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NE-SW Active Tectonic Tilting of Korean Peninsula

SUNG-JA CHOI[1], UEECHAN CHWAE[1] and DOROTHY MERRITTS[2]
[1]*Div. of Geology, Korea Institute of Geoscience & Mineral Resources, Korea*
[2]*Dept. of Geosciences, Franklin & Marshall College, USA*

Topographic feature of Korean peninsula (KP) is characterized to high land to the east and the low to the west. The eastern coastline shows a monotonous straight shore with rocky cliffs and narrow sand beach, whereas the west has indented rias type accompanied large tidal flat. Marine terraces of the east and west, mapped out since 1998, were interpreted with geologic and morphotectonic concept by using DGPS techniques. Uplift-rates of local areas were measured and compared to understand different active tectonic movements between the east and west coasts of KP. Along the southeastern coast, Pleistocene-Holocene marine terraces of 102-km-long are classified to 7 steps, and are divided to 3 blocks of north, middle and south on the basis of different uplift rate. Altitudes of terraces in the north and south blocks are <1m, 10-12m, 20-22m, 33m, and 42-44m. Whereas, the middle is higher at every terrace; 4-5m, 19-24m, 33m, 48m, and 70m.The northeastern areas have three distinctive terraces. Each of three paleo-shorelines shows higher elevation towards the north. At the mid-eastern coast, the highest terrace locates at 90-100m, the second at 70-80m, and the lowest at 25-30m. In the south, only one step about 20m high was reported along the southeastern tip. The indented west coast, known as a submerging shore with remarkably wide tidal-flat, shows that very narrow platform distributes sporadically without beach deposits in rocky cliff, and that two levels of terraces are at 10-20m and 20-30m along the mid-west coast. Around the mid-southwestern coast, the 1st terrace of 2-3m high and the 2nd of 7-8m show typical wave cut platform with sea notch and cave. The 3rd of 20m looks older, and composes of beach pebbles on the surface. The 1st is interpreted as MIS 5a and the second as MIS 5e on the basis of seismic profile(Chun, 2001). The 2nd terrace of Beopsungpo is correlated to the one of 10-20m at Taean-Byunsan areas. The platform of 10-20m high is correlated to a last interglacial age and the 20-30m high one during the penultimate stage (Oh, 1981). We noticed that the west coast has undergone slow uplift rate of about lesser than 0.016m/ky as a standing or submerging coast, and is gently tilted to the south same as the east. Both of the east and west coasts are tilted to the south, but show different uplift rates, which is higher at the east. The NE-SW tilting trend of KP is based on active tectonic movement of Chugaryong and Yangsan faults and WNW-ESE confining pressure accompanied weak earthquake zone(>MM 3.0), the top-up-to-the-west reverse active faults, and GPS vector (290°) during the latest Pleistocene-Holocene.

Key words: Morphotectonic, Paleo-shorelines, Different uplift rates, NE-SW tilting trend of KP, GPS vector (290°)