Phylogenetic diversity, antibiotic susceptibility and enzymatic activities of bacterial isolates from sediments of Eastern Mediterranean Sea

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Abstract

Phylogenetic diversity of isolated bacteria and biogeochemical variability of sediments in shallow and deep basins of Eastern Mediterranean Sea were studied. According to 16S rRNA gene sequence analysis, the strains isolated from the study area were belonged to the *Firmicutes*, *Gammaproteobacteria* and *Actinobacteria*. The present study provided highly diverse bacterial strains of fourteen different families especially with probability of representing new taxa in addition to the dominant genus *Bacillus* in each sediment samples. The actinomycetes were tested physiologically using commercial kits and found that they utilized proteins rather than carbohydrates. Geochemical parameters of the sediments together with enzymatic activity results of the strains underlined the nitrogen limitation in the area. The highest antibiotic resistance for the *Firmicutes* and *Gammaproteobacteria* strains was obtained from coastal sediments compared to deep basins supported by a positive correlation between sediment size and antibiotic resistance. The influence of environmental parameters was observed as the variability of bacterial community composition such that phylogenetic diversity was much higher in higher taxa for shallower regions, especially in North Aegean Sea as compared to deep basins of Eastern Mediterranean Sea as supported in hierarchical cluster analysis of the isolates and statistical analysis including principe component analysis.

Recent Publications (minimum 5)

1. Gärtner A, Blümel M, Wiese J, Imhoff JF (2011) Isolation and characterization of bacteria from the Eastern Mediterranean deep sea. Antonie Leeuwenhoek 100:421–435.
2. Gontag EA, Fenical W, Jensen PR (2007) Phylogenetic diversity of Gram-positive bacteria cultured from marine sediments. Appl Environ Microbiol 73(10):3272–3282.
3. McIntyre A (Ed) (2010) A global census of marine microbes. In *Life in the world's oceans: diversity, distribution and abundance*. NewYork: Wiley-Blackwell.
4. Tamura K, Peterson D, Peterson N, Stecher G, Nei M, Kumar S (2011) MEGA5: Molecular Evolutionary Genetics Analysis using maximum likelihood, evolutionary distance, and maximum parsimony methods. Mol Bio Evol 28:2731–2739.
5. Tuncer I, Bizsel N (2017) Bacterial phylogeny in sediments and environmental characteristics of Aegean Sea. IJASET 5(1): 85–90.



Biography

Ilknur Tuncer was born in Turkey, 1980. She received two BSc degrees in chemistry and genetics from Bogazici University, Turkey, MSc degree in marine sciences from Bangor University, UK and PhD degree in marine sciences from Dokuz Eylul University, Turkey. She has several books, publications. She is an editorial member for several scientific journals. She joins conferences as committee member and speaker. Her current reseach interests are marine environment, microbiology, phylogeny, species-area relations, human health, medicine.

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