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Super Typhoon Haiyan which occurred in November, 2013 left as many as 5,200 people dead and destroyed towns across the Philippines. However, because of rapid climate change, we cannot disregard such a super typhoon strike probability in Korean Peninsula. If we can detect the frequency and periodicity of paleo-geohazards recorded in sediments, the extreme geohazards can be predicted and its damage can be somewhat mitigated.
The geology, geochemistry and mineralogy of the island sediments ahead of Yeongjeon coast, Haenam-gun, the most southern part, Korean peninsula were investigated. Shells from the three shelly gravel layers were used for 14C age dating and cube samples were collected at 5-10cm intervals for measuring the magnetic susceptibility, grain size distribution and geochemical analyses at the study site. Granitic gneiss clasts of debris flow mixed with the weathered tuffaceous materials on the eroded face of tuff rock. The sediments of Pleistocene were also eroded almost horizontally and unconformably covered by late Holocene shelly gravel deposits characterized by some kind of shells and unsorted sub-rounded or rounded gravels to pebbles. The horizontal erosion face is 2.2m in elevation and the current erosion face of beach was observed at 1.2m in elevation. This indicates that the former erosion face would have been formed at higher sea level than those of latter one by the similar mechanism of current erosion in the study site. Three shelly gravel layers overlie the erosion face from 2.2m to 2.9m in elevation. The reflected water energy caused by stronger storm would have been needed for delivering gravels and cobbles to the erosion face. Three shell layers dated as 3200 yr BP, 1900 yr BP, and 1700 yr BP, respectively. Four sedimentary units, from unit 1 to 4 in ascending order, are distinguished on the basis of sedimentary textures, shell contents, grain size distribution and vertical color variations. The sand ratios in the grain size distribution pattern are likely to be related with high contents of gravels and cobbles in units 2 and 4. There have been more than three stronger storms to deliver the marine gravels and shells to the erosion face of 2.2m in elevation. Erosion process pronounced by basement erosion of tuffaceous rock, followed by sedimentation process of Pleistocene debris flows, subsequently Holocene erosion, and finally Holocene gravels and shells by reflected waves near beach. The sedimentation is not controlled by the influence of break water, but is affected by the reflected water from coastal zone.