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# Dealing with sample data and the extended specimen concept

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IMC12  
August 12, 2024

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# Specimens

1. Multiple collections or cultured isolates (from different populations)
    - a specimen and a culture is ideal
  2. Multiple lines of evidence
    - morphology
    - multi-locus DNA analyses
    - metabolic or proteomic data
    - physiology
    - ecology
    - biogeography
    - mating studies
  3. Ecological and geographic data
  4. DNA barcode sequence (ITS) from Holotype and other collections
  5. Compliance with Convention on Biological Diversity and Nagoya Protocol
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# Sample data

1. Country, state/province, municipality, and locality
  2. Habitat, substrate and host (if applicable)
  3. Decimal latitude and longitude
  4. Elevation in meters (**not mandatory for cultures**)
  5. Date of Collection and, if a culture, date of isolation
  6. Collector(s) and collection number
  7. Fungarium/herbarium acronym and barcode or accession number (**not mandatory for cultures**)
-

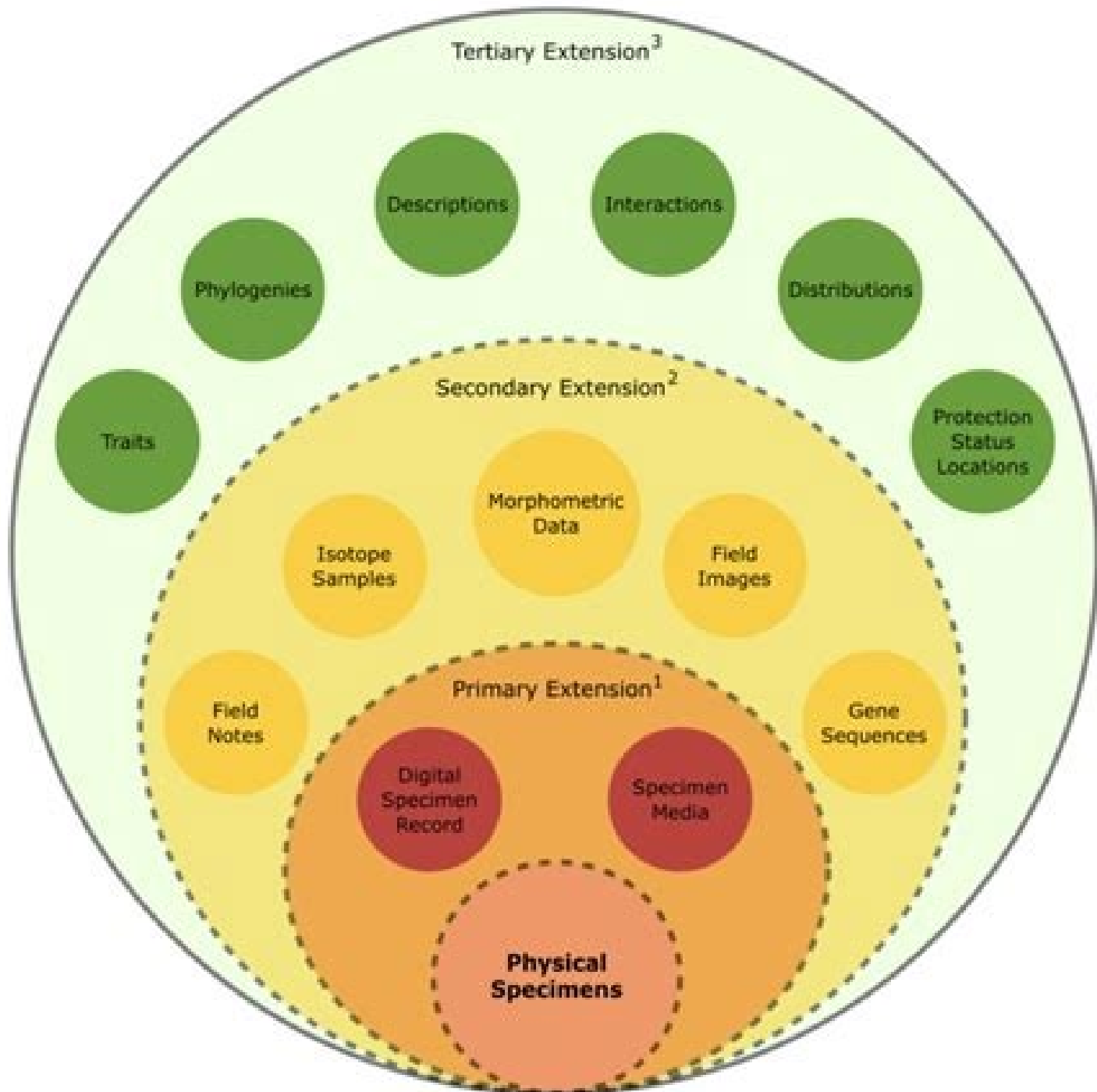
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*Gyromitra americanigigas* Dirks, A.N. Mill. & Methven, sp.  
nov. Fig. 3

