Control on Carbonate Sedimentation of Tacipi Formation, South Sulawesi, Indonesia

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South Sulawesi is located in the centre of a complex tectonic region where Indo-Australian, Eurasian and Pacific plates interact and collide. The Tacipi Formation (Fig. 1) was deposited during the middle Miocene to early Pliocene in an intra-arc or forearc setting. Facies distribution, diagenesis and hydrocarbon potential of these carbonate was strongly influenced by the tectono-stratigraphic setting, faulting, subsidence and relative sea level changes.

Interpretation of seismic data (Fig. 2), detailed facies mapping, logging and petrography has allowed differentiation of the carbonate deposits into three different regions; Northern Bone, Southern Bone and Western Bone regions. Outcrops of the Tacipi cover an area of 1,500 km2 and the thickness of the formation varies between 300 - 700 km. Subcrops of these carbonates also occur in the Sengkang Basin (Northern Bone Region) and form economic gas reservoir. Dominant lithologies within the formation include reef related facies (framestone, rudstone and floatstones), packstone and wackestone. These contain a wide variety of shallow marine bioclasts, such as corals, coralline algae, mollusc and large benthic foraminifera and planktonic foraminifera.

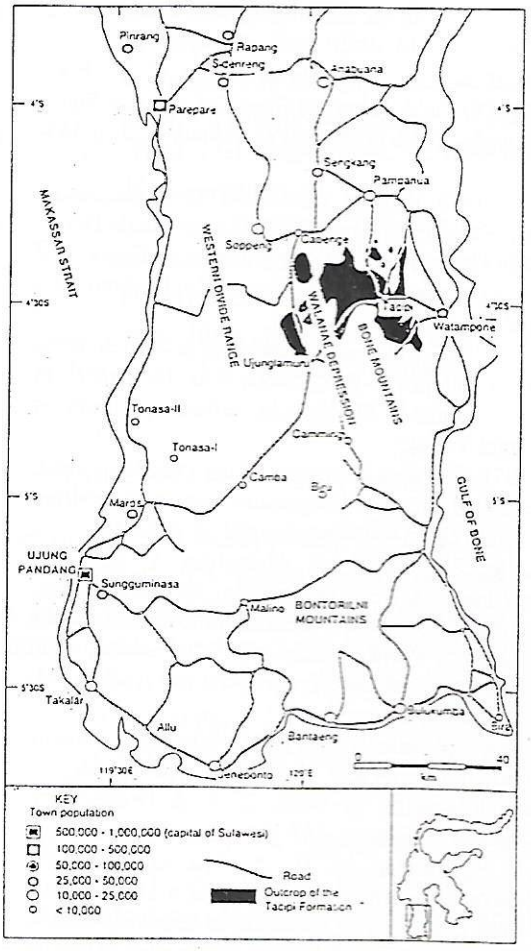


Fig. 1. The location of outcrops of the Tacipi Fm. in South Sulawesi (after Sukamto, 1982; Sukamto & Supriatna, 1982), road access routes are shown.

The northern outcrops of the Tacipi Formation consist of isolated knoll-reefs, mostly displaying a north-south trend, surrounded by deeper water facies (Fig. 3). These buildups are composed of deeper-water middle Miocene facies at the base and shallow upwards into late Miocene reef complexes with locally developed karstification. These outcrops are comparable with knoll-reefs forming gas reservoirs in the subsurface. However, differential subsidence resulted in variations in the time of drowning of these reefs. Outcrops of the Southern Bone region border the northern margin of the Bone Mountains and consists of Middle Miocene shallow water carbonate deposited in a shelfal setting. Normal faulting and the formation of an active graben system resulted in segmentation of the platform in the Southern Bone region in late Miocene times and the contemporaneous development of shallowing and deepening upward sequences. The Western Bone region lies to the west of the Bone Mountains and is characterised by the occurrence of edeposited facies containing reworked upper Cretaceous sandstones, Tertiary volcanics, Miocene carbonate clasts and unlithified bioclasts. The facies variations in these three regions indicate that tectonics and relative sea level changes strongly controlled the facies distribution.

