





# Update on the terrestrial orchid flora of the Tacana volcano and close area, Chiapas, Mexico

Bertolini Vincenzo<sup>1\*</sup> ; William Cetzal-Ix<sup>2</sup> ; Edgar Mó<sup>3</sup> ; Ivan Tamayo-Cen<sup>2</sup> 

<sup>1</sup> El Colegio de la Frontera Sur unidad Tapachula. Carretera Antiguo Aeropuerto km. 2.5, Centro, 30700, Tapachula de Córdova y Ordoñez, Chiapas.

<sup>2</sup> Tecnológico Nacional de México, Instituto Tecnológico de Chiná, Calle 11 entre 22 y 28, Colonia Centro Chiná 24050, Campeche, México.

<sup>3</sup> Universidad de San Carlos de Guatemala, Carrera de Agronomía, Centro Universitario del Norte (CUNOR), Cobán, Alta Verapaz, 16001, Guatemala.

\* Correspondencia: vin.bertolini@gmail.com

## ABSTRACT

**Objective:** To assess the number of terrestrial orchid species on the Tacaná volcano, Chiapas, and to empirically observe distribution/elevation patterns and ecological conditions.

**Design/Methodology/Approach:** Random line transect sampling, over two years, for a total of 8 sites, each starting from the vicinity of rural villages. Samples were deposited in the CICY herbarium and analysed using dichotomous keys and field photographs. New records were compared with the GBIF data distribution.

**Results:** 52 different taxa have been identified. 24 species are new records for the Soconusco region, where the Tacaná volcano is located. In this way, the Soconusco region becomes the richest Mexican region for the number of orchid species, joining a total of 351 species.

**Study Limitations/Implications:** Building an accurate prediction model based on environmental and topographic variables could suggest microsites within the Tacaná Park that we have not visited for practical and technical reasons.

**Findings/Conclusions:** The total number of taxa in the Soconusco region increases to 351. Terrestrial orchids are not usually studied in depth in tropical places, but they are also important in the ecological balance of the natural site. A specific inventory could show more richness of tropical ecosystems.

**Keywords:** checklist, new botanical records, Orchidaceae, protected area, Soconusco.

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## INTRODUCTION

The Soconusco region of Chiapas, located on the Pacific slope of southeastern Mexico, is home to highly fertile soils and an important diversity of ecosystems, ranging from mangroves on the coast to tropical, temperate and dwarf alpine forests on the Tacaná volcano (4,092 m) (Bertolini *et al.*, 2016b). According to Rzedowski (1978) and Breedlove (1981), Soconusco has vegetation of tropical evergreen forest, mountain mesophyll forest, coniferous forest, *Quercus* forest and grasslands, and moor at the top. In addition, it has two priority terrestrial regions (Spanish acronym: RTP): El Triunfo-La Encrucijada-Palo Blanco (RTP 133) and Tacaná-Boquerón (RTP 135), set up by



the National Commission for the Use and Conservation of Biodiversity (CONABIO), and three biosphere reserves: Volcán Tacaná, La Encrucijada and El Triunfo, catalogued by the National Commission of Protected Areas (CONANP) (Arriaga *et al.*, 2000; Damon, 2013). The orographic-environmental heterogeneity of the area is suitable for a wide variety of ecosystems-ecological niches that allow for an important biodiversity. Soconusco, part of the Sierra Madre de Chiapas (SMC), has been the subject of research for about eight decades, with explorations by renowned botanists such as Matuda (1950a, 1950b), Miranda (1953) and Breedlove (1981, 1986). Recently, the SMC's floristic knowledge has been enhanced by botanists from various national institutions, with a focus on protected areas such as El Triunfo (Long y Heath, 1991; Williams, 1991; López-Molina, 2000; Pérez-Farrera, 2004; Pérez-Farrera y Miceli-Méndez, 2004; Pérez-Farrera *et al.*, 2012; Martínez-Meléndez *et al.*, 2008, 2009), La Fraileasca (Bachem & Rojas, 1994) and La Sepultura (Castillo, 1996; Reyes-García, 2008).

