

A bacterial strain E21 was isolated from a sample of water collected in the salt lake located close to Ain Salah, Algeria. The analysis of 16S rRNA gene sequence had indicated that the strain had 93 % sequence similarity with the genus *Natrialba* sp. strain E21 (Gen - Bank, FR750525.1) and was considered extremely halo- philic. Production of biosurfactant by the strain E21 with free and entrapped cells was investigated using soluble starch in the saline conditions. Biosurfactant synthesis was followed by measuring the surface tension and emulsifying index 9 days under optimal conditions (40C, pH 7). Some diffusional limitations in alginate and agar beads affected the kinetics of biosurfactant production when compared to that obtained with free cells culture. The minimum values of surface tension were 27 and 30 mN m<sup>-1</sup> achieved after 9 days with free and immobilized cells, respectively, while the corresponding maximum E24 values were 65.3 and 62.3 %, respectively. The re-use of bacterial cells along with the limited cell losses provided by the immobilized system might lead to significant reduction of the biosur- factant production cost