

Different Bioactive Constituents and Biochemical Composition of Brown Seaweed***Spatoglossum marginatum***

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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

contributed from algae (Dhargalkar and Neelam Pereira, 2005). Marine green growth are the most established individuals from the plant realm stretching out back a large number of a great many years. They are salt water dwelling simple organisms that fall into rather outdated category of plants. The macroalgae are under threat in developing countries, where they are being disturbed by a variety of human activities. India has a vast coastline of more than 27000 km, which harbours a large diversity of marine algal species (Sahoo et al., 2003). Seaweeds have been reported to have valuable medicinal principles such as antibiotics, laxatives, anticoagulants, anti-ulcer products, neurotoxins and suspending agents in radiological preparations (Scheuer, 1990). Cancer prevention agent guards is a fundamental condition for ordinary living being working. Nevertheless, despite their association with several diseases and pathological conditions, such as neurological diseases and inflammatory states, and with the aging process, reactive species can be beneficial to the organism when used by the immune system to destroy the pathogens, or when acting as messenger molecules in cell signaling pathways (Romano et al, 2010). Extractive value is the amount of an extract that a substance yields in a particular solvent and is often an approximate measure of the amount of certain constituents that the drug contains (Khandelwal, 2008). Both sea weeds contains good crude fibre content, generally crude fibre intake decreases the incidence of several types of diseases as due to its beneficial effects like increasing the volume of fecal bulk, cholesterol and glycaemic levels, trapping substances that can be dangerous for the human organism (mutagenic and carcinogenic agents), stimulating the proliferation of the intestinal flora etc., (Heredia et al., 2002). Marine organisms contain developed exceptional metabolic and physiological capability to not only ensure survival in a great variety of extreme habitat but also proffer the production of metabolites. Seaweeds have been used as food stuff in Asian diet as it contains carotenoids, proteins, vitamins, dietary fibres, essential fatty acids and minerals. Based on available literature selected brown seaweed screened for different biochemical parameters and bioactive constituents.

Material and methods:

Collection

The brown seaweed *S. marginatum* collection from places of Ramanathapuram district, Tamil Nadu, India.

Plant material

The brown seaweed was dried under shade, mechanically reduced to a moderately coarse powder and stored in amber coloured airtight containers. Coarse type of the medication was utilized for assurance of physicochemical parameters like dampness content, debris esteems, expanding list, frothing file, remote natural issue, extractive qualities, and subjective fluorescence.

Physico-chemical analysis

Air dried brown seaweed *S. marginatum* was used for the quantitative determination of ash values, extractive values, moisture content, swelling index, foaming index and foreign organic matter, via standard methods (Kokate, 2005; The British Pharmacopoeia Commission, 2010). The total ashes value for a crude drug is not always reliable since there is a possibility of the presence of non-physiological substances such as earthy matters. Along these lines, the parameters, for example, corrosive insoluble (Arjun et al., 2017), water-solvent and sulphated debris esteems were performed. Extractive values with petroleum ether, chloroform, ethyl acetate, ethanol, methanol and water were also determined (Trease and Evans, 2002). The fluorescence analysis is a tool for the determination of constituents in the brown seaweed powdered that gives a definite idea of the chemical nature. Fluorescence analysis of brown seaweed powdered and various extracts was carried out by the standard method (Kumar et al., 2012).

Preliminary Phytochemicals screening

Preliminary phytochemical screening was performed using standard procedures (Khandelwal 2002; Kokate, 2005). The concentrates acquired from various solvents were exposed to distinguishing proof tests for the recognition of various phytoconstituents through natural and inorganic components examination, by means of the strategy for (Khandelwal, 2002).

Results and discussion

Physicochemical analysis

Drugs originating from brown seaweed powdered sources are thought to be a promising alternative for other synthetic anti-diabetics such as sulphonylureas, insulin treatment and biguanides. Brown seaweed powdered products are believed to more preferable due to less toxicity, economic and better patient compliance. Hence, medicinal brown seaweed powdered and products thereof are used in many countries in the treatment and management of diabetes. The results of physicochemical parameters such as total ash, acid insoluble ash, water-soluble ash and sulphated ash are shown in sulphated ash value (9.2%) was lower than the total ash value

(11.7%). The acid-insoluble and water-soluble ash values (9.2% & 7.0%), respectively (Table. 1). Further, the results also showed that moisture content, swelling index and foaming index were found (19.23%) to be 0.5 cm and less than 100 respectively while foreign organic content was found to be nil (Table: 2). The extractive values for various solvents such as ethanol, methanol, water, chloroform, ethyl acetate and, petroleum ether were found to be 3.1%, 1.3%, 1.8%, 0.7%, 0.3% and 0.9% respectively (Azhagu Madhavan et al., 2019).

