



CONTENT

REVIEW ARTICLE

- **Matrix metalloproteinase: An overview**
Rajendra Jangde..... 301

RESEARCH ARTICLE

- **Quantitative Determination of Alkaloid, Allicin, Glycoside and Saponin Constituents of the Leaves of *Sansevieria senegambica* Baker by Gas Chromatography.**
Ikewuchi Catherine C., Ikewuchi Jude C., Ayalogu Edward O. and Onyeike Eugene N. 308
- **Synthesis, Characterization and Anti-microbial Evaluation of Substituted Benzo[g]indol-2-one Derivatives**
Vijayabaskaran M., Lakshmi G., Senthilraja M., Sivakumar P., Vijayanthimala P. and Perumal P...... 313
- **Study of Deltamethrin Persistence in Soil Microcosm, By Simulating Arid, Semi-Arid and Soudano-Sahelian Malarial Zones**
Rabani Adamou, Paul W. Savadogo, Alassane Abdoulaye, Alice Nare, Maimouna Soumaila, Idrissa Moussa, Michel P. Sedogo and Khalid Ikhiri..... 318
- **Effect of Light/Dark Cycle on Amino Acids and Protein in the muscle of Chicken**
R. K. Pradhan and Abhijit Ray..... 324
- **Exploring the Mycological Diversity in Southern Western Ghats**
Danial Thomas P. and Ambikapathy V. 329
- **Formulation and Evaluation of Bilayered Buccal Adhesive Tablets of Carvedilol**
Sirisha Y and Venkateswara Rao T...... 335
- **Epidemiological Investigation of Acute Diarrhoea (Gastroenteritis) and Vomiting Cases in Urban Palitana, Gujarat**
Q.H. Khan and P.K. Shrivastava..... 340
- **Screening of Biofuel Producing Microalgae from Different Fresh-Water Bodies around Chennai**
T. Murugan and U.S. Mahadeva Rao..... 343
- **Comparative Analysis on the Major Nutrient Composition of Locally Available Four Different Varieties of Rice (*Oryza sativa*) in Bangladesh**
Srikanta Chowdhury, Md. T.A. Chowdhury, Md. Golam Kabir, Dwaipayan Sikdar, Aninda Kumar Nath, Md. Zia Uddin and Dibyajyoti Saha..... 346
- **An Estimator of Population Variance Using Auxiliary Information under General Sampling Design**
Vyas Dubey and Minal Uprety..... 351
- Instruction to author** 359

Abstract

REVIEW ARTICLE

Matrix metalloproteinase: An overview

*Rajendra Jangde**.....301

University Institute of Pharmacy, Pt. Ravi Shankar Shukla University, Raipur (C.G.) 492010

ABSTRACT:

Matrix metalloproteinases (MMP) are proteolytic enzymes that play an important role in various aspects of cancer progression. Matrix metalloproteinases (MMPs) are a family of nine or more highly homologous Zn (++)-endopeptidases that collectively cleave most if not all of the constituents of the extracellular matrix. The present review discusses in detail the primary structures and the overlapping yet distinct substrate specificities of MMPs as well as the mode of activation of the unique MMP precursors. The regulation of MMP activity at the transcriptional level and at the extracellular level (precursor activation, inhibition of activated, mature enzymes) is also discussed. A final segment of the review details the current knowledge of the involvement of MMP in specific developmental or pathological conditions, including human periodontal diseases.

KEYWORDS: Matrix metalloproteinases, Cancer, endopeptidases, Diseases.

RESEARCH ARTICLE

Quantitative Determination of Alkaloid, Allicin, Glycoside and Saponin Constituents of the Leaves of *Sansevieria senegambica* Baker by Gas Chromatography.

Ikewuchi Catherine C., Ikewuchi Jude C., Ayalogu Edward O. and Onyeike Eugene N.*308

Department of Biochemistry, Faculty of Science, University of Port Harcourt, P.M.B. 5323, Choba, Nigeria.

