

# Peeking into the future : fungi in the greening Arctic

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## **Curriculum Vitae**

Luis Neves Morgado was born in Lisbon, Portugal, on March 27, 1982. He carried out his licence degree (4.5 years) in biology at Évora University (Portugal). His final project to complete the degree focused on the macrofungal community associated with Ouercus coccifera and the mushroom poisoning cases in the Alto Alentejo region in collaboration with Évora Hospital. He then



obtained a Leonardo da Vinci scholarship to train and study the molecular phylogeny and biogeography of Entoloma (Agaricales, Fungi) in the National Herbarium of the Netherlands at Leiden University. Next, he pursued a MSc. in management and conservation of natural resources at Évora University and Lisbon Technical University (Portugal). His final project focused on the traditional use of mushroom species by locals in the Alto Alentejo region. During his MSc. he co-founded a mycological group in an NGO and organized several workshops about mushroom identification and management of mycological resources. After obtaining his MSc. in 2011, he started his PhD. study under the supervision of Dr. József Geml and Prof. Dr. Erik Smets at Leiden University and Naturalis Biodiversity Center. The PhD. project was focused on effects of climate changes on arctic fungal communities. Besides his main research project, he engaged in other research projects related with tropical fungal ecology, fungal molecular phylogeny, evolution and taxonomy. During his PhD. study he did field work in the Netherlands, Alaska (USA), and Sabah (Malaysia). He attended and presented his work in national and international conferences, such as the Mycological Society of America Annual Meeting, the International Mycological Congress, BioSyst.EU, the Netherlands Annual Ecological Meeting, among others. After completing his PhD., he will be appointed as a postdoctoral researcher at the University of Oslo, focusing on the ecology of boreal fungi.

# Publications in peer reviewed journals

#### Published

**Morgado LN**, Semenova TA, Welker JM, Walker MD, Smets E, Geml J. Long-term increase in snow depth leads to compositional changes in arctic ectomycorrhizal fungal communities. *Global Change Biology* (accepted).

**Morgado LN**, Noordeloos ME, Hausknecht A (2016). *Clitopilus reticulosporus*, a new species with unique spore ornamentation, its phylogenetic affinities and implications on the spore evolution theory. *Mycological Progress* 15:26: DOI 10.1007/s11557-016-1165-0.

Merckx VSFT, (...), **Morgado LN**, et al. (2015). Evolution of Endemism on a Young Tropical Mountain. *Nature* **524**: 347-350.

Geml J, **Morgado LN**, Semenova TA, Welker JM, Walker MD, Smets E (2015). Longterm warming alters richness and composition of taxonomic and functional groups of arctic fungi. *FEMS Microbiology Ecology* **91**: doi: 10.1093/femsec/fiv095.

Semenova TA, **Morgado LN**, Welker JM, Walker MD, Smets E, Geml J (2015). Longterm experimental warming alters community composition of ascomycetes in Alaskan moist and dry arctic tundra. *Molecular Ecology* **24**: 424-437.

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#### Submitted or in preparation

Geml J, **Morgado L**, Semenova T, Schilthuizen M. Elevational patterns of richness and community composition of ectomycorrhizal fungi on Mount Kinabalu and the Crocker Range in Borneo. *The ISME Journal* (submitted).

Semenova TA, **Morgado LN**, Welker JM, Walker MD, Smets E, Geml J. Compositional and functional shifts in arctic fungal communities in response to long-term experimental snow depth increase. (in preparation).

Oliveira P, Arraino-Castilho R, Vila-Viçosa C, Castro, MR, **Morgado LN**. Discovery of a new cryptic taxon among sporocarp collections of the edible *Amanita ponderosa* (Basidiomycota, Agaricales). *Cryptogamie* (submitted).

## Publications in non-peer reviewed journals

Noordeloos ME & Morgado LN (2015). New insights into *Entoloma bloxamii*. Coolia 58: 41-47.

**Morgado LN**, Martins L, Gonçalves H, Oliveira P (2006). Estudo de intoxicações causadas por ingestão de macrofungos na região do Alto Alentejo. *Anais da Associação Micológica A Pantorra* **6**: 65–74.

## Abstracts and other publications

**Morgado LN** (2015). Phylogenetic overview of the Entolomataceae with insights into biogeographical patterns and character evolution. *XXIII meeting of the European Confederation of Mediterranean Mycology – CEMM*. Fornos de Algodres, Portugal. (Invited speaker).

Geml J, Pastor N, **Morgado LN**, Semenova T, Nouhra ER (2015). Mycota of understudied biodiversity hotspots –DNA metabarcoding reveals hyperdiverse communities and strong habitat partitioning along altitudinal gradients in Borneo and in the Andes. *DNA Barcoding – The gold standard for species recognition*. Utrecht, the Netherlands. (Oral presentation)

Geml J, **Morgado LN**, Semenova TA, Smets E, Walker MD, Welker JM (2015). Peek into the future – long-term warming and increased snow depth alter richness and composition of taxonomic and functional groups of arctic fungi. *Symposium Netherlands Polar Programme: Polar tipping points – identifying rapid changes in the polar regions*. The Hague, the Netherlands. (Oral presentation)

