ALIEN FORAMINIFERS ALONG THE AEGEAN AND SOUTHWESTERN COASTS OF TURKEY

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Abstract
Many Indo-Pacific originated foraminifer species have been recorded from the Eastern Mediterranean. In the framework of this study, sediment samples collected from various depths in the Aegean and Southwestern Mediterranean coasts of Turkey have been analysed. 26 genera and 32 species of recent benthic foraminifera, commonly known from Indo-Pacific or Atlantic have been identified. 27 of these alien species are observed only on the Turkish coastline in the Mediterranean Sea and 18 of them are new records for the Mediterranean fauna.
Keywords : Aegean Sea, Eastern Mediterranean, Foraminifera, Migrant Species.

Several hundred marine alien species in the Eastern Mediterranean are of Indo-Pacific origin. Alien algae, fishes, molluscs and crustaceans are intensively studied, but little is known about the alien microfauna of the Mediterranean, though some alien foraminiferan species have already been recorded from the Eastern Mediterranean [1, 2]. In the framework of this study, sediment samples from various depths (3-30 m) of the Aegean and southwesternMediterranean coasts of Turkey were analyzed and the composition as well as the distribution of the alien foraminifers were determined.

Twenty-six genera and 32 species of recent alien benthic foraminiferans with various distribution patterns in the eastern Aegean and Mediterranean coasts ofTurkey were recorded. These taxa include; *Haddonia* spp., *Edentostomina cultrata* (Brady), *Clavulina angularis* d'Orbigny, *C.* cf. *multicamerata*Chapman, *Nodopthalmidium antillarum* Cushman, *Spiroloculina* cf *.angulata* Cushman, *S. antillarum* d'Orbigny, *Schlumbergerina alveoliniformis* (Brady), *Hauerina diversa* Cushman, *Quinqueloculina*cf. *mosharrafai* Said, *Miliolinella* cf. *hybrida* (Terquem), *Pseudomassilina reticulata* (Heron-Allen and Earland), *Pyrgo denticulata* (Brady), *Triloculina*cf. *fichteliana* d'Orbigny, *Articulina alticostata* Cushman, *Peneroplis arietinus* (Batsch), *Cycorbiculina compressa* (d'Orbigny), *Amphisorus hemprichii* Ehrenberg, *Sorites orbiculus* Ehrenberg *, S. variabilis* Lacroix, *Pyramidulina catesbyi* (d'Orbigny), *P. perversa* (Schwager), *Astacolus insolitus* (Schwager), *A. sublegumen* (Parr), *Entosigmomorphina* sp., *Cymbaloporetta plana* (Cushman), *C. squammosa* (d'Orbigny), *Acervulina inhaerens* Schultze, *Planogypsina acervalis* (Brady), *P.squamiformis* (Chapman), *Amphistegina lobifera* Larsen, *Elphidium charlottense* (Vella) *, E. striatopunctatum* (Fichtel and Moll) and *Heterostegina depressa* d'Orbigny. 27 of these alien species are observed only along the Turkish coastline in the Mediterranean Sea, whereas, *Haddonia* sp., *Clavulina angularis*, *C.* cf. *multicamerata*, *Schlumbergerina alveoliniformis*, *Quinqueloculina* cf. *mosharrafai*, *Miliolinella* cf. *hybrida*, *Pseudomassilina reticulata*, *Pyrgo denticulata*, *Triloculina* cf. *fichteliana*, *Peneroplis arietinus*, *Cyclorbiculina compressa*, *Amphisorus hemprichii*, *Sorites variabilis*, *Pyramidulina catesbyi*, *P. perversa*, *Cymbaloporetta plana*, *C. squammosa*, *Elphidium* cf. *charlottense* aren ew records for the Mediterranean fauna.

Most of the alien foraminiferan species are rare, represented by 1 to 100 individuals per 5gr of sediment. However, *Amphistegina lobifera* Larsen forms dense populations along the southwestern coasts of Turkey with up to 230.-310 individuals/m^2. The high ratio of tests in the sediment (3.75 grams / 5 grams) results in large amounts of sand formation.

The majority of these alien species are only known from the Indo-Pacific, while some species are recorded both in the Atlantic and the Indo-Pacific (i.e., *C.angularis*, *N. antillarum*, *S. antillarum*, *S. alveoliniformis*, *H. diversa*, *C. compressa*, *A. hemprichii*, *P. catesbyi*, *C. squammosa*, *A. inhaerens*, *P. acervalis*, *P. squamiformis*, *Amphistegina* spp., *H. depressa*) [3-6]. But since, with the exceptionof *S. orbiculus*, these species have yet to be found in the westernMediterranean, it is suggested that the populations in the eastern Mediterranean most likely originated from the Indo-Pacific.

References

1 - Meriç E., Avşar N. and Bergin F. 2004. Benthic foraminifera of Eastern Aegean Sea (Turkey) systematics and autoecology. *Chamber of Geological Engineers of Turkey and Turkish Marine Research Foundation* , Publication No: 18: 306 p.
2 - Hyams O., Almogi-Labin A. and Benjamini, C. 2002. Larger foraminifera of the southeastern Mediterranean shallow continental shelf of Israel. *Israel Journal of Earth-Sciences*, 51: 169-179.
3 - Baccaert J. 1987. Distribution patterns and taxonomy of benthic foraminifera in the Lizard Island Reef Complex, Northern Great Barrier Reef, Australia. *Ph. D. Thesis* . Liege, C. A. P. S. Lab. Biosédimentologie.
4 - Hatta A. and Ujiie H. 1992. Benthic foraminifera from Coral Sea between Ishigaki and Iriomote Islands. Southern Ryukyu Island Arc, northwestern Pacific. *Bulletin College of Science, University of the Ryukyus*, 54: 163-287.
5 - Hottinger L., Halicz E. and Reiss Z. 1993. Recent foraminiferida from the Gulf of Aqaba, Red Sea. Slovenska Akademija Znanosti in Umetnosti, *Academia Scientiarum et Artium Slovenica*, 179 p, 230 pls.
6 - Langer M. R. and Hottinger L. 2000. Biogeography of selected "larger"foraminifera. *Micropaleontology,* 46, Supplement 1: 105-126.