サケの母川回帰を解明するバイオテレメトリー

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Abstract

One of the most interesting and challenging mysteries in the fish biology is the homing mechanism of salmon to migrate long distances from the open water to their natal river for spawning, but there are still many unknowns because the lack of a suitable model system to follow their whole life cycles, especially during the oceanic migration. In addition to chum salmon (*Oncorhynchus keta*) that migrate from the north Pacific Ocean to Hokkaido, lacustrine sockeye salmon (*O. nerka*) and masu salmon (*O. masou*) in Lake Toya, Hokkaido, Japan, where the lake serves as a model "ocean", offer good model systems for studying the physiological mechanisms of the homing migration in salmon. Three biotelemetry instruments (ultrasonic transmitter, electromyographic radiotransmitter, and micro-datalogger) have been applied to investigate the homing behaviors of mature chum, sockeye, and masu salmon. Since each instrument has great advantages and/or minor disadvantages, we are developing an automatic salmon-tracking robot boat consisting interrelated four equipment systems; a robot boat, an ultrasonic tracking system, a signal processing and control system, and a telecommunication system between a land base and the robot boat. These new biotelemetry technologies make it possible to clarify the physiological mechanisms of the homing migration.