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DEVELOPMENT OF CORE COLLECTION IN CASHEW USING MORPHOLOGICAL AND MOLECULAR DATA

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AB-V1-1

Cashew (*Anacardium Occidentale* L.) is an important edible nut crop cultivated in India. Due to increased use of cookies and ice creams worldwide, huge production cashews is economic and cashew with proper color, size and shape has high value in exporting. Varieties of cashew are grown on the coastal side of India. A large germplasm collection of cashews in gene banks limits accessibility of this crop in crop breeding. Core is a set plants having all good qualities. “Core” sets to ensure guaranteed access to useful alleles or characteristics retained in gene banks is necessary. The software, Power Core, effectively selects the accessions/varieties with larger diversity representing the entire coverage of variables and gives a 100% reproducible list of entries. In this work we have used 169 varieties of cashew and developed the core using morphological and molecular data with the help of power core. Using the core, the development of new hybrids consisting of all economically important characters and to get the genetic relationship of unknown variables.



INVOLVEMENT OF PHYSICAL PARAMETERS IN IMPROVING SERRATIOPEPTIDASE FERMENTATION BY *SERRATIA MARCESCENS* MU1

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AB-V1-2

Serratiopeptidase (EC No 3.4.24.40), a serine protease promotes healing and repair by breaking down abnormal exudates, proteins and improves absorption of decomposed products through lymphatics and blood. Since it possesses a higher affinity for cyclooxygenase it affects the production of inflammatory mediators such as interleukins, prostaglandins and thromboxane thereby reducing inflammation. Fermentation of microbial therapeutic enzymes such as serratiopeptidase has been often under the influence of various nutritional and physical parameters. Taking this point into consideration, the present study attempts to understand the influence of physical parameters such as initial pH of the medium, incubation time, agitation, inoculum load, etc. affecting the submerged fermentation of serratiopeptidase by *Serratia marcescens* MU1. Optimized carbon and nitrogen sources were introduced into the mineral salt broth and one factor at a time approach of parameter optimization was adopted. Fermentation medium having neutral pH supported highest yield of the enzyme. Enzyme production was greatly reduced at extremes of pH. Beyond 72 h of incubation a progressive decrease in serratiopeptidase production was recorded. As compared to static incubation, agitation at 150 rpm improved the enzyme synthesis. High and low inoculum load negatively influenced the fermentation process. Therefore, it can be concluded that serratiopeptidase fermentation by *Serratia marcescens* MU1 is a cost effective process as it involves moderate pH, lesser inoculum load and short incubation time. The study advocates that *Serratia marcescens* MU1 is a potent producer of serratiopeptidase and may be exploited for the industrial fermentation process.



EFFECT OF LEMON PEEL IN HEPATIC AND VISCERAL REGENERATION IN ZEBRA FISH

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AB-V1-3

The main objective of the study is identification of effect of Lemon peel extract in Hepatic and visceral regeneration in Zebra fish (*Danio rerio*). Ascorbic acid was used as reference standard. Liver function and oxidative stress was measured, caudal fin regeneration studied and also histopathology of liver was examined. Lemon peel extract was subjected to gas chromatography / mass spectroscopy(GC/MS) and it was auto docked with the mitochondrial Succinate dehydrogenase enzyme. Feeding on lemon peel led to significant decrease in enzyme activity i.e. Succinate dehydrogenase in parallel to Ascorbic acid. There was a significant weight loss in the fishes fed with lemon peel. These result suggest the citrus peel possesses antioxidant potential and regeneration ability of visceral organ. Thus helpful in treatment and management.



***JUSTICIA WYANAADENSIS* LEAF EXTRACTS TARGETING QUORUM SENSING
IN *PSEUDOMONAS AERUGINOSA***

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AB-V1-4

Quorum sensing plays an important role in *Pseudomonas aeruginosa* virulence. Blocking of quorum sensing ability is viewed as viable antimicrobial chemotherapy poorly proving to be a safe anti-virulent drug. The antimicrobial ability of bioactive components from *Justicia wynaadensis* have been reported. This study focuses on the inhibition of quorum sensing properties of solvent extracts of *J. wynaadensis* leaves using *Pseudomonas aeruginosa* as a model organism. The study was carried on the inhibition of motility of *P. aeruginosa* by swimming, swarming and twitching assay and the inhibition of pyocyanin production. A marked reduction in pyocyanin production was observed in heat treated aqueous extract, hexane and chloroform extracts. The motility inhibition was seen in heat treated aqueous extract, aqueous extract and chloroform extracts, however hexane extract induced the motility. Thus, the studies hint the possible effect of the bioactive components of different extracts of *J. wynaadensis* on reducing the virulence of the *P. aeruginosa*. This is a preliminary investigation and identification of the bioactive compounds should be studied further.



A STUDY ON ECOLOGICAL STATUS OF CAUVERY RIVER IN KODAGU DISTRICT

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AB-V1-5

Water quality assessment is an essential and integral part of conservation strategy as it provides us important information on the status of these waterways enabling target oriented management actions. It also informs as to ways of waterways function and behaviors of nutrients and other contaminants over time. Both quality and quantity of impurities found in natural water depend on a number of factors, thus vary by region and by time of year. The present study examined and evaluated the quality of Cauvery River in Kodagu District. Water samples were collected from different river basin locations and were assessed during November 2017 to February 2018. The parameters like pH, temperature, total dissolved solids, density, BOD, COD, DO and total coliforms were determined to assess the quality of river. The pH ranged from 6 to 8.5, DO (0.4-3.6mg/L), BOD (0.4-7.2mg/L), CO₂ (0-8mg/L), temperature (8⁰C -13⁰C), TDS (0.07-0.58mg/L), Density(0.813-0.929mg/L), specific gravity(0.958-1.0mg/L) and coliforms were detected. Although the river is in sustainable condition, the presence of coliforms indicates pollution in the sampling sites of the river which makes it unfit for human use.



**PHYTOCHEMICAL SCREENING, ALPHA AMYLASE INHIBITORY,
ANTIARTHRITIS AND ANTIOXIDANT ACTIVITY OF *CISSUS*
QUADRANGULARIS L.**

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AB-V1-6

In the present study, preliminary phytochemical screening and in-vitro alpha amylase inhibitory, antiarthrititis and antioxidant activity of methanolic stem extract of *Cissus quadrangularis* was investigated. Phytochemical screening of the extract revealed the presence of flavonoids, terpenoids, tannins, steroids and glycosides. The total phenolic content of the extract was found to be 50 mg/g equivalent of gallic acid. The present study clearly indicated that the extract exhibited good alpha amylase inhibitory activity in a dose dependent manner. The extract showed highest inhibitory activity of 63%. In vitro antiarthritic activity was evaluated using protein denaturation method. The percent inhibition of the extract on protein denaturation was found to be 73.6%. The antioxidant activity was studied by using in vitro antioxidant models viz., DPPH radical scavenging activity and reducing power assay. The extract showed 94.9% inhibition of free radicals in DPPH assay. The reducing power ability of the extract observed in ferric reducing model was dose dependent.



PHYTOCHEMICALS OF *OCIMUM AMERICANUM* L. AND ITS BIOLOGICAL ACTIVITY

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AB-V1-7

In the present investigation, phytochemical screening, antioxidant, antiarthritis and antimicrobial potentials of methanolic leaf extract of *Ocimum americanum* was investigated. The antioxidant activity was assessed through DPPH assay and reducing power assay. The free radical scavenging activity of the extract was confirmed in DPPH assay. The extract showed the stronger radical scavenging effect with 70% inhibition. The reducing power of the extract increased with increasing concentration. Phytochemical screening studies of the extract showed the presence of flavonoids, terpenoids, steroids, saponins, glycosides and tannins. Determination of the total phenolic contents revealed that extract contains 30mg of phenolic compounds. In vitro antiarthritic activity was studied using protein denaturation method. The extract showed 68.7% inhibition of the protein denaturation at 200 µg/ml. The in vitro antimicrobial activity of the extract was investigated against *Bacillus cereus*, *Proteus vulgaris*, *Staphylococcus aureus*, *Klebsiella* spp. and *Enterobacter aerogens* using the agar diffusion method. The extract inhibited the growth of all the presently investigated bacteria with zone of inhibition between 8 - 16 mm.



STUDIES ON THE PHYTOCHEMICALS, ANTIARTHRITIS AND FREE RADICAL SCAVENGING ACTIVITY OF *OCIMUM AMERICANUM* L.

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AB-V1-8

The aim of this study was to evaluate the phytochemicals and in vitro biological activity of methanolic stem extract of *Ocimum americanum*. The extract was assessed for their antioxidant activity using DPPH assay and reducing power assay. Inhibition of DPPH free radicals by the extract was observed 87%. The reducing power was found to be concentration dependent. Phytochemical screening revealed the presence of terpenoids flavonoids, tannins, steroids and glycosides. Total phenolic content was measured by Folin-Ciocalteu method. The extract showed phenolic content of 35mg gallic acid equivalent per gram of extract. In vitro antiarthritic activity was studied using protein denaturation method. The extract showed 75.91% inhibition of the protein denaturation.



SSR MARKER STUDIES FOR DRAWING GENETIC RELATIONSHIP AMONG SOME POPULAR VARIETIES OF CASHEW

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AB-V1-9

Cashew (*Anacardium Occidentale* L.) is a tropical tree crop belonging to family of *Anacardiaceae*. Cashew nut is widely consumed, India is large producer and exporter of cashew kernels in world. over 65% of world export of cashew kernels is accounted by India. Cashews has high economic value and cashew with proper shape, size and color has high value in exporting. Different varieties of cashew are grown on costal side of India. From DCR and other research centers in country, many high yielding varieties with good nut size have been released. The most popular varieties, such as vengarula-4, ullal-3, Bhadesi, Selection-2 and the hybrids H-126,H-125,H-130 was taken to assay the genetic relationship among the parents and the hybrid. Cashew DNA was extracted by CTAB extraction procedure of Mneney et al.(1997) with slight modification. Simple sequence repeats(SSR) primers of cashew are the molecular markers which is unaffected by environmental conditions, were used to determine the genetic relationship between varieties. Using NTSYS.2.0, the dendrograms was plotted to check the genetic distance between the varieties. The analysis of genetic relationships in cashew varieties and habrids and SSR banding data can be useful for plant improvement, descriptions of new varieties.



A STUDY OF INTERACTION BETWEEN LOW FREQUENCY SOUND WAVES AND GERMINATION OF COWPEA SEEDS (VIGNA UNGUICULATA)

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AB-V1-10

This research studied the interactions and effects of low frequency audible sound waves with the germination and growth of cowpea seeds (*Vigna unguiculata*). Experiments were conducted in 3 aspects, seed germination time, weight gain of seeds and stem elongation. It was identified that the frequency range from 660Hz to 680Hz has detrimental effects on germination, weight gain and stem elongation. It was also found that the sound radiation has direct effects on the production of enzymes in the plant system namely alpha amylase which takes part actively in germination process. Theories of mechano perception proposed by JC Bose is further investigated here and the interactions with enzymatic system of plant is further explored based on the frequency response of plants.



CLINICAL ASSESSMENT OF KNEE OSTEOARTHRITIS PATIENTS IN MYSURU CITY, KARNATAKA

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AB-V1-11

Osteoarthritis (OA) is the most common form of arthritis and also known as degenerative joint disease. Knee Osteoarthritis (KOA) is a leading cause of disability and is mainly affecting knee joint and further articular cartilage degradation. The objective was to study the clinical assessment of BMI, WOMAC Scores and Erythrocyte Sedimentation Rate (ESR) in patients with KOA and controls. Methods: The study was recruited 150 KOA patients and 15 control groups randomly, diagnosed by Orthopaedic doctors in K.R. Hospital, Mysuru. Further, calculation of BMI, a structured interview questionnaire was used to WOMAC scores and clinical assessment of ESR by Westergren method. There were 95 (63.33%) women and 55 (36.67%) men with a sex ratio of 0.57. The mean average age \pm standard deviation of patients with KOA was 30 ± 5.83 years. About 46% of patients were having normal BMI, 23.33% overweight and least is the obese, the overall mean average and standard deviation was 30 ± 23.68 . The mean average and Standard deviation of Erythrocyte Sedimentation Rate (ESR) of KOA patients was 33.13 ± 21.202 . WOMAC scores out of 150 KOA patients, the mean average of 91 patients were having moderate in Pain, Stiffness and Physical functions, it constitute about 63.33%, 51.33% and 67.33% respectively, whereas one patient was extreme and rest of it severe, mild and no pain. The correlation between clinical evidence and ESR levels founds that, there is a variation while comparing KOA patients and control. In WOMAC scores, the majority of the patients were having moderate Pain of KOA patients while doing different activities and the least is extreme.



BIOPROSPECTING OF RHIZOSPHERE ACTINOMYCETES FOR PRODUCTION OF BIOACTIVE METABOLITES

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AB-V1-12

Actinomycetes constitute a diverse group of microorganisms that are widely distributed in terrestrial, freshwater and marine habitats. Actinomycetes are potential producers of economically important primary and secondary metabolites. Some of these include hydrolytic enzymes, pigments, antibiotics and anti-tumour agents. Among the actinomycetes, species of *Streptomyces* constitute second highest percentage after *Nocardia* in terms of distribution. They are prolific producers of medicinally important secondary metabolites and about 80% of total antibiotics are produced from the species of *Streptomyces*. The present study aimed at isolation and characterisation of some novel strains of actinomycetes capable of producing medically important bioactive compounds. Thirty four isolates of actinomycetes were obtained from the rhizosphere soils across Karnataka, Uttar Pradesh, Maharashtra and Gujarat. Based on Gram's staining all the isolates were identified as *Streptomyces* sp. 53% and 73% of the isolates produced pectinase and cellulase, respectively. Screening for L-asparaginase production revealed five isolates (K1, K2, K4, K7 and K11) to be potential producers of the enzyme. Isolates K1, K5, K6, K11, K15 and M19 synthesized diffusible pigments on starch casein nitrate agar. Isolates K1, K5, K6 and M19 exhibited antibacterial activity against *Bacillus* sp. and *Staphylococcus aureus*, but no activity was detected against *Serratia marcescens* and *Pseudomonas aeruginosa*. Isolates K1, K4, K6, K7, K15 and M19 demonstrated antagonistic activity against *Aspergillus flavus*, *Fusarium* sp. and *Cladosporium* sp. Biochemical, physiological and molecular characterisation of the potent *Streptomyces* isolates are currently being conducted.



