

Taste-Related Amino Acid Analysis Using Phenylthiocarbamyl (PTC) in Scallop

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Published September 22, 2020

ABSTRACT

Scallops are consumed globally due to their good and distinctive taste. Particularly, scallops are popular and have high amounts of taste-related amino acids. The amino acid profile should thus be investigated as a significant amount of taste-related amino acids may be found in scallops. Currently, a specialized HPLC with a fluorescent detector is used for amino acid analysis but this method has its limitations due to its low flexibility and high operational cost. In this study, scallop-derived amino acids were derivatized to PTC-amino acids using phenylisothiocyanate (PITC) and analyzed for the taste-related amino acids using a versatile HPLC with a UV detector. I focused on glutamine acid, glycine, alanine, and arginine, as these are the major taste components in scallops. First, I examined 0.5 mM of each, as well as a mixed amino acid solution, and confirmed their detection times. Next, I examined scallop amino acid samples and compared them with standard solutions. For the PTC-amino acid derivatization, 70 μ L of ethanol, 20 μ L of trimethylamine, and 20 μ L of PITC were added to 40 μ L of sample solution and reacted for 30 min. Then, I added 500 μ L of 50 mM acetic acid buffer (pH = 6.0):acetonitrile (97:3) to the reaction mixture, filtered using a 0.22- μ m filter, and analyzed these samples using HPLC. The confirmed detection times for each sample are as follows: 4.2 ± 0.2 min (Glutamine acid), 7.2 ± 0.2 min (glycine), 8.4 ± 0.2 min (alanine), and 7.8 ± 0.2 min (arginine) both in separate and mixture solutions. These detection times were confirmed in both scallop samples. Therefore, I established an approach to determine taste-related amino acids in scallops using HPLC with a UV detector and derivatization to PTC-amino acids.

Keywords: Taste-related amino acid, Scallop, HPLC, UV detector, PTC-amino acids

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Citation: Seki H. (2020) Taste-Related Amino Acid Analysis Using Phenylthiocarbamyl (PTC) in Scallop. Food Nutr Current Res, 3(S1): 5.

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