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## Primer registro de *Pereskiopsis blakeana* J. G. Ortega (Cactaceae: Opuntioideae) en Chihuahua, México.

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### ABSTRACT

A botanical exploration was conducted in the southern part of Chihuahua state, where cacti and other flowering plants were collected during three journeys between 2021 and 2022. *Pereskiopsis blakeana* J. G. Ortega, a new genus and species not previously reported for the flora of Chihuahua, was recorded. The taxon was identified by specialists using taxonomic literature and comparing specimens with those in the herbarium collections of Sinaloa. The species is an erect shrub with a thick stem covered in thorny areoles, oval, turgid, alternate leaves, one or two long central spines on the branches, large yellow polypetalous flowers with numerous stamens, and cylindrical green-violet fruits that are edible when ripe. The cactus was collected in the tropical deciduous forest of the mountain community of Dolores, in the Guadalupe y Calvo municipality. The record extends the taxon distribution to a more northern location than previously reported.

**KEY WORDS:** Tropical deciduous forest, flora, northern boundary, southern Chihuahua.

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## RESUMEN

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Se realizó una exploración botánica a la zona sur del estado de Chihuahua, donde se colectaron cactáceas y otras plantas con flor durante tres salidas durante el período 2021-2022. Fue registrada *Pereskopsis blakeana* J. G. Ortega, un nuevo género y especie no reportados con antelación para la flora de Chihuahua. El taxón fue determinado por especialistas empleando literatura taxonómica y comparando los especímenes con los depositados en las colecciones de herbarios de Sinaloa. La especie es un arbusto erecto de tallo grueso y cubierto de areolas espinosas, con hojas ovaladas y turgentes, alternas, una o dos largas espinas centrales en las ramas, flores amarillas, grandes y polipétalas, con numerosos estambres y frutos cilíndricos verde-violáceos comestibles en la madurez. La cactácea fue colectada en el bosque tropical caducifolio de la comunidad serrana de Dolores, municipio de Guadalupe y Calvo. El registro extiende la distribución del género a una localidad más septentrional que la registrada anteriormente.

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**PALABRAS CLAVE:** Bosque tropical caducifolio, flora, límite septentrional, sur de Chihuahua.

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### Introduction

The flora of southern Chihuahua, bordering Sinaloa and Durango, is characterized by tropical deciduous forest and has been little studied despite being home to a great wealth of plants. This region is located at the confluence of two floristic provinces: The Pacific Coast and the Sierra Madre Occidental (Rzedowski, 2006; González-Elizondo *et al.*, 2012). The relief is dominated by deep ravines and slopes crowned by sharp and rugged peaks, making exploration complex. There is no real estimate of the floristic diversity in the state, but Villaseñor-Ríos (2016) recorded 4,291 species, 176 families, and 1,091 genera, with 89 endemic species.

Most botanical studies have focused on the central and northern portions of the state, such as those by Knobloch and Correll (1962), Estrada *et al.* (1997), Estrada and Martínez (2000), Estrada and Villarreal-Quintanilla (2010), and Vega-Mares *et al.* (2020). Studies by Laferriere (1994), Spellenberg *et al.* (1996), Martin *et al.* (1998), and Lebgue *et al.* (2005) are available for the southern zone, specifically from the Madera, Ocampo, Urique, and Batopilas municipalities, which border the Sonora and Sinaloa states.

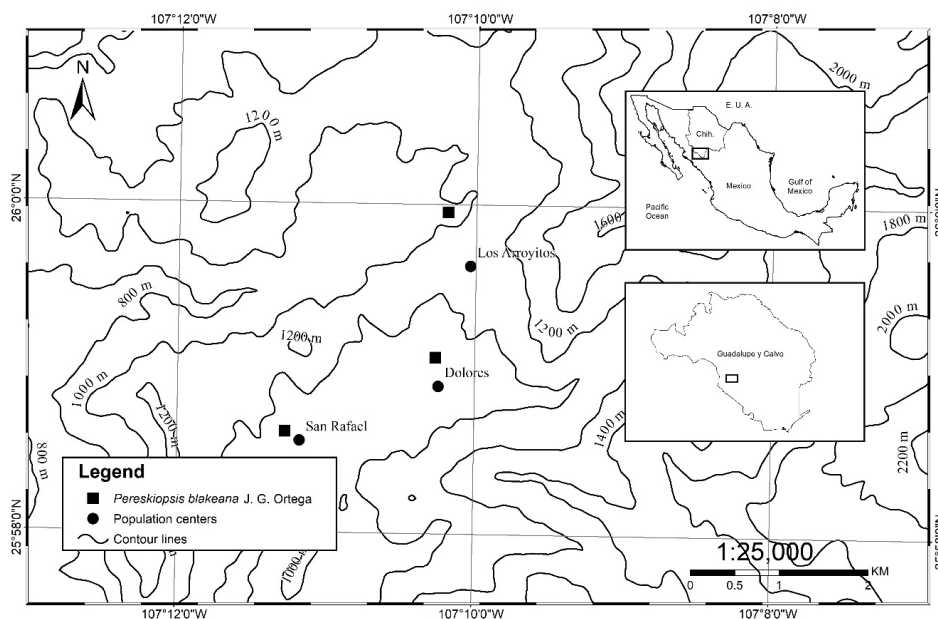
The aforementioned reports, as well as those by Lebgue *et al.* (2011), Lebgue and Quintana (2013), which focused on the cacti of the state, do not report the *Pereskopsis* genus. This genus is present in the neighboring states of Durango, Sinaloa, and Sonora with different

