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Physical Sciences Section

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NEW PENTACYCLIC TRITERPENOIDS FROM *PLUMERIA OBTUSA*

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(Received December 16, 1989)

Two new pentacyclic triterpenoids obtusic acid (1) and obtusilinic acid (2) have been isolated from fresh leaves of *Plumeria obtusa* and their structures elucidated through spectroscopic and chemical methods.

Key words: *Plumeria obtusa* leaves, Apocynaceae, Pentacyclic triterpenoids, Obtusic acid, Obtusilinic acid.

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ACTION OF CrO_3 /PYRIDINE COMPLEX ON URSOLIC ACID – FORMATION OF 3-OXO-11-EN-13 β , 28-OLIDE AND 3, 11-DIOXO-URSOLIC ACID

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(Received January 16, 1990)

Ursolic acid on treatment with CrO_3 /pyridine complex at room temperature for 3 hours furnished 3-oxo-11-en-13 β , 28-olide (2) and 3, 11-dioxo-ursolic acid (4) through allylic oxidation, along with the expected 3-oxo-derivative (3). This is the first report on the action of CrO_3 /pyridine on ursolic acid. The allylic oxidations with this reagent are also very rare and required a prolonged treatment in previous studies.

Key words: CrO_3 /pyridine complex, ursolic acid, 3-oxo-11-en-13 β , 28-olide, 3, 11-dioxo-ursolic acid, 3-oxo ursolic acid, allylic oxidation.

Introduction

lead to the synthesis of another natural triterpene 3 β hydroxy

SYNTHESIS AND BIOCIDAL ACTIVITY OF IRON (II,III), COBALT (II,III) AND NICKEL (II) DIPYRIDYL COMPLEXES

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(Received July 14, 1988; revised October 8, 1989)

The biological activities of Fe^{2+} -, Fe^{3+} -, Co^{2+} -, Co^{3+} - and Ni^{2+} - dipyridyl complexes as well as the metal salts of $(\text{NH}_4)_2\text{SO}_4$, $\text{FeSO}_4 \cdot 6\text{H}_2\text{O}$, $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$, $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$, $(\text{NH}_4)_2\text{SO}_4$, $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$, 2,2-dipyridyl and mixtures of some amino acids or some vitamins alone or mixtures of cyanocobalamine+ thiamine+ pantothenic acid, inositol + nicotonic acid + folic acid, ascorbic acid + biotin + riboflavin, vitamin B-complex have been investigated against some bacteria facultative *Bacillus stearothermophilus*, halophilic *Bacillus subtilis* strains (at 30 and 55°) and obligate *Bacillus stearothermophilus* (at 55°) and fungi *Aspergillus fumigatus* (at 30 and 50°), *Penicilliumnigrilacans* (at 30°) and *Humicola lanuginosa* (at 30 and 55°) species. It is concluded that dipyridyl is antibacterial and antifungal, and the bioactive effect of metal salts and their complexes increases with the increase of concentration and temperature. However, they are inactive towards bacteria and fungi species on using 50 μg concentration per disc. On the other hand, mixtures of dipyridyl and amino acids, and dipyridyl and vitamins have combined bioactive effects on bacteria and fungi species.

Key words: Biocidal activity, Metal ion, Biological system.

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QUALITATIVE ANALYSIS OF RAW SKINS IN PAKISTAN

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(Received September 7, 1988; revised March 21, 1989)

The extent of attack of microorganism on collagen depends on the intensity of microbial growth, though mostly superficial in nature, yet affects the quality of leather and its texture. This paper highlights the cross section of microbial growth in raw skin after varying time intervals prior to curing.

Key words: Leather microbiology, Leather microbes, Skin micro-analysis

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CHARACTERIZATION OF CHROME TANNERY WASTE WATER FROM GOAT SKIN PRODUCTION UNIT

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(Received August 1, 1989 ; revised January 17, 1990)

Mixed tannery effluent from goat skins production unit, was analysed Chemically and Microbiologically, to assess pollution load. Various treatments were also analysed to compare affectivity. Off all the studies, Chemical as well as Microbiological, it had been observed that aeration treatment brought the pollution down to some extent, while aeration with FeCl_3 addition indicated gradual increase in parameters of COD., total dissolved solids, as well as a marked increase in bacterial plate count.

Key words: Goat skin, Tannery waste water, Effluent analysis.

Introduction

experiments were of A R grades. Raw materials (Tannery

CHARACTERISATION OF FULLER'S EARTH FROM D.G. KHAN

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(Received February 7, 1982; revised February 18, 1988)

Fuller's earth from D.G. Khan has been studied with an aim of its characterisation and evaluation as a bleaching earth. Its mineralogy, cation exchange capacity, swelling index, D.T.A. chemical analysis, surface area, activation and bleaching behaviour have been studied and it has been found that this earth, when properly activated, can match the best bleaching earth available in the international market.

