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## New records of *Dothideomycetes* from Mexico

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**ABSTRACT**—Ten dothideomycetous species were studied. New records for the Mexican mycobiota include *Heptameria obesa*, *Leptospora rubella*, *Macrovalsaria megalospora*, and *Psilogonium claviforme*, and an extended distribution for rarely reported dothideomycetes in Mexico is reported for *Anteaglonium abbreviatum*, *Astrosphaeriella trochus*, *Gloniopsis praelonga*, *Hysterobrevium mori*, *Oedohysterium insidens*, and *Rhytidhysterium rufulum*. Observations and photographs on macro- and microscopic characters are provided.

**KEY WORDS**—*Ascomycota*, taxonomy, chorology

### Introduction

Most fungi with ascostromatic development and bitunicate asci are generally associated with the *Dothideomycetes*, the ascomycete class with the highest number of species (slightly more than 19,000; Kirk et al. 2008). They are found in nature as pathogens, endophytes or epiphytes of living plants, and saprobes that degrade cellulose or other carbohydrates in organic matter, litter, and dung.

Knowledge about ascomycetes in Mexico is still low compared to some European countries where more research has been completed on ascomycete mycological diversity. In Mexico, Medel (2007a) cited 687 ascomycete species, while González & Hanlin (2008) reported 880 species, excluding lichenized ascomycetes. *Pezizales* and *Xylariales* are represented by the greatest number of species records. The first record of a dothideomycetous species for Mexico dates back more than 60 years to *Sphaeria pertusa* Pers. (= *Trematosphaeria pertusa* (Pers.) Fuckel) cited by Fries (1851) in Veracruz. Publications on dothideomycetous species of Mexico include Hyde (1992), San Martín (1996), San Martín & Lavin (1999), Checa et al. (2002), Medel (2007b), and Méndez-Mayboca et al. (2010).

## Materials & methods

Specimens of *Dothideomycetes* examined included those deposited in the XAL fungal collection as well as collections obtained by S. Chacón & F. Tapia in Veracruz and southeast Mexico during November 2011–September 2012.

Hysterothecia and pseudothecia were examined using a stereoscopic microscope, and microscopic structures were examined using a light microscope. Ascospores were sectioned using a razor blade and mounted in KOH (3% or 5%) and Meltzer solutions as needed. Asci, ascospores, pseudoparaphyses, and peridial thickness were measured.

Species were identified consulting Zogg (1962), Dennis (1981), Sivanesan (1984), Barr (1990a,b), and Boehm et al. (2009). Complete descriptions are provided for species newly recorded for Mexico, and a taxonomic summary and brief notes are presented for the species previously recorded. The recent collections have been deposited in the Herbarium of the Instituto de Ecología A.C. Xalapa (XAL), Veracruz, Mexico.

## Taxonomy

*Anteaglonium abbreviatum* (Schwein.) Mugambi & Huhndorf, Syst. Biodiv. 7(4):

460 (2009)