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climate warming in moist and dry tundra of Arctic Alaska. XVII Congress of European Mycologists. Madeira, Portugal. (Oral presentation)

Geml J, **Morgado LN**, Semenova TA, Smets E, Walker MD, Welker JM (2015). Longterm warming and increased snow depth alter richness and composition of taxonomic and functional groups of arctic fungi. *21st International Tundra Experiment meeting: Integrating Arctic Plant and Microbial Ecology*. Uppsala, Sweden. (Oral presentation)

**Morgado LN**, Semenova TA, Smets E, Walker MD, Welker JM, Geml J (2015). Compositional shifts in arctic ectomycorrhizal fungal community in response to long-term increased snow depth in Northern Alaska. *Ecology of soil microorganisms 2015 – microbes as important drivers of soil processes*. Prague, Czech Republic. (Poster presentation)

**Morgado LN**, Semenova TA, Welker JM, Walker MD, Geml J (2015). Compositional shifts in ectomycorrhizal fungal community in response to long-term snow depth manipulations. *Netherlands Annual Ecological Meeting*. Lunteren, The Netherlands. (Oral presentation)

Semenova TA, **Morgado LN**, Welker JM, Walker MD, Smets E, Geml J (2015). Climate warming alters comunities of soil ascomycetes in arctic Alaskan tundra. *Netherlands Annual Ecological Meeting*. Lunteren, The Netherlands. (Oral presentation)

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**Morgado LN**, Semenova TA, Welker JM, Walker MD, Geml J. (2014). What can 1,000,000 sequences tell us about climatic changes and ectomycorrhizal (ECM) fungal communities? *Netherlands Annual Ecological Meeting*. Lunteren, The Netherlands. (Poster presentation)

Semenova TA, **Morgado LN**, Welker JM, Walker MD, Smets E, Geml J (2014). Global warming changes soil ascomycetous fungal communities in the arctic tundra. *Netherlands Annual Ecological Meeting*. Lunteren, The Netherlands. (Poster presentation)

Morgado LN, Semenova TA, Welker JM, Walker MD, Smets E, Geml J (2014). Long-term experimental warming have distinct effects in the ectomycorrhizal fungal

communities of moist tussock and dry tundra in the Arctic Alaska. *The 10th International Mycological Congress*. Bangkok, Thailand. (Oral presentation)

**Morgado LN**, Semenova TA, Welker JM, Walker MD, Smets E, Geml J (2014). Linking local-scale diversity changes in ectomycorrhizal fungal communities with functional traits: a case study from long-term warming experiments in Arctic Alaska. *The 10th International Mycological Congress*. Bangkok, Thailand. (Poster presentation)

Semenova TA, **Morgado LN**, Welker JM, Walker MD, Smets E, Geml J (2014). Ascomycetous fungal communities respond to experimental warming in the mesic and dry arctic tundra. *The 10th International Mycological Congress*. Bangkok, Thailand. (Oral presentation)

**Morgado LN**, Semenova TA, Taylor DL, Geml J (2013). Biodiversity and habitat partitioning of arctic ectomycorrhizal fungi and their role in vegetation change due to climate change. *Netherlands Annual Ecological Meeting*. Lunteren, The Netherlands. (Poster presentation)

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Geml J, Both MG, McFarland, Timling I, **Morgado LN**, Laursen GL, Taylor DL (2013). Diversity and habitat partitioning of the ectomycorrhizal *Cortinarius* in boreal forest and arctic tundra ecosystems. *2nd BioSyst.EU Global Systematics*, Vienna, Austria. (Oral presentation)

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Geml J, **Morgado LN**, Neilen M, Noordeloos ME (2012). DNA barcoding of ectomycorrhizal agaric fungi of the Flora Agaricina Neerlandica for taxonomic and ecological studies. *Third European Congress for the Barcode of Life*. Brussels, Belgium. (Oral presentation)

**Morgado LN**, Noordeloos ME, Co-David D, Lamourex Y, Geml J (2012). Biogeographic and phylogenetic relationships of four easily recognizable morphospecies of *Entoloma* Section *Entoloma* (Basidiomycota) inferred from molecular and morphological data. *Mycological Society of America Annual Meeting*. New Haven, CT, USA. (Oral presentation)

**Morgado LN**, Neilen M, Noordeloos ME, Taylor DL, Timling I, Geml J (2012). Phylogenetic diversity of the ectomycorrhizal genus *Cortinarius* (Agaricales, Basidiomycota) in the Arctic. *Mycological Society of America Annual Meeting*. New Haven, CT, USA. (Poster presentation)

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**Morgado LN**, Alegria N, Fachada V, Vila-Viçosa C, Oliveira P (2007). Macromycetes diversity in three mountain ranges in the South of Portugal. *Macromycology Meeting of the National Agronomic Institute*. Oeiras, Portugal. (Poster presentation)

**Morgado LN**, Martins L, Gonçalves H, Oliveira P (2005). Estudo de intoxicações causadas por ingestão de macrofungos na região do Alto Alentejo. *XII Luso-Galaico Macromycology Congress*. Vila-Real, Portugal. (Poster presentation)

**Morgado LN** (2012) Mount Kinabalu: Green Stars of the Forest. *Scientific American*. (Blog article)

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