Late Silurian and Early Devonian radiolarian assemblages from the Yokokurayama and Konomori areas in the Kurosegawa belt, Southwest Japan

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The radiolarian biozonations for the Upper Silurian to Lower Devonian in the Kurosegawa belt, Southwest Japan, were developed by Furutani (1983), Wakamatsu et al. (1990), Aitchison et al. (1996), and Umeda (1998b), based mainly upon the studies of tuffaceous clastic strata in the Yokokurayama and Konomori areas. However, the availability of only sparse data of latest Silurian to Early Devonian radiolarians in the 1990s has hampered age assignments of the radiolarian assemblages. In addition, since most information on radiolarians from this belt has come from spot localities with poor chronostratigraphic control, little is known about faunal transition during this time period.

We recognized three radiolarian assemblages (YK-1 to 3) from fine-grained portion of an alternating tuffaceous sandstone and mudstone sequence of the Nakahata Formation (Umeda, 1998a) in the Yokokurayama area. YK-1 is characterized by diverse species of inaniguttids with a large spherical outer cortical shell (200 to 300 μm), including *Oriundogutta* (?) *kingi*, *Zadrappolus yoshikiensis*, and *Fusalfanus* (?) sp. YK-2 contains *Praespongocoelia* (?) sp. and *Futobari* (?) spp., which are somewhat similar to *Futobari solidus* in their external appearances (but they differ from *F. solidus* in the cortical shell structure and spine morphology). YK-3 is characterized by the occurrences of some inaniguttids, small spherical radiolarians with short bladed spines, and *Deflantrica solidum*. Four radiolarian assemblages (KN-1 to 4) from felsic tuff and fine-grained portion of an alternating tuffaceous sandstone and mudstone in the Konomori area. KN-1 characteristically contains *Pseudospongoprunum sagittatum*. The species compositions of KN-2 and 4 are very similar to those of YK-2 and 3, respectively, and therefore they can be correlated each other. KN-3 is characterized by *Praespongocoelia robusta* and small spherical radiolarians.

The age of KN-1 is Late Silurian based on the occurrence of *P. sagittatum* (Noble, 1994; Umeda, 1998b). Considering the species composition of YK-1, characterized by large inaniguttids, this assemblage is also Late Silurian in age. In the previous study (Umeda, 1998b), the stratigraphic interval yielding YK-2 and 3, and KN-2 to 4 was subdivided into *Futobari solidus* and *Trilonche* (?) sp. A zones; however, YK-2, KN-2, and KN-3 contain no *F. solidus*. Recently, Late Silurian (Ludlovian) chitinozoans have been reported from the type locality of *F. solidus* (Ichinotani of the Yoshiki Formation in the Hida Gaien belt: Vandenbroucke et al., 2019). Therefore, the age of these assemblages is Ludlovian or younger. The palaeoscenidiid-dominated fauna (YK-3 and KN-4) is Early Devonian in age, based on the correlation with a similar fauna of the Hida Gaien belt (Sato and Kurihara, 2018 JpGU). The result of the present study suggests that a gradual faunal change from an inaniguttid-dominated fauna to a palaeoscenidiid-dominated fauna took place some time in latest Silurian to early Devonian.