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Laboulbenia (Laboulbeniales, Ascomycota) on Gerridae (Heteroptera, Insecta): a new species and new species records from Panama

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Abstract

Laboulbeniales (Fungi, Ascomycota) are microscopic ectoparasites of arthropods, primarily insects. Thus far, of about 2,325 described species of Laboulbeniales, 96 are reported from hosts in the order Hemiptera, including 15 species of the large genus *Laboulbenia*. Here, we describe one new species of *Laboulbenia* from *Tachygerris surinamensis* (Hemiptera, Gerridae) collected in Panama. Only four other species of Laboulbeniales have been described from Gerridae. We also report the presence of two previously described species on the same host species in Panama: *Laboulbenia neogerris*, a new country record, and *L. tachygerris*. The finding of *L. neogerris* on *T. surinamensis* is notable as it was previously known only on hosts in the genus *Neogerris* (Gerridae). Our specimens of *T. surinamensis* also represent a new country record for Panama; this species was thus far only known from Brazil, Costa Rica, and Suriname.

Resumen extendido

Antecedentes: Los Laboulbeniales son ectoparásitos pequeños obligados a vivir sobre artrópodos, generalmente insectos. El 80% se registra en Coleoptera y el 20% en otros grupos. Existe poco interés por estos hongos, actualmente se han descrito 2,325 especies en 145 géneros. En este momento, se conocen 96 especies de parásitos de Hemiptera, de los cuales cuatro son especies de *Laboulbenia*. En este artículo se presentan tres especies de *Laboulbenia* en *Tachygerris surinamensis*, incluyendo una nueva especie para la ciencia y dos nuevos registros para Panamá.

Metódos: Para la colecta de los insectos semiacuáticos se utilizaron técnicas de captura estándarizadas (Gibb & Oseto 2019). Los insectos capturados se colocaron en etanol 70-95% y fueron transportados al laboratorio. Posteriormente, los insectos se examinaron con un microscopio y fueron separados los especímenes infestados y almacenados en etanol al 95% para su posterior procesamiento. Se extrajeron los talos de los insectos y se prepararon placas microscópicas con solución de Amam con una gota de medio de Hoyer. Empleando cuatro talos de *L. ephemerolacuna* se realizó la secuenciación de ADN para su diferenciación con *L. tachygerris*.

Resultados: Se describe a *Laboulbenia ephemerolacuna* Kaishian & Haelew., sp. nov., como la quinta especie de *Laboulbenia* que parásita la familia Gerridae. Esta especie se relaciona con *L. tachygerris*, aunque se distinguen por varias características: *L. ephemerolacuna* presenta un hábito corto y compacto, la célula VI es muy variable en forma, a menudo no se distingue y la célula de inserción es aplanada, marrón oscuro, ubicada a lo largo de la célula III+IV, mientras que, *L. tachygerris* presenta hábito extremadamente alargado, la célula VI es más ancha que larga, siempre se distingue y la célula de inserción sobresale de la célula III+IV separando la célula basal del apéndice con un septo estrecho y oscuro.

Laboulbenia neogerris en *T. surinamensis* se registra como nuevo para Panamá, los caracteres coinciden con el protologo, sin embargo, el espécimen de Bolivia mostró la célula V en la parte

distal ubicada entre el peritecio y la célula de inserción, mientras que el espécimen que aquí se reporta no muestra esta característica. También se registra a *T. surinamense* como nuevo hospedante para *L. tachygerris* con la célula de inserción similar a *L. ephemerolacuna*. Por su parte, *Tachygerris surinamense* se reporta como un nuevo registro para Panamá, y se amplía la distribución ya que se registraba solo en Brasil, Suriname y recientemente en Costa Rica.

Discusión: En Panamá se registraban 40 especies de *Laboulbenia* y recientemente se suman cinco especies, en total se registran 85 especies de Laboulbeniomycetes. Este número sigue siendo bajo si lo comparamos con países como Ecuador y Brasil por lo que se espera que con los trabajos que realizan estudiantes panameños este número aumente, las investigaciones se deben centrar en hospedantes menos conocidos.

