Phytotaxa 634 (3): 204–214
https://www.mapress.com/pt/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

https://doi.org/10.11646/phytotaxa.634.3.2

Thelephora pacifica (Basidiomycota: Thelephorales), a new species of the tropical forests in the Mexican Pacific coast

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Abstract

Thelephora is a genus of ectomycorrhizal fungi distributed in angiosperm and gymnosperm forests around the world. In this study, we describe *Thelephora pacifica*, a new species associated with tropical oak forests in Mexico. Phylogenetically, it is the sister group of *T. pseudoganbajun* from China. Morphologically, it corresponds to *T. vialis* previously reported in Mexico. *Thelephora pacifica* has a flabelliform basidiocarp with a hymenophore of grayish-brown color with pinkish tinges contrasting with the yellowish-olive margin. It is distributed in the Pacific forests of Mexico, an area with a high potential for endemism.

Key words: phylogeny, Oak mushrooms, Mexico, taxonomy, Thelephoraceae

Introduction

In 1785, Ehrhart introduced the generic name *Thelephora* Ehrh. ex Willd. to encompass fungi distinguished by C. L. Willdenow as possessing a leathery consistency, infundibuliform or clavarioid shape, and basidiomata resupinate or stipitate, along with smooth or papillate hymenophore, which is inferior or amphigenous in certain species. Subsequently, E. M. Fries in his *Systema Mycologicum* affirmed the validity of the genus, designating *T. terrestris* Ehrh. ex Fr. as the type species (Willdenow 1787; Fries 1821; Burt 1914; Lentz 1942). Numerous monographs of the genus have since been published, including those authored by Burt (1914), Lentz (1942) and Corner (1968), among others.

The genus *Thelephora* is characterized by basidiomata that are steroid, clavarioid, cantharelloid or spatulate in form, pleuropodal or resupinate. The hymenophore varies from smooth to slightly wrinkled or papillate, and the surface of the pileus ranges from glabrous to strigose or slightly furrowed. In certain species, the hymenophore is amphigenous. The genus exhibits a monomitic hyphal system with branched, fibulate hyphae; tetrasporic basidia, and typically muricate, warty, or echinulate, subhyaline to brownish, inamyloid ornamented spores (Li *et al*. 2020; Liu *et al*. 2021).

Currently, 56 species of *Thelephora* are globally recognized (Bánki *et al*. 2023) and the genus is believed to exhibit a preference for temperate climates in the Northern Hemisphere. However, approximately 28 species are in tropical or subtropical regions (Colpaert 1999; Ramírez-López *et al*. 2015). In Mexico, there are 11 recorded *Thelephora* species include *T. antocephala* var. *americana* (Peck) Corner (1968: 40), *T. arbuscula* Corner (1968: 42), *T. caryophyllea* (Schaeffer) Persoon (1801: 565), *T. cervicornis* Corner (1968: 49), *T. dominicana* Angelini, Losi & Vizzini (2016: 29), *T. griseozonata* Cooke (1891: 104), *T. pseudoversatilis* Ramírez-López & Villegas (2015: 353), *T. regularis* var. *regularis* Schweintz (1822: 105), *T. regularis* var. *multipartita* (Schweintz) Corner (1968: 83), *T. terrestris* (Ehrhart)

 Accepted by Md. Iqbal Hosen: 8 Jan. 2024; published: 18 Jan. 2024

Fries (1821: 431), *T. versatilis* Ramírez-López & Villegas (2015: 352), and *T. vialis* Schweintz (1832: 165) (Sánchez-Jácome & Guzmán-Dávalos, 1997; Ramírez-López *et al*. 2015; Uitzil-Colli *et al*. 2020) This compilation represents nearly 20% of the global diversity. Research on the genus has been limited, primarily focusing on morphology, and more recently, on phylogenetic studies.

Thelephora and its sister group, *Tomentella,* are ectomycorrhizal fungi associated with various angiosperms and gymnosperms. The *Tomentella-Thelephora* clade stands out as one of the most abundant fungal groups in soil. Through environmental sequencing of the internal transcribed spacer (ITS) region, at least 41,500 putative species have been estimated within this clade (Tedersoo *et al*., 2022). The Mexican Pacific coast is widely acknowledged as a region with high endemism across various fungal groups (Tedersoo *et al*., 2022). In this study, we present the description of a new species of *Thelephora*, *T. pacifica sp. nov*. thriving in tropical oak forests transitioning into subperennial tropical forest on the Mexican Pacific coast. This species bears a resemblance to the *T. ganbajun* complex.