Table: 1. Different biochemical contents of *S. marginatum* extract

S. No.	Parameters	Values
1	Total Ash	11.7%
2	Acid Insoluble Ash	1.3%
3	Water Soluble Ash	7.0%
4	Sulphated Ash	9.2%
5	Moisture Content	19.23%
6	Foreign Organic Matter	Nil
7	Foaming Index	Less than 100
8	Swelling Index	0.5 cm

Table: 2. Extractive values of *S. marginatum* extract

S. No.	Solvent	Values % (w/w)
1	Ethanol	1.8
2	Methanol	1.3
3	Water	1.8
4	Chloroform	0.7
5	Ethyl Acetate	0.3
6	Petroleum Ether	0.9

The fluorescence analysis is a tool for the determination of constituents in the brown seaweed powdered that gives a definite idea of the chemical nature. Thus, separates were likewise exposed to UV chamber and fluorescence was watched and consistency was noted as an extra character for distinguishing proof. Fluorescence investigation of the powdered medications was performed and arranged which assists with distinguishing the defilement on the grounds that phyto-constituents display trademark fluorescence under bright light when they got blended reagents (Fig. 1). The fluorescence displayed by the blend was ascribed to the substance constituents present in the rough medication. Before the phytochemical screening, a good guess of phytoconstituents was finished by the conduct of powder tranquilize with various compound reagents which powdered medication demonstrated various hues when it gets varied the

particular reagents which reflects the presence phytochemicals in accordance by means of the colours obtained. Fluorescence behavior of *S. marginatum* extract was represented (Table 3).

Preliminary phytochemical screening

The phytochemical report of the brown seaweed powdered exposed the presence of alkaloids, carbohydrates, flavonoids, proteins, amino acids, phenols, tannins, glycosides and steroids as organic phytoconstituents (Table 4). Every constituent plays an important role and deficiency of anyone constituent may lead to abnormal developments in the body (Vinothini et al., 2017). Brown seaweed powdered is a rich source of all the elements essential for a human being. Qualitative analysis of various inorganic elements revealed the presence of calcium, magnesium, potassium, iron, sulphates and phosphates (Table 5).

