The Effect of Extraction Pressure and Co-solvent on the Yield and Antioxidant Activities of Extracts of *Sargassum* spp. Using Super Critical Carbon dioxide

Lekshmi R.G. Kumar, R. Jayarani, K.K. Anas, N.S. Chaterjee, C.S. Tejpal, K.K. Asha, K.V. Vishnu, R. Ananadan and Suseela Mathew

Central Institute of Fisheries Technology, Matsyapuri P.O., Cochin - 682 029

E mail: lekshmirgcof@gmail.com

In the last decade, research on bioactive compounds from natural sources has spurred great deal of interest due to the increasing demand of consumers in functional foods having health promoting effects. Taking into account the drawbacks associated with the use of conventional extraction methods, sustainable techniques such as supercritical carbon dioxide assisted extraction are currently being employed for the isolation of bioactive compounds. Among the plethora of marine organisms, seaweeds are considered as one of the richest repository of antioxidants. In the present study, we have attempted to study the effect of extraction pressure, time and percentage of co-solvent on the yield and antioxidant activities of extracts from brown algae (*Sargassum* spp.) to optimize the best extraction conditions. Different combinations of the conditions were employed for the extraction such as pressure in the range of 100 - 400 bar, 1-8 h time and 1-15% ethanol. The results showed that extraction pressure, temperature and modifier (ethanol) were the main three variables that influenced the yields of extracts. The highest yield was obtained at the pressure of 250 bar, 15% co-solvent for an extraction time of 1 h, whereas the highest antioxidant activity in terms of total polyphenol content was obtained at an extraction pressure of 250 bar, 8% co-solvent for an extraction time of 4.5h. These results indicate that supercritical extraction can be explored as promising alternative process for recovering compounds of high antioxidant activity from *Sargassum* spp. Besides, super critical carbon dioxide extraction can be recommended as state-of-the-art environmentally friendly technology for recovering optimum amounts of bioactive compounds from seaweeds with in minimum time.