



FUNGAL FOOD OF THE MESOAMERICAN GODS, *USTILAGO MAYDIS*

Britt A. Bunyard

Photographs courtesy of Margaret Metcalfe, Spain - Images continue through page 37.

Looking more like excrement than a mushroom, and with an unsavory name to match, Corn Smut is a conspicuous fungus with an amazing life cycle. Known scientifically as *Ustilago maydis*, this fungal parasite of corn (maize) plants can be found throughout warmer North America and Europe.

Historically, Corn Smut was common on field and sweet corn, but modern varieties are resistant. Heirloom corn is still susceptible, as is popcorn and Indian corn.

Smuts, along with the rusts, are basidiomycetes and thus close relatives to mushroom-producing fungi more familiar to all of us. All are parasites of plants and mostly pretty small. Taxonomically speaking, however, rusts and smuts are very large and

fascinating groups of fungi. The rusts are especially interesting as many require different lifecycle states on different and distinct hosts, termed heteroecy; smuts are autoecious, thus complete their lifecycles in a single host. While the smuts do not cause all that many economically important diseases of plants, many rusts are important commercial pests of agricultural crops, some of global importance, and have been previously featured in FUNGI.



All parts of the corn plant may be infected by the Corn Smut fungus, but galls mostly are seen on ears because the silk (an extension of the female part of the plant) is receptive to pollination—as well as fungal invasion.

The lifecycle of smut fungi features

two spore stages. The large galls are a mass of black, sooty (“smutty”) teliospores enclosed in a smooth covering of plant tissue. Teliospores overwinter, their germination timed to the reproduction cycle of the corn plant. Teliospores germinate in the soil, giving rise to hyphae with club-shaped basidia; borne on each are tiny basidiospores (“sporidia”). Haploid sporidia alight on corn plants—but are not yet able to infect the host. First they must germinate, growing in a yeast-like manner in search of a partner. Successful crossing between two different mating types restores the dikaryotic condition. Armed with a full complement of genes, the smut fungus is now infectious—but still needs some luck. If on the silk, the fungus must reach the ovary before pollination occurs. If the fungus lands anywhere else on the corn plant, it cannot penetrate the tough cuticle of the corn plant unless damaged (e.g., by hail, insects, etc.). Damage to plant tissues (natural or mechanical) can facilitate infection via sporidial or telial hyphae. Thus, outbreaks of corn smut are frequently associated with episodes of hail damage.

Corn Smut is edible and long considered a delicacy in Mexico, prepared in all manner of ways including

Continued on page 32.

MycoCards

Boletes of Northeastern North America

– Updated –
– 2nd Edition –

\$24⁹⁵

Two pictures on every card

New synopsis of most important features

Tylophilus
rubrobrunneus

‘Reddish Brown Bitter Bolete’

Reddish-brown cap often small compared to stem

CAP	Reddish-brown aging duller brown
PILES	White aging pinkish-brown
STEM	White or brown with olive stains, long, slightly resiculate
STAINING	Pores pinkish to brownish, never solidly brown
TASTE AND EDIBILITY	Bitter/ Too litter to eat
HABITAT	Oak, beech, mixed woods
NOTES	T. violatinctus is more purplish and doesn't stain brown, T. variegatus is reticulate

Newly expanded

New category

Notes & Lookalikes

• Large, tarot-sized cards

• 55 species • 110 photos

Also Available: Boletes of Western North America

MycoCards.com

DANIEL WINKLER, BILL NEILL & GARY GILBERT





MH More Holiday.

Come and visit Girona, Spain. We have a wide selection of vacation rental homes and cultural experiences for you to enjoy!

<https://moreholiday.es/en/>

<https://fabrega-goertzen.com/en/>

To see a bit more of the Girona Province, Spain, check out my photos at:

<https://www.instagram.com/margaretmetcalfphotography/>

Continued from page 29.

ice cream. (It actually tastes better than it looks, with flavors of mushroom, corn, chocolate, and vanilla.) Sometimes called “Mexican corn truffle,” *huitlacoche* (also spelled *cuitlacoche*) was the Aztec name, which roughly translates to raven’s “excrement” or “droppings.” A personal favorite nickname for it is that of myco-raconteur David Arora: “porn on the cob.”

The fungus is so revered in Mexico that it has been depicted in artwork on ceramic dinnerware and serving platters, floor and wall tiles, and other handicrafts since the time of the Aztecs. Easily the most spectacular of artwork devoted

to this fungus (indeed, maybe to any fungus) can be found in painted murals of Mexico City’s Mercado de Abelardo Rodríguez. Technically, the murals are within the Teatro del Pueblo, a building more or less attached to the market. The corn murals were painted by Antonio Pujol and described as *La Plaga del Maíz* (“plague of maize”)—the original idea was to show the people visiting the market, in a very graphic and detailed way, the growth of Mexico’s staple food (since pre-Hispanic times) and the plagues associated with it. If you look closely, you will spot many corn pests, including birds and grasshoppers. Some of the frescos depict the development

of infection from immature to mature with the Corn Smut fungus. One mural shows a youth delivering *huitlacoche* to his parents. Within the market, shoppers can still to this day purchase all the staples of life, including tortillas made fresh over smoky fires and ... *huitlacoche*, when in season.

Acknowledgment: Thanks to Margaret Metcalfe, who lived in Mexico City for 10 years and discovered the beautiful artwork described here. We are so thankful that she shared her photographs. She is back home now in Spain and eager to welcome visitors to Girona, Spain! Check out the accompanying ad with information. †





In the early 20th Century, artists produced murals on many public buildings in Mexico City. Many of these murals were for the purpose of making a political statement or showing social conflict. However, many depicted day-to-day life or plants of economic importance to the locals. The Abelardo L. Rodriguez Market is a traditional public market located in the historic center of Mexico City, northeast of the main plaza, or Zócalo. It was built in 1934 as a prototype for a more modern marketplace; its most distinctive feature is the approximately 1,450 square meters of wall and ceiling space covered in murals. The project of painting the murals was overseen by the famous Diego Rivera; many of the muralists were former students of Rivera. The murals reflect socialist themes in part due to the policies of the Mexican government to promote the benefits of the 1910 Mexican Revolution. They also reflect the concerns of these artists during this time period, leading to themes such as the exploitation of workers, peasants and miners, the fight against Nazism and fascism, and racial discrimination. Six of the ten painters involved with the project were Mexican, three were American and one was Japanese (the great Isamu Noguchi). This mural work quickly gave the market and the neighborhood around it prominence. The collection of art in the market has been ranked fourth in value, for all of Mexico, after the murals in the Palacio de Bellas Artes, the Secretaría de Educación Pública building and the National Palace. Noguchi's work alone has been valued at two million U.S. dollars. Sadly, in spite of this, these murals are practically unknown by domestic or international visitors to the city. †







EN HOJA DE *maíz*

CUITLACOCH en salsa verde con granos de elote.

FLOR DE CALABAZA en salsa verde con epazote.

NOPALITOS guisado en salsa de guajillo con hoja de aguacate.

CHAMPIÑONES con verdolaga en salsa verde.

PIÑA con aceite de coco.

MANZANA con aceite de coco.



