

# Pakistan Journal of Scientific and Industrial Research

Vol. 51, No. 4

Golden Jubilee Issue

July - August 2008

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## *Message*

It is a privilege and honour to announce that *Pakistan Journal of Scientific and Industrial Research (PJSIR)* completed fifty years of its publication (in the year 2007). This Journal was launched way back in 1958 by Prof. Dr. Salimuzzaman Siddiqui (Late), the renowned scientist and founder of PCSIR, to disseminate the research findings of the scientists and technologists, primarily those of PCSIR, for the benefit of the global scientific community. In spite of many technical and financial hurdles the Journal stuck to its commitment and continued its uninterrupted publication. I congratulate the Editorial Team of the Journal for the commendable work. It is also appreciated that the Journal gives exposure to the researches relating to the indigenous as well as third world issues.

It is a matter of pride that PJSIR has kept pace with the times and continuously improved its standard in keeping with the advances in knowledge. The world has become a global village and it is not possible to work in isolation or keep the scientific developments undeclared. The Journal conforms to the international standards and it is hoped that it will be enlisted with the International Scientific Institute (ISI) for the grant of Impact Factor. I wish and pray for continued success of the Journal in the times to come.

**Shehryar Khan**  
**Chairman PCSIR**



## *Message*

It is a matter of great pleasure and pride in knowing that “*Pakistan Journal of Scientific and Industrial Research (PJSIR)*”, the bimonthly Journal of PCSIR has completed fifty years of its uninterrupted publication.

Prosperity of industrialized countries is attributed to their advancement in the field of science and technology. Pakistan is blessed with abundant natural resources. With the passage of time, more mineral deposits are being discovered and unexplored resources are being explored; what required is to make these valuable deposits utilizable through research and developmental work. PCSIR has carried out tremendous work on these lines and its Journal (PJSIR) has performed the task assigned to it for disseminating research findings in a standard format to scientific community globally.

In the light of current global challenges and threats posed by the internal and external factors, concerted R&D efforts are required to be undertaken by the scientific community at national level to help in providing solutions for the critical problems being faced by industrial/S&T sector. Substantial amount has been allocated by the Government of Pakistan for human resource development and improvement of infrastructure at research institutes and technical training centres for the promotion of S&T based research activities. It is hoped that, PCSIR in particular and the scientific community in general, will put extra efforts towards this endeavour. I pray that *Pakistan Journal of Scientific and Industrial Research (PJSIR)* may continue its uninterrupted publication as in the past and prosper further in future to achieve the highest standard of recognition.

**Jamil Ahmed Chaudhry**  
**Member (Science) PCSIR**



## *Editorial*

*Pakistan Journal of Scientific and Industrial Research (PJSIR)*, the prime Journal of PCSIR, completed fifty years of its publication in the year 2007 and this year, its Golden Jubilee is being celebrated. The Journal disseminates the researches carried out by the scientists, primarily those of PCSIR, to the global scientific community. It conforms to the international standards and the papers published in it are pre-reviewed by the subject experts of international stature.

Two important projects, exclusively designed for the Golden Jubilee of the Journal, are on the anvil. One relates to the preparation of the Index to the Contents of the past fifty volumes of the Journal which is likely to be launched shortly. The second one is in the process of implementation with the collaboration of the Institute of Research Promotion (IRP); via the latter's Pak Database (PDP), access to the abstracts of the papers published in the Journal during the last fifty years will be freely available.

A number of new features recently inducted emblazon the year of celebrations. Computerization of the overall activities has inducted a number of improvements in the system. The total time consumed in the processing of the papers has been reduced down to one month and the activation of the website of the Journal ([www.pjsir.org](http://www.pjsir.org)) has facilitated on-line users, authors and referees. Lately introduced Manuscript Tracking System has made submission of papers and their book-keeping a lot easier.

The assistance of the reviewers of papers and the Higher Education Commission (HEC) is heartily acknowledged. Without scholarly contribution of the former and guidance and financial assistance of the latter, it would have been difficult to implement many corrective measures. It is hoped that valuable suggestions and guidance of the scientific community to further improve the standard of **PJSIR** would remain available.