Key words: Fuller's earth, Bleaching earth, Chemical analysis.

Short Communication

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**EVIDENCE OF SOLVENT AND TEMPERATURE
DEPENDENT MULTINUCLEAR NMR
CHEMICAL SHIFTS IN 1,1,1,3,3,3-HEXA-
METHYLDISILAZANE**

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(Received November 25, 1989)

Biological Sciences Section

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STUDIES ON THE LIPID CLASSES OF *FERULA ASSAFOETIDA* L. (HING) SEED OIL

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(Received September 28, 1989; revised January 29, 1990)

Ferula assafoetida L. seed oil (3.02%) was examined for the fatty acid composition. The oil was fractionated by TLC into lipid classes; "neutral lipids (78.37%) and "polar lipids (21.63%)". Further analysis of the "neutral" lipids revealed the presence of hydrocarbons (3.76%), Wax esters (3.05%) triglycerides (36.58%), free fatty acids (12.89%), 1:3-diglycerides (9.27%), 1:2-diglycerides (7.91%), 2-mono-glycerides (2.76%) and 1-monoglycerides (2.15%), the fatty acid composition of the whole oil and its fractions was determined by GC. All the lipids classes except triglycerides, free acids and 1:3-glycerides showed a fairly large amount of an odd numbered fatty acid ($C_{17:0}$).

Key words: Lipid classes, *Ferrula assafoetida*, Seed oil.

BIOCHEMICAL AND TAXONOMICAL STUDIES OF SEA SQUID FROM PAKISTANI WATERS

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(Received July 9, 1989; revised January 6, 1990)

The coastal waters of Pakistan abound in conventional and non-conventional varieties of fish. Among the non-conventional varieties squids are found in quite appreciable quantities. In this study 5 species of sea squids were identified and evaluated chemically. *Loligo duvacelli* was found to be the main species forming the bulk of the total catch. Squid meat is rich in protein content ranging from (19.27%-2.84%), while its fat content is low ranging (1.65%-2.31%). Minimum moisture and maximum fat and protein were recorded in *Sepia pharaonis*.

Key words: Sea Squid, Taxonomical, Biochemical study.

EFFECT OF COMBINATION OF SOIL AND FOLIAR APPLICATION OF UREA ON THREE WHEAT GENOTYPES*

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(Received May 25, 1989; revised January 14, 1990)

The performance of three wheat genotypes at different combinations of soil and foliar application of urea applied at the rate of 120 kg N/ha was evaluated. Of the three cultivars, Sind 81 responded significantly ($P < 0.05$) to different fertilizer treatments with the highest yield when all N was supplied foliarly. The grain yield of Jauhar 78 and Sarsabz was not stimulated by any fertilizer combination as compared with standard top dressing treatment. The proportion of grain in total dry matter produced and grain protein content were also enhanced significantly ($P < 0.05$) by different urea combinations. The increase in protein content over the control varied from 22.3 to 34.6 percent and from 3.7 to 10.1 percent over standard top dressing. Significant genotype $\times$ N treatment interactions were found for grain and dry matter yields but not for grain protein content and harvest index.

Key words: Urea, Wheat genotypes, Foliar spray.

ALGAL PERIODICITY IN A SPRING

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(Received October 6, 1988; revised January 4, 1990)

Periodicity of algae was studied in a spring ecosystem having constant physical and chemical properties. Forty seven species of algae belonging to 33 genera of three algal groups, Chlorophyceae, Bacillariophyceae and Cyanophyceae were recorded from the spring.

Key words: Periodicity, Spring, Algal

ABIOTIC FACTORS INFLUENCING DEVELOPMENT AND LONGEVITY OF *TETRASTICHUS PYRILLAE* CRAW. (HYMENOPTERA: FULOPHIDAE), AN EGG PARASITE OF *PYRILLA PERPUSILLA* WALK

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(Received June 4, 1989; revised January 28, 1990)

Cumulative effect of two abiotic factors temperature ($15-35^{\circ}$) and relative humidity (50-90%) on longevity and total duration of life cycle of *Tetrastichus pyrrillae* Crawford, one of the important parasite, parasitizing eggs of *Pyrilla perpusilla* Walker was determined. Influence of temperature both on the longevity and the developmental period of the egg-parasite was highly significant while the relative humidity did not cause any effect. Average longevity of males decreased from 7.06 to 1.58 days and that of females from 12.28 to 1.29 days in response to corresponding rise in test temperature from 15 to $35 \pm 1.5^{\circ}$. Mean duration of the life cycle also declined from 40.53 to 8.99 days as the rearing temperature was raised from 15 to $30 \pm 1.5^{\circ}$ while no development could take place at or above 32.5° .