In this sense, floristic knowledge is incomplete for areas such as the orographic system formed by Tacaná volcano and Cerro Boquerón, referred to here as the Tacaná-Boquerón region (RTB), which forms part of the Mesoamerican-Mexican Biological Corridor (CBMM). This corridor extends from the area of the great volcanoes of Guatemala and enters Mexico through the Sierra Madre de Chiapas, providing an important link between the reserves of the Tacaná volcano, El Triunfo, La Sepultura and La Encrucijada; la Selva del Ocote also maintains the unity of the protected natural areas of northeastern Chiapas, which extend into Guatemala through the Petén (CONABIO, 2024). The corridor allows the integration, continuity and conservation of biological and ecological processes of a Nearctic and Neotropical biota, as well as elements that probably originated in Mesoamerica (Mittermeier *et al.*, 1999). The RTB represents an environmental gradient (50 km long) from sea level on the Pacific coast to the summit of the Tacaná volcano, with variations in soil types, climates, plant communities and agro-ecosystems, and therefore a high biological richness, which is a priority for conservation in Mexico (Arriaga *et al.*, 2000). However, the lowland and intermediate areas of the RTB are affected by severe deforestation, intensive and extensive agricultural and livestock farming practices, increasing human population, poor road construction techniques and the effects of climate change (Arriaga *et al.*, 2000; Soto Arenas *et al.*, 2007a, 2007b; Challenger *et al.*, 2010). In addition, their highly fragmented habitats, with little continuity between forest remnants and loss of transition zones, affect the local flora and fauna of the areas concerned, increasing possible local extinctions (personal observation).

The Orchidaceae are one of the most charismatic groups of the Chiapas flora due to their great biological and ecological diversity. It has an estimated richness of 723 species (Beutelspacher and Moreno, 2018), more than half of the richness reported for Mexico, which is approximately 1,200-1,300 species (Hágsater *et al.*, 2005; Villaseñor, 2016). Chiapas occupies the first places of orchid diversity in Mexico (Damon, 2010) and Soconusco contributes an important part of its diversity: its geographical location is strategic for the connectivity of biodiversity of North and South America. Floristic studies of orchids in Chiapas are concentrated in protected areas such as La Lacandona (Soto Arenas, 1994), Montebello (Cabrera-Chacón, 2000; Soto Arenas, 2001), El Cañón del

Sumidero (Miceli *et al.*, 2009; Espinosa-Jiménez *et al.*, 2011), El Triunfo (Pérez-Farrera y Miceli-Méndez, 2004; Martínez-Meléndez *et al.*, 2009, 2011; Martínez-Camilo *et al.*, 2012) and la Selva del Ocote (Miceli, 2002; Moreno-Molina, 2010).

The RTB and adjacent areas have ideal abiotic conditions (such as diverse forest types) for Orchidaceae, considering the high presence of orchids (325 species) in the region, positioning it as the second richest in Mexico for Orchidaceae. (Solano *et al.*, 2016), second only to the area of El Momón-Las Margaritas-Montebello (Chiapas) with 333 especies (Soto-Arenas, 2001). Two new records have recently been reported for the site, *Svenkoeltzia congestifolia* (Orchidaceae) (Bertolini *et al.*, 2016a) and *Lockhartia hercodonta* (Orchidaceae) (Martínez-Meléndez *et al.*, 2017), total of 327 species for the RTB.

The following paper updates the knowledge of the terrestrial orchids of the Tacaná volcano. The scarce or non-existent information on terrestrial orchids from some parts of the area shows the great challenge of locating and identifying them, perhaps because most of them are tiny and seasonal.

## MATERIALS AND METHODS

In 2016 and 2017, 102 specimens of terrestrial orchids were collected in the Tacaná Volcano biosphere reserve. [licences SEMARNAT and CONANP y *Reserva de la Biosfera volcán Tacaná*; files: SGPA/DGVS/04089/15, SGPA/DGGFS/712/4131/15 and REBIVTA /032/2015). 8 sites were sampled, four per year, using 1-3 random transects 5-8 km long and 4 m wide. 68 surveys were carried out, each lasting 4-6 hours. The 8 sites were located with the rural communities Peloponeso and Finca Perú Paris (municipality of Tapachula); Agua Caliente, Benito Juárez “El Plan”, Milán and Santa María La Vega (municipality of Cacahoatán); Los Alpes and Chiquihuites (municipality of Unión Juárez) (Figure 1).

During the field trips, the habitat and its conservation were empirically assessed for future analysis. Collected samples were herbarised at the ECO-TA-H herbarium (Ecosur, Tapachula), 2 flowers per samples were preserved in a 90% alcohol solution of benzoic acid and glycerol. Blooms were photographed using a Sony alpha 37<sup>®</sup> camera and specimens were georeferenced using a Garmin GPS, Oregon 650<sup>®</sup>. The specimens were deposited in the CICY herbarium (*Centro de Investigación Científica de Yucatán, A.C.*).

