



## MEMORANDUM OF UNDERSTANDING

Dated - 10<sup>th</sup> July, 2018  
Between



Department of Zoology and Biotechnology,  
A.V.V.M Sri Pushpam College (Autonomous),  
NAAC RE-ACCREDITED at 'A' Grade CGPA at 3.38 out of 4.00,  
Poondi, Thanjavur (Dt) - 613 503, Tamil Nadu, India.

Department of Zoology,  
Rajah Serfoji Govt. College (Autonomous),  
Thanjavur - 613 005  
Tamil Nadu, India.

Department of Zoology and Biotechnology, A.V.V.M Sri Pushpam College (Autonomous), Poondi, Thanjavur (Dt) - 613503, Tamil Nadu, India and Department of Zoology, Rajah Serfoji Government College (Autonomous), Thanjavur - 613 005, Tamil Nadu, India hereby enter into this General Agreement to foster International Cooperation in Education and Research.

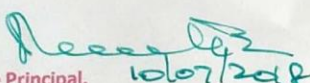
1. Both Parties agree to encourage the following exchange activities based on their respective academic and educational needs.

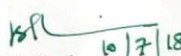
- |                                      |                            |
|--------------------------------------|----------------------------|
| a. Exchange of Scholars              | b. Exchange of Students    |
| c. Exchange of Research facilities   | d. Joint Research Programs |
| e. Joint Conferences                 | f. Joint Online Programs   |
| g. Other Academic exchange Programme |                            |
- as may be agreed to by both the parties from time to time

2. The implementation of each exchange program referred above will follow the guidelines established on mutual agreement by both the parties. Efforts will be made by both the parties to find financial resources for carrying out the activities listed above.

3. Nothing shall diminish the full autonomy of either institution nor will any constraints be imposed by either upon the other in carrying out the agreement.

4. This agreement shall be in force for a period of FIVE YEARS from the date of the last signing and is subject to revision or modification by mutual consent. It is also understood that this agreement may serve as the basis for the specific agreements to be developed at a later date. It is further understood that either institution may terminate the agreement at any time, upon one year written notification to the partner institution, although such action will only be taken after mutual consultation in order to avoid any possible inconvenience to either party.

  
The Principal,  
A.V.V.M Sri Pushpam College (Autonomous),  
Poondi - 613 503, Thanjavur (Dt),  
Tamil Nadu, India

  
The Principal,  
Rajah Serfoji Govt. College (Autonomous),  
Thanjavur - 613 005,  
TamilNadu, India.


5. Amendment to MOU:

The Memorandum of Understanding may be amended in writing by mutual consent between both parties, IN WITNESS WHEREOF, the undersigned parties have agreed and executed this document in English in two originals.

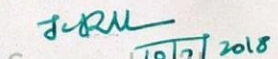
For A.V.V.M Sri Pushpam College


For Rajah Serfoji Government College

WITNESSES:

1)   
(Dr. R. RAJAKUMAR)

1)   
(Dr. R. RAJAKUMAR)

2)   
(Dr. K. Ravi Chandran)

2)   
(Dr. K. Ravi Chandran)



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**RAJAH SERFOJI GOVT. COLLEGE (A),  
THANJAVUR -05, TAMILNADU, INDIA  
(ACCREDITED "A" GRADE BY NAAC.  
DST -FIST COLLEGE)**



## **CERTIFICATE OF EXCELLENCE**

**This is presented to**



**Dr.S.Ganesan, Asst.Professor,  
Dept of Zoology & Biotechnology,  
A.V.V.M.Sri Pushpam College (A),  
Poondi, Thanjavur,**

**with deep appreciation for acted as a Resource  
Person on "National Level Webinar on Phytomedicine  
and Health" organized by PG & Research Department of  
Biochemistry, Rajah Serfoji Government College (A),  
Thanjavur, Tamilnadu , India, on 13th July 2020.**

