

3-1. Migration and Distribution of Salmon (Poster-10)

Nonrandom Distribution of Chum Salmon Stocks in the Bering Sea and North Pacific Ocean during Summer and Fall in 2002 to 2004

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Stock origin and ocean distribution of immature chum salmon in the Bering Sea and North Pacific Ocean were estimated by genetic stock identification (GSI) using mitochondrial DNA (mtDNA) single nucleotide polymorphisms (SNPs). The samples were collected by surface trawl during the Bering/Aleutian Salmon International Survey (BASIS) research cruise of R/V *Kaiyo maru* in the summer (late June and July) and/or fall (late August to mid September) of 2002 to 2004. More than 1,700 blood samples were collected on board from chum salmon in each year. These samples were used to extract DNA, and detect mtDNA SNPs for identification of haplotypes by the DNA microarray method. Stock contributions (Japan, Russia, or North America) of immature chum salmon were estimated with the obtained mtDNA haplotype data by a conditional maximum likelihood algorithm using mtDNA baseline data from 96 populations in the North Pacific Rim. Relationships between distribution pattern of specific stocks and sea surface temperature (SST) were examined by randomization test. The mixture samples of chum salmon were more than 97% immature fish in the fall of 2002 and 2003, whereas the occurrence of immature fish was less than 90% in the summer (80.2% in 2003 and 88.1% in 2004). Our genetic stock estimates suggested that immature fish were mostly of Asian (Japanese and Russian) origins, and were widely distributed in the surveyed areas (51°41'–58°30'N, 172°30'E–172°21'W of 2002; 52°33'–58°24'N, 174°41'E–170°34'W of 2003 summer; 52°30'–57°59'N, 174°49'E–170°17'W of 2003 fall; 52°58'N–57°58'N, 175°14'E–170°01'W of 2004) of the Bering Sea during summer and fall. Particularly, the Japanese stocks were predominant in the northcentral and northeast Bering Sea, and the Russian stocks were abundant in the western and southern Bering Sea. Although the North American stocks tended to increase in the eastern Bering Sea and around the Aleutian Islands, their occurrence was generally less abundant than the Asian stocks in the Bering Sea. The randomization test showed non-significant correlation between the stock distribution and SST. The present mtDNA microarray analysis suggests that the distribution pattern of each stock showed no inter-annual variation within the three survey years (2002 to 2004), and it was not significantly related with SST.