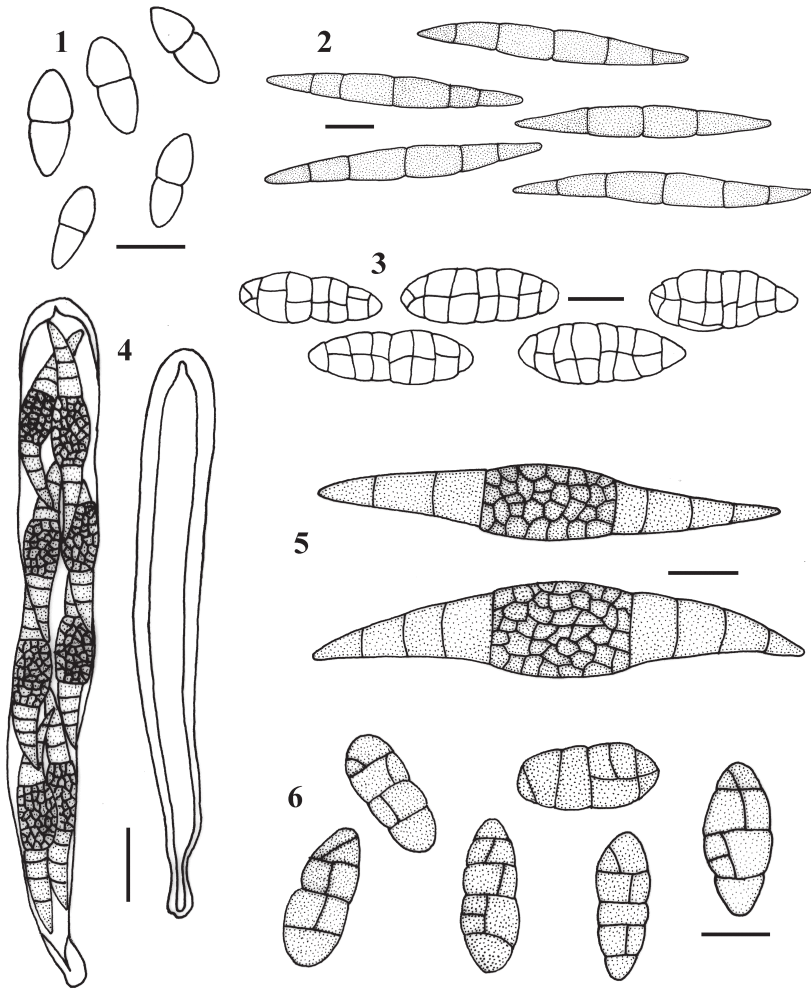
FIGS. 1, 15

≡ *Glonium abbreviatum* (Schwein.) M.L. Lohman

OBSERVATIONS— *Anteaglonium abbreviatum* is characterized mainly by linear hysterothecia with truncated apices, which allow some blackening on the substrate and spores that are fusiform, bicellular, constrained at the septum, and measure  $(6.5\text{--}7\text{--}7.5\text{--}8) \times 2.5\text{--}3 \mu\text{m}$ . *Anteaglonium globosum* Mugambi & Huhndorf ( $6\text{--}7 \times 2\text{--}3 \mu\text{m}$ ) and *A. parvulum* (W.R. Gerard) Mugambi & Huhndorf ( $6\text{--}8 \times 2.5\text{--}3 \mu\text{m}$ ) have similarly sized and shaped spores (Boehm et al. 2009) but differ in the form of hysterothecium. In *A. globosum* the hysterothecium is globose (as the name suggests) and roughened, while in *A. parvulum* the hysterothecium is linear but with acuminate apices. Spore sizes for *A. abbreviatum* (as *Glonium abbreviatum*) have been described as measuring  $6\text{--}8 \times 2\text{--}5 \mu\text{m}$  (Lohman 1937),  $(5\text{--})6\text{--}7\text{--}(8) \times 2\text{--}3\text{--}(3.5) \mu\text{m}$  (Zogg 1962), and  $7\text{--}8 \times 3 \mu\text{m}$  (Romero 1987). *Anteaglonium abbreviatum* is widely distributed and was recently cited by Méndez-Mayboca et al. (2010, as *G. abbreviatum*) from Sonora. It is reported for the State of Veracruz here for the first time.

HABITAT— On dead wood in forest relict of *Fagus grandifolia* var. *mexicana* (Martínez) Little, 850–1900 m asl.

SPECIMENS EXAMINED – MEXICO. VERACRUZ: Municipality of Emiliano Zapata, CHAVARRILLO-EL PALMAR ROAD on Monte Oscuro summit, 13 October 2004, S. Chacón 5530; Municipality of Acatlán, ACATLÁN VOLCANO upper south part, 11 November 2011, S. Chacón & F. Tapia 6613; Municipality of Xalapa, PARQUE NATURA natural protected area, 1 November 2011, S. Chacón & F. Tapia 6585; HOUSE GARDEN on Adolfo Ruiz Cortines Ave., ~200 m from Hospital de Especialidades Médicas, 27 August 2012, S. Chacón & F. Tapia 6849; COLONIA EL OLMO, ex-hacienda Las Ánimas, 27 August 2012, S. Chacón & F. Tapia 6861. SONORA: Municipality of Álamos, EL AGUAJE, 14 September 2006, S. Chacón 5764.



FIGS 1–6. *Anteaeglonium abbreviatum*, 1: ascospores. *Astrosphaeriella trochus*, 2: ascospores. *Gloniopsis praelonga*, 3: ascospores. *Heptameria obesa*, 4: mature and immature asci. 5: ascospores. *Hysterobrevium mori*, 6: ascospores. Scale bars: 1= 5  $\mu$ m; 2–6= 10  $\mu$ m

*Astrosphaeriella trochus* (Penz. & Sacc.) D. Hawksw., Bot. J. Linn. Soc. 82: 46 (1981)  
 FIG. 2, 16

OBSERVATIONS— The studied material is consistent with Hawksworth (1981, except for the spore color, cited by Hawksworth as reddish-brown), and agrees with San Martín & Lavin (1999, who described olivaceous-brown to pale-

brown spores). This is the second record of the species in Mexico and the first for the state of Veracruz. Previously it was recorded for the state of Chiapas by San Martín & Lavin (1999).

**HABITAT**— On stems of *Bambusa* sp. and an undetermined grass in a semi-deciduous forest and a coffee plantation; 460–1300 m asl.

**SPECIMENS EXAMINED** – MEXICO. VERACRUZ: Municipality of Actopan, Km 28 XALAPA-VERACRUZ HIGHWAY, near the highest turn to Balastreira, 7 September 1995, S. Chacón 4930; Municipality of Xico, NEAR TEXOLO WATERFALL, 22 October 1999, S. Chacón 5216; Municipality of Xalapa, EL OLMO SECTION, southeast Xalapa, 15 August 2012, S. Chacón & F. Tapia 6820; FRANCISCO JAVIER CLAVIJERO BOTANIC GARDEN, Km 2.5 old road Xalapa-Coatepec, 22 August 2012, F. Tapia 2637; INECOL CLOUD FOREST SANCTUARY, km 2.5 old road Xalapa-Coatepec, 26 August 2011, S. Chacón, E. Utrera, F. Tapia & G. Medrano 6293.

