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Marine Grass Boone to Diabetes

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Abstract: ***The global population will be increasing day by day and suffering with non communicable diseases especially Diabetes mellitus which is related to faulty dietary habits include low fiber intake and high intake of carbohydrates and lack of intake of multi nutrients. Compared to other risk factors, obesity and overweight are the most significant risk factors for diabetes. During 2017, we were conducted a study on, Obesity is a predisposing factor of diabetes mellitus, the results shows majority of the subjects (88%) are obese because of their faulty dietary patterns. Keeping this in view, which are abundant to human consumption, there as interest in looking for new bioactive compounds to treat this disease, including metabolites ofmarine origin. The present study aimed to check the anti diabetic activity of HALODULE UNINERVIS powder in streptozocin induced diabetic rats. It is a seagrass that is high in polyphenols, magnesium, zinc, iron, and dietary fiber. Low in carbohydrates. Divided the wistar rats into five groups include normal control, diabetes control, supplementation of powder 50mg/kg.b.wt, 150mg/kg.b.wt and 250mg/kg.b.wt for 20 days. Anti diabetic effect supplementation was slightly decreased at the 10 hour. The final results shown 35percent observed on the 20th day by 100mg/kg administration. 54percent reduction of glucose level inthe 20th day administration at dose level of 150mg/kg. 250mg/kg supplementation is more effective were observed 63percent on the 20th day. Higher dosage of supplementation will be more effective compare to other doses. Additionally it was observed there is no toxicity of this grass. So it can be used for human consumption to control blood glucose levels in diabetes.***

Keywords: Halodule uninervis, diabetes mellitus, anti-diabetic properties, marine-derived compounds, blood glucose levels

1. Introduction

Population of the world will be increasing day by day. At the same time they are suffering with non-communicable diseases especially Diabetes mellitus is related to faulty dietary habits include low fiber intake and high intake of carbohydrates and lack of intake of multi nutrients. Diabetes is a chronic metabolic disorder, which occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. It leads to hyperglycaemia. If left untreated, can cause many complications include diabetic ketoacidosis, cardiovascular diseases, stroke, chronic kidney disease, foot ulcers and retinopathy leads to high mortality and morbidity rates.

The average age at onset of diabetes seen in middle or elderly people. But according to WHO, 8.7 percent of population in the age group of 20 and 70 years suffering with diabetes. Currently, one in every four people are suffering with adult-onset of diabetes (type-2) under the age group of 25 years and 2.5 percent in the urban and 1.8 percent in the rural population above the age of 15 years, according to ICMR. India currently represents 49 percent of the world is diabetes burden, with an estimated 72 million cases in 2017, and almost double to 134 million by 2025.

Keeping this in view, the researchers had taken a lot of experiments which are abundant to human consumption, which are in turn to control the blood sugar levels. In recent years, there has been as growing interest in looking for new bioactive compounds to treat this disease, including metabolites of marine origin. Both in vitro and in vivo screenings have been used totest anti-hyper glycaemic and anti-diabetic activities of marine organisms. In that, sea grass isthe one of the hypoglycaemic food, to control blood sugar levels. Halodule uninervis having 2-4 leaves in each branch. Leaves are the edible portion, to consume only after processing.

2. Materials and Methods

Collection of material

The sea grass were collected from around coastal area of Mandapam, near Rameswaram, Tamilnadu. Used biodegradable packaging method to transport, by sprinkling of sea water until starting the drying method. Before drying, washed it under running tap water and removed waste particles and kept it at room temperature for five days and sundry thoroughly for two days especially in the early morning, later powder it. The powdered sea grass were stored in airtight container, and used for further research.

Biochemical analysis:

The prepared sample were selected and standardized by checking the anti diabetic properties through the nutrient analysis was carried out in SGS lab through standardized procedures. It isrich in dietary fiber, magnesium, zinc, iron, and polyphenols. Carbohydrates are low and acidic in nature. The limit range for microbial growth on food sample is 20-25 colonies. If the number of colonies is more than that, the food sample is not consumable. In the sample the microbial growth was seen, but it was less than limit range, which implies that it is consumable.

Animal experiment:

Experimental animal male wistar rats weighing about 150 to 250 grams, was kept under standardized conditions. All animal experiments were conducted according to the rules and regulations of Institutional animal ethical committee clearance.

Acute toxicity study:

This study was carried out under the OECD guidelines. Halodule uninervis powder dosage range is 50 to 250mg/kg was administered orally to different groups. The animals kept under observation for one week to adjust the environmental changes after started the experiment and observed to identify any toxic symptoms or death. It was continued for further 2 weeks of time.

Diabetes induced:
The animals divided into six groups. Normal saline given to Group 1, dosage of powder was administered orally to Groups-III, IV and V. Streptozocin induced based on body weight i.e 60mg/kg, blood Samples were collected through vein to check the glucose levels after 24 hours of administration of streptozocin.

Supplementation details:

Each group contain six animals. The supplementation details as tabulated below.

Group	Study
I	Normal control (Saline)
II	Sreptozocin treated control (60mg/kg.ip)
III	Streptozocin (60mg/kg.ip) + Halodule uninervis powder (50mg/kg)
IV	Streptozocin (60mg/kg.ip) + Halodule uninervis powder (150mg/kg)
V	Streptozocin (60mg/kg.ip) + Halodule uninervis powder (250mg/kg)

Supplementation was given as per protocol. Before supplementation blood samples were collected 2, 4, 6 and 8 hours. After supplementation the blood samples were collected on 6th day, 9th day, 12th, 16th, 18th, and 20th day.

Statistical analysis:
After completion of supplementation statistical analysis were carried out by using ANOVA to compared the results between control and experimental groups before and after supplementation. The analysis shown it is statistically significant (p value is .001).

3. Result

Anti diabetic effect supplementation was slightly decreased at the 10 hour at the dosage level of 250mg/kg. There is no reduction of blood glucose levels at the dosage of 50mg/kg (p.007). The final results shown 35percent observed on the 20th day by 50mg/kg administration (p.004). 54percent reduction of glucose level in the 20th day administration at dose level of 150mg/kg. 250mg/kg supplementation is more effective were observed 63percent on the 20th day (p.001).

4. Discussion

The present study reveals, Halodule uninervis act as a neutraceutical to treat diabetes. The study was conducted by following all rules and regulations. The sea grass powder showed anti diabetic activity at different doses.

During this study, also observed physical parameters of wistar rats include body weight, food intake, water intake and any irritability behaviour. Weight was maintained by this supplementation.

5. Conclusion

The experimental findings of the present study concluded that powder of Halodule uninervisis act as anti diabetic to control blood glucose levels.

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