



## **Detrital zircon U-Pb geochronology of the age-unknown quartzites in southwest Korea: Implications for paleotectonic configuration during the assembling of the East Asian continent**

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Detrital zircon geochronology is a powerful tool to infer depositional age and provenance of quartzites, because they are barren but generally contain zircons in spite of their mature composition. The Korean Peninsula comprises three major Precambrian massifs. In the southern Korean Peninsula there are twelve quartzite strata with depositional ages traditionally known to be ranging from Precambrian to Mesozoic. However, their stratigraphic significance is yet clear, partly due to lack of depositional age data and vague stratigraphic relationships with other strata. Among them two quartzite strata, the Hongdo and Yongamsan Formations distributed in the Yeongnam massif, were chosen for this study, largely because the depositional ages of these two formations may provide information related to the paleotectonic affinity of the Korean Peninsula during assembling of the East Asian continent. The Hongdo Formation is barren distributed in Hongdo Island, southwest Korea, and mainly comprises of quartzose sandstones. Its depositional environment is interpreted as a braided plain setting in a large alluvial fan system. Depositional age of the Hongdo Formation is still questionable although it is commonly regarded as of Mesozoic in age based on its lithology and depositional environment. The Yongamsan Formation is metaquartzite located in the southwesternmost part of the Korean Peninsula. It overlies Precambrian granite gneiss and is conformably overlain by upper Paleozoic strata. However, the depositional age of the Yongamsan Formation is still unknown. To infer the depositional age and provenance of the Hongdo and Yongamsan Formations, LA-ICP-MS U-Pb ages of detrital zircon grains were analyzed.

Among 300 Hongdo zircons analyzed, 184 grains yielded concordant or slightly discordant (<15%) ages ranging from Archean to Early Neoproterozoic (2752-879 Ma). The Hongdo zircons have major peak ages at ca. 1650, 1850, 2100, 2400, and 2650 Ma. Most zircon grains are older than 1600 Ma except for three grains and the Late Paleoproterozoic zircon grains increase at the expense of Archean to Paleoproterozoic zircons up sequence. The Yongamsan zircons yielded 21 concordant or slightly discordant ages out of 100 analyzed grains, showing major peak ages at ca. 1877 and 2539 Ma. Paleoproterozoic zircons occupy 80% of the detrital zircons of the Yongamsan Formation. Dominance of Archean and Proterozoic zircons in both the Hongdo and Yongamsan Formations indicates that their source region might have comprised of Archean to Paleoproterozoic rocks exclusively. The absence of Phanerozoic zircons in two formations suggests that the depositional ages of the Hongdo and Yongamsan Formations are probably prior to the Mesozoic, considering occurrence of relatively continuous magmatism in the East Asian continental margin throughout the Mesozoic era. Based on these data the paleotectonic affinity of the studied part of the Korean Peninsula will be discussed.