*K. Jayaprakash*

**Dr.K. Jeyaprakash  
(Head-Biochemistry)  
Organizing Secretary**

*Dr.V.Senthamil Selvi*

**Dr.V.Senthamil Selvi  
Principal**









PG & RESEARCH DEPARTMENT OF BIOCHEMISTRY  
RAJAH SERFOJI GOVERNMENT COLLEGE

(AUTONOMOUS)

(Reaccredited with 'A' Grade by NAAC)

Affiliated to Bharathidasan University, Thanjavur - 613 005. Tamil Nadu, India



**CERTIFICATE**

This is to certify that Dr./Mr./Ms. S. Ganesan, Dept. of Zoology & Biotechnology,

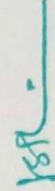
A.V.V.M. Pushpam College (A), Poondi, Thanjavur

has participated / presented a poster / delivered a lecture entitled The role of oxidative

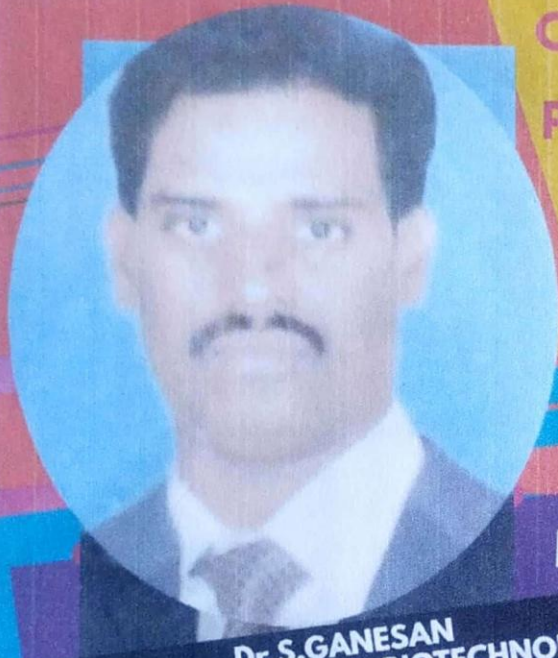
stress in diabetic complications.

in the National Seminar on "NOVEL APPROACHES AND CHALLENGES IN PHYTOMEDICINE AND  
PHYTOPHARMACEUTICALS" on 16<sup>th</sup> March 2020, Sponsored by Tamil Nadu State Council for Higher  
Education, Chennai.

Organising Secretary  
(Dr.K.Jeyaprakash)

  
Principal  
(Dr.V.Senthamilselvi)

OPEN FOR REGISTRATION



**Dr.S.GANESAN**  
DEPT. OF ZOOLOGY & BIOTECHNOLOGY  
A.V.V.M.Sri Pushpam College (A), Poondi

**RAJAH SERFOJI GOVT.  
COLLEGE (AUTONOMOUS)  
THANJAVUR-05  
PG & RESEARCH DEPT. OF  
BIOCHEMISTRY**

**NATIONAL WEBINAR  
ON**

**PHYTOMEDICINE AND HEALTH**

No registration Fee  
E-Certificate will be issued



**MONDAY- 13.07.2020**



**11.30 - 12.30 PM**

Last date for registration

11.07.2020

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Registration link

<https://forms.gle/5j1urNDHWfiv2iCaA>



**RAJAH SERFOJI GOVT.COLLEGE (A),  
THANJAVUR, TAMILNADU, INDIA**



**PG & RESEARCH DEPT. OF BIOCHEMISTRY**

**Certificate of Excellence**



**Dr.S.Ganesan,**  
Asst.Professor, Dept. of  
Zoology & Biotechnology,  
A.V.V.M.Sri Pushpam College  
(A), Poondi, Thanjavur

has presented a lecture on Role of of stem cells  
in human health and Research, organized by PG  
& Research Dept. Biochemistry, Rajah Serfoji  
Govt. College (A), Thanjavur, on 26th June 2021

