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Biostratigraphy and paleoceanography of the Japan Sea in Joetsu Basin since 120 cal. kyr BP

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In the Japan Sea, the Quaternary sediments are characterized by alternating dark and light layers that demonstrate different bottom water oxygenation. Biostratigraphy and paleoceanography of the Japan Sea around Joetsu Basin has been reconstructed in core MD179-3312 since 120 cal. kyr BP. Based on both benthic and planktonic foraminifera assemblages, the sequence of this core is divided into 7 biozones, Biozone 7 to 1, in stratigraphic ascending order.

The Biozone 7 (120-115 cal. kyr BP) is characterized by occurrence of *Globigerinoides ruber*, a marker species of warm surface water, and can be correlated with MIS 5.5. The Biozone 6 (115 to 25 cal. kyr BP) is divided into 5 subzone, Subzone 6-5 to 6-1, The Subzones 6-5, 6-3 and 6-1 are characterized by appearance of both suboxic and oxic species. It seems that during these periods the water oxygenation fluctuated between suboxic and oxic conditions from time to time corresponding to increase and decrease of nutrients supplied by low saline East China Sea Coastal Water through the Tsushima Strait. The Subzones 6-4 and 6-2 characterized by abundant occurence of suboxic to euxinic species such as *Brizalina pacifica*, *Stainforthia loeblichi* and *Nonionella globosa*. During these periods the deep-water oxygenation reduced by high productivity and low vertical mixing which is caused suboxic to euxinic conditions. The Biozone 5 (25 to 15 cal. kyr BP) characterized by the thin-laminated dark layers (TL-2), with high abundant of *Globigerina umblicata* and low or absent benthic foraminifera, corresponding to the sea-level drop below the sill depth of Tsushima Strait. The TL layers during this period represent euxinic bottom-water and the Japan Sea was nearly isolated from the open ocean. The Biozone 4 (15-11.5 cal. kyr BP) characterized by appearance of *Elphidium excavatum* which is a cool shallow-water species and shows the inflow of Oyashio Cold Water. The Biozon 3 (11.5-11 cal. kyr BP) is lithologically correlated with TL1 and characterized by high amount of *Brizalina pacifica* which is demonstrates suboxic to euxinic bottom water condition. The Biozone 2 (11-7 cal. kyr BP) is characterized by appearance of Pullenia aperture, low or absent of both benthic and planktonic foraminifera and indicates low saline condition. In the Biozone 1 (7 cal. kyr BP to recent) a warm-water species, *Globigerinoides ruber*, is found as in the Biozone 7. A drastic change of dominant species from *Globigerina bulloides* to *Neogloboquadrina incompta* in planktonic assemblage suggests the invasion of the Tsushima Warm Current (TWC) into the Japan Sea. The regeneration of deep water followed the initiation of the TWC inflow into the Japan Sea, and the modern Japan Sea Proper Water with high oxygen has been generated.