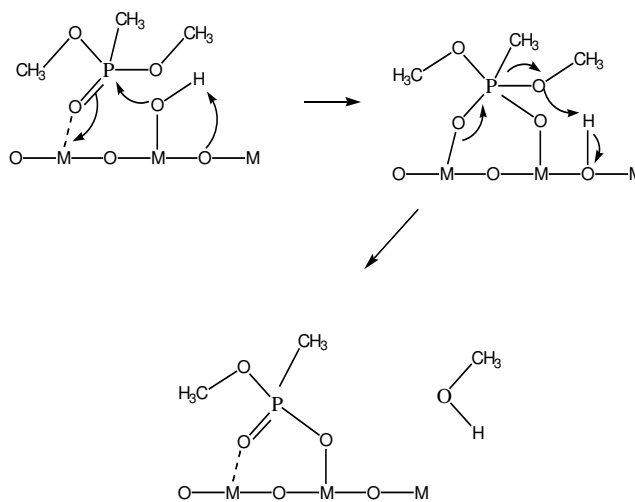


CONTENTS

Reviews

91 Nanomaterials based decontaminants against chemical warfare agents

This review deals with history and recent technological advancements in the area of nanomaterials (NMs) and their application in decontamination of chemical warfare agents, which on contact create adverse health symptoms in humans. NMs based decontamination systems are an alternative approach to liquid decontamination media with promising decontamination properties against chemical warfare agents. High surface area and adequate reactivity towards chemical warfare detoxification are key assets of NMs intended for such applications.



G K Prasad, P V R K Ramacharyulu & Beer Singh

105 Controlled release agrochemicals formulations: A review

This study reviews controlled release formulation (CRF) of agrochemicals (fertilizers, pesticides, herbicides, plant growth regulators etc.). Synthetic as well as naturally occurring polymers have been used for preparation of these formulations. Dual applications of polymer supported herbicides have also been attempted. This strategy would open new areas for prevailing registered pesticides in India. Scope of CRF in controlling other pests like mosquito is also visualised.

Saurabh Dubey, Vishal Jhelum & P K Patanjali

113 A survey on mutation testing methods for automatic test cases generation

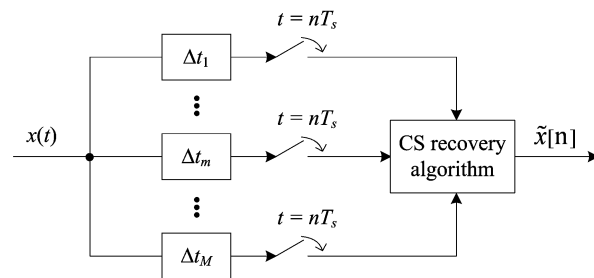
Mutation testing is a fault based testing strategy to measure quality of testing. It measures how good the tests are by inserting faults into the program under test. This review presents a survey on various mutation testing tools available. Basic concepts and notations of mutation testing are described along with working mechanisms.

R Jeevarathinam & Antony Selvadoss Thanamani

Management & Information Technology

118 Sub-Nyquist sampling of high-speed repetitive waveforms using compressed sensing

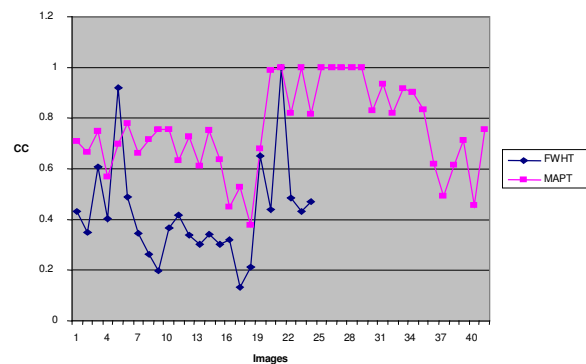
This study presents a sub-Nyquist sampling model using compressed sensing (CS) as a new signal processing framework to acquire and reconstruct sparse signals. High-speed periodic signals were sampled using low frequency sampling circuit and reconstructed via CS recovery algorithm, resulting in a high equivalent sampling frequency. This prototype system is able to capture repetitive waveforms at an equivalent sampling rate of 2.5 GHz while sampling at no more than 50 MHz physically.



