Newsletter of the

FRIENDS OF THE FARLOW

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A Note

Donald Pfister

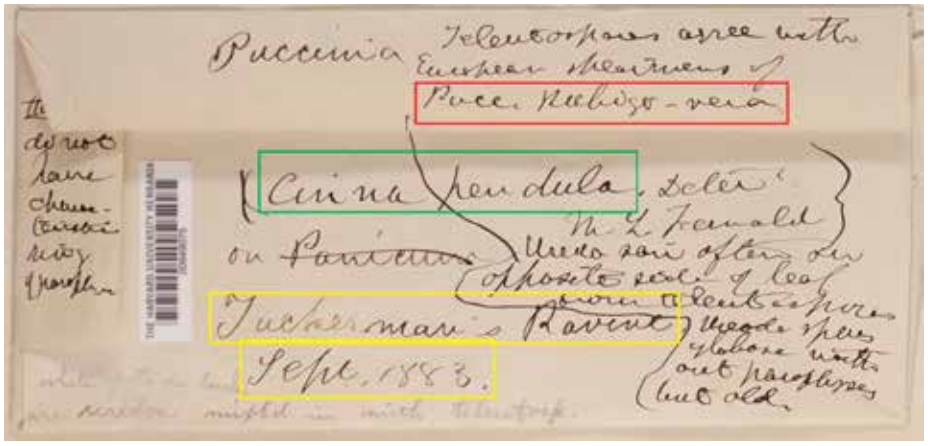
The Farlow Library and Herbarium has been closed during the COVID-19 virus outbreak. Although we are closed, work has moved forward. For researchers this has meant working on papers and reviewing articles. For the Library and Herbarium staff work has moved to activities that can be accomplished off-site. You will find the product of some of these activities documented in the articles included in this newsletter. The article by Hannah Merchant, Genevieve Tocci and Walter Kittredge, directly involves rust specimens housed in the Farlow Herbarium and points out the breadth and size of the holdings. The article led by Luis Quijada gives insight into the work that is being done on our collections from southern Chile and the critical role continuing field work and exploration plays, particularly in areas that have not been well sampled. The librarians have continued to offer support to researchers. We have all come to depend upon on-line sources to accomplish our research and the librarians have been of great aid in seeking those items we need. I have been working at home but look forward to a time when, no matter how limited, I can use my books and microscopes in my office. We have met weekly via Zoom for updates and social contact. One of the casualties of the virus has been the camaraderie and sense of community that has been so much a part of life at the Farlow. Until a vaccine is available or other treatments are discovered, we will pass in hallways, leave notes for our colleagues or otherwise keep our distance.

Digitization of Rust Fungus Specimens

Hannah Merchant, Genevieve Tocci and Walter Kittredge

Digitization of specimens is a large part of curatorial operations in the Farlow Herbarium. We completed databasing and imaging significant portions of the Lichen, Bryophyte, Macroalgae, and Macrofungi collections, and are now working on digitizing our Microfungi. Much of the digitization was organized through large-scale collaborative projects in North American herbaria funded by the National Science Foundation. Although that funding has ended, we are committed to continuing the digitization of Microfungi specimens from North America including Mexico, Canada, and the continental United States. Our current efforts focus on the rust fungi (previously known as Uredinales), which is a large and densely stored part of the herbarium that includes important collections from major rust specialists of the past 150 years.

Rust fungus specimens present interesting challenges not typically found in other groups in the Farlow Herbarium's collections. Rust life cycles are complex, as the obligate parasites have multiple developmental phases, often requiring more than one host plant to complete the cycle. The data associated with these specimens may help tease out complex relationships between fungi and plants, so it is critical that we accurately database all information regarding the spore phases and host from each specimen's label. This may be straightforward or more difficult depending on the specimen. A complicated specimen may be a combination of multiple spore phases of the same fungus collected on different hosts on different dates. The label may be written in Latin, or with handwriting that is difficult to decipher. Spending time with the rusts to ensure we do not overlook these unique details has unearthed some interesting finds in our collection.

