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East flank of the Sibumasu block in NW Thailand and Myanmar and its possible northward continuation into Yunnan: a review and suggested tectono-stratigraphic interpretation

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ABSTRACT

The east flank of the Sibumasu block was a passive continental margin, and in NW Thailand is marked by the absence of the autochthonous Middle Permian–Triassic platform carbonates which are widespread across the rest of Sibumasu further west. Instead, the carbonates are represented by hemipelagic cherts, mudstones and sandstones including turbidites. During the northward drift of Sibumasu, following its Early Permian rifting from Gondwana, an accretionary complex was present where Palaeotethyan pelagic rocks as old as Devonian were subducted beneath the Sukhothai volcanic arc. At the time of Sibumasu's collision with the Sukhothai arc, beginning in the Middle Triassic, the accretionary complex was thrust westwards across the east flank of Sibumasu. It is suggested that in the Late Triassic the thrust pile which had been the accretionary complex underwent erosion and was the source of terrigenous clastic rocks deposited further west in a foredeep basin.

The boundary of Sibumasu's east flank with the Permo-Triassic carbonate platform further west is the arcuate Mae Ping-Nam Teng Fault system. Notwithstanding later Cenozoic strike-slip displacement, those faults (as well as the Mae Yuam Fault) are interpreted to have had an earlier history of westward-directed Indosinian thrusting.

Northwards in Myanmar and Yunnan the Sibumasu Permo-Triassic carbonate shelf continues as the Shan Plateau and Baoshan Block. The east flank is represented by the Changning–Menglian Belt, and the Palaeotethys 'cryptic suture' in Thailand possibly joins with the Lancangjiang Suture.

1. Introduction

Sibumasu, also called the West Malaya Block (Stauffer, 1974), the Thai–Malay Peninsula Block (Ridd, 1980), and Shan–Thai (Bunopas, 1981), is now the widely-accepted name in SE Asia given to a ribbon-like continental fragment which began rifting from Gondwana in the Late Carboniferous–Early Permian, and from the Early Permian drifted north before colliding with another Gondwana-derived block, Indochina, in the Triassic (Ridd, 1976, 1980, and for example Metcalfe, 1999, 2011; Sone and Metcalfe, 2008; Ueno and Charoentitirat, 2011). The orogeny resulting from that collision is the Indosinian, a term coined in former French Indochina but now widely adopted throughout SE Asia. In northern Thailand the principal features of that collision are now largely agreed (e.g. Metcalfe, 1999; Sone and Metcalfe, 2008; Ueno and Charoentitirat, 2011; Barber et al., 2011). The site of the former ocean, Palaeotethys, which lay between Sibumasu and Indochina was recognized as the Chiang Rai tectonic line by Mitchell (1977), and later called the 'cryptic suture' by Barr and Macdonald (1991) (Fig. 1), which in turn marks the boundary between the central and eastern granite provinces of Southeast Asia (Mitchell, 1977; Cobbing et al., 1992; Charusiri et al., 1993). East of the cryptic suture a volcanic arc was recognized (Zone 3 of Mitchell, 1977; the Sukhothai Zone of Barr and Macdonald, 1991; the Sukhothai Fold Belt of Bunopas, 1981) which lay along the western margin of the Indochina block, and beneath which the Palaeotethys oceanic crust and sediments were subducting eastwards.

The part of Sibumasu adjoining the Palaeotethys suture on its west was named by Barr and Macdonald (1991) the Inthanon Zone (Fig. 1). As discussed more fully in Section 2, below, it is now widely accepted that Palaeotethyan rocks were thrust west across the Inthanon Zone during the Triassic plate collision, and these included mountain-size blocks of Carboniferous–Permian limestone interpreted as the cappings of former oceanic seamounts or plateaux. But beneath those allochthonous blocks the Sibumasu

