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New alternative sources of anticancer drug precursors found by HPLC-DAD-MS in Lamiaceae species in Brazil

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Podophyllotoxin possesses anti-tumor effects and high cytotoxic activity. Currently, this compound is no longer used in its natural form due to its side effects. To take advantage of its pharmacological activities, podophyllotoxin is used as the starting material for the semi-synthetic derivatives etoposide, teniposide and etopophos. Currently, podophyllotoxin is obtained from isolation from the rhizomes of Podophyllum emodii and P. peltatum. However, this method does not represent an ideal production system due to the intensive harvesting of these species and the lack of cultivation of these species. The aim of this work was to develop an easy methodology for obtaining lignan enriched semi-purified extracts and developing a sensitive reverse phase HPLC-DAD-MS method for the determination of aryltetralin lignans in plants, especially species of Lamiaceae as an alternative source of podophyllotoxin. Lignans were identified and quantificated by its retention times; UV-VIS and mass spectra. In mass spectra, a peak at m/z 397 is related to the species derived from molecular ion with a loss of water [M+H–H2O] and at m/z 313 due to the loss of the lactone ring. Results showed that some species of Lamiaceae can be considered alternative sources of podophyllotoxin and related compounds and their aerial parts can be used. Lamiaceae species had a total lignan content of the podophyllotoxin group of about 4% relative to the dry weight of the plant, a value comparable to podophyllum. The possible commercial procurement of these components from aerial parts of plants represents a great advantage as they are renewable sources.

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