Con base en la literatura y en los datos obtenidos en Panamá, *L. neogerris* se muestra como una especie oligovora ya que presenta dos hospedantes *Neogerris* y *Tachygerris*, es posible que se debe a que son insectos semiacuáticos que se encuentran agregados con varias especies e incluso familias, permitiendo la transmisión de las esporas entre los insectos, la selección divergente de las poblaciones en distintos hospedantes hasta la especiación. Además, el habitad efímero y la plasticidad del hospedante permiten la selección oligovora del hongo. También explica el alto grado de plasticidad receptacular de *L. ephemerolacuna* y las pequeñas diferencias observadas en la morfología de *L. neogerris* y *L. tachygerris.*

Introduction

Laboulbeniales are miniscule ectoparasites that are obligately associated with a variety of arthropods, particularly the insects. The vast majority of Laboulbeniales species, approximately 80%, have been recorded from Coleoptera (subphylum Hexapoda), whereas the remaining 20% of species are distributed amongst numerous insect and non-insect arthropod groups including Acari, Opiliones (subphylum Chelicerata); Diplopoda (subphylum Myriapoda); Blattodea, Dermaptera, Diptera, Hemiptera, Hymenoptera, Orthoptera, Psocodea, and Thysanoptera (subphylum Hexapoda) (Weir & Hammond 1997; Haelewaters *et al.* 2021). Despite being an extremely large group of fungi with species estimates as high as 75,000 (Weir & Hammond 1997), few researchers have dedicated their attention towards this group (Haelewaters *et al.* 2021). With only 2,325 species described in 145 genera (Haelewaters *et al.* 2020; Kirk 2019), tens of thousands of species await description, particularly within tropical habitats (e.g., Santamaría & Faille 2009; Rossi 2010; Haelewaters *et al.* 2014).

A recent surge of interest in Laboulbeniales research in Panama was driven by a bachelor's thesis (Valdés & Villarreal 2005) resulting in the description of *Laboulbenia tortilis* J.A. Bernal & R. Kirschner as a new species (Villarreal *et al.* 2010), as well as the collaboration of D.H. with R.V.V.S. and Juan A. Bernal Vega (†2018). Haelewaters *et al.* (2017) reported 27 new country records for Panama, including two new species, and presented a parasite–host list of all 78 species of Laboulbeniales known from Panama. Since then, five species have been described from the country (Haelewaters & Pfister 2019; Song *et al.* 2019; Kaishian *et al.* 2020; Liu *et al.* 2020), resulting in a total of 83 species of Laboulbeniales that have been reported in Panama thus far. The species diversity of Laboulbeniales in Panama is likely much higher; ongoing fieldwork by the authors since 2015 has resulted in many infected host specimens that are still in need of processing.

The genus *Laboulbenia* Mont. & C.P. Robin is

the largest and most ubiquitous genus in the order, occurring on a broad range of hosts on all continents except Antarctica (Weir & Hammond 1997; Weir 2001; Haelewaters *et al.* 2019). Most species of *Laboulbenia* are associated with coleopteran hosts (beetles), but hosts can also be representatives of other larger groups, including: Acari, Diptera, Hemiptera, Hymenoptera, and Orthoptera. Thus far, sixteen species of *Laboulbenia* are described on semi-aquatic bugs (Hemiptera, suborder Heteroptera) (reviewed in Santamaría 2008; Song *et al.* 2019; Kaishian *et al.* 2020). Of these, four have been reported in Panama: *Laboulbenia brachymetrae* A. Weir, W. Rossi & Kaishian on *Brachymetra albinervus* (Amyot & Serville, 1843) [as "*albenerva*"] (Gerridae), *L. drakei* R. K. Benj. on *Rhagovelia* sp. (Veliidae), *L. tachygerris* A. Weir, W. Rossi & Kaishian on *Tachygerris opacus* (Champion, 1901) (Gerridae), and *L. usingeri* R. K. Benj on *Rhagovelia uncinata* Champion, 1898 (Benjamin 1967; Kaishian *et al.* 2020).

Here we provide details for three species of *Laboulbenia* reported on specimens of *Tachygerris surinamensis* Hungerford & Matsuda, 1958 (Hemiptera, Heteroptera, Gerridae) from Panama, two of which represent new country records. Additionally, we describe one new species, *L. ephemerolacuna*, that is morphologically distinct from all other previously described taxa (Benjamin 1967; Kaishian *et al.* 2020; Poisson 1954; Thaxter 1912).

