

Abstract

Biosurfactant-producing yeasts were isolated from different biotopes including food samples, waste and sand samples collected from areas contaminated with hydrocarbons in Algeria. Isolates were screened for biosurfactant/bioemulsifier production in mineral salt medium and in high salinity using emulsification index (E24), drop-collapse test, spread oil technique and hemolytic activity. Fifty of one hundred isolates were positive for almost all the qualitative tests, four of them were the best strains for biosurfactants production with emulsions over than 60%. More interestingly, one high-salt-tolerant yeast isolate was the most potent biosurfactants producing yeast with an emulsification index of 69.50 ± 0.70 . It was identified by morphological, physiological and biochemical tests and by 5.8s-rDNA Analysis as *Cryptococcus sp.* YLF. This strain produced biosurfactant using different carbon and nitrogen sources and when grown in low-cost fermentative media based on agro industrial by-products and wastes like whey, molasses, corn steep liquor, date syrup and olive mill wastewater (OMW) supplemented with NaCl (2.5 M). The biosurfactant produced by *Cryptococcus sp.* YLF was partially characterized as glycolipid based on the estimation of macromolecules, TLC and IR analysis. The crude biosurfactant demonstrated stability regarding surface tension reduction and emulsification activity in a range of temperatures (5–100 °C), pH (2–12) and high salinities (1–10%). The partially purified biosurfactant showed promising potential for application in enhanced oil recovery (EOR).