MycoBank: MB844178

*Type:* USA, Michigan, Washtenaw County, Stinchfield Woods, 42.41 N, 83.92 W, on soil in a *Pinus* sp. plantation, 5 May 2020, A.C. Dirks (ACD0256), Holotype (MICH352014), Isotype (ILLS00114755), GenBank ON527894 (ITS), GenBank ON532830 (LSU).

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*Cercophora vinosa*



Fungal Planet 467 – 4 July 2016

***Cercophora vinosa* A.N. Mill. & J. Fourn., sp. nov.**

*Etymology.* The specific epithet refers to the purple colour in the outermost layer of the ascomal wall.

Classification — *Lasiosphaeriaceae*, *Sordariales*, *Sordario-mycetes*.

*Ascomata* subglobose to broadly obpyriform with a stout conical to hemispherical neck, 420–670 µm diam × 420–650 µm high, erumpent through a thick, felty yellowish grey subiculum spreading widely over the substrate, gregarious to loosely clustered, more rarely in contact; underlying wood discoloured greyish brown or unaltered, not stained purple; subiculum encrusted with sand particles, composed of pale brown, septate hyphae 1.5–3.5 µm wide, thin- to moderately thick-walled; neck papillate, broadly conical to rounded, sometimes undifferentiated, 80–170 µm high, ostiolate, black, roughened or obscurely sulcate. *Ascomatal wall* 34–56 µm thick on sides and at base in longitudinal section, slightly thicker at apex, roughened, dark purple gradually turning blackish, pseudoparenchymatous, leathery, 3-layered: outermost layer 10–15 µm thick, present on upper half of ascomata, fugacious, composed of several rows of thin-walled, hyaline, angular cells containing a purple substance that slightly fades in 10 % KOH and dissolves in chloral-lactophenol; middle layer 20–30 µm thick, composed of independent clusters of subcarbonaceous opaque cells, breaking into small angular plaques upon pressure but lacking a network of hyphae connecting the plaques as in cephalothecoid walls; inner layer 14–22 µm thick, composed of flattened, thin-walled subhyaline cells. *Ascomatal apex* periphysate. *Centrum* hyaline to yellowish. *Paraphyses* filiform, 4.5–8 µm wide at base and occasionally slightly moniliform, tapering to 2–2.5 µm wide above asci, hyaline, thin-walled, abundant, septate, unbranched, persistent. *Asci* unitunicate, cylindrical, 320–380 × 19–23 µm, spore-bearing part fusoid-ventricose, apex rounded, long-stipitate, stipe 100–160 µm long, often slightly sinuous, with eight bi- to triseriate ascospores, apical ring double, refractive, 2.7–3 µm wide × 1–1.2 µm high, inamyloid, staining in blue Waterman ink, subapical globule absent. *Ascospores* cylindrical, (54.5–)60.5–73.5(–79.5) × (3–)4–6(–7) µm (66.7 × 5 µm), straight to slightly sigmoid, geniculate in lower quarter, hyaline, aseptate, densely guttulate; bipolar appendages (27–)35–56 µm long, lash-like, 3–4 µm wide at base, centrally attached on ascospores ends, readily staining in blue Waterman ink and in aqueous nigrosin, sometimes granular at base, persistent; ascospore becoming differentiated into an apical swollen head and a basal tail while inside the ascus; head ellipsoid, 15.5–19 × 8–9 µm, usually 1-septate, remaining hyaline, rarely pigmented; tail 41–50 × 4–5 µm, obscurely 2–4-septate, hyaline, the lower end swelling upon germination; germinating from upper and

lower ends, more rarely laterally before being released. *Asexual morph*: Hyphae largely undifferentiated, 1.5–5 µm wide, thin-walled, hyaline to pale brown. *Conidiogenous cells* phialides, commonly produced from pale brown hyphae as single terminal or several lateral phialides, delimited by a basal septum, monophialidic or polyphialidic, cylindrical to obpyriform, 9–18 × 2.5–4 µm at widest part, mostly pale brown, constricted below the collarette, 1–1.5 µm just below the collarette; collarette short, slightly flaring, inconspicuous, same colour as phialide. *Conidia* subglobose to pyriform, truncate at base, 2.5–4.5 × 1.5–2.5 µm (3.3 × 2.2 µm), hyaline.

