Journal of
Oceanography and Marine Research

Christaki et al., J Oceanogr Mar Res 2016, 4:1
DOI: 10.4172/2572-3103.1000e114

Editorial Open Access

Phycobiliproteins: A New Perspective in Natural Pigments Derived from Microalgae

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Received date: July 15, 2016; **Accepted date:** July 15, 2016; **Published date:** July 20, 2016

Citation: Christaki E, Bonos E, Giannenas I, Florou-Paneri P (2016) Phycobiliproteins: A New Perspective in Natural Pigments Derived from Microalgae. J Oceanogr Mar Res 4: e114. doi:10.4172/2572-3103.1000e114

Keywords: Phycobiliproteins; Phycoerythrin; Phycocyanin

Editorial

Nowadays, many researches have focused on the use of natural pigments derived from microalgae, because they have health-promoting properties and a wide range of potential industrial applications, mainly in the food and feed industries, as well as in the pharmaceutical and the cosmetic industries. Consumers are becoming increasingly aware of the correlation between diet health and disease prevention, therefore microalgae represent an innovative and dynamic area in biotechnology.

Phycobiliproteins are deep-coloured, water soluble, fluorescent proteins that can be found in microalgae, especially cyanobacteria, e.g. Spirulina platensis and rhodophyta e.g. *Galdieria sulphuraria*. Phycobiliproteins are constituents of the subcellular structures called phycobilisomes, and are covalently bound via cysteine amino acid chromophores, the phycobilins [1,2]. They can capture light energy and pass it to chlorophylls during photosynthesis [3,4].

Generally, phycobiliproteins are classified into: Phycoerythrin (PE), a red pigment; phycocyanin (PC), a blue pigment; and allophycocyanin (APC), a light blue pigment. These pigments differ in their spectral properties [3,5]. Phycobiliproteins can be used in various foods, such as dairy products, candies, ice-creams, beverages, etc., although they are sensitive to high temperatures and light [1,6]. Furthermore, phycobiliproteins have fluorescent properties that are used in immunoassays as biochemical tracers. Especially phycoerythrin is appreciated and considered as the brightest Phycobiliproteins because of its intense fluorescence and is used in the pharmaceutical industry as sensitive indicator. In addition, these pigments can have applications in the cosmetic industry e.g. as skin cream to stimulate collagen synthesis [1,6,7].

Recently, there has been considerable interest in phycobiliproteins, with respect to their antioxidant activities. They can neutralize the reactive oxygen species (ROS) due to their chemical structures and chelating properties, thus reducing the oxidative stress [8]. Accordingly, phycobiliproteins have shown the ability to protect organisms against various chronic disorders as cancer, diabetes, coronary disease, neurodegenerative diseases or to ameliorate the cognitive functions [1,6]. In particular, according to published research, phycocyanin could be used as a nephroprotector or a protector of human pancreatic cells [5,8].

Consequently, phycobiliproteins are high-value natural products, originated from microalgae, which appear to be a successful case of blue biotechnology and further increase in their use is expected in the future.

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