species such as *P. porteri* J. G. Ortega, *P. blakeana* J. G. Ortega, and *P. aquosa* (F. A. C. Weber) Britton & Rose.

This work aimed to record and describe some ecological and usage aspects of *Peresklopsis blakeana* J. G. Ortega in the Chihuahua state, as well as to present the taxon distribution and thus contribute to the knowledge of the state flora.

## Material and methods

The Dolores township, in the Guadalupe y Calvo municipality, is located in the southern part of the Chihuahua state, on the border with the states of Sinaloa to the south and Durango to the southeast, at an altitude of approximately 910 masl. It is situated between the coordinates 25°58'46"N, 107°09'46"W and 25°58'44"N, 107°10'09"W (**Figure 1**), in the foothills of the Sierra Madre Occidental. The region has a predominantly dry semi-warm climate with summer rains (BShw) (INEGI, 2021).



**Figure 1. Distribution of *Peresklopsis blakeana* J. G. Ortega at Dolores township, Guadalupe y Calvo municipality, Chihuahua, Mexico.**

Three field trips were conducted throughout the study area (December 2021, January 2022, and March 2022). Different routes were traveled to contribute to a floristic inventory of the region,

and botanical samples were collected following the methodology proposed by Sánchez-Mejorada (1986). Subsequently, the samples were taken to the Botany Laboratory of the Biology Faculty of the Universidad Autónoma de Sinaloa, where they were identified using the specialized taxonomic bibliographies of Sánchez-Mejorada (1961), Bravo-Hollis and Sánchez-Mejorada (1991), Guzmán *et al.* (1993), and Arias-Montes (1996). They were also compared with specimens from the herbarium collections of the Jardín Botánico Culiacán (HJBC) and the Faculty of Agronomy of the Universidad Autónoma de Sinaloa (EACS-UAS). Species identity was corroborated by specialists in the genus. Finally, the collections were deposited in the UACH herbarium of the Faculty of Zootechnics and Ecology of the Universidad Autónoma de Chihuahua.

## Results and Discussion

During the process of determining the specimens collected for the research “Vegetación y florística del bosque tropical caducifolio del municipio de Guadalupe y Calvo, Chihuahua”, specimens of the *Pereskia* genus were found that differed from *P. porteri* and *P. aquosa*, species known and recorded in the neighboring states of Sinaloa, Sonora, and Durango (Arias-Montes, 1996; Martin *et al.*, 1998; Paredes-Aguilar *et al.*, 2000; Piña-Ruiz, 2012; González-Elizondo *et al.*, 2015; Villaseñor-Ríos, 2016; Vega-Aviña *et al.*, 2021). The identity of the botanical samples corresponds to *P. blakeana* J. G. Ortega, which constitutes a new genus and species record for the region. The species can be easily identified due to its erect shrubby habit, ranging from 1.8 to 2.2 meters in height, with a robust stem, succulent obovate leaves with acute bases and apices, and a long single central spine up to 3.7 cm long arising from areoles with whitish, hirsute hairs, along with abundant short, yellow glochids. It also features yellow polypetalous flowers with abundant stamens and cylindrical-pyriform, smooth fruits about 5 cm long and nearly 2 cm wide at maturity (Arias-Montes, 1996). The species was located in three different sites: on stream slopes protected from sunlight by the canopy of woody forms of the tropical deciduous forest. These sites included trees such as *Ipomoea arborescens* (Humb. & Bonpl. ex Willd.) G. Don, *Senna atomaria* (L.) H. S. Irwin & Barneby, *Celtis iguanaea* (Jacq.) Sarg., *Pisonia aculeata* L., *Lysiloma divaricatum* (Jacq.) J. F. Macbr., and shrubs such as *Randia echinocarpa* Moc. & Sessé ex DC., and *Tabernaemontana tomentosa* (Greenm.) A. O. Simões & M. E. Endress in the San Rafael, Panteón de Dolores, and Arroyo de Fernando localities.

