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Title: Cloning and Expression Profile of Arylalkylamine N-acetyltransferase-2 During the Spawning Season in *Boleophthalmus pectinirostris*

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关键词: 大弹涂鱼; 芳基烷基胺-N-乙酰转移酶基因亚型2; 克隆表达; 生殖季节

Keywords: *Boleophthalmus pectinirostris*; $aanat2$; cloning expression; spawning season

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摘要: 克隆获得编码大弹涂鱼(*Boleophthalmus pectinirostris*)芳基烷基胺-N-乙酰转移酶亚型2(arylalkylamine N-acetyltransferase-2,AANAT2)的cDNA序列,其核苷酸长度为630 bp,可编码209个氨基酸.运用实时荧光定量聚合酶链式反应(PCR)技术,检测了生殖季节大弹涂鱼脑组织中芳基烷基胺-N-乙酰转移酶基因亚型2($aanat2$)的月周期以及日周期的表达趋势.结果显示, $aanat2$ 基因具有明显的半月周期变化节律,即1个月有2个周期,每个周期均出现1个峰值.第1个峰值出现的时间在上弦月附近,第2次峰值则出现在下弦月附近,并且每个周期峰值出现的时间与大弹涂鱼产卵时间一致.此外, $aanat2$ 基因的表达在一天之内也呈周期性变化趋势,在12:00—15:00和03:00—06:00时,表达出现2段峰值;而在21:00和9:00时,表达量最低.本研究结果提示, $aanat2$ 通过影响褪黑素的合成和分泌,参与了大弹涂鱼半月周期产卵的调控.

Abstract: The mudskipper *Boleophthalmus pectinirostris*, a burrow-dwelling fish inhabiting intertidal mudflats, spawns around the first or last lunar quarter during the spawning season. To understand the involvement of arylalkylamine N-acetyltransferase-2 $aanat2$ in this semilunar spawning rhythm, we first cloned cDNA

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of *aanat2* from mudskipper in this study. The length of *aanat2* cDNA was 630 bp, encoding a polypeptide of 209 amino acids. Quantitative Real-Time PCR was used to detect the semilunar and daily expression profile of *aanat2* gene in the brain of mudskipper during the spawning season. The results showed that the transcriptional expression of *aanat2* in the brain of *B. pectinirostris* appeared to have a semilunar periodic rhythm with two peaks. The two peaks coincided with the timing of spawning in this species, the first peak was observed around the first quarter moon, and the second one around the last quarter moon. The diurnal expression of *aanat2* gene in the brain of *B. pectinirostris* changed at a certain level, with the two higher concentrations observed during 12:00-15:00 and 03:00-06:00, and the two lower ones at 21:00 and 9:00. These results suggested that *aanat2* may involve in the regulation of semilunar spawning rhythm in *B. pectinirostris* through mediating melatonin synthesis and secretion.

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