

## = Bisporella citrina =

*Bisporella citrina* , commonly known as yellow fairy cups or lemon discos , is a species of fungus in the family Helotiaceae . The fungus produces tiny yellow cups up to 3 mm ( 0 @. @ 12 in ) in diameter , often without stalks , that fruit in groups or dense clusters on decaying deciduous wood that has lost its bark . The widely distributed species is found in North Africa , Asia , Europe , North America , and Central and South America . Found in late summer and autumn , the fungus is fairly common , but is easily overlooked owing to its small size . There are several similar species that can in most cases be distinguished by differences in color , morphology , or substrate . Microscopically , *B. citrina* can be distinguished from these lookalikes by its elliptical spores , which have a central partition , and an oil drop at each end .

## = = Taxonomy = =

The species was originally described from Europe in 1789 by German naturalist August Batsch as *Peziza citrina* . Elias Fries sanctioned this name in the second volume of his *Systema Mycologicum* ( 1821 ) . Jean Louis Émile Boudier transferred the species to *Calycella* in 1885 . Another historical name for the fungus was derived from Johann Hedwig 's 1789 *Octospora citrina* . Fries referred Hedwig 's name to *Helotium* in 1846 , and for several decades the fungus was known as either *Calycella citrina* or *Helotium citrinum* , depending on which generic concept an author accepted . In a 1974 publication , Richard Korf noted that the generic name *Helotium* competes with a basidiomycete genus of the same name , and under the rules of botanical nomenclature , the ascomycete version of the name had to be abandoned because the basidiomycete version was sanctioned by Fries in 1832 , and thus had priority . He also pointed out that the generic name *Calycella* could not be used , as it is a synonym of an older name *Calycina* , which contains species that bear no taxonomic relationship to *Helotium citrinum* . Accordingly , he formally transferred *Helotium citrinum* to *Bisporella* , to produce the new combination *Bisporella citrina* . Korf further noted that since *Bisporella* was published by Pier Andrea Saccardo in 1884 , it had priority over Boudier 's 1885 *Calycella* . *Calycella* has since been folded into *Bisporella* .

The specific epithet *citrina* is derived from the Latin *citrin* , meaning " lemon yellow " . Common names for the fungus include " yellow fairy cups " , and the British Mycological Society @-@ approved " lemon disco " ; the name " disco " is short for *Discomycetes* , an older term for ascomycete species with disc- and cup @-@ shaped fruit bodies . Samuel Frederick Gray called it the " lemon funnel @-@ stool " in his 1821 work *A Natural Arrangement of British Plants* .

## = = Description = =

Fruit bodies begin as spherical , closed globules , before expanding . The smooth , bright yellow fruit bodies are small ? typically less than 3 mm ( 0 @. @ 12 in ) in diameter and up to 1 mm ( 0 @. @ 04 in ) high ? and shallowly cup- or disc @-@ shaped . The inner surface is smooth , and bright yellow , while the outer surface is a paler yellow . In mass , the spore color is white . The stalk is broad , pale yellow in color , and short to nearly absent ; when present it is rarely more than 1 mm . The fruit bodies may be so numerous that their shapes are distorted by overcrowding . Fruit bodies that have dried are wrinkled and have a dull orangish @-@ brown color . The fruit bodies have no distinctive taste nor odor , and are not edible .

The smooth spores are roughly elliptical , measuring 8 ? 14 by 3 ? 5 ?m ; in maturity they have one cross @-@ wall , and oil drops at either end . The asci ( spore @-@ bearing cells ) measure 100 ? 135 by 7 ? 10 ?m . The paraphyses are shaped liked narrow cylinders with diameters up to 1 @. @ 5 ?m , and have tips that are rounded or somewhat club @-@ shaped. ? @-@ Carotene is the predominant pigment responsible for the yellow color of the fruit body .

## = = = Similar species = = =

There are several small yellow discomycetes with which *Bisporella citrina* might be confused . Lookalikes include the acorn cup ( *Hymenoscyphus fructigenus* ) that grows on fallen acorns and hickory nuts . The green stain fungus ( *Chlorociboria aeruginascens* ) forms blue @-@ green cups , and stains its wood substrate bluish @-@ green . *Lachnellula arida* is up to 6 mm ( 0 @.@ 24 in ) in diameter , and has hairs around the edge of its cup , and its outer surface is covered with short brown hairs . Fruit bodies of *Bisporella sulfurina* have a coloration similar to *B. citrina* , but they are smaller and grow in clusters on old , blackened , fungal stroma on wood .

Other lookalikes include *Hymenoscyphus* species , including *H. calyculus* , but these can be distinguished by their distinct stalks , and growth on smaller woody debris like sticks and twigs , rather than logs and stumps . Many other small , yellow discs have fringed or hairy margins to the discs , like *Anthracobia melaloma* ; this latter species grows on or near moss , rather than wood . *Chlorosplenium chlora* is another small cup fungus resembling *B. citrina* . It has a bright yellow outer surface , but the hymenium becomes develops greenish tints in age . The common jellyspot fungus ( *Dacrymyces stillatus* ) is usually smaller but can approach the dimensions of *B. citrina* . Similar in color , its fruit bodies are usually blob @-@ like rather than cup shaped . Another cup fungus that grows on dead beech wood is *Neobulgaria pura* , but its fruit bodies are larger , ranging from 2 ? 4 cm ( 0 @.@ 8 ? 1 @.@ 6 in ) .

= = Ecology and distribution = =

*Bisporella citrina* is saprobic , and so obtains nutrients by breaking down complex organic molecules into simpler ones . Fruit bodies are typically encountered growing in dense clusters on the surface of rotten wood ( especially deciduous trees ) , particularly beech . They have also been found growing on the fruit bodies of the polypore fungus *Daedaleopsis confragosa* . In a study of the succession of fungi associated with the decay of a 120 @-@ year @-@ old healthy beech tree uprooted by strong winds , *B. citrina* was found on the wood about three years after the fall . It appeared after early colonizers such as *Quaternaria quaternata* , *Tubercularia vulgaris* ( the anamorph form of *Nectria cinnabarina* ) , and *Bulgaria inquinans* , and was followed by *Stereum hirsutum* and *Nectria cinnabarina* .

The widespread fungus is known from North Africa , Asia , Europe , North America , Central and South America , Australia , and New Zealand . It is one of the most common of the small discomycetes .