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Physical Sciences

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MEASUREMENT OF MAJOR AMBIENT AIR POLLUTION COMPONENTS AT SUB- URBAN AREA OF KARACHI

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Base line study for the measurement of major ambient air pollution components such as O_3 , SO_2 , CO, NO, NO_x , PM10, methane, non-methane along with the meteorological parameters was carried out by Air pollution Monitoring Mobile Laboratory at an urban back ground site of Karachi. The average concentration of O_3 was found to be between 4.62 and 20.36 ppb, SO_2 0.73 and 4.69 ppb, CO 0.14 and 0.77 ppm, NO 0.92 and 2.73 ppb, NO_x 3.1 and 7.5 ppb, PM10 142 and 251 $\mu g m^{-3}$, methane 1.09 and 2.7 ppm, non-methane hydrocarbon 0.41 and 0.96 ppm.

Key word: Ambient air pollution components, Photochemical oxidant, Baseline data, Ozone.

PHYTOCHEMICAL STUDIES ON *CUSCUTA REFLEXA*

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Nine compounds including coumarin α -amyirin, β -amyirin, α -amyirin acetate, β -amyirin acetate, oleanolic acetate, oleanolic acid, stigmasterol and lupeol are reported for the first time from the genus *Cuscuta*. Their structures have been established with the help of spectral data.

Key words: *Cuscuta reflexa*, Coumarin, Triterpenes, Steroids.

SPECTROPHOTOMETRIC DETERMINATION OF PALLADIUM (II) WITH RUBEANIC ACID (RA) IN PRESENCE OF PYRIDINE, PIPERIDINE AND 3-PICOLINE

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Unpretentious and exclusive methods for the spectrophotometric determination of trace amount of divalent palladium (II) have been developed with rubeanic acid (dithio-oxamide) in presence of secondary ligands like pyridine, piperidine and 3-picoline. Both direct and extraction spectrophotometry showed that coloured rubeanates are only stable in acidic medium. The violent yellow coloured products are formed below pH 5.0 with an absorption maxima at 416.0 and 422.0 (pyridine), 405.0 and 416.5 (piperidine) and 418.0 and 422.0 (3-picoline) both in direct and isoamyl alcohol (IAA) extracted system, respectively. Results indicate that the highest sensitivity and molar absorptivity of Pd-RA pyridine system in direct spectrophotometry were $0.01497 \mu\text{g Pd (II) cm}^{-2}$ and $7107.89 \text{ L mol}^{-1} \text{ cm}^{-1}$ respectively. IAA extracted Pd-RA-piperidine system was found to give a sensitivity of $0.01087 \mu\text{g(Pd(II) cm}^{-2}$ and molar absorptivity of $9788.80 \text{ L mol}^{-1} \text{ cm}^{-1}$ which were the highest of all the system. The effects due to variation of pH, reagent concentrations, order of addition of reagents, time, temperature and solvent media on the absorption spectra have been investigated and the optimum conditions determined. The effects of diverse ions and their tolerance limit have also been studied.

Key words : Spectrophotometry, Rubeanic acid, Secondary ligands, Palladium (II).

ON CONDENSING MAPPINGS IN D-METRIC SPACES

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(Received 12 April 1993; accepted 17 May 1995)

In this paper two measures of noncompactness in D-metric spaces are defined and some fixed point theorems are proved for condensing mappings in D-metric spaces.

Key words. Condensing mapping, D-metric, Fixed point.

Short Communication

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**ON GENERALIZATION OF BANACH'S FIXED
POINT THEOREM**

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Short Communication

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TRACE ELEMENTS IN INDIGENOUS MEDICINAL PLANTS (*RHAZYA STRICTA*, *VINCA ROSEA* AND *FAGONIA CRETICA*)

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Biological Sciences

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STUDIES ON CARROT PULP AS SOURCE OF NUTRITIONAL DIETARY FIBRE

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(Received 01 August 1996; accepted 7 January 1998)

Effect of various blanching processes on the retention of different nutrients of carrot pulp was investigated. Each blanching process showed different behaviour on the retention of nutrients. Carrot pulp contained 5.1 - 5.6% protein, 1.1 - 1.5% lipids, 5.6 - 6.5% minerals and 15.6 - 19.7% soluble sugars. Non reducing sugars were almost two times more than reducing sugars in all carrot pulp products. Carotene and vitamin C were present in all pulp products but highest content of the two nutrients was observed in the pulp obtained from unblanched carrots. Hemicellulose and cellulose were found to be the two main predominant dietary fibre components of carrot pulps, while water holding capacity (WHC) of carrot pulps ranged from 10.3-13.9g water per gram organic matter. Considering dietary fibre components, WHC, Carotene and other nutrients, carrot pulp was found to be a good source of dietary fibre.

