Factors affecting somatic growth in juvenile Pacific halibut

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PURPOSE

To provide the Commission with a description of the studies conducted by IPHC Secretariat on factors affecting somatic growth in juvenile Pacific halibut.

BACKGROUND

The recent decrease in size-at-age (SAA) of Pacific halibut since 1990s, combined with low recruitment of cohorts spawned at the time of the initial decrease in SAA in the 1990s have contributed to a decrease in exploitable Pacific halibut biomass. Despite the importance of this decrease in exploitable biomass for fisheries management, our understanding of the potential causes for the historical change in SAA is still rather scarce. Changes in SAA in Pacific halibut have been hypothesized as being attributable to a variety of causes, including a fisheries-dependent effect through size-selective harvest, changes in population dynamics of the Pacific halibut stock due to a density effect, or changes in somatic growth as a result of environmental and ecological influences. Of the different possible environmental influences, temperature is believed to play a predominant role in influencing somatic growth in the Pacific halibut. Therefore, research activities at the IPHC in this area are devoted to further understand the potential effects of environmental conditions on somatic growth by evaluating the effects of temperature, among others, on spatial, temporal, and age-specific growth patterns in the Pacific halibut.

DISCUSSION

In order to provide information on the effects of factors that may influence growth in the Pacific halibut, the IPHC is engaged in research activities designed to develop and validate physiological tools for measuring and monitoring growth patterns. The strategy that was chosen initially involved the identification of potential molecular markers for growth studies by identifying genes expressed in growth-relevant tissues such as white and red skeletal muscle and liver. The second strategy involved the manipulation of growth rates in juvenile Pacific halibut by temperature manipulation. Through acclimation at a low temperature (2C), growth was suppressed, whereas through temperature-induced growth compensation, growth was stimulated, resulting in two opposite growth patterns (suppressed versus induced) that could be compared in order to identify those genes that respond to temperature and that, therefore, could be considered acceptable growth markers. This strategy has resulted in the identification of a large set of potential growth markers that could be useful for the detection of different growth patterns in the wild.

RECOMMENDATION/S

That the RAB:

1) **NOTE** paper IPHC-2018-RAB019-09 which outlined the studies on growth in juvenile Pacific halibut by IPHC staff.