

# **Identification of Iranian macroalgae with the highest amount of bioactive compound of homotaurine as a potential treatment for Alzheimer's disease**

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## **Abstract**

Alzheimer's disease (AD) is a devastating, progressive neurological disease that leads to disability of millions of elderly people across the world. Some species of marine algae are containing of taurine and homotaurine which may shield the brain against the devastating effects of AD. In this work, the existence of these compounds particularly homotaurine, was investigated in Iranian seaweeds. In this work, 43 red, brown and green macroalgae species were collected from southern and northern coastal areas of Iran and the concentration of two bioactive compounds, homotaurine and taurine, were assessed in them. The studied macroalgae were sampled from Iranian coastal of Oman Gulf, Persian Gulf (Gheshm) and Caspian Sea (Nowshahr). Among 43 studied species, 32 species contained taurine and only 9 species contained homotaurine. Homotaurine was not detected solely in none of the studied algae. *Hypnea valentiae* and *Hypnea musciformis* contained the highest amount of homotaurine and taurine, respectively. They belong to the red algae or *Rhodophyta* groups of eukaryotic algae. It seems, generally the red, brown and green algae showed the highest content of the studied bioactive compounds, respectively. *Caulepa racemosa* was the only species of green algae which contains both of the taurine and homotaurine. Extraction process from various species of marine algae was performed in ethanol:water (80:20 v/v) mixture during 12 h. Furthermore, pre-column derivatization of the extracts was carried out using o-phthalaldehyde

(OPA) and determined by high-performance liquid chromatography equipped with fluorescence detection (HPLC-FLD). The dynamic linear ranges were 0.1-2.5 mg L<sup>-1</sup> and 0.05-2.5 mg L<sup>-1</sup> for taurine and homotaurine, respectively. Liquid chromatography-mass spectrometry (LC-MS) analysis was also performed to confirm the presence of homotaurine in the algae

## **Keywords**

Macroalgae, Homotaurine, Taurine, Gulf of Oman, Persian Gulf, Caspian Sea