

= Leucopaxillus giganteus =

Leucopaxillus giganteus, commonly known as the giant leucopax (formerly as the giant clitocybe) or the giant funnel, is a saprobic species of fungus in the Tricholomataceae family. As its common names imply, the fruit body, or mushroom, can become quite large; the cap reaches diameters of up to 40 cm (16 in). It has a white or pale cream cap, and is funnel @-@ shaped when mature, with the gills running down the length of the stem. Considered by some to be a choice edible when young, this species has a cosmopolitan distribution, and is typically found growing in groups or rings in grassy pastures, roadside hedges, or woodland clearings. *Leucopaxillus giganteus* contains a number of bioactive compounds, one of which has displayed antibiotic and anti @-@ tumor properties in laboratory tests.

= = Taxonomy = =

The species was first described as *Agaricus giganteus* by English naturalist James Sowerby in 1809, who illustrated it in his book *Coloured Figures of English Fungi*. Other historical synonyms include *Clitocybe gigantea* (Quélet, 1872), *Paxillus giganteus* (Fries, 1874), and *Omphalia geotropa* var. *gigantea* (Quélet, 1886). In 1934, Robert Kühner and René Maire created the genus *Astropaxillus* to contain species of *Leucopaxillus* with smooth spores, and they set *L. giganteus* as its type species. American mycologist Rolf Singer transferred it to its current genus in 1938, but recognized the value of maintaining a distinction of the smooth @-@ spored species, and so made *L. giganteus* the type species of section *Aspropaxilli*.

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= = Description = =

The cap of *L. giganteus* can become rather large, up to 40 cm (16 in) in diameter with a thickness of 1 to 1 @. @ 2 cm (0 @. @ 4 to 0 @. @ 5 in) at half the radius. Younger specimens have caps that are convex, with a margin that is rolled downwards, but as the mushrooms matures the cap flattens out and eventually becomes shallowly funnel @-@ shaped. The cap is smooth and creamy white in color, but may develop brown stains and circular cracks with age.

The cream @-@ colored gills are narrow, crowded close together, and have a decurrent attachment ? running down the length of the stem; in age the gills will darken to a buff color. The stem is off @-@ white with reddish @-@ brown fibers and has dimensions, when mature, of up to 4 @. @ 5 to 6 cm (1 @. @ 8 to 2 @. @ 4 in) tall by 1 @. @ 5 to 3 cm (0 @. @ 6 to 1 @. @ 2 in) thick. There is no ring on the stem. At the base of the stem there is typically a dense, white mycelium that may form a mat. The flesh is firm, and also is white. Mature specimens are fragile, and difficult to remove from the ground without breaking.

= = = Microscopic characteristics = = =

When viewed in deposit, such as with a spore print, the spores appear white. When viewed with a light microscope, the spores are ovoid to ellipsoid, translucent (hyaline), have a smooth surface, and possess a broadly rounded apex and base; the spore dimensions are 6 ? 8 by 3 @. @ 5 ? 5 µm. Like all *Leucopaxillus* species, the spores of *L. giganteus* are amyloid ? meaning that they will absorb iodine when stained with Melzer's reagent ? however, the extent of the stain may be variable. The spore @-@ bearing cells, the basidia, are 25 ? 40 by 4 @. @ 5 ? 8 µm, narrowly club @-@ shaped, and are attached to either 2 or 4 spores. The hyphae of this species invariably have clamp connections.

= = = Similar species = = =

Leucopaxillus giganteus somewhat resembles *Leucopaxillus candidus* , but this latter species has a darker coloring and is found more commonly in montane regions . *Leucopaxillus septentrionalis* is also large and resembles *L. giganteus* at some points during its development , but may be distinguished by its nauseous odor , the tan color of the cap , and the adnate (gill squarely attached to the stem) to slightly adnexed (narrowly attached) gills . *Leucopaxillus candidus* tends to be smaller , with a cap diameter ranging from 6 to 20 cm (2 @. @ 4 to 7 @. @ 9 in) broad . Both *Leucopaxillus gentianeus* and *Lactarius vellereus* have been suggested as additional lookalike species . Young specimens of *Leucopaxillus giganteus* may be confused with *Clitocybe irina* , *C. praemagna* or *C. robusta* . White *Lactarius* and *Russula* species may also appear superficially similar , but they have brittle flesh that breaks cleanly , unlike the fibrous flesh of *Leucopaxillus giganteus* .

= = Habitat and distribution = =

Leucopaxillus giganteus can form fairy rings in grassy areas like pastures , and is also found along roadsides ; it produces fruiting bodies in summer and autumn . It is a saprobic species , and so derives nutrients by decomposing organic matter .

The fungus has a cosmopolitan distribution , and occurs throughout the temperate zone of the northern hemisphere . It is found in North America , Britain , and Europe . David Arora reports that in North America , it is most common in the Pacific Northwest and the Rocky Mountains .

= = Uses = =

= = = Edibility = = =

Although one source claims that the species is a " choice edible when young " , another source warns of the possibility of stomach cramps and diarrhea . Burrows suggests preparing specimens by cutting them up and boiling the pieces , and disposing the water ; then they may be used in dishes such as stews and casseroles . Because of its large size , one specimen can be enough to be consumed by several individuals . The odor has been said to be farinaceous or similar to fish meal ; the taste and smell of the mushroom have also been alternately characterized as " mild and pleasant " or " truly disgusting " . The species is also a favorite food for species of the fruit fly genus *Drosophila* .

= = = Bioactive compounds = = =

Leucopaxillus giganteus contains a bioactive compound named clitocine that has antibiotic activity against a number of bacteria that are pathogenic to humans , such as *Bacillus cereus* and *Bacillus subtilis* ; an earlier (1945) study showed antibiotic activity against *Mycobacterium tuberculosis* , *Salmonella typhi* , and *Brucea abortus* . Clitocine has also been shown to promote apoptosis (cell death) in human cervical cancer cells in vitro (HeLa) . The mycelia of *L. giganteus* , when grown in liquid culture , has been shown to produce phenols and flavonoids that have antioxidant activity .