

Scale Criteria Identify Chum Salmon, *Oncorhynchus keta* (Walbaum) Stocks in Gillnet Catches within Economic Zone of Russia

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In our study, stock identification of chum salmon was accomplished based on the scale structure criteria in the first year of growth according to techniques described by Davis et al. (1990) and Patton (1998). Fifteen variables were measured including: the number of sclerites for the first year of growth, the total radius of the first year growth zone, the total radius of the first year growth zone divided by two, the triplets of intersclerital distances from the first sclerite (six measures), and the retrospective triplets of intersclerital distances from the last winter sclerite of the first oceanic period of the growth (six measures).

The data baselines were created for the fish of 0.3 and 0.4 ages from the rivers of East and West Kamchatka, Sakhalin, Japan, and North America for the period of 1997–2000 (see Fig. 1 for location of sample collections). Scale samples were also collected from marine catches of chum salmon fisheries with the economic zone of Russia (Fig. 2).

Fig. 1. Sampling area of the chum salmon scale standards, used for the basis lines in 1997-2000: 1 – Kukhtuy River; 2 – Tauy R.; 3 – Nayakhan R.; 4 – Krutogorova R.; 5 – Kikhchik R.; 6 – Utka R.; 7 – Bolshaya R.; 8 – Tym R.; 9 – Kalininka R.; 10 – Tokushibetsu R.; 11 – Yurappu R.; 12 – Gakko R.; 13 – Tokachi R.; 14 – Abashiri R.; 15 – Avacha R.; 16 – Zhupanova R.; 17 – Kamchatka R.; 18 – Khaylula R.; 19 – Apuka R.; 20 – Yukon R.; 21 – Big Eddy R.; 22 – Kuskokwim R.; 23 – Nushagak R.

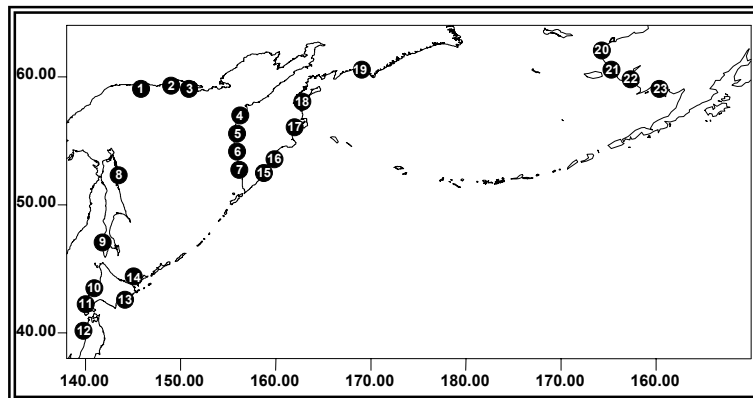
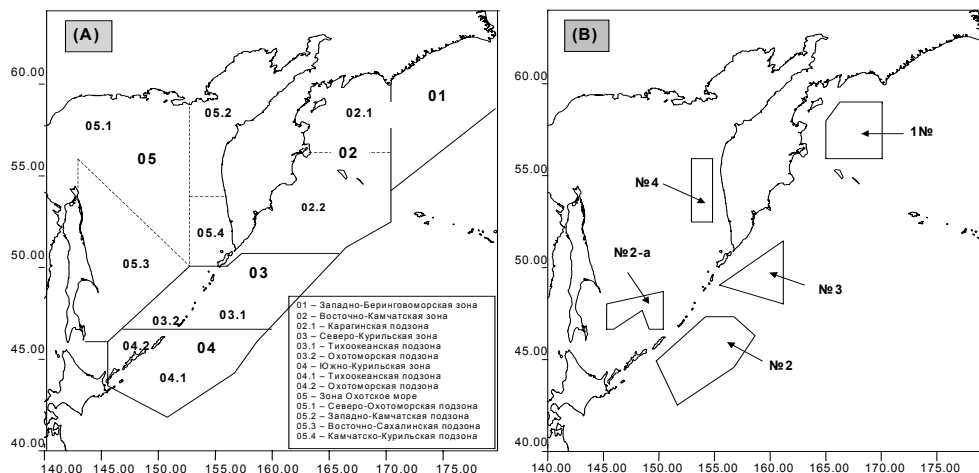


Fig. 2. The scheme of Russian (A) and Japan (B) gill-net fishery areas within Russian Federation economic zone.

