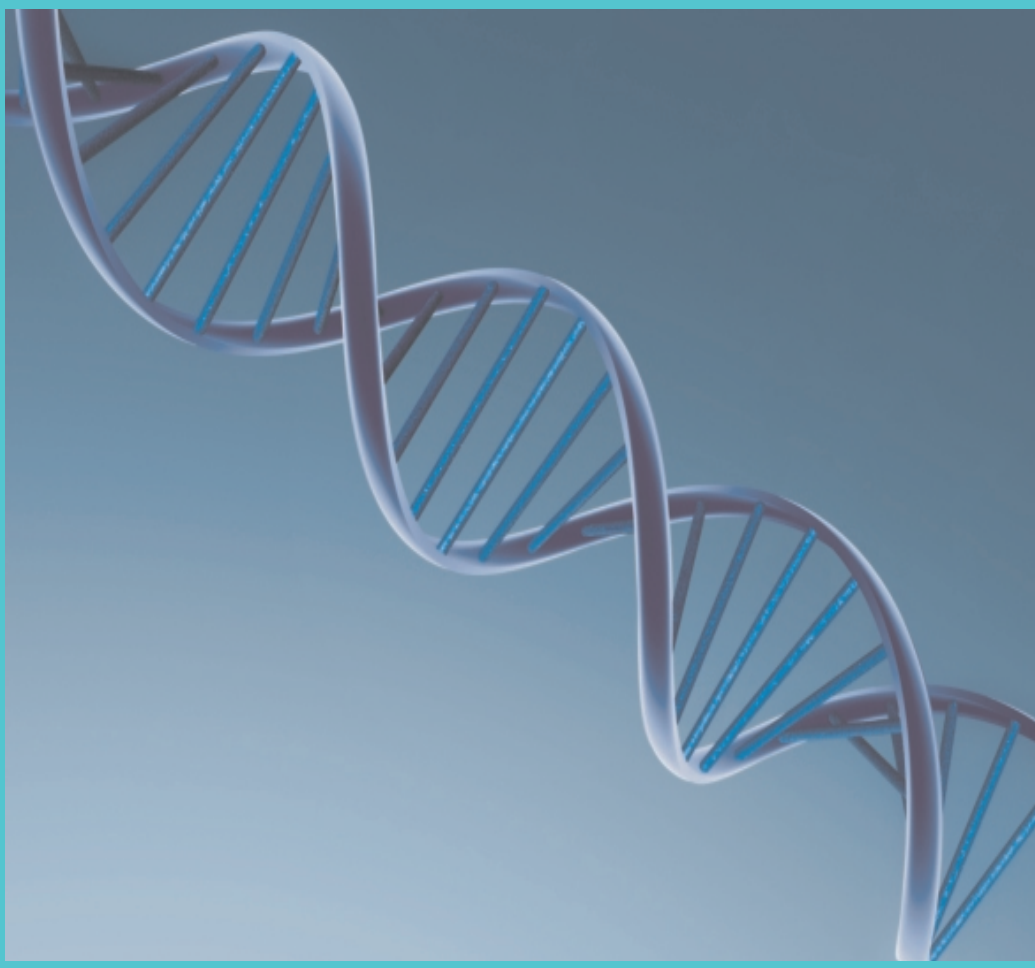
Progressive Education Society's

MODERN COLLEGE OF ARTS, SCIENCE & COMMERCE

Shivajinagar, Pune - 411 005.

Affiliated to University of Pune | NAAC Accredited with 'A' Grade | Best College Award by University of Pune

ABSTRACT BOOK



State Level Conference on

MICROBIOLOGY IN 21st CENTURY

25th - 26th February 2011

Organised by :

Department of Microbiology

Abstract Book

State level Conference on 'Microbiology in 21st Century'

25th – 26th February, 2011

Dr. Gajanan R. Ekbote
Chief Organizer and
Chairman, Business Council, Progressive Education Society, Pune 5.

Dr. Rajendra. S. Zunjarrao
Convener and
Principal, Modern College of Arts, Science and Commerce, Pune 5.

Dr. (Mrs.) Shilpa S. Mujumdar
Organizing Secretary and Head, Department of Microbiology

Organized By

Department of Microbiology
Modern College of Arts, Science and Commerce
Shivajinagar, Pune 5.
Under Quality Improvement Programme of University of Pune

Mission statement

"To Create
Multidisciplinary Best Citizens
To Suit
Local, National and International Needs
Having
Scientific Temperament,
Moral and Ethical Values
and
Multifaceted, Proactive Personality
By
Providing Excellent Education"

State Level Conference on

'Microbiology in 21st Century'

25th – 26th February, 2011

Organized by

Department of Microbiology

Modern College of Arts, Science & Commerce,

Shivajinagar, Pune, 411005, Maharashtra, India.

Conference Schedule - Friday, 25th February 2011

Inaugural Function	
10.00 am-11.00 am	Registration and Refreshment
11.00 am-12.00 pm	Inauguration • **DR. GAJANAN R. EKBOTE**, Chairman, *Business Council, P. E. Society, Pune* • **DR. RAMESH S. PARANJAPE,** Director, *NARI, Pune* • **PROF. MRS. JYOTSNA. G. EKBOTE**, Chairman, *LMC (Junior College), MCASC, Pune* • **DR. RAJENDRA S. ZUNJARRAO**, Principal, *MCASC, Pune* • **DR. ARVIND K. PANDE,** Prof-In-charge, *Department of Biotechnology and Microbiology.*
12.00 pm-12.45 pm	**DR. RAMESH S. PARANJAPE**, Key Note Speaker Director, *National AIDS Research Institute, Pune*
12.45 pm-01.30 pm	**Lunch**

Session I

Lectures	
01.30 pm-02.00 pm	**DR. PRASHANT K. DHAKEPHALKAR,** Chairperson *Scientist 'E', Agharkar Research Institute,* ***Pune***
02.00 pm-02.45 pm	**DR. S. MOHAN KARUPPAYIL,** Invited Speaker Topic:" **Prokaryotes and Eukaryotes: Do they talk to each other?**" *Professor and Director, School of Life Sciences, S.R.T.M.University,* ***Nanded***
02.45 pm-03.30 pm	**DR. PRAKASH R. THORAT,** Invited Speaker Topic:"**Decolourization and degradation of textile dyes by microorganisms**" *Executive member, AMI; HOD, Microbiology, Shri Shivaji Mahavidyalaya,* ***Barshi****.*
Oral Presentations	
03.30 pm-03.40 pm	**OP 01** *Candida glabrata* infection of the nasal septum – an unusual case report. **Dr. Roma A. Chougale** *MBBS, MD, Lecturer in Microbiology, D. Y. Patil College,* ***Kolhapur.***
03.40 pm-03.50 pm	**OP 02** Prevalence of methicillin resistant S*taphylococcus aureus* in D.Y.Patil hospital and Research centre. **Dr. Reena A.Dighe** *MBBS, DCP, MD, Department of Microbiology,D. Y. Patil Medical College,* ***Kolhapur****.*
03.50 pm-04.00 pm	**OP 03** Bacteriological quality of water, sanitation interventions and health with special reference to diarrhoea**.** **Mr. Anil M. Garode** *Department of Microbiology, Shri. Shivaji Science and Arts College, Chikhli,* ***Buldhana****.*
04.00 pm-04.10 pm	**OP 04** Screening of fungal isolates for lignolytic enzyme, manganese peroxides **Madhuri A. Udata, Joshi A. J., Dr. Mahendra K. Ranjekar.** *Department of Microbiology, Dayanand Science College,* ***Latur****.*
04.10 pm-04.20 pm	**OP 05** Biotransformation of Textile Azo Dyes by Aerobic Bacteria. **Ravi V. Kale and Prakash R. Thorat.** *P.G.Department of Microbiology and Research Center, Shri Shivaji Mahavidyalaya, Barshi,* ***Solapur****.*
04.20 pm-04.30 pm	**OP 06** A cost-effective protocol for cultivation, microbial and biochemical analysis and high yielding nutritious variety of mushrooms. **Supriya V. Suryawanshi, Bhagyashree V. More, Nilesh P. Anandwani, Jayesh A. Patil,** *Department of Microbiology, PSGVPM's, ASC College, Shahada, 425409,* ***Nandurbar****.*
04.30 pm-04.40 pm	**OP 07** Biosurfactant production by a marine strain of *Pseudomonas.* **Vijendra A. Kavatalkar, Smita S. Bhuyan, Peehu S. Pardeshi, Prof. Balu A. Chopade.** *Department of Microbiology & Institute of Bioinformatics and Biotechnology, University of Pune,* ***Pune****.*
04.40 pm-05.00 pm	**Tea**

Session II

Lectures	
10.00 am-10.30 am	Refreshment
10.30 am-11.00 am	**DR. DIGAMBAR V. GOKHALE,** Chairperson *Scientist 'F', National Chemical Laboratory,* ***Pune***
11.00 am-11.45 am	**PROF. ARVIND M. DESHMUKH,** Invited Speaker Topic:"**Microbial solubilization of metals from waste printed circuit boards**" *Head, Department of Microbiology, BAMU,* ***Osmanabad****.*
11.45 am-12.30 pm	**PROF. SUDHIR B. CHINCHOLKAR,** Invited Speaker Topic:"**Recent Trends in Microbial Control of Phytopathogens**" *Director, BCUD, North Maharashtra University,* ***Jalgaon***
Oral Presentations	
12.30 pm-12.40 pm	**OP 08** Antiplasmid activity of herbal extracts on Methicillin Resistant *Staphylococcus aureus* **Avinash D. Bholay, Anita N. Katkade, Kaveri S. Palekar.** *Department of Microbiology, K. T. H. M. College,* ***Nashik***
12.40 pm-12.50 pm	**OP 09** Study of extended spectrum beta lactamase (ESBL) producing Gram negative bacilli in family *Enterobacteriaceae*. **Dr.Vishwashanti. S. Vatkar, Dr.P.G.Shadija, Dr.S.J.Ghosh** *Department of Microbiology, Dr.D.Y.Patil Medical College, Kasaba Bavada,* ***Kolhapur****.*
12.50 pm-01.00 pm	**OP 10** Microbial Bioaugmentation for treatment of industrial effluents in Common Effluent Treatment Plant (CETP) **Snehal B. Bari, Nilesh A. Sonune, Amit R. Sinnarkar, Dr.Seema S.Sarnaik, G.K.Wagh, Dr.Pradnya P.Kanekar** *Microbial Sciences Division, MACS-Agharkar Research Institute, G.G. Agarkar Road,* ***Pune****.*
01.00 pm-01.10 pm	**OP 11** Isolation of *Rhizobium* and Optimization of Growth Conditions for Development of Biofertilizer for *Trigonella foenumgraecum* (Fenugreek). **Aasawari S. Pawar and Rajendra Choure.** *Department of Microbiology, The Institute of Science,* ***Mumbai****.*
01.10 pm-01.20 pm	**OP 12** Synthesis and characterization of ZnO nanoparticles and their application on textiles as antimicrobial agents and UV absorbers. **Rutuja.R.Phatate, Rebecca.S.Thombre and Sonal.P.Bathija.** *Department of Biotechnology, Modern College of Arts, Science and Commerce, Shivajinagar,* ***Pune****.*
1.20 pm-01.30 pm	**OP 13** Comparative study on the production of Prodigiosin by *Serratia marcescens* using various crude fatty acid sources and its applications. **Pankaj .S. Picha, Sheetal .P. Pardeshi** *Department of Microbiology, Modern College of Arts, Science and Commerce, Shivajinagar,* ***Pune****.*
01.30 pm-02.00 pm	**Lunch**

Session III

02.00 pm-03.00 pm	**Poster Presentation**

Session IV

03.00 pm-04.00 pm	**Panel Discussion** • **DR. BALU A. CHOPADE,** *Director, Institute of Bioinformatics and Biotechnology, Pune* • **DR. RAJNEESH B. VAIDYA,** *HOD, Microbiology, The Institute of Science, Mumbai.* • **DR. BALU P. KAPADNIS,** *HOD, Microbiology, University of Pune, Pune.* • **DR. RENU BHARADWAJ,** *Dean, B.J.Medical College, Pune.* • **DR. PRAKASH R. THORAT,** *Executive member, AMI; HOD, Microbiology, Shri Shivaji Mahavidyalaya, Barshi.* • **DR. RAJENDRA S. ZUNJARRAO,** *Principal, MCASC, Shivajinagar, Pune.* • **DR. ARVIND K. PANDE,** *Prof. In Charge, Department of Microbiology and Biotechnology*
04.00 pm-04.10 pm	**Tea**
04.10 pm-04.40 pm	**Valedictory function** • **DR. GAJANAN R. EKBOTE**, *Chairman, Business Council, P. E. Society, Shivajinagar, Pune*. • **DR. RAMCHANDRA V. GADRE,** *Scientist, National Chemical Laboratory, Pune* • **PROF. MRS. JYOSTNA. G. EKBOTE**, *Chairman, LMC Junior College, MCASC, Shivajinagar, Pune.* • **DR. RAJENDRA S. ZUNJARRAO**, *Principal, MCASC, Shivajinagar , Pune* • **DR. ARVIND K. PANDE**, *Prof. In Charge, Department of Microbiology and Biotechnology, MCASC, Shivajinagar , Pune* • **DR. SHILPA S. MUJUMDAR**, *Head, Department of Microbiology, MCASC, Shivajinagar, Pune.*
04.40 pm-05.10 pm	**Certificate Distribution**

Message from Executive member, AMI

Dr. Thorat P. R.
Executive Member,
Association of Microbiologist of India

Head,
P.G. Department of Microbiology and Research Center,
Shri. Shivaji Mahavidyalaya, Barshi 413411

Member BOS in Microbiology
Faculty of Science,
Solapur University,
Solapur, Maharashtra

"It gives me immense pleasure to know that Modern College of Arts, Science and Commerce, Shivajinagar, Pune-5 is organizing a State level Conference on '**Microbiology in 21st Century'** from 25th – 26th Feb. 2011.

Microbiology is one of the fastest growing knowledge based sector and it has numerous advantages in terms of research and development. The research done and ongoing research in this field has ushered in a revolution in the field of health, medicine and pharmaceutical, food, biotech industries, thus paving the way to improve and increase the productivity in the country.

The scope of Microbiology is diverse and it covers areas as different and distinctive as Pharmaceuticals, Agricultural Molecular and Environmental Microbiology. It is extremely important, therefore to provide quality exposure to new generation of students and to acquaint them with all the facets of this multifaceted area of study. It is thus extremely commendable that the Modern College of Arts, Science and Commerce, Shivajinagar, Pune 05 is hosting the State level conference of its kind in the area of Microbiology in Pune region.

I am thus quite sure that **"Microbiology in 21st Century"** will provide the perfect platform to bring together students, researchers and subject experts to discuss the emerging area of Microbiology for benefit of all living beings.

I convey my best wishes to the organizers for a great success of '**Microbiology in 21st Century' conference."**

Dr. P. R. Thorat
Member Central Executive Council,
Association of Microbiologists of India

Message from Director, *IBB, University of Pune*

Professor B. A. Chopade
Director,
Institute of Bioinformatics and Biotechnology,
University of Pune
Ganeshkhind, Pune 07

"It is indeed my pleasure to note that the department of Microbiology, Modern College of Arts, Science and Commerce, Pune 5 is organizing State Level Conference on "Microbiology in 21st Century" on 25th and 26th February 2011. The Pune city, historically enriched with cultural heritage is also a major educational hub in the country; it is therefore an appropriate location to host such an important conference.

The subject Microbiology has great relevance, connotations and concerns not only to microbiologists but to all the walks of human life through its immense power in terms of microbial biotechnology. Microbiology has made great impact on all facets of human life, nay it be foods and nutrition, health and wellness, industrial chemicals and materials, energy, agriculture or ecology and environment. Microbial diversity is being viewed as one of the most precious national resources, on par with mineral or fossil fuel resources. New engineered bacteria useful in industrial applications are emerging from the new discipline of synthetic biology.

Microbiology and Microbiologist in particular play an important role in the development of scientific advancement and new vista in modern research in biological sciences. It is the time to recollect the immense contributions of microbiologists that made our life comfortable and healthy.

I wish that all the delegates of the conference to get maximum benefits through their participation in the conference. I send my best wishes and greetings to all the participants and the organizers and wish the event good luck and grand success."

Professor B.A. Chopade
Director,
Institute of Bioinformatics and Biotechnology,
University of Pune
Ganeshkhind, Pune 07

Message from Head, Microbiology, University of Pune

Professor B. P. Kapadnis
Head,
Department of Microbiology,
University of Pune,
Ganeshkhind, Pune 07

"I am happy to know that the Department of Microbiology, Modern College of Arts, Science and Commerce, Pune 05, is organizing State Level Conference entitled "Microbiology in 21st Century" on 25th and 26th February 2011.

In today's Modern world, Microbiology is considered a vibrant and exciting field with many applications and the new and exciting discoveries been made in microbial ecology, molecular genetics, space microbiology etc. With the changing faces of microbes, it is mandatory for us to refine our approaches towards treating the infectious diseases. Genetically tailored medicine is picking up pace and that really gives us a ray of hope in combating the problem of multidrug resistant organisms which is the need of the hour. This conference will present multitude of subjects with a unique blend of modern research in microbiology.

I am certain that this conference will prove to be the perfect platform for the professionals to greatly benefit from the exchange of ideas and also the debates and deliberations related to the explorations of an integrated approach to microbiology.

I wish all the best and success for this conference."

Professor B. P. Kapadnis
Department of Microbiology,
University of Pune,
Ganeshkhind, Pune 07

Chairman's Message

Dr. G. R. Ekbote
Chairman,
Business Council,
Progressive Education Society
Shivajinagr, Pune 5.

Chief Organizer,
'State level Conference on
Microbiology in 21st Century'
25th - 26th February 2011

"Progressive education Society is one of the leading educational institutions in Maharashtra. P. E. Society was founded by a well-known dedicated teacher late Shankarrao Kanitkar along with his colleagues in year 1934. The team of dedicated teachers with their untiring efforts and sacrifice built up reputation of all its institutions over a period of time. The school, colleges, management and computer institutes run by the society have earned a reputation as institution imparting quality education all over Maharashtra. P. E. Society runs 56 educational institutions, which include pre-Primary, Primary, Secondary, Higher Secondary School and Arts, Science and Commerce Colleges, Engineering College, College of Pharmacy, Institute of Management, Institute of Computer Science, Information Technology Centre and Law College etc.

The Modern College of Arts, Science and Commerce, Shivajinagar, Pune 5 was founded by Progressive Education Society, in 1970. The colleges affiliated to the University of Pune. The college provides various academic amenities so as to attain Bachelor and Master Degrees in the field of Arts, Science, Commerce, Computer Science, Computer Application and Biotechnology. The college is a reputed educational institution, which has been known for producing outstanding students who take on different careers, as per their academic merit successfully in the society. University of Pune has awarded "**Best College Award**" to the college.

The college not only ensures academic development of the students but also provides them with opportunities to prove themselves by means of extra-curricular and co-curricular activities. Moreover, in the field of sports, the college has made a name for itself. So far 28 students of the college have won prestigious 'Shri. Shiv Chhatrapati Award'. The College has a well-equipped gymnasium by which the students are benefited. The Arts circle of the college works hard for the promotion of cultural activities. The Career Guidance Center makes its presence felt by providing necessary information and guidance to the students as and when required. The record of achievements of the college clearly indicates that the college has firmly established itself as **'Modern'** and **'Progressive'** educational institution. The College is accredited with 'A' grade by NAAC, Bangalore. Various educational authorities have

noted the achievements and reputation of the college. The Govt. of Maharashtra and University of Pune has recently accorded the sanction to increase the intake capacity of the M.Sc. course. The young and highly qualified team of faculty members spares no efforts to keep the students well informed and in updating their knowledge. The students are also reciprocating by their high achievements in academic performance. A large number of students are getting excellent placements in different part of the country & also abroad. Every year several students are also selected in reputed foreign universities for higher studies.

