

## Geochronological study of the Tetori Group and Motodo Formation in Ono City, Fukui Prefecture, Hida and Hida Gaien Belts

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**INTRODUCTION** Although the Tetori Group is very famous in Japan for dinosaur fossils, the scattered distributions of the group as well as the absence of key beds and scarcity of index fossils make it difficult to assign the precise age of each formation and to correlate formations and members between areas of distribution. The Motodo Formation, on the other hand, is composed mainly of red beds, and is different from the Tetori Group in lithology and distribution. However a conglomerate member of the Motodo Formation yields granadiorite clasts having CHIME zircon ages of 201±20 Ma and 202±30 Ma, indicating that the Motodo Formation is possibly correlated with some part of the Tetori Group (ca. 170-120 Ma).

**GEOLOGIC SETTING** The Tetori Group in the study area is divided into the Kuzuryu, Itoshiro, and Akaiwa subgroups in ascending order, and is distributed in the Lake-Kuzuryuko, Ishitoshirogawa-River, and Managawa-River areas of the study area. The following formations of the Tetori Group in the study area have been assumed to be of Jurassic from ammonoid fossils: The Kaizara (Bathonian-Callovian) and Yambarazaka (Oxfordian) formations of the Kuzuryu Subgroup in the Lake-Kuzuryuko and Ishitoshirogawa-River areas, and the Kamihambara Formation (Early Tithonian) in the Lake-Kuzuryuko area. The Tetori Group in the Managawa-River area is subdivided into the Kuzuryu and Itoshiro subgroups by Yamada *et al.* (1989), but the Middle Formation of the "Kuzuryu Subgroup" likely yields Early Tithonian ammonoid (Sato, T., personal comm. in Yamada and Uemura, 2008). The Motodo Formation belongs to the Hida Gaien Belt and is composed of the Nakajima Tuff Breccia, Wasadani Conglomerate, and Kumokawa Conglomerate members, in ascending order. The Wasadani Conglomerate Member yields granadiorite clasts mentioned above.

**SAMPLE AND METHOD** LA-ICP-MS, U-Pb zircon dating was carried out of a sandstone sample of the Itsuki Formation, occupying the upper part of the Itoshiro Subgroup in the Ishitoshirogawa-River area, a lapilli tuff sample of the Upper Formation of the "Kuzuryu Subgroup" in the Managawa-River area, and a tuff breccia sample of the Nakajima Tuff Breccia Member of the Motodo Formation

**RESULTS** The youngest U-Pb zircon age of the sample from the Itsuki Formation was 127.3±2.5 Ma (Barremian). The lapilli tuff sample from the Upper Formation of the "Kuzuryu Subgroup" in the Managawa-River area was dated as 126.3±2.8 Ma (Barremian). The Nakajima Tuff Breccia Member of the Motodo Formation was dated as 254.2±2.5 Ma (Wuchiapingian, Late Permian).

**DISCUSSION** From the geochronological data and previous studies listed above, the Middle to Upper Formations of the "Kuzuryu Subgroup" in the Managawa-River area can be correlated with the Kamihanbara to Itsuki formations of the Itoshiro Subgroup in the Lake-Kuzuryuko area. The Nakajima Tuff Breccia Member of the Motodo Formation is a product of 254.2±2.5 Ma (Wuchiapingian, Late Permian) volcanic activity, which is interpreted to have taken place along the island arc where the sedimentary complexes of the Akiyoshi and Ultra-Tanba belts were accreted.

Keywords: U-Pb age, zircon, LA-ICP-MS, Tetori Group, Motodo Formation