DIVERSITY OF *MAGNAPORTHE ORYZAE*, THE RICE BLAST PATHOGEN POPULATION IN DIFFERENT DISTRICTS OF KARNATAKA, INDIA

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AB-V1-13

Magnaporthe oryzae B. Couch the rice blast fungus is the main pathological threat to rice crop worldwide. According to the latest revision of the UN population prospects, the world population is projected to grow by 34 percent from 6.8 billion in 2017 to 9.1 billion by 2050. There is an urgent need to increase global production of rice to meet the demand by the increasing population with decreasing cultivable land. Breakdown of blast resistance is the major cause of yield instability in several rice growing areas. Application of fungicides can reduce the severity of disease to some extent but repeated applications of fungicide results in higher cost and becomes health hazardous for farmers. The use of different rice blast resistant rice varieties in the cultivation of rice could be the most effective and cost effective way to reduce the adverse effect of the blast disease. Knowledge generated in the current research work can help breeders to evolve better resistant varieties of rice. In the current investigation a total of 171 places were visited and rice blast diseased samples were collected from 101 diseased plots of different geographical regions of Karnataka, India. 72 mono conidial cultures were established. Pathogen was characterized using molecular tools and variations among the ITS region was studied. These isolates were further subjected to molecular studies to understand the extent of genetic diversity using inverted repeat transposons and SSR markers. It was found out, the population shows high diversity.



SYNTHESIS AND PRO-APOPTOTIC ACTIVITY OF ARYL TETRALIN DERIVATIVES

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AB-V1-14

In Recent years Aryl tetralins are an interesting class of natural products- family of secondary metabolites, due to their pharmacological properties, a great number of structural possibilities and the chemical approaches to their synthesis. Aryl tetralins are known to have anti-cancer, antimitotic and antiviral activity and specifically inhibit certain enzymes. The aryl tetralins as potential antimitotic agents were synthesized in four step reactions using Grignard reagent. The structures of the synthesized compounds were confirmed by spectral and elemental analysis data. The synthesized compounds were also screened for their antioxidant, antimicrobial, pro-apoptotic and anti-angiogenic activity using different antioxidant and staining assays. Strong scavenging activity against DPPH radicals, super oxide dismutase and lipid peroxidase activity was exhibited by the tested compounds. Current findings show that Aryl tetralin derivatives 2B and 4B, exhibited a potent antioxidant. Molecular docking and 3D coordinates were obtained by using PRODRG online server (Schüttelkopf et al., 2004). Good pro-apoptotic activity was showed by the 2B and 4B tetralin derivatives in Geimsa, Acridine orange- EtBr staining techniques. Tryphan blue exclusion, and DNA fragmentation assay of 2B and 4B tetralin derivatives revealed their growth inhibitory activity on EAT cells by induction of apoptosis.



PLANT BIOACTIVES ATTENUATES DIABETES-INDUCED CHANGES IN GLUCOSE TRANSPORTERS AND INSULIN SIGNALING MOLECULES IN RAT BRAIN

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AB-V1-15

Dysregulated glucose homeostasis as a consequence of impaired neuronal insulin signaling engenders several complications in the brain, known as diabetic encephalopathy. Bioactive compounds such as quercetin, naringenin, and berberine are potent anti-diabetic and can cross the blood-brain barrier and offer neuroprotection. The focus of the study was to establish propensity of bioactive molecules to modulate diabetes-mediated changes in key molecules of neuronal insulin signaling pathway and glucose transporters (GLUTs). Diabetes was induced in male Wistar rats by streptozotocin at 45 mg/kg body weight. Quercetin, naringenin, and berberine exerted beneficial effects as gauged by basic parameters such as blood glucose and urine sugar. Effect on key insulin signaling components namely, insulin receptor substrate 1 (IRS 1), phosphatidylinositol 3 kinase (PI3K), Akt 1, various glucose transporters and low-density lipoprotein receptor-related protein 1 (LRP1) were evaluated by western blot analysis. Results indicated that quercetin was the most potent amongst the three tested bioactives and restored low-density lipoprotein receptor-related protein 1 (LRP1) and brain insulin signaling components as well as glucose transporters like GLUT 1, GLUT2, GLUT 3 and GLUT 4 expression. Berberine and naringenin improved IRS 1, GLUT 1 and GLUT 3 expression but did not show sufficient effect on PI3K and Akt 1 activation and GLUT 4 levels. Our findings demonstrate that plant-derived bioactive molecules like quercetin, naringenin and berberine can act through both insulin-dependent and -independent mechanisms thereby modulating glucose homeostasis.



ROOT KNOT NEMATODE IN MAJOR MULBERRY GROWING AREAS OF SOUTHERN KARNATAKA

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AB-V1-16

Mulberry (*Morus* spp.) the sole food plant of silkworm (*Bombyx mori* L.), is cultivated both in tropical and temperate countries of the world. India is the second largest country in the world under mulberry cultivation. Mulberry is cultivated mainly in the states of Karnataka, Tamil Nadu, Andhra Pradesh, Jammu and Kashmir, Uttar Pradesh, West Bengal and North-Eastern states. Root knot nematode (RKN) is a serious problem in mulberry growing areas. The present study were carried out to investigate the destructive nature of RKN (*Meloidogyne incognita*) incidence in mulberry. A roving survey was carried out in five traditional mulberry growing districts of southern Karnataka. The results indicated that incidence of root knot nematode was found in all the five districts of southern Karnataka. The highest RKN incidence was noticed in Ramanagar district (50 %). Whereas, the lowest was recorded in Mysuru district (20%). Root knot infected root samples were collected from the surveyed field to study the association of soil borne fungal pathogens and further molecular characterization. On the basis of morphological studies, four different fungal pathogens associated with RKN were identified as *Fusarium solani*, *F. oxysporum*, *Macrophomina phaseolina* and *Phythium* spp. In addition to that bio-control agents *Trichoderma harzianum*, *T. viride* and other saprophytic fungal organisms were found in the root zone of mulberry.



PHYSICOCHEMICAL AND FUNCTIONAL CHARACTERISTICS OF GELATIN POWDERS PREPARED FROM ROHU FISH (*LABEO ROHITA*) PROCESSING BYPRODUCTS USING DIFFERENT DRYING METHODS

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AB-V1-17

The objective was evaluation of different drying methods on yield, physicochemical and functional properties of gelatin from rohu (*Labeo rohita*) swim bladder. Gelatin from rohu swim bladder was extracted at 60 °C for 9 h and subjected to different drying (freeze drying, spray drying, and vacuum drying). Effects of different drying methods on physicochemical properties and functional properties (solubility, emulsion, foaming, gelling) were evaluated comparatively. Freeze drying exhibited higher gelatin yield (54.51%, dry weight basis) as compared to the other drying counterpart ($P < 0.05$). All gelatin samples had glycine as the major amino acid followed by alanine, glutamic acid and hydroxyproline, respectively. Freeze-dried gelatin (GFD) and spray-dried gelatin (GSD) showed α (α_1 and α_2) and β -chains as the predominant components. However, vacuum-dried gelatin (GVD) presented only α (α_1 and α_2) components. FTIR spectra of GVD revealed pronounced loss in the triple-helix as compared to GFD and GSD. GFD and GSD had the highest surface hydrophobicity than GVD ($P < 0.05$). All gelatins had >90% protein solubility. GSD exhibited higher emulsifying and foaming properties than GFD and GVD ($P < 0.05$). However, there is no significance difference found in gelling properties of GFD and GSD ($P > 0.05$). Thus, freeze drying or spray drying could be an effective method for production of quality gelatin from rohu swim bladder.



PRODUCTION AND APPLICATION OF CELLULASE IN DETERGENT AND TEXTILE INDUSTRIES

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AB-V1-18

Cellulases are inducible enzymes synthesized by large diversity of microorganisms including fungi, bacteria and actinomycetes. Microbial cellulases have shown their potential in various industries including paper and pulp, textile, laundry, biofuel production, food and feed industry, brewing and agriculture. As per the survey, cellulase market is bound to witness an exponential growth throughout the forecasted period of 2016-2026. Therefore, this paper emphasises on cost effective production of cellulase, which has competence in textile and laundry industries. In this study, isolates of bacteria, fungi and actinomycetes were collected from soil samples. Each isolate was screened on CMC (carboxy methyl cellulose) containing medium, for their zone of hydrolysis. The zone of hydrolysis was measured and accordingly, six isolates (A₈, I₁, I₂, I₇, F₂ and B₁) having enzymatic index greater than 1.5 were selected for further analysis. The isolates were evaluated for the production of cellulase by submerged fermentation (Smf) using minimal basal medium with CMC. Isolate A₈ which gave highest cellulase activity of 43.17 IU/mL with a specific activity of 355.7 was selected for further studies. Cost effective production of cellulase was attempted using various agrowastes and oil cakes. Pongamia Oil Cake (POC) and Rice Husk (RH) supported 75.83 IU/ml and 40.83 IU/ml cellulase activity, respectively at pH6. On testing the detergent compatibility of A₈ cellulase, it was observed that the enzyme was 100% stable in all the detergents tested. Bio finishing potential of the enzyme in terms of tests for weight loss, feel method, and Indigo dye removal shall be discussed.



THE LEAF MACRO, SECONDARY AND MICRONUTRIENT STATUS OF ROBUSTA COFFEE (*COFFEA CANEPHORA*) INFLUENCED BY ORGANIC AND INTEGRATED NUTRIENT MANAGEMENT PRACTICES

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AB-V1-19

In plants, mineral nutrients are elements acquired primarily in the form of inorganic ions from the soil. After being absorbed by the roots, the mineral elements are translocated into various parts of the plant, where they are utilized in numerous biological and metabolic functions. Thus, most essential elements have multiple roles in plant metabolism. Some elements, such as nitrogen, phosphorus and potassium can readily move from leaf to leaf; while others such as boron, iron and calcium are relatively immobile in most of the plant species. Mineral element requirement changes during the various stages of growth and development of a plant. Coffee has been a widely accepted beverage for many centuries. Arabica and robusta coffee are two important species of coffee which are grown commercially throughout the world. In India, among different cultivars of robusta coffee S.274 produces more bold beans compared to others. Because of this trait and also due to its wide adaptability S.274 has become more popular. The current field experiment was conducted to know effect of different modes of nutrition (organics and INM), shade pattern and irrigation schedule on the leaf nutrient status and yield of robusta coffee (S.274). In general, the most of the macro and secondary-nutrient status was higher in INM mode compared to that of exclusive organics. Accumulation of micronutrients was favored in the organic mode of nutrition compared to INM. Similarly, the open shade encouraged more assimilation of nutrient reserves compared to the thick shade pattern. Further, the winter irrigation was found to be promising over limited irrigations as evidenced by higher nutrient reserves in the former case. The influence of different nutrient management was also revealed in terms of the productivity. The average bean yield over two years under different treatments remained higher (1230 kg ha⁻¹) in INM mode of nutrition compared to that of exclusive organics (1101 kg ha⁻¹).



ISOLATION AND SCREENING OF RHIZOSPHERE MICROORGANISMS OF *COLEUS AROMATICUS* AGAINST *PHOMOPSIS AZADIRACHTAE*

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AB-V1-20

Neem (*Azadirachta indica*) is an evergreen eco-friendly tree. Neem is well known for its antimicrobial activities; however neem is not free from microbial diseases. Neem trees are now under great threat due to destructive die-back disease caused by a fungus, *Phomopsis azadirachtae* (Sateesh, Bhat and Devaki 1997). In the present study attempts were made for the *in vitro* management of *Phomopsis azadirachtae* on neem by evaluating *Coleus aromaticus*, rhizosphere microorganisms against the pathogen and also by screening neem rhizosphere fungi against it. These microorganisms inhibited the growth of *Phomopsis azadirachtae* *in vitro*, and were found to be highly effective bio control agents. Most of the isolated microbes from rhizosphere show the promising biochemical activity against the *Phomopsis azadirachtae*. Effect and growth inhibition of *Phomopsis azadirachtae* were seen by the bacteria CaRB1, CaRB2, CaRB3 and CaRB4 at 2cm apart. Some of the rhizosphere fungi such as *Fusarium*, *Cuvularia*, *Cladosporium* and *Aspergillus* also showed the Biocontrol activity against *Phomopsis azadirachtae* in the present study.



3, 5-DICHLOROANTHRANILIC ACID (DCA) MEDIATED TRANSCRIPT PROFILING DURING INDUCED RESISTANCE IN PEARL MILLET AGAINST DOWNY MILDEW DISEASE

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AB-V1-21

Downy mildew disease caused by the biotrophic oomycete *Sclerospora graminicolais* the main constraint for pearl millet production incurring huge yield and economic losses. The synthetic resistance elicitor 3, 5-Dichloroanthranilic acid (DCA) when applied exogenously protected pearl millet plants by inducing systemic and durable resistance against downy mildew disease. This enhanced resistance associated with the up regulation of various defense genes and proteins. Transcripts of mRNA of the defense enzymes PAL and POX were significantly enhanced 3.7 and 4.8 folds higher expression at 6 and 9 hai then the untreated control. The cell wall cross-linking protein HRGPs at 9 hai also confirmed 1.4 folds higher expression in DCA treated seedlings compare to the control. Pathogenesis related proteins PR-1 and PR-5 which are regarded as markers of induced resistance were significantly over expressed in DCA treated seedlings. At 48 hai, PR-1 gene expression showed 5.3 folds higher expression and PR-5 gene expression in DCA treated seedlings was 3.3 folds of higher expression at 24 hai than that of check. Early and increased expression of defense enzymes PAL and POX and defense proteins HRGPs, PR-1 and PR-5 are ascribed as grounds for enhanced downy mildew protection that is offered by DCA treatment. Changes in transcriptional profiles of defense enzyme and proteins triggered by DCA obviously resembles defense-related responses elicited during induced resistance in plant disease management and in particular to pearl millet downy mildew disease.



