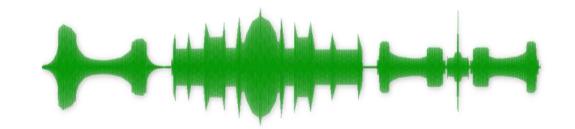
Application of algae in Cosmetics



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Introduction

Algae are a complex group of aquatic organisms capable of photosynthesis. Algae are further divided into two major categories, microalgae and macroalgae [1]. Algae contain different biochemical compounds including polysaccharides, proteins, lipids, phenolic compounds, pigments, vitamins, and other bioactive as well as macro and microelements. A worldwide tendency for products considered healthy, environmentally sustainable, and ecologically obtained led cosmetic industries to fund the analysis and development of new products containing compounds or extracts from natural sources. As a result, the alga is one of the most popular natural cosmetic ingredients on the market. Nearly every cosmetics company offers products containing alga. This is because of the natural origin of alga and therefore the diversity of bioactive agents causing numerous health effects on the skin [2].

Application of algae in cosmetics

The applications of alga in the cosmetic industry have recently received more attention for treating skin problems, like tanning, aging, and pigment disorders. The main microalgae established on the cosmetic market include *Arthrospira sp.*, *Chlorella sp.*, and *Spirulina sp.* They are utilized in skincare, haircare, and sun protection products. Macroalgae are applied largely as dry powders in face masks, body lotions, face and hand creams, and other products. The most popular micronized macroalgae present on the market are *Ascophyllum nodosum*, *Chondrus crispus*, and *F. vesiculosus*.

Some bioactive compounds from brown algae exhibit multiple cosmeceutical activities, including **phlorotannin**, which possesses several activities, such as antioxidant, anti-inflammation, and antiaging [3]. Likewise, **fucoidan**, a sulphated polysaccharide isolated from brown algae, contributes to anti-inflammation, anti-melanogenic and anticancer. **Fucoxanthin**, a carotenoid isolated from brown, red, green and microalgae exhibit anti-melanogenic, anti-aging and antioxidant activities [4].

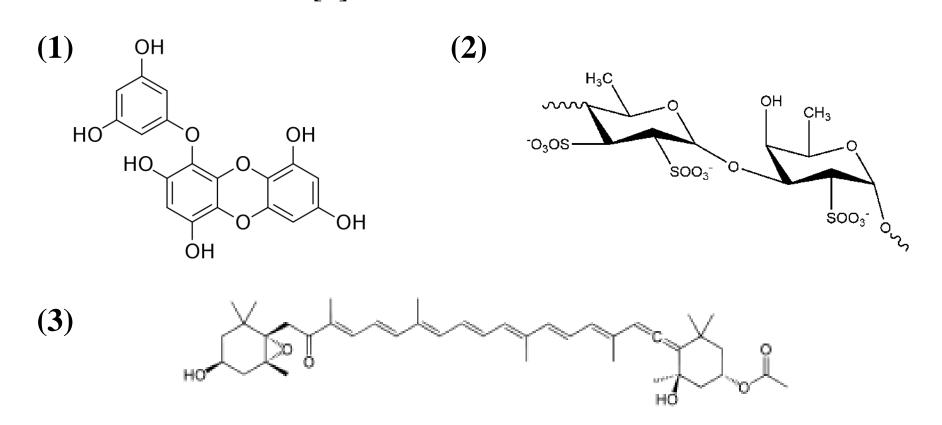


Figure 1. Chemical structures of bioactive compounds derived from algae. (1) Eckol, (2) Fucoidan, (3) Fucoxanthin

Algae are utilized in different kinds of cosmetics products, like body lotions, face masks, and shampoos, and within the most advanced cosmetics and cosmeceuticals utilized in the treatment of acne, psoriasis, or eczema [2,3].

