

ISOLATION OF CHITINASE PRODUCING ORGANISM FROM SOIL FOR BIOCONTROL ACTIVITY

Rajadurai.T, Robin James. J, Sanjeev MS, Lali Growther

Department of Microbiology, Hindusthan College of Arts & Science, Coimbatore

Abstract

Fungal pathogens cause huge economic loss in plantation sector. Chemical pesticide and fungicides are used predominantly by the farmers that cause potential harm to human and animal health. Chitin is an important component in the cell wall of fungi. When chitin is degraded, it causes leakage of cell contents and death of fungi. Thus for the control of fungal pathogens, enzymes that degrade fungal cell wall component, Chitin were studied. Microorganisms are a major source of Chitinase enzymes. A total of 5 different rhizosphere soil samples were aseptically collected from different regions of Coimbatore, India. Media containing colloidal chitin was used for screening of soil microorganisms. Colonies showing clear zones were considered as chitinase producing organisms. Isolates showing clear zones were identified based on morphological and biochemical characteristics. Three isolates showed clear zones around the colonies and the potential strain was identified as *Bacillus* sp. Chitinase enzyme was assayed following standard procedures and effect of carbon, nitrogen sources and physical parameters like temperature and pH was optimized for chitinase enzyme production.

Key words: Chitinase, *Bacillus*, biocontrol agents

ISOLATION OF *STAPHYLOCOCCUS SP.* AND *PSEUDOMONAS SP.* FROM ADULTS AND STUDY OF THEIR ANTIBIOTIC SENSITIVITY PATTERN

Durgadarshini RV, Gnanasoundharya V, Sivasankar K, Sneha S, Lali Growther

Department of Microbiology, Hindusthan College of Arts & Science, Coimbatore

Abstract

Staphylococcus and *Pseudomonas* are causative agents of skin infections. Both these organisms remain a common cause for morbidity and mortality. These organisms develop resistance often and adults carry *Staphylococcus aureus* in their anterior nares. *Pseudomonas* sp are oligotrophs and can grow at limited nutrient solutions. The presence of *Pseudomonas* was isolated from skin surface using swabs moistened in sterile saline. This study was aimed at isolation of the common skin pathogens *Staphylococcus* and *Pseudomonas* from human adults. Swabs moistened with sterile saline were used for collection of samples. Selective media were used for the isolation of organisms. *Pseudomonas* isolation agar and Mannitol Salt agar were used for isolation of *Pseudomonas* and *Staphylococcus* sp. respectively. A total of 100 samples

were collected. Antibiotic sensitivity testing was done for 12 different antibiotics. 57 Staphylococcus isolates and 5 Pseudomonas isolates were identified. Multi drug resistance isolates also were identified. This confirms the presence of Staphylococcus in the anterior nares of human adults. These adults serve as carriers for the transmission of these pathogens.

Key words: *Staphylococcus aureus*, Pseudomonas, anterior nares

ANTIBACTERIAL ACTIVITY AND PHYTOCHEMICAL ANALYSIS OF ABUTILON INDICUM

N.Hemashenpagam*., Arul Sebastian Raj. T**, Girishkumar.U**, Meena.M**,
Poornima.V.K**, Pournami Gopan.S**, Raj Nivetha.R**, Dharshini.N**

*Professor in Microbiology,

**III B.Sc., Microbiology

PG & Research Department of Microbiology,
Hindusthan College of Arts and Science, Coimbatore

ABSTRACT

During past several years, there has been growing interest among the usage of various medicinal plants from traditional system of medicine for the treatment of different ailments. The herb Abutilon indicum are noted for their medicinal benefits in traditional system of medicine. It is used in ayurveda, folk medicines, siddha unani and Tibetan medicine system. The present study was conducted to determine the Antimicrobial activity and phytochemical analysis of Abutilon indicum leaf extracts with different solvents such as Petroleum ether, 70% Ethanol, Chloroform and water against E. coli, Enterococci, Bacillus sp., Pseudomonas, Staphylococcus sp., The disk diffusion method was used to test the Antimicrobial activity and the Phytochemical analysis are carried out. The extracts suppressed the growth of organism used.