Materials and methods

Insect specimens were collected using standard entomological trapping methods (e.g., Gibb & Oseto 2019). Sampling procedures were licensed and approved by the Government of Panama (Ministerio de Ambiente de Panamá: SE/AH-2-16 and SC/AH-1-17). Insects were stored in 70–95% ethanol for transport to the laboratory where they were screened under dissecting scopes at 50 magnification. Thalli of Laboulbeniales were removed from their hosts at the foot and mounted in Amann solution with the help of a droplet of Hoyer's medium (Benjamin 1971). We performed a DNA extraction from *L. ephemerolacuna* with a modified REPLI-g Single Cell Kit (Qiagen, Valencia, California, USA) using 4 thalli and attempted PCR amplification of the internal transcribed spacer (ITS) region of the ribosomal DNA (rDNA) and the partial nuclear large subunit rDNA (LSU) following protocols in Haelewaters *et al.* (2019).

Line drawings of thalli were made with PITT artist pens (FaberCastell, Nürnberg, Germany) based on images taken with an Olympus SC30 camera mounted to a BH2-RFCA compound microscope, then scanned using an HP Scanjet G5040 scanner and edited with Adobe Photoshop and Illustrator 2020 version 24.1.1. The terms "anterior" and "posterior" used in the description refer to the side of the perithecium and the side away from the perithecium, respectively. Permanent slides were deposited at FH (Farlow Herbarium, Harvard University, Cambridge, Massachusetts, USA) and PUL (Kriebel Herbarium, Purdue University, West Lafayette, Indiana, USA). Host specimens were deposited at MUPADI (Museo de Peces de Agua Dulce e Invertebrados, Universidad Autónoma de Chiriquí, David, Panama). Fungal taxonomy is according to Index Fungorum (2020); insect taxonomy follows GBIF (2020).

Taxonomy

Laboulbenia ephemerolacuna Kaishian & Haelew., **sp. nov.**
Index Fungorum IF558700
Figs. 1 & 2A

Etymology

ephemerolacuna = temporary pond, referring to the ephemeral puddles from which the host for this species was collected.

Typification

Panama. Colón Province: Parque Nacional Soberanía, Pipeline Road, 9°07′38.36″N 79°42′53.45″W, 71 m a.s.l., 3 July 2017, *leg.* L.A. Meckler & K.A Silas, sifting in puddles, on male *Tachygerris surinamensis* Hungerford & Matsuda, 1958 (Hemiptera, Heteroptera, Gerridae), slide D. Haelew. 1341d (**holotype**, FH 00313759, 18 thalli from right profemur and tibia).

