Evaluation on the potential of betaine, taurine, nucleotide and nucleoside as feeding stimulant for juvenile marble goby Oxyeleotris marmoratus through behavioural assays

Abstract

This study was conducted to evaluate the potential of betaine, taurine, inosine (INO), inosine 5'-monophosphate disodium (IMP·Na2), and guanosine 5'-monophosphate disodium (GMP·Na2) as a feeding stimulant for juvenile marble goby (Oxyeleotrismarmoratus) (total length 6.6–8.5 cm) through behavioural assays using agar gel pellets. All fish were conditioned to accept agar gel pellet before the behavioural assays started. Each chemical substance was tested on 50 replicates of individual fish once, and the overall ingestion rate was calculated as the representative data. The pure agar gel pellet was totally rejected by the fish (0 % ingestion rate). Therefore, any added test substance which can significantly improve the fish ingestion of the agar gel pellet can be the potential feeding stimulant. Of all the chemical substances tested at 0.1 M concentration, the ingestion rates of both INO and IMP·Na2 were the highest (both 100 %) and were significantly higher ($P < 0.05$) than those of the other chemical substances tested. However, INO was identified as the most potent feeding stimulant as it could function perfectly (100 %) even at the lower concentrations tested (0.01 and 0.001 M). The ingestion rates of IMP·Na2 were found significantly decreased ($P < 0.05$) at the concentrations of 0.01 and 0.001 M (78 and 2 %, respectively). The ingestion rate of GMP·Na2 at 0.1 M was 60 %, hence higher concentration (>0.1 M) may be required to improve its efficiency as the feeding stimulant. Taurine was not a feeding stimulant, and betaine was neither a feeding stimulant nor feed enhancer for the juvenile O. marmoratus.