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Temperate coral reefs and coral communities and their recent changes

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Latitudinal gradients of coral reef geomorphology and coral communities are observed in Japan, as it covers a wide latitudinal range, stretching from subtropical to temperate areas. While the northernmost coral reef was found in Iki Island, Nagasaki Prefecture, coring and age determination revealed existence of a coral reef at a higher latitude, Tsushima Island (Yamano et al., 2012; Geology). The coral reef was composed of faviid corals, which shows substantial difference from coral reefs in tropical and subtropical areas with acroporid corals. Recently, settlement of warm-temperate species, Acropora solitaryensis was observed in the vicinity of the coral reef. Data mining of coral occurrence from the 1930s showed poleward range expansion of not only A. solitaryensis but also tropical-subtropical species, A. muricata, A. hyacinthus and Pavona decussata (Yamano et al., 2011; GRL). The maximum speed of the range expansions was 14km/year. Warming sea surface temperatures in the last century was attributed to the expansions. Corals are some of the world’s most important species, being not only primary producers, but also habitat-forming species, and thus fundamental ecosystem modification is expected according to changes in their distribution.

Keywords: coral, poleward expansion, global warming