Material and methods

Morphological data. The macroscopic characteristics were described based on the methodology outlined in Cifuentes e*t al*. (1986). Fruiting body coloration was determined with the Methuen color guide (Kornerup & Wanscher 1978). Specimens were photographed under natural conditions using a Canon Powershot SX10 IS digital camera. Microscopic structures were described following Largent *et al*. (1977). Observations of microscopic characters were conducted on freehand sections of dried basidiocarps, which were mounted in 3% KOH. All microscopic structure observations were performed using a brightfield microscope (Zeiss Primostar), while digital images captured with a Canon G16 camera. Microscopic measurements were done using ToupView software v. 4.11 (ToupTek Photonics Co., Ltd). The average length (L^m) and width (W^m) of the spores were determined, and the variation in the length-to-width ratio (Q) and the ratio average length to average width L^m/W^m (Q^m) between specimens were calculated. To observe spore ornamentation, photographs were taken under the scanning electron microscope (Hitachi model SU1510) at the "Laboratorio de Microscopía y fotografía de la Biodiversidad", from Instituto de Biología, Universidad Nacional Autónoma de México (UNAM).

The holotype is deposited in the fungi collection of the National Herbarium (MEXU-HO); while a paratype is conserved in the Mycology Section of the Faculty of Sciences Herbarium, UNAM (FCME). Additional specimens are kept in the fungi collection of the Biological Collections Laboratory of the Universidad del Mar, Puerto Escondido campus (LCB-UMAR). Also, we asked for the Herbarium "Luz María Villarreal de Puga" (IBUG) of the Universidad de Guadalajara, for specimens identified as *Thelephora vialis*.

DNA extraction, amplification, and sequencing. Genomic DNA extraction from fruitbodies was performed with the DNeasy Plant kit (Qiagen) following the manufacturer's guidelines. The ITS region was amplified using primers ITS1F and ITS4 (Gardes & Bruns 1993; White *et al*. 1990), while the large subunit ribosomal DNA region (LSU) was amplified with primers LR0R and LR5 (Vilgalys & Hester 1990). PCR amplification was carried out using Taq&LOAD™ MasterMix (MP Biomedicals) under the following conditions: initial denaturation at 94 ºC for 5 min followed by 35 cycles of 94 °C for 30 s, annealing at 55 ºC for 30 s, and extension 72 ºC for 60 s, with a final extension at 72 °C for 5 min (Pérez-Pazos *et al*., 2019). Verification of PCR products was confirmed through 1% agarose gel electrophoresis stained with GelGreen® Nucleic Acid Gel Stain (Biotium). The PCR products underwent purification using Exo-SAP-IT™ PCR Product Cleanup Reagent (Applied Biosystems) as per the manufacturer's instructions. Sequencing of PCR products was carried out on an ABI 3100 sequencer (Applied Biosystems) at the "Laboratorio de Secuenciación Genómica de la Biodiversidad y de la Salud", Instituto de Biología, UNAM utilizing PCR primers. Subsequently, sequences were checked for quality, assembled and edited with Geneious Prime software v. 2023.2.1. Comparisons of the sequences were conducted using the BLASTN algorithm against all the sequences in GenBank and UNITE (Abarenkov *et al*., 2010). The resulting sequences were deposited in GenBank under accession numbers OR548193 to OR548196 (ITS) and OR602206 to OR602208 (LSU).

Phylogenetic analyses. We conducted sequence alignment using MAFFT v7 (Katoh *et al*., 2019) incorporating all obtained sequences along with NCBI sequences from *Thelephora* and *Tomentella* specimens, as well as other outgroup genera from Thelephoraceae (*Amaurodon* and *Pseudotomentella*). To enhance sequence diversity, we included specimens with the highest similarity percentage through a BLASTN search on GenBank. Phylogenetic analyses were performed for each amplified region (ITS and LSU) individually as well as through concatenated analysis. Alignment refined was undertaken in Mesquite 3.81 (Maddison & Maddison 2023) and the finalized alignment was exported for model selection using jModelTest2 on CIPRES (Miller *et al*., 2010). The model with the highest probability was GTR + I + gamma, and subsequent Bayesian analysis was executed in Mr. Bayes v.3.2.7 (Ronquist *et al*., 2012) with four Markov chains, sampling every 500 topologies, spanning 5 million generations and producing a consensus tree with the highest posterior probability. Maximum likelihood analyses were performed in RAXML on CIPRES, incorporating 1000 bootstrap replicates. In both analyses, *Amaurodon aquicoeruleus* (GenBank AM490944) was designated as the outgroup. The topology generated in Mr. Bayes was employed for both analyses, and Bayesian Posterior Probabilities as well as maximum likelihood support values for each clade were indicated.