ABSTRACT:

The alkaloid, allicin, glycoside and saponin levels of the leaves of *Sansevieria senegambica* were determined by gas liquid chromatography. The leaves are rich in alkaloids (93.76mg/kg wet weight and 293.91 mg/kg dry weight), with low allicin (1.2115 mg/kg wet weight and 3.7979 mg/kg dry weight) and saponin (0.94978 mg/kg wet weight and 2.97737 mg/kg dry weight), and very low glycoside (0.02547 mg/kg wet weight and 0.07985 mg/kg dry weight) contents. Twelve alkaloids were detected, consisting mainly of ambelline (about 24.39%), 6-hydroxybuphanidrine (18.10%) and crinamidine (17.73%). Of the three allicins detected, diallylthiosulphinate (about 52.70%) was the most abundant, while the most abundant saponin was avenacins B-1 (about 37.75%). These results show that the leaves are rich in alkaloids, lending credence to their use for medicinal purposes.

KEYWORDS: Alkaloids, allicins, glycosides, medicinal plants, phytochemical, *Sansevieria senegambica*, saponins.

Synthesis, Characterization and Anti-microbial Evaluation of Substituted Benzo[g]indol-2-one Derivatives

Vijayabaskaran M., Lakshmi G., Senthilraja M., Sivakumar P., Vijayanthimala P. and Perumal P.*.....313

Department of Pharmaceutical Chemistry, J.K.K. Nattraja College of Pharmacy, Komarapalayam-638183, Tamil Nadu, INDIA.

ABSTRACT:

Indole derivatives (Isatin) are potential synthons, for building synthetically a variety of chemical systems known for their broader biological and pharmacological applications. In the present investigation, title compounds (V₁-V₅) were synthesized by the condensation reaction of 3-[(2)-(phenyl methylidene) hydrazono]-1, 3-dihydro-2H-benzo[g]indol-2-one (IV) with different aryl aldehydes, as such reactions are not reported so far. The synthesized compounds were characterized by IR, ¹H NMR and MASS spectroscopy. They were screened for their antimicrobial potential against bacterial strains i.e., *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris* and fungal strains i.e., *Candida albicans* and *Yeast*. Compound V₅ (Nitro) was more potent anti- microbial agent against both bacteria [Gram (+Ve) and Gram (-Ve) organisms] followed by compound V₄ (Chloro) and V₂ (4-Methoxy).

KEYWORDS: Isatin, Aryl aldehydes, Antimicrobial activity, *Bacillus subtilis*, *Candida albicans*.

Study of Deltamethrin Persistence in Soil Microcosm, By Simulating Arid, Semi-Arid and Soudano-Sahelian Malarial Zones

Rabani Adamou^{1*}, Paul W. Savadogo², Alassane Abdoulaye¹, Alice Nare², Maimouna Soumaila¹, Idrissa Moussa¹, Michel P. Sedogo² and Khalid Ikhiri¹318

¹Departement of Chemistry, Faculty of Sciences, Abdou Moumouni University, BP10662, Niamey-Niger.

²National institute of environment and agriculture research, 01 BP 476, Ouagadougou 01, Burkina Faso.

ABSTRACT:

According to pyrethroids high toxicity for aquatic animals and non-target insects, their extensive use in sub-Saharan Africa to control malaria is of concern. Deltamethrin biodegradation investigation have shown that this pyrethroid is more degraded in soudano-sahelian and semi-arid zones with annual rainfall extending from 800 - 300 mm compared to arid zone (0 mm). In local sandy and clay soils amended with 40 mg insecticide kg⁻¹ dry weight soil, the observed biodegradation rates after three months varied respectively from 59 to 84% and 53 to 78% according to rainfall. The microbial activity is relatively inhibited in clay soil where the insecticide is firmly adsorbed to organic matters and sediments. The observed microbial activity depends also to the soil insecticide rate. Indeed, in Sahel sandy soil zone, deltamethrin was degraded after three months at 59, 73 and > 80% for respectively 40, 20 and 10 mg/kg amended soil. At high concentration, deltamethrin inhibits the microbial activity but a preliminary one week soil incubation before insecticide application increased the biodegradation rate. It reached 98 and 92% respectively in amended 40 mg/kg sandy and clay soils. Hence, deltamethrin treatment during the rainy season will present less environmental risks.

