Sargassum sp has higher Phenolic contents than Iyengaria sp

GHAZALA BUTT1*, EJAZ HUSSAIN1, ABDUR REHMAN KHOKHAR2, SIDRA HASNAIN3

ABSTRACT

Background: There is a considerable increase in the field of molecular biology as evidenced by advancements in genetics, genomics and proteomics. With overwhelmingly expanding information about human diseases, the identification of bioactive ingredients isolated from natural sources has also gained tremendous appreciation.

Methods: Sargassum sp and Iyengaria sp were collected from southeast coast of Karachi. The powdered seaweed samples (500 g of Sargassum sp and Iyengaria sp) were extracted with methanol in conical flasks at room temperature for three weeks. The samples were filtered using Whatman filter paper to obtain clarified filtrates. Phenol contents were evaluated.

Results: Methanolic extract of Sargassum sp shows the highest phenolic contents of 677.74 (mg/ml) and Iyengaria sp shows phenolic content with value 471.6 mg/ml.

Conclusion: This is a preliminary study highlighting potential of Sargassum sp and future studies must converge on in-vitro analysis of these species for a better understanding of the protein and gene network regulated by phenols.

Keywords: Sargassum sp, phenolic content, Iyengaria sp

INTRODUCTION

There is a rapidly accumulating evidence of identification of bioactive ingredients from algae. Bromophenols isolated from Symphyocladia latiuiscula have shown notable antifungal activity (Xu et al, 2014). It is interesting to note that polyphenols isolated from Padina boergeseni considerably reduced ferric nitrotriacetate induced renal oxidative damage in rats (Rajamani et al, 2014). Two novel phlorotannins purified from polyphenol powder prepared from Ecklonia kurome Okamura displayed strong antioxidant activity (Yotsu-Yamashita et al, 2013). Dieckol and phlorofucofuroeckol isolated from edible brown alga, Eisenia bicyclus also revealed remarkable antioxidant potential (Kwon et al, 2013). Polyphenol-Rich Fraction of Brown Alga Ecklonia cava has been noted to effectively reduce obesity and glucose levels in high-fat diet-induced obese mice (Park et al, 2012). The study was designed to analyze phenolic contents of Sargassum sp and Iyengaria sp.

MATERIALS AND METHODS

Algal Material: Seaweeds used in this study were Sargassum sp and Iyengaria sp. The seaweeds were collected during the winter season in the month of Feb. 2013, from, Sandspit, Hawkesbay, Buleji, Haji Goth and Paradise Point region on the southeast coast of Karachi Pakistan respectively. The seaweeds samples were dried, and powdered after washing thoroughly in fresh water to remove salt and other unwanted materials and stored in airtight containers at room temperature for further study. The powdered shed-dried seaweed samples (500 g of Sargassum sp and Iyengaria sp) were extracted with methanol in conical flasks (1500 ml) (Volumetric flasks, (Pyrex) 1000 cm3) respectively at room temperature for three weeks. The samples were filtered by Whatman filter paper (Whatmann filter paper no. 1, 2, 41, and 42.) to obtain clarified filtrates. The study was designed to analyze phenolic contents of Sargassum sp and Iyengaria sp.

Total Phenolic Contents: Total phenolic content of Sargassum sp and Iyengaria sp were determined with the Folin-Ciocalteau’s reagent method. Concisely, 0.1 ml (5 mg/ml) of a sample was mixed with 2.0 ml of 2% Na2CO3 and keep at room temperature for 2 min. 0.1 ml of 50% reagent of Folin-Ciocalteau’s phenol mixture was added, after that the reaction reagent was vigorously mixed and keeps it to room temperature for 30 min. After completion of incubation period, absorbance of algal...
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Sample was noted at 720 nm with the help of spectrophotometer. Different volumes of quercetin (1 mM) were used as standards.

RESULTS AND DISCUSSION

Figure: Total Phenolic Contents of Sargassum and lyengaria sp

Methanolic extract of Sargassum sp shows the highest phenolic contents of 677.74 (mg/ml) and lyengaria sp shows phenolic content with value 471.6 mg/ml. There is a progressive increase in research work addressing identification of wide ranging biological activities of polyphenols. Two novel phlorotannins purified from polyphenol powder prepared from Ecklonia kurome Okamura displayed strong antioxidant activity (Yotsu-Yamashita et al, 2013). There are exciting pieces of evidence suggesting role of polyphenols isolated from Limoniastrum guyonianum aqueous gall extract in inducing apoptosis in colorectal cancer cells Krifa et al, 2014. It has recently been convincingly revealed that polyphenolics from peach substantially reduced cancer growth in xenografted mice Noratto et al, 2014. Confluence of information also has started to shed light on approaches to maximize bioavailability of polyphenols and in line with this approach, chitosan-based nanoformulated green tea polyphenol EGCG significantly inhibited cancer development in xenografted mice Khan et al, 2014. This is a preliminary study highlighting potential of Sargassum sp and future studies must converge on in-vitro analysis of these species for a better understanding of the protein and gene network regulated by phenols.

REFERENCES