Yijiu Zhao, Xiaoyan Zhuang,
Houjun Wang & Zhijian Dai

123 Performance analysis of brain image registration techniques using fast walsh hadamard transform and modified adaptive polar transform

This study proposes a medical image registration method using two algorithms [Fast Walsh Hadamard transform (FWHT) and Modified Adaptive Polar transform (MAPT)], which register images of same or different modalities using CT or / and MRI brain images. FWHT gave better results than MAPT. In medical image registration of brain images, FWHT is more reliable for translation and rotation invariant, whereas MAPT is more reliable for scaling and rotation invariant. Hence for registration of brain images using translation and rotation, FWHT can be used, and for registration of brain images using rotation and scaling, MAPT can be used.



D Sasikala & R Neelaveni

S & T and Industrial Research

129 Effect of geometry on flow structure and pressure drop in pneumatic conveying of solids along horizontal ducts

This study presents further developments in Euler/Lagrange approach to calculate confined particle-laden flows in pneumatic conveying lines. Special emphasis is placed on influence of particle-wall collisions and wall roughness as well as inter-particle collisions on developing two-phase flow structure and resulting process parameters. In a horizontal pipe flow, due to wall roughness-induced focussing of particle trajectories towards the core of pipe, a secondary flow in pipe cross-section develops. Additional pressure drop due to particles in pipe flow was higher than that in channel due to different wall collision behaviour.

S Laín & M Sommerfeld

135 Biological characterization of marine fish pathogen, *Acinetobacter* sp. strain An 2 producing antibacterial metabolites

This study presents antibacterial activity of several organic metabolites produced by a fish pathogen, *Acinetobacter* sp. strain An 2, from marine ecosystem of Goa. Cell extract demonstrated stronger inhibitory effects on Gram negative bacteria as compared to common antibiotics. GC-MS analysis of crude cell extract revealed presence of potential antimicrobials (butylated hydroxytoluene, phenol, pyrrolo-phenol, benzo-quinone, pyrrolo-pyrazine, phthalic acid butyl octyl ester and penta-fluoro- propionic acid hepta-decyl ester). FTIR analysis of its exopolysaccharide (EPS) revealed presence of amine, amide, carboxylic and phenyl groups. Therefore, this strain can be exploited as a potential candidate for several antibacterial drugs to combat bacterial pathogens causing serious fish and human diseases.

Anju Pandey, Milind Mohan Naik & Santosh Kumar Dubey

142 Effect of nutritional and environmental factors on cellulases activity by thermophilic bacteria isolated from hot spring

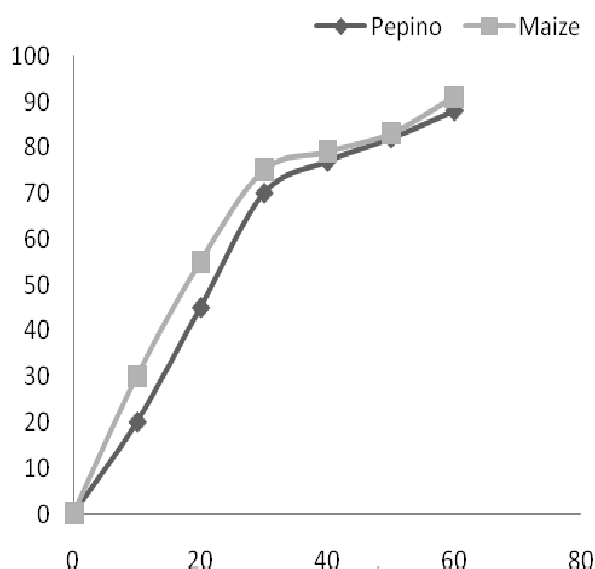
This study presents effects of some nutritional and environmental factors on cellulases production by isolates, *Bacillus licheniformis* WBS1 and *Bacillus* sp. WBS3, which have been isolated from an Indian hot spring. Activity of both CMCase and FPase were higher in case of wheat straw. Maximum enzymatic activity was found at following optimum parameters: pH (8.0 when grown on rice, 9.0 when grown on wheat); temperature, 60°C; and incubation period, 60 h. In addition, combination of inorganic and organic nitrogen source was found to be most suitable for cellulases production.

