

Occurrence of *Calyptogena* and calcareous concretions from the Pliocene Urago Formation of the Kazusa Group at Ten-en, Kamakura

Kiminori Taguchi[1]; Ryuichi Majima[2]

[1] Kanagawa Pref. Mus. Nat. Hist.; [2] EdHS, Yokohama Natn. Univ.

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Fossil *Calyptogena* with methane-induced calcareous concretions are found as colonial occurrence in the Upper Pliocene Urago Formation of the Kazusa Group at Ten-en, Kamakura City, Kanagawa Prefecture. Very little has been reported about occurrence of the fossil *Calyptogena* at Ten-en, although it had been described by Shikama and Masujima (1969), Niitsuma et al. (1989) and Hirata et al. (1990). Two core samples are recovered from hard tuffaceous sandstone containing shells of *Calyptogena* at Ten-en: cores No.1 (25.5 m in depth) and No.2 (40 m in depth). They are bored normal to the bedding plane (strike N60 degree W, dip 15 degree N) and consist mainly of tuffaceous sandstone often showing cross-lamination, massive sandstone, pumiceous beds. Shell materials of *Calyptogena* are mostly dissolved away, then the fossils are remained only as molds, and occur in 0-3 m, 4.8 m, 7 m in core No. 1, and in 1.5-2.6 m, 3.5 m, 4-4.8 m, 6 m, 9 m, 11 m in core No. 2. Authigenic carbonate concretions are concordantly developed along the *Calyptogena* shells, that is, 0-6m, 7-10m in core No. 1, and 1.5-2.8m, 3.2-12.1m, 13-15.8m in core No. 2. The assemblage therefore distributes vertically to at least 11 m in core depth, and ranges at least 40 m in the north-south direction based on the field observations. Garnet-bearing tephra layers are discovered in cores depth 20.45 m (Core No. 1) and 22.4 m (Core No. 2), respectively. This tephra probably correlatable with the late Pliocene Mk 19 tephra in the Nakatsu Group, Aikawa Town, based on the chemical composition of the garnets.