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Physical Sciences Section

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ISOLATION AND STRUCTURE OF HOLACINE A NEW ALKALOID FROM THE BARK OF *HOLARRHENA ANTIDYSENTERICA* LINN

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(Received July 19, 1981)

Two new alkaloids provisionally named as holacine and holacimine have been isolated from the bark of *Holarrhena antidysenterica*. The structure of holacine has been elucidated through spectral studies and chemical reactions.

VOLUMETRIC DETERMINATION OF SULPHITE WITH N-BROMOSUCCINIMIDE USING BORDEAUX RED AS INDICATOR

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(Received February 11, 1981)

A new method for the determination of sodium sulphite has been described where N-Bromosuccinimide has been used as a direct titrant. Bordeaux red has been used as an indicator whose rose red colour changes to yellow at the end point. The interference due to thiosulphate, sulphide, sulphate and Fe^{+2} have also been studied and removed. The method is convenient, rapid and accurate.

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EXTRACTION-SPECTROPHOTOMETRIC DETERMINATION OF Co(II) IN THE PRESENCE OF Fe(III).

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(Received March 14, 1981)

Formation of complexes between cobalt and iron and thiocyanate in the presence of hydrochloric acid has been examined. The blue coloured complex of Co(II)-SCN is quantitatively extractable into an organic phase containing tribenzylamine (TBA), (a high molecular weight amine: (H.M.W.A.), whereas the blood red complex of Fe(III)-SCN formed under the same conditions is only partially extracted. This selective extractability by TBA has made possible the determination of cobalt in presence of iron.

EFFECT OF GRADED LEVEL OF INSULIN ON BLOOD SUGAR AND LIPID DISTRIBUTION IN A HIBERNATING LIZARD

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The effects of intraperitoneal administration of insulin, in graded doses, was studied on blood sugar and lipid distribution in a hibernating lizard, *Uromastix hardwickii*. The lizards were found to be quite resistant to insulin, they tolerated up to 25 units of insulin, in 5 divided doses, without any insulin shock. The blood sugar was insignificantly below the normal level in the insulin treated animals. Plasma glyceride level was slightly lowered and liver glyceride was little elevated after insulin administration. The most prominent effect was observed in the case of adipose tissue glycerides. At lower doses the glyceride level of adipose tissue depressed insignificantly but highly significant depression was noted as soon as a dose higher than five units was injected. It appears that insulin induces a dose dependent lipolysis in adipose tissue. No marked variation in the total cholesterol content was observed in plasma, liver and adipose tissue after insulin administration. Plasma phospholipid level was gradually decreased reaching a minimum value at a dose of 10 units of insulin. At further higher doses the phospholipid level again started to increase, but still remained below the normal level. The reverse was true in the case of liver phospholipid. The major fatty acids of adipose tissue were palmitic, stearic and oleic acids. Myristic, palmitoleic, linoleic and arachidic acids were also present in appreciable amounts. The level of palmitoleic, oleic, linoleic and arachidic acid of adipose tissue was increased significantly with a concomitant decrease in the levels of palmitic and steric acids in the insulin treated animals.

CRITERION FOR THE FORMATION OF A THERMOCLINE IN THE EASTERN IRISH SEA

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Several workers have proposed criteria to determine whether complete vertical mixing should occur or a thermocline be developed as a result of summer heating. For waters around the British Isles Fearnhead (1975) found that the existence of fronts between well mixed and stratified waters corresponds to a value of $H/u_m^3 \approx 100$, where H is the depth of water and u_m is the amplitude of the tidal current. Considerable degree of stratification in temperature and salinity was observed over a large part of the area in the Eastern Irish Sea during the summers of 1975 and 1976. In view of the current interest in the occurrence of the fronts and their relation to mixing processes the conditions observed in these two summers are related to various criteria which have been proposed. Contours of the values $P=H/u_m^3$ show that the critical value of about 100 applied fairly well to the area in the Eastern Irish Sea. One would expect a thermocline to be formed earlier in summer where the values of the parameter p are the highest.

IDENTIFICATION AND ESTIMATION OF GOLD (Au^{197}) PRESENT IN A FORMAT BY NEUTRON ACTIVATION AND GAMMA RAY SPECTROSCOPY*

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(Received December 13, 1980)

A method is given for identification of gold, present in a format in micro quantities, by Neutron activation and gamma ray spectroscopy, employing a NaI (TI) detector system. Gamma radiation spectrum of the activated element displays characteristic photo peaks at specific energies (E) and definite half life ($T_{1/2}$). The determined values of E and $T_{1/2}$ can be used to ascertain the presence of gold in the format. The weight of the element in the format has been estimated with the help of data obtained in an ancillary experiment, performed simultaneously. The weight is found to be $(11.1 \pm 0.2)\mu\text{g}$. This method can be used for prospecting of gold and other elements in unknown samples.

