

For Immediate Release



AUB research team identifies algae from Lebanon that could serve as fuel or food source

Beirut, Lebanon- 25/08/2014 - An AUB research team has identified a number of algae species in Lebanon that show promising potential as super foods, as well as possible sources of fuel.

Professor Yusuf Abou Jawdah from the Faculty of Agricultural and Food Sciences has been studying microalgae species in Lebanon for almost two years, as part of an EU-funded project called, "Production of biofuels from microalgae in selected Mediterranean Countries ENPI MED-ALGAE."

Launched in 2012, the project hopes to identify cost-effective, renewable sources of energy. AUB and ALMEE (Lebanese Association for Energy Saving and for Environment) from Lebanon are among a consortium of 12 organizations from six Mediterranean countries collaborating on the study. In addition to Lebanon, organizations from Cyprus, Greece, Italy, Malta, and Egypt have formed a partnership which is coordinated by the Agricultural Research Institute of Cyprus in collaboration with the Cyprus Energy Agency and is expected to implement successfully the ENPI MED- ALGAE project.

While trying to produce fuel from the algae, Professor Abou Jawdah came across an interesting "side effect." Some of the algae under study proved to be excellent sources of protein as well as other food supplements.

"So far, we have identified 21 species from along the Lebanese coast, using molecular biology tools," explained Abou Jawdah. "Among these, we have done detailed analyses to four species, and the initial results are exciting."

Microalgae from the Jounieh coast showed high levels of Omega 3 fatty acid, an essential nutrient for health and an excellent anti-oxidant, usually found in fish. Meanwhile, the composition of another species in Jbeil, in powder form, showed a 20 percent protein content, which is considered high. "By way of comparison, red meat has about 20 percent protein," said Abou Jawdah. "So this microalgae can potentially be used as a nutritive food or animal feed source; especially so, if its protein content may be doubled by manipulating the culture conditions."

Abou Jawdah noted that the poly unsaturated fatty acid lipid content (such as Omega 3 fatty acids) in one Lebanese microalgae species was higher than those normally reported in other participating Mediterranean countries.

However, Abou Jawdah is still not satisfied with the biofuel yield of the algae he is studying. "Nevertheless, I have high hopes," he said. "If we improve the growth conditions of light and the water's food composition, I am sure we will see some exciting results."

To test growth conditions, Abou Jawdah has been growing algae in different media and containers, including flat and cylindrical bioreactors and shallow artificial ponds, known as raceway ponds. (To watch a short clip of the various containers, [press here](#).)

Similarly, while Abou Jawdah's algae in laboratory trials have produced less biofuel than a reference algae provided by the National and Kapodistrian University of Athens, one of the

algae cultures grown in raceway ponds produced the same quantity of biodiesel as the reference species. Abou Jawdah thinks that by tweaking the experiment's conditions, he could also improve biofuel yields. "I am confident we can improve the efficiency of our system several folds, which will improve yields in a comparable manner," he said.

Unlike other crops used for producing biofuels, microalgae do not compete with conventional agricultural production, noted Abou Jawdah. Moreover, microalgae may serve as a potential source of clean biofuel, because unlike fossil fuels, whatever CO₂ is produced in the process is taken out of the atmosphere by the growing microalgae.

Other potential "side effects" to the experiment include isolating compounds with anti-fungal, anti-bacterial, anti-cancerous, and anti-inflammatory properties from the algae. What's more, Abou Jawdah thinks the algae possess substances that could be used in cosmetics, such as chlorophyll and beta-carotene; while other microalgae could prove useful in wastewater treatment.

"What's great about AUB is that we are all within walking distance of each other, and so we can all collaborate on these various studies to produce interesting research," said Abou Jawdah. "All we need are some excellent funding sources that could support our work."

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Note to Editors

About AUB

Founded in 1866, the American University of Beirut bases its educational philosophy, standards, and practices on the American liberal arts model of higher education. A teaching-centered research university, AUB has more than 700 full-time faculty members and a student body of about 8,500 students. AUB currently offers more than 100 programs leading to the bachelor's, master's, MD, and PhD degrees. It provides medical education and training to students from throughout the region at its Medical Center that includes a full service 420-bed hospital.

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