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多层抽屉式循环水幼鲍养殖系统及养殖效果

Recirculating aquaculture system with multi-layer drawer culture tanks for juvenile abalone and its effects

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中文摘要:

为了提高皱纹盘鲍的养殖效果,该文设计了多层抽屉式循环水养殖幼鲍系统,分析了养殖期间系统的水质指标和耗能量,及不同养殖密度下幼鲍的生长率和成活率。结果表明,该系统适宜的幼鲍养殖密度为150个/屉(70 cm×40 cm×10 cm/屉),为流水式养鲍密度的6~9倍。试验过程中水温、溶解氧、pH值、盐度、NH₄⁺-N和NO₂⁻-N指标均达到幼鲍生长条件,NH₄⁺-N和NO₂⁻-N体积质量基本稳定在0.023~0.065 mg/L和0.014~0.041 mg/L范围内。试验期间总耗电量为688.88 kW·h,其中海水加热占总耗电量19.62%,相当于每天1.287 kW·h耗电量,大约是流水式养殖加热耗能的1/7。该研究表明,多层抽屉式循环水养鲍系统是一种安全、高效、节能减排的养殖模式。该系统可供选择养鲍设施时参考。

英文摘要:

In order to improve the culture efficiency of disk abalone, *Haliotis discus hannai*, the recirculating aquaculture system (RAS) with multi-layer drawer abalone culture tanks (70 cm×40 cm×10 cm per drawer) were designed. The water quality parameters, energy consumption during experiment period, as well as the growth rate and survival of juvenile abalone in different culture densities were monitored. The results showed that the culture density for 150 individuals per drawer in the recirculating systems was appropriate, which was about 6-9 times of the flow-through systems. The temperature, dissolved oxygen, pH value, salinity, NH₄⁺-N and NO₂⁻-N were all maintained within acceptable ranges for the normal growth of disk abalone. The total NH₄⁺-N and NO₂⁻-N stabilized around 0.023-0.065 mg/L and 0.014-0.041 mg/L, respectively. The power consumption per day for heating was 1.287 kW·h, where the power consumption for heating sea water accounted for 19.62% of the total power consumption (688.88 kW·h). Compared with conventional flow-through system, it was only one-seventh of energy consumption for heating sea water. The study indicates that it is a kind of mode with the characteristics of safe, high efficiency, energy saving and low pollution for RAS with drawer-type culture tank for disk abalone culture. The results can provide references for choosing abalone culture devices.

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