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KINETIC BEHAVIOUR OF THE SULPHONATED LIGNIN-FURFURAL RESIN

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(Received May 25, 1968)

The breakthrough capacity of the sulphonated lignin-furfural resin depends on the condition of sulphonation. This capacity as well as the capacity determined by the dynamic method are influenced by different cations. No other anions, except the acetate, can influence the capacity determined by the dynamic method. Concentration also has marked effect on the sorption of a cation. This effect is much more prominent than the effect produced by the change in the flow rate. The value of the breakthrough capacity does not change even if the resin is taken in the Na^+ form instead of the H^+ form. Moreover, 2M NaCl can elute Ca^{2+} ions quantitatively.

Values of the distribution coefficient with different cations increase with the increase of pH up to certain range and then tend to approach limiting values.

DIFFUSIVE SEPARATION IN THE UPPER ATMOSPHERE

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(Received May 1, 1967)

Density and temperature measurements with magnetic mass spectrometer taken at two Aerobee flights have been analysed and interpreted using the equation for diffusive equilibrium. It is found that O(16) is in diffusive equilibrium starting from 130 km, whereas N₂(28) and O₂(32) from 110–115 km. The temperature measurements compare with the theoretical values very nicely within 1%.

STUDIES ON INDIGENOUS IRON ORES

Part I.—Effect of Heat in Presence of Carbon Dioxide, Nitrogen and Air

SHABBIR AHMED QURESHI, ABDUL HAMEED SHAIKH and SHAKIL AHMED

Engineering Division, Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

(Received October 4, 1967; revised February 7, 1968)

The effect of heat on Makerwal, Chichali (East) and Chichali (West) iron ores of sizes 3–4 in and –200 mesh, in an atmosphere of CO_2 , N_2 and air—the primary components of blast-furnace gases—over a temperature range of 200–1200°C with a view to reduce the Fe^{++} contents of the ore, has been studied. The ferrous content of the heated ores sharply falls after 600°C. This means that the FeO , which is an undesirable product, can be reduced to a minimum simply by heating the ore at 600°C and that this could presumably pave the way for an economical metallurgical process.

Also studied are the magnetic properties acquired on heating and the possibility of the magnetic separation of the iron oxides. The approach does not appear to be promising as most of the iron is lost in the non-magnetic part of the iron ore.

CHEMICAL CONSTITUENTS OF LYCEUM EUROPAEUM

Part I.—Isolation of Lyceamin and β -Sitosterol

M. MANZOOR-I-KHUDA* and (Miss) SITWAT SULTANA

*Drugs, Pharmaceuticals and Pesticides Research Division, Central Laboratories,
Pakistan Council of Scientific and Industrial Research, Karachi*

(Received January 5, 1968)

A new water-soluble base now designated as lyceamin, m.p. 280–81°C, $C_{19}H_{42}N_4O_7 \cdot 4H_2O$, and β -sitosterol, m.p. 136–37°C, have been isolated from the aerial part of *Lyceum europaeum*.

CHEMICAL CONSTITUENTS OF CAPPARIS APHYLLA

Part II.—Isolation of Capparin, Capparilin and Capparinin

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(Received January 5, 1958)

New water-soluble indole bases designated as capparin, m.p. 236–38°, α_D^{20} –17° (c 1.05%, ethanol), capparilin, m.p. 188–91°, α_D^{29} –43° (c 0.58%, ethanol) and capparinin, m.p. 229–31°C, α_D^{29} –12° (c 1.3%, ethanol) have been isolated from the roots of *Capparis aphylla*.

**CHEMICAL STUDIES ON BUXUS PAPILOSA—ISOLATION OF TWO NEW ALKALOIDS
BUXPAPINE AND BUXPAPAMINE**

M. IKRAM, G.A. MIANA and F. MAHMUD

North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received February 7, 1968; revised March 14, 1968)

Two new alkaloids provisionally named *buxpapine*, $C_{27}H_{34}N_2O$ and *buxpapamine*, $C_{28}H_{30}N_2O$ have been isolated from strong base fraction of *B. papilosa*.

