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Physical Sciences Section

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SYNTHESIS AND REACTIONS OF 3-ACETYL AND 3-CINNAMOYL COUMARINS

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3-Cinnamoyl and 3-(5'-aryl-2', 4'-pentadienoyl) - coumarin derivatives (II) have been prepared. The reaction of compounds (II) with hydrazines, aromatic hydrocarbons under Friedel-Craft conditions, Grignard reagents and active methylene compounds under Michael conditions have been investigated. Also the condensation of compound (Ia) with cyclohexanone, ethyl methyl ketone, diethyl malonate, hydrazines and aromatic amines have been studied. Most of the prepared compounds were subjected to *in vitro* testing against two gram-positive and two gram-negative bacteria.

Key words: Reaction of 3-acetyl, Reaction of 3-cinnamoyl coumarins.

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SOME REACTIONS OF 3-THIOXO-6 - [2-ACYL/ALKYL AMINOPHENYL]–1,2,4-TRIAZIN-5(2H,4H) ONES

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A series of some new 3-thioxo-6-(2- acyl/alkylaminophenyl)-1,2,4-triazin-5-(2H,4H) ones (II,XIV) have been synthesized. Behaviour of these products towards amine, hydrazine, thiosemicarbazide, gl. acetic acid, halogenated acetic acid and acetylenetetrachloride have been discussed. The important bands of the UV absorption, IR spectra and main H^1-NMR signals are assigned and discussed in relation to molecular structure.

Key words: Acyl/alkylaminophenyl-1,2,4- triazinones.

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ORGANIC REACTIONS IN THE AQUEOUS MEDIUM
Part-IV. Simple Methods for the Synthesis of N-Unsubstituted Salicylaldehyde-Imine, Hydrosalicylamide and Tricyclobenzoxine

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(Received March 25, 1990; revised January 15, 1991)

A stable N-unsubstituted imine, salicylaldehyde-imine (II) has been synthesised in good yield (90%) for the first time. Interaction of salicylaldehyde with ammonia and ammonium salts in protic and aprotic solvents yielded salicylaldehydeimine (II), hydrosalicylamide (III) and tricyclobenzoxine (IV). The synthesis of hydrosalicylamide has been carried out in water and the yields are identical or better than those in organic solvents. Optimum conditions for the synthesis of (II), (III) and (IV) in 90, 92 and 62% yields, respectively, have been established by varying parameters of the reactions involved. A possible mechanism for their formation has also been discussed.

Key words: Synthesis, Salicylaldehyde-imine, Benzoxine.

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ESSENTIAL OILS OF GRAMMINEAE FAMILY HAVING ANTIBACTERIAL ACTIVITY

Part -I. (*Cymbopogon citratus, C. martinii* and *C. Jawarancusa* Oils)

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(Received May 5, 1990; revised January 26, 1991)

The essential oils of three indigenous species of Grammineae family, and Cymbopogon genus, i.e. *Cymbopogon citratus, C. martinii,* and *C. jawarancusa,* had been tested for their antibacterial activity against *Escherichia coli, Staphylococcus aureus, Shigella flexneri,* and *Salmonella typhi,* Para-A by spectrophotometeric method. The essential oil of *C. citratus* was found to be highly active even at lowest concentration and caused complete inhibition of *S. aureus* at less than 400 ppm. The other bacteria also exhibited high response to this essential oil. *C. martinii* oil was more active against *S. flexneri* and *S. typhi* while the essential oil of *C. jawarancusa* also had appreciably high activity against both of these bacteria, but less than the former two oils. The activity of above mentioned oils might have been attributed to their major constituents, like citral, geraniol and piperitone. Conditions should be searched to produce varieties of these grasses with higher concentrations of these active components.

Key words: Essential oils, Antibacterial, Cymbopogon.

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SEASONAL VARIATIONS IN INORGANIC COMPOSITION OF EDIBLE CRAB (*PORTUNUS PELAGICUS* LINNAEUS)

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(Received July 28, 1988; revised December 23, 1990)

Present communication reports the variations in the accumulation of macro and micro- elements throughout the year, in edible and non-edible components of crab (*Portunus pelagicus* Linnaeus). Among macro-elements sodium was found in highest quantity in all the three parts (body meat, claw meat and inedible or trash), followed by potassium, phosphorus, calcium and magnesium in descending order in body meat while in claw meat magnesium was found in excess of calcium. On the other hand the distribution of calcium, phosphorus, magnesium and potassium come next to sodium in trash portion. Maximum quantity of iron was found in both edible and non-edible fractions, among the micro-elements, while concentration of manganese was minimum in edible part contrasting the lowest value of copper in trash.

Key words: Crab, Inorganic elements, Body meat.

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IN VITRO ANTHELMINTIC ACTIVITY OF SOME ESSENTIAL OILS

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(Received September 7, 1989; revised January 30, 1991)

The essential oils from the leaves of *Artabotrys odoratissimus*, inflorescence of *Capillipedium foetidum* and the grass of *Cymbopogon martini* possess very good to moderate anthelmintic activity against *Pheretima posthuma* (earth worms), *Taenia solium* (tape worms) and *Ascaris lumbricoides* (round worms). The activity exceeds the efficacy of piperazine phosphate.

