蜂膠原膠及市售產品之品質分析與抑菌活性

Quality Analysis and Antimicrobial Activity of Crude Propolis and Commercial Products

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[摘要]

蜂膠為一多源性物質，是經由蜜蜂採集利用樹脂、膠質、蜜蠟、花粉、精油等混合而成的動植物衍生物。早在西元前，蜂膠已被民間作為醫療上的用途，近期諸多研究報告已證實其具有抗細菌、抗真菌與病毒、局部麻醉、抑制潰瘍、激發免疫力及降血壓等功效，而此等具價值性的特質，係由其中之化學組成所賦予，包括脂肪族酸、酚酸及其衍生酯類、芳香族醛類、醇類等，以及已被證實存於蜂膠中的多種類黃酮化合物。本研究取 6 種不同來源的蜂膠原膠與 16 種市售蜂膠產品，進行各項物理特性、化學成分與活性成分之品質分析，進而測定其抗生能力。物理特性分析包括水活性、色澤及熔點的測定；化學成分分析包括灰分、蜂蠟、樹脂、不純物與 95%乙醇萃出物含量的測定與濾紙擴散試驗；活性成分分析則包括蜂膠之總類黃酮和總酚類含量的測定，並以薄層色層分析(TLC)與高效能液相層析 (HPLC)予以定性定量；抗生能力方面，包括最低抑菌濃度(MIC)的測定與不同蜂膠含膠量抑菌試驗等。研究結果顯示，蜂膠原膠之水活性 Aw 值介於 0.45~0.90，色澤分析顯示出其色彩差別感上有明顯差異，熔點介於 63~94℃間，原膠之蜂蠟平均含量為 25.12%，市售產 品含量介於 0.24~64.19%，原膠之不純物及 95%乙醇萃出物平均含量分別為 15.24％與 63. 24％，蜂膠市售產品則分別介於 0.87~32.98%與 53.15~98.81%間，原膠之樹脂與膠質平均含量為 26.1％，市售含量介於 2.88~79.92%，原膠之灰分平均含量為 7.00％，濾紙擴散試驗則無法推斷其有效成分之含量。原膠之總類黃酮平均含量為 7.80％，市售產品介於 0.79~ 14.88％，原膠之槲皮酮平均含量為 1.38％，市售產品介於 0.04~0.49％，原膠之總酚類平均含量為 6.77％，市售產品介於 0.46~6.27％，利用薄層色層分析可簡易定性部份蜂膠中之阿魏酸及槲皮酮等成分，在抗生特性上枯草桿菌對蜂膠的敏感性顯然優於金黃色葡萄球菌，抑菌作用非常明確，顯示蜂膠之抑菌性極佳。

關鍵字: 蜂　　膠 propolis
成分分析 composition analysis
活性成分 active compositions
抗生能力 antimicrobial ability

[摘要]

Propolis is a heterogeneous material composed of really complexsubstances, includes resins, balsams, beeswax, pollen, essential oils , gathered bybees. Propolis is known to have been used in old folk medicine as early as 300BC. Recently, it was reported to possess antibacterial, fungicidal,antiviral, local anaesthetic, antiulcer, immunostimulating and hypotensive activities etc. These valuable properties of propolis are created by its specialchemical composition, fatty and phenolic acids and their esters, aromatic aldehydesand alcohols etc., as well as a large number of flavonoid compounds, were identified. The objectives of this study were to analyze the physical characteristics, chemical and active compositions and to approve the antimicrobial ability of 6 crude propolis from different source and 16 commercial products. The physical characteristics analysis includesdetermining of water activity, color and melting point. The chemical compositionanalysis of includes determining of ash, beeswax, resin concentration, impurity, 95 ％ethanolic extracts and filter paper diffusion test. The activecompositions analysis includes determining of total flavonoids, total phenolicsubstances, and qualitative analysis by TLC and quantitative analysis by using HPLC.The antimicrobial characteristics test includes determining the minimalinhibitory concentration (MIC) and the antibacterial ability of different resin concentration. The analysis of water activity showed the Aw value was0.45~0. 90, the divergence was appreciable, the melting point was 63~94℃, theaverage beeswax of crude propolis was 25.12%, the beeswax of commercial productswas 0.24~64.19%, the average impurity and 95％ ethanolic extracts of crude propolis was 15.24％and 63.24％, in commercial products was 0.87~32.98%and 53.15~98.81 %. The average resin of crude propolis was 26.1％, commercial products was 2.88~79.92%. The average ash of crude propolis was 7.00％. However, the filter paper diffusion test can not approve the active compositions concentration of propolis. The total flavonoids average concentration of crude propolis was 7.80％, commercial products was0.79~14.88 %. The quercetin average concentration of crude propolis was 1.38％, commercial products was 0.04~0.49％. The total phenolic substances average concentration of crude propolis was 6.77％, commercial products was0.46~6.27 %. Simple qualitative analysis of the ferulic acid and quercetin by TLCwas available. In the antimicrobial characteristics aspect, the sensitivity of propolis, Bacillus subtilis was higher than Staphylococcus aureus. . The series tests of propolis antimicrobial ability was shown apparently .