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STUDIES ON RHAZYA STRICTA DCNE.

Part I.—Isolation of a new Alkaloid "Sewarine"

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A new alkaloid, *sewarine* has been isolated from an indigenous medicinal plant Sesar (*Rhazya stricta* Dcne.). On the basis of studies in the chemical constitution of sewarine which has been found to possess marked oncolytic activity, a structure for the base has been proposed, and some of its salts and derivatives have been described.

CHEMICAL EXAMINATION OF SARCOCOCCA SALIGNA

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From the crude alkaloidal mixture (1.3%) obtained from cold alcoholic extract of the dried leaves of *Sarcococca saligna*, two new alkaloids have been isolated (I) A shining crystalline base, provisionally named Salignine, has been obtained in an yield of 0.12%, has molecular formula $C_{29}H_{52}N_2O$, m.p. 229-30°C., $[\alpha]_D^{25} + 18.5$ (MeOH) and gives the following derivatives: methiodide $C_{30}H_{55}N_2OI$, m.p. 268-69 C., hydrochloride, $C_{29}H_{52}N_2O \cdot HCl \cdot H_2O$, m.p. 261-63°C., picrate m.p. 128-30°C. (decomp), Chloroplatinate m.p. 214-15 (decomp), and gold chloride m.p. 177-78°C. (decomp). (II) A white needle shaped crystalline product obtained in 0.05% yield has m.p. 136-37°C., $[\alpha]_D^{25} + 64$ (MeOH), and molecular formula $C_{25}H_{44}ON$.

TURBIDIMETRIC DETERMINATION OF MORPHINE IN SUBMICRO QUANTITIES

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A turbidimetric method is proposed for the determination of morphine in the range of 10—80 μ g. The procedure has been applied to the estimation of morphine after its chromatographic separation from other alkaloids in synthetic mixtures and pharmaceutical preparations. The method is rapid and accurate within $\pm 1.0\%$.

Part II.—Influence of Catalysts on the Reaction between Linseed Oil and Pentaerythritol Rosin Ester

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Reaction between pentaerythritol — rosin ester and linseed oil has been studied in the presence of catalysts such as litharge, manganese dioxide and cobalt acetate. The present investigations have confirmed the previous findings that catalysts play a significant role in the oil-resin reactions during the preparation of oleo-resin varnishes. The most significant result of the present investigations is that whereas the catalysts accelerate the rate of polymerisation in case of linseed oil and linseed oil-ester gum based varnishes, it has just the opposite effect in case of linseed oil-pentaerythritol rosin ester, coatings. This indicates that if more reactive components are used in the manufacture of varnish, it should be possible to prepare improved coatings, with the use of catalysts to alter the course of oil-resin reaction.

KINETICS OF OXIDATION OF TARTARIC ACID BY Ce(IV) IN PRESENCE OF SULPHURIC ACID

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Oxidation of tartaric acid by Ce(IV) in sulphuric acid has been studied. The reaction is found to be of the first order in initial stages ($\sim 40\%$ of the completion of reaction), but to a major extent it is of second order. Second order rate constant increases with the increase in pH from 1.8 to 3.6. Effect of ionic strength indicates Z.A. Z.B. = -2.05 . Value of energy of activation, frequency factor and entropy are 11.65 Kcal; 2×10^7 litre mol⁻¹ sec⁻¹ and -19.06 e.u. respectively. The results can be explained on the basis of the formation of a complex between tartarate and Ce (IV) ions which decomposes to give a free radical.

PREPARATION AND PROPERTIES OF PHOSPHORYLATED JUTE CELLULOSE

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Different methods were examined for phosphorylation of jute cellulose. Best results were obtained with urea-phosphoric acid method with slight modification of the procedure. The effects of reagent/cellulose ratio, temperature and period of reaction were studied. Under optimum conditions, the product contained about 11% phosphorus and had a cation exchange capacity of over 3.5 m. equiv/g. The ion-exchange behaviour has been characterized and evaluated by pH-titration and conductometric methods. The product has good flow characteristics and can be conveniently used in a column.