Key words: Abiotic factors, pyrrillae, sugarcane.

Introduction

viz. 50, 70 and 90 for study longevity. Similarly adult parasites

Short Communication

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**DESCRIPTION OF MALE GENITALIA OF
LODOSOCORIS AZHARI AHMAD AND AFZAL
(PENTATOMIDAE :PENTATOMINAE:
HALYINI FROM PAKISTAN**

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Technology Section

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INEXPENSIVE TECHNOLOGIES FOR WATER DECONTAMINATION

PART I. Studies on disinfection of Well Waters by Simple Diffusion Chlorinators

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((Received July 19, 1989; revised December 15, 1989))

Performance of a simple diffusion chlorinator is described for two wells in which sewage contamination seeps in continuously [1]. The average amount of residual chlorine was found to be 0.5 ppm for a period of about 40 days [2]. During the first three weeks MPN/dl reduced to >3 from 1100⁺ and 960 MPN/dl in both wells and during the fourth weeks it fluctuated between 4 and 11 MPN/dl, whereas Eijkman test became -ve from +ve and remained -ve upto six weeks [3]. There is no significant change in the average chemical composition of the waters after the installation of chlorinators. Studies have been carried out on the development, performance and evaluation of a simple method for the slow release of chlorine and for the debacterification of highly contaminated well waters. Data on the disinfection potential of diffusion chlorinator and the chemical and microbiological quality of the resulting waters have been collected. The developed in-expensive chlorinator removes coliform and faecal coliform satisfactorily and makes the water free from pathogenic bacteria. The developed technique, if applied appropriately to the polluted wells of rural and urban areas, may produce a tolerable water which could be used safely for human consumption.

Key words: Water decontamination, Chlorinator, Microorganism

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THE UTILIZATION OF SPENT NICKEL CATALYST

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(Received December 24, 1988; revised January 6, 1990)

Spent nickel catalyst can be utilized for the recovery of fat (58.0%), nickel (8.0%), filter aids (30.0%), iron as an impurity (4.0%). The fatty acid composition of fat as determined by GLC is $C_{12:0}$ (2.2%), $C_{14:0}$ (1.8%), $C_{16:0}$ (37.4%), $C_{18:0}$ (10.7%), $C_{18:1}$ (42.6%), $C_{18:2}$ (5.3%). The reactivated filter aids showed bleachability (64.5% when reactivated at 350°).

Key words: Filter acid, Bleachability, Leaching.

PREPARATION OF NICKEL SALTS FROM SPENT NICKEL CATALYST

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(Received February 4, 1989; revised January 6, 1990)

The spent nickel catalyst (100 kg) was processed to leach out nickel (8kg) as nickel sulphate (38 kg) which is converted into nickel carbonate (16 kg) and subsequently into nickel formate (24 kg). The nickel formate is crystallized, dried, ground and sieved to 200 mesh prior to the activation of nickel into embedded nickel catalyst.

Key words: Nickel formate, Embedded, Poisoning.

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REGENERATION OF NICKEL CATALYST

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The stainless steel activation unit is used for the degradation of nickel formate at 230° by automatically controlled electric heating system. The hydrogen gas is passed through during the process. The embedded nickel catalyst contains nickel (21.0%), fat (67.0%) and diatomaceous earth (12.0%).

Key words: Degradation, Transformation, Pyrophoric.

PRELIMINARY STUDIES ON THE DEHYDRATION OF CITRUS FRUIT JUICES

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(Received June 1, 1987; revised December 24, 1989)

Juice from different varieties of citrus fruits grown in NWFP, were processed, concentrated and preserved. The concentrated juice was dehydrated after the addition and thorough mixing of appropriate flavour preserving agents. The dehydrated product of all the three citrus varieties i.e. Malta (sweet orange), Kinno and Fruiter were prepared. The juice powder, properly packed (in air-tight containers) and stored, had a shelf-life of upto 3 months. However, the product kept in glass bottles packed in polyethylene bags, had a tendency to absorb moisture and develop lumps with the passage of time. The products obtained were analysed for nutrients and other attributes and the data given.

Key words: Dehydration, Citrus juices, Juice powder

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LEACHING OF LEAD FROM LOCAL EARTHEN WARE POTTERY

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(Received May 25, 1989; revised November 15, 1989)

An attempt has been made to estimate the amount of leachable toxic lead from local earthenwares available in the market, under ordinary household conditions. The unchained lead present in glazes of cheap local earthenwares was leached out with 1.5% lactic acid and 10% citric acid and estimated by Dithiozone method. The results obtained reveal that the concentration of lead extracted from all the samples is under limit except Sample I, hence the possibility of any health hazard due to the continuous domestic use of such earthenwares could be ruled out.

Key words: Glaze, Earthenware, Leaching