

ODOURLESS PETAI PAPAN (*PARKIA SPECIOSA* HASSK.) WITH POTENT ORGANOPOLYSULFIDES BIOSIGNALLING MODULATOR

Adam Linoby¹, Muhammad Syakir², Haikal Ikhmal³, Fatin Mahfuzah⁴, Fatin Nurafiqah⁵
^{1,2,3,4,5}*Faculty of Sports Science and Recreation, UiTM Negeri Sembilan, Kampus Seremban, Malaysia*
 linoby@uitm.edu.my

ABSTRACT:

Diseases of the cardiovascular system are a leading cause of mortality worldwide. Inflated levels of oxidative stress have been implicated in many chronic diseases. Emerging evidence suggests that organopolysulfide; an important signalling biomolecule, has vasodilatory and antioxidant properties. Referring to its physiological benefits, there is a great deal of interest in food industry to increase dietary organopolysulfide levels in human body. *Parkia speciosa*, locally known as petai or stink bean, is rich in organopolysulfides that can potentially function as polysulfide donor. VasoBean is the first encapsulated extract of odorless petai papan (*Parkia speciosa* Hassk.), manufactured using unique rapid lyophilized-harvesting method. The preliminary pharmacokinetics data suggests that VasoBean is a potent slow-releasing donor of plasma polysulfides which caused sharp reductions in blood pressure indices. Besides its prehypertensive effect, this data also indicates that VasoBean elevates antioxidant and reduces oxidative stress biomarkers. Thus, the results supports that the consumption of VasoBean is extremely beneficial when it comes to improve vascular health as well as to improve redox balance.

Keywords: *Parkia speciosa*, polysulfides, gasotransmitter, biosignalling nutrient, hypertension

INTRODUCTION

It has recently been suggested that gasotransmitter signalling molecule hydrogen sulfide (H₂S) can positively impact mitochondrial function and cell metabolism. In addition, there is emerging evidence that H₂S has antioxidant and vasodilatory properties. Given the physiological benefits afforded by H₂S, there is a great deal of interest in searching of organopolysulfides food that have the potential to increase H₂S levels in the human body. *Parkia Speciosa* (locally known as petai or stink bean) is rich in organopolysulfides that can potentially function as H₂S donor and relatively safe for human consumption (Liang et al. 2017). Thus, this study explores unique processing methods to produce VasoBean, the first *Parkia Speciosa* extract standardized with organopolysulfides content. It is hypothesized that VasoBean supplementation could improve blood pressure.

METHODS

Literature search has been conducted and none described method to increase dietary organopolysulfides content as proposed in this work. The closest description to this study was proposed by Buring et al. (2013). However, Buring et al. (2013) differs from this work as it focuses on describing lyophilisation method of *Parkia speciosa* beans for treatment of diabetes mellitus type 2, while VasoBean work focuses on method to improve organopolysulfides content for treatment of number of diseases by promoting slow releasing signalling molecule hydrogen sulfide.

A. Extract Preparation

A unique method of preparing a powdered extract of fresh *parkia speciosa* is conducted. Due to volatile nature of organopolysulfides, the *parkia speciosa* needs to be quickly frozen within minutes of harvesting to -10°C or below to obtain a frozen *parkia speciosa*. The trial indicates that this preparation method is likely to retain the higher dietary organopolysulfides content as compared to conventional harvesting method. Subsequently, the frozen beans went through freeze-drying process in which the pressure surrounding them was reduced. This eventually produced fully freeze-fried beans, as water and volatiles sublimated and/or evaporated. Finally, the waterless beans were grounded to be turned into powder utilizing a 30-mesh screen size and the production was collected. An analysis of sulfides compound content is subsequently performed using monobromobimane (MBB) method as described in Shen et al. (2015) for standardization purposes.

B. Effectiveness and Safety Measures

A test on the accuracy of exercise movement performance and researcher observations were performed. A group of eight males (mean \pm SD: age, 38 ± 3 years; height, 163 ± 5 cm; body mass, 87 ± 3 kg) volunteered to participate in a double blind, placebo-controlled, randomized crossover study trial to measure, using time-analysis, the effects of acute VasoBean supplementation on blood pressure and total sulfide changes. In this ethically approved study, the frequency of adverse effect reaction was also analyzed.

