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Physical Sciences

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Synthesis and Reactions of Some New Substituted Benzoxazin-4-One and Quinazolin-4-One

M. E. Shaban, A. M. Youssef, N. K. El-Aasar and A.K. El-Ziaty*

Laboratory of Organic Chemistry, Chemistry Department, Faculty of Science, Ain Shams University, Cairo, Egypt

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Abstract. The reaction of 3,4-dichlorobenzoyl chloride with 3,5-dibromo anthranilic acid yielded benzoxazine derivative (**1**), whose reaction with primary and secondary amines such as benzyl amine, *p*-chloroaniline, *p*-anisidine, *p*-toluidine, piperidine and morpholine in boiling ethanol yielded six (3,5-dibromo-2-(3,4-dichlorobenzoylamino)-*N*-substituted benzamides (**2-7**). Reaction of the derivative (**1**) with hydrazine hydrate (1:1 molar proportions) gave the unexpected product 6,8-dibromo-2-(3,4-dichlorophenyl)-3-(2-(3,4-dichlorobenzoylamino)-3,5-dibromobenzamido)quinazolin-4-one (**8**).

Keywords: benzoxazine derivatives, quinazoline derivatives, 3-thia-1-azabutane-2,4-dione

Synthesis of Some 2-Methyl-3-(Arylthiocarbamido) Quinazol-4-Ones and 2-Methyl-3-(Arylidencarboxamido) Quinazol-4-Ones as Potential Antimicrobial Agents

B. D. Gupta

Department of Chemistry, Northern India Engineering College, Lucknow 226001, India

(received July 23, 2007; revised June 10, 2008; accepted June 12, 2008)

Abstract. Some quinazolone derivatives of 2-methyl-3-(arylthiocarbamido) quinazol-4-ones (**2**) and 2-methyl-3-(arylidencarboxamido) quinazol-4-ones (**3**) have been synthesized and assayed for their possible antibacterial activity against *Bacillus subtilis*, *Bacillus cereus*, *Salmonella aureus*, *Salmonella lutae* and antiviral activity against *Gomphrena mosaic* virus. Some of these compounds show notable activity.

Keywords: quinazol-4-ones, antibacterial activity, antiviral activity

Some Physical Characteristics and Nutritional Composition of the Seeds of Wild Pepper (*Erythrococca anomala*, Benth)

E. A. Akande^{a*}, G. O. Adegoke^b and F. C. Mathooko^c

^aDepartment of Food Science and Engineering, Ladoke Akintola University of Technology, Ogbomosho, Oyo State, Nigeria

^bDepartment of Food Technology, University of Ibadan, Ibadan, Oyo State, Nigeria

^cDepartment of Food Science and Technology, Jommo Kenyatta University of Agriculture and Technology, Nairobi, Kenya

(received January 31, 2008; revised March 26, 2008; accepted April 04, 2008)

Abstract. Study of physical properties and nutritional components of whole and powdered wild pepper seeds (*Erythrococca anomala*, Benth) revealed that the seeds have good parameters for machineability. The contents of moisture, ash, protein, lipid and carbohydrate and major and trace minerals were found in functional quantities, while the heavy metals were negligible or absent. Thus the seeds are potential source of nutrients and can be used as additive in food product development.

Keywords: *Erythrococca anomala*, nutritional composition, product development, seed machineability

Relative Study of the Colour Fastness of Cotton, Woolen and Silk Fabrics Dyed With Walnut Bark Dye

Bushra Khalid*, Azra Yaqub, Lubna Liaquat and Mohammad Sohaib

Applied Chemistry Research Centre, PCSIR Laboratories Complex, Lahore-54600, Pakistan

(received February 19, 2008; May 27, 2008; accepted June 12, 2008)

Abstract. Natural walnut dye was extracted from walnut bark and applied to cotton, woolen and silk fabrics with the same depth of colour and colour fastness was assessed. Walnut dye had good saturation on all the three fabrics and its colour fastness properties ranged between good and excellent.

