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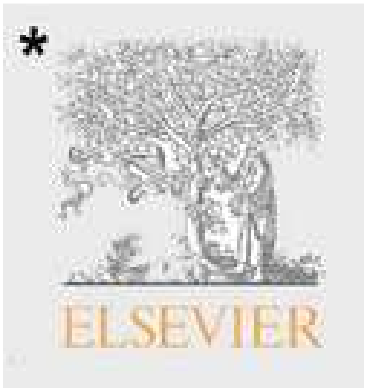
Proceedings of

National Symposium on Status, Challenges & Opportunities in Life Sciences
10th September 2011

International Journal of Pharma and Bio Sciences

Ashok & Rita Patel Institute of Integrated Study & Research in Biotechnology & Allied Sciences (ARIBAS)
New VallabhVidyaNagar, Anand, Gujarat



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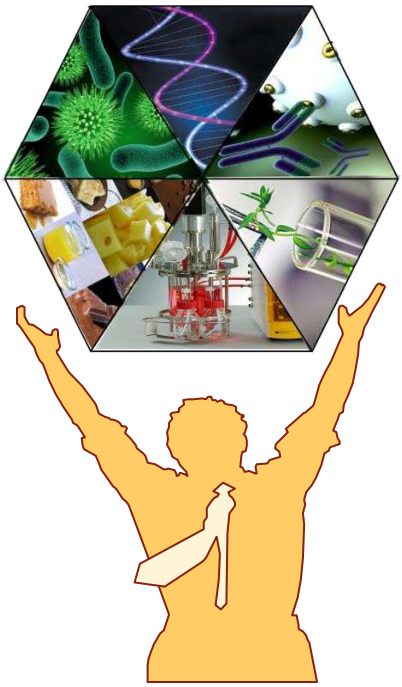
National Symposium on

Status, Challenges & Opportunities in Life-Sciences

10th September 2011



Jointly Organized by

Department of Microbiology and

Department of Integrated Biotechnology

(Environmental Biotechnology)

Ashok & Rita Patel Institute of Integrated Study & Research in Biotechnology & Allied Sciences (ARIBAS)

New Vallabh Vidya Nagar, Anand, Gujarat

SOUVENIR

Our Management & Institute

Over the span of 65 years, Charutar Vidya Mandal (CVM) has made spectacular progress by venturing into various emerging disciplines. Under the dynamic leadership of Dr. C.L. Patel, CVM has achieved incredible heights. With his team of devoted academicians, he has been nurturing forty-six educational institutions contributing to the panoramic growth of Vallabh Vidyanagar and New Vallabh Vidyanagar.

With the generosity and kind gesture of Mr. Ashok and Mrs. Rita Patel, CVM has been able to fulfill yet another dream in the form of ARIBAS where quality education is being imparted at postgraduate & doctorate level in applied sciences *viz.* Microbiology, Biotechnology, Genetics, Pharmaceutical Chemistry and Integrated Biotechnology. The institute is affiliated to Sardar Patel University, V.V. Nagar, Anand.

About the Symposium

Life sciences have been offering solution to the challenges in almost every sphere of human interface especially in food, health, energy, and the environment. The radical transformation in research strategies and methodologies has helped to enunciate the *modus operandi* of metabolic interaction at molecular level, thus enabling to answer and raise noble queries.

With the rapid pace of developments in various arrays of life sciences *viz.* agricultural, pharmaceuticals, food, medicinal and environmental, a platform to update current knowledge is the need of hour.

Such platform promises not only to set the standards of ethics and integrity and share valuable research findings with scientific fraternity but also inspire budding life scientists. Therefore, we are convening researchers, academicians and students, within an interdisciplinary scenario, to deliberate on the Status, Challenges and Opportunities in Life Sciences.

The success of symposium is more than evident from an overwhelming 622 registrations from across the country. The participants travelled from far away places like Jharkhand, Uttar Pradesh, Maharashtra and Karnataka.

About the Symposium...contd.

We received participation from University Teaching Departments and Post Graduate Colleges of North Gujarat University, Patan, Veer Narmada South Gujarat University, Surat, University of Allahabad, Gujarat University, M S University Baroda, Saurashtra University, Rajkot, CHARUSAT, Changa, Sardar Patel University, Ganpat University, Mehsana, Anand Agriculture University, Sardar Patel University, Kadi Vishwa vidyalaya, Gandhinagar, Gujrat Vidya peeth, Rajiv Gandhi University of Health Sciences, Bangalore, Gulbarga College of Pharmacy, Karnataka, to name a few.

■

Themes of the Symposium

The symposium provides significant opportunities for professional education, networking, and resource building for registrants. You should strongly consider attending, if you are involved in the fields of:

- Microbial and Industrial Biotechnology
- Environmental Sciences
- Food and Agricultural sciences
- Healthcare Sciences

MESSAGES FROM THE DESK OF

- Dr. C.L. Patel (Chief Patron)
- Dr. R.P. Patel (Patron)
- Dr. P.S. Patel (Convener)
- Dr. R.G. Shah (Chief Guest)

FROM THE DESK OF CHIEF PATRON

Dr. C.L. Patel
Chairman,
Charutar Vidya Mandal,
Vallabh Vidya Nagar, Anand, Gujarat

Education is said to be the medium of transmission of culture and civilization. New Vallabh Vidyanagar of today seems like the fulfillment of Sardar Patel's vision of new India. We are the inheritors of the dreams of Shri Bhaikaka, Shri Bhikhabhai Saheb and Shri H.M. Patel and wish to steer New Vallabh Vidyanagar into a center of excellence in the field of education. CVM has been able to fulfill yet another dream in the form of "Ashok & Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences" (**ARIBAS**) where quality education is being imparted at post-graduate and doctorate level.

I am very pleased to know that a National Symposium entitled **"Status, Challenges & Opportunities in Life-Sciences"** is being organized at ARIBAS on September 10th, 2011. Such conglomeration will definitely provide an opportunity and platform to life scientists to share their findings and discuss the emerging concepts. More importantly, the students "our budding scientists" would be able to have a glance at the fore fronts of research and development which might prove prudent step to inculcate scientific instinct in them. Moreover, with the changing world order, where India sees herself as an active power player in coming decades, a stronger base of technocrats would be required to spearhead the development of novel solutions to the existing and emerging issues. Organizing such symposium is in line with the commitment of *Charutar Vidya Mandal* to prepare the quality professionals to the serve scientific fraternity.

My Best wishes for the success of the Symposium.

Best Wishes

Dr. C.L. Patel

FROM THE DESK OF PATRON

Dr. R.P. Patel
Secretary,
Charutar Vidya Mandal,
Vallabh Vidya Nagar, Anand, Gujarat

I am very glad to know that ARIBAS is organizing National Symposium entitled **"Status, Challenges & Opportunities in Life-Sciences"**. Organizing such conventions on a regular basis is an appreciable effort invested by ARIBAS for promoting collaboration between academicians, scientists, students, researchers and other stakeholders in the field of basic and applied sciences.

I feel that the symposium will provide an appropriate platform for scientists and academicians from all over India to deliberate on present status and future challenges pertaining to various basic and applied aspects of life sciences and harness the benefits for betterment of the society. The scientific discussions during the symposium will serve as knowledge bank for all participants. The program will surely be an enthralling experience and yield considerable take home value.

I wish the symposium a great success.

Best Wishes

Dr. R.P. Patel

FROM THE DESK OF CONVENER

Dr. Pradip S. Patel
Director,
Ashok & Rita Patel Institute of Integrated Study & Research in Biotechnology & Allied Sciences,
Vallabh Vidya Nagar, Anand, Gujarat

I take this auspicious opportunity to welcome all guests, speakers and delegates to the one day National Symposium entitled **"Status, Challenges & Opportunities in Life-Sciences"** hosted by our institute on 10th September 2011. Life sciences have touched almost every field useful for mankind. The robust technologies aid in enriching the research database at a very rapid pace. It becomes essential to share the views, expertise, research findings and implications pertaining to various basic and applied sciences.

This symposium is an effort to convene researchers and students from all over India to showcase their active research and share the understanding of concepts. I believe that such discussion platforms would create an appropriate prospect for interdisciplinary and transdisciplinary facets and provide an opportunity for all of us to update our skills in order to move ahead in the field.

I cordially welcome all speakers, delegates and students and I am sure that the experience at this symposium will be memorable for everyone. The no. of registrants above 600 will categorically help to explore new horizons of science frontiers. In closing, I would like to quote Sir Francis Darwin (1848 - 1925) "The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them" (Eugenics Review, April 1914).

I wish the symposium grand success.

Best Wishes

Dr. Pradip S. Patel

FROM THE DESK OF CHIEF GUEST

Dr. R.G. Shah
Member Secretary,
State Level Environment Impact Assessment Authority, Paryavaran Bhavan,
Sector-10A,Gandhinagar-382010, Gujarat

I am glad to know that ARIBAS has organized one day National Symposium entitled **"Status, Challenges & Opportunities in Life-Sciences"** on 10th September 2011. I extend warm greetings and congratulation to the organizers that they have invested sincere efforts to create a platform to team up, share ideas and develop an interactive network for people from both industrial and educational backgrounds.

I believe that creating scientific awareness in the direction of applied sciences and the implications thereof in our environment is need of the hour. I am sure that the discussion forums during scientific session will provide an opportunity to develop insights into the existing concepts and channelize the discussions to explore newer cutting edges of sciences.

I wish the symposium a great success.

Best Wishes

Dr. R.G. Shah

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ORAL PRESENTATIONS

Section:

MICROBIAL & INDUSTRIAL BIOTECHNOLOGY

PREPARATION OF NANOPARTICLES USING BIOSURFACTANT

MEHA TRIVEDI, KISHOR CHAUHAN

Ashok & Rita Patel Institute Of Integrated Study & Research in Biotechnology & Allied Sciences, New Vallabh Vidyanagar , Anand , Gujarat

Many possible applications of bio surfactants have raised up now a days. Commercially available surfactants are toxic to human and environment. Bio surfactants, as they are produced by microorganisms, are eco-friendly, biodegradable and nontoxic in nature. Attempts have been made to produce different metal nanoparticles with the use of bio surfactant. Different methods were used to produce metal nanoparticles of AgNO3, COCl2, FeSO4, CuSO4, NiCl2, ZnCl2 and FeCl3. The particles were analysed for their particle size. Results were compared for different methods and the best method for preparation of nanoparticles was suggested.

LIQUID FORMULATION OF AZOTOBACTER CHROOCOCCUM (ABA-1) FOR SEED INOCULATION"

ACHARYA PAYAL K. , GUPTA D. G. * , JHALA Y.K., SHELAT H.N. AND VYAS R.V.

Department of Microbiology, B. A. College of Agriculture,
Anand Agricultural University, Anand – 388 110, Gujarat (India)

Liquid, Carrier and Granular formulations of Azotobacter chroococcum (ABA-1) were prepared from Jensen's broth having 9.5x1011 cfu/ml . Bacterial survival in formulations as well as on inoculated Pearl millet seeds was studied using Jensen's agar and there in vivo efficacy testing on growth parameters of P.millet cv GHB-558 in pots. In formulations, Azotobacter count was decreased 10 and 100 folds after 3 and 5 months, respectively . Survival of bacteria on seed was reduced from 1010 to 105 after 48 hours. Seed germination effect of all formulations on seed agar showed increased root and shoot length with secondary root formation as compared to uninoculated control. In a pot trial, Azotobacter formulation containing 2% glycerol + 2% PVP registered highest plant height, shoot and root weight at 60 DAS by seed application in Pearl millet , which was significantly superior over other formulations, recommended dose (80 kg ha-1) of nitrogen and absolute control.

OPTIMIZATION OF FUNGAL GROWTH MEDIUM USING BANANA WASTE AS BASE

DIPALI ARORA1, PINAKIN DHANDHUKIA2 AND JANKI THAKKER1*

1 P.D.Patel Institute of Applied Science, CHARUSAT, Changa
2Ashok & Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, Sardar Patel University, New Vidyanagar

In present study, new fungal growth medium was optimized using agricultural waste of banana stem using fungal species viz. Fusarium oxysporum f.sp. cubense (Foc), Aspergillus niger ATCC no.1344, A. oryzae ATCC no. 3107. Elemental analysis (carbon, nitrogen, hydrogen) of banana stem powder was carried out. Sucrose, dextrose and maltose were initially tested as additives where Foc and A. oryzae showed max spreading rate on dextrose and sucrose augmented plates. A. niger showed equal growth on maltose and sucrose. Although spreading of mycelial mate was rapid but not thick. On further addition of nitrogen source (sodium nitrate) thick mat was obtained compared to nitrogen lacking medium with corresponding increase in dry mycelial weight (DMW) when tested in broth. Screening of various factors was carried out using Plackett-Burman and sucrose, (NH4)2SO4, KH2PO4 and MgSO4, were selected to optimize further using response surface methodology (RSM). This study showed prominent fungal growth by supplementing waste banana stem with sucrose and few other salts can provide result oriented cheaper alternative media for fungal cultivation in laboratory as well as alternative for utilizing agriculture waste.