*K. Jay*

**Dr.K.Jeyaprakash**  
(Organizing secretary)

*Dr. V. Senthamil Selvi*

**Dr.V.Senthamil Selvi**  
Principal

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RAJAH SERFOJI GOVT. COLLEGE (AUTONOMOUS),  
THANJAVUR -05



PG & RESEARCH DEPT OF BIOCHEMISTRY

16.03.2020

ATTENDANCE CERTIFICATE

This is to certify that Dr.S.Ganesan, Dept of Zoology and Biotechnology, A.V.V.M.Pushpam College, (A), Poondi, Thanjavur, has acted as a Resource Person and delivered a lecture on "Role of Oxidative Stress in Diabetic Complications" in a National Seminar on "Novel approaches and Challenges in Phytomedicine and Phytopharmaceuticals" Sponsored by Tamil Nadu State Council for Higher Education, Chennai, 16<sup>th</sup> March 2020.

*K. Jeyaprasanth*  
16/3/2020  
Head of the Department

**Dr. K. JEYAPRAKASH**  
M.Sc., M.Phil., Ph.D., PGDCA  
Head, Dept. of Biochemistry  
Rajah Serfoji Govt. College  
Thanjavur - 613 005







## Serum lipid profile and *In-vivo* antidiabetic activity of medicinal plant *Costus spicatus* in diabetic albino wistar rats

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<sup>2</sup> PG & Research Department of Zoology, Rajah Serfoji Government College (Autonomous), Thanjavur, Tamil Nadu, India.

### Abstract

The medication is solution properties arsenic harming, tonic, diuretic, uterotonic and sterility in ladies and leaves is shown especially in diabetes. Diabetes mellitus is an endocrine, metabolic problem wherein the homeo-balance of sugar and lipid digestion is inappropriately controlled by the pancreatic chemical, insulin, eventually bringing about expanded blood glucose. In our examination, diabetes was initiated in rodents by single intraperitoneal infusion of Streptozotocin (STZ) at a portion of 45mg/kg b.w. The hepatoprotective adequacy of ethanolic concentrate of *Costus spicatus* (ACS) at a portion of 500 mg/kg b.w. was examined. Diabetes mellitus is related with reformist metabolic insanity, deteriorating glycemic control, and morphological changes in the liver, pancreas and different organs. Compared to the lipid profile in control and experimental rats  $167.3 \pm 7.7$  \* maximum values and minimum values  $103.6 \pm 6.7$  \*.

**Keywords:** albino rats, *Costus spicatus*, STZ, Insulin, HDL, LDL

### Introduction

#### Histopathology

Histological procedures are used for the assessment of tissue changes in either induced or spontaneous diseases. Principally, it compares the experimentally altered or diseased tissues with matching samples from control or healthy counterparts (Slaoui and Fiette, 2011). In the streptozotocin model, the pancreatic  $\beta$  - cells can be damaged or destroyed with the help of streptozotocin <sup>[1]</sup>. Histopathological studies after administration of streptozotocin have altered the morphological features of the pancreas and kidney. After the administration of an antidiabetic drug, the islets of Langerhans containing beta cells were restored to nearly normal in streptozotocin-induced diabetes in rats. The observations like basal vacuolization, hypertrophy in glomeruli, glycogen accumulation, degeneration of tubular epithelium, glomerulosclerosis, increased mesangial matrix, hyalinization, thickening of membrane, etc. may be noted in the histopathology of the kidney <sup>[2]</sup>. The slight improvement in the pancreas, kidney, liver, lungs and brain tissue may be due to antioxidant properties of the antidiabetic drug and its capability to scavenge the free radicals generated from streptozotocin, apart from its role in enhancing the functional capabilities of the immune system <sup>[3]</sup>. In the kidney, hypertrophy is observed in both the glomerular basement membrane and capillaries that may contribute to ending stage renal damage <sup>[4]</sup>.

