

= *Collybia cirrhata* =

Collybia cirrhata is a species of fungus in the Tricholomataceae family of the Agaricales order (gilled mushrooms). The species was first described in the scientific literature in 1786 , but not validly named until 1803 . Found in Europe , Northern Eurasia , and North America , it is known from temperate , boreal , and alpine or arctic habitats . It is a saprobic species that grows in clusters on the decaying or blackened remains of other mushrooms . The fruit bodies are small , with whitish convex to flattened caps up to 11 mm (0 @. @ 43 in) in diameter , narrow white gills , and slender whitish stems 8 ? 25 mm (0 @. @ 3 ? 1 @. @ 0 in) long and up to 2 mm (0 @. @ 08 in) thick . *C. cirrhata* can be distinguished from the other two members of *Collybia* by the absence of a sclerotium at the base of the stem . The mushroom , although not poisonous , is considered inedible because of its insubstantial size .

= = Taxonomy and phylogeny = =

The species first appeared in the scientific literature in 1786 as *Agaricus amanitae* by August Johann Georg Karl Batsch ; *Agaricus amanitae* subsp. *cirrhatum* , proposed by Christian Hendrik Persoon in 1800 , is considered synonymous . A later combination based on this name , *Collybia amanitae* , was published by Hanns Kreisel in 1987 . However , Kreisel noted the combination to be " ined . " , indicating that he did not believe the name to be validly published , according to article 34 @. @ 1 of the rules for botanical nomenclature , which states : " A name is not validly published ... when it is not accepted by the author in the original publication . "

The first correct name was published in 1803 by Heinrich Christian Friedrich Schumacher , who called the species *Agaricus cirrhatus* . French mycologist Lucien Quélet transferred it to *Collybia* in 1879 , resulting in the binomial by which it is currently known . The species had also been transferred to *Microcollybia* by Georges Métrod in 1952 and again by Lennox in 1979 (because Métrod 's transfer was considered a nomen nudum , and thus invalid according to nomenclatural rules) ; the genus *Microcollybia* has since been wrapped into *Collybia* .

Molecular phylogenetics have shown that *C. cirrhata* forms a monophyletic clade with the remaining two species of *Collybia* . Because *C. cirrhata* is the only one of the three *Collybia* species lacking sclerotia , it has been suggested that this character trait is an apomorphy ? that is , unique to a single , terminal species within a clade .

The specific epithet is derived from the Latin *cirrata* , meaning " curled " . Charles Horton Peck called it the " fringed @-@ rooted *Collybia* " . In the United Kingdom , it is commonly known as the " piggyback shanklet " .

= = Description = =

The cap is initially convex when young , later becoming convex to flattened or slightly depressed in the center , reaching a diameter of 3 ? 11 mm (0 @. @ 12 ? 0 @. @ 43 in) . The cap margin starts out rolled or curved inward , but straightens out as it matures . The cap surface ranges from dry to moist , smooth to covered with fine whitish hairs , and is mostly even with translucent radial grooves at the margin . It is subhygrophanous (changing color somewhat depending on hydration) , becoming a grayish @-@ orange when watery or old , and usually is white with a very faint pinkish flush when fresh . The flesh is whitish , quite thin , and has no distinctive taste or odor . The gills are adnate to slightly arcuate (curved into the shape of a bow) with a tooth (meaning that the gills curve up to join the stem but then , very close to the stem , the gill edge curves down again) . There are between 12 and 20 gills that extend completely from the cap edge to the stem , and three to five tiers of lamellulae (shorter gills that do not extend completely from the cap edge to the stem) . The gills are thin , narrow to moderately broad , and white to pinkish @-@ buff . The gill edges are even , and the same color as the gill faces .

The stem is 8 ? 25 mm (0 @. @ 3 ? 1 @. @ 0 in) long and up to 2 mm (0 @. @ 08 in) thick , equal in width throughout to slightly enlarged downward , flexible and filamentous but not fragile . The

stem surface is dry , whitish to grayish @-@ orange , sometimes with tiny hairs on the upper portion that become coarser near the base . The stem base often has rhizomorph @-@ like strands or copious whitish mycelia . The stem , unlike the other two species of *Collybia* , do not originate from a sclerotium . The stem becomes hollow as it matures . Although it is not considered poisonous , *C. cirrhata* is too small and insubstantial to be considered edible .