*Gloniopsis praelonga* (Schwein.) Underw. & Earle, Bull. Alabama Agricultural

Experiment Station 80: 196 (1897)

FIG. 3, 17

**OBSERVATIONS**— *Gloniopsis praelonga* is distinguished by its spores (18–) 20–30(–31) × 8–12(–13) μm, hyaline, ovoid with obtuse ends, inequilateral, with (5–)6–7 transverse septa and 2–3 longitudinal septa and by presenting linear ellipsoid erumpent to superficial hysterothecia. The studied material is consistent with the descriptions of Zogg (1962), Barr (1990a), and Boehm et al. (2009). Previously recorded for Mexico from the State of Sonora by Méndez-Mayboca et al. (2008), it is recorded here for the first time for the State of Veracruz.

**HABITAT**— On dead branches in a forest relict of *Fagus grandifolia* var. *mexicana* and cloud forest; 1900 m asl.

**SPECIMENS EXAMINED** – MEXICO. VERACRUZ: Municipality of Acatlán, ACATLÁN VOLCANO upper south, 14 November 2011, Chacón & Tapia 6618; 25 November 2011, Chacón & Tapia 6641; Municipality of Xalapa, FRANCISCO JAVIER CLAVIJERO BOTANIC GARDEN, Km 2.5 old road Xalapa-Coatepec, 10 March 1995, F. Tapia 1291; 28 February 1997, F. Tapia 1638; MONTEVIDEO SECTION, southeast part of the city, 30 July 2012, F. Tapia 2595; 15 October 2012, S. Chacón 6872; LÁZARO CÁRDENAS AVE. central green area, ~200 m from the State Treasury Office, 22 August 2012, S. Chacón & F. Tapia 6843.

*Heptameria obesa* (Durieu & Mont.) Sacc., Syll. Fung. 2: 88 (1883) FIGS. 4, 5, 18

Pseudothecia subepidermal to suberumpent in the cortex, solitary or densely confluent, subglobose to ovoid with a flat base, papilla conspicuous, completely black, 370–600(–710) μm wide and 380–560(–600) μm high; peridium 110–280 μm thick, composed of thick-walled isodiametric cells, dark brown to black. Asci (120–)130–190 × 17–22 μm, claviform, bitunicate, octosporous, the base shortly stipitate. Cellular pseudoparaphyses. Ascospores (45–) 50–72(–75) × 9–13(–14) μm, fusiform, straight to slightly curved, with 6–9 septa, dictyoseptate or muriform, the average cell is dark-brown to dark-reddish

and from brown pale to hyaline towards the ends with 2–3(–4) transverse septa, slightly constricted at the septum that separates the middle portion; biseriate to occasionally uniseriate in the ascus.

**HABITAT**— On dead wood (*Pseudotsuga* sp.) and dead branches (*Baccharis* sp.), on mesquite vegetation mixed with *Quercus* spp. and *Pseudotsuga* sp. in a *Pinus-Pseudotsuga-Quercus* forest; 2300–2600 m asl.

**SPECIMENS EXAMINED** – MEXICO. PUEBLA: Municipality of Salvador el Seco, KM 62 PEROTE-PUEBLA ROAD level with height of the entrance to La Caida, 15 August 1996, S. Chacón 5091. VERACRUZ: Municipality of Perote, PEROTE-PUEBLA ROAD 500 m after Perote, turn 10 km to the right, 24 September 2010, S. Chacón & E. Utrera 602.

**OBSERVATIONS**— *Heptameria obesa* is characterized by the shape of its spores (fusiform, like bull horns) with a dictyoseptate or muriform central part and only the ends with transverse septa. The studied material coincides with the descriptions given by Lucas & Sutton (1971), Barr (1990a), Sierra-López (2006), and Catania & Romero (2010). *Heptameria* has been placed in *Pleosporaceae* by von Arx & Müller (1975) and in *Leptosphaeriaceae* by Barr (1987, 1990a). Kirk et al. (2008) placed it within *Dothideomycetes*, with uncertain familial affinity. *Heptameria obesa* is known from Algeria, Argentina, Spain, USA, France, Portugal, and Taiwan. This is the first record of the species in Mexico.

*Hysterobrevium mori* (Schwein.) E.W.A. Boehm & C.L. Schoch, Stud. Mycol. 64: 62 (2009) FIGS. 6, 19  
 ≡ *Hysterographium mori* (Schwein.) Rehm

**OBSERVATIONS**— *Hysterobrevium mori* is one of the world's most common species and comprised the species with the second highest number of specimens found in our study. It is distinguished from other *Hysterobrevium* species primarily by its ellipsoid muriform spores of (13–)16–23(–25) × (7–)8–10 µm, with 3–5 transverse septa, as cited by Zogg (1962), Dennis (1981), and Barr (1990a) (all as *Hysterographium mori*) and Boehm et al. (2009) and Lorenzo & Messuti (2009). The species was recently reported from Sonora by Méndez-Mayboca et al. (2010; as *Hysterographium mori*). Here its distribution is extended to the states of Oaxaca, Puebla, Tamaulipas, and Veracruz.

