

Sediment wave formation on slope base environments: an example of the Neogene Aoshima Formation, Miyazaki Prefecture, Southwest Japan

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Sediment waves with a wavelength of a few hundred meters and an amplitude of a few meters are observed in a turbidite succession of the uppermost part of the Neogene Aoshima Formation, Miyazaki Group. Sediment waves, a type of large sedimentary bedform in deep-sea environments, are frequently observed on levees and in channels of modern, deep-sea floors, and shallow subsurface areas. The Aoshima Formation is suggested to have been deposited on a slope-to-basin area offshore of a fan delta. However, because a turbidite succession of the Aoshima Formation shows a rather monotonous, detailed, and precise depositional setting, the sedimentary waves have not been clarified. To clarify why the sediment waves were in the limited area and horizon of the Aoshima Formation, sedimentary logs were measured at turbidite successions, including upcurrent and downcurrent regions of the sediment waves. Also, the sedimentary logs were carefully correlated together and sedimentary facies of the succession were analysed. The results are as follows: (1) Sediment gravity-flow deposits of the sediment wave horizon have relatively variable thickness. Facies could only be traced between a few hundred meters, even though most sediment gravity-flow deposits of the Aoshima Formation can trace more than 10 km along the paleocurrent directions. In addition, sediment gravity-flow deposits in the sediment wave horizon can trace between the upcurrent and downcurrent sections, except for an interval of the sediment wave formation. (2) Rare, thick sediment gravity-flow deposits including slump-fold beds are observed just under the downcurrent area of the sediment wave horizon. (3) Sediment gravity-flow deposits overlaying the beds, including slump-folds, are relatively thicker than other areas. (4) Sediment gravity-flow deposits in the sediment wave interval show oblique paleocurrent directions against sediment gravity-flow deposits in the upcurrent and downcurrent regions. (5) Small-scale slumping deposits are located at the most downcurrent part of the sediment wave. Results (1) to (3) suggest that the sediment waves of the Aoshima Formation developed on an upcurrent area of a slope change-point near the slope base. Also, results (4) and (5) suggest that the sediment waves were in a depositional channel on the slope base.

Keywords: turbidite, sediment wave, Aoshima Formation