content of citrus fruit.

EVALUATION OF PROTEINS OF SOME MARINE EDIBLE FISH FOUND AROUND KARACHI COAST

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(Received March 9, 1972)

Abstract. Proteins extracted from fourteen different marine edible fish found around Karachi coast were analysed for amino acid contents and net protein utilisation (NPU) value by rat assay. When compared with FAO reference protein, the fish proteins were found to contain adequate amounts of essential amino acids except for slight deficiencies for tryptophan, sulphur, amino acids and lysine. NPU standardised values ranged from 86-100% which corroborated the results of chemical analysis. It was observed that NPU (st) values compared within $\pm 10\%$ (except for dawan and khokhar) with the protein scores calculated by using FAO 1957 Amino Acid Pattern. Protein scores calculated by FAO 1965 Pattern are consistently lower than those calculated by 1957 Pattern of NPU (st) values.

COMPARATIVE CYTOLOGY OF SELF-COMPATIBLE AND SELF-INCOMPATIBLE APRICOTS

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(Received November 29, 1971)

Abstract. Pollen-tube growth and fertilization were studied in two apricot clones and five representative F1 seedlings, to determine whether incompatibility is responsible for the higher degree of sterility in most members of the progeny. Hand-pollination in the laboratory of emasculated flowers included (a) self and cross-pollination of the parents, Perfection and University of California selection 3-10, (b) self-pollination involving two and three cross-pollinations involving four members, all representing a cross-section of the fruiting behaviour of the F1 progeny. Pistils were fixed at 6 hr intervals up to 96 hr after pollination and serial sections were studied for the extent of pollen-tube growth at each time of fixation and for pollen-tube features indicating incompatibility. Evidence of incompatibility appeared in all pollinations, in inhibition of growth of some tubes, in their coiling, and having swollen or bent ends. Evidence has been cited to suggest that incompatibility in apricot probably involves the gametophytic system of pollen control. The evidence also led to the hypothesis that most of the fertility in plants concerned here is pseudofertility.

**TWO NEW SPECIES OF SALDIDAE FROM WEST PAKISTAN
(HEMIPTERA : HETEROPTERA)***

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(Received January 3, 1972; revised February 14, 1972)

Abstract. The family Saldidae has not been so far reported from West Pakistan. This study describes, for the first time, two new species of Saldidae, *Saldula korangiensis* and *S. minor* from Karachi, Sind Province, West Pakistan. The dorsal view of both species as well as male and female genitalia are illustrated and a key to Pakistani species is included.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

SOME NEW ADDITIONS TO THE TYPHLOCYBINE FAUNA OF EAST PAKISTAN

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(Received January 5, 1972; revised April 11, 1972)

Abstract. The typhlocybina fauna (Cicadellidae:Homoptera) reported from East Pakistan consists of 23 species under 13 genera. Present account adds 9 species under 7 genera. Of these *Paolia tangailensis*, *Empoasca profusa*, *Amrasca curvata*, *Helionida dumurae*, *Zygina niazii*, and *Empoasca spinosa*, are new to science, whereas species *Motschulskia serrata* (Matsumura), *Typhlocyba longicephala* Ahmed, and *Empoasca terminalis* Distant are new reports from East Pakistan.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October, 1972

ACUTE TOXICITY OF FIVE CHLORINATED HYDROCARBON INSECTICIDES TO THE FISH, *CHANNA PUNCTATUTS*

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(Received October 13, 1971; revised March 10, 1972)

Abstract. A study of the acute toxicity of five chlorinated hydrocarbon insecticides to the fish, *Channa punctatus*, was carried out. The insecticides in decreasing order of toxicity to the fish were Endrin, Dieldrin, DDT, Aldrin and BHC, respectively. The behaviour of fish during exposure to insecticides was also observed.

SHARKS, SKATES AND RAYS OF THE ARABIAN SEA**M. RAHIMULLAH QURESHI***198, Bahadurabad, Road No. 11, Karachi 5*

(Received October 20, 1971)

Abstract. This paper is based on the study of 26 species of sharks, 3 of saw fishes, 3 of guitar fishes and many sting rays, giant rays and cow rays (class Elasmobranchii). This study included landings on the Karachi Fish Harbour, on the coasts of Sind and Mekran and on the departmental and other trawlers. Mention has been made of the byproducts produced in the Biochemical Laboratory of the P.C.S.I.R., Karachi. Although elasmobranchs have been described by many authors but the publications are scattered and many are not easily available, some have become out-of-date.

Short Communication

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A COMPLEX DISEASE OF TOMATO AND PAPAYA CAUSED BY NEMATODE-FUNGI ASSOCIATION IN PAKISTAN

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(Received January 6, 1972)

Technology Section

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

INDUCTION OF RIPENING DELAY IN MANGOES (VAR. DUSEHRI) BY GAMMA IRRADIATION AND REFRIGERATION

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(Received March 10, 1972)

Abstract. Effect of gamma irradiation alone and in combination with curing (pal) and refrigeration was studied for causing delay in ripening of 'dusehri' mangoes. Biochemical and physiological parameters investigated during storage included ethylene production, pectic substances, ascorbic acid, sugars, acidity, total carotenoids and total soluble solids. A radiation dose of 30 Krad was found to be optimum for causing a ripening delay of 7 days in mangoes when stored at room temperature (35-38°C). Visual observations revealed that refrigeration did not appear to have any added benefit with irradiation for extending the shelf life of this fruit. Both irradiated and unirradiated mangoes ripened normally under various curing conditions, although the delaying effect of irradiation was maintained. *Aspergillus niger* and *A. flavus* were primarily responsible for the spoilage of mangoes.