KEYWORDS: deltamethrin persistence, biodegradation, soil, malarious zones.

Effect of Light/Dark Cycle on Amino Acids and Protein in the muscle of Chicken

R. K. Pradhan* and Abhijit Ray.....324

SOS Life Science, Pt. Ravishankar Shukla University, Raipur

ABSTRACT:

Poultry meat quality is affected by numerous factors. However, light schedule for rearing poultry birds is considered the most important factor for productions and meat quality. In the present study L:D 04:04, L:D 16:08, L:D 12:12 and LL conditions was utilized for rearing the birds. Water was provided ad libitum. Care was taken to prevent light entering the cage from outside. From each group nine birds were decapitated and tissues were obtained on 1st, 14th, 28th and 42nd days. The Tissues were stored at -20°C and was later estimated for total muscle protein and amino acid. The mean concentration and SE of free amino acid (gm/100gm) on LD 04:04, LD 16:08, LD 12:12 and LL was found to be 0.13 ± 0.01, 0.17 ± 0.02, 0.14 ± 0.01 and 0.19 ± 0.02 respectively and that of protein was 15.22 ± 1.23, 25.98 ± 1.00, 21.42 ± 1.21 and 25.79 ± 1.45 respectively. A significantly higher concentration of free amino acid in

LL schedule as compared to LD 12:12 and LD 04:04 have been observed in the present study ($p < 0.05$). Result suggests that continuous light may be beneficial for quality poultry meat production as higher level of free amino acid has also been implicated for lowering protein breakdown (Tipton and Wolfe, 2004). However statistical analysis of the data fails to detect any difference in the level of muscle free amino acid among the birds exposed to LL and 16:08 LD schedules. Similarly difference in the protein content between these two groups of birds was also not significant. Hence the LD schedule 16:08 may be more suitable and economic for quality meat production in poultry industry especially since it requires less energy for production.

KEYWORDS: Poultry, Meat quality, Protein content, Amino acid content, Light schedule

Exploring the Mycological Diversity in Southern Western Ghats

Danial Thomas P.^{1*} and Ambikapathy V.².....329

¹Dept. of Microbiology, J.J. College of Arts and Science, Shivpuram, Pudukkottai-622422

²PG & Research Dept. of Botany and Microbiology, A.V.V.M Sri Pushpam College (Autonomous), Poondi – 613 503, Thanjavur Dt.

ABSTRACT:

The mycobiota of the soil of the forest floor of South Western Ghats moist deciduous forests was investigated. In the present study soil fungal diversity at four sites were evaluated in a tropical moist broadleaf forest, the ecoregion of southern India. The study period was a full year covering all the four seasons viz. winter, summer, pre-monsoon and post monsoon. We isolated and identified 87 species belonging to 17 genera. Compositional differences were observed among samples from different soil samples like saprophytic species predominating in the litter layer. The total count of genus or species did not always follow the number of cases of isolation. Most of the genera detected belonged to the Ascomycotina with fewer proportions belonging to Deuteromycotina. The genera of highest incidence was found to be *Aspergillus* 28.73% (25 species) followed by *Penicillium*, *Fusarium* and *Alternaria* sharing 13.79% (12 species), 8.04% (7 species) and 6.89% (6 species) respectively. *Curvularia*, *Mucor* and *Trichoderma* share 5.74% (5 species each). *Rhizopus* comprises 3.44% (3 species). The other species like *Cladosporium*, *Dreschlera*, *Curvularia*, *Emericella*, *Saccharomyces* and *Verticillium* comprise 2.29% (2 species each). *Absidia*, *Allomyces*, *Hormodendrum*, *Neurospora*, *Sarocladium*, etc. comprise one species each. Among these isolates *Sarocladium oryzae* was found to be a rare species isolated. *Hormodendrum* was found to be one of a potential cellulose degraders among these isolates. Comparable levels of fungal richness were observed following traditional specimen-based collecting and culturing surveys, but only after extensive sampling.