**HABITAT**— On dead branches of *Acacia constricta* A. Gray, *Helietta parvifolia* (A. Gray) Benth, and *Cercidium praecox* (Ruiz & Pav.) Harms, in various types of xerophytic scrub vegetation, tropical deciduous forest, tropical forest, and *Quercus* forest, from 10–1550 m asl.

**SPECIMENS EXAMINED** – MEXICO. OAXACA: Municipality of Teotitlán, VALLEY OF TEOTITLÁN, Km 73, Teotitlán-Cuicatlán road, 25 January 1991, L. Montoya 1949, 1950. PUEBLA: Municipality of Zapotitlán Salinas, BOTANIC GARDEN OF THE BIOLOGICAL STATION OF UNAM, 16 April 1999, S. Chacón 5129, 5131; 17 April 1999, S. Chacón 5134; 12 June 1999, S. Chacón 5151; 1.5 KM TURN TO SANTIAGO COATEPEC, Huajuapán Zapotitlán road, 13 December 1997, S. Chacón 5110, 5112; Flores s/n. SONORA:

Municipality of Álamos, HUERTA VIEJA, 12 September 2006, S. Chacón 5736; PALO INJERTO, 13 September 2006, S. Chacón 5747; MESA DEL TRIGO, 14 September 2006, S. Chacón 5769; Municipality of Fronteras, LA VALDEZA, 29 August 2007, S. Chacón 5856; Municipality of Cumpas, LA SELVA, 30 August 2007, S. Chacón 5864. TAMAULIPAS: Municipality of Hidalgo, KM 79 CIUDAD VICTORIA-LINARES ROAD, 19 April 1996, S. Chacón 5026, 5028. VERACRUZ: Municipality of Xalapa, PARQUE NATURA protected natural area, 16 August 2011, S. Chacón & E. Utrera 6232; 1 November 2011, S. Chacón & F. Tapia 6584; Municipality of Actopan, LA MANCHA, Biological Station CICOLMA, 14 October 2004, S. Chacón 5536.

*Leptospora rubella* (Pers.) Rabenh., Klotzschii Herb. Viv. Mycol., Edn 2: no. 532

(1857)

FIGS. 7, 8, 20

≡ *Ophiobolus rubellus* (Pers.) Sacc.

Pseudothecia subepidermal, gregarious to just a few, pyriform, short necked, sometimes broad and straight at the base resembling a flask, 450 µm high and 300 µm wide, black or sometimes the host with reddish-purple dye. Peridium 35–60 µm thick, formed by sub-globose cells 5–10 µm, periphery cells dark-brown and those towards the inside, hyaline, thick wall. Asci 125–190(–200) × (5–)6–7(–7.5) µm, cylindrical, bitunicate, basal part with a short stipe. Pseudoparaphyses abundant, filiform, hyaline, septate, 1–3 µm thick, anastomosed. Spores 120–180 × 1–1.5 µm, hyaline to yellowish, cylindrical, transversely multiseptate, irregularly spiral within the ascus.

SPECIMEN EXAMINED – MEXICO. VERACRUZ: Municipality of Xalapa. FRANCISCO JAVIER CLAVIJERO BOTANIC GARDEN, Km 2.5 old road Xalapa-Coatepec, 2 December 2011, S. Chacón & F. Tapia 6660.