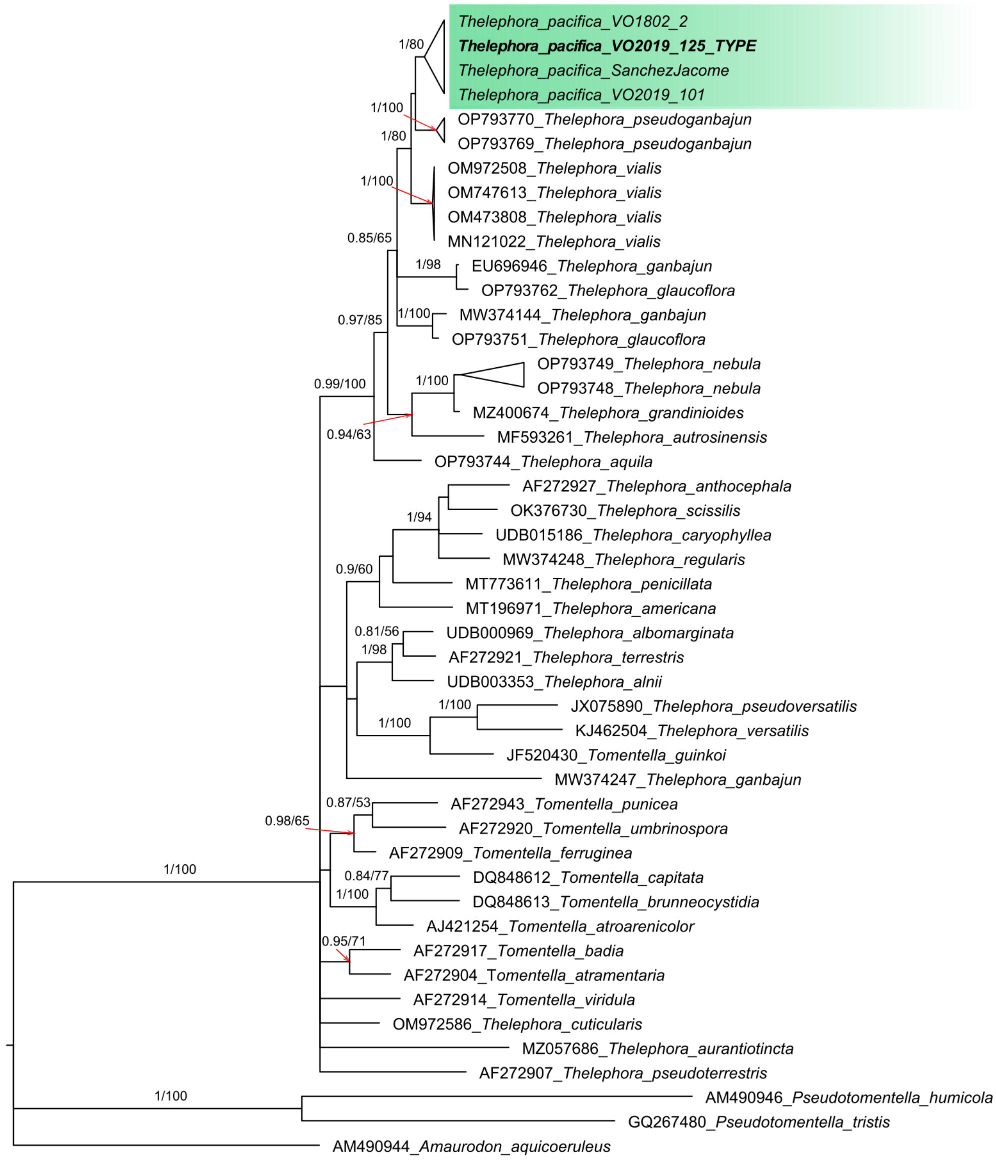

FIGURE 1. Bayesian concatenated analysis of ITS and LSU rDNA regions, with 5 million generations and GTR + I + Gamma substitution model. Posterior probabilities and Bootstrap values are indicated along the branches. Sequences belonging to *Thelephora pacifica* are enclosed within a green rectangle, with the sequence of the type specimen highlighted in bold.