The observed individuals show flowers from the end of August to September and the fruits develop and ripen from mid-October to December; the species is deciduous and initiates defoliation with the change in color of the leaves from light green to intense pink during the December frosts, leaving the plant without leaves in mid-January, and initiating leaf development with the first rains at the end of June (Figure 2).



**Figure 2. Habit, thorns, and leaves with the pink or purplish color that indicates the beginning of defoliation.**

The species is usually found on lithosol, phaeozem, and regosol soils, locally known as tucuruquay (INEGI, 2021). It is associated with other cacti such as *Pachycereus pecten-aboriginum* (Engelm. ex S. Watson) Britton & Rose, *Stenocereus montanus* (Britton & Rose) Buxb., *Pilosocereus alensis* (F. A. C. Weber ex Rol.-Goss.) Byles & G. D. Rowley, *Mammillaria marksiana* Krainz, *Opuntia karwinskiana* Salm-Dyck, and *O. pubescens* H. L. Wendl. ex Pfeiff. It also uses wire fences as support when located between crop boundaries, while in the wild, it mainly uses the branches of *P. aculeata*, *C. iguanaea*, and *R. echinocarpa*.

**Specimens examined:** Mexico: Chihuahua, Guadalupe y Calvo municipality, San Rafael community (25°58'36.68"N, 107°11'16.02"W), 885 masl, January 14<sup>th</sup>, 2022. (JSD 20-UACH); Panteón de Dolores (25°59'04.27"N, 107°10'15.69"W), 910 masl, January 16<sup>th</sup>, 2022 (JSD 21-UACH); Arroyo de Fernando (25°59'57.17"N, 107°10'11.27"W), 975 masl, January 16<sup>th</sup>, 2022 (JSD 75-UACH).

*Pereskiopsis blakeana* grows in the Mexican tropics within the Pacific Coast floristic province, with its greatest abundance in Sinaloa and extending its distribution to Durango and Michoacán (Bravo-Hollis and Sánchez-Mejorada, 1991; Guzmán *et al.*, 1993; Vega-Aviña *et al.*, 2021). It has been recorded in neighboring municipalities to Guadalupe y Calvo, such as Badiraguato in Sinaloa and Tamazula in Durango, where it grows in primary vegetation environments of tropical deciduous forests and thorny forests. Its fruits are dispersed by wildlife such as coyotes, foxes, wild boars, raccoons, and coatis, as well as some domestic animals like chickens, cows, goats, and pigs. This dispersal helps seeds to spread away from the mother plant to sites with a higher germination probability (Cares *et al.*, 2018). The inhabitants of the region, who call the plant "Alcajey" or "Alcajeye," reported several uses. It is valued as an ornamental plant for the beauty of

its flowers and its edible fruits and leaves. Additionally, it is used to reinforce live fences due to its sharp thorns and irritating glochids.

In Mexico, the species has been reported in Sinaloa, Durango, and Michoacán (Villaseñor-Ríos, 2016; Tropicos, 2022). With this new record, the southwestern state of Chihuahua is established as the northernmost limit of its distribution.

## Conclusions

This record suggests the need to continue with flora studies in the southwestern zone of Chihuahua since it is an area that has been scarcely studied and that presents a great variety of vegetation types, which have remained unexplored until recently, due to the difficulty of accessing the region bordering Sinaloa, Durango and Chihuahua because of the complex social situation that prevails. The knowledge generated could be applied to the use of these resources, as well as to actions for their protection and conservation.

## Author contribution

Work conceptualization: JSD, GMS, BSM. Methodology development: JSD, GMS, BSM. Software management: EAGD. Experimental validation: JSD, GMS, BSM. Data analysis: JSD, GMS, BSM. Data management: JSD, GMS, BSM. Manuscript writing and preparation: JSD, GMS, BSM. Writing, revising, and editing: JSD, GMS, BSM. Project manager: JSD. Fund acquisition: JSD, GMS, BSM.

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## Statement of Informed Consent

“Informed consent was obtained from all subjects involved in the study.”

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## Conflict of interest

“The authors declare that they have no conflict of interest.”

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