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## Phytochemical variation among populations of *Fouquieria splendens* Engelm (*Fouquieriaceae*)

Hugo Manuel Monreal-García\*, Norma Almaraz-Abarca, José Antonio Ávila-Reyes, María del Socoro González-Elizondo, Yolanda Herrera-Arrieta, Rene Torres-Ricario, Marcela Verónica Gutiérrez-Velázquez.

Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional, Unidad Durango, Instituto Politécnico Nacional, México

*Fouquieria splendens*, commonly known as "ocotillo", is the most widely distributed member of the family *Fouquieriaceae* (*Ericales*). This plant is endemic to the arid and semiarid zones of Mexico and the southwestern United States<sup>1</sup>. In Durango, Mexico, there is a relictual population of *F. splendens* that grows in an intermediate environment between deciduous tropical forest and xeric scrublands<sup>2</sup>. Plants synthesize a wide diversity of chemical compounds called secondary metabolites. The concentration of secondary metabolites is affected by environmental conditions, such as the amount of light, CO<sub>2</sub> concentration, temperature, soil nutrients, and water deficit<sup>3</sup>. The aim of the current study was to determine the phytochemical variation between two populations of *Fouquieria splendens* subsp. *splendens* (S1 and S2, S1 representing a relictual population) and one of *F. splendens* subsp. *campanulata* (S3), all growing under contrasting environmental conditions. Hydroalcoholic extracts were prepared, and separately analyzed, from leaves and inflorescences of adult individuals collected from each population. Total phenolics, flavonoids, condensed tannins, anthocyanins and carotenoids were determined by spectrometric methods. Phenolic composition was determined by HPLC-DAD<sup>4</sup>. Each peak was quantified by an external standard. The average daily temperature, precipitation, radiation, and relative humidity of each location were registered. Soil from each collection site was analyzed. The data were subjected to an ANOVA and means were separated by Duncan's multiple range tests. Correlation analysis between the spectrophotometric determinations and the environmental variables were carried out. Relevant interpopulation differences in the quantitative phytochemical composition were found (Tables 1 and 2). The population with the highest foliar total phenolic content was the relictual population S1, whereas S3 accumulated both the highest foliar flavonoid concentration and the highest foliar condensed tannins levels.

Table 1. Total phenols, total flavonoids and condensed tannins in foliar tissue of three wild populations of *Fouquieria splendens*.

Flowers from S1 had the highest anthocyanin concentration, whereas flowers from S2 presented the highest carotenoid content (Table 2). The qualitative HPLC-DAD analysis revealed no differences in the phenolic composition, indicating that the two subspecies of *F. splendens* have a highly conserved phenolic profile (Figure 1) and that the relictual condition have not impacted on the qualitative phenolic composition. Some variations in the concentration of individual phenolics were found between populations. Ellagic acid derivatives and phenolic acids were the mayor phenolic compounds in both leaves and inflorescences. The correlation analysis revealed the important role of environmental conditions in determining the quantitative phytochemical differences between populations of *F. splendens*.

### Biography

Hugo Monreal is chemical engineer graduated at Instituto Tecnológico de Durango, currently he is PhD student in biotechnology, his line of research is phytochemistry..

hugo.monreal@gmail.com

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