

Pakistan Journal of Scientific and Industrial Research

Vol. 18, Nos. 3-4

June-August 1975

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Physical Sciences' Section

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SPECTROPHOTOMETRIC DETERMINATION OF TITANIUM AFTER EXTRACTION OF THE Ti(II)-SCN SYSTEM BY HIGH MOLECULAR WEIGHT AMINES

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(Received July 16, 1974; revised January 24, 1975)

Abstract. As investigation of the complex formed between Ti(II) and thiocyanate in sulphuric acid solutions has been carried out, and its extractability by high molecular weight (HMWA) tertiary amines in organic solvents examined. The orange yellow complex is quantitatively extractable from an aqueous phase into an organic phase containing tribenzylamine or Allamine 336. On the basis of this extractability a new method has been developed for the spectrophotometric determination of traces of titanium (0.1-1 p.p.m.) in presence of other elements. Comparison of the absorption spectra of the coloured species in the aqueous and amine phases indicate the presence of the same absorption species in each medium. The extractability of the complex by HMWA suggests that the coloured species is anionic.

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CONSTITUENTS OF ACER PENTAPOMICUM

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(Received December 2, 1974)

Abstract. Gallic acid and its methyl and ethyl esters have been isolated from the leaves of *A. pentapomicum* and identified by IR and NMR spectroscopy and mass spectrometry of the ester triacetates.

Review

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

**ALKALOIDS OF SOME OF THE PLANTS
OF THE COMPOSITAE**

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(Received February 10, 1975)

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

DIAZIRIDINES

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(Received September 19, 1974; revised January 30, 1975)

Short Communication

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

ANALYTICAL APPLICATION OF LINEAR SCAN AND/OR CYCLIC VOLTAMMETRY PEAK CURRENT

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(Received October 31, 1974)

Biological Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

MITES FROM MAMMALS OF WEST PAKISTAN

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(Received April 5, 1975)

Abstract. Nearly 15,000 gamasine mites of 46 species and 17 genera were identified from mammals of 29 species and 26 genera taken from 79 localities in West Pakistan between September, 1962 and May, 1967. Mites of *Laelaps pavlovskyi* were found in greater numbers than those of other species, although *Eulaelaps stabularis*, *L. algericus*, and *L. nuttalli* were on the greatest variety of hosts. Mammals of the genus *Meriones* were the most heavily infested, although greater varieties of mites were found on *Apodemus* and *Mus*. Most of the species of mites were widely distributed geographically, but *L. pavlovskyi*, *L. algericus*, and *Allodermanyssus sanguineus* were not found in some localities even though their common hosts occurred there.

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

COMPARATIVE EXTERNAL CEPHALIC MORPHOLOGY OF SOME COREOIDS (HETEROPTERA : COREOIDEA) WITH REFERENCE TO THEIR PHYLOGENY*

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(Received October 15, 1974; revised January 13, 1975)

Abstract. The comparative external cephalic morphology of 9 species of the families Stenocephalidae, Rhopalidae, Alydidae and Coreidae of the superfamily Coreoidea is studied in detail in addition to an examination of all the representatives of these families from Pakistan and East Bengal. The results are compared with the data available in the existing literature and on the basis of these characters the phylogenetic positions of these families are also briefly discussed.

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

REARING THE LARVAE OF *DACUS ZONATUS** IN MEDIA WITH INEXPENSIVE AND READILY AVAILABLE AGRICULTURAL BYPRODUCTS†

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(Received June 5, 1974; revised February 27, 1975)

Abstract. Certain low-cost ingredients were found to be satisfactory, in combination with wheat shorts, for rearing the larvae of *Dacus zonatus* (Saunders). The flies were reared successfully for 3 consecutive generations when sugarcane bagasse or rice husk was substituted partially for the standard wheat shorts in the larval medium, but mango sawdust, also evaluated in combination with wheat shorts, was not effective. Molasses was found to be as satisfactory as granulated sugar in the larval diet.