EVALUATION OF ANTIDIABETIC, ANTIMICROBIAL AND ANTIOXIDANT ACTIVITY OF *PHYLLANTHUS ACIDUS* IN *IN VITRO* CONDITION

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AB-V1-22

The present study aims to investigate the phytochemical screening, antioxidant anti-diabetic activity and anti-microbial assay of commonly used fruits *Phyllanthus acidus*. Edible part *Phyllanthus acidus* fruit is taken for the study. Extraction of *P. acidus* was performed using four different solvents such as Hexane, chloroform, ethyl acetate, acetone, and methanol. The phytochemical screening of *P. acidus* revealed strong presence of Flavonoids in all the solvents. Terpenoids are present in all the solvent aspects of methanol, and Tanin is present in all the solvent aspects of Hexane, completely absent in Arthroquinone and Saponin. The antioxidant activity was determined by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) method. In DPPH assay, free radical scavenging activity of the extracts was evaluated comparing with ascorbic acid at the wavelength of 517 nm. Methanol extract showed highest IC₅₀ value compared to all other extracts. Methanolic extract of *P. acidus* exhibited antioxidant activity with IC₅₀ 144 µg/ml and Acetone and ethyl extracts revealed IC₅₀ value of 168 and 192 µg/ml respectively. Likewise, chloroform and hexane extract showed IC₅₀ value of 202 and 224 µg/ml respectively. The reducing power of methanolic extract was higher than other solvent extracts viz., acetone, ethyl acetate, chloroform and hexane. α -Amylase inhibitory activity of fruit *Phyllanthus acidus* were investigated for their potential to inhibit α -amylase activity. Amongst the selected extract, methanolic extract at 100 µg/mL concentration, had the highest amylase inhibition of 72.06%, followed by acetone, ethyl acetate, chloroform and hexane with the inhibition of 59.6%, 54.66%, 17.9%, 14.9% respectively. Anti-microbial activity was investigated by using different bacteria that are *E. coli*, *aureus*, *klebsiella*, *valgaricu*. For the studies the acetone extract shows highest activity on bacterial agents tested compared to other solvent extract. The acetone extract at the concentration of 100 µg/ml showed 6 mm diameter zone of inhibition against *E. coli*. This was followed by 4 mm zone of inhibition against *Staphylococcus aureus*. Likewise, at the same concentration 100 µg/ml other solvents HEXANE, CHLOROFORM, ETHYLE ACETATE, ACETONE, METHANOL zone of inhibition against *E. coli*, *aureus*, *klebsiella*, *valgaricu*.



**EVALUATION OF LIPASE PROFILE IN FEW GERMINATING MILLET SEEDS,
PARTIAL PURIFICATION AND CHARACTERIZATION OF LIPASE FROM
PEARL MILLET.**

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AB-V1-23

Lipases (triacylglycerol acylhydrolase, E.C. 3.1.1.3) is the enzyme catalysing the breakdown of the TAG into glycerol and free fatty acids. Lipase is used in industrial bio-catalytic processes and also it is helpful in the production of anti-obesity drugs. Lipase activity in different millets i.e pearl millet, foxtail millet and kodo millet increased gradually from day zero to a maximum on the 3rd day of germination. of all the three millets present pearl millet showed maximum lipase activity of 0.2415 μ M/ml/min which was partially purified using ammonium sulphate precipitation and characterised. Optimal pH and temperature for lipase activity were 8.0 and 30°C, respectively. The K_m value estimated from Lineweaver-Burk plot was 0.125 μ m with pNPB as substrate and V_{max} obtained was 0.1315 μ M/ml/min. The lipase activity was slightly increased with the addition of aqueous extract of stone breaker plant while the rate of reaction was decreased by the addition of aqueous extract of leaves of Vitamin plant, Insulin plant, Night Jasmine plant and Rue plant.



***IN SILICO* EVALUATION OF CHITIN AND CHITOSAN AGAINST ESTROGEN AND PROGESTERONE RECEPTORS FOR BREAST CANCER**

CELL LINES (MCF 7)

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AB-V1-24

Chitin is a polysaccharide of N-Acetyl glucosamine linked by β -(1,4)-glycosidic bonds. Chitosan is a polysaccharide containing repeated units of D glucosamine and N-acetyl glucosamine units linked by β -(1,4)-glycosidic bonds. Chitin and chitosan are found in a wide range of natural sources such as crustaceans, fungi, insects and some algae. Breast cancer cell lines MCF7 are estrogen positive, progesterone receptor positive and HER2 receptor negative enabling them suitable for hormone therapy. Estrogen receptors are proteins that are activated by hormone estrogen. Once activated, are able to translocate into the nucleus and bind to DNA to regulate the activity of different genes that promotes growth of breast cancer cells. By using different templates available in the protein data bank, the 3 dimensional structures of estrogen and progesterone receptor proteins were elucidated by utilizing Modeller software. The structural validation was done by using Ramachandran plot and SAVES. Active sites of the proteins were identified by using COACH server. Chitin and Chitosan were docked to the active sites of the estrogen and progesterone receptor by using Autodock. Based on the results of the present study, chitosan isolated from different waste of sericulture industry will be evaluated under in vitro condition against the breast cancer cell lines.



***IN SILICO*EVALUATION OF DIFFERENT ANTIVIRAL DRUGS AGAINST VIRAL PROTEINS OF *BOMBYX MORI* NUCLEOPOLYHEDROSIS VIRUS**

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AB-V1-25

Baculoviruses are a family of DNA viruses that have a large, circular, supercoiled, and double stranded DNA-containing genome that infect insects, particularly of the order Lepidoptera. *Bombyx mori* nucleopolyhedrovirus (BmNPV), one of the best characterized baculoviruses which causes upto 50% yield loss. In order to survive in the adverse condition in silkworm, virus generates different proteins. In order to block the movement or reorganization of virus in the host system, the expression of viral proteins needs to be controlled by blocking binding sites of the respective proteins. With this background, the present work was aimed to evaluate the different commercially available antiviral drugs against the proteins encoded by the BmNPV. The structure of the virus encoded proteins was elucidated by using homology modelling techniques. The structural validation was done by employing SAVES and Ramachandran plot. Binding sites of the proteins were identified by using COACH server. The drugs were docked to the binding sites of the virus encoded proteins by using Autodock. The identified promising drugs will be evaluated under *in vivo* condition.



IN SILICO* EVALUATION OF DIFFERENT ANTIPROTOZOAL DRUGS AGAINST SPORE WALL PROTEINS (SWPS) OF *NOSEMA BOMBYCIS

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AB-V1-26

Mulberry silkworm (*Bombyx mori* L.) is infected by different pathogens. Among them, due to transovarial transmission, pebrine disease, a protozoan disease caused by *Nosema bombycis* has become a major hurdle for silk production. It is an epidemic disease that attacks all tissues and all development stages of the silkworm *i.e.*, from embryo to adult. In advanced infections, small brown patches cover the body of the silkworm. Diseased larvae, which either is unable to spin cocoons or else spin them loosely, die without pupating. With this context, the present work was aimed to evaluate the antiprotozoal drugs against the spore wall proteins present in the outer and inner membrane of the *N. bombycis*. The structure of the proteins was elucidated by adopting different homology modelling techniques. The structural validation was done by using SAVES and The Ramachandran plot. Active sites of the proteins were identified by using COACH server. The known antiprotozoal drugs were docked to the active sites of the SWPs by using AutoDock. The identified promising drugs will be evaluated under *in vivo* condition.



TESTING ANTIOXIDANT AND THERAPEUTIC POTENTIAL OF HERBAL DRUGS USING *DROSOPHILA* MODEL

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AB-V1-27

Polyphenolic bioactives are water-soluble phytochemicals which are abundantly present among all the plant preparations owing to the secondary pathways of the aromatic aminoacids. They are abundantly present in leaves, bark and roots in addition to flowers, fruits and seeds of the plants. Polyphenolic bioactives may occur freely or as glycosides (gallic acid, ferulic acid, quercetin etc.). Polyphenolic bioactives may serve as potent therapeutic agents owing to their water solubility and multiple hydroxyl groups which scavenge free radicals. Various polyphenolic bioactives have been reported from an array of plants and their significant biological properties have been demonstrated. Polyphenolic bioactives are powerful antioxidants *in vitro* however, *in vivo* properties have not been reported to a considerable extent. The anti-inflammatory action of polyphenolic bioactives may be attributed to its direct and strong antioxidant action but also its regulatory effect on expression of genes involved in the inflammatory pathway. Most studies on the potential health benefits of polyphenolic bioactives have been focused on its effect on cardiovascular health, its anti-cancer activity and anti-inflammatory properties. The beneficial effects of polyphenolic bioactives on cardiovascular health may be driven by their affinity for serum proteins and their antioxidant activity. Further, they act on different cells involved in the pathophysiology of atherosclerosis. In addition, studies have shown that polyphenolic bioactives act as anti-cancer agents by inhibiting promotion and progression of tumor cells, pre-malignant cells, increased apoptosis, anti-angiogenesis. We have planned to isolate polyphenolic bioactives from specific plant products and test their biological properties against various degenerative diseases of humans, among *Drosophila melanogaster* model. The data obtained from this study would serve basis for using polyphenolic bioactives as therapeutic adjuvants for the major degenerative disorders like CVD, NDD, diabetes and cancer.



DNA DAMAGING INHIBITION ACTIVITY OF *PERSEA AMERICANA*

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AB-V1-28

A “Big Bang” is currently impacting the food, health food and pharmaceutical industries, among others. This ‘big bang’ derives from an explosion in research and publications providing scientific evidence to support hypotheses that phytochemicals in food and in isolated from provide health benefits to the consumer. No longer is ‘an apple a day keeps the doctor away’ a cliché. There has been a big increase in interest in our ability to understand the importance of polyphenols as natural medicines.

The avocado (*Persea americana*) belongs to the family Lauraceae is used as herbal medicine from ancient time, The present study was aimed on methanolic peel extracts of *Persea americana* for phytochemical constituents,7 determine the efficacy of the methanolic peel extracts of *Persea americana* through DNA Damage inhibition assay (H₂O₂ proteolysis) pro-oxidant induced DNA damage using human peripheral lymphocytes. H₂O₂ scavenging activity of plant extract is significant compare to that of standard ascorbic acid at 50-950 µl concentration at a IC₅₀ value of 2.247 (450µl), at 450µl/ml, showed a promising DNA Damage inhibition activity, The hemolytic activity is not significant awards RBC’s even at the concentration range of 2µg/ml-26µgm/ml stating that the peel methanolic extract pf *P.americana* is less toxic, further analysis of oxidative DNA damage by diphenylamine method using human peripheral lymphocytes showed that the extract offered 60% protection compared to BHA which offered protection by 88%..Altogether, the results of current study revealed that *Persea americana* is a potential source of antioxidants and leads pharmacological credence to the ethnomedical use of this plant in traditional system of medicines, justifying its therapeutic application as “Drug Targets” for free-radical-induced diseases.



IN VITRO ANTI-ARTHRITIC ACTIVITY OF *PERSEA AMERICANA* PEEL EXTRACT

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AB-V1-29

Herbs are staging a comeback and herbal renaissance? Is happening all over the globe. The herbal products today symbolize safety in contrast to the synthetic that are regarded as unsafe to human and environment. *Persea americana* commonly known as Avacado is a plant species belonging to Lauraceae family .The cultivators of West Indian race are localized folks in Maharashtra, Tamil nadu and Karnataka. They are well known among the people and widely used for their nutritive and medicinal properties; they are rich source of poly phenolic compounds and Phenolic acids.

The present study deals with the in vitro anti-arthritis activity in PAMPE. The phytochemical analysis indicated the presence of several physiologically active phytochemicals such as phenols, flavonoids, triterpenoids, steroids, alkaloids etc. since these compounds are of pharmacological interest, coupled with the use of this plant in traditional medicine, prompted us to check PAMPE for anti-arthritis activity by the inhibition of protein denaturation method. Scientific validation shows a promising anti arthritis activity.



ISOLATION AND CHARACTERIZATION OF LECTINS FROM *PERSEA AMERICANA*

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AB-V1-30

Lectins are glycoproteins which are non immune origin which possess the ability to agglutinate erythrocytes by binding to specific carbohydrate residue present on the surface. The agglutin are devoid of specificity for carbohydrates, but interact readily with basic proteins or basic polyamino acid. The lectins perform different biological activities and help in secondary metabolism. ABO blood group system with Rhesus comprises of distinct determinant and lectins agglutinate with specific type of antigen present on RBCs. The extract agglutinates the erythrocytes of ABO blood group which resembles the characteristics of lectins.

Persea americana commonly known as Avacado is a plant species belonging to Lauraceae family. The cultivators of West India race are localised folks in Maharashtra, Karnataka, and Tamilnadu. They are well known among the people and widely used for nutritive and medical properties. The proposed study aims at the isolation of Lectins from *Persea americana* and test their ability to agglutinate the erythrocytes.



BIODEGRADATION OF AFLATOXIN BY PEROXIDASE ENZYME ISOLATED FROM *PERSEA AMERICANA*.

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AB-V1-31

Aflatoxins are secondary metabolites produced by the moulds *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin producing moulds are widely distributed in nature. The main biological effects of aflatoxins are carcinogenicity, immunosuppression, mutagenicity and teratogenicity. Aflatoxins cause liver damage, decrease milk yield, decreased egg production and overall performance, and suppresses immunity in animals consuming low dietary concentrations. Specific enzymes that are capable of degrading aflatoxins have been purified from microbial systems. The detoxification by specific enzymes avoids the drawback of using the microorganisms which may in addition to its degradation activity, change flavor or impair the nutrition value and acceptability of the product from the environment. The present study is examined to isolate crude peroxidase from *Persea americana* seed sample and checked for the degradation of aflatoxin, which makes as an efficient tool for detoxification of aflatoxin from the environment.



ISOLATION AND CHARACTERIZATION OF PHYTOCHEMICALS OF *OSCILLATORIA* FROM LOCAL WATER BODIES

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AB-V1-32

Cyanobacteria are rich source of structurally new & biologically active metabolites with potential benefits against human diseases. Phytonutrients and pigments present in cyanobacteria act as antioxidants which facilitate the formation of body defense mechanism against free radical damage to cells. Recent studies indicate the presence of some bioactive compounds from blue green algae which are shown to inhibit anticancer, antimicrobial, antifungal or anti-inflammatory and other pharmacological activities.