**Dr. Kaniz Fizza Azhar**  
**Executive Editor**

# Special Paper

Pak. J. Sci. Ind. Res. 2008 **51**(4) 177-184

## **Fifty Years of Pakistan Journal of Scientific and Industrial Research - An Overview With Reference to PCSIR Laboratories**

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(received February 15, 2008; revised March 4, 2008; accepted March 22, 2008)

# Physical Sciences

Pak. J. Sci. Ind. Res. 2008 51(4) 185-190

## Phylogenetic and Computational Structure-Function Studies of $\alpha$ -1,4-Glucosidase (Maltase) From Baker's Yeast (*Saccharomyces cerevisiae*)

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(received June 25, 2008; revised July 29, 2008; accepted July 30, 2008)

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**Abstract.** Study, through blasting, cladogenesis, multiple sequence alignment and protein homology modeling, of  $\alpha$ ,1,4 glucosidase from *S. cerevisiae* YJM789, showed the presence of different paralogues and orthologues of maltase in different genera of fungi and prokaryotes. The sequences of glucosidases contained 4 characteristic consensus regions. In the tertiary structure (modelled) of Baker's yeast maltase, all the residues of consensus region were congregated in the central region of the folded protein, rendering the formation of catalytic groove. On the basis of the orientation and spatial location of residues in catalytic groove, Asp200 is proposed to be the second substrate-binding site.

**Keywords:** maltase, baker's yeast, protein homology modelling

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## Study of Structure and Properties of Thermoplastic Polyurethanes

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(received May 12, 2008; revised July 14, 2008; accepted July 15, 2008)

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**Abstract.** In the investigation on the effect of clay nano-composite on the structure and properties of thermoplastic polyurethanes (TPUs), the mechanical properties of TPUs had maximum values with 8 wt % clay content. The wide angle X-ray diffraction patterns showed that the glycerol propoxylate had better compatibility with the organoclay than poly(propylene glycol).

**Keywords:** polyurethanes, thermoplastic polyurethanes, elastomers, clay nanocomposite, glycerol propoxylate

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## Preparation and Evaluation of Ciprofloxacin Hydrochloride Floating Oral Delivery System

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(received April 4, 2008; revised August 10, 2008; accepted August 10, 2008)

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**Abstract .** A sustained release system for ciprofloxacin hydrochloride designed to increase its residence time in the stomach was achieved through the preparation of floating microparticles by the solvent diffusion technique, using Eudragit S 100 and Eudragit RL 100 polymers. Eight different ratios of Eudragit mixture were used for the formulation, all of which showed good flow properties and packability. The drug retained in the microparticles decreased with increase in Eudragit RL 100 content, whereas, the floating ability increased with increase in weight ratio of Eudragit RL 100. There were differences between the formulations as to their appearance and size distribution. Fourier transform infrared (FTIR) spectrophotometric study confirmed intactness of drug in formulations. The formulation containing ES: ERL in a ratio 1.5:1 exhibited high percentage of floating particles with a controlled release of drug in 0.1N HCl.

**Keywords:** ciprofloxacin hydrochloride; floating drug delivery, eudragit

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# Biological Sciences

Pak. J. Sci. Ind. Res. 2008 51(4) 206-211

## Molecular and Biochemical Evaluation of Genetic Effects of *Calotropis procera* (Ait.) Latex on *Aspergillus terreus* Thom

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(received January 1, 2008; revised July 2, 2008; accepted July 3, 2008)

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**Abstract.** On treating dense conidial suspensions of *Aspergillus terreus* Thom with different concentrations of *Calotropis procera* latex, for investigating the genotoxicity of the latter, it was found that latex of *Calotropis procera* had potent lethal and mutagenic activities. Survival percentage decreased as concentration or time of exposure increased. Frequency of auxotrophic mutants increased with increase in concentration or exposure time. Most auxotrophic mutants were amino acid requiring mutants. DNA and total protein contents of each mutant was significantly lower than wild type of *Aspergillus terreus*. RAPD demonstrated polymorphic genetic bands of electrophoretic products of PCR for all mutants compared with the wild type strain. SDS-PAGE results expressed a polymorphism of protein bands as well. All these results indicated the mutagenicity of the latex of *Calotropis procera*.

