Changes of Na^+/K^+-ATPase isoform expression in gills and kidneys of euryhaline pufferfish (*Tetraodon nigroviridis*) acclimated to hypo- and hypertonic environments

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Na^+/K^+-ATPase (NKA) activity in osmoregulatory organs of euryhaline teleosts exhibited adaptive changes for sustaining osmotic homeostasis upon salinity challenge. Composed of α and β subunit, NKA is a primary active transporter protein ubiquitously expressed in animal cell membrane. NKA α subunit transports cations and couples active transport by hydrolysis of ATP. β subunit is necessary for functional stabilization of mature α subunit. Compositional changes in various α and β subunit isoforms is one of the regulatory mechanisms for alteration of NKA activity. In this study, we identified six NKA α- and β-isoforms from *Tetraodon nigroviridis* genome by bioinformatic tools, and named these isoforms based on the analysis of phylogenetic tree. Real-time PCR was subsequently used to examine the transcript expression of these isoforms in gills and kidneys of fresh water- and seawater-acclimated pufferfish. The results showed that expression of branchial α1a / α1b and renal α1a / α3a altered with environmental salinities. Among the β-isoforms, mRNA abundance of gill β1b and kidney β1a / β1c was salinity-dependent. Comparison of mRNA expression in osmoregulatory organs of all NKA α- and β-isoforms found in the pufferfish genome illustrated possible mechanisms leading to adaptive changes of NKA activity in this euryhaline model fish.