Somen Acharya & Anita Chaudhary

149 Tablet disintegrant activities of new starch from immature pepino fruits

A new starch powder isolated by steeping process from pepino fruits (*Solanum muricatum* Aiton) as tablet disintegrant was compared with maize starch BP (MS) in paracetamol tablets prepared via wet granulation method. PS formulations showed longer disintegration time than MS. However disintegration time was comparable at 10% w/w concentration: PS, 4.7; and MS, 5.0 min. PS is likely to initiate disintegration by swelling and capillary action. Drug dissolution (70%) was within 30 min. Thus PS powder appears to be a suitable substitute for MS as internal disintegrant in paracetamol tablet formulations.

Saleemulla Khan, G Ramu,
G Krishna Mohan, K N Jayaveera &
Chetan Bhalgat

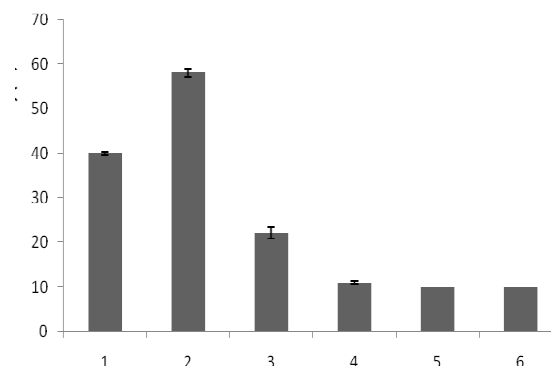


Energy and Environment

156 Bioethanol production from acid pretreated water hyacinth by separate hydrolysis and fermentation

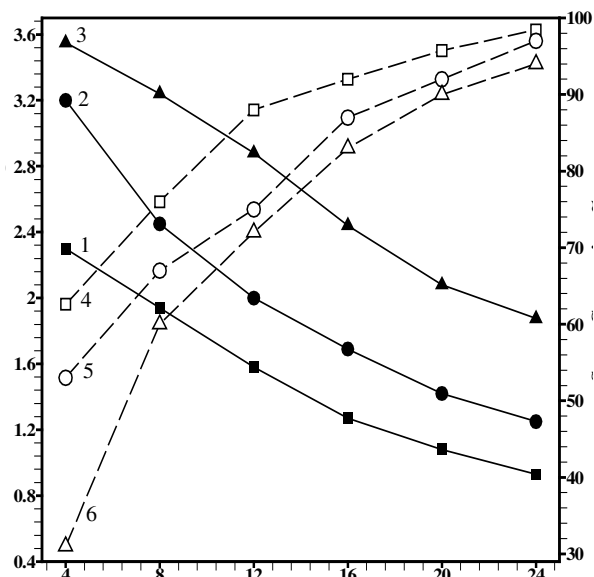
This study evaluated water hyacinth as feedstock for bioethanol production. Among different organic and mineral acids tested on pretreatment of water hyacinth, H₂SO₄ was found to be effective. Structural changes before and after pretreatment were evaluated by SEM, FTIR and XRD analysis. Various process parameters on hydrolysis of H₂SO₄ pretreated water hyacinth were optimized. Under optimized conditions, bioethanol (0.292% w/v) was obtained with an actual efficiency of 59.3%.

Karri Satyanagalakshmi, Raveendran Sindhu,
Parameswaran Binod,
Kanakambaran Usha Janu,
Rajeev K Sukumaran & Ashok Pandey


162 Ethanol production with natural carbon sources in batch and continuous fermentation using free and immobilized *Saccharomyces cerevisiae*

