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STUDENT PROJECTS SCHEME
SEMINAR CUM EXHIBITION
(2017 - 2018)

PROCEEDINGS

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WPT is the transmission of electrical power from the power source to an electrical load without the use of physical connectors. History of WPT began with the formulation of Maxwell's equations in 1862. Maxwell described phenomena of radio waves in his equations. Later, in 1884 Henry Poynting illustrated electromagnetic waves as an energy flow and is used in his Poynting theorem. Nikola Tesla investigated the principle of WPT at the end of the 19th century. Tesla's experiment was not exploited to a commercial level because of its seemingly unsafe nature, low efficiency, and financial constraints. After Tesla's initial experiments, electromagnetic waves are used for wireless communications and remote sensing applications. With the advent of advanced semiconductor technologies, Tesla's proposition has now become a reality. The wireless nature of this transmission makes it useful in environments where implementation of physical connectors can be inconvenient, hazardous or impossible, particularly in EVs.

Process description

In loosely coupled systems, the primary often does not use a magnetic core in order to minimize cost. Since there is no closed magnetic core, a major portion of the magneto motive force will be situated across a substantial air gap. In such cases it is advantageous to fully utilize the primary by operating at the rated current of the coil, and letting the voltage vary as a function of the load. The primary power source thus needs to supply a controlled current to the primary coil or track. Due to the complexity involved in the design procedure of loosely coupled systems, it is necessary to make some assumptions. One important assumption is that the operating frequency is known. The choice of frequency involves a trade- off between the cost and complexity of the power supply, and the power transfer capability of the electromagnetic structure. The power transfer capability of any IPT system is a strong function of operating frequency. In theory, the relationship is linear, but secondary effects such as skin and proximity effects, as well as increased core losses, result in a less than linear power increase with frequency. The cost and complexity of the power supply will, on the other hand, increase with increasing frequency. An iterative process is necessary to determine the most cost-effective frequency. With the current state of power electronic technology, the most economic power transfer frequencies are in the order of 10 kHz to 100 kHz for multi-kilowatt systems and even higher at lower powers. These frequencies are bound to move up as the technology improves.

Guide: Mr. A.Senthilnathan, Assistant Professor Department of Electrical and Electronics Engineering, Dr.N.G.P.Institute of Technology, Coimbatore-641048

ANTIMICROBIAL EFFICIENCY OF ANNONA MURICATA EXTRACT AGAINST AEROMONAS HYDROPHILA INFECTION IN CARASSIUS AURATUS

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21/8/18.

Abstract

Natural remedies from medicinal plants are found to be safe and effective. Annona muricata extract contains a wide spectrum of activity against a group of bacteria that are responsible for the most common bacterial diseases. The present study focus find out the better active principles and phytochemical of the Annona muricata herb. This research offers summarized information about A. muricata extract incorporated diet fed Carassius auratus useful to solve the problems of Aeromonas hydrophila infection in ornamental fish industry.

Key words: Annona muricata, phytochemical; Carassius auratus; Aeromonas hydrophila

Introduction

Natural products play a major role as active substances, model molecules for the discovery and validation of drug targets. Leaf extract of Annnona muricata is used in the treatment of various bacterial infectious diseases such as pneumonia, diarrohea, urinary tract infection and even some skin disease. Annona muricata extract contains a wide spectrum of activity against a group of bacteria that are responsible for the most common bacterial diseases. Thus, the plant possesses an abundant of the antibacterial compounds. The aim of the present study was to investigate the photochemical and antimicrobial activities of the extract from A. muricata using experimental animal models.

Methodology

Ten gram dried powders of Annona muricata plant leaf material filtering the extracts were prepared. In order to study the functional groups of the active extracts, they will be analysed through Phytochemicals, TLC, FTIR and GC-MS. After structural elucidation of the active compounds, they will be incorporated to the artificial diets with different concentrations and combinations such as 100, 200 and 400 mg Kg^{-1} feeding to the fish culture experiments. After a regular interval such as 20, 40, 60 and 80 days random sampling will be made and challenge and monitor the cumulative mortality, haematological and biochemical diagnosis and improvement will be analyzed.