In the present study water samples were collected from local water bodies in and around Mysuru & Hunsur and then further subjected to isolation of individual strains from the mixture by pipette method followed by purification of the sample to get a single culture by antibiotic treatment method. *Oscillatoria* thus isolated is subjected to mass cultivation, solvent extracted by using methanol and subjected to phytochemical screening & TLC analysis. The phytoconstituents include the Saponins, terpenoids, flavonoids which are the promising agents offering antioxidant property, the TLC analysis shows the presence of the phycocyanin & Phycoerythrin, the study is in progress for the isolation of the pigment respectively.



STEROIDAL ALKALOID “SOLANIDINE” TARGETS PI3 KINASE SIGNALLING TO INDUCE APOPTOGENIC EFFECTS IN MELONOMA CELLS

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AB-V1-33

Targeting cell signalling pathways that balances survival advantages to melanoma has become a major focus of investigation to establish treatment strategy in the current era. Solanidine a very well characterized steroidal alkaloid widely available in Solanaceae family of plants was investigated for antiproliferative studies against murine B16F10 and human A375 melanoma cells. The result infers IC_{50} value of 10 μ M by inducing prolonged cytotoxic effect in melanoma cells. The Solanidine effect induced DNA damage and membrane changes indicating the apoptogenic events. Further the detailed investigation of molecular mechanism of Solanidine defined the upregulation of anti apoptotic genes such as Bax and Bad. The cell survival signalling event PI3/AKT was clearly downregulated. As a consequence regressed tumor effect was noticed in both *in-vitro* and *in-vivo* conditions. Overall it is understood that solanidine could be effectively developed as drug for the treatment of melanoma.



THE LATEX SAP OF THE DIETARY VEGETABLE “CHYOTA” WITH POTENT LECTIN ACTIVITY INDUCES IMMUNOMODULATORY EFFECT

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AB-V1-34

Lifestyle and dietary modifications have contributed much to somatic genetic alteration which has concomitantly led to increase in many diseases. Henceforth, plant based and dietary interventions to counteract through immunomodulation to target disease transformation are in great demand. We investigated the latex sap (LS) of the dietary vegetable “Chyota” which is domesticated plant species with the potent lectin activity for its functional role against the immunomodulatory effect. Lectins from the latex sap was partially purified by ammonium sulphate precipitation and SDS-PAGE. The lectin activity was analyzed through chicken and Human RBC hemagglutination activity. The Partially purified latex lectin was characterized for thermal and pH stability. Further the pharmacological evaluation against various immune cells revealed the immunomodulatory effect of the latex lectin which is under current investigation. Collectively our study provides tangible evidences that latex sap from “Chyota” has immunopotentiating ability significantly.



CHARACTERISATION OF COMPOUNDS BY GC-MS FROM THE EXTRACTS OF *Schefflera* SPECIES (ARALIACEAE) FROM WESTERN GHATS

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AB-V1-35

The genus *Schefflera*, is a well-known ornamental plant of the family Araliaceae with ethno medicinal value. The phytochemical constituents mainly saponins and triterpenic glycosides have been isolated as the major compounds from *Schefflera* species. Two extracts showing potent anti-oxidant activity, viz., the methanol flower extract of *S. venulosa* and ethyl acetate stem bark of *S. wallichiana* with good IC₅₀ value were analysed by GC-MS to determine the type(s) of probable antioxidant compounds present. The methanol flower extract of *S. venulosa* revealed the presence of 120 compounds whereas ethyl acetate stem bark extract of *S. wallichiana* showed the presence of 115 compounds. Among those, 23 compounds from methanol flower extract of *S. venulosa* and 25 compounds from ethyl acetate stem bark extract of *S. wallichiana* have been identified as the probable antioxidant compounds based on the functional group they possess. The present study is the first report on the characterisation of compounds by GC-MS from *S. wallichiana*.



FECAL MICROBIOTA TRANSPLANTATION

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AB-V1-36

Intestinal microflora is the major influencing factor which decides the health of individuals. Any disruptions to this microflora causes major gastrointestinal diseases such as Recurrent *Clostridiumdifficile*, Ulcerative colitis, inflammatory bowl diseases, D-Lactic acid acidosis etc,. An healthy individuals contains the beneficial bacterial flora in the fecus, this is introduced to the patient's large colon through coloscopy. Fecal microbial transplantation involves restoration of the colonic microflora. It can be applied when the prolonged antibiotic treatment has to be done. There is more than 90% of the successful results are drawn through fecal microbial transplant as human probiotic infusion. It reduces the risk of bacteria becoming resistant to antibiotics. Donor sample is screened, tested and obligate anaerobes were killed to prepare the specimen of 200-300 g and is administered to patients through colonoscope or nasogastric tube. The prepared autologous fecal sample provided by the donors is also can be used. It is concluded that, the fecal microbiota can be employed for the replacement of harmless bacteria to pathogenic organisms by diluting and inactivating them by the mechanisms of bacteriocins produced by the fecal microbiota.



SCREENING OF FIBRIN DEGRADING ENZYME FROM *BACILLUS* SPECIES

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AB-V1-37

Fibrin, a biological plug formed by the action of thrombin on fibrinogen, arrests the blood loss. However, the formation of a fibrin clot in blood vessels is the leading cause of cardiovascular diseases worldwide. Fibrinolytic enzyme such as Nattokinase from *Bacillus* species dissolves the clot and helps in normal blood flow. However, there is variation in ability and specification of these enzymes in their action towards fibrin degradation. In this regard, the present investigation was focused on the isolation of potent fibrinolytic protease producing *Bacillus* species from a native food source for their possible application as orally administrable preparation. Initially, *Bacillus* cultures were isolated from naturally fermented grains and their protease producing ability was confirmed by skim milk and casein agar plate assay. Among the isolates, M2.1, R2, S3Ba, S3B1a, S3B1b, S3C1, S3A1 and S46 showed clear zones around the colony indicating the proteolytic activity. The cell-free supernatant of the isolates was further subjected to quantitative protease assay using azocasein along with zymogram studies. The isolate S46 with highest proteolytic activity (84.2U/mg) was considered for the media optimization for higher protease yield. The result indicated that the highest enzyme production (553.9U/mg) was recorded on the 4th day of incubation. Fibrinolytic activity of the S46 was checked using fibrin plate assay and the isolate showed clear zone indicating the fibrinolytic activity. The protease containing in cell-free supernatant was further subjected to partial purification using ammonium sulfate precipitation and characterization. The study suggests the possibility of this enzyme preparation in formulating orally administrable thrombolytic enzyme preparation for thrombosis and related disorders similar to nattokinase.



MOLECULAR CHARACTERIZATION AND EXOPROTEIN PROFILING OF *FUSARIUM SPP.* FROM CONTAMINATED SOIL

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AB-V1-38

Fusarium is a soil borne fungi and many are known to be phytopathogens causing wilt disease in plants. The disease is characterized by yellowing and drying of leaves finally leading to death of the plant. The diseased plant shows very less or no yield that result in heavy economic loss. To understand the role of *Fusariumspp.* during pathogenesis, the present study was aimed to isolate *Fusarium* strains from wilt proven agricultural fields and to characterize their major exoprotein responsible for infection. In this regard, around 26 rhizosphere soil samples were collected from wilt infected banana and tomato field, serially diluted and plated on Potato Dextrose Agar media supplemented with chloramphenicol. Around 8 *Fusarium spp.* were selected based on conidial and hyphal morphology. The selected strains were tested for toxicity by cut seedling method. Among 8 *Fusarium* isolates, five showed yellowing of leaves and drying after 48 hour of treatment. Exoprotein in the supernatant was profiled by SDS-PAGE analysis. Further, the strains were subjected for RAPD-PCR and 18S rDNA sequencing for their molecular identification. The study signifies the role of exoprotein in disease progression and can be a target for management strategy.



BIODEGRADATION OF PETROLEUM WASTE BY LIPOLYTIC *BACILLUS* SPP.

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AB-V1-39

Petroleum industry meets the energy requirements of most industries and daily life. However, this industry also generates a lot of hydrocarbon wastes which includes emulsions of petroleum and brine used to extract petroleum, crude oil leaked from pipelines and materials saturated with oil accidentally. The aim of the present study was to isolate lipase enzyme producing bacteria that are able to degrade hydrocarbons from oil contaminated soil. *Bacillus* is one of the better-known hydrocarbon degrader and hence this bacterium was isolated from petroleum waste. Initially, lipolytic cultures were isolated by screening on tributyrin, rhodamine plates and petrol utilization ability on Bushnell Haas media supplemented with 2.5% petrol. Accordingly, 8 potent lipolytic cultures were selected and quantified for enzyme activity. Results obtained showed IND 2.31, G1.121 and IND 2.22 with highest lipase activity (1.62, 0.88 and 0.58 U/mg). These cultures were selected and analyzed for petrol degradation ability for a period of 6 days. According to the results obtained, IND 2.31 and G1.121 indicated highest degradation ability on the 6th day. The lipase enzyme from these two cultures was partially purified and characterized. The enzyme was able to degrade petroleum waste. The overall work signified the potency of selected culture in bioremediation of petroleum waste through enzymatic degradation of hydrocarbon contaminants and may answer for the problem of pollution from petroleum waste in an eco-friendly way.



PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY FROM LEAVES OF *BOSWELLIA SERRATA* ROXB. EX COLEBR

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AB-V1-40

Plants are potent biochemists and have been components of phytomedicine since times immemorial. In the present work *Boswellia serrata* Roxb. ex Colebr belonging to Burseraceae family was evaluated for antibacterial activity against important pathogenic bacteria viz. *Staphylococcus aureus* (MTCC 7443), *Salmonella typhi* (MTCC 98) *Bacillus subtilis* (MTCC441) and *Pseudomonas aeruginosa* (MTCC 7925). The test plant was also evaluated for antifungal activity against *Aspergillus flavus* and *Cladosporium cladosporioides*. The test plant materials were separately extracted with water and successively with Chloroform, Ethyl acetate and Methanol. Each of these solvent extracts was subjected to antibacterial activity assay by agar well diffusion method and antifungal activity was determined by Poisoned food technique. Among the different solvents tested, Methanol extract of *Boswellia serrata* leaves showed significant inhibitory activity against almost all the test pathogens. Further investigations are in process to determine the bioactive principle responsible for the antibacterial activity from *Boswellia serrata* leaves.



EFFECT OF SALICYLIC ACID ON SEED GERMINATION AND SEEDLING VIGOR OF PEARL MILLET UNDER *IN VITRO* CONDITIONS

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AB-V1-41

Pearl millet (*Pennisetum glaucum* (L.)R.Br.) is one of the important millet crop grown mainly for food and fodder in semi-arid tropical regions of Asia and Africa. The seed germination and yield is affected by many fungal diseases. Abiotic inducer like salicylic acid (SA) is widely used in improvement of seed germination and vigor of many plant crops. In this context, present study was intended to investigate the effect of salicylic acid by treating seeds with different concentrations of SA like 0.25 mM, 0.5 mM, 0.75 mM and 1.0 mM to study its relation on seed germination and vigor by between paper towel method at different time intervals (3h & 6 h). The result indicated that in general 6 h treatments recorded good germination and vigor when compared to 3 h treatments. Maximum germination of 92.5%, seedling vigor of 1639.20 was recorded at 0.5 mM SA for 6 h followed by 0.75 mM which showed 89% germination, 1609.11 seedling vigor. Poor germination of 67% and seedling vigour of 1312 was observed in control. Therefore, SA serves as good inducer in improving seed germination and seedling vigor upon seed treatment under *in vitro* conditions.



ANTIMICROBIAL ACTIVITY, PHYTOCHEMICAL AND CHROMATOGRAPHIC ANALYSIS OF *ANDROGRAPHIS SERPYLLIFOLIA*

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AB-V1-42

Hexane, chloroform and methanol extracts of ethnomedicinal plant *Andrographis serpyllifolia* Rottler ex Vahl collected from Western Ghats, Karnataka was evaluated for antibacterial activity against human pathogenic bacteria *Staphylococcus aureus*, *Salmonella typhi*, *Pseudomonas aeruginosa* and *Escherichia coli*. Methanol extract revealed highly significant antibacterial activity against test pathogenic bacteria compared to other extracts. All the extracts were subjected to phytochemical analysis, whereas methanolic extracts was analyzed by TLC analysis. The results revealed the presence of a flavonoid and terpenoids. In addition, the MIC of the extracts was also determined.



POTENTIAL OF PREDATORY BACTERIA AS BIOCONTROL AGENTS

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AB-V1-43

Bdellovibrio and like organisms (BALOs) are small, predatory, Deltaproteobacteria that prey on other Gram-negative pathogens. Many authors have unfolded the possible use of BALOs Daptobacter, and Myxobacteria as biological control agents in environmental as well as medical microbiological settings. They are found occur in diverse soil, marine and fresh water ecologies. Strongly associated with natural biofilms and recent studies have shown that effective predation occurs in these naturally occurring bacterial communities. Predatory bacteria maintained their ability to prey on Multi Drug Resistance bacteria regardless of their antimicrobial resistance, hence, might be used as therapeutic agents where other antimicrobial drugs fail .Also Periodontal infections could also be an interesting target for the application of BALOs as biological Gram-negative bacteria and therefore potentially susceptible to BALOs antimicrobial agents. Accordingly, this review aims to present the evolution toward applying Bdellovibrio, bacteriovorus and such predatory bacteria as an antibacterial agent to deal with oral infections, general medical conditions, environmental and industrial issues.



SURVEY OF MEDICINAL AND ETHNOBOTANICAL PLANTS OF ARAKANAKERE VILLAGE OF MANDYA DISTRICT, KARNATAKA, INDIA.

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AB-V1-44

Survey of medicinal and Ethnobotanical plants in Arakanakere village was conducted during Oct–2016 to March–2017. The survey revealed that 78 medicinal plant species belonging to various families are being used as drugs to cure various ailments such as skin disorders, wound healing etc. It was found that plants like *Withania somnifera* and *Zingiber officinale* are widely used to cure Rheumatism. *Aloe vera* and *Achyranthes aspera* are commonly used for treating various skin disorders. Ethnobotanically *Bambusa sp.* is used to make furniture, scaffolding, toys, cups and spoons. The study throws light on new uses of many known plants.



