Traditional Medicine in The Littoral and Neritic Zones

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ABSTRACT

*Brown algae (*Phaeophyceae*), particularly *Sargassum sp.*, play a significant role in traditional medicine due to their rich bioactive compounds. This study explores the potential and utilization of brown algae as pharmaceutical ingredients, focusing on their presence in the littoral and neritic zones. *Sargassum sp.* is known for its antioxidant, anti-inflammatory, and antimicrobial properties, contributing to the prevention and treatment of various health conditions, including skin diseases, digestive disorders, and respiratory ailments. The polysaccharides and phenolic compounds in brown algae, such as phlorotannins, provide significant health benefits and are used in modern pharmaceutical applications, including stroke prevention and immune system enhancement. This research highlights the importance of sustainable utilization and quality control in the use of algae-based medicines to ensure safety and efficacy. With further scientific advancements, brown algae have the potential to revolutionize the pharmaceutical industry and improve public health.*

Keyword : traditional, littoral, neritic

1. INTRODUCTION

Algae are photosynthetic organisms found in various aquatic ecosystems such as seas, lakes, rivers, and ponds. In Indonesia, the potential of algae as a resource has been utilized in various fields, including the food, cosmetics, and pharmaceutical industries. In the pharmaceutical field, several types of algae have been developed as medicinal ingredients, such as diatoms (*Navicula sp.*) used in cardiovascular disease treatment, as well as certain types of red and brown algae with anticancer properties. One of the cities in Indonesia with great potential to develop algae-based pharmaceutical products is Medan. Brown algae (*Phaeophyceae*) are widely distributed in Indonesia, growing in both sheltered and high-wave waters, typically found in shallow marine waters such as the littoral and neritic zones because they require sunlight for photosynthesis. The maximum depth at which brown algae can live is usually around 200 meters. (Ulfa et al., 2024). The littoral zone is known as the intertidal zone, as it is the uppermost area of the ocean surface. This zone is submerged in water during high tide and becomes land during low tide. Many marine organisms can be found in this zone, including seaweed, starfish, crabs, sea urchins, shrimp, and even marine worms. On the other hand, the neritic zone is characterized by a flat sandy coastline and extends about 200 meters from the sea surface, allowing sunlight to penetrate the bottom. This area serves as a habitat for various species of algae and fish. (Saefi & Maulana, 2022)

2. METHODS

Research on the potential and utilization of active compounds from brown algae has been conducted in various fields, including pharmaceuticals, cosmetics, medicine, animal feed, fisheries, and industry. The data for this study were obtained from a review of primary and secondary research data from various studies on brown algae *Sargassum sp.* The data are presented descriptively. (Pakidi & Suwoyo, 2017)

3. RESULTS AND DISCUSSION

Brown algae, particularly *Sargassum sp.*, are commonly used as traditional medicine due to their bioactive compound content. *Sargassum sp.* contains several phenolic compounds, such as phlorotannins, which act as antioxidants. These antioxidants protect body cells from damage caused by free radicals and contribute to the prevention of various diseases. Research indicates that brown algae extracts have anti-inflammatory and antimicrobial activities, making them potential candidates for treating various health conditions. Additionally, brown algae in traditional

medicine are believed to help boost the immune system and support the healing process. In some regions, brown algae have been used in traditional remedies to treat digestive disorders and skin problems. (Pakidi & Suwoyo, 2017). The polysaccharides found in the cell walls of brown algae are known to have anti-inflammatory, anticoagulant (preventing blood clotting), and immunomodulatory properties. As a phenolic compound, phlorotannin functions as an antioxidant that protects cells from oxidative damage and reduces the risk of chronic diseases. Brown algae also contain alkaloids, terpenoids, and polyphenols, which exhibit antibacterial, antiviral, and antifungal activities. (Pakidi & Suwoyo, 2017). The use of brown algae in traditional medicine ranges from treating mild to severe diseases, including:

1. Skin Diseases : Brown algae extracts are often used to treat skin conditions such as eczema, dermatitis, and acne. Their antibacterial and anti-inflammatory properties help reduce inflammation and infection.
2. Digestive Disorders : These algae help improve digestive health by supporting the growth of beneficial gut bacteria and alleviating constipation symptoms.
3. Respiratory Diseases : In some traditions, *Sargassum sp.* is used as a remedy to relieve coughs and improve respiratory health.
4. Anticancer Properties : Preliminary research suggests that compounds in brown algae may have antitumor effects, aiding in cancer prevention and treatment. (Pakidi & Suwoyo, 2017)

One commercially available pharmaceutical product derived from brown algae is **Brown Seaweed**, a capsule supplement made from brown algae (*Laminaria Japonica*). This product helps prevent strokes by increasing fat metabolism in the blood, restoring motor function and the nervous system after a stroke, and thinning the blood to prevent blood vessel blockages. *Laminaria Japonica* has been used in traditional medicine to treat various health conditions. The iodine content in this brown algae is believed to address thyroid disorders. *Laminaria Japonica* also contains fucoidan, a compound that enhances the immune system, reduces inflammation, prevents cancer, lowers blood pressure, and prevents blood clotting and infections. Fucoxanthin, an antioxidant in *Laminaria Japonica*, gives the algae its distinct color and is being explored as a potential anti-obesity supplement. (Ulfa et al., 2024) . Although brown algae are generally considered safe for consumption, it is essential to monitor the correct dosage and source of the algae. Contaminated algae with heavy metals or toxic substances may pose health risks. (Pakidi & Suwoyo, 2017).

4. CONCLUSION

Brown algae (*Phaeophyceae*) are typically found in shallow marine waters in the littoral and neritic zones. *Sargassum sp.*, in particular, is used as a traditional medicinal ingredient in Indonesia due to its rich bioactive compounds, such as phenolics and phlorotannins, which offer health benefits, including antioxidant properties, digestive health support, and respiratory disease treatment. With further development, algae could become a valuable alternative in the pharmaceutical field, presenting opportunities to enhance the medicinal industry and improve public health.

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