B - 2

Volatile Flavor Compounds in Seafood-like Flavoring Sauce

Hun Kim, Woo-Jin Cho,
Eun-Jeong Jeong, Young-Mi Lee and Yong-Jun Cha
Department of Food and Nutrition, Changwon National University

Introduction

As seafood processing by-products, various seafood processing waste wasters (SPWWs) are produced at seafood processing plants in Korea. However almost of them have been discarded without suitable application methods, although those have high contents of available compounds, such as protein, amino acids (Hang et al, 1980; Shiau and Chai, 1990). These discarded SPWWs might causes of marine environmental pollution and waste in aspects of potential food resources. Therefore, the development of seafood-like flavoring sauce was attempted from six SPWWs for the decrement of these problems by using various waste waters at the same time. The objective of this study was to identify and compare the changes of volatile flavor compounds among seafood-like flavoring sauces prepared with 4 processing conditions of different recipes using solid phase microextraction (SPME) method.

Materials and Methods

Materials: Six SPWWs including blue mussel cooker effluent (MCE), cockle shell cooker effluent (CCE), oyster cooker effluent (OCE), oyster shuckng water (OSW), squid cooker effluent (SCE) and anchovy cooker effluent (ACE), were donated from seafood processing plants located in southern area in Korea.

Sample preparation: After blending each material by 4.2 (MCE) : 4.2 (CCE) : 1.9 (OCE) : 0.1 (SCE) : 0.1 (OSW) : 0.1 (ACE) (w/w), this basic mixture was concentrated (up to Brix 35) by thermal treatment (85±1℃, vacuum status (680 torr) with the addition of xylose 0.75% (w/w) or/and gluten acidic ahydrolysate (GAH) 0.50% (w/w).

SPME method: The SPME fiber coated with 65 μm of polydimethylsiloxane /divinylbenzene (PDMS/DVB, Supelco Inc., USA) was used. Absorption of flavor compounds in headspace was conducted for 30 min at 45℃, and desorption was conducted at the GC injection port (220℃) for 5 min.

Gas chromatography/Mass spectrometry (GC/MS): HP 6890 GC/5973 mass selective detector (MSD) (Hewlett-Packard Co., USA) by splitless mode equipped with an HP-INNOWax capillary column (60 m length × 0.25 mm i.d. × 0.25 μ

m film thickness) was used. Oven temperature was programmed at 40℃ initially (5 min hold), increased to 220℃ (30 min hold) at a rate of 3℃/min.

Statistical analysis: Duncan's multiple-range test and Pearson's correlation analysis were conducted using the SPSS system (Statistical Package, SPSS Inc. USA) , and these were conducted at the 95% significant difference level.

Results and Discussion

A total of 84 volatile compounds were detected in all samples and consisted of 11 aldehydes, 7 ketones, 7 N-containing compounds, 10 acids, 19 esters, 15 aromatic compounds, 4 alcohols and 11 miscellaneous compounds. Among these, the compound groups significantly affected by addition of additives were aldehydes and acids. Pearson's correlation analysis between content of flavor compound and sensory score of odor was conducted to determine flavor compound having positive correlation with odor property of sauce. Four compounds such as 3-(methylthio)propanal, decanal, 3-(methyl -thio)propanol and dimethyl sulfide showed significant positive correlation with odor properties of sauce ($p<0.05$). These compounds increased with addition of xylose and gluten acidic hydrolysate (GAH) and may contribute to mild cooked flavor in sauce. Conclusively, the addition of xylose and GAH could induce the improvement of sensory quality in seafood-like flavoring sauce.

REFERENCES

Hang YD, Woodams EE, Parsons GF. 1980. Isolation and chemical evaluation of protein from clam wash water. *J Food Sci* 45: 1040-1044.

Shiau CY, Chai T. 1990. Characterization of oyster shucking liquid wastes and their utilization as oyster soup. *J Food Sci* 55: 374-378.

Cho SY, Joo DS, Park SH, Kang HJ, Jeon JK. 2000. Changes of taurine content in squid meat during squid processing and taurine content in the squid processing waste water. *J Korean Fish Soc* 33: 51-54.