Concentrated research and development is required on various micro based technologies that can be utilized to increase crop production and utilize agro waste, manage abiotic stress drug design, for biocontrol of important insect pests and in post harvest technologies

I am certain that the conference will prove to the perfect platform for the professionals to greatly benefit from the exchange of ideas and also, the debates and deliberations related to explorations of integrated approach to Microbiology. I also hope that there will be sufficient knowledge and direction for the young and budding scientists also.

I congratulate the principal of modern college Dr. Rajendra S. Zunjarrao, Dr. Shilpa S. Mujumdar, HOD, Department of Microbiology and organizing team for organizing this conference and wish them a grand success."

Dr. G. R. Ekbote
Chairman,
Business Council,
Progressive Education Society
Shivajinagr, Pune 5.

Principal's Message

Dr. Rajendra S. Zunjarrao
Principal,
Progressive Education Society's
Modern College of Arts, Science and Commerce,
Shivajinagar, Pune 5.

Convener,
'State level Conference on
Microbiology in 21st Century'
25th - 26th February 2011

"We are happy to welcome you to the State level Conference on 'Microbiology in 21st Century' organized by Department of Microbiology, Modern College of Arts, Science and Commerce, Pune 05.

Since 1985, P. E. Society has been making pioneering efforts in establishing higher and technical educational institutions under the dynamic leadership of its Chairman, Dr. G. R. Ekbote, a well known surgeon and member of the Senate, Academic Council of the University of Pune. He has been recently appointed as U.G.C. Nominee on University of Health sciences, West Bengal and also on National Institute of Technology, Surathkhal, Karnataka. The institution of P. E. Society are progressing remarkably and making their mark in the field of education. It is in this context that the era from 1986 till today is characterized as era of exponential growth and academic development.

Progressive Education Society's Modern College of Arts Science and Commerce, Shivajinagar, Pune 05, was established in the year 1970. At present we have approximately 8,000 students. We run courses in arts, commence and science including Biotechnology, Microbiology, Computer Science etc. The college is reaccredited by NAAC, Bangalore with 'A' grade status. The college is well known for its academic excellence. Many past students of our college have excelled in the field of academic activities, sports and cultural activities. The college has received **'Best College Award'** of University of Pune in year 2008.

The subject Microbiology has always remained fascinating. Microorganisms are thought to be the origin of life and also big factories producing thousands of biochemical compounds. The whole mechanism of life processes is illustrated by these tiny organisms. They are versatile in adapting themselves to any kind of environment. They project themselves to be both useful and harmful to life. All these unique features of microorganisms will be reveled in this conference. The title of the conference" Microbiology in 21st Century" speaks about the glorious progress made in various branches of microbiology touching many aspects of life. The topics of the conference offer opportunity to scientists, teachers, students, industrialists, environmentalists, agriculturists and ecologists to present their contributions made for the betterment of human life.

Our college has maintained tradition of organizing National/International Level Conferences, Workshops, Seminars and Symposiums. Although, Microbiology is a basic science, it has played major role in the development various aspects of

science. With this notion in mind we had submitted proposal to the University of Pune to organize State level conference on 'Microbiology in 21st Century' under its Quality Improvement Programme. We are very glad to communicate you that, in response to our Proposal University of Pune has given approval and consent to organize the International Conference on the said topic.

As it is state level event we have invited and expecting the participation of Resource Persons, Subject Experts, Scientists, Eminent Personalities from the academic field and industry, Faculties and Students from the various districts in Maharashtra. On this occasion I convey my warm greetings and felicitations to all the delegates and wish them a scintillating conference."

Dr. Rajendra S. Zunjarrao
Principal,
Progressive Education Society's
Modern College of Arts, Science and Commerce,
Shivajinagar, Pune 5.

Committees for State Level Conference

"Microbiology in 21st Century"

25th and 26th February 2011

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Extended Abstract

Prokaryotes and Eukaryotes: Do They Talk to Each Other?

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A paradigm shift is happening in our understanding of the world of unicellular eukaryotes and prokaryotes. The microorganisms, like bacteria and yeasts are often considered as non cooperative individualistic organisms. In fact, they are very social organisms and in nature they tend to live as communities called as biofilms and often behave like multicellular organisms. Biofilms are multicellular assemblages of cells encased in extracellular matrixes. They are interactive and use small diffusible molecules for communication, through a process referred as quorum sensing. They release small diffusible molecules which parallel with cell density and bind to sensors when they reach a critical concentration. The bound proteins activate the transcription of various genes resulting in behavioral changes. Hundreds of genes are regulated by the quorum sensing or chemical signaling molecules. The genes regulated include those which govern luminance, pathogencity, virulence factors, symbiosis/predation to cite a few. The chemical language used by microorganisms may be species/ genera specific or general. In short, microorganisms can detect the presence and density of not only their own species, but also members of other genera or even kingdom. Most of the time, the biofilms are not homogenous assemblages but polymicrobial. For example, in cystic fibrosis patients *Pseudomonas aeruginosa-Candida albicans* biofilms are common. Various studies shown that bacteria and fungi are not silent partners in biofilms but are engaged in meaningful dialogues resulting in changes in gene expression and observable behavioral changes. Eukaryotic hosts may recognize the quorum sensing molecules produced by the pathogens and may adapt strategies to handle it. Quorum sensing molecules of the pathogens are shown to elicit responses in the host often in favor of them or vice versa. The prokaryote - eukaryote dialogue is not only of importance to pathogenecity or virulence but may also influence secondary metabolite production, symbiosis and/or predation. Understanding the prokaryote-eukaryote dialogue may open up new opportunities for drug development and also reveal the marvelous biology behind the interactions.

Extended Abstract

Decolorization and Degradation of Textile Azo Dyes by Microorganisms

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Water is the most precious divine natural resource that exists on our planet. Environment and life are in very close relationship on earth. Humans must protect these natural resources to lead life happily, but rapid industrial development and population explosion has made the problem of environmental pollution more and more acute. In India maximum population inhabits in villages and slum areas, where there is no safe drinking water supply. Dyes and pigments are used in various industrial processes like, textile, pharmaceutical, cosmetics, food, printing, etc. The textile industry is the largest, indispensable and backbone industries of some under-developed and developing countries in the world. The water required for textile industry is very large. Azo dyes that are used in the textile industries are xenobiotic compounds which contain (-N=N-) linkage and which are mutagenic as well as toxic to living organisms and environment also. Textile industry is confronted with the problem of color removal and effluent salt content reduction.

The most pressing environmental problem facing the textile industry is the dye containing waste-water. The dye containing effluent represents highly problematic wastewaters not only because of high COD, BOD suspended solids, toxic compounds, but also because of color (dyes) which make them easily recognized and poses esthetic problems. When dyes are released in the environment, they form toxic compounds which harm the living creatures. Also the dyes color the water reservoirs which reduce the penetration of sunlight in turn leading to eutrophication. Presently there is no economical and efficient means or process to achieve the reduction of these two parameters. Now-a-days dye wastewater is treated by physical and chemical procedures which have many shortcomings. These physico-chemical methods available for the treatment of these synthetic dye-stuff, like flocculation, sorption, electrochemical and oxidative degradation. These physico-chemical methods available for the treatment of these synthetic dye-stuff, like flocculation, sorption, electrochemical and oxidative degradation which have limitations like cost effectiveness sludge or residue formation which is difficult to dispose off and also limited in their applications.

Many studies have been focused on the microorganisms that are able to degrade the dyes, suggesting the bioremediation as an environment friendly and cost competitive alternative for dyed wastewater treatment. Decolorization of the synthetic

dye using different microorganisms appear to be effective, environment friendly, less expensive and with reproducible biotransformation data. Dye-stuffs are degraded by range of microorganisms in nature but studies are concentrated on bacterial and fungal decolorization of the dye.

Release of azo dye in the environment is of great concern due to, colour, toxicity, mutagenicity and recalcitrant nature of the dye, considerable attention has been given in determining the ability of microorganism in decolorization and degradation of the azo dyes. In the present study, acclimatized microorganisms isolated from natural sources were used for the study of decolorization and degradation of the dyes *viz.* Acid Blue - 113, Acid Red - 1, Reactive Orange - 16, Direct Yellow - 50, Yellow - 4G, Orange - 2R, Methyl Red and Disperse Brown - 3REL. In all total 63 microorganisms were isolated, these isolates showed good decolorization pattern with average of 97.95% in nutrient broth condition. In Half Strength Nutrient Broth condition, the isolates showed 86.33% decolorization of the dyes. The cell free extract of the isolates showed 89.07% decolorization of the dyes. The percent COD reduction of the dyes was determined, the isolates showed upto 88.00% reduction in COD of the dyes. The degradation of the dyes was determined by GC-MS analysis technique. The microorganisms were identified by 16s rRNA analysis technique.

Key Words

Decolorization, Degradation, Aerobic, Bacteria, Azo Dyes, COD reduction

Extended Abstract

Microbial Solubilization of Metals from Waste Printed Circuit Boards

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With the rapid development of technology, the problem of older electronic equipments is increasing. The main reason behind such increase is low rate of recycling which, in turn, is due to the complex nature of such waste. Traditional ways for treating such waste are not economical and they contribute to pollution. The promising answer for the problem is bioleaching.

Studies were carried out to solubilize heavy metals from electronic waste. For this purpose, the consortium was obtained using a simple way, similar to that of 'top down' approach. Printed circuit boards (PCBs) were used as representative samples of e-waste. Various concentrations of PCB powder were used (1-5%) for bioleaching and their effects on metal solubilization, changes in pH and concentration of ferrous iron were accessed. Maximum level of metal solubilization was found to be 96.93% Cu, 93.33 % zinc for 10 g/litre of PCB powder and 10.26 % Ni for 30 g/litre of PCB powder. In case of lead, only 0.58% solubilization was achieved when 20 g/litre of PCB powder was used. The precipitate formed during bioleaching was analyzed by SEM EDAX which shows the presence of Tin (59.96%), Cu (23.97%), Pb (9.30%) and Fe(5.92%). The causes of copper precipitation were discussed.

Key Words

Microbial consortium, Printed circuit boards, Bioleaching

Extended Abstract

Recent Trends in Microbial Control of Phytopathogens

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Progress in molecular biology and analytical methods has helped in understanding of biological control of soil borne phytopathogens. There exists a great diversity among pathogenic fungi and bacteria. Therefore, control of such pathogenic micro-organisms is a great challenge. Plant Growth Promoting Rhizobacteria (PGPR) and Bio-control Agents (BCA) having multiple activities is a proper antidote against such phytopathogens. Earlier practices like – fighting of phytopathogens with soil fumigants and using agricultural practices like – crop rotation, tillage is either harmful or inadequate. The recent progress in technology focuses on knowledge on mechanism of competition of food, space, iron, parasitism, induction of systemic resistance and antibiosis. Recent approaches eg. identification of plant genes which improve plant interaction with disease suppressive bacteria, identification of genetic factors of biocontrol strain which alter/diminish biocontrol feature eg. phase variation, identification of factors produced by phytopathogens which alter biocontrol mechanisms eg. fusaric acid reduce anti-fungal metabolite production and also interfere quorum sensing/cell signaling, manipulation of soil mineral properties to optimize biological control would strengthen the efforts of agriculturists in time and space. Out of available novel biocontrol agents, our laboratory has concentrated on phenazines. Phenazines are heterocyclic, nitrogen containing, brightly colored secondary metabolites produced by a variety of bacteria. They exhibit anti-fungal as well as anti-bacterial activity. We concentrated on *Pseudomonas aeruginosa* 4365 which secretes phenazine-1-carboxylic acid (PCA) and pyocyanin. Standard protocol for laboratory scale production of PCA and pyocyanin was developed. Both compounds were purified to obtain crystals. This purified material was characterized with the help of UV-Visible Spectroscopy, IR, NMR and HPLC. Anti-fungal activity was studied in vitro. Pyocyanin, though a weak antifungal showed pH dependent inhibition of *Scelrotium rolfsii.* PCA is comparatively strong antifungal compound and inhibited *Fusarium oxysporum*, *Sclerotium rolfsii* and *Colletotrichum falcatum* at very low concentrations. Scaled up production of PCA at 12 L and 125 L was carried out. An attempt was made to evaluate comparative activity of PCA as a foliar fungicide through field trial on chilli which demonstrated that PCA has, if not better, comparable activity with various commercial chemical fungicides. Process details and other technical information will be discussed in conference.

Extended Abstract

Abstract of the Presentation

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Microorganisms, their cells or their replicable parts are the tools for biotechnology. These microbes are diverse and show numerous metabolic activities leading to products of immense industrial importance. The vast number of microorganisms has been isolated, identified conserved and utilized for benefit of mankind. However, 99% of the environmental microbes cannot be cultured under laboratory conditions. Thus the majority of the microbes thus remain hidden which need to be explored, identified and also conserved. These untapped microbial sources can be exploited using metagenomic approach to obtain novel microbial products. All these microbial strains need to be preserved in pure form without losing their genetic as well as phenotypic identity. Microbial Resource center (MRCs) act as custodians of such microbial diversity and play an important role in the storage and supply of authentic reference cultures for research and development. Microbial culture collections are established in many countries having variety of purposes. There are very small culture collections (200 microbial strains) and also large cultures collection possessing more than 50,000 microbial strains.

NCIM Resource Center is a pioneer microbial culture collection facility in India, which offers services to educational / research institutes and industries. NCIM is a unique resource dedicated to the isolation, collection, preservation and distribution of authentic cultures of industrially important microorganisms. NCIM holds about 3500 microbial strains of bacteria (1500), yeast (550), fungi (1300) and algae (15). The main objective of the facility is to supply authentic cultures to research institutes and industries. The catalogue of microbial strains can be accessed through http://www.ncl-india.org/ncim. Ours is small culture collection compared to ATCC and NCIMB. However, I will discuss some of the achievements emerging out of screening our own microbial sources.

OP11

Isolation of Rhizobium and Optimization of Growth Conditions for Development of Biofertilizer for *Trigonella foenumgraecum* (Fenugreek)

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Trigonella foenumgraecum (fenugreek) is known for its rich dietary proteins, medicinal properties which are supported by symbiotic nitrogen fixation by *Rhizobium* in its root nodules. These properties get compromised by imbalanced nitrogen supply as chemical fertilizers. Biofertilizers are considered to maintain the nutritional and organoleptic qualities of the leafy vegetable. The present study describes the screening of a *Rhizobium* strain isolated from root nodules of fenugreek, optimization of cultivation conditions and application of Rhizobium biofertilizer. Isolates were characterized by analysis of growth rate, acid production,40^{o}C tolerance, tolerance of 2% NaCl, and symbiotic performance. The *Rhizobium* isolates were found to be temperature and pH sensitive, (optimum values of 25°C and 8.0, respectively). Medium composition for laboratory scale growth was optimized using Plackett-Burman approach. These isolates grown on the optimized medium were tested for their differential effect on germination of seeds and plant growth promotion of fenugreek seedlings of cultivars S_1 and S_2, *in vitro* in sterile Petri-plates as well as *in vivo* in different soils, SL_1 and SL_2. Germination rate was higher in both the seedlings S_1 and S_2, treated with the Rhizobium cultures, than controls which were untreated. In pot assay, pots seeded with Rhizobium, seeds showed enhanced plant growth than uninoculated controls, though there was considerable difference in growth pattern of test plants.

PP01

Isolation and Characterization of *Listeria* Species from Environmental and Clinical Sample

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Listeria spp. are ubiquitous in nature. Out of 8 spp. 2 are pathogenic to humans and animals. 14 environmental and 133 clinical samples were screened for presence of *Listeria* spp. Out of 14 environmetal samples, 2 (14.28%) and of 133 clinical samples, 25 (18.79 %) were positive for *Listeria* spp. Biochemical and genetical studies confirmed that 11(7.48%) were pathogenic strains of *Listeria monocytogenes*. CAMP and ALOA tests were performed to confirm the isolates. Further serotyping study of these 11 pathogenic strain revealed that 5 isolates were of 4b serotype and 6 were 1/2b serotype. Other species detected were *L. ivanovii* and other *Listeria* spp. No environmental samples contained pathogenic spp. of *Listeria*. Isolates were sensitive toward the antibiotics viz. Ampicillin, Doxycycline, Ciprofloxacin, Vancomycin and shows intermediate resistances toward the Chloramphenicol, Penicillin, Gentamycin.

Key words
Listeria spp, ALOA test, CAMP test, Serotyping, AST.

PP02

Antimicrobial Activity of *Vinca Rosea (Catharanthus Roseus* L.) and *Clematis Gouriana a*gainst Pathogenic Bacteria

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Vinca rosea (*Catharanthus roseus* L.) and *Clematis gouriana* has historically been used to treat a wide assortment of diseases. *Catharanthus roseus* L. has wound healing activity in diabetic patients. *Clematis gouriana* is an endemic medicinal plant of western ghats and India, used in the treatment of dermatopathy, blood diseases, leprosy, wound healing, viral fever, headache and cardiac disorders. Ethanol extract and water extract of *Catharanthus roseus* L., methanol and water extract of *Clematis gouriana* was studied. Ethanol extract and water extract of *Catharanthus roseus* L. of 50mg/ml, 100mg/ml, 150mg/ml concentration was studied and methanol and water extract of *Clematis gouriana* of 50mg/ml, 100mg/ml, 150mg/ml concentration were studied. All plant extracts were checked for Minimum Inhibitory Concentration and Minimum Bactericidal Concentration. Then the extracts were evaluated to find out phytochemical compounds by Thin layer Chromatography.

PP03

Isolation and Screening of Plant Growth Promoting Bacteria from Rhizosphere

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Plant growth promoting bacteria (PGPB) are soil and rhizosphere bacteria that can benefit plant growth. Given the negative environmental impact of chemical fertilizers and there increasing cost, the use of PGPB as natural fertilizers is advantageous for the development of sustainable agriculture. 20 strain showing phosphate solubilization activity and 6 strains showing nitrogen fixation activity were isolated from farm soil located near Saswad. The isolate showing both the activities was selected for the further studies and identified as *Staphylococcus hominis* by API kit. Application of *Staphylococcus hominis* culture with lignite showed plant growth promoting activity. *Staphylococcus hominis* also showed positive Siderophore and Indol Acetic Acid production.

Key Words

Phosphate solubilization, Nitrogen fixation, plant growth promoting bacteria.