KEYWORDS: Biodiversity, Fungi, Western Ghats, seasons

Formulation and Evaluation of Bilayered Buccal Adhesive Tablets of Carvedilol

Sirisha Y and Venkateswara Rao T.....335

Bapatla College of Pharmacy, Bapatla Educational Society, Bapatla, Guntur District, Andhrapradesh-522101

ABSTRACT:

Carvedilol is a non selective α and β receptor blocker which undergoes extensive hepatic first pass metabolism by liver and has poor oral bioavailability of 25% - 30%. In the present investigation Carvedilol was formulated as a bilayered buccal adhesive tablets in order to avoid the first-pass effect and decrease the drug loss using different polymers and excipients. Twelve formulations were made using different concentrations (17%w/w, 35%w/w, 53%w/w) of Carbopol934P, HPMC (3500-6000cps), HPC and Guar gum. The formulations were tested for %weight variation, hardness, Friability, %Drug content, *in-vitro* drug release, surface pH, Swelling index and Mucoadhesive strength. Mucoadhesive strength was determined by the modified balance method in grams and was found to be between 27.75 \pm 0.234gm to 75.94 \pm 0.146gm and Surface pH was found to be 7. *In-vitro* release studies revealed that

as polymer concentration increases from 17% to 53%w/w, rate of drug release was retarded and the data was fitted into pharmacokinetic models. Among all other formulations, formulations (F₄,F₈ and F₁₁) containing 17%w/w HPMC, 35%w/wHPC and 35%w/w Guar gum were found to be best as the release was retarded upto 8.5 hours and they have good mucoadhesive strength and they follow zero order with non-fickian diffusion mechanism.

KEYWORDS: Bilayered buccal tablets, Carvedilol, Carbopol934P, HPMC, HPC, Guar gum

Epidemiological Investigation of Acute Diarrhoea (Gastroenteritis) and Vomiting Cases in Urban Palitana, Gujarat

Q.H. Khan and P.K. Shrivastava*.....340

Dept. Of Community Medicine, Govt. Medical College Jagdalpur {Chhattisgarh}

ABSTRACT:

Introduction:-

Diarrhoea occurs worldwide and causes 4% of all deaths and 5% health loss to disability. Acute diarrhoea and vomiting epidemic occurs in urban Palitana in year 2000.

Aim: - To find out the magnitude, sources of epidemic and to suggest preventive and control measures.

Study design: - Cross sectional study. Persons from Palitana city and persons are coming to Palitana during chatrumaas (July to October months) from different parts of India to celebrate the Jain festival.

Results:-Contaminated water and unhygienic practices to provide the food to the people coming to Palitana from different parts of India, residing in the various dharmshaalas were found to be the cause of this epidemic.

KEYWORDS: Acute diarrhoea, drinking water, Jain festival (Chatrumaas), rapid response team (RRT)

Screening of Biofuel Producing Microalgae from Different Fresh-Water Bodies around Chennai

T. Murugan¹ and U.S. Mahadeva Rao²343

¹SRM Arts and Science College, Kattankulathur, Tamilnadu - 603203, India.

²Faculty of Medicine and Health Science, Universiti Sultan Zainal Abidin, 20400 Kuala Terengganu, Malaysia.

ABSTRACT:

Aim: The present study is to carry out in search of high biofuel producing microalgae from local fresh water bodies.

Objective: Biofuel is a clean burning fuel currently being produced from algae, vegetable oils or animal fats. Its chemical structure is that of fatty acid alkyl esters.