Results

The result of the phytochemical analysis showed that the A. muricata had the presence of tannin, saponin, steroids and flavanoids. Thin layer chromatographic analysis of the hot water extract of A. muricata revealed that, the R_f value spot 0.164, 0.275 and 0.611 was confirmed as the active compounds. The active fraction of A. muricata extract have the functional groups in the I-R spectrum. The broad peak around 2922 cm^{-1} may be the –OH stretching or -NH stretching the one peak at 1041 cm^{-1} may be due to C-O stretching. The one at 673 cm^{-1} may be due to C≡C-H. The one at 1624 cm^{-1} may be due to $RONO_2$. The observation revealed that it may be inferred that the compound is alkenes or ketones. Thus the extract may contain a free carbonyl group where the OH group is hydrogen bonded. The extract is also suspected to contain a carbonyl species in conjugation with O= bond (Fig 3)

The antibiogram studies of the Aeromonas hydrophila against the selected Antibiotics (zone of inhibition in cm) the maximum values were got for strain by using the antibiotic Chloramphenicol at 1.5 cm in diameter. A. muricata were effectively suppressed the pathogens at 0.7, 0.8 and 2 cm of zone of inhibition to A. hydrophila. The goldfish C. auratus succumbed to death cent percent within six days after A. hydrophila challenge when no vaccination was given. The A. muricata extract incorporated diet fed fishes survived of 90 % after ten days of challenges in A. hydrophila respectively in 25 days of post (dpv) vaccination.

The biochemical parameters including serum albumin, globulin and proteins of treated C. auratus. The serum albumin level of vaccinated groups was increased from the control fishes. The amount of globulin was found to be higher in all the A. muricata extract incorporated diet fed groups when compared with the control group. The total serum protein analysis was performed in the control and vaccinated groups. The total serum protein was increased in the experimental groups. The RBC level was decreased in the control groups (no vaccination) when compared to the A. muricata extract incorporated diet fed groups. This diet may be useful to solve the problems of A. hydrophila infection in ornamental fish industry.

Discussion

Nowadays the chemical and synthetic vaccines have some demerits including high cost and some side effects. The antibacterial compound from herbal origin are advisable in aquaculture operations due to its

versatile characterizers are safety, eco-friendly and create no side effects. In the present study, the phytochemical analysis of the A. muricata root extracts revealed the presence of saponin, steroid, tannin and flavanoids. The major active constituents of root extract A. muricata are steroidal saponins namely shatavarins apart from alkaloids, flavonoids, sterols and terpenes (Kumaran and Citarasu, 2015). The extract of A. muricata was separated into its constitutive fractions by preparative thin layer chromatography (TLC). The R_f value obtained was 0.164, 0.275 and 0.611 and the fractions may be active compounds. The FTIR study revealed that, A. muricata had primary or secondary amine or an amide or substituted amide, olefininc band, cumulated system, C-F and C-Br bond (Bremer and Geesey, 1991).

The herbal antibacterial compound along with the A. hydrophila helped to increase the survival in juveniles of C. auratus after 25 dpv. The better weight gain (90 mg day^{-1}) was achieved in the highest doses antibacterial compound with inactivated A. hydrophila treated groups (Citarasu et al., 2006). The influences of the A. muricata extract improve the survival of the treated fishes by 90%. Like the serum biochemical parameters, the hematological parameters also improved the same way. In the present study, the high quality of A. muricata extract incorporated diet helped to enhance the hematological parameters after the 25 dpv vaccination.

Guide: Dr. T. Kumaran, Assistant Professor, Department of Zoology, Muslim Arts College, Thiruvithancode-629174

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Muslim Arts College,
Thiruvithancode - 629 174

2. Name of the student(s) : P. Teja Singh

3. Title of the project : Antimicrobial efficiency of annonamuricata extract against aeromonas hydrophila infection in Carassius auratus

4. Project code : EEE - 072

It is certified that a sum of Rs. 10000/- (Rupees Ten thousand) Sanctioned by the council for carrying out above mentioned student project has been utilized for the purpose for which it was sanctioned and sum of Rs. Nil remaining unutilized is refunded.

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This is to certify that **Ms/Mr.P.Jeya Singh, Muslim Arts College, Thiruvithancode-629174** has successfully completed the project titled **"Antimicrobial efficiency of *Annona muricata* extract against *Aeromonas hydrophila* infection in *Carassius auratus*"** in the Sector **ELECTRICAL, ELECTRONICS AND COMMUNICATION ENGINEERING** under **STUDENT PROJECT SCHEME** sponsored by the Council during the academic year 2017-2018.

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ANTIMICROBIAL EFFICIENCY OF *ANNONA MURICATA* EXTRACT AGAINST *AEROMONAS HYDROPHILA* INFECTION IN *CARASSIUS AURATUS*

A THESIS

Submitted by

P. JEYA SINGH
(Reg. No.: 20163092524105)

in partial fulfillment for the award of the degree of

MASTER OF SCIENCE IN

ZOOLOGY

PG& RESEARCH DEPARTMENT OF ZOOLOGY
MUSLIM ARTS COLLEGE, THIRUVITHAN CODU
MANONMANIUM SUNDARANAR UNIVERSITY

APRIL 2018

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Signature of the External Examiner

18/04/2018

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P. JEYA SINGH

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