

# PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 10, No. 4

October 1967

## COMPARATIVE MEASUREMENTS OF THE TEMPERATURE DERIVATIVES OF VISCOSITY, DENSITY AND REFRACTIVE INDEX OF LIQUIDS AND SOLUTIONS

### Part V.—Flow Activation Energy and Refractive Index Measurements on Amyl Alcohol, Isoamyl Alcohol and n-Butyl Alcohol

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(Received July 18, 1967)

The comparative measurements of  $E_\eta$ , the activation energy of viscous flow and  $-dn/dT$  the temperature derivative of refractive index are here extended to amyl alcohol, isoamyl alcohol and n-butyl alcohol. The  $E_\eta$  and  $-dn/dT$  curves for these three alcohols exhibit a series of maxima and minima which tend to become more prominent at temperatures above 40°C. In each case, there are ten to eleven minima in the range between 20°C and 70°C, and the two sets of minima correspond with each other within less than 0.7°C on the average.

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

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(Received September 16, 1966)

The reaction of aminopyranodioxins (I) with alkoxides, i.e. sodium methoxide and sodium ethoxide, has been investigated further. The UV and IR spectra of the new products has been recorded.

## SYNTHESIS OF SUBSTITUTED PYRIDINES

**Part V.—Formation of 6-Hydroxy-4-(*o,m*-methylphenoxy)-2-oxo-1-phenylpyridine-3-Carboxyanilides**

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(Received November 19, 1966)

The formation of *N*-substituted pyridine-3-carboxyanilides (the substituent at position 1, being phenyl, *o*, *m*, *p*,-tolyl, *o*, *m*, *p*-methoxyphenyl, benzyl, and  $\alpha$ -naphthyl,  $\beta$ -naphthyl; while the substituent at position 4, being *o*-methylphenoxy and *m*-methylphenoxy respectively) was achieved in yields 50–90%. In support of structure II, various chemical transformations were carried out.

# A NEW GROUP OF AZOIC PIGMENTS BASED ON THE COUPLING REACTION OF 5-CHLORO-OXINE WITH THE DIAZONIUM SALTS OF AROMATIC AMINES

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(Received March 12, 1967)

A new group of azoic pigments has been prepared by the coupling reaction of 5-chloro-8-hydroxyquinoline with the diazonium salts of aromatic amines. According to this reaction, aniline, *o*-, *m*-, and *p*-chloroanilines, *o*-, *m*- and *p*-bromoanilines, *o*-, *m*- and *p*-nitroanilines, *p*-aminophenol, 2:4-dichloroaniline, *o*-anisidine, *p*-toluidine, 5-nitro, *o*-toluidine, *p*-aminoazobenzene hydrochloride, *p*-aminodiphenyl, *p*-aminoacetanilide,  $\alpha$ - and  $\beta$ -naphthylamines, etc., have yielded such azoic pigments as are mostly deep red in colour.

# CHEMICAL EXAMINATION OF THE HEARTWOOD OF VARIOUS WEST PAKISTANI TREES

## Part I.—The Heartwood of *Prosopis specigera* (Jandi)

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(Received January 18, 1966; revised January 26, 1967)

Ethanol extraction of the heartwood of *Prosopis specigera* yields 0.5% material which contains 26% sugars consisting of sucrose, glucose, fructose, arabinose and mannose. The extract also contains 0.4% n-decanol, 0.5%  $\beta$ -sitosterol and 7.7% of the esters of lauric, myristic, palmitic, stearic, oleic and linoleic acids. The presence of 5 flavanones in the acetone-soluble fraction of the extract was also indicated. The major portion of the extract was tannins.

## TOXICITY OF PETKOLIN AGAINST COTTON APHIDS (HEMIPTERA: APHIDIDAE)

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(Received November 19, 1966)

Aphicidal action of Petkolin-A, Petkolin-M and Petkolin-S, have been studied under laboratory condition against adult apterous agamic female cotton aphid, *Aphis gossypii* Glover. Results have been compared with other chlorinated insecticides, e.g., BHC (benzene hexachloride) and Endrin. It was found that Petkolin-S was as effective as BHC and more toxic than Endrin.