ALKALOIDAL COMPOSITION OF OPIUM OBTAINED WITH SUCCESSIVE LANCINGS

M. IKRAM, M. RAFIULLAH, A.A. DURRANI and M. ISRAR KHAN

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M.B. ZAMAN

Pakistan Forest Research Institute, Peshawar

(Received July, 14, 1967; revised November 6, 1967)

Opium from various lancements and the capsules after each lancing were analysed for alkaloidal content. Morphine and codeine content is maximum in the third lancing opium, whereas narcotine and papaverine is maximum in the seventh and fifth lancing opium, respectively. In case of capsules, the individual alkaloidal content is maximum after second or third lancing.

PREPARATION OF SOME ALKYL ARYL CARBINOLS AS INTERMEDIATES OF BHILAWANOL TYPE COMPOUNDS

MUHAMMAD HANIF, JAMILUR REHMAN, MUSHTAQ AHMAD, IFTIKHAR AHMAD, S.A. KHAN
and M.K. BHATTY

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(Received February 2, 1967; revised January 20, 1968)

The Grignard reaction of *o*-, or *m*-, or *p*-methoxybenzaldehyde with a straight chain, saturated alkyl halide, having C₁₁ to C₁₇ carbon atoms has led to the preparation of a large number of alkyl methoxyphenyl carbinols. These carbinols can be converted into compounds analogous to bhilawanol by dehydration and demethylation.

STUDIES ON THE LEAF JUICE OF TRIFOLIUM RESUPINATUM

MOHAMMAD NAZIR and F.H. SHAH

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(Received December 14, 1967)

The changes in the protein and lipid contents of the juice extracted from *Trifolium resupinatum* (Persian clover) leaves, when incubated at 37°C for different periods, were studied. A 4.6% increase in TCA (trichloroacetic acid) soluble nitrogen and 5.8% in free phosphates associated with a 3.45 and 2.08% decrease in phospholipids and nucleic acid phosphorus respectively, was observed after 2 hr.

The juice, when incubated at 37°C, in a medium containing 0.8% (w/v) casein at pH 5.5, hydrolysed 49.0% of the casein. The juice also liberated inorganic phosphorus from egg lecithin and hydrolysed 38.78% of it in 24 hr under optimum conditions.

NUTRITIONAL PROPERTIES OF RAPESEED PROTEIN CONCENTRATE PREPARED FROM COMMERCIAL RAPESEED CAKE

IFTIKHAR ALI SHAIKH, MOHAMMAD ARSHAD, M.Y. IKRAMUL HAQUE and S. MAQSOOD ALI

West Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Lahore

(Received April 4, 1967; revised November 9, 1967)

Rapeseed protein concentrate, free from allyl isothiocyanate, was prepared from locally available rapeseed cake. Protein content and net protein utilization (NPU) of the protein concentrate were found to be 70.0% and 63.6% respectively as against 35% and 53% of the original flour prepared from rapeseed cake, showing marked improvement in the quality and quantity of the rapeseed protein after processing rapeseed flour into the protein concentrate. When mixed with fish protein concentrate or skim milk powder so that the ratio of proteins from either source is equal, the NPU was improved to the level of animal protein employed. Growth rate and protein efficiency ratio of a semi-synthetic diet containing rapeseed protein concentrate were comparable to a casein diet used under the same conditions as control. Reproductive performance of rats fed on rapeseed protein concentrate diet were also found satisfactory.

PHARMACOLOGICAL STUDY OF MORINGA PTERYGOSPERMA

SARFRAZ SIDDIQI and MOHAMMAD IKHLAS KHAN

Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

(Received June 20, 1965; revised March 6, 1968)

Moringa pterygosperma, commonly known as 'Sanjna', is a well-known medicinal plant. The aqueous extract of the leaves was found to be an active hypotensive agent on intravenous injection in anaesthetised dogs. It stimulated the isolated rabbit heart, had neuromuscular blocking action on phrenic nerve-diaphragm preparation and produced sedation in conscious animals. The alcoholic extract had similar properties. The toxicity of the compound was very low.

