

Ultrasound/Microwave Assisted Extraction Recovery and Identification of Bioactive Compounds (Polyphenols) from Tarbush (*Flourensia cernua*)

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Abstract : The plant known as tarbush (*Flourensia cernua*) is a plant originating in northern Mexico, mainly in the states of Coahuila, Durango, San Luis Potosí, Zacatecas and Chihuahua. It is a branched shrub that belongs to the family Asteraceae, has oval leaves of 6 to 11 cm in length and also has small yellow flowers. In Mexico, the tarbush is a very appreciated plant because it has been used as a traditional medicinal agent, for the treatment of gastrointestinal diseases, skin infections and as a healing agent. This plant has been used mainly as an infusion. Due to its traditional use, the content and type of phytochemicals present in the plant are currently unknown and are responsible for its biological properties, so its recovery and identification is very important because the compounds that it contains have relevant applications in the field of food, pharmaceuticals and medicine. The objective of this work was to determine the best extraction condition of phytochemical compounds (mainly polyphenolic compounds) from the leaf using ultrasound/microwave assisted extraction (U/M-AE). To reach the objective, U/M-AE extractions were performed evaluating three mass/volume ratios (1:8, 1:12, 1:16), three ethanol/water solvent concentrations (0%, 30% and 70%), ultrasound extraction time of 20 min and 5 min at 70°C of microwave treatment. All experiments were performed using a fractional factorial experimental design. Once the best extraction condition was defined, the compounds were recovered by liquid column chromatography using Amberlite XAD-16, the polyphenolic fraction was recovered with ethanol and then evaporated. The recovered polyphenolic compounds were quantified by spectrophotometric techniques and identified by HPLC/ESI/MS. The results obtained showed that the best extraction condition of the compounds was using a mass/volume ratio of 1:8 and solvent ethanol/water concentration of 70%. The concentration obtained from polyphenolic compounds using this condition was 22.74 mg/g and finally, 16 compounds of polyphenolic origin were identified. The results obtained in this work allow us to postulate the Mexican plant known as tarbush as a relevant source of bioactive polyphenolic compounds of food, pharmaceutical and medicinal interest.

Keywords : U/M-AE, tarbush, polyphenols, identification

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