## MYCOSTASIS IN SEMI-ARID SOIL OF WEST PAKISTAN

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(Received January 31, 1967; revised June 14, 1967)

Eleven species of fungi were tested by agar disk technique for sensitivity to mycostasis of six different soils. The capability of spore germination of all fungi except a species of *Alternaria* was reduced to a varying degree due to mycostasis. All the six soils were mycostatic, the University of Karachi campus soil being the least. Autoclaving of the soils depleted the inhibitory factor. Autoclaved soil, when kept exposed to the atmosphere for 30 days allowing contamination by aerial microflora, regained mycostasis indicating probable microbial origin of the inhibitory factors. The upper layer of the soil, the site for intense microbial activity, was more mycostatic than the soil at lower depth. The soil containing moisture of 90% water holding capacity greatly diminished mycostasis but did not eliminate it.

## SOME NEW RECORDS OF FUNGI FROM WEST PAKISTAN

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(Received June 17, 1966)

During the screening of soil fungi from Karachi soils some new records, *Aspergillus sclerotiorum* Huber, *Penicillium lilacinum* Thom, *Penicillium ehrlichii* Kleb, *Dactylium fusarioides* Frag. & Cif. *Myrothecium verrucaria* Ditm. ex Fr., *Microascus trigonosporus* Emmons & Dodge, and *Pseudoarachniotus hyalinosporus* Kuehn, Orr & Ghosh were isolated for the first time from West Pakistan. **The first five belong to Imperfect Fungi while the latter two are members of Ascomycetes.**

These organisms were grown on Czapek's dox agar and corn meal agar media under similar conditions. The difference in respect of growth and formation of fruiting bodies was noted. The Czapek's medium was more favourable **than the corn meal medium.** The controversy regarding *Penicillium lilacinum* and *Spicaria violacea* Abbot was discussed. In the author's opinion the organism should be determined as *Penicillium lilacinum* in view of its having more affinities towards the same.



**A NEW GENUS (NEOSTEREOPALPUS) OF THE EURYGENIINI (COLEOPTERA:  
ANTHICIDAE) FROM JAPAN\* †**

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(Received December 14, 1966)

A new genus (*Neostereopalpus*) is proposed for the Japanese species *Eurgenius niponicus* Lewis, 1895, chiefly on the basis of the ovipositor of the female, which is short and compact and in this respect different from other Anthicidae and similar to most Meloidae.

**OBSERVATIONS ON THE AUSTRALIAN DIACALLA COMATA PASCOE (COLEOPTERA,  
ANTHICIDAE, EURYGENIINAE)**

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(Received December 14, 1966)

The Australian species, *Diacalla comata* Pascoe, has been redescribed and illustrated. The monotypic genus *Diacalla* Pascoe has been characterised and compared from other Australian genera of the Eurygeniini.

**A THIRD SPECIES OF STEREOPALPUS (COLEOPTERA: ANTHICIDAE: EURYGENI-  
INAE) FROM CHINA\***

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(Received December 14, 1966)

*Eurygenius asiaticus* Pic has been transferred to *Stereopalpus* Ferte-Senectere and a new combination has been proposed. The holotype of *S. asiaticus* (Pic), deposited in the Paris Museum collection, has been described and compared with other species. A key to the three Chinese species is given.

**EURYGENIUS VILLOSUS CHAMPION, A COLOMBIAN SPECIES OF CADOGENIUS  
HELLER (COLEOPTERA: ANTHICIDAE: EURYGENIINAE)\***

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(Received December 14, 1966)

The holotype of *Eurygenius villosus* Champion from Colombia deposited in the British Museum (Natural History) London, has been redescribed. The species has been transferred to the Neotropical genus *Cadogenius* Heller and a new combination has been proposed. A key to the three species (*C. iquitosensis* Abdullah, *C. ohaysi* Heller and *C. villosus* (Champion) of *Cadogenius* is given.