ISOLATION AND CHARACTERIZATION OF THERMOSTABLE UREASE PRODUCING ORGANISM

CHIRAG PATEL1, RAVIPURI GOSWAMI1, PINAKIN DHANDHUKIA1 AND JANKI THAKKER2

1Ashok & Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, Sardar Patel University, New Vidyanagar, Anand, Gujarat, India
2Department of Biotechnology, P.D. Patel Institute of Applied Science, CHARUSAT, Changa Anand, Gujarat, India

Ureases are widespread in plants, fungi, and bacteria. Urease has wide applications in agricultural as well as medical field. In the present study, extracellular urease producing strain EU1 was isolated from soil near costal region of Dhuvaran using urea agar plate amended with phenol red indicator. EU1 was gram negative rods arranged in diploid and chains. Growth of EU1 showed lag phase for initial 8 hours followed by exponential growth which continues till 32 hours. Maximum Urease production (42 units/ml) was detected at 24 hours in Urea broth. Optimum temperature and pH for the growth were found to be 37°C and pH 7 respectively and urease enzyme production by EU1. Optimum temperature and pH for urease enzyme production was found to be 30°C and pH 7 respectively. Optimum temperature and pH for urease enzyme activity was found to be 37°C and pH 5 respectively. Urease enzyme was stable at higher temperatures for about 120 min. Urease enzyme successfully concentrated 2 fold using cold concentration method. Km and Vmax of urease enzyme was found to be 0.4 [redacted] and 0.11 [redacted]/ml/min respectively. Enzyme concentration dependent co-precipitation of calcium was also observed.

PRODUCTION SCALE UP OF AZOTOBACTER ON AGRO-INDUSTRIAL WASTE.

PATEL K.T*., VYAS. R.V. AND SHELAT H.N.

Department of Microbiology, B. A. College of Agriculture,
Anand Agricultural University, Anand – 388 110, Gujarat (India)

Azotobacter is free living nitrogen fixing diazotrophic bacteria are able to provide 20-25 kg of nitrogen per hectare in neutral to alkaline soil. Due to its market value and demand by farmers, it requires to establish protocols for large scale production in industrial fermentor using agro industrial wastes . Conventional biofertilizer technologies to cultivate Azotobacter using chemically defined medium are governed by the cost and availability of a suitable carbon source/s. Mass cultivation of Azotobacter was attempted on different agro-industrial wastes viz. molasses, tomato, CSL, banana and rice in solid or liquid forms. Optimization of different wastes and their combinations was conducted in 250 ml flask on shaker in laboratory. The best combination banana pseudo stem waste + tomato pulp waste gave 5.2 X 1010 CFU/ml after 1 week. Same combination was scaled up in 25L fermentor at parameters 30±2˚C, 250 rpm and 7.2 pH, 4-6 psi O2 kg/cm2, which also yielded 1.8 X 1010 CFU/ml indicating good scope of agricultural waste for mass production.

BIOSYNTHESIS OF CDS QUANTUM DOTS USING A GLUCONOBACTER SP.

BHAVIN PATEL1, DHAVAL PADHYA1, PINAKIN DHANDHUKIA1*, JANKI THAKKER2

1Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, New Vidyanagar, Anand, Gujarat, India
2Department of Biotechnology, P. D. Patel institute of Applied Sciences, CHARUSAT, Changa, Anand, Gujarat, India

Present study is the first report for the use of Cd resistance organism for nanoparticle synthesis as far as our literature survey. Cd resistant cultures were isolated from the soil samples collected from surrounding the chemical polluted zone at Naroda GIDC, Ahmedabad. One culture was selected for further experimentation based on highest Cd tolerance and identified belonging to Gluconobacter sp. based on biochemical tests. Physicochemical parameters for biosynthesis of CdS quantum dot were investigated UV-Visible spectrophotometer by tracking surface plasmon resonance of CdS. It was found that the quantum dot size was dependent on the pH of the medium. High monodispersity has been observed on all pH. CdS quantum dots were further characterized using XRD and FTIR. The particle size distribution of nanoparticle confirms the size of quantum dots were 1.926, 0.638, 1.415 nm in reaction pH 5, 7 and 9 respectively. The results clearly indicate that biological synthesis of quantum dots is green alternative to chemical process with excellent control in monodispersity and size.

PRODUCTION AND PARTIAL CHARACTERIZATION OF EXTRACELLULAR POLYMERIC SUBSTANCE (EPS) FROM YEAST STRAIN DHM1

DEVANSHI PATEL, MARGI DAVE AND HILOR PATHAK*

Department of Microbiology, P.D. Patel Institute of Applied Sciences, Charotar University of Science & Technology (CHARUSAT), Charusat campus, Changa – 388 421, Gujarat, India

Microbial extracellular polymeric substances (EPS) are the renewable and the most significant group of polymeric materials. The diversity exhibited by the chemistry and structure of EPS bestow on them the diversified roles in various fields like microbial ecology, medicine, dairy industry, biofilms, etc. depicting their biotechnological significance. Despite their ubiquitous distribution, a great lack of knowledge exists on the EPS production using yeast cells. Here, we describe the extraction and partial characterization of EPS from the yeast strain DHM1. The capsule staining of the yeast strain DHM1 confirmed the presence of EPS as cell bound capsule. The EPS was extracted using pre-chilled acetone. The time course profile of EPS production revealed that maximum production (17.9 g/L) from yeast strain DHM1 was achieved after 48 h of incubation. The chromatographic analysis of the hydrolyzed EPS depicted the presence of aldopentose and amino acid moeities. The FTIR spectrum of the native EPS confirmed the presence of sugars and amino-acids. The extracted EPS depicted a viscosity of 82.3 (mPa.s) at a shear rate of 1 s-1. The extracted EPS portrayed non-Newtonian behavior in the range of 1 to 800 shear rate (s-1) while it exhibited Newtonian behavior from 800 to 3000 shear rate (s-1). To the best of our knowledge, this is the first report depicting EPS production using yeast cell.

BIOSYNTHESIS OF GOLD NANOPARTICLES USING FUSARIUM OXYSPORUM F.SP. CUBENSE

PRANAY DALWADI1, PINAKIN DHANDHUKIA2 AND JANKI THAKKER1

1P.D.Patel Institute of Applied Science, CHARUSAT, Changa
2Ashok & Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, Sardar Patel University, New Vidyanagar

The development of reliable processes for the synthesis of silver nanomaterials is an important aspect of nanotechnology today. In the present study, extracellular synthesis of gold nanoparticles was investigated using a plant pathogenic fungus Fusarium oxysporum f.sp. Cubense (Foc). It was found that aqueous gold ions was reduced by Foc strain in solution when exposed, thereby leading to the formation of gold hydrosol. The effect of the reaction time on the gold nanoparticle biosynthesis has been reported using UV-visible spectrophotometert. The characterization was carried out using visible observation, U.V visible spectrophotometer, FTIR, and Particle size analyzer for biosynthesis of gold nanoparticle. The gold nanoparticles synthesized were in the range of 20–40nm in dimensions. Gold nanoparticles are used as tagging agent as well as antimicrobial agent. The potentialities of biosynthesized gold nanoparticles as antibacterial agent was assayed and found to be effective against Staphylococcus aureus and Pseudomonas sp.

FERMENTATION PROTOCOL SETUP & DEVISING MASS PRODUCTION TECHNOLOGY IN LABORATORY & PILOT PLANT FERMENTOR.

R. V. VYAS *, H. N. SHELAT, D. G. GUPTA AND Y. K. JHALA, H. K. PATEL

DBT project on PGPR Department of Microbiology,
Anand Agricultural University, Anand-388110 (Gujarat)

Different agricultural wastes were tried as cheap C & N sources (feed stock) *viz.* molasses, corn steep liquor, casein, tomato, potato and banana waste as substrates in combinations of 10 gm keeping C:N content approximately 3:1 and mixed with 70 ml water for mass multiplication of PGPR cultures and incubated at 28±2˚C on shaker at 80 rpm up to 7 days. At harvest, cell count (spore/cysts including cells) was carried out microscopically using Neubauer's chamber. In all combination tested, synthetic media showed the highest microbial count in microscopic observation as well as plate count on respective medium for the organism. Among all wastes combinations tested CSL+ Potato+ Banana showed better response as compared with other combinations in terms of higher microbial count.

"DETECTION OF CRY GENE FROM NATIVE BACILLUS THURINGIENSIS ISOLATES"

AMIN RAHUL R., PRAJAPATI RONAK* AND VYAS, R. V.

Department of Microbiology, B. A. College of Agriculture,
Anand Agricultural University, Anand – 388 110, Gujarat (India)

Bacillus thuringiensis (B.t.) is a gram-positive, spore forming, soil bacterium which produces different insecticidal crystal proteins encoded by cry genes are effective tool to control insects, mites, nematode etc. Native isolated of B. thuringiensis (CT-1 ,CT-2,TOB-1) recovered from farms of A.A.U check with Standard strains of B. thuringiensis Bio var. kurstaki Btk and HD-73. All the isolates were subjected to PCR using general and specific primers of different cry genes. PCR products were electrophoresed on 2 % agarose gel. All the isolates showed presence of cry1 gene. All three B.t. isolates showed presence of cry1A and cry1Ac genes. Standard B.t.k.HD-1 and HD-73 showed presence of cry1, cry1Aand cry1Ac.From all three isolates including standards, cry protein extraction and estimation was carried out. The data showed that the concentration of protein was ranging from 1.41 to 1.92 mg/ml. Isolate CT-2 gave maximum protein concentration (1.79 mg/ml), while isolate CT-1 had minimum (1.41 mg/ml) with respect to standard B.t.k. HD-1 (1.92 mg/ml).

MICROBIAL PRODUCTION OF CAROTENOID: FERMENTATION PARAMETERS, ANTIOXIDANT ACTIVITY AND ANTIMICROBIAL ACTIVITY

KRUPA PATEL1, PINAKIN DHANDHUKIA2 AND JANKI THAKKER1*

1 P.D.Patel Institute of Applied Science, CHARUSAT, Changa
2 Ashok & Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, Sardar Patel University, Anand

Carotenoids are orange to yellow color tetraterpenoid pigment present in plants, algae, fungus and some bacteria. The aim of present the study was isolation and identification of carotenoid producing microbial strain from marine source. We have studied the environmental factors like media, pH, temperature, sugar and aeration and optimize it for higher production. Microbial cells produced higher pigment in media- Marine broth (MB) 1/10, pH-7, temperature-27ºC, sugar- sucrose, and when incubated at static condition. The intracellular pigments were extracted by cell lysis method and it showed best solubility in methanol as solvent as compare to ethyl acetate, chloroform, acetone and hexane. Pigment purification and characterization was done by using chromatography technique, UV-Visible spectroscopy and FTIR. After purification, four different bands were obtained; the maximum absorbance was A456.8. By comparing results with standard β-carotene, it was concluded that pigment was carotenoid. Now-a-days carotenoids are used as neutraceuticals due to their antioxidant activity. Carotenoids mainly serve as source of vitamin A (α-carotene, β-carotene and β-cryptoxanthin), increasing the functioning of immune system, preventing the cell from damage due to their antioxidant effect, so they are mainly use in food and pharmaceutical purpose. Crude pigments and microbial cells also secrete certain extra cellular compound have antimicrobial activity against Escherichia coli, Bacillus megaterium, Bacillus cereus, Bacillus subtillis, Enterobacter aerogenes, Staptococcus pneumoniae, and Pseudomonas aeruginosa

SPECTROPHOTOMETRIC METHOD FOR SIMULTANEOUS ESTIMATION OF 11β,17α-DIHYDROXY-4-PREGNENE-3,20-DIONE-21-O-SUCCINATE BIOCONVERSION PRODUCTS

RAHUL PATEL1 & KIRTI PAWAR2

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Methods based on liquid chromatography, combination of gas chromatography and mass spectrometry, have been widely used by several workers for separation and quantification of individual 17-ketosteroids. These methods are time-consuming and involve sophisticated instrumentation. Steroid bio-conversion products give chromogens with sulphuric acid that show absorbance at different wavelengths. Based on this concept it was decided to develop a simultaneous estimation method. Nutrient broth medium was inoculated with actively growing culture of by Pseudomodas putida MTCC 1259. After 24 hr growth, precursor steroid was added and bioconversion medium extracted with ethyl acetate after every 24 hr and subjected to thin layer chromatography for following the accumulation of products. The precursor was completely degraded within 96 hr and the bioconversion medium showed only two products after 120 hr. The products were isolated by preparative thin layer chromatography and crystallized. Simultaneous equation method, for estimation of the two bioconversion products of hydrocortisone succinate has been developed using sulphuric acid chromogens. This method could be applied for monitoring the progress of bioconversion of 11β,17α-dihydroxy-4-pregnene-3,20-dione-21-O-succinate to a 17-ketosteroid by Pseudomodas putida MTCC 1259. The products were characterized by infrared spectroscopy.

