



PHYTOTAXA

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One hundred new species of lichenized fungi: a signature of undiscovered global diversity

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Abstract

The number of undescribed species of lichenized fungi has been estimated at roughly 10,000. Describing and cataloging these would take the existing number of taxonomists several decades; however, the support for taxonomy is in decline worldwide. In this paper we emphasize the dire need for taxonomic expertise in lichenology. We bring together 103 colleagues from institutions worldwide to describe a total of 100 new species of lichenized fungi, representing a wide taxonomic and geographic range. The newly described species are: *Acarospora flavisparsa*, *A. janae*, *Aderkomyces thailandicus*, *Amandinea maritima*, *Ampliotrema cocosense*, *Anomomorpha lecanorina*, *A. tuberculata*, *Aspicilia mansourii*, *Bacidina soarediata*, *Badimia multiseptata*, *B. vezdana*, *Biatora epirotica*, *Buellia sulphurica*, *Bunodophoron pinnatum*, *Byssoloma spinulosum*, *Calopadia cinereopruinosa*, *C. editae*, *Caloplaca brownlieae*, *C. decipioides*, *C. digitaurea*, *C. magnussoniana*, *C. mereschkowskiana*, *C. yorkensis*, *Calvitimela uniseptata*, *Chapsa microspora*, *C. psoromica*, *C. rubropulveracea*, *C. thallostroma*, *Chiodecton pustuliferum*, *Cladonia mongkolsukii*, *Clypeopyrenis porinoides*, *Coccocarpia delicatula*, *Coenogonium flammeum*, *Cresponea ancistrosporelloides*, *Crocynia microphyllina*, *Dictyonema hernandezii*, *D. hirsutum*, *Diorygma microsporum*, *D. sticticum*, *Echinoplaca pernambucensis*, *E. schizidiifera*, *Eremithallus marusae*, *Everniastrum constictovexans*, *Fellhanera borbonica*, *Fibrillithecis sprucei*, *Fissurina astroisidiata*, *F. nigrolabiata*, *F. subcomparimuralis*, *Graphis caribica*, *G. cerradensis*, *G. itatiaiensis*, *G. marusa*, *Gyalideopsis chicaque*, *Gyrotrema papillatum*, *Harpidium gavilaniae*, *Hypogymnia amplexa*, *Hypotrachyna guatemalensis*, *H. indica*, *H. lueckingii*, *H. paracitrella*, *H. paraphyscioides*, *H. parasinuosa*, *Icmadophila eucalypti*, *Krogia microphylla*, *Lecanora mugambii*, *L. printzenii*, *L. xanthoplumosella*, *Lecidea lygommella*, *Lecidella greenii*, *Lempholemma corticola*, *Lepraria sekikaica*, *Lobariella sipmanii*, *Megalospora austropacifica*, *M. galapagoensis*, *Menegazzia endocrocea*, *Myriotrema endoflavescens*, *Ocellularia albobullata*, *O. vizcayensis*, *Ochrolechia insularis*, *Opegrapha viridipruinosa*, *Pannaria phyllidiata*, *Parmelia asiatica*, *Pertusaria conspersa*, *Phlyctis psoromica*, *Placopsis imshaugii*, *Platismatia wheeleri*, *Porina huainamdungensis*, *Ramalina hyrcana*, *R. stoffersii*, *Relicina colombiana*, *Rhizocarpon diploschistidina*, *Sticta venosa*, *Sagenidiopsis isidiata*, *Tapellaria albomarginata*, *Thelotrema fijiense*, *Tricharia nigriuncinata*, *Usnea galapagona*, *U. pallidocarpa*, *Verrucaria rhizicola*, and *Xanthomendoza rosmarieae*. In addition, three new combinations are proposed: *Fibrillithecis dehiscens*, *Lobariella botryoides*, and *Lobariella pallida*.

Key words: Darwin declaration, Encyclopedia of Life, Global Taxonomy Initiative, lichens, taxonomy, taxonomic impediment

Introduction

The number of species inhabiting our planet is estimated to be between 2–10 and 30–100 million (May 1988, Curtis *et al.* 2002, Rosenzweig *et al.* 2003). About 2.2 million are recorded, including 400,000 plants, 100,000 fungi (including 17,500 lichens), 1.5 million animals, 200,000 protists, and 10,000 bacteria (Prance *et al.* 2000, Govaerts 2001, Pitman & Jørgensen 2002, Scotland & Wortley 2003, Schloss *et al.* 2004, Williamson & Day 2007, Feuerer & Hawksworth 2007, Kirk *et al.* 2008). The total number of fungi is estimated at 700,000 to 1.5 million species (Hawksworth 1991, 2001, Mueller & Schmit 2007). The majority of the undescribed fungal species are expected in poorly studied areas, such as tropical forests or in under-explored habitats, for example living on or in insects, plants or lichens (Hawksworth & Rossman 1997, Frohlich & Hyde 1999, Taylor *et al.* 2000a, Sipman & Aptroot 2001, Lawrey & Diederich 2003, Arnold & Lutzoni 2007). There is also a growing body of evidence suggesting that the approach to current species recognition, which is based largely on morphology and chemistry, significantly underestimates the number of species. Phylogenetic studies indicate that numerous distinct lineages may be hidden under a single species name (Roy *et al.* 1998, Grube & Kroken 2000, Kroken & Taylor 2001, Koufopanou *et al.* 2001, Peterson *et al.* 2001, Cruse *et al.* 2002, Molina *et al.* 2004, Douhan & Rizzo 2005, Pringle *et al.* 2005, Geml *et al.* 2006, Kausserud *et al.* 2006, Matute *et al.* 2006, Arguello *et al.* 2007b, Giraud *et al.* 2008, Wirtz *et al.* 2008, Baloch & Grube 2009).

Even with a conservative estimate of ten million existing species, including perhaps around one million fungi, the number of eight million remaining undiscovered species, including 900,000 fungi, is mind-boggling. Assuming that modern taxonomic revisions were produced mainly in the past 50 years, it would