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Physical Sciences Section

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RESCINNAMINOL – A NEW ALKALOID FROM *RAUWOLFIA SERPENTINA* BENTH

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(Received October 11, 1986)

A new yohambanoide, rescinnaminol, has been isolated from the roots of *Rauwolfia serpentina* Benth of Thai origin and its structure has been elucidated through spectroscopic studies.

Key words: *Rauwolfia serpentina*; Rescinnaminol, Yohambanoide

SYNTHESIS OF N-SUBSTITUTED PIPERIDINES

Nucleophilic Displacement of Pyridine by Piperidine From *N*-Substituted Pyridinium Salts

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(Received October 1, 1984; revised March 17, 1986)

N-substituted monocyclic, tricyclic, and pentacyclic-pyridinium salts were prepared by the interaction of pyrylium salts with variable amines. The *N*-substituted pyridinium obtained salts were reacted with piperidine by nucleophilic substitution to give *N*-substituted-piperidines.

Key words: Piperidines and Pyridinium Salts.

ZINC-SORBITOL, DEXTRIN AND CITRIC ACID COMPLEX

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(Received February 27, 1985; revised April 4, 1986)

A preparation containing a complex of zinc, sorbitol, dextrin and citric acid is described. Complex formation with sorbitol alone is not satisfactory and dextrin is an essential component for its stability. The preparation is stable between pH 6 to 8.

Key words: Zinc-sorbitol, Zinc-hexitol chelate and chelate of zinc.

ESTIMATION OF QUALITY CONTROL PARAMETERS AND TRACE METAL LEVELS IN VARIOUS PUBLIC UTILITY WATERS: PART II. — PUNJAB

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(Received December 24, 1984; revised July 2, 1986)

Using standard analytical methods, together with atomic absorption technique, various water quality control parameters and trace metal levels for public utility waters in a selected area of Punjab are estimated and reported. The study entails measurements of alkalinity, hardness, phosphate, nitrate/nitrite, dissolved oxygen and chemical oxygen demand contents in natural, non-treated waters drawn from springs, wells, and tank supplies. The trace metal levels in these waters are estimated for duplicate runs at a precision of $\pm 1.5\%$ for sodium, potassium, copper, iron, zinc, strontium, nickel, cobalt, lead, cadmium, chromium, barium and mercury. The data are reported at $\pm 2S$ confidence level, and discussed in terms of acceptance/rejection of the waters as per maximum allowed tolerable levels for the estimated burden of various parameters.

Key words: Water Quality; Trace Metal Levels in Water; Water Quality Parameters.

CHARACTERISTICS OF LIPIDS AND COMPONENT GLYCERIDES OF ARABIAN CAMEL *CAMELUS DROMEDARIUS* BY GAS CHROMATOGRAPHY

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(Received April 15, 1986; revised July 20, 1986)

Estimation of major fatty acids of triglycerides from the hump, stomach and rump of camel fat was carried out by subjecting the methyl esters to gas chromatography. There is a wide variation in the percentage composition of fatty acids in different parts of the same body. Iodine value, refractive index, saponification value and the ratios of oleic acid to stearic acid and total unsaturated fatty acids to total saturated fatty acids have been determined.

Key words: Characteristics, Lipids and *Camelus dromedarius*.

STUDY OF HEXAMINECOBALT (III) TRICARBONATOCOBALTATE (III) AS ANALYTICAL REAGENT: DETERMINATION OF CATECHOL

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(Received August 19, 1985; revised July 7, 1986)

The usefulness of hexaminecobalt (III) tricarbonatocobaltate (III) as analytical titrant has been extended for the successful determination of catechol in μg amounts. A study has been made through which the best acidic media — H_2SO_4 3N and 4N, HCl 1N and 2N, from various concentrations of H_2SO_4 , HCl , HClO_4 and HOAC have been found out for this determination. Catechol in 4.0N H_2SO_4 medium can be determined within the range from 55.0 μg to 990.0 μg with a maximum error of + 3.03% for the later amount and in 2.0N HCl within the range from 99.0 μg to 925.0 μg with the maximum error of + 7.56% for latter amount. The results reported are quite useful and the method has been recommended for routine use.

