

# Extracting bioactive compounds from marine microalgae

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Fish oil has high levels of omega-3s but with declining fish stocks, it is imperative to find alternative sources. Credit: Wikimedia

Microalgae can produce high value health compounds like omega-3s , traditionally sourced from fish. With declining fish stocks, an alternative source is imperative. Published in the *Pertanika Journal of Tropical Agricultural Science*, researchers evaluated various methods for

extracting fatty acids and carotenoids from two microalgae species.

Microalgae are photosynthetic microorganisms that produce high value compounds considered essential for human health, including polyunsaturated [fatty acids](#) (e.g., omega-3s like EPA and DHA), various pigments (chlorophyll and carotenoids), and vitamins. Although fish have traditionally been our principal dietary source of EPA and DHA, declining marine [fish stocks](#), the unpleasant odour of fish oil, and other disadvantages, have prompted a search for alternative sources of these nutrients.

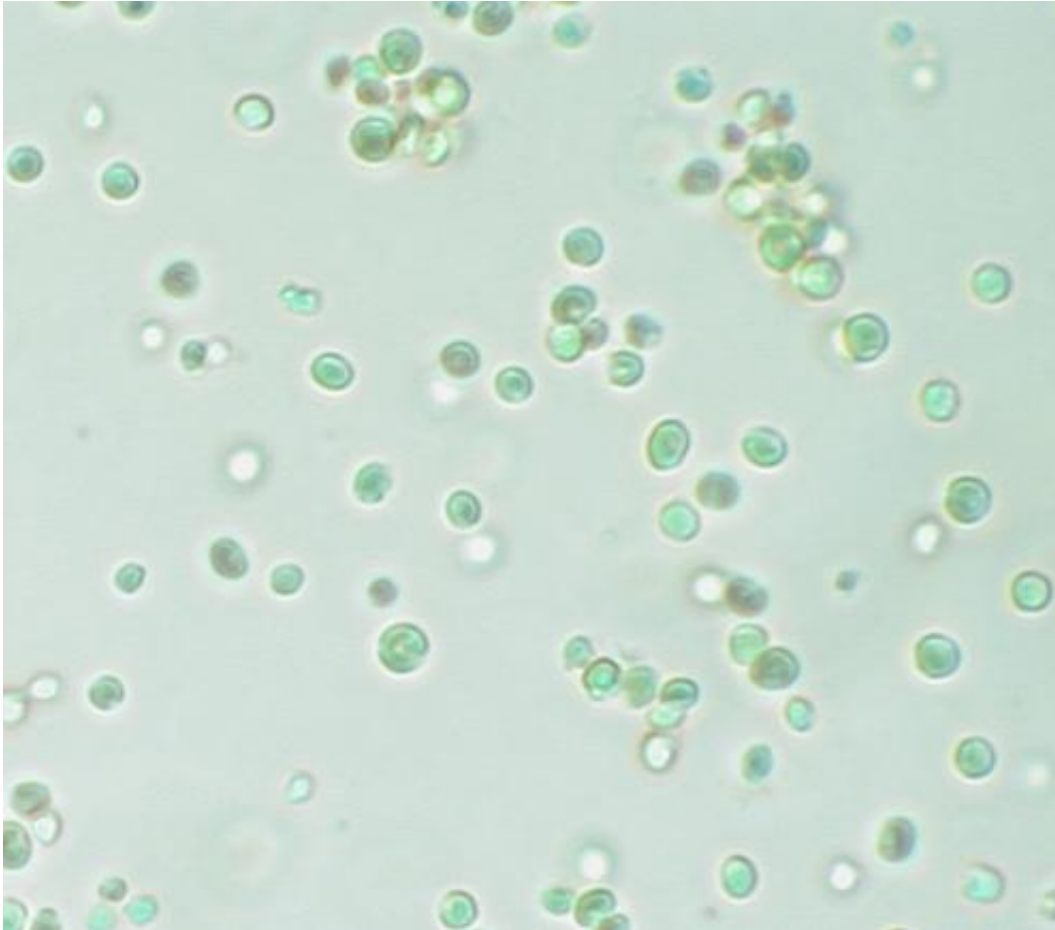
In a study, published in the *Pertanika Journal of Tropical Agricultural Science*, S. P. Loh and S. Lee of the Universiti Putra Malaysia evaluated various methods for extracting fatty acids and carotenoids from two microalgae species: *Chaetoceros gracillis*, a diatom, and *Nannochloropsis oculata*, a unicellular green alga. Both species play an important role in the food chain, while *N. oculata* is also widely cultivated for [fish](#) hatcheries and shrimp farms.

No standard extraction methods currently exist for determining the fatty acid or carotenoid content of microalgae. Therefore, the researchers selected different extraction methods based on these criteria: maximum extraction efficiency, ease of handling, and use of solvents of low toxicity.

Overall, the study found that high amounts of fatty acids and carotenoids could be obtained from both microalgae. However, for both fatty acid and carotenoid extraction, one extraction method was superior in *N. oculata* while another method yielded the best results in *C. gracillis*.

The researchers also found that *N. oculata* had higher amounts of the omega-3 fatty acid EPA, while *C. gracillis* was particularly high in palmitic acid and palmitoleic acid levels. In addition, there were

significantly higher carotenoid levels in *N. oculata* compared to *C. gracillis*.



*Nannochloropsis* sp. microalgae viewed under a light microscope. Credit: Wageningen University by Inks002 / Wikimedia Commons

Provided by Universiti Putra Malaysia (UPM)

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