EFFECT OF 9- ALPHA-HYDROXYLASE INHIBITORS ON CHOLESTEROL SIDE CHAIN CLEAVAGE BY SOME MICROORGANISM

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A screening of various microbial strains for side chain cleavage of cholesterol was attempted. Many microorganisms were found to utilize cholesterol as sole source of carbon and energy. The main aim of microbial cholesterol side chain cleavage is to produce 17-ketosteroids by bioconversion which can be converted into many pharmacologically active compounds. Use of 9-alpha-hydroxylase inhibitors in the cholesterol bioconversions is recommended for accumulation of 17-ketosteroids. The inhibitors used in the present investigation were iso-propanol, cupric chloride and 8-hydroxy quinoline . The effect of concentration and time of addition of inhibitors was studied. The parameters were studied Mycobacterium fortuitum van fortuitum MTCC 951 , Arthrobacter MTCC 4294 , Pseudomonas Putida MTCC 1259 and Nocardia MTCC 1534 and products produced were analysed with the help of thin layer chromatography. The extracts of bioconversion medium in organic solvents were subjected to Gas chromatography and peaks of bioconversion products analysed by Mass spectroscopic methods. The results clearly indicated modification in the precursor molecule which needs further analysis by IR and NMR spectroscopic methods to determine the structure of the degradation products.

ANTIMICROBIAL SPECTRUM OF SOME MEDICINAL PLANTS TOWARDS HUMAN SKIN PATHOGENS

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Plants have always been source of medicines. There has been revival of great interest in medicinally important plants. This is because of increased awareness of the limitations of synthetic pharmaceutical products to control major disease. Plants produce diverse range of bioactive molecules from its different parts like leaves, stem, latex, bark, root, flower, seed, fruit etc Especially plant extracts have great potential as antimicrobial compound against pathogenic microorganisms that can be used to treat infectious diseases.. Plant synthesizes large number of secondary metabolites; they may serve as future reservoir of novel drug and therapeutic agents. Many of these metabolites have been observed to be active against skin diseases. The present study was undertaken to screen locally available medicinal plants for their growth inhibiting activity against human skin pathogens. In this work, mainly phytochemical constituents present in the potential plants extract were characterized by qualitative analysis, thin layer chromatography and TLC-bioautography. The antimicrobial sensitivity assay of plant extracts against skin pathogens were also carried out. The plant materials were sequentially extracted using hexane, ethyl acetate, methanol, distilled water and then used for antimicrobial assay. The results of sensitivity of skin (SA, SP, PA and CA) were assessed by visualizing the presence or absence of inhibition zone and measuring the zone of diameter. Some of the medicinal plants selected in this study are potential source of antimicrobial agents. Comparatively good inhibitory activity of methanolic and ethyl acetate extract of Rubia cordifolia against Candida albicans and its subsequent phytochemical screening indicates presence of multiple bioactive substances. But, further chromatographic and spectroscopic characterization of these substances is required for their potential as antimicrobial agent against human skin pathogens.

DEVELOPMENT OF THIN LAYER CHROMATOGRAPHIC METHOD FOR SEPARATION OF CHOLESTEROL AND ANDROSTADIENEDIONE

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Thin layer chromatography has been used for the analysis of natural and synthetic steroids in various environmental materials. This study focuses on steroid analysis, mainly cholesterol and ADD.Thin-layer chromatography (TLC) continues to be an important method for qualitative analysis of steroids because of its inherent advantages like cost effectiveness, rapid and simultaneous multiple sampleanalysis. Cholesterol is an amphipathic molecule andis the major source of the steroids. ADD is an essential intermediate to host the steroid based product and belongs to the 17-ketosteroid family. Both ADD and cholesterol show similarities in structure, solubility,mobility, formation of color spots and Rf value in the organic solvents used as a mobile phase in thin layer chromatographic technique. Techniques used such as gas chromatography, HPTLC, IR, NMR to separate ADD and cholesterol were very difficult and expensive. So optimization of different mobile phase system of TLC for the separation of ADD and cholesterol was necessary. TLC was carried out on glass plates coated with 25% silica gel G and samples were loaded with capillary actions.Mixtures of different organic solvents were usedto optimize the mobile phase to achieve the maximum separation of ADD and cholesterol. Organic solvents used were taken in different proportions. Combinations of organic solvents selected were benzene:ethyl-acetate, acetone:hexane, benzene:ethyl-acetate:acetone, benzene:ethyl-acetate:methanol and benzene:ethyl-acetat:hexane.

Section:

ENVIRONMENTAL SCIENCES

COMPARISON OF SOLID SUBSTRATE AND LIQUID MEDIA USED FOR FORMULATION OF TRICODERMA VIRIDE

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Trichoderma viride has been widely used as antagonistic fungal agents against several pests as well as plant growth enhancers. In the recent years, the environmental contaminations caused by excessive use of chemical pesticides are substituted by bio-pesticides to control plant pests and plant diseases. Trichoderma viride is a potential fungal biocontrol agent against a range of plant pathogens. There are several media used for production of Trichoderma viride like:-Substrate used to produce Trichoderma viride by solid state fermentation:-Gram, barley seed, and millet and liquid media such as PDA Composed, PDA (Hi media), Sabouraud Dextrose Agar (SDA), Czapek dox agar. The advantages of Solid Substrate fermentation (SSF) in various processes are found to be greater than in submerged fermentation. This technique not only decreases the cost of the process but also makes product cheaper for consumers. Tricoderma viride is so popular that its commercial formulations are available for field application in India.

USE OF COCONUT WASTE AS FUNGAL GROWTH MEDIA

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Every year thousands of tonnes of agriculture waste is produced. Some wastes, being biological, are easily degraded. Whereas, some waste, in spite of being biological, cannot be easily degraded like green coconut shell, banana stem etc. Though some waste can be used as animal feed but waste like coconut shell can't be used as animal feed also. Therefore, we have used Coconut shell waste for preparation of fungal growth media using test organisms Fusarium oxysporum, Aspergillus niger, A. oryzae. Coconut shell was assayed for its elemental analysis and several additives such as daxtrose, maltose and sucrose as carbon source. In initial screening of medium component through conventional method, it was found that sucrose was preferred as carbon source, followed by dextrose and maltose which gave maximum dry mycelial weight (DMW) of all three fungi. Higher concentration of coconut (6.6gm/l) along with amendment of nitrogen source in solid media were produced equal zone compared to standard media like PDA, SDA, CDA for A. niger and A. oryzae. When tested in liquid medium, similarly nearly equal amount of biomass produced. For further optimization eleven factors for finding significant additives with coconut shell were screened using Plackett-Burman design. Out of 11 independent factors, dextrose and urea were most significant as carbon source and nitrogen source respectively. Followed by response surface methodology resulted in final composition of coconut shell dextrose medium (CDM). The final composition of media was tested against PDB, a routinely used media for cultivation of fungus, which similar DMW (6.08gm/l). This study showed prominent fungal growth by supplementing waste coconut shell with dextrose or agar media. Thus, supplementing agricultural waste along with available growth media can provide result oriented cheaper alternative media for fungal cultivation in laboratory as well as alternative for utilizing agriculture waste.

MICROBIAL DECOLOURIZATION STUDY OF REACTIVE DYE BLUE 3R

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Synthetic dyes are widely used in different industries ranging from food, textile production, printing and pharmaceuticals. The majority of these dyes are recalcitrant. They are resistant to be decomposed by conventional treatment technologies. The aim of present study is to examine the potential of bacterial culture for decolourization of textile dye. The efficient bacterial strain DJ 1 can decolourize Reactive dye Blue 3R (100 mg l-1) under static condition. In present study 94% decolourization was observed at pH 7 and at 37˚C within 28 h with 0.1% Glucose, 0.5% Yeast extract and 0.5% NaCl concentration. This decolourization potential increased the applicability of this micro-organism for the dye removal. The degradation study was analyzed by TLC, UV-Visible and FTIR. Decolorized sample shows 61% reduction in the COD. Sodium alginate immobilized cells were utilized for the same application and same extent of decolourization was obtained up to 5 cycles after repeated addition of dye Reactive Blue 3R 100 mg l-1.

STUDY OF LIQUID FORMULATIONS & NITROGEN FIXING CAPACITY OF AZOSPIRILLUM LIPOFERUM & AZOTOBACTER CHROCOCCUM

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Nitrogen is one of the major and important elements required for plant growth. In spite of hazardous agrochemicals like chemical fertilizer; use of PGPR is the better and greener option. *Azospirillum lipoferum* as a microaerophilic free living nitrogen fixing bacteria has been proved as a Nitrogen fixing bacteria for cereals and grasses however, *Azotobacter chrococcum* is an aerobic free living nitrogen fixing bacteria for cereals and vegetables. NFb medium is used to grow *Azospirillum lipoferum*. *Idetification of* both strain was done by various biochemical tests. Nitrogen fixing capacity of both cultures was checked in pot and field study with various plants like rice, maize and bajri. In pot analysis, *Azospirillum lipoferum and Azotobacter chrococcum* coated seeds of maize and bajri showed higher growth in comparison with various controls. Four different liquid formulations were tried to check the stability and activity of both strains

BIODEGRADATION OF TURQUOISE BLUE DYE BY BACILLUS MEGATERIUM ISOLATED FROM INDUSTRIAL EFFLUENT

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Bacterial cultures isolated from soil have the capacity to decolorize and degrade the textile dyes. The present study was conducted to investigate the decolorization and degradation of textile dye effluent by using bacteria isolated from textile dye containing soil. The isolated bacterial species was identified as *Bacillus megaterium*. The bacterial inoculum was inoculated into flask containing Turquoise blue dye(1mM) with Glucose Peptone Yeast Extract (GPY) medium and then sterilized and incubated for a week. The decolorization was expressed in terms of percentage decolorization. The bacterial culture exhibited 85% decolorization ability within 1 week. Maximum rate of decolorization was observed when glucose and NH4Cl were supplemented in the medium. The decolorization was determined by HPTLC method.

TRANSFORMATION OF GROUNDNUT - ARACHIS HYPOGEA L. VAR. GG20 WITH THE COX GENE- AN ATTEMPT TO DEVELOP SALINITY TOLERANCE.

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Salinity is one of the most serious environmental factors limiting the productivity of crop plants (Ashraf, 1999). Agricultural productivity in the world is threatened in about 77 million hectare of agricultural land of which 45 million hectare is irrigated and 32 million hectare land is non irrigated (Munns, 2002). This problem is very relevant to the state of Gujarat due to its long coast line.

Groundnut (Arachis hypogea L.) is one of the most important cash crops of Gujarat. The seeds of the plants are rich source of oil, used as food, fodder and also increases the soil productivity by fixing the atmospheric nitrogen. Gujarat is the highest producer of Groundnut in the country. However, its cultivation faces challenge of increasing levels of soil salinity in the costal region of the state.

An attempt was made to develop saline tolerance in Groundnut var. GG20 using the bacterial cox gene through Agrobacterium mediated transformation. The Agrobacterium tumefaciens strain LBA 4404 carrying binary vector pHS724 was co-cultivated with different groundnut explants under dark condition for five days. Binary vector pHS724 includes gene of interest cox gene, nptII gene and the uidA (GUS) gene which represents the eukaryotic reporter gene.

After co-cultivation, the explants were inoculated on MS medium containing respective growth hormones.and cefotaxime (antibiotic) to eliminate extra growth of Agrobacterium. The cultures were sub-cultured on respective medium containing cefotaxime and kanamycin for selection. After 2-3 cycles of sequential selection, the plantlets were transferred on root induction medium. The rooted plants were further transferred on to respective medium containing different concentration of NaCl. The transgene integration was confirmed by in situ GUS assay where the the GUS positive regenerants showed the typical indigo blue colouration of X-Gluc treatment. Transgenic plants so raised showed saline tolerance up to 150mM NaCl concentration.

STATUS OF HYDRO-BIOLOGICAL PARAMATERS OF SEWAGE FED KHODIYAR WETLAND OF ANAND DISTRICT

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The phytoplankton primary productivity, biomass and species were studied on Khodiyar wetland, Anand, Gujarat. The ponds were set up to promote the integration of biomass and phytoplankton primary productivity in the surrounding area and increase phytoplankton production. The wetland is shallow and sewage fed. The wetland Khodiyar had high pH on average of 7.8. DO concentration was found higher in cooler months compared to other seasons might be due to the temperature variation which shows inverse relationship with water temperature. The water was alkaline during entire study period and free CO2 was found highest in the month of August and lowest in June. The bicarbonates dominated over chlorides and sulphate. Mg hardness was more as compared to Ca hardness. The nitrates and phosphates of sewage -fed waters were found to be highest during summer months and least in rainy season. The phytoplankton primary productivity was high. The main limitation to the productivity was light due to the low turbidity and high nutrients levels in the wetland. Ponds nutrients are also influenced are also by the sewage from the wetlands. The biomass was also high and chlorophyll a was influenced by the low turbidity.

EFFECT OF SOME ENVIRONMENTAL CONDITIONS ON BIOCONVERSION OF 11B,17A-DIHYDROXY-4-PREGNENE-3,20-DIONE-21-SUCCINATE BY PSEUDOMONAS PUTIDA MTCC 1259

JAY JETHVA

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Steroids constitute a particular class of lipids characterized by a typical tetracyclic skeleton, composed of one five-member ring and three fused six-member rings. Steroids are widely used as therapeutic agents and since their inception in the market, research efforts have been made in order to improve production processes as well as to develop novel synthetic molecules, with enhanced efficiency and reduced side effects. The present work is on corticosteroid. The corticosteroid used in this research work is 11β,17α-dihydroxy-4-Pregnene-3,20-dione-21-succinate.