#### Drug or chemical induced diabetes

Many drugs can impair insulin secretion. These medicine might not cause polygenic disorder by themselves, but they may precipitate diabetes in individuals with insulin resistance. Certain toxins like Vacor (a rat poison) and blood vessel pentamidine will for good destroy duct gland  $\beta$ -cells. Such drug reactions, fortunately, are rare. Some

drugs and hormones can impair insulin action. Examples include nicotinic acid and glucocorticoids. Patients reception  $\alpha$ -interferon has reported near develop diabetes connected through islet cell antibodies and, in certain instances, severe insulin deficiency <sup>[5]</sup>.

#### Infections

Certain viruses have been associated with  $\beta$ -cell destruction. Diabetes happens in patients with inborn German measles, although most of these patients have HLA and immune markers characteristic of type 1 diabetes. Also, coxsackievirus B, cytomegalovirus, adenovirus, and mumps have been implicated in inducing certain cases of the disease or diabetes <sup>[6]</sup>.

#### Acute toxicity

The wide market and growing demand for natural medicinal plants in the forms of food or health supplement, is increasing nowadays. The different processes employed in the development of such products resulted in qualitative or quantitative changes in the chemical profiles of the plant material causing the alteration of the biological profile. Most of the researches mainly focus on optimizing and advancing the extraction methods to extract maximum biological active material. However, assessing the toxicity profile of medicinal plants is of vital importance. It becomes particularly essential since most people have a general belief that all-natural products are safe and free to access and consume since most of these products are marketed as supplements. Hence it is important to have proper chemical, toxicological, and safety data for the usage of plants with traditional claims on health benefits <sup>[7]</sup>. Acute toxicity testing is usually carried out to determine the effect of a single dose on animal species like rodents and non-rodents. In acute toxicological testing, the investigational product is administered at different dose levels, and the effect is





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## IMPACT OF NUTRITIONAL INTERVENTIONS ON CORONA VIRUS INFECTION – REVIEW ARTICLE

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<sup>4</sup>Assistant Professor, Dept of Biotechnology, PRIST University, Thanjavur -613 403.

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Head, PG & Research Dept. of Biochemistry, Rajah Serfoji Govt. College (A), Thanjavur -05.

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### ABSTRACT

Protection of host against environmental agents such as pathogenic micro-organisms (bacteria, fungi, and viruses) and chemicals, has been controlled by immune system, thereby preserving the integrity of the body. Adequate nutritional status should be maintained with appropriate intakes of calories, vitamins, minerals to preserve organism defense mechanisms and water that should be continuously provided by a healthy diet. The emergence of new infectious diseases with new pathogenic properties constitutes a serious health issue worldwide. Severe acute respiratory syndrome (SARS) represents one of the most recent emerging infectious diseases, caused by a novel coronavirus member called (SARS-CoV-2), identified in Wuhan, Hubei, China in December 2019, and recognized as pandemic by the World Health Organization (WHO). The nutritional status of each COVID-19-infected patient should be assessed prior undertaking treatments. Nutritional support should be the basis of management of any infected individual. Therefore, preventive measures remain the first priority and strategy to develop throughout proper hygiene, healthy diet and staying home.

**KEYWORDS:** Nutrition, vitamins, minerals, Immune system, Viral diseases, SARS-CoV-2.

### 1.0. INTRODUCTION

Coronaviruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans, these viruses cause respiratory tract infections that can range from mild to lethal. Mild illnesses include some cases of the common cold (which is caused also by certain other viruses, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS, and COVID-19. Symptoms in other species vary: in chickens, they cause an upper respiratory tract disease, while in cows and pigs they cause diarrhea. There are as yet no vaccines or antiviral drugs to prevent or treat human coronavirus infections.<sup>[1]</sup>

Coronaviruses constitute the subfamily *Orthocoronavirinae*, in the family *Coronaviridae*, order *Nidovirales*, and realm *Riboviria*. They are enveloped viruses with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry. The genome size of coronaviruses ranges from approximately 26 to 32 kilobases, one of the largest among RNA viruses. They have characteristic club-shaped spikes that project from their surface, which

in electron micrographs create an image reminiscent of the solar corona, from which their name derives.<sup>[2,3]</sup>