PP04

Isolation of Poly-β-Hydroxyalkanoate Producing Bacteria from waste water and optimization of its production parameters

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Polyhydroxyalkanoates are considered good substitutes for petroleum derived synthetic plastics because of their similar physical and chemical properties and can get degraded completely to CO_2 and water under natural environment by the enzymatic activities of microorganisms. Poly-β-hydroxyalkanoates (PHA) are synthesized by numerous bacteria as an intracellular carbon and energy storage compound under limited concentrations of nutrients with excess carbon. The objective of the present study is to isolate the bacteria from waste water and that are capable of producing poly - β- hydroxyalkanoates and their characterization. The study also carried out to optimize the growth parameters such as pH, temperature, time, nutrient concentrations etc. Waste water containing mostly sewage sample from Siddheshwar Ghat, Mulla river, Pune was collected. It is screened for bacteria producing poly – β – hydroxyalkanoate (PHA). Detection of PHA production was done by Sudan black staining and Spectrophotometry. The media optimization was carried out using modified E2 medium containing either one of the various carbon sources such as Glucose, Fructose, Maltose, Sucrose, and either one of the Nitrogen sources such as Ammonium chloride, Ammonium sulfate and ammonium Phosphate and yeast extract. Other growth parameters such as pH (5.0, 6.0, 7.0 and 8.0), temperature (ambient temperature, 28 ^oC, 30 ^oC, and 32^oC) and time (about 24hr, 48hr and 72hr) were optimized for production of PHA. The bacterial isolates were designated as Wi1 to Wi30 (W=Waste water, i=isolate) were found to produce PHA. Among these four cultures Wi2, Wi4, Wi8, and Wi13 were selected for evaluation of growth parameters for maximum PHA production, since these are found to be most promising PHA accumulating bacteria. Among the parameters evaluated in the independent experiments 1g % glucose, 0.1 g % ammonium phosphate, time of about 48hr, temperature 32^oC and pH 7.0 were found to be suitable for maximum production of PHA by Wi2, Wi4 and Wi8. Wi13 also shows maximum production of PHA at above concentrations except pH for maximum production of PHA is 8.0

Key Words

Poly–β–hydroxyalkanoate, PHA, Optimization of growth parameters

OP03

Bacteriological Quality of Water, Sanitation Interventions and Health with Special Reference to Diarrhoea.

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The primary justification for the decade was to improve the health of people, primarily children, who suffer because of inadequate and contaminated water supplies and poor sanitation. In developing countries, three basic types of the services could benefit child health: an improvement in the quality drinking water, an increasing the quantity of water provided and used and provision of sanitation facilities for safe disposal of the human excreta. Diarrhoea can occur following the ingestion of water contaminated with the infectious agent of the diarrhoea. Water containing pathogenic bacteria at doses below those necessary to infect humans, may be used for preparation of foods, at which time the bacteria may incubate and multiply in the food. Effective disposal of human excreta should play a role in the control of major infectious agents of diarrhoea which are eliminated via the faces. Young children, the primary excretors of these agents, do not the toilet. Therefore, the hygienic disposal of their faces is necessary to break the faecal oral transmission of these pathogens. Interruption of this transmission by water and sanitation improvement is probably the major mechanism whereby children's health can be improved. The bacteriological examinations of drinking water support the study. Excreta disposal appears to consistently play a more important role in determining children's health in developing areas, than do water supplies especially where the prevalence of diarrhoea is high.

PP05

Characterization of Contaminants of Cosmetics and Their Antibacterial Sensitivity against Synthetic and Natural Preservatives

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Microbial contaminants in cosmetic products have two origins i.e. during production and filling, and during the use by the customer. From the moment in which the cosmetic unit is opened until the consumer finishes the product, there is a permanent, variable and additive microbial contamination of the cosmetic caused by the domestic environment and the consumer's body. Contaminating microorganisms may cause spoilage of the products and when pathogenic represent a serious health risk for the consumer worldwide. Therefore, the study was conducted to determine the level and the type of contaminants present in various intact and in use products. The microbial load was found to be higher than the permissible limit of 10^3cfu/g or ml for topical products and 10^2cfu/g or ml for eye based products as per Bureau of Indian Standards (2009). The contaminants were isolated, maintained on tryptone soya agar and identified on the basis of morphological and biochemical characteristics. The biodegradable ability of isolates (20) were studied in presence of the preservatives such as methyl paraben and propyl paraben as sole sources of carbon added separately to mineral salts medium during successive enrichments. The biodegradation of preservatives was confirmed on mineral salts medium by observing zone of hydrolysis for eight isolates. The effect of various concentrations (0.2-2%) of propyl paraben was studied colorimetrically on growth of four isolates and it was observed that the growth was slightly affected in presence of preservative as compared to in its absence. The plasmid curing experiment established that the property of utilization of the paraben is chromosomal encoded. Thus, it was noted that the preservatives were not successful in preservation of the cosmetic products in respect of their spectrum of antibacterial activity. Now days, the use of essential oils as functional ingredients in cosmetics is gaining momentum, both for the growing interest of consumers in ingredients from natural sources and also because of increasing concern about potentially harmful synthetic additives. Therefore, the antibacterial activity of such 11 essential oils was screened against the 20 isolates of the contaminants and 6 of them were found to be antibacterial in action showing variation in degree of inhibition; while 2 of them showed no antibacterial activity. However, lime, eucalyptus and tea tree oil exhibited inhibitory action against all the isolates. Conclusively, it was established that the natural essential oils were better in spectrum of action.

PP06

Study of Quorum Sensing and Quorum Quenching in *Vibrio fischeri* and Application in Aquaculture

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Total fish production in the world market is estimated to be above 110 million tons and aquaculture accounts for 47%. However, in most of the Asian countries aquaculture industry is beset by bacterial and viral diseases, especially the shrimp and prawn culture industry. Disease has become a limiting factor in prawn and shrimp culture subsector. Major aquaculture pathogens are *Vibrio harveyi* & *Vibrio fischeri* which are bioluminescent bacteria commonly found in aquatic environment. So far conventional approaches like use of disinfectants and antimicrobial drugs have had limited success in the prevention or cure of aquatic diseases. The use of antimicrobial drugs has led to emergence of more virulent pathogens and eventual transfer of antimicrobial resistance to human pathogens. In this study, we tried using, beneficial bacteria (probiotics), which are environmentally safe to displace the pathogens and inhibit their proliferation. Bioluminescent bacteria were isolated from squid .They were confirmed as *Vibrio* by plating on Thiosulphate citrate bile sucrose agar and studying their morphology. They were identified as *Vibrio fischeri* by biochemical tests .This culture showed maximum bioluminescence in 10 hours when grown in sea water broth .When luminescence induced cell free supernatant broth was added to a fresh sea water broth +Vibrio culture it was observed that luminescence occurred within 6 hrs indicating quorum sensing due to autoinduction,. Five isolates were obtained from shrimp's intestine & identified tentatively as belonging to *Bacillus* species. When a cell free filtrate of a cocktail of these 5 isolates was added to the *Vibrio* culture in sea water broth luminescence was delayed indicating quorum quenching. All these 5 isolates could inhibit the *Vibrio* isolate when tested by cross-streaking method. Antagonism assay, by well-diffusion method, using individual cell free extract of the five Bacillus isolates against Vibrio culture showed zones of inhibition of 12mm, 15mm, 13mm, 14mm, 16mm. To check the antagonistic potential, co-culture method was performed by growing *Vibrio* and the Bacillus culture together & it was found that viable counts of *Vibrio* decreased after 6 hrs & there was no growth at 48 hrs. The *Bacillus* isolates were found to be non-hemolytic when grown on blood agar thus can be safely used in the environment. The Bacillus isolates can thus be used individually or as a cocktail as a probiont to overcome *Vibrio* infection in shrimp aquaculture.

PP07

Biodegradation of Triaminotrinitrobenzene (TATB)

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Environmental contamination of nitrocompounds is associated principally with the explosives industry. However, global production and explosive use is unavoidable. The nitroexplosive as well as their environmentally transformed products are toxic showing symptoms as kidney trouble, jaundice etc. Present studies include biodegradation of recently developed insensitive high energy nitroexplosive (IHE) 1,3,5-triamino-2,4,6-trinitrobenzene (TATB). It is an aromatic explosive, having benzene ring structure with three nitro groups (NO_2) and three amino (NH_2) groups attached, alternately to the ring. The current process for the production of TATB used by HEMRL, Pune is a two-stage process using 1, 3, 5-trichlorobenzene (TCB) as the starting material. In first nitration step, trichlorobenzene is converted to trichlorotrinitriobenzene (TCTNB) which then is further converted into TATB in amination step. Wastewaters generated during their production are highly acidic having high nitrate, ammoniacal nitrogen and chloride content causing environmental hazards. TATB is known as a recalcitrant compound because of the symmetric location of the nitro group on the aromatic ring, an arrangement that limits attack of classic dioxygenase enzymes involved in the microbial metabolism of aromatic compounds. In the present study, total 18 bacterial isolates were obtained from soil samples collected from TATB production site using enrichment, adaptation and soil baiting techniques. Out of these, only two bacterial isolates and one isolate of actinomycete could use TATB as sole source of nitrogen when incorporated in Davis Mingioli's synthetic medium at the concentration of 100 mg/l. The isolates showed removal of TATB in the range of 20-30% and nitrate in the range of 20-35% when incorporated in Davis Mingioli's synthetic medium supplemented with 0.05% peptone.

PP08

Production of Amylase by Bacteria Isolated from Soil Sample

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Starch degrading bacteria are most important for industries such as food, fermentation, textile and paper. Thus isolating and manipulating pure culture from various samples has manifold importance for various biotechnology industries. In the present investigation bacterial strains were isolated from soil sample collected from Agricultural College, Pune. Si-5 & Si-6 bacterial isolate from soil were found to be the most promising amylase producing bacteria among 15 isolates & these were selected for further study. Growth patterns as well as optimum growth conditions were determined. The optimum temperature for these strains was 37^{o}C, whereas maximum growth was observed at 1and 2% starch concentration respectively. The pH range was found to be 7-8 for optimum growth. Maximum enzyme activity was observed at this condition.

Key Words
Amylase, soil, starch degrading

OP08

Antiplasmid Activity of Herbal Extracts on Methicillin Resistant *Staphylococcus aureus*

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The methicillin resistance *Staphylococcus aureus* (MRSA) is a serious health problem and major challenge to the global drug discovery programmers. Most of the genetic determinants that confer resistance to antibiotics are located on R-plasmids in bacteria. The present investigation was undertaken to investigate the ability of organic and aqueous extracts of leaves of different plants to cure R- plasmids from certain clinical isolates. Active fractions demonstrating antibacterial andant plasmid activities were isolated from the organic and aqueous extracts of shade dried leaves of Azadirachta*indica, Annonasquamosa, Ocimumsanctum, Pongamiapinnata*. Plasmid curing activity of organic extracts wasdetermined by evaluating the ability of bacterial growth in the presence of antibiotics. The physical loss of plasmid DNA in the cured derivatives was further confirmed by agarose gel electrophoresis.The active fractions of aqueous and organic extracts of leaves of tested plants cured the R-plasmids from MRSA. Such plasmid loss reversed the multiple antibiotic resistance in curedstrains making them sensitive to low concentrations of conventional antibiotics. These extracts may be a source to develop antiplasmid agent of natural origin to control the development and spread of plasmid borne multiple antibiotic resistance.

Key Words:
Antibacterial Activity, Antibiotic Resistance, Antiplasmid Activity, Herbal Extracts, Plasmid Curing

PP09

Characterization of Thermo-Tolerant and Acid /Alkali Tolerant β-Glucosidase from Bacterial Isolate

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Cellulose is most abundant on earth constituting about half of the carbonaceous compounds in terrestrial biomass. Endo and exo glucanases act synergistically and promote solubilization of crystalline cellulose into soluble sugars. Biotechnical application of β glucosidase include converting phytoestrogen glucosides in fruits and vegetables to aglycone moieties, detoxification of cassava, aroma enhancement and removing bitter compounds from citrus fruit juices or unripe olives. The purpose of this study is to isolate bacteria from raw material that is rice straw and unai thermal spring water. These isolate would be screened for β glucosidase production and different parameters of these crude filtrate would be detected.

Key Words
Cellulose, β-Glucosidase , Acid /Alkali Tolerant, Thermo-Tolerant

PP10

Detoxication of Azo Dyes by Microbial Pure Cultures as well as Microbial Consortia

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Azo dyes are used widely in the manufacture of various consumer goods such as leather, textile, plastics, paper, hair care products and cosmetics. Azo dyes are largest group of dyes used in industry representing more than half of the annual production. It has been estimated that 10% of the dye stuff during this dying processes dose not bind to the fibers and is therefore released in to the sewage or environment. Azo dyes have structural properties that are not easily degradable under natural conditions. Different microorganisms such as aerobic and anaerobic bacteria and actinomycetes have been found to catalyze dye decolorization and dye detoxication. From textile effluents 25 microbial species were isolated. After screening the most efficient four cultures are selected for further study out of them two are bacteria and two are actinomycetes. All four species can decolorize and detoxify 'Acid dyes' (Methyl red), 'Reactive dyes' (Reactive red-195, Reactive black-5, Reactive yellow-145), 'Tryphenyl methane dye' (Malachite green) and 'simulated effluent' (Mixture of 10 dyes). In order to study physiological and metabolic aspects of decolorization and detoxication process Reactive yellow- 145 was selected as model azo dye under static and shaking conditions. After optimization of physicochemical parameters bacterial pure cultures shows 90% decolorization within three days under stationary conditions and Actinomycetes pure cultures shows 80% of decolorization within 5 days under shaking conditions. Instead pure cultures the bacterial and actinomycetal consortia are also tested for decolorization and detoxication. Promising results were obtained about 95% to 96% of decolorization seen within less period of time than that of pure cultures. The biodegradation of azo dyes produces various 'aromatic amines' which were confirmed by 'TLC' and 'FTIR' studies. Detoxication studies were carried out in vivo by seed germination. The mixed consortia proved to be significantly efficient than the individual isolates, which could be further characterized by activated sludge process for heterogeneous dye effluents.

Key words
Detoxication, Azo Dyes, Reactive Yellow, Consortia, FTIR, Decolorization

PP11

Probiotic Properties of *Lactobacillus* Isolates from Milk of Domestic Animals and Commercial Available Probiotic Preparations against Enteric Bacterial Pathogens

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Probiotic is the group of microbes that may be helpful directly for enhanced resistance against intestinal pathogens and in the prevention of diseases. A total of 120 milk samples (40 each from buffalo, cow and goat) were analyzed and 110 isolates were identified as Lactic Acid Bacteria (LAB). Out of these 11 isolates were recognized as prominent probiotics, among them 3 isolates were identified as excellent probiotics. These excellent probiotics were compared their probiotic potential with commercial probiotic preparations such as Sporlac powder, LactoBacil plus, P-Biotics kid, Gastroline, Pre-Pro kid and standard probiotic bacterial strains *L. plantarum* (MTCC 2621) and *L. rhamnosus* (MTCC 1048). The isolated LAB exhibited excellent probiotic characteristics than commercial probiotic preparations and standard probiotic bacterial strains. Study suggested that use of probiotic bacteria from milk of domestic animals can be help to prevent or control the intestinal infections and contributes health benefits to consumers.

Key Words

Probiotics, *Lactobacillus,* Antibacterial Activity, Bacteriocin, Commercial Probiotic Preparations

PP12

Isolation, Purification and Application of Lipase Enzyme

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Lipases are used in the food, dairy, detergent, cosmetic, tanning industries and most widely used as biocatalyst in the field of organic chemistry. In the view of their current and potential application lipases are considered to be promising class of industrial enzyme. These are currently used in the production of fine chemical, pharmaceutical preparations, flavour compounds and other food additatives. Lipase (triacylglycerol acylhydrolase; EC 3.1.1.3) are produced by actinomycetes _either alone or together with esterases (carboxylic-ester hydrolases; EC 3.1.1.1).Lipases are unusual extracellular, hydrolytic enzyme because they act on substrates providing an water and oil interface.Even though Lipases and esterases differ in their ability to act at Interfaces. In general, the use of water soluble substrates is considered diagnostic for esterases, and the use of water in-solublesubstrates is considered diagnostic for Lipases Screening of lipase producers is done by using tributyrin(9) or Tween 80(12) as a substrate .Olive oil is an inexpensive substitute for trioleoylglycerol. Then various concentration of tributyrin were added to minimal medium and activity were studied . Tributyrin agar and Rhodamine B agar test was done for confirmation. Rhodamine B is used in presence of uranyl ions, yielding orange fluorencent complexes with an excitation wavelength of 350nm. Enzyme purification was done by Ammonium sulphate precipitation method. Molecular weight was determined by SDS-PAGE. Application of enzyme was studied. Most commercially available lipases are synthesized by bacteria, fungi and actinomycetes. The search for new lipases with greater thermostability and various substrate selectivity is still going on. Hence this work is being done for lipase producer by a actinomycetes from hot water.

PP13

Antibiotic Production from *Bacillus spp.* Active against *Staphylococcus aureus*

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The word antibiotic comes from the Greek anti meaning 'against' and bios meaning 'life'. There are many Bacteria can produce antibiotic. Among these *Bacillus spp*. Produce many type of antibiotics. Mersacidin is a new peptide antibiotic containing β-methyllanthionine. It is classified as a member of the proposed lantibiotic group of antibiotics, and is produced by a species of *Bacillus.* It is peptide antibiotic. This new peptide antibiotic isolate from fermentations of a Bacillus species. It is mainly active against Gram-positive bacteria, particularly *Staphylococcus aureus*, including methicillin-resistant strains.This Meracidin antibiotic is active against many strains of *Staphylococcus spp.*

Key words
Mersacidin, *Bacillus spp.*

PP14

Antimicrobial Activity of Mangroves against Multidrug-Resistant (MDR) Pathogens

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The term mangrove is also used to designate Facultative halophytic and marine tidal forests comprising of trees, shrubs,palms, epiphytes,ground ferns and grasses which are associated in strands or groves.These wetland ecosystems are among the most productive and diverse in the world and more than 80% of marine catches are directly or indirectly dependent on mangrove and other coastal ecosystems worldwide. Mangroves are highly productive and economical which also protect the shoreline from erosion and cyclonic conditions. This unique tree resource is usedfor various purposes like tannin extraction, paper and pulp, firewood, timber, charcoal ,fodder, medicinal uses and several other by-products.The antimicrobial activity of mangroves are largely unexplored. The most dominant mangrove species found along the east and west coast of India are :- *Rhizophora mucronata, R.apiculata, Sonneratia alba, S. caseolafis, Xylocarpus granatum, X.molluscensis, Avicennia officinalis, A. marina, Bruguiera gymnorrhiza, B.parviflora, Salvadora persica, Sesuvium portulacastrum.* Mangroves and mangrove associates contain biologically active antiviral,antibacterial and antifungal compounds. They also provide rich source of steroids , triterpenes, saponins, flavonoids, alkaloids and tannins. Therefore it is worth to screen mangrove plants for the presence of new antibacterial compounds to combat the pathogenic bacterial & fungal strains. The MDR pathogens like *Streptococcus , E.coli , Klebshiella , Pseudomonas , Staphyllococcus aureus , Staphyllococcus xylulose , Xanthomonas* which were resistant to drugs like Amicasin, Netilmycin , Gentamycin, Cefotaxime, Amphicillin +Sulbactam,Sparfloxacin were treated with the mangrove extracts at different concentration in two different solvents (EA, MeOH) in Muller-Hington Broth ,become sensitive to the above mentioned drugs.Extracts prepared in Ethyl acetate (EA) are more potent as compared to that prepared in Methanol (MeOH). Sensitivity of MDR pathogens is carried out in Muller –Hington agar by Agar Gel Diffusion Method. Extact of mangrove was obtained by Sequential Soxhlet Extraction method. Most of the drug resistance properties are associated with R –plasmids.The physical partial or complete loss of plasmid were confirmed by Agarose gel electrophoresis technique. The synergestic effect of mixed extracts and the potentiation activity with standard antibiotics are under experimentation.

