

Body Size Variation of Juvenile Chum Salmon Collected From Three Coastal Areas of Hokkaido, Northern Japan

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For Pacific salmon *Oncorhynchus* spp., growth during coastal residency (the first few weeks after juvenile salmon enter the sea) is a critical factor for juvenile survival (Bradford 1995). Thus, many researchers have studied the growth of juveniles. Although individual growth rates can be estimated using scale and otolith analyses, body size is often used as a simple index of growth rate (e.g. LaCroix et al. 2009; Duffy and Beauchamp 2011). In some instances, such as when using historical data, the only available measure of growth may be body size. However, the size of juvenile salmon in a given area may not accurately reflect the growth rate because individuals that originate from rivers outside the area may migrate into it and be captured. Juvenile chum salmon *O. keta* increase in size throughout their oceanic migration (Mayama and Ishida 2003). Therefore, individuals growing outside an area and that had a longer coastal residency can immigrate into the area and cause an overestimation of chum salmon growth rate.

To evaluate the relationship between juvenile chum salmon body size and the river of origin, we compared the size of fish in samples collected from three areas off the coast of Hokkaido, northern Japan. We analyzed data from surface trawl surveys of chum salmon conducted in three coastal areas (Atsuta, Konbumori and Shari) from late March to mid-July, 1999-2010. Results showed the sizes of juveniles in the Konbumori area (annual mean fork length ranged 8-12 cm) were larger than fish collected in the Atsuta and Shari areas (annual mean fork length ranged 5-6 cm). Otolith analysis suggested that the large size of juveniles in Konbumori was due to immigration of large individuals originating from rivers located outside the area. Our results highlight the need to consider the migratory behaviour of individuals when considering the cause of body size variation in juvenile chum salmon.

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