

## Mesozoic tectonics of South Korea implied from the structural elements and age constraints of the Bansong Formation

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The Late Triassic to Early Jurassic (?) Daedong Group of Korea has classically been used as a key sequence to defining the Middle Triassic Songrim orogeny and Middle Jurassic Daebo 'orogeny' (e.g. Kobayashi, 1953; Lee, 1987). The group consists of siliciclastic deposits formed in small-scale nonmarine basins scattered in the Korean peninsula, and contains pyroclastic rocks. Cluzel (1992) interpreted that the Daedong Group was deposited in half-grabens or pull-apart basins formed by right-lateral movement of northeast-striking transcurrent shear zones during the late stages of the Middle Triassic Indosinian tectonic event (corresponding to the Songrim orogeny). Despite its importance in understanding the nature and timing of Mesozoic tectonic events, there have been few studies on sedimentology of the Daedong Group and its basin-forming tectonics, and no attempt to determine isotopic age of the associated pyroclastic rocks.

The Daedong Group in the Taebaeksan basin of the Okcheon belt, the Bansong Formation, consists of conglomerate, pyroclastic rocks, sandstone, and shale (Kobayashi, 1953; Reedman and Um, 1975). The Bansong Formation occurs on the footwall sides of major thrusts (Deokpori and Gongsuweon thrusts).

Although the age of the Bansong Formation has been considered to be the Late Triassic to Early Jurassic (e.g. Kobayashi, 1953; Reedman and Um, 1975; Chun et al., 1994) or the Late Triassic to Jurassic (Chun, 2004) based on plant fossils, its precise age is still controversial.

Using the results of the structural analyses of the Bansong Formation and adjacent sequences, and SHRIMP (Sensitive High-Resolution Ion MicroProbe) U-Pb zircon age determination of tuff from the lower part of the Bansong Formation in the eastern Yeongweol area, the following conclusions were reached:

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**Key words:** Bansong Formation, SHRIMP U-Pb zircon age, Deokpori thrust, Gongsuweon thrust, Mesozoic tectonics of Korea

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1. Our SHRIMP U-Pb zircon ages ( $186.3 \pm 1.5$  and  $187.2 \pm 1.5$  Ma) of tuff from the lower unit of the Bansong Formation (a part of the Daedong Group) on the footwall of the Gongsuweon thrust in the Taebaeksan basin is the oldest Phanerozoic volcanic age identified so far in South Korea. It suggests that the Bansong Formation in the eastern Yeongweol area formed ca. 187 Ma (late Early Jurassic) and younger.
2. The Bansong Formation is interpreted to be deposited in the foreland basin of the Gongsuweon thrust developed in an intra-arc setting due to northwesterly orthogonal convergence of the Izanagi plate on the Asiatic margin from the Early Jurassic.
3. The depositional age of the Bansong Formation on the footwall of the Deokpori thrust in the eastern Yeongweol area should be different from that on the footwall of the Gongsuweon thrust since no pyroclastic rocks are involved.
4. The northeast-striking Deokpori (Gakdong) thrust is not an 'intercontinental' transform fault between the North and South China blocks as some geologists thought, but an 'intracontinental' thrust.
5. The Songrim orogeny resulting from the collision between the North and South China blocks ranges from the Late Permian to Late Triassic. This orogeny was followed by the Daebo tectonic event representing compressional deformation of supracrustal sequences in the Okcheon belt and the development of crustal-scale right-lateral shear zones in the continental-arc setting from the Early to Middle Jurassic.

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