



# Morphological Characteristics of Spores in Six Genera in the Family Cortinariaceae

James Mueck\* and David Lewis‡

\*Eastfield College, DCCCD, Mesquite, TX ‡Mycologist, President of the Gulf States Mycological Society



## Abstract

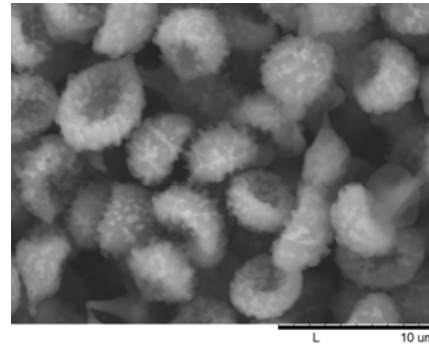
The family Cortinariaceae is a mushroom family that is in the order Agaricales. The basidiospores in this family are morphologically different in each genus. The purpose of this study is to document the difference in size and surface structure of spores in the six genera: *Gymnopilus*, *Hebeloma*, *Cortinarius*, *Crepidotus*, *Galerina*, and *Inocybe*. Results gathered from this study conclude that spores in this family are different in each genus.

## Introduction

Cortinariaceae is one of the largest mushroom families containing more than 2,000 species (1). The focus of this research is to evaluate size and surface structure of the basidiospores in the six genera: *Gymnopilus*, *Hebeloma*, *Cortinarius*, *Crepidotus*, *Galerina*, and *Inocybe*. Cortinariaceae is characterized by having brown spore prints and veils called cortina over the gills (2,3). This study will compare the basidiospores of six genera in the family Cortinariaceae and determine how they are different using a scanning electron microscope (SEM).

## Methods

Specimens in this study were from the David Lewis mycological collection housed at the Big Thicket Field Research Station (F.R.S.). The specimens were collected with a Swiss Army knife to keep the specimen intact. They were stored in plastic bags. Then taken back to the research station and identified and labeled. The Specimens were dehydrated in a food dehydrator. Once at Eastfield College, the specimens were looked at under a dissecting microscope and a section of gill was removed and placed on a stub to go into the SEM. Micrographs were taken and the spores were measured in micrometers (µm). A comparison of spores was done and data was recorded.



TM-1000 Scanning EM

Figure 1. An example of an elliptical shaped spore with a tuberculate surface.

## Results

The results this experiment show the difference in spore size and surface structures of basidiospores in the family Cortinariaceae. The largest spores were found in *Galerina*. The spores from different species in separate genera differed in size and description (Table 1, 2). The spores are morphologically different in size and surface structure. The spores varied in surface structure from being an elliptically shaped spore with tuberculate surface (Figure 1) to being a globose shaped spore with a glabrous surface.

## Discussion

The results collected from this study support the hypothesis that spores from six genera of the same family, Cortinariaceae, vary from each other. The spores varied in both size and spore surface structures depending on which genera the spores are categorized. Spores in one genus were similar in shape when compared to other spores from other species in the same genus. This study proves that in such a large family as Cortinariaceae that the spores in one genera are different from another.

## Literature Cited

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GENUS	SPECIES	Length Average (µm)	Width Average (µm)
<b>CORTINARIUS</b>			
	POSSIBLE MARYLANDE SANGUINEUS	7.08	4.80
	SPECIES	8.94	5.14
	DELIBUTUS?	5.44	4.24
	SEMISANGUINEUS	5.68	3.82
	AUREIFOLIUS	7.19	5.97
	ALBOVIOLACEUS	5.45	4.87
		6.78	5.39
<b>INOCYBE</b>			
	RIMOSA	6.15	3.22
	UNKNOWN	7.03	3.72
	POSSIBLE FASTIGIATA	6.37	3.84
	SPECIES	7.14	3.86
		7.74	6.24
		8.32	6.02
<b>GYMNOPILUS</b>			
	FULVOSQUAMULOSUS	6.84	4.87
	SPECIES	5.93	4.77
	LIQUIRITIAE	6.52	4.98
		6.05	4.27
		5.76	3.86
<b>CREPIDOTUS</b>			
	SPECIES	6.84	4.87
		5.44	3.76
	CROCOPHYLLUS	4.94	4.58
		4.92	4.16
<b>GALERINA</b>			
	SPECIES	10.93	6.66
<b>HEBELOMA</b>			
	SPECIES	6.92	4.92
	SPECIES 2	6.44	3.72
		5.62	3.74

Table 1. The average length and width of each species

DPL	GENUS	SPECIES	Warty	Globose	Elliptical	Subglobose	Glabrous	Asperulate
5309	CORTINARIUS	(NEAR MARYLANDE SANGUINEUS)			X			
7134	CORTINARIUS	SANGUINEUS			X			
7605	CORTINARIUS	SPECIES	X			X		
7637	CORTINARIUS	DELIBUTUS?				X		
7819*	CORTINARIUS	SEMISANGUINEUS			X			X
8439	CORTINARIUS	AUREIFOLIUS				X		
8771	CORTINARIUS	ALBOVIOLACEUS	X	X				
9067	INOCYBE	RIMOSA	X		X			
8507	INOCYBE	?	X		X			
8247*	INOCYBE	FASTIGIATA?			X		X	
7107*	INOCYBE	FASTIGIATA?			X		X	
7038	INOCYBE	SPECIES			X		X	
7036	INOCYBE	SPECIES			X		X	
6206	GYMNOPILUS	FULVOSQUAMULOSUS			X			
8254	GYMNOPILUS	SPECIES				X		
8313	GYMNOPILUS	FULVOSQUAMULOSUS			X			
9086	GYMNOPILUS	LIQUIRITIAE			X			
9031	GYMNOPILUS	LIQUIRITIAE			X			
7361	CREPIDOTUS	SPECIES		X				X
8621	CREPIDOTUS	SPECIES		X			X	
8895	CREPIDOTUS	CROCOPHYLLUS		X				X
8896	CREPIDOTUS	CROCOPHYLLUS		X				X
7789	GALERINA	SPECIES			X		X	
7602	HEBELOMA	SPECIES			X			X
7660	HEBELOMA	SPECIES 2			X			X
8354	HEBELOMA	SPECIES			X		X	

Table 2- Shows the difference in spore morphology. \*species and descriptive terms (2).