Key Words

Mangroves, Multidrug-Resistance, Unexplored, Synergestic Effect, Potentiation Effect

PP15

Biosorption of hexavalent chromium from aqueous solutions using dead fungal biomass of P. *chrysogenum*

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Chromium presents threat to the environment due to its toxicity, bioaccumulation and biomagnifications hence necessitating its removal. Use of microorganisms for removal of Chromium by biosorption is gaining attention. This research employed dead biomass of *P. chrysogenum* in batch experiments where the effects of pH, temperature, shaking speed, metal concentration, mass of biomass and contact time were examined. pH was the most critical factor increasing the removal of Chromium with a decrease in pH. Biosorption was enhanced from 13.19% by treatment of biomass using 1M phosphoric acid coupled with autoclaving to 22.93%. The optimum temperature and shaking speed for the biosorption were found to be 25°C and 150 rpm respectively. The removal of Chromium was affected by concentration of the metal as well as biomass. The biosorption reached equilibrium after 165 min of the initial contact exhibiting 1st order kinetics. Sorption data were described by freundlich and Langmuir Isotherms. Desorption and re-usability studies indicated usefulness of 10mM NaOH at S/L of 2 for five biosorption -desorption cycles. The amine and carboxyl groups of the fungal cell wall contributed to the sorption process as confirmed from potentiometry and FT-IR analysis. SEM indicated accumulation of Chromium in the fungal mycelium.

PP16

Study of Antibiotic Resistance Patterns in Campylobacter spp. Isolated from Pune, Maharashtra

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Campylobacter are thermophilic Gram negative enteric pathogens responsible for both human and animal disease. Poultry is one of the most important sources of human *Campylobacter* infections. Antimicrobial resistance has emerged among *Campylobacter* mainly as a consequence of the unchecked use of antibiotics in poultry production. *Campylobacter jejuni* and *Campylobacter coli* have been found to be commonly associated with bacterial diarrhoea. *C. jejuni* accounts for more infections than those caused by *Salmonella* and *E.coli* combined. Except for certain severe and systemic cases, most cases of campylobacteriosis do not require antimicrobial treatment as they are self-limiting. Macrolides and fluoroquinolones are regarded as the drugs of choice to treat such infections. *Campylobacter* shows intrinsic resistance to a number of antibiotics including trimethoprim, vancomycin and cefoperazone. In this study, *Campylobacter* isolates were studied for their antimicrobial susceptibility pattern. 25 antibiotics belonging to the classes macrolides, fluoroquinolones, cephalosporins and aminoglycosides were selected for the study. They included erythromycin, ceftriaxone, ciprofloxacin, gentamicin and tetracycline. The cultures used were isolated from poultry slaughter houses around Pune, Maharashtra. The minimum inhibitory concentration (MIC) as well as the minimum bactericidal concentration (MBC) was determined using the agar dilution and broth microdilution methods. The MIC values were determined according to breakpoints specified by CLSI (Clinical and Laboratory Standards Institute). Breakpoints for resistance to ciprofloxacin are established at ≥4 µg/ml while values for azithromycin and erythromycin are ≥8 µg/ml and ≥32 µg/ml respectively. It is also necessary to determine whether the resistance to the antimicrobial agents is plasmid or chromosomally mediated by studies involving plasmid curing. This work aims at studying the prevalence of antibiotic resistance in *Campylobacter*.

Key Words
Agar Dilution, Antibiotic Resistance, Broth Microdilution, *Campylobacter*

PP17

Antimicrobial Activity of New Sulphanylamide Analogues against Commonly Occurring Multidrug Resistant Urinary Tract Pathogens

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Elimination of the most widespread multidrug resistant strains of pathogenic bacteria like *Staphylococcus, E.coli and Pseudomonas* has become a major challenge in the field of medicine. These strains have acquired resistance to most of the existing antibiotics specially sulphonamides. They are also responsible for many of the hospital acquired infections. It is thus the need of the hour to develop new more effective and safe drugs to fight these nosocomial pathogens. Sulphonamides have been used as effective antibacterial agents for many years and are well known for their diverse pharmacological activities. Seven new compounds were synthesized from sulphanylamide and structurally characterized. The sulfonamide- Schiff bases with biologically active Gallic acid moiety were incorporated into these molecules in order to increase their antimicrobial spectrum. The side chains were substituted with new active groups. The compounds were named as STZ, IND, THB, DHB, CHR, SNL, and SDZ. Our chief aim was to check the activity of these newly synthesized compounds against some of the most commonly occurring multidrug resistant pathogens from pathological samples. . The organisms were isolated from urine sample and were identified as *E.coli*, *Staphylococcus* and *Pseudomonas*. It seems that these organisms develop resistance to sulphonamides rapidly and efflux pumps are considered to be the most common and basic mechanisms of multidrug resistance. One or more than one pump may be present in the resistant cells. The newly synthesized compounds were assayed by well diffusion method for antimicrobial activity against these pathogens both clinical isolates as well as standard cultures. Among the tested compounds STZ exhibited a good antibacterial activity. MIC and MBC was also performed. Co-trimoxazole was used as a standard.

Keywords:
Multidrug Resistant Pathogens, Antibacterial Activity, STZ , Sulphanylamide, UTI , Schiff Bases

PP18

Isolation, Identification and Characterization of Bioluminescent Bacteria from Fish Sample and Its Use as Water Pollution Indicator

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Bioluminescence is the light emission phenomenon in which photons of specific wavelengths are emitted due to conversion of chemical energy into light energy. Some marine fishes have evolved the ability, to harness these light-producing microbes showing symbiotic association. These animals have special light organs that provide bioluminescent bacteria both a safe place to live and a source of food. Gram Positive luminescent diplococci were isolated from marine squid. Effects of environmental parameters such as temperature and pH were observed on production of luminescence. Maximum luminescence was observed at 26^0 C and at ph 8. The enzymes were produced by diplococci are catalase, oxidase and esterase.

Key words

Bioluminescence, Squid, Esterase

PP19

Assessment of Genetic Diversity among Mango Varieties by RAPD Markers

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Information about the extent of genetic diversity/relatedness in mango germplasm is vital for developing coherent strategies for future gains in productivity. The genetic diversity/relatedness among mango cultivars developed in Goa has not been investigated previously. We have assessed the genetic diversity among 16 mango cultivars using randomly amplified polymorphic DNA (RAPD). 25 random ten-mer primers were surveyed, out of which 15 were selected for further studies. Genetic similarity between genotypes was in the range of 0.10 to 0.66%. These coefficients were utilized to construct a dendogram using the unweighted pair group of arithmetic means (UPGMA). The genotypes were grouped into two main clusters. But no significant segregation among varieties found may be due to less geographic distance and common gene pool origin.

Key words

RAPD, Germplasm, UPGMA, Dendogram.

PP20

Development of Microbial Biostimulants to Enhance Fertility of Saline Soils for Sustainable Agriculture

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Biostimulants is a class of product which enhances soil fertility as well as plant growth. Biostimulants enhances shoot and root development, improve soil structure and texture,improve plant ability to recover from disease and insect damage, reduces the effect of pH and soil colloidal imbalance. Various microorganisms contribute to soil fertility which are nitrogen fixing microorganisms, phosphate solublizing microorganisms, siderophore producing microorganisms, fungi, nematodes, protozoa, bacteria living around root system. Present work is aimed to isolates salt tolerant microorganisms as well as salt tolerant *Azotobacter* species from saline soil and their use as biostimulant to enhance fertility of saline soil.

Key Words
Soil Fertility, Saline Soil, Salt Tolerant Microorganisms, Salt Tolerant, *Azotobacter*, Biostimulants

PP21

Assessment of Water Purification Potential of *Moringa Oleifera* Coagulant Protein (MOCP)

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Moringa oleifera (MO) is a multipurpose, medium or small-sized tree, from regions of north-west India and indigenous to many parts of Asia, Africa, and South America. Its pods have been employed as an inexpensive and cost effective sorbent for the removal of organics, and coagulant for water treatment. It is a non-toxic natural organic polymer. Treatment plants generally uses materials like synthetic organic polymers and inorganic chemicals which are not that much cost worthy and are causing hazards to human health. So,the main objective of this work was to use the MO seeds as a natural,cost effective,eco friendly adsorbent for the examining the quality of drinking water of our campus. *Moringa oleifera* seeds were investigated as alternative natural materials for drinking water treatment. The coagulant protein from the *Moringa Oleifera* seed was extracted and then purified on the lab scale by using dialysis technique. *Moringa Oleifera* coagulant protein (MOCP) possessed considerable coagulation and sludge conditioning properties as alum. It also showed antimicrobial effects against microorganisms at room temperature. It also inhibits the bacteriophage replication .MOCP was found to be stable at pH 6.8.A small volume coagulation method was used to verify the coagulation activity experiments. We conclude that the MO biomass has the potential to be used in the wastewater treatment in an efficient way and with low cost.

Key Words
Moringa oleifera , *Moringa oleifera* Coagulant Protein (MOCP), Coagulation, Alum.

OP06

A Cost-Effective Protocol for Cultivation, Microbial and Biochemical Analysis and High Yielding Nutritious Variety of Mushrooms.

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Mushroom is a fleshy, spore-bearing, fruiting body of a fungus typically produced above the ground on soil or on agro industrial wastes. In our project we have cultivated and analysed the species of Mushrooms Pleurotus Sajar-Kaju which is popular for their nutritional value. For the cultivation purpose. Well sterilized substrate was used and temperature of 18-32^{0}C and humidity of 80-85% was maintained throughout. Mushrooms were harvested on 21st days. Another promising feature observed was regarding the inflorescence. An average of 10-12 flowers has been reported but the count obtainable in the present study was upto 20 flowers. The weight of the flower normally attained is within 60-100 g. The wet weight reached in this study was 77 g and the dry weight was 11 g which was quite satisfactory. We have done micro flora of mushroom sample. We have biochemically analysed the mushroom which mainly includes proteins, carbohydrates, Fat, amino acids and minerals which mainly includes K,Mn,Cu,Na,Zn,Ca. (AAS and Flame Photometer) .We intend to go for further optimization of conditions which is likely to give better yield in terms of inflorescence and weight of the fruiting body.

Key words
Mushroom, Fungiculture, AAS and Flame Photometer

OP05

Biotransformation of Textile Azo Dyes by Aerobic Bacteria

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Release of azo dye in the environment is of great concern due to, colour, toxicity, mutagenicity and recalcitrant nature of the dye, considerable attention has been given in determining the ability of microorganism in decolorization and degradation of the azo dyes. Acclimatized microorganisms isolated from natural sources, were used for the study of decolorization and degradation of the dyes Reactive Orange 16 and Orange 2R. In all 12 promising isolates of Reactive Orange 16 and 1 isolate of Orange 2R were isolated which could decolorize 1000 µg/ml of dye to more than 70.00 % in nutrient medium and up to 68.00 % in half strength nutrient medium. The cell free extract showed decolorization up to 67.00 % in less than 24 hours. Percent decolorization of the dye was determined by spectrophotometer at (λmax) 492 nm and 484nm. Six isolates reduced the COD by more than 85.00 %.

PP22

Isolation of Bacteriophage against *Campylobacter* from Poultry in Pune

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Campylobacter jejuni is a Gram-negative food-borne pathogen that is a major cause of bacterial enteritis worldwide. It is a microaerophilic and thermotolerant bacterium, commonly found in poultry. Due to the unrestricted use of antibiotics in poultry, antibiotic resistance is rampant in *Campylobacter*. Biocontrol of this bacterium in live poultry is difficult. An increasing trend in antibiotic resistance is observed in this bacterium. Phage-therapy is a promising alternative for Campylobacter biocontrol. Bacteriophages specific for this bacterium have been isolated previously but no work has been done on it in India yet. This study focuses on isolation of the phages from retail poultry in Pune and their percentage reduction of target *C. jejuni* strains. In the present study 26 isolates of Campylobacter were isolated from slaughter houses in Pune. Biochemical tests were carried out along with a latex agglutination test and PCR to confirm them. Alongside 6 bacteriophages were isolated from Chicken Intestines to combat the presence *of Campylobacter jejuni* which were found to be Campylobacter specific.

Key Words
Campylobacter, Bacteriophage, Phage-therapy.

PP23

Isolation and Identification of Pathogens of Seafood *Penaeus sp.*

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Fresh and frozen seafood products are in wide use and typical of the diet in Indian subcontinent. Prawns (*Penaeus monodon*) were examined for the presence of microbiological contamination. Total bacterial counts of aerobic mesophilic bacteria (AB), *Salmonella* and *Shigella* spp., *Enterobacteriaceae*, *Escherichia coli*, *Staphylococcus aureus*, *Vibrio spp* and *Pseudomonas spp* was done for 10 prawn samples collected from fish markets across Mumbai. *The* microbiological quality of individual samples varied widely. The method used for analysis could serve as a basis for future testing of seafood, and as a template for regional testing scheme on the microbial contamination of seafood for comparative epidemiological and statistical studies. Knowledge of contaminations is very critical in the Good Hygienic Practices programme and effective hygiene as well sanitary procedures in food processing plants are necessary, should contamination by coliform and faecal coliform bacteria persist. 51 isolates were collected from these experiments which were then subjected to antibiotic susceptibility test for 16 antibiotics from various classes. 12 of these isolates were found to be resistant to 50% of the antibiotics used. It was found that 98.81% of the strains were resistant to at least one drug. The intensification of fish culture has caused the emergence of new pathogens, and the need for sustainable treatments and prophylactic measures. These 12 drug resistant strains were treated with several herbal extracts to provide an alternative to antibiotics. These studies will help to establish Good Hygienic Practices to ensure pathogen free sea food supply. International interdisciplinary cooperation is essential, and FAO, OIE and WHO have organized a number of consultations to address the issues related to antimicrobial use, the emergence of resistant pathogens and the potential public health impact.

PP24

To Study Anti-Bacterial Activity of Various Medicinal Plants against Mixed Dental Flora

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The medicinal properties of several plants been documented in ancient Indian literature. The purpose of this study is to evaluate the anti-bacterial effect of extracts of 13 medicinal plants and to prepare a poly herbal product in the form of tablet. Aqueous and ethanolic extracts of different medicinal plants were screened for their anti-microbial activity on Blood Agar Medium. Agar well diffusion method was used to detect the zone of inhibition. *Terminalia chebula, Caryophyllus aromaticus and Garcinia indica* showed maximum zone of inhibition. The mixture of effective extracts and many commercial toothpastes were tested against mixed dental flora. The mixture can prevent the growth of dental bacteria and can act as an astringent. Tablets were prepared from the most effective samples.

Key words

Herbal Extracts, Anti-Bacterial Activity, Agar Well Diffusion Method, Mixed Dental Flora.

PP25

Screening and Production of Laccase from Fungi

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Laccase are multi copper oxidases having wide substrate specificity mainly found in white rot fungi. Laccase act on broad range of substrates. The primary carbon source would be used in place of glucose & guaiacol for laccase production that is rice, wheat & maize. A purpose of this study is to isolate fungi from industrial effluent & woody part of dead plants. These isolate would be screened for laccase production on media containing guaiacol. Screened fungi would be tested for production of laccase & the effect of culture filtrate on dye decolorization. Also characterization of these culture filtrate would be detected.

Key Words
Lactase, Fungi, Dye Decolourization.

PP26

Studies on Bioemulsifier Production from *Provdentia Stuartii* Isolated from Garden Soil

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Provdentia stuartii was isolated from garden soil of Modern College, Shivajinagar, Pune. It showed good emulsification activity and produced maximum bioemulsifier of 237 EU/ml at 30^0C, PH 7.5 with (0.5%) sunflower oil in Luria Bertani broth. *Provdentia stuartii* also showed production of urease and gelatinase.

PP27

Comparative Study Of Bioinoculants Prepared From Rhizosphere Soil And Non-Rhizosphere Soil.

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In this project a comparative study was carried out between the bioinoculants prepared from rhizosphere soil and non-rhizosphere soil. The screening for nitrogen fixing organism from rhizosphere and non-rhizosphere soil was done by serial dilution using Ashby's agar. Gram staining and Capsule staining was done for confirmation of organism. Plant growth promoting rhizosphere properties were detected by subjecting the organism to phosphate solubalition using Pikovskayas agar. Liquid bioinoculants were prepared on ashby's broth using suitable strain and kept on shaker. Organisms were counted by Neubaur's chamber. Lab trials were done. The microbiota of the rhizosphere was more active physiologically than that of non-rhizosphere soil. The root length and the shoot length of the plants was found to be more in soil treated with bioinoculant prepared from rhizosphere. This project will be applicable in increasing the nitrogen content of the soil; phosphate solubilisation increase phosphate in soil and also productivity; Plant Growth Promoting Rhizosphere organisms release amino acids, sugars used by plants. As the rhizosphere organisms are more adapted to the environment giving high efficiency in terms of yield of crop such organisms can be isolated from the soil and custom-made biofertilizers can be given to farmers. Also, such biofertilizers would not disturb the biological cycles as is done by other chemical fertilizers.

PP28

Isolation of Siderophore Producing Organism from Rhizosphere Soil of *Adathoda Vasica*

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Microorganisms from rhizosphere soil sample of *Adathoda vasica* (Adulsa) were isolated on Luria agar. Twelve strains were isolated. One Gram positive rod Screened for sederophore production by Arnow and Caskys assay for Catacholate and hydroxymate type of siderophore respectively. Gram positive rod showed Arnow assay positive .This organism take for further study ,Media optimization for maximum siderophore production was carried out with Succinate broth, Luria broth, King's B broth. It was found that King's B Media produces maximum siderophore. Other Environmental factors pH 5.6, Temperature 28^0C, aeration at 120 rpm were found optimum for maximum siderophore production.

PP29

Comparative Analysis of Faecal Microbiota from Normal and Obese *Wistar* Rats.

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Obesity is defined as abnormal fat accumulation that imposes a great health risk. The syndrome is just not limited to the western countries, it has sprawled many developing countries and India is no exception. Recently, an alarming rate of prevelance of abnormal and visceral obesity was reported from one of the metro cities. A genetic reason could not explain this obesity epidemic. Recent discoveries have revealed a strong association between gut microbiota and obesity. Although phylum level perturbations were reported, a keen hunt for an exclusively responsible bacterium is a hot topic of research. To complement these efforts, we initiated screening gut microbial community in a rat model of obesity. In this study, we have constructed and screened, 16s rRNA gene based library for control and obese *wistar* rats. Approximately, 200 clones were sequenced for each of the four animals in each group. Bioinformatics analysis confirmed that the ratio of Bacteroidetes to Firmicutes is higher in gut of control rats than diet induced obese rats.

PP30

Production of Bacterial Cellulose by *Acetobacter Xylinum* (NCIM 2526) Using Fruit Waste and Checking For Its Application

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The population increase necessitates search for new biopolymers. *Acetobacter xylinum* is one of the widely studied microorganism for the production of bacterial cellulose(BC), Although plant are major producers of cellulose, its degradation results in release of harmful byproducts such as lignin which does not occur in case of BC. Nowadays, bacterial cellulose finds wide applications in paper making, garment and health care industries. Although production of BC by *A. xylinum* is known it is costly which limits its application on large scale. In present study economical production of BC using fruit waste instead of synthetic media has been studied along with its application for medical purpose. Carbon and Nitrogen sources were initially standardized in synthetic medium (Hesrin & schramm) for production of BC. Results indicate maximum production of BC obtained using Fructose (0.5%) and Yeast extract (0.5%). Fruit wastes (mashed banana peel and mix fruit waste) was substituted in the medium as carbon and nitrogen source for maximum production of biomass and BC. Cellulose obtained was quantified on dry weight basis as well as by specific chemical method. Mix fruit waste was found to be more suitable for the production of BC than the banana peel. To prove its application in the health industry, obtained BC was coated on the cotton gauze and checked with respect to water absorption & vertical wicking against the control.