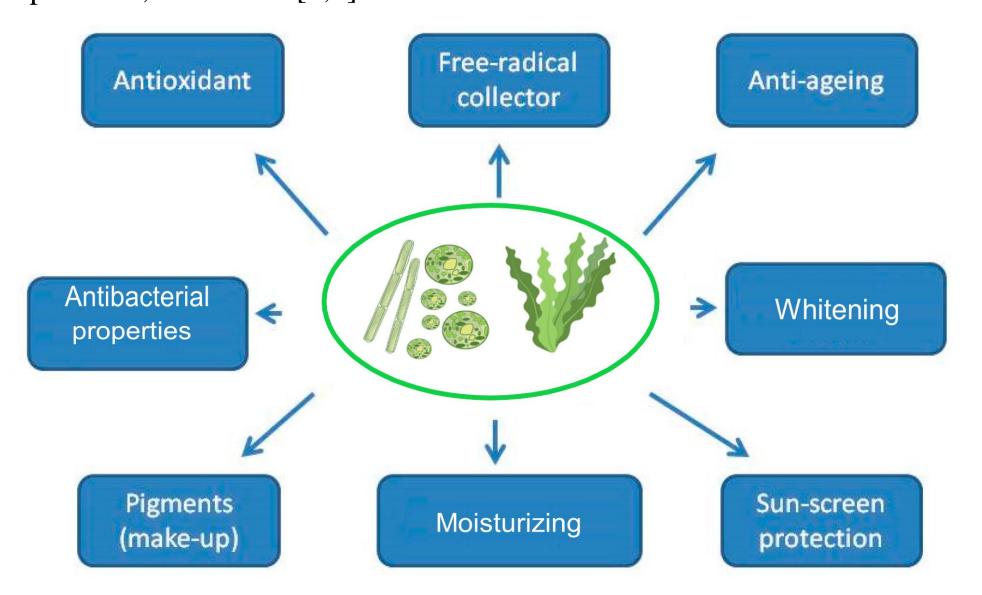


Figure 2. Potential benefits of algae derived active ingredients in skin care.

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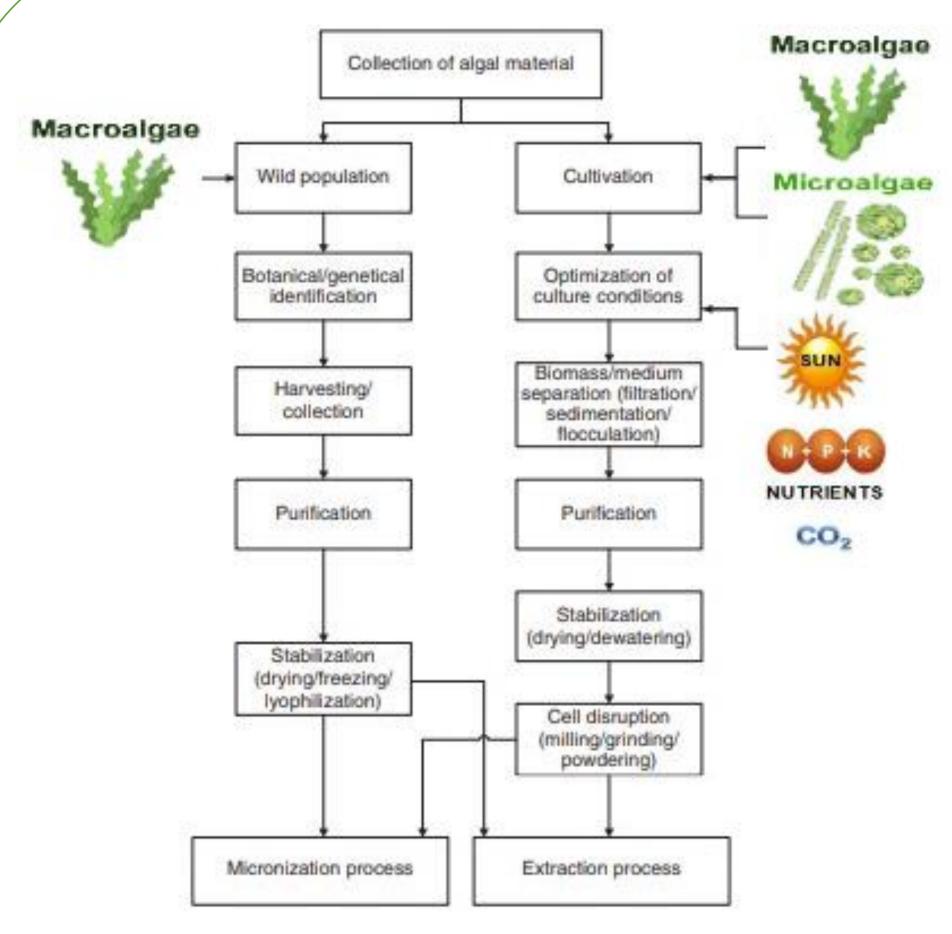


Figure 3. Algae processing for cosmetics industry

After drying, algae could also be micronized or extracted to recover high-value products from their biomass and added to cosmetics in this form. Therefore, algal biomass as a micronized algae and algae extracts are the major forms of algae utilized in the cosmetic industry.

Conclusion

Algal metabolites such as polysaccharides, mycosporine-like amino acids, proteins, etc. have diverse functions and applications. They enhance the health of the skin by acting as an anti-aging, anti-inflammatory, antioxidant, anti-wrinkling, and collagen-boosting agent. Algae are one of the most promising and profitable sectors of the biotechnology industry. This review in the main focuses on the growing applications of algae in the cosmetic industry.

References

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