

Identification of FXYD protein genes in two euryhaline medaka: tissue-specific expression and responses to salinity challenge

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For euryhaline teleosts that survive in a variety of habitats, it is important to maintain a stable internal environment. Upon salinity challenge, the Na⁺-K⁺-ATPase (NKA) of fish osmoregulatory organs such as the gill, kidney, and intestine is a primary driving force for many ionic transporting systems. Recently, the FXYD protein family was found to be the novel regulator of NKA. In mammals, FXYD proteins were consisted of at least seven members and characterized by a transmembrane domain and an extra-membrane FXYD motif, expressed in a tissue-specific fashion. The expressions and functions of FXYD proteins in mammals and sharks were widely studied, but few related studies focused on euryhaline teleosts. Hence we investigated the expression of the FXYD protein family of two euryhaline medaka (*Oryzias latipes* and *O. dancena*) in response to salinity changes. Seven isoforms of FXYD protein in two euryhaline medaka were cloned in *O. latipes* and *O. dancena*, respectively. Determined by the real-time PCR, mRNA expression of several *fyd* genes differed between freshwater- and seawater-acclimated fish, indicating significant roles for osmoregulatory adaptations. Future studies will focus on the molecular regulatory mechanisms of FXYD protein and NKA expression of euryhaline teleosts.