Methods: Biofuel is produced by trans-esterification of oils with short chain alcohols or by the esterification of fatty acids. The transesterification reaction consists of transforming triglycerides into fatty acid alkyl ester in the presence of an alcohol such as methanol or ethanol and catalyst such as an alkali or acid with glycerol as a by product. Water samples were aseptically collected from selected water bodies. They were subjected to physicochemical analysis and screening of biofuel producers.

Results: The isolated biofuel producing microalgae were grown on their respective media to obtain biomass and their biofuel producing efficacy. Among 5 species isolated one species showed that high biomass and biofuel yield.

Conclusion: It was concluded that the fresh water bodies found around Chennai are the richest source of native biofuel producers and the chlorella stood first in biofuel producing efficiency in our study.

KEYWORDS: biofuel, triglyceride, fatty acid alkyl esters, transesterification, glycerol, Biomass.

Comparative Analysis on the Major Nutrient Composition of Locally Available Four Different Varieties of Rice (*Oryza sativa*) in Bangladesh

Srikanta Chowdhury^{1*}, Md. T.A. Chowdhury¹, Md. Golam Kabir¹, Dwaipayan Sikdar¹, Aninda Kumar Nath², Md. Zia Uddin² and Dibyajyoti Saha²346

¹Department of Biochemistry and Molecular Biology, University of Chittagong, Bangladesh

²Department of Pharmacy, BGC Trust University, Bangladesh, Chittagong.

ABSTRACT:

The aim of the present study was to obtain comparative data on chemical compositions and nutritive values of four different varieties of rice. The results indicated that moisture, ash, total soluble solid and crude fiber contents of the different varieties of rice were in the ranges of 9.98-10.90%, 9.45-11.12%, 10.06-11.25% and 9.35-10.35% respectively. The ranges in the values of total protein, water soluble protein, dry matter, polysaccharide, total sugar, reducing and non-reducing sugar compositions of rice were 12.45-14.06%, 3.20-4.71%, 89.10-90.02%, 10.95-12.25%, 4.35-4.96%, 1.15-1.45%, and 3.10-3.58% respectively. Vitamin B₁ and Vitamin B₂ contents of rice were found to be ranged from 2.98-3.81 and 0.61-0.86 mg/100 gm of rice respectively. Twelve amino acids were detected in all of the four varieties of rice in the total form by paper chromatography. Rice contained about 14.95-16.16% oil. Triglyceride, diglyceride, monoglyceride, and non-glyceride were found to be varied from 91.76-93.08%, 1.51-2.30%, 1.45-1.96% and 3.63-5.24% respectively. Rice oils contained mostly unsaturated fatty acid which was varied from 71.06-74.95%. Total lipids were fractionated into lipid classes by silicic acid column chromatography.

KEYWORDS: Rice, Chemical compositions, Nutritive values, Chromatography, Fatty acids.

An Estimator of Population Variance Using Auxiliary Information under General Sampling Design

Vyas Dubey* and Minal Uprety351

School of Studies in Statistics, Pt. Ravishankar Shukla University, Raipur, (C.G.)

ABSTRACT:

The paper deal with a difference type estimator of population variance using auxiliary information is more efficient than various estimators under stringent conditions. Properties of proposed estimator have been studied after estimating the constants involved in the estimator and hence a modified regression type estimator has been suggested which has superiority over Isaki (1983) type regression estimator of population variance. At last numerical illustration have been made.

KEYWORDS: Auxiliary variable, Ratio and Regression type estimators, Bias, Mean square error (MSE), Relative Efficiency, Simple Random Sampling.

ADMINISTRATIVE, EDITORIAL, ADVERTISING AND SUBSCRIPTION OFFICE

A and V Publications, RJPT House, Lokmanya Grih Nirman Society, Rohanipuram,
In-front of Sector- 1, Pt. Deendayal Upadhyay Nagar, Raipur 492 010. (CG) India.
Phone No. +919406051618. E. mail: editor.rjst@gmail.com; Website: www.anvpublication.org