Natural spawning, embryonic and larval development of F2 hybrid grouper, tiger grouper Epinephelus fuscoguttatus × giant grouper E. lanceolatus

ABSTRACT

This study aims to reveal the first report of the natural spawning of F1 hybrid grouper (TGGG), a crossbreed between the tiger grouper, Epinephelus fuscoguttatus × giant grouper, E. lanceolatus, since its first production in 2006. This marks the completion of its full cycle after a 10-year period. In order to establish a seed rearing protocol for a novel F2 hybrid TGGG, natural spawning, embryonic and larval developments were thoroughly observed. Five batches of natural spawning were recorded with an average of 1.50–15.3 kg eggs collected, while fertilization and hatching rates were recorded at 85.3–97.6%, and 63.0–98.3%, respectively. F2 larvae hatched out at 17:50 hours with an average body size of 1.74?±?0.01 mm, and a yolk sac volume of 0.85?±?0.197 mm3. The first feeding was initiated 3 days after hatching, which coincided with the onset of functional feeding apparatus and active swimming behavior. Larval dorsal and pelvic spines were formed at 6 days AH coupled with dynamic feeding activity, as more food was found in the digestive tract. Meanwhile, the F2 hybrid grouper shifted habitat from pelagic to benthic as early as 25 days AH, and entered a juvenile stage at 35 days AH, attaining a skin coloration similar to that of the F1 juvenile. This study concluded that naturally spawned eggs of F2 hybrid TGGG were exceptionally high in quality, although larvae were small and fragile, and performed vigorous feeding activities and cannibalistic behavior. Thus, these findings can serve as primary data to further develop the optimal rearing protocol to enhance the overall rearing performance.