



Antioxidant Activity of Leatherwood Honey and the Correlation with Chemical and Physico-Chemical Parameters

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Presentation

Antioxidant activity is a very valuable property in honey because of its protective effects against free radicals. However, little is known about the antioxidant activity of leatherwood honey. Therefore, one aim of this study was to determine the level of antioxidant activity in leatherwood honey in order to increase its market value. Moreover, for further understanding of influencing factors on antioxidant activity, correlation with the total phenolic content, the hydrogen peroxide content and the physico-chemical parameters, including the electrical conductivity, pH, colour and water content, was investigated. The antioxidant activity of leatherwood honey was determined by two different methods, including the measurement of the DPPH radical scavenging activity, which ranged from 9.3 to 97.6 μmol ascorbic acid equivalents per 100 g honey and the ferric ion reducing antioxidant power (FRAP), which ranged from 122.6 to 585.5 $\mu\text{mol Fe}^{2+}$ equivalents per 100 g honey. In the analysed leatherwood honey samples, electrical conductivity ranged from 482 to 666 $\mu\text{S/cm}$, pH from 4.07 to 6.20, colour from 0.214 to 1.119 mAU, water content from 14.8 to 20.2 %, hydrogen peroxide content from 5.7 to 35.2 μg per gram honey and total phenolic content from 22.4 to 66.8 mg gallic acid equivalents per gram honey. To investigate the relationship between the antioxidant activity, the physico-chemical properties, the hydrogen peroxide content and the phenolic content, tree models and generalized additive models were fit to the data to test for complicated interactions and non-linear relationships among the explanatory variables. The significance of the explanatory variables was determined using the minimal adequate model in a multiple linear regression, which was selected according to the Akaike's information criterion. Statistical results indicate that both the DPPH radical scavenging activity and the ferric ion reducing antioxidant power can be related to the total phenolic content, the pH, the colour and the water content. Overall, the antioxidant properties demonstrated here might contribute to the marketing of leatherwood honey in the cosmetic industry as an active component in anti-aging products or in the food industry as a natural preservative, for example. Moreover, the results from the statistical analysis might have implications for further studies aiming to investigate the underlying parameters which are related to high antioxidant activity in honey.