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Research Article

**PHYTOCHEMICAL ANALYSIS OF METHANOLIC EXTRACT  
OF CAULERPA SCALPELLIFORMIS (R.BR.) WEB. V. BOSSE  
COLLECTED FROM HARE ISLAND, THOOTHUKUDI,  
TAMIL NADU, INDIA****John Peter Paul, J.**Director, Centre for Advanced Research in Plant Sciences (CARPS), Department of Botany,  
St. Xavier's College (Autonomous), Palayamkottai – 627 002, Tamil Nadu, India.E.mail: [johnarock2008@yahoo.com](mailto:johnarock2008@yahoo.com)**Abstract:**

The plan of the present study was to explore the phytochemicals in the methanolic extract of *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse collected from Hare Island, Thoothukudi, Tamil Nadu, India. The phytochemical screening of methanolic extract was studied using the standard procedure using UV-Visible spectroscopic and FTIR. The UV-Visible spectrum was found to have the presence of the compounds separated at the nm of 246.5, 340, 391.5, 447.5, 531.5 and 662 with the absorption 3.917, 3.838, 3.954, 3.898, 1.331 and 3.103 respectively. The FTIR analysis showed the presence of functional groups such as organophosphorus, sulfonic acids, sulfonyl chlorides, amino acids, phosphines, aliphatic, alcohols and phenols.

**Key words:** *Caulerpa scalpelliformis*, Phytochemicals, UV-Visible, FTIR**\*\*Corresponding Author:****Dr. John Peter Paul J,**

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## INTRODUCTION:

Medicinal plants and human beings have exceptional relationship since time immemorial. Human's vital interest in plants, primarily as a source of food, shelter and clothing, dates back to the very origin of human civilization. Plants are nature's "Chemical factories" which provides the richest source of organic chemicals on earth. The world is blessed with a great variety of natural vegetations, some of which are used as traditional medicine to cure various sicknesses and diseases [1,2]. Some are also useful as flavoring agents, while others act as food additives and preservatives [3,4]. In addition, some plants have been used in the manufacture of adhesives, textiles, dyes, paints, plastic and rubber industries [5]. But, considering richness of the plant world, the knowledge of plants acquired by man is still insufficient.

Seaweeds are considered as source of bioactive compounds and produce a great variety of secondary metabolites characterized by a broad spectrum of biological activities [6]. There are numerous reports of compounds derived from seaweeds with a broad range of biological activities such as antibiotics, antiviral diseases, anti-tumour and anti-inflammatory as well as neurotoxins [7]. Phytochemical types include sterols, isopyrenoids, amino acids, terpenoids, phlorotannins, steroids, phenolic compounds, halogenated ketones and alkanes, cyclic polysulphides, fatty acids and acrylic acid have been isolated from seaweeds. Hence, pharmacologists, physiologists and chemists have been paying increasing attention to the marine organisms particularly on seaweeds for screening bioactive substances. Several works have been undertaken on crude and purified compounds obtained from seaweeds for evaluating the bioactive potential [8]. In the present study, the phytochemical analysis of the methanolic extract of *Caulerpa scalpelliformis* was concentrated.

## MATERIALS AND METHODS:

### Collection of plant materials

The plant materials for the present study were collected from Hare Island, Thoothukudi in the south east coast of Tamil Nadu, India, during the month of December, 2016. *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse belonging to Chlorophyceae (green

algae) was made during the low tidal and subtidal regions (up to 1m depth) by hand picking. The collected materials were washed thoroughly with marine water in the field itself to remove the epiphytes and sediment particles. Then the samples were packed separately in polythene bags in wet conditions and brought to the laboratory, then thoroughly washed in tap water followed by distilled water to remove the salt on the surface of the thalli. They were stored in 5% formalin solution [9].

### Preparation of extracts

For the preparation of methanolic extract, the plant specimens were washed thoroughly and placed on blotting paper and spread out at room temperature in the shade condition for drying. The shade dried samples were grounded to fine powder using a tissue blender. The powdered samples were then stored in the refrigerator for further use. 30g powdered samples were packed in Soxhlet apparatus and extracted with methanol for 8h separately [10].

### UV-Vis spectral analysis

The methanolic crude extract containing the bioactive compound was analyzed UV-Visible spectroscopically for further confirmation. The methanolic crude extract of *Caulerpa scalpelliformis* was scanned in a wavelength ranging from 200-900nm using a Shimadzu spectrophotometer and characteristic peaks were detected [11].

### FTIR analysis

FTIR analysis was performed using Perkin Elmer Spectrophotometer system, which was used to detect the characteristic peaks and their functional groups. The peak values of the FTIR were recorded. Each and every analysis was repeated twice and confirmed the spectrum [12].

## RESULTS AND DISCUSSION:

### UV-Visible spectrum analysis

The UV-Visible spectrum of the selected green seaweed was selected at the wavelength of 200nm to 900nm due to the sharpness of the peaks and proper baseline. The methanolic spectrum of *Caulerpa scalpelliformis* showed the compounds separated at the nm of 246.5, 340, 391.5, 447.5, 531.5 and 662 with the absorption 3.917, 3.838, 3.954, 3.898, 1.331 and 3.103 respectively (Figure 1 and Table 1).