**GENUS CARDUUS (COMPOSITAE) AS REPRESENTED IN THE INDO-PAKISTAN
SUBCONTINENT**

S.M.A. KAZMI*

North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received October 11, 1966; revised July 25, 1967)

A taxonomic revision of genus *Carduus* as represented in the Indo-Pakistan subcontinent, has been made. Key to the species, their descriptions, notes on their differentiating characters and distribution have been given.

STUDIES ON THE AUTECOLOGY AND CULTURE OF LALLEMENTIA ROYLEANA BENTH.

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North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received August 23, 1967; revised February 9, 1968)

Lallementia royleana Benth. is found growing wild in West Pakistan. The seeds of the species are used medicinally and are comparable with the seeds of *Plantago ovata*. As the yield per acre of *L. royleana* and mucilage contents of the seeds are larger than the different species of *Plantago*, experiments on its culture were undertaken further to improve the quality of drug. Observations on its culture and autecology have been given and a method of its cultivation has been developed which improved the quality and yield per acre of the drug considerably.

ON THE CULTURE OF MENTHA LONGIFOLIA (L.) HUDS.

S.M.A. KAZMI* and A.H. SIDDIQUI

North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received December 16, 1967; revised January 31, 1968)

Mentha longifolia (L.) Huds. is the commonest species of wild mint in West Pakistan. In order to assess the possibilities of its commercial exploitation, experiments on its cultivation were undertaken and an economical method was developed. It has been observed that crops raised with this method contain the required percentage of mint oil and menthol prescribed by B.P. and can be exploited for the purpose. Methods, observations and results of analysis have been given in this paper.

COPROPHILOUS FUNGI OF WEST PAKISTAN. PART II.—KARACHI.

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(Received December 14, 1967; revised March 7, 1968)

In continuation of the studies on coprophilous fungi from West Pakistan, eleven more species belonging to Ascomycota have been reported. These are: *Ascophanus aurora* (Crouan) Boud., *A. granuliformis* (Crouan) Boud., *A. lacteus* (Cooke & Phill.) Sacc., *Chaetomium aterrimum* Ell. & Ev., *C. aureum* Chivers, *C. globosum* Kunze ex Fries, *C. spirale* Zopf., *Kernia nitida* (Sacc.) Nieuwland, *Lophotrichus brevirostratus* Ames, *Podospora hyalopilosa* (Stratton) Cain, and *Thielavia variospora* Cain.

All of these species have been recorded for the first time from Karachi. The genus *Lophotrichus* has never been reported previously from Pakistan. The species new to this part of the world are *Ascophanus aurora* (Crouan) Boud., *A. granuliformis* (Crouan) Boud., *A. lacteus* (Cooke & Phill.) Sacc., *Chaetomium aterrimum* Ell. & Ev., *Lophotrichus brevirostratus* Ames, and *Thielavia variospora* Cain.

Descriptions which could help laboratory identifications as well as the illustrations pertaining to all the species included have been provided.

STUDIES ON STORED GRAIN FUNGI

Part 1.—Fungi from Wheat and Rice from Karachi

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Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

(Received October 14, 1967; revised January 13, 1968)

Studies to isolate and identify different fungi from seven varieties of rice (Basmati, Joshi, Kangni, Permal, Begmi, Basmati Broken and Scla Basmati) and two varieties of wheat (Red and White) stored in four different godowns in Karachi area were carried out.

A total of 132 samples were screened from which 550 colonies of fungi emerged. Forty-three species and 7 genera belonging to different groups of fungi were isolated. Among rice, Joshi and Basmati were found to be highly susceptible to storage fungi. From Joshi 15 fungi while from Basmati 16 organisms were isolated. In wheat varieties, White was more susceptible than Red variety.