DIPHENYL NITRIDES OF ANTIMONY, ARSENIC AND PHOSPHORUS

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Diphenyl phosphinic nitrides (trimer and tetramer) have been synthesised by two different methods and their yields have been worked out. Similarly arsenic and antimony nitrilic compounds have been prepared, but by different methods. Their preparations have been made in the medium of liquid ammonia. Properties of all these compounds have been studied and their structures with the magnetic susceptibilities measurements have been determined. The composition of various compounds in this category already known, have also been determined and the previous findings supported.

Part I.—Growth of Young Albino Rats as Influenced by Heat-treated Mustard Oil and Erucin Supplementation of Groundnut Oil in Fish Flour Diet

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(Received April 1, 1965)

A growth inhibitory factor present in mustard oil was investigated by feeding young albino rats with raw, boiled and steamed mustard oil and with groundnut oil supplemented with erucin. The results show a definite improvement of the growth due to heating of the mustard oil. Partial substitution of groundnut oil with erucin at 40% level did not produce any appreciable change in the growth rate calculated per 100 calories food intake. It appears that the lower growth rate as effected by mustard oil feeding is not due to high erucic acid content but may be attributed to the presence of some volatile compound which is removed during the ordinary process of cooking of the food-stuffs with this oil.

PREPARATION OF BLAND PROTEIN MEAL FROM MUSTARD SEED CAKE

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Attempts were made to convert an animal feed into palatable protein meal for human consumption. Allyl-isothiocyanate, a toxic substance, present in mustard seeds was liberated by enzymic hydrolysis of its glucoside and removed by steam distillation. The product thus obtained was free from the toxic material and contained 33.0% proteins on the fat-free basis. Crisp Pakoras prepared from the proteins were fairly acceptable and contained 16.5% proteins on fat-free basis. Net protein utilization value of the meal was 42%.

BIOCHEMICAL AND NUTRITIONAL STUDIES ON EAST PAKISTAN FISH

Part X.—Reducing Sugar Content of some Fresh Water Fish as Influenced by Boiling Treatment and Storage under Room Temperature and in Ice

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(Received June 29, 1964)

The reducing sugar content of the muscles of some fresh water fish of East Pakistan as influenced by boiling treatment, ice storage and by spoilage due to storage at ordinary room temperature, has been investigated. The average value in the fresh fish is 42.9 mg. percent and this on parboiling of the whole fish drops to 26.6 mg. percent. Storage of the fresh fish at ordinary room temperature of 80-84°F which leads to decomposition, reduces the value by 47.1 % from the original value. Storage of the boiled fish, on the contrary, reduces the value by 25.6 %. Storage in ice for 2 days did not show any change of the values of fresh and boiled fish samples. The significance of the difference in the reduction of the reducing sugar due to storage of fresh fish and boiled fish at ordinary room temperature and constancy due to storage in ice has been discussed in the light of the enzymes from two sources—one from endogenous source of the fish tissues and another from the exogenous source of spoilage microorganisms.

CHEMICAL CHANGES DURING MALTING OF CEREALS

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The digestibility of wheat, maize and sorghum increased when the seeds were germinated. Kilning of these seeds imparted an appetizing flavour to the malted flour. Vitamin B₁, soluble amino acids and soluble sugars were determined at various stages of germination and were maximum in wheat seeds.

MORPHOMETRICAL AND HISTOLOGICAL STUDY OF THE REPRODUCTIVE SYSTEM OF DESERT LOCUST, *SCHISTOCERCA GREGARIA* (Forsk.) ORTHOPTERA ACRIDIDAE

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The average total number of ovarioles per grasshopper was found to be 107.9, while the average number of ovarioles in right or left ovary was 53.9. The maximum difference between the number of ovarioles of the left and right ovaries was 7. The number of egg rudiments per ovariole varied from 13-20, with an average of 15 in the young females. The testicular follicles varied from 120-154, with an average of 132.9 per grasshopper.

The average length and breadth of the testes, testicular follicles, vas deferens between accessory glands and testicular follicles and ejaculatory duct was 7.65 mm. and 2.3 mm., 3.1 mm., and 0.24 mm., 15.5 mm. and 0.15 mm. and 1.6 mm. and 0.32 mm. respectively (Table 1).