Results

Genetic diversity

The sequences obtained from Oaxaca specimens and from the IBUG herbarium formed a group displaying a 98.9% pairwise identity and 98% identical sites. Within the sequences, seven ambiguous nucleotides and three insertions were identified. Ambiguity occurred at positions 416 and 518, involving a guanine and adenosine. Positions 515, 569, 585, 640, and 641 exhibited ambiguities with both cytosine and a thymine. Additionally, insertions were observed at positions 463–464, by a doble thymine, and at position 581, where a guanine was inserted.

Phylogenetic analyses

Nucleotide comparison of *T. pacifica* reveal a similarity exceeding 95% with *T. ganbajun* from China and *T. vialis* from the United States based on ITS. To enhance the precision of our phylogenetic analyses, we incorporated sequences from four newly identified species within *T. ganbajun* complex. In addition, we included the sequence of the "*T. vialis*" specimens reported by Sánchez-Jácome and Guzmán-Dávalos (1997). We found that *T. pacifica* and "*T. vialis*" reported from Jalisco form a monophyletic clade (Bayesian Posterior Probability = 1, bootstrap = 80), suggesting they should be the same species. Both are sister groups of *T. pseudoganbajun* reported from China (BPP = 0.75; bs = 62). Notably, *Thelephora pacifica* falls within the clade of *T. ganbajun sensu lato* – *T. ganbajun, T. pseudoganbajun, T. nebula, T. glaucoflora* and *T. aquila* – originally described from China. This clade also includes *T. vialis* sequences from North Carolina, USA (BPP = 1; bs = 100) (**FIGURE 1**).

Taxonomy

Thelephora pacifica **Villarr.-Ord., Alvarez-Manjarrez, Maldonado & Sánchez, *sp. nov.***
(FIGURE 2)

