

Abstract

Euglena gracilis (*E. gracilis*) is a photosynthetic green microalga that lives in freshwater. It is known that *E. gracilis* synthesizes antioxidants such as ascorbic acid, glutathione, carotenoid, and tocopherols to protect themselves from Reactive Oxygen Species (ROS) in order to survive in their living environment. The essentiality of these antioxidants in *E. gracilis* is the same as in the human body. The simultaneous production of these antioxidants in *E. gracilis* showed the possibility of *E. gracilis* as the source of new food ingredients and consideration of it as a nutritional supplement for humans. Therefore, the objective of the present experiment is to identify the eligibility of *E. gracilis* as a new antioxidant source ingredient. In this research, the *E. gracilis* cells were cultured in Cramer-Myers (CM) media, a photoautotrophic environment for a week. Meanwhile, for the samples of fruits and vegetables were tomato, spinach, yellow bell pepper, kiwi, and carrots. The antioxidants that were analyzed in this experiment are ascorbic acid, glutathione, β -carotene, and carotenoid. Tocopherols could not be analyzed due to undeveloped method and time limitation. The respective antioxidants from the samples were extracted by using solvents that are suitable with their polarity. The analysis for the ascorbic acid, glutathione, β -carotene, and carotenoid were done either by HPLC or spectrophotometry. The results showed that *E. gracilis* had higher content of glutathione, β -carotene, and carotenoids compared to the fruits and vegetables samples while less content of ascorbic acid. Although it is low in ascorbic acid, *E. gracilis* is still eligible for the future source of antioxidant as most of antioxidant content in *E. gracilis* are comparable towards the fruits and vegetables sample which are the main source of antioxidant in human diets.

Keywords: *E. gracilis*, antioxidants, fruits and vegetables, analysis of antioxidant