

# Anatomical Variation in Four Species of *Amanita*, Using Scanning Electron Microscopy

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## Abstract

Morphological variation in four common species of *Amanita* indigenous to Southeast Texas were studied using the Hitachi TM-1000 SEM. The four *Amanita* in this study were *Amanita* (*A.*) *vaginata*, *A. bisporigera*, *A. brunnescens*, and *A. flavoconia*; with emphasis on *A. flavoconia*, because it is the only non poisonous *Amanita* in the study. The structure of *A. flavoconia* is unique to the genera of the selected group of *Amanita*.

## Introduction

*Amanita* is one of the better-known genera of Basidiomycetes. Since Persoon established the genus in 1797, (Zhang *et al.* 2004) some infrageneric classifications based on morphology have been purposed. There is little supporting research work on *Amanita* involving scanning electron microscopy. The purpose for this study was to determine the microscopic morphological variation among *Amanita vaginata*, *A. bisporigera*, *A. brunnescens* and *A. flavoconia*; and determine on whether or not *A. flavoconia* is unique to the *Amanita* genera of the selected group.

## Discussion

Based on SEM morphology, three of the *Amanita*, *A. vaginata*, *A. bisporigera* and *A. brunnescens*, had similar microscopic gill and stalk characteristics. They also had hollow stalk context and non-fused gills. *Amanita flavoconia* was unique having fused gills and a solid stalk. *A. flavoconia* was the only edible *Amanita* in this study.

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## Literature Cited

Zhang, L.F., Yang, J.B. and Yang, Z.L. (2004).  
Molecular phylogeny of eastern Asian species of  
*Amanita* (Agaricales, Basidiomycota): taxonomic and  
biogeographic implications. *Fungal Diversity* 17:  
219- 238.

## Methods

### Specimen Collection:

The specimens were collected from the Lance Rosier Unit of the Big Thicket National Preserve in wax paper bags and transported in wicker baskets. Global Positioning System were used to determine locality of each collection site.

### Specimen Preparation:

The specimens were identified, then dehydrated for storage purposes, using a standard home dehydrator. The four specimens were dissected into three parts; pelvis (cap), lamellae (gills), stape (stalk). The spores were viewed *in situ* between the gills.

### Specimen Magnification:

Each component from all four specimens were viewed and compared using the TM-1000 SEM.

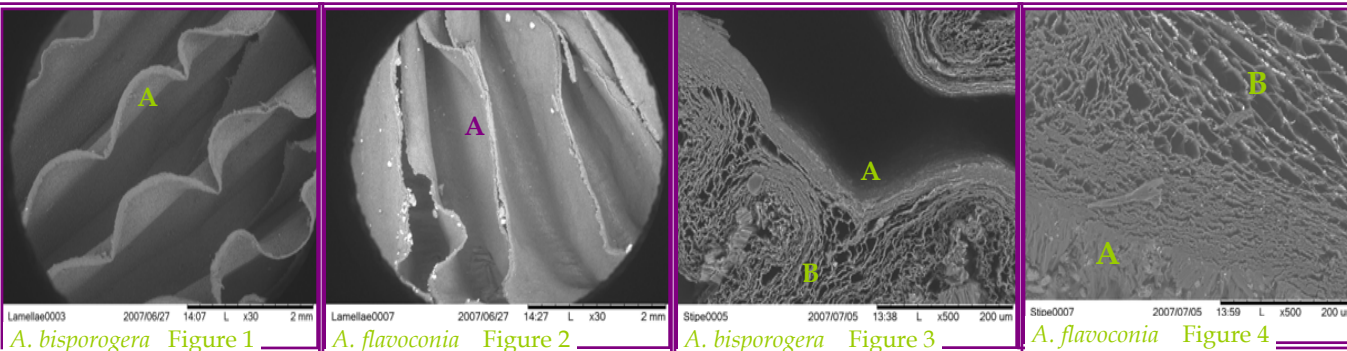


Figure 5  
*A. flavoconia*

Figure 6  
*A. bisporigera*

## Results

Macroscopically the morphology of *Amanita* is indistinguishable (fig 5 & 6). Microscopically, however the gills have distinctive markings and orientation. *Amanita bisporigera* has a margin at the edge of the gill (Fig. 1-A). *Amanita flavoconia* gills are attached to one another (Fig. 2-A). The stalk of *A. bisporigera* is hollow (Fig. 3-A) and the cavity is smooth and lined with densely packed hyphae (Fig. 3-B). *Amanita flavoconias* lacks a hollow core having a medulla composed of densely packed hyphae (Fig. 4-A) and a more loosely packed cortex (Fig. 4-B).