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COMPARATIVE PHYTOCHEMICAL ANALYSIS BETWEEN *GLYCYRRHIZA GLABRA* AND SEA WEEDS

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ABSTRACT :

Glycyrrhiza glabra (licorice) is a vital sweet root plant spread over the land. *Ulva reticulata*, *Ulva lactuca*, *Sargassum*, *Gracilaria corticata* and *Kappaphycus alvarezii* are sea weeds which is considered as treasure of sea. Both are having various medicinal, pharmacological and biomedical properties. Hence in this study, comparative phytochemical (saponin, chlorophyll, carotenoid and pectin) analysis was carried out between *Glycyrrhiza glabra* and sea weeds in order to find out the source of richness of phytochemicals. It was observed that the highest percentage of phytochemicals available in *Glycyrrhiza glabra* than the sea weeds, so it would be utilized in better way towards the phytopharmaceutical drug development in future.

KEYWORDS : *Glycyrrhiza glabra , Gracilaria corticata* and *Kappaphycus alvarezii*.

INTRODUCTION

Glycyrrhiza is derived from the ancient Greek term glykos, meaning sweet, and rhiza, meaning “sweet root” contains a compound that is roughly 50 times sweeter than sugar. Licorice (*Glycyrrhiza glabra*) root has been used to treat a variety of illness ranging from the common cold to liver disease. This herb has long been valued as a demulcent and expectorant to relieve respiratory aliments, stomach problems, inflammatory disorders, skin diseases and stress relief also to prevent and treat stomach ulcers (Rao, 1993). Among the chemical constituents of the *Glycyrrhiza glabra*, glabridin and glabrene exhibited inhibitory activity against the growth of *H.pylori*, bacteria, is associated with most duodenal, gastric ulcers and cancers (Karkanis *et al*., 2018).

METHODOLOGY

COLLECTION OF SEAWEEDS

The Seaweeds *Ulva reticulata*, *Ulva lactuca*, *Sargassum*, *Gracilaria corticata* and Kappaphycus *alvarezii* were collected from Gulf of Mannar, India, during January, 2018. The samples so obtained were processed powdered and solvent extraction done with methanol and ethanol.

EXTRACTION OF SAPONIN

5g of powdered plant material was collected and added 10 mL hexane. The supernatant was discarded and then added 5 mL of ethanol. But the seaweeds were treated by methanol. The alcoholic extract was separated and added 4 mL water saturated n-butanol. Then the n-butanol phase was separated and added to the volume of 1 mL EtoEt. The precipitate was obtained as crude saponin, confirmed by boiled with water for 1 min. Cooled the tubes and set aside 5 minutes. Stable foam of above 2 cm or more is a positive test for the presence of saponin (Hostettmann and Marston 2005).

EXTRACTION OF CHLOROPHYLL

1g of fresh sample was homogenized with 5 mL of 80% acetone. It was centrifuged at 3000 rpm for 10 mins. The supernatant was collected and the sample was made up to 10 mL. The absorbance was read at 645 nm. The total chlorophyll content was measured.

EXTRACTION OF CAROTENOID

1g of fresh sample was homogenized with 5 mL of 80% acetone. It was centrifuged at 3000 rpm for 10 minutes. Add a pinch of fine sand and it was recentrifuged at 3000 rpm for 10 minutes. The supernatant was collected. Read at 440 nm. The total carotenoid content was measured.

EXTRACTION OF PECTIN

Raw material was sliced and weighed (5g for one sample). Then allow for pretreatment. This was done in three groups (method A: frozen at -20c for 24hours / method B: steamed for 20-30 min. / method C: soaked in 60 mL of ethanol for 30min). After pretreatment the sample were mixed with deionized water and heated at 80ºC and filtered this residue by using cheese cloth then removed water from the filtrate with evaporator. Added 30 mL of C_2H_5OH to recrystallize pectin from the solution. The gel was filtered and transferred to crucible and allowed for dry at 70ºC for 24 hours. After the drying process, the obtained yellow pectin was weighed (Harborne, 1998). The effects of three factors were investigated. The yield of pectin extraction was calculated by the following formula;

