

Effect of selected pretreatments on phytochemicals and antioxidant activity of commercially available horse gram (*Macrotyloma uniflorum* (Lam.) Verdc.) seeds

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Macrotyloma uniflorum (Horse gram) shows remarkable health effective antioxidant potential. As raw seeds are hard to cook; pretreatments are used to reduce cooking time. However, the scientific information of the effects of these pretreatments on phytochemicals and antioxidant activity is not available. Hence, this study was designed to determine the impact of selected pretreatments, i.e. soaking and germination, on phytochemicals and antioxidant potential in commercially available horse gram seeds. Using purchased seed samples from a retail shop in Matara, Sri Lanka., qualitative phytochemical screening, quantitative determination of total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activity using DPPH assay and FRAP assays were performed with triplicates of methanolic extracts of a) soaked (8h), b) soaked (8h) and germinated (24h and 48h) seeds, after c) cooking or d) in uncooked conditions. The results were compared with those of raw seeds. Data were statistically analyzed by One- way ANOVA, 2-sample and paired T tests using Minitab 17 software. Phytochemical screening revealed the presence of highly important bioactive compounds irrespective of the type of pretreatment. TPC, TFC and FRAP contents were significantly higher in the raw seeds compared to other treatments. In treated samples, TPC was the highest in the cooked seeds after 24h germination pretreatment ($P=0.001$). TFC and FRAP were highest in the cooked after 8h soaking pretreatment ($P < 0.001$ for both). IC_{50} values of DPPH assay showed no significant difference ($P < 0.05$) between soaking and 24h germination. The best antioxidant capacity (300 mg/mL) was observed in the raw soaked seeds for 8h. Hence, the soaked (8h) seeds are better to cook for human consumption due to relatively less effect on phytochemicals and antioxidant properties compared to other selected treatments and germination does not affect much on major antioxidant groups.

Keywords: Antioxidants, *Macrotyloma uniflorum*, phytochemicals, pre-treatments

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