

**UNIVERSITI TEKNOLOGI MARA**

**POLYSULPHIDE-ENRICHED  
GARLIC SUPPLEMENTATION:  
DOSE-RESPONSE RELATIONSHIPS  
AND PHYSIOLOGICAL RESPONSES  
TO HIGH INTENSITY  
INTERMITTENT EXERCISE**

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**MSc**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.


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## ABSTRACT

A new emerging study shows that moderately boiled garlic enriched polysulphide-derived hydrogen sulphide (H<sub>2</sub>S). However, the dose-response effect of polysulphide-enriched garlic (PEG) on endogenous H<sub>2</sub>S production, and the therapeutic, ergogenic and physiological responses has yet to be explored. In a randomized, double-blind, placebo-controlled crossover design trial, 12 healthy men ingested 2 g, 4 g and 6 g of PEG or placebo (PLA) to establish the effects of PEG on systolic BP, diastolic BP and eH<sub>2</sub>S over 24-hr. Subsequently, 15 collegiate-level male completed high-intensity intermittent exercise tests, with optimal timing and dose of PEG informed from the preceding trial. Compared to PLA, systolic BP was lowered in a dose-dependent manner in 4 g and 6 PEG ( $p < 0.01$ ), but not diastolic BP ( $p > 0.05$ ). Similarly, eH<sub>2</sub>S was significantly elevated in the two of the highest dosages of PEG compared to PLA, with no additional increase in eH<sub>2</sub>S after ingesting 6 g compared with 4 g PEG (both  $p < 0.001$ ) with peak changes ( $\Delta$ ) at 3 to 5 hours relative to baseline ( $p < 0.05$ ). In the subsequent phase, following 5-day supplementation of 4 g PEG and PLA prior to 3 hours preceding the completion of a YYIRTL1. Resting eH<sub>2</sub>S was ~42% greater, while systolic BP and mean arterial pressure (MAP) was lower by ~2.6% in PEG compared to PLA ( $p < 0.05$ ). Performance in the cognitive function test was ~3.81% and ~2.66% faster at rest and during YYIRTL1, respectively, with performance in YYIRTL1 only tended to increase in PEG compared to PLA ( $p = 0.08$ ). Blood [glucose] and mean heart rate was lower during YYIRTL1 ( $p < 0.05$ ), but no changes in blood [lactate]. Taken together, the present study suggests that PEG supplementation dose-dependently lower resting BP and may enhance cognitive function during high-intensity intermittent performance.

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