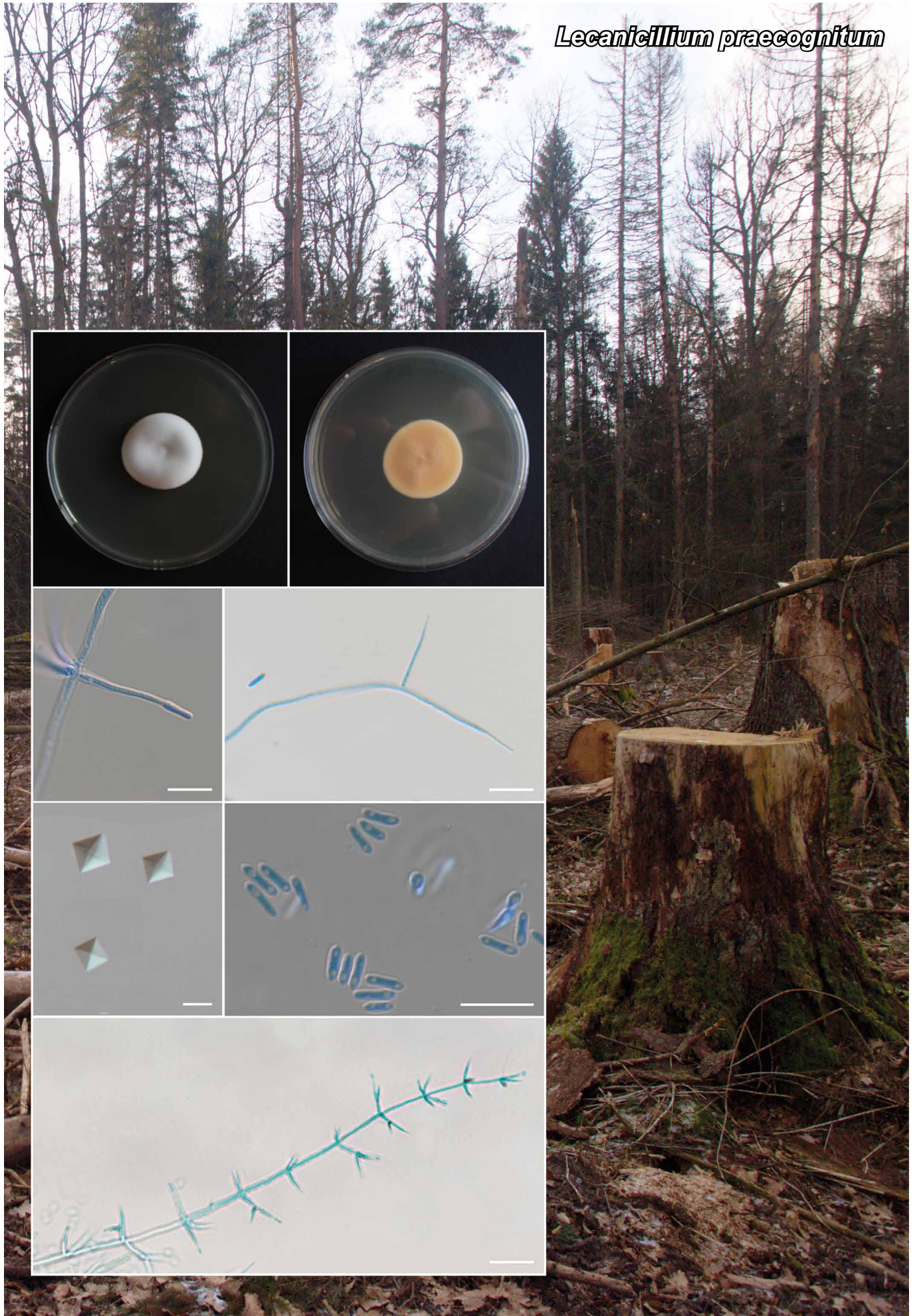


Lecanicillium praecognitum



Fungal Planet 1088 – 29 June 2020

***Lecanicillium praecognitum* Gorczak & Kisto, sp. nov.**

Etymology. *prae* (Latin: before, ahead of) + *cognitum* (Latin: known, noted; neut. part. adj.); known before; referring to the fact that the species was noted several years before formal description.

Classification — *Cordycipitaceae*, *Hypocreales*, *Sordariomycetes*.

On sabouraud dextrose agar (SDA): *Conidiophores* erect, mostly single, sometimes in whorls up to four. Unfrequently secondary phialides arise, sometimes in whorls up to three. *Phialides* 17.5–43.5 (av. = 28.5) μm long \times 1.5–3 (av. = 2.3) μm wide. *Conidia* hyaline, smooth, granular, oblong to slightly fusiform, solitary or in small clusters, (3.5–)4–6.5(–7.5) (av. = 5.3) μm long \times 1–2.5(–3) (av. = 1.8) μm wide, usually trice as long as wide, with one to two guttules. *Vegetative hyphae* smooth, hyaline, regularly septate, 1.5–3 (av. = 2.2) μm wide. *Crystals* octahedral, translucent, 10.5–20(–22.5) (av. = 16.5) μm long in medium, less regularly in substrate mycelium.

Culture characteristics — (in darkness, 20 \pm 2 $^{\circ}\text{C}$). Colonies cottony, margin even to slightly irregular, with dense and abundant aerial mycelium. On SDA and potato dextrose agar (PDA) averse white, reverse creamy to yellow, reaching 3 cm in 14 d, 5.5 cm in 21 d. Octahedral crystals produced in the medium and substrate mycelium. Sometimes yellowish droplets of exudate on the surface of older cultures. Growth is slow but not arrested in 4 $^{\circ}\text{C}$.

