

**EXTRACTION OF BIOACTIVE COMPOUNDS  
FROM *Ulva lactuca* (SEA LETTUCE) COLLECTED  
FROM THE SOUTH COAST OF SRI LANKA**

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by

**KIRUMBARA LIYANAGE GAYADI RUMESHANI**

**Department of Animal Science  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University of Sri Lanka**

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## Abstract

*Ulva lactuca* is one of the famous edible seaweeds around the world. It is a rich source of many nutrients and bioactive compounds. Solvent extraction method is commonly used in extracting bioactive compounds in seaweeds which may be non-food grade. The objective of this study was to develop a simple, inexpensive and nontoxic extraction technique to extract bioactive compounds from *Ulva lactuca* and analyze the functional properties of the crude extract of *Ulva lactuca* and compare with a commonly used solvent extraction method. Four types of seaweed treatments (05 g) namely Fresh, Air-dried (AD), Oven-dried (OD) and Freeze-dried (FD) were used for the water extraction using three different ratios as 1:10, 1:20 and 1:30 and Air-dried sample using Methanol as the control. The crude extracts derived from different extraction methods were used for analyzing the functional properties as antioxidant activity by Thiobarbituric Reactive Substance (TBARS) assay and 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay, Ferrous chelation activity and antibacterial activity using the well diffusion method. All the trials were done in triplicates. Data were analyzed using the Minitab 18. In TBARS assay, methanol extracts showed the lowest TBARS value ( $-1.10 \pm 0.08$ ) and AD (1:30) and OD (1:10, 1:20, 1:30) showed no significant difference ( $p > 0.05$ ) compared to antioxidant activity of the methanol extracts. Almost all the samples showed antioxidant activity except Fresh (1:10, 1:20) and AD (1:10). However, In DPPH scavenging assay, DPPH scavenging activity of Fresh (1:10, 1:20, 1:30), AD (1:10, 1:20, 1:30), OD (1:10, 1:30) and FD (1:30) showed no significant difference ( $p > 0.05$ ) compared to that of methanol extracts. AD (1:10) showed the highest DPPH scavenging activity ( $89.54 \pm 4.56\%$ ) which is higher than methanol ( $87.75 \pm 2.87$ ) and Ascorbic acid ( $85.73 \pm 0.19$ ). In ferrous chelation activity, only AD (1:20) showed the ferrous chelation. In antibacterial activity, all the water extracts showed good antibacterial activity for locally isolated strains of *E.coli* and *Salmonella*. Therefore it can be concluded that considering the time of production, simplicity, toxicity and cost; water extraction of AD (1:20) can be used as the most suitable combination for extracting the bioactive compounds from *Ulva lactuca*.

**Keywords:** *Ulva lactuca*, Water extraction, Antioxidant activity, Ferrous chelation activity, Antibacterial activity.