CHELATING BEHAVIOUR OF SUBSTITUTED 3-ARYLHYDRAZO PENTANE-2,4-DIONE.

Part V*. Physico Chemical Studies of Copper Complexes with o-, m-, p- and 4-Me-o-Sulphonic Benzene-Hydrazo Pentane-2,4-Dione

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The dissociation constants of four sulphonic derivatives of 3-benzenehydrazopentane-2,4-dione were determined, as well as the stability constants and composition of their complexes with copper were studied spectrophotometrically. Conductometric titrations confirmed the spectrophotometric results. pH-metric and IR studies of the copper complexes are also carried out.

Biological Sciences Section

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EFFECT OF A JUVENILE HORMONE ANALOGUE ON THE DESERT LOCUST, *SCHISTOCERCA GREGARIA* (FORSKAL)

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(Received May 24, 1981)

Juvenile hormone activity of Stauffer R-20458 was assessed on fifth-instar nymphs of the desert locust, *Schistocerca gregaria* (Forsk.) by topical application and intra-haemocoelic injection. The maximum sensitivity to the test compound was observed during the first four days following the final molt. The maximum number of intermediates were obtained when the compound was applied to the pronotal area at dosages varying from 2.5 to 20 µg. Morphogenetic effects included changes in pronotal pigmentation and wrinkling of both pairs of wings. The ED₅₀ was 20 µg/g of body weight. Treated nymphs that survived, compared favourably with control insects in terms of oocyte maturation, gonadal size and fecundity.

MATING BEHAVIOUR AND OVIPOSITION OF *DIACRISIA OBLIQUA* WLK.
(LEPIDOPTERA: ARCTIIDAE)

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(Received April 25, 1981)

Mating behaviour and oviposition of Jute hairy caterpillar, *Diacrisia obliqua* were studied in the laboratory at $28 \pm 1^\circ$ and $60 \pm 5\%$ relative humidity with 14 hr of darkness and 10 hr of fluorescent tube light. Mating was mostly observed in the late hours of night. The female showed excitement to attract the attention of the male prior to mating. The female preferred the lower surface of the leaves for oviposition.

INFLUENCE OF (2-CHLOROETHYL)-TRIMETHYL AMMONIUM CHLORIDE (CCC) ON THE GROWTH AND DEVELOPMENT OF WHEAT

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(Received August 23, 1981)

The effects of (2-Chloroethyl)-trimethyl ammonium chloride on growth, development and yield aspects were investigated at the University of Agriculture, Faisalabad.

The seeds of wheat variety C-591 were soaked in 0, 600, 1000 and 1400 parts per million solution of cycocel for 24 hr. Cycocel treatment decreased plant height, shoot dry weight and shoot per root ratio. Increase in the concentration of cycocel increased the dry weight of shoot, while shoot/root ratio decreased significantly in 1000 and 1400 ppm as compared to control. Cycocel increased the root length significantly. The root dry weight was increased significantly only in 1000 ppm cycocel treated plants as compared to control. The leaf area was unaffected by the treatment. The number of tillers, length of spikes, number of spikelets and number of kernels were increased significantly by the application of 1000 ppm cycocel. The grain yield was significantly increased by all the three concentrations of cycocel used as compared to control. There was 45.4 % increase in grain yield in 1000 ppm treated plants whereas the increase recorded in 600 and 1400 ppm treated plants was 28.9 and 23.4 % respectively. The grain yield of 932.01 g was observed in control.

Technology Section

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SYMBIOTIC BIODEGRADATION OF CROP RESIDUES

Part I. Biodegradation of Wheat and Rice Straw

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The effect of pre-treatment and reduction in particle size of straws on its microbial digestibility has been investigated. Biodegradation of rice straw was 48.35 % and 69.93 % when *Penicillium* and *B. polymyxa* were employed singly. The combination of *B. polymyxa* with *Penicillium* showed an improvement in the degradability of rice straw upto 71.67 %. The digestibility of cellulose present in wheat straw increased by 54.85 % by symbiotic effect of *B. Cereus* and *Chaetomium*. Reduction in particle size improved the susceptibility to microorganisms.

CHEMICAL EXAMINATION OF CUTICLE WAX OF ORANGE AND KINNOW FRUITS

Part I. Analysis of the Saponifiable Fraction

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(Received June 25, 1981)

Saponifiable matter of the cuticle wax from oranges and kinnow fruit peels has been analysed for its fatty acid composition. The constituent fatty acids vary from C_{12} to C_{24} with unsaturated acids ranging from 40 to 60 % of the total saponifiable matter. The neutral fraction of the wax is under examination.