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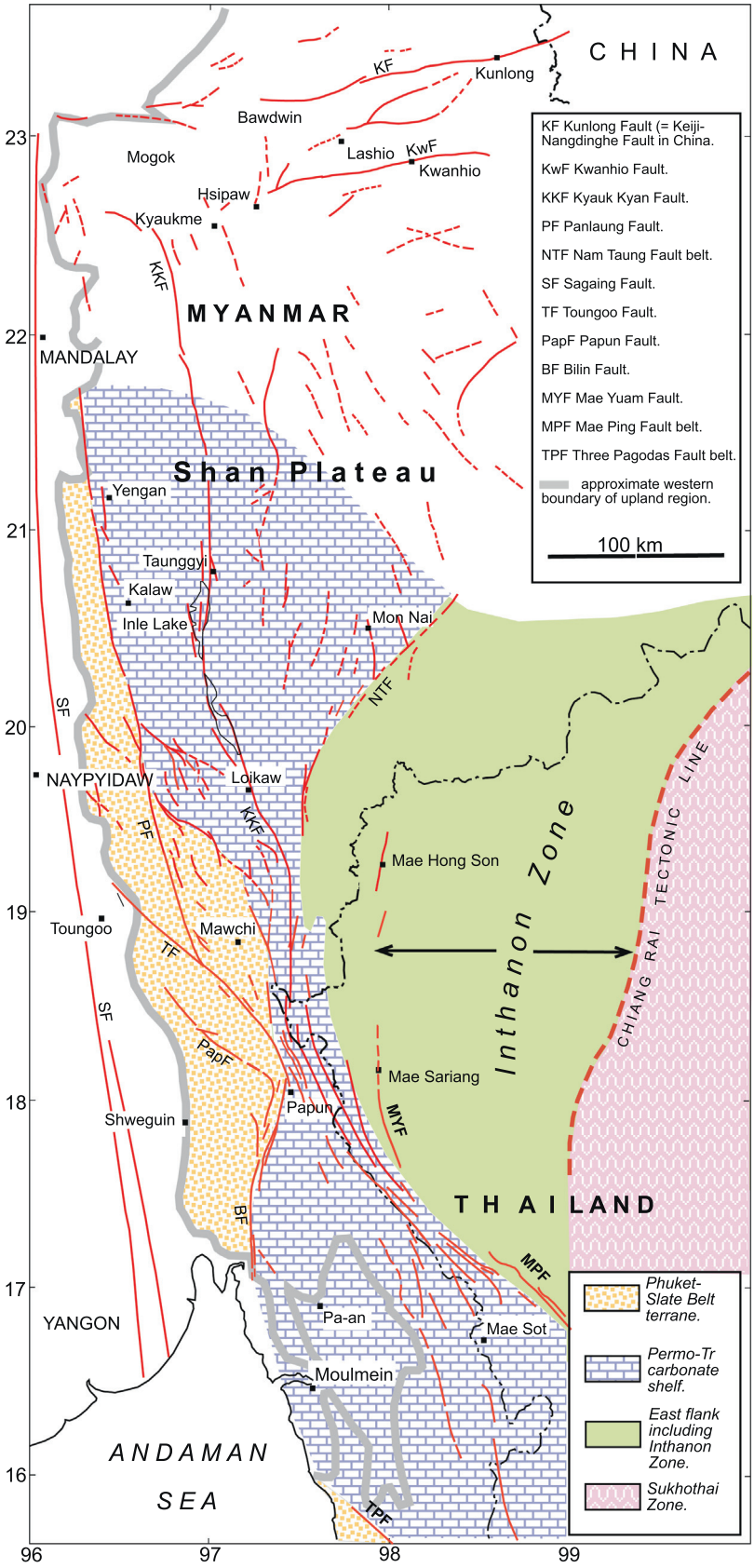

Fig. 1. NW Thailand and part of Myanmar, showing the tripartite division of the Sibumasu block: the Phuket-Slate Belt terrane in the west; the broad belt on which Permo-Triassic carbonate shelf sediments were deposited (which also extended westward over the Phuket-Slate Belt terrane); and the east flank of Sibumasu where the carbonate-shelf deposits have passed laterally to deeper-marine chert and terrigenous clastic sediments overlain east of the Mae Yuam Fault belt by allochthonous Palaeotethyan rocks (the Inthanon Zone). The Sukhothai Zone in the east is bounded by the Chiang Rai tectonic line 'cryptic suture'.