

Normal faulting and structural analyses in eastern edge of Central Range in eastern Taiwan: an exhumed subduction fore-arc accretionary prism?

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Based mainly on field structural investigations and combing available geophysical, geochemical and geochronological information, this study intends to delineate the deformation structures and their implications for tectonic evolution in the schist/slate belt in eastern margin of the Central Range in eastern Taiwan, while exhumed rapidly after subducted (?) and collided with the leading edge of the NW-moving Philippine Sea plate and the Luzon arc subsequently. Field observations indicate that the slate belt (Xin-gao Fm.) in eastern edge of the Central Range shows a general shallow E-dipping main cleavage, in contrast to a W-dipping schistosity in the older and more deformed metamorphic schist belt (Tananao complex). In-between, the Yuli belt, a intensively sheared quartz-mica schist with some ultramafic bodies, which recently was interpreted as an exhumed subduction channel, represents the contact between the above two units. Brittle normal faults at outcrop scale were found in the Xin-gao slate Fm. that shows a E-W (NE-SW to SE-NW) extension, which seems to be consistent with the extension strain derived from GPS measurement as well as focal mechanisms of several shallow earthquakes in the eastern Central Range. As a result, we tend to interpret this E-W extension, which is either perpendicular or obliquely sub-perpendicular to the mountain belt, is provoked by rapid exhumation of the Yuli belt and the Xin-gao Fm since 15-18 Ma. Tentatively, we propose a geological/tectonic evolution model for reconstructing the development of deformation fabrics in space (i.e., the different rock units, Tananao complex, Yuli belt, and Xin-gao Fm) and time (i.e., from burial stage, to subduction, to exhumation).

Keywords: Taiwan, normal fault, Central Range, metamorphic fabrics