PP31

Aureobasidium Pullulans Grown on Various Feedstocks for Comparative Studies

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Aureobasidium pullulans, a yeast-like fungus has been well-studied and explored for its ability to produce pullulan, a polysaccharide of multiple uses. This organism also produces different types of enzymes which have different activities and along with the pullulan which is extracellular; it also produces the black pigments called melanin. This organism and its close relative, *Aureobasidium mausonii,* has been studied in our laboratory for quite some time and one of us (Vinay Rale) has exhaustive research experience with the organism. We undertook to study *Aureobasidium pullulans* with the sole objective of growth and product formation on molasses and spent wash at shake flask and at batch-scale fermenter level to compare its performance (growth and product formation) in standard medium. The amount of biomass as well as pullulan production is quite high in batch- scale fermenter in compare with shake flask, when the fermentation parameters was optimized according to the favor of this organism viz., agitation, temperature, pH, etc. . Also, the morphology change of the organism is observed from shake flask to fermenter. The secondary objective was to manifest concomitant reductions in BOD and COD values of theses substrates, viz., beet molasses and spent wash from brewery industry. The initial BOD and COD for the spent wash is obtained which is 24000 mg/lit and 215000 mg/lit respectively and initial BOD and COD for beet molasses is obtained which is 280000 mg/lit and 2100000 mg/lit respectively. The results of this study of one so far are quite interesting. Our last objective was to try obtaining an organism which produces less or no pigments which itself helps better result in extracellular polysaccharide production as well as BOD and COD reduction. This is done by exposing the organism under UV light for 20 minutes.

PP32

Antimicrobial Effect of *Bombax Ceiba*

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Bombax ceiba belongs to the family *Bombacaceae*. It found in tropical region. It is a large sized, tall, deciduous tree, which has been found to have many medicinal uses. All parts of the tree such as stem, leaves, root, flowers, and thorns are used for medicinal purpose. It can be used in treatment of diabetes, kidney stone, constipation, asthama, food poisoning, paralysis, haemoptysis of pulmonary tuberculosis, influenza, leucorrhoea, menorrhagia, acne, bleeding piles, diarrhoea, dysentery, skin disease, dental caries, tooth ache etc. Present study is concentrated on extracting bioactive compounds from stem and leaves using solvents such as diethyl ether, chloroform, methanol and water. Effects of these extracts were further studied on pathogenic organisms like *Proteus, Pseudomonas, Staphylococcus aureus, E. coli, Salmonella typhi*, and *Candida spp*. Results will pave the way towards better understanding of antimicrobial activity of plant extracts as well as its purification. Purified products can be studied further for drug designing and plant tissue culture techniques for large scale production of bioactive compounds.

PP33

Production and Purification of Extracellular RNases from *Streptomyces venezualae* (NCIM 2215)

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Among the five *Streptomyces* cultures from NCIM (National Centre for Industrial Micro-organisms, National Chemical Laboratory, Pune) screened for RNase production in MGYP (Malt extract, Glucose, Yeast extract, Peptone) medium *Streptomyces venezualae* (NCIM-2215) showed maximum RNase activity (270 U/ml) and was selected for further optimization studies. In optimization studies effect of different media components on RNase production was studied and the MGYP medium was modified to PG (Peptone, Glucose) medium which is simple and cost effective. Effect of different organic and inorganic nitrogen sources on RNase production was also studied and Peptone was found to be the most suitable organic nitrogen source. Inorganic nitrogen sources resulted in very poor RNase activity. In PG medium the RNase activity increased by 4.8 times (270 U/ml to 1302 U/ml) where as the specific activity increased by 6.7 times (1986U/mg to 13285U/mg). Hence this medium was selected for RNase production. The maximum extracellular RNase activity and specific activity was detected at 72 hours and maximum intracellular RNase activity was detected at 96 hours. DNase activity was also observed but it was very less as compared to RNase activity. *Streptomyces venezualae* produces non specific nuclease. RNase activity does not require metal ions where as DNase activity requires Mn^{2+} ions. Purification of the enzyme showed that heat treatment is not a suitable method for purification since it resulted in loss of RNase activity. Ammonium sulphate precipitation was the first step of purification. Ion exchange chromatography was used in next step of purification and enzyme was loaded on DEAE cellulose (anion exchanger) column. The enzyme was eluted unbound and other impurities were removed from the enzyme since they bound to the column. The enzyme was then loaded on FPLC gel filtration column (Superose-12) and the final recovery was 10%. The specific activity of the enzyme increased 2.3 fold at this step of purification.

PP34

Isolation Screening for Penicillin-VAcylase Producing Organism, Optimization of Culture Conditions, Effect of Media Constituents on Production of Enzyme from *B. Cereus*

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Penicillin-V acylase (PVA) is a pharmaceutically important enzyme. Penicillin acylases belong to N-terminal nucleophile (Ntn)-hydrolase super family, Penicillin acylase proteins , amidohydrolase enzymes that cleave penicillin's at the amide bond connecting the side chain to their B-lactam nucleus, releasing 6- aminopenicillianic acid (6-APA) corresponding side chain. 6- APA is the building block of semi synthetic penicillin's .Penicillin acylase acts as scavenger enzyme for phenylacylated compounds. Isolation of 10 morphologically different organisms was done from soil sample of Hindustan Antibiotic pune, Screening for penicillin acylase- producing microorganisms was carried out by plate assay method. Out of which 1 isolate showed Penicillin–V acylase activity. Activity was checked by sensitivity of 6-APA to *serratia marcescens*, comparatively resistant to penicillin. The morphological and physiological characterization of the PVA-producing Gram positive isolate ATUAVP1846 was performed by a private institute, using 16srRNA sequencing and FAME analysis, isolate was identified as *B. cereus*. The 16S rRNA gene sequence of ATUAVP 1846 was compared with all other known 16S rRNA gene sequences of bacillus spp., and a phylogenetic tree was constructed using Neighbour joining method (CLUSTAL X) with the related taxa. This is the first report on the production of PVA by *B.cereus*. Fermentation parameters such as Optimization of Cultural Conditions and Effect of Media Supplements for Maximum PVA production were studied in batch fermentation under shake flask conditions. Optimum inoculum size was found to be 10%. Maximum enzyme production was observed at 30°C and pH 7.0, after an incubation of 24 hrs, and optimum dispensing volume was 75ml in 250 ml Erlenmeyer flask. Out of all used 'C' sources used (2.0%) max. PVA production is achieved in the case of glycerol followed by glucose followed by sucrose, and Out of all used 'N' sources used (0.3%) max. PVA production is achieved in the case of ammonium phosphate.

PP35

Characterization of Plasmid Encoded Resistance To β-Lactam Antibiotics of *Acinetobacter Baumannii* AIIMS7, A Clinical Isolate

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Acinetobacter baumannii is an opportunistic nosocomial multidrug resistant pathogen. A clinical isolate from All India Institute of Medical Sciences, New Delhi, AIIMS7 is multidrug resistant showing high resistance to β-lactam antibiotics. AIIMS7 consists of four plasmids, one high molecular weight (57 kb), one mid molecular weight (20 kb) and two low molecular weight (<10 kb each).The objective of this study was phenotypic and biochemical characterization of the HMW plasmid encoded resistance to β-lactam antibiotics. A transformant *Acinetobacter baylyi* ADP1 (T17), harbouring the high molecular weight plasmid was obtained by natural transformation. Phenotypic characterization of β-lactamases was performed by using various disc assay methods. In biochemical characterization molecular weight of β-lactamase was detected by SDS PAGE followed by activity staining with nitrocefin. Phenotypic characterization demonstrated presence of carbapenemase and AmpC type of β-lactamase in AIIMS7. Activity staining showed that of the two types of beta lactamases present in the wild type isolate AIIMS 7 (19.31kD and 39.44kD), the transformant T17 showed only one of the beta lactamase (39.44kD) which appears to be plasmid encoded. Further molecular characterisation of the beta lactamase gene/s present on this high molecular weight plasmid is under study.

Key Words

Acinetobacter, Multidrug Resistant, Plasmid, β-lactamase.

PP36

Optimization of Growth Parameters for Ethanol Production by Yeasts

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34 yeast cultures were isolated from different sugar containing food materials, fruits, fermented foods, sugar syrups and agricultural wastes using Glucose Yeast extract Peptone (GYP) medium. All the isolates were screened for ethanol production and best ethanol producing cultures BG-1, SCJ-3 and PG-2 were selected for further single parametric studies. Effect of different carbon sources, nitrogen sources, pH, temperature and fermentation time on ethanol production was studied. Ethanol was produced maximally using 20 g/L sucrose as carbon source , 10 g/L coconut meal as nitrogen source at pH-4, temperature 30 °C, inoculum size 5 % (v/v) in 58 hours incubation for BG-1 and 24 hours for SCJ-3 with ethanol concentration of 7.77 g/L and 10.659 g/L respectively as estimated by Gas chromatography. The total carbon content of optimized medium for SCJ-3 was estimated and the yield of ethanol produced was 10.659 g/L of medium consumed. This gives 92.64 % efficiency of ethanol yield. Ethanol was produced maximally for culture PG-2 using 20 g/L fructose as the Carbon source, 10 g/L urea as nitrogen source, pH-5, temperature 37 °C and 48 hours fermentation time. During optimization studies ethanol concentration was increased from 6.12 g/L to 11.2 g/L when estimated by CAN method and 2.242 g/L to 5.180 g/L as estimated by Gas chromatography. The three best Ethanol producing yeast isolates PG-2, SCJ-3 and BG-1 were characterized by morphology, biochemical and molecular characterization and identified as *Kodamaea ohmeri, Candida intermedia* and *Torulaspora delbreucki* respectively.

PP37

Comparative in-vitro Antimicrobial Activity of the Extract of *Gloriosa Superba* against Laboratory and Antibiotic Resistant Clinical Isolates of Common Pathogens

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Gloriosa superba (family: Liliaceae) is widely used as a medicinal plant, and the alkaloids from the plant (Colchicine and Gloriosine) are being used in the treatment of gout and rheumatism. The increasing prevalence of multidrug resistant strains of micro organisms has stimulated the exploration of alternate antimicrobial regimens. Thus, taking into account the medicinal importance of *Gloriosa superba* Linn., in this respect, an attempt was made in the current study to investigate the antimicrobial potential of this plant. Extract of dried leaves and tubers was extracted in ethanol and methanol and their antimicrobial activity was determined against standard cultures of *Escherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella pneumonia, Pseudomonas aeruginosa, Proteus vulgaris, Bacillus sp* .and 8 cephalosporin resistant clinical isolates of *Escherichia coli* (3 strains), *Proteus mirabilis, Enterobacter, Klebsiella, Pseudomonas* and *Acinetobacter.* The extract also showed antimicrobial activity against cephalosporin resistant organisms. The object of this study was to formulate a new, cost effective antimicrobial combination for drug-resistant diseases based on synergistic activity of cefotaxime with methanolic extract of *Gloriosa superba.* Methanolic extract was found to act synergistically with the cephalosporin antibiotic and inhibited growth of the cephalosporin resistant organisms in presence of cefotaxime. The highest synergism rate was attained against *Proteus mirabilis.* Phytochemical screening of extract showed presence of alkaloids, flavonoids and steroids. Thus, the current investigation leads to fresh sources of new antimicrobial regimes in future. This is the first report in vitro which revealed synergistic inhibition of antibiotic resistant organism by the extracts of medicinally important ornamental plant *Gloriosa superba* (Kalhari).

PP38

Extracellular RNase production and purification from *Streptomyces sp.* (NCIM 2081)

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Among five *Streptomyces* culture from NCIM (National Collection of Industrial Microorganisms) *Streptomyces sp*.(NCIM 2081) showed maximum RNase activity (257U/ml) during screening in MGYP(Malt extract 0.5%, Glucose 1%, Yeast extract 0.3%, Peptone 0.5%) medium so selected for optimization studies. During optimization studies first effect of various media components was studied. Malt extract and Yeast extract when omitted from MGYP medium higher activity was obtained. This was useful in reducing cost of the medium. The organism could grow in simple BG (Beef extract 0.8%, Glucose 1%) medium instead of MGYP medium. Effect of organic and inorganic nitrogen sources showed that organic nitrogen sources produced more RNase activity than inorganic nitrogen sources. Beef extract was the most suitable nitrogen source for RNase production. Effect of initial pH on RNase production showed maximum RNase activity at pH 6.0 in BG medium. Optimization studies resulted in 2 fold increase in RNase activity and 6.6 fold increase in specific activity. Production profile of *Strptomyces sp.*(NCIM 2081) culture showed that in BG medium maximum extracellular RNase was produced in 72 hrs. and maximum intracellular RNase was produced in 96 hrs. with 76% sugar utilized within 72-96 hrs. *Streptomyces sp*. (NCIM 2081) produced nonspecific nuclease producing DNase ativity also. RNase activity could be detected in absence of metal ions, but Mn^{+2} ion for DNase. Purification of enzyme showed that heat treatment and Ammonium sulphate precipitation are not suitable methods which resulted in very poor recovery. During ion exchange chromatography the enzyme came unbound when loaded on DEAE-cellulose column at pH 7.0. Enzyme bound to CM-cellulose column at pH 5.0 and eluted with buffer and 0.5M salt resulting in 3 fold purification and 16.6% recovery. CM eluted enzyme was loaded on FPLC gel filtration column (Superose 12) resulting in 8.9% recovery.

PP39

Isolation and Characterization of Oxalate Degrading Organism

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Kidney/ urinary tract stone disease is a major health problem throughout the world. Most of the stone are composed of oxalate or calcium oxalate. Oxalic acid or its salt found in variety of food. Increased absorption of oxalate mayoccure after food containing elevated amount of oxalate is taken. Humans lack the enzyme needed to metabolize dietary oxalate. Oxalate in humans can be eliminated through excretion in urine, forming insoluble calcium oxalate and excretion in faeces and oxalate degradation by gastrointestinal tract microorganism etc. Oxalate degrading facultative aerobic bacteria were isolated from different sources. Organisms were characterized on the basis of morphological and biochemical observations. Among these organism one organism belongs to genus- *Stomatococcus* . This organism is further characterized for utilization of different oxalate sources. Oxaltate degradation product, formate was detected by FTIR analysis, which suggest the production of oxalate degrading enzyme oxalyl-coAtransferase by the organism. The amount of oxalate degradation was determined by Titrimetric analysis with $KMnO_4$. The degradation rate of oxalate by the isolate is found to be around 40%.

OP13

Comparative Study on The Production of Prodigiosin by *Serratia marcescens* Using Various Crude Fatty Acid Sources and Its Applications

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Prodigiosin produced by *Serratia marcescens* is a promising drug owing to its reported characteristics of having antifungal, immunosuppressive, antiproliferative and anticancer activity. From an industrial point of view the necessity to obtain a suitable medium to simultaneously enhance the growth of *Serratia marcescens* and the pigment production was the aim of this work. Pigment producing organisms were isolated from air and rhizosphere and screened for their ability to produce pigment. One isolate, PP1 was selected for further studies. It was biochemically characterized and identified to be *Serratia marcescens* by API kit. Production was optimized with respect to different environmental parameters using crude and pure carbon sources. Extraction procedure and purification protocol was also modified and developed to recover pigment. Medium supplemented with fatty acid containing source were found to give better yield of pigment than defined media. Crude carbon sources reduce the cost of production medium when compared with pure carbon source and the pigment thus obtained can be used as colorants in textile and paint formulations and also for therapeutic applications.

Key Words
Prodigiosin, *Serratia,* Pigment, Paint.

PP40

Oligotyping of Antibiotic Resistance Genes from Clinical Isolates of *Acinetobacter Spp.*

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Acinetobacter spp. has emerged as important nosocomial pathogens causing a serious therapeutic failure. Rapid genotyping methods for the identification and typing of these organisms have allowed a better appreciation of the epidemiology and survival of these organisms in the hospital environment. In the present study, we characterize the diversity of antibiotic resistance in twenty-six isolates of *Acinetobacter spp*. obtained from various hospitals in India, which showed multidrug resistance by phenotypic assays and also harbored multiple plasmids. The genes for the drug resistance are either chromosomal or plasmid encoded. Genomic DNA was isolated using Sigma-Aldrich GenElute Bacterial Genomic DNA kit. PCR amplification was done using 30 pairs of primers specific for different classes of ß-lactamases (Class A, Class B, Class C and Class D), aminoglycosides and quinolones. Out of twenty-six isolates characterized, all showed positive amplification with more than one primer. Maximum isolates had genes for Class C ß-lactamase followed by Class A, Class D and Class B. The AmpC and ADC type of ß-lactamase was found to be more prevalent. Similarly aph-A6 was found to be more prevalent among aminoglycosides and gyrA, parC, QnrA among quinolones. The resistance of *Acinetobacter* to quinolones is of prime importance since quinolones are highly used as a treatment now-a-days. If the genes for quinolone resistance are present on plasmids, it will lead to transfer of these genes to other susceptible organisms. Hence this study will prove to be important in epidemiological point of view.

Key Words

Acinetobacter, ß-lactamases, Aminoglycosides and Quinolones

PP41

Optimization of Amylase, Production by Fungi Isolated from Rhizosphere Soil

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Four different Amylase producing organisms were isolated on potato dextrose agar from rhizosphere soil of Botanical garden of Modern College of ACS, Shivaji Nagar, Pune 05, after primary screening on starch agar plate. Two fungi were taken for further study (F1 & F2) which were showing zone of clearance on starch agar plate. Three different media viz. sabouraud, Amylase specific media 1, Amylase specific media 2 were checked for their ability to support maximum amylase production, out of these three medium sabouraud showed maximum production of amylase. Physical parameter like pH and temperature were optimized using sabouraud. Fungal strains F1 and F2 showed optimum production of amylase at pH 7 and 6, temperature 28^0C and 32^0C respectively. Time course of amylase production was also determined for both the isolates.

PP42

Reduction of heavy metals from domestic sewage by using Microorganisms

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Rapid population growth, urbanization has increased the need for reuse of wastewater in agriculture. Wastewater poses certain environmental and health risks to consumers. Sludge is composed of by-products collected at different stages of the wastewater treatment process. It contains both compounds of agricultural value and pollutants, which usually consist of heavy metals, organic pollutants and pathogens. The characteristics of sludge depend on the original pollution load of the wastewater and also on the efficiency of its treatment, followed by the treatment of sludge. The World health organization (WHO) estimates that 80% of all chronic disorders can be attributed to heavy metal contamination, as it produces free radicals. Presence of heavy metals reduces the efficacy of medical treatments by up to 60%. Heavy metal toxicity is directly or indirectly linked to many complications such as headaches, anger etc. and to disorders such as arthritis, asthma, chronic fatigue syndrome, diabetes, fibromyalgia, heart disease, arterial sclerosis, multiple sclerosis, Parkinson's disease, ulcers etc. and depletion of the body's immune system. It has been reported that the concentration of heavy metals can be reduced by using bacteria and fungi such as *Aspergillus* for bioremediation of domestic sludge to reduce its toxicity. Hence, bioremediation of sludge to reduce heavy metals content was studied. Sludge was neutral in nature, contained 4.21- 6.43 mg/l copper and 6.0-8.15mg/l zinc. Among the twenty isolates obtained from sludge, four isolates could remove up to 54.76% copper and 2.11% zinc in 24 hours. Studies on reduction of copper from sludge were carried out with respect to environmental factors such as temperature, pH, carbon source and nitrogen source and incubation time. One of the isolates, R, showed optimum reduction of copper up to 71% at ambient temperature ($28_{\pm}2^{o}$c), pH 7, 1% glucose concentration, 0.1% peptone concentration and incubation for 28 hours, proving to be useful in the reduction of copper from domestic sludge.