The term bioconversion refers to the use of live organisms often microorganisms to carry out a chemical reaction that is more costly or not feasible non-biologically. These organisms convert a substance to a chemically modified form. Various kind of bioconversion, such as hydroxylation, dehydrogenation, isomerisation and hydrolysis are now routinely performed at an industrial level utilizing wide variety of microorganisms. The amazing versatility of microorganisms in the transformation of steroid provided an important theoretical background for the application of microbial enzyme to chemical synthesis. An attempt was made to cleave the side chain of the precursor corticosteroid by growing cells of Pseudomonas putida MTCC 1259. The effect of various environmental conditions on bioconversion of 11β,17α-dihydroxy-4-pregnene-3,20-dione-21-succinate was optimized. The organism was found to optimally convert the precursor at pH 7.5, temperature 37º C at 50 µg/ml concentration. Other parameters optimized were time of substrate addition and medium composition. The product accumulated was analysed by TLC, GC and Mass spectroscopic methods.

BIODETERIORATION OF PESTICIDES

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Pesticides are widely used as insect and pest management for enhanced crop production. It's toxicity to other forms of life risk the ecological balance. Biodegradation of pesticides is an example of low cost and eco-friendly removal of contaminant from contaminated sites. Environmental isolates JA1, JA4, KA2, KA4, KhA2, KhA4 have been isolated using minimal media supplemented with different pesticides (Dichlorvos, Chlorpyrifos, Endosulfan). The chemotactic respose of microbes in chemical-in-plug assay as well appearance of turbidity in minimal media indicated microbial response towards pesticides in question. The analysis of intermediate chemical compound is underway using Gas chromatography - Mass Spectroscopy. The potentiality of these isolates can be harnessed to reduce the pesticides related environmental threat.

STUDY OF PHYSICO-CHEMICAL PARAMETERS OF RIVER VISHWAMITRI

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River Vishwamitri, a seasonal river, flows east to west between Mahi and Narmada rivers in Gujarat, India. It originates from Pavagadh, flows through Vadodara city and empties itself into gulf of Khambhat. As it flows through Vadodara, the river was subjected to drainage of city's sewage and effluent from nearby industries. Water sample from different stations have been collected and various Physico-chemical parameters like turbidity, EC, BOD, COD, TS, TDS and TSS have been analyzed. Out of six stations evaluated TS was found to be 800ppm at talsat, DO was found nil except the starting point, BOD was 156 mg\L at Bhimnath bridge while COD was 900 mg\L at Sama Bridge followed by Total Hardness, found to be 352 mg\L at Kalali. As the River flows across the city, study indicated higher conc. of studied environmental parameter. It can be concluded that the disposal of urban domestic sewage in the river was the major cause of pollution which could effect the Riverine life and public health across the bank.

ENDOPHYTIC BACTERIA AS PGPR FOR MAIZE (ZEA MAYS L.)

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Endophytic bacteria *viz. Acetobacter* and *Azospirillum* residing within living plant tissues without substantially harming plants have found a large number of applications in today's agriculture such as nutrient cycling, tolerance to biotic and abiotic stress as well as promotion of plant growth. In present study, endophytic bacteria mainly belonging to genera *Acetobacter* and *Azospirillum* were isolated from surface sterilized plant parts of species *Cynodon dactylon* (Durva), *Pothos scandens* (Money plant), *Ipomea batata* (Sweet potato), *Saccharum officinarum* (Sugarcane) *cv.* CO.LK-8001 and CO.-84135, *Musa paradica* (Banana) and *Zea mays* (maize) *cv.* GM-6 by using LGIP and NFB selective media, respectively. All the isolates can colonize maize endophytically under laboratory conditions, where in isolate A-5 found best. *In vitro* nitrogen fixation rates of all the isolates ranged from 4.0 to 36.3 mg N fixed / gm of sugar consumed. All the isolates were also capable of solubilizing tri calcium phosphate in Pikovskaya's broth and the rates. Seed and soil inoculation of all the isolates significantly influenced growth of maize *cv.* Narmada moti in pot experiment during Kharif 2008 and yield of maize *cv.* Narmada moti in field experiment. Among all isolates, A-10 was found superior over all other isolates. However, seed inoculation was giving better results than soil inoculation.

CAREER IN LIFE SCIENCES

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Life Sciences which started with the study of plants and animals have now acquired a big dimension in the form of the study of crops and insect pests of crops , fruits and vegetables, medicinal plants, gardening, bonsai, mushroom cultivation, silviculture, aquaculture, cattle farming, piggery, poultry, insect culture including apiculture, sericulture, and lac culture, etc. The above studies are helpful in making us available our basic amenities of life named as food, shelter and clothing and also making us healthy and civilized. But the ever increasing population is imposing serious constraint on our resources and development. Because of shortage of food grains and other food items such as milk, fruits and vegetables, the inflation is rising day by day. Because of changes in life styles and nutritional problems, there are reports of different kinds of diseases and health problems to humans and animals. Non-scientific approach to development based on urbanization and industrialization has led to deterioration of our environment including air, water, land, forests, and wild life. The climate change and threat to biodiversity are the consequences. To counter these ill-effects and challenges medical science, pharmacology, molecular biology, biochemistry, bioinformatics, recombinant DNA technology, biotechnology, etc. have provided newer opportunities and have added new dimensions to the scope of life sciences. The development in fishing industry, prawn capture, pearl culture, ornamental fish culture, vermiculture, forensic science in crime investigation, DNA fingerprinting , single cell protein industry, secondary metabolites, sea food industry, tissue culture, monoclonal antibodies, high yielding useful plant and animal varieties, gene therapy, leather industry, fur and wool industry, disease control, environmental protection, energy conservation, etc. is making the subject more and more applied and increasing its charm to those who are willing to pursue its study.

AN ASSESSMENT OF SEASONAL VARIATION IN HEAVY METAL CONTAMINATION IN WATER AND SEDIMENTS OF RIVER SABARMATI AND KHARICUT CANAL AT AHMEDABAD, GUJARAT.

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Heavy metal contamination in river is one of the major quality issues in many fast growing cities. Ahmedabad is the seventh largest city and eighth largest metropolitan area of India, located on the bank of the river Sabarmati. The Sabarmati River is a backbone of Ahmedabad city. A total of approximately 15-20 km stretch of Sabarmati River passes through the centre of the city and acts as a source of irrigation and drinking water and as a sink for discharging urban and industrial waste water.

The objective of the present study is to assess the seasonal variations in river water and sediment quality with respect to heavy metal contamination. To get the extent of trace metals contamination, water and sediment samples were collected from five different sites along the course of Sabarmati River and Kharicut canal, in pre-monsoon, monsoon and post-monsoon seasons. The concentration of trace metals such as Chromium, Copper, Lead, Nickel and Zinc was determined using Inductively Coupled Plasma Spectrometer (ICP). The concentrations of heavy metals were found to be higher in the pre-monsoon season than in the monsoon and post-monsoon seasons in water samples. The Pollution Load Index (PLI), Contamination factor (Cf) and Degree of Contamination (Cd) in sediments was calculated to know the extent of anthropogenic pressures. The values of Cd clearly indicated very high degree of contamination at Kharicut canal (S-4: 32.25 & S-5: 54.52) and considerable degree of contamination at three sites of Sabarmati river viz; S-1, S-2 and S-3 with values 14.30, 14.42 and 17.21 respectively. Lead and Nickel could not be traced in any of the river water samples.

Section:

FOOD & AGRICULTURAL SCIENCES

EVALUATION OF PLANT GROWTH-PROMOTING YEAST AND FLUORESCENT PSEUDOMONAS FOR SUPPRESSION OF WILT DISEASE IN PIGEON PEA (CAJANUS CAJAN) CAUSED BY FUSARIUM UDUM

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A study was planned to obtain potential naturally occurring fluorescent *Pseudomonas* and yeast strains exhibiting both the activities *viz.* plant growth-promotion and biological suppression of wilt disease. Twenty seven fluorescent *Pseudomonas* and four yeast strains were isolated from the suppressive and rhizospheric soil of various ecological niches such as pigeon pea (*Cajanas cajan*), chickpea (*Cicer arietinum*) and untamed neem (*Azadirachta indica*) plantlets after enrichment. All the isolates were subjected to morphological and biochemical characterization. Two isolates; one of *Candida* species and other of fluorescent *Pseudomonas* fp-15 were selected which showed significant *in-vitro* plant growth promoting activity and no significant unsympathetic effects on the growth of each other, *Rhizobium* species as well as *Trichoderma* species were selected for further studies. During *in-vitro* studies, both the preferred isolates - *Candida* species and fluorescent *Pseudomonas* fp-15 significantly inhibited the mycelial growth of *F. udum* (60.13 % & 77.41 % respectively) and *Fusarium oxysporum* (64.13 % and 72.41 % respectively). Pot experiment with seven treatments and three repetitions showed that seed bacterization with fluorescent *Pseudomonas* fp-15 + FYM enriched with *Candia* isolate treatment exhibited a notable increase in seed germination, plant health and more significant wilt control in pot with wilt-sick (*F. udum*) soil (wilt index = 2) The consequences suggest that fluorescent *Pseudomonas* fp-15 along with *Candida* species may be applied in a specific way to attain better growth and management of wilt disease in pigeon pea.

MOLECULAR CHARACTERIZATION OF ECONOMICALLY IMPORTANT INSECT PESTS OF AGRO-ECOSYSTEMS

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γ- taxonomy continues to be the cornerstone of any pest management research or applications. It is imperative that pest organisms be identified properly so that judicious use of the literature can be made and management strategies can be designed as quickly as possible. Dr. Paul Hebert identified a gene that is common to all animals but with slight difference in each species, which gave rise to the concept of "Barcoding". Agriculture and Agri. Food, Canada have a project name, "Barcode of life". For 300 insects and mites spp. they are going to develop database of barcodes for insects. Documenting the nature of genetic variation, magnitude and distribution is necessary for understanding the behavior, response to selection pressure, structure and dynamics of different populations and management. Early detection of pest infestation is a pre-requisite for sustainable crop protection. Molecular identification is not limited by polymorphisms, sex and stage of development of target species and elucidates prevalence of bio-types. Morphological variations in the polyphagous species, due to diverse food habitat and pathogen-vector relationships can well be validated through molecular characterization. Knowledge of the patterns of genetic diversity of an insect pest population can aid in the understanding of its biology and ultimate control in an IPM system, for example it enables large scale screening of field-trapped specimens and is used to evaluate the attractiveness and specificity of pheromone traps. Within an ecosystem, genetic variation depends on gene flow, host range and time since separation. Molecular characterization helps speculating about the migratory route of migratory insects and for effective forecasting strategies for long range migratory insects. Again in some cases molecular characterization proves that gene flow between the populations is independent of geographic distance and appears to be unrestricted.

STATUS OF PREDATORY COCCINELLIDS IN AGRICULTURE

DOLA CHAKRABORTY1 AND D. M. KORAT2

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Coccinellids, known as ladybird beetles are one of the most common and easily recognizable invertebrate components of almost every terrestrial ecosystem. Species in the family are so ubiquitous and yet so sensitive to environmental conditions that they have been proposed as indicator species. This species complex also contributes to the regulation of many soft bodied insects, especially those in the order Homoptera, and is valuable in controlling the eggs and larval stages of other insects. Conservation of predatory coccinellids by habitat manipulation for eg; inter-cropping, mixed-cropping or spraying sugary materials have been tried and found successful. Bio-diversity studies in different parts of the country have proved the host and crop specificity of the ladybirds. Coccinellids are distributed worldwide and occupy all the habitats and niches of their preys. More than 4,500 predacious species of coccinellidae family have been described that comprises of approximately 300 species with 261 species of known prey record constituting 57 genera, which are predacious on various insect and acarine pests. Survey and surveillance of prey and predators have immense value in the pest management strategies and add to knowledge of predator behaviour in relation to the reproduction, population and occurrence of the pest and the crops in our country. Studies on biological parameters and morphometry helped establishing mass-culturing technology and population dynamics along with biotic potential aided in the field release projects sustaining sucking pest population below threshold levels. Safer insecticides could have been incorporated in various IPM programmes along with coccinellids, establishing promising management tools. Molecular characterization techniques promises to be very useful source of markers for maintaining colonies and tracking genes in biological control projects and in identifying species and immature stage of insects and have been tried for the predatory coccinellids upto a certain extent. After success in species identification and most commonly sequenced regions *viz;* mt-DNA and nuclear r-DNA, cytochrome oxydase-1 (CO-I, CO-II and 16S r-DNA and 12S r-DNA) barcoding of coccinellids is the next aim to be accomplished. Mass culturing technologies for the predominant species have come up with successful results hence field releases are becoming possible. Different combinations of artificial diets proved efficient in maintaining the population for artificial rearing purpose.

