

SCIENCE

Algae-produced oil may be a greener, healthier alternative to palm oil

By Ben Coxworth
March 28, 2022



[VIEW 1 IMAGES](#)

Powdered micro-algae that has been washed, dried, and treated with methanol (left), alongside a vial of oil produced by the algae Nanyang Technological University

Palm oil is a *very* widely-used food ingredient, but its production has a huge environmental impact, plus it may not be entirely healthy to consume. A greener, "lower-fat" alternative could be on the way, however, in the form of oil produced by algae.

Along with its use as a cooking oil in many regions, palm oil is also utilized as a stabilizing additive that keeps other food ingredients from separating, plus it gives processed foods a

smooth, creamy consistency.

Unfortunately, in order to grow the palm trees from which the oil is harvested, large areas of tropical rainforest are cut down and cleared on an ongoing basis. Additionally, while the oil *is* cholesterol-free and has some claimed health benefits, it *does* contain 52 percent saturated fats – these can cause cardiovascular and [possibly other](#) health problems.

In an effort to address these drawbacks, scientists from Singapore's Nanyang Technological University and Malaysia's University of Malay looked to a micro-algae known as *Chromochloris zofingiensis*.

For the study, the researchers added pyruvic acid – which is an organic acid present in all living cells – to a solution consisting of the micro-algae and a liquid growth medium. The mixture was then exposed to ultraviolet light, to stimulate photosynthesis. After 14 days, the algae was removed, washed, dried and then treated with methanol. The latter treatment was required in order to break the bonds between the algae proteins and the oils produced *by* those proteins during the photosynthesis process.

The harvested oil is said to possess qualities similar to those of palm oil, although it contains significantly fewer saturated fatty acids, offset by a larger percentage of heart-healthy polyunsaturated fatty acids. In the present version of the technology, 160 grams of algae would be required to produce enough oil to manufacture a 100-gram chocolate bar.

As an added bonus, the scientists have announced that they've developed a method of producing the pyruvic acid by fermenting existing organic waste products such as soybean residue and fruit peels. Additionally, they state that the artificially generated ultraviolet light could be replaced by sunlight, in large-scale production facilities. The algae would then convert atmospheric carbon dioxide to biomass, as it grew.

"We are capitalizing on the concept of establishing a circular economy, finding uses for would-be waste products and re-injecting them into the food chain," says the lead scientist, Nanyang's Prof. William Chen. "In this case, we rely on one of nature's key processes, fermentation, to convert that organic matter into nutrient-rich solutions, which could be used to cultivate algae, which not only reduces our reliance on palm oil, but keeps carbon out of the atmosphere."

The research is described in a paper that was recently published in the *Journal of Applied Phycology*.

Source: [Nanyang Technological University](#)



NEW ATLAS



We recommend

A study of green concrete made partly from agricultural waste leftovers

Kumar Shehzad et al., *Journal of Biofuels*, 2021

Fuels from Algae: A Review

K. Rajakumari et al., *Research Journal of Pharmacy and Technology*, 2019

Alkaline Catalytic Transesterification for Palm Oil Biodiesel and Characterisation of Palm Oil Biodiesel

Baskar Thangaraj et al., *Journal of Biofuels*, 2013

["Algal" Biodiesel: Future Prospects and Problems](#)

A. Roy Choudhary et al., *Water and Energy International*, 2011

Biodiesel Production from Microalgae- A Sustainable Fuel

Anshul Singla et al., *Journal of Biofuels*, 2010

South-east Asia palm oil reform pressure will grow

Expert Briefings, 2016

Powered by **TREND MD**

TAGS

SCIENCE

NANYANG TECHNOLOGICAL UNIVERSITY

PALM

VEGETABLE OIL

ALGAE

NEW ATLAS AUDIO

NO COMMENTS



Ben Coxworth

Based out of Edmonton, Canada, Ben Coxworth has been writing for New Atlas since 2009 and is presently Managing Editor for North America. An experienced freelance writer, he previously obtained an English BA from the University of Saskatchewan, then spent over 20 years working in various markets as a television reporter, producer and news videographer. Ben is particularly interested in scientific innovation, human-powered transportation, and the marine environment.

MOST VIEWED