



Abstract

Phenolic Compounds from Amaranthaceae Family as Potential Antitumor and Antibacterial Drugs [†]

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Abstract: Despite the numerous advances in modern medicine, cancer and bacterial diseases cause the death of 10 and 11 million people globally every year, respectively. Due to the significant heterogeneity associated with carcinogenesis and the constant emergence of resistant bacterial strains caused by the misuse of antibiotics, the search for new compounds of natural origin, with bioactive properties related to tumor and bacterial diseases, is growing each year. One of the most relevant compounds found in plants are secondary metabolites, specifically phenolic compounds (PC). There is a vast literature on these molecules and their associated bioactivities, but the establishment of new trials revealing the therapeutic uses of these compounds is continually evolving. In this study, the identification and quantification of PC from three species of the Amaranthaceae family (*Alternanthera sessilis* (L.) R., *Dicliptera chinensis* (L.) Juss. and *Dysphania ambrosioides* (L.) Mosyakin and Clemants) were carried out. In brief, the maceration of each sample was performed in ethanol/water (80:20 v/v). Then, PC were identified in the aqueous phase by Ultra-Performance Liquid Chromatography-Diode Array Detector-Mass Spectrometry (UPLC-DAD-MS), working in negative mode. The results showed a high flavonoid content in the three species, with a 11.4–15.1 mg/g range of extract. Apigenin, luteolin and isorhamnetin derivatives were the most abundant compounds. Then, the cytotoxic and antibacterial activities of the extracts were determined. Different tumoral cell lines (Caco-2, MCF-7, NCI-H460) were cultivated in the presence of the extracts, and the results revealed high growth-inhibitory concentration 50% (GI₅₀) values, ranging from 263 ± 12 to 188 ± 14 µg/mL. In parallel, the antibacterial activity of the extracts was assessed against different Gram-positive (*Escherichia coli*, *Klebsiella pneumoniae*, *Morganella morganii*, *Proteus mirabilis* and *Pseudomonas aeruginosa*) and Gram-negative (*Enterococcus faecalis*, *Listeria monocytogenes* and methicillin-resistant *Staphylococcus aureus* (MRSA)) strains. *A. sessilis* showed minimal inhibitory concentrations (MIC) of 5 mg/mL against *M. morganii*, as well as *D. ambrosioides*, and MRSA strain. These results showed a significant phenolic compounds activity to be present in these three species, exhibiting a high potential for nutraceutical and pharmaceutical applications.

Keywords: phenolic compounds; Amaranthaceae; flavonoids; bioactivities

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