

THE KENTING MÉLANGE AND ITS RECORD OF TECTONIC EVENTS

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ABSTRACT

The Kenting Formation of the Hengchun Peninsula (Tsan, 1974a, b) includes a remarkable mélangé which is intimately associated with normal mudstone-sandstone sequences. The normal sequences, much of the mélangé matrix, and some of the blocks are Miocene in age (Chang, 1965, 1966; Chi, 1982). The time of emplacement was probably latest Miocene or Pliocene. There is an inferred structural gradation from folded normal Kenting sediments to similar sediments with disrupted strata and, finally, to fully developed mélangé in which the muddy matrix is pervasively sheared and no longer stratified in the usual sense. The fully developed mélangé exhibits crude, faint, olistostromal layering, and it contains blocks of igneous and sedimentary rocks, some of which are exotic, and some of which are unusual mafic-clast conglomerates.

The mafic and (rare) ultramafic rocks which occur as monolithic blocks and as clasts in conglomerate blocks probably represent fragments of the oceanic lithosphere of a now-vanished part of the South China Sea (Biq, 1977). Sandstone and mudstone blocks, as well as the mélangé matrix and the normal sequences of the Kenting Formation, are chiefly continent-derived deep water sediments deposited along the Eurasian margin. Thus materials from oceanic lithosphere and continent are mingled in the mélangé.

Probably the oceanic and continental components were at one time incorporated in the accretionary wedge which formed alongside the Luzon island arc during convergence between the Philippine Sea plate and Eurasia. The wedge must have become emergent, because most of the ophiolitic and arc-derived rocks in the mélangé occur as rounded pebbles in the mafic-clast conglomerate blocks. Hence these rocks were subaerially eroded and were deposited as pebbles in temporary basins, possibly on the west flank of the accretionary wedge. Steepening of the flank could have triggered westward-moving debris flows which formed the Kenting mélangé. The latter may have come to rest in the Manila Trench (Biq, 1977). The collision between the Luzon arc and the continent was impending, but had not occurred yet.

INTRODUCTION

Within the last ten or fifteen years, mélangé* has been recognized as one of the most important types of rock assemblage in the mountain ranges or mobile belts of the world. There are two Tertiary mélangé complexes in Taiwan, separated by a belt of pre-Tertiary metamorphic basement. The eastern mélangé is the Lichi Formation (Hsu, 1956), which is exposed along the southwestern slope and the southern part of the Coastal Range. The western mélangé is located on the Hengchun Peninsula at the southern tip of the Central Range and is part of the Kenting Formation (Tsan, 1974 a, b).

The Kenting mélangé is similar to the Lichi mélangé in many essential characteristics and in topographic features. However, the lithologic composition of some

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* In this paper, the term "mélangé" is intended to be non-genetic. Some mélangés are tectonic, some are olistostromal, and many are of uncertain or polygenetic origin.