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Stratigraphy and age of stratiform manganese deposits in the Chichibu Belt, Japan

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The chert-hosted manganese deposits have been known to occur in the Triassic to Jurassic chert or chert-greenstone complex within a Jurassic accretionary complex, Chichibu Belt, southwest Japan. In order to reveal the specific age of the manganese deposits, this study investigated the occurrence and depositional age of the seven localities of manganese deposits (Taura, Tinu, Takahama, Kubodomari, Takahira, Kakinoo, Akimoto) in Saiki and Takachiho areas in the Chichibu Belt of eastern Kyushu.We also performed XRF analyses to infer the origin of manganese deposits.

Triassic and Jurassic radiolarian fossils were obtained from the 6 samples of the chert bed below the manganese deposits in the three localities (Takahama, Takahira, Akimoto). In Takahira locality, the manganese deposit occurs above the massive chert with akashiro silicastone. The red bedded chert above the manganese deposit yields radiolarian fossils such as; *Trialatus longicornutus* and *Poulpus carcharus*. These radiolarians show that age of manganese deposits can be correlated with the late Carnian age. In Takahama and Akimoto localities, the bedded chert above the manganese deposit is gray and occurs the Lower Jurassic radiolarian fossils (e.g., *Trillus elkhornensis* and *Tricolocapsa plicarum*). The XRF analysis revealed that the geochemical features of the manganese deposits in the study area is geochemically similar to the modern submarine hydrothermal manganese deposits. Consequently, manganese deposits in the eastern Kyushu were deposited by hydrothermal activity in an open-ocean setting around the late Carnian and Early Jurassic. The large volumes of flood basalts were erupted in the Carnian and Early Jurassic, and their ages are consistent with the depositional ages of the manganese deposits from the Chichibu Belt in eastern Kyushu.

Keywords: Chichibu Belt, stratiform manganese deposits, radiolarian biostratigraphy, Upper Triassic, Lower Jurassic, volcanic activity