

## UGM Researchers Develop Microalgae for Bio Jet Fuel

Tuesday, 06 October 2020 WIB, By: Natasa Adelayanti



UGM research team has been developing microalgae as an environmentally friendly alternative fuel source since 2008. Many researchers from the Faculty of Biology, Faculty of Engineering, and the UGM Center for Energy Studies are involved in the research that aims to exploit the potential of overflowing microalgae in Indonesian waters territory and have not been identified. The content of lipids and carbohydrates as fuel sources like carbon compounds has attracted Japanese companies and Japanese research agencies to build a partnership.

The Japanese national research and development agency, NEDO or the New Energy and Industrial Technology Development Organization: Japanese National Research and Development Agency for the development of Biojet Fuel Production Technology with Microalgae based technology has appointed two UGM researchers, namely Dr. Eko Agus Suyono from the UGM Faculty of Biology and Prof. Dr. Arief Budiman from the Faculty of Engineering and Companies from Japan (Euglena Co., Ltd).

Eko Agus Suyono said to reporters on Monday (5/10) that UGM and Japan would later produce the Euglena microalgae as aircraft fuel that can be mass-produced in this research collaboration project. According to him, UGM has been collecting local microalgae that breathe in Indonesia's natural environment and selecting strains that grow most efficiently in Indonesia's weather conditions. UGM has also assessed the content and traits of fats and oils that accumulate in selected microalgae.

"These microalgae have the potential to fuel aircraft because it appears from inhabiting organisms, where it has high productivity, fast harvests, is rich in biofuel sources, saves land, and can absorb CO<sub>2</sub>," he explained.

Eko also said that to convert the microalgae content into a fuel source, some researchers needed to conduct several steps, including the isolation process and optimization of local strain cultivation, then continued with identifying the compound content. Furthermore, the conversion process technology to become biofuels is practically the same as oil and gas fuels. "So, it is essentially the same as the compound for oil and gas," he said.

The lecturer at the UGM Faculty of Biology said that Euglena is a microalgae species that can absorb CO<sub>2</sub> through photosynthesis and grow by saving the carbon while producing oxygen. The carbon absorbed by Euglena stores as fat and oil in the cells. "Throughout a chemical process, Euglena can transform fats and oils into various types of carbohydrates used for biodiesel and bio jets for sustainable aircraft," he said.

Eko also added that in this project, he would use CO<sub>2</sub> produced from coal-fired power plants to be used as raw material for Euglena's photosynthesis process, which is detached from Indonesia, namely in Yogyakarta and Kalimantan. Eko said if this joint research project is a success, UGM can contribute to the United Nations' program of the Sustainable Development Goals (SDGs) by initiatively fostering sustainable global development.

As is well known, this research collaboration was between researchers of Universitas Gadjah Mada, who was collaborating with Euglena Co., Ltd., in conducting collections of native Indonesian microalgae that are useful for biojet commercialization. Moreover, this project will also involve several institutions and industries in Japan, including Euglena Co. Ltd., DENSO Corporation, ITOCHU Corporation, Mitsubishi Chemical Corporation, Mitsubishi Kakoki Kaisha, Ltd., Tokyo University of Marine Science and Technology, and Chuo University.

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