Keywords

Antibacterial, Phytochemicals

ANTIBACTERIAL EFFECT OF ALLIUM SATIVUM CLOVES, ZINGIBER OFFICINALE RHIZOMES AND PEPPERMINT LEAVES

Dr.R.Manju , Bubby Sheela S., Joel Nirmal Kumar J., Karthik Raja K.P., Lakshmi Priyanka C.,
Sangeetha S., Sasi Kumar S., Shalini Ulaganathan**., Yuvan Balaji T**.

PG and Research Department of Microbiology

Hindusthan College of Arts and Science

Abstract

To evaluate the antibacterial properties of Allium sativum (garlic) cloves, Zingiber officinale (ginger) rhizomes and Peppermint Leaves against multi-drug resistant clinical

pathogens causing nosocomial infection. The cloves of garlic, Peppermint Leaves and rhizomes of ginger were extracted with 95% (v/v) ethanol. The ethanolic extracts were subjected to antibacterial sensitivity test against clinical pathogens. Anti-bacterial potentials of the extracts of three were tested against five gram negative and two gram positive multi-drug resistant bacteria isolates. All the bacterial isolates were susceptible to crude extracts of both plants extracts. Except *Enterobacter* sp. and *Klebsiella* sp., all other isolates were susceptible when subjected to ethanolic extracts of garlic and ginger. The highest inhibition zone was observed with garlic (19.45 mm) against *Pseudomonas aeruginosa*. The minimal inhibitory concentration was as low as 75.00 µg/mL against *P. aeruginosa*. Natural spices of garlic, Peppermint Leaves and ginger possess effective anti-bacterial activity against multi-drug clinical pathogens and can be used for prevention of drug resistant microbial diseases and further evaluation is necessary.

Keywords: Garlic, Ginger, Peppermint Leaves, Multi-drug resistant, Multiple antibiotic resistance, Antibacterial activity

MOSQUITO REPELLENT FROM PLANTS

A.Manivannan, Jeyarekha M, Nisha T.A., Sleepa Paul, Soundarya G., Sri Vigneswaran .V.,
Subhasree.R., Yuvasree.R.,
PG and Research Department of Microbiology
Hindusthan College of Arts and Science

Abstract

Mosquitoes are wide spread in the world. To tackle them many mosquito repellents are emerged in the market. But, the mosquitoes became resistant to them. Not only this, the consumers are getting many known and unknown ill effects with them. So, an attempt has been made by developing a herbal mosquito repellent based on traditional practices and species available in the garden to provide a reliable, prolonged and complete protection from mosquito bites by killing them. Essential oils from fresh samples of six aromatic plants viz., *Clinopodium vulgare*, *Cymbopogon flexuosus*, *Piper betle*, *Acacia leucophloea* and *Plectranthus amboinicus* were extracted by grinding the samples, soaking them in kerosene overnight and add olive oil, rose water (*Rosa x damascena*) and salt. Filter the mixture through cloth. Transfer this preparation into an empty refill. Now the refill is ready to use. Nulliparous, 3-5-day-old female adult *Aedes aegypti* mosquitoes were used for repellency screening as per ICMR protocol. The formulated repellents were evaluated for their action. The oil extract from the samples were tested on the mosquitoes. The extracts showed positive results as there was no mosquito during

the repellency but there were difference in their repellency period. This study demonstrates the potential of essential oils from all the six Samples and their blend as mosquito repellents against *Ae. aegypti*, the vector of dengue, chikungunya and Yellow fever. The results shows that the formulated repellents were effective, cheaper and non -poisonous than the presently available chemical based marketed mosquito repellents.

Keywords: *Ocimum tenuiflorum*, *Cymbopogon*, *Rosa x damascena*, *Piper betle*, *Acacia leucophloea*, *Plectranthus amboinicus*, Mosquitoes, herbal mosquito repellent, economical.