**STERIPHODON ABDOMINALIS (PIC) COMB. NOV. (COLEOPTERA: ANTHICIDAE:  
EURYGENIINAE) FROM BENGAL\***

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(Received December 14, 1966)

Following the examination of the holotype of *Eurygenius abdominalis* Pic, the species from Bengal, has been transferred to the genus *Steriphodon* Abeille and a new combination (*S. abdominalis*) has been proposed. The holotype from the Paris Museum collection has been redescribed. A key to four species from India and Pakistan is given.

## THE OCCURRENCE OF A SPINY-HEADED WORM PALLISENTIS NANDAI IN NANDUS NANDUS FROM PONDS INSIDE CHANDPUR FISHERIES CAMPUS

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(Received October 8, 1966)

Examination of 89 specimens of *Nandus nandus* collected from a pond inside Chandpur Fisheries Campus, East Pakistan, revealed the presence of the worm, *Pallisentis nandi*, in cysts attached to visceral organs, mainly the liver and the wall of intestine. Their percentage of incidence and infection intensity, recorded monthwise, did not show any seasonal variation during the period from November 1965 to April 1966. Morphological features of this species were compared with those of the other species namely *Pallisentis ophicephali* found in the fishes of the family Ophicephalidae. Massive infestation with this worm did not, however, cause any apparent detriment to the host and in none of the 89 specimens there was any appreciable pathological effect.

## ELECTRICAL RESISTIVITY OF POWDERED WOOD CHARCOAL

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(Received March 27, 1967)

Electrical resistivity of powdered wood charcoal of different grain sizes thermally activated at 350°, 500°, 600°, 700°, 800° and 1000°C was determined upto an applied pressure of 1931 lb/in<sup>2</sup>. The results show that the resistivity decreases with increasing applied pressure and becomes almost steady beyond 1725 lb/in<sup>2</sup>. No meaningful dependence on particle size was observed. The resistivity decreases with increasing carbonisation temperature and most of the decrease takes place under 700°C; between temperatures of 350° and 700°C the resistivity changes from 0.35 ohm c.m. to 0.05 ohm cm, and from 700° to 1000°C the resistivity decreases only to 0.03 ohm cm. Analyses of the volatile matter evolved from the wood chars show appreciable increase in the amount of hydrogen at carbonisation temperatures above 700°C.

# A STUDY OF INTERGRANULAR CORROSION AND POWDER FORMATION OF 18/8 STAINLESS STEEL

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(Received July 6, 1965; revised September 12, 1967)

The heat treatment of stainless steel, the carbide precipitation in the grain boundaries and the influence of heat treatment on the powder formation has been studied. The most suitable bath for the electrochemical disintegration of heat treated stainless steel has been evolved and electrolytic conditions determined.



# TIME-HIATUS AT THE OLIGOCENE/EOCENE BOUNDARY IN SIND

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(Received October 15, 1966)

Evidence has been presented to show that, contrary to the earlier belief, the Khirthar Limestone is not wholly of Middle Eocene age but ranges up into the Oligocene. The Colombo Plan Survey has designated the Middle Eocene part of the Khirthar Limestone as Khirthar Member and the Oligocene part as the Gorag Member. The two Members are apparently conformable, but detailed faunal investigation has shown that there is a time-hiatus between the two as the faunas representing the greater part of the Auversian and the entire Bartonian Stages of Europe are missing.

## **GEOCHEMICAL INVESTIGATION OF MUSAKHEL LIMESTONE**

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( Received January 8, 1966 )

Six representative samples of limestone were selected for the study of the effects of their mineral components and proportion and their various uses in industry. The samples were collected from Musakhel in the Salt Range, West Pakistan.

## **TALC DEPOSITS OF JAMRUD, KHYBER AGENCY**

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(Received June 16, 1966)

Geology and chemical composition of the talc deposits of Jamrud in Khyber Agency have been investigated. Two individual veins about two miles apart are located South and North of Oosinala. The talc is of fairly good quality, and suitable for use in cosmetics, pottery, paper, textile, tiles preparation and soaps industry. The proved reserve from both the veins is estimated to be about 40,000 tons. Improved mining methods are recommended for winning the maximum percentage of talc.