ENDOPHYTIC MYCOPOPULATION OF *PTERIS TREMULA*

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AB-V1-45

Endophytic fungi are microorganisms that live within plant tissues without causing disease during their life cycle. Distribution of these endophytic fungi in various plant organs differs in diversity and abundance. This study was conducted to investigate diversity of endophytic fungi from leaves and stems of Pteridophytic fern *Pteris tremula*. Isolation and identification of mycopopulation was not yet reported and this is the first study reporting the diversity of endophytic fungi inhabiting *Pteris tremula*. Among 364 endophytic fungi yielding plant tissue bits, around 214 individual isolates were isolated. Foliar tissue showed highest endophytic diversity with the 95% colonization rate, when compared to the stem having 87% colonization rate. Among 214 endophytic fungi *Xylaria* sp. were the predominant genus isolated from both the plant tissues with the colonization frequency of 37.38%, followed by *Cladosporium* sp. (16.82%), *Gliocladium* sp. (8.41%), *Myrothecium* sp. (4.67%) and *Phoma* sp. (4.20%). Estimation of the Shannon-wiener diversity index (Hs) showed leaves having highest diversity indices (2.18) when compare to the stem (1.70). Highest Species Richness (S) was observed in leaves (17.0) when compared to stems (9.0). Simpson Diversity Index (1-D) shows highest value for endophytic fungi inhabiting leaves (0.79). Our results suggest that *Pteristremula* has rich and diverse endophytic communities and may be a potential source of bioactive molecules, which will be carried out in further studies.



EVALUATION OF POTENCY OF BIOACTIVE COMPOUND ISOLATED FROM THE SEEDS OF *PSORALEACORYLIFOLIA* L. ON PREVENTION OF AFLATOXIN PRODUCTION IN INFECTED MAIZE SEEDS BY *ASPERGILLUSFLAVUS*

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AB-V1-46

In vitro evaluation of bioactive 2H-Furo[2,3-H]-1-benzopyran-2-one isolated from the seeds of *P.corylifolia* employing standard phytochemical procedure and characterized by subjecting to NMR, GC-MS , crystallography and IR spectroscopy were subjected for the analysis of Inhibition of mycelial growth of *Aspergillus flavus* (Aflatoxin producing strain) and aflatoxin biosynthesis were tested by disk diffusion, poisoned food technique and macrodilution techniques. Different concentration of bioactive compound viz., 500 ppm, 1000 ppm 1500 ppm and 2000 ppm were evaluated for the inhibition of *A.flavus* by poisoned food technique. Complete inhibition was observed in 500 and 1000 ppm concentration compared to control. At 500 ppm concentration, complete inhibition of mycelial growth of *A.flavus* was observed when tested for the analysis of dry mycelia weight. At 50 ppm , 75 ppm and 100 ppm concentration of the bioactive compound , the mycelia growth of *A.flavus* was not inhibited completely at 50 and 75 ppm and the biosynthesis of aflatoxin production was blocked at 75 ppm concentration of the bioactive compound when subjected for the analysis of aflatoxin production by thin-layer chromatography (TLC) and fluorescence spectroscopy techniques using AFB1 standard.



EVALUATION OF ANTIBACTERIAL ACTIVITY OF AQUEOUS AND SOLVENT EXTRACTS OF *BIXA ORELLANA*L. SEED

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AB-V1-47

Evaluation of antibacterial activity of *Bixa orellana*L.(Seeds) belongs to family Bixaceae were tested against five bacterial species viz., *Escherichia coli*, *Enterobacter aerogenes*, *Proteus vulgaris*, *Klebsiella pneumonia* and *Bacillus cereus* in *invitro* condition. In Aqueous seed extract tested at different concentration viz., 10, 20, 30,40, 50, 50, 60,70, 80, 90, 100%, *E. coli* and *P. vulgaris* recorded a maximum inhibition of 38.0 mm and 36.0 mm at 100%concentration, followed by *E. aerogenes*, *B. cereus* and *K. pneumonia* and recorded 31.0mm, 30.0mm and 26.0mm inhibition respectively. In different solvent extract viz., petroleum ether, benzene, chloroform, methanol and ethanol tested at were tested at 10to 100% concentration, maximum inhibition was observed in methanol and benzene extract and recorded 40mm and 37mm inhibition in *P. vulgaris* and *E. coli* Compared to standard antibiotic gentamycein at a recommended concentration of 25mg, *E. coli* recoded 30.0mm, *E.aerogen* recorded 24.0mm, *P.vulgaris* recorded 25.0mm, *K. pneumonia* recorded 29.0mm and *B. cereus* recorded 32.0mm inhibition respectively.



FORMULATION AND EVALUATION OF BIOPOLYMER BASED TRANSDERMAL DRUG DELIVERY SYSTEM

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AB-V1-48

The present investigation comprises the formulation and in vitro evaluation of Domperidone loaded transdermal drug delivery system (TDDS) for controlled release. The films were prepared using biopolymer xanthan gum (Xg) and sodium alginate (SA) by varying the concentrations viz., 10:0, 8:2, 6:4, 5:5, 4:6, 3:7, 4:6, 3:7, 2:8, and 0:10 (Xg/SA, wt/wt,%). The drug loaded membranes were evaluated for thickness, content uniformity, tensile strength, percentage elongation at break, stability studies. Domperidone was found to be compatible with the prepared formulation as revealed by Fourier transform infrared (FTIR) spectroscopy studies. In-vitro release studies were carried out in open glass diffusion cell for a period of 8 hrs and it showed controlled release of drug from the polymeric matrix. The study reveals that the prepared transdermal films can serve as potential vehicles for improved transdermal delivery to achieve controlled release of drug and improved bioavailability.



MODERN APPROACHES FOR THE CONSERVATION OF BIODIVERSITY

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AB-V1-49

It is widely accepted that biodiversity loss and poverty are linked problems and that conservation and poverty reduction should be tackled together. However, success with integrated strategies is elusive. Biodiversity encompasses species, genetic diversity and ecosystem diversity. Of the estimated 8.1 million species in the world, 1.9 million species were described. Worldwide destruction of the natural environment in form of habitat destruction, invasion of alien species and particularly climate change is resulting in alarming loss of biological diversity over the past few decades. Climate change is identified as the most significant drivers of biodiversity loss and affects all the levels of biodiversity, from organism to biome levels. The latest Inter Governmental Panel on Climate Change report (IPCC, 2014) projected that there will be a further rise in temperature of at least 2°C above the current level and the world is more likely face an increase in mean temperature of 3°C–6°C. The distributions of many species are expected to shift markedly during this period and many species may go extinct. IUCN 2015 Red list identified that 11,233 plant species are under various degrees of threat. Given this background, conservation and management of biodiversity has become crucial and strategies to maintain and restore biodiversity include the use of both conventional and modern technologies.

In the past few decades genetic and remote sensing technologies combined with ecological techniques has contributing a lot in conservation of biodiversity. This includes next generation sequencing, species distribution modeling, quantitative ecology coupled with remote sensing technology. Ecological techniques and remote sensing technologies in combination are of immense value.



MOLECULAR CHARACTERIZATION OF ROOT ROT CAUSING FUNGAL PATHOGENS AND STANDARDIZATION OF INOCULATION METHODS IN MULBERRY

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AB-V1-50

Root rot disease is a serious menace in mulberry (*Morus* spp.) and is prevalent in several mulberry growing areas in India. Fungal species *Fusarium solani*, *F. oxysporum*, *Lasiodiplodiatheobromae* and *Macrophomina phaseolina* were found to be associated with root rot disease. Forty six disease mulberry root samples were collected from mulberry growers field in different areas of South India based on their wilting symptoms during 2016 and 2017. A total of 35 isolates of *F. solani* five isolates of *F. oxysporum* six isolates of *L. theobromae* species were recovered from the infected root samples. The molecular characterization of fungal isolates based on ITS sequences was carried out for species identity. Among forty six, representative isolates of eleven were selected, sequenced and deposited in NCBI database. There was a perfect correlation between morphological and molecular characterisation. A phylogenetic tree was constructed and the resulting dendrogram showed relations among different species. Isolates belonging to different geographical regions were grouped together in the same cluster indicating less diversity among the fungal isolates. Eleven mulberry genotypes were selected for checking the virulence of the isolates and to standardise the method of inoculation for root rot. Three months old mulberry saplings were raised in pots, four replications were maintained for each genotype along with two controls and were inoculated with three fungal species responsible for root rot infection using two different inoculation methods namely root dip and toothpick under glass house condition. The root dip method was very stable in their pathogenic effect, simpler and more convenient than the toothpick method. The resistant genotypes are being used to develop mapping populations for QTL analysis and to study the transcriptomic profile of root rot disease in Mulberry.



OPTIMIZATION AND PRODUCTION OF SYMBIOTIC BEVERAGES USING GROUNDNUT OILCAKE AS SUBSTRATE

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AB-V1-51

Symbiotic beverage is the combination of probiotic and prebiotics. Groundnut cake contains protein and they are very rich in calcium, phosphorus, iron, zinc and boron. They are also rich in vitamin E and vitamin B. The main aim of the present study is to prepare a symbiotic beverage using groundnut oil cake. Probiotic strains were isolated from various sources and screened for potential probiotic characters. Further optimization was carried out by groundnut oil cake as the substrate and honey is used as the prebiotics. Optimization was carried out for the following parameters such as substrate concentration, temperature, inoculum size, sugar & honey. After incubation the supernatant was tested for titerable acidity, specific gravity and standard plate count. The beverage provides better health benefits such as healthy digestive tract and immune system.



COMPARATIVE STUDY ON THE PRODUCTION OF LIPASE BY USING SOLID STATE FERMENTATION AND SUBMERGED FERMENTATION FROM FUNGAL SOURCE

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AB-V1-52

Comparative yield of *lipase* enzyme from different fungal sources was studied by using Solid State Fermentation and Submerged Fermentation. The fungi were isolated from soil, by serial dilution technique and identified *A.flavus*, *Mucor*, *A.niger* and *Fusarium*. The isolated strains were screened for the production of *lipase* by the technique emulsion tributiryn agar method. Two strains *A.flavus* & *Mucor* were selected for production of *lipase*. The enzyme *lipase* was produced by using Solid State Fermentation & Submerged Fermentation. The assay was performed by using titrimetric method to check the activity of enzyme produced. A high activity of 16.6U/ml and 13.6 U/ml was observed. Protein estimation also was done by Lowry's method and high lipase yield of 2.0mg/ml and 1.5 mg/ml were achieved. For both Solid State Fermentation and Submerged Fermentation, the purification of enzyme was performed after 7 days of incubation. Thereafter, the activity of enzyme was checked at different ranges of temperature and pH, and at different concentration of activators and inhibitors. The optimum temperature was found to be 40°C, and the enzyme was most active at pH 7. The activity of enzyme was found to be increased with increased concentration of activators and the activity was found to be decreased as the concentration of inhibitor increases.



**BANANA (*MUSA SP. VAR. NANJANGUD RASABALE*) PSEUDOSTEM PREVENTS
HYPERGLYCAEMIA-INDUCED OXIDATIVE STRESS IN DIABETIC
NEUROPATHY RODENT MODEL**

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AB-V1-53

Banana is an extensively cultivated plant worldwide, mainly for its fruit, while its ancillary product, the banana pseudostem, is consumed as a vegetable and is highly recommended for diabetics in the traditional Indian medicine system. This study is based on an investigation of oxidative stress mediated nerve damage in diabetic neuropathy using banana (*Musa sp. var. Nanjangud Rasabale*) pseudostem (PB) in a rat model of streptozotocin-induced diabetic neuropathy. After 12 weeks, streptozotocin-induced diabetic rats developed neuropathy which was evident from decreased tail-flick latency (thermal hyperalgesia). This was accompanied by decreased motor coordination as assessed by performance on rota-rod treadmill. Rats fed with diet supplemented containing 5% PB ameliorated hyperalgesia, improved motor coordination and reversed reduction in Na⁺ K⁺ ATPase activity. There was an increase in lipid peroxidation in sciatic nerve of diabetic animals along with decrease in phospholipid levels, while treatment attenuated lipid peroxidation and restored phospholipids to control levels. This was associated with decrease in glutathione and protein thiols. The activities of antioxidant enzymes; superoxide dismutase, catalase, glutathione reductase, glutathione peroxidase and glutathione-S-transferase were reduced in sciatic nerve of diabetic animals. PB treatment significantly ameliorated decrease in antioxidant defence and clearly demonstrate the effect of PB is mediated through attenuation of oxidative stress. Hence, it can be concluded that banana pseudostem in the form of diet or nutraceuticals is beneficial in chronic diabetics exhibiting neuropathy.



PLASMID ISOLATION AND CURING OF TOXIN PRODUCING *STAPHYLOCOCCUS AUREUS* ISOLATES FROM SWEET SAMPLES

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AB-V1-54

Among 27 isolates from 50 samples, the isolates AR₂D and VP₁B, were selected for the current study. These two isolates showed resistance to four antibiotics and were positive for α haemolysis. Plasmid isolation and plasmid curing was carried out for the two isolates. Plasmid cured cultures were subjected to protein estimation, microhaemagglutination test and antibiotic susceptibility test against the four antibiotics to which they showed resistance. Both the isolates could show presence of single band of plasmid which disappeared at the end of curing period. The amount of protein produced by the isolates did not decrease on plasmid curing. Both the isolates still retained haemolytic properties after plasmid curing. The isolate AR₂D had lost the resistance to all four antibiotics whereas the isolate VP₁B lost the resistance to three antibiotics, but still retained resistance to Vancomycin alone. This indicates that the genes responsible for toxin production are present on genomic DNA, whereas the genes responsible for antibiotic resistance are present on plasmid DNA except for resistance to vancomycin.