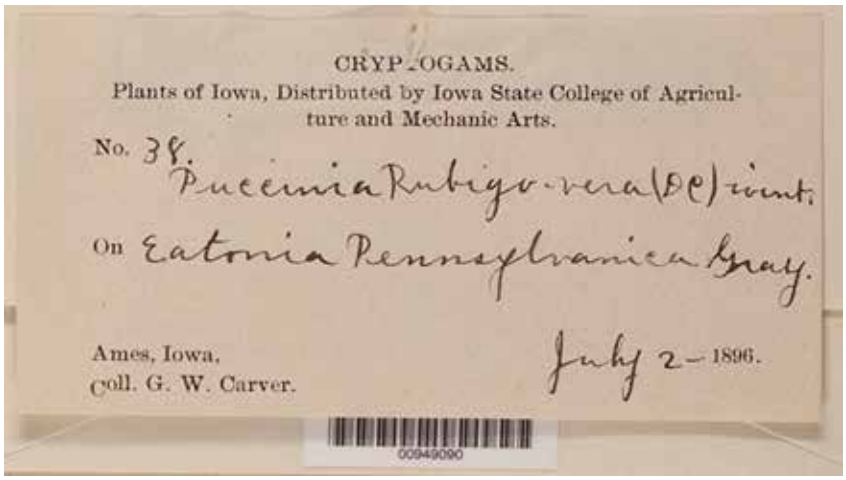


Example of a difficult-to-decipher handwritten label. The primary handwriting is W. G. Farlow's. The label data is as follows: Taxon name, red: Puccinia rubigo-vera*; Host, green:* Cinna pendula*; Collecting information, yellow: Tuckerman's Ravine, Sept. 1883. The remaining text is a description of the spores*.

Collections from a Famous African American Inventor

George Washington Carver, best known for his agricultural work, is considered the most prominent African American scientist of the 20th century. He was born into slavery during the American Civil War, was educated at the Iowa State Agricultural College (now Iowa State University), and notably developed hundreds of inventions for processing peanut and sweet potato crops. Less well-known is the fact that his legacy includes significant research in plant pathology. Carver collected many rust fungus specimens in Iowa while studying for his bachelor's and master's degrees. Later, he made additional collections in Alabama, where he served as the head of the Agriculture Department at the Tuskegee Institute (now Tuskegee University).

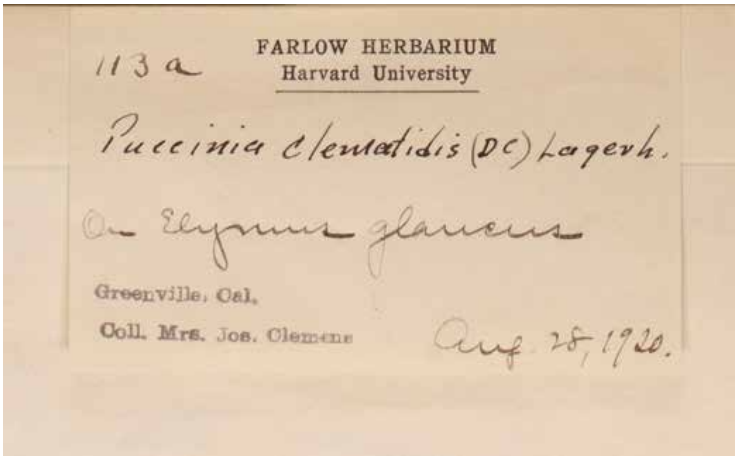
Some of his fungus specimens are present in the Farlow Herbarium: our digitized collections currently include 25 G. W. Carver collections made between 1895 and 1906 from both Iowa and Alabama. This number will surely increase as we continue to work through the rust fungi. Encountering a specimen from such a famous historical figure brightens any workday and reminds us about the varied times people lived through while making botanical collections.



George Washington Carver's collection of Puccinia rubigo-vera (DC.) G. Winter *from Ames, Iowa.*

Prominent Woman Botanist

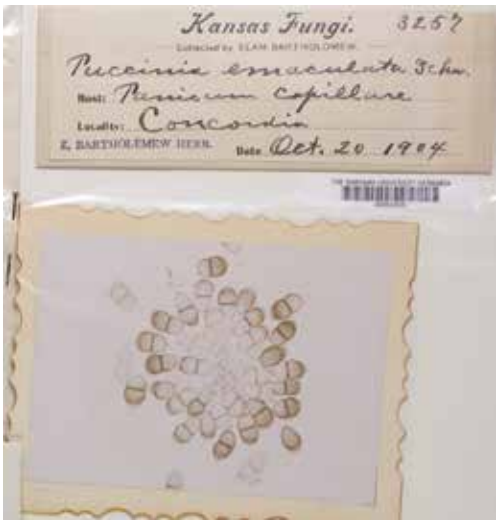
While most well-known botanists from the 18th and 19th centuries were male, the Harvard University Herbaria's vast collections include specimens from many prolific female collectors. One of these women was Mary Strong Clemens—or, as her cryptogamic collecting labels frequently name her, Mrs. Joseph Clemens. Joseph Clemens was a U.S. Army chaplain overseas, mainly in the South Pacific, and Mrs. Clemens collected extensively wherever her husband was stationed. After Joseph retired, he became her assistant in botanical collecting. Her tens of thousands of collections from the United States, Southeast Asia, and Australia are well-represented in the Herbaria, and the Farlow contains many of her rust specimens from California and Oklahoma. It is likely that when we digitize rusts collected outside of North America, we will find even more of her numerous collections.