MORPHOLOGY AND BIOCHEMISTRY OF HUMAN CATARACTS STUDIED IN PAKISTAN*

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(Received February 10, 1975)

Abstract. Human cataractous lenses were studied *in vivo* and *in vitro* in this Department. The site and extent of opacities were the basis of classifying immature cataracts *in vivo*. *In vitro* cataracts were classified on the basis of colour, consistency and transparency. There is an early age incidence of cataracts in Pakistan as compared to European countries. Diabetics get an early senile change, starting with posterior subcapsular opacities probably due to metabolic changes in vitreous.

In the light of biochemical studies and the views presented by van Heyningen and Kinoshita it was concluded that glutathione when present in high concentration inhibits oxidative mechanism in the lens which causes inhibition of soluble proteins leading to cataract formation. A parallel decrease of reduced ascorbic acid with respect to reduced glutathione suggested that in the energy metabolism of lens ascorbate reductase is the key enzyme.

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

FACTORS AFFECTING THE PRODUCTION OF PROTEINS BY AZOTOBACTER CHROOCOCCUM

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(Received August 19, 1974; revised March 12, 1975)

Abstract. The aeration intensity as well as different organic supplements were tested as factors affecting the utilization of glucose and the synthesis of proteins by *A. chroococcum* when cultivated in a laboratory fermentor. The best aeration intensity was 1.0 litre air/1.0 litre of medium/min. Addition of vitamins to the fermentation medium was not effective in this respect. Acetate, α -ketoglutarate, succinate, malate and fumarate accelerated the utilization of glucose and reduced the fermentation period.

Short Communications

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AN ALKALINE PHOSPHATASE FROM FLOWERS OF CALOTROPIS PROCERA

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(Received September 10, 1974)

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

BIOLOGICAL POLLUTION (SEWERAGE FUNGI)
Part I

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(Received June 18, 1974; revised January 2, 1975)

Technology Section

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

THE INFLUENCE OF TIME AND METHOD OF APPLICATION OF SUPERPHOSPHATE ON THE AVAILABILITY OF P TO COTTON AND THE P CONTENT OF COTTON LEAVES

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(Received December 18, 1974; revised February 27, 1975)

Abstract. Fraction of P taken up by cotton (*Gossypium hirsutum* L.) from labelled superphosphate fertilizer varied from as little as 2% (30 days after sowing) to as high as 65% (60 days after sowing). The available P supplied by soil ('A' value) was highest at the initial stages of growth and decreased gradually with time. The maximum benefit of applied fertilizer was obtained when it was applied at least 30 days after sowing. No significant difference in the P content of cotton leaf was observed when superphosphate was applied by broadcast or by banding.

COMMERCIAL UTILIZATION OF LILACEAE YUCCA, GLAUCA (BEAR GRASS)

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(Received July 26, 1974; revised January 30, 1975)

Abstract. *Yucca (glauca)* i.e., bear grass is a plant, widely grown in Hazara district. Studies were carried out on the extraction of fibres from the leaves of the plant and all important physical and chemical characteristics of the fibres were determined and compared with the characteristics of bast fibres. It was found that most of the physical and chemical characteristics are similar to a considerable extent to the chief bast fibres i.e., flax, hemp, ramie and jute. The possibility of growing the plant and its commercial utilization have been discussed.

AGITATION LEACHING OF SAINDAK OXIDIZED COPPER ORE USING SULPHURIC ACID

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(Received November 18, 1974; revised March 19, 1975)

Abstract. Investigation of agitation leaching of Saindak oxidized copper ore using 10-100 g/l sulphuric acid has been carried out with a view to optimize particle size, acid consumption, and liquid-solid ratio. Copper extraction up to 96% was achieved using ore of —60 mesh size, a liquid-solid ratio of 2.5/l, and the corresponding acid consumption was found to be 2.47 kg/kg Cu extracted. The particle size of —8 mesh was found much more convenient from the filtration point of view, but gave 57% recovery in 30 min, with liquid-solid ratio of 2.5/l, and an acid consumption of 2.6 kg/kg Cu extracted. Fines were separated from the crushed ore and were separately leached with the acid. An extraction of 93% was achieved using liquid-solid ratio of 1.5/l with an acid consumption of 4.2 kg/kg Cu extracted. The kinetics studies indicate, that the agitation leaching of the ore is a first order reaction.

