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Seasonal Variation of Surface Sediments in the Gochang Beach, Korea

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The Gochang Beach, located on the southwestern coast of Korea, was studied in terms of four season variations of surface sediment and sedimentary environment. The Gochang Beach consists of the Dongho, Kwangseungri, Myeongsasipri beaches from north to south. During the four seasons of spring (May), summer (August), and fall (November), and winter (February), surface sediments of 135 sites were sampled across nine survey lines (15 sites in each survey line), respectively.
The pocket-type Dongho Beach is mainly composed of fine to coarse sands, and the ratio of fine sand is the largest. The average of grain size is the coarsest in the summer. The spatial distribution of surface sediments shows a coast-parallel band of fine and medium sands during three seasons of spring, fall, and winter, whereas medium sands dominated in the northern part of the study area during the summer. These results suggest that a tide is more effective than a wave in the surface sediments of the Dongho Beach during the summer.
The surface sediments of the Kwangseungri Beach are mainly composed of fine-grained sands, and the mean grain size is the coarsest in winter. Mud facies partly exists in summer, whereas it is nearly absent in winter. The spatial distribution of surface sediments shows a coast-parallel band of fine and medium sands during spring, fall, and winter. In the northern part, the study area is dominated by fine sands during summer, whereas by coarse sands during winter. These results are interpreted that tide is more effective than wave on the surface sediment distribution of the Kwangseungri Beach during summer season.
The open-coast Myeongsasipri Beach is mainly composed of fine to medium sand, the distribution of which shows a coast-parallel trend. Grain-size distribution shows a bi-modal trend in the summer and winter and a uni-mode in the spring and fall. Grain size of the winter is the coarsest among those of four seasons. During the winter, the upper tidal flat was dominated by medium sand, while the lower tidal flat was dominated by find sand. Such a feature is attributed to wave-dominated sedimentation in the winter. The dominant finer-grain size of the summer rather than that of the winter is interpreted that tidal energy played an important role in the tidal flat sedimentation during the summer. Sedimentary environments of the Myeongsasipri Beach are suggestive of a seasonal change from wave-dominated conditions in the winter to tide-dominated conditions in the summer as a result of seasonal variations of the intensity of onshore-directed winds and waves.

Keywords: seasonal variation, surface sediment, macro-tide, beach, Gochang

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