**PLANT GROWTH PROMOTING FUNGUS- *PENICILLIUM*
OXALICUM INVESTIGATES DEFENSE MECHANISM IN PEARL MILLET UPON
INFECTION WITH DOWNY MILDEW DISEASE**

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AB-V1-55

Rhizosphere-resident antagonistic microorganisms (plant growth promoting fungi/ bacteria) are ideal biocontrol agents, as the rhizosphere provides the frontline defense for roots against infection by the pathogens. Pearl millet susceptible seeds (cv. 70425) were treated with PGPF- *Penicillium oxalicum* at 1×10^8 CFU ml⁻¹ to test its ability to enhance crop growth, induce resistance to downy mildew disease caused by *Sclerospora graminicola*. *P. oxalicum* treatment to seeds for 6 h, significantly enhanced the seed germination (91%), seedling vigor (1427) and downy mildew disease protection (62%) in comparison with the untreated control. The spatio-temporal studies revealed that inducers *P. oxalicum* required a minimum of 72 h for developing maximum disease resistance which was maintained thereafter. Seed treatment with *P. oxalicum* offered defense at morphological (HR), histological (deposition of lignin and callose) and biochemical (peroxidase and chitinase) levels. The study highlights the efficiency of *P. oxalicum* in inducing resistance against upon infection with downy mildew upon seed treatment. The results of the study confirm that PGPF- *P. oxalicum* can be used as a source of inducer in pearl millet against downy mildew disease and the findings have also evidenced the inter-connection of induced systemic resistance and defense responses.



IN VITRO ANTIOXIDANT ACTIVITIES OF POLYPHENOL RICH EXTRACT FROM DIFFERENT PARTS OF GARCINIA XANTHOCHYMUS FRUIT

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AB-V1-56

Garcinia xanthochymus belongs to *Clusiaceae* Family, and its fruits are known for its nutritional value and health benefits. Limited scientific evidences have been shown on the elucidation of fruit bioactive components. Here we made an attempt to identify and characterize the phenolic compounds of the different parts of fruit and to study their antioxidant activity. Phenolic content was found to be highest in methanol extract of peel. The HPLC analysis showed that the higher content of epicatechin was found in peel and pulp, catechin in sun dried rind and chlorogenic acid in seed. Peel extract exhibited higher antioxidant (DPPH, ABTS and FRAP) activity. Thus the fruit may have health beneficial properties which have to be further investigated.



ECONOMICAL AND RAPID GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES USING *MELIA AZERDARACH* LEAF EXTRACT AND THEIR ANTIBACTERIAL ACTIVITY.

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AB-V1-57

Here in we report the synthesis of zinc oxide nanoparticles (ZnO NPs) by eco-friendly green combustion method at $400 \pm 10^{\circ}\text{C}$ using zinc hexahydrate nitrate as precursor and *Melia azerdarach*(L.) leaf extract as fuel. UV-Vis spectroscopy, Fourier transform infrared spectroscopy (FT-IR), Powder X-ray diffraction (PXRD), Scanning electron microscopy (SEM), and Transmission Electron Microscopy (TEM) studies had been performed to characterize the ZnO NPs. Subsequently, the antibacterial activity of ZnO NPs was evaluated against gram positive and gram negative bacteria by disc diffusion and broth microplate dilution method. The antimicrobial activity was found to be enhanced with the increase in ZnO NPs in dose dependent manner.



MODERN APPROACHES FOR THE CONSERVATION OF BIODIVERSITY

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AB-V1-58

It is widely accepted that biodiversity loss and poverty are linked problems and that conservation and poverty reduction should be tackled together. However, success with integrated strategies is elusive. Biodiversity encompasses species, genetic diversity and ecosystem diversity. Of the estimated 8.1 million species in the world, 1.9 million species were described. Worldwide destruction of the natural environment in form of habitat destruction, invasion of alien species and particularly climate change is resulting in alarming loss of biological diversity over the past few decades. Climate change is identified as the most significant drivers of biodiversity loss and affects all the levels of biodiversity, from organism to biome levels. The latest Inter Governmental Panel on Climate Change report (IPCC, 2014) projected that there will be a further rise in temperature of at least 2°C above the current level and the world is more likely face an increase in mean temperature of 3°C–6°C. The distributions of many species are expected to shift markedly during this period and many species may go extinct. IUCN 2015 Red list identified that 11,233 plant species are under various degrees of threat. Given this background, conservation and management of biodiversity has become crucial and strategies to maintain and restore biodiversity include the use of both conventional and modern technologies. In the past few decades genetic and remote sensing technologies combined with ecological techniques has contributing a lot in conservation of biodiversity. This includes next generation sequencing, species distribution modeling, quantitative ecology coupled with remote sensing technology. Ecological techniques and remote sensing technologies in combination are of immense value.



EFFECT OF RHIZOSPHERIC *FUSARIUM* SP. ON SOLUBILIZATION OF PHOSPHATE UNDER *IN VITRO* CONDITIONS

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AB-V1-59

Plants are incapable of converting inorganic phosphate into organic phosphate (useful form) which is very much essential for plant growth. In the present study, isolated rhizospheric fungi i.e., *Fusarium* sp. (NBP-17) was tested for its ability to solubilize tricalcium phosphate (TCP) amended in Pikovskaya's Broth Medium. The amount of phosphate solubilized in medium was quantified using spectroscopic analysis and optical density was read at 600 nm against a blank. The result showed that *Fusarium* sp. (NBP-17) found to solubilize insoluble TCP ($200 \mu\text{g P L}^{-1}$) and recorded 40.14% solubilization. Therefore, study concludes that isolated rhizospheric fungus have considerable capacity to solubilize TCP which serves an important role in promoting the growth of the chilli plants.



IMPACT OF *FUSARIUM* CULTURE FILTRATE ON MAIZE SEED QUALITY

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AB-V1-60

Maize is one of the most important cereals in the world after wheat and rice. The maize cultivars 25K55, C11921, JMH-203 were collected from Gowribidanoor and Chikkaballapur, Karnataka. The present study was aimed to find out the effect of *Fusarium* sp. cultural filtrate on seed quality of maize. The maize cultivars were first screened for seed microflora which had more incidences of *Fusarium* species namely, *Fusarium oxysporum*, *Fusarium moniliforme*, *Fusarium solani*. Seeds treated with cultural filtrate of *Fusarium oxysporum* revealed effective germination 90% and vigor index of 3126 followed by *Fusarium moniliforme* (88%), vigor index (2013) and *Fusarium solani* (84%) vigor index 3940.



WATER QUALITY ASSESSMENT USING DIATOMS AS ECOLOGICAL INDICATORS IN K.R. NAGAR LAKES, MYSORE

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AB-V1-61

The present study was intended to evaluate the water quality in Hosa-Agrahara and Hebbal lakes of K.R. Nagar, Mysore district. Diatoms are important contributors to primary production and critical indicators of aquatic ecosystem conditions, past and present. The sample was collected in the months of January and February 2017. The diatom was studied by Van dam software to find out the Ecological values. Diversity of diatoms was more and comprised of *Synedraulna*, *Cymbellaaffinis*, *Naviculaminima*, *Nitzchiamicrocephala*, *Surirella spundrida* and *Navicula mutica* with the average population of 5600. The present investigation reveals that due to the presence of diatoms, the lakes water is nitrogen tolerant with autotrophic taxa impacting anthropogenic eutrophication activity and organic pollution.



STUDY ON THE EFFECT OF LIQUID BIOFERTILIZER ON GROWTH OF *VIGNA RADIATA* L.S.

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AB-V1-62

The present work was aimed to find out the combined efficacy of liquid biofertilizers viz *Azotobacter* and *Rhizobium* on growth promoting activities of green gram. Biofertilizer treatments showed that the combined effect of both liquids (*Azotobacter*+*Rhizobium*) enhanced growth promoting activities with maximum plant height (36.5cm), number of leaves (17.66cm), with root length (9.16cm), with shoot length (27.33cm) and increased chlorophyll content (1.712mg^{-1}) when compared to single treatments of *Azotobacter* and *Rhizobium* showing plant height (33.46cm & 31.06cm), plant leaves (14.66cm & 11.83cm), root length (6.08cm & 4.12cm) and shoot length (22.33cm & 19.09cm) respectively when compared to control.



BIO ACCESSIBILITY OF DIETARY POLYPHENOLS EXTRACTED FROM DIFFERENT DEHYDRATED POWDERS OF *CAPPARIS ZEYLANICA* FRUITS

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AB-V1-63

Capparis zeylanica is known for its nutritional value and health benefits. The fruits of this plant were used to reduce many ailments in traditional medicine. It is also used in food preparations such as pickles and curries. The fruits were sour with an acidity of 1.4%. Dehydration of the fruits by shade drying (SH), hot air drying (HD) and sun drying (SN) were conducted. The fruits were found to have high amount of polyphenols which were found to exhibit antioxidant activities. The bio accessibility of dietary polyphenols in gastrointestinal digestion indicated 60% accessible of polyphenols for shade dried samples (SH) followed by (HD) and (SN) samples.



**EVALUATION OF LIPASE PROFILE IN FEW GERMINATING MILLET SEEDS,
PARTIAL PURIFICATION AND CHARACTERIZATION OF LIPASE FROM
PEARL MILLET.**

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AB-V1-64

Lipases (triacylglycerol acylhydrolase, E.C. 3.1.1.3) is the enzyme catalysing the breakdown of the TAG into glycerol and free fatty acids. Lipase is used in industrial bio-catalytic processes and also it is helpful in the production of anti-obesity drugs. Lipase activity in different millets i.e pearl millet, foxtail millet and kodo millet increased gradually from day zero to a maximum on the 3rd day of germination. of all the three millets present pearl millet showed maximum lipase activity of 0.2415 μ M/ml/min which was partially purified using ammonium sulphate precipitation and characterised. Optimal pH and temperature for lipase activity were 8.0 and 30°C, respectively. The K_m value estimated from Lineweaver-Burk plot was 0.125 μ m with pNPB as substrate and V_{max} obtained was 0.1315 μ M/ml/min. The lipase activity was slightly increased with the addition of aqueous extract of stone breaker plant while the rate of reaction was decreased by the addition of aqueous extract of leaves of Vitamin plant, Insulin plant, Night Jasmine plant and Rue plant.



ISOLATION AND SCREENING OF ANTIMICROBIAL METABOLITE PRODUCERS FROM MARINE SOURCE

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AB-V1-65

Frequent incidences of antibiotic resistance is concern of health and lead to search for new efficient drugs. Marine microorganisms are an excellent source of bioactive compounds, where antimicrobial compounds stand in the majority. Marine sediments were collected from the different coastal area, Chennai, India. Bacteria were isolated by their ability to grow in various media. Further, to produce metabolites, the pure isolates were cultured in Zobell marine broth. Solvent extraction, antimicrobial assay, were carried out for identifying active strains. Antimicrobial activity of 20 isolates were tested against 9 food borne pathogens [*E. coli*, *Salmonella*, *Klebsiella*, *Staphylococcus aureus*, *Listeria*, *Micrococcus*, *Bacillus subtilis*, *Bacillus cereus*, *Candida albicans*] by disc diffusion method. Based on the zone of inhibition data four active strains showed inhibition on many foodborne pathogens. By 16S rRNA sequencing it was confirmed that one of the active strain belongs to *Bacillus licheniformis*.



IN SILICO EVALUATION OF DIFFERENT ANTIVIRAL DRUGS AGAINST VIRAL PROTEINS OF *BOMBYX MORI* NUCLEO POLYHEDROSIS VIRUS

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AB-V1-66

Baculoviruses are a family of DNA viruses that have a large, circular, supercoiled, and double stranded DNA-containing genome that infect insects, particularly of the order Lepidoptera. *Bombyx mori* nucleopolyhedrovirus (BmNPV), one of the best characterized baculoviruses which causes upto 50% yield loss. In order to survive in the adverse condition in silkworm, virus generates different proteins. In order to block the movement or reorganization of virus in the host system, the expression of viral proteins needs to be controlled by blocking binding sites of the respective proteins. With this background, the present work was aimed to evaluate the different commercially available antiviral drugs against the proteins encoded by the BmNPV. The structure of the virus encoded proteins was elucidated by using homology modelling techniques. The structural validation was done by employing SAVES and Ramachandran plot. Binding sites of the proteins were identified by using COACH server. The drugs were docked to the binding sites of the virus encoded proteins by using Autodock. The identified promising drugs will be evaluated under *in vivo* condition.



SAPONINS AS IMMUNOMODULATORY AGENTS

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AB-V1-67

Indian medicinal plants are a rich source of substances which are claimed to induce paraimmunity immunostimulation and immunosuppression both need to be tackled in order to regulate the normal immunological functioning.

Persea americana commonly known as Avocado is a plant species belonging to Lauraceae family. The cultivators of West Indian race are localized folks in Maharashtra, Tamil Nadu and Karnataka They are well known among the people and widely used for their nutritive and medicinal properties. In the proposed study, preliminary phytochemical screening indicated the presence of Alkaloids, carbohydrates, Proteins, flavonoids, terpenoids, glycosides, tannin & steroids etc., Saponins are either triterpenoid or steroidal glycosides proven to be essential phytoconstituents with various pharmacological activities, such as antiallergic, antiphlogostic, cytotoxic antitumour, antiviral immunomodulating antihepatotoxic, molluscicidal and antifungal activity. The work is in progress to check the efficiency of *Persea americana* to stimulate the proliferation of murine T and B lymphocytes *in vitro*.



MODULATORY ROLE OF NUTRACEUTICALS AGAINST DEMENTIA: EVIDENCE FROM *DROSOPHILA MELANOGASTER*

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AB-V1-69

Dementia is a progressive disorder of memory loss and impaired cognitive ability. Late stage dementia is severe enough to reduce a person's ability to normally perform routine activities. Dementia comes in many forms, with the Alzheimer's and vascular subtypes being the most common. Alzheimer's disease (AD) is a major progressive neurodegenerative disorder characterized by dementia. Alzheimer's disease pathophysiology involves oxidative stress and altered protein processing among basal forebrain cortical cholinergic neurons leading to their degeneration. Alzheimer's disease is characterized by low levels of acetylcholine in the brain of Alzheimer's disease patients. The treatment of dementia includes strategies, which are safe and effective in either reducing or slowing the disease progression. Several chemical substances belonging to classes of natural dietary origin display protective properties against age related diseases like AD. These nutraceuticals (which differ structurally) act at different levels of neuro protective phenomena. Various nutraceuticals which possess acetyl choline esterase (AChE) inhibitory activity have been suggested as therapeutic principles against dementia. As a proof of principle, we plan to test whether nutraceuticals treatment ameliorates dementia symptoms and biochemical changes among *Drosophila* against-scopolamine-induced dementia.



METALAXYL INDUCED ALTERATIONS IN THE MORPHOLOGICAL RESPONSES OF MAIZE SEEDLINGS DURING EARLY GERMINATION.

