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Data Article

Quantitative data on latest-Quaternary benthic foraminiferal assemblages in the South Evoikos Gulf semi-enclosed basin (central Aegean, Greece)



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ABSTRACT

We herein present an original high-resolution dataset on the Late Pleistocene to Holocene (>15.17 ka BP) benthic foraminiferal record of two continuous sediment cores (DEH 5 and DEH 1), drilled from the shallow (max. depth ~75 m) semi-enclosed basin of South Evoikos Gulf (central Aegean, Greece). Owing to its particular configuration, this marginal setting has been heavily affected by the latest-glacial to modern-interglacial sea-level and climate oscillations that left clear imprints on the benthic foraminiferal community. Our data comprise quantitative information of the downcore faunal distribution (raw species counts and relative abundances), diversity measurements, simplified datasets used for clustering analysis and calibrated age spans. This material can be efficiently utilized in any comparative or synthetic future study on the reconstruction of the latest-Quaternary palaeoceanographic (palaeobathymetric, sea-level) and palaeoenvironmental evolution of the Mediterranean shelf. The present data article is associated with the research article "Impact of latest-glacial to Holocene sea-level oscillations on central Aegean shelf ecosystems: A benthic

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Specifications Table

Subject	Earth and Planetary Sciences
Specific subject area	Late Quaternary benthic foraminiferal palaeoenvironmental and palaeobathymetric reconstruction
Type of data	Spreadsheets
How data were acquired	Binocular microscope (Leica MZ 12.5), SEM, ¹⁴ C Accelerator Mass Spectrometry (AMS), PAleontological STatistics (PAST) statistical package version 3.20 [2], Calib version 7.1 software [3]
Data format	Raw Analysed
Parameters for data collection	Standard laboratory techniques of analysing sediment cores samples addressed to micropalaeontological research were followed: Based on the lithological variations of the cores, the sediment samples were collected with 1 to 2-cm resolution. A small fraction of 20 g dry weight of each sample was wet-sieved through 125 µm and then oven-dried at 50 °C.
Description of data collection	Benthic foraminiferal specimens were hand-picked, taxonomically identified and counted under the binocular microscope. Samples rich in microfauna were split into suitable aliquots, containing at least 300 benthic foraminiferal individuals. Samples containing less than 300 individuals were entirely hand-picked. Where microfossils were absent or rare (<30 specimens) samples were omitted.
Data source location	South Evoikos Gulf, Central Aegean, Greece, 38° 11' 19.3992"N, 24° 7' 46.9488"E (DEH5 core) and 38° 12' 23.1228"N, 24° 8' 14.2404"E (DEH1 core)
Data accessibility	With the article
Related research article	M.A. Louvari, H. Drinia, G. Kontakiotis, L. Di Bella, A. Antonarakou, G. Anastasakis, Impact of latest-glacial to Holocene sea-level oscillations on central Aegean shelf ecosystems: A benthic foraminiferal palaeoenvironmental assessment of South Evoikos Gulf, Greece, <i>J. Mar. Syst.</i> (2019). https://doi.org/10.1016/j.jmarsys.2019.05.007

Value of the Data

- Our high-resolution quantitative dataset on the latest-Quaternary (>15.17 ka BP) benthic foraminiferal assemblages in the South Evoikos Gulf traces the faunal patterns and temporal shifts and thoroughly allows the reconstruction of the gradually alternating palaeoenvironments and the palaeobathymetric evolution of this central Aegean's marginal basin.
- The presented dataset provides an efficient comparative basis for investigating both past (latest-Quaternary) and recent Mediterranean benthic foraminiferal shelf ecosystems and their (palaeo)oceanographic development. Our regional benthic foraminiferal data can also contribute toward the synthesis of a more widescale dataset on these key (palaeo) ecological indicators.
- The South Evoikos Gulf's shallow (max. depth ~75 m) semi-enclosed basin has been heavily affected by the latest-glacial to modern-interglacial sea-level and climate oscillations. Given the little seismicity that this area presents [4], the benthic foraminiferal record deposited in this basin is tectonically unaffected, constituting an excellent source of data for investigating the latest-Quaternary sea-level changes and moreover developing an accurate relative sea-level curve.

