

New localities of fossil cold-seep assemblages from the Pleistocene Otsuka Formation of the Nakatsu Group, central Japan

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We report two new localities of fossil cold-seep assemblages from the Pleistocene Otsuka Formation, Nakatsu Group, exposed along the northeastern bank of the Sagami River, Sagami City, central Japan. The Otsuka Formation is composed mostly of massive mudstones in which pumice-rich lapilli tuff beds (several cm to several dozen cm in thickness) and thin sandstone beds are intercalated.

Our new localities (Locs. 1 and 2) occur lucinid fossils in the massive mudstones associated sporadically with the authigenic carbonate concretions (several cm to several dozen cm in size). In Loc.1, scoria and pumice grains (0.5 to 2 mm in size) are scattered and lenticular fine grained sandstone, 7 cm in maximum thickness, is intercalated. The 17 large bivalve fossils, mostly articulated lucinids, occur sporadically in 0.4 m in height and 1 m in width of the outcrop. Most of the fossils are entirely dissolved in this locality. The commissure planes of articulated bivalves are arranged perpendicular to the bedding plane, with their umbos oriented upward. In Loc.2, scoria and pumice grains (0.5 to 2 mm in size), and granule-size pumice grains are scattered. The 42 articulated and disarticulated bivalve fossils, mostly lucinids, occur sporadically in 2 m in height and 1.2 m in width of the outcrop. Most of the fossils are entirely dissolved as well as in Loc.1. The articulated and disarticulated bivalve fossils are counted, respectively, 27 and 15 in numbers. The commissure planes of many articulated bivalve fossils are arranged perpendicular to the bedding plane, with their umbos oriented upward, whereas the commissure planes of disarticulated shells are arranged parallel to the bedding plane with convex-down (8 in number) and convex-up (4 in number) in positions.

Lucinids are known to live in their umbos oriented upward to the sediment (Stanley, 1970 ; Kondo, 1990 and Kanno, 1993). So that, the many articulated lucinid fossils reported herein are interpreted to be preserved in their life positions.

Keywords: Nakatsu Group, fossil cold-seep assemblage, Pleistocene