Key words: Hexaminecobalt (III) Tricarbonatocobaltate (III); Catechol Determination.

HUMAN HEALTH AND MINOR MINERALS

Part II. Studies of the Chewing Effect of *Gymnema sylvestre* (Gurmar Buti)

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(Received December 16, 1984; revised May 26, 1986)

It has been observed that *Gymnema sylvestre* when chewed, causes hypogeusia (loss of taste investigate acuity). A trace metals analysis was carried out to investigate this fact. The presence of excessive amounts of copper (197 ppm) provides a clue towards this observation. Copper can easily replace zinc from the gustin protein present in the saliva, creating deficiency of zinc. The temporary deficiency of zinc creates this loss of taste acuity for a short period of time.

Key words: Taste acuity; Copper; Zinc.

Short Communication

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**SYNTHESIS OF NEW 1, 2-DIHYDRO-4-AMINO-2-THIOXO-5H-INDENO 1, 2-d
PYRIMIDIN-5-ONE DERIVATIVES**

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(Received March 21, 1983; revised February 9, 1986)

Key words: Indandione; Pyrimidine; IR.

Biological Sciences Section

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COMPOSITION OF TOTAL LIPIDS FROM *ACACIA ARABICA* AND *ACACIA FARNESIANA* SEED OILS

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(Received February 6, 1985; revised July 9, 1986)

Total purified lipid fractions (4 % on the dry weight basis) obtained from the seeds of *Acacia arabica* and *A. farnesiana* were found to be 69.9 % and 78.5 % neutral and 31.1 % and 21.5 % polar lipids respectively. Fatty acid composition of all separated lipid classes was also determined. The triglyceride percentage in *A. farnesiana* was higher (58.28 %) than in *A. arabica* (39.5 %), whereas the percentage of hydrocarbon-wax-ester was lower (0.31 %) in *A. farnesiana* and higher (9.6 %) in *A. arabica*. Other lipid classes of the two species were quantitatively similar in their relative percentages. The major fatty acids in all the lipid classes were found to be $C_{16:0}$, $C_{18:0}$, $C_{18:1}$ and $C_{18:2}$. Lipid classes of *A. farnesiana* contained relatively higher amounts of $C_{18:2}$, while those of *A. arabica* contained higher amounts of $C_{18:1}$.

Key words: Acacia, Lipids, glycerides.

BIOLOGICAL EVALUATION OF *SILYBUM MARIANUM* SEED OIL FOR NUTRITIONAL PURPOSES

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(Received January 22, 1986)

Silybum marianum seed oil was fed to forty-day old fifteen Swiss albino mice of equal body weight for six weeks. An increase of 6 %, 25 % and 31 % of the initial body weight was recorded at 0 %, 5 % and 10 % levels of added oil to the normal diets respectively. Higher feed intakes were also noted at 5 % and 10 % levels of the oil in the diet.

At the end of the experimental period (6 weeks) the average blood cholesterol value of 5 % and 10 % oil fed mice was noted to be 113.1 mg and 102.3 mg per 100 ml respectively. No microscopic pathological lesions were observed on liver, kidney, stomach and intestines of the mice at any levels of the dietary oil. Histopathological examinations showed no degenerative changes.

Key words: Cholesterol, Oil, Histopathology, Rat.

LABORATORY EVALUATION OF SYSTEMIC FUNGICIDES FOR THE CONTROL OF ROOT-ROT FUNGI IN *PIPER BETLE* L. (PAN)

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(Received December 2, 1985; revised September 4, 1986)

Comparative efficacy of five systemic fungicides, namely, Afugan, Benlate, Morocide, Saprool and Topsin has been examined under laboratory conditions against the fungi causing root-rot of *Piper betle* L. These include *Alternaria* sp., *Botryodiplodia theobromae* Pat., *Cephalosporium curtipes* Sacc., *Colletotrichum capsici* (Syd.) Butl. & Bis. and *Fusarium vasinfectum* Atkin. Histograms have been provided, showing the percentage of inhibition caused by different concentrations of the above fungicides for each of the species involved.