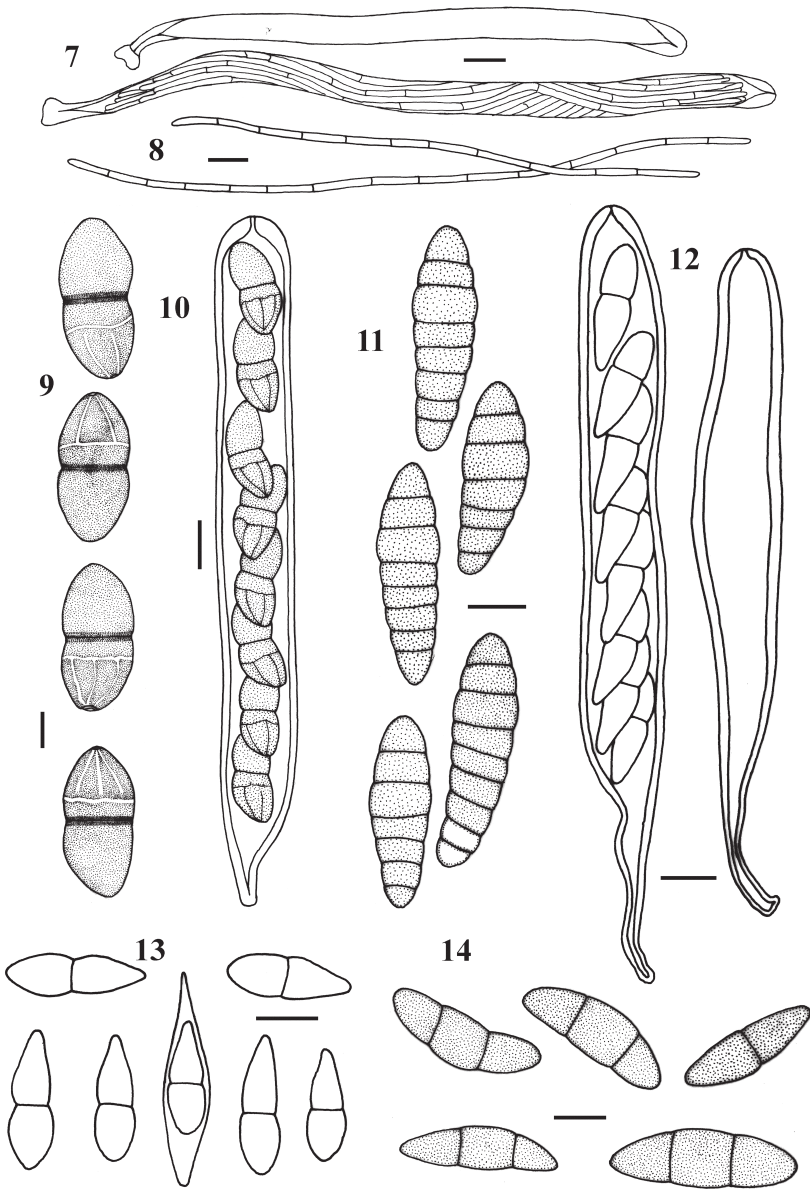
OBSERVATIONS— The main features of this species are reddish-purple spots that present both pseudothecia and the host and the sub-cylindrical spiral spores with abundant septa and spore and ascus measurements that different authors described as very variable. Furthermore, this coincides well with the descriptions of Shoemaker (1976: as *Ophiobolus rubellus*), Walker (1980), Dennis (1970), and Crous et al. (2006). *Leptospora rubella* is known from North America and Europe. This is the first record of the species for Mexico.

*Macrovalsaria megalospora* (Mont.) Sivan., Trans. Br. Mycol. Soc. 65(3): 400 (1975)

FIGS. 9, 10, 21

≡ *Macrovasaria leonensis* (Deighton) Petr.

Ascoma solitary or sometimes confluent, unilocular to multilocular, sub-immersed and erumpent, with traces of bark around the ascomata, subglobose-conical, with flat base, 500–1000 µm diam. and 400–750 µm high, ostiolate with a well developed papilla, which contains paraphyses, black. Peridium 50–80 µm thick, the outer portion covered by a crusty layer and the inner formed by isodiametric hyaline–dark cells of intricate texture with numerous small dark-brown to nearly black particles, Asci 250–290 × 25–30 µm, cylindrical,



FIGS 7–14. *Leptospora rubella*, 7: immature and mature asci. 8: ascospores. *Macrovalsaria megalospora*, 9: ascospores. 10: mature ascus. *Oedohysterium insidens*, 11: ascospores. *Psilogonium claviforme*, 12: mature and immature asci. 13: ascospores. *Rhytidhysteron rufulum*, 14: ascospores. Scale bars: 7–9, 11–14 = 10  $\mu$ m; 10 = 20  $\mu$ m

shortly stipitate, fissitunicate, octosporous and with a clear ocular chamber. Pseudoparaphyses filamentous, septate, anastomosed,  $\leq 2.5\mu\text{m}$  thick, hyaline. Spores  $38\text{--}44 \times 18\text{--}20\ \mu\text{m}$ , ellipsoid, finely verrucose, uniseriate, pale-brown-dark brown, with a central septum strongly constrained and darker than the rest of the spore, one of the ends with helmet-like structure or cover with clear linear halos like striae covering  $\pm \frac{3}{4}$  of the total of the spore.

HABITAT— On stems of *Cassia fistula* L. in secondary vegetation type, at 20 m asl.

SPECIMEN EXAMINED – MEXICO. VERACRUZ: Municipality of Cotaxtla, NEAR THE COTAXTLA EXPERIMENTAL FIELD, 26 August 1996, A. Romero s/n.

OBSERVATIONS— Ellipsoid spores with a helmet-like cover with striae toward one end, the presence of a single septum, and the dark-brown color are diagnostic features of this species. *Macrovalsaria leonensis* was treated by Sivanesan (1975) as a synonym of *M. megalospora*; consequently, *Macrovalsaria* remains a monotypic genus. The Mexican material coincides well with the description given by Sivanesan (1975), Hyde (1994), and Wang & Lin (2004). *M. megalospora* is a pantropical species known from Africa, Asia, and South America. This is the first record of the species for Mexico.

