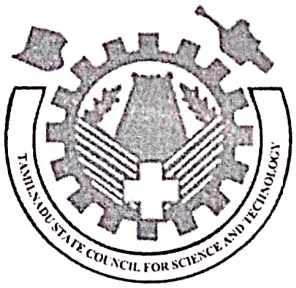
STUDENT PROJECTS SCHEME
(2019 - 2020)

PROCEEDINGS



TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
CHENNAI

199	Dr. S. Palani Professor Dept. of Biotechnology Arunai Engineering College Tiruvannamalai - 606 603	Insilico evaluation of anticancer drug from natural products	P.C. Pavithra A. Priyadharshini	MS-024	7500/-
200	Mrs. Lisha Daniel Assistant Professor Dept. of Biomedical Sciences & Technology Noorul Islam Centre for Higher Education, Noorul Islam University Kanyakumari - 629 180	IoT Based Dialysis Monitoring System	A. Abhimal L. Geethujoy M. Krishnajith	MS-025	7500/-
201	Dr R Rajendran Associate Professor Dept of Microbiology PSG College of Arts and Science Coimbatore - 641014	Development and characterisation of hydrogels for efficient treatment of burn wound infections	M Shibasini	MS-026	7500/-
202	Dr. T. Kumaran Assistant Professor Dept. of Nutrition and Dietetics Muslim Arts College Kanyakumari - 629 174	Nutritional evaluation phytochemical and functional group analysis of seaweed ulva lactuca supplemented diet control malnutrition	J.A. Jesiba	MS-027	7500/-
203	Dr. Anisha Cynthia Sathiasekar Professor & HoD Dept. of Oral Pathology Rajas Dental College and Hospital Tirunelvei - 627 105	Comparative evaluation of the proliferative and epithelial mesenchymal transition characteristics in oral epithelial dysplasia-a case control study	Dr. T. Ahila	MS-028	7500/-
204	Dr. S. Pandi Prabha Associate Professor Dept. of Biotechnology Sri Venkateswara College of Engineering Sriperumbudur - 602 117	Induction of apoptosis in cancer cells by phytol for cancer treatment	M. Maheshwari H.S. Pavithra	MS-029	7500/-
205	Dr Leninisha Shanmugam Asst Professor Dept of IT Easwari Engineering College,Chennai -600089	Early detection of brain tumours from ultrasonic images using tensor flow	R.R.Monickha S.Sangeetha G.Niranjana	MS-030	7500/-
206	Dr. Nalini Aswath Professor & HoD Dept. of Oral medicine and Radiology Sree Balaji Dental College and Hospital Chennai - 600 100	Microbiota of dental abscess and their susceptibility to the empirical antibiotic therapy	M. Jemima Judith	MS-031	7500/-
207	Dr. K. Subha Assistant Professor PG & Research Dept. of Microbiology M.R. Government Arts College, Mannargudi-614001	A survey and awareness programme on human diseases (Dengue and Malaria)	S. Kousalya	MS-032	7500/-

effective antibacterial activity. It indicated that the hydrogel can able to withstand under dissolvable conditions. The hydrogel effectively absorbs large volume of fluid and as well as it is able to donate fluid. Novel hydrogels based on alginate and chitosan have been investigated in order to explore their potential application as novel medicated dressings by associating antimicrobial activity with improved sustained release characteristics. The overall study concludes that *Musa paradisiaca* loaded hydrogel has good wound healing applications when used as wound dressings for burn wounds.

Guide: **Dr. R. Rajendran**, Associate Professor, Department of Microbiology, PSG college of Arts and Science, Coimbatore – 641 014.

NUTRITIONAL EVALUATION, PHYTOCHEMICAL AND FUNCTIONAL GROUP ANALYSIS OF SEAWEED ULVA LACTUCA SUPPLEMENTED DIET CONTROL MALNUTRITION

J.A. Jesiba
Department of Nutrition and Dietetics,
Muslim Arts College, Thiruvithancode – 629 174.