Key words: Fungicide; Root-rot and *Piper betle*.

SUSCEPTIBILITY OF CEREALS TO ORGANOCHLORINE PESTICIDES

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(Received September 8, 1985; revised May 21, 1986)

The results of surveys of a number of cereal types for susceptibility to the organochlorine pesticides 1, 1, 1-trichloro-2, 2-bis (*p*-chlorophenyl) ethane ('DDT') and toxaphene are presented. Different genes appear to be implicated in the responses to the two pesticides, though their biochemical mode of action is similar.

Key words: DDT; Toxaphene; Photosynthetic Electron Flow.

EFFECT OF DDT ON SOIL MICROORGANISMS ISOLATED FROM PUNJAB PADDY FIELD

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(Received December 12, 1984; revised July 20, 1986)

Comparison between the application of DDT technical 70 % and DDT formulation 50 % WP at recommended dose (1 kg/ha) indicates a similar level of retardation of microbes, showing only 20-30 % growth as compared to control.

Tolerance study indicated that *B. apairius* and *S. epidermidis* can stand DDT formulation up to 200 times higher than the normal field application rate, whereas *B. megaterium*, *B. subtilis* and *B. circulans* showed minimum tolerance to DDT's normal field application rate.

Key words: Insecticides DDT; Soil Bacteria; Paddy Field; Plate Dilution Methods.

MICRONUTRIENT STATUS OF SOME WHEAT AND RICE SOILS OF PUNJAB, PAKISTAN

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(Received October 29, 1985; revised, July 17, 1986)

As a result of micronutrient survey of wheat and rice growing areas in some districts of the Punjab, the available Zn determined in wheat soils ranged from 0.22-1.56 ppm showing 26 % of the soils deficient while in rice soils, Zn ranged from 0.20-1.72 ppm and Cu from 0.27-4.71 ppm showing 82 and 7 % of the soils deficient in Zn and Cu respectively. However, Cu in wheat soils and Fe and Mn in both type of soils were sufficient.

Generally, there was a significant ($P < 0.05$) positive correlation among various micronutrients and soil clay, organic matter and carbonate contents but nonsignificant negative with pH. Multiple regression relationship obtained between DTPA extractable soil Zn and Cu and soil characteristics of either type of soils was limited to predict element availability in soils.

Key words: Micronutrients; Rice and Wheat; Punjab Soil.

PHOSPHORUS AND ZINC NUTRITION OF TRITICALE (*TRITICOSECALE WITTMACK*) AND WHEAT (*TRITICUM AESTIVUM* L.) ON AN ALKALINE CALCAREOUS SOIL

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(Received August 4, 1985; revised, August 13, 1986)

A field experiment on an alkaline calcareous soil was conducted to investigate P and Zn nutrition of triticale and wheat. In general, the grain yield of wheat was higher ($P < .05$) than that of triticale and the opposite was true as far as straw yield was concerned. Phosphorus application increased ($P < .05$) the grain and straw yields of both crops and Zn application had little effect. Lower response of triticale to applied P was attributed to its extensive root system which explored more of the native P. Applied P decreased Zn concentration ($P < .05$) because of dilution effect and Zn application had little effect on the P concentration of the two crops. Total uptake of P and Zn by triticale was higher ($P < .05$) than that of wheat.

Key words: Phosphorus; Triticale; Wheat; Zinc.

CHEMICAL CONTROL OF ONION THRIPS IN MID-HILL CONDITIONS OF MINGORA (SWAT)

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(Received November 14, 1985; revised September 9, 1986)

Cypermethrin, deltamethrin + triazophos, methamidophos and methomyl were initially effective against onion thrips, *Thrips tabaci* Lind. However, from the 15th day after application methamidophos and methomyl showed a sharp decrease in effectiveness, while the others exhibited a gradual decrease in effectiveness. BPMC was moderately effective against thrips on both a short and long term basis.

Key words: *Thrips tabaci* Lind; Onion; Insecticides.

