葡萄糖胺與麩胺酸鈉衍生物抗菌活性之研究

Studies on the Antibacterial Activity of the Derivative from Glucosamine and Monosodium Glutamate

中文摘要

葡萄糖胺是一種胺基糖，存在於脊椎動物組織的多醣中，同時也是幾丁質的主要組成成分。它具有抑制腫瘤之作用，同時亦被廣泛地被用來治療骨關節炎。麩胺酸鈉是味精的化學名稱，是一種非必需的胺基酸—麩胺酸—的鈉鹽。它是一種人工調味料，可以改變菜餚之口味，廣爲日本、台灣及東南亞地區之家庭所使用。本論文於實驗中證明，原本不具抗細菌能力之麩胺酸鈉及葡萄糖胺，經過混合並於高溫高壓下，能夠生成可抑制革蘭氏陽性菌及陰性菌生長之衍生物，其最小抑菌濃度值介於每毫升 1.25 到 2.5 毫克。然而，本衍生物在此濃度對鼠纖維母細胞亦具有細胞毒性。因此，如何純化並利用此衍生物之抗菌能力同時避開其細胞毒性，或是以其他胺基酸取代麩胺酸鈉作爲實驗之標的物，將是下一步值得探討之課題。同時，本論文亦提出於烹調食物時，必須注意同時添加味精及葡萄糖胺會產生毒性物質之可能性。

英文摘要

Glucosamine is an aminosugar. It occurs in many polysaccharides of vertebrate tissues and is also a major component of chitin. It can inhibit the growth of tumor cells, and is used extensively to treat osteoarthritis clinically. Monosodium glutamate is a sodium salt of a non-essential amino acid, glutamate. It improves the flavor of food, and is mostly used by the families of Japan, Taiwan and Southeast Asia. In this thesis, we prove through experiments that after the combination under high temperature and pressure, these non-bacteria-inhibiting chemicals can form a derivative that is capable of inhibiting the growth of both Gram positive and negative bacteria. The minimal inhibitory concentrations are between 1.25 to 2.5 microgram per microliter. However, this derivative also shows cytotoxicity to rat fibroblast. How to take advantage of this new derivative to fight against bacteria and avoid its cytotoxicity will be the issues to be explored. In the meanwhile, we also propose the possibility of producing a toxic substance during cooking with the addition of both monosodium glutamate and glucosamine