ANGIOGENIC PROPERTIES OF HERBAL EXTRACT USING CAM MODEL

Dr.G.Arun Kumar., Ajith Kumar.M., Aravindhan.A., Arun Kumar.R., Gayathri.D.,
Hindumathi.M., Kavitha.C., Mahalakshmi.A.
PG and Research Department of Microbiology
Hindusthan College of Arts and Science

ABSTRACT

Cancer is a major cause of death worldwide and angiogenesis is critical in cancer progression. Development of new blood vessels and nutrition of tumor cells are heavily dependent on angiogenesis. Angiogenesis is the formation of new blood vessels from existing vasculature. There are several “on” and “off” switches that regulate the process. Decreasing or inhibiting angiogenesis can be therapeutic in cancer and other diseases. Thus, angiogenesis is an important process that occurs both during health and disease. This study was conducted to investigate the anti-angiogenic activity of *Carica papaya* leaf. The anti-angiogenic activity of papaya leaf was evaluated using docking behaviour of known bioactive compounds of leaf as ligands with angiogenic receptors VEGFR1 and VEGFR2 along with their putative binding sites using Swiss Dock Web server (In silico) and further based on docking results leaf aqueous extract was used for implantation in chorioallantoic membrane (CAM) egg yolk angiogenesis model (in vivo). Docking studies and binding free energy calculations revealed that among known bioactive compounds of leaf Ascorbic acid, quercetin, riboflavin and lycopene have maximum free energy as compared to other investigated ligands. Similarly, CAM assay also showed the inhibitory effect of the *Carica papaya* leaf with respect their reduction in length, size and junctions of blood capillaries compared to untreated egg yolk. The results showed that Ascorbic Acid, Quercetin, Riboflavin and, Lycopene (leaf compounds) can attenuate angiogenesis in pathological conditions and can be potent in drug discovery as well as medical science.

Keywords: *Carica papaya*, Angiogenesis, Medical Science, Cancer, Pathological, Phytochemical.

BIOFUEL PRODUCTION FROM WASTE PAPER

Dr. N.Vanitha., S.Sivarajeshwari., S.Priyadharshini., M.Priyadharshini., Nivetha.B., Sajitha.V.,
Shanmugajothi.S., Sivaramakrishnan.K.
PG And Research Department Of Microbiology
Hindusthan College Of Arts And Science, Coimbatore-28.

Abstract

In this research, bioethanol was produced from office waste by acid hydrolysis and subsequent fermentation using *Saccharomyces cerevisiae*. Conditions for the acid hydrolysis of waste paper were optimized by varying acid volume from 100 to 300 mL, reaction time 30-180 min, with a sulfuric acid concentration of 5.0 at 121 °C in an autoclave. The best results were obtained for acid hydrolysis of waste paper with the following conditions: an acid volume of 200 mL during 120 min of reaction time. After the fermentation process with *Saccharomyces cerevisiae* during 24 hours at 30 °C and 150 rpm, 0.1035 mL ethanol /g dried paper were obtained. Finally, some physical properties of obtained bioethanol were determined and compared with the standards.

Keywords: Bioethanol, waste paper, acid hydrolysis, fermentation

EXTRACTION AND ANALYSIS OF PIGMENT FROM BANANA FLOWER BRACT

Mrs. Ajitha C., Deepa R., Dominic Infant Raj A., Jenifer Jenisa S., Koushika B., Sahaya Abisha M., Sakthi Nanjundeeswari M., Santhiya K.
PG and Research Department of Microbiology
Hindusthan College of Arts and Science

ABSTRACT

Anthocyanin pigment has significant importance since it has antibacterial, antiviral, anticancer, and antioxidant properties. Banana flower bract (*Musa paradisiaca*) has potential source of natural color with the pigment anthocyanin. The present study was carried out to analyse the phytochemical properties, antioxidant activities and to quantitate the presence of anthocyanin pigment. The pigment extraction was carried out using different solvents like petroleum ether, ethanol and water. The extract was analysed for the qualitative phytochemical properties. Quantitative analysis was performed using spectrophotometric and gravimetric method and the outcome was determined.

