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In vitro anti-inflammatory and antioxidant activities of Paspanguwa decoction and its constituents

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The Paspanguwa herbal formulation is commonly consumed as a traditional medicine in Sri Lanka. Paspanguwa consists of five ingredients, namely the rhizome of *Zingiber officinale* (Inguru), leaves and stem of *Hedyotis corymbosa* (Pathpadagam), dried berries of *Solanum xanthocarpum* (Katuwalbatu), dried stem of *Coscinium fenestratum* (Venivalgata), and dried seeds of *Coriandrum sativum* (Koththamalli). The importance and objective of this study was to prove the antioxidant and anti-inflammatory properties of traditionally used decotion, Paspanguwa claimed to have. In the present study, water extracts of the individual ingredient and the Paspanguwa decoction were screened for their total soluble phenolic content (TPC), total soluble flavonoid content (TFC), 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity, and their ability to inhibit protein denaturation (anti-inflammatory activity). The highest and the lowest TPC was seen in Coriander and ginger as 12.76 ± 1.00 and 7.89 ± 0.86 mg Gallic acid equivalent/g dry weight, respectively. The highest and the lowest TFC was seen in Katuwalbatu and Pathpadagam as 778.19 ± 1.40 and 282.14 ± 1.49 µg Catechin equivalent/g of dry weight, respectively. The lowest and the highest IC_{50} values for the DPPH assay was seen in Paspanguwa decoction and Katuwalbatu as 253.4 ± 8.2 and 609.7 ± 5.6 µg/mL, respectively, while the standard ascorbic acid showed 111.0 ± 6.1 µg/mL. The highest and lowest reducing power percentages were seen in Paspanguwa decoction and coriander as 94.74 ± 1.31 and 22.95 ± 0.96 while the standard ascorbic acid showed 109.89 ± 0.96. The ability to inhibit protein denaturation varied in the order of: Acetylsalicylic acid (standard) > Paspanguwa decoction > ginger > coriander > Venivalgata > Katuwalbatu > Pathpadagam at all the three concentrations (625, 1250, and 2500 µg/mL). These results suggest that Paspanguwa water extract is a good source of antioxidants with TFC and TPC with a higher ability to inhibit protein denaturation. Our findings corroborate with the previous in vitro studies of the antioxidant activity of Paspanguwa. However, our study is the first to reveal the anti-inflammatory action, total flavonoid content, and reducing power of the Paspanguwa herbal formula. Further, this study validated the use of Paspanguwa as a good source of antioxidants together with anti-inflammatory activity in traditional Ayurvedic medicine.

Keywords: Anti-inflammatory, Antioxidant, DPPH, Flavonoid, Phenolic

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