*Oedohysterium insidens* (Schwein.) E.W.A. Boehm & C.L. Schoch, Stud. Mycol. 64: 59 (2009) FIGS. 11, 22  
≡ *Hysterium insidens* Schwein.

OBSERVATIONS— *Oedohysterium insidens* is easily distinguished from other *Oedohysterium* species by fusiform spores with 6–9 transverse septa and a wider supra-median part  $30\text{--}40\text{--}(45) \times 10\text{--}11\text{--}(12)\ \mu\text{m}$ . In contrast, the spore size variability is evident. Zogg (1962) and Boehm et al. (2009) both cite spore sizes of  $(20\text{--})23\text{--}28\text{--}(38) \times (5\text{--})7\text{--}10\text{--}(13)\ \mu\text{m}$ , while Dennis (1981) cites  $21\text{--}38 \times 6\text{--}12\ \mu\text{m}$  and Sivanesan (1984)  $20\text{--}38 \times 6\text{--}12\ \mu\text{m}$ . The species was recorded for Sonora by Méndez-Mayboca et al. (2008; as *Hysterium insidens*) with spores  $32\text{--}45 \times 11\text{--}14\ \mu\text{m}$ . Here *O. insidens* is cited for the first time for the State of Puebla.

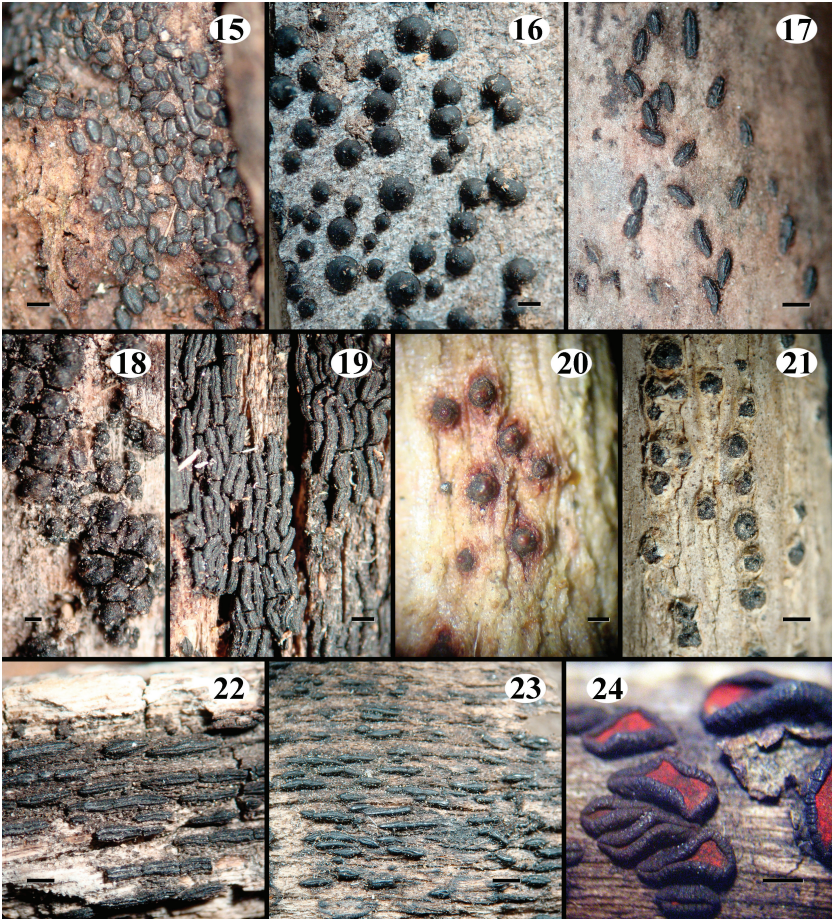
HABITAT— On dead wood of *Acacia constricta* in xerophytic vegetation at 1500 m asl.

SPECIMENS EXAMINED – MEXICO. PUEBLA: Municipality of Zapotitlán Salinas, BIOLOGICAL STATION OF THE UNAM, 12 June 1999, S. Chacón 5142. SONORA: Municipality of Fronteras, LA VALDEZA, 25 August 2005, S. Chacón 5627.

*Psilogonium clavisporum* (Seaver) E. Boehm, C.L. Schoch & Spatafora, Mycol. Res. 113(4): 469 (2009) FIGS. 12, 13, 23  
≡ *Glonium clavisporum* Seaver

Hysterothecia gregarious, superficial, arranged in parallel, linear to navicular, some slightly curved,  $\leq 3\ \text{mm}$  long, faintly striated longitudinally,