RESULTS AND DISCUSSIONS

A. Blood Pressure

The analysis revealed that a sharp reduction in systolic BP and mean arterial pressure occurred at 3, 5 and 9 hours postadministration of VasoBean relative to baseline ($P < 0.05$). The mean diastolic BP was lower in VasoBean as compared to placebo only at 5-hr, and reduction following VasoBean compared to presupplementation baseline at 3 and 5-hr (Fig. 1). A significant correlation was noted between the change in systolic BP, diastolic BP and mean arterial pressure, and the change in plasma total sulfide ($P < 0.05$).

B. Adverse effect reaction

VasoBean supplementation is well tolerated and this is proven by the lack of severe or moderate adverse reactions reported during the course of the trial.

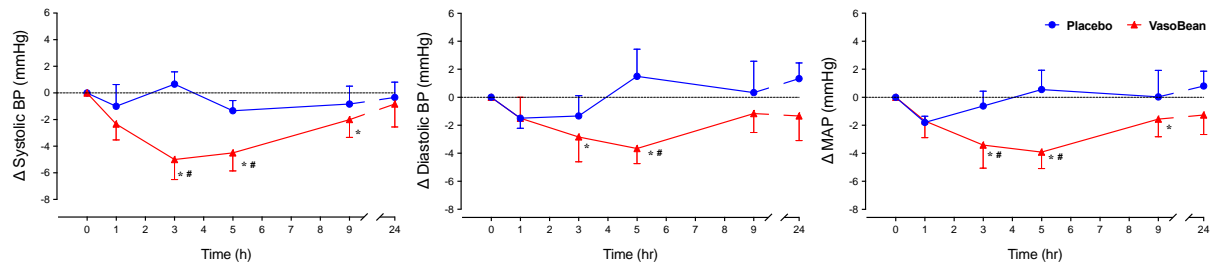


Fig. 1. Change (Δ) relative to presupplementation baseline in systolic blood pressure (BP), diastolic BP, and mean arterial pressure (MAP) following consumption of acute VasoBean and placebo (group means \pm SEM). *Difference from presupplementation baseline ($P < 0.05$); #difference from placebo ($P < 0.05$).

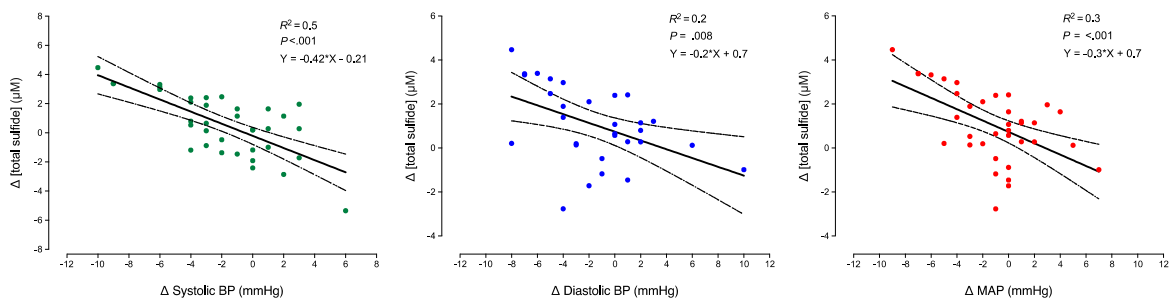


Fig. 2. The relationship between the difference (Δ) in plasma total sulfide and the Δ in systolic blood pressure (BP), diastolic BP and mean arterial pressure.

CONCLUSION

In conclusion, VasoBean is the first parkia speciosa extract, standardized for important biosignalling compound organopolysulfides. Human trial has shown that acute supplementation of VasoBean successfully reduced BP indices, potentially elevated polysulfides content and function as safe hydrogen sulfide donor. Thus, VasoBean benefits various stakeholders including healthy aging, health professional as well as expected to have a high commercialization potential.

REFERENCES

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