

ζ -point against Tactile Stimulation and Its Effect to Forward Motion of Fish upon Contact with a Mesh [in Japanese]

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Abstract

Two series of glass-tank experiments with blinded fish were conducted to investigate the existence of a ζ -point (a body section over which external stimulation alters forward and backward motions of fish) against tactile stimulation and its effect in determining the direction of swimming upon contact with a net webbing. *Cyprinus carpio*, *Salmo mykiss*, *Tilapia mossambica* and *Lepomis macrochirus* were tested. Longitudinally random positions over the bodies of these fish were stimulated using thin sticks and they moved either forward or backward according to the location of the stimulated positions. *Cyprinus carpio* which encountered net webbing expanded in a tank proceeded into a mesh at different ratios under the conditions of three mesh sizes and three hang-in ratios. Geometrical analysis of contact of a netting twine and a fish body section indicated that the probability of proceeding into an encountered mesh increases with mesh size and is modally maximised at a certain hang-in ratio. It was concluded that, (1) a tactile ζ -point, ζ_t exists at a body section which is unique to each species, and (2) the probability for fish to proceed into a mesh of gillnet is affected by the position of ζ_t , body form and size, mesh size and hang-in ratio.