

Taxonomy and Systematics of fungi from South America –a special issue in honoring Leif Ryvardeen: Introduction

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Since the ending of the nineteenth century and the beginning of the last one, pioneered by mycologists such as Carlos Spegazzini, A. Giacomo Bresadola, Johann Rick and Miles Joseph Berkeley, mycological research in South America has grown vigorously and continues in the present time. Numerous taxa have been described, many papers have been published, and several regional mycotas have been produced.

One of the major contributors in this field is Professor Leif Ryvardeen, who has made substantial contributions to the knowledge of polypore diversity in his series of articles Neotropical polypores, where he describes patterns of polypore distribution and put forth clever hypotheses about the processes behind those patterns. In addition he worked closely with several local mycologists (Fig. 1). The contributions of Dr. Ryvardeen are not restricted to South America or to polypores. It would be a quite difficult task to enumerate Ryvardeen's overall contributions to the field of mycology, but for any mycologist it is clearly evident that his contributions –more than three hundred published articles and books– extend all around the world and substantially improved our knowledge on fungal diversity on a global scale.

It is for this reason that we have dedicated this special issue of *Kurtziana* to Professor Leif Ryvardeen in honour of his devotion to South American mycology.

As will become evident from the summary provided below, this collection of papers covers taxonomy, systematics, chorology, and even mycogeography of South American fungi. All of these topics have been touched by Dr. Ryvardeen in his distinguished scientific writings on Basidiomycota.

In the first article of this issue, Rajchenberg & Pildain (p. 7) show that while phylogenetic analysis of the ITS region of the polypore *Ryvardenia cretacea* revealed the existence of two well supported clades, each belonging to two now separated Gondwanic territories, Australia and Argentina, there are no morphological differences or biological incompatibility between isolates. The authors suggest that the biogeographical isolation between isolates and populations might be underlying some kind of speciation in this taxon but that this process is still insufficiently developed to support two separate entities. The results of this study support the idea that phylogenetic differentiation precedes phenotypic and reproductive isolation and provide further evidence on the complex nature of issues regarding species concepts, recognition, and delimitation. Instead, Batnik et al. (p. 15) describe the new species *Laetiporus caribensis*, a Caribbean species, distinguished from related members of the genus by smaller basidiospores, mating incompatibility, and divergent ITS sequences. In this case, a clear example of complete sympatric speciation between *L. caribensis* and the closely related *L. gilbertsonii*, could be hypothesized.

In their study of *Inocybe* from Guyana, Matheny et al. (p. 23) describe five new species, two new records and provide molecular identifications of ectomycorrhizal root tips of species of *Dicymbe* and *Aldina* (Fabaceae). Among these, five match known *Inocybe* species from Guyana while another eight *Inocybe* ITS sequences present no match with known morphological species represented in regional or global sequence databases. Along these same lines, Baroni et al. (p. 41) describe five new species of *Pouzarella* from northwest Argentina and report *P. ferreri* for the first time in that country. Both studies also provide descriptions, illustrations, and discussions of the taxa together with keys to species known for each country respectively. Certainly these articles “will be reference for agaricologists working in South America,” as one reviewer noted.

Exploring for wood rotting fungi, Drechsler-Santos et al. (p. 65) and Iturriaga et al. (p. 73) found and describe two new interesting species from the neotropics, a Basidiomycota in the genus *Daedalea* and an Ascomycota in the genus *Pseudoplectania*, respectively.

Romero et al. (p. 79) report for the first time the rare species *Rickiella edulis* (Ascomycota) from Argentina and go further beyond this by confirming the monophyly of the Sarcoscyphaceae and proposing a new tribe to accommodate *Wynnea*.

In a survey of wood samples, basidiomes and conidiomata from London plane trees (*Platanus acerifolia*) in a urban ecosystem from Argentina, Robles et al. (p. 91) show that despite the fact that the analysis of the ITS region is a useful taxonomic tool, the diagnosis of wood-rot fungi on trees still needs to be complemented with studies involving morphological and culture aspects of the fungi. Furthermore, the lack of sequences in the databases is shown to be an obstacle for ensuring the taxonomic positions of obtained sequences even for fungi decaying wood in a host from the northern hemisphere.

The distribution of two Basidiomycota and one Ascomycota known for the tropics is expanded in three chorological notes: Hallenberg (p. 109) extends the distribution of the tropical corticioid *Leptocorticium tenellum* to the *Nothofagus* temperate forest in southern Chile while Wartchow (p. 113) extend the distribution of an amazonian *Clavulina* to the Atlantic forest in Brasil. In turn, Bianchinotti et al. (p. 119) report two species of *Rhynchomeliola*, a genus previously known only from Brazil in South America, from the *Nothofagus* temperate forest of the Argentinean side. Moreover, *Rhynchomeliola lomatiiae* is recorded for the first time since its original description where it was known only from herbarium material of *Lomatia polymorpha* in Australia.

Finally, two annotated lists of important groups in Ascomycota are provided, albeit with different geographical and taxonomic coverage. Petrini & Petrini (p. 127) contribute a list of *Rosellinia* species collected in South and Central America and deposited in international and private herbaria, while Lorenzo & Messuti (p. 141), based mainly on the literature reports and herbarium specimens, offer a checklist of hysteriaceous Ascomycota in the families Hysteriaceae and Mytiliniaceae from

Fig. 1. 1979: Leif during a field work outside Oslo in one of his field curses. 1981: during a workshop in Iguazu National Park (Misiones, Argentina), from the left: Leif Ryvarde, Viviana Katz, Jorge E. Wright, Daniel Cabral and Silvia Lopez. 1983: Leif and Mario Rajchenberg during a research stay of MR in Oslo. 1987: field trips in Brazil, **a**: Ilha do Cardoso, from the left: David Norman Pegler, Marina Capelari, Kurt Hjortstam, Rosana Maziero, Leif and Maria Isabel, **b**: Campos de Jordão, from the left: Leif, David Norman Pegler, Kurt Hjortstam, Marina Capelari and Maria Isabel. 1998: Leif during a field trip north of Oslo. 2007: workshop on neotropical Polypores in Lima, Peru, **a**: Leif giving a theoretical class, **b**: at the field trip of the workshop, crossing a river in the Peruvian Amazonian upper basin, **c**: after a long field work day including a fall in the river. 2008a: receiving *Honoris causa* PhD at the Universidad Nacional de Cordoba, Cordoba, Argentina. 2008b: after the ceremony of *Honoris causa* PhD, from the left: Gerardo Robledo and his sun Augusto, Leif, Mario Rajchenberg and Gabriel Bernardello. 2009: working at his office, captured by Ricardo Drechsler-Santos during his research stay at Oslo. 2011: During the Latin-American Congress of Mycology, from de left: Aida Vasco, Richard Korf, Ana Esperanza Franco-Molano, Leif and Milagro Mata.



Argentina and Chile. These two catalogs will undoubtedly serve as baseline resources for future studies of those taxa and serve updated agendas of taxonomic and systematic problems to be solved in these groups.

The contributions summarized above certainly constitute a very small sample of what kind of investigations regarding fungi are being carried out in South America. Nonetheless, the studies and approaches provided here clearly show, as claimed in every meeting, congress, and symposium, that we are extremely far from having a handle on the diversity of fungi and their systematic classification from this part of the world. Thus, we must continue to advocate for more efforts dedicated to field collections, morphological and culture based assessments and molecular analyses of fungi if we hope to increase our knowledge about the fungi and ultimately to initiate regional conservation programmes.

We believe the efforts presented here serve to add another brick of knowledge in our striving to understand the biodiversity of fungi in South America.

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