PRESENT STATUS OF PAPAYA MEALYBUG IN INDIA

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Papaya mealybug, Paracoccus marginatus Williams and Granara is an exotic invasive pest and has been reported to attack several host plants including many economically important tropical fruits, vegetables, ornamentals and weeds. In India, it has been recorded first time in 2008 at Coimbatore (Tamil Nadu) and subsequently spread to neighbouring states like Karnataka, Andhra Pradesh, Kerala, Maharashtra and parts of Tripura. P. marginatus is a polyphagous pest and has a wide host range of over 60 species of plants belonging to 22 families under 25 genera. Apart from papaya, this pest has also been reported on bhendi, cotton, teak, mulberry, sunflower, nerium, redgram, sweet potato, jatropha, guava, tomato, ber, coccinea, chilli, beans, brinjal, tapioca, neem, Plumeria, pepper, banana, mango, citrus, avocado, cherry, sapota and Hibiscus. Nymphs and adults suck the sap from leaves, fruits and stems which resulted in chlorosis, plant stunting, leaf deformation or crinkling and early fruit drop. Total monetary losses caused by the pest on papaya, mulberry and cassava in Tamil Nadu has been been reported Rs.435 crores. The papaya mealybug completes its life cycle within a period of one month. Prolonged drought with scanty rainfall and less number of rainy days favours faster multiplication. Dispersal occurs by wind, rain, irrigation water, birds, clothing, agricultural equipments, animals, human beings etc. Single tactic of pest control may not hold good for mealybug and hence integrated approach is suggested. Pruning of infested plant parts, removal of crop residues, weeds/alternate host plants, avoid flood irrigation and destruction of ant colonies have been suggested. Spray application of profenophos, acephate and chlorpyriphos have been found effective. Application of chemical pesticides gave only temporary relief and hence biological control has been identified as a key component for successful management of the pest. Good numbers of natural enemies have been reported on P. marginatus. The National Bureau of Agriculturally Important Insects,Bangalore launched a nation wide programme for classical biological control of this exotic invasive pest. Augmentative release of Acerophaghus papayae has been proved most effective and considered as classical biological control of the pest. It is easy to prevent the spread the mealybug by adopting certain phytosanitary measures. Avoiding the movement of planting material from infested areas to other areas has been suggested to prevent the spread of mealybug.

OXIDATIVE RESPONSE OF GROUNDNUT (ARACHIS HYPOGAEA L.) TO BENZYL ADENINE UNDER WATER STRESS

J.J. DHRUVE*, A. V. KOTECHA, POONAM, CHAUDHARY SALEHA AND D.N. VAKHARIA

Main Vegetable Research Station*,
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Field experiment was conducted during summer season to study the effect of water deficit stress and benzyl adenine on relative water content, peroxidase(POX), ascorbate peroxidase (APOX), polyphenol oxidase (PPO), catalase (CAT) and superoxide dismutase (SOD) content in groundnut cultivars viz., GG-2, GG-7 and J-11 during vegetative phenophase. The leaves were collected at vegetative stage and used for analysis. Among the cultivars the relative water content was observed highest in GG 2. The ascorbate peroxidase and polyphenol oxidase activities were recorded maximum in cv. GG-2 at vegetative stage. The maximum catalase and SOD activity was found in cv. J-11. On imposing drought the activity of oxidative enzymes were recorded maximum. The peroxidase and ascorbate peroxidase activity was further increased in the BA soaked seed treatment followed by drought treatments. While, PPO and SOD activity was recorded low in BA soaked seed followed by drought conditions. In case of the catalase activity was declined in BA soaked seed treatments followed by drought at vegetative stages.

INFLUENCE OF SEED TREATMENT OF BENZYL ADENINE ON SOME OSMOLYLTES IN GROUNDNUT (ARACHIS HYPOGAEA L.) UNDER WATER STRESS CONDITION

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Field experiment was conducted during summer season to study the effect of water deficit stress and benzyl adenine on relative water content, chlorophyll stability index, membrane injury, total soluble sugar and reducing sugars content in groundnut cultivars viz., GG-2, GG-7 and J-11 during vegetative phenophase. A split plot design consist three main plots (varieties) and each main plot was sub divided into nine sub plots (treatments). The leaves were collected at vegetative stage and used for analysis.

Among the cultivars the highest relative water content, chlorophyll stability index (CSI), praline, total soluble sugars and reducing sugars content were observed in GG 2. On imposing drought the relative water content (RWC) was declined. While the MI was increased which, resulted lower MSI under drought conditions. The chlorophyll stability index was the lowest under drought conditions. Incase of osmolytes such as free amino acids, proline, ascorbic acid, total soluble sugars and reducing sugars were accumulated in drought condition. The BA soaked seed treatment followed by drought retained more RWC and less membrane injury in leaf as compared to drought treatment alone. The retention of chlorophyll content was more with BA soaked seed followed by drought and the CSI was increased with BA soaked seed followed by drought treatments. However, the proline, Total soluble sugars and reducing sugars were higher in BA soaked seed followed by drought treatments. The ascorbic acid and epicuticular wax content was lower in BA soaked seed followed by drought.

EFFECT OF NATURAL LIQUID FERTILIZER ON GROWTH & PRODUCTION OF GROUNDNUT

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Department of Biochemistry
Saurashtra University Rajkot.

An estimated 70% of Indian arable land is rained. & about 46.5% of the annual income is dependent on the farming. This increases the usefulness of introducing low cost growth promoter as a viable alternative to high cost chemicals. Nutrients are important and crucial elements, which are required for the plant for its growth and development. To synthesize liquid fertilizer from sea weeds, to get more yields there is a great and huge stock. In the present study, decomposed sea weeds were used for growth and yield of groundnut. Liquid spray was made from decomposed sea weeds and it will use with every type of pesticides, herbicides, fungicides, etc. The results showed the 50% increase in the growth and yield of ground nut, which was sprayed with our liquid fertilizer product as compared to the normal groundnut plant. Standardization of the present product is required for further research in more and more crop.

EFFECT OF SUNLIGHT ON ACTIVE CONSTITUENTS OF ANDROGRAPHIS PANICULATA- AN IMPORTANT MEDICINAL HERB OF TROPICAL ASIA

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India is one of the greatest emporia of medicinal plants. The medicinal plants are generally grown in an open field, but the active principles of these are greatly affected by the fluctuating light intensities. Therefore, there is an upsurge need to study the effect of the natural light conditions i.e. sunlight, on the plant physiology and metabolite content in order to have quantitative yield. Andrographis paniculata, a medicinal herb was selected for present investigation to study the effect of sunlight and shade conditions. During the present investigations, several morphological changes of the plants grown under different light conditions were studied. The active principles such as ascorbic acid, total phenols, flavonoids, total lactones and andrographolides were estimated using standard methods from the plants grown in two experimental plots with different light and shade conditions. The findings revealed that sunlight had a profound effect on the growth and development of the plant. The quantitative estimation of ascorbic acid, flavonoids, total lactone and andrographolide revealed remarkable difference in plants grown in different light intensities. The ascorbic acid content was recorded 4.44 mg.g-1 FW in the sunlight leaves while in the shade condition it was 2.48 mg.g-1FW. HPLC analysis of alkaloid Andrographolide revealed that the plants grown under sunlight condition had higher concentration of the alkaloid i.e. 2.43%±0.1279 in the leaves of sunlight grown plants while minimum of 1.56%± 0.0450 during fruiting stage. In the shade condition the value was lower with 1.32%±0.1279 during vegetative stage. The results were further validated by statistical analysis such as ANOVA, Duncan's multiple test range and correlation matrix.

As the plant is used for its active principle i.e. andrographolide, present work will help in designing proper field conditions and light intensity to exploit maximum alkaloids

Section:

HEALTHCARE SCIENCES

MOLECULAR CHARACTERIZATION OF HEALTHY AND VIRUS INFECTED OKRA.

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JAYESH PATHAK1 AND NOUSHAD PARVEZ

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Okra (bhindi), Abelmoschus esculentus (L.) Moench, belongs to the family Malvaceae. India is the largest producer of Okra (bhindi) in the world. Yellow Vein Mosaic is a severe disease of the crop all over India, and is the main limiting factor in the cultivation of the crop more extensively. Marker assisted selection may enhance the results with stable virus resistant/tolerant varieties. Wild Okra varieties are resistant to yellow vein mosaic virus and may prove useful in identifying and characterizing gene(s) of interest. Fresh leaves of different varieties of okra (healthy and virus infected) were analyzed to estimate the possibility of molecular diversity which might have been arisen due to virus infection using DNA centered PCR based Random Amplified Polymorphic DNA (RAPD) markers. Considering the importance of marker system reflecting the random and conserved part of the genome, the present investigation was carried out with four groups of okra using 20 dominant RAPD primers for marker assisted selection of resistance. A rapid DNA isolation protocol using modified CTAB extraction employing PVP, Protienase K, and RNAase A that can be used for okra, using mature leaf tissues as the starting material was standardized in the present investigation. The genomic DNA samples extracted from okra leaves of different variety were subjected to PCR amplification. RAPD derived unique resistance band was observed with OPF-07 decamer and viral specific band with OPK-14 primer. The resistance specific band generated with OPF-07 might be due to some of the defense gene present. Any specific resistance band for yellow vein mosaic virus infection in Okra with OPK-07 is not yet reported in literature. We construe from the study that in case of mosaic virus infection, the viral genome might get integrated in to the plant genome and the integrated part might be present in between the site of OPK series primer resulting in polymorphism. Further investigation towards sequencing of this particular band is warranted.

EVALUATING THE ROLE OF A NOVEL PROBIOTIC STRAIN IN NEONATAL THERAPEUTICS USING A PYROSEQUENCING BASED METAGENOMIC APPROACH TO TRACK ITS TRANSLOCATION FROM MATERNAL TO INFANT GUT MICROBIOME.

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Rationale: The gut microbiome–mammalian 'Superorganism' has a big influence in the etiology and development of several diseases in man. The findings of the studies on the host microbiome interactions has revealed that the state of the gastrointestinal system of the neonate at birth has profound implications not only for well-being during infancy, but for long-term health. The sterile infant gut gets colonized with the bacteria of maternal origin. Since human breast milk leucocytes arise from cells which have migrated from the intestine to the lactating mammary gland via the lymphatics and the circulation, it can be considered that the cellular circuitry conveys microbial components in a similar manner. The transfer of maternal bacteria from her intestines to breast milk is mediated by intestinal dendritic cells that process pathogens and present them to lymphoid cells. One of the current approaches used to modulate the balance of intestinal microflora is based on oral administration of probiotics. This study hence is framed on the hypothesis that the phenomenon of bacterial translocation can be used to colonize the foetal intestine with the desired probiotic strain by maternal feeding of the probiotic strain. **Beneficiaries:** The above mentioned nutritional approach can be used to correct the GI dysbiosis in infants delivered via C section or undergoing some foetal stress. The infant can reap the benefits of the probiotic strain all through his life. **Approach:** Bacterial DNA sequencing from maternal faeces, blood, milk, and feces could be carried out using 454 Life Sciences Genome Sequencer FLX instrument based on pyrosequencing (Roche) following Titanium chemistry. Metagenomic analsyis using RDP classifier –II database server and tools like BLAST, MG-RAST, MEGAN, WEBCARMA, etc. Intervention studies on mother infant pair fed with freeze dried cultures of the established probiotic strain and quantification using real time PCR can establish the translocation.

EFFECT OF SIMULATED GASTRIC CONDITION ON PROBOTIC POTENTIAL OF ENTEROCOCCI

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Most of the probiotic strains available in the market are of western or European origin, and there is a strong need for exploring new indigenous probiotic organisms. *Enterococcus faecalis* and *E. faecium* are the most studied and frequently found organisms in various sources such as soil, water, human intestines, fermented foods and dairy products. The ability of Enterococci to survive gastrointestinal transit is one of the main characteristic desirable for probiotic activity. In view of above, the present investigation was taken up to isolate enterococci from indigenous lentils, milk and fecal samples. Out of 30 isolates 22 were confirmed as enterococci on the basis of molecular based identification. Among 22, 9 were selected on the basis of primary gastric transit tolerance (acid and bile resistance). These selected 9 isolates were evaluated for significant adhesive properties like biofilm formation, autoaggregation and cell surface hydrophobicity during gastrointestinal simulation. All 9 isolates has shown significant adhesive properties but among them some isolates like M-12-DR, M-16-DR, M-18-DR, M-19-DR, F-27-DR were having virulence traits. Thus, they cannot be further investigated as probiotics. Moreover, the above mentioned isolates were found as E. faecalis by species specific identification. But isolates F-21-DR, F-22-DR, F-29-DR and F-30-DR were devoid of any virulence activity, had significant adhesive property and identified as E. faecium. Thus, the present study suggests the screening of locally isolated enterococci has greater probiotic potentials primarily because of its acid and bile tolerance, adhesive properties during gastrointestinal simulation, bacteriocin production and less intense pathogenicity of E. faecium isolates.

