Economic Heavy Mineral Potential of Beach Sediments of the Fethiye Gulf

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This study is carried out to investigate sedimentary transport and depositional processes, heavy mineral distribution and possible economically important placer potentials of coastal beaches of the Fethiye Gulf. This study also forms part of a Project (09B4343019) supported by the Ankara University Scientific Research Projects Office. To perform this, during the year 2009, a total of 51 sediment samples were collected along the shoreline and backshore parts of coastal beaches of Fethiye and subjected to well-known sedimentary petrographic methods. Geomorphological field observations, grain size analysis by dry-sieves, heavy mineral analysis by bromoform liquid, and statistical interpretations constitute important data of this presentation. Sediment samples are obtained from the uppermost 5 cm of beach surface and thus the results represent effects of present conditions. Some beaches are composed entirely of gravelly materials and in some others sandy and mixture of sandy-gravelly sediments were dominant. In particularly, to compare data along the entire gulf, sandy material was preferred for the analysis. For heavy mineral analysis, carbonate-free material with %10 HCl and grain size fraction of < 0.5 mm was used.

Mean grain size of shoreline sediments varied between -2.5 and 2.5 Φ showing the dominance of coarse to fine sand (0-2.5 Φ). Sorting values indicate moderately well sorting in the eastern section (0.5-1.0 Φ) whereas medium-poorly sorted sediments are confined to central section (1-2.5 Φ). In backshore sediments from the eastern section of the gulf, mean grain size mostly varied between 0 and -2.5 (coarse sand to granule), while coarse to fine sand (0 to + 2.5 Φ) prevailed in central and western sections. Total heavy mineral contents in < 0.5 mm grain size fractions generally ranged from 5 to -10%, although locally values up to 20-36% were also obtained. Total heavy mineral contents of shoreline and backshore sediments displayed locally changing values. Relatively higher heavy mineral contents (>20%) are determined in sediments with mean grain size between 1.12 and 2.48 Φ (medium to fine-sand) and sorting from 0.66 to 1.05 (moderately sorted). Studies on economical heavy mineral potantiel are stil going on, and the present available data indicate that changing marine hydrographic and coastal sediment input conditions have important effects on the results of sedimentary grain size and heavy mineral distribution. Field observations also suggest that occurrences of ophiolitic rocks on coastal hinterland are important source rocks.

Key words: *Fethiye Gulf, beach, sediment, grain size, heavy mineral, economic potential, ophiolites*