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CONTENTS

Management & Information Technology

- 135 **Prediction of Rescue Mutants to Restore Functional Activity of Tumor Protein TP53 through Data Mining Techniques**

S G Jacob & R G Ramani

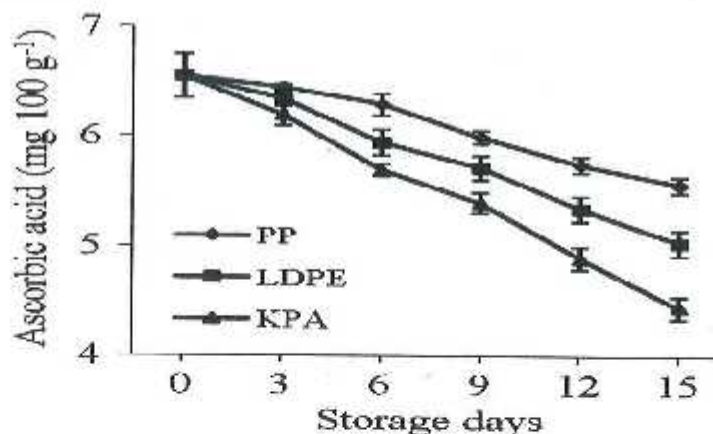
Several oncogenic malignancies show evidence of carrying mutations in the TP53 gene causing defects in the genome maintenance mechanisms that tend to instigate cancer. Early and precise detection of genetic mutations is a demanding task in the field of bioinformatics and molecular biology, while the accurate identification of rescue mutations presents great therapeutic remedies. In this research investigation, our aim is to identify potential P53 cancer-causing mutants and predict possible rescue mutations at secondary-site DNA binding domains. We highlight the impact of data mining techniques on predicting the active and inactive P53 mutant status based on the amino-acid substitutions at the DNA-binding sites.

S & T and Industrial Research

- 141 **Correct packaging retained phytochemical, antioxidant properties and increases shelf life of minimally processed pomegranate (*Punica granatum* L.) arils Cv. Mridula**

K Bhatia, R Asrey & E Varghese

This study investigated the effect of packaging materials (Poly propylene, low density poly ethylene and KPA bags) with different water and gas transmission rate on minimally processed 'Mridula' pomegranate arils stored at 5 ± 2 °C and 85 ± 5 % RH for 15 days. During course of storage, phytochemical and antioxidant properties of minimally processed arils were determined at 3 days interval. The results indicated that packaging material influenced ascorbic acid, phenols, anthocyanins, antioxidant and sensory score of minimally processed arils. Arils packed in PP bags retained better total phenols, anthocyanins and antioxidant compared to LDPE and KPA packed arils.



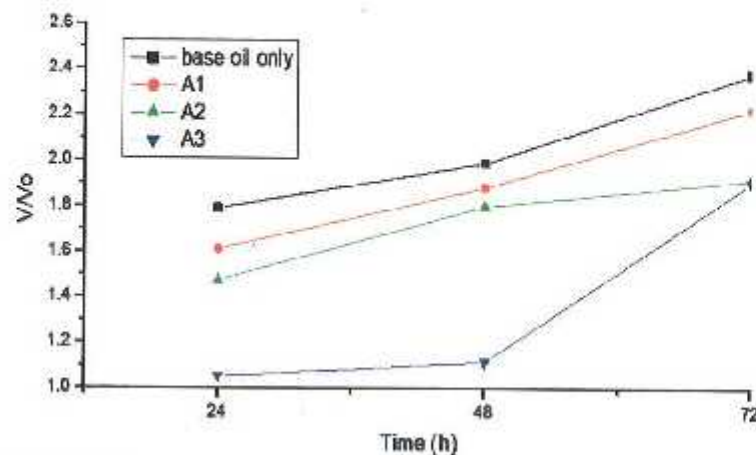
145 **The optimization of some extracellular enzymes biosynthesis by *Aspergillus niger* 377-4**

