



## **Mode of sub-basins compartmentalization and developing sequence of the Paleogene Penghu basin in western Taiwan**

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A series of NE-SW trending Paleogene rift basins had developed on the southeastern Eurasian Plate. Each basin had separately undergone active extension in the Paleogene. The Penghu basin is one of the Paleogene rift basins in western Taiwan Strait and composed of three NE-SW trending sub-basins. The main purpose of this study is to investigate the evolution of the Penghu basin and the modes of compartmentalization of the sub-basins and their developing sequence. This study also proposes the kinematics of syn-rift structural settings.

The major boundary normal faults of the Penghu basin strike NE-SW but turn into E-W to the south. The intra-basin normal faults can be grouped into two orientations, NE-SW and E-W. The E-W striking normal faults separate the Penghu basin into three sub-basins, northeastern, central and southwestern sub-basins respectively. The width of the Penghu basin becomes narrower toward the northeast. The D-L profiles demonstrating the lateral variation in throw of the normal fault indicate that the major boundary normal fault comprised three individual segments in the early rift stage. Fault segments were breached in the late rift stage and fault displacement was mainly active in the southern segment. For the intra-basin faults, the NE-SW striking faults were still active after the cease of slip on E-W striking faults. In the final, extensional ratio was largest in the southwestern sub-basin and decreased through the central one and toward the northeastern one.

In summary, the Penghu had been compartmentalized into three sub-basins by E-W striking fault since the early rift stage. With lateral propagation of the faults, three individual major boundary normal faults were fully breached and hereafter the E-W striking faults had less influence on basin architecture in this stage. Finally, three sub-basins were combined to form the Penghu basin.

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