# Changes in NKA expression in Asian sea bass (*Lates calcarifer*) during salinity challenge

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**Abstract**

Asian bass, *Lates calcarifer* is one of the most valuable marine fish which is known as Barramundi in Australia. This fish is an important and commercial aquatic species of Southeast Asia, which is widely cultivated in Australia, Thailand and Indonesia. This species is resistant to salinity and water temperature changes, and can live in environments with different osmolality such as sea water, estuaries and fresh water. This makes it an ideal species for studying the effects of salinity on physiological responses. This study designed to evaluate the change in expression of $Na^+$-$K^+$ ATPase (NKA) and $Na^+/K^+/2Cl^-$ (NKCC) Co-transporter in gill tissue of Asian bass kept in a range of salinities including freshwater, 15, 35 and 50 ppt. Totals of 180 individuals were randomly distributed into 12 fiber-glass aerated tanks (volume 300-L). Persian Gulf water with salinity of 50 ppt was used in this study. Other salinities were

made by diluting seawater. Each treatment was done in triplicate. Fish kept in experimental salinities 7 days. At the end of period of study, fish were euthanized and gill tissue removed. The expression of mRNAs NKA and NKCC was measured in the gill. The U shape pattern for expression of NKA was recorded in this study, as the highest branchial expression of NKA was seen in 50 ppt, while its lowest expression was recorded in 35 ppt. NKCC expression showed a similar U shape pattern. Our findings showed that NKA and NKCC expression as major transporters of gill has the highest expression in unusual habitat and lower expression in the natural salinity of the environment.

**Keywords:** *Lates calcarifer*, Salinity, gill, NKCC, NKA