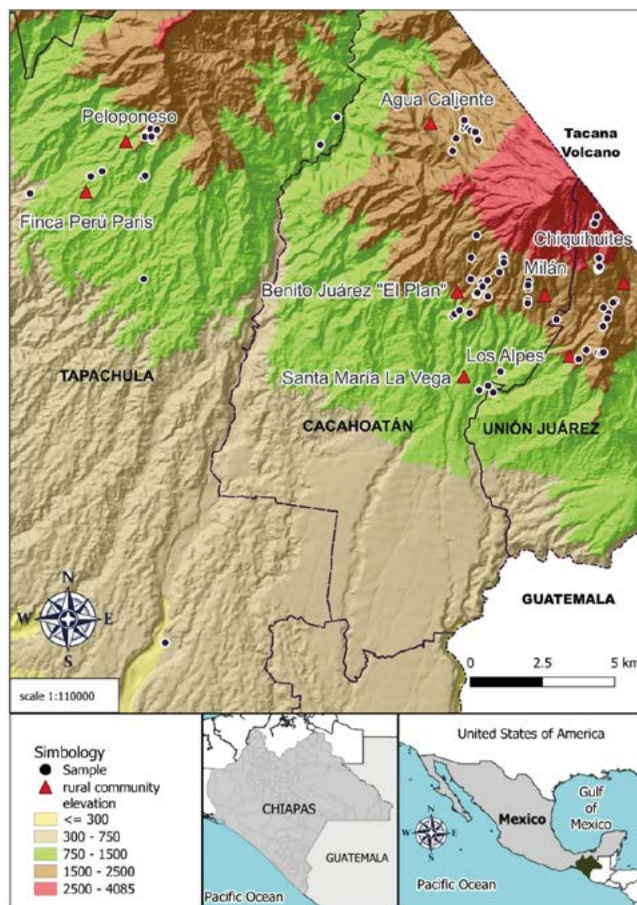
## RESULTS AND DISCUSSION

The 102 herbarium specimens were classified into 52 species of geophytic orchids (Table 1; Figure 2).

The altitudinal data show a higher frequency of species between 1,500 and 2,000 m a.s.l. with just over 30 species. On the other hand, between 2,000 and 2,500 m a.s.l. there were 20 species (Figure 3).

The highest number of specimens collected came from the villages of the municipality of Cacahoatán, with four different villages visited. The lowest number of specimens collected came from the municipality of Tapachula (Figure 4).

Habitats with the highest number of samples were from Tropical montane cloud forest (TMCF), coffee plantation (CP) and secondary forest (SF). Mood (M) and Pine forest (PF) were the poorest (Figure 5).



**Figure 1.** The location of sampled specimens: Tacaná volcano and the close area.

The empirical observations made on the state of conservation suggest that there is a degree of disturbance due to the anthropic impact of settlements and associated productive agricultural activities. The site we consider the best conserved is Agua Caliente, followed by Benito Juárez el Plan (both in Cacaohoatán), and the least conserved is Chiquihuites (Unión Juárez), because we have observed microsites with high levels of disturbance and soil erosion due to logging.

These results show that ten of the records are novel for the state of Chiapas compared to previous estimates (Villaseñor *et al.*, 2016). In addition, 24 records are new for the study area compared with Solano *et al.* (2016). Underestimation of sampling in areas of low conservation interest could be a source of bias in the process of global biodiversity consensus, in our case for Orchidaceae in Mexico and Chiapas. These results highlight the importance of continuing to explore the various forests of the country, despite the fact that they are not priority areas for conservation or hard to explore. In addition, future botanical explorations and even detailed herbarium research, including sampling in areas of little interest as well as areas never explored, are likely to add to our knowledge of the country's floristic biodiversity with new records or the discovery of new species (ex.: Martínez-Camilo *et al.*, 2019).

**Table 1.** Taxa of terrestrial orchids found on Tacaná volcano and close areas. \*TDF=Tropical dry forest; TMCF: Tropical montane cloud forest; CP=Coffee plantation, PF=Pine forest; M=Moor; FL=Fallow land; SF=Secondary forest. Distribution report for the area (DRA): NRS=new records versus Solano *et al.* (2016), NRV=new records versus both Solano *et al.* (2016) and Villaseñor (2016), Conservation status (+) according with NOM-059-SEMARNAT-2010 (SEMARNAT, 2010). Voucher CICY herbarium (VCH): number of samples (collector: V. Bertolini).

