HISTOLOGY AND ULTRASTRUCTURE OF THE *ELASTIC SPRING APPARATUS* IN *ACANTHODORAS CATAPHRACTUS* (SILURIFORMES: DORADIDAE)

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Eight catfish families are known to have a group of morphological structures called *Elastic Spring Apparatus* (*ESA*). It is formed by the extremely flexible anterior branch of the fourth vertebra parapophyse (= *Müllerian ramus*), which ends in a vertical bony plate associated with the anterior part of the swimbladder; and by the protractor muscle which, according to the species, differs widely in origin, size and insertion. Different studies indicated that fast-contracting muscles show morphological adaptations. The present study aims to give an update on the morphological data concerning the protractor muscle in *Acanthodoras cataphractus* (Siluriformes: Doradidae), in order to infer its contraction capacities. Fibres of the protractor muscle differ from those of white and red muscles. They show an extensive development of the sarcoplasmic reticulum and have thinner myofibrils. These characteristics suggest the ability to contract fast and a great resistance to fatigue in comparison to white and red muscles. All these characters propose the protractor muscle is able to perform fast contractions, inducing rapid cycles of backward and forward motions of the *Müllerian ramus*, inducing sound production. However, the precise mechanism is actually unknown.

INTRASACCULAR INJECTION OF AMINOGLYCOSIDES: A NOVEL METHOD FOR TEMPORARY DAMAGING FISH INNER EAR HAIR CELLS

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Fish models are increasingly being used for hearing research investigations. Aminoglycoside antibiotics that are used for damaging the inner ear hair cells can have systemic side effects leading to death of study animals. This study aimed to compare two methods: i) systemic (intravenous) and ii) local (intrasaccular) gentamicin administration for induction of inner ear hair cell damage in the Atlantic cod, *Gadus morhua* (L.). Hair cell damage was assessed using scanning electron microscopy; hair cell density, prevalence of immature hair cells and kinocilia length were measured. Gentamicin-treated fish were compared with control and sham fish. Intravenous gentamicin led to dose-dependent mortality caused by nephrotoxicity. The only visible effect after treatment was more immature hair cells and shorter kinocilia, the effect on hair cell density was equivocal. Following intrasaccular gentamicin treatment, fish mortality was negligible, and hair cells were damaged regardless of dose. Here, we observed decreased hair cell density, high prevalence of immature hair cells, and significantly shortened kinocilia. Conclusion: intrasaccular injection is preferable to intravenous injection of gentamicin for the study of ototoxicity in the Atlantic cod.