#### 1.1. Etymology

The name "coronavirus" is derived from Latin *corona*, meaning "crown" or "wreath", itself a borrowing from Greek.<sup>[4]</sup> The name was coined by June Almeida and David Tyrrell who first observed and studied human coronaviruses. The word was first used in print in 1968 by an informal group of virologists in the journal *Nature* to designate the new family of viruses.<sup>[5]</sup> The name refers to the characteristic appearance of virions (the infective form of the virus) by electron microscopy, which have a fringe of large, bulbous surface projections creating an image reminiscent of the solar corona or halo. This morphology is created by the viral spike peplomers, which are proteins on the surface of the virus.<sup>[6]</sup>

#### 1.2. History

Coronaviruses were first discovered in the 1930s when an acute respiratory infection of domesticated chickens was shown to be caused by infectious bronchitis



## Different Bioactive Constituents and Biochemical Composition of Brown Seaweed

*Spatoglossum marginatum*S. Andrews<sup>1</sup>, S. Azhagu Madhavan<sup>1</sup>, S. Ganesan<sup>1\*</sup>, P. Arjun<sup>2</sup>, R. Jeyaprakash<sup>3</sup>S. Baskara Sanjeevi<sup>4</sup> and M. Ramasamy<sup>1</sup><sup>1</sup>PG & Research Department of Zoology & Biotechnology, A.V.V.M. Sri Pushpam College  
(An Autonomous Institution Affiliated to Bharathidasan University) Poondi, Thanjavur – 613503, Tamil Nadu, India\*Corresponding author e-mail: [ganesanmolbio@gmail.com](mailto:ganesanmolbio@gmail.com)<sup>2</sup>Department of Biotechnology, PRIST Deemed University, Thanjavur – 613403, Tamil Nadu,  
India<sup>3</sup>PG & Research Department of Biochemistry, Rajah Serfoji Government College (Autonomous),  
Thanjavur – 613005, Tamil Nadu, India<sup>4</sup>PG & Research Department of Zoology, Government Arts College (Autonomous),  
Kumbakonam – 612001, Tamil Nadu, India**Abstract**

The enormous stores for good green growth are the sea, oceans and investigation of kelp is called as phycology or nature. The identification and detachment of new substances are developing from the wellspring of marine creatures. The ocean growth live in salty water are eukaryotic living beings considered civilized wellspring of bioactive characteristic items. The fluorescence qualities of dark colored kelp powdered concentrates were resolved under UV long and short wavelengths and customary noticeable light. The present examination researched to investigate the phytochemical constituents of the kelp *Spatoglossum marginatum* (Brown green growth). The darker marine green growth *S. marginatum* has a place with ethanol was utilized as a dissolvable framework for arrangement of concentrate of *S. marginatum*. The ethanolic concentrates were experienced to subjectively phytochemical test by methods for commonplace measures. Phytochemical investigation shows the nearness of alkaloids, tannins, steroids, flavonoids, sugars, though proteins, free phylobatannins, saponins and anthraquinone were seen as missing. The consequences of the investigation may lead an establishment for the further examinations on this marine green growth *S. marginatum*.

**Keywords:** Alkaloids, Flavonoids, *S. marginatum*, Seaweed, Ethanol.

**Introduction**

Nearly 5,000,000 species available in the sea are virtually untapped source of secondary metabolites. Kelp is the unprecedented maintainable assets of marine biological system and man has been utilizing the ocean growth as nourishment, feed and drug. It was estimated that about 90% of the plant species of marine are algae and about 50% of the global photosynthesis is



## ***In-vivo* assay methods to study the Anti-diabetic activity of ethanolic extract of flower of *Costus spicatus* in diabetic albino Wistar rats**

Senthilkumar S<sup>1</sup>, Azhagu Madhavan S<sup>1</sup>, Mariappan P<sup>2</sup>, Ganesan S<sup>1\*</sup>

<sup>1</sup> PG and Research Department of Zoology, A Veeriyar Vandayar Memorial Sri Periyar College, (An Autonomous Institution Affiliated to Bharathidasan University) Poondi, Thanjavur, Tamil Nadu, India