Keywords: walnut bark dye, *Juglan regia*, natural dye, colour fastness

Quantitation of Fatty Acids by GLC and Separation of Omega-6 Nutraceutical Fatty Acid From *Carthamus tinctorius* L. Seed Oil Cultivated in Pakistan

Rubina Saleem^{a*}, Ambrat^a, Zahra Yaqeen^b and Tehmina Sohail^b

^aApplied Chemistry Research Centre, PCSIR Laboratories Complex, Karachi - 75280, Pakistan

^bPharmaceutical Research Centre, PCSIR Laboratories Complex, Karachi - 75280, Pakistan

(received July 13, 2007; revised June 8, 2008; accepted June 15, 2008)

Abstract. The GLC analysis of *Carthamus tinctorius* (safflower) yielded average hexane extracted oil content of 28% (25-30%); the oil contained high level of linoleic acid (74%). Monounsaturated fatty acid, oleic acid amounted 12.94%, while the saturated fatty acids like palmitic acid and stearic acid were 9.43 and 1.81%, respectively. Iodine value of linoleic acid was found to be 160.1 while its purity was 93.1%.

Keywords: *Carthamus tinctorius*, linoleic acid, omega-6 fatty acids

Major Ion Chemistry of Groundwaters From the Peshawar Intermontane Basin, NWFP, Pakistan

M. Asim Yousafzai

Department of Geology, University of Peshawar, Peshawar, Pakistan

(received April 21, 2008; revised June 12, 2008; accepted June 15, 2008)

Abstract. Investigation of spring and well waters of the Peshawar Intermontane basin and its surroundings in the Himalayan belt of Pakistan revealed that their temperature, pH, total dissolved solids and electrical conductivity values fall within the permissible range of drinking and irrigation water except the waters in vicinity of exposed faults. Minerals in the spring water are in the order of $\text{Ca} > \text{Mg} > (\text{Na} + \text{K})$ with bicarbonate as the dominant anion, whereas in the well water, the order is reversed, with sulphate as the dominant anion.

Keywords: Peshawar hydrochemistry, ground water, minerals, Pakistan

Short Communication

Determination of Positional Isomers of Monoenoic Fatty Acids Separated From Seed Oils of *Nicotiana tabacum* L. and *Nicotiana rustica*

Amran Waheed*, Muhammad Saleem and Shahid Mahmud

PCSIR Laboratories Complex, Lahore-54600, Pakistan

(received January 1, 2008; revised June 6, 2008; accepted June 9, 2008)

Abstract. The octadecenoic acid separated from the seed oils of *Nicotiana tabacum* L. and *Nicotiana rustica* by the application of argentation thin layer chromatography was oxidized by modified Von Rudloff's technique. The liberated monofunctional and difunctional carboxylic acids were separated and identified by the application of thin layer chromatography and gas chromatography. The positional isomers determined in both species were *cis*-9-octadecenoic acid and *cis*-11-octadecenoic acid.

Keywords: isomers, monoenoic fatty acids, *Nicotiana tabacum*, *Nicotiana rustica*, seed oils

Biological Sciences

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Stimulatory Effect of Medium Ingredients on Alkaline Protease Production by *Bacillus licheniformis* N-2 and Compatibility Studies With Commercial Detergents

Muhammad Nadeem^{a*}, Javed Iqbal Qazi^b, Shahjahan Baig^a and Quratulain Syed^a

^aFood and Biotechnology Research Center, PCSIR Labs. Complex, Lahore-54600, Pakistan

^bDepartment of Zoology, University of the Punjab, New Campus, Lahore, Pakistan

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Abstract. Suitable concentration of ingredients of the growth medium played a vital role in production of alkaline protease by *Bacillus licheniformis*. Maximum enzyme activity (875.05 PU/ml) was achieved when the bacterium was grown in the medium containing glucose (1%), soybean meal (1%), K_2HPO_4 (0.5%), $MgSO_4 \cdot 7H_2O$ (0.05%), NaCl (0.05%), $CaCl_2 \cdot 2H_2O$ (0.05%) at 37 °C on 24 h incubation period with agitation of 140 rpm in shake flask cultures. More than 1% glucose decreased the enzyme production. The protease had excellent stability with wide range of commercial detergents such as Ariel, Bonus, Bright Total, Surf Excel, Wheel and non-branded detergents, recommending its use as an effective additive in detergent formulation.

