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ASSESSMENT OF TRACE ELEMENT CONCENTRATIONS IN FENUGREEK AND LUPIN PLANTED IN THE EXPERIMENTAL FARM, HIGH DAM LAKE DEVELOPMENT AUTHORITY, GERF HUSSEIN BEACH LOCALITY, EGYPT

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The trace elements Ag, Au, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Pb, Sr and Zn in fenugreek and lupin (leaves, stems, pods, pericarp, seeds, testa and cotyledon) as well as in soil samples taken from the immediate vicinity of crop roots at 10, 30 and 60 cm depths in the Gerf Hussein area were determined using flame atomic absorption spectrophotometer. Ca and Cl were estimated by EDTA and Cl by ion selective electrode. The results indicated that the trace elements are present in high concentrations in the soil samples collected from 60 cm depth. In fenugreek and lupin, most elements are concentrated in leaves and stems. The elements Ca, Cl, Co, Fe, Mg, Mn, K and Zn are present in higher concentrations in the crops as compared to the soil.

Key words: Spectrophotometer, Trace elements, Fenugreek and Lupin.

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VISCOSITY OF LITHIUM CHLORIDE SOLUTIONS IN WATER-METHANOL MIXTURES

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(Received December 11, 1993 ; revised November 28, 1994)

The viscosities of LiCl in aqueous methanol solution (10 - 50%) were measured at various concentrations (1.0×10^2 to 8.0×10^{-2} mol.dm⁻³) and temperatures (30 - 46°C) respectively. The viscosity was interpreted in terms of Jones-Dole and Root density equations. Jones-Dole coefficients A and B and Root equation constants were evaluated by linear extrapolation using the least square method. The positive and increasing value of Jones-Dole B-coefficients lead to the conclusion that lithium chloride in aqueous methanol behaves as structure enhancer. Different activation parameters such as energy of activation (ΔE), free energy change ($G\Delta^*$) and entropy change of activation (ΔS^*) at different solvent composition and salt concentrations were also evaluated.

Key words: Viscosity, Jones-Dole coefficients, Root equation.

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A FACILE SYNTHESIS OF 4,5-DIARYL-5, 1-DIHYDRO-s-TRIAZOL-3- THIOL. *Part-III*

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4,5-Diaryl-5, 1-dihydro-s-triazol-3-thiols have been synthesized via cyclization of 1-arylaminomethylthio-semi-carbazide derivatives using concentrated hydrochloric acid or from the reaction of arylaminomethylhydrazine derivatives with carbon disulphide in alkaline medium. Some heterocyclic system viz, pyrazolidinyltriazoline, thiazolidinylaminotriazoline, triazinotriazolidine and tetrazinyltriazoline, have been derived from 3-hydrazinotriazoline derivative, obtained from reaction of the title compound with hydrazine. The structures of the new compounds have been established by elemental analyses and spectral data.

Key words: Hydrobromic acid, Schiff bases, Carbon tetrachloride, Anilines, Triazole derivatives, Thiosemicarbazide, Hydrazine.

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SOLVENT EFFECTS IN THE REACTION OF ETHYLOXALATE WITH HYDROXIDE IONS

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The reaction between ethyloxalate and hydroxide ions was studied in a series of ethanol-water mixtures at $25 \pm 0.1^\circ\text{C}$ to find out the dependence of reaction rate on dielectric constant of the medium. Attempts were made to calculate the radii of activated complex for single sphere (r^*) and double sphere (r_{AB}) models from the linear plots of logarithm of rate constant at zero ionic strength (k_0) against reciprocal of the dielectric constant ($1/\epsilon$), in order to find out the most probable shape of the activated complex. A comparison of the experimental values of radii (r^*) and (r_{AB}) respectively with the theoretical values led to the conclusion that activated complex exists as a double sphere model.

Key words: Rate constant, Dielectric constant, Activated complex.

Biological Sciences Section

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STUDY OF FRUITS AND VEGETABLES IN NWFP, ISLAMABAD AND BALOCHISTAN FOR ORGANOCHLORINE, ORGANOPHOSPHORUS AND PYRETHROID PESTICIDES RESIDUES

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(Received June 15, 1994 ; revised November 8, 1994)

Samples of fruits and vegetables procured from the growers' fields and main selling points of North West Frontier Province, Islamabad and Quetta/Pishin districts of Balochistan during Dec.1990 and Sep. 1992, were monitored for organochlorine, organophosphorus and pyrethroid pesticides. Among the 300 samples screened, 121 samples contained a variety of pesticides. Thirty-eight samples contained pesticide residues above maximum residue limits (MRLs) proposed by FAO/WHO, while for several samples, no MRL was available for detected pesticides but high amounts of residues were found to be present in certain commodities. The remaining samples did not contain detectable pesticide residues.

Key words: Pesticide residues, Gas chromatography, Maximum residue limits.