1. Data

Data reported herein, have been derived from the micropalaeontological analysis of the Late Pleistocene to Holocene (>15.17 ka BP) benthic foraminiferal record of two continuous sediment cores, the DEH 5 and DEH 1, retrieved from the South Evoikos Gulf (central Aegean Sea, Greece) [1]. The data comprise raw benthic foraminiferal species counts (Table 1 for DEH 5 and 2 for DEH 1 core), downcore relative abundances of each species (Tables 3 and 4), values of several diversity indices (Tables 5 and 6),

simplified datasets used to perform multivariate analysis (Tables 7 and 8) and the ^{14}C dating background of the studied successions, including the calculation of the sedimentation rates within the dating points (Table 9).

2. Experimental design, materials, and methods

The sediment cores DEH 5 and DEH 1 have been obtained in June 2006, during a core-drilling campaign directed by the Historical Geology-Palaeontology department of the National and Kapodistrian University of Athens, on board the R/V “MARINOS”. These cores have been retrieved from the South Evoikos Gulf middle shelf setting (75.5 m water depth for DEH 5 and 70 m for DEH 1; $38^{\circ} 11' 19.3992''\text{N}$, $24^{\circ} 7' 46.9488''\text{E}$ and $38^{\circ} 12' 23.1228''\text{N}$, $24^{\circ} 8' 14.2404''\text{E}$, respectively) using a 3-m long benthos gravity corer. In the laboratory, the cores were split lengthwise into a working and an archive half, photographed and visually described. Based on their lithological variation and giving special emphasis on lithological changes, the working halves of the cores were sampled with 1-cm resolutions for DEH 5 (frequent lithological changes) and with 2-cm for DEH 1 core (uniform lithology). A small fraction of 20 g dry weight of each sample was wet-sieved through 125 μm , in order to avoid juvenile foraminiferal specimens and then oven-dried at 50 $^{\circ}\text{C}$. Benthic foraminiferal specimens were hand-picked, taxonomically identified and counted under a binocular microscope (Leica MZ 12.5). Samples rich in microfauna were split into suitable aliquots, containing at least 300 benthic foraminiferal individuals, using an Otto Microsplitter. Samples containing less than 300 individuals were entirely hand-picked. Where microfossils were absent or rare (<30 specimens) samples were omitted from further statistical analysis (eventually, 88 samples for DEH5 and 56 for DEH1 were analysed). Benthic foraminiferal species were classified according to the Mediterranean systematics proposed mainly by Refs. [5–8]. Online catalogues were also consulted (www.marinespecies.org/foraminifera; www.foraminifera.eu).

Raw species counts (Tables 1 and 2) were converted into percentage data (% relative abundances; Tables 3 and 4) of the total analysed microfauna for each sample. Species diversity was expressed by the ecological indices of: Species Richness (S), Fisher-alpha (α) [9], Shannon-Wiener (H') [10], and Dominance (D) (Tables 5 and 6). Q-mode Hierarchical Cluster Analysis (HCA), using the Unweighted Pair-Group Method with Arithmetic mean (UPGMA) algorithm, was performed on the benthic foraminiferal content of each core, in order to define natural groups of samples with uniform faunal characteristics. In order to determine possible similarities in the faunal content of the samples, Bray-Curtis similarity index was selected [11]. For a more coherent faunal database, a simplified version of the full data, comprising only species with relative abundance >5% in at least one sample, was used for the multivariate analysis (Tables 7 and 8). In addition, less abundant species with close phylogenetic affinities and similar ecological characteristics were merged together into major species groups. Both diversity and multivariate analysis were performed using the software package of PAST (Palaeontological Statistics), version 3.20 [2].

The chronological framework of the cores was established by five accelerator mass spectrometry radiocarbon (AMS ^{14}C) dates for the core DEH 5 and three for the core DEH 1 on mixed epifaunal benthic foraminiferal tests (10–20 mg). The AMS radiocarbon analyses were contacted by Beta Analytic Inc., Miami, Florida, USA. The conventional ^{14}C ages were calibrated by means of the Calib version 7.1 software [3] and the MARINE13 dataset, with a regional reservoir age correction (ΔR) of 58 ± 85 years [12]. In accordance with previous works in the Aegean Sea [13–16], the age model of the analysed successions was established by linear interpolation between all dating points and the related sedimentation rates were calculated (Table 9).

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.dib.2019.104539>.

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