

Research Article

Identification and characterization of bioactive compounds in two algae species of *Haematococcus pulvialis* and *Dunatiella saline* from the waterbodies of Basrah region, Iraq

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Abstract: This study was conducted to identify and characterize bioactive compounds in two algae Chlorophyta species of *Haematococcus pulvialis* and *Dunatiella saline* collected from water bodies in the Karmat Ali area, Basrah Governorate, southern Iraq. The results revealed differences between them in the volatile compounds. A total of 65 peaks of volatile compounds were found in *H. pulvialis*, as the highest percentage was Hexadecanoic acid, ethyl ester, followed by 8-Heptadecene, n-Hexadecanoic acid, and Hexadecanoic acid, methyl ester. In the *D. saline*, 55 peaks of volatile compounds were recorded, such as 2 (4H)-Benzofuranone,5,6,7,7a-tetrahydro-4,4,7a-trimethyl-,(R)-, n-Hexadecanoic acid, Oleic Acid, Vitamin E, and other compounds.

Keywords: Bioactive compounds, Gaschromatography–mass spectrometry, Aquatic ecosystem, Metabolites.

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Introduction

Algae can produce biologically active substances (Blunt et al. 2008; Cabrite et al. 2010) that are an important source for the production of many bioactive compounds that synthesize them as secondary metabolites playing important roles as antibacterial, antifungal, antiviral (Najdenski et al. 2013; Komatsu et al. 2013), reducing lipid (Panahi et al. 2016), antioxidant and the treatment of cancer cells (Silva et al. 2019). Studies have shown that algae possess high efficiency in producing a group of antibiotics that directly affect resistance to many diseases. They produce two types of effective compounds, the first inside their cells, known as intracellular products, and the second outside their cells, as extracellular products. The algae extracts are different according to their different chemical composition of amino and fatty acid sugars. For example, algae of the genus *Prototheca* produce

lactic acids with small amounts of succinic acid, and the genus *Chlorella* can produce acetic and lactic acids (Kim et al. 2006).

Algae have been used in medical and pharmaceutical applications since ancient times, as the first use of algae by the Chinese dates back to about 2700 BC (Hoppe 1979). Considering that specific algal species were used in the treatment of people with Gangrene in Africa because they contain effective substances and anti-growth of some bacteria. Algae constitute a source of about 9% of the biomedical compounds obtained and used in the medical fields (Jha & Zi-Rong 2004). They are also used in cosmetics and foodstuffs (Demirel et al. 2012). Algae are characterized by their ability to live in different environments; they are found in fresh and salty waters. They are either phytoplankton floating on the surface of the water, or they are attached to the animal's bodies as Epizoic. They are also attached to