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Determination of psychopharmaceutical adulterants in plant food supplements using UHPLC-MS/MS

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In the last decades, medicinal plants and derived products have become increasingly available on the EU market as components of formulations sold as plant food supplements (PFS). Such products are legally considered as foods under the Directive 2002/46/EC [1] and do not require any kind of authorization to be placed on the market. The legal responsibility for its safety relies on the business operators.

Among the several issues that may affect the safety of PFS, adulterations including the addition of illegal substances represent an increasing public health concern. In this context, the adulteration by the addition of psychopharmaceuticals should be investigated. Chromatographic methods, especially LC, coupled to various detectors are commonly used for the detection of fraudulent addition of pharmaceuticals in complex mixtures such as PFS. Among them, LC-MS/MS provides accurate and sensitive detection of the target compounds [2].

The purpose of this study was to assess the presence of psychopharmaceutical adulterants namely, fluoxetine, sertraline, citalopram, venlafaxine, paroxetine, trazodone, and diazepam in St. John's wort (*Hypericum perforatum*) based PFS since this plant and/or extracts are traditionally used for its antidepressive properties. Analysis was performed in a Nexera Ultra-High Performance Liquid Chromatograph coupled to a triple-quadrupole mass spectrometer (LCMS-8030 Shimadzu) with an electrospray ionization source (ESI), operating in positive ion mode, using a Kinetex C18 fused core column (150 × 2.10 mm i.d.; 1.7 μm) (Phenomenex). Multiple reaction monitoring mode (MRM) was selected and pharmaceuticals were quantified by internal standard calibration method. Prior to analysis PFS samples were extracted with methanol. The methodology was applied to a set of 20 St. John's wort based PFS commercially available in the Portuguese market.

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