Taxa	Municipality	Elevation (m)	Habitat	VHC	DRA
<i>Aulosepalum hemichreum</i> (Lindl.) Garay	Tapachula	1107	TDF*	10	
<i>Aulosepalum hemichreum</i> (Lindl.) Garay	Unión Juárez	1815	TMCF*	173	
<i>Bletia purpurata</i> A. Rich. & Galeotti	Cacahoatán	1803	Road	121	
<i>Bletia purpurea</i> (Lam.) A.DC.	Cacahoatán	1107	TDF	11	
<i>Cranichis apiculata</i> Lindl.	Tapachula	1606	TMCF	154	NRS
<i>Cranichis apiculata</i> Lindl.	Cacahoatán	2031	TMCF	162	
<i>Cranichis muscosa</i> Sw.	Cacahoatán	898	CP*	226	
<i>Cranichis notata</i> Dressler	Cacahoatán	965	CP	232	NRV
<i>Cranichis revoluta</i> Hamer & Garay	Cacahoatán	1781	TDF	118	NRS
<i>Cranichis wagneri</i> Rchb.f	Cacahoatán	1803	TMCF	120	
<i>Cranichis wagneri</i> Rchb.f	Cacahoatán	1433	CP	149	
<i>Cranichis wagneri</i> Rchb.f	Cacahoatán	2133	TMCF	168	
<i>Cranichis wagneri</i> Rchb.f	Cacahoatán	1462	TMCF	233	
<i>Cyclopogon comosus</i> (Rchb. f.) Burns-Bal. & E.W. Greenw.	Cacahoatán	1749	SF*	23	NRS
<i>Cyclopogon comosus</i> (Rchb. f.) Burns-Bal. & E.W. Greenw.	Tapachula	1513	SF	151	
<i>Cyclopogon comosus</i> (Rchb. f.) Burns-Bal. & E.W. Greenw.	Unión Juárez	2340	TMCF	203	
<i>Cyclopogon cranichoides</i> (Griseb.) Schltr.	Unión Juárez	2570	TMCF	17	
<i>Cyclopogon elatus</i> (Sw.) Schltr.	Unión Juárez	3103	M*	228	NRS
<i>Cyclopogon luteo-albus</i> (A. Rich. & Galeotti) Schltr.	Cacahoatán	1703	SF	19	NRS
<i>Cyclopogon luteo-albus</i> (A. Rich. & Galeotti) Schltr.	Unión Juárez	1654	TMCF	94	
<i>Cyclopogon luteo-albus</i> (A. Rich. & Galeotti) Schltr.	Tapachula	1606	TMCF	184	
<i>Cyclopogon luteo-albus</i> (A. Rich. & Galeotti) Schltr.	Cacahoatán	1462	CP	192	
<i>Cyclopogon miradorensis</i> Schltr.	Cacahoatán	1983	TMCF	25	NRV
<i>Cyclopogon miradorensis</i> Schltr.	Unión Juárez	1639	TMCF	29	
<i>Cyclopogon miradorensis</i> Schltr.	Unión Juárez	1811	TMCF	42	
<i>Cyclopogon miradorensis</i> Schltr.	Tapachula	1513	SF	151	
<i>Cyclopogon papilio</i> Szlach.	Cacahoatán	1704	TMCF	135	
<i>Cyclopogon papilio</i> Szlach.	Cacahoatán	2020	TMCF	166	
<i>Cyclopogon papilio</i> Szlach.	Cacahoatán	1704	TMCF	134	
<i>Cyclopogon prasophyllum</i> (Rchb. f.) Schltr.	Cacahoatán	1785	SF	24	
<i>Cyclopogon saccatus</i> (Rchb. f.) Burns-Bal. & E.W. Greenw.	Cacahoatán	1719	SF	222	NRS
<i>Epidendrum radicans</i> Pav. ex Lindl.	Unión Juárez	1856	Road	63	
<i>Epidendrum ramosum</i> Jacq.	Unión Juárez	1856	CP	56	
<i>Epidendrum verrucosum</i> Sw.	Cacahoatán	1769	TDF	117	
<i>Funkiella rubrocallosa</i> (BL Rob. & Greenm.) Salazar & Soto Arenas	Unión Juárez	3159	PF*	230	NRV
<i>Goodyera dolabripetala</i> (Ames) Schltr.	Cacahoatán	2438	TMCF	82	NRS
<i>Goodyera major</i> Ames & Correll	Unión Juárez	1812	TMCF	106	NRV



