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## Tectonic evolution of accretionary prism in the arc–continent collision terrane of Taiwan

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### Abstract

The thick sedimentary and meta-sedimentary rocks west of the Eocene–Paleozoic metamorphic basement of Taiwan represent an accretionary prism developed between the Eurasian continent and the Philippine Sea plate. The accretionary prism consists of a subduction wedge in the east and a collision prism in the west. The deep-marine subduction wedge developed during the eastward subduction of the South China Sea oceanic crust since the Early Miocene. In the Central Range, a regional unconformity with mylonite structure occurred between the Miocene deep-marine slates-turbidites and the Paleozoic–Eocene metamorphic basement. The unconformity marks the tectonostratigraphic break between the overlying subduction wedge and the underlying underthrust Eurasian continent. The subduction wedge extends from the western Central Range southwards through the Hengchun Peninsula to the offshore Hengchun Ridge. Subduction of the South China Sea oceanic crust further led to the oblique arc–continent collision starting about 6.5 Ma in northern Taiwan. During the collision, the shallow-marine passive margin and foreland sequences were progressively incorporated to the collision prism by a series of west-vergent thrusts in the Hsüehshan Range and the Western Foothills. The Kaoping Slope west of the subduction wedge of the Hengchun Ridge represents the modern collision prism in the active arc–continent collision zone. The collision prism is juxtaposed against the subduction wedge to the east along the Lishan–Laonung–Hengchun fault, which extends offshore to the 30-km-wide fault zone between the Kaoping Slope and the Hengchun Ridge. Before the onset of the arc–continent collision, the Lishan–Laonung–Hengchun fault developed along the northern part of the proto-Manila trench and acted as the thrust front located to the west of the subduction wedge. At present, the thrust front has migrated southwestward to the west of the collision prism. The arc–continent collision propagated southwards and yielded the time-transgressive deformations from north to south to result a south tapering configuration of Taiwan. This paper is the first to recognize the consistent occurrence of the subduction wedge and collision prism onshore and offshore Taiwan. This allows reconstruction of the tectonic evolution of the accretionary prism during the subduction and collision tectonics of Taiwan.

**Keywords:** accretionary prism; arc–continent collision; Taiwan; Eurasian continent; Manila trench

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