

RESEARCH ARTICLE

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## Evaluation of the antioxidant activity of *Betula pendula* leaves extract and its effects on model foods

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### ABSTRACT

**Context:** *Betula pendula* Roth (Betulaceae) exhibits many pharmacological activities in humans including anticancer, antibacterial, and antiviral effects. However, the antioxidant activity of BP towards lipid degradation has not been fully determined.

**Objective:** The BP ethanol and methanol extracts were evaluated to determine antioxidant activity by an *in vitro* method and lyophilized extract of BP was added to beef patties to study oxidative stability.

**Materials and methods:** Antioxidant activities of extracts of BP were determined by measuring scavenging radical activity against methoxy radical generated by Fenton reaction 2,2'-azino-bis-3-ethylbenzothiazoline-6-sulphonic acid (TEAC) radical cation, the oxygen radical absorbance capacity (ORAC) and the ferric reducing antioxidant power (FRAP) assays. The lipid deterioration in beef patties containing 0.1% and 0.3% (w/w) of lyophilized extract of BP stored in 80:20 (v/v) O<sub>2</sub>:CO<sub>2</sub> modified atmosphere (MAP) at 4 °C for 10 days was determined using thiobarbituric acid reacting substances (TBARS), % metmyoglobin and colour value.

**Results:** The BP methanol extract revealed the presence of catechin, myricetin, quercetin, naringenin, and *p*-coumaric acid. The BP ethanol (50% w/w) extract showed scavenging activity in TEAC, ORAC and FRAP assays with values of 1.45, 2.81, 1.52 mmol Trolox equivalents (TE)/g DW, respectively. Reductions in lipid oxidation were found in samples treated with lyophilized BP extract (0.1% and 0.3% w/w) as manifested by the changes of colour and metmyoglobin concentration. A preliminary study film with BP showed retard degradation of lipid in muscle food.

**Conclusion:** The present results indicated that the BP extracts can be used as natural food antioxidants.

### ARTICLE HISTORY

Received 12 February 2016  
Revised 3 September 2016  
Accepted 3 December 2016

### KEYWORDS

Polyphenol; lipid oxidation;  
active packaging