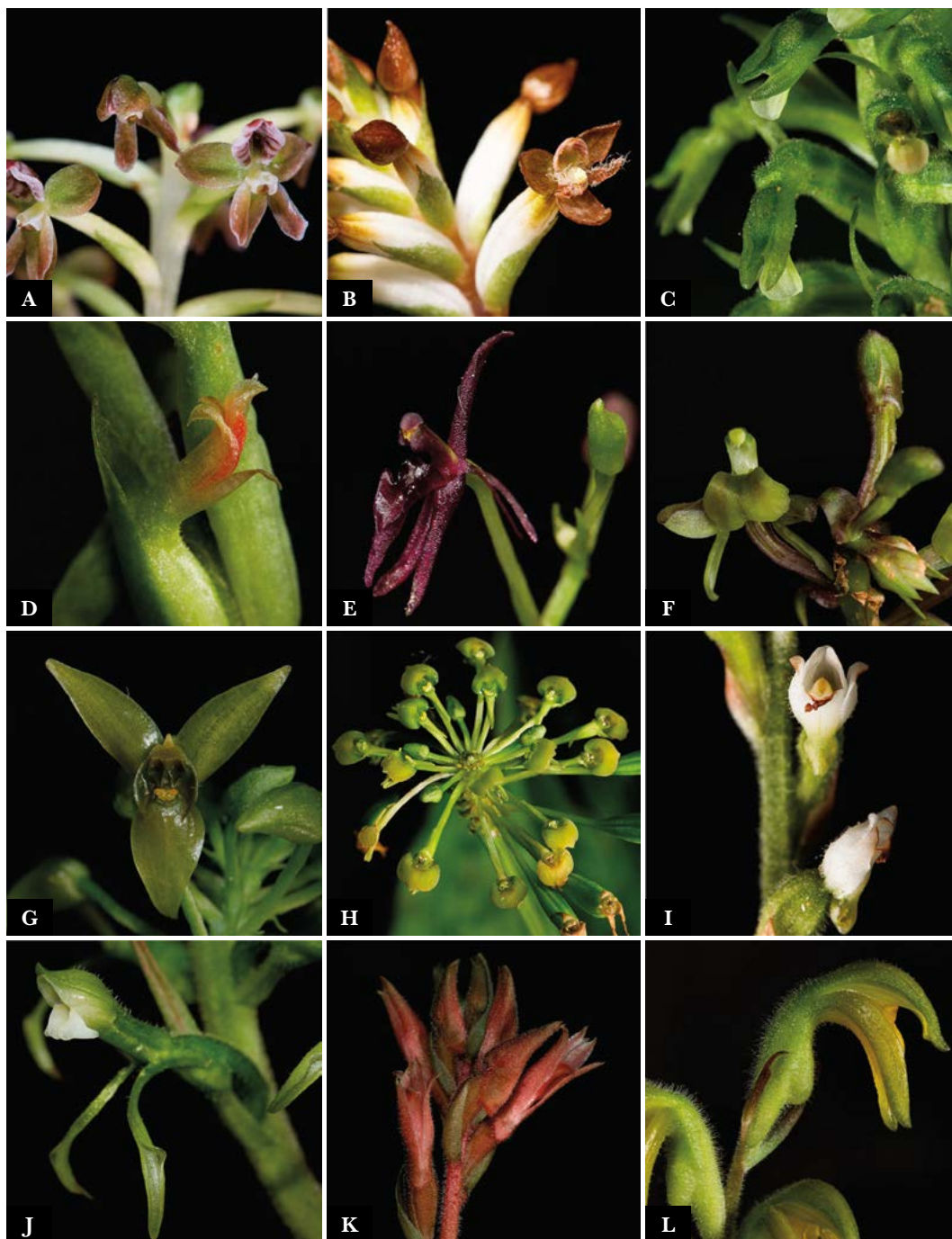
**Table 1.** Continues...