PP43

Isolation and Characterization of Indole Acetic Acid (IAA) Producing Organism from Rhizosphere of Gram (*Cicer Arientinum*)

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1 g of soil sample collected from rhizosphere of gram was mixed in 10 ml of sterile saline. Serial dilutions of the sample were prepared and 0.1 ml of this dilution was spread on sterile Luria –Bertanni agar plates. After incubation at 30°C for 24 hrs ,8 colonies were selected and screened for preliminary characteristics by their morphological features ,Gram character ,motility, oxidase test, catalase test and capsule staining and then for IAA production by Salkovaski's test. Media used was LB broth without tryptophan. Red colour formation was considered positive evidence for IAA production. All showed IAA production. Out of 8, P2 and P4 isolates gave maximum IAA production than others. Cultures were preserved on LB agar slants for further use. The effect of time course and carbon and nitrogen sources on IAA production was checked by P2 and P4 isolates by Salkovaski's test. Media used was LB broth with tryptophan (1 mg/ml). Uninoculated LB broth with tryptophan was kept as control. Absorbance was checked at 540 nm. Maximum IAA was produced at 72 hours of incubation by replacing carbon source (yeast extract) from LB broth with sucrose and by using tryptone as nitrogen source. Effect of temperature and pH was checked. Maximum IAA production was seen at 37°C for P2 isolate and 32°C for P4 isolate at pH 8. P2 was identified as *M. lacunata* and P4 as unidentified organism by mini API test.

PP44

Wound Healing Properties of honey

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Healing of infected and chronic wounds is a common challenge faced by doctors; this problem has recently escalated due to the persistence of antibiotic resistant bacteria. Hence new approaches for treating wounds are required. There is some evidence that honey helps in accelerating wound healing and thus should be looked at as an alternate form of treatment. A study was conducted to evaluate the antibacterial potency of common honeys found in the market namely- Dabur, Pondaghat and Khadi honey against *S. aureus*, *P. aerugenosa*, *Streptococci* and *Candida albicans*. MIC with the above honeys was carried out using agar dilution method (range 5%-30% v/v) and it was found that Khadi honey was most potent and had the least amount of contaminant spores. All the honeys were the most effective against pseudomonas, knocking it out at 10% v/v concentration while it took a concentration of at least 25% to knock out the rest. Candida persisted beyond 30% v/v concentration of honey. A control MIC using a sugar solution with concentration of sugars close to that in honey was set up to see if the properties of honey were solely due to the osmotic effect of the sugars present. It was found that all the four organisms mentioned survived beyond 30% concentration of the sugar solution indicating that honey has some properties other than its high sugar content that account for its lower MIC's. Since honey was found to be most effective against the laboratory strain of *Pseudomonas aeruginosa,* four antibiotic resistant strains of the same organism were tested for their sensitivity to honey using agar dilution method. It was observed that honey inhibited these strains at a concentration of 15%. The effect of honey and SSD ointment (a common antibiotic cream used on wounds and infected burns) on preformed biofilms of *S. aureus* and *P. aeruginosa* was evaluated by colorimetric measurement of biofilms using crystal violet. It was seen that 50% diluted honey was slightly more effective than SSD on biofilms of the above organisms. Furthermore to test the effect of honey on wound healing, angiogenesis by chorio allantoic membrane assay was performed using fertilized Leghorn chicken eggs. It was found that honey accelerated the rate of angiogenesis as compared to a positive control, a negative control and a saline control. This suggests that angiogenesis may also be one of the factors that make honey more effective in wound healing.

PP45

Optimization and Characterization of Lipase Production by a Selected Bacillus sp. and Its Application

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The growing interest in lipase production is related to the potential biotechnological applications that the enzyme present and so there is immense need to discover and develop new commercial microbial sources for lipase production. With this need of time the present work deals with lipase production Bacillus species isolated from stagnant fish runoff water and its characterization and application wherein the isolate was isolated on Victoria Blue Olive Oil Agar where lipase production was indicated by zone of hydrolysis of olive oil. Optimization of medium components revealed glucose, ammonium chloride, olive oil, potassium chloride as an optimum source and RT (28°C ± 2°C) as optimum temperature with optimum pH of 7.0 under shaking condition for favorable lipase production. Production was carried out with optimized parameters and fermentation studies revealed that 50 hours was best for recovery of culture medium for extraction and purification of lipase. Cell free supernatant obtained by centrifugation was further purified by ammonium sulfate precipitation and dialysis. Further, cell free supernatant was used as enzyme source for characterization of lipase. Optimum enzyme activity was observed at pH-7.0 and RT^{0}C. The enzyme was found stable in wide range of pH and temperature. Potassium ions stimulated enzyme activity up to 493.33%. 1% iso- propyl alcohol was found to be a good organic solvent enhancing the lipase activity up to 166.66%. Tween-80 was found to be effective stimulator for lipase activity increasing it up to 173.33%. The enzyme exhibited good stability with bleach i.e. Sodium Hypochlorite. Olive oil was found to be the best substrate, among those tested. The lipase activity was found stable in commercial detergent which was even more enhanced in presence of $CaCl_2$. Immobilization of lipase was carried in different carriers by entrapment and its specific activity was studied where 2% agarose had the highest specific activity. The purified lipase was found efficient in complete removal of olive oil from cotton fabric along with detergent. Also the enzyme was found to have antagonistic effect on beef fat as it degraded the fat completely. The lipase hydrolyzed castor oil more than 89.28% in 6 days.

PP46

Laboratory Study on Bioremediation of Diesel Oil Contaminated Soil from a Garage

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Pollution caused by the release of petroleum hydrocarbons has always threatened health and sustainability of the environment. Diesel is one of the major pollutants. Being water insoluble, diesel oil also shows low and slow biodegradability. Surfactants increase the aqueous solubility and consequently degradation of hydrocarbons. However chemical surfactants are relatively toxic, less biodegradable and show limited efficiency. On the whole biosurfactants are specific in action, biodegradable, less toxic, can be prepared easily and show widespread applicability. Therefore in the present study an attempt was made to isolate a biosurfactant producer and asses its role in the bioremediation of diesel oil. On screening garage samples contaminated with crude oil and it's by products, six isolates were obtained and the best isolate was selected on the basis of its emulsification activity measured by oil emulsification assay. It was screened for the better emulsification activity in different carbon sources (sucrose, glucose and lactose) using the same oil emulsification assay. The selected isolate was found to be *Pseudomonas* which gave maximum emulsification with glucose. The biosurfactant was extracted from cell free broth of *Pseudomonas* using Acetone precipitation method and analyzed for its protein and carbohydrate content using Folin Lowery and Phenol Sulphuric acid method respectively. A comparative analysis of purified biosurfactant with chemical surfactant (Tween- 80) was carried out. 61.53% biodegradtion was found in presence of purified biosurfactant in comparison with 55% for Tween- 80 whereas only 42.85% biodegradation was observed using whole biosurfactant producer. The biosurfactant was also found to bring about greater reduction in the surface tension in comparison with chemical surfactant (Tween- 80). Thus, this study revealed the efficacy of biosurfactants over the synthetic surfactant in bioremediation.

Key Words
Biosurfactant, Diesel oil, Chemical Surfactant, Bioremediation

PP47

Production of Gibberellic Acid by Soil Fungi

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Gibberellin (GA) is a plant hormone that regulates growth and influences various developmental processes in plants. Considering its wide array of applications, production of gibberellin and its enhancement by sources like fungi and bacteria is of prime importance and it may also meet the ever increasing demand of gibberellin. Present work focuses on production of gibberellin by four different fungi isolated from paddy field samples. Spectroscopic analysis revealed four promising fungal gibberellin producing cultures in Czapek Dox broth at 29^0C for 7 days. Optimization of parameters like pH and temperature and identification of the fungal cultures is in process.

Key Words
Gibberellin, hormone, Fungi, Czapek Dox

OP02

Prevalence of Methicillin Resistant *Staphylococcus aureus* in D. Y. Patil Hospital and Research Centre, Kolhapur

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Staphylococci are ubiquitous in nature with about a dozen species occurring as part of human flora. The most virulent of the genus, *Staphylococcus aureus*, is the most common cause of bacterial infection. After the discovery of penicillin in 1940 the mortality rate from staphylococcal infections dropped dramatically. However, the golden period was soon interrupted by the appearance of penicillin resistant *S. aureus* strains. Several different classes of antibiotics were developed in response. Methicillin , a semi synthetic penicillin was introduced in 1959. First Methicillin resistant *Staphylococcus aureus* was reported in 1961 in UK. Since then it became major nosocomial pathogen worldwide, popularly designated as MRSA. Methicillin was later replaced by a more stable drug Oxacillin. *Staphylococci spp*. has a unique epidemiological pattern and is well known to develop resistance to antibiotics rapidly and therefore very difficult to treat, especially those contracted in the hospitals. Prevalence of multidrug resistant *Staphylococci* amongst patients, hospital personnel and environment can be a cause of outbreak of infection in the hospital. Regular surveillance is important as a preventive measure. Clinical samples received in Microbiology laboratory of Dr. D.Y.Patil hospital. Kolhapur within a period of 12 months were studied for Methicillin resistant staphylococcus isolates. *Staphylococci* were also isolated from hospital personnel and environment and studied for Methicillin resistance. Out of 150 Methicillin resistant *staphylococci* isolates from the clinical samples 106 (70.6%) were identified as *Staphylococcus* aureus i.e. MRSA and 44 (29.4%) were MR-CoNS. Amongst the hospital personnel 13.33% were MRSA and 2.8% were MR-CoNS. From the air sampling of the hospital environment 204 *staphylococci* were isolated, out of which, 21.66% were MRSA and 6.94% were MR-CoNS.

Key Words
MRSA, Clinical samples, Hospital personnel, Hospital environment.

PP48

Production of Xanthan Gum By *Xanthomonas Compestris* Using Industrial and Kitchen Waste as a Production Media

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Xanthan gum is polysaccharide used as food additive, commonaly used as food thickening agent and stabilizer. One of the most remarkable properties of xanthan gum is its ability to produce a large increase in viscosity of a liquid by adding a very small quantity of gum. Xanthan gum helps to create pleasant texture in many ice creams. *Xanthomonas compestris* is the pathogen isolated from the infected leaves of cabbage was able to produce extracellular polysaccharides when inoculated in fermentation broth containing banana peel extract as sugar source, cabbage extract as nitrogen source and other ingredients. After fermentation that can vary in time one to four days. The polymer mat be precipitated from the medium by the addition of alcohol, dried and milled to give a powder that will be readily soluble in water.

OP12

Synthesis and Characterization of ZnO Nanoparticles and Their Application on Textiles as Antimicrobial Agents and UV Absorbers.

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The application of nanoscale materials and structures, usually ranging from 1 to 100 nanometers is an emerging area of nanoscience and nanotechnology. Synthesis of nanoparticles is an area of constant interest for its wide range of applications.
ZnO nanoparticles were synthesized using simple chemical method and their characterization was done using UV spectroscopy, Scanning electron microcopy, and X-ray diffraction. The antimicrobial activity of ZnO nanoparticles was studied using agar well diffusion technique. An awareness of personal sanitation, contact disease transmission and personal protection has led to the development of antimicrobial textiles. Application of effective antibacterial agent and UV absorbers- ZnO nanoparticles to textiles for producing antimicrobial and UV absorbing textiles is a future aspect of this project.

Key Words
ZnO Nanoparticles, Antimicrobial agent, UV absorbers

OP01

Candida Glabrata Infection of the Nasal Septum – An Unusual Case Report

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Candida glabrata, formerly called *Torulopsis glabrata* is small unicellular, eukaryotic, budding yeast, usually round to oval in shape. It multiplies by production of blastoconidia. It is the only species of genus Candida that does not produce pseudohyphae. *Candida glabrata* was considered as relatively non-pathogenic and part of normal flora of healthy individuals and rarely causing serious infections in humans. However, following the widespread use of Immunosuppressive therapy with broad spectrum antifungal therapy, the frequency of mucocutaneous and systemic infections caused after colonization by Candida glabrata has significantly increased in older age groups over the past few years. While Candida albicans remains the major yeast pathogen, several other species like Candida tropicalis, *C.krusei* and *C.glabrata* are now known to cause opportunistic infections in septicemia, urinary tract, organ transplantation, meningitis, pneumonia and haematologic malignancies. The primary concern for *Candida glabrata* is that it is less susceptible to Amphoterecin B and Fluconazole and can develop resistance to other Azoles. Hence these infections are difficult to treat. For this reason, it is clinically important that a pure growth of yeast from a deep - seated source (i.e fluid or tissue) be fully speciated. Without speciation, Physicians would tend to use an Azole agent for treatment due to the decreased toxicity of these drugs. Patients with *Candida glabrata* should be immediately placed on Amphoterecin-B, since this is the only effective therapy for Azole-resistant yeast infection. Here is presented the case report of a 58 year old male patient with uncontrolled Diabetes mellitus, having an infected nasal septum, diagnosed clinically and histopathologically as "suspected mucormycoses". Microscopy of infected tissue by Gram stain and Lactophenol cotton Blue mount of colonies revealed small 3-5 µ, oval budding yeast cells. Yeast colonies were seen on Blood agar and Sabouraud's Dextrose agar. The absence of pseudohyphae and chlamydospores on Dalmau plate culture and appearance of dark pink to violet colonies on CHROMagar Candida medium offered a rapid and cost- effective diagnosis of *Candida glabrata*. Screening for non-albicans Candida species should be performed on all clinical specimen suspecting mycotic infections.

Key Words

Candida glabrata, CHROMagar Candida Medium, Dalmau Plate culture

PP49

Biological Synthesis of Silver Nanoparticles and Evaluation of Their Antibacterial Activity

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The integration of nanomaterials with biology is finding wide applicability in various areas of medical science. Silver has been long recognized as having inhibitory effect on various microorganisms present in medical and industrial processes. But silver nanoparticles (SNPs), when synthesized by wet chemical reduction method are found to be toxic, flammable and not at all environment friendly. Therefore in present study, an attempt was made to formulate a cost effective and environment friendly technique for green synthesis of SNPs, which were synthesized using extracts of *Allium cepa, Azadirachta indica* and *Carica papaya* with $AgNO_3$ solutions in varying ratios (1:2, 1:4) and their antibacterial activity was studied using disk diffusion method on isolates viz., *Escherichia coli, Klebsiella pneumonia, Pseudomonas aeruginosa, Staphlococcus aureus and Steptococcus pyogenes* obtained from bed sheets of casualty ward from Prince Aly Khan Hospital. SNPs (1:2) showing maximum antibacterial activity were characterized by uv-vis spectroscopy and scanning electron microscopy (SEM) and then impregnated onto cotton cloth and their antibacterial activity on the same isolates was studied. The effect of consecutive washing of the coated disks with distilled water on antibacterial property was also investigated. The antibacterial activity of the cotton bed sheet coated with SNPs could be retained up to 3 washings. Silver nitrate on its own was bactericidal to the isolates and of all different plant extracts, *Carica papaya* showed maximum antibacterial activity. These plant extracts were further found to show synergistic bactericidal effect with $AgNO_3$. This work demonstrates the possible use of biologically synthesized SNPs incorporated in cotton bed sheets to minimize nosocomial infections.

Key Words:

Silver nanoparticles, Antibacterial, Plant extracts, *Escherichia coli, Klebsiella pneumonia, Pseudomonas aeruginosa, Staphlococcus aureus, Steptococcus pyogenes, Allium cepa, Azadirachta indica, Carica papaya.*

PP50

Study of Ocular Microflora, Antimicrobial and Antiadhesive Activity of MPS Solutions on Ocular Isolates

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Contact lenses have proved to be useful for visual correction but lysozyme and albumin present in tears are found to provide a good environment for biofilm formation by many ocular organisms. Therefore attempt was made to study the microflora on various MPS against these isolates. A survey was carried out at 17 different opticians across Mumbai and 50 samples were collected from people between 12-49 years. Various isolates viz. *Staphylococcus aureus*. *Streptococcus* mutans, *Candida albicans*, *Proteus vulgaris*, *Klebsiella pneumoniae*, *Pseudomonas* spp. were detected in these samples. Various multipurpose solution used for lens cleaning were assessed for their antimicrobial activity was studied against these isolates using modified ISO 14729, Disc diffusion and Agar well diffusion method. Their percentage inhibition was studied.Antiadhesive activity of these isolate was studied by contact lens adherence, coverslip adherence method and by scanning electron microscopy. The strength of adherence of all isolates were found to be decrease in presence of MPS. Out of all MPS solutions ReNu and Complete were found to show maximum antibacterial activity. Where Flexilens and ReNu showed maximal antiadhesive property. The antiadhesive affectivity of these MPS was found to increase when used in presence of vibration type cleaning device.

PP51

Identification and Extraction of Tobacco Mosaic Virus (DNA) Using Molecular Techniques

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Tobacco mosaic virus is found in tobacco plants. In this project the infected and healthy tobacco leaves are analysed by SDS-PAGE (Sodium Dodecyl Sulphate-Polyacrylamide Gel Electrophoresis). The total viral protein is separated using ELISA (Enzyme Linked Immunosorbant Assay), where the color change in ELISA plate shows the presence of viral protein. The protein is electrophoresed and the protein bands are transferred onto Nitrocellulose Membrane. This gives the position of protein of our interest. Later the genomic DNA is extracted (Genomic DNA Extraction) by Agarose Gel Electrophoresis. Certain viruses such as ToMV are very easily isolated and removed and thus create a new hybrid plant with healthy factors.

Key Words
ToMV, SDS-PAGE, ELISA, Genomic DNA, Nitocellulose Membrane, Agarose Gel

PP52

Phylogenetic Analysis of Insulin (Protein) Using Bioinformatics Tools

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The project focuses on the phylogenetic and structural study of protein (insulin) in six different species the query sequence of these species was taken from NCBI (National Centre of Biotechnology Information). The species such as *Bos Taurus*, *Mus musculus*, *Gallus gallus*, *Drosophila melanogaster*, *Rattus norvegious*, *Caenorhabditis* are sequenced using the tools of bioinformatics. The sequence alignment was done and phylogenetic analysis was performed dendrogram of the protein sequence was constucted. the tools used for the analysis are blast, workbench, pfam, emboss, cath, target p, hyperchem, hex, signal p. are used and is compared the species relation on the basis of insulin structure. It can be used for the taxonomical studies of different species.

Key Words

Phylogenetics - to show evolutionary relationship, *Mus musculus* - house rat *Bos Taur*us - cattle, *Gallus gallus* - roster, *Caenorhabditis* - worm

MPP53

Microbial Degradation of Diaminodinitroethene, a High Energy Nitroexplosive

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Nitroexplosives comprise a major component of nitro compounds and are highly energetic materials. Use of nitroexplosives is important for nation's security. Environmentally transformed products of these nitroexplosives are harmful to environment and human beings. Present studies include biodegradation of recently developed insensitive high energy nitroexplosives 1,1-diamino-2,2-dinitroethylene (FOX-7). It is one of the important nitro explosive of class called as high energy insensitive explosive (IHE). It is synthesized by HEMRL Pune, by the treatment of acetamidinium chloride with diethylmalonate to obtain 2-methyl-pyrimidine-4,6-dione which on nitration followed by hydrolysis gives FOX-7. It is an aliphatic compound with two nitro and two amino groups attached to carbon-carbon double bond. Wastewater generated during the production of FOX-7 is highly acidic and contains FOX-7 in high amounts and it appears to be allergic to human beings causing symptoms like methaemoglobnaemia. Therefore biodegradation study of FOX-7 and its environmentally transformed metabolites is necessary. 13 bacterial isolates were obtained by soil enrichment technique using the soil samples collected from FOX-7 production site. Out of these four bacterial isolates comprising 3 Actinomycetes and one isolate of *Micrococcus* sp. could use FOX-7 as the sole source of carbon and nitrogen when incorporated in synthetic medium at the concentration of 500 mg/l. At the initial concentration of FOX-7 as 400 mg/l in the synthetic medium, the removal was enhanced from 20% to 40% after supplementation of medium with 0.01% peptone. These isolates were also able to grow in the wastewater generated during production of FOX-7 and thus can be used for bioremediation purpose.

