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7-Azaindole Derivatives as Potential Antibacterial Agents

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Physical Sciences

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7-Azaindole Derivatives as Potential Antibacterial Agents

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Abstract. Azaindole analogues, as antimicrobial agent, have shown significant response against a number of gram positive and gram negative bacteria. In the present work, synthesis of novel derivatives of 7- azaindole and their antibacterial and cytotoxic activities are reported.

Keywords: azaindole, antibacterial agent, cytotoxicity

Synthesis of Some New Substituted Quinazolin-4-3*H*-Ones as Potent Anticonvulsant Agents

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Abstract. A new series of 3-(4-(2-(6,8-dibromo-3-(substituted phenyl)-4-oxo-3,4-dihydroquinazolin-2-yl)methyl)hydrazinyl)thiazol-2-yl)-2-phenylthiazolidin-4-ones were synthesized and their structures were elucidated on the basis of elemental analyses and spectroscopic studies (IR, ¹H-NMR). All the synthesized compounds **1-32** were screened for their anticonvulsant activity at a dose of 30 mg/kg. The compound **31** was found to be the most potent compound of this series showing 90% protection against MES.

Keywords: benzylidenoquinazolinones, thiazolylquinazolinones, thiazolidinoylquinazolinone, anticonvulsant activity, toxicity

Synthesis of Blue Pigment from Kaolin

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(received December 18, 2007; revised January 14, 2009; accepted January 19, 2009)

Abstract: Kaolin of Swat NWFP, Pakistan was analyzed and its suitability was tested for utilizing the raw material for the synthesis of blue pigment. It was successfully utilized for the preparation of ultramarine blue pigment by subsequent reductive and oxidative heating with other ingredients. The pigment was characterized by UV-Vis, IR spectrophotometry and XRD.

Keywords: kaolin, ultramarine blue, pigment, Swat, Pakistan

Biological Sciences

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Evaluation of the Seed Oil of Three *Citrus* species, for the Control of the Bean Beetle, *Callosobruchus maculatus* (F) (Coleoptera: Bruchidae)

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(received August 25, 2008; revised January 1, 2009; accepted January 3, 2009)

Abstract. On application of the seed oil of ripe and unripe fruits of *Citrus sinensis*, *C. paradisi* and *C. aurantifolia* to the cowpea bruchid, *Callosobruchus maculatus* (F) for three days, a dose of 0.5 ml of *C. sinensis* gave, significantly, high mortality rate upto 85%. In case of *C. aurantifolia*, mortality ranged from 75% to 100%. Same least dosage of seed oil of ripe *C. paradisi* produced 58.8% to 100% mortality, whereas, except the dose of 0.5 ml, all the other treatments of unripe *C. paradisi* resulted in 100% mortality after 24 h.

Keywords: pest control, *Citrus* seed oils, bean beetle, *Callosobruchus maculatus*

Growth Measurement of Some Amylolytic *Bacillus* Species in Three Media

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(received August 8, 2007; revised January 13, 2009; accepted January 16, 2009)

Abstract. Study of the growth pattern of some *Bacillus* species on starchy substrates showed that the metabolic activity affected the enzymatic activity. *B. subtilis* (WBS), *B. licheniformis* (WBL) and *B. coagulans* (MBC) generally had higher growth rate. *B. circulans* (SBC) and *B. coagulans* (WBC) had higher growth on cornstarch medium with corresponding higher β -amylase production as compared to other strains such as *B. polymyxa*. Ten of the 13 *Bacillus* species studied had better performance on cornstarch than on soluble starch except *B. macerans* (MBM), *B. macerans* (SMB2) and *B. subtilis* (WBS). The enzyme production ranged from 0.022 unit/cfu $\times 10^2$ to 0.912 unit/cfu $\times 10^2$ on cornstarch and 0.01 unit/cfu $\times 10^2$ to 0.693 unit/cfu $\times 10^2$ on soluble starch. Relatively higher α -amylase activity was observed in *B. subtilis*, *B. licheniformis*, *B. macerans* and *B. circulans* (WBC1).