= = = Microscopic characteristics = = =

In deposit , the spores appear white . Individual spores are ellipsoid to tear @-@ shaped in profile , obovoid to ellipsoid or roughly cylindric in face or back view , with dimensions of $4 \text{ @.} @ 8 ? 6 \text{ @.} @ 4$ by $2 ? 2 \text{ @.} @ 8$ (sometimes up to $3 \text{ @.} @ 5$) μm . They are smooth , inamyloid , and acyanophilous (unreactive to staining with Melzer 's reagent and methyl blue , respectively) . The basidia (spore @-@ bearing cells of the hymenium) are roughly club @-@ shaped , four @-@ spored , and measure $17 \text{ @.} @ 5 ? 21$ by $4 \text{ @.} @ 8 ? 5 \text{ @.} @ 6$ μm . The gills do not have cystidia . The gill tissue is made of hyphae that are interwoven to roughly parallel , and inamyloid . The hyphae are $2 \text{ @.} @ 8 ? 8 \text{ @.} @ 4$ μm in diameter and smooth . The cap tissue is made of interwoven hyphae beneath the center of the cap , but radially oriented over the gills ; it too is inamyloid . These hyphae are $3 \text{ @.} @ 5 ? 8 \text{ @.} @ 4$ μm in diameter , smooth , but have irregularly thickened walls . The cap cuticle is an ixocutis ? a gelatinized layer of hyphae lying parallel to the cap surface . The hyphae comprising this layer are $2 \text{ @.} @ 8 ? 6 \text{ @.} @ 4$ μm in diameter , smooth , and thin @-@ walled . They are covered with scattered , short pouch @-@ like outgrowths . The cuticle of the stem is a layer of parallel , vertically oriented hyphae ; the hyphae measure $3 \text{ @.} @ 5 ? 4 \text{ @.} @ 2$ μm , and are smooth , slightly thick @-@ walled , and pale yellowish @-@ brown in alkaline solution . They give rise to a covering of tangled and branched caulocystidia (cystidia on the stem) that have multiple septa . The caulocystidia are $2 \text{ @.} @ 8 ? 4 \text{ @.} @ 8$ μm in diameter , smooth , thin walled , and shaped like contorted cylinders . Clamp connections are present in the hyphae of all tissues .

= = = Similar species = = =

Collybia cirrhata is most likely to be confused with the remaining members of *Collybia* , which have a similar external appearance . *C. tuberosa* is distinguished by its dark reddish @-@ brown sclerotia that resemble apple seeds , while *C. cookei* has wrinkled , often irregularly shaped sclerotia that are pale yellow to orange . Other similar mushrooms include *Baeospora myosura* and species of *Strobilurus* , but these species only grow on pine cones .

= = = Habitat and distribution = = =

Like all species remaining in the genus *Collybia* , *C. cirrhata* is saprobic , and is typically found growing on the decaying or blackened remains of other mushrooms ; occasionally the fruit bodies may be found growing on moss or soil without any apparent connection to decaying mushrooms , although these observations may represent instances where the remnant host tissue ? possibly from a previous season ? has decayed to such an extent that it remains as buried fragments in the substrate . Known hosts include *Lactarius* , *Russula* , *Meripilus giganteus* , and *Bovista dermoxantha* .

Collybia cirrhata is known from temperate , boreal , and alpine or arctic habitats . The fungus is widespread in Europe , including Bulgaria , Denmark , Germany , Greece , Latvia , Scandinavia , Slovakia , Switzerland , Turkey , and the United Kingdom . The mushroom is also common in northern montane regions of North America . In Asia , the fungus has been reported in Korea , and in Hokkaido , northern Japan . It is also known from Greenland . A 2009 publication suggested that based on the known evidence , the species ' distribution may be circumboreal .