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AB-V1-70

Seed treatment with systemic fungicides is one of the common methods used for controlling seed borne diseases of maize. The use of fungicide, whether beneficial or harmful for the growth of crops is an issue for a long time. So the present study was aimed at evaluation of the effect of Metalaxyl, a systemic fungicide on morphological features of maize during early germination. In the present investigation, the germination percentage was counted on 4th day and 7th day. The result showed a decrease in germination percentage in maize seedlings with increase in fungicide concentrations ranging from 1.5mg to 7mg/g however 4.5mg treated seedlings did not show much variation in germination percentage. Significant increase in root length and decrease in shoot length with increased concentration of metalaxyl was observed. Decreased vigour index in treated seedlings was noted compared to control on all the days of observation and the highest decrease was observed in 7mg treated seedlings. The present study showed a reduction in fresh weight except in 4.5mg/g treated seedlings and increase in the dry weight in the metalaxyl treated seedlings when compared with the control. The result of the present study suggests the phytotoxic effect of metalaxyl at higher concentration (6 and 7mg/g). Therefore the usage of fungicide beyond threshold concentration should be avoided for the better crop yield.



ANTIBACTERIAL POTENTIAL OF *ARTEMISIA NILAGIRICA* PLANT EXTRACTS AGAINST PHYTO PATHOGENIC BACTERIA *P. SOLANACEARUM* AND *P. SYRINGAE* CAUSING DISEASES IN MANY IMPORTANT CROPS

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AB-V1-71

Diseases of plants are exploding with the potential to wipe out the crops and resulting in loss of total global food production. *P. solanacearum* and *P. syringae* are important Phytopathogenic bacteria causing a large number of diseases in many important crops like potato, brinjal, tomato . The aqueous and four different solvent viz. petroleum ether, chloroform, ethyl acetate and methanol extracts of *Artemisia nilagirica* whole plant were subjected to antibacterial activity. Petroleum ether extract showed significant inhibition zone followed by chloroform extract against the test bacteria. petroleum ether extract recorded a maximum inhibition zone in the range of 12-14mm and chloroform extract 12-13mm . *P. syringae* was more sensitive to all the extracts indicating that it may have antibacterial secondary metabolites responsible for bactericidal action. Phytochemical analysis of petroleum ether, chloroform extract showed the presence of flavanoids, terpenoids, tannins and steroids.



BIOLOGICAL CONTROL OF A COMMON PHYTO PATHOGENIC BACTERIA *XANTHOMONAS* BY *ARISTOLOCHIA INDICA* LEAF EXTRACTS

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AB-V1-72

Plant diseases are the major setback in agriculture production. This can be overcome by the use of pesticides. But the extensive use of pesticides has led to a wide spectrum of environment and human health hazards especially when it is vegetables. The better alternative is “Biological control” which is an eco-friendly strategy, especially with botanicals proving better alternatives in disease control. *Xanthomonas* is an important Phytopathogenic bacteria causing a large number of diseases in many important vegetables and crops. The antibacterial activity of *Aristolochia indica* was tested against three *Xanthomonas* species namely, *X. axonopodis* p.v. *vesicatoria* causal organism of bacterial spot of tomato, *Xanthomonas oryzae* causing bacterial blight of paddy and *Xanthomonas campestris* p.v. *campestris* causing black rot of cabbage. The four different solvent extracts viz. petroleum ether, chloroform, ethyl acetate and methanol were subjected to antibacterial activity. Chloroform, Ethyl acetate and methanol extracts showed activity against all the tested bacteria with inhibition zone ranging from 14- 23 mm. *X. campestris* was sensitive to all the extracts with maximum zone of inhibition of 23mm. *X. axonopodis* p.v. *vesicatoria* was sensitive to ethyl acetate and methanol extracts with inhibition zone of 20 and 22mm respectively. Phytochemical analysis of ethyl acetate and methanol extract showed the presence of flavanoids, terpenoids, tannins and steroids.



ISOLATION AND IDENTIFICATION OF POTENTIAL STRAINS OF BIOLOGICAL AGENTS FROM SOIL AGAINST THE FOOT ROT DISEASE OF PEPPER.

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AB-V1-73

Black pepper is a woody climber and cultivated in Karnataka, Maharashtra , Andhra Pradesh and Tamilnadu etc.,*Phytophthora capsici* causes disease namely foot rot known as “Quick Wilt” in pepper. It is a serious and destructive disease affecting all parts of vine. Several bio-agents like *Trichoderma*, *Pseudomonas fluorescense*, PGPR/ PGPS will be isolated from soil of different cultivated regions of Karnataka. Isolation and enumeration was performed by serial dilution plate technique. These agents parasitize around hyphae of pathogen by secreting lyase enzyme to decompose cell wall of pathogen, *Rhizoctonia*, *Phomopsis cassia* etc., will produce secondary metabolites like terpenoids, alkaloids, aromatic compounds and antibiotics by which they suppress the pathogen and manage the disease.



GENOME-WIDE IDENTIFICATION AND CHARACTERIZATION OF TIFY GENE IN *MORUS NOTABILIS*

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AB-V1-74

Mulberry is an economically important crop which is sole food source for domesticated mulberry silkworm, *Bombyx mori*. The availability of mulberry (*Morus notabilis*) draft genome provides an opportunity to identify and characterize important gene families especially the group of plant specific genes which are important in plant growth and defence mechanism. Among them, TIFY genes are plant specific with a broad range of functions such as plant growth, tissue development and defence regulation. Moreover, it play an important role in modulating plant hormone signalling pathways. TIFY domain contains the core motif TIF [F/Y] XG that constitutes approximately 36 conserved amino acids. In the present study, Genome-wide identification of TIFY gene family were carried out in *Morus notabilis*. Further, which are classified into TIFY, JASMONATE ZIM-Domain (JAZ), ZML and PPD sub-families. We performed comparative analysis of TIFY genes among the Arabidopsis, Brassica, cotton and other closely related plant families to mulberry. This study will provide an insight into the TIFY genes and its mechanism in the plant hormone signalling and will helpful for crop improvement.



ASSESSMENT OF FUNCTIONAL AND TECHNOLOGICAL PROPERTIES OF LACTIC ACID BACTERIA FOR PROBIOTIC APPLICATION

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AB-V1-75

Probiotics are live microorganisms that maintain healthy intestinal microflora with additional health benefits to the host. The present study was undertaken to study the functional and technological properties of Lactic acid bacteria (LAB) isolated from food sources for their potential application as probiotics. Among three selected lactic acid bacteria (LB 48, 79, 81) LB48 and LB79 displayed highest acid tolerance with 68% and 67% survival after 1 hour of incubation at pH 2 respectively. Bile tolerance was maximum in LB48 with 84% survival after 24 hours of incubation at 1.5% bile concentration. Auto aggregation and Co-aggregation activity was significantly noted along with adhesion ability. The selected cultures showed antimicrobial activity against five food borne pathogen (*Listeria monocytogens*, *Shigella species*, *Micrococcus luteus*, *Staphylococcus aureus*, *Escherichiacoli*). The culture also displayed potential antioxidant activity. Enzymatic analysis showed the presence of protease enzyme. Technologically the cultures were found to be stable at temperature ranging from 30-50°C and pH ranging from 4 to 8. The overall results confirms the probiotic properties of the isolates for inclusion as adjuvant in functional food formulation.



CHARACTERIZATION OF ANTIMICROBIAL PEPTIDE FROM LACTIC ACID BACTERIA FOR APPLICATION AS BIOPRESERVATIVE.

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AB-V1-76

Extensive use of chemically synthesized antibiotics has led to the development of multidrug resistance and emergence of superbugs which has become a global public health concern. Presently, world is looking for a potential alternative to antibiotics. Antimicrobial peptide (AMPs) is one such promising alternative to combat drug resistant bacteria. AMPs are ribosomally synthesized host defensive peptides. In this regard, study was undertaken to characterize the AMPs producing food grade lactic acid bacteria (LAB) for their application as biopreservatives. Five LAB (L9, L25, L48, L76, L78) were selected and analysed for their antimicrobial activity against five food borne pathogen such as *E.coli*, *Micrococcus luteus*, *Staphylococcus aureus*, *Listeria monocytogenes*, *Shigella* sp. The neutralized cell free supernatant of selected LAB showed inhibition zone ranging from 12mm to 14mm diameter. Further, the effect of different carbon sources on antimicrobial potential was studied by growing the cultures in media supplemented with 1% each of glucose, lactose, maltose, mannose and melibiose individually. According to the results obtained minimum inhibitory concentration (MIC) was highest with glucose against *E.coli* (20 to 30 AU/ml), *Micrococcus luteus* (20 to 640 AU/ml) and *Shigella* sp(20 to 40 AU/ml). Further the antimicrobial peptide was partially purified by ammonium sulphate precipitation, chloroform extraction and acetone precipitation. Results showed maximum inhibitory activity in 60% ammonium sulphate saturation. The partially purified peptide was analysed by SDS-PAGE and overlay assay. The mode of action was analysed by using *Bacillus* biosensors. The overall study depicts the potency of AMPs from LAB for application as biopreservative.



ENRICHMENT OF SILKWORM POWDER THROUGH LAB FERMENTATION

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AB-V1-77

Sericulture, a well-established agro-based industry in India occupies a distinctive position in the country, especially in the rural areas. The industry produces enormous quantities of pupa waste and silkworm litter which remains unutilized. The accumulated seri waste can be converted to value added products. In this regard, the present study was focused on the isolation of fermentable lactic acid bacteria (LAB) from silkworm powder and applying the same for silk worm powder fermentation and investigating the fatty acid profile. Initially, 19 bacterial cultures were isolated from silk worm powder and characterized for preliminary characteristics of the LAB, i.e., Gram-positive, non-spore forming, catalase negative and sugar fermentation ability. The selected cultures were analyzed for fermentation of silk worm powder by determining cell count, pH, total acidity, total sugars, reducing sugars, protein content, lipid content, and degraded proteins for 5 consecutive days. Under optimum condition, the best culture was used for fermenting silk worm powder and the lipid was extracted. Fatty acid profile of lipid was carried out by Gas chromatography. The results proved the presence of useful compounds signifying the nutritional value of the fermented product.



TANNASE PRODUCING FOOD GRADE BACTERIAL STRAINS: A POTENTIAL SOURCE FOR TANNIN DEGRADATION

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AB-V1-78

Tannins are the polyphenolic compounds mainly present in plants. Since tannins have antinutritional effects, degrading them with tannase enzyme produced by food grade bacterial strains plays an important role in nutrition. Thus, in this present study bacterial strains were isolated from the fermented tannin rich sources (grains and fruits), and checked for their ability to produce tannase. Around 16 colonies were isolated, purified and checked for tannase activity. Among them, 15 cultures showed tannase production as observed by brown zones on tannin containing minimal media. The culture C₂ showing maximum tannase activity (0.064 U/mg) was selected for optimum enzyme production by using various percentage of tannic acid (0.1%-0.7%). According to results obtained, the culture showed maximum enzyme production (0.52U/mg) at a concentration of 0.2% tannic acid after 48h of incubation at 37°C. Further tannase was partially purified by ammonium sulphate precipitation (60%) and dialyzed. Molecular weight was determined by SDS-PAGE and the activity was assessed by overlay assay.



BACILLUS PROTEASE AND THEIR APPLICATION IN PRODUCTION OF FISH PROTEIN HYDROLYSATE

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AB-V1-79

The fish processing industry is a major economic source for many countries with large coastal areas. These industries along with processed fish also generate about 15-20% of waste during processing which are being discarded, that has led to environmental pollution. However, these wastes can be reutilized for the production of various value added products. Fish hydrolysate is one such by-products of enzymatic degradation of fish waste with high nutraceutical value. In this regard, the study was focused on isolation of proteolytic *Bacillus* spp. for their application in production of fish protein hydrolysate. Initially *Bacillus* spp. was selectively isolated from fish waste collected from local markets in and around Mysore. The proteolytic activity was confirmed by zone of clearance on skim milk and casein agar medium. Among them four *Bacillus* spp. (INT 1.2, PR 1, PI 4, and INT 1) were selected with higher protease activity i.e 6.68, 22.14, 7.30 and 23.40 U/mg for analyzing optimum culture condition for enzyme production. According to results obtained INT 1 and PI 4 showed highest activity (347.33 and 320.76 U/mg) in presence of 1% glucose and 1% tryptone. Incubation time of 24 h was found optimum for enzyme production. Further under optimum condition, the culture INT 1 was grown and the enzyme was partially purified by ammonium sulphate precipitation and dialysis. The potent culture was further applied for production of fish protein hydrolysate and analyzed for its potential characteristics.



RECEPTOR MEDIATED SIGNALING IN CASPASE ACTIVATION FOR APOPTOSIS

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AB-V1-80

Cellular aging, or senescence, is the process by which a cell becomes old and dies. It is due to the shortening of chromosomal telomeres to the point that the chromosome reaches a critical length. DNA damage can, but does not always, induce cell death. The cell death may be by the result of the natural process of old cells dying and being replaced by new ones, or from disease, localized injury, or the death of the organism. Apoptosis or Type I cell-death, and autophagy or Type II cell-death are both forms of programmed cell death, while necrosis is a non-physiological process that occurs as a result of infection or injury. Every cells life span is predetermined by various factors including the telomere region and undergoes death in a programmed way by activating the various signaling pathways, the process commonly known as programmed cell death (PCD) or Apoptosis. While, necrosis is the cell death caused by external factors such as trauma or infection, and occurs in several different forms. Apoptosis can be initiated through one of two pathways; the intrinsic pathway, where the cell kills itself because it senses cell stress, and extrinsic pathway, where the cell kills itself because of signals from other cells. Both pathways induce cell death by activating caspases, which are proteases, the enzymes that degrade proteins. Failing to undergo programmed death due to mutation in the genes like p53, E2F genes, Caspase genes leads to uncontrolled proliferation and tumour development. The TNF-induced (tumour necrosis factor) model and the Fas- Fas ligand-mediated model, both involves the receptors coupled to extrinsic signals. The significance of restoring apoptosis signaling towards selective targeting of cancerous cells exploits the caspase family of death-inducing molecules as a powerful therapeutic platform for the development of potent anticancer strategies.