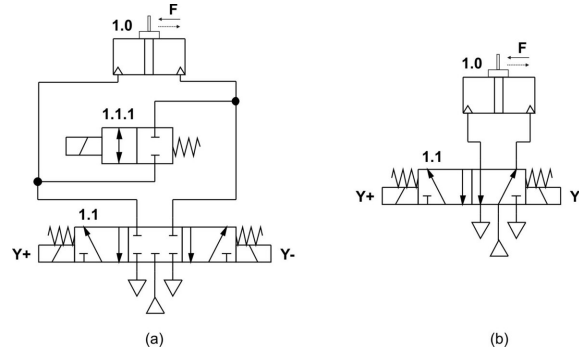
This study presents ethanol production from molasses, dates and sugarcane syrup with sugar concentration of 35 g/l in batch culture. Molasses (retention time, 24 h; initial sugar concentration, 100 g/l) gave highest yield of ethanol [conc., 45.5 g/l (theoretical yield 89%)] in a packed bed reactor loaded with immobilized *Saccharomyces cerevisiae* beads (mean diam, 3 mm). Entrapment method was used to encapsulate free cells using 2.5% sodium alginate solution, solidified in calcium chloride bath. Growth kinetic model for *S. cerevisiae* in batch culture and rate model for performance of immobilized cell reactor were determined.

Hoda Shafaghat, Ghasem D Najafpour,
Pouya Sirous Rezaei &
Mazyar Sharifzadeh-Baei



170 Cost effectiveness of restoring energy in execution part of pneumatic system

This study presents a structure of pneumatic systems with a special emphasis on energy saving in execution by a method of restoring energy via by-pass valve. Realized average energy savings are: conventional systems, 38.8; and servo systems, 28.6%. Cost effectiveness of proposed method is also presented.



Vladislav Blagojević, Dragan Šešlija & Miodrag Stojiljković

Book Reviews

177 ‘Grand unified Theory: Part I’ & ‘Quality Control for Value Addition in Food Processing’ reviewed by Dr P D Tyagi

Author-Reader Platform

179 Instructions to contributors

Author Index

Acharya S	142	Parameswaran B	156
Bhalgat C	149	Patanjali P K	105
Blagojević V	170	Prasad G K	91
Chaudhary A	142	Ramacharyulu P V R K	91
Dai Z	118	Ramu G	149
Dubey S	105	Rezaei P S	162
Dubey S K	135	Sasikala D	123
Janu K U	156	Satyanagalakshmi K	156
Jayaveera K N	149	Šešlija D	170
Jeevarathinam R	113	Shafaghat H	162
Jhelum V	105	Sharifzadeh-Baei M	162
Khan S	149	Sindhu R	156
Lafin S	129	Singh B	91
Mohan G K	149	Sommerfeld M	129
Naik M M	135	Stojiljković M	170
Najafpour G D	162	Sukumaran R K	156
Neelaveni R	123	Thanamani A S	113
Pandey Anju	135	Wang H	118
Pandey Ashok	156	Zhao Y	118
		Zhuang X	118

Keyword Index

<i>Acinetobacter</i> sp.	135	Maize starch	149
Agrochemicals	105	Management	170
Antibacterial activity	135	Medical image registration	123
Automatic test cases	113	Modified Adaptive Polar Transform (MAPT)	123
Bioethanol	156	Molasses	162
Cellulases	142	Mutation testing	113
Compressed sensing (CS)	118	Nanomaterials	91
Controlled release formulation (CRF)	105	Normalization	123
Crude cell extract	135	Nutritional factors	142
Chemical warfare agents	91	Paracetamol	149
Decontamination	91	Pepino	149
Energy efficiency	170	Pesticides	105
EPS	135	Pneumatic conveying	129
Equivalent sampling frequency	118	Pneumatic system	170
Ethanol production	162	Polymers	105
Fast Walsh Hadamard Transform (FWHT)	123	Pretreatment	156
Fermentation	156	Restoring energy	170
Fruits	149	<i>Saccharomyces cerevisiae</i>	162
Gas-solid flow	129	Signal reconstruction	118
Hot spring	142	Software testing	113
Immobilized cells	162	<i>Solanum muricatum</i>	149
Indicator	135	Starch and disintegrant	149
Interleaved sampling	118	Sulphuric acid	156
Inter-particle collisions	129	Thermophiles	142
Isolation	142	Turbulence	129
Kinetic parameters	162	Wall roughness	129
Lignocellulosic biomass	156	Water hyacinth	156