<sup>2</sup> PG and Research Department of Zoology, Rajah Serfoji Government College, (Autonomous), Thanjavur, Tamil Nadu, India

### **Abstract**

The characteristic phytochemical constituents are steroids, tri-terpenoid, Anthraquinone glycosides, proteins are established in the concentrates of *Costus spicatus* flower. Established gentle to direct movement and better anthelmintic action after contrasted with ethanolic separate. Oral administration of effect of ECS to diabetic induced rats at dosage of 500 mg/kg body weight resulted during significant decrease of elevated blood glucose and hepatic transaminase enzyme levels, at different treatment period (0<sup>th</sup> day, 28<sup>th</sup> day and 45<sup>th</sup> day) which also showed the structural changes in cytoarchitecture of STZ induced diabetic rats. (SGOT), (SGPT) and (ALP) levels. Confirmed the effect diabetic medicinal plants in restore in pancreas of ECS in anti-hyperglycaemic activity.

**Keywords:** *costus spicatus*, diabetes mellitus, streptozotocin, pancrease, insulin

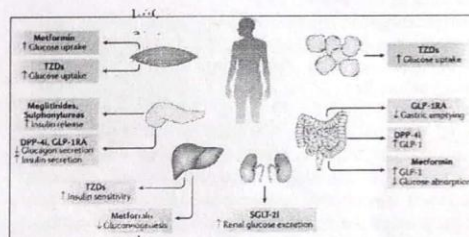
### **Introduction**

Diabetes mellitus (DM) is one of the oldest known human diseases and one of the biggest health problems of researchers, especially after the spread among children largely due to unhealthy nutrition and unhealthy lifestyle with less physical activity and the riskiness of this is on the health of individuals and society [1-3]. Persians, Indians, and ancient Egyptians described the symptoms of the disease, but the proper understanding of the situation has developed over the last 100 years. Diabetes has 3 major types: Diabetes mellitus type 1: the result of the destruction of insulin-producing cells [4]. These cells are called beta-cells ( $\beta$ -cells), which are treated with insulin, and diabetes mellitus type 2: which does not depend on insulin and depends on diet and medicines; beta cells secrete insulin, but the inability is to identify and benefit from insulin by the cells and is treated with drugs, including Sulfonylurea in addition to diet and physical activity. In addition, Diabetes may appear during pregnancy and is called Gestational Diabetes [5]. Diabetic quickly turns into a global health problem due to its complications, especially with the high population rate, aging, urbanization, urbanization, increased physical inactivity, and obesity [6-7]. *Punica granatum*, also called (Pomegranate), has been described as a treatment for diabetes in traditional Greek medicine Unani system of medicine.

### **Mechanism of action of diabetic drugs**

The system of different medications metformin would perhaps focus on the liver to downsize gluconeogenesis and skeletal muscles to build up fringe aldohexose use, with a potential job in the gut to expand levels of glucagon-like peptide 1 (GLP-1). Sulfonylurea's and meglitinides increment insulin discharge inside the pancreas. Thiazolidinediones (TZDs) go about as chemical sensitizers

in striated muscle, fat tissue and the liver. GLP-1 receptor (GLP-1R) agonists (GLP-1RA) focus on the pipe organ to broaden chemical emission and cut back chemical creation, just as act in the gut to lessen gastric purging [3, 16].



Target organs and action mechanism of various diabetic drugs.

**Fig 1:** Mechanism of action of diabetic drugs

Nanotechnology can be characterized as the science and designing associated with the combination, plan, portrayal, observing, fixing, development and control of the human organic framework at the atomic level. Nanomedicine is the combination of nanotechnology in medication for better human medical care.

Nano-materials have special physicochemical properties, like high surface to mass proportion, minuscule size, and high reactivity.

These properties can be utilized to conquer the constraints of conventional DM medicines and finding. The kidney has a vital role in the normal physiology of humans. Its disorders have considered a major cause of disability and in worst circumstances lead to death.



