

An Example of Load Cast-like Structure in Bedded Chert from Chichibu, Japan

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Various sedimentary structures of bedded chert similar to those of ordinary clastic rocks have been reported (IMOTO and SAITO, 1973, IMOTO *et al.*, 1974; NISBET and PRICE, 1974; IMOTO and FUKUTOMI, 1975; SUYARI, 1976). SAITO and SEKINE (1976) described before small-scale penecontemporaneous deformation structures of bedded chert from Chichibu, Kanto Mountains. In many remarkably deformed bedded cherts of the Chichibu terrain, it is not always easy to distinguish the syn-sedimentary deformations from such deformations caused by tectonic movement as exemplified by fracturing and distortion in incipient stage of formation of tectonic lenses. One of the criteria to discriminate them is whether the deformations are confined to a single bed between undeformed beds or not. This paper principally concerns a load cast-like structure which was discovered in Hosokubodani, the upper course of Urayamagawa, Chichibu, Kanto Mountains (Fig. 1).

In an outcrop chert beds of 1–5 cm thick each are separated by shaly partings. Most chert beds are structureless by the naked eyes, though rarely showing fine parallel laminations. On the lower surface of the chert beds there are sometimes developed slight bulges or swellings varying from a centimeter to several centimeters across and from a few millimeters to a few centimeters in relief. The underlying thin shaly layers are distorted and bent downward, but appear not to be truncated by scouring. Those bulges or swellings resemble load casts of ordinary clastic rocks in shape. They can be distinguished from such flute marks as described by IMOTO *et al.* (1974) and also from the scour-and-fill structures by their external forms, by the irregularity of arrangement and by the absence of distinct up- and down-current ends. It is considered that those external structures are of primary sedimentary origin and formed on the shaly material when it was being still considerably plastic.

Siliceous organic remains and internal structure are not infrequently visible through the close inspection of the specimen etched by hydrofluoric acid. A cross section of the load cast-like structure is illustrated in Fig. 2. In this example, the siliceous organic remains in the lower part of the chert layer is a little coarser than that found in the upper

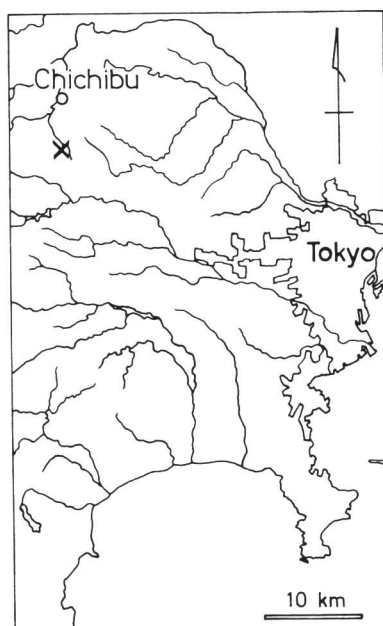


Fig. 1. Locality map

part. The deformation structures are developed exclusively within a single chert layer. Even in the single layer, it seems that the deformed lamina are covered directly by the overlying undeformed siliceous sediments. Faulting is restricted in the disturbed lower part of the chert layer and never extends into the overlying siliceous sediments. A small scale folding is confined in the central part of the load cast-like structure. These deformations seem to have been made at the earlier stage of consolidation after the deposition of siliceous material, probably due to some differential vertical movement or depression without any effects of slumping or other kinds of lateral displacement.

From the above-mentioned evidences it is concluded that the load cast-like structure in bedded chert is not a kind of sole-marking, scour-and-fill structure and filling up of channel, but a structure syn-depositionally formed by downward differential sinking.

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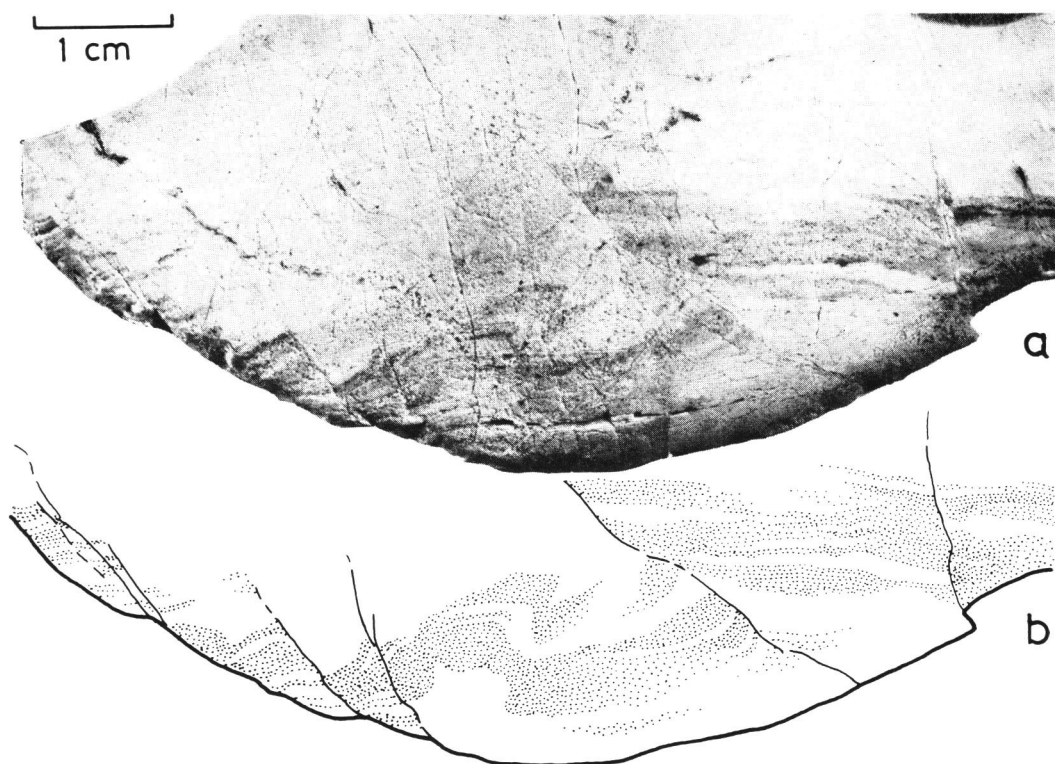


Fig. 2. Cross section showing the internal and external structures of the swelling on the base of the chert layer. Photograph of etched surface (a) and a sketch of its disturbed lower part (b)

