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Microalgae Pigments: Sustainable Solutions for a Greener Future

[Natural Pigments: Sources, Properties, and Health Benefits](#) • Book Chapter • 2026

[Johari, Nursyafica Nadia](#) ; [Othman, Rashidi](#)

Department of Landscape Architecture, Kulliyyah of Architecture and Environmental Design,
International Islamic University Malaysia, Kuala Lumpur, Malaysia

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Abstract

Microalgae pigments are extensively used in various industries such as the food, nutraceutical, pharmaceutical, aquaculture, and cosmetics industries. They have also been applied in clinical and research settings, where they function well as labels for receptors and antibodies. One of the most prominent characteristics of algae is their colour, which is determined by their pigments. These pigments are colourful chemical substances that are part of the photosynthetic system of microalgae. Due to their numerous potential industrial uses and health-promoting qualities, natural pigments derived from microalgae have been the subject of numerous studies. As consumers become more conscious of the link between nutrition, health, and illness prevention, microalgae represent a significant and exciting new field in biotechnology. The market is currently in high demand for microalgal pigments as naturally occurring, renewable colour enhancers for foods and feeds that also have health benefits. Moreover, these pigments, which exhibit remarkable dyeing

properties even at extremely low concentrations (parts per million), find significant uses in the pharmaceutical and cosmetic industries respectively as biochemical tracers in immune assays and as fluorescence-based indicators in skin creams that promote collagen synthesis. Natural pigments derived from microalgae not only provide colour, but they also have anti-inflammatory, anti-cancer, and antioxidant properties that make them a good substitute for artificial colorants. Therefore, the futures of all the microalgae and pigments derived from them that have been discussed are promising. Microalgae have been recognized by science as a natural source of nutraceuticals and colorants, and their potential has already been demonstrated in several industrial applications. Although there are still some issues to be resolved, the pigments derived from microalgae are likely to surpass synthetic forms due to their renewable and sustainable nature, as well as their additional health benefits. Copyright © 2026 by Nova Science Publishers, Inc.

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Corresponding authors

Corresponding
author

N.N. Johari

Affiliation

Department of Landscape Architecture, Kulliyah of Architecture and
Environmental Design, International Islamic University Malaysia, Kuala
Lumpur, Malaysia

Email address

syaficanadia@gmail.com