

Taste component comparisons of single seed Pacific oysters collected in the first and the second harvest years in Nagasaki prefecture

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Abstract

We compared the taste components of Pacific oysters (*Crassostrea gigas*) cultured using the single seed method (single seed oysters) off the coast of Konagai (Nagasaki Prefecture, Japan) that were cultured for different periods. Single seed oysters that had been farmed up to the first harvest year (first-year oysters), the procedure typical in this area, and those that had been kept for an additional summer and into the second harvest year (second-year oysters) were compared. We analyzed taste components including free amino acids, ATP and related compounds, and glycogen levels in the oysters that were obtained in the different harvest seasons. The experiments were repeated at 4 different times between February 2013 and February 2014 because of chemical constituent fluctuations under various environmental conditions. First, we used 2-way ANOVA to analyze all groups of the data collected in the experimental replicates and then we independently evaluated differences between the 2 groups, first- and second-year oysters, using *t*-tests. The second-year single seed oysters showed significantly higher values of whole body weights and soft-tissue weights than those of first-year oysters. However, the soft tissue ratios, meaning soft tissue per gram of the whole body weight including the shell, were significantly lower in second-year oysters than first-year oysters, which suggested that second-year oysters had less edible contents. Significantly higher glycine, alanine, and serine levels were observed in first-year oysters than in second-year oysters, indicating that first-year oysters might be more sweet-tasting. In contrast, no significant differences in AMP, IMP, and glycogen levels were observed between the 2 groups of single seed oysters. Moreover, in a taste evaluation test of the 2 oyster groups performed in January 2014, different culture periods had little or no effect on taste, except for their better shape and larger size.

Keywords : Pacific oyster, single seed, taste components, free amino acids, sensory evaluation

I Introduction

Oyster cultivation in Japan conventionally uses a method in which many young oysters are attached to scallop shell platforms that are tied to a rope and then submerged in the sea¹⁻³⁾. In this conventional suspension method, the oysters grow and become overpopulated, causing them to form slender or warped shapes. In contrast, in the single seed cultivation method, oyster larvae are allowed to settle pieces of cracked oyster shells⁴⁾ or on plastic plates in a hatchery⁵⁾. Once they grow into small-sized shells (10-20 mm in shell length)^{5, 6)},

they are individually transferred into mesh baskets and raised in the sea. Using this method, oysters form round shell shapes that are desired by markets supplying oysters within shells, which are to be eaten raw. Because single seed oysters are said to be nutritionally rich and better tasting, their market prices are higher than oysters cultured using the conventional method⁷⁾. In a previous study⁸⁾, we reported that oysters cultured using the single seed method had greater levels of total free amino acids and taste-associated amino acids than those cultivated using the conventional suspension method.

Single seed oysters cultured off the coast of Konagai,

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