Phenolic content and antioxidant activity of Tetraselmis tetrathele (West) Butcher 1959 cultured in annular photobireactor

ABSTRACT

Tetraselmis tetrathele (West) Butcher is an important microalgae due to its high antioxidant content and other bioactive compounds such as flavonoids and polyphenols. Therefore, it has potential as a suitable raw ingredient for various product developments in aquaculture, food and nutraceutical industries. The antioxidant activity of T. tetrathele (UPMC-A0007) was determined by culturing in f/2 and Conway media for 56 days in 120 l annular photobioreactors. The total phenolic (TPC) and antioxidant contents of T. tetrathele were determined six times during different phases of the culture period. The antioxidant activities of T. tetrathele's crude extract were determined by diphenylpicrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) and 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) assays. Two groups of cells based on size; small sized-cells (3.0-5.0?10-11g cell(-1)) and big sized-cells (5.5-8.0?10(-11) g cell(-1)) were observed in the f/2 media. Small sized-group showed 1.6 times higher total phenolic content (2.99?0.14 mg GAEg(-1)) than big sized-cells. These results suggest that T. tetrathele is a potential antioxidant source and effective antioxidant production can be achieved by controlling the cell size in their culturing process.

Keyword: Antioxidant activity; Cell size; Phenolic compounds; Photobioreactor; Tetraselmis tetrathele