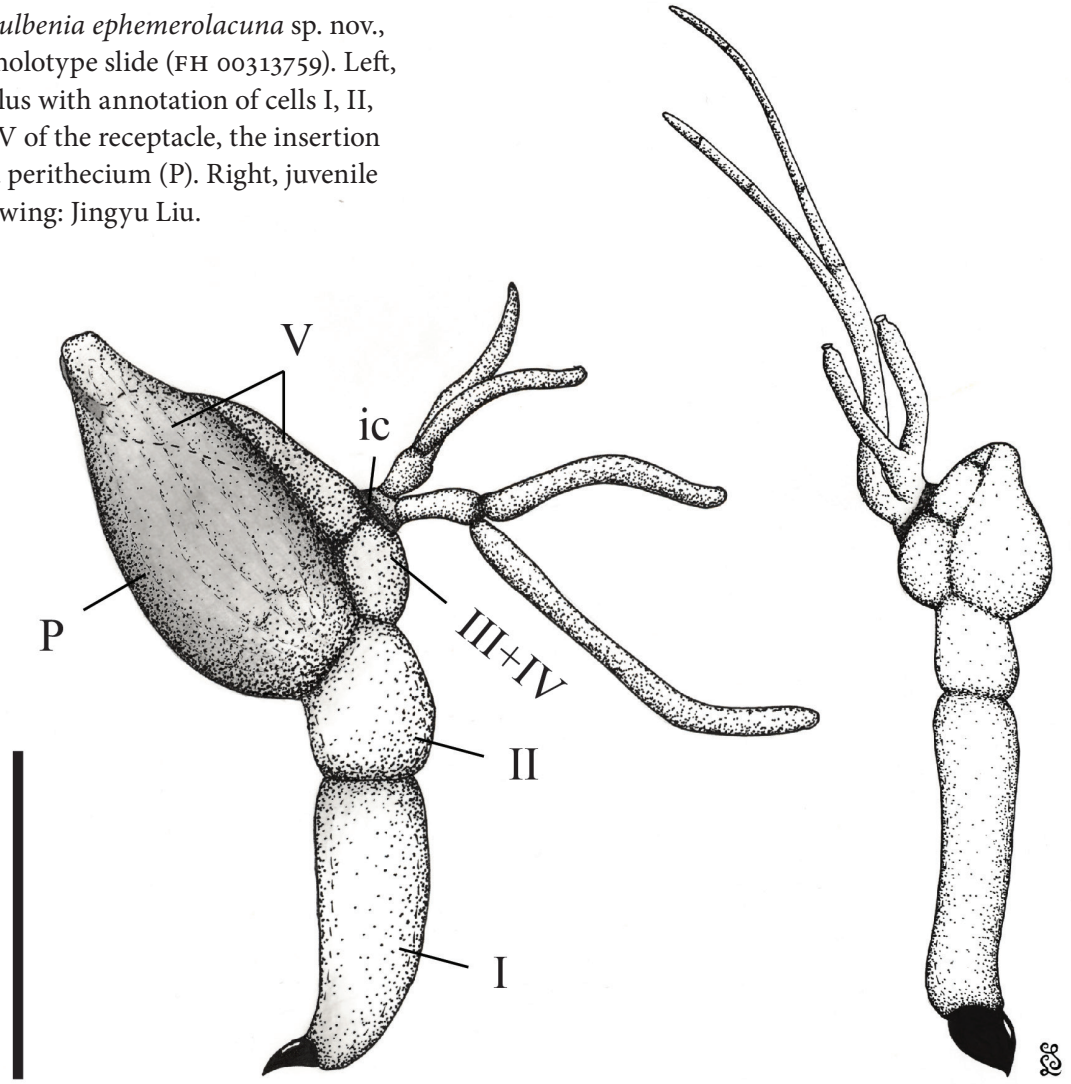

Fig. 1. *Laboulbenia ephemerolacuna* sp. nov., thalli from holotype slide (FH 00313759). Left, mature thallus with annotation of cells I, II, III+IV, and V of the receptacle, the insertion cell (ic), and perithecium (P). Right, juvenile thallus. Drawing: Jingyu Liu.

Diagnosis

Differs from *Laboulbenia tachygerris* by the shorter and often irregularly shaped cell II, the flattened and dark brown insertion cell positioned alongside cell III+IV, the appendage consisting of two main branches, and the blunt perithecial apex.

Description

Total length 110–176 µm from blackened foot to perithecial tip. *Receptacle* hyaline to light olivaceous, overall compact. *Cell I* 44–97 × 13–22 µm, relatively elongate. *Cell II* 4.5–25 × 9–11 µm, much smaller compared to cell I, trapezoidal to irregularly wedge-shaped; septum II/VI oblique. *Cell III+IV* 11–134 × 4.5–9 µm, arising from the posteriodistal tip of cell II, irregular, usually bulging outwardly, positioned alongside the basal portion of the perithecium. *Cell V* 11–245 × 11 µm, finger-like in shape, laterally adnate to the perithecial venter; distinctly spiraled along the upper half of perithecial venter, tapering towards perithecial apex. *Insertion cell* 9 × 2 µm, dark brown, flattened, oriented parallel to perithecial axis. *Appendage* consisting of a single, minute, triangular, hyaline basal cell, which gives rise to two broadly rectangular cells, 18–23 × 4 µm and 9–11 × 4 µm, the lower of which usually longer

than the other; each of these cell giving rise to two branches consisting of elongate, rectangular cells, the lower two of which may support a single antheridium at their distal ends; appendage branches usually exceeding perithecial tip but oriented perpendicular to the perithecial axis; longest appendage branch 120 µm. *Antheridia* 12–24 × 5 µm, flask-shaped, slender; converting into simple, elongate branches when older. *Cell VI* 16 × 11 µm, very variable in size and shape, quadrangular, with the anterior margin bulging outwardly, often compressed and undetectable. *Perithecium* 35–52 × 17–26 µm, dark brown, ovoid or broadly fusiform; asymmetrical, with the anterior margin convex and the posterior margin straight; however, the laterally adnate cells III+IV and V give the overall appearance of a more convex posterior margin compared to the anterior one; wall cells usually spiraled; gradually tapering to the apex, which is blunt, composed of two unequally sized lip cells, one being more narrow and sometimes more darkly pigmented than the other, though coloration is variable. *Ascospores* 39 × 4.4 µm.