UTILIZATION OF WHEAT BRAN FOR THE PRODUCTION OF RED PIGMENT BY *TALAROMYCES PURPUREOGENUS* CFRM02

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AB-V1-81

Microorganisms producing pigmented metabolites are attractive as these metabolites have a significant effect on the health, nutrition, and economics of our society. However, the utilization of suitable growth substrate for pigment production is essential for biotechnological applications.

Here wheat bran was utilized for the production of *T. purpureogenus* pigment by submerged fermentation. Various factors like substrate, pH, temperature, mode of cultivation influence the pigments production. At pH 6, pigment production was higher in terms of absorbance (0.362 ± 0.00) at $494\text{nm } \lambda_{\text{max}}$ and colour value (16.32 ± 1.40) for redness. While the increase in the pigment production was observed at 30°C . Addition of carbon source xylose to the basal medium induced the pigment production. Similarly among nitrogen sources the addition of yeast extract induced the pigment production. Biomass yield was significantly higher in all the carbon sources, except xylose (1.090 ± 0.14). Further, the addition N2C1 (17.98 ± 1.87) to the basal medium yielded the higher pigment whereas lower pigment production was observed in was N4C3 (5.57 ± 2.41) composition. These results suggested the utilisation of wheat bran along with carbon and nitrogen for the pigment production in *T. purpureogenus*.



BIOCHEMICAL AND CULTURAL CHARACTERISTICS OF SKIN MICROBIOTA AND THEIR ANTIBIOTIC PROFILE ISOLATED FROM 'O' BLOOD TYPE INDIVIDUAL

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AB-V1-82

The skin is the largest organ of human body colonized by a diverse group of microorganisms, most of which are having mutualistic and commensalic association with their host. The colonization of skin microbiota depends on the ecology and topology of the skin and also endogenous host factors and exogenous environmental factors. The cutaneous innate and adaptive immune responses can modulate the skin microflora. The blood type is one the endogenous host factors decides the colonization of these microflora and immune response to certain health complications. The susceptibility and resistance to various diseases such as heart trouble, cancers, ulcers, malaria, smallpox, influenza, cholera, urinary tract infection, infertility and stress are driven by human blood types. Individuals with blood group 'O' are more susceptible than other to cholera and resistant to risk of heart attacks. An attempt was made to isolate the skin microbiota from the 'O' blood group individual and characterized four selected isolates biochemically and culturally. The result of the study suggested that, all the four isolates were Gram positive cocci or bacilli and showed catalase positive. The isolates were unable to utilize mannitol as sole source of carbon. The antibiotic profile of the isolates revealed that, all the isolates were resistant to penicillin and susceptible to chloramphenicol and streptomycin. For tetracycline, isolates 1 and 4 showed resistance and isolate 2 was susceptible. The cultural, biochemical and physiological characteristics revealed that, the genus of the four isolates may be either *Staphylococcus* or *Streptococcus*. The present investigation recommended that, the isolates are coagulase negative as they does not ferment mannitol and are considered as normal flora of the skin. Further studies are required to evaluate the molecular characteristics of the isolates and their beneficial role in maintaining health of the skin.



IMPACT ASSESSMENT OF PESTICIDE EFFECT ON COCONUT PLANTATION SOIL BACTERIAL DIVERSITY AND SOIL FERTILITY

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AB-V1-83

Soil provides habitat for a variety of microorganisms that performs various ecological functions. Any alteration to the natural quality of the soil will cause an impact on soil microbes. Pesticide application is thus a threat to soil microbial diversity. The indiscriminate use of the pesticide will affect soil nutrients as well as microbial community. The present study was carried out to analyze the impact assessment of pesticide effect on coconut plantation soil bacterial diversity and soil fertility. Pesticide applied and non pesticide applied soil samples were collected from Karivellur (North), south Pattiam (South), Naduvil (East) and Ettikulam (West) of Kannur district. Nutrient analysis of the collected soil samples using standardized protocols showed that non pesticide soil sample has more nutrient content level than pesticide applied sample, except in the case of sulphur, calcium, magnesium (macro nutrients) and manganese (micro nutrient). pH was also low in pesticide applied soil than non pesticide applied soil. Bacterial analysis was carried out using carbohydrate utilization test by the plate method using Simmon's citrate agar. Different carbohydrate medium shows different results. Pesticide added soil samples shows the less number of colonies on medium than non pesticide soil sample. Even though some nutrient contents have increased by pesticide application, the microorganism could not tolerate with that condition.



EVALUATION OF VEGETATIVE GROWTH PARAMETERS OF TOMATO PLANTS AGAINST EARLY BLIGHT DISEASE BY SEEDS PRIMED WITH CRUDE OLIGOSACCHARIDES EXTRACTED FROM ENDOPHYTIC FUNGI

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AB-V1-84

Tomato is one of the most popular crops and widely cultivated throughout the world for its nutritional value. Early blight is the most common and devastating disease in tomato caused by *Alternaria solani*. Its severe infection leads to defoliation of leaves, drying off of twigs and losses in fruit yield. In this present study tomato seeds were primed with crude oligosaccharides extracted from endophytic fungi for the evaluation of vegetative growth parameters under greenhouse conditions. Among the different concentrations of crude oligosaccharides used, 2.0 mg/ml concentration showed highest Plant height, number of leaves, fresh and dry weight of shoots and roots when compare to control and other treatments.



ENDOPHYTE MEDIATED INDUCTION OF DEFENCE ENZYMES TO ENHANCE THE RESISTANCE OF TURMERIC AGAINST *RHIZOCTONIA SOLANI* CAUSING LEAF BLIGHT

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AB-V1-85

Leaf Blight caused by *Rhizoctonia solani* is becoming major constraint for the production of turmeric in India. Due to excessive usage of fungicides viz., ridomil, mancozeb, metalaxyl, carbendazim etc, the pathogens tend to develop resistance. In the present study, the efficacy of endophytic fungi, *Trichoderma harzianum* TharDOB-31, *T. asperellum* Tasp DOB-19 and bacteria *P. aeruginosa* BacDOB-E19, *Pseudomonas fluorescens* BacDOB-E10 strains were tested for their ability to induce systemic resistance against *R. solani*. *In vitro* studies revealed that endophytic fungi *Trichoderma harzianum* TharDOB-31 and *T. asperellum* Tasp DOB-19 showed inhibition of mycelial growth of *R. solani* upto 77% and 76% respectively. Similarly endophytic bacterial isolate *P. aeruginosa* BacDOB-E19 and *P. fluorescens* BacDOB-E10 showed inhibition of mycelia growth of pathogen upto 74 % and 72 % respectively. Susceptible turmeric cultivar 'Erode local' was used in the present study. The regulation of defense enzymes such as peroxidase (POX), phenylalanine ammonia-lyase (PAL), polyphenoloxidase (PPO), PR-protein like chitinase in turmeric plants due to the application of bioagents followed by challenge inoculation with pathogen were studied in green house and in filed conditions for the enhancement of yield. Application of endophytic biocontrol agents followed by challenge inoculation with *R. solani* exhibited maximum induction of the defense-related enzymes compared with untreated and pathogen control, in turn increased the plant growth and yield of turmeric. Results indicated in addition to direct antagonism and plant growth promotion, the increased induction of defense enzymes due to treatment of bioagents collectively contributed to enhance resistance against invasion of *R. solani* in turmeric. Outcomes of the study will be useful in formulating the talc-based endophytic biocontrol agents to control leaf blight in turmeric plants.



IN VITRO EVALUATION OF *CORCHORUS CAPSULARIS* L. (SEED) FOR ANTIBACTERIAL POTENTIALITY AGAINST IMPORTANT SPECIES OF BACTERIA

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AB-V1-86

Evaluation of antibacterial potentiality of aqueous and solvent extracts of *Corchorus capsularis* L. belongs to family Malvaceae were evaluated against five pathogens viz., *Escherichia coli*, *Enterobacter aerogenes*, *Proteus vulgaris*, *Staphylococcus aureus* and *Bacillus cereus* tested at 10, 20, 30, 40, 50, 60, 70, 80, 90, 100%, concentration. In aqueous seed extract, maximum inhibition was observed in *P. vulgaris* and *S. aureus* and recorded 34.0 mm and 34.0 mm at 100 % concentration followed by *E. coli*, *B. cereus* and *E. aerogenes*, and recorded 33.0 mm, 24.0 mm and 20.0 mm inhibition respectively. In different solvent extracts viz., petroleum ether, benzene, chloroform, methanol and ethanol tested at 10 to 100% concentration, maximum inhibition was observed in methanol extract and recorded 36.0 mm in *P. vulgaris*. Followed by *E. coli*, *E. aerogen* and *S. aureus* and recorded 31.0 mm inhibition at 100% concentration. Least inhibition was observed in *B. cereus* and recorded 25.0 mm at 100% concentration. Significant activity was also observed in 10 to 90% concentration. Compared to standard antibiotic gentamycein at a recommended concentration of 25mg, *E. coli* recorded 30.0 mm, *E. aerogen* recorded 24.0 mm, *P. vulgaris* recorded 25.0 mm, *S. aureus* recorded 29.0 mm and *B. cereus* recorded 32.0 mm inhibition respectively.



BIOINFORMATICS FOR THE SUSTAINABLE DEVELOPMENT-DRUG DISCOVERY A BOON FOR MOTHER NATURE

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AB-V1-87

Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The global scenario with reference to medical science is combating various diseases and developing techniques identify it without much economic loss. But the conventional techniques involve a lot of financial input as well as loss of environment cause of induction of chemicals for experimental studies. In this scenario, Bioinformatics acts a boon in drug discovery process which involves much less investment in both economic and environmental cadre while proceeding as the most advanced technology to emerge. The goal of drug discovery is to contrive bioactive molecules that efficaciously modify a disease in a way that is beneficial to the patient while keeping adverse effects such as toxic responses controllable. On the molecular level, these requirements translate into a picture where a drug molecule binds to one or more target proteins that are implicated in the pathophysiology of a disease and act as, for example, inhibitors, agonists or modulators. Computational methods for predicting 3D protein models are widely used in the pharmaceutical industry, and much effort has been invested in improving model accuracy, and in expanding the scope of these methods. Methods are generally categorised into template-based (i.e. homology) modelling and de novo modelling. Traditional homology modelling (or comparative modelling) is considered to be the most accurate of these methods and is thus most commonly applied in drug discovery research. This follows molecular docking i.e., screening of chemical databases for ligand discovery, the method retains important weaknesses. A testament to these is the criterion by which docking screens are evaluated: the enrichment of annotated ligands from among a large database of presumed nonbinding “decoy” molecules. Thus developing a new drug without economic and environmental loss.



GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES FROM BAMBOO LEAF EXTRACT AND ITS ANTI BACTERIAL ACTIVITY

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AB-V1-88

In the present study, the green synthetic method was employed for producing zinc oxide nanoparticles (ZnO NPs). The method is, environmentally benign, cost-efficient and simple. Bamboo leaf extract was used as a fuel for the synthesis of ZnO NPs from zinc nitrate Hexahydrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$) by low-temperature combustion method. The obtained ZnO NPs were characterized by various analytical instruments like UV/vis spectroscopic, Fourier transform infrared spectroscopy (FT-IR), Powder X-ray diffraction (PXRD) and Scanning electron microscopy (SEM). In addition, the antibacterial activity of ZnO NPs was assessed against gram-positive and gram-negative bacteria. The synthesized ZnO NP antibacterial activity was found be dose-dependent.



BIOCONTROL OF *PSEUDOMONAS FLUORESCENCE* AGAINST *RALSTONIA SOLANACEARUM* IN TOMATO AND ITS PLANT GROWTH PROMOTING EFFECTS.

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AB-V1-89

The present investigation was to use *Pseudomonas fluorescens* isolates in managing diseased tomato crop, an economically important. The bacterial wilt caused by *Ralstonia solanacearum* decreased tomato production in all parts of the world. *R. solanacearum* isolates from infected tomato plants and their rhizosphere soil samples were isolated using triphenyl tetrazolium chloride (TZC) medium. Efficacy of *P. fluorescens* isolates were used under greenhouse conditions wherein seed treatment with *P. fluorescens* (Pf3, Pf5, and Pf8) isolates improved the seed germination and seedling vigor and suppressed the wilt incidence, promoting plant growth. The disease incidence reduced an average of 51% in treated plants. The suspensions of *P. fluorescens* isolates were applied in pot experiment through different methods like seed, root, soil, and their integration methods seed+root, root+soil, seed+soil and seed+root+soil. The percentage of wilt incidence was lowest (31.1%) in *R. solanacearum* and *P. fluorescens* treated plants while the population dynamics of the *R. solanacearum* and *P. fluorescens* in soil showed the crop receiving seed+root+soil treatment soil had the lowest population recovery of the *R. solanacearum* 28.13×10^8 colony forming unit (CFU)/g (7.71) and correspondingly highest population recovery of the *P. fluorescens* 185.27×10^8 CFU/g (8.92). The yield attributes, and physiological and biochemical parameters were also found to be best performing in the seed+root+soil treatment of the *P. fluorescens* indicating its potential as PGPR. In the field study, in compared to control, seedlings treatment with *P. fluorescens* gave an average of 26 quintals/ha (14.73%) increase in tomato yield.



INFLUENCE OF FERMENTATION CONDITIONS ON PIGMENT PRODUCTION BY *PENICILLIUM ACULEATUM*

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AB-V1-90

Color, in one form or the other, has been a vital part of many industries from centuries together. The existing authorized natural colorants are either products of plant or animal origin with various drawbacks like instability against light, heat or pH, low solubility in water, and are often unavailable throughout the year. There are a good number of micro-organisms which are able to produce pigments in high yields. An intracellular pigment-producing filamentous fungus *Penicillium aculeatum* was isolated and identified from soil sample. The optimum growth conditions for high pigment yield were investigated at several parameters namely, pH, temperature, inoculum age, incubation time, light, carbon source and nitrogen source. The optimized culture conditions for highest pigment production are as follows; Dextrose 2%, Peptone (0.4%), pH 6, temperature 30°C, green light (577– 492 nm), incubation time – 7 days and inoculum age – 6 days old. Our attention was focused to isolate and optimize the fermentation conditions in order to produce a higher yield of the pigment, which is an important requirement for commercial applications.