

Boron Tolerant Actinobacteria from Boron Mines in Turkeyİlayda Gül Karakuş¹, Semiha Çetinel Aksoy¹, Ataç Uzel¹

¹Ege University, Faculty of Science, Department of Biology, Basic and Industrial Microbiology
Section, 35100, Bornova, İzmir, TURKEY
atacuzel@gmail.com; atac.uzel@ege.edu.tr

Aim of the study: In the world, 72% of the boron reserves are found in Turkey and there are only a few studies on the microorganisms found here, especially the actinobacteria, the largest known antibiotic producers. Furthermore some antibiotics contain B atoms in their molecular structures. Therefore these studies aimed to isolation and characterization of the actinobacteria and determine their antibiotic production potentials as well as filling the literature space in this area with the characterization of actinobacteria in the boron mines of our country.

Material and Methods: Soil, underground water, waste pool samples were collected from 3 different boron mines (Kütahya/Emet, Eskişehir/Kırka and Balıkesir/Bigadiç) which are depended to directorate general of Eti Mine Enterprises. Actinomycetes Isolation Agar plates were inoculated with samples and incubated at 27°C for 2-5 weeks. Isolates were purified after incubation and their boron tolerances were determined in the same medium containing different concentrations of Boron. Isolates were also screened for their antimicrobial activity using boron containing fermentation medium and potent isolates were also identified based on the 16SrDNA sequences.

Results: A total of 24 actinobacteria isolates were purified from Boron mines. The strain B2-1 showed the best boron tolerance with growing in medium containing 175 mM boron. Isolates were subjected to fermentation in the liquid medium containing different concentrations of boron. Some strains (B2-2, B2-3, B5-2, B5-4 and E7-3) showed activity in the boron free fermentation medium and some strains showed activity in the boron containing (50mM) boron. However, strain E7-3 showed antimicrobial activity in 100mM boron containing fermentation medium. Furthermore, isolates were identified according to the phenotypic and genotypic assays and assigned to the genus *Streptomyces*.

Acknowledgements: This work was supported by Scientific and Technical Research Council of Turkey (TÜBİTAK) by providing scholarship to İlayda Gül Karakuş with the 2210-C programme.

Keywords: Boron, actinobacteria, boron tolerance, antimicrobial activity, antibiotics