= Stropharia caerulea =

Stropharia caerulea , commonly known as the blue roundhead , is an inedible species of agaric fungus in the family Strophariaceae . It is a common species found in Europe and North America , where it grows as a saprophyte in meadows , roadsides , hedgerows , gardens , and woodchip mulch . S. caerulea was officially described to science in 1979 , although it was known to be a distinct species for about two centuries before that . The taxon Stropharia cyanea , as defined by Risto Tuomikoski in 1953 , and used by several later authors , is a synonym of S. caerulea .

The fruit bodies (mushrooms) of Stropharia caerulea feature a greenish @-@ blue cap sparsely covered in white flecks of veil at the margin , and a sticky , glutinous surface texture . Gills on the cap underside have an adnate or sinuate attachment to the stipe . They are initially pale purplish @-@ brown , becoming darker brown in age as the spores mature . The greenish stipe is covered in white scales up to a thin , transient ring . It is similar in appearance to its less common relative Stropharia aeruginosa , but that species has a more robust ring on its stipe , more scales on the cap , and darker gills with white edges .

= = Taxonomy = =

In 1953 , the Finnish scientist Risto Tuomikoski observed that the well @-@ known Stropharia aeruginosa had a lookalike species that was characterized by a brown spore print , an indistinct , temporary ring on the stipe , and chrysocystidia lining the gill edges . Tuomikoski called this lookalike Stropharia cyanea , a name he based on James Bolton 's 1820 taxon Agaricus cyaneus . Later researchers confirmed the existence and widespread European distribution of this taxon . Tuomikoski 's use of the name S. cyanea , however , was incorrect as Bolton 's type refers to the purple @-@ brown spored species S. aeruginosa . Despite this , the misapplied name S. cyanea has persisted in some contemporary field guides .

Stropharia caerulea was first mentioned in the scientific literature by James Bolton in 1788 , under the name Agaricus politus . This usage is not considered valid according to nomenclatural rules , because it was used by Christian Hendrik Persoon to refer to another species in his 1801 Synopsis methodica fungorum , which is a sanctioned work . Stropharia caerulea was officially described by mycologist Hanns Kreisel in 1979 from collections made near Woldegk , Germany . Machiel Noordeloos transferred the species to Psilocybe in 1995 , but today this genus is mostly reserved for species that contain the psychoactive compounds psilocybin and psilocin . Although psilocybin had once been reported from S. caerulea , subsequent analyses have not revealed any traces of the substance in the fruit bodies .

The specific epithet caerulea is Latin for " blue " . The mushroom is commonly known as the blue roundhead . French mycologist Régis Courtecuisse has called the mushroom " verdigris agaric " , but numerous other authors use this name to refer instead to Stropharia aeruginosa .

= = Description = =

Fruitbodies have conical to flattened caps measuring 2 ? 7 @.@ 5 cm (0 @.@ 8 ? 3 @.@ 0 in) in diameter . They usually have a low , broad umbo . The colour of the cap depends on its age , ranging from pale blue @-@ green to yellowish @-@ bluish green . There is often a whitish zone around the margin , which invariably has bluish @-@ green tints . When moist , the cap is sticky with a cuticle that may be readily peeled ; dry caps are smooth and shiny . Gills are initially pale purplish @-@ brown , becoming darker brown in age as the spores mature . They have an adnate or sinuate attachment to the stipe . The stipe has a short @-@ lived annular (ring) zone ; above this zone the stipe is smooth , while below it is fibrous and scaly . The flesh is colourless , although it may have tinges of blue in the cap and stipe , and lacks any distinctive odour or flavour . Stropharia cyanea fruit bodies are not edible .

The spore print is brown . Spores typically measure 8 @.@ 0 ? 9 @.@ 0 by 4 @.@ 0 ? 5 @.@ 5 µm , and have an ellipsoid to oblong to ovoid shape , depending on the viewing angle . Basidia (

spore @-@ bearing cells) are narrowly club @-@ shaped , four @-@ spored , and have dimensions of 24 ? 40 by 7 ? 12 µm . The cheilochrysocystidia (found on the gill edge) are club @-@ shaped , measuring 30 ? 55 by 4 ? 40 µm , with a neck that is 2 ? 5 µm wide . Pleurochrysocystidia (on the gill face) are 40 ? 60 by 5 ? 18 µm with a 2 ? 4 µm @-@ wide neck . Clamp connections are abundant in all tissues of S. caerulea . The fungus produces acanthocytes , which are spiny cells produced on short branches on the mycelium .

= = = Similar species = = =

There are a few greenish Stropharia with which S. caerulea might be confused . Stropharia pseudocyanea is an uncommon species that grows in meadows . It has a more slender form than S. caerulea , a soft , spongy stipe , and flesh with an odour similar to fresh pepper . Microscopically , it has a dense palisade of slender , capitate (with a spherical tip) non @-@ staining cheilocystidia on the gill edge . This gives the gills of young , fresh fruit bodies a whitish edge , a feature that is absent from S. caerulea . Another lookalike , S. aeruginosa , is less common than S. caerulea . It is distinguished from the latter by the well @-@ developed ring zone on its stipe , darker gills with white edges , and more numerous whitish scales around the cap margin . Additionally , S. aeruginosa has more stable colours than S. caerulea , the colouration of which tends to quickly wash out . However , collections of Stropharia often show characteristics that are intermediate between two or more species , making them difficult to identify accurately .

= = Habitat , distribution , and ecology = =

Stropharia caerulea is a saprophytic fungus that fruits singly or in groups . It grows in or on meadows , roadsides , hedgerows , gardens , and woodchip mulch . In Europe it is often found in beech woods in alkaline soil . It is a common species found throughout Europe , where it fruits from July to November . Although also found in North America , generally fruiting from August to October , the full extent of its distribution there is unknown .

Fruitbodies of Stropharia caerulea form mycelial cords ? rootlike structures consisting of a dense mass of hyphae ? which create extensive underground networks that move nutrients and allow the fungus to " forage " for resources . These cords are often associated with stems and rhizomes of the common nettle (Urtica dioica) . These mycelial systems ' development and the species 's interactions with other cord @-@ forming wood decomposer basidiomycetes have been investigated . The mycelia of Stropharia caerulea form a fractal structure characterized by a dense , relatively slowly extending front , a formation associated with finding relatively homogeneously distributed nutrients ? equivalent to short @-@ range foraging . An increase in the supply of soil nitrogen or phosphorus increases the fractal branching of the mycelia , allowing increased uptake of nutrients .