Key words : Carrot pulp, Blanching process, Dietary fibre components, Water holding capacity.

CHEMICAL COMPOSITION OF *THUJA ORIENTALIS* L. FRUITS AT DIFFERENT STAGES OF MATURITY

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The essential oil obtained by hydrodistillation of the fruits from *Thuja orientalis* at two stages was analysed by GC and GC/MS. Among the compounds identified, α -pinene (41.48-45.61%), Δ^3 -carene (32.69-34.55) β -terpinene (2.28-2.51%), p-cymene (1.29-2.23%), cedrol (1.82-4.50%), camphene (1.78-1.96%), D-limonene (1.47-2.40%) and myrtenol (1.27-4.40%) were found to predominate, while other compounds were either in small quantities (i.e. less than 1%) or in traces.

Key words: *Thuja orientalis* L., Coniferae, Monoterpenes, Sesquiterpenes.

SURVIVAL AND GROWTH IN POSTLARVAE OF *MACROBRACHIUM ROSENBERGII* (DE MAN) ON DIFFERENT DIETS

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(Received 17 February 1999; accepted 11 August 1999)

Studies on the evaluation of different diets for postlarvae (PL) of *Macrobrachium rosenbergii* indicated higher mortality when fed on pelleted feed than on live *Artemia* nauplii, zooplankton or combination feeds. Statistically significant differences were recorded in the length and weight of postlarvae (at 5% level) fed zooplankton, *Artemia* nauplii and combination feeds when compared to pelleted feed. It suggests the preference of live feed over artificial feed by the postlarvae. Results further indicate that zooplankton promoted growth of postlarvae equal to the growth increment by *Artemia* nauplii either as individual or combination feed.

Key words: Live feed, Zooplankton, Pelleted feed, Postlarvae of *Macrobrachium rosenbergii*.

YIELD RESPONSE OF GRAM TO IRRIGATION IN PAKISTAN

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(Received December 15 1997; accepted March 15 1999)

The response of gram to number of irrigations was determined during 1995-96 and 96-97. Effect of irrigation on branches per plant, seeds per pod and 100-seed weight was non-significant in both the years. However, plant height, pods per plant and grain yield were increased significantly by applying one or two irrigations as compared to without irrigation. The results suggested that one irrigation at flowering was enough to obtain the maximum yield of gram.

Key words: Gram, Irrigation, Growth stages

STUDIES ON THE CONTROL OF SUBTERRANEAN TERMITES ATTACKING GROUNDNUT CROP (*ARACHIS HYPOGEA* L.) BY TENEKIL IN COMPARISON WITH HEPTACHLOR AND CHLORDANE

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Short Communication

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HYBRID VIGOUR IN BASMATI RICE

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Technology

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HYDROCHLORIC ACID LEACHING OF SPHALERITE IN THE PRESENCE OF AN OXIDIZING AGENT

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(Received 9 September 1997; accepted 1st December 1998)

Dissolution experiments of a natural sphalerite ore from Nigeria were carried out in hydrochloric acid - potassium chlorate (v) solutions at various temperatures to study the physico-chemical factors and the mechanism for the leaching of zinc from this mineral. The dissolution rate was strongly influenced by the temperature and concentration of the leaching reagent. It was, however, independent of the stirring speed over the range 0 - 400 rpm and fitted the kinetic equation based on the shrinking core model for chemical reaction control. An activation energy of about 43 kJ mol⁻¹ was calculated for the leaching process.

Key words: Leaching, Hydrochloric acid, Potassium chlorate (v), Sphalerite, Kinetics.

Short Communication

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**A NOTE ON PHYSICAL AND CHEMICAL
TESTS ON SOME DIMENSION STONES**

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