The effect of initial solid and moisture contents, temperature and time of incubation on the production of polygalacturonase, phytase, acid phosphatase, xylanase and β -glucanase by *Aspergillus niger* 377-4 during solid state fermentation was studied. Parameters of enzyme synthesis were optimized using statistical experimental designs. It was shown that the capacity of strain to synthesize the aforementioned enzymes could be modified within a wide range by culture parameters selection. The optimal polygalacturonase production efficiency was achieved with the initial medium mass of 19.9 g and humidity of 59.9%, after 77.7 h of incubation at 28.9°C. The best combination of culture parameters for phytase synthesis was: initial medium mass 19.9 g, moisture 50%, temperature 33°C and incubation time 83.9 h. The highest activity of acid phosphatase was obtained after 81.3 h of incubation at 27°C, with initial substrate mass of 17.8 g and moistness content of 60%.

A Wikiera, M Mika, A S Janiszewska & K Zyla

150 **Mannich bases and Phosphosulphurized Mannich bases: Synthesis, characterization and performance evaluation as potential lube oil additives**

With increasing demands being placed on lubricants for automotive engines and transmissions, it has become necessary to improve the function of lubricants. Modern lubricants are formulated from a range of base fluids and chemical additives to improve their function or to add some new performance properties in them. In this study, some Mannich bases were prepared by using *p*-cresol, formaldehyde and different polyethylene polyamines. Phosphosulphurized Mannich bases were also prepared by the using P_2S_5 . Structure of the prepared compounds has been confirmed by infrared spectroscopy, NMR and molecular weight determination.



P Ghosh & M Hoque

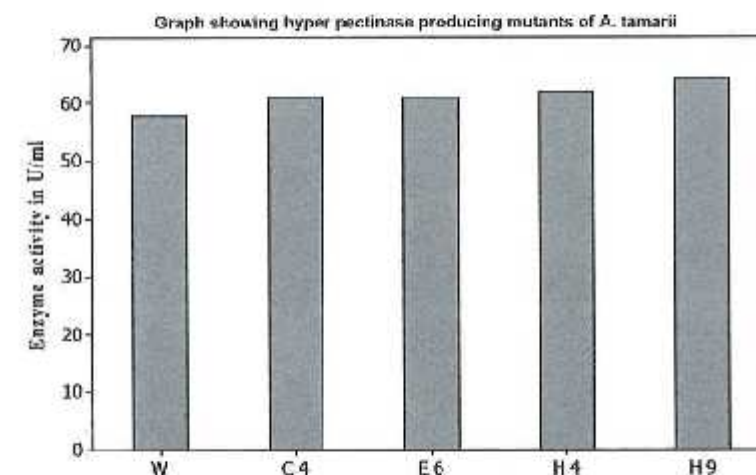
155 **Proximate, mineral composition and antioxidant properties of some wild leafy vegetables**

We analysed five wild leafy vegetables (*Amaranthus viridis*, *Chenopodium album*, *Diplazium esculentum*, *Nasturtium officinale* and *Urtica dioica*) of Sikkim for proximate and mineral composition. Wild leafy vegetables (WLV) of Sikkim are found nutritionally rich in terms of calorific value, fibre, protein and low fat which altogether indicate the potentiality of the WLVs as good source of non-conventional vegetables. WLVs were also analysed for antioxidant properties, total phenolic content and vitamin C content. All five WLVs were found to exhibit moderate antioxidant activity with variability in total phenolic content and vitamin C content. It firmly establishes rich nutritional efficiency of WLVs in the local diets.