Key words: Anthelmintic activity, Essential oils.

Biological Sciences Section

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CYTOLOGICAL INVESTIGATIONS IN THREE SPECIES OF *CONVOLVULUS* LINN. FROM PAKISTAN

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(Received January 24,1990; revised January 1,1991)

Convolvulus arvensis Linn., *C. glomeratus* Choisy and *C. prostratus* Fors, were cytologically investigated (n= 25 for *C. arvensis* and n= 14 for *C. glomeratus* with normal meiotic behaviour were found). Two chromosomal forms with n=18 and 20 were recorded for *C. prostratus*. Anomalous behaviour during microsporogenesis was observed with univalents, trivalents and quadrivalents in 53% of pollen mother cells (PMCs). Complete bivalent formation was recorded in 47% of PMCs scored.

Key words: *Convolvulus*, Anomalous microsporogenesis, Polyploidy, Diploidization.

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VARIATIONS IN IONIC CONCENTRATION OF BLOOD SERUM DURING RAMADAN FASTING

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(Received April 18, 1989; revised December 11, 1990)

Variations in the composition of Na, K, Mg, Ca, and Cu ions have been recorded by analysing blood samples from 40 healthy fasting volunteers during the later days of Ramadan, taken in the morning and late evening. It has been observed that the constituents of the blood serum of fasting volunteers can be strongly correlated with respect to ionic concentration and age groups by using Q-mode cluster analysis technique. The three age groups as identified are: upto 38 years; between 38 and 45, and above 45 years. High concentration of Na and K characterises the age group between 38 and 45 years. The relative decrease in Na and K ions during the morning and evening samples in the first and second age groups is quite significant and it is less so in the third. The Ca and Cu ion level, as shown by R-mode analysis, generally increases while that of Na and K ions decreases towards the evening. It has positive correlation with Mg and a low or negative correlation with Na. The decrease in Na and K ions is of a lower order among the elderly persons. It has been concluded from the study that fasting has a significant effect on the ionic balance. High intake of rich food in the earliest hours of the day raises the Na and Ca levels and lowers the Cu ion level which is restored to normal values (obtained from samples in the post-Ramadan days) towards the breakfast time in the evening.

Key words: Ionic concentration, Blood serum, Ramadan.

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THE FIRST RECORD OF *GEOPHILOMORPH CENTIPEDES* (MECISTOCEPHALIDAE: MECISTOCEPHALINAE) FROM PAKISTAN

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(Received February 24, 1990; revised January 30, 1991)

One species belonging to genus *Mecistocephalus* Nwp. (Geophilomorpha: Mecistocephalidae: Mecistocephalinae) have been recorded for the first time from Pakistan. The specimens are studied with special reference to their mouth-parts and poison claws.

Key words: First record, *Geophilomorph centipedes*, Pakistan.

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EFFECTS OF CONSTANT LIGHT AND DARK TO THE NUCLEUS PREOPTICUS OF *CHANNA GACHUA* (HAM.)

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(Received January 20, 1990; revised January 26, 1991)

Fresh water air breathing fish *Channa gachua* were exposed to continuous light and dark for the period of 30 days. The fishes which received exposure of continuous light showed increase diameter of the nuclei of neuronal bodies and marked depletion of neurosecretory material in the nucleus preopticus, while fishes received continuous darkness showed the reduced diameter of the nuclei of the neuronal bodies and tendency of accumulation of neurosecretory material in nucleus preopticus.

Key words: Constant light, Nucleus preopticus, *Channa gachua*.

Technology Section

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SEPARATION AND ANALYSIS OF SUGARS FROM *PINUS ROXBURGHII* BARK

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(Received February 27, 1990; revised January 6, 1991)

Sugars were extracted from the bark of *Pinus roxburghii* by two methods. Their separation and identification were carried out by thin-layer and paper chromatography. The amount of sugars determined by UV method for different samples varied in the order, glucose 1.25 - 2.49%, fructose 1.2 - 2.9% and arabinose, 1.17 - 1.87%. The amounts of total sugar (4.9 - 6.8%) determined by titrimetric and UV method are comparable.

Key words: Sugar analysis, *Pinus roxburghii* bark, Carbohydrates.

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DILUENT EFFECTS OF BENZENE AND TOLUENE ON THE CATIONIC COPOLYMERIZATION OF STYRENE AND β-PINENE

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(Received July 18, 1989; revised January 14, 1991)

$AlCl_3$ initiated copolymerization of styrene and β -pinene in benzene and toluene has been carried out at 10° using anhydrous $AlCl_3$ as a catalyst. Both monomers combine in all monomeric ratios to form copolymer. The rate of copolymerization of the binary mixture of styrene and β-pinene is higher in toluene than in benzene. Furthermore the copolymer obtained at different monomeric ratios in toluene possess higher molecular weight than the copolymer prepared in benzene at the same monomeric ratios. Toluene and benzene not only serve as diluent in the cationic copolymerization but also response as chain transfer agent. The value of K' obtained in these solvents is 5.5 - 6.4 x 10^{-3} showing the product is highly tacky and contain more flexible molecules.

Key words: Dielectric constant, Flexible molecules, Premature growing polymer chain.