MANAGEMENT OF ADVERSE DRUG REACTIONS BY INNOVATIVE SYSTEM

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Adverse drug reactions are bound to be as old as drugs. Adverse effects may cause medical complications and Complication, in medicine, is an unfavourable evolution of a disease, a health condition or a medical treatment. Adverse drug reaction is 'any response to a drug which is noxious and unintended and which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function. '

Adverse drug reactions are considered as one among causes of morbidity and mortality.Around 6% of hospital admission is estimated to be due to ADRs and about 6-15% of hospitalized patients experience a serious ADR. Detection of these ADRs is difficult.The detection of adverse drug reactions (ADRs) has become increasingly significant because of introduction of a large number of potent toxic chemicals as drugs in the last two or three decades. WHO has intervened seriously in this matter and established an international adverse drug reactions monitoring centre at Uppsala, Sweden, which is collaborating with around70countries.

The availability and use of large computerized clinical databases linked to electronic medical records (EMR) now provide facilities for the detection of adverse drug events (ADE) and also the decision support tools for clinicians to react appropriately to their detection. Our adverse drug reaction software offers a sophisticated graphical interface that allows you to model the simplest or most complex systems or processes using reliability block diagrams (RBDs) or fault tree analysis (FTA) — or a combination of both approaches.Software has been design in such way that to facilitate user with easy accessibility. Visual Basic programming language (6.0) is use as frame work and is converted into EXCEL 2007 file and CD form is made which can be operated in any computer.Software contains all ADRs and contraindication of all generic drugs. Software is under the process of copy rights. This software will help to prevent the adverse drug reactions easily.

EFFECT OF BAYLEAF EXTRACT AS AN ANTICARCINOGEN USING AMES TEST

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The Ames test is a way of determining whether a compound causes genetic mutations(changes)

Animal liver cells extracts are combined with Salmonella typhimurium bacteria.The mixture is then exposed to the test substance and examined for signs that bacteria has mutated.

Ames plate incorporation test is used for quantitative analysis of the mutagenic effectiveness of the compounds. The Ames test does not directly indicate the carcinogenic potential of the substance, however there is a good correlation between mutagen strength and carcinogen strength in rodent.

This test employs with strains of Salmonella typhimurium which have been selected based on their sensitivity to mutation. The test substance (liquid) or an extract of the test substance and the test organisms are mixed together in a soft agar solution.Reverse mutation can be observed.

In present study we have isolated the strain of Salmonella typhimurium from the blood sample of a highly infected person. The strain was tested against Bay leaf extract along with rat liver homogenate for the anticarcinogenic effect of the test sample. It was found that Bay leaf extract along with rat liver homogenate showed less number of colonies i.e 360 as compared to that of control (550)

Finally it can be concluded that Bay leaf extract acts as an anticarcinogenic agent and its use in food product is beneficial for human health. Spices because able to grow in the presence of homogenate, hence it is proved that Bay leaf which is an ingredient of garam masala acts as an anticarcinogenic agent.

PHYTOCHEMICAL SCREENING AND ANTIOXIDANT PROPERTIES AMONG LEAVES OF HIBISCUS ROSA-SINENSIS OF DIFFERENT FLOWER COLORS

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Hibiscus rosa-sinensis is known for ornamental values and also for medicinal properties. Hibiscus (Rose mallow) is a large genus of about 200–220 species of flowering plants in the family Malvaceae. Hibiscus rosa-sinensis is an attractive shrub with large, brilliantly colored flowers. Numerous varieties, cultivars and hybrids are available, with flower colors ranging from white through yellow and orange to scarlet and shades of pink, with both single and double sets of petals. Studies were undertaken for determination of phytochemical analysis and antioxidant properties present in leaves of five cultivars (Red, Yellow, Orange, Pink and White) for various medicinally important compounds and their quantification. These properties were investigated to evaluate their therapeutic potential along with wide variability. Qualitative analysis of 7 chemicals (Tannin, Phlobatannins, Cardiac Glycosides, Flavonoids, Terpenoids, Saponin and Alkaloids) indicates negative test in Phlobatannins and Cardiac Glycosides while the remaining chemicals have shown positive test. Significant findings of this work clearly indicate that the quantity of phytochemicals varies in different cultivars. Especially in red one, maximum amount of phenol has been found to be present compared to other four cultivars. Antioxidant property was measured with the help of various methods. Among these five cultivars, maximum amount of antioxidant activity was observed in the red one. In the remaining cultivars, variation has been observed. The antioxidant property observed in the present study might be useful for the development of newer and more potent antioxidants. The significance of the phytochemical constituents with respect to their role in traditional medicine treatment has been discussed. Despite the wide geographical distribution and importance of H. rosa-sinensiss, very little information's are available about its cultivars. In the present study, an attempt has been made to study the phytochemical as well as antioxidant properties present in leaves of above mentioned five cultivars. Statistical analysis also has been done along with the experimental proceedings. Probably this is the first experimental investigation carried out in the cultivars of Hibiscus rosa-sinensis.

POSTER PRESENTATIONS

Section:

MICROBIAL & INDUSTRIAL BIOTECHNOLOGY

METAGENOMICS

KHUSHBU PATEL

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The study of the collective genomes of microorganisms at their natural habitat such as soil , sea , air , human gut , ancient DNA . Metagenomics is the genomic analysis of microorganisms by direct extraction & cloning of DNA from an assemblage of microorganisms, bypassing the need to isolate & culture of individual microbial species. Analysis of 16s r-RNA genes , provides phylogenetic description of community membership , providing little insight into genetics , physiology & biochemistry of the member , ecology of environmental microorganisms , energy & nutrient recycling within the community , genome structure , gene function , population genetics . Metagenomics gives scientists access to millions of microbes that have not previously been studied. Metagenomics applied in developing microbe based tools for monitoring environmental damage & cleaning up oil spills, waste, to improve methods for detecting diseases in crops, live stock & food products. The power of microbial communities may lead to more sustainable & environmentally friendly biologically based energy source. Metagenomics also supports taxonomy & classification of microbes. Application of metagenomics is also in field of life sciences, biotechnology, and agriculture as well in microbial forensics.

RADIOACTIVE RESISTANT BACTERIA

SHRIKANT PANCHAL

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One of the most radioactive resistant organisms is Deinococcus radiodurans. It can survive under conditions like cold, dehydration, vacuum, acidic, oxidizing and electrophilic agents. So, known as a polyextremophiles and has been listed as the world's toughest bacterium in The Guinness Book Of World Records.

D. radiodurans is capable of withstanding an acute dose of 10,000 Gray of ionizing radiation causing DNA damage, with almost no loss of viability. It is also capable to growth under continuous chronic radiation (60 Gy/hour).

D. radiodurans ssb gene that codes for the largest bacterial SSB monomer identified to date (1). The D. radiodurans SSB protein efficiently stimulates its recA and also E. coli. recA protein-promoted DNA strand exchange reactions. It helps to understand the extraordinary DNA repair capacity. These bacteria can also repair many small fragments from an entire chromosome.

RecA genes from D. geothermalis and D. murrayi, bacteria that are slightly thermophilic and extremely resistant to γ-radiation, were isolated, cloned and expressed in E. coli. After production and purification, the biochemical properties of DgeRecA and DmuRecA proteins were determined and the DNA binding by those proteins is stimulated by Mg2+ ions (2).

The bacterial mercuric reductase gene has been cloned from E. coli into Deinococcus to detoxify the ionic mercury residue frequently found in radioactive waste.

The site of the recent disaster at the Japanese nuclear power plants damaged by the earthquake and tsunami; where the various cleaning methods will be used at radioactive material spread over area near the plants, might include the bacterial species, D. radiodurans, the only known bacteria able to survive high doses of radioactivity. For many years, the bacteria Thiobacillus ferooxidans has been used in copper mining operations to extract the metal from poor quality ore.

SURVIVAL OF STARTER AND PROBIOTIC CULTURES AT FERMENTATION LEVEL

RIDDHI BHATT , SHWETA VAKANI, PURVI SHARMA, SONAM KALYANI

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In the manufacture of food, there is a demand of stable and well-conditioned starter, protective and probiotic cultures. The established process for the preparation of these cultures is freeze drying as it is known to be a very gentle drying method. However, freeze drying is a lengthy and energy intensive process. Moreover, the survival of some bacterial strains is negatively affected by the freezing process . An alternative drying method is vacuum drying, which works at reduced temperatures by applying vacuum. The influence of low temperature vacuum drying process parameters on the survival, metabolic activity and residual water content of three different bacterial strains (Lactobacillus paracasei spp. paracasei, Lactobacillus delbrueckii spp. bulgaricus and Bifidobacterium lactis) was studied . In this study, Shelf temperature of organisms and chamber pressure of fermentor were varied and optimized by statastically using response surface methodology with regard to survival of organisms and its residual water content. It is shown that the survival rate of organisms after low temperature vacuum drying is comparable good than that of freeze drying of it. Based on the optimization experiments the combined influence of fermentation pH for the most detrimental and drying process parameters was studied for the best process condition. The results show that interactions between process of drying and fermentation conditions influences the organisms (Lactobacillus delbrueckii ssp. bulgaricus and Bifidobacterium lactis) but are also highly strain specific.

"CAN MICROBES BE ALIENS?"

HETU BARAD , HEERAL SHAH , JAHANVI JOSHI

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In the current issue of "the International Journal Of Systematics & Evolutionary Microbiology" , it was reported that a novel microbe named Herminiimonas glaciei was trapped more than 3 kilometres, under glacial ice in Greenland for over 1,20,000 years – may hold clues so as to what life forms might exist on other planets, - this was a work carried out by Dr. Jennifer Loveland – Curtze and the team of scientists from pennsylvania state university. The team showed great patience and had worked hard in bringing back life to microbe from dormant stage. They first incubated their samples at 20 C for seven months and then at 5 o C for further four and the half months, and the result obtained was very small purple brown colonies of bacteria . Herminiimonas glaciei is very small bacteria even smaller than bacterial standards –it is 10 -50 times smaller than E.coli . It was assumed that its small size must have probably helped it to survive in the liquid veins among ice crystals and the thin liquid film on their surfaces. Small cell size has certain advantages like more efficient nutrient uptake, protection against predators and occupation of micro-niches. It was also noted that ultramicrobacteria are dominant in many soil and marine environments. Most of the life forms on our planet earth has always consisted of microorganisms, it is reasonable to consider that it might be true for other planets also. Hence, by studying microorganisms living under such an extreme conditions on earth, may provide us an insight that what sorts of microbes could survive else where in the solar system.

Section:

ENVIRONMENTAL SCIENCES

MICROBIAL ENHANCED OIL RECOVERY

KINJAL BHATT

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Many bacteria produce biosurfactants naturally and have been exploited in attempts to cleanup oil spills also to release additional oil from depleted wells. Stephen F lucks in 2001 explained that there is inefficient oil recovery even using secondary recovery techniques. Use of chemicals including solvents and surfactants which reduce the interfacial tension between the trapped oil, however solvents are expensive. In case of thermal extraction fire flooding of tar sands; is expensive and is claimed to consume upto one third of every barrel produced. Many species consume oil as sources of carbon in the presence of other nutrients producing methane and carbondioxide. The MEOR (microbial enhanced oil recovery) was patented(1) using Desulfovibrio in situ, anaerobic Clostridium that produces gases, short chain fatty acid, alcohols, and surfactants respectively. Also injection of microbes with suitable nutrients as molasses into oil bearing formation under laboratory conditions. Yarbrough and Coyt, Using Clostridium acetobutylicum and beet molasses achieved successful increase in oil production in situ. By microbial treatment Douglas could recover an average of 32% more residual light crude than waterflood recovery. (2) The reservoir was waterflooded for 20 years, water cut was 80-90%, then TRC-322, Enterobacter and some other microbes which produce CO2, acid and soluble polymer applied to the production well, 60% of the wells showed increase in oil cut, effectiveness, Enterobacter CJF-002 producing insoluble polymers was identified in the oil field. Water cut was dramatically reduced. (3) 12 bacterial strains were isolated from Saudi crude oils. Samples were collected from bottom hole and streaked on the human blood agar as well as Mueller- Hinton agar plates, incubated overnight at 370C, two sets were examined one for aerobic and anaerobic cultures. Anaerobic plates were reincubated. Isolated cultures were propagated and subcultured. Different biochemical test were carried out based on results, 3 bacteria strains: O12, O6a, O9 were selected for displacement tests. Results show that O12 and O6a were found to produce biogases and biosurfactants. Biopolymers were produced by O9. The greatest oil recovery was obtained from actuation of indigenous bacteria by 1% molasses concentration. Continuous monitoring of surface tension, viscosity, pH and acidity is carried out. The flow control will be maintained for long time because the polymer gel once produced can survive at high temperature. The oil recovery found to be increased almost double in volume by periodic monitoring and evaluating CFU, PCR and HPLC of target organism in situ.

OIL DEGRADING MICROORGANISM IN DEEP SEA

NEHA GAJIPARA, PRIYANKA PATEL, UNNATI PATEL,VIVEKA JETLI

Ashok &Rita Patel Institute of Integrated Study & Research in Biotechnology & Allied Sciences .