Typus. POLAND, Podlaskie Voivodeship, Białowieża Forest, forest division '210D–a', near Postolowo, on insects' frass beneath fallen bark of Norway spruce *Picea abies* previously infected with European spruce bark beetle *Ips typographus*, Nov. 2017, *M. Gorczak* (holotype WA0000067215, culture ex-type MGC 39; ITS, SSU, LSU, *TEF1- α* and *RPB2* sequences GenBank MT247058, MT247062, MT247060, MT267523 and MT267525, MycoBank MB834982).

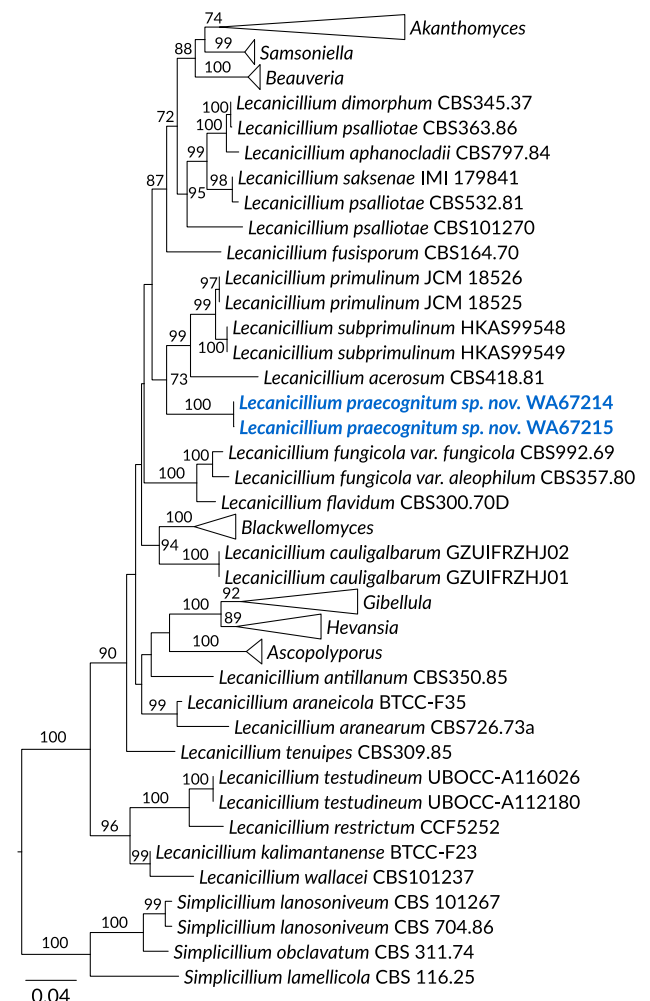
Additional material examined. POLAND, Pomorskie Voivodeship, Wierzychucino, Royal Fern Nature Reserve, on nematoceros fly exuvium in decaying *Fomes fomentarius* on *Betula pendula* log, July 2016, *M. Gorczak*, herbarium specimen WA0000067214, culture MGC 76; ITS, SSU, LSU, *TEF1- α* and *RPB2* sequences GenBank MT247059, MT247063, MT247061, MT267524 and MT267526.

Notes — Based on a megablast search of NCBI's GenBank nucleotide database, four similar ITS sequences were found (98.9–99.8 % identity). Two of them belongs to strains isolated from wood: historic construction wood in Chiloé, Chile (GenBank KF675189.1) and *Picea abies* wood from Sweden (GenBank AY805597.1) and other two sequences were generated during research on mycorrhizae of *Ericaceae*: *Pyrola media* in Scotland, UK (GenBank FN565380.1) and *Epacris pulchella* in south-eastern Australia (GenBank AY627789.2). This variety suggests that the species have a global distribution and much wider ecological niche than known strains. However, if *L. praecognitum* can thrive on frass of minute arthropods as we observed, the actual substratum might have been overlooked in previous cases. No specimens are available from a

Colour illustrations. Białowieża Primeval Forest logging site, Poland. Fourteen-day-old colonies of *L. praecognitum* on SDA at 20 $^{\circ}\text{C}$, obverse (left) and reverse (right); solitary phialides; octahedral crystals in medium; conidia; apical hyphae with whorls of phialides and secondary phialides. Scale bars = 10 μm .

2004 study in Sweden (A. Menkis pers. comm.) or 2014 study in Chile (R. Blanchette pers. comm.).

Lecanicillium longisporum is morphologically most similar to *L. praecognitum*, but it has longer (up to 10.5 μm) and sometimes septate spores (Zare & Gams 2001). Other species with similar spores includes *Akanthomyces muscarius* (formerly *Lecanicillium*), which differs in size of conidia and more often has phialides in the whorls; *A. attenuatum*, which differs in phialide size and has at least some conidia with attenuate base; *L. flavidum* and *L. fungicola* which produce spores in slimy heads; *L. fuisporium* which produces characteristic broad conidia, and *L. nodulosum* which has characteristic swellings of hyphae. Related *L. aceroseum* is most similar when it comes to size of phialides and conidia but it can be easily distinguished by its long, thin, acerose spores.



The best scoring maximum likelihood tree calculated from ITS, SSU, LSU rDNA and protein coding *TEF1- α* , *RPB1* and *RPB2* sequences shows the relationships within the family *Cordycipitaceae*. The tree was constructed with RAxML-NG (Kozlov et al. 2019) on a partitioned alignment based on the Zhou et al. (2018) dataset. The dataset contained 81 taxa and a total of 5 198 characters of which 2 050 were variable. Bootstrap support values at branches were obtained by generating 1 000 bootstrap replicates. Only bootstrap support values \geq 70 % are shown. The tree is rooted with the genus *Simplicillium*.