Known distribution and hosts

Currently only known from *Tachygerris surinamensis* along Pipeline Road in Parque Nacional Soberanía, Panama.

Other specimens examined

Panama. Colón Province: Parque Nacional Soberanía, Pipeline Road, 9°08′01.98″N, 79°43′19.68″W, 50 m a.s.l., 14 July 2017, leg. L.A. Meckler & K.A. Silas, sifting in a puddle on the road, on female *T. surinamensis*, slide D. Haelew. 1336b (**paratype**, FH 00313755, 5 thalli from left mesopleuron). Colón Province: Parque Nacional Soberanía, Pipeline Road, 3 July 2017, *leg.* L.A. Meckler & K.A Silas, sifting in puddles, on female *Tachygerris surinamensis*, slide D. Haelew. 1304a (**paratype**, FH 00313754, 5 thalli from left mesopleuron). Colón Province: Parque Nacional Soberanía, Pipeline Road, 12 June 2017, *leg.* D. Haelewaters, sifting in puddles, on female *T. surinamensis*, slide D. Haelew. 1296c (**paratype**, FH 00313752, 6 thalli from right mesopleuron). *Ibid.*, on male *T. surinamensis*, slides D. Haelew. 1295b (**paratype**, FH 00313748, 2 thalli from mesopleuron) and D. Haelew. 1295c (**paratype**, FH 00313749, 5 thalli from right procoxa and -femur). A total of 41 thalli were examined, of which 8 were juvenile, 8 submature, and 24 mature (one thallus was damaged).

Notes

Laboulbenia ephemerolacuna is the fifth species of *Laboulbenia* known from representatives of the family Gerridae (water striders). The other four species are *Laboulbenia brachymetrae*, *L. cylindrostethi* A. Weir, W. Rossi & Kaishian, *L. neogerris* A. Weir, W. Rossi & Kaishian, and *L. tachygerris* (Kaishian *et al.* 2020). Of those, *L. tachygerris* is most similar to *L. ephemerolacuna*, although both species can be distinguished based on several characters. First and most notably, the overall habitus of *L. ephemerolacuna* is short and compact, whereas *L. tachygerris* is extremely elongate measuring up to approximately 400 µm—especially cell II is very elongate (up to 205 µm long) in *L. tachygerris*. Second, cell VI in *L. ephemerolacuna* is highly variable in shape and difficult to distinguish, whereas in *L. tachygerris* it is broader than long and always detectable. Third, the insertion cell is quite different. In *L. tachygerris*, it protrudes away from cell III+IV and is separated from the basal cell of the appendage by a dark, constricted septum. In *L. ephemerolacuna*, however, the insertion cell is flattened, dark brown, located alongside cell III+IV. In addition, the appendage always consists of two main branches in *L. ephemerolacuna,* whereas *in L. tachygerris* an appendage with a single branch is common. Finally, the perithecial apex is distinctly curved anteriorly in *L. tachygerris* due to the very unequal lips; this arrangement is not observed in *L. ephemerolacuna*.

While we have been able to sequence other species of *Laboulbenia* (Haelewaters *et al.* 2019; Haelewaters & De Kesel 2020), attempts to sequence *L. ephemerolacuna* have thus far been unsuccessful. Many specimens of *T. surinamensis* were observed along Pipeline Road but only about a dozen were collected for this study. Upon return to Gamboa, Panama, molecular work will be done locally at the Gamboa Laboratories and the Molecular Multi-User's Lab

at the Naos Marine Laboratories to make optimal use of freshly collected specimens. Because *L. ephemerolacuna* and *L. tachygerris* are the morphologically two most similar species and both taxa were one time found on the same insect host, it will be particularly interesting to analyze nucleotide differences of barcode markers in pairwise comparison.

