



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2020; 6(2): 163-165
www.allresearchjournal.com
Received: 16-12-2019
Accepted: 21-01-2020

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Methanol Extraction of seaweed on polyester fabric

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Abstract

Seaweed is rich in bioactive compounds, antimicrobial and antioxidant properties and is not compatible with the skin and biodegradable. In the ulvaceae family, it is an edible green algae. Most marine algae, including chlorophyll, carotenoids, phycobilins, beta-carotene, and lutein, have large pigments. The aquatic algae process contains polysaccharides, polysaccharides, lipids, carbohydrates, carotenoids, vitamins, enzymes, sterols, and antibiotics. Alkaloids, terpenes, terpenoids, agaragar, algin, and phloro tannins are the antimicrobial compounds present in seaweeds. Natural colors are produced using Ulvans and oligo Ulvans from green seaweed and act as a pigment-producing color. Ulvans are water-soluble pigments that are used to absorb and pass green to the surface of the fabric. The primary pigment for Ulvans in seaweed. The colors are drawn from the sea weed. In this research, the color was derived from green seaweed, which shows promising color of the fabric.

Keywords: seaweed, medicinal use, methanol extraction, color pigments, polyester fabric

1. Introduction

1.1. Seaweed (*Ulva lactuca*)

In the ulvaceae family, it's an edible green algae. Many marine algae, including chlorophyll, carotenoids, phycobilins, beta-carotene, and lutein, have large pigments. Seaweed is rich in bioactive compounds, antimicrobial and antioxidant properties, and is not compatible with the skin and biodegradable. Polysaccharides, polysaccharides, lipids, proteins, carotenoids, vitamins, sterols, enzymes and antibiotics are involved in the process of marine algae. Alkaloids, terpenes, terpenoids, agaragar, algin, and phloro tannins are the antimicrobial compounds found in seaweeds. There are 32 chlorophytes, 64 phaeophytes and 125 rhodophytes in a total of 250 species worldwide. It can eliminate toxic metals like copper, zinc and cadmium ions, nickel, lead and can be used in the dyeing process depending on the seaweed. Using Ulvans and oligo Ulvans, natural colors are extracted from the green seaweed and serve as color generating pigments. Ulvans are water-soluble pigments used to absorb and carry green to the surface of the fiber. The Ulvans' primary marine pigment. The coloring is taken from the sea weed. The coloring is drawn from the sea weed. Ulvans primary pigment in seaweed. Analysis of marine nutrition showed high levels of carbohydrates, minerals, vitamins, and iodine. Used to treat the dye's effluent.

It has special characteristics such as high absorption of moisture and free from allergies. A decent source of unsaturated fatty acids, dietary fibers and high nutrients for aquatic weeds. Proteins below 5% in green seaweed. It is used mainly for cosmetic purposes. *Ulva lactuca's* marine algae is a rich source of fiber and nutrients. It has a very high mineral content. Green marine algae are sustainable feed supplies for the food and biotech industries from an economic perspective, including bioremediation, integrated aquaculture systems, and future biofuel growth.

1.2. Medicinal Uses

There are few clinical studies to consider marine algae health advice. Seaweeds, however, are an essential, low sodium mineral origin. Due to decreased cholesterol and suppression of appetite, these can be helpful in heart conditions. Seaweed-derived alginates were used for wound dressings. Patients taking war far and eating large quantities of seaweed foods witnessing a change in the standardized global ratio due to high seaweed vitamin K content. Due to their active components, which are responsible for their various pharmacological activities, aquatic medicinal plants have been the dominant source of human health.

Because of their secondary metabolites, the current limited use of marine algae needs to be diversified into other areas of use. Seaweed could be used in the form of food and medicine as a plant with a unique structure and biochemical composition due to its multi-functional properties.

Weight watchers need not be afraid of ingesting seaweed, as it only offers 5 to 20 calories and contains virtually no fat. Seaweeds, such as sea lettuce, are good sources of iodine which help stimulate and sustain the thyroid gland's proper functioning. Sea lettuce also contains high protein and iron amounts. Sea lettuce serving provides only 5 to 20 calories and almost no fat. Sea lettuce has a high fiber content that gives a sense of satiety when consumed in a meal. Snack foods and other processed food items can be flavored with seaweed granules. This helps reduce the consumption of sodium and lowers the risk of high blood pressure, heart attack or stroke. Sea lettuce's high soluble fiber content increases the rate of meat digestion, helping to regulate and control the absorption of blood glucose. Sea vegetables fiber soaks water and helps remove waste. Anti-inflammatory and anti-cancer effects of marine lettuce and other marine vegetables.

1.3. Polyester Fabric

Polyester is a synthetic fiber formed by alcohol-acid chemical action from wood, oil, water and air. A mixture of molecules in this reaction makes a large product with a

structural repeat that maintains its shape hard to stain throughout its duration. In home furniture, blankets, sheets, bed spreads, curtains, mattress ticking and table clothes, polyester and polyester mixtures are also used to improve absorption and minimize static electricity polyesters. Also used in pillows, comforters, bedspreads, quilted clothing, other homes, winter jackets, etc.

2. Methodology

2.1. Materials Required For Finishing

Fabric	-	100% Cotton
Methanol Extracted	-	100ml
M:L:R	-	1:5
Drying Temp.	-	60 °C-70 °C
Time	-	30 minutes
Curing Temp.	-	60 °C-70 °C

2.2. Extraction of dye from seaweed

The seaweed with distilled water is collected and washed. For 3 weeks, they dried shadow and grinded into fine powders. Collect and store the fine powders in sterile containers. Using soxhlet instruments, bioactive compounds are extracted. Approximately 100ml solvent (methanol) was used for 20 gm of dust. Soxhlet extraction was carried out for 30 minutes. The extracts are collected and stored.



Seaweed



Seaweed Powder



Soxhlet Extraction



Methanol Extracted Solution

3. Result

3.1. Finishing of Seaweed Extracts on Polyester fabrics

The fabric samples were used as a cross-linking agent with the extracts obtained separately using citric acid. The extracts are applied to the polyester cloth through the dip and dry process. The finished fabrics were taken and dried at 100 °C-120 °C for 5 min and heated at 180 °C for 3 min.



Drying Oven



Seaweed Extracts Dyed Polyester Fabric

4. Conclusion

The color of seaweed gives a very good color to the polyester fabrics. Many forms of seaweed are available, the key benefit of being colored by seaweed. Every algae gives colors. Specific properties such as antibacterial, antifungal and also antioxidant have been checked for this color

finished fabric. The color velocity test shows good results. More studies can be conducted by adjusting the mordants to give different shades and colors, as well as by changing the extraction method which gives good results.

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