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Research Article

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Phytochemical screening of marine algae *Ulva lacuta* (Linn.) and *Enteromorpha intestinalis* (Linn.)

S. D. Shankhadarwar

Department of Botany, R. Ruia College, Matunga, Mumbai

ABSTRACT

Seaweeds have been one of the richest and most promising sources of bioactive primary and secondary metabolites. The preliminary screening was performed by Harbone method the results of the phytochemical screening reveled presence of flavonoids , alkaloids, steroids , sapnonins and phenols in Ulva lacuta and Enteromorpha intestinalis. The crude extracts of Ulva lacuta and Enteromorpha intestinal is screened for the presence of active components flavonoids , alkaloids, steroids, sapnonins and phenols of were carried out by Thin Layer Chromatography method. The quantitative estimation in above two species showed the presence of Proteins and lipid in moderate amount. The aim of the present study is to evaluate the phytochemical constituents of the Ulva lacuta and Enteromorpha intestinalis

Key words: *U. lacuta*, *E. intestinalis*, phytochemical, flavonoids, alkaloids, steroids, sapnonins and phenols.

INTRODUCTION

Seaweed are rich in polysaccharides, vitamins, minerals, bioactive substances like polyphenols, proteins, lipids and carotenoid that possess antioxidant, antibacterial, antiviral and other beneficial functions. Marine products are currently of considerable interest in the food and pharmaceutical industries for the development of antioxidants (2). Most of the compounds of marine algae show anti-bacterial activities. Marine algae have number of novel biologically active metabolites. So, for many chemically unique compounds identify and isolated and number of them are under investigation. (7, 12). The phyto constituents such as flavonoids, phenols and tannins are present in seaweeds and sea grasses, indicating a possibility that the extracts may have antioxidant property (6). This activity is believed to help in eradicating a number of diseases through free radical scavenging activity. Phenolic compound or Polyphenols have received considerable attention because of their physiological functions including antioxidant , antimutagenic and antitumor activities (1) **.** A large number of phytochemicals belonging to several chemical classes have been shown to have inhibitory effect. Seaweeds are valuable sources of protein, fibre, vitamins, polyunsaturated fatty acids, macro and trace elements (8, 10, 13 15) Qualitative phytochemical screening of the powdered green alga *U. lactuca* reveals the presence of alkaloids, flavonoids, saponins, terpenoids and cardiac glycosides. However, tannins, phlobatannins and steroids were not detected.

EXPERIMENTAL SECTION

Collection of algae: The marine algae *Ulva lacuta* and *Enteromorpha intestinalis* collected from the intertidal region of the Mumbai coastal water and immediately brought to the laboratory in plastic bags containing water to prevent evaporation. Then the sample was washed thoroughly with sea water to remove extraneous materials.

Samples were dried at 37°C and ground in an electric mixer. The extract was then concentrated and dried by a rotary evaporator.

Preliminary Tests for detection of components: Preparation of algal extract for preliminary tests , 200mg of dried algal powder was crushed in 10ml of methanol using a mortar and pestle and it was filtered through muslin cloth. The filtrate was collected in a clean test tube. This served as the sample for detection of various components in algae. (Extracts of alga prepared using the above mentioned procedure.)

Separation of components by Thin layer chromatography: Thin layer chromatography technique was used for the separation of active components flavonoids , alkaloids, steroids , sapnonins and phenols from various solvents combinations gave separated phytoconstituents which were observed under U.V. light by (3, 4, 13) Total lipid content of. was estimated according to Bligh and Dyer's method and proteins by Lawry's methods.

RESULTS AND DISCUSSION

The presence of important phytochemicals such as flavonoids ,alkaloids, saponins, phenols, steroids were screened and represented in the Table 1. *Ulva lactuca* and *Enteromorpha intestinalis* showed the presence of almost all the phytochemical constituents. Steroids and saponin were present in minimum amount flavonoids and alkaloids were present in good amount .Preliminary phytochemical screening of twelve different chemical compounds (steroids, alkaloids, phenolic groups, saponins, tannin, flavonoids, anthraquinone, carbohydrates, carboxylic acid, coumarins, proteins and xantoproteins) were tested in six different extracts of *U. reticulata* and *S. wightii* (5) . Photochemical constituents like flavonoids ,alkaloids, saponins, phenols, steroids were analyzed with thin layer chromatography represented in Table no.2 Flavonoids Rf value 0.70 ± 0.01 , 0.64 ± 0.01 alkaloids Rf 0.56 ± 0.02 , value phenols Rf value 0.43 ± 0.01 steroids Rf 0.81± 0.01 value sapnonin Rf 0.54 ± 0.01 value for *Ulva lactuca* . *Enteromorpha intestinalis* showed flavonoids Rf 0.90 ± 0.01 , 0.86 ± 0.02 value alkaloids Rf value 0.80 ± 0.01, 0.52 ± 0.01 steroids Rf value 0.77 ± 0.02 saponins Rf value 0.40 ± 0.02 (fig no.1) . *Ulva lactuca* contained higher amount of phenol but in *Enteromorpha intestinalis* flavonoids and alkaloids are higher amount . Saponin and steroid present in medium in range in both the green marine algae. Alkaloids were found to be most abundant one in *Gracilaria corticata* extracts while flavonoids to be low in *Gracilaria corticata*. In *Spirulina platensis*, flavonoids were high and alkaloids were found to be low (9). *Sargassum wightii* were tested for steroids alkaloids , Flavonoids phenols and saponins presence with varied degree. Phenolic and steroids present in methanolic extracts of *S. wightii* were separated using TLC three different spots were detected in different Rf value (14) . The quantitative estimation in above two species showed the presence higher amount of proteins in *Ulva lactuca* 16.52 ± 0.1mg/gm but lipid content higher in *Enteromorpha intestinalis* 3.3±0.1 (Table no. 3)

