

ON USING CRITERION OF "NUMBER SCLERITES FOR THE FIRST SUMMER
GROWTH ZONE" FOR DIFFERENTIATION OF ASIAN CHUM SALMON STOCKS

by

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ABSTRACT

The number of sclerites for the first summer growth zone ("summer sclerites") has been checked for seven general Kamchatkan populations of chum salmon. It has been proved, that scale samples from six among seven populations bear over 22 cc summer" sclerites. Thus, using criterion, on the basis of what chum salmon, having up to 22 "summer" sclerites, has had been reckoned as "northern" (relating to the north- west shore of the Sea of Okhotsk, Kamchatka, Northern Sakhaline, Central and Northern Kuril Islands) has been declined for identification of Kamchatkan population of chum salmon from marine catches.

Total reproductive abundance of native chum salmon Asian stocks, inhabiting continental rivers, Sakhaline and Kuril Islands, amounted 50-60 mln individuals until mid 1950s. Over recent 4 decades it had been reduced to 10-20 mln. Approximately that time there was launched creating the largest chum salmon stock, reared at the hatcheries on Honsu and Hokkaido, it being the abundance of reproductive stock about 70-80 mln individuals. Feeding areal of this stock had been spread far to the north, adjoining to the feeding areal of native Asian stocks. Perhaps it is the reason of reduction of weight and fecundity of the largest Kamchatcan chum salmon population from Kamchatka river (Zavarina, 1995).

In this view, for the purpose of estimation of interrelations between natural and artificial Asian chum salmon stocks we searched for reliable criterion in order to differentiate fishes from mixed marine catches. One of such criteria was "number of sclerites for the first growth zone" ("summer sclerites") (Kobayashi, 1961; Birman, 1968. Kovtun, 1983; Klovatch et al., 1996). Two relative types of scale, "southern" and "northern", had been distinguished accordingly to mentioned criterion. "Southern" type of scale was reckoned as having 23 and more summer sclerites. Populations, having this type of scale, originated from Japan, southern Sakhaline and Iturup. Populations with "northern" type of scale (related to Kamchatka, north-west shore of the Sea of Okhotsk and north-east Sakhaline) was reckoned as having under 22 summer sclerites. We had to study mentioned criterion for its fitness to identification of Kamchatka chum salmon populations in marine catches. For this purpose there was checked the number of "summer" sclerites for the first year of life up to a year winter ring for chum salmon representations from general fishery rivers on Kamchatka for 1993-1996. All data have been represented in the Table.

Table

Number of "summer" sclerites (M) for the first year of life in chum salmon populations from the rivers of Kamchatka

River	Age	1993	1994	1995	1996
		$\frac{M+m}{N^*}$	$\frac{M+m}{N}$	$\frac{M+m}{N}$	$\frac{M+m}{N}$
r. Kamchatka	3+	$\frac{23.23+0.35}{61}$	$\frac{23.06+0.38}{44}$	-	$\frac{24.06+0.42}{31}$
	4+	$\frac{22.59+0.32}{61}$	$\frac{22.91+0.28}{64}$	$\frac{24.23+0.21}{85}$	$\frac{23.45+0.41}{33}$
r. Khailulya	3+	$\frac{20.54+0.18}{80}$	-	$\frac{18.97+0.36}{33}$	$\frac{20.3+0.31}{43}$
	4+	-	$\frac{20.38+0.16}{83}$	-	$\frac{18.8+0.34}{33}$
r. Avacha	3+	$\frac{23.93+0.38}{42}$	-	-	$\frac{24.7+0.65}{27}$
	4+	$\frac{23.52+0.31}{56}$	$\frac{24.01+0.29}{91}$	$\frac{24.89+0.28}{79}$	$\frac{22.30+0.36}{39}$
r. Bolshaya	3+	$\frac{22.29+0.24}{84}$	-	-	$\frac{21.54+0.19}{69}$
	4+	-	-	$\frac{22.30+0.30}{57}$	-
r. Icha	3+	-	-	$\frac{22.87+0.34}{23}$	$\frac{20.90+0.29}{52}$
	4+	-	-	-	$\frac{17.90+0.39}{16}$
r. Khairuzova	3+	$\frac{23.31+0.26}{70}$	$\frac{24.29+0.28}{41}$	-	-
	4+	$\frac{23.72+0.38}{54}$	$\frac{22.60+0.28}{60}$	-	-
r. Vorovskaya	3+	$\frac{22.53+0.22}{72}$	-	-	$\frac{22.70+0.32}{28}$
	4+	-	$\frac{22.72+0.22}{75}$	$\frac{24.08+0.32}{39}$	-

N* - number of samples.

It is clear from this table, that the number of occurring summer sclerites (expressed in round numbers) averagely for different year amounts 22-24 in Kamchatka River representations, 19-20 in Khailulya River, 22 in Bolshaya River, 23-24 in Khairuzova River, 18-23 in Icha River, 23-24 in Vorovskaya River. As it follows from the table, chum salmon of most Kamchatka populations has average number of summer sclerites for the first year over 22.

Nevertheless, it is obvious from the table, that the number of sclerites for the first year varies significantly. For example, for Icha River it was 23 in 1995, also next year it was only 18. Hence, chum salmon, reproducing in Icha River, could be recognized as "southern" in 1995 or as certainly "northern" in 1996.

Adduced materials prejudice against using criterion of 'the number of summer sclerites for the first year of life' for differentiation of general Kamchatka chum salmon populations, which has been reckoned as 30% of total chum salmon stock in the Far East of Russia. Application of another complex criteria is much appreciable indeed.

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