

Analysis of flavonoids in propolis blended milk powder

高明義、吳芳禎

E-mail: 9318411@mail.dyu.edu.tw

ABSTRACT

Propolis blended milk powder has become popular in the market recently. Bioactive materials on contents such as flavonoid in propolis that varies can be affected by the origin, season harvested, extraction method and so forth. The aim of this study has selected five propolis powder, ten commercial propolis blended milk powder and one propolis-free milk powder which analyzed for flavonoid by HPLC and spectrophotometer. Results revealed significant difference in HPLC chromatograms for five propolis powder. In addition, five propolis powder of flavonoid contents analyzed by AlCl₃ method were recorded at 0.48 ± 0.05 %, 3.12 ± 0.16 %, 0.67 ± 0.04 %, 0.29 ± 0.02 % and 0.32 ± 0.04 %, respectively. By method of 2,4-dinitrophenylhydrazine(2,4-DPN), results showed as following: 0.95 ± 0.17 %, 0.19 ± 0.02 %, 0.26 ± 0.00 %, 0.24 ± 0.01 % and 0.30 ± 0.02 %, respectively. Total content of flavonoid were sum of content analyzed by AlCl₃ method and 2,4-DPN method, recording at 1.42 ± 0.18 %, 3.31 ± 0.16 %, 0.93 ± 0.04 %, 0.53 ± 0.02 % and 0.62 ± 0.04 %, respectively. Obviously, five propolis powder variously contained total content of flavonoid. Furthermore, defatted solvents were petroleum ether, n-Hexane and ethyl ether of propolis blended milk powder were tested. Using petroleum ether as defatted solvent, there did not affect the analysis of flavonoid. According previous results, peak of 38 min retention time(RT) was chosen as index peak and identified as chrysin. The optimum analysis conditions of HPLC for analysis of flavonoid in propolis blended milk powder as following: RP-C18 column, mobile phase methanol : water : acetic acid (56 : 41 : 3), flow rate 1.0 ml/min, UV detector set at 275 nm. The linear correlation (R²) on analysis of propolis powder and propolis blended milk powder have exceeded 0.99. Precision (%) of propolis powder and propolis blended milk powder were 2.2 ± 2.0 % and 0.6 ± 0.2 %, respectively. Recovery percentage of HPLC chromatography was 78.0 ± 1.8 %. Moreover, five concentration samples derived from propolis powder and propolis blended milk powder were analyzed by AlCl₃ method. Data stated that amount of flavonoids by AlCl₃ method was higher as 500~680 % than HPLC. It was apparent that there were other ingredients which may interfere with analysis of flavonoids. Therefore, it was not proper to analysis flavonoids by spectrophotometer in propolis blended milk powder. There was really not index peak of 38 min RT in each sample of propolis blended milk powder. The chromatograms were not the same even though there indicated the same amount of propolis in labels. Nevertheless, similar chromatograms of propolis powder may originate in the same suppliers. As a result, the study recommends that analysis of total flavonoids in propolis powder by spectrophotometer first, then establishing index peak. Comparisons of relationship between analysis results of propolis powder by spectrophotometer and analysis results of propolis blended milk powder by HPLC, it may find interrelated function to estimate amount of flavonoids in propolis blended milk powder.

Keywords : propolis ; flavonoid ; HPLC ; milk powder

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