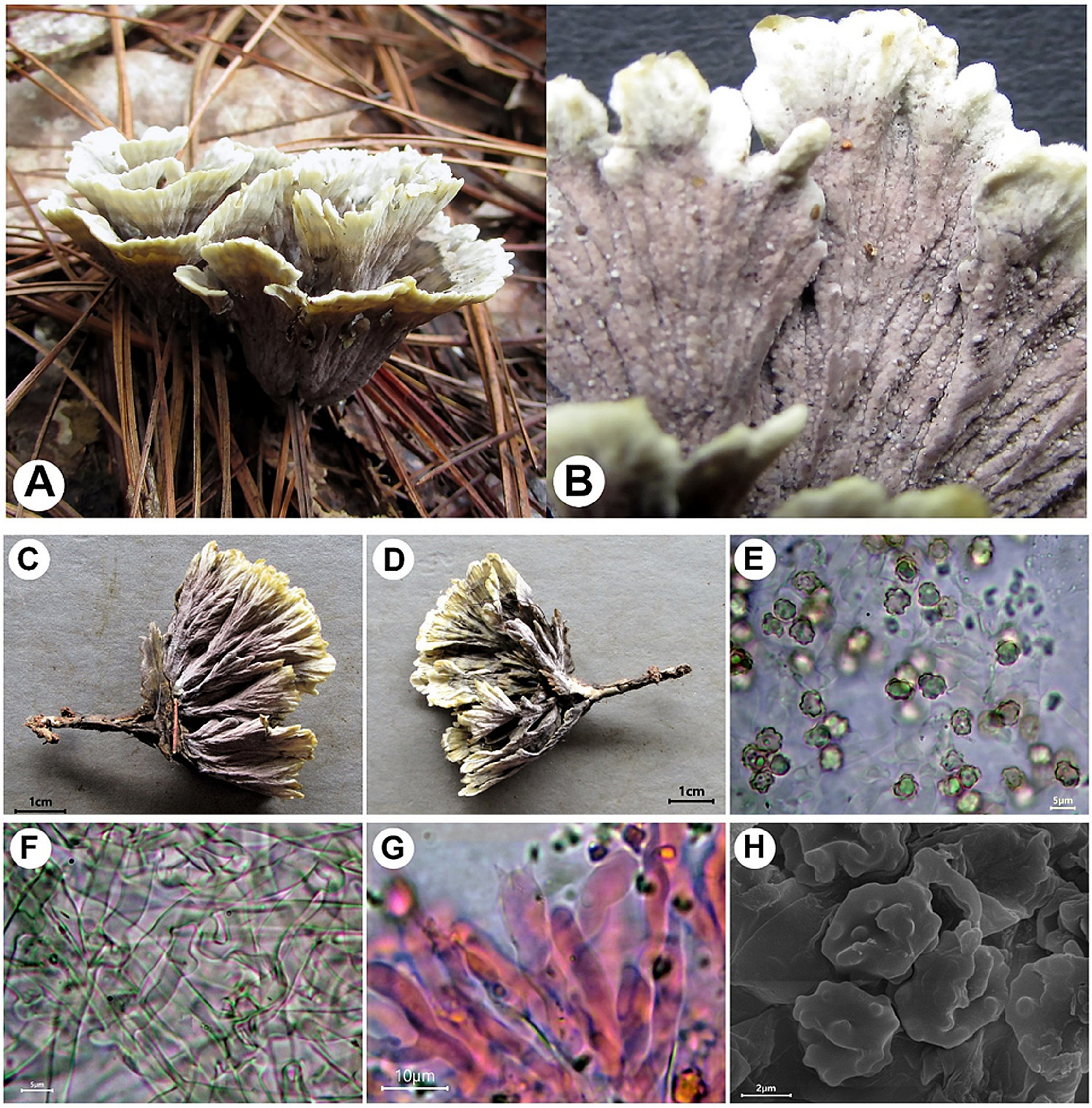

FIGURE 2. Morphological characteristics of *Thelephora pacifica*. A. Basidiome in its natural environment; B. Hymenophore displaying distinctive folds and warts; C–D. Macroscopic features of basidiome; E. Tuberculate spores; F. Context hyphae with fibulae; G. Basidia and basidioles; H. Tuberculate spores. Images E–G were captured using a light microscope, while H shows spores observed under a scanning electron microscope (12.9 mm × 7.5 K).

TYPE:—MÉXICO. Oaxaca: San Gabriel Mixtepec municipality, Rancho El Sagrado, September 27th, 2019, Villarruel-Ordaz 1883, photo VO 2019-125, (Holotype: MEXU-HO 30494)

MycoBank: 850299

GenBank number: OR548196 (ITS), OR602208 (LSU)

Etymology. Regarding distribution in Pacific tropical forests of Mexico.

Diagnosis. Basidiomata flabellate, fleshy to slightly leathery, grayish brown with olive-yellow tones towards the margin of the lobules, pileus fibrillose surface and hymenophore is irregular to papillate. Subglobose warty spores. It develops in subtropical oak forests in transition to semideciduous tropical forest.

Thelephora pacifica bears a resemblance to *T. ganbajun* in terms of basidiomata morphology, differing primarily in the pileus surface coloration—grayish to black in *T. ganbajun*, while *T. pacifica* displays grayish-brown tones with olive colors along the margin. Furthermore, *T. pacifica* boasts larger spores ((4.3–) 4.7–6.8 (–7.3) × (3.6–) 4.0–5.5 (–6.0) µm) compared to *T. ganbajun*. Additionally, *T. pacifica* shares similarities with *T. pseudoganbajun*, but it distinguishes by having smaller basidia (19.5–30 × 4.7–6.3 µm).

Description. *Basidiomata* 23–42 mm height, 21–54 mm wide, petaloid to flabellate, tenacious fleshy to leathery consistency; surface marked with concentric lines, regularly longitudinally plicate, occasionally, it may have a pseudo-stipe slightly fibrillose to tomentose at base; grayish brown (5D3,2) with slightly pale olive-yellow (4C3) margin, and shades darkening to dark grayish brown (5F2–6F3) toward base; hymenophore smooth to papillate, warty or folded, grayish brown (8D2–9D3), darkening to grayish brown to purplish brown (8F3–10F4) towards base and margin on both sides of basidiome yellowish white (2, 3, 4A2) with olive yellow tones (3B2, 3C3); occasionally a cylindrical, irregular stipe with a pubescent surface, dark grayish brown (5F2) to almost black, from 15 to 23 mm length and up to 3 mm in width.