See Fig. 3 in page 19

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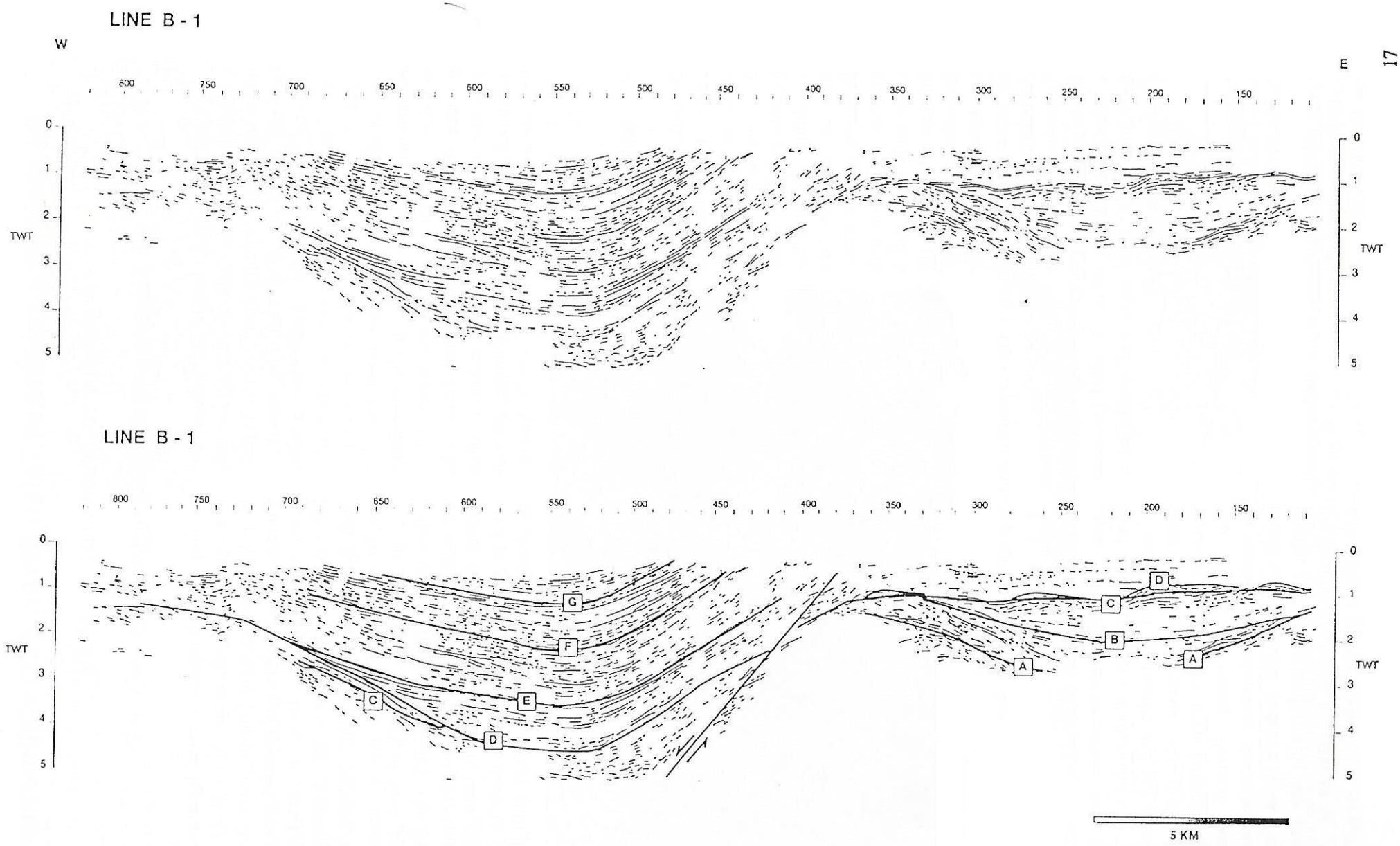


Fig. 2. The E-W seismic section across East Sengkang Basin showing a two type of basin. The major structural unit is normal fault which separated Sengkang Basin into East Sengkang Basin and West Sengkang Basin. The west Sengkang Basin is deep basin reaching more than 4 sec. depth whilst East Sengkang Basin is relatively shallow havinga depth of about 2 sec.