

Abstract

# A Dose-Response Study to Assess the Effects of New Zealand Pine Bark Extract on Glycaemic Responses in Healthy Participants <sup>†</sup>

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**Background:** The current estimation of 451 million people diagnosed with diabetes is expected to increase to 693 million by 2045. Plant extracts have been shown to improve glycaemic control in humans. However, evidence is lacking regarding the hypoglycaemic effects of New Zealand pine bark obtained from *Pinus radiata* trees.

**Methods:** An acute, placebo-controlled, single-blind, dose-response, crossover study was designed to investigate the hypoglycaemic potential of increasing doses of New Zealand pine bark extract (supplied by ENZO Nutraceuticals New Zealand Ltd.) on postprandial blood glucose response in healthy individuals. At each visit, participants arrived fasted for at least 10 h and were given a single capsule containing either pine bark extract in one of the doses (50, 100 or 400 mg) or a placebo (microcrystalline cellulose) to swallow with 150mL of water. This was followed by a 2-h oral glucose tolerance test (OGTT). Capillary blood samples were taken at -20, 0, 15, 30, 45, 60, 90 and 120 min. Incremental area under curve (iAUC) of postprandial glucose response during the OGTT was calculated using the trapezoidal rule. Statistical analysis was carried out using a one-way factorial repeated-measures ANOVA (95% confidence interval) with Bonferroni post hoc analyses.

**Results:** Eighteen healthy participants (11 women, 7 males, 24.2 ± 1.0 years old) completed the study. The mean iAUC of control and pine bark doses of 50, 100 and 400 mg were 318.3 ± 26.4, 259.5 ± 21.0, 285.7 ± 29.6, and 242.2 ± 17.5 (mmol/L·h), respectively,  $F(3.00, 51.00)=2.90$ ,  $p=0.049$  across the four intervention arms. Results showed that there was a mean reduction in all doses compared to control of 18.5%, 10.2% and 23.9%, respectively. Although no significant dose response relationship was detected, post hoc test showed a significant iAUC reduction of 76.1 ± 25.1 (mmol/L × h) at 400 mg compared to control,  $p = 0.046$ .

**Conclusions:** Results from the present study suggest that New Zealand pine bark may have hypoglycaemic effects in healthy participants and could potentially be beneficial for individuals with impaired glycaemic control.

**Supplementary Material:** The poster is available online at [www.mdpi.com/504-3900/8/1/52/s1](http://www.mdpi.com/504-3900/8/1/52/s1).



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