**Keywords:** *Calotropis procera*, mutagenicity, *Aspergillus terreus*, genotoxicity

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## **Evaluation of Antiemetic Activities of Alcoholic Extract of *Grewia asiatica* in Experimental Model Dog**

**Zahra Yaqeen\*, Tehmina Sohail, Atiq-ur-Rahman, Muhammad Saleem and Zakir-ur Rehman**  
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(received April 25, 2007; revised July 4, 2008; accepted July 10, 2008)

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**Abstract.** The fruits of *Grewia asiatica* were evaluated for the antiemetic activity in the experimental model dogs, whereas, acute oral toxicity test was carried out in mice and rats. Maximum oral dose of 200 mg/kg and 600 mg/kg of crude alcoholic extract was found non toxic in mice and rats. Oral dose of crude alcoholic extract (120 mg/kg body weight) caused antiemetic effect in dogs in 3 h and controlled emesis centrally induced by Apomorphine (0.044 mg/kg body weight). This activity of *G. asiatica* was comparable with standard commercial anti-emetic drugs like Maxolon (Metoclopramide) and Largactil tablets 10 mg (Chlorpromazine) of M/s. Aventis Pharma., Pakistan.

**Keywords:** antiemetic activity, *Grewia asiatica* fruits, alcoholic extract

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## Genetic Analysis of Fibre and Earliness Parameters in F<sub>2</sub> Progenies of Intra-hirsutum Crosses

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(received April 12, 2007; revised July 8, 2008; accepted July 12, 2008)

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**Abstract.** Study of ten F<sub>2</sub> progenies of cotton along with their ten parental lines showed that the mean performance of genotypes differed significantly for the traits fibre length, seed index, lint index, micronaire value and earliness. Among F<sub>2</sub> hybrids, progeny CIM-499 x NB-111/S exhibited maximum heritability percentage for lint index and seed index, whereas progeny VH-142 x CRIS-134 expressed high genetic advances for fibre length and micronaire value. Progeny BH-147 x CIM-511 exhibited fair amount of genetic variance for earliness. The studied breeding material hence may reliably be used as a potential segregating population to improve fibre and earliness attributes in cotton.

**Keywords:** genetic analysis, fibre and earliness characters, intra-hirsutum crosses, *Gossypium hirsutum*

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## **Occurrence and Severity of Arsenic in Urine, Hair and Nails Through Contaminated Drinking Water in Pakistan**

**Farooq A. Khan, Ameera Javed\*, Javed Iqbal, Alia B. Munshi and Ishratullah Siddiqui**

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(received October 2, 2007; revised June 26, 2008; accepted July 7, 2008)

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**Abstract.** The study on contamination of well waters of Hyderabad city with arsenic and its effect on urine, hair and nails of people consuming this water revealed the concentration of arsenic in well waters to be 25.413 to 1286.47 ppb and that in urine of the people to be 2.032-33.906 ppb, in hair 105.7-427.96 ppb and in nails 8.579-71.033 ppb.

**Keywords:** Pakistan, groundwater, arsenic contamination, Hyderabad city

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# Review

Pak. J. Sci. Ind. Res. 2008 **51**(4) 225-234

## Food and Drug Interaction—a Growing Concern

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(received March 12, 2008; revised August 22, 2008; accepted August 24, 2008)

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**Abstract.** Food and drug are taken for the survival and well-being of human race. Food-drug interaction occurs when food including beverages taken orally affects the properties of intestinal enzymes (P450), which alters pharmacokinetics, bioavailability and pharmacodynamics of the drug. The bioavailability of a drug determines its therapeutic value. An increase in the amount of a drug would produce undesired toxic effects; whereas a reduced amount would result in serious complications that could be termed as therapeutic failure. Such health hazards are more pronounced in elderly persons and those who are taking potent drugs to control/treat chronic diseases. Also, the severity of adverse effect depends on the therapeutic index of a drug, more pronounced for a drug with low therapeutic index. The food (nutrient)-drug interaction has been recognized as a major health issue in western countries. Popular health magazines, newspapers etc. often summarize researches published in scientific journals, proceedings of conferences in simple to understand language to educate and warn readers on the consequences of food (nutrient)- drug interaction etc. Several national health agencies are also involved in conducting surveys and devising policies to minimize food-drug interactions.

**Keywords:** food-drug interaction, foods, drugs

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