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Antioxidant and anti-inflammatory properties of red, white and pink globe amaranth hydromethanolic extracts

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Medicinal plants have been playing a vital role on human health and healing, representing one of the major sources of drugs in modern and traditional medicine [1]. Plants synthesize and preserve a variety of biochemical products that can be used as pharmaceutical compounds [2], and recently there has been an increasing interest in the therapeutic potential of plants as antioxidants and anti-inflammatories [3]. Oxidative stress and inflammation play critical roles in the pathogenesis of many diseases, such as cancer, cardiovascular disease, arthritis and obesity [4], among others. Thus, the aim of this study was to explore the bioactivity of red, white and pink globe amaranth (different cultivars of Gomphrena globosa L.) hydromethanolic extracts, namely the antioxidant and anti-inflammatory activities. The antioxidant activity was tested through radicals scavenging capacity, reducing power, and lipid peroxidation inhibition, whereas the anti-inflammatory activity was assessed by monitoring the inhibition of nitric oxide (NO) release in the mouse macrophage-like cell line RAW 264.7. The absence of toxicity of the extracts was also confirmed by the sulphorodamine B (SRB) assay applied to a porcine liver primary culture (PLP2) established by the authors.

Among the three studied samples, pink globe amaranth showed the highest antioxidant activity, with the lowest EC\textsubscript{50} values (0.25 to 1.02 mg/mL), followed by red (0.41 to 1.30 mg/mL) and white (0.57 to 1.47 mg/mL) globe amaranth. Regarding the anti-inflammatory activity, pink and red globe amaranth also revealed the lowest EC\textsubscript{50} values (133 and 136 \textmu g/mL, respectively), with white globe amaranth revealing an EC\textsubscript{50} value of 198\textmu g/mL. None of the extracts presented cytotoxicity in PLP2 cells up to 400 \textmu g/mL. From the results obtained, we can conclude that the extracts of these plants can be considered good sources of antioxidants and can also be used for anti-inflammatory purposes.

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References: