

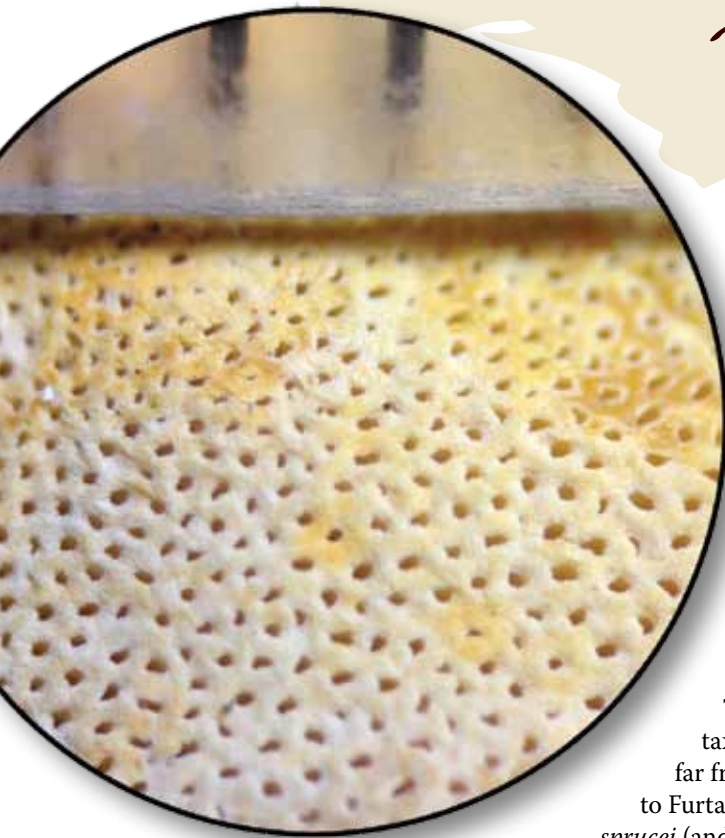


# The first report of *Amauroderma* from Florida

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two other “*A. sprucei*” sequences in GenBank, also from Brazil, were completely different.

This indicates again that taxonomy of *Amauroderma* is far from being settled. According to Furtado (1981), *Amauroderma sprucei* (and similar *A. shomburgkii* [Mont. & Berk.] Torrend differing only in brownish context) belong to most common *Amauroderma* species and have a wide distribution in tropical countries ranging from Brazil, Colombia, Costa

Rica, Cuba, Dominican Republic, Puerto Rico, and Venezuela.

*Amauroderma* is a genus of polypores within the family *Ganodermataceae*. The primary difference between *Amauroderma* (*Amauro-*, meaning dark or dusky, and *-derma* meaning skin) and *Ganoderma* (*Gano-*, meaning shiny) is with the basidiospore characteristics. *Amauroderma* has round spores with spines which are sometimes quite coarse, while *Ganoderma* have ellipsoid, truncate spores with spines (Ryvarden, 2004). *Humphreya coffeata*

**A** *mauroderma* specimens were found in southwest Florida during August 2016. They grew in association with Laurel Oak (*Quercus laurifolia*). The specimens resemble *Ganoderma* and especially *Humphreya coffeata*, though they are smaller, more petite, and delicate. Also unlike *Ganoderma* which fruit directly from wood, these specimens grew terrestrially from rich soil mixed with decayed hardwood debris. Fresh samples were collected, dehydrated, and then shipped to the Academy of Sciences of the Czech Republic, care of Josef Vlasák who is a specialist with determining polypores. They were deposited in the herbaria PRM (National Museum Prague, Mycological Department, accession PRM 944385), NY (New York Botanical Garden, Steere Herbarium), and also FLAS (University of Florida, Mycological Herbarium).