EVALUATION OF MUSAKHEL LIMESTONE FOR MAKING COLOURLESS GLASS

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(Received June 5, 1974; revised January 4, 1975)

Abstract. Six limestone formations of Sakesar, Nammal, Khairabad, Ceratite and Productus beds were studied from Musakhel in detail for their uses in colourless glass manufacture. The Productus limestone samples of Permian system contain the minimum Fe_2O_3 contents. After beneficiation one of the samples of this system in combination with Daud Khel¹ sand was used for making colourless glasses and the results were found very satisfactory.

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, June-August 1975

EFFECT OF COOKING ON THE ESSENTIAL AMINO ACID CONTENT AND NET PROTEIN UTILIZATION (NPU) OF COMMON PULSES

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(Received October 9, 1974; revised January 25, 1975)

Abstract. Five commonly grown pulses, gram (Bengal gram), masur (lentil), mung (green gram), mash (black gram), and arhar (red gram) were evaluated for their total amino acid content; available amino acid content and NPU. Pulses contained 23.87-25.31% protein and sufficient quantities of all essential amino acids except methionine and tryptophan. Cooking of pulses caused losses of amino acids to varying degrees but the NPU of cooked pulses was generally higher than uncooked pulses. Gram showed the highest NPU (61.9%).

STUDIES ON THE STORAGE STABILITY OF GUAVA FRUIT JUICE

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(Received November 25, 1974; revised March 1, 1975)

Abstract. Sugared, as well as single strength guava juice samples were subjected to chemical analysis and organoleptic evaluation at 90-day intervals up to a storage period of 270 days. Results of these investigations revealed that though there had been some deteriorations in chemical constituents during storage, yet all the juice samples were organoleptically acceptable with the exception of sugared sample stored without the addition of a preservative. Single strength juice retained higher amount of ascorbic acid (35%) as compared to the sugared sample (25%). Addition of sodium citrate to sugared samples helped in preserving the natural colour and flavour of guava juice. However, in case of single strength juice, the sample without sodium citrate was preferred by the judges as compared to the single strength juice containing sodium citrate.

THE EFFECT OF ROOTSTOCK AND MATURITY ON BITTERNESS IN ORANGE JUICE*

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(Received May 13, 1974; revised January 13, 1975)

Abstract. The effect of rootstock and maturity on the bitterness, limonin content and other physicochemical characteristics of orange juice was determined. The rootstock trials showed that juice from Jaffa oranges grown on Jullundur khatti (rough lemon) and Jatti khatti (rough lemon) contained the highest amount of limonin followed by those grown on Kharna khatta and Seville kimb (sour orange), Mithi (sweet lemon) and Jamberi Lyallpur in decreasing order. Studies on the effect of maturity have shown that the limonin content of Valencia oranges decreased from a high level of 6.2 p.p.m. in December to about 0.9 p.p.m. in following March. Acidity, pH, ascorbic acid and the total soluble solids were also determined in both Jaffa and Valencia orange juices. Organoleptic evaluation confirmed the physicochemical results.

Short Communication

Pakistan J. Sci. Ind. Res., Vol. 18, Nos. 3-4, Juune-August 1975

STUDIES ON THE DIFFERENT PARTS OF THE FLEECE OF HASHTNAGRI SHEEP

Part I. Difference in Felting Potential of Loose Wool Fibres

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(Received August 21, 1974, revised January 16, 1975)