Aspergillus flavus with a percentage of 29.7 was the most prevalent organism on both wheat and rice. The frequency of other *Aspergilli* like *A. sydowi*, *A. tamaris*, *A. versicolor*, and *A. candidus* was low as compared to *A. flavus* and *A. niger*.

Phaeoramularia sp., *Aspergillus nidulans*, *Absidia corymbifera*, *Alternaria tenuissima* and *Circinella* sp. appear to have been isolated for the first time from wheat and rice.

Surface disinfection of seeds at 1:1000 HgCl₂ for 1,2,3,4 and 5 min decreased the frequency of fungi and at 5 min interval very few fungi appeared.

GRAIN STORAGE FUNGI ASSOCIATED WITH MITES

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Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

(Received January 4, 1968)

Studies were carried out to isolate fungi from various stored-grain mites. Mites recorded from samples of local grains were identified to be *Acarus siro* L., *Rhizoglyphus* sp., *Cheyletus* sp., *Suidasia medanensis* Oud., *Macrocheles* sp. and *Tydeus* sp. Seven genera and 18 species belonging to different groups of fungi were found to be associated with these mites. *Macrocheles* sp. carried more fungi, while *Acarus siro* L. carried less number of organisms than other mites.

STORED GRAIN INSECTS AS CARRIER OF FUNGI

S. SHAHID HUSAIN, (Miss) SHAMEEM SAEED QURESHI, (Miss) S. ASJAD HASAN and M. ANWARULLAH

Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

(Received October 24, 1967; revised January 16, 1968)

Various fungi were isolated from insects *Bruchus chinensis* (Linn.), *Trogoderma granarium* (Everts.), *Tribolium confusum* (DuVal) and *Sitophilus oryzae* (Linn.) obtained from stored moong, wheat, flour and rice respectively. Four genera and 14 species belonging to fungi Imperfecti were found to be associated with these insects. The genus *Aspergillus* dominated over all the fungi prevalent on various insects. *Sitophilus oryzae* carried more fungi while *Tribolium confusum* carried least number of organisms than other insects.

A KEY TO THE IPSWICH FOSSIL BEETLES (COLEOPTERA) FROM THE PERMIAN OF AUSTRALIA*

MOHAMMAD ABDULLAH

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(Received December 14, 1966)

Nearly 240 million years ago, in the Permian period of the Palaeozoic era, there were a number of beetle species living in Ipswich (Australia), which are now represented by remains (impressions) of their elytra. A practical key for the identification of these fossil insects thought to represent 59 different species of the Coleoptera is presented following an examination of the types in the Department of Palaeontology, British Museum (Natural History) London and the original descriptions.

THE MICROPEPLIDAE AND STAPHYLINIDAE (I. STENINAE, EUAESTHETINAE AND OXYPORINAE), COLEOPTERA OF PAKISTAN WITH DESCRIPTIONS OF A NEW TRIBE, GENUS AND THREE SPECIES FROM KARACHI

MOHAMMAD ABDULLAH* and NOORUN-NISA QADRI

(Received March 14, 1968)

Keys (with distinguishing characters) are provided for the tribes, genera and species of the Micropeplidae and the Staphylinidae subfamilies Steninae (including Megalopinae), Euaesthetinae and Oxyporinae of West and East Pakistan. A **new tribe**, Hameedini of the Oxyporinae, which differs from the Oxyporini in lacking gular sutures and in the absence of a stalk in the metendosternite or furca etc., is described with the following additional **new taxa** from West Pakistan: *Hameedia* **gen. n.**, *H. batoolae* **sp. n.**, *H. maculata* **sp. n.** and *H. rabiae* **sp. n.** Similarities and differences of the Hameedini (Oxyporinae) from the Steninae are noted and it is suggested that the two subfamilies are related in a phylogenetic sense.

