

The structures, flavor-modifying effects, and CaSR activities of γ -glutamyl peptides comprising sulfur-containing amino acids were investigated. The chemical structures, including the linkage mode of the *N*-terminal glutamic acid, of γ -L-glutamyl-*S*-(2-propenyl)-L-cysteine (γ -L-glutamyl-*S*-allyl-L-cysteine) and its sulfoxide isolated from garlic were established by comparing their NMR spectra with those of authentic peptides prepared using chemical methods. Mass spectrometric analysis also enabled determination of the linkage modes in the glutamyl dipeptides by their characteristic fragmentation. In sensory evaluation, these peptides exhibited flavor-modifying effects (continuity) in umami solutions less pronounced but similar to that of glutathione. Furthermore, the peptides exhibited intrinsic flavor due to the sulfur-containing structure, which may be partially responsible for their flavor-modifying effects. In CaSR assays, γ -L-glutamyl-*S*-methyl-L-cysteinylglycine was most active, which indicates that the presence of a medium-sized aliphatic substituent at the second amino acid residue in γ -glutamyl peptides enhances CaSR activity.

Structural analyses and taste evaluations of γ -L-glutamyl-*S*-(2-propenyl)-L-cysteine and its sulfoxide isolated from garlic and related peptides were performed using authentic chemically synthesized samples.