Taxa	Municipality	Elevation (m)	Habitat	VHC	DRA
<i>Goodyera striata</i> Rchb.f	Cacahoatán	2328	TMCF	132	
<i>Goodyera striata</i> Rchb.f	Cacahoatán	2127	TMCF	223	
<i>Goodyera striata</i> Rchb.f	Unión Juárez	2441	TMCF	227	
<i>Govenia superba</i> (Lex.) Lindl.	Tapachula	1488	TMCF	71	
<i>Govenia superba</i> (Lex.) Lindl.	Cacahoatán	2250	TMCF	74	
<i>Govenia superba</i> (Lex.) Lindl.	Tapachula	1488	Road	98	
<i>Habenaria distans</i> Griseb	Cacahoatán	1759	TDF	116	NRS
<i>Habenaria distans</i> Griseb	Unión Juárez	1818	SF	142	
<i>Habenaria distans</i> Griseb	Unión Juárez	2449	CP	144	
<i>Habenaria distans</i> Griseb	Cacahoatán	1433	SF	155	
<i>Habenaria distans</i> Griseb	Cacahoatán	2031	SF	165	
<i>Habenaria distans</i> Griseb	Tapachula	1513	FL	182	
<i>Habenaria distans</i> Griseb	Cacahoatán	2127	TMCF	224	
<i>Habenaria distans</i> Griseb	Cacahoatán	1462	TMCF	231	
<i>Habenaria distans</i> Griseb	Cacahoatán	1462	TMCF	233	
<i>Habenaria eustachya</i> Rchb. F	Cacahoatán	2328	SF	136	
<i>Habenaria eustachya</i> Rchb. F	Unión Juárez	1818	TMCF	138	
<i>Habenaria eustachya</i> Rchb. F	Cacahoatán	1433	CP	150	
<i>Habenaria eustachya</i> Rchb. F	Cacahoatán	1885	CP	157	
<i>Habenaria eustachya</i> Rchb. F	Cacahoatán	2060	SF	161	
<i>Habenaria eustachya</i> Rchb. F	Cacahoatán	1440	CP	179	
<i>Habenaria eustachya</i> Rchb. F	Tapachula	890	SF	189	
<i>Habenaria eustachya</i> Rchb. F	Tapachula	1088	SF	221	
<i>Kreodanthus casillasii</i> R. González	Tapachula	1624	CP	153	NRS
<i>Liparis arnoglossophylla</i> (Rchb. f.) Hemsl.	Unión Juárez	2378	TMCF	215	NRV
<i>Liparis cordiformis</i> C. Schweinf.	Unión Juárez	2332	TMCF	212b	NRS
<i>Liparis fantastica</i> Ames & C. Schweinf	Unión Juárez	2332	TMCF	212	NRV
<i>Liparis nervosa</i> (Thunb.) Lindl	Cacahoatán	1462	SF	225	NRS
<i>Malaxis histionantha</i> (Otto) Garay & Dunst.	Tapachula	1282	FL	66	NRV
<i>Malaxis lepanthiflora</i> (Schltr.) Ames	Tapachula	2062	TMCF	211	
<i>Malaxis lepanthiflora</i> (Schltr.) Ames	Cacahoatán	2097	TMCF	217	
<i>Malaxis macrostachya</i> (Lex.) Kuntze	Cacahoatán	1882	TMCF	124	
<i>Malaxis maianthemifolia</i> Schltdl. & Cham.	Cacahoatán	1882	TMCF	123	NRV
<i>Malaxis pandurata</i> (Schltr.) Ames (+)	Unión Juárez	1935	TMCF	61	
<i>Malaxis parthonii</i> C. Morren	Cacahoatán	1746	TMCF	78	NRV
<i>Malaxis parthonii</i> C. Morren	Cacahoatán	2132	TMCF	81	
<i>Malaxis parthonii</i> C. Morren	Cacahoatán	1774	SF	216	
<i>Malaxis parthonii</i> C. Morren	Cacahoatán	1549	SF	47	
<i>Malaxis parthonii</i> C. Morren	Unión Juárez	1823	TMCF	88	
<i>Malaxis parthonii</i> C. Morren	Unión Juárez	2025	TMCF	92	

