

Sedimentological feature and occurrence frequency of deep-sea tsunamiites in the Miocene Morozaki Group, central Japan

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In the southern part of the Chita Peninsula, Aichi Prefecture, central Japan, the Miocene Morozaki Group is distributed. This group consists of predominant mudstones or muddy alternations, which were formed in upper bathyal environments (a few hundred meters deep). Among these mudstones, exceptionally coarse conglomerates including meter-scale boulders appear in the Tsubutegaura Shore near the tip of the Chita Peninsula. The conglomerate that includes the largest boulder of the shore is interpreted as a tsunamiite (Shiki and Yamazaki, 1996, *Sed. Geol.*, 104, 175-188).

The beds distributed in the Tsubutegaura Shore are divided into two blocks by a small fault; we term Block A (western part) and Block B (eastern part). The conglomerate mentioned above appears in Block B. In the present study, we investigated beds of Block A, in which coarse beds such as conglomerates appear likewise those of Block B.

The beds of Block A are about 30 meters thick. These beds are lithologically classified into two types; mudstones (Facies 1) and intercalated coarse (sands or gravels) beds (Facies 2). The coarse beds are supposed to be event beds which were formed by exceptional high-energy currents in deep-sea environments. These coarse beds are subdivided into two types; Facies 2a and 2b. The lithological facies in Block A are summarized as follows;

Facies 1: Mudstones with thin intercalations of very fine-grained sandstones. Trace fossils are common. This facies is interpreted as background sediments.

Facies 2a: A fining upward succession of conglomerate and overlying sandstone. The conglomerate is about 0.2 to 1 meters thick, and clast-supported. Angular, pebble to boulder grade gravels are common, and rounded gravels are rare. The sandstone is predominantly composed of medium- to coarse-grained sand.

Facies 2b: Medium- to coarse-grained sandstone which common includes very coarse-grained sand to pebble grade gravels, rare boulder-grade gravels. Some isolated gravels appear. The sandstone is less than 0.2 meters thick, and sometimes laterally pinches out.

Considering sedimentary environments (upper bathyal sea bottom) of the beds, storm surges are excluded from the agent that formed the beds. Possible agent is tsunamis. Tsunami events having formed the beds of Facies 2a are supposed to have been larger than those of Facies 2b.

Event beds such as Facies 2a or 2b are unevenly distributed in stratigraphical section of Block A. Facies 2a appears in the lowermost part (ca. 0m to 2m) and the uppermost part (ca. 27m to 30m) of the section. Facies 2b appears in the upper part (ca. 14m to 27m). On the other hands, the lower part (ca. 2m to 14m) is exclusively composed of Facies 1 (background sediments). Because Facies 2a and 2b are interbedded in Facies 1, sedimentary environments are supposed to have been constant during deposition of beds in Block A. Therefore, uneven distribution of Facies 2a and 2b in the section probably show long-term change of tsunami activity.

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