Oil pollution is an marine environmental problem in deep sea which increasing importance of oil degrading microorganism. Hundreds of millions of litters of petroleum enter in marine envio environment. Hydrocarbon degrading microorganism adapted to grow and thrive in oil containing environment, have an important role in the biological treatment of this pollution ,this organism produce biosurfactants of diverse chemical nature and molecular size. These surface active materials increase the surfase area of hydrophobic water insoluble substrates and increase their bioavaibilility,there by enhancing the growth of bacteria and the rate of bioremediation.The fate of petroleum substances in the marine environment is ultimately defined by their transformation and degradation due to microbial activity,about a hundred known species of bacteria and fungi are able to use oil component to sustain their growth and metabolism. Alcanivorex is a specialist which are in low number but it blooms when oil spillage. Psychrophilic microorganism play a significant role in degrading oil in deep sea. Microorganism play significant role in degrading process because oil cleaning process by human cause lung,cardiovascular,chomosomal disease.

BIOWEAPON AND BIOTERRORISM

MOHIT JAIN, SWEETY SONI, NEHA PATEL

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Bioweapon, is the use of pathogenic microorganism like bacteria, viruses or fungi for mass destruction. Bioweapons are the ancient though very much effective weapons. First they were used in 1500-1200 B.C. Greece were victims of plague were driven into enemy land. During 4th century Scythian archers dipped their arrow tips with snake venom, human blood and animal feaces to cause wound to become infected. In recent time bioweapons are very widely used by so many countries for mass destruction. There are mainly two methods for its dispersion through air or powder forms. The mainly used agents: in bacterias are Bacillus anthracis and Vibrio cholerae. And in fungi Coccidioides immitis for viruses Congo-crimen haemorrhagic fever viruses. The effect of Bioweapon on human body are by three means. It may be inhalation, or cutaneous or gastrointestinal. Bioweapons have advantages over conventional weapons like it is cheap, effective in very low quantity. Bioweapons also have some disadvantages like bioweapons are unpredictable. Though Bioweapons are dangerous, can be diagnose and treated by antibiotic therapy.

BIO ABSORBENTS

-curing souvenirs…

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Bio absorbents are natural living things carried out the process known as bioabsorption which utilizes the inexpensive dead biomass for absorption of heavy metals which are toxic and absorb heavy metal ions from the environment and carries out detoxification and decomposition process in the environment. Various examples of such absorbents are efficient microbes, algae, macrophytes, terrestrial plants and opuntia. They help in improving the process technology for recycling the waste materials like plastics, paper, rubber and textiles and the positive effects on the livestock waste and effluent into lagoons and rivers led to the use of efficient microbes for environmental purposes: from land/soil remediation to water purification and also included cleaning polluted waterways, lakes and lagoons, municipal wastewater treatment plants, and landfills/dump sites.

SURFACE-DISPLAY TECHNIQUE FOR ENVIRONMENTAL REMEDIATION AND BIOFUELS PRODUCTION

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Surface display is a powerful technique that uses natural microbial functional components to express proteins or peptides on the cell exterior. Cells with surface display are used as biocatalysts, biosorbents and biostimulants. Inorganic pollutants, such as heavy metals and radionuclides, are recalcitrant and do not disintegrate. Therefore, sequestration and/or immobilization are ideal remediation strategies. Organic compounds degrade through microbial-mediated or chemical processes. However, certain anthropogenic chemicals that do not exist in nature are recalcitrant because no naturally occurring enzymes break down these compounds. Biocatalysts based on surface-display enzymes could improve remediation efficiency of these deleterious xenobiotics by eliminating the transport barrier across the cell membrane. Microbial cell-surface display has proven to be extremely important for numerous applications, ranging from combinatorial library screening and protein engineering to bioremediation and biofuels production. By contrast, display system based on auto transporter proteins (ATs) and ice nucleation protein (INP) are excellent systems for the display of the large and complex proteins.

Section:

FOOD & AGRICULTURAL SCIENCES

PROBIOTICS IN THE MANAGEMENT OF INFLAMMATORY BOWEL DISEASE

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The intestinal flora has a conditioning effect on intestinal homeostasis, delivering regulatory signals to the epithelium, the mucosal immune system and to the neuromuscular activity of the gut. However, increasing evidence suggests that some components of the enteric flora are essential ingredients in the pathogenesis of inflammatory bowel disease (IBD); this has prompted interest in therapeutic manipulation of the flora with probiotics. Probiotics are biologic control agents— described as live microbial food supplements which confer a health benefit beyond inherent basic nutrition

Probiotics have been shown to be effective against enteric pathogens by several mechanisms. They produce bacteriocins, a diverse group of low-molecular-weight peptides produced mostly by Lactobacilli that possess antimicrobial action against a number of bacteria, especially Gram-positive bacteria. Similar substances, active against both Gram-positive and -negative bacteria, are also produced by Bifidobacteria.

There is increased investigation of the human microbiome as it relates to health and disease. Dysbiosis is implicated in various clinical conditions including inflammatory bowel disease (IBD). Probiotics have been explored as a potential treatment for IBD and other diseases. This new acceptance has been facilitated by increased understanding of the mechanisms of action by which these agents exert their beneficial effects, by the development of molecular methods for analyzing and identifying complex bacterial communities within mammalian intestines and by the construction of well-designed, controlled clinical trials of the effects of probiotics on inflammatory bowel disease (IBD).

NUTRACEUTICALS: IS IT A BRIDGING GAP BETWEEN FOOD AND MEDICINE????

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Hippocrates highlighted around 2000years ago, “Let food be your medicine and medicine be your food” The quality of life in terms of income, spending and lifestyle has improved with economic development. However, it has also thrown up a major challenge in the form of `lifestyle diseases'. The first victim of this lifestyle change has been food habits. Consumption of junk food has increased manifold, which has led to a number of diseases related to nutritional deficiencies. Nutraceuticals can play an important role in controlling them. The term “nutraceutical” combines the word “nutrient” (a nourishing food or food component) with “pharmaceutical” (a medical drug). The word “nutraceutical” has been used to describe a broad list of products sold under the premise of being dietary supplements (i.e. a food), but for the expressed intent of treatment or prevention of disease. The theory behind the mode of action of nutraceuticals is to provide functional benefits by increasing the supply of natural building blocks in the body. Replacement of these building blocks can work in two ways:

To diminish disease signs or to improve performance. The use of nutraceuticals as performance enhancers is much more common than treatment of disease.

Questions can arise whether a nutrient used as part of a treatment for a defined disease can be considered a drug, whereas the same nutrient is used to enhance health (reduce the risk of disease), can be considered a functional food or dietary supplement? This overlap shows interlinks that exist between functional foods and medicines. Which nutraceutical possess health preventing or health promoting properties and therapeutic potentials? Once identified, which limits are to be considered in order to avoid risks of health? Are combinations of nutraceuticals more effective than larger quantities of single nutraceuticals?

THE GLITTER OF THE GOLDEN RICE MUST BE REAL

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Transgenic crops are genetically modified crops that contain a gene that has been artifically inserted into crop, instead of being inserted through pollination.The gene that is inserted into the crop is called a transgene.There are various examples of transgenic crops such as Bt Brinjal,Bt Corn,Bt cotton etc.Bt rice is one of the most important crop providing additional nutrients.Colored rice is a good source of nutrient.Anthocyanins from colored rice would be consume more and consistently than those from grapes,since rice is the major staple food. GM rice can have added vitamins and minerals to help the world's malnutrition and vitamin mineral deficiency problem.The most well known GM rice is Golden rice. Components of various types of rice shows antioxidant activity and anti-inflamatory activity. Application of breeding strategies includes traditional breeding, transgenic engineering in research of new generation that possess health benefits.Golden rice is a variety of Oryza sativa rice produced through genetic engineering to biosynthesize beta-carotene, a precursor of pro-vitamin A in the edible parts of rice.Golden rice was developed as a fortified food to be used in areas where there is a shortage of dietary vitamins.The drawbacks of the golden rice is that, Bt toxin was leaked into the soil by the roots of the plants,which affecs the enzymes of the soil which increases soil acid phosphate and decreases soil urease.GE Bt rice could lead to adverse effects on the environment.Golden rice, yellowed in appearance because it is infused with the vitamin A precursor beta-carotene, could save thousands of malnourished people each year from blindness and the other vitamin A–deficiency diseases.

NON-DAIRY PROBIOTIC PRODUCTS

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There is evidence documenting the beneficial health effects of probiotic microorganisms. Also, many studies have reported that the best matrices to deliver probiotic are dairy fermented products. However, recently several raw materials have been extensively investigated to determine if they are suitable substrates to produce novel non-dairy probiotic microorganisms, and it has been found that traditional fermented foods may contain viable probiotic microorganisms. Numerous such examples can be found in the text. Therefore, the aim of this review was to investigate the utilization of probiotics in new and traditional non-dairy products with probiotic potential. It was found that while cereals have been extensively investigated to develop new probiotic foods; further research about the probiotic beneficial effects of traditional fermented products is needed.

PROBIOTIC NATURE OF ENTEROCOCCUS

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The Enterobacteriaceae microbiota, including their diversity as well as the distribution of haemolytic and virulence gene-harbouring Escherichia coli of 56-day-old healthy piglets, The majority of E. coli clones from the jejunum were also found in the colon, with up to 10 different E. coli clones in one intestinal section. Other Enterobacteriaceae species were represented by only one clone localized to one intestinal section. Novel strain of Enterococcus faecium bacterium (here in after referred to as strain PR88) which shows particular favourable abilities in colonising the human gastrointestinal system, and in alleviating symptoms of gastrointestinal disorders especially so-called "irritable bowel syndrome" (IBS). Strain PR88 confers similar benefits in cases of other severe abdominal complaints, such as so-called "inflammatory bowel disease" (IBD). , the strain PR88 can advantageously be administered to animals, especially domesticated mammals such as pigs, cattle, horses and domestic pets. Coccidiosis is the major parasitic disease of poultry and is caused by the apicomplexan parasites Eimeria. that various dietary and live microbial supplements can influence host immunity against enteric diseases prompted us to investigate the role of a Pediococcus-based probiotic on coccidiosis in broiler chickens. Performance, diarrhea incidence, and occurrence of Escherichia coli virulence genes during long-term administration of a probiotic Enterococcus faecium strain to sows and piglets. the influence of oral treatment of pigs with the probiotic bacterium Enterococcus faecium NCIMB 10415 on Salmonella enterica serovar Typhimurium DT104 infections in weaning piglets. Clinical symptoms, fecal excretion, the organ distribution of Salmonella, and the humoral immune response (immunoglobulin G [IgG], IgM, and IgA levels) in serum were examined. , fecal excretion and colonization of Salmonella in organs were significantly greater in piglets fed E. faecium.

EFFECT OF GROWTH REGULATORS ON PLANT TISSUE CULTURE

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Plant tissue culture is a practice used to propagate plants under sterile conditions, often to produce clones of a plant. Plant tissue culture first attempted by Haberlandt(1902)-grew palisade cells from leaves of various plants but they did not divide. In 1934- White generated continuously growing culture of meristematic cells of tomato. Plant tissue culture relies on the fact that many plant cells have the ability to regenerate a whole plant (totipotency). Single cells, plant cells without cell walls (protoplasts), pieces of leaves, or (less commonly) roots can often be used to generate a new plant on culture media given the required nutrients and plant growth regulators. The plant hormones are natural substances produced by plants that acts to control plant activities. They are produced in one part of a plant and then transported to other parts, where they initiate a response. They stimulate cell division and hence regulate the growth and differentiation of shoot and roots on explant and embryos in semisolid or in liquid medium cultures. The plant hormones are also known as growth regulators .The purpose of the plant hormone is to start growth, to stop growth, modify growth and development of growth. There are various types of plant hormones like Auxins, Gibberellins, Cytokinins, Abscisic acid and Ethylene. Auxins are used in cell elongation, induce cell division, apical dominance, adventitious root formation and somatic embryogenesis. Gibberellins are also used in cell elongation and cell division. It also stimulate the development flowers and cause internode stretching. Cytokinins promotes cell division, cell enlargement, stimulates differentiation of cell and delays senescence in leaves. Abscissic acid is used only for sometic embyogenesis and for culturing woody species. It induces abscission of leaves and fruits, and dormancy induction of buds and seeds. Ethylene promotes senescence and fruit ripening. Very high or low concentration of the hormones in plant may inhibit the growth.The optimum concentration of this plant hormones may vary from different plant species.

Section:

HEALTHCARE SCIENCES

TRANSLATIONAL MEDICINE: A FUTURE TRANSLATIONAL RESEARCH

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Translational medicine is process of turning appropriate biological discoveries into drugs and medical devices that can be used in the treatment of patients. In recent years, how to apply basic researchdiscoveries to the development of trials and studies in humans has attracted much attention. Such basic research is typically conducted in the laboratory, or in preclinical studies in which scientists study disease at a molecular or cellular level.

Translational medicine refers to the translation of basic scientific discoveries into practical applications.More specifically, translational research moves basic discoveries from the laboratory ("the bench") into clinical practice to diagnose and treat patients ("bedside"). Translational medicine incorporates aspects of both basic science and clinical research, and consequently forms a powerful practice that accelerates clinical research.Clinical laboratory professionals and patients, who are more directly involved in clinical practice, translational research responds to the need to obtain benefit from research, thus closing the gap between what we know and what we practice. The objective of Translational medicine to improve positive health benefits, Medicine and Treatment.

