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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_{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_{50} values (133 and 136 µg/mL, respectively), with white globe amaranth revealing an EC_{50} value of 198µg/mL. None of the extracts presented cytotoxicity in PLP2 cells up to 400 µg/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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