M. S. Clemens (or Mrs. Jos. Clemens) rust fungus collection from California.

Herbarium of a Prolific Pathologist

A significant portion of the Farlow's rust specimens came from the Herbarium of Elam Bartholomew. After Bartholomew's death in 1934, the Farlow was fortunate to acquire his fungal herbarium and integrate the 40,000 specimens, largely rusts, into the collection. It is likely that this acquisition came close to doubling the number of rust collections in the Farlow at that time. Bartholomew was an unparalleled mycologist despite having no formal training in botany. He acquired many important specimens from mycologists around the world in addition to collecting prolifically in the United States. Collecting was a family affair: we also have collections from his wife R. I. Bartholomew; his sons J. E. Bartholomew and E. T. Bartholomew; and daughter-in-law M. L. K. Bartholomew. One trait these collections have in common is neat and legible handwriting on many of the labels, which allows us to digitize these specimens with relative ease.



A specimen of Puccinia *in the Farlow Herbarium that came from the Herbarium of Elam Bartholomew. Some specimens, such as this one, are accompanied by photographs of spores.*

Conclusion

For the past year, digitizing rust specimens was a task set aside for "Friday Project Day," a weekly time when Herbaria staff work together on various long-term projects. With the attention of only two curatorial staff members for 2.5 hours per week, the progress on digitizing these specimens had been steady, but slow. Due to COVID-19, Harvard University Herbaria staff are now working remotely, which has resulted in additional time dedicated to digitizing rust specimens. The specimens do not have to leave the building to be databased: we work directly from images of the labels we prepared before our last day in the office. Modern technologies like our database software and image-sharing applications enable us to move forward in making our collections known and accessible online, even while working from home.

Uromyces ari-triphylli (Schwein.) Seeler *collected on Jack-in-the-pulpit* (Arisaema triphyllum (L.) *in May 2020. After digitizing many rust specimens, a curatorial staff member has begun to collect them regularly as part of his research on local floras in Massachusetts.*

Work at the Farlow

Curatorial staff members **Hannah Merchant** and **Genevieve Tocci** added barcodes and took photographs of thousands of rust fungus specimen labels before we started working remotely. They now transcribe the data directly from these label images into the Harvard Herbaria database, making these data available for on-line access.

Liam Nokes, our high school student assistant, is working on revising a manuscript about the potential application of marine lichens as bioindicators for coastal ocean pollution based on data collected in the Boston Harbor Islands.

Kathy LoBuglio, Research Assistant is currently working on collaborative projects: The Biology of Morels from Chile (with Don Pfister; Rosanne Healy & Matt Smith from University of Florida; and Giuliana Furci of Fundación Fungi, Chile); Phylogeny of Scutellinia, Bactridium and Sphaerosporium. (with Don Pfister; Rosanne Healy & Matt Smith from University of Florida; and Karen Hansen from the Swedish Museum of Natural History and Norway Maple in the Northeast US Hosts Several *Colletotrichum* Species (with Don Pfister; and Khoshnood Nourollahi)

Luis Quijada, a Postdoctoral Student, is working on projects related to the taxonomy, systematic, ecology and evolution of Discomycetes (disc-shaped Ascomycota). The first project is reviewing genus and species in the family Tympanidaceae. A second project is about fungi from the Chilean Patagonian (Tierra del Fuego), resulting in several genera and possible new species to science.

Martha Finta continued her tireless work on preparing bryophyte specimens for filing. These thousands of mosses and hepatics were collected in China as part of the Biodiversity of the Hengduan Mountains project. Thank you, Martha!

Don Pfister, **Jennifer Brown**, (Collection Manager) and **Scott Fulton** (Conservator) of the Ware Collection of Blaschka Glass Models of Plants published an amazing book entitled Glass Flowers: Marvels of Art and Science at Harvard.

Visitors and Researchers

Troy McMullin, Lichenologist at the Canadian Museum of Nature, spent time in the collections during his visit to speak at Friends of the Farlow Annual Meeting in November 2019.

Ann E. Hajek, Department of Entomology, Cornell University, visited the Farlow Library to review Roland Thaxter papers related to *Entomophaga aulicae* (Entomophthorales)

Early in the year, the Farlow Library hosted **Alex Csiszar's** History of Science class to introduce them to books and archives from the Farlow Library as well as our other library collections.

Alumnus **Jason Karakehian**, currently working on his PhD at the University of Illinois at Urbana-Champaign, returned to the Farlow in January to continue his work on Triblidiaceae.

Khoshnood Nourollahi, of the Isfahan University of Technology, Iran joined the Pfister Lab as a Research Associate in January. He has been working with Don Pfister and Kathy LoBuglio on the project Norway maple in the Northeast US Hosts Several *Colletotrichum* species.

Goia Lyra, from the Universidade Federal de Bahia, Brazil, visited the Farlow in January to examine red algae specimens.

Fellowships and Awards

Luis Quijada, has been selected as a recipient of the Farlow Fellowship, a 1-year fellowship with the intent to facilitate research on and curation of the collections at the Farlow Herbarium.

Jason Karakehian, received a Dean's Prize for Outstanding ALM Thesis (in Biology) from the Harvard Extension School for his thesis entitled *"A Preliminary Study in* Propolis *(Fungi, Ascomycota):* Propolis farinosa- *Common, Cosmopolitan and Plurivorous."*

Botanical Illustrations Search Portal

Diane Rielinger

Looking for an amazing original illustration of a particular species? Want to see the original drawings that led to published plates? The Botany Libraries have launched a new website that displays some of the just-digitized botanical illustrations in our collections. Built on Harvard Library's CURIOSity platform, you can easily browse and search by library, collection or across collections. Genus and species were added where available, allowing for searching by scientific name.

There are currently over 1,000 items from the Farlow collection in the CURIOSity Botanical Illustrations collection, including drawings of lichens from the Pacific Exploring Expedition under Ringgold and Rogers, illustrations of champignons from the Patouillard Herbarium, watercolors of fungi by Lizzie Churchill Allen, and drawings for W.S. Sullivant's *Icones Muscorum* and *Mexican Mosses*. Try a simple search of the word "fern" to see illustrations from a number of non-Farlow collections.

Still to come are hundreds of additional illustrations from *Icones Farlowianae*, multiple collections of fungi paintings, and drawings for published plates. These will be added to the CURIOSity website once the digitizing is completed.

Amanita vaginata, *Pl. 47, No. 3879*
Illustrations of champignons collected by Paul Maury in the Patouillard Herbarium

Transcription Project

Library Staff

The Botany Libraries have been fortunate to secure funds from various sources in the last several years to digitize archival materials. The top priorities have been field notes and correspondence from the collections' archives. There are now thousands of pages of manuscript material available online via HOLLIS and the Biodiversity Heritage Library.

Our next priority is to transcribe as much handwritten material as possible to make the content more accessible. The Harvard Library recently offered transcription service to selected archival materials via "From the Page," a crowdsourcing transcription software system, starting with materials from the Harvard-wide Colonial North America (CNA) project. We currently have two archival CNA collections available: the Stephen Elliott papers, consisting of manuscripts, research notes, subscription forms and correspondence; and the Manasseh Cutler papers, consisting of notebooks with plant observations and correspondence.

"From the Page" allows volunteers to sign up and start transcribing with an easy-to-use interface. If you are interested in transcribing any of the Harvard material, please contact us (botref@oeb.harvard.edu) and we will share the Harvard's guidelines and our local conventions. We will add more content in the future and look forward to enlisting the interest and expertise in our community.

Recent Publications

Quijada L., H.-O. Baral, E. Beltrán-Tejera, and D.H. Pfister. 2020: *Orbilia jesu-laurae* (Ascomycota, Orbiliomycetes), a new species of neotropical nematode-trapping fungus from Puerto Rico, supported by morphology and molecular phylogenetics. Willdenowia 50: 241–251.

Pfister, D.H., L.Quijada, and K.F. LoBuglio. 2020. *Geodina* (Pezizomycetes: Wynneaceae) has a single widespread species in tropical America. Fungal Systematics and Evolution, 5 (1) :131-138.

Quijada, L., J.B Tanney, E. Popov, P.R. Johnston, and D.H. Pfister. 2020. Cones, needles and wood: *Micraspis* (Micraspidaceae, Micraspidales fam. et ord. nov.) speciation segregates by host plant tissues. Fungal Systematics and Evolution, 5 (1): 99-112.

Blackwell, M., D.Haelewaters, and D.H. Pfister. 2020. Laboulbeniomycetes: Evolution, natural history, and Thaxter's final word. Mycologia: 1-12. https://doi.org/10.1080/00275514.2020.1718442

Haelewaters, D., A. Okrasińska, M. Gorczak, and Pfister, D.H., 2020. Draft genome sequence of the globally distributed cockroach-infecting fungus *Herpomyces periplanetae* strain D. Haelew. 1187d. Microbiology Resource Announcements, 9 (6).

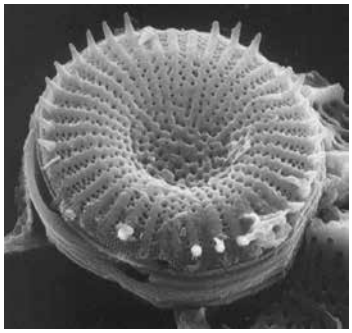
Haelewaters, D., T. Hiller, E.A. Kemp, P.S. van Wielink, D.I. Shapiro-Ilan, M.C. Aime, O. Nedved, D.H. Pfister, and T.E. Cottrell. 2020. Mortality of native and invasive ladybirds co-infected by ectoparasitic and entomopathogenic fungi. bioRxiv. Posted 18 April, 2020.

Beimforde, Christina, Alexander R. Schmidt, Jouko Rikkinen, and J. K. Mitchell. 2020. Sareomycetes cl. nov.: A new proposal for placement of the resinicolous genus *Sarea* (Ascomycota, Pezizomycotina). Fungal Systematics and Evolution. 6: 25-37 .

Robert Edgar and the Farlow Diatoms

Donald Pfister

For more than 40 years the Farlow Herbarium has had the advantage of having the aid and support of Robert Edgar. Bob's special area of expertise is diatom taxonomy and ecology with a very strong sideline in the history of the field of diatom studies. The Farlow collection of diatoms is large and, in part because these are primarily microscope slide, their curation is sometimes difficult. Tiny handwriting can be daunting. The slide labels may be written in many languages. And, the slides themselves may carry representatives of several species. Working with this collection takes an expert. Bob came to the Farlow as a research associate and helped manage the complexities. At the time Bob was a professor at the University of Massachusetts, Dartmouth. He would make almost weekly trips to Cambridge where he studied the collections, indexed the slides, arranged them appropriately and delved into the origin of the collections and the collectors. Our catalogues of the diatom collections on-line are all his work, and he has continued to curate the online collection, as well as the Diatom.org resource.



In retirement Bob moved to northern Vermont and continued to help us with loan requests and when we were on the trail of a particular item. He served as president of the Friends of the Farlow and is a founding member. Now time and distance have conspired and Bob has decided it is time to close the Farlow door. We will miss his wise advice and his willingness to always help out. More we will miss his dedication and willingness to dig just a little deeper to answer difficult questions regarding the collection. Best wishes Bob, please stay in contact.

Exploring the diversity of fungi at "the end of the world:" Leotiomycetes from the forests of Patagonian Chile

Luis Quijada, Katherine LoBuglio, Jason Karakehian, Giuliana Furci, Daniella Torres & Donald H. Pfister

Leotiomycetes is one of the most speciose monophyletic groups in Ascomycota (Fungi). Often referred to as "inoperculate discomycetes," they are known to be not only cosmopolitan plant-pathogens or saprobes, but also to be endophytes, mycorrhizal and algal symbionts (O'Brien et al. 2005, Sieber 2007, Baral 2016, Johnston et al. 2019). The diversity of these fungi is well documented in the Northern Hemisphere, and in being so it provides a good example with which to illustrate the knowledge gap in fungal biodiversity between North and South America. The ratio of reports between these continents is 22:1 according to our search in GBIF (2019). Biogeographic studies demonstrate that the richness of the class increases toward the poles. Diversity in the tropics is lower, but the reason is unclear with climatic predictors having been suggested as an explanation (Tedersoo et al. 2014). Leotiomycetes diversity has been suggested to be related to specificity and preferences of hosts, linked to vegetation types and the micro- and macroclimatic conditions (Sieber 2007, Quijada 2015). Southern Hemisphere temperate forests differ from those in the Northern Hemisphere. These differences are due to biogeographic isolation, climate, dominance of the broadleaf tree genus *Nothofagus*, and high endemism of host plants (Armesto et al. 1992, CONAF 2011, CONAMA 2008). The Patagonian forests of Chile and Argentina have been little explored for fungi, and even less so for micro-fungi such as those in Leotiomycetes that typically produce fruitbodies measuring less than 0.5 mm – hardly "charismatic macrofungi" compared to mushrooms. Research by Truong et al. (2017) demonstrates the prominence of these fungi and the need to study them. In their fungal survey using a next-generation sequencing approach with environmental samples, only 30% of the sequences obtained from 1,430 samples matched known fungi, according to searches in the UNITE database. This mismatch occurs not only because many taxa remain undiscovered, but also because many named taxa lack DNA reference sequences. This situation is particularly striking in Leotiomycetes when it is taken into consideration that they have been shown to be the second most diverse group of fungi in southern temperate forests, in a study of soil isolates worldwide (Tedersoo et al. 2014).

With this compelling research opportunity to put these fungi on the map, Donald Pfister led a select Farlow-centric research group during the end of last year's austral autumn to explore the diversity of Leotiomycetes at "the end of the world" in Chilean Tierra del Fuego. Our work follows in the footsteps of several mycologists. Carlos Spegazzini, the Italian-Argentine mycologist, was a pioneer in documenting the fungi of the region. The eminent Harvard mycologist, Roland Thaxter, spent several months in Punta Arenas just across the Strait of Magellan in 1906. In recent years, Donald Pfister and Matt Smith have led students and collaborators in several research expeditions to explore fungal diversity on the mainland of Chile. However, none of these investigations targeted Leotiomycetes. By far the strongest influence on our work has been the investigations carried out by Irma Gamundí. Her treatments of discomycetes from Tierra del Fuego are the foundation for our research (Gamundi 1986, 1987, 1976, 1980).

Personnel on our expedition included Donald Pfister, Luis Quijada, a postdoc student at the Farlow, and two members of Fundación Fungi of Chile, Giuliana Furci and Daniella Torres. The research was done in Karukinka Natural Park, a protected area in south western Tierra del Fuego. The weather there is rainy and cold-temperate without a dry season. Rain varies between 400-620 mm/year and the average temperature is between 1-11°C. The Park is 297.655 ha with tracts of *Nothofagus* forests and peat bogs. The last survey of fungi inside the park (Furci & Repetto-Giavelli 2012), found more than 140 species, representing 11% of the fungi known from Tierra del Fuego. Six of the 140 species were Leotiomycetes: *Calycina citrina*,*Chlorociboria aeruginosa, Cudoniella clavus, Cyttaria darwinii, C. exigua and C. harioti (op. cit.)*.

Our quest to expand the knowledge of Leotiomycetes in this region of the world was realized by surveying five localities around the research station in Karukinka Natural Reserve (Fig. 1) on a daily basis for 10 days. Typically, we spent 6–8 hours in the field, from morning through the afternoon. In the evenings we worked-up fresh collections, documenting macro- and microscopic features. For Leotiomycetes to be properly identified and documented, they must be studied in the living condition. Diagnostic morphological features that allow determination of genera and species are observed mostly in living cells. This approach to identification is called "vital taxonomy" (Baral 1992). The difference, in regards to traditional “herbarium taxonomy” using dried, dead specimens, is that in dead material one cannot see certain types of guttules in the sterile tissues of the fruitbodies (e.g. excipulum and paraphyses) or in the ascospores. Without properly observing these features, even a generic diagnosis may not be possible, as in the cases of *Calycina* vs *Bisporella* and *Mollisia* vs *Pyrenopeziza*, for example. The perceived difficulty in adopting the vital taxonomy approach is a reason that few researchers around the world study Leotiomycetes. However, our group is experienced, and thanks to our funding, good research infrastructure at Karukinka, and logistical support from Fundación Fungi, we had all the resources we needed to properly work this challenging group of fungi using vital taxonomy.

Figure 1. Field trip photographs from Karukinka Natural Park (Tierra del Fuego) showing environment, researchers and field station.

During our admittedly brief survey, we made 79 collections of 62 species that are well documented, scientifically valuable voucher specimens that will be accessioned into the Farlow Herbarium. Distribution of richness and diversity (Fig. 2a) varied among the localities, with La Paciencia being the least diverse and Franklin Forest being the most diverse. Three localities were richest in species and collections (Laguna del Cura, Lago Deseado, Franklin Forest) with more than 15 species each. The five localities are relatively equidistant (a few kilometers apart) and the ecosystems, vegetation and host plants are the same. For that reason, the low overlap of species between the localities is notable – between 1-10% (Fig. 2b). This is no more than 5 species shared between localities. The majority of specimens were found on wood, mostly on *Nothofagus*, but some species were also found on fallen leaves, herbs, soil, or even growing on liverworts (Fig. 3). Among the few shared species, *Calycina citrina* and *Mitrulinia ushuaiae* (Fig. 4), growing on *Nothofagus* wood, were common. Other shared species included *Pseudomitrula horakii*, an earth tongue-like fungus that grows on woody and leafy debris. The unusual diversity in each locality, with little overlap of species, agreed with the results of previous authors who noted that southern temperate forests are rich in Leotiomycetes (Tedersoo et al. 2014, Truong et al. 2017).

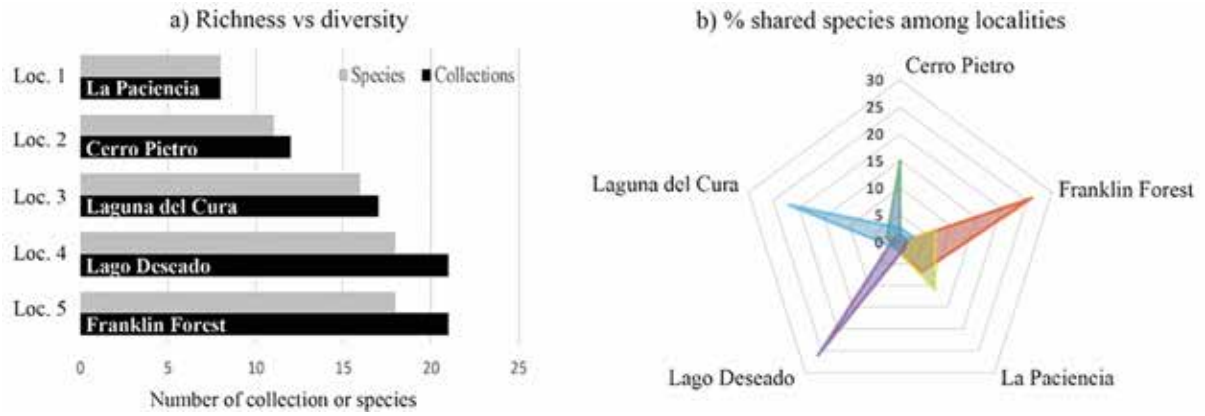


Figure 2. Richness and diversity of Leotiomycetes by locality and percentage of shared species among them.

Returning to the Farlow Herbarium, we continued the morphological analysis of our specimens and began molecular sequence work. From the start, we focused on collections where we were confident in our generic determination, but where a specific determination was elusive (i.e. *Arachnopeziza, Bulgariella, Capitotricha* and *Chlorociboria*, Fig. 4). It is possible that these collections represent new species. In collaboration with Peter Johnston, a specialist in Leotiomycetes at Landcare Research, New Zealand, we conducted a phylogenetic analysis comparing our collections with those in GenBank, a publicly-accessible sequence repository, and his own collections from the Southern Hemisphere, including New Zealand and Argentina.

Our initial results indicate we have new species in the genera *Arachnopeziza, Bulgariella, Capitotricha, Propolis* and *Mellitiosporiella* (Fig. 4). Moreover, we are excited to have confirmed three new species in *Chlorociboria* (Fig 4). These species are distinct from the commonly reported *Chlorociboria aeruginascens* (Green Elf Cup), and other species that strongly stain the wood substratum green and that produce green-turquoise, cyathiform apothecia. Strikingly, one of our new species is white, the other two are pale green, and neither stain the wood substratum. Collecting was profitable on dead, exposed logs and branches of *Nothofagus*. We made collections of desiccation-tolerant fungi in Marthamycetales that include two new species of *Propolis* and one of *Mellitiosporiella* (Fig. 4). Currently, there are only two described species of *Propolis* from Patagonia, *P. pulchella* and *P. lugubris*, both described by Spegazzini in 1888. Our collection of *Mellitiosporiella* resembles *M. macrospora* described from *Juniperus* and *Salix* from Oregon, USA. It is probably the first report of this genus from South America.

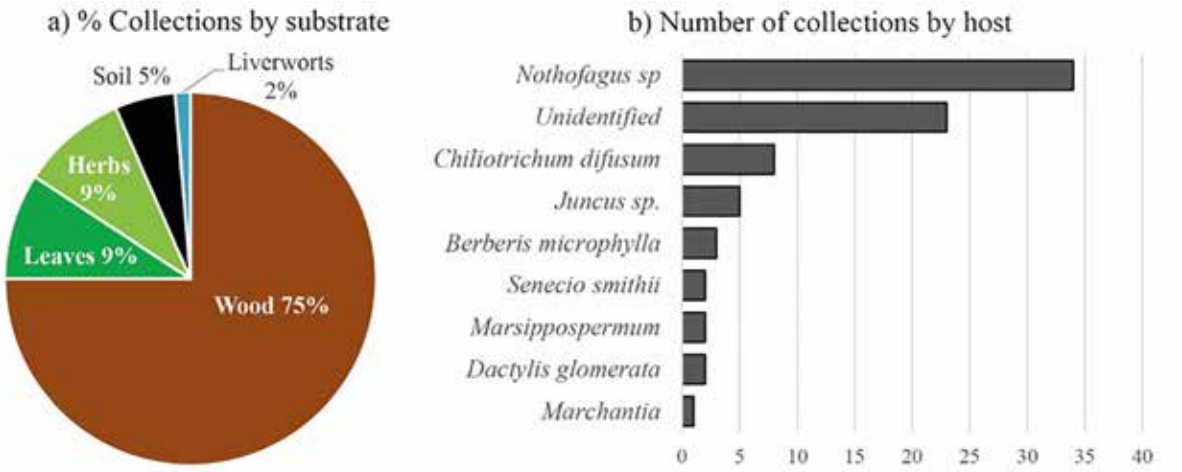


Figure 3. Abundance of Leotiomycetes found by substrate and host.

Next, we turned our attention to those collections with family-rank or uncertain generic determinations. For these, we are sequencing several genes (protein and non-protein coding genes) such as ITS, LSU, RPB1, RPB2 and TEF. We will then compare these sequences to those in the dataset generated by Johnston *et al.* (2019) that includes representative sequences from all orders and families in Leotiomycetes. We hope that this approach will provide insights into the systematic position (order, family, genus) of our collections. At this time, we have several collections with sequences of four or five genes; these represent two possible new genera in two different families, one in Dermataceae and another in Helotiaceae (Fig. 4).

Finally, we have confirmed species previously reported from Tierra del Fuego such as *Mollisia palustri*s, *Bisporella shusterii*, and *Mitrulinia ushuaiae* (Fig. 4), and we have found several new reports including *Pezoloma marchantiae* (Fig. 4). This cup fungus has a beautiful pinkish disc with groups of united hairs at the margin. It has a special ecology; it grows in bogs on decayed liverworts of the genus *Marchantia*. This is probably the first report of this species in the South Hemisphere, but we are still working to confirm this.

Figure 4. Macrophotographs of different Leotiomycetes species found it in Karukinka during our expedition. Identification included in each photo at the bottom.

Acknowledgments

D. H. Pfister thanks the David Rockefeller Center for Latin American Study at Harvard University for a faculty grant that supported this work as well as previous travel to these special areas. The first author thanks the support of the Department of Organismic and Evolutionary Biology (OEB, Harvard), Royal T. Moore awards and the “Fundación Ramón Areces.”

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In Memoriam

Maggie Rogers, a long-time member of the Oregon Mycological Society, the North American Mycological Association and a Friend of the Farlow, passed away in Portland, OR in November 2018. Maggie graciously donated a large collection of mushroom-themed stamps to the Farlow Collection. Steve Trudell shared the news of her passing and wrote a tribute to Maggie, published in Fungi Magazine.

John Barrett of Twin Falls, Idaho, passed away in July 2019. John, a lawyer by training, pursued science on this own. He was keenly interested in bryophytes (mosses). His dear friends Ken and Heidi Romney shared the news of his passing.

Clara Cummings Walk Alternative

While the annual spring Clara Cummings walk has been postponed due to the COVID-19 pandemic, there are still opportunities to observe fungi wherever you may live.

Consider joining iNaturalist, a free online platform for making observations about nature. On iNaturalist, "observations" are pictures, videos or sound recordings of plants, animals or microorganisms. Observations that are deemed research grade by the community then flow into the Global Biodiversity Information System database, making these data available for researchers anywhere. To date there are over 2 million observations of fungi and lichens!

Updated Website and Social Media

The Friends of the Farlow website has been updated!
We've also been dabbling in social media.
Please consider following @FarlowFriends on Twitter!

Join us!

Receive the FoF Newsletter, notification of the annual book sale, discounts on Farlow publications and services, invitations to the annual meeting and other events, and a special welcome when visiting the Farlow. Dues notices will be issued in December.

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