Basidia 19.5–30 µm long and 4.7–6.3 µm wide medially, tetrasporic, cylindrical to sub-cylindrical, slightly curved or contoured, hyaline, thin-walled, 2–3 µm sterigmata, clamped at the base; no cystidia observed. *Basidiospores* (4.3–) 4.7–6.8 (–7.3) × (3.6–) 4.0–5.5 (–6.0) µm (ornamentation excluded), L^m = 5.7 µm, A^m = 4.8 µm, Q^m = 1.18, globose to subglobose in polar view and broadly ellipsoid in lateral view, tuberculate to nodular, thick-walled, warty ornamentation 0.3 to 0.5 µm thick, translucent yellowish in KOH (5%). *Hyphal system* monomitic, 3–4 µm in diameter, highly branched hyphae with presence of fibulae, with cyanescent reaction in KOH (5%) in some portions of the context.

Habit and habitat. Growing gregariously in a gradient of subtropical oak forest with sub-perennial tropical forest from 650 to 800 meters above sea level.

Additional specimens examined. MÉXICO, Oaxaca: San Gabriel Mixtepec municipality, Camino a la Finca Aurora, cerro de la Olla, August 2nd, 2019, Villarruel-Ordaz 1802, photo VO 2019-44 (FCME 28004; NCBI: OR548194 (ITS)); Rancho El Sagrado, September 20th, 2019, Villarruel-Ordaz 1859, photo VO 2019-101 (LCB-UMAR 0605; NCBI: OR548195 (ITS); OR602206 (LSU)); September 27th, 2019, Villarruel-Ordaz 1883, photo VO 2019-125 (MEXU-HO 30494; NCBI: OR548196 (ITS); OR602208 (LSU)); October 1st, 2023, Villarruel-Ordaz 1959, photo VO 2023-1 (LCB-UMAR 0607); Jalisco: San Sebastián del Oeste municipality, Sánchez Jácome s.n. (IBUG; NCBI: OR548193 (ITS)).

Note. *Thelephora pacifica* exhibits morphological similarities to *T. ganbajun* sensu Zang (1987:85), as originally described in China. The original description *T. ganbajun* indicated echinulate spores measuring 7–12 × 6–8 µm. However, Li *et al*. (2020) reevaluated the type specimen and determined that the spores were tuberculate and considerably smaller (4.5–6 × 4.2–5 µm). In order to have a better understanding of the morphological characters of *T. ganbajun*, Li *et al*. (2020) provided a revised description based on their own collected specimen. They reported spores are 4.5–5.5 × 4–5 µm (including ornamentation) consistent with the type specimen. Our specimens present a larger spore size than that reported by Li *et al*. (2020). Additionally, there are distinctions in the coloration of the surface of the pileus and hymenophore, with *T. ganbajun* presenting grayish to almost black tones, while *T. pacifica* displays a grayish brown coloration with olive yellow tones towards the margin. Furthermore, Yang *et al*. (2023) present a more detailed description of *T. ganbajun* based on the type specimen (**TABLE 1**). Our specimens differ from the description of *T. ganbajun sensu* Yang *et al*. (2023) primarily in their larger spore size (**TABLE 1**).

T. pacifica shares morphological similarities with *T. pseudoganbajun* Yang & Yuan (2023: 11), particularly in the shape and ornamentation of the spores. However, they differ in the size of the basidia, with those of *T. pseudoganbajun* being larger 45–65 × 6–10 µm, and showing a blue-greenish reaction to KOH (3%) in the context.

TABLE 1. Morphological comparision of *Thelephora pacifica, T. ganbajun, T. pseduoganbajun* and *T. vialis* reported by various authors.

