蜂膠中酚類化合物之組成與特性

Composition and characterization of propolis polyphenols

林文華

[摘要]

中文摘要

本研究發現蜂膠組成因來源不同有很大的差異。蜂膠乙醇萃取液中酚類化合物含量以大陸地區之蜂膠較多, 聚合型單寧則以巴西蜂膠產地含量最高, 類黃酮與 CAPE 之含量則差異較大, 含量分別介於 0.22~12.52 mg/ml 及 0.21~5.59 mg/ml, 市售蜂膠商品則以聚合型單寧及類黃酮含量較高。蜂膠乙醇萃取液所含之酚類化合物有 70%是簡單酚類, 其次為水解型單寧, 而非單寧性黃烷含量低, 除少數蜂膠原塊外, 聚合型單寧含量並不高, 而蜂膠水萃液中, 主要為簡單酚類及非單寧性黃烷, 其次為水解型單寧, 而聚合型單寧含量最少。蜂膠酚類化合物之相對聚合度在 84~133%之間, 經膠體過濾層析及粒徑排除層析可知蜂膠分子量分佈相當集中, 顯示蜂膠中酚類化合物分子之大小差異不大。本研究利用薄層層析區分蜂膠中之酚類化合物, 並以亞麻油酸之氧化, 評估其抗氧化能力, 發現以 SPOT5(Rf0.32-0.39) 最具抗氧化性, 其次為 SPOT 1(Rf0.08-0.11), 由高效能液相層析之結果可知, 蜂膠中具有抗氧化性的酚類物質,涵蓋高極性與中極性之物質, 顯示蜂膠中可能含有數種以上具抗氧化 性之酚類化合物。蜂膠揮發性成份分析結果中得知蜂膠之香味組成隨產地有很大差異性, 而主要化合物揮發性物質是 terpene 類之化合物(如:alpha-pinene)所組成, 而酚類化合物亦有貢獻。

關鍵字: 蜂膠 propolis
酚類化合物 polyphenolic
膠體過濾 gel filtration
抗氧化性 antioxidation
薄層層析 thin layer chromatography
高效能液相層析 High performance liquid chromatography

[摘要]
Astract
Results showed that great difference among propolis of different regions. Ethanolic extract of propolis contained much higher levels of phenolicsthan the aqueous extract. The Chinese propolis were found pasundant in total phenolis. The content condensed tannin were higher in Brazil propolis thanthe others. The contents of flavonoids and CAPE varied in the range of0.22-12. 52mg/ml and 0.21-5.59mg/ml respectively. Commercial propolis exhibitedhigh levels of condensed tannin and flavonoids. Simple phenols is the maior phenolics of propolis, followed by hydrolyzable tannin, non-tannin flavansand condensed tannin. Simple phenols and non-tannin flavans were also themajor one of the aqueous extract of propolis ,followed by hydrolyzable tanninand condensed tannin. The relative polymerization of phenolics was in therange of 91-133%. The same results were also found by gel filtration in SephadexLH-20 gel and size exclusion in HPLC.TLC was used to separate the phenolics of propolis, and linoleic acid was used to evaluate the antioxidative abilityof separated ones. Results showed that spot 5(Rf=0.32-0.39) exhibited great antioxidation, followed by spot 1(Rf=0.08-0.11). The above separated spots were analyzed by HPLC. Each spot contained compounds of high and middle polarity. It seems that there were some antioxidative phenolics inpropolis. In the volatile materials analysis, the volatile matters varied withdifferent propolis sources. Terpene were the major volatile subjects. And phenoliswere included in the volatile materials.