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Bioactivity and chemical characterization in hydrophilic and lipophilic compounds of *Chenopodium ambrosioides* L.



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ABSTRACT

The bioactive properties (antioxidant and antitumour activities, and hepatotoxicity) of the infusion and methanolic extracts of *Chenopodium ambrosioides* L., a plant commonly used in Portuguese folk medicine, were compared. The chemical composition in hydrophilic (sugars, organic acids and phenolic compounds) and lipophilic (fatty acids and tocopherols) fractions were determined. In general, the infusion revealed higher antioxidant activity, while the methanolic extract was the only one showing antitumour effects against colon, cervical and hepatocellular carcinoma cell lines. No toxicity in non-tumour cells was observed either for the infusion or the extract. The studied plant proved to be a good source of natural antioxidants and other bioactive compounds, which may have industrial use. As far as we know, this is the first detailed chemical characterization and bioactivity evaluation of *C. ambrosioides* methanolic extract and infusion.

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1. Introduction

Oxidative stress is an imbalance between the generation of reactive oxygen species (ROS; which include unstable oxygen radicals such as superoxide radical and hydroxyl radical and non-radical molecules like hydrogen peroxide) and the body's antioxidant defence capacity, having an important role in normal cell functioning. When produced in excess ROS can have harmful effects, affecting cellular lipids, proteins and DNA, leading to their modification, and often destruction,

and inhibiting their normal function (Rosenfeldt et al., 2013; Valko et al., 2007). Relevant diseases such as cancer, diabetes, cirrhosis, heart disease or dementia disorders, as well as ageing process have been associated with the uncontrolled production of free radicals (Halliwell, 2012; Valko et al., 2007).

Some plants traditionally used have medicinal properties with great potential for therapeutic applications in the treatment of some of the aforementioned diseases, since they are a natural source of bioactive compounds, including antioxidants, such as polyphenols, vitamins, carotenoids, unsatu-

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