Laboulbenia neogerris A. Weir, W. Rossi & Kaishian, Mycologia 112 (3): 574 (2020).
Fig. 2B

Known distribution and hosts

Described from Venezuela on *Neogerris celeris* (Drake & Harris, 1934) (Hemiptera, Heteroptera, Gerridae). Also reported in Bolivia on *Neogerris* sp. (Kaishian *et al*. 2020).

Specimens examined

Panama. Colón Province: Parque Nacional Soberanía, Pipeline Road, 12 June 2017, *leg.* D. Haelewaters, sifting in puddles, on *Tachygerris surinamensis*, slides D. Haelew. 1294a (FH 00313745, 2 mature thalli from left mesotibia), D. Haelew. 1294c (FH 00313746, 3 thalli from left mesofemur), and D. Haelew. 1294d (PUL F28996, 1 mature thallus from right mesofemur). *Ibid*., on female *T. surinamensis*, slides D. Haelew. 1296b (FH 00313751, 3 mature thalli from right embolium) and D. Haelew. 1296d (FH 00313753, 3 mature thalli from left metatibia). Colón Province: Parque Nacional Soberanía, Pipeline Road, 3 July 2017, *leg.* L.A. Meckler & K.A. Silas, sifting in puddles, on male *T. surinamensis*, slides D. Haelew. 1341a (FH 00313756, 2 thalli from left right mesopleuron), D. Haelew. 1341b (FH 00313757, 2 mature thalli from left metafemur), and D. Haelew. 1341c (FH 00313758, 1 juvenile thallus from left mesotibia).

Notes

The material from Panama represents a new country record, marking a substantial range extension for this species. The Panamanian host is *Tachygerris surinamensis*, whereas the type material was found on a species of *Neogerris*, after which the fungus is named. Both host genera are members of the family Gerridae, but the new host genus record for the species is noteworthy. The Bolivian material of *L. neogerris* (Kaishian *et al*. 2020: Fig. 2D) shows cell V proliferating distally to grow upwards between the perithecium and insertion cell. This arrangement is not seen in the thalli from *T. surinamensis*. In all other morphological aspects, the Panamanian material agrees with the protologue.

Laboulbenia tachygerris A. Weir, W. Rossi & Kaishian, Mycologia 112 (3): 574 (2020).
Fig. 2C

Known distribution and hosts

Described from Panama on *Tachygerris opacus* (Hemiptera, Heteroptera, Gerridae). Also reported in the protologue (Kaishian *et al*. 2020) from Brazil and Peru on *T. adamsoni* (Drake, 1942).

Specimens examined

Panama. Colón Province: Parque Nacional Soberanía, Pipeline Road, 12 June 2017, *leg.* D. Haelewaters, sifting in puddles, on male *T. surinamensis*, slide D. Haelew. 1295a (FH 00313747, 1 submature and 2 mature thalli from mesopleuron). *Ibid*., on female *T. surinamensis*, slide D. Haelew. 1296a (FH 00313750, 3 juvenile and 7 mature thalli from scutellum).

Notes

Tachygerris surinamensis, the host we found infected with *L. tachygerris*, represents the third host for this species after *T. adamsoni* and *T. opacus* (holotype). The new collection is noteworthy in that the observed thalli are different from the protologue description in their insertion cell; in our Panamanian material its placement and shape is reminiscent of the situation in *L. ephemerolacuna*. The other morphological characters of the studied thalli agree with the description and illustrations of *L. tachygerris* in Kaishian *et al.* (2020), except for the lips of the perithecial apex, which are unequal but less so compared to the type material and more rounded.

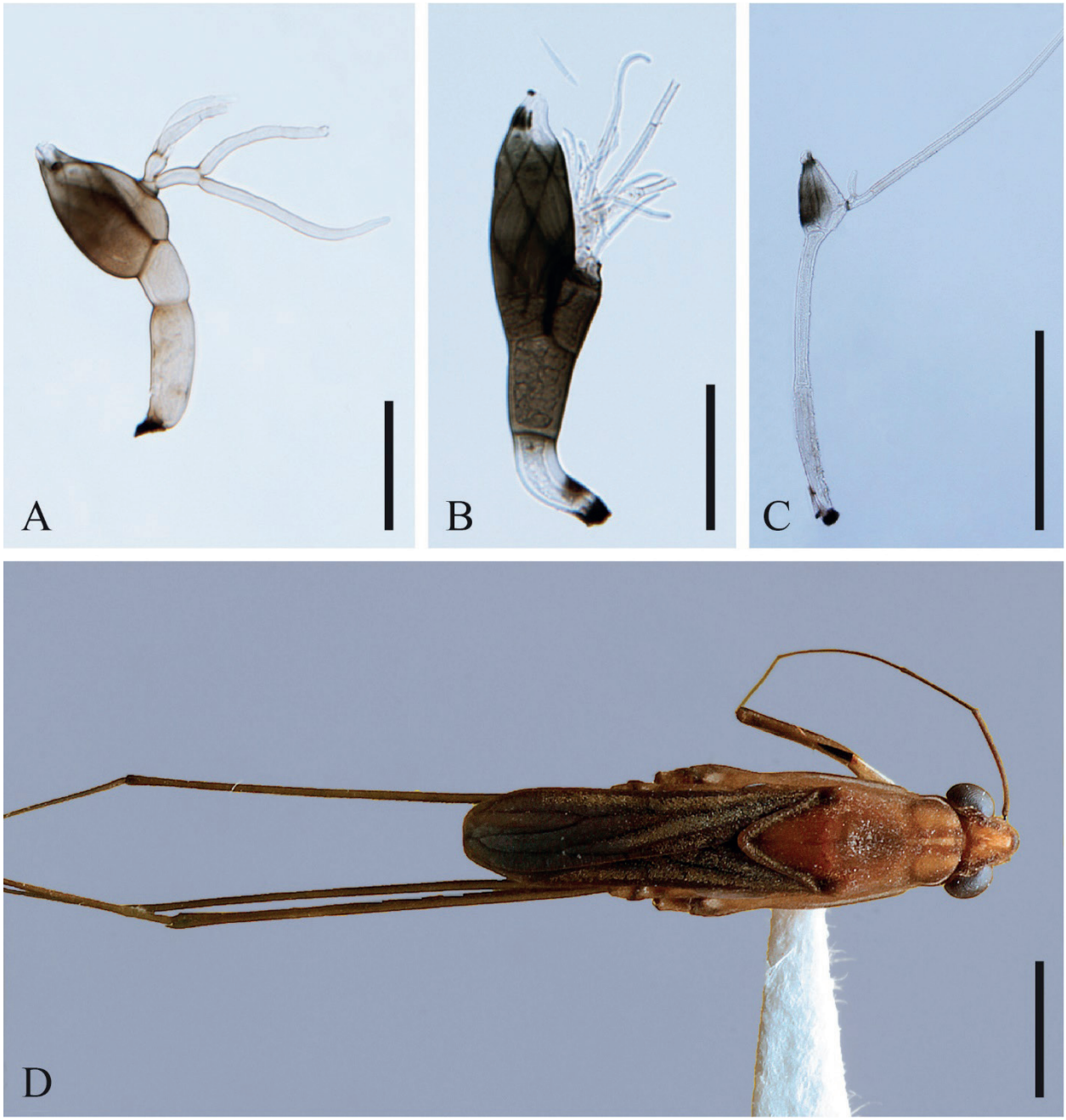

Fig. 2. Fungal and insect records from Panama. **A.** *Laboulbenia ephemerolacuna* sp. nov. (FH 00313759). **B.** *Laboulbenia neogerris* (FH 00313745). **C.** *Laboulbenia tachygerris* (FH 00313747). **D.** *Tachygerris surinamensis* (MUPADI: D. Haelew. 1295), the host for the three species of *Laboulbenia* reported in this study. Scale bars: A, B = 50 µm, C = 100 µm, D = 2 mm.

Discussion

Laboulbeniales of Panama

In this paper, we describe a new species, *Laboulbenia ephemerolacuna*, and present *L. neogerris* as a new country record for Panama. In addition to the 40 species of *Laboulbenia* listed by Haelewaters *et*

al. (2017), five *Laboulbenia* species were recently added to the checklist of Panamanian Laboulbeniales. These are *L. bernaliana* Haelew. & Santam., *L. brachymetrae*, *L. ephemerolacuna*, *L. neogerris*, and *L. tachygerris* (Song *et al.* 2019; Kaishian *et al.* 2020; this paper). The total number of thallus-forming Laboulbeniomycetes reported in Panama thus far is 85. Since 2017, 34 species have been added resulting from increased fieldwork and study of museum insect collections. Notwithstanding, the number of Herpomycetales and Laboulbeniales in Panama is still rather low—especially compared to countries such as Brazil and Ecuador (Rossi & Bergonzo 2008; Rossi *et al.* 2016). We expect the number of Laboulbeniales reported for the country to increase in coming years given research that is being done by students at the Universidad Autónoma de Chiriquí, among others. As has also been suggested for continued Laboulbeniomycetes research in Belgium and the Netherlands (Haelewaters & De Kesel 2020), future work of Laboulbeniales in Panama will need to focus on (*i*) lesser-known host groups (e.g., aquatic insects, coprophilic Coleoptera, Diptera, Ptiliidae, Staphylinidae) and (*ii*) undersampled habitats such as animal nests, caves, and rotting fruit and plant debris.

Habitat specificity

Most species of Laboulbeniales have a single host; we refer to these as univorous. A second group of oligovorous species infect hosts in related genera (De Kesel 1996). Plurivorous taxa occur on phylogenetically distant host groups and are frequently found on spatially proximate host individuals that share either the same microhabitat or interact in a close relationship (predator/prey, symbiotic). Compatible body chemistry among cohabitating hosts may facilitate plurivory (Benjamin 1971). Cohabitation can lead to successful host shifts, as is the case for *Laboulbenia ecitonis* G. Blum, which occurs on representatives of at least three arthropod orders (Coleoptera, Hymenoptera, and Acarina). Alternatively, host shifts may represent ecological dead ends, such as in the case of *Rickia wasmannii* Cavara on a larva of an inquiline fly species, *Microdon myrmicae* Schonrogge *et al.*, 2002 (Syrphidae) (Pfliegler *et al.* 2016). As demonstrated by De Kesel (1996), soil conditions impact fungus development; optimal conditions for fungal development equal those that are optimal for the host. Host physiology alone does not dictate success of the fungus and the occurrence of atypical host infections is more probable in habitat conditions (such as soil or potentially aquatic chemistry) that are consistent with those of a typical host. The relatively high number of univorous taxa of Laboulbeniales on host groups such as Carabidae (ground beetles) and Staphylinidae (rove beetles) are likely proportionate to the high number of unique life histories of these host groups.

Based on the available literature (Kaishian *et al.* 2020) and our Panamanian data, *L. neogerris* occurs on hosts in both *Neogerris* Matsumura, 1913 and *Tachygerris* Drake, 1957. This oligovorous nature of *L. neogerris* may be explained by the ecology of the hosts; semi-aquatic insects are often found in massive aggregations or swarms of multiple species or even representatives of different families (Schuh & Slater 1995; D. Haelewaters & P. Kaishian pers. obs.). These aggregations increase opportunities for ascospore transmission among different insect hosts, potentially followed by divergent selection of populations on different hosts and ultimately leading to speciation. The ephemeral habitat of the insect host may also select for the oligovorous nature of the fungi, as host plasticity may be adaptive under such sporadic environmental conditions. This may also account for the relatively high degree of receptacular plasticity observed in *L. ephemerolacuna,* as well as the minor morphological differences found in the newly obtained material of *L. neogerris* and *L. tachygerris* as compared to the type material.

Tachygerris surinamensis, a new record for Panama

In addition to the fungal records presented above, the Panamanian insect host, *Tachygerris surinamensis* (Fig. 2D), is a new country record. The genus *Tachygerris* belongs to the subfamily Gerrinae (Hemiptera, Gerridae) with 17 species described in the Neotropics (Mondragón *et al.* 2017). The species of this genus are often found in habitats with abundant debris or litter in stagnant water or in wells made in streams. Two species were already reported from Panama,

both distributed in the central and western part of the country (Tuñon *et al*. 2015): *T. opacus* and *T. quadrilineatus* (Champion, 1898). *Tachygerris surinamensis* has thus far been registered in northern Brazil and Suriname (Hungerford & Matsuda 1958; Moreira *et al*. 2011). Recently, it was reported in Costa Rica pending confirmation (Pacheco-Chaves *et al*. 2018). The Costa Rican and our Panamanian material represents a significant northwestern expansion of the distribution range of this species compared to the earlier northern South American reports.

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