EXTRACTION AND ANTIOXIDANT EVALUATION OF EXTRACT OF *Eysenhardtia polystachya* FOR COSMETIC APPLICATIONS

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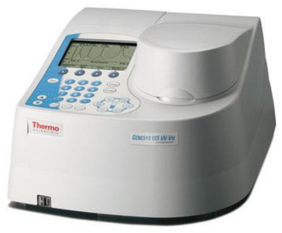
Introduction:

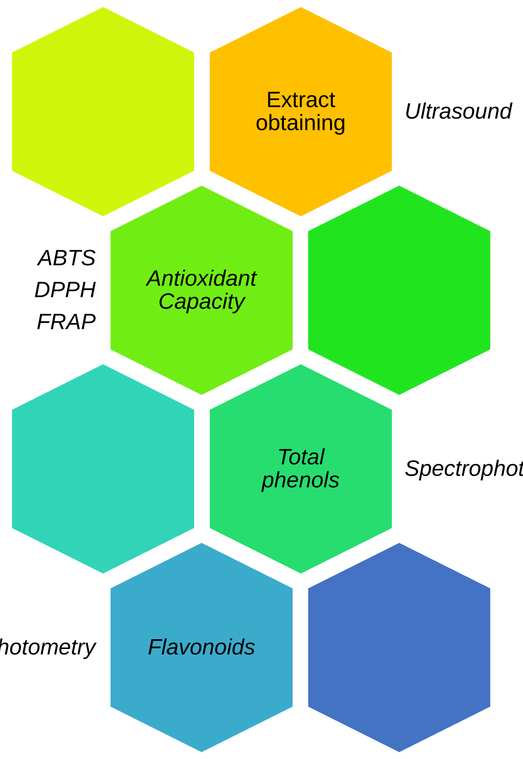
Currently, cosmetology is looking for alternatives and new trends for skincare and sun protection; therefore, finding sustainable and high-impact alternatives in various products' new formulations is necessary. For example, *Eysenhardtia polystachya* is a tree distributed in Mexico and Texas and locally known as "*palo azul*." The infusion of this tree's bark in water shows fluorescence, and its components have been traditionally used for different purposes such as antidiabetic, antioxidant, antisolar, and antimicrobial. However, extraction is often inefficient and influences the properties and functionality, particularly on antioxidant capacity. This tree gained attention due to its blue fluorescence because of its infusion in water and its biological properties, including antidiabetic, antibacterial, and antioxidant (Narvaez-Mastache et al., 2006; Gutiérrez & Báez, 2014). Among the components that have been found in *E. polystachya* extracts are aurons, flavonoids, isoflavonoids, and matalin. All flavonoids contain a 15-carbon skeleton; their central structure is a 2-phenylbenzopyranone, in which the three-carbon bridge between phenyl groups is commonly cyclized with oxygen. Other components of the plant extract are methylated flavonoids (Ferreira-García et al., 2017). The compounds responsible for the fluorescence of *E. Polystachya* are Coatline A and B, which represent a C-β-glucopyranosyl-α-hydroxy dihydrochalcone (Beltrami et al., 1980) and different isoflavonoids (Burns et al., 1984). These compounds are ionizable at basic pH values , and fluorescence is observed (Álvarez & Delgado, 1999; Valeur, 2001). The work aimed was to establish the effectiveness of ultrasound extraction of *E. polystachya* on the phenolic and antioxidant capacity of extract.

Materials & Methods:

Obtaining the extract

E. Polystachya was acquired in the municipal market of Cuautitlán México. The fraction rich in flavonoids was extracted with an ethanol/water mixture in a 2:1 ratio assisted by ultrasound using an ultrasonic processor (Hielscher Ultrasonics gmbh, UP200Ht, Teltow, Germany) in 3 h doing the ultrasonication every 20 min with a duration of 5 min each at a temperature of 25 °C with 50 W of power. The mass/volume ratio of the product and extraction medium was 1:6. After extraction, the solution was evaporated at 6.7 kPa in a rotary evaporator (RV10, IKA® Wilmington, USA) at 40 °C. Finally, the remaining solution was dried in trays in a convective oven at 50 °C to obtain the solids extracted rich in flavonoids.





Results & Discussion:

The spectral scan (Figure 1) revealed two maximum absorbances at 284 and 325 nm corresponding to two superimposed chromophore groups characteristic of the extract at 240-280 nm for the band I and at 320-380 nm for band II, verifying the presence of isoflavones, flavones, and flavanols.

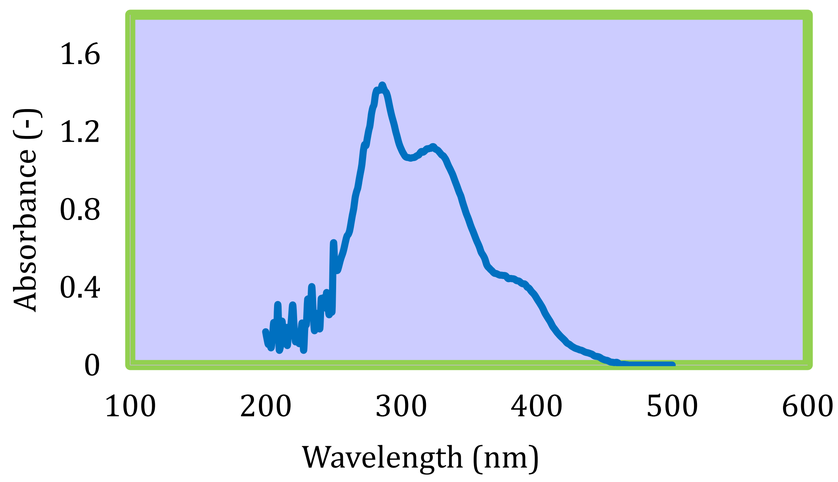


Figure 1. The spectral scan of *E. polystachya* extract.

The concentration of polyphenols obtained was 92.42 mg GAEq/mg of extract, and for flavonoids, 59.91 mg quercetin Eq/mg, the extract obtained is rich in polyphenols than 65% are flavonoids. These values are comparable to those reported by Gutiérrez & Báez (2014) for EP extracts. Phenolic compounds have an aromatic ring that carries one or more hydroxyl groups, and their structure can vary from a simple phenolic molecule to that of a complex high molecular weight polymer (Haminiuk et al., 2012)

For the antioxidant capacity, the following results were obtained: 3.29 ± 0.11 µmol EAA/mg (FRAP), 2.97 ± 0.27 µmol EAA/mg (DPPH), and 2.82 ± 0.31 µmol EAA/mg (ABTS), which confirms the high antioxidant capacity of the extract obtained, which is assigned directly to the flavonoid-rich faction it contains. Gutiérrez & Báez (2014) report that the results of antioxidant capacity obtained by ABTS and DPPH for the EP extracts are comparable for inhibiting free radicals when BHT and ascorbic acid are used positive control, inhibiting almost 100% of the radical. At concentrations of 100 µg/mL of EP extract.

Conclusions:

It can be concluded that the extract rich in flavonoids obtained in the present experimental study presents a great alternative as an antioxidant photoprotective agent for cosmetic applications, in particular for antiaging and sun protection products.

Aknowledgments:

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