

## *Gloeocapsa gelatinosa* as a source of extracellular polymeric substances: production, structural characterization and antioxidant activity

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### Abstract

Cyanobacterial extracellular polymeric substances are polymeric materials that own characteristics suitable for industrial and biotechnological applications. The thermophilic cyanobacteria *Gloeocapsa gelatinosa* was cultivated in a cylindrical reactor and the production of biomass and EPSs were investigated during a 15 days period. The results revealed that this strain is amongst the most efficient EPSs producer (0.8 g L<sup>-1</sup> in 12 days). EPSs produced were sulphated heteropolysaccharides composed by nine different monosaccharides and two uronic acids. Thermogravimetric analysis showed that EPSs were extremely thermostable and the atomic force microscopy analysis showed that they are formed by pointed structural. Beyond that, EPSs presented high levels for water holding capacity and water holding index. The EPSs display an effective antioxidant activity via directly scavenging free radicals, particularly DDPH when compared to L-ascorbic acid (IC<sub>50</sub> of 0.2 and 0.6 g L<sup>-1</sup>, respectively) and as a metal chelating agent when compared to EDTA (0.6 and 0.8 g L<sup>-1</sup>, respectively). The results obtained stimulate the industrial exploitation of this thermophilic *Gloeocapsa gelatinosa* for the production of EPSs with several biotechnological applications in the food, medicine, pharmaceutical and related fields.

### Biography

Wejdene Gongi is a PhD student in the national institute of agronomy, Tunisia. Obtained two master's degree in marine sciences and animal biotechnology. Published 2 articles and participated in many conferences and courses. This work was supported by the Institute of Sciences and Technology of Tunisia and the Tunisian Ministry of Higher Education and Scientific Research, by Foundation for Science and Technology (UIDB/04423/2020 + UIDP/04423/2020), and by the European Territorial Cooperation Programme PCT-MAC 2014-2020 (MAC/1.1.B/269).



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