Keywords: medium ingredients, detergent compatibility, *B. licheniformis* N-2, alkaline protease

Antidiarrhoeal Evaluation of Some Nigerian Medicinal Plants Used in Bini Traditional Folk Medicine

Flossy I. Obuekwe^{ab*} and Ihuoma C. Onyejekwe^a

^aDepartment of Pharmaceutical Microbiology, Faculty of Pharmacy, University of Benin, Benin City, Nigeria

^bDepartment of Environment Health, Concordia University College of Alberta, 7128 Ada Boulevard,
Edmonton, Alberta, Canada

(received February 13, 2008; revised June 10, 2008; accepted June 12, 2008)

Abstract. Four medicinal plants namely; *Vernonia amygdalina*, *Psidium guajava*, *Chromolaena odorata* and *Anarcadium occidentale*, commonly used for the treatment of diarrhoea in Bini traditional folk medicine in Nigeria were tested against *Escherichia coli*, *Staphylococcus aureus* and *Klebsiella aerogenes*. The leaf extracts of *P. guajava* and *A. occidentale* completely inhibited the growth of all the organisms tested, while *V. amygdalina* inhibited the growth of *K. aerogenes* only. Metronidazole was used as the standard antidiarrhoeal drug. Glycosides were found in all the plant extracts. This study, favours the use of the leaf extracts of *A. occidentale*, *P. guajava* and *V. amygdalina* for the treatment of diarrhoea in Nigeria.

Keywords: antidiarrhoeal drugs, medicinal plants, Nigeria, Bini folk medicine

Short Communication

Proximate Composition of Head of Wild and Farmed *Catla catla*

Amana Nadeem^{a*}, Farhana Liaqat^a, Bilal Hussain^a and K. Iqbal^b

^aDepartment of Zoology, GC University, Faisalabad, Pakistan

^bCEPS, PCSIR Laboratories Complex, Lahore - 54600, Pakistan

(received May 21, 2007; revised June 2, 2008; accepted June 8, 2008)

Abstract. In the study for finding out the proximate composition of head of wild and farmed *Catla catla*, the moisture contents were recorded as $63.06 \pm 0.46\%$ and $54.91 \pm 0.53\%$, protein contents as $14.77 \pm 0.37\%$ and $19.92 \pm 0.44\%$, lipids contents as $7.56 \pm 0.46\%$ and $11.90 \pm 0.25\%$, ash contents as $12.26 \pm 0.52\%$ and $12.40 \pm 0.31\%$ and total nitrogen free extract as $2.31 \pm 0.05\%$ and $0.74 \pm 0.03\%$, respectively. Thus farmed fish contained more lipid and protein contents as compared to that of wild fish.

Keywords: *Catla catla*, head composition, farmed fish

Review

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A Comprehensive Systematic Pharmacological Review on *Harpagophytum procumbens* DC. (Devil's claw)

Elisabetta Miraldi*, Marco Biagi and Daniela Giachetti

Section of Pharmaceutical Biology, Department of Environmental Sciences "G. Sarfatti"
University of Siena, Via T. Pendola, 62 - 53100 Siena, Italy

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Abstract. Popularly known as Devil's claw, *Harpagophytum procumbens* DC. (Pedaliaceae) is native to the Kalahari savannas of southern Africa and Namibia. It has been widely used to treat rheumatism. Its secondary tuberous roots contain iridoid glycosides (procumbide, procumboside, harpagoside) as the active principles. This species seems to stimulate migration of interleukins and leucocytes to painful and inflamed joint areas. The drug is indicated for osteoarthritis, degenerative disease of the joints and arthritic processes. Although, *in vivo* pharmacological studies have been carried out in different animal models, with different methodologies and different types of extracts, producing contradictory results, recent clinical studies have shown that *H. procumbens* could be a valid alternative to conventional drugs, especially in the treatment of lumbar pain.

Keywords: *Harpagophytum procumbens*, osteoarthritis, joint ailments, iridoid glycosides