OP10

Microbial Bioaugmentation for Treatment of Industrial Effluents in Common Effluent Treatment Plant (CETP)

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Chemical industries play an important role in development of any country however, they also contribute to environmental pollution particularly water pollution due to large volume of effluent generated during the production and presence of toxic chemicals either in the form of unused raw material or unrecovered finished product. Effluent treatment plant thus becomes an unavoidable component of a chemical industry. Since it is difficult to set up an effluent treatment plant independently for a small scale unit, existence of common effluent treatment plant (CETP) becomes useful for cluster of such small scale units. The wastewater in CETP is usually heterogeneous in nature. It is quite difficult to treat such type of mixed effluent using a single, pure microbial culture. The wastewater under study is from a CETP receiving effluents from chemical industries producing dyes and pigments (e.g. Direct blue, Yellow FG, Magenta, Crystal violet, Acid yellow, Fast garnet GBC); pesticides (Temephos, Ethion, Turbuphos, Hexaconazole) , pharmaceuticals (Bitamethazone valerate, Fluoxetine hydrochloride, Cyclosporin), petrochemicals (spray oil, liquid paraffin) etc. The wastewater is highly acidic in nature and dark in appearance with appreciable settelable matter. It contains organic load in terms of Chemical Oxygen Demand (COD) to the extent of 8000 mg/L and ammoniacal nitrogen up to 900 mg/L. Bacterial consortium was developed using the bacteria isolated from the soil in the premises of CETP, and bacterial consortium used at site. The bacterial consortium developed lowered the COD from an initial 8000 mg/l to 1500 mg/l at flask level, and 5500 mg/l to 1820 mg/l at 5 l scale in the laboratory. The experiments carried out at site resulted in removal of COD from initial 6800 mg/l to 3967 mg/l at 25 l scale and from 3000 mg/l to 1400 mg/l at a pilot plant of size 25 m^3. The bacteria belonged to genera *Ochrobactrum, Pseudomonas, Sphingomonas,* Comamonas, *Cupriavidus, Xanthomonas*, *Klebsiella, Bacillus, Flavobacterium, Aeromonas, Bacteroides, Ralstonia and Achromobacter*. Except *Bacteroides, Ralstonia* and *Achromobacter*, all other genera were found to be efficient in reducing the organic load and thus indicated their potential for bioaugmentation purpose.

PP54

Determination of Resistance of *Listeria monocytogens* Towards Sanitizers and Antibiotics in Presence of Tween 80

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Listeria spp are ubiquitous in nature & express the resistance towards different type of sanitizers and antibiotics in the presence of tween 80 (polyoxyethelin sorbitan monolate). Listeria spp. could secreat extracellular enzyme i.e glycosyl transferase which helps bacteria to increase the unsaturation to saturation ratio at 37^0c. Two isolates GG3V & BH2V were screened for determination of resistance towards sodium hypochloride , dettole and ampicillin. MIC were determine before and after treatment of tween80 and remarkable shift was observed. Efflux pump activity was checked by Ethidium bromide agar plate assay. Further checking of efflux was confirmed by PCR for Mdrl gene. Both the isolates showing susceptibility towards Ampicillin , Gentamycin, Roxythomycin, Azithromycin.

Key words
Tween80, MIC, Efflux pump, Mdrl gene, AST.

PP55

Antibacterial Activity of Crude Extracts of Spices against Food Borne Pathogenic Microorganisms

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Growing concern about safety of foods led to the development of natural antimicrobials. Spices are the most commonly used antimicrobials. Spices like clove, coriander, nutmeg, cinnamon, lemongrass, cardamom, black pepper white pepper, cumin, turmeric, ginger exhibit antimicrobial activity. Present investigation is focused on black pepper (*Piper nigrum L.*) cumin (*Cuminum cyminum* L), and turmeric (C*urcuma longa*.). Crude extracts were used for determination of antibacterial activity and phytochemical screening. Solvent extraction was done for cumin (seeds), black pepper (seeds) and turmeric (rhizomes); solvents used were methanol, ethanol, acetone and DMSO. Spice extracts in methanol & ethanol showed antibacterial activity against bacterial pathogens.

Key words
Antibacterial activity, *Piper nigrum*, *Curcuma longa.*

PP56

Evaluation of Antibacterial Activity of Pigments Produced by *Pseudomonas aeruginosa*

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A hallmark feature of several pathogenic microbes is the distinctive colour of their microbial colonies when propagated in the clinical laboratory. Such pigmentation comes in variety of hues and has A hallmark feature of several pathogenic microbes is the distinctive colour of their microbial colonies when propagated in the clinical laboratory. Such pigmentation comes in variety of hues and has often proven to be useful in food, cloth, painting, cosmetics, pharmaceuticals and plastics as an option for artificial synthetic pigments which create serious environment and safety problems. Hence the present work mainly focuses on the production and evaluation of safe and natural pigments from natural resources. The pigment producing Pseudomonas species were isolated from soil, water and contaminated egg samples on cetrimide agar and maintained by refrigeration at 4^0c. The isolates were identified by performing following tests: macroscopic and microscopic morphology motility, Catalase, Oxidase, Hugh-Leifsons, Casein hydrolysis, Indole and H_2S production. The isolates were compared for their pigment production ability in King's A, Demoss and Franks, Minimal Salt and nutrient broth media by spectrometric method at 520nm. Only, two isolates showed better pigment in King's A medium compared to Demoss &Franks broth medium (i.e.: isolate no-26 and isolate no-15). The direct co -relationship between pigment and biomass production of isolate no-26 in King's A broth at 35^0C on rotary shaker with 200rpm at the interval of 24 hours was studied and the maximum pigment and biomass was at 120th hour followed by decrease after 144 hours. The optimum conditions for pigment production determined for isolate no-26 were pH-7.0 and temperature-35°C in presence of glucose as a C-source, ammonia as a N- source and $Fecl_3$ as a source of iron.The pigment was extracted by Blackwood and Neish method and the antibacterial activity of pigment extract was tested against the common pathogens of food, water and cosmetic products by well diffusion technique. The antibacterial activity was noticed against E.coli, K.pneumonae, P.vulgaris, S.flexnerri, S.aureus; while no activity was observed against S.pyogen and P.merabilis. The hemolytic activity test was performed using human RBC's to check the suitability of pigment for human consumption and also to check the non-toxicity of the pigment which was confirmed by negative results of the test. Since pigment showed a good antibacterial activity and no blood hemolysis, it may be used to discover new drugs with broad spectrum or it can be used as a food colorant in beverages, cakes or to decorate and display the food items.

PP57

Biodegradation of Hexavalent Chromium Using Microorganisms

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Hexavalent Chromium is a toxic, mutagenic and carcinogenic compound which is produced as a by-product of many industries like metal plating, dye manufacturing, leather tanneries etc. Due to its high solubility, it can reach the underground water sources and contaminate them. Consumption of Hexavalent Chromium at limits exceeding the EPA standards can lead to severe damage to the kidneys, lungs, skin and other organs. It can also lead to the development of cancers and mutations in the genome. It affects plant also. Although Hexavalent Chromium is harmful to microorganisms, a large number of them can tolerate high concentrations and even reduce it to the non toxic Trivalent Chromium. These include genera like *Bacillus, Pseudomonas, Arthrobacter* etc. The aim of our research is to isolate, analyse and identify microorganisms that are able to degrade high levels of Hexavalent Chromium in water. The samples taken were sewage water so as to obtain an indigenous strain as most of the industrial effluents are discharge in sewage. The sample whose consortia of microbes had the highest degradation potential for Hexavalent Chromium was selected and analysed further. The consortium was plated to obtain the individual isolates. It was found that only one isolate was responsible for the degradation process. This isolate was then subjected to increasing concentrations of Hexavalent Chromium in Davis – Mingioli Synthetic medium and the reduction was checked each day up to day 10. The effect of pH and Temperature on the degradation potential of the isolate was also checked to optimize the parameters for rapid remediation of contaminated sites or sewage waters. Results showed that the isolate could degrade Hexavalent Chromium up to a concentration of 50 ppm with complete and rapid degradation of 10 ppm and 20 ppm in 2 and 5 days respectively. The optimum pH range of the isolate for degradation was found out to be 6 to 8. The optimum temperature for the growth of the organism was 37 ºC and degradation was faster at 55 ºC. This isolate could be extremely useful in remediating contaminated sites due to its ability to reduce Hexavalent Chromium at such high concentrations and also its removal from sewage water treatment plants as the organism is mesophilic.

PP58

Study of Synthesis of Silver Nanoparticles

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Silver nanoparticles were prepared by bacterial reduction, Bio physical reduction, and chemical reduction method. The formation of Silver nanoparticles was observed using UV-Visible absorption spectroscopy. The formation of Silver nanoparticles was studed by the typical surface Plasmon absorption maxima at 418-420nm form the UV-Vis spectrum. We have used energy dispersive spectroscopy (EDX), Scanning Electron microscopy (SEM) to characterize the Silver nanoparticles. The nanoparticles of Silver demonstrated anti bacterial activity against gram negative bacteria and gram positive bacteria . The anti cancerous activity of Silver nanoparticles was studied on cancerous cell line The Human Monocytic cell line (THP1).

Key Words

Silver nanoparticles**,** UV-Vis spectrum, SEM, EDX, Antibacterial, Anticancerous.

PP59

Decolorization of Textile Dye Direct Lemon Yellow by *Burkholderia Cepacia*

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Discharge of textile wastewater containing toxic dyes can adversely affect the aquatic ecosystems and human health. This study is part of efforts to develop textile effluent bio treatment processes to produce reusable water by decolorization and degradation of dyes to non toxic metabolites by bacteria. In the present study, a dye decolorizing bacterium was isolated from dye contaminated sample and identified as *Burkholderia cepacia* by 16S rRNA sequencing. The effect of pH, temperature, aeration, % inoculum, initial concentration of dye, initial concentration of various carbon and nitrogen sources was studied with an aim to determine the optimal conditions required for maximum decolourization and degradation of Direct lemon yellow, which was used as a model dye. The optimum dye-decolorizing activity of the culture was observed at pH 7.4 and incubation temperature of 30° C after 7 days. Decolorization was confirmed by UV-VIS spectrophotometer. The initial dye solution showed high peak at the wavelength of 410nm. The decolorized dye showed disappearance of peak and appearance of peak at 298nm, which indicated that the decolorization is due to dye degradation by *Burkholderia cepacia*. Optimum decolorization took place strictly under aerobic conditions, which is contrary to other well-documented reports. *Burkholderia cepacia* showed 99% decolorization of Direct lemon yellow in presence of 1% (w/v) glucose and 98% in presence of 1% (w/v) yeast extract. The isolate had an ability to decolorize five other structurally different textile dyes. Adsorption of Direct lemon yellow on Na-alginate beads and degradation were studied. Cells immobilised in 7.5% Na-alginate matrix showed lower decolorization (30%) as compared to free cells (77%) and considering the dye adsorption phenomenon on alginate beads (11%) the efficiency of the two systems was not found to be comparable. Phytotoxicity and microbial toxicity studies were also carried out using the original dye. Phytotoxic effect of Direct lemon yellow on growth of *Phasealus mungo, Triticum aestivum* was studied by calculating factors, such as percentage of germination, height of shoot and length of leaf.

Keywords:
Direct lemon yellow, Decolorization, *Burkholderia cepacia*, Phytotoxicity.

PP60

Phytochemical and Antibacterial Screening of Solvent Extracts of Leaves of *Bauhinia Racemosa* Lam. (*Caesalpiniaceae*) against Enteric Bacterial Pathogens

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Phytochemical screening of the plant leaves reveals the presence of carbohydrates, alkaloids, flavonoids, steroids, and tannins. Petroleum ether extract, chloroform extract, ethyl acetate extract and methanol extracts of leaves of *Bauhinia racemosa* Linn. were prepared and antibacterial activity were studied by disc diffusion method against certain enteric bacterial pathogens such as *Escherichia coli, Staphylococcus aureus, Klebsiella pneumonia, Enterobacter aerogenes, Pseudomonas aeruginosa, Salmonella typhimurium, Salmonella typhi, Staphylococcus epidermidis* and *Proteus vulgaris*. The Methanol extracts had wide range of antibacterial activity against enteric bacterial pathogens than the petroleum ether extract, where as ethyl acetate extract were slightly higher antibacterial activity than chloroform extract. Antibacterial activity of various extract of leaves of *Bauhinia racemosa* was carried in attempt to develop a new pharmaceutical drug from natural origin for prevention of enteric infection.

Key Words

Antibacterial activity, *Bauhinia racemosa,* enteric bacterial pathogens

PP61

Viral Diagnosis by Using RT – PCR: A Case Study on Banana Chlorosis Disease

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Banana is an important fruit crop of tropical and sub-tropical countries. Banana plant has an herbaceous stem and belongs to the family *Musaceae*. The wild relatives of banana contain large, hard seeds but the domesticated varieties are seedless. Due to the lack of viable seeds, propagation is done vegetatively, by means of corms. Banana crop is vulnerable to many diseases amongst which viral diseases are the major constraints in production. Banana Chlorosis disease was first reported in Australia (Magee, 1940) and in India (Joshi and Joshi, 1974). The causative organism, BSV is a positive sense RNA plant virus with a tripartite genome. In the current investigation RT-PCR technique was used to detect the presence of the virus from the infected plant samples. Two sets of primer specific to coat protein gene were procured from Indian Institute of Horticultural Research, Bangalore. Different parameters such as annealing time, annealing temperature, forward and reverse primer concentration etc were used to standardize the amplification protocol. The cDNA was amplified and the product of 700bp was successfully obtained. The results were compared with that of healthy plant samples which did not show any amplification with the primers. The current protocol can be used to screen a number of corms prior to plantation, thus avoiding heavy losses.

Key Words
RT - PCR, Banana Chlorosis Disease, *Musaceae*, RNA virus, CMV

PP62

Biopulp - An Eco-Friendly Approach

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Even in the world of paperless office, we are forced to use papers. Plants are used as a raw material in the conventional pulping process by cooking under high temperature and pressure. This process requires many chemicals and high energy. Due to extensive destruction of plants, there as been environmental imbalance. The microbiology techniques may be explored to help in avoiding the deforestration. In our project, an attempt is made to prepare the eco-friendly pulp. Biodegradation of lignin by Basidiomycetes, Bacteria and Actinomycetes has been reported. Hence to produce biopulp from lignocellulosic material, we have screened 14 isolates of Actinomycetes and 7 isolates of Bacteria from termite guts. Agricultural byproducts such as sugarcane bagasse and soybean industry waste were the two substrates used for the production of biopulp since they are easily available and cost effective. The presence of lignin in high content produces pitches in the final product i.e. paper. Thus it is necessary to reduce the lignin content of the raw materials used for preparation of paper. Solid state fermentation was performed to get maximum reduction of lignin content in these substrates. The individual types of Actinomycetes, Bacteria and also consortia were inoculated in these substrates to carry out solid state fermentation at room temperature. After 30 days incubation, lignin content was determined by kappa number. Two of the Actinomycetes showed decrease in lignin content upto 0.1% and 0.356%.The biopulp so produced was then used to make eco-friendly paper. The addition of binding agent while making paper helps in specific texture and strength of the final product. While preparing ecofriendly paper; we have added binding agents' viz. Pullulan, gelatin & Fenugreek powder. The ecofriendly paper made using pullulan & gelatin gave paper with good strength and odorless. Further the isolates of Actinomycetes can be exploited to produce Polysaccharide and Asparginase.

PP63

Plasmid Profiling and Antibacterial Activity of Garlic Extract and Clove Oil on Clinical Isolates of *Pseudomonas aeruginosa*

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Pseudomonas aeruginosa is an opportunistic pathogen, and a common cause of nosocomial infection. It exhibits an innate resistance to a wide range of antibiotics. *Pseudomonas aeruginosa* maintains antibiotic resistance plasmids, both Resistance-factors and Resistance Transfer Factors. The bacterium is naturally resistant to many antibiotics due to low permeability to outer membrane, constitutive expression of efflux pumps and production of plasmid encoded extended-spectrum β-lactamases (ESBLs). Resistance is either innate resistance (chromosomally-encoded) or acquired resistance (plasmid-encoded). Antibacterial susceptibility testing of aqueous extract of garlic and clove oil against multidrug resistant clinical isolates of *Pseudomonas aeruginosa* was done. Garlic is reported to exhibit broad spectrum antibacterial activity against both Gram-positive and Gram-negative bacteria. Clove oil is also known to have an antagonist effect against Gram-negative bacteria. Different concentrations of Aqueous Garlic Extract and Clove Oil were used to check antibacterial activity on fifteen isolates by disc diffusion method. Inhibition zones ranging from 8-25 mm by aqueous garlic extract and 8-33 mm by clove oil were observed. In addition plasmid profiling of eight isolates was done by the midi-prep and Kado and Liu method. However plasmid was not detected in the isolates tested so far.

Key Words

Pseudomonas aeruginosa, Aqueous Garlic Extract, Clove oil, Plasmid profiling.

OP04

Screening of Fungal Isolates for Lignolytic Enzyme, Manganese Peroxides

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Lignin is an insoluble, high molecular weight polymer. So, various fungi specifically white rot fungi degrades it extracellularly. The fungi attack the lignin so as to fragment it & diffuse to the hyphae & cross the cell membrane. Biodegradation of lignin is carried out by lignolytic enzyme system which includes laccases, manganese peroxidase and lignin peroxidase. Manganese peroxidase is heme peroxidase and it forms family of isoenzymes. The aim of present work is screening of the lignolytic fungi for production and assay of manganese peroxidase using the property that it can oxidize a variety of phenols and dyes.

Key Words
Lignolytic enzymes, Manganese peroxidase, Wood bark.

PP64

Screening of Lipases as Potential Virulence Factor in *Acinetobacter* species Isolated from Different Hospitals in India

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Lipases (triacylglycerol acylhydrolases; EC 3.1.1.3) are produced by various microorganisms either alone or together with esterases (carboxylic ester hydrolases; EC 3.1.1.1). The present study aims at understanding the possible virulence properties of these lipases. The organism chosen for the study is *Acinetobacter,* known as an important nosocomial pathogen which has not been studied much for the variety of virulence factors it possesses. In the present study, we screened 42 clinical isolates of *Acinetobacter* spp. for production of lipases by three different plate assays viz. Rhodamine B, Phenol red and Tributyrin Agar Plate assay. By Tributyrin Agar assay, 15 isolates were shown positive for lipase production some of which also could be only esterase positive. For confirmation, Phenol red assay and Rhodamine B assay was performed. On phenol red agar 8 isolates were shown to produce lipase. By Rhodamine B method the same 8 isolates were screened positive for lipase production. Lipases produced by these isolates were further quantified by titrimetric method. A comparative account of these methods showed that Rhodamine B plate assay at 0.01% of Rhodamine B was sensitive and efficient in screening the lipase producers. Future studies would include purification, molecular characterization & studying the potential virulence properties of *Acinetobacter* lipases.