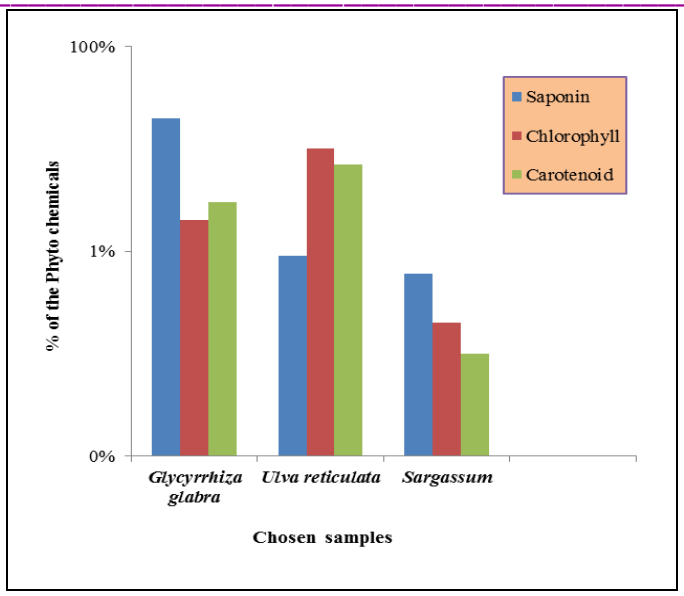
$$\% \text{ pectin} = \frac{\text{weight of obtained pectin} \times 100}{\text{weight of sample}}$$

RESULTS AND DISCUSSION

COMPARISON OF SAPONIN, CHLOROPHYLL AND CAROTENOIDS

Graph 1 revealed that total saponin was high in *Glycyrrhiza glabra* and medium in *Ulva reticulata*, very less in *Sargassum*. The Chlorophyll content is high in *Ulva reticulata* and medium in *Glycyrrhiza glabra* and very less in *Sargassum*. The carotenoid content was high in *Ulva reticulata*, medium in *Glycyrrhiza glabra* and very less in *Sargassum*. The homogenizing extraction system was optimized for maximum saponin, chlorophyll and carotenoid content. Aqueous ethanolic extract was found best for *Glycyrrhiza glabra* and poor for *Ulva reticulata* and *Sargassum*.

Maximum saponin was found in ethanolic extract of *Glycyrrhiza glabra* than *Ulva reticulata* and *Sargassum*. *Glycyrrhiza glabra* root can be better utilized for extraction of saponin, chlorophyll and carotenoid that are much need in the health care industry. The wasted sea weeds can be used for better ayurveda preparation for good of mankind, and also sea weeds have a better position in the place of medicinal plants. The isolation of active compounds from the extracts of *Glycyrrhiza glabra*, *Ulva reticulata* and *Sargassum* and its structural elucidation were completed (Herz *et al*., 1998).



Graph 1 Saponin, chlorophyll and carotenoid comparison in chosen samples

COMPARISON OF PECTIN

According to Table 1, the maximum amount of pectin was extracted by adding ethanol to raw material and heated at 60ºc for 30 mins. The highest percentage of pectin (9.3%) was obtained from *Glycyrrhiza glabra* by the ethanolic treatment. The heating treatment of pectin extract from *Glycyrrhiza glabra* yielded the maximum amount of pectin (3.8%). The lowest percentage of pectin was found by frozen treatment (0.9%). Therefore, the optimal condition of pretreatment of raw material was done by adding ethanol and heating at 60ºC for 30 mins. *Kappaphycus alvarezii* contains the highest percentage of pectin (2.5%) by the ethanolic treatment. The heating treatment of pectin extract from *Kappaphycus alvarezii* yielded the maximum amount of pectin (1.8%). The lowest percentage of pectin was found by frozen treatment (0.4%).Therefore, the optimal condition of pretreatment of raw material was done by adding ethanol and heating at 60ºc for 30 mins (Wittschier *et al*., 2009).

The maximum amount of pectin was extracted by adding ethanol to raw material and heating at 60ºC for 30 mins. *Ulva lactuca* contains the highest percentage of pectin (0.7%) by the ethanolic treatment. The heating treatment of pectin extracts from *Ulva lactuca* yielded the maximum amount of pectin (0.6%). The lowest percentage of pectin was found by frozen treatment (0.2%). Therefore, the optimal condition of pretreatment of raw material was done by adding ethanol and heating at 60ºc for 30mins. Aqueous ethanolic extract was found as best in *Glycyrrhiza glabra* and *Kappaphycuss alvarezii* and poor in *Ulva lactuca*.

Table 1 Effect of pretreatment method on pectin extraction

Pretreatment	Name of the samples	Amount of pectin (%)
Ethanolic treatment	*Glycyrrhiza glabra*	**9.3**
	Kappaphycus alvarezii	2.5
	Ulva lactuca	0.7
Heating treatment	*Glycyrrhiza glabra*	**3.8**
	Kappaphycus alvarezii	1.8
	Ulva lactuca	0.6
Frozen at 24 hours	*Glycyrrhiza glabra*	**0.9**
	Kappaphycus alvarezii	0.4
	Ulva lactuca	0.2

CONCLUSION

The phyto chemicals of *Glycyrrhiza glabra* are found to be great and having capacity to behave as potent safe antibacterial, antioxidant and anti cancer agent. Since this research could create permanent remedy for various diseases by extraction of plenty of phytochemicals from *Glycyrrhiza glabra*.

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