Table 1: Phytochemical constituents of U. *lactuca* and *E. intestinalis*

Content	U. *lactuca*	*E. intestinalis*
Flavonoids	+++	+++
Alkaloids	+	+
Phenols	++	+
Saponin	+	+
Steroid	+	+

Table 2: TLC profile of U. *lactuca* and *E. intestinalis*

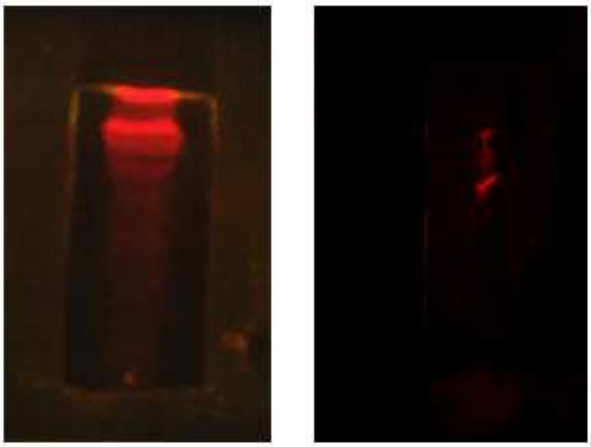
Phytochemicals	U. *lactuca*	*E. intestinalis*
Flavonoids	0.70 ± 0.01 , 0.64 ± 0.01	0.90± 0.01 , 0.86 ± 0.02
Alkaloids	0.56 ± 0.02	0.80 ± 0.01, 0.52 ± 0.01
Phenol	0.43 ± 0.01	----------
Steroids	0.81±0.01	0.77 ± 0.02
Saponin	0.54 ± 0.01	0.40 ± 0.02

Table 3: Quantitative phytochemical screening of *U. lactuca* and *E. intestinalis*

	U. lactuca	*E. intestinalis*
Protein	16.52 ± 0.1	08.26±0.1
Lipid	2.09 ±0.1	3.3±0.1

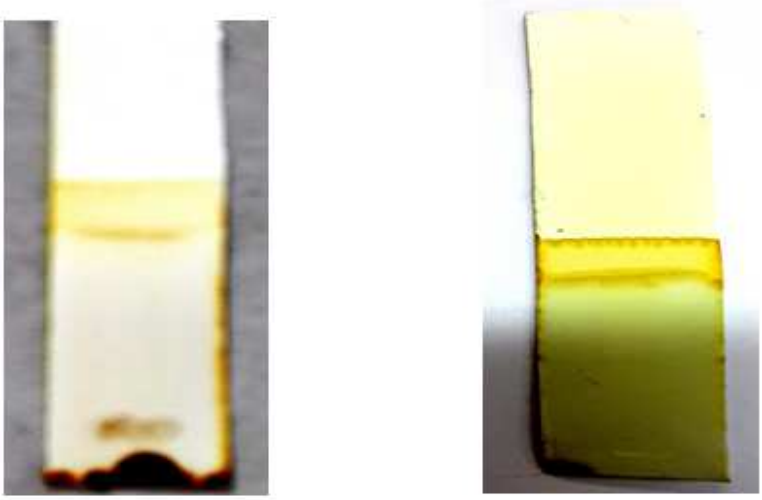
Value mg/gm

Fig. 1: TLC Profile *E. intestinalis* and *U. lactuca*

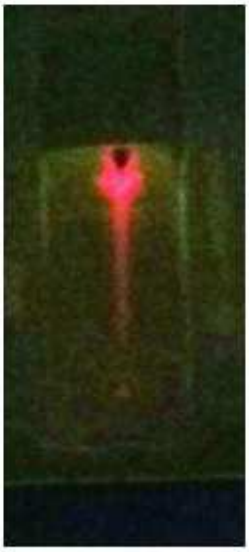


Flavonoids *E. intestinalis* *U. lactuca*

Alkaloids *E. intestinalis* *U. lactuca*



Saponin *E. intestinalis* *U. lactuca*



Steroids *E. intestinalis* *U. lactuca*

Phenol *U. lactuca*

CONCLUSION

The marine algae *Ulva lacuta* and *E. intestinalis* have several chemical constituents of high therapeutic efficacy. Further studies are required to investigate the extracts of for potential pharmacological properties.

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