The resultant morphological identification was *Amauroderma sprucei* (Pat.) Torrend, based on small pores (5-6 per mm), round echinulate spores (about 9µm in diameter), and white interior context. The DNA sequence of rRNA ITS region from the collection was very similar but not identical (97% of sequence identity) to *A. sprucei* collections from Brazil present in GenBank. Nevertheless,



(=*Ganoderma coffeatum*), another taxon of *Ganodermataceae*, has somewhat intermediary characteristics: spores of *Ganoderma* shape, but with coarse spines, and elongated to transversal crests. *Amauroderma* species (and also very similar *H. coffeata*) are widely distributed in American tropics and show mostly slender, stipitate fruitbodies with small caps and stipes covered with brownish tomentum. In the available keys (e.g. Ryvar den, 2004), their determination was based mostly on pore and spore size; the delimitation and distribution of most species is however poorly known. From 21 American species treated in Ryvar den (2004), 8 were collected only once or twice, which throws doubts on reliability of taxonomical traits used for determination. Gomes-Silva et al. (2015) revealed several previous misdeterminations in *Amauroderma*, added 6 more newly discovered species from Brazil, and attempted broadly based molecular phylogeny with the result that polyphyletic nature of *Amauroderma* is probable, because many *Amauroderma* sequences are more close to species of *Ganoderma* than to other *Amauroderma*.

*Amauroderma* species are typical tropical fungi, never previously collected in the USA according to the current checklist of North American polypores (Zhou et al., 2016).

### References Cited

- Furtado, J.S. 1981. Taxonomy of *Amauroderma* (Basidiomycetes, Polyporaceae). *Memoirs of the New York Botanical Garden* 34: 1-109.
- Gomes-Silva, A.C., N.C. De Lima Jr., E. Malosso, L. Ryvar den, and T.B. Gibertoni. 2015. Delimitation of taxa in *Amauroderma* (Ganodermataceae, Polyporales) based in morphology and molecular phylogeny of Brazilian specimens. *Phytotaxa* 227(3): 201-228.
- Ryvar den, L. 2004. *Neotropical Polypores*. Part 1. Synopsis Fungorum 19, Fungiflora, Oslo, 229 pp.
- Zhou, L.-W., K.K. Nakasone, H.H. Burdsall Jr., J. Ginns, J. Vlasák, O. Miettinen, V. Spirin, T. Niemelä, H.-S. Yuan, S.-H. He, B.-K. Cui, J.-H. Xing, and Y.-C. Dai. 2016. Polypore diversity in North America with an annotated checklist. *Mycological Progress* 15: 771-790. †



## Editor's Pics

### Bears, mushrooms, and bees.

Bees are small but essential for much of the life on our planet. Humans rely heavily on bees to pollinate much of the plants we grow for food, fiber, and silage for livestock. But bees are now in big trouble. A complex disease called colony collapse disorder (CCD) has been wiping out bees in North America since at least 2006. The disease is not yet fully understood, despite years of study, but many factors seem to be involved. Suggested causes include increasing urbanization and loss of biodiversity, particularly wildflower meadows and weeds that provided high quality bee forage, poor nutrition and malnutrition, immunodeficiencies, microbial pathogens including viruses, bacteria, fungi and protozoa, both lethal and sub-lethal exposure to pesticides including insecticides, fungicides and herbicides, beekeeper applied miticides and antibiotics, parasitic mites (*Varroa destructor* and *V. jacobsoni* mites) and *Acarapis woodi* tracheal mites), the fungi *Nosema ceranae* and *N. apis*, heavy metals, toxic pollutants, natural plant toxins, biting insects, selective breeding in apiculture and loss of genetic diversity, climate change and increased

environmental stresses from drought and cold snaps, and combinations of these factors. Paul Stamets has come up with what he thinks is solution to CCD— interestingly it involves fungi found growing naturally in the environment— and he recently was granted a patent for his “Integrative fungal solutions for protecting bees and overcoming colony collapse disorder (CCD).”

This is a tale of “Bears, Mushrooms and Bees.” And it involves two important observations in nature, a great deal of knowledge about ecosystems, and a researcher not hobbled with scientific dogma. It’s also 51 pages long, so I’ll give you the highlights. Observation 1: On one of his many forays in the old growth forests of the Olympic Peninsula, Stamets noticed a conifer tree scratched by a bear (a photograph appears in the book he authored, *Mycelium Running: How Mushrooms Can Help Save the World*). Apparently it’s pretty common knowledge in the Pacific NW that bears scratch trees. On young conifers, particularly Douglas-fir trees, bears will rip strips of bark off with their teeth to reach insects or the sweet-tasting sap found inside. This foraging activity is commonly seen in tree plantations where large stands of trees are similarly aged and of a single species. Stamets knew that

