

Genetic stock identification of chinook salmon, *Oncorhynchus tshawytscha* (Walbaum)

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The Kamchatka peninsula is the only area in Asia, where Chinook salmon, *Oncorhynchus tshawytscha* (Walbaum), could be found. There are two big river drainages (Kamchatka River on the east coast and Bolshaya River on the west coast of the peninsula) with abundant populations of Chinook salmon, and a lot of small Chinook populations, inhabiting many other Kamchatkan smaller rivers. Using the starch gel electrophoresis technique, we studied the protein gene frequencies at approximately 70 loci in 14 collections from 7 rivers including the Kamchatka and Bolshaya Rivers. Thirty loci were found to be variable, others – monomorphic in Asian populations. The genetic diversity was highly significant within Asian region among Kamchatkan populations. The most extensive differences between populations of Kamchatka and Bolshaya Rivers were found at *ALAT**, *sAH1**, *sIDH2**, *mMDH2**, *MPI**, *mSOD1**, *TPI4**, *sME1**, *sME2**, *GPIA**. Within the same watershed we did not find the significant genetic differences, and also the spring and summer adult runs in Kamchatka River did not differ significantly. We revealed the great differentiation between Asian and American populations of Chinook salmon. The allelic frequencies at 24 loci were different among regional groups of Asia and North America (*sAAT1,2**, *mAAT1**, *mAAT2**, *ADA2**, *sMDHB1,2**, *PGM2**, *PEPLT**, *PEPD2**, *sAH**, *sIDHP1**, *sIDHP2**, *sAAT3**, *PEPA**, *PEPB1**, *sSOD1**, *TPI4**, *GPIB1,2**, *IDDH1**, *sME1**, *sME2**, *MPI**, *PGK2**, *PEPD2**, *FDH**). The *GPIB1,2**, *sMEP2**, *PEPA** and *sSOD1** loci were almost monomorphic in Asia and polymorphic in Northern America. The *IDDH1** locus, on contrary, was highly polymorphic in Asia while almost monomorphic in Northern America. There were significant differences between regional population groups in *ALAT**, *ADA2** and *TPI4** loci. The Asian populations were the most similar with north-western Alaska and Bristol Bay American populations, though there were some loci significantly different between those regional groups of populations (*sAAT3**, *sAH**, *IDDH1**, *sIDHP1**, *sMDHB1,2**, *MPI**, *PEPLT**, *PEPD2**, *PEPB1**). Thus, genetic differentiation affords excellent opportunities to discriminate Asian and American populations of Chinook salmon with high precision and accuracy.

In 1998–2000 the mixed-stock fisheries collections from catches in Russian EZ were analyzed using enzyme genetic markers. The predominant stocks were from north-west of Kamchatka peninsula, and also from Kamchatka and Bolshaya River drainages. From American stocks only Kodiak populations contributed more than 1% in the catches, but still the percentages were very low. They were found in catches in May and mostly in immature fish. In this group in May the contribution of Alaskan populations was about 25%.