PRELIMINARY STUDIES ON THE PRESERVATION OF FALSA (GREWIA ASIATICA)

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(Received February 21, 1972; revised May 9, 1972)

Abstract. Some effects of gamma radiation and packing in polyethylene bags were studied on 'falsa'. Fruit packed in polyethylene bags containing KMnO_4 developed proper colour and remained in good condition for 5 days (at 25°C) while the condition of control fruit deteriorated after 2 days. There was an increase in sugars, while ascorbic acid and acidity decreased during ripening. *Alternaria* sp. and *Helminthosporium* sp. seemed to cause fruit decay.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

SPECTROPHOTOMETRIC DETERMINATION OF 1-MONOGLYCERIDES IN FATS

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(Received June 21, 1971; revised January 31, 1972)

Abstract. A method for the determination of a small amount of 1-monoglycerides in fats has been described. The method is based on a quantitative periodic acid oxidation—the resultant formaldehyde giving magenta colour with Schiff's reagent is determined spectrophotometrically. The method is quite accurate for samples containing both small as well as large amounts of 1-monoglycerides.

VOLUME-COMPOSITION STUDY OF SILICATE GLASSES

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(Received January 22, 1972; revised February 21, 1972)

Abstract. The density of the ternary and quarternary silicate glasses was measured at room temperature. The density derivative V_0 dependent upon R , the number of oxygen ions per network former, led to the critical study of the relationship $V_0 = V_0^0 / 1 - Rx$. For the same molar composition both X and V_0 vary as a function of cation radius.

LOSS OF DIAZINON FROM DACCA PADDY FIELD SOILS

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(Received October 7, 1971; revised February 28, 1972)

Abstract. Soils from three different areas near to Dacca decomposed aqueous solution of Diazinon. 100 g each of the mixed soils decomposed about 5 mg Diazinon in 24 hr. The rate of decomposition was not influenced by aeration. Little Diazinon was degraded by heat sterilized soil suggesting the action of living organisms. This was confirmed by growing a suspension of a pure culture of soil microflora which decomposed Diazinon and was also heat labile. Decomposition stopped when about half the Diazinon was decomposed.

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FUNGICIDAL AND ANTIFOULING PROPERTIES OF HALOMERCURYACETALDEHYDES

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(Received January 13, 1972; revised April 13, 1972)

Abstract. A study has been made of the fungicidal and antifouling properties of halo-mercuryacetaldehydes. The fungicidal action was tested against the organism *Aspergillus niger* (vanteigh) and the results were compared with phenylmercury halides and acetates. Iodomercuryacetaldehyde was found to be the most effective, while the bromo and chloromercuryacetaldehydes were rather weaker fungicides. Antifouling tests were carried out by impregnating the candidate antifoulants on porous panels and immersing them under the sea. The preliminary investigations revealed that these compounds might be antifoulants.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

STUDIES IN THE PREPARATION OF OXIDATION-RESISTANT MODIFIED ROSINS

Part II. Preparation and Properties of Stable Fused and Precipitated Cobalt Rosinates

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(Received March 18, 1972)

Abstract. Cobalt derivatives of oxidation-resistant sulphur-modified rosins by fusion and precipitation methods have been prepared. Fused rosinates do not block and varying amounts of cobalt have been incorporated successfully up to a maximum of equivalent combining ratio. The improvement in properties, i.e. stability, Co content, solubility and rate of drying, have been studied in this paper.

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

SULPHUR DYES FROM BLACK LIQUOR

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(Received January 19, 1972; revised May 5, 1972)

Abstract. Black liquor, a waste product of paper mills, has been utilized for preparing dark brown sulphur dyes. The lignin obtained on acidification of black liquor was thionated both by liquid and dry methods under different conditions. Dye obtained by dry thionation under certain conditions was fast to washing and light. It was comparable in substantivity to sulphur brown. It had a Dygar strength of 115% as compared to commercial sulphur brown of 25%.

EFFECT OF pH, TEMPERATURE AND SALT CONCENTRATION ON THE FELTABILITY OF WOOL

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(Received January 5, 1972; revised March 25, 1972)

Abstract. It has been shown that while the feltability of loose wool broadly increases with increasing acidity, i.e. decreases with increasing alkalinity up to pH 9-10, there is a peculiar increase around pH 7, followed by a definite decrease and then again a conspicuous increase beyond pH 10. Different quantities of NaCl dissolved in the felting medium accelerate the felting at pH 1.2, but reduce it at pH 5.6 and pH 9.2 under similar conditions. The effect of change of temperature of the felting liquor from 30 to 100°C on the degree of felting has also been investigated at different pH values.

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

EFFECT OF SALTING (PARTIAL DEHYDRATION) GREEN PEAS PRIOR TO DEHYDRATION ON THE QUALITY OF DEHYDRATED PEAS

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(Received February 12, 1972; revised April 18, 1972)

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

**SUPPRESSION OF REGROWTH OF MESQUITE
(PROSOPIS SIPCIGERA) BY TRIOXONE '100'
(2,4,5-TRICHLOROPHENOXY ACETIC ACID)**

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(Received April 22, 1971; revised March 20, 1972)

Pakistan J. Sci. Ind. Res., Vol. 15, Nos. 4-5, August-October 1972

**EFFECT OF AMINO ACIDS AND ORGANIC
ACIDS ON THE GROWTH OF STREPTOMYCES
NRC-101**

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(Received August 13, 1971; revised February 28, 1972)