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Physical Sciences Section

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NIMBOCINOL AND 17-EPINIMBOCINOL-ALKALINE HYDROLYSIS PRODUCTS OF AZADIRADIONE

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(Received February 12, 1991)

Hydrolysis of azadiradione (1), one of the main triterpenoids of *Azadirachta indica* (Neem), with 5% methanolic potash yielded a new triterpenoid 17-epinimbocinol (3) along with the known isomeric triterpenoid nimbocinol (2) in a ratio of 1:2. Their structures have been elucidated through spectral studies.

Key words : Meliacin derivatives, 17 Epinimbocinol, Nimbocinol, 2D-NMR.

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SYNTHESIS AND BIOLOGICAL ACTIVITY OF 2-(1-NAPHTHYL)-THIENO- [2,3-d] PYRIMIDINES

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(Received September 2, 1990; revised March 4, 1991)

Thieno[2,3-d]pyrimidines 3a-e were synthesized by the alkylation of pyrimidine 1 followed by cyclodehydration. Compound 3c was converted into 6-cinnamoylthieno[2,3-d]pyrimidines 3d,e by its condensation with aromatic aldehydes.

Key words: 4-Mercapto-pyrimidine, 4-Substituted pyrimidine, Thienopyrimidines.

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PREPARATION AND CHARACTERISATION OF SOME MIXED LIGAND COMPLEXES OF Fe (III) AND Ru (III) WITH PHTHALIC ACID AND AMINE BASES

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(Received May 21, 1990; revised November 25, 1990)

Mixed ligand octahedral complexes of Fe (III) and Ru (III) were prepared and characterised on the basis of elemental analysis, magnetic and conductivity measurements, IR and electronic spectral studies. The complexes prepared are $K[MP_2L_2]$, $K[MP_2L']$ and $K_2[MP_2L'']$, where M = Fe (III) and Ru (III), P = deprotonated phthalic acid, L = quinoline, iso-quinoline, α -picoline, γ -picoline, pyridine, L' = 2-aminopyrldine, O - phenanthroline, 3 - aminopyridine, 2, 2' - bipyridyl and L'' = 8 - hydroxyquinoline.

Key words: Fe (III), Ru (III) phthalate, Amine bases.

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SYNTHESIS OF NITROGENOUS COMPOUNDS. *Part -III*

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(Received March 15, 1990; revised February 4, 1991)

Condensation of 2-aryl-4-formyltriazole (4) with acylhydrazines supplied hydrazones (5), which upon oxidation gave 3,5-disubstituted oxadiazoles (6). Similarly, condensation of 4-substituted but-3-en-2-one (7) with acylhydrazines produced acylhydrazones (8), whereas, with hydrazines generated the hydrazones (9) which with ethanolic HCl underwent cyclization to the pyrazolines (10). Oxidation of (10) with bromine-water furnished the brominated pyrazoles (11). Reaction of (10c) and (11c) with isocyanate and isothiocyanate derivatives produced benzenesulphonylurea (12, 13; X = O) and thiourea (12, 13; X = S) derivatives. Cyclization of the thiourea derivatives (12, 13; X = S) with ethyl bromoacetate and ethyl β -bromo-propionate furnished 2-iminothiazolidinones (14, 16) and 2-iminothiazinones (15, 17) respectively.

Key words: Synthesis-Heterocyclic compounds.

SYNTHESIS OF NITROGENOUS COMPOUNDS. *Part - IV*

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(Received March 15, 1990; revised February 4, 1991)

Ethyl 6-aryl-2,4-dioxo- Δ^2 -hexenoate (5) has been synthesized by condensation of 4-substituted-but-3-en-2-one (4) with ethyl oxalate. Ester (5) on reaction with hydroxylamine afforded the isoxazole ester (6), whereas, with *o*-phenylenediamine produced the oxyquinoxaline (7). Condensation of (5) with acylhydrazines furnished the hydrazones (8) which were cyclized to N-acylpyrazoles (9). With hydrazines, compound (5) underwent cyclization to the pyrazole esters (10) which were hydrolysed to the acids (11). Ester (10c) on fusion with hydrazine hydrate gave the acid hydrazide (12). Reaction of (12) with the appropriate isothiocyanate derivatives yielded the disubstituted thiosemicarbazides (13a-d) which were cyclized into thiotriazoles (14a-d), thiadiazoles (15a-c) and oxadiazoles (16a-d).

Key words: Synthesis-Heterocyclic compounds.

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DIOXOURANIUM (VI) COMPLEXES OF SCHIFF'S BASES DERIVED FROM SULPHONAMIDES

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(Received July 20, 1988; revised February, 26, 1991)

A new series of $(\text{UO}_2(\text{SB})_2) \cdot 2\text{H}_2\text{O}$ complexes are prepared, where SB is monobasic tridentate Schiff base ligand derived from some sulphonamides. The complexes are subjected to elemental microanalysis and characterized by ir electronic and $^1\text{Hnmr}$ spectra, TGA and X-ray analysis.

Key words: Dioxouranium derivatives, Schiff's bases, Sulphonamides.

ACTIVATED CARBON FROM INDIGENOUS INFERIOR WOODS
Part-III. Adsorption of Copper, Hexavalent Chromium and Zinc-Carbon
Selection and pH Influence

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(Received July 11, 1990; Revised February 20, 1991)

The phenomena of copper, hexavalent chromium and zinc adsorption by activated carbon samples prepared from different native woods was studied to select an appropriate sample for maximum adsorption in each of the case. The activated carbon prepared from Eucalyptus (*E. camaldulensis*), a hardwood, has overall shown better adsorbing behaviour. The pH of the metal solution has been found to be the principal variable affecting the adsorption. It was thereafter concluded that in the case of copper and zinc, there was no significant adsorption below pH 4 and in case of Cr^{6+} , optimum pH is 2 for maximum adsorption, gradually decreasing with increasing pH of the metal solution.