Keywords: *Bacillus* sp., starch, beta amylase production, enzymatic activity

Endemicity of Urinary Schistosomiasis in Ogbese-Ekiti Community of Ise-Orun Local Government Area of Ekiti State, Nigeria

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Abstract. In random examination of 191 students of Ogbese-Ekiti community of Nigeria for urinary schistosomiasis, 170 (89%) were found positive for *Schistosoma haematobium* eggs in their urine. The prevalence in the secondary school was 97.4%, while the prevalence in the primary school was 87.5%. The overall mean intensity of *S. haematobium* eggs/10 ml of urine in this community was 339.4. Also, 5.9% of the infected pupils excreted above 1000 eggs/10 ml of urine, while 59.8% had moderate intensity (50-499 eggs/10 ml of urine). The percentage macrohaematuria was 84. Among five aquatic snails *Bulinus (B) forskalii*, *Bulinus (B) globosus*, *Pila ovata*, *Potadoma moerchi* and *Melanoides tuberculata* of river Ogbese, only *B. (P) globosus* shed the characteristic cercariae of *S. haematobium*. A monthly mean of *B. globosus* in river Ogbese was 53.2 and an increase in the population density of the snail occurred between November and May, 2004. The highest infection rate of *B. (P) globosus* with *S. haematobium* occurred in the month of March.

Keywords: schistosomiasis, aquatic snail, *S. haematobium*, Ogbese-Ekiti

Dynamics of Clay Mineralogy With Profile Depth in Relation to Long Term Potassium Fertilizer Application to Sugar Cane Crop

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Abstract. The experiment consisted of treatment of sugar cane crop with N, NP, NPK and farmyard manure and determination of its effect on soil mica, vermiculite and montmorillonite over a period of 18 years. The NPK treatment had greater mica in coarse clay, but less in fine clay than NP and control treatments. Vermiculite in coarse clay fraction, in NPK treatment, increased with the depth as compared to other treatments. The fertilizer treatment effect on smectite content was obvious only in AP horizon in fine clay fraction.

Keywords: clay mineralogy, potassium fertilizer, sugar cane

The Effects of Industrial Soil Pollution on *Prosopis juliflora* Swartz Growth Around Karachi

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(received August 22, 2008; revised January 6, 2009; accepted January 10, 2009)

Abstract. Study of the effect of soils of towel, garment, rubber and ply-wood factories of Korangi and Landhi industrial estates of Karachi and that of the University of Karachi on the growth of *Prosopis juliflora* Swartz plants growing in these areas demonstrated detrimental effect of industrial soils on the growth of plants of all the areas particularly on the plants growing at the University site.

Keywords: plant growth, *Prosopis juliflora*, soil pollutants, industrial pollution

Short Communication

Investigation of Starch Modification Potential of 'Kanwa' – an Alkaline Salt

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(received May 14, 2008; revised January 23, 2009; accepted February 10, 2009)

Abstract. Cassava-starch-modification potential of 'Kanwa' at different concentrations was studied. Kanwa modified cassava-starches showed better swelling power, paste clarity, viscosity, peak viscosity, freeze-thaw stability and reduced gelatinization time over native starch. However, native starch had better water solubility and set back viscosity.

Keywords: kanwa, modified starches, starch modifying property

Technology

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Bactericidal Efficacy of Silver Impregnated Activated Carbon for Disinfection of Water

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Abstract. When highly contaminated water was passed through two types of silver coated activated carbon and their mixtures with sand, the former was found to be far better medium for disinfection of water, with bactericidal efficacy of about 2.5 times that of the latter.

Keywords: bactericidal efficacy, activated carbon, water disinfection, silver impregnation

A ^{15}N Tracer Study to Evaluate the Effects of Nitrogen and Copper Fertilization on Fertilizer Nitrogen Efficiency in Rice Production

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Abstract. In the study of the effects of nitrogen and copper fertilization on rice yield when four rates of N (0, 60, 120 and 180 kg N/ha) as ^{15}N labelled urea and three rates of Cu (0, 5 and 10 kg Cu/ha) were applied, grain yield increased significantly with increasing N rates upto 120 kg N/ha. The recovery of fertilizer N was around 40% irrespective of N and Cu rates. Copper application at 10 kg/ha increased grain yield by 0.53 t/ha insignificantly. Cu content in the straw was below the critical deficiency level of 6 mg/kg. Thus higher rate of Cu fertilizer (above 10 kg/ha) in soil increase rice yield and fertilizer N efficiency if Cu is applied as basal. Alternately, Cu may be applied as foliar spray on standing crop to avoid Cu adsorption in the soil.

Keywords: ^{15}N tracer study, copper, rice, fertilizer nitrogen efficiency
