

Taste Compounds of Alaska Pollack *Sikhae* during Fermentation at Low Temperature Conditions

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Introduction

Fermented fish (*jeotkal*) has been used as a method of preserving perishable fish and marine products. Recently, however, high salted *jeotkal* (20% and more) has avoided from consumer by reasons of organoleptic quality (high salinity), health value (degenerative chronic disease), and hygienic safety. Among these *jeotkals*, meanwhile, *sikhae* (lactic acid fermented fishes) has been traditionally favored in the eastern coastal area of Korea, which contain below 10% of salt content with acidic range (pH4~5). Namely, the shelf-life of perishable fish can be extended by acid-fermentation with adding carbohydrates and low salt, comparing with adding salt (*jeotkal*) only. Therefore, a few studies were attempted in aspect of restoration of traditional *sikhae* in Korea.

The objective of this study was to analysis taste compounds of Alaska pollack *sikhae* during fermentation.

Materials and Methods

Making condition of *sikhae*: Alaska pollack *sikhae* was made from blending pan-dressed Alaska pollack with a vegetable mixture composed of cooked cereals (rice and millet; 1: 1 ratio, 19.0% to total weight), red pepper (7.0%), garlic (2.4%), ginger (1.4%), malt powder (3.8%), and sliced radish (19.0%). The mixture were packed into a glass gar for fermentation. The Alaska pollack *sikhaes* were fermented with 3 treatments; namely, control (C) was stored at 5°C after aging of 6 day at 20°C, A1 was stored at -2°C after aging of 6 days at 20°C (A1) and A2 was stored -2°C after aging of 2 stages followed by 6 days at 20°C and 7 days at 5°C in that order.

Non-volatile organic acids: Non-volatile organic acids were analyzed by a modified method of Lee et al. (1993) used for analysis of GC (HP 6890, Hewlett-Packard Co., USA).

Free amino acids: Free amino acids were determined according to a modified method of Lee et al. (1981). The free amino acids was quantitatively analyzed using amino acid analyzer (Biochrom 20, Pharmacia Biotech, USA).

ATP related compounds: ATP related compounds were determined by the method of Lee et al. (1984). A 5 µL of preparation was analyzed by HP1100 HPLC (Hewlett Packard, USA)

Ex-N, TMAO, TMA, and Total Creatinine-N: The Ex-N was determined by semi-micro

Kjeldahl method. The TMA-N, TMAO-N and total creatinine-N were measured using a spectrophotometer (Varian 634S, Palo Alto, CA, USA).

Results and Discussion

Among 7 non-volatile organic acids detected in Alaska pollack *sikhae* during aging, two acids, lactic acid and citric acid, were the major taste-active compounds which were composed of 95.7~98.2% of the total amounts. Amounts of 2 acidic amino acids, aspartic acid and glutamic acid, having a MSG-like taste, increased in A1 and A2 during fermentation, whereas amounts of those decreased in C after 25days. Levels of 4 amino acids, alanine, glycine, serine and threonine having a sweet taste, show a similar tendency with acidic amino acids. Especially, the total amounts of 7 amino acids, arginine, histidine, Isoleucine, leucine, methionine, phenylalanine and valine, having a bitter taste, increased with aging times in all samples and were composed of over 30% in total free amino acids in 79days. The total amounts of ATP related compounds increased about 1.7~1.8 times than before aging in all samples. Especially, the amount of hypoxanthin increased up to 90% of total ATP related compounds during aging. Total amounts of Ex-N increased to 1.43~1.96 times than before aging in C, 1.83~1.99 in A1 and 1.83~1.95 in A2, respectively. The Ex-N including free amino acid, ATP related compounds and total creatinine was supposed to have important role in taste of Alaska pollack *sikhae* from the analyzing results of taste compounds.

References

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