= Cyathus striatus =

Cyathus striatus , commonly known as the fluted bird 's nest , is a common saprobic bird 's nest fungus with a widespread distribution throughout temperate regions of the world . This fungus resembles a miniature bird 's nest with numerous tiny " eggs " ; the eggs , or peridioles , are actually lens @-@ shaped bodies that contain spores . C. striatus can be distinguished from most other bird 's nest fungi by its hairy exterior and grooved (striated) inner walls . Although most frequently found growing on dead wood in open forests , it also grows on wood chip mulch in urban areas . The fruiting bodies are encountered from summer until early winter . The color and size of this species can vary somewhat , but they are typically less than a centimeter wide and tall , and grey or brown in color . Another common name given to C. striatus , splash cups , alludes to the method of spore dispersal : the sides of the cup are angled such that falling drops of water can dislodge the peridioles and eject them from the cup . The specific epithet is derived from the Latin stria , meaning " with fine ridges or grooves " .

= = Taxonomy = =

Cyathus striatus was first described by William Hudson in his 1778 work Flora Anglica as Peziza striata . Carl Ludwig Willdenow transferred it to Cyathus in 1787 .

= = Description = =

The " nest " , or peridium , is usually about 7 to 10 mm in height and 6 to 8 mm in width , but the size is somewhat variable and specimens have been found with heights and widths of up to 1 @.@ 5 cm (0 @.@ 59 in) . The shape typically resembles a vase or inverted cone . The outer surface (exoperidium) ranges in color from slightly brownish to grayish buff to deep brown ; the exoperidium has a shaggy or hairy texture (a tomentum) , with the hairs mostly pointing downward . The inner surface of the peridium (the endoperidium) is striated or grooved , and shiny . Young specimens have a lid , technically called an epiphragm , a thin membrane that covers the cup opening . The epiphragm is hairy like the rest of the exoperidial surface , but the hairs often wear off leaving behind a thin white layer stretched across the lid of the cup . As the peridium matures and expands , this membrane breaks and falls off , exposing the peridioles within . The peridium is attached to its growing surface by a mass of closely packed hyphae called an emplacement ; in C. striatus the maximum diameter of the emplacement is typically 8 ? 12 mm , and often incorporating small fragments of the growing surface into its structure .

Peridiole structure

The peridioles are about 1 to 1 @.@ 5 mm wide and rarely up to 2 mm wide . They are disc @-@ shaped , but may appear angular due to pressure from neighbouring peridioles . Peridioles may be dark , or a drab gray if still covered with a thin membrane called a tunica .

Peridioles in C. striatus are sheathed and attached to the endoperidium by complex cords of mycelia known as a funiculus in the singular . The funiculus is differentiated into three regions : the basal piece , which attaches it to the inner wall of the peridium , the middle piece , and an upper sheath , called the purse , connected to the lower surface of the peridiole . Inside the purse and middle piece is a coiled thread of interwoven hyphae called the funicular cord , attached at one end to the peridiole and at the other end to an entangled mass of hyphae called the hapteron . When dry the funiculus is brittle , but when wet it is capable of long extension .

= = = Microscopic characteristics = = =

The basidia , the spore @-@ bearing cells , are club @-@ shaped with long stalks . They typically hold 4 spores that are sessile , that is , attached directly to the surface of the basidium , rather than by a short stalk (a sterigmata) . Spores measure about 15 to 20 µm long by 8 to 12 µm wide . They are elliptical , smooth , hyaline , and notched at one end . During development , the spores are

separated from the basidia when the latter collapse and gelatinize along with other cells lining the inner walls of the peridiole . The spores expand in size somewhat after being detached from the basidia .

= = Habitat and distribution = =

Cyathus striatus is a saprobic fungus , deriving its nutrition from decaying organic material , and is typically found growing in clusters on small twigs or other woody debris . It is also common on mulch under shrubs . The features of the microenvironment largely influence the appearance of C. striatus ; all else being equal , it is more likely to be found in moist , shallow depressions than elevated areas . It is very widespread in temperate areas throughout the world , growing in summer and fall . The fungus has been recorded from Asia , Europe , North America , Central America , South America , and New Zealand .

= = Life cycle = =

Cyathus striatus can reproduce both asexually (via vegetative spores) , or sexually (with meiosis) , typical of taxa in the basidiomycetes that contain both haploid and diploid stages . Basidiospores produced in the peridioles each contain a single haploid nucleus . After the spores have been dispersed into a suitable growing environment , they germinate and develop into homokaryotic hyphae , with a single nucleus in each cell compartment . When two homokaryotic hyphae of different mating compatibility groups fuse with one another , they form a dikaryotic mycelia in a process called plasmogamy . After a period of time and under the appropriate environmental conditions , fruiting bodies may be formed from the dikaryotic mycelia . These fruiting bodies produce peridioles containing the basidia upon which new spores are made . Young basidia contain a pair of haploid sexually compatible nuclei which fuse , and the resulting diploid fusion nucleus undergoes meiosis to produce haploid basidiospores . The process of meiosis in C. striatus has been found to be similar to that of higher organisms .

= = Spore dispersal = =

The cone shaped fruiting body of Cyathus striatus makes use of a splash @-@ cup mechanism to help disperse the spores . When a raindrop hits the interior of the cup with the optimal angle and velocity , the downward force of the water ejects the peridioles into the air . The force of ejection rips open the funiculus , releasing the tightly wound funicular cord . The hapteron attached to the end of the funiculus is adhesive , and when it contacts a nearby plant stem or stick , the hapteron sticks to it ; the funicular cord wraps around the stem or stick powered by the force of the still @-@ moving peridiole (similar to a tetherball) . The peridioles degrade over time to eventually release the spores within , or they may be eaten by herbivorous animals and redeposited after passing through the digestive tract .

= = Bioactive compounds = =

Cyathus striatus has proven to be a rich source of bioactive chemical compounds . It was first reported in 1971 to produce " indolic " substances (compounds with an indole ring structure) as well as a complex of diterpenoid antibiotic compounds collectively known as cyathins . Several years later , research revealed the indolic substances to be compounds now known as striatins . Striatins (A , B and C) have antibiotic activity against fungi imperfecti , and various Gram @-@ positive and Gram @-@ negative bacteria . C. striatus also produces sesquiterpene compounds called schizandronols . It also contains the triterpene compounds glochidone , glochidonol , glochidiol and glochidiol diacetate , cyathic acid , striatic acid , cyathadonic acid and epistriatic acid . The latter four compounds were unknown prior to their isolation from C. striatus .