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SIGNIFICANCE OF PREANTHESIS AND POSTANTHESIS N ASSIMILATION IN DETERMINING GRAIN YIELD AND GRAIN N YIELD IN WHEAT

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(Received October 27, 1993; revised August 22, 1994)

In a pot experiment, 8 wheat varieties were compared for N partitioning at anthesis and maturity to study the significance of preanthesis and postanthesis N uptake and postanthesis dry matter accumulation in determining grain yield, grain N yield and grain nitrogen concentration (GNC). The wheat varieties (Lu-26, Sind-81, Pak-81, Durum, Punjab-85, Fbd-85, Sarsabz and M-143) were grown with and without applying fertilizer N. Varietal differences were observed for N uptake and response to applied N. However, the efficiency of N translocation from shoot to grain during maturation was almost identical in all the varieties except for Punjab-85, which showed lower translocation, but derived a higher amount of N from soil after anthesis. Remobilization of vegetative N ranged between 74 and 85% in different varieties at the two N levels. However, substantial quantities of N were also taken up after anthesis. The amount of this N was much higher in fertilized than in unfertilized plants. The results of this study suggested the both pre and post-anthesis N uptake are important in influencing the grain yield.

Key words: N partitioning, N uptake, Wheat.

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THE USE OF *SESBANIA* AS AN ALTERNATIVE SOURCE OF UREA-N FOR BR-11 RICE

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(Received August 25, 1994 ; revised December 1, 1994)

A field trial was conducted to evaluate the performance of *Sesbania* and *Azolla* manures as alternative sources of urea-N in producing higher yield of BR-11 rice. *Sesbania* (inoculated with *Bradyrhizobium* inoculant) treatment resulted in the highest rice yield of 4363 kg/ha with a yield benefit of 44% increase over control. The increase in rice yield was 32% due to urea and 31% for *Sesbania* (uninoc.). *Azolla* manuring could not give significantly higher yield because of insufficient biomass production due to elevated temperature prevailing during the growth period. *Sesbania* manuring enriched soil fertility by increasing organic matter level and P, K and S availability in soils.

Key words: *Azolla*, Rice, *Sesbania*, Urea.

INFLUENCES OF MAJOR PESTS OF RICE ON YIELD IN BANGLADESH

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(Received January 3, 1994 ; revised September 25, 1994)

Field experiments were conducted during aman season of 1990 with two rice varieties namely, Nizersail and IR20, to determine the influences of pests on rice yield and interrelationship among the attacking pests. Abundance of rice pests showed negative correlations with rice yield. Path coefficient analysis reveals that abundance of *Scirpophaga incertulas* and *Sesamia inferens* (rice stem borers) had the maximum negative direct effect on rice yield. Step-wise regression equations showed the highest relative importance of rice stem borers for their damaging capabilities on rice yield followed by *Dicladispa armigera* (rice hispa).

Key words: Stem borers, Green leafhopper, Rice swarming caterpillar, Rice hispa, Influence of pests, Rice yield.

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IDENTIFICATION AND QUANTIFICATION OF ECDYSTEROIDS FROM *AERVA* *TOMENTOSA* AND *PANDIAKA INVOLUCRATA*

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Ecdysteroids have been isolated and quantified from the roots of *Aerva tomentosa* (0.035%) and the aerial parts of *Pandiaka involucrata* (0.3%). The latter has been found as one of the best source of 20-hydroxyecdysone in plants, traces of 5,20-dihydroxyecdysone have also been detected from it.

Key words: Ecdysteroids, *Pandiaka*, *Aerva*, Amaranthaceae, 20-Hydroxyecdysone.

Technology Section

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EFFECT OF TEMPERATURE AND USE OF FERMENTED GREEN GRAM AS STARTER CULTURE ON THE PREPARATION OF FERMENTED FISH SILAGE

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(Received March 9, 1994 ; revised September 13, 1994)

Fermented fish silage was prepared at different controlled temperatures: 10°, 20°, 30° and 40°C. Samples were taken out at 0, 3, 7, 14 and 21 days for determining changes in pH value, non protein or soluble nitrogen, peptides, ammonia, amino acid nitrogen and lactic acid bacterial (LAB) count. According to the findings of this study, the temperature has a profound effect on the quality and the duration of fermentation of fish silage. Good quality silage can be prepared within 3 days at 40°, 7 days at 30°, 14 days at 20° and 21 days at 10°C. Merits of fermented green gram as starter culture were also evaluated at these temperatures.

Key words: Temperature, Fermentation, Lactic acid bacteria, Green gram, Starter, Fish silage.

BIOCHEMICAL CHANGES IN RICE DURING STORAGE AT THREE DIFFERENT TEMPERATURES

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Biochemical changes in rice stored at 10°, 25° and 45°C for 6 months were studied. The changes in pH, titratable acidity and loss in solids of the rice stored at 25° and 45°C were significant. Amylase activity of the samples showed a decrease during storage. A significant decrease in water soluble amylose alongwith an increase in insoluble amylose contents was observed during storage of rice at 25° and 45°C. However, total amylose contents of rice remained unchanged during 6 months storage.

Key words: Rice, Biochemical changes, Storage.