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Physical Sciences Section

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FUGACITY COEFFICIENT WITH MODIFIED CONSTANTS OF REDLICH-KWONG EQUATION OF STATE

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The adequacy of the modified constants of Redlich-Kwong equation of state suggested by various research workers has been studied on the criterion of equality of fugacity coefficients of vapour and liquid phases. The comparison with the data of twelve compounds showed that the approach of Medani and Hasan (1978) gave the least deviations. The values of constants, with their approach, for propane, argon, nitrogen, methane and methanol have also been reported.

DEPENDENCE OF INTENSITY OF LINES ON CONCENTRATION OF TIN DURING EXCITATION IN AN A.C.ARC

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(Received January 27, 1981; revised July 7, 1984)

Studies were carried out to show the real effect of tin on the precision of analysis especially for Cu, Pb and Sb together with Mo which is used as I.S. The effect of tin on the absolute intensity was remarkable if its concentration was less than about 40%. The maximum intensity change was attained at 10% tin. The detection limits were measured for the 3 elements viz Cu, Pb and Sb.

LAND BASED POLLUTION AND THE MARINE ENVIRONMENT OF KARACHI COAST

M. Arshad Ali Beg, S. Naeem Mahmood, Sitwat Naeem and A.H.K. Yousufzai

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(Received May 2, 1984)

Surveys were carried out to assess the degree of pollution caused by the discharge of industrial and municipal effluents through Lyari river into the coastal areas of Karachi, initially between January and December in 1980 at monthly intervals and during 1981-82 at quarterly intervals. Several chemical parameters have been used to evaluate the quality of Lyari discharge and of the sea water. It is found that the former, being strong sewage is the major source of pollution in the Manora Channel.

The healthy growth of mangroves on the one hand and widespread pollution by Lyari effluents which supplies organic nutrients over the entire Manora Channel suggests that an ecological balance has been arrived at and the channel presents itself as a dynamic ecosystem receiving nutrients from Lyari and distributing and spilling it all over by tidal action.

The high bicarbonate content of the beaches is suggested to be due to air pollution on shore.

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STUDIES ON THE BIOLOGICAL CONTAMINATION OF THE COASTAL ENVIRONMENT OF KARACHI

M. Arshad Ali Beg, Najma Basit, Farzana Siddiqui, Ismat Mahmood
and Mahmood A. Siddiqui*

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(Received May 21, 1984)

Microbiological investigations undertaken to assess the degree of pollution caused by the discharge of industrial and municipal effluents through Lyari river into the coastal areas of Karachi indicate that a high FC Count (918/dl) is found on the beaches. The pattern of variation of FC Counts (MPN) among the samples collected from the contaminated area during 1980 and 1982 has been discussed.

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CALCULATION OF MONTHLY AVERAGE SOLAR RADIATION ON INCLINED SURFACES

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(Received Sept. 9, 1983; revised May 22, 1984)

In this paper monthly average daily radiations incident on inclined surfaces facing directly towards the equator have been estimated. The ground reflectance of 0.23 for semidesert land of Bahawalpur (lat. 30°N) has been used.

Short Communication

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CONSTITUENTS OF *CONYZA AEGYPTIACA* L*

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Biological Sciences Section

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EXPERIMENTAL CULTIVATION OF *VERNONIA PAUCIFLORA* — A RICH SOURCE OF VERNOLIC ACID

Parveen Aziz, Shafiq A. Khan and A.W. Sabir

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Various cultivation parameters for the cultivation of *Vernonia pauciflora* (N.O. Compositae), have been studied. This exotic species has been successfully introduced and the crops have been raised in the fields of the PCSIR Laboratories, Lahore, for six successive years with satisfactory results. It has been found that on average the plants mature in 180 days (November-May) and the seeds yield an oil (33-37%) that contains (74-80%) vernolic acid.

DEVELOPMENT OF ERUCIC ACID AND GLUCOSINOLATE— FREE RAPESEEDS (CRUCIFERS) IN PAKISTAN

Part III. Erucic Acid and Glucosinolate Levels of Eatable Crucifers of Pakistan.

Shafiq Ahmad Khan, Salma, Esar Ahmad Butt, Abdul Waheed Sabir and Parveen Aziz,

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(Received March 1, 1984)

Seed oils from ten species of eatable Crucifers have been evaluated for their physico-chemical characteristics and fatty acid compositions. The glucosinolate levels of the seed meals have also been determined. It has been observed that in all these species the erucic acid and glucosinolate levels (33-57%) and (T—0.5%) respectively, have wide variations.

DEVELOPMENT OF ERUCIC ACID AND GLUCOSINOLATE-FREE RAPESEEDS (CRUCIFERS) IN PAKISTAN*

Part IV. The Instance of Erucic Acid and Glucosinolate Occurrence in Some Wild Crucifers of Pakistan

Shafiq Ahmad Khan, Salma, Abdul Waheed Sabir and Parveen Aziz

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(Received March 1, 1984)

The seeds from wild growing *Alyssum desertorum*, *Cardaria chalepense* *Conringia planisiliqua*, *Coronopus didymus* *Descurania sophia*, *Erysimum repandum*, *Malcolmia cabulica*, *Nastrutium officinale* and *Sisymbrium irio* (N.O. Cruciferae), have been analysed for their oil, erucic acid and glucosinolate contents. It has been found that all these species have a wide variation of erucic acid (1.55-31.42%) and glucosinolate (0-0.5%).