**Table 1.** Continues...

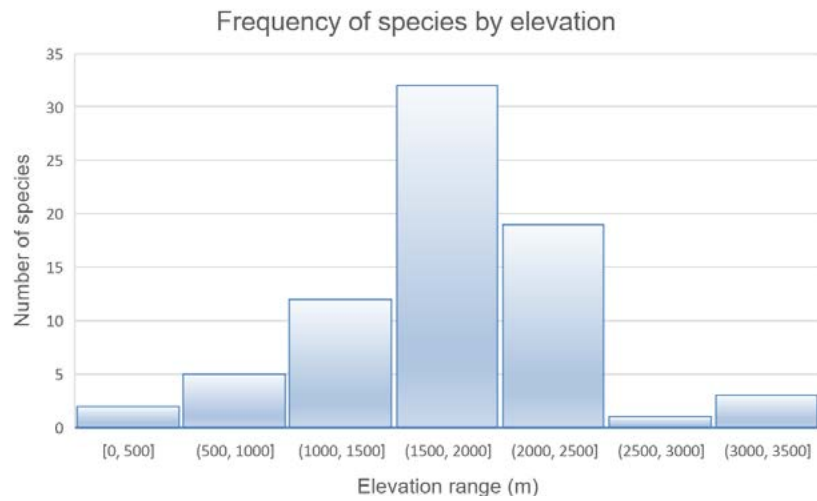
Taxa	Municipality	Elevation (m)	Habitat	VHC	DRA
<i>Malaxis parthonii</i> C. Morren	Unión Juárez	2004	TMCF	93	
<i>Malaxis parthonii</i> C. Morren	Unión Juárez	2004	TMCF	95	
<i>Malaxis parthonii</i> C. Morren	Unión Juárez	2004	TMCF	96	
<i>Malaxis soulei</i> LO Williams	Tapachula	1566	TMCF	100	NRS
<i>Malaxis soulei</i> LO Williams	Cacahoatán	2060	TMCF	163	
<i>Microchilus lunifer</i> (Schltr.) Ormerod	Cacahoatán	2056	TMCF	167	
<i>Oeceoclades maculata</i> Lindl.	Tapachula	1257	CP	64	
<i>Pelexia funckiana</i> (A. Rich. & Galeotti) Schltr	Cacahoatán	1705	TMCF	176	
<i>Pelexia funckiana</i> (A. Rich. & Galeotti) Schltr	Cacahoatán	1780	TMCF	191	
<i>Pelexia funckiana</i> (A. Rich. & Galeotti) Schltr	Cacahoatán	1661	TMCF	201	
<i>Platythelys maculata</i> (Hook.) Garay	Cacahoatán	1691	TMCF	126	
<i>Platythelys maculata</i> (Hook.) Garay	Unión Juárez	1744	TMCF	84	
<i>Platythelys maculata</i> (Hook.) Garay	Tapachula	1663	FL	102	
<i>Platythelys maculata</i> (Hook.) Garay	Cacahoatán	1433	CP	148	
<i>Platythelys maculata</i> (Hook.) Garay	Unión Juárez	973	CP	214	
<i>Platythelys venustula</i> (Ames) Garay	Tapachula	1624	CP	152	
<i>Ponthieva triloba</i> Schltr.	Cacahoatán	2328	TMCF	131	
<i>Ponthieva tuerckheimii</i> Schltr.	Cacahoatán	1704	TMCF	110	
<i>Prescottia stachyodes</i> (Sw.) Lindl.	Cacahoatán	2328	TMCF	133	
<i>Prescottia stachyodes</i> (Sw.) Lindl.	Unión Juárez	2449	CP	145	
<i>Prescottia stachyodes</i> (Sw.) Lindl.	Cacahoatán	1990	TMCF	170	
<i>Psilochilus macrophyllus</i> (Lindl.) Ames	Tapachula	1642	TMCF	4	NRS
<i>Rhynchostele bictoniensis</i> (Bateman) Soto Arenas & Salazar	Cacahoatán	2031	TDF	164	
<i>Sacoila lanceolata</i> (Aubl.) Garay	Tapachula	326	Urban street	46	
<i>Sacoila lanceolata</i> (Aubl.) Garay	Cacahoatán	947	Urban street	206	
<i>Sarcoglottis cerina</i> (Lindl.) PN Don (+)	Cacahoatán	1788	TDF	196	
<i>Sobralia rogersiana</i> Christenson	Cacahoatán	1780	TDF	53	NRS
<i>Sobralia rogersiana</i> Christenson	Tapachula	1488	TMCF / CP	72	NRS
<i>Triphora trianthophoros</i> (Sw.) Rydb.	Cacahoatán	1885	TMCF	112	NRV
<i>Triphora trianthophoros</i> (Sw.) Rydb.	Cacahoatán	1882	TMCF	122	

Between 1,500 and 2,500 m.a.s.l., the greatest diversity of specimens was obtained in terms of individuals collected (Table 1), as well as species diversity. At that elevation we can find the TMCF, the ecological niche with highest biodiversity in México and priority of conservation policy (CONABIO, 2024; González-Espinosa *et al.*, 2016, Ochoa-Ochoa *et al.*, 2010; Ochoa-Ochoa *et al.*, 2021). High altitude and mountain conditions appear to favour an increase in species diversity, and it is also suggested that these are conditions that have had a positive effect on species diversification in the past compared to other ecosystem types (Givnish *et al.*, 2016).

