

**Effect of Microbial Consortium on Diesel Oil Biodegradation**Caner VURAL<sup>1</sup>, Cansu VURAL<sup>1</sup>, Tuğba TOPBAŞ<sup>1</sup>, Güven ÖZDEMİR<sup>1</sup><sup>1</sup>Basic and Industrial Microbiology Section, Dept. of Biology, Ege University, Izmir, TURKEY.  
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**Aim of the study:** Diesel oils or lubricants are derived from crude oil which are used in diesel cars and light commercial vehicle engines. Fuel-borne many environmental issues are constituted about these oils and diesel oils can be considered as non-negligible environmental pollutants. Microbial consortia can play a significant role for degradation of petroleum hydrocarbons. Screening of new microbial degraders on specific hydrocarbons provides new perspectives for removal of hydrocarbons which have several hazards to environment. In this study, we aimed to determine of effects of microbial consortia on diesel oil degradation.

**Material and Methods:** Crude oil samples were collected from petrochemical industry for selection of active microbial consortium. In order to perform widely screening; *n*-tridecane, *n*-tetradecane, *n*-hexadecane, sunflower seed oil and olive oil were used as a sole carbon and energy source in culture media. Each carbon source was added to flasks with sterilized 50 ml Bushnell Haas medium (added 0.025% yeast extract). Rotary incubator was set to 200 rpm and incubations were performed at 30°C in dark conditions. At the end of incubation period, one flask named as CT-1 was selected. Diesel oil 15W40 is characterized as mineral oil was purchased commercially. Degradation assay was carried out in 50 ml BHY medium added 0.15g and 0.075g diesel oil 15W40. Flasks were incubated at 30°C in rotary shaker at 200 rpm for 21 days. Analytical analyses were performed with Gas Chromatograph. Analyses of diesel oil composition were carried out to determine remaining diesel oil from total amount. Three microbial isolates (CT1-1, CT1-2 and CT1-3) were obtained as consortium members and isolates were evaluated in gram reactions, catalase, oxidase and KOH assays. Lipase and protease activities were screened additionally. Genomic DNA isolations were carried out and molecular biological analyses were performed to identify successful isolates.

**Results:** CT-1 flask has showed successful degradative activity. GC analyses have showed that degradation rate of diesel oil 15W40 is 93% with CT-1 consortium in 21 days. As members of CT-1 consortium; CT1-1, CT1-2 and CT1-3 were identified as *Citrobacter sp.* (99%), *Pseudomonas japonica* (100%) and *Bacillus sp.* respectively. These isolates can be considered as new microorganisms for diesel oil biodegradation.

**Keywords:** Biodegradation, diesel oil, microbial consortium.