S Pradhan, S Manivannan & J P Tamang

160 **Strain improvement by induction of mutagenesis for hyper production of pectinase using *Aspergillus tamarii***

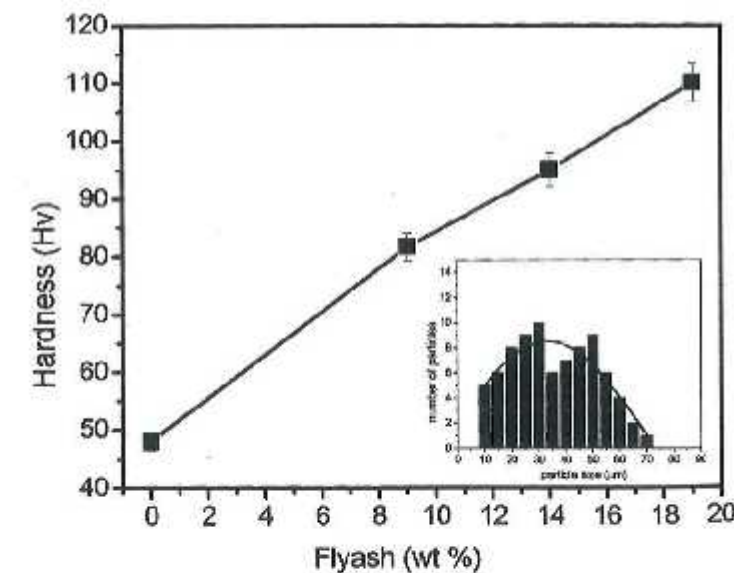
The present study describes the improvement of previously isolated fungal strain, *Aspergillus tamarii*, for pectinase production by application of multistep mutagenesis using physical (UV irradiation) and chemical agents (Colchicine, Ethidium bromide and Hydrogen peroxide). Mutants obtained after 1st treatment was screened for activity and the high producing strains were selected. The selected 1st generation mutants were treated for two times at same concentration with same mutagen to obtain third generation mutants. The wild/parent strain cultivated in previously determined production media, Citrus peel - groundnut oil cake (CG) showed its maximum activity of pectinase production (59 U/ml).



S Akbar, R C Prasuna & R Khanam

165 **Hardness, Tribology and Microstructural studies on Aluminum - Flyash metal Matrix Composites**

Flyash reinforced aluminium metal matrix composites (Al-MMC) have been synthesized by stir casting method and was fabricated by sand casting in to required sizes. Flyash content with various compositions (9, 14 and 19 wt %) was used with aluminium metal by adding magnesium content 1% for the present investigations. Flyash content with various compositions of Al-MMCs were tested for its hardness using Vicker's microhardness tester. It was found that the hardness increases with increase in flyash content. The surface morphology of the samples were investigated by scanning electron microscope (SEM) and optical microscopic techniques.



K A R Kumar, K Balamurugan & D Gnanaraj

171 **Quality assessment of chromatophores isolated from squid skin as natural pigment in formulation of lipstick**

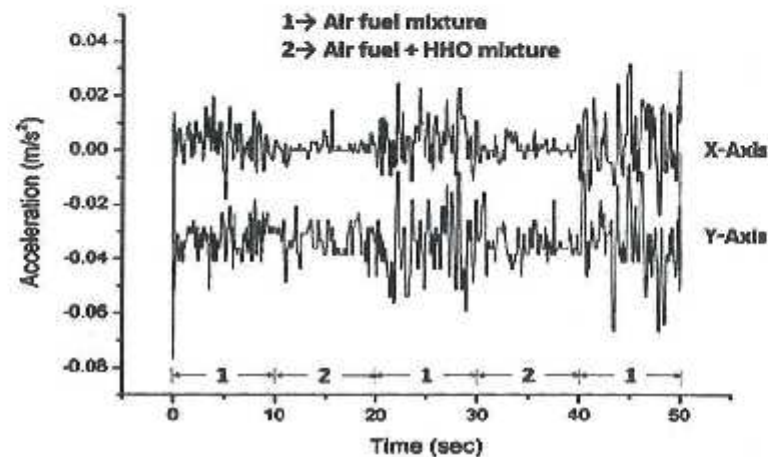
Lipsticks are made to appeal to the current fashion trend and come in a wide range of colors. Lipstick is the only cosmetic ingested, and because of this strict controls on ingredients, as well as the manufacturing processes, are imposed. As long as cosmetics remain in fashion, the market for lipstick will continue to be strong, adding markets in other countries as well as diversifying currently identified markets. But the pigments used in lipsticks can cause health hazards like infertility, anemia and cancer, as well as learning disabilities, mental retardation and behavioral problems, nausea, attention deficit, headaches, skin irritation, etc. The FDA has laid strict regulations regarding the use of lead as a lipstick ingredient. In the present study the chromatophores from squid skins were isolated, and used as natural pigment in lipsticks. Five shades (SQ1, SQ2, SQ3, SQ4 and SQ5) were developed using this pigment and they were screened for consumer acceptance applying hedonic scale method (0 to 9). Comparison with the instrumental reading was also done for the sensory scores.