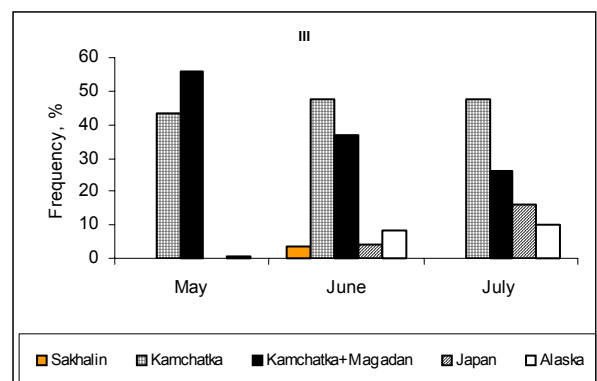
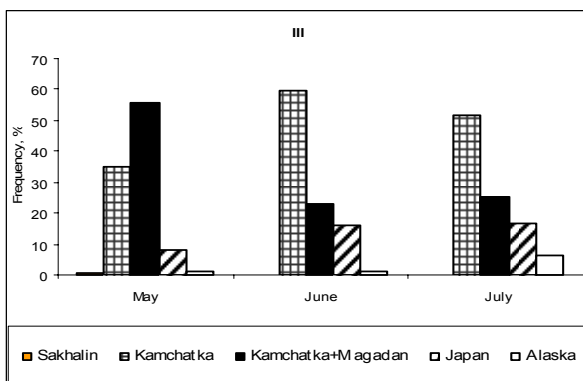
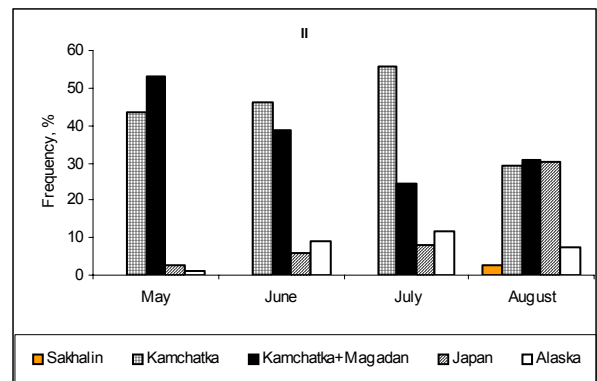
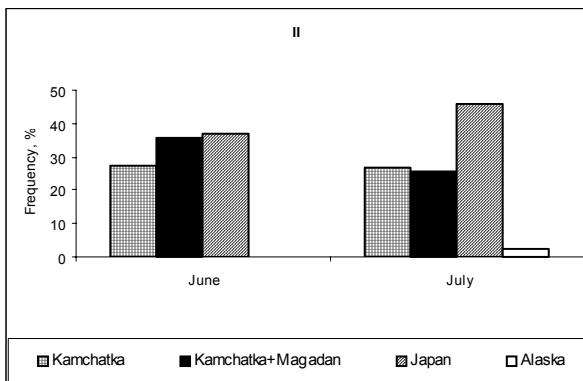
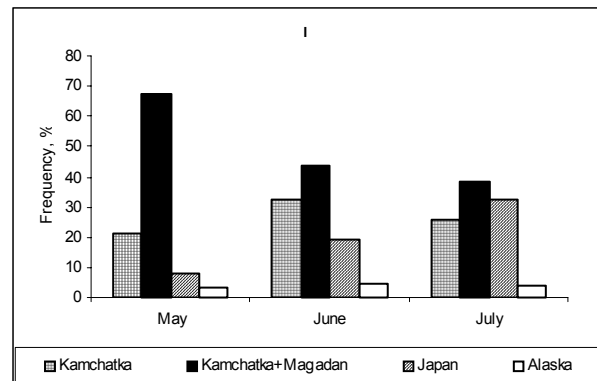
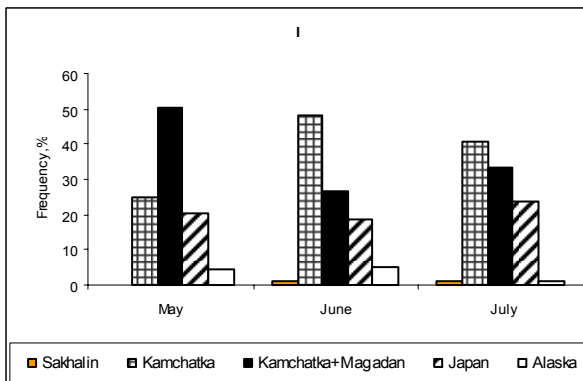


Cluster analysis revealed the substantial differences among regional groups of stocks such as West and East Kamchatka, Sakhalin, Magadan, Japan and Alaska. Russian stocks, mostly from Kamchatka and North Okhotsk Sea, dominated the catches in all years. North Okhotsk Sea chum salmon dominated in May. Later their percentage decreased while chum salmon from Kamchatka Peninsula dominated. The frequency of Sakhalin chum salmon was insignificant. Chum salmon originating from Japan were found in catches over the whole period of the fisheries, their frequency being largest in August. American chum salmon were found in the catches in small numbers.

Based on the frequencies of principal local chum salmon stocks in these gillnet catches, it is reasonable to conclude that stocks of North Okhotsk Sea and Kamchatka have the earliest run timing in the fishery. In May and June the contribution of these stocks was in range of 70–90% (Fig. 3, 4). Relative abundance of Japanese chum salmon for the same period was in range of 10–20% and increased during August. The distribution of stocks revealed by these scale criteria was similar to that described by genetic analysis (Varnavskaya, 2001).

Fig. 3. Frequency of the principal chum salmon local stocks in gill-net catches in Karaginskaya subzone - 61.02.1 (district N 1) (I), Petropavlovsk-Commanders subzone - 61.02.2 (II), Pacific subzone - 61.03.1 (district N 3) (III) in 1999.

Fig. 4. Frequency of the principal chum salmon local stocks in gill-net catches in Karaginskaya subzone - 61.02.1 (district N 1) (I), Petropavlovsk-Commanders subzone - 61.02.2 (II), Pacific subzone - 61.03.1 (district N 3) (III) in 2000.



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