

Evaluation of Antioxidant activity of the isolated Cyanobacteria from the Khoor-e-Khooran Mangrove Forest

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Received date: 2023.02.06

Reception date: 2023.02.13

Abstract

Cyanobacteria inhabited in mangrove ecosystems have achieved special properties due to physiological interactions with other biological communities living in this habitat. Therefore, the aim of this study was to isolate and evaluate the antioxidant activity of cyanobacteria in the mangrove ecosystem of Khoore Khooran. For this purpose, 9 sea water samples were taken from 3 different stations. Isolation of cyanobacteria was done by inoculating water samples on BG11 agar medium. Identification of isolates was done based on morphological characteristics using Desikachary method key. The antioxidant activity of the isolates was measured using the method of inhibition of diphenyl-1-picrylhydrazyl (DPPH) free radicals. A total of 52 cyanobacterial isolates were isolated. Identification of isolates showed that *Phormidium* and *Oscillatoria* were the dominant genera with 45% and 29%, respectively. After that, the isolates belonging to the genera *Anabaena*, *Microcystis*, *Nostoc* and *Spirulina* constituted 10, 8, 6 and 2% of the isolates, respectively. Evaluation of the antioxidant activity of metabolites extracted from cyanobacterial isolates using the DPPH free radical inhibition method showed that 12 isolates, equal to 23.53% of all isolates, were produced antioxidant compounds. Among them, 8 isolates belonged to the *Phormidium* genus. The IC₅₀ of the antioxidant activity of the extracted metabolites ranged from 46.1 to 675.4 µg/ml. These results showed the biodiversity pattern of cyanobacteria in the studied ecosystem in the sampling period. Also, 12 isolates of cyanobacteria producing antioxidant metabolites, especially isolate KH 15, were introduced for further studies.

Keywords: Microbial antioxidants, Marine cyanobacteria, Mangrove ecosystem, Khoor-e-Khooran.