



كلية الزراعة
قسم الميكروبيولوجيا الزراعية

ABSTRACT



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البحث الخامس

Ibrahim, I. M. , Fedonenko, Y. P., Sigida, E. N., Kokoulin, M. S., Grinev, V. S., Mokrushin, I. G., Burygin, G. L., Zakharevich, A. M., Shirokov, A. A., & Konnova, S. A. (2023). Structural characterization and physicochemical properties of the exopolysaccharide produced by the moderately halophilic bacterium <i>Chromohalobacter salexigens</i> , strain 3EQS1. <i>Extremophiles</i> , 27(1), 4.				البحث الخامس	
فردى مشترك مع آخرين من خارج التخصص – منشور				5	

Title	Structural characterization and physicochemical properties of the exopolysaccharide produced by the moderately halophilic bacterium <i>Chromohalobacter salexigens</i> , strain 3EQS1.				
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ABSTRACT

A strain, 3EQS1, was isolated from a salt sample taken from Lake Qarun (Fayoum Province, Egypt). On the basis of physiological, biochemical, and phylogenetic analyses, the strain was classified as *Chromohalobacter salexigens*. By 72 h of growth at 25 °C, strain 3EQS1 produced large amounts (15.1 g L⁻¹) of exopolysaccharide (EPS) in a liquid mineral medium (initial pH 8.0) containing 10% sucrose and 10% NaCl. The EPS was precipitated from the cell-free culture



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medium with chilled ethanol and was purified by gel-permeation and anion-exchange chromatography. The molecular mass of the EPS was 0.9×10^6 Da. Chemical analyses, Fourier transform infrared spectroscopy, and nuclear magnetic resonance spectroscopy showed that the EPS was a linear β -D-(2 \rightarrow 6)-linked fructan (levan). In aqueous solution, the EPS tended to form supramolecular aggregates with a critical aggregation concentration of $240 \mu\text{g mL}^{-1}$. The EPS had high emulsifying activity (E_{24} , %) against kerosene ($31.2 \pm 0.4\%$), sunflower oil ($76.9 \pm 1.3\%$), and crude oil ($98.9 \pm 0.8\%$), and it also had surfactant properties. A 0.1% (w/v) aqueous EPS solution reduced the surface tension of water by 11.9%. The levan of *C. salexigens* 3EQS1 may be useful in various biotechnological processes.