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宇奈月地域における U-Pb 地質年代図
U-Pb geochronological map of Unazuki area

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The Unazuki area, situated at the northeastern part of the Hida Belt, which is one of crucial sites for deciphering the Permo-Triassic orogeny in East Asia, has experienced the kyanite-sillimanite type metamorphism characterized by a clockwise P-T path. The Unazuki area is classified into the Hida gneiss region (Katakaigawa group), the Unazuki schist region (Unazuki group), and the Unazuki plutonic complex. Radiometric ages of the Unazuki schists, previously determined by Rb-Sr and K-Ar methods, are scattered from 248 Ma to 175 Ma primarily because of multi-phase metamorphism and deformation. Geochronological data for the Unazuki plutonic complex are limited. In this study, U-Pb geochronology of zircon and titanite was applied to the schists and the plutonic complex to discuss about timing of the kyanite-sillimanite type metamorphism and thermal history.

Protoliths of the Unazuki schists are sedimentary and felsic volcanic rocks. Probability of U-Pb data of detrital zircons in pelitic schist shows some peaks centered at 453, 365, 347, 320, 310, and 298 Ma, which suggests that protolith of the Unazuki metamorphic rocks were deposited after 298 Ma. U-Pb data of quartzo-feldspathic schist derived from felsic volcanics yield an eruption age of 258 +/- 2 Ma, indicating that regional metamorphism occurred after 258 Ma. On the other hand, U-Pb age of a granite in north part of the Unazuki area is 253 +/- 1 Ma. The granite contains some xenoliths of the Unazuki schist, in which staurolite is replaced by andalusite and cordierite due to thermal flux from granitic magma. Therefore, regional metamorphism occurred between 258 and 253 Ma, suggesting a rapid metamorphic progression. 251 +/- 1 Ma of gneissose quartz diorite containing the Unazuki schists supports the timing of the regional metamorphism.

The granite in central part contains Eoarchean-Paleoproterozoic zircon inheritance and shows 256 +/- 2 Ma, whereas that in south part is 250 +/- 1 Ma. Hornblende quartz diorite in central part yields 191.1 +/- 0.8 Ma, whereas biotite quartz diorite in south part is 275 +/- 2 Ma. Meta-gabbros in central part yield 260-256 Ma. Some parts of zircon in meta-gabbros were recrystallized at ca. 236 Ma.

Eboshiyama mylonite in the Katakaigawa group shows 250.0 +/- 0.4 Ma, which suggests that mylonitization of the Katakaigawa group occurred after the regional metamorphism of the Unazuki group.

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