Species	Basidiospores	Basidia	Cystidia	Basidiomata	Habitat
Thelephora pacifica sp. nov.	Subglobose, tuberculate to nodular, (4.3–) 4.7–6.8 (–7.3) × (3.6–) 4.0–5.5 (–6.0) μm, excluding ornamentation of 0.3 a 0.5 μm	19.5–30 × 4.7–6.3 μm, subcylindric, sinuose	No observations	Petaloid to flabellate, slightly fibrillose to tomentose at base; grayish brown darkening to purplish brown toward base; hymenophore plicate, smooth to papillate, grayish brown with yellowish-brown to olive-yellow tones at margin on both sides of basidiomata. Sometimes may form a central stipe.	Tropical subperennial forest with oaks
Thelephora ganbajun sensu Zang (1987) *Type description. See anotation in the text	Angular, echuinulate, 7–12 × 6–8 μm	25–35 × 9–12 μm, elongate, clavate	52-80 × 7-14 μm, clavate or subventricoses	Whitish-gray or blackish-gray surface of the pileus and grayish-white hymenophore	Conifer forest (*Pinus yunannensis* or *Pinus kesiyae)*
Thelephora ganbajun sensu Li *et al.* (2020)	4.5–5.5 × 4–5 μm including ornamentation	Not mentioned	Not mentioned	Pileus 7-9 × 8-10 cm, with serrated margins	Conifer forest (*Pinus yunannensis)*
Thelephora ganbajun sensu Yang *et al.* (2023)	Subglobose, irregularly lobade, (5) 5.5–7 (7.5) × (4.5) 5–6 (6.7) μm, excluding ornamentation	25–55 × 6–8 μm, subcylindric	50–85 × 6–8 μm	Flabellate, often imbricate, surface of pileus gray to dark brown, grayish yellow toward margin, hymenophore light gray to almost black toward base and whitish toward margin.	Conifer forest
Thelephora pseudoganbajun Yang & Yuan (2023)	Subglobose to irregularly lobade, tuberculate (5.1) 5.5–7(7.2) × (4= 4.3–5.5(6.1) μm excluding ornamentation	45 –65 × 6–10 um	Absent	Pilleus more or less deeply lacerate, flabellate to spatulate, usually imbricate and rosette-shaped, margin thin and imperceptibly wavy. Hymenophore rugulose or longitudinally wrinkled, light brown to brown at base, margin white and inconspicuously tuberculate.	Conifer and broad leaf forests
Thelephora vialis sensu Burt (1914)	Obtuse angular, 4.5–7 × 4.5–5 μm	Not mentioned	Not mentioned	Petaloid, surface of pileus dirty whitish to brown in center, surface plicate or fibrillose, hymenophore rough somewhat papillate, pale yellow to pale brown	Not mentioned
Thelephora vialis sensu Sánchez-Jácome and Guzmán-Dávalos (1997)	Lobade, verrucose 5.6–7.2 × 4.8–6.4 μm, ornamentation down to 0.8 μm	Not mentioned	Not mentioned	Petaloid to flabellate, surface of pileus velutinous to fibrillose-tomentose, some radially fibrillose-plicate, pale yellow with irregular dull green or gray areas. Hymenophore smooth to papillate, brown, brown-gray, light brown with whitish-orange or yellowish margin.	Pine and broad leaf forests
Thelephora vialis sensu Li *et al.* (2020)	4.5–7 × 4.5–5 μm	Not mentioned	Not mentioned	Pileus radially pleated or rough petiole with agglutinated fibrils and grayish white or yellowish hymenophore.	Not mentioned
Thelephora vialis sensu Liu *et al.* (2021)	4.5–7 (8) × 4.5–6 (6.5) μm,	26.4–64.0 × 5.6–10.4 μm	Not mentioned	Not mentioned	*Populus* spp, *Salix* spp. forest

T. pacifica is also very similar to *Thelephora vialis*, as reported from the State of Jalisco, Mexico by Sánchez-Jácome & Guzmán-Dávalos (1997), representing a new record for Mexico. The macroscopic characteristics documented by these authors align closely with those of *T. pacifica*. However, a significant discrepancy is observed in spore characteristics. Although the size of spores can overlap in both species, there is a discernible difference in the thickness of the ornamentation. In our specimens, the ornamentation can be up to 0.5 µm thick, whereas the specimens reported for Jalisco had ornamentation as thick as 0.8 µm.

Liu *et al*. (2021) emphasized the diagnostic significance of basidia in the infrageneric identification of *Thelephora*. They reported that *T. vialis* exhibits basida sizes from 26.4–64.0 × 5.6–10.4 µm, a range that contrasts significantly with the observations in our specimens, indicating a substantial difference (**TABLE 1**).

Discussion

This paper introduces a new species of *Thelephora* that shares morphological similarities with the *T. ganbajun* complex. *Thelephora pacifica* thrives in oak forests transitioning to medium sub-perennial forest within tropical zones, distinguishing from the pine forest distribution of *T. ganbajun*.