Abstract

Natural products as pure compounds provide unlimited opportunities for new drug leads because of the unmatched availability of chemical diversity. Seaweeds are consumed by coastal people in many regions of the world. Nutrient and Phytochemical analysis of *Ulva lactuca* extracts revealed that numerous compounds in plants traditionally used for medicinal purposes have many therapeutical properties.. This project results suggest that the nutritional properties and phytochemical activity demostrated by the seaweed for control malnutrition and leads to the isolation of new and novel compounds. The intention of this project is to know the nutritional composition of the seaweed *U. lactuca* for utilisation in human nutrition in the future

Introduction

Sea weeds are good additive to improve the nutritive quality of various foods. Seaweeds are rich sources of many trace elements, minerals, protein, iodine, bromine, vitamins, polysaccharides, bioactive substances and micronutrients. *Ulva* species are cultured for the global food market, but are generally of a lower value than other red or brown seaweeds. However, as it is attractive and is purported to have good nutritional value, appropriate marketing may increase the value as appears to be the case of late as demand seems to have increased. Current claims in the food market and elsewhere state that *Ulva* species. Contain 15 per cent protein, 50 per cent sugar and starch, less than one per cent fat, high in iron, iodine and all elements. The protein content of brown seaweeds are generally low when compared to red and green seaweeds. With respect to the high protein level and amino acid composition, the red seaweeds appear to be an interesting potential source of food protein. Certain species of green algae like *Ulva* species have high levels of arginine or glycine. The free amino acid fraction of seaweeds is composed of alanine, aminobutyric acid, taurine, ornithine, citrulline and hydroxyproline. Levels of these differ according to the species. All species of seaweeds contain histidine, which is necessary for children and taurine which has pharmacological activity

Materials and Methods

The collection of seaweeds in the field is done during the low tide. As the sea shore of manakudy of Kanyakumari District contains a rich vegetation of marine algae and the use of seaweeds as food is not quite popular in India, the present investigation has been chosen on seaweed *Ulva lactuca*. Macro nutrient and micro nutrient components were analysed for selected seaweed. The collected seaweed *U. lactuca* used to prepare extract and separate the filtrate for further use of samples. The micronutrients namely iron, phosphorus, calcium, magnesium and niacin were analysed by standard AOAC methods. The methanolic extracts obtained from underexploited seaweeds were used for phytochemical studies. Different concentrations of each algal extract were added to the respective wells on the MHA plates. The extraction solvent was evaporated under vacuum and used for antimicrobial assay by disc diffusion technique and confirmed by Minimum Bactericidal Concentration (MBC) study. Concentrations ranging from 50 µL, 75 µL and 100 µL respectively were placed in the wells and allowed to diffuse at room temperature for 30 minutes. The extract loaded plates were kept for incubation at 37°C for 24 hours. After incubation, a clear zone was observed around the well which was the evidence for the presence of antibacterial active compounds in the algal extracts. Diameters of the zone of inhibition were measured in millimetres (including the diameter of the well). Phytochemicals like alkaloids, glycosides, carbohydrates, proteins and amino acids, flavonoid, sterols, saponins, tannins, gums and mucilage, terpenoids, phenols, starch and quinones were analysed by qualitative chemical method. The selected seaweed *U. lactuca* extract were analyzed qualitatively for the active compounds by Fourier transform infra Red (FTIR) method described by Kemp.

Results

The carbohydrate content of the selected seaweed varied from (0.421 mg/g) to (0.32 mg/g).The maximum protein content was recorded in *U.lactuca* (0.374 mg/g). Protein malnutrition exacerbates aged-related loss of muscle mass and function, and adequate protein may prevent muscle loss. The provision of adequate natural foods is a reasonable approach to improving nutritional status of young generation. Seaweeds are known to be high in mineral content; more than 30 per cent of dry weight of marine algae is ash which contains various kinds of minerals. The calcium content of the selected seaweed *U. lactuca* was 0.742 mg/g, the maximum Phosphorus concentration was found to be high in *U. lactuca* (0.145 mg/g). In the present study sodium and potassium accumulation was found to be high in the selected seaweed. Potassium and sodium are two of the most important electrolyte minerals. Adequate potassium and sodium is necessary for proper functioning of our nervous system, muscles, heart, kidneys and pancreas, and for regulating blood pressure and blood sugar. Seaweeds are some of nature's most concentrated sources of potassium and sodium, in a nearly ideal ratio. Their salty taste is mostly due to their high potassium content. The plant extract also showed antibacterial activity at concentrations of 25 mg/ml, 50 mg/ml and 100mg/ml respectively. At these concentrations, the extract inhibited the growth of *E.coli, A.hydrophila* and *P.aeruginosa* and produced percentage inhibition ranging between 72.4% to 86.5%.

The phytochemical screening of methanolic extracts showed the presence of different types of active constituents, namely alkaloids, cardiac glycosides, flavonoids, terpenoids, tannins, Sterols and Saponins. These compounds were present in almost all the plants extracts. The active fraction of the *U. lactuca* extract gave the following peaks in the FTI-R spectrum. The peaks represented the various functional groups in the molecule. The one at 2852.82 cm^{-1}

may be due to $C_{sp}3$-H. The one at 1261.46 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.