STUDIES IN MOISTURE REGAIN OF SOME PAK COTTONS AND YARNS

ABDUL HAMEED KHAN, ABDUL RASHID SHAH and MAQBOOL ALAM

West Pakistan Agricultural University, Lyallpur

(Received June 5, 1967)

Studies in moisture regain of raw cotton and yarn in some Pak cottons were conducted at Lyallpur during the years 1965-66. The varietal differences were found to be highly significant with actual range of 7.43 in L11 to 11.05% in 231R. Desi cottons recorded higher values than Pak varieties. The actual values for 231R and S.N.R. were 10.33 and 11.05 as compared to the highest value of 8.31% for L.S.S. in the Pak varieties followed by AC321, M100 and 362F. The differences in moisture regain of yarn due to varieties were highly significant, the actual range being 6.01 in 124F to 9.05% for 231R. The highest value of 7.03% in Pak cottons was recorded in case of L.S.S. followed by AC 321, M100 and 362F. Desi varieties recorded higher values as compared to Pak varieties and higher values of moisture regain of raw cotton and yarn were found to be associated with coarser and more mature fibres.

STUDY OF GEOCHEMICAL PARAMETERS AND RESERVOIR PROPERTIES OF MIOCENE SEDIMENTS OF PART OF CHITTAGONG HILL TRACTS, E. PAKISTAN

ABDUS SAMAD and SYED AZKAR ALI

Geological and Analytical Laboratories, Oil and Gas Development Corporation, Karachi

(Received December 19, 1966)

The petrographic study of rock samples from Upper Bhuban, Boka Bil and Tipam formations of Miocene age from Dakhin Nila, Olah Taung, Sitakund and Semutang areas and a few core samples from Jaldi wells drilled by Oil and Gas Development Corporation in Chittagong Hill Tracts, East Pakistan was undertaken with a view to evaluate the source and reservoir rocks of these areas. The study included the determination of paragenetic association of minerals, heavy mineral content, determination of effective porosity and hydraulic factor, grain size analysis and the determination of permeability. The data thus obtained shows that sediments of Upper Bhuban and Boka Bil formations from Dakhin Nila and Olah Taung, Upper Bhuban formation from Jaldi and Sitakund and Tipam formation from Semutang area may be considered as potential source rocks as revealed by extremely reducing potential (Eh from -0.27 to -0.3) during their deposition. Rocks of Boka Bil formation from Jaldi and Sitakund areas are also interesting from the point of view of source rocks as they have been deposited in weakly alkaline reducing condition. These rocks are reservoir of average to large capacity (9-20.5%) and by their permeability, rocks of Upper Bhuban formation correspond to medium to high permeability, those of Boka Bil formation correspond to negligible permeability and of Tipam formation correspond to poor to high permeability.

MINERALOGICAL AND CERAMIC PROPERTIES OF WEST PAKISTAN FELDSPARS

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(Received July 25, 1967)

Feldspar samples collected in Hazara District were studied for mineralogical classification and ceramic utility. Specific gravity, chemical composition, IR spectrum, softening temperature, colour of the softened products, thermal expansion and petrography were investigated. Most of the feldspars could be used in the glass and ceramics industries.

Special Paper

**A STUDY OF PROCEDURES OF SELECTING AND CHANNELIZING SCIENTISTS FOR
RESEARCH AND DEVELOPMENT, PART I**

M.M. QURASHI*

Defence Science Organization, Ministry of Defence, Government of Pakistan, Rawalpindi

SHORT COMMUNICATION

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ACRYLONITRILE POLYMERISATION WITH VARIOUS REDUCING ACTIVATORS

FAZAL HUSSAIN, A. J. AHMED AND K. NABI

Institute of Chemistry, University of Punjab, Lahore

(Received February 6, 1968)

ALKALOIDS OF CORYDALIS STEWARTII FEDDE: CORYDININE

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North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received July 15, 1967)

EFFECT OF THE SUPPRESSED CLIMACTERIC RISE ON THE RIPENING CHANGES OF LYCOPERSICUM ESCULENTUM

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