Key Words
Acinetobacter, Lipases, Virulence, Rhodamine B, Titrimetry

PP65

In Vitro Studies of Antimicrobial Properties of Extracts from Unani Medicinal Plants

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Nature has blessed India with immense variety of medicinal plants which are being used since times immemorial to cure diseases. Unani system of medicine is distinct from other fields of medicine as the drugs it uses are natural. Being natural and inexpensive, Unani medicines provide an effective and safe alternative to the existing medicines. The prime reason for these medicines not being widely known is that the literature survey is either in Persian, Urdu or Arabic language. Hence there is a need to provide a scientific base and documentation for this system. Due to emergence of drug resistant pathogens like MRSA, skin infections are becoming very common. The skin pathogens like *Staphylococcus aureus, Candida albicans, Pseudomonas aeruginosa and Escherichia coli* are responsible for severe skin infections. There is a growing need to discover new antimicrobial compounds with diverse chemical structures and novel mechanism of action. Unani plants producing wide range of secondary metabolites possessing antimicrobial properties can be harnessed to treat skin pathogens. For estimating the antimicrobial activity of these plants, active principles are extracted using either crude extraction or Soxhlet apparatus. Different solvents such as chloroform, ethanol, and methanol are employed for this purpose. The extracts are then subjected to well diffusion assay. Screening was carried out using methanol extracts from plants like Psoralea *corylifolia, Swertia chirata, Embelia ribes, Rubia cordifolia, Nardostachys jatamansi, Smilax glabra, Wrightia tinctoria, Picrorhiza kurroa, Cyperus rotundus, and Gymnema sylvestre* against Gram positive, Gram negative and fungal pathogens. The methanol extracts of *Psoralea corylifolia* and of *Embelia ribes* showed maximum activity against *Candida albicans* and *Staphylococcus aureus* while minimum activity was observed with *Pseudomonas aeruginosa and Escherichia coli.* Thus, by formulating the extracts into medicines Unani system can provide a cure to the skin infections and prove to be a boon for the society.

Key Words
Unani System, Drug resistance, Antimicrobial activity

PP66

Lignin Degrading Peroxidase in Biobleaching of Paper-Pulp Mill and Textile Dye-Based Effluents

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Lignin, the nature's plastic is the major pollutant from paper-pulp mill effluent due to its intense unaesthetic brown color, hydrophobicity and poor mechanical properties, tends to be a recalcitrant compound. Textile dye-based industries release colored effluents due to presence of large amount of mixture of dyes which is also hazardous. Microbial extracellular lignin peroxidase enzyme has a potential to degrade lignin and a wide range of complex aromatic dyestuffs. From various environmental niche eight bacterial and two actinomycetes isolates were screened for lignolytic activity out of which three bacterial and one actinomycetes were able to decolorize 44% to 49% of lignin. Crude extracts of lignin peroxidase enzyme gave 60% to 76% decolourization of methylene blue dye during enzyme assay. The studies on biobleaching of paper-pulp mill effluent gave 60% to 75% color reduction and in case of textile dye- based effluent 50% to 58% decolourization was observed. The heterogeneous combination of lignin peroxidases from mixed consortia gave 80% to 85% color reduction in treatment of paper-pulp mill effluent and 70% to 75% decolourization in treatment of textile dye-based effluent which is significantly high. This system of lignin peroxidase may be efficiently used in biobleaching and biodegradation of effluents from respective industries.

Key words:
Lignin peroxidase, Biobleaching, Paper-Pulp mill effluent, Textile dye-based effluent

PP67

Bacterial Synthesis of Silver Nanoparticles and Its Applications

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The development of reliable processes for the synthesis of silver nanomaterials is an important aspect of nanotechnology today. Many synthetic procedures for silver nanoparticles are available, but a narrow and controlled size preparation seems difficult to obtain because it depends on the adjusted concentration of reacting chemicals and controlled reaction environment. Colloidal metal particles can be obtained by chemical synthesis but these methods use toxic chemicals in the synthesis protocol, which raises great concern for environmental reasons. The nanoparticles synthesized biologically are stabilized directly in the process by proteins.Although it is known that microorganisms such as bacteria, yeast, and fungi play an important role in the remediation of toxic metals through reduction of the metal ions, only recently this approach is considered interesting as nanofactories. In this study, the production of silver nanoparticles by some bacteria is investigated by both intracellularly and extracellularly. For intracellular, the silver resistant organisms were grown in conventional media containing $AgNO_3$, and for extracellular, the test strains were cultivated in their special conventional conditions for 24 hours. $AgNO_3$ at concentration of 10mM is separately added to the each reaction vessels that contained the supernatants of *Escherichia coli, , Bacillus subtilis*,. The silver nanoparticles thus produced were characterized by transmission electron microscopy and UV-visible spectroscopy. The silver nanoparticles were effectively produced, by, *Escherichia coli and Bacillus subtilis*.The prepared silver nanoparticles were in the range of 12–25 nm with increased stability and enhanced anti-bacterial potency. This effect is dose dependent and is more pronounced against Gram-negative bacteria than Gram-positive organisms. Antifungal effects of silver nanoparticles on certain pathogens of the skin were investigated. Nano-Ag showed potent activity against clinical isolates and ATCC strains of *Trichophyton rubrum , Candida albicans , Aspergillus fumigatous* The results showed nano-Ag exerted activity on the mycelial anatomy and spore germination. Thus, the study indicates that the nano-Ag may have considerable antifungal activity, deserving further investigation for clinical applications.In the area of water purification, nanotechnology offers the possibility of an efficient removal of pollutants and germs. The nanoparticles may be used for detection and removal of chemical and biological substances.

Key Words
Silver-Nanotechnology, Bacteria-Nanoparticles, Extracellular, Intracellular, TEM, Antimicrobial

OP09

Study of Extended Spectrum Beta-Lactamase (ESBL) Producing Gram Negative Bacilli in Family *Enterobacteriaceae*.

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ESBL producing Gram Negative Bacilli is a worldwide problem. Although few studies have reported on the prevalence of ESBL producers in Indian hospitals, ESBL producing bacteria may have evolved in several hospitals all over the country. Therefore the study was carried out at Dept of Microbiology, D. Y. Patil Hospital and Research Center, Kadamwadi, Kolhapur, to examine the incidence of ESBL producing strains and multiple drug resistance in family *Enterobacteriaceae* during the period of Dec 2007 to May 2009. A total number of 197 GNB belonging to family *Enterobacteriaceae* were isolated from various clinical samples & studied for ESBL production by Kirby- Bauer disc diffusion test as per CLSI (Clinical Laboratory Standards Institute) standards & confirmed by using DDST (Double Disc Synergy Test). Out of 197 isolates, 83 isolates (42.13%) were potential ESBL producers on the basis of resistance or decreased sensitivity to third generation Cephalosporins (3GC). ESBL production is detected by Jarlier DDST for these 83 isolates. Seventy (35.53%) isolates out of these 83 isolates were DDST positive. All the ESBL producers were tested for MIC and antibiotic sensitivity test (AST). All these 70 isolates were susceptible to Imipenem (100%), Piperacillin-tazobactum (87.5%) and Amikacin (81.2%). Among these isolates *E.coli* 33 (39.75%) & *Klebsiella pneumoniae* 16 (37.20%) were most common ESBL producers. Majority of the ESBL producers were isolated from the medical ward 20 (28.57%) followed by surgical ward 16 (22.85%) and from ICU 12 (17.14%).

Key Words
Extended Spectrum beta-Lactamases (ESBL), 3GC, Resistance, *Enterobacteriaceae*.

PP68

Accumulation of Polyhydroxyalkanoate (PHA) from Styrene by *Pseudomonas* spp and Effect of N_2 Concentraction on PHA Accumulation

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PHA are polyester of various hydroxyalkanoate which are synthesized by many organisms. But *Pseudomonas* can produce PHA efficiently by using toxic aromatic hydrocarbon Styrene, which is also much resistant to microbial degradation.
Styrene is released in millions of kilograms in a year from petrochemical and polymer processing industries. Styrene is a suspected carcinogen,teratogen ,toxic to kidneys, respiratory tract,and nervous system. PHA accumulated as discrete granules in the cytoplasm of microorganism and it acts as storage source of carbon in unbalanced nutrient environment such as nitrogen deficiency. The conversion of styrene to PHA by *Pseudomonas* spp. Provides a new link between an aromatic environmental pollutant and aliphatic PHA accumulation. PHA possess properties similar to various synthetic thermoplastic polyester. It is used in the production of plastic utensils and other disposable iteams,food packaging, biodegradable rubber,in cosmetic,medicine and as antibiotic. Our routinely used petroleum based plastics are non biodegradable and hence cause environmental hazards. But the PHA are the bioplastics which is biodegradable and can be used as alternative to conventional plastic for the betterment of environment and also environmentaly hazardous styrene is converted into ecofriendly useful products. It is important for the global community to have an alternative for the products derived from petroleum oil such as plastic. PHAs at least will be a solution for the most of the industries and society.

OP07

Biosurfactant Production by a Marine Strain of *Pseudomonas*

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A marine isolate of *Pseudomonas aeruginosa* produced a potent biosurfactant in PG medium at pH 7.2, 30°C at 120 hours. The biosurfactant is a secondary metabolite and was partially purified by extraction with chloroform: methanol followed by preparative thin layer chromatography. The biosurfactant is a brown, water soluble powder made up of lipid and polysaccharide with a yield of 1g/lit. The biosurfactant lowered the surface tension (SFT) of distilled water to 49.377 mN/m, had a critical micelle concentration of 25µg/L and reduced interfacial tension (IFT) between kerosene-water interface. Partially purified biosurfactant exhibited antimicrobial activity against *Staphylococcus aureus, Bacillus subtilis, Bacillus pumilus* and *E. coli.* It was also able to chelate chromate and ferrous ions indicating its potential use in bioremediation. The crude biosurfactant at concentration 500 µg/ml exhibited 83.9 % killing of HeLa cells. The partially purified biosurfactant disrupted 97% *Pseudomonas aeruginosa* 01 and 74% *Acinetobacter baumannii* biofilms. Additionally, the crude biosurfactant also had an intense antioxidant activity of 83.55 % per 20 minutes. Large number of beneficial traits make this biosurfactant excellent candidate for environmental and biomedical applications.

Key Words
Biosurfactant, *Pseudomonas aeruginosa*, SFT, IFT, Antimicrobial, Anticancer, Antioxidant, Metal chelation

PP69

Utilization of Molasses for Biosurfactant Production by *Streptomyces* S2

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Actinomycetes were isolated from soil and screened for production of Biosurfactant. Total nineteen isolates were obtained, out of which, five exhibited biosurfactant production. Biosurfactant production was carried out in medium containing molasses as the sole carbon source. Maximum biosurfactant production was shown by *Streptomyces* S2. Effect of environmental parameters such as pH, salt and nitrogen source on biosurfactant production were checked. pH of 7.5 , Pb (0.1g%), Mg (1g%) & $NaNO_3$ (1g%) supplementation resulted in maximum biosurfactant production. Purification of biosurfactant is under process.

Key words
Biosurfactant, Bioemusification, Actinomycetes, *Streptomyces*

PP70

Isolation, Characterization and Application of Phenol Degraders

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Industrial wastewaters containing high concentrations of phenolic compounds are discharged into the natural ecosystem representing serious environmental problem. Two isolates were obtained by selective enrichment technique using minimal medium supplemented with phenol (100- 1000 µg/ml). Both the isolates, identified as *Candida guilliermondii* were selected on the basis of growth response to increasing concentration of phenol and degradation efficiency. Both the strains showed resistance to heavy metals such as Ni^{+2} Cu^{+2}, Pb^{+2} and Cd^{+2} as well as to various antibiotics indicating their potential in bioremediation. Plasmidial location of genes conferring resistance to phenol, heavy metals and antibiotics was detected in only one isolate by acridine orange curing. Plasmid was isolated by alkaline lysis method and detected by agarose gel electrophoresis. Horizontal gene transfer by transformation was carried out under laboratory as well as simulated conditions. The two isolates were used as a consortium to obtain high degradation efficiency. The consortia were evaluated for their ability to degrade phenol at different pH, temperature, organic and inorganic nitrogen source and phenol concentration. Efficient biodegradation was observed at pH 7, temperature 30°C, nitrogen source (20 mg of N_2/mg of phenol) urea, phenol concentration 1000 µg/ml. The consortia in immobilized form also degraded phenol.

PP71

Antibacterial Activity of Medicinal Plants against Gastrointestinal Pathogens

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Medicinal plants are important for the study of traditional uses and act as a new anti-infectious agents. Plants like Neem (*Azardica indica*), tulsi(*Ocium sanctum*), ginger(*Zingiber officinale*), lemon(*Citrus aurantifolia*), garlic(*Allium sativum*), guava(*Psidium guajava*), lemon grass(*Cymbopogon citrate*) show antibacterial activity .Out of these plants neem ,tulsi , ginger ,lemon were taken for *in vitro* antibacterial susceptibility tests. Solvents like methanol, ethanol and acetone were used for extraction .The ethanolic and acetone extracts exhibited high antibacterial activity against *Bacillus, S. aureus* and *Klebsiella.*

Key words
Solvent extracts, Medicinal plants, Antibacterial activity

PP72

Utilization of Petroleum Hydrocarbons by Bacteria Isolated from Soil and Contaminated With Engine Oil

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Environmental pollution with petroleum and petroleum products has been recognized as one of the most serious problems. Oil is released into the environment which affects many species of plants and animals as well as humans. Contamination of soil by oil causes it to lose its useful properties such as fertility, water holding capacity, permeability and binding capacity. Hence, the attempt of study was to investigate the counter measure to remediate soil contaminated with oil. Bioremediation provides an effective and efficient strategy to speed up the cleanup process. For that purpose three mechanic workshops were selected where the soil had been contaminated. Soil samples were enriched using Bushnell-Hass enrichment medium for a week. A total of 30 bacterial strains capable of using used engine oil as a sole carbon source were isolated.

These isolates were identified on the basis of standard morphological, cultural and biochemical characteristics using Bergy's manual of Determinative Bacteriology. Out of these 30 isolates, 7 showed prominent oil degrading activity. These isolates are *Pseudomonas*, *Serratia*, *Bacillus*, *Micrococcus*, *Proteus* and *Alcaligens*. Their lipase activity had been observed on Egg yolk agar, Phenol red agar and oil powder agar. The steel industry effluent from Ahrnednagar MIDC. (Indian Seamless Metal Tubes) was analyzed for physico-chemical characteristics which include BOD, COD, DO, pH, Alkalinity, Chloride and Phosphate. Along with these the further study also includes the comparison of oil degrading capability of the isolates obtained from soil and the bacteria which are initially present in the effluent sample and preparation of carrier based biodegrader.

Keywords
Oil degradation, Lipase activity, Phvsico-Chemical characterization

PP73

Biodegradation of Commercially Used Insecticides by Soil Isolates

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Insecticide degradation is the breaking down of toxic pesticides into nontoxic compounds and, in some cases, down to the original elements from which they were derived. The most common type of degradation is carried out in the soil by microorganisms, especially the fungi and bacteria. Insecticides which are rapidly degraded are called non-persistent while those which resist degradation are termed persistent. Use of persistent insecticides like Malathion, Carbofuran etc, has resulted in the entry of these insecticides in the ecosystems. Contamination of soil and water by such pesticides is a major environmental concern. There is a potential carcinogenic risk from such insecticides so there is a serious need to develop remediation processes for their elimination or minimization in the environment. The present article is a constructive approach focused towards environmental management. It highlights on the biodegradation of a pesticide thiamethoxam and diafenthiruon. They are broad spectrum pest controllers commonly used nowadays under various trade names for destruction of leaf-feeding pests on cotton, soybean etc. Serial dilution and pour plate techniques were used for screening of organisms which could degrade these pesticides. The isolates were subjected to a range of concentrations of pesticides from 10-100 mgL' in solid and liquid media and the colony forming units and absorbance in liquid media respectively was investigated to determine the concentrations which could be tolerated by the isolates. A comparative account of the isolates has been depicted in the presentation. We further intend to determine the number of days which would be required for complete elimination of the supplied quantity of the pesticides and use the data for trails on degradation studies in the field.

PP74

Biodegradation of Diesel Oil by Soil Isolates

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Due to wide spread use of diesel oil, the natural attenuation, which relies on in situ biodegradation of pollutants, has received a large amount of attention. This inevitably has hazardous effects on human life and safety. The parameters typically measured in laboratory tests of bioremediation efficacy include enumeration of microbial populations, gravimetrically measuring the quantity of residual oil. The most direct measure of bioremediation efficacy is the monitoring of diesel oil. Microbial degradation process aids the elimination of spilled oil from the environment. Large amounts of the oil can be cleared by various physical and chemical methods. However, such methods find limited use under natural environmental conditions. Microbiological means have found considerable significance in the past few decades. Degradation of diesel oil was monitored over a twenty-seven day period using gravimetric method .Two isolates of soil identified as Pseudomonas aeruginosa and Pseudomonas species were polluted with the oil samples at a loading rate of 2% (v/w). These soil samples, together with the unpolluted control samples were seeded with the two isolates. The rate of oil degradation by these isolates at the interval of three days, up to twenty seven days was thus determined. There was a consistent decrease in the quantity of residual oil starting from the third day continuing till the twenty-seventh day. The approximate rate of degradation was investigated to be approximately 54 % under un-optimized conditions.

Key Words
Diesel oil, Gravimetric, Bioremediation

PP75

Raw wastes as alternative media for *Trichoderma*: towards sustainable development

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Waste disposal is of major concern in developed and developing countries. Especially biosolids generated from waste water treatment plants are becoming an environmental nuisance. Conventionally they are disposed by land filling, land spreading, and incineration. Lots of wasted potatoes are thrown directly into waste dumps from vegetable markets and agricultural lands. Bread, bread edges, and bread crumbs are disposed off in large quantities from hospitality and hotel industry. All these wastes need to be disposed off in a proper and scientific manner. The comforting fact is that these wastes are a good source of microbial nutrients. Hence, in this study we used these raw wastes as growth media for *Trichoderma viride*. *Trichoderma viride* is a well known biofungicide and promotes good plant growth in many ways. Waste materials like biosolids were collected from Pune Municipal Corporation's Sewage Treatment Plant, Erandwane, Pune. These biosolids were sun-dried for four days. Waste potatoes were collected from vegetable market while bread edges were collected from restaurants. Spores of *Trichoderma viride* were sprinkled on sterilized raw wastes aseptically, incubated at room temperature for 48-72 hrs, and observed for growth. The results showed very good growth with sporulation substantiating that these wastes can be very good media for the *Trichoderma viride*. Using this simple know-how we can bring about biobeneficiation of wastes. Moreover, this technique is cheaper than other methods for mass production of *Trichoderma viride*. Biobeneficiation of wastes is most promising for sustainable development.

Key words

Trichoderma viride, wastes, biosolids, bread edges, potatoes

PP76

Characterization and biodivesrsity of Pashan lake water

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Pashan lake is a fresh water man made reservoir constructed on Ramnadi rivulet of Mutha river. In the past, water from this lake was used for drinking purpose. At present this water is not used by Municipal Corporation for drinking purpose because of deteriorated water quality. This deterioration is because of human activities like washing of trucks and dumping of sewage and industrial waste water from nearby human settlements. At present this ecosystem is under stress of water pollution. Present study is to characterize the Pashan lake water with respect to its physico-chemical and biological properties and to study its microbial diversity. Physico-chemical and biological properties of any aquatic system and its biodiversity are influenced by each other. Results will pave a way to know whether in future this fresh water resource could be used again as a potable water resource or not?

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