

Screening of edible oils for polycyclic aromatic hydrocarbons using microwave-assisted liquid-liquid and solid phase extraction coupled to one- to three-way fluorescence spectroscopy analysis

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The potential of microwave-assisted liquid-liquid and solid phase extraction coupled with fluorescence spectroscopy and employing one- to three-way spectral data was assessed in terms of their capacity for the rapid detection of heavy polycyclic aromatic hydrocarbons (PAHs) in olive and sunflower oils. Tocopherols and pigments groups (chlorophyll and pheophytin) present in oil matrices were the main interference compounds in the detection of PAHs using fluorescence spectroscopy. Partial spectral overlap and inner-filter effects were observed in the emission range of the analytes. The effectiveness of removing these interferences using solid phase extraction (silica, C18 and graphitized carbon black) was examined. Solid phase extraction with silica was the most effective method for the removal of pigments and tocopherol and allowed for the detection of PAHs in edible oils using fluorescence spectroscopy. The limit of detection was observed to depend on the use of one-, two- or three-way