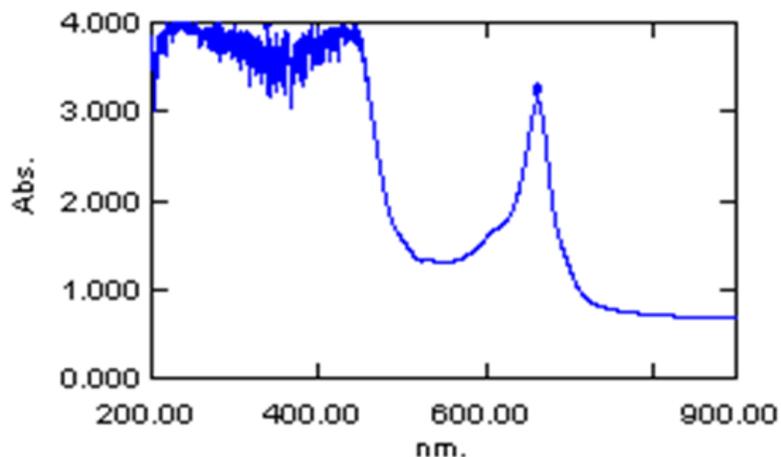


Fig. 1: UV-Visible spectrum of methanolic extract of *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse

Table 1: UV-Visible spectrum of methanolic extract of *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse

Nm	662	531.5	447.5	391.5	340	246.5
Abs	3.103	1.331	3.898	3.954	3.838	3.917

#### FTIR analysis

The FTIR spectrum was used to identify the functional group of the active components present in the methanolic extract of the selected green seaweed based on the peak value in the region of infra red radiation. The FTIR results of methanolic extract of *Caulerpa scalpelliformis* showed different peaks at 1038.60, 1075.24, 1383.83, 1637.45, 2337.56, 2360.71, 2852.52, 2922.92 and 3417.63 $\text{cm}^{-1}$ . It was

confirmed the presence of functional groups such as organophosphorus (P-O-C antisym stretch), sulfonic acids ( $\text{SO}_3$  sym stretch), sulfonyl chlorides ( $\text{SO}_2$  antisym stretch), amino acids ( $\text{NH}_3$  deformation), phosphines (P-H stretch), phosphines (P-H stretch), aliphatic (CH antisym and sym stretch), aliphatic (CH antisym and sym stretch) and alcohols and phenols (OH stretch) respectively (Figure 2 and Table 2).

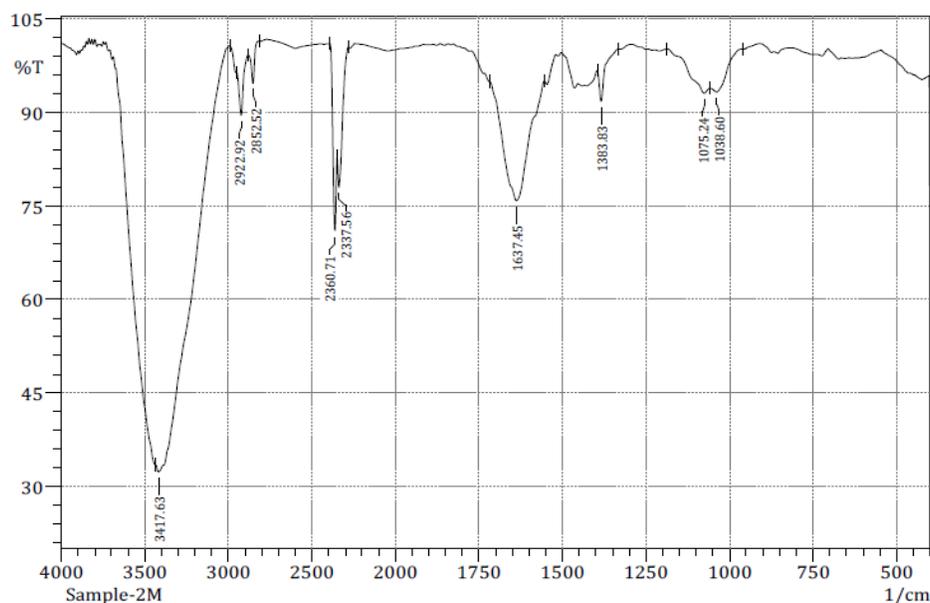


Fig. 2: FT-IR spectrum of methanolic extract of *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse

**Table 2: FTIR spectrum analysis of methanolic extract of *Caulerpa scalpelliformis* (R.Br.) Web. V. Bosse.**

Peak value	Functional group	Assignment
3417.63	Alcohols and Phenols	OH stretch
2922.92	Aliphatic	CH Antisym and Sym stretch
2852.52	Aliphatic	CH Antisym and Sym stretch
2360.71	Phosphines	P-H stretch
2337.56	Phosphines	P-H stretch
1637.45	Amino acids	NH <sub>3</sub> deformation
1383.83	Sulfonyl chlorides	SO <sub>2</sub> Antisym stretch
1075.24	Sulfonic acids	SO <sub>3</sub> Sym stretch
1038.60	Organophosphorus	P-O-C Antisym stretch

**CONCLUSION:**

From the present study, it was observed that UV-Visible spectrum showed the compounds separated at the nm of 246.5, 340, 391.5, 447.5, 531.5 and 662 with the absorption 3.917, 3.838, 3.954, 3.898, 1.331 and 3.103 respectively. The FTIR analysis showed the presence of functional groups such as organophosphorus, sulfonic acids, sulfonyl chlorides, amino acids, phosphines, aliphatic, alcohols and phenols.

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**CONFLICT OF INTEREST:**

The author declares that she has no conflict of interest.

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