Figs 15–24. Pseudothecia and hysterothecia. 15: *Anteaglonium abbreviatum* (S. Chacón 5764): scale bar = 1.5 mm. 16: *Astrosphaeriella trochus* (F. Tapia 2637): scale bar = 1.2 mm. 17: *Gloniopsis praelonga* (S. Chacón 6872): scale bar = 2.0 mm. 18: *Heptameria obesa* (S. Chacón 5091): scale bar = 0.5 mm. 19: *Hystero brevium mori* (S. Chacón 5864): scale bar = 0.75 mm. 20: *Leptospora rubella* (S. Chacón & F. Tapia 6660): scale bar = 0.4 mm. 21: *Macrovalsaria megalospora* (A. Romero s/n): scale bar = 1.8 mm. 22: *Oedohysterium insidens* (S. Chacón 5627): scale bar = 1.2 mm. 23: *Psilogonium claviforme* (S. Chacón 5004-C): scale bar = 2.8 mm. 24: *Rhytidhysterium rufulum* (S. Chacón 5859): scale bar = 0.2 mm.

with apices obtuse or acuminate, black, subiculum absent. Peridium carbonaceous. Asci 95–120 × (10–)12–13 μm, cylindrical, short stiped, hyaline to yellowish. Pseudoparaphyses anastomosed, cylindrical 1–2 μm thick, hyaline to olivaceous-yellow. Spores (16–)18–20(–23) × (5.5–)6–6.5(–7) μm, ellipsoid

to obovoid, asymmetric, with one end rounded and one more sub-fusoid, constrained by a central septum, hyaline, uniseriate in the ascus.

**HABITAT**— On decorticated wood in a semideciduous forest, 4 m asl.

**SPECIMEN EXAMINED** – MEXICO. VERACRUZ: Municipality of Tampico Alto, 10 KM BEFORE THE LLANO DE BUSTOS BRIDGE, Tuxpan-Tampico road, 16 April 1996, S. Chacón 5004-C.

**OBSERVATIONS**— The spore size and the hysterothecial shape characterize the species. Our specimen coincides well with the descriptions of Seaver (1925), Lohman (1937), and Boehm et al. (2009). According to Zogg (1962), *Glonium clavissporum* ( $\equiv$  *Psiloglonium clavissporum*) is synonymous with *G. lineare* (Fr.) De Not.; however, Boehm et al. (2009) considered them a separate species, describing for *G. lineare* hysterothecia confluent and smaller spores (10–)12–14(–18)  $\times$  (4–)5–7(–8)  $\mu\text{m}$ . Another species that could be confused with *P. clavissporum* is *P. chambianum* (A.L. Guyot) E.W.A. Boehm & C.L. Schoch, which differs by its wider spores (6–)8–9(–10)  $\mu\text{m}$ ; Zogg 1962; Boehm et al. 2009). *Psiloglonium clavissporum* is known from Africa, India, and Central and North America. Here it is recorded for the first time for the mycobiota of Mexico.

***Rhytidhysteron rufulum*** (Spreng.) Speg., Anales Soc. Ci. Argent. 90: 177 (1921)

["1920"]

FIGS. 14, 24

$\equiv$  *Trybliidiella rufula* (Spreng.) Sacc.

**OBSERVATIONS**— *Rhytidhysteron rufulum* is mainly characterized by discoid apothecia, with the hymen reddish, yellowish, or even yellow-greenish and in the hysterothecial form in young individuals and apothecial form in mature individuals. Spores ellipsoid, 23–35  $\times$  9–14  $\mu\text{m}$ , with 1–3 slightly constricted transverse septa, which coincides with the descriptions of Dennis (1970; as *Trybliidiella rufula*), Samuels & Müller (1979), Kutorga & Hawksworth (1997), and Mendez-Mayboca et al. (2010).

Guzmán (1983) cited *Hysterium angustatum* Alb. & Schwein. from Yucatán and Méndez-Mayboca et al. (2008) cited *H. truncatulum* Cooke & Peck from Sonora; however, our examination of both specimens on which these authors based their descriptions indicated that they are conspecific with *R. rufulum*. Salinas-Salgado et al. (2012) cited *H. angustatum* from Guerrero, which is the first authentic record of this taxon for Mexico, and Méndez-Mayboca et al. (2010) cited *R. rufulum* for Sonora. This paper extends its distribution to the states of Chiapas, Guerrero, Nuevo León, Puebla, Queretaro, Quintana Roo, Tabasco, Tamaulipas, Veracruz, and Yucatán.

**SPECIMENS EXAMINED** – MEXICO. CHIAPAS: Municipality of Ocosingo, NEAR RUINS OF BONANPAK, 25 April 2012, F. Tapia & S. Chacón 2525; F. Tapia & S. Chacón 2531; Municipality of Tuxtla Chico, ROSARIO IZAPA EXPERIMENTAL FIELD, Km 18