The average length and breadth of spermatheca, spermathecal duct, lateral oviduct, common oviduct, and ovariole was 2.26 mm. and 0.91 mm., 12.5 mm. and 0.14 mm., 8.24 mm. and 1.29 mm., 5.0 mm. and 0.99 mm., 5.7 mm. and 0.19 mm. respectively. The length and breadth of the ovary was variable depending upon the development of eggs. The average length of uncoiled accessory gland was found to be 9.9 mm. in females about to lay eggs (Table 2).

MINERALOGICAL AND CERAMIC INVESTIGATIONS ON A HIGH ALUMINA CLAY FROM SKESAR HILLS

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X-Ray, D.T.A. and other ceramic data are presented for a high alumina clay from Mianwali District. X-Ray studies revealed that the ore contains minerals boehmite, kaolinite and anatase. D.T.A. and other studies confirm the X-Ray findings. The mineral after calcination contains 72% Al_2O_3 , thus having the highest percentage of alumina so far reported to occur in Pakistan. The mineral was found useful for ceramic purposes, such as for making high alumina refractories for lining in metallurgical, cement and glass furnaces. It could also be used for extracting alumina.

THERMOMETRIC ANALYSIS OF SOME SAMPLES FROM POTWAR AREA

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Eleven rock samples were taken from Potwar area for paleotemperature determination. The present study has shown that the maximum temperatures of crystallization of calcite may be approximately equivalent to paleotemperature of the parent rock. The lowest limit of maximum temperature ($160^{\circ}\text{C}.$) favours the migration of viscous oil and the highest limit of maximum temperature ($400^{\circ}\text{C}.$) is likely to destroy the hydrocarbons in rocks. Higher temperature has been observed in the older rocks.

ANODISING OF ALUMINIUM

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A mixture of alcohol and water containing suitable amount of sodium hydroxide has been investigated as a new electrolyte for anodising of aluminium articles. The anodised film developed with this electrolyte is more transparent compared to those of other processes and can be dyed subsequently by the usual techniques.

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Studies have been made on various samples of Lohi wool collected from the home tract of the breed. It has been tested for diameter, breaking strength, elongation and subsequently stress, tenacity and tensile strength have been calculated. The tensile properties of True, Heterotypical and Medullated wool have also been compared with that of Kaghani, Hashtnagri and Harnai wool.

STUDIES ON CATALYTIC PRODUCTION OF DIETHYL ETHER FROM ALCOHOL¹

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The efficiency of a specially prepared catalyst from potash alum and aluminium sulphate has been investigated for the maximum conversion of alcohol into diethyl ether. With the catalyst mesh size 20-40, temperature of reaction 220-250°C., feed rate of alcohol 0.55 g./h./g. catalyst at atmospheric pressure, the yield of ether is as high as 76%. The catalyst can convert sixty times of its weight of alcohol into ether.

A THERMOSETTING PLASTIC FROM HORNS AND HOOFS

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Steam-distilled horns and hoofs powder is reacted with formaldehyde and ammonia. The polymer, on blending with saw-dust and a resin such as urea or phenol-formaldehyde or furfuraldehyde, yields a thermosetting composition which exhibits the characteristics of urea formaldehyde or phenol-formaldehyde or furfuraldehyde plastics.

SHORT COMMUNICATION

STUDIES ON MELILOTUS INDICA (LINN.) ALL

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SYNTHESIS OF 4,6-DIHYDROXY-1,3-DISUBSTITUTED PYRIDINES

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AMINO ACID CONTENT OF FISH MUSCLE PROTEINS

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**STUDIES ON THE IDENTIFICATION OF SUGARS IN FRUIT JUICES BY PAPER
PARTITION CHROMATOGRAPHY**

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**ACARICIDAL ACTIVITY OF PETKOLIN AGAINST RED SPIDER MITES (ACARINA
TETRANYCHIDAE)**

M. ANWARULLAH AND (MISS) TASNEEM AKHTAR

(Received August 26, 1965)

PHARMACOGNOSTIC STUDY OF THE STEM AND LEAF OF LANTANA INDICA ROXB

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STUDIES ON THE TENSILE CHARACTERISTICS OF TERAHI WOOL FIBRES

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