Diel osmorespiration rhythms of juvenile marble goby (Oxyeleotris marmorata)

ABSTRACT

Oxyeleotris marmorata is an ambush predator. It is known for slow growth rate and high market demand. Farming of O. marmorata still remains a challenge. In order to establish a proper feeding practice to stimulate growth, knowledge of its metabolic processes and cost should be examined. Therefore, this study was designed to investigate the diel osmorespiration rhythms of O. marmorata in response to feeding challenge by using an osmorespirometry assay. The results have shown that oxygen consumption rate of the fed fish was approximately 3 times higher than that of the unfed fish in early evening to support specific dynamic action. Digestion and ingestion processes were likely to be completed within 18–20 h in parallel with the ammonia excretion noticeable in early morning. Under resting metabolism, metabolic oxygen consumption was influenced by diel phase, but no effect was noted in ammonia excretion. As a nocturnal species, O. marmorata exhibited standard aerobic metabolic mode under dark phase followed by light phase, with high oxygen consumption rate found in either fed or unfed fish. It can be confirmed that both the diel phase and feeding have a significant interactive impact on oxygen consumption rate, whereas ammonia metabolism is impacted by feeding state. High metabolic rate of O. marmorata supports the nocturnal foraging activity in this fish. This finding suggested that feeding of O. marmorata should be performed during nighttime and water renewal should be conducted during daytime.