ALLELOPATHY AS EXPRESSED BY *STACHYS PARVIFLORA* BTH.

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(Received April 7, 1985; revised April 27, 1986)

Allelopathic effects of *S. parviflora* Bth. on seed germination and seedling growth of *S. sudanense* Cv. Dale, *L. culinaris*, *P. radiatus*, *P. vulgaris*, *B. campestris*, *B. chinensis*, *R. sativus*, *T. alexandrum*, *S. italica* and *C. arietinum* were studied in the laboratory. Aqueous extracts, litter-bed of shoots and roots, and volatiles from entire plants of *S. parviflora* invariably arrested both germination and seedling growth under laboratory conditions. The inhibitory effects were species specific. The roots were generally more toxic than shoots. Soil leaching due to rains rectified the toxic effects of added toxins. The findings suggests that *S. parviflora* is potentially allelopathic.

Key words: *Stachys parviflora*; Allelopathy; Crops; Growth reduction.

OPTIMUM SUGAR LEVEL IN A WHEAT BASED LARVAL DIET FOR REARING OF MELON FLY, *DACUS CUCURBITAE* (Coq.)*

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(Received October 13, 1985; revised July 7, 1986)

The effect of five sugar levels, viz. 0, 3, 6, 9 and 12 % in the standard 3 % yeast, wheat based melon fly (*Dacus cucurbitae* (Coq.) larval diet was investigated. The results from three successive generations reared on each diet showed that 6 % sugar gave significantly higher pupal recovery and weight, percent adult eclosion, fecundity and egg hatchability. Sugar levels 9, 3, 0 and 12 % followed in that order.

Key words: Melon fly, sugar levels, larval diet.

EFFECT OF ATMOSPHERIC POLLUTION ON CHLOROPHYLL AND PROTEIN CONTENTS OF SOME PLANTS GROWING IN KARACHI REGION

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(Received January 23, 1985; revised September 1, 1986)

The effect of air pollution caused by automobile exhausts and industries were studied on the chlorophyll and protein contents of some plants growing in Karachi. In general, pollution stress showed a decrease in the chlorophyll and protein contents in all the species examined except for *Ficus benghalensis* which showed almost equal amount of chlorophyll in control and polluted plants. Possible explanations for these changes caused by environmental pollution are discussed.

Key words: Pollution, Protein, Plants.

Short Communication

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MILK COAGULATING ENZYME (RENNET) FROM *ASPERGILLUS ORYZAE*

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Technology Section

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COMMERCIAL DEHYDRATION OF VEGETABLES Part I. Design and Development of Dehydration Unit

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(Received September 9, 1985; revised April 27, 1986)

A dehydration unit has been designed and developed for the production of dehydrated vegetables. The unit has been fabricated by using local materials of construction and makes use of a gas fired furnace and heat exchanger for heating air. The vegetable, after pretreatment, is dehydrated under controlled conditions of temperature and humidity using counter and con-current arrangement of hot air flow followed by the removal of residual moisture in a finishing dryer. The processing capacity of the plant is from 3 to 5 tonnes per 3 shifts a day, depending upon the particular vegetable used. Data on the bulk dehydration of various vegetables has been described and discussed. Figures on the labour requirement, electricity, natural gas and water consumption are given. Consideration has also been given to the economics of the process.

Key words: Dehydration; Vegetables; Design.

TAKING DENSITY INSTEAD OF WEIGHT OR VOLUME OF SOIL FOR QUANTIFICATION OF POPULATION OF SOIL ORGANISMS

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(Received October 17, 1985; revised June 16, 1986)

A new method for nematode population quantification in which the equivalence of soil volumes based on its density is determined, has been discussed. In this method, first the soil density (d) is determined. This is multiplied by a standard measure (s) to obtain the ' ds '. Thus soil nematode population may be expressed in terms of the number per case-dependent ' ds ' instead of fixed volume (cc) or weight (g). This method resolves the problem caused by large differences in soil density in comparing the number of nematodes.

Key words: Nematode population quantification; soil density; nematology methodology.