Halotolerants microorganisms able to live in saline environments, offer a multitude of actual or potential applications in various fields of biotechnology. This is why some strains of Halobacteria from an Algerian culture collection were screened for biosurfactant production in a standard medium using the qualitative drop-collapse test and emulsification activity assay. Five of the Halobacteria strains reduced the growth medium surface tension below 40mNm-1 and two of them exhibited high emulsion-stabilising capacity. Diesel oil-in-water emulsions were stabilized over a broad range of conditions, from pH 2 to 11, with up to 35% sodium chloride or up to 25% ethanol in the aqueous phase. Emulsions were stable to three cycles of freezing and thawing. The components of the biosurfactant were determined; it contains sugar, protein and lipid. The two Halobacteria strains with enhanced biosurfactants producers designed strain A21 and strain D21 were selected to identify by phenotypic, biochemical characteristics and by partial 16S rRNA gene sequencing. The strains have Mg2+and salt growth requirements are always above 15% (w/v) salts with an optimal concentration of 15% to 20%. Analyses of partial 16S rRNA gene sequences of the two strains suggested that they were halophiles belonging to genera of the family Halobacteriaceae, Halovivax (strain A21) and Haloarcula (strain D21). To our knowledge, this a first report of biosurfactant production at such a high salt concentration