The description of the specimens identified as *T. vialis,* initially reported as the first record for Mexico by Sánchez-Jácome & Guzmán-Dávalos (1997), aligns closely with the characteristics of this new species. Noteworthy exceptions include the size of the spore ornamentation, which we interpret as part of the phenotypic diversity within *T. pacifica*. Following morphological and phylogenetic analysis, we conclude that these entities are the same species, prompting the revision and retraction of the record of *T. vialis* for Mexico. Sánchez-Jácome & Guzmán-Dávalos (1997) suggest a potential distribution of *T. vialis* along the Neovolcanic Trans Mexican Belt based on recorded occurrences in coniferous oak forests in San Sebastián del Oeste, Jalisco, and the Sierra de Manantlán, spanning Colima and Jalisco, Mexico. However, the type locality of the new species is in an oak forest transitioning to medium sub perennial forest in the municipality of San Gabriel Mixtepec, Oaxaca, Mexico. Therefore, we report that *T. pacifica* likely extends its distribution along the Pacific coast from Jalisco to Oaxaca, exhibiting a preference for oak forests.

Thelephora vialis, originally described in Europe in 1832 by Schweinitz, has been reported from North America and China (Li *et al*. 2020). Recently obtained sequences from specimens identified as *T. vialis* in North Carolina, USA were used for our phylogenetic analysis. Although the original description of *T. vialis* is concise and does not specify any deposited specimens in an herbarium in the protologue (https://www.biodiversitylibrary.org/page/24786764#page/219/mode/1up), a specimen labeled as *T. vialis* is deposited in the collection of The Academy of Natural Sciences of Philadelphia, USA, where the Schweinitz herbarium was deposited, thanks to collections by Salem and Bethlehem. Investigating and sequencing this specimen would be crucial to reevaluate the morphological concept of this species.

Our phylogenetic analyses showed that *T. pacifica* is a sister group to *T. pseudoganbajun* with low Bootstrap support but high posterior probability. These results are primarily attributed to specific ambiguous nucleotides, which could produce misleading estimates of topology and branch lengths (Lemmon *et al.* 2009). We proved that sequences from our specimens clustered at least al 98% of similarity before we performed phylogenetic analyses. However, across all analyses, both separated and concatenated ITS and LSU regions consistently yield the same results. *Thelephora pacifica* falls within the *T. ganbajun sensu lato* clade from China alongside *T. vialis* from the United States. Yang *et al.* (2023) already noted that their four new species clustered within a clade with *T. austrosinensis, T. grandinoides,* and *T. vialis*. These species, along with *T. pseudoganbajun, T. nebula, T. aquila, T. glaucoflora,* and *T. ganbajun* share characteristics such as rosette-shaped fruitbody, imbricate at a central base, with a zonate surface of the pileus, hyphae with crystals in some species, and tuberculate spores. These characteristics are also present in *T. pacifica*, establishing its morphological affinity with this clade. The habitats of these fungi are described as subtropical areas primarily dominated by the Fagaceae family, with a lesser presence of pines. Our species aligns with this general pattern, likely being host by a member of Fagaceae family. However, it differs by being situated in more tropical locations. Oak forests in Mexico are acknowledged as for their role as hubs of high fungal diversity and are recognized as potential sites of endemism (García-Guzmán *et al*., 2017).

Conclusion

We present the description of *Thelephora pacifica*, identified as the sister group of *T. pseudoganbajun*, both belonging to a clade by flabeliform imbricated fruitbodies with tuberculate spores. The distribution of this species encompasses oak, coniferous and sub evergreen tropical forests. We also cancel the record of *T. vialis* for Mexico, as our analysis reveals it to be a distinct new species. With the inclusion of this new taxon, the total count of *Thelephora* species in Mexico remains at 11, and *T. pacifica* stands as the third species formally described in Mexico.

Acknowledgments

We thank the Sierra Martínez family, owners of "Rancho El Sagrado" for the opportunity to access their property. We also thank the Herbarium Luz María Villarreal de Puga (IBUG) of the Universidad de Guadalajara for the loan of materials. We also thank the Universidad Nacional Autónoma de México for funding the project PAPIIT-UNAM IA203324, as well as the Secretaría de Educación Pública for the support through the program for the Fomento a la Generación y Aplicación e Innovadora del Conocimiento (2008) and Fortalecimiento de los Cuerpos Académicos en Formación (2013). We are particularly grateful to the Universidad del Mar for the support of the internal projects 2IG1805, 2IG1904 and 2IG2102. We also thank Dr. Laura Márquez, technician of the Biodiversity and Health Genomic Sequencing Laboratory, and M. Sci. María Berenit Mendonza Garfias, technician of the Microscopy and Biodiversity Photography Laboratory of the Instituto de Biología, UNAM for the scanning electron photographs.

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