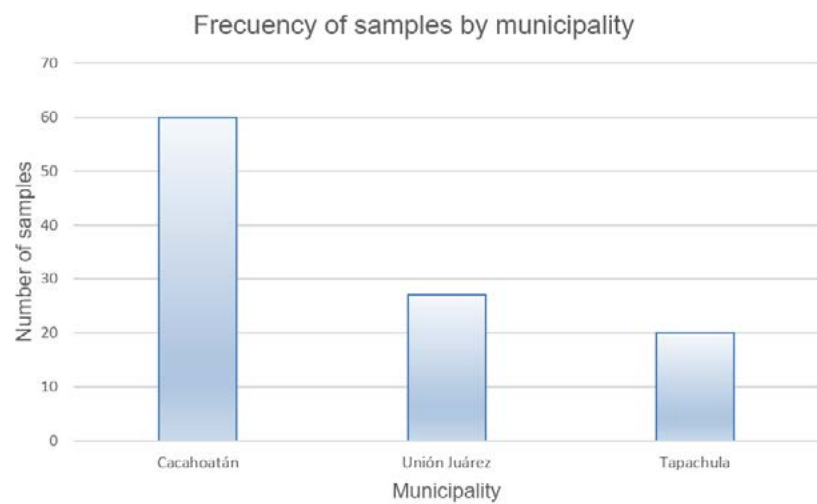


**Figure 2.** Example of microphotography of some specimens of terrestrial orchid of Tacaná. A) *Cranichis apiculata* Lindl.; B) *Cranichis wagneri* Rchb.f.; C) *Cyclopogon luteo-albus* (A. Rich. & Galeotti) Schltr.; D) *Funkiella rubrocallosa* (BL Rob. & Greenm.) Salazar & Soto Arenas; E) *Liparis cordiformis* C. Schweinf.; F) *Liparis nervosa* (Thunb.) Lindl.; G) *Malaxis lepanthiflora* (Schltr.) Ames; H) *Malaxis parthonii* C. Morren; I) *Microchilus lunifer* (Schltr.) Ormerod; J) *Pelexia funkiana* (A. Rich. & Galeotti) Schltr.; K) *Sacoila lanceolata* (Aubl.) Garay; L) *Sarcoglottis cerina* (Lindl.) PN Don (photographer: M.Sc. Eduardo Rafael Chamé Vázquez).

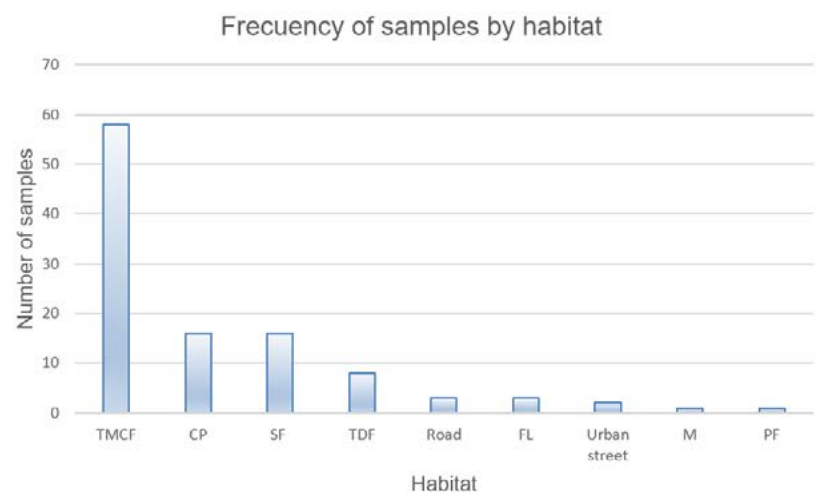




**Figure 3.** Frequency of species by elevation.



**Figure 4.** Municipality and number of samples.



**Figure 5.** Different habitats and number of samples found.



**Figure 6.** *Psilochilus macrophyllus* (Lindl.) Ames *in situ*. Left picture shows a plant in bloom, the right one a plant with capsule.

Although fragmented, observations (*e.g.* increased vegetation cover, isolation from urban sprawl) suggest that there is still a high level of forest conservation. The conservation status of the sampled habitats lacks formal conservation studies and should therefore be prioritised for a systematic and timely assessment of scientific and certainly social interest (*e.g.* the important contribution of ecosystem services provided by forests) to provide objective and representative data to determine the conservation status of the flora.

*Malaxis pandurata* (Schltr.) Ames and *Sarcoglottis cerina* (Lindl.) PN Don are listed as priorities according to the NOM059-2010 (SEMARNAT, 2010). The data from this study position the RTP 135 Tacaná-Boquerón as the Mexican region with the highest number of Orchidaceae species in Mexico, followed by El Momón-Las Margaritas-Montebello with 333 species. These results suggest a total of 351 orchid species for this region of Mexico, which should be maintained as a high conservation priority. The orchid diversity is likely to increase with future explorations into less accessible areas of the Tacaná. For example, for Peru, for many years (Tamayo-Cen *et al.*, 2020), the genus *Encyclia* was only considered present in the country with eight species; however, during the last explorations, its diversity has risen to 13, of which three are new reports for the country and two are new entities in the process of publication (Tamayo-Cen *et al.* in press; Ocupa-Horna *et al.*, 2024). Finally, we recommend that researchers include a multidisciplinary approach in future floristic lists (when it is possible), which include as much information as possible from each collection, allowing these data to be useful in future research, such as conservation status analyses. Even the possibility of making calculations such as phylogenetic or taxonomic diversity should be included to provide different metrics-evidence that fit the needs of particular areas for conservation decision-making.

## CONCLUSIONS

The terrestrial priority region 135 Tacaná-Boquerón represents an important source of biodiversity for Mexico. On this occasion we determined that the orchid record for this site is still incomplete, in reference to the terrestrial elements of this family. This is probably the case for many sites in Mexico. A careful scheme of field trips during different seasons of the year could detect new records providing further knowledge of Mexican biodiversity. With these latest findings, the Tacaná region reaches a total of 351 taxa of orchid species equal to taxonomic units.

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