Culture characteristics — Colonies (of holotype) slow-growing on all media, covering the PDA plates in 8 wk, 25–30 mm diam after 8 wk on the WA and CMA plates, downy to silky on WA and CMA, subfelty on PDA, hyaline on WA, hyaline to greyish yellow (4B3) on CMA, brown (5F8) and becoming greyish red (7B5) at plug on PDA; margin even or wavy, appressed, hyaline on WA and CMA, becoming olive brown (4F8) on PDA; reverse same as the mat.

*Typus.* FRANCE, Ariège, Castelnau-Durban, Artillac stream, down-stream from the marble quarry, c. 410 m elev., on decorticated branch of *Salix* sp., 8 cm diam, partly submerged, 22 July 2014, *J. Fournier*, JF 14067 (holotype ILLS 79802, cultures ex-type ANM Acc#840-1, -2, -3, -4, -5, deposited in CBS, ITS-LSU sequence GenBank KX171944, beta-tubulin sequence GenBank KX171942, MycoBank MB816935).

*Other material examined.* FRANCE, Ariège, Montségur, Le Lassat stream flowing at the village, 880–890 m elev., on submerged decorticated wood of *Populus* sp., soc. *Amniculicola lignicola*, 16 Nov. 2014, *J. Fournier* (JF 14156); Illier, Laramade, Vicdessos stream, 630 m elev., on submerged wood of *Fraxinus excelsior*, 25 Nov. 2014, *J. Fournier* (JF 14163); Rimont, Paletès, Peyrau brook, c. 400 m elev., on submerged wood of *Alnus glutinosa*, 4 Dec. 2014, *J. Fournier* (JF 14170).

Notes — *Cercophora vinosa* is distinguished by its ascomata that possess a distinct purplish colour in the outermost wall layer, asci with a double ring but lack a subapical globule, long ascospores with lash-like appendages and aquatic habitat. Only two other species of *Cercophora* are known to have violet-coloured ascomata, *C. septentrionalis* and *C. caerulea*. Although these species also possess asci with a double ring but no subapical globule and ascospores with long, lash-like appendages, both have shorter ascospores (38–43 µm and 43–48 µm, respectively) and occur on dung. The ascomata in *C. septentrionalis* are covered by brown, flexuous hairs, whereas a distinct dark purple to blackish blue subiculum surrounds the ascomata in *C. caerulea* (Lundqvist 1972). *Cercophora vinosa* occurs in a well-supported clade with *C. solaris* in which it shares only a cephalothecoid-like ascomal wall and lack of a subapical globule (Catania et al. 2011).

For phylogenetic tree, see MycoBank.



## University of Arizona, Gilbertson Mycological Herbarium

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**Catalog #:** AN 043440  
**Secondary Catalog #:** AN 043440, 273184  
**Taxon:** *Morchella brunnea* M. Kuo  
**Family:** Morchellaceae  
**Determiner:** Teresa A. Clements  
**Collector:** Teresa A. Clements  
**Date:** 2017-03-28  
**Locality:** United States, Arizona, Yavapai  
**Substrate:** on soil under Arizona cypress, ash, ponderosa pine & oak  
**Description:** [Original observation #273184](#) (Mushroom Observer)

**Usage Rights:** CC0 1.0 (Public-domain)  
**Record ID:** 66dc1911-e0aa-472b-b8e2-4e419bbcae9d  
**Occurrence ID (GUID):** 66dc1911-e0aa-472b-b8e2-4e419bbcae9d

For additional information on this occurrence, please contact: A. Elizabeth  
 Do you see an error? If so, errors can be fixed using the Occurrence Editor



### GenBank

**Identifier:** MG547872  
**Locus:** internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence  
**URL:** <https://www.ncbi.nlm.nih.gov/nuccore/MG547872>  
**Notes:**

### Morchella brunnea voucher MO 273184 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence

GenBank: MG547872.1  
[FASTA](#) [Graphics](#)

Go to:

**LOCUS** MG547872 675 bp DNA linear PLM 23-NOV-2017  
**DEFINITION** Morchella brunnea voucher MO 273184 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene, complete sequence; and internal transcribed spacer 2, partial sequence.  
**ACCESSION** MG547872  
**VERSION** MG547872.1  
**KEYWORDS** .  
**SOURCE** Morchella brunnea  
**ORGANISM** *Morchella brunnea*  
 Eukaryota; Fungi; Dikarya; Ascomycota; Pezizomycotina; Pezizomycetes; Pezizales; Morchellaceae; Morchella.  
**REFERENCE**  
**AUTHORS** Clements, T.A.  
**TITLE** Direct Submission  
**JOURNAL** Submitted (18-NOV-2017) Scientific Committee, AMS, 1430 W. Wagon Wheel Rd, Cottonwood, AZ 86326, USA  
**COMMENT** ##Assembly-Data-START##  
 Sequencing Technology :: Sanger dideoxy sequencing  
 ##Assembly-Data-END##  
**FEATURES**  
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 Location/Qualifiers  
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 /country="USA: Arizona, Yavapai Co."  
 /collection\_date="28-Mar-2017"  
 /collected\_by="Teresa A. Clements"  
 <1..>675  
 /note="contains internal transcribed spacer 1, 5.8S ribosomal RNA, and internal transcribed spacer 2"

Customize view

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Run BLAST

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Find in this Sequence

Related information

Taxonomy

LinkOut to external resources

Mycology Collections Portal

[Mycology Collections Portal]

Recent activity

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Morchella brunnea voucher MO 273184

internal transcribed spacer 1, partial Nucleotide

Cladophialophora mycetomatis strain CBS

454.82 28S ribosomal RNA gene, pE Nucleotide

Cladophialophora matsushimae partial 28S

rRNA gene, strain MFC-1P384 Nucleotide

Cladophialophora potulitorum strain CBS

112222 18S ribosomal RNA gene, pA Nucleotide

eu0035409 (0)

Nucleotide

### MUSHROOM OBSERVER

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Observation 273184: *Morchella brunnea* M.Kuo

**When:** 2017-03-28  
**Collection location:** Yavapai Co., Arizona, USA [Click for map]  
**Who:** Terri Clements/Donna Fulton (pinonbistro)  
**Specimen available**  
**Herbarium record:**  
 TAC 1561 © Teresa Clements (pinonbistro@msn.com): Personal Herbarium  
**Sequences:**  
 ITS - GenBank #MG547872 [Show Archive Record | Run BLAST@]  
**Notes:**  
 This will be sequenced. My bet is that it will turn out to be either *M. brunnea* or *Mel-8*. *M. brunnea* is described by Kuo et al. 2012 as having a conical cap attached with a sinus, ridges that are dark brown to black in young fruit bodies, a mealy to granulated stem, and "appearing under hardwoods, including *A. menziesii* and *Quercus* spp.; probably also to be expected in non-burned conifer forests." In fact we did find a specimen of *M. brunnea* (sequenced) under ponderosa pine in Az. The obs was collected in an area of pine, cypress and oak. Regarding the similarity of *M. brunnea* and *Mel-8* Kuo et al 2012 says: "Among the species that are similar in appearance to *M. brunnea*, only the poorly known *Morchella* sp. *Mel-8* apparently inhabits similar western habitats." *Mel-8* was found under incense cedar, a member of the cypress family.

**About *Morchella brunnea* M.Kuo**  
 MyCoPortal  
 Mycobank  
**Observations of:**  
 This Name (27)  
 This Taxon, any name (27)  
 Other Taxa, this name proposed (20)  
 Other Taxa, this taxon proposed (20)  
 Species in *Morchella* Dill. ex Pers. (101)  
 Public Description (Default) [Edit]  
 Draft For Macrofungi Of The Pacific Northwest By Chaetomius (Private)

#### Species Lists

TAC AZ Vouchered Specimens  
 TAC AZ Sequenced Specimens

#### External Links

MycoPortal

#### Map

Hide thumbnail map.



#### Proposed Names

Morchella brunnea M.Kuo	User	Community Vote
Recognized by sight: Velvet black ridges and yellowish pits, sinus between cap and stem, granulate unridged stem, on ground under AZ cypress and AZ ash with ponderosa pine and oak nearby, next to intermittent drainage, soil temps 47-48 degrees, elevation about 4500' Used references: <a href="http://www.mushroomexpert.com/morchella_brunnea.html">http://www.mushroomexpert.com/morchella_brunnea.html</a>	pinonbistro	94% (3)
<i>Morchella</i> Dill. ex Pers.	amanitarita	61% (2)
Recognized by sight		
<i>Morchella</i> sect. <i>Distantes</i> Boud.	pinonbistro	57% (1)
Recognized by sight		





<https://www.redbubble.com>