Cacahuatlán-Tapachula road, 14 December 1992, S. Chacón 4633; 15 December 1995, S. Chacón 4974. **GUERRERO: Municipality of Tololoapa**, KM 40 IGUALA-CIUDAD ALTAMIRANO ROAD, 2 July 1982, G. Rodríguez 234-A. **NUEVO LEÓN: Municipality of Santiago**, KM 5 WEST OF EL CERRITO, 4 October 1980, S. Chacón 53. **PUEBLA: Municipality of Francisco Z. Mena**, MOCTEZUMA, along the stream on the estate of Don Felipe Chote, 23 June 2012, S. Chacón 6790; **Municipality of Zapotitlán Salinas**, UNAM BIOLOGICAL STATION BOTANICAL GARDEN, 11 August 1998, S. Chacón s/n; 18 September 1998, J. Flores s/n; 16 April 1999, S. Chacón 5128; 17 April 1999, S. Chacón 5135; 12 June 1999, S. Chacón 5141. **QUERETARO: Municipality of Pinal de Amoles**, LA CUESTA, Km 3 south of Escanelilla, 15 July 1983, G. Rodríguez 1973. **QUINTANA ROO: Municipality of Santa Matilde**, PUERTO MORELOS TO VALLARTA ROAD, ~1 Km from the turn to Tulum, 3 November 1981, A. López 1652 (as *Hysterium angustatum* in Guzmán, 1983). **SONORA: Municipality of Álamos**, NEAR CUZALITO, 16 September 2006, S. Chacón 5812; EL CAJÓN, 13 September 2006, S. Chacón 5744; San Pedro, 13 September 2006, S. Chacón 5757; PROMONTORIOS, 12 September 2006, S. Chacón 5711, 5730; **Municipality of Cumpas**, LA SELVA, 27 August 2005, S. Chacón 5692 (as *Hysterium truncatulum* in Méndez-Mayboca et al. 2008); 30 August 2007, S. Chacón 5859. **TABASCO: Municipality of Cárdenas**, LA CHONTALPA, Ecological Reserve of the Colegio de Posgraduados, Tabasco Campus, Km 21 Cárdenas- Coatzacoalcos road, 24 April 2012, F. Tapia & S. Chacón 2509; **Municipality of Cunduacán**, HUIMANGO, 7 December 1983, R. Solano 27; **Municipality of Nacajuca**, EL SANDINAL, 8 February 1984, R. Solano 152; **Municipality of Comalcalco**, ORIENTE 2<sup>ND</sup> SECTION, 7 February 1984, R. Solano 119. **TAMAULIPAS: Municipality of Matamoros**, ~KM 15 MATAMOROS-VALLE HERMOSO ROAD, vía El Sendero level with the turn to the village of El Control, 17 May 2003, S. Chacón 5500, 5501; **Municipality of Casas**, KM 68 CIUDAD VICTORIA-SOTO DE LA MARINA ROAD, 12 June 1983, G. Rodríguez 1735; EJIDO CAMOTERO, near Mante, 17 August 1980, A. Enoch s/n. **VERACRUZ: Municipality of Actopan**, CICOLMA BIOLOGICAL STATION, La Mancha, 25 August 1983, A. Sampieri 158; **Municipality of Coacoatzintla**, 1 KM AFTER COACOATZINTLA, Xalapa-Naolinco road, 6 November 1984, A. Sampieri 1104; **Municipality of Dos Rios**, ~5 KM BEFORE REACHING CHAVARRILLO near the Tabiguera and the municipal landfill, 3 October 1995, S. Chacón 4941; 7 KM BEFORE CHAVARRILLO, Estanzuela-Chavarrillo road, 22 October 1999, S. Chacón 5221, 5222; **Municipality of Emiliano Zapata**, CHAVARRILLO AND CARRIZAL LOCAL ROAD, 15 November 1995, S. Chacón 4962, 4959; **Municipality of Hidalgotitlán**, SAN CARLOS, Zapata and San Carlos road, 23 April 2012, S. Chacón & F. Tapia 6725, 6726; NEAR EL MACAYAL CEMETERY, 23 April 2012, F. Tapia 2495, 6717, 6719; **Municipality of Jalcomulco**, XALAPA-HUATUSCO ROAD 1 Km from turn to Jalcomulco, 2 July 1983, S. Chacón 1289; 26 September 1985, S. Chacón 3096; **Municipality of Minatitlán**, ROMITA 19 KM FROM MINATITLÁN, 23 April 2012, F. Tapia 2505; **Municipality of San Andrés Tlalnehuayocan**, NEAR PLAN DE SEDEÑO, on the way to San Andres Tlalnehuayocan, 13 October 1995, S. Chacón 4956; NEAR SAN ANTONIO HIDALGO, 14 May 2000, D. Jarvio 509; **Municipality of Xico**, NEAR THE WATERFALL, 22 October 1999, S. Chacón 5209, FRANCISCO JAVIER CLAVIJERO BOTANIC GARDEN, km 2.5 old road, Xalapa-Coatepec 11 October 1989, S. Chacón 4217; **Municipality of Xalapa**, PARQUE NATURA, Southeastern Xalapa, 30 August 2011, S. Chacón & F. Tapia 6301; CERRO MACUILTEPEC PARK, Northern Xalapa, 11 October 2011, S. Chacón 6458; 25 October 2011, S. Chacón & F. Tapia 6526. **YUCATAN: Municipality of Mérida**, 2 KM BEFORE TURN TO ONCAN, Mérida-Tixkokob road, 28 October 1984, S. Chacón 2701.

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