AOGS 2005


# Detachment faulting and unconformity in the Cretaceous forearc basin along with syn-subduction exhumation of blueschists (Hokkaido, Japan).

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We present the stratigraphy, clastic composition, and structure of a forearc basin deposits which record the unroofing processes of the 110-125 Ma blueschist facies subduction complex (Iwashimizu Complex: IWC). IWC is unconformably overlain by the 100-110 Ma deposits (Middle Yezo Group: MY) of the Yezo forearc basin sequence, suggesting its local exhumation within the forearc basin.

To the east (trench-side) of the unconformity localities, a conformable forearc basin suite from the basement (Lower Sorachi Ophiolite: LSO) via pre-unconformity deposits (Upper Sorachi and Lower Yezo Groups: US-LY) to MY structurally overlies the IWC equivalents. LSO and US-LY are mostly lacking around the unconformity. A mélange zone containing blocks of IWC, LSO, and presumable US-LY origin structurally overlies the IWC on the boundary between the "unconformable" and "conformable" areas. The MY unconformably overlies the mélange zones, or crosscuts the boundary faults between IWC and klippen of LSO or US-LY. There are gaps of metamorphic pressure between IWC (6-8 kb) and the overlying klippe and mélange blocks of LSO, (<3 kb) implying normal faulting.

Metabasite clasts originated from IWC and LSO are contained in the basal conglomerate of MY, which occurs as fluvial to marine fan-delta deposits, thin marine conglomerate rich in shell fragments (storm lag?), and thick graded conglomerate (gravelly turbidite). They also occur in the overlying sandstone member as clasts and blocks in pebbly mudstone beds (debris flow), and as sandstone intercalations in turbidite beds. Ubiquitous debris flow deposits suggest unstable slope environment just after the exhumation. The metabasite clasts are minor components, whose volume is insufficient for an erosion-driven exhumation.

The occurrences suggest that the forearc basin suit (LSO, US, and LY) were tectonically attenuated and mostly removed as IWC was being unroofed. The mélange probably originated from the major low-angle normal fault (detachment) for the unroofing, resulting in mixing of the footwall IWC and the hangingwall forearc basin rocks. This tectonic mélange, which resulted from exhumation, is distinguished from common subduction-related tectonic mélanges consisting of fragments of elagic and trench-fill sediments and oceanic basalts. The exhumation of IWC may have been driven (or resulted in) upper-plate extension during the subduction.