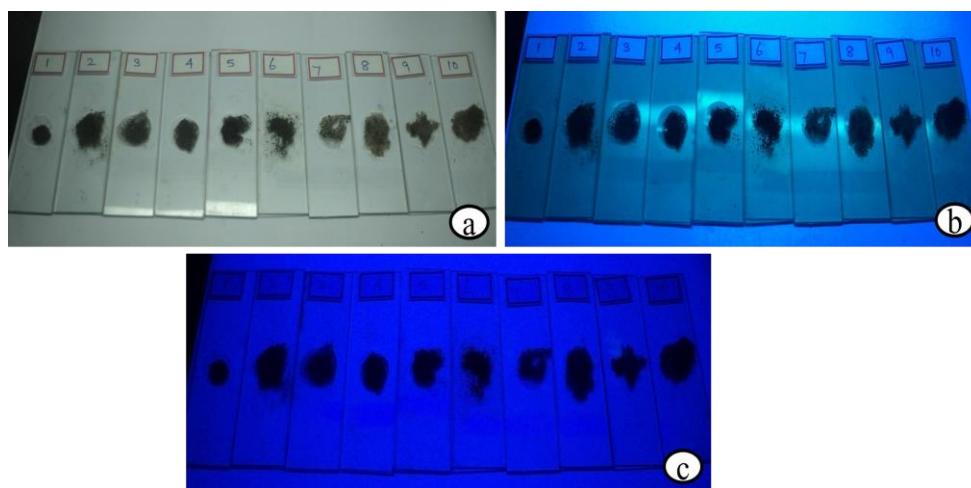


Fig 1: Fluorescence studies of *Spatoglossum marginatum* extract

a. Visible light, b. Short UV, c. Long UV

Table 3. Fluorescence studies of *S. marginatum* extract

S. No	Analyzed phytochemical factor	Visible Light	Short UV 254 nm	Long UV 365 nm
1	Brown seaweed powder (pp)	Dark Green	Light Green	Dark Block
2	PP with water	Light Green	Light Green	Dark Green
3	PP with Hexane	Dark Brown	Light Brown	Brown
4	PP with Chloroform	Light Green	Green	Block
5	PP with Methanol	Dark Green	Light Green	Dark Black
6	PP with acetone	Green	Dark Black	Green
7	PP with IN Sodium hydroxide in water	Light Green	Brownish - Yellow	Light Green
8	PP with IN Hydrochloric acid	Dark Green	Green	Dark Green
9	PP with sulphuric acid with an equal amount of water	Light Green	Dark Block	Black

10	PP with Nitric acid diluted with an equal amount of water	Dark Green	Green	Light Green
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Table 4. Qualitative analysis of phytochemicals analysis *S. marginatum* extract

S. No	Analyzed phytochemical factor	Ethanol	Methanol	Water	Chloroform	Ethyl Acetate	Ethanol
1.	Tannin	++	+	+	+	+	+
2.	Phlobatannins	+	+	++	-	-	+
3.	Saponin	-	+	++	+	-	-
4.	Flavonoids	+++	++	-	+	++	++
5.	Steroids	++	-	+	-	+	+
6.	Terpenoids	+	+	+	-	-	+
7.	Triterpenoids	+	+	-	+	+	+
8.	Alkaloids	+++	++	+	+	+	+
9.	Carbohydrate	+	+	+	-	-	-
10.	Protein	++	-	++	-	+	-
11.	Anthraquinone	-	-	+	-	+	+
12.	Polyphenol	++	+	++	+	-	-

(+) Positive, (-) Negative

Brown seaweed powdered is the main source of good quality source of pharmacognostical and physicochemical parameters have essential role in identification, and establishment of quality parameter of the species. Supplementation of *S. marginatum* may be useful for human health associated emerging diseases such as diabetes, hypertension and cancer.

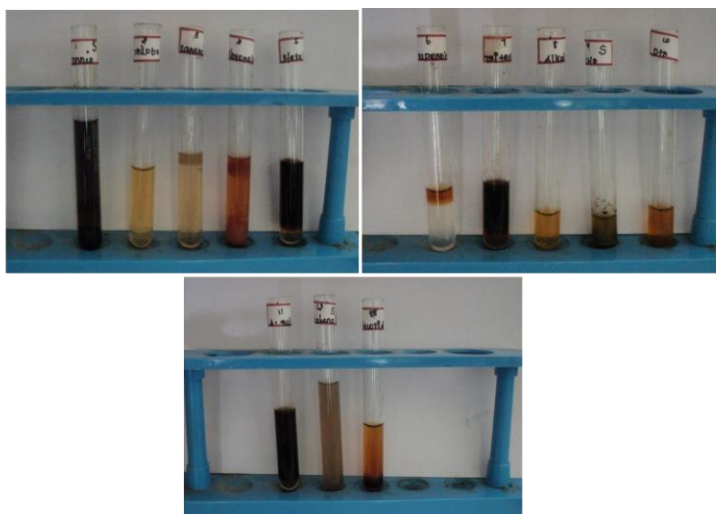


Fig 2: Qualitative analysis of Phytochemicals analysis *S marginatum* ethanolic extract.

Tannin, Phlobatannins, Saponin, Flavonoids, Steroids, Terpenoids, Triterpenoids, Alkaloids, Carbohydrate, Protein, Anthraquinone, Polyphenol and Glycoside. Indications: “+” means positive activity, “-” means negative activity

Table 5. Qualitative analysis of inorganic elements analysis of *S. marginatum* extract

S. No.	Parameters	Values
1	Total Ash	11.7%
2	Acid Insoluble Ash	1.3%
3	Water Soluble Ash	7.0%
4	Sulphated Ash	9.2%
5	Moisture Content	19.23%
6	Foreign Organic Matter	Nil
7	Foaming Index	Less than 100
8	Swelling Index	0.5 cm

Conclusion

Brown seaweed analysis the substances which have ability to prevent such protein denaturation could be a useful anti-arthritis drug and diabetic natural sources highly presence of ethanolic extract from physicochemical parameters have essential jobs in recognizable proof, verification and foundation of value parameters of the species.

Conflicts of interest:

The authors stated that no conflicts of interest.

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