Key words: Copper, Zinc, Hexavalent chromium, Activated carbon, Inferior woods.

Biological Sciences Section

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ANTIFUNGAL ACTIVITY OF SOME ESSENTIAL OILS FROM LOCAL PLANTS

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(Received September 8, 1990; revised March 9, 1991)

Six essential oils, *Acorus calamus* (roots and adventitious roots), *Callistemon lanceolatus*, (flowers and leaves) *Laurus nobilis* (leaves) and *Cymbopogon martini* (leaves) were screened for their antifungal activity against nine pathogenic fungi and yeast by disc diffusion method. Fungi tested were *Aspergillus niger*, *A. fumigatus*, *A. parasiticus*, *Trichophyton tonsurans*, *Helminthosporium oryzae*, *Monilia sitophila*, *Penicillium digitatum*, *Candida albicans* and *Saccharomyces cerevisiae*. The antifungal activity of these oils were compared with that of some commercial antifungal drugs. *C. martini* var. *motia* showed maximum inhibitory effect against almost all the fungi tested.

Key words: Antifungal, Essential oils, *Acorus calamus*.

Introduction

5. *M. sitophila*.

Phytopathogenic.

REPELLENT EFFECT OF NOGOS TO ADULT *TRIBOLIUM CASTANEUM* HERBST

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(Received February 27, 1990; revised February 20, 1991)

Repellent effect of nogos to adult *Tribolium castaneum* was studied. Results indicated that the adults were repelled by contact with flour medium treated with nogos at concentrations of 10, 50 and 100 ppm. The adults also showed responses to the vapour of the treated medium.

Key words: *Tribolium*, Flour and Nogos.

RESPONSE OF HYESUN-33 SUNFLOWER TO AUTUMN AND SPRING PLANTING AT DIFFERENT GEOMETRICAL PATTERNS

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(Received February 20, 1989; revised December 24, 1990)

A field study was conducted to determine effect of different planting patterns on seed yield, oil and protein content of sunflower at uniform plant population during the autumn and spring of 1986 and 1987. Planting geometry comprised 60 cm spaced single rows (60 x 30 cm), 90 cm spaced single rows (90 x 20, cm) 90 cm spaced double row strips (30/90 cm), 120 cm spaced triple row strips (30/120 cm) and 60 x 60 cm hills with two plants per hill. Planting in 90 cm spaced double row strips produced significantly higher seed yield/ha than other planting patterns. Yields for this pattern were 4576 and 3226 kg/ha for spring and autumn crop, respectively. The minimum seed yield was recorded for 120 cm spaced triple-row strip planting pattern which was 4260 and 2983 kg/ha for the spring and autumn crop, respectively. Spring crop yielded significantly higher than autumn crop recording on an average 4411 and 3150 kg/ha, respectively. Seed oil and protein content were not affected significantly by any of the planting patterns in both the seasons.

Key words: Planting geometry, Autumn and Spring, Oil and Protein contents.

STUDY ON RELATIONSHIPS BETWEEN PHYSIOLOGICAL PARAMETERS OF INDICAS

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(Received December 14, 1989; revised February 14, 1991)

Six cultivars of coarse rice were grown in earthen pots for the determination of genotypic variation in total plant dry weight alongwith some of their other physiological growth parameters. The total leaf area and total dry matter production was the highest in cultivar 4389-3 followed by IR-6. Likewise genotypes 4389-3 and IR-6 showed their superiority over other genotypes in Relative Growth Rate (RGR), Net Assimilation Rate (NAR) and Specific Leaf Weight (SLW) near maturity. The inter-relationships between derived growth parameters showed that specific leaf weight (SLW) had strong positive correlation with the net assimilation rate (NAR) and relative growth rate (RGR) showed strong positive correlation with net assimilation rate. On the basis of leaf area, dry matter production and other growth parameters it can safely be concluded that cultivar 4389-3 is the best physiologically efficient genotype followed by IR-6.

Key words: Genetic evaluation, Rice, Physiological parameters.

Short Communication

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***Polyodontes melanonotus* (Grube) (Polychaeta:
Polyodontidae) a New Distributional Record
for Pakistan**

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Technology Section

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SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF HYDRAZINE HYDRATE IN THE ULTRAVIOLET REGION

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(Received November 4, 1989; revised February 20, 1991)

A quick spectrophotometric method for the determination of hydrazine hydrate in aqueous solutions has been developed by utilizing the maxima shown by it in the ultraviolet (UV) region. Normal basic impurities associated with technical grade product do not interfere. λ Comparison with the established iodometric technique has also been studied to assess the accuracy of the method.

Key words: Spectrophotometric method, Hydrazine hydrate, Ultraviolet region.

ROLE OF WATER IN AQUEOUS SOLUTION OF IRON GALLIC ACID COMPLEXES

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(Received August 29, 1989; revised February 7, 1991)

During different chemical reactions between gallic acid and iron it is observed that iron chelation with gallic acid is slow if iron is already hydrated or in aqueous solution and much faster if solid iron in form of its salts is mixed with this ligand (gallic acid). It means that iron absorption in biological environment is more if iron is taken in solution (syrup or juice) than if iron is taken in solid state (tablets or capsules), because it is difficult to convert chelated iron into absorbable iron (ferrous ions). It is also found that tannins (gallic acid) taken in with the iron hindered the iron absorption due to fast chelation, while if tannin solutions are somewhat aged than iron solution, than it can not behave as effective chelating agent because there rate of reaction with metal is slowed down due to quinone formation.

Key words: Gallic acid, Iron gallic acid complex, Aqueous solution.