Conclusion

Dietary strategies in aged-care should aim to improve protein intake and prevent malnutrition in peoples. The provision of dairy foods, in line with recommended intake levels is likely a simple and cost-effective method that may reduce malnutrition risk in human. The overall observation of the project thus suggests that the seaweed *U. lactuca*, which originate plentifully in this eco system, not only make up a large volume by themselves, but can also have considerable implications in food and pharmaceutical industry as a source of basic material in the preparation of protein rich nutrient supplement products and fine chemical synthesis.

Guide: **Dr. T. Kumaran**, Assistant Professor, Department of Nutrition and Dietetics, Muslim Arts College, Thiruvithancode – 629 174.

INDUCTION OF APOPTOSIS IN CANCER CELLS BY PHYTOL FOR CANCER TREATMENT

M. Maheswari and H. S. Pavithra
Department of Biotechnology,
Sri Venkateswara College of Engineering, Sriperumbudur – 602 117.

Abstract

The project aims to study the apoptogenic activity of phytol derived from the medicinal plant *Hydrilla verticillata* and its anticancer activity on oral cancer cell lines.

Introduction

Apoptosis is a nonsurgical means which leads to the extermination of cancer. This phenomenon of apoptosis is primarily caused of caspases which are essentially proteases. Several reports have assessed the anticancer activities of plant extracts that contain phytol as a major component. Phytol is a natural linear diterpene fatty alcohol, an integral part of the chlorophyll is found in copious amounts in the aquatic weed *Hydrilla verticillata*.

Motivation

Oral cancer was prevalently detected in most of the cancer cases reported in Tamil Nadu. To address this, a natural compound phytol from *Hydrilla verticillata*, could be used treat oral cancer by inducing programmed cell death i.e. apoptosis and this would be an effective cure.

Materials and Methods

Soxhlet extraction was performed with powdered *Hydrilla verticillata* using ethanol as the solvent and the extracted sample was collected. The oral cancer lines were purchased from NCCS Pune, and were subcultured for 4 to 5 passages in Dulbecco's Modified Eagle Medium with 10% Fetal Bovine Serum and antibiotics solution. Cytotoxic assay was performed using tetrazolium salt by microtitre plate method.

TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

GOVERNMENT OF TAMILNADU

CERTIFICATE

This is to certify that **Ms. J.A. Jesiba, Muslim Arts College, Kanyakumari - 629 174** has successfully completed the project titled "***Nutritional evaluation phytochemical and functional group analysis of seaweed ulva lactuca supplemented diet control malnutrition***" in the Sector **MEDICAL SCIENCES** under **STUDENT PROJECT SCHEME** sponsored by the Council during the academic year 2019-2020.

Chennai-600025
18.12.2020

DR.R.SRINIVASAN
Member Secretary

No.MS-027/2020

தமிழ்நாடு அறிவியல் தொழில்நுட்ப மாநில மன்றம்
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Member Secretary

Lr.no: TNSCST/SPS/2019-20/6/ 07.07.2021

To

Registrar/Director/Dean/Principal

Sir,

Sub: TNSCST-Student Projects Scheme (2019-20)-Project Completion certificate - Proceedings-sent-regarding

Kindly find enclosed herewith the project completion certificate of your students under Student Project Scheme (2019-20) of the state council and a CD containing findings of the projects as proceedings. I request you to distribute the certificates to the students concerned.

Thanking you

7/7/21
Member Secretary

Encl: as above

NUTRITIONAL EVALUATION, PHYTOCHEMICAL AND FUNCTIONAL GROUP ANALYSIS OF SEAWEED *ULVA LACTUCA* SUPPLEMENTED DIET CONTROL MALNUTRITION

A THESIS

Submitted by

J.A. JESIBA

A Dissertation submitted to the Manonmaniam Sundaranar University in partial fulfillment of the requirement for the award of the degree of

MASTER OF SCIENCE

IN

NUTRITION AND DIETETICS WITH HOSPITALITY MANAGEMENT

DEPARTMENT OF NUTRITION AND DIETETICS

MUSLIM ARTS COLLEGE

THIRUVITHANCODE-629174

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LIST OF CONTENTS

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"To believe that mind is all, that

Thought is all is only a higher materialism"

First, I thank God for giving me power and blessing to complete this thesis successfully.

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J.A. JESIBA