

Morphology and Canyon Forming Processes of Upper Reach of the Penghu Submarine Canyon off Southwestern Taiwan

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ABSTRACT

The main course of the Penghu Submarine Canyon is located along the intersection of bottoms of the Kaoping Slope and the South China Sea Slope in a nearly north-south direction. The Penghu Canyon can be considered a single head canyon with three major tributary canyons joining into the main course to form the fan-shaped upper reach of the canyon. The upper reach begins near the shelf edge of the Taiwan Strait Shelf and extends about 150 km southwards to a water depth about 2200 m at the lower slope where no tributary canyons are present. The upper reach of the Penghu Canyon shows high relief, steep walls and V-shaped cross sections, showing typical canyon morphology.

Characteristics of seismic profiles suggest that the formation of the upper reach of the Penghu Canyon is mainly attributed to foreland basin sedimentation and accompanying incision of the syn-depositional orogenic sediments of the basin. Orogenic sediments derived from Taiwan progressively onlap westward and bury the Chinese passive margin and deposit in the bottom of the foreland basin. The main course of the Penghu Canyon has resulted mainly from excavating the orogenic sediments along the axis, tilting southward, of the deep foreland basin.

Slumping and sliding and downward excavation into the sea floors by downslope sediment flows are the major forming processes in the canyon head and upper canyon part. Diapiric intrusion becomes important in the formation of the lower parts of the upper reach of the Penghu Canyon.

(Key words: Morphology, Processes, Submarine Canyon, Penghu, Taiwan)

1. INTRODUCTION

1.1 Tectonic Setting

The island of Taiwan is located at the junction between the Ryukyu and the Luzon Arcs in

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