Keywords: Banana bract, Anthocyanin, Phytochemicals, Quantification.

PRESERVATION OF FRUITS BY ALOE VERA COATING

Dr. Achuth J, Dharshana K, Ganga B, Harichandran M, Lignesh Kumar D, Rekha D, Sree Vidya V, Sri Balaji.

*PG and Research Department of Microbiology, Hindusthan College of Arts and Science, Coimbatore, 641028

Abstract:

Novel green technological advances in antimicrobial edible coatings of food and feed hold high potential in extending their shelf life as well as resorting the concerning food safety and quality specifications. Aloe vera gel is proven to be safe for both human and animal consumption and consequently has emerged as an attractive choice for the food coating agent. The present study is carried out to evaluate the food coating efficiency of Aloe vera gel on raw fruits. The study is framed to establish its role in preventing microbial growth, preserving their biochemical properties and role in prolonging the biodegradation. The aloe vera gel coated fruits were artificially spiked with the common fungal and bacterial contaminants. They were observed for changes in morphological and biochemical properties in comparison with the control. The study established that the aloe vera gel coated samples which were artificially spiked with the food contaminants showed delayed degradation in their properties, in comparison to the control.

Keywords: Food safety, food coating agent, Preservation

BIODIESEL PRODUCTION FROM WASTE COOKING OIL

T.Krithika., Aravind.A., Arjunan.R., Gayathri.G., Swarnavarshini.N., Swathy.R., Thulasi.P., Vaishnavi.J., Gnanavignsh.S.

PG and Research Department of Microbiology,
Hindusthan College of Arts and Science, Coimbatore, 641028

Abstract

Biodiesel is a mono-alkyl ester of vegetable oil, animal fat, and recycled cooking oil. It is attaining significance in the quest of finding sustainable fuel as it is compatible with petro-diesel and its synthesis process is becoming more commercially deployable. It is commonly prepared by the trans-esterification of triglycerides or the esterification of free fatty acid with methanol by stirring and accelerated by the presence of base or acidic catalyst. This study aimed to identify the potential chemical catalyst for the production of biodiesel to achieve maximum yield and purity. Biodiesel was produced by trans-esterification of waste cooking oil (WCO) using NaOH,

KOH, CaO and K₃PO₄ as base catalyst. The yield of biodiesel and glycerol was measured. The produced biodiesels were analyzed for various parameters such as Flashpoint, Fire point, Freeze point. The calorific value of all the biodiesel samples was determined. Based on the yield and properties, NaOH was selected as a potential alkali base catalyst for the production. Around 68% of WCO was converted to biodiesel in the presence of NaOH and 30% of pure glycerol was recovered which also has many commercial applications.

Keywords: Biodiesel, Trans-esterification, catalyst, calorific value

EDIBLE BOTTLE MUSHROOM CULTIVATION

Vanitha.N, Jayasri.S, Alycia.D, Nandhini.E, Abinaya.K, Sangeetha.M, Sachin Edison.S
PG & Research Department of Microbiology
Hindusthan College of Arts & Science, Coimbatore.

Abstract:

Mushroom (Oyster and Shiitake) were cultivated in controlled environment using agricultural wastes, Maize cob, rice bran, wheat bran and cotton waste as the substrates. 30.0 g each of the Mushrooms produced were dried at temperatures 60, 105 and 120°C, milled and packaged. Freshly harvested samples of both were frozen. The physical properties of freshly harvested mushrooms were determined and the Proximate Analysis revealed that the mushroom produced using this method is of high quality. The technology of production is relatively simple, cheaper and appropriate to our local condition. This paper examines how mushroom can be produced using agricultural waste in a controlled environment for economic advancement.

Keywords: Sterile plastic bottle, Oyster Mushroom, Agricultural Waste