F Hassan, P A Muhamed, V Geethalakshmi & T V Sankar

Energy and Environment

176 **Performance evaluation of an IC Engine using Oxyhydrogen as a fuel supplement**

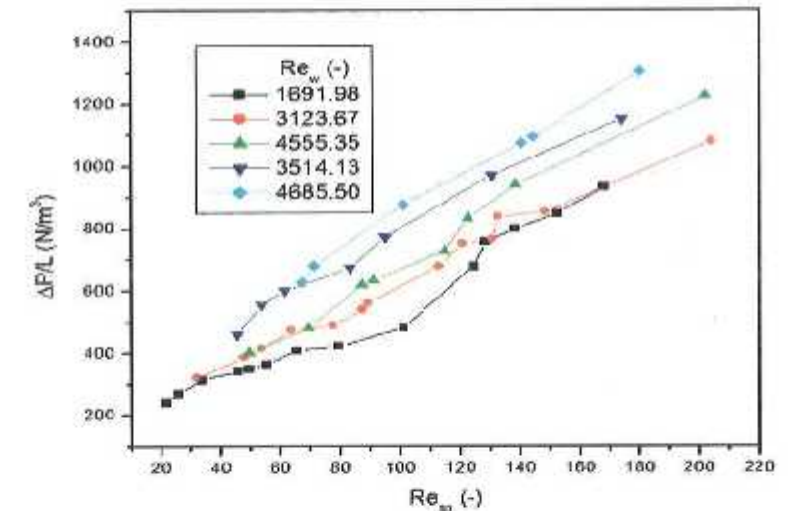
Commonly used fuels such as petrol and diesel have definite energy values and the extent of energy retrieval is limited due to the operating principle of the IC engine. Water upon electrolysis dissociates into hydrogen and oxygen, both the gases together in a common duct called as oxyhydrogen is used to increase the overall energy content of the primary fuel with a proportionate increase in efficiency. In the present investigation, this method is used to generate oxyhydrogen and feed it as a supplement fuel into the air intake manifold of a four stroke diesel engine test rig coupled to a rope brake dynamometer. The performance of the engine is monitored with the supply of oxyhydrogen intake at different electrolyte concentrations.



R Abhilash, K Gopalakrishna & K Venkatesh

180 **Analysis of Frictional Pressure Drop based on Flow Regimes of Oil-water Flow in Pipeline**

This article presents the analysis of frictional pressure drop, flow regimes of oil-water flow in an inclined pipeline. The analysis is done based on the Lockhart-Martinelli principle. The Lockhart-Martinelli model is modified and incorporated to predict the frictional pressure drop of oil-water flow in inclined pipeline. The effects of operating variables such as oil and water flow rates on frictional pressure drop are investigated. To predict the frictional pressure drop, friction factor of oil-water two-phase flow, correlations have also been developed for different flow regimes as a function of different dimensionless groups by introducing the operating variables and physical properties. The studies of the pressure drop of oil-water flow in pipeline may give insight into a further understanding and modeling of the liquid-liquid two-phase flow characteristics in chemical industries.



K R Naidu, T K Mandal & S K Majumder

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