The effects of size grading and stocking density on growth performance of juvenile abalone, Haliotis tuberculataLinnaeus. Aquaculture

Author Yunus D. Mgaya, John P. Mercera

Abstract

The effects of size grading and stocking density on the growth of juvenile European abalone, Haliotis tuberculata L. (Gastropoda: Haliotidae) were assessed in the hatchery. Animals were held in cages deployed in a flowtray with recirculating seawater maintained at 18 ± 2 °C, and fed ad libitum on the red alga Palmaria palmata (L.) Kuntze. In the grading experiment juvenile abalone were divided into four populations consisting of small (mean ± s.e; initial shell length = 15.3 ± 0.15 mm; n = 35), medium (initial shell length = 19.6 ± 0.16 mm; n = 35), large (initial shell length = 23.8 ± 0.17 mm; n = 35) and an ungraded control group (16.8 ± 0.41 mm; n = 35). Rearing was carried out over a period of 226 days, after which it could be concluded that an advantage in overall growth performance had been gained by grading the animals. There was evidence that growth of small abalone improved in the absence of larger conspecifics.

In the stocking density experiment with two size grades and three stocking densities, a decreasing exponential relationship was found between growth (body weight and shell length) and stocking density, with a substantial amount of growth occurring at all densities. Final total biomass for both grades of abalone increased with density. For the smaller grade biomass gain increased as density increased. However, for the larger grade biomass gain declined at higher density. Overall mean survival (± s.e) was 98.3 ± 0.4% and was not influenced by density. It is suggested that the choice of stocking density is essentially a trade-off between maximum growth, optimal biomass gain, and economic considerations which may dictate densities that would result in a net reduction in overall production costs.

Key word Haliotis tuberculata; Size grading; Stocking density; Growth; Biomass-mollusc