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**EGG MASSES AND LARVAE OF TWO SPECIES OF *CYPRAEA* (MOLLUSCA: GASTROPODA)
FROM THE COAST OF KARACHI BORDERING THE NORTHERN ARABIAN SEA**

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(Received February 2, 1984)

The egg masses of two species of *Cypraea*, *C. arabica* and *C. turdus* are described and illustrated for the first time. Both species deposit benthonic egg capsules; the egg capsules are of generalised type, which is a characteristic of the genus. The two species differ considerably in the size of their egg capsules and number of eggs per mass.

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**OPTIMUM MOISTURE AND DEPTH LEVEL IN FINE VERMICULITE FOR
PUPATION OF ORIENTAL FRUIT FLY, *DACUS DORSALIS* HENDEL
(DIPTERA: TEPHRITIDAE)***

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(Received January 27, 1984)

Studies were conducted to determine an optimum moisture and depth level for pupation of *Dacus dorsalis* Hendel in fine vermiculite at 0, 10, 20 and 40% moisture and 1.2, 2.4 and 3.6 cm depth levels. It was found that pupation was significantly affected at all levels of moisture and depth. Adult emergence was not significantly different at various moisture levels, however, it was significantly higher at deeper depth level. On the basis of per cent mean pupation and adult emergence 10% moisture at 3.6 cm depth was recorded as an optimum level for pupation of this species in fine vermiculite.

BIOMETRICAL ANALYSIS FOR COMBINING ABILITY OF FOUR SPRING WHEAT CULTIVARS

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(Received March 17, 1984; revised August 21, 1984)

Combining ability analysis of four wheat varieties was carried out for yield and its major components like number of heads per plant, number of grains per head and grain weight. Mean square values for general and specific combining ability were highly significant ($P \leq 0.01$). The greater proportion of variance component for general combining ability revealed the nature of gene action to be predominantly additive for all the characters. Cultivar LU 21 proved to be the best general combiner for number of grains per head and yield per plant whereas C273 and LU75 respectively showed their promise for grain weight and number of heads per plant. The varietal crosses i.e., LU21 x LU75, LU75 x LU235 and C273 x LU21 reflected highest specific combining ability for number of heads per plant, number of grains per head and grain weight respectively.

**LABORATORY EVALUATION OF SOME INSECTICIDES FOR THE
CONTROL OF PAINTED BUG, *BAGRADA HILARIS* (BURM.)
(HETEROPTERA: PENTATOMIDAE)**

(Received April 28, 1983; revised 9-8-1984)

Sana Ullah Khan Khattak

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Laboratory studies on the effectiveness and residual toxicity of six insecticides were carried out against *Bagrada hilaris* using 0.025 and 0.05% concentrations. The results showed that Dimecron, Azodrin and Metasystox gave significantly higher mortality and persistency. Phosdrin gave significantly higher initial kill but dissipated sharply while Vapona and Nexion proved significantly less effective.

Short Communication

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**A LEAF SPOT DISEASE OF DAHLIA DAHLIA VARIABILIS (WILLD.) DESF. CAUSED BY
ALTERNARIA TENUISSIMA (KUNZE EX PERS.) WILTSHIRE**

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Technology Section

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OILSEED PROCESSING TECHNOLOGY IN PAKISTAN

Part II. Lahore Oil Expeller, Mechanical Aspects and Improvements

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(Received April 16, 1984)

The design of the existing Lahore Expeller (size 4") has been modified by the addition of a reverse worm (1.5") at the end of the main screw assembly. Alternation in the adjacent iron bars of the drainage barrel for oil squeezing have also been affected. As a result of these modifications the residual oil in the cake has been reduced to 7.5% as against 11-12% obtained by the expeller now in use. The quality of the residual meal is not affected.

Working on rapeseeds alone, it has been estimated that an additional amount of 10,000 tons of oil worth about Rs. 100 million (@Rs. 10/- kg) can be additionally recovered.

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A STUDY OF GLASS SANDS FROM DARA PEZU AND MIANWALI AREAS

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(Received April 16, 1984)

A laboratory investigation was carried out on fourteen samples of sands from Dara Pezu and Mianwali to study their suitability in glass industry. The investigation involves the removal of coarse and fine grains, washing treatment and finally magnet application. The percentage of Fe_2O_3 in raw as well as in final products was determined. The sand sample No. V from Dara Pezu containing iron 0.04% was found to be the best of the whole lot. Sample Nos. II and III from Mianwali containing iron 0.05% come next in the order. All the above three sands may, therefore, be used for making colourless and laboratory glasswares.

Short Communication

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**MOISTURE CONTENT OF ASCORBIC ACID TABLETS STORED AT VARIOUS
TEMPERATURES AND HUMIDITIES**

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