The coastline of the Sea of Okhotsk, Hokkaido, is ideal habitat for the scallop Patinopecten yessoensis, and has supported important fisheries for this species since the early 1900s. Maximum annual production was 83,000 tonnes in 1934, although catch records dating back to 1920 show that these were 5–8-year cycles of good and poor harvests up to 1945. Thief fishing did not cut to 1945, although the resource normally recovered due to recruitment of a strong year class. However, rampant harvesting in the postwar decade (1945–1955) reduced annual production to ∼6,000 tonnes, where it remained for the next 25 years. Attempts to restrict harvest areas and seasons, prohibit certain types of gear, and introduce size limits during this period did not succeed in restoring the fishery (Uki 2006).

A distinct genetic stock around Hokkaido is considered to exist (Sato et al. 2005). Following the development of the technology, it became possible to culture scallops en masse in Mutsu Bay, Funka Bay, Sapporo, and the Saroma Lake areas using exogenous and plentiful juveniles. The increases in production of scallops in hanging culture were astounding.

Still, there are several concerns for the sustainability of the scallop aquaculture, including overfishing among the individuals derived from artificial seeds and genetic impact of stocked hatchery scallops on the natural populations. Several recent studies have begun to address these questions including genetic analyses of Japanese scallops using isozyme markers, mitochondrial DNA and a limited number of microsatellite markers (Ju et al. 2010).

There have been several studies carried out on genetic structure and diversity. Chang et al. (2013) studied the genetic diversity of five cultured and natural populations of Japanese scallops using microsatellites (DRA) markers. The five populations were from the enhanced fishery at Zhangji Island, the natural populations in north sea area of the Yellow Sea, a Japanese cultured population, an artificial population of Japanese scallops in north sea area of the Yellow Sea, and a Russian population and an albino population collected from Dachangshan Island. It was found that the difference in genetic diversity among the five populations was not significant. Harnett et al. (2013) studied the genetic diversity in two generations of cultured Japanese scallops from Daohar Island (China) and Tangshan Island (China) and one wild Japanese scallop population. The phenotype characters (shell length and shell height) of four F1 progeny populations were measured. No significant differences were found between different characters in four F1 progeny populations at different growth stages. The difference in genetic diversity among the four F1 progeny populations was not significant (Ando et al. 2013, Akinyi et al. 2014).

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