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“Development on the margin”

Total Phenolic Content and Antioxidant Potential of Traditionally Processed *Mucuna monosperma* Seeds: An Indian Under-utilised Legume Grain

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Abstract

Accumulation of chemical, biochemical, clinical and epidemiological evidences indicate an inverse correlation between the consumption of legume seeds and incidence of several chronic diseases. Such obvious health benefits of legume seeds are believed to contribute by the presence of polyphenolic compounds. Therefore, recent studies are mainly focusing on the health promoting/disease preventing role of phenolic compounds in legume grains. In this context, the seed materials of *Mucuna monosperma* DC ex Wight (common name: Negro bean, local name: periyattalargai), an Indian underutilised food legume received more attention. The boiled Negro bean seeds are eaten by tribes of Northeastern India, the Oceanic group of tribes, the Onges, Great Andamanese and Sompens. In the present study, the methanolic extract of Negro bean was analysed for total phenolic content and antioxidant properties. The raw seeds contained a total free phenolic content of 13.82 ± 1.69 g catechin equivalent/100 g extract DM. Ferric reducing/antioxidant power (FRAP, 1446 mmol Fe[II]/mg extract), inhibition of β -carotene degradation (48.81 %) and scavenging activity against DPPH (64.40 %) and superoxide (43.78 %) radicals were exhibited by the extract. A significant correlation was recognised between the phenolic content and antioxidant properties. When considering the effect of traditional processing methods, sprouting + oil-frying caused an apparent increase on the total phenolic content and a significant improvement in the antioxidant and free radical scavenging capacity of Negro bean, while soaking + cooking as well as open-pan roasting treatments showed diminishing effects. Thus, sprouting + oil-frying treatment could offer a good strategy to improve the phenolic content and antioxidant activity in Negro bean. Therefore, such suitably processed under-utilised legume grain with substantial antioxidant activity could be envisaged as a dietary ingredient in the formulation of supplementary foods with therapeutic values.

Keywords: Antioxidant activity, *Mucuna monosperma*, Negro bean, total phenolics, traditional processing methods