This means transferring diagnostic and therapeutic advances that have proven effective in large well-conducted trials (and are therefore evidenced-based,) to daily medical practice. Some examples of recent developments in clinical laboratory testing, including markers of cardiovascular diseases, clinical proteomics and recombinant allergens, attest to the importance of a careful evaluation of all variables allowing the introduction of such new insights into clinical practice in order to assure better clinical outcomes.

TERATOGENESIS
A WIDE SPECTRUM STUDY AND OVERVIEW OF TERATOGENIC MECHANISM

DEBAYAN BAIDYA

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Teratology is a study of congenital malformations, also referred as a discourse on prodigies of extraordinary teratoma (encapsulated tumors derivatives of three germ layers). Generally Teratogenesis is referred as birth defects occur due to consumption of certain drugs or teratogens such as alcohol during pregnancy or gestation period in mammalian embryo, the side effects of intake of such drugs that further turns to teratogens inhibits the growth of embryo leading to incomplete growth of limbs, vision problems, facial deformation etc. very known example of “Fetal Alcohol Syndrome” occurs due to the consumption of ethanol by the conceptus during gestation period. And much known disasters of “Thalidomide” drug generally used in early 1960s as sedatives turned out to be a Teratogens. The access of adverse influences to developing tissues depends on the nature of the influence. Several factors affect the ability of a teratogen to contact a developing conceptus, such as the nature of the agent itself, route and degree of maternal exposure, rate of placental transfer and systemic absorption, and composition of the maternal and embryonic/fetal genotypes. Abnormal embryo is produced due to chaotic development of teratomas. Teratogenesis is classified further on the basis of the causative factors if Teratogenesis is caused by mutation it is referred as Genetic Teratogenesis generally categorized on the basis of the penetrance (proportional effect) and expressively (degree in individual); another reason for the classification of Teratogenesis is due to the effect of the environmental factors, almost any factor can be teratogenic whether biological or non biological for example physical factors. chemical teratogens mentioned factor are categorized to be the cause of Environmental Teratogenesis; these congenital has became very common in the last century but yet there is not accurate treatments available and even mechanism of some teratogen is not yet known, and therefore it is a biggest challenge to the life science

ROLE OF AGR LOCUS OF STAPHYLOCOCCUS AUREUS IN MASTITIS

VIRAL N. PATHAK AND NAYAN BHAGAT

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Mastitis is one of the common diseases of dairy cattle and an inflammatory response of the mammary glands tissue. Mastitis causes considerable loss to the dairy industry. Among several bacterial pathogens that can cause mastitis, Staphylococcus aureus (a gram-positive bacterium) is probably the most lethal agent because it causes chronic and deep infection in the mammary glands that is extremely difficult to be cured. In india, it leads to major economical loss to farmers; as per 2006 estimates referred in ICAR's National Agricultural Innovation Project, the estimated annual loss due to mastitis alone is nearly Rs16,702 millions.

Mastitis is multi factorial and a costly problem affecting all milk producing ruminants in India. The staphylococcal accessory gene regulator (agr) is the most important locus responsible for the regulation of virulence factors. Expression of agr gene in the pathogenic staphylococci is very crucial in bacterial colonization. The agr system coordinately down-regulates the production of cell wall-associated proteins and upregulates secreted proteins at late to stationary growth phase in vitro. Hence, the main aim of the present study was to detect agr group genes in the S. aureus isolated from 360(Write no. of samples) mastitis milk samples. Total 78 isolates of S. aureus were obtained from mastitic cow's milk and the isolates were then examined for the production of α-hemolysin and protein A. The accessory gene regulator (agr locus) was analyzed by polymerase chain reaction (PCR) by using specific primers. The agr locus, which consists of hld, agrB, agrD, agrC, and agrA, was detected in most of the (78) isolates including two reference strains (Wood 46 and Cowan I). Results of this study can be an introduction for more complete studies on distribution of agr genes in strains of Staphylococcus isolated from mastitis cases and the rote of involvement of these genes in pathogencity of the bovine mastitis.

BASIC FACTS AND CONTROLLING OF MASTITIS IN DAIRY ANIMALS

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Mastitis occurs when the udder becomes inflamed because leukocytes are released into the mammary gland in response to invasion of the teat canal, usually by bacteria.Inflammation mainly cause by Staphylococcus aureus,Streptococcus agalactiae,Streptococcus uberis,E coli,Klebsiella and other cocci.They cause clinical and subclinical type of infection.These bacteria multiply and produce toxins that cause injury to milk secreting tissue and various ducts throughout the mammary gland . Somatic cell count(SCC) will be increse in affected animal due to hyper inflammatory response.Elevated leukocytes, or somatic cells, cause a reduction in milk production and alter milk composition.These changes in turn adversely affect quality and quantity of dairy products. The determination of milk SCC is widely used to monitor udder health and the milk quality. The elevated SCC consist primarily of leucocytes which include macrophages, lymphocytes and neutrophils. During inflammation, major increase in SCC is because of the influx of neutrophils into milk and at this time over 90% of the cells may be Polymorphonuclear nutrophil(PMN) leukreytes.All coliform and Staphylococcus aureus mastitis vaccins formulation use gram negative core antigens to produce non specific immunity directed against endotoxic disease.The vaccins are marketed as Somato-Staph® and Lysigin®, J-5 Bacterin and mastiguard,J-vac®. Staphylococcus aureus infections remain the largest mastitis problem of dairy animals. Cure rate with antibiotic therapy during lactation is very low. Many infected animals become chronic eases and have to be culled. Streptococcus agalactiae respond well to antibiotic therapy and can be eradicated from dairy herds with good mastitis control practices, including teat dipping and dry animal treatment. Streptococcus dysgalactiae may live almost anywhere: in the udder, rumen, and feces, and in the barn. They can be controlled with proper sanitation and are moderately susceptible to antibiotics. Controlling environmental mastitis is achieved by reducing the number of bacteria to which the teat end is exposed. The animals environment should be as clean and dry as possible. The animal should have no access to manure, mud, or pools of stagnant water and calving area must be clean. Post milking teat dipping with a germicidal dip is recommended. Attempts to control environmental mastitis during dry period, using either germicidal or barrier dips, have been unsuccessful.Proper antibiotic therapy is recommended for all quarters of all animals at drying off, it helps to control environmental streptococci during the early dry period.

ARE STEM CELLS BEING A SOLUTION FOR NEURODEGENERATIVE DISORDERS???

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Many common neurological disorders, such as Parkinson's disease, stroke and multiple sclerosis, are caused by a loss of neurons and glial cells. Neurodegenerative diseases are characterized by neurodegenerative changes or apoptosis of neurons involved in networks, leading to permanent paralysis and loss of sensation below the site of the injury. Cell replacement therapy has provided the basis for the development of potentially powerful new therapeutic strategies for a broad spectrum of human neurological diseases because cells are permanently destroyed in these conditions. In recent years, neurons and glial cells have successfully been generated from stem cells, and extensive efforts by investigators to develop stem cell based brain transplantation therapies have been carried out.

The next step is to translate these exciting advances from the laboratory into clinically useful therapies. More recently, efforts have been extended to stimulating the formation and preventing the death of neurons and glial cells produced by endogenous stem cells within the adult central nervous system.

As per the previously published experimental and preclinical studies involving stem cell-based cell for neurodegenerative diseases and discuss the future prospects for stem cell therapy of neurological disorders in the clinical setting. Steady and solid progress in stem cell research in both basic and preclinical settings in neurological science should support the hope for development of stem cell-based cell therapies for neurological diseases.

PATHOGENICITY OF ENTEROBACTER SAKAZAKII

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Enterobacter sakazakii is member of family Enterbactriaceae & genus Enterobacter. It is a motile peritrichous, gram negative bacilli. This organism which was initially referred to as 'Yellow-Pigmented Cloacae' was classified as E.sakazakii in 1980on the basis of differences in DNA-DNA hybridization, biochemical reactions, pigment production & antibiotic susceptibility, compared with E.cloacae. Recently found that E.sakazakii is genomically heterogeneous & therefore, poorly defined species. It is regarded as an emerging opportunistic human pathogen & etiological agent of life-threatening bacterial infections in infants, which was first implicated in <28 days aged infants. Feeding with powered infant formula (PIF) has been epidemiologically implicated in several clinical cases, so infants should be exclusively breast-fed for the first 6 months of life. Because PIF is not a sterile product & to reduce the risk of infection, the reconstitution of powered formula should be undertaken by caregivers using good hygienic measures & in accordance with the product manufacturer's food safety guidelines. Infections are important cause of life threatening meningitis, septicemia & necrotizing enterocolitis in infants. Increasing awareness of E.sakazakii infection among medical personnel & continuous education of all care gives to the potential threats posed by this organism will be essential to protect infants at high risk.

ANTI AGING

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Anti-aging can be a difficult topic to address. The hormone or endocrine theory of aging asserts that the most important factors in aging are the changes brought about in the body by the endocrine system. The complex endocrine system of our body controls the hormones that regulate many body processes. Growth Hormone (GH) is like testosterone, estrogen, progesterone, melatonin or DHEA - one of many endocrine hormones that decline with age. As we age, we gradually lose Human Growth Hormone. Starting in our 20's, Growth Hormone secretion declines anywhere between 10% to 20% a decade, and by 50 you only secrete 25% as much as the average 20 year old. By the age of 60 most people will have approximately 80% less growth hormone in their system than when they were 20. when HGH was administered to his elderly patients, within several weeks they all noticed significant improvement. The benefits included a general feeling of enhanced well being, a reduction in feelings of depression, a decline in fat cells, an increase in lean muscle mass and, after a few months, increased skin thickness and elasticity.

RNA INTERFERENCE AND ITS APPLICATION IN TREATING HUMAN DISEASES

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Gene silencing can occur either through repression of transcription, termed transcriptional gene silencing (TGS) or through translational repression and mRNA degradation, termed post transcriptional gene silencing (PTGS). Related mechanism of RNA interference was found in animals, results in specific degradation of endogenous RNA in the presence of homologous dsRNA either locally injected or transcribed from an inverted repeat transgene. RNAi is a multistep process involves the generation of siRNA through the action of RNase III endonuclease 'Dicer' or RNA induced silencing complex (RICS). Argonaute proteins are essential components of the RNAi machinery. They are associated with siRNA or miRNA to silence gene expression. SiRNA and longer dsRNA have the ability to induce innate immune response which eventually leads to cell death. RNAi can be used for variety of purpose including biomedical research, health care and drug discovery. Specific dsRNA molecules are designed to silence specific genes in humans and animals.RNAi can also be used for the treatment of HIV, viral hepatitis, cardiovascular and cerebrovascular disease, metabolic disease, neurodegenerative disorder and cancer.

THE WORLD INSIDE THE WOMB

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The topic mainly includes the development or formation of fetus or whole organism from single cell inside the uterus or womb.Single cell is known as zygote and the single divides mitoticaly and produce whole-multicellular organism. It also includes events of fertilization and how stem cells plays role to produce different and special type of cells. The fertilization includes the movement of sperm in female reproductive track. It also includes recognition of ova and some physiological changes in sperm and ova. Recognition is mainly based on chemotactic and thermotactic motion. Embryo development, various stages of embryo development and development of various organs and system.Development of different system takes places from mainly three layers that includes ectoderm,endoderm and measoderm.Expression of genes at various stages of development. Expression of some genes differs in cell type and the stage of development.This topic also includes about sex determination of fetus.

ROLE OF PHARMACOGENOMICS IN GENETIC DISORDERS

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The developments of Pharmacogenomics represent the evolution of biomedicine from treating the general disease itself to treating the malfunction of an individual person, the “root” of disease. With the change of focus from disease to humans, Pharmacogenomics hope for the transformation from disease treatment to disease prevention. There are some genetic based disease which are incurable although using medicine but it may possible to prevent while Pharmacogenomics is apply for treating this disease. Asthma is a common disease characterized by airway inflammation and bronchorestriction.There are several common categories of medicine for treating Asthma however, not all asthmatics have the same response to their medication, some of which are adverbs response that are potentially life threatening because interindividual response to Asthma medications can vary considerably, the potential for genetic contribution to variable drug response is significant. By using Pharmacogenomics protocol in which biological pathway targeted by Asthma therapy. Alzheimer is a loss of brain function that gradually gets worse overtime. It affects memory, thinking and behaviors. Pharmacological treatment in Alzheimer’s disease (AD) account for 10-20% direct cost and fewer than 205 of AD is moderate responder to conventional drugs (Donepezil, Rivastigmine, Galantamine, Memantine) with doubtful cost-effectiveness. Both AD pathogenesis and drug metabolism are genetically regulated complex behavior in which 100 of genes co-operatively participate. Functional genomics study in AD reveled that age of onset, brain therapy, immune function etc.are associated with AD related gene. The incorporation of Pharmacogenomics to AD treatment can improve drug efficiency and safety. Sickle cell anemia is an inherited disease in which hemoglobin take on an abnormal shape. It blocks flow of blood and cells do not get enough oxygen. This disorder treated by medication called Hydroxyurea but it gives side-effect such as reduction in white blood cells. Using Pharmacogenomics protocol in which single nucleotide polymorphism (SNP) have important role that could modify the phenotype of sickle-cell disease.