= Parasola auricoma =

Parasola auricoma is a species of agaric fungus in the family Psathyrellaceae . First described scientifically in 1886 , the species is found in Europe , Japan , and North America . The small , umbrella @-@ shaped fruit bodies (mushrooms) of the fungus grow in grass or woodchips and are short @-@ lived , usually collapsing with age in a few hours . The caps are up to 6 cm (2 @.@ 4 in) wide , initially elliptical before flattening out , and colored reddish @-@ brown to greyish , depending on their age and hydration . They are pleated with radial grooves extending from the center to the edge of the cap . The slender , whitish stems are up to 12 cm (4 @.@ 7 in) long and a few millimeters thick . Microscopically , P. auricoma is characterized by the presence of setae (thick @-@ walled bristles) in its cap cuticle . This characteristic , in addition to the relatively large , ellipsoid spores can be used to distinguish it from other morphologically similar Parasola species .

= = Taxonomy = =

The species was first described in 1886 by French mycologist Narcisse Théophile Patouillard as Coprinus auricomus . It was transferred to Parasola in 2001 when molecular phylogenetics was used to sort the coprinoid genera (i.e. , Coprinus and the segregate genera Coprinopsis , Coprinellus , and Parasola) into natural monophyletic groups . According to the nomenclatural database MycoBank , Parasola hansenii , described by Jakob Emanuel Lange in 1915 and named in honor of Danish mycologist Emil Christian Hansen , is a facultative synonym (based on a different type) . Although this synonymy is accepted by several authorities , P.D. Orton and Roy Watling disagree , suggesting that C. hansenii is a forgotten species that requires reanalysis .

In a 2010 study of the type material of several coprinoid taxa , Laszlo Nagy and colleagues assigned Patouillard 's plate 453 (containing the original description) as the lectotype for P. auricoma , as they believed it to be " sufficiently diagnostic for a clear @-@ cut definition of this taxon . " They also determined that Pseudocoprinus besseyi and Coprinus elongatipes (both species were described in a 1946 publication by Alexander H. Smith and Lexemuel Ray Hesler) were conspecific with P. auricoma .

The placement of P. auricoma within Parasola is somewhat controversial . It has often been classified in the section Auricomi , a grouping of species characterized by the absence of a veil , and the occasional presence of caulocystidia (cystidia on the stem) , pileocystidia (cystidia on the cap surface) , or dark setae @-@ like elements . Several molecular phylogenetics studies have confirmed its inclusion in the Parasola clade , but its relationship to other members of the group have not been fully resolved due to limited sampling . A recent analysis suggests that in the phylogenetic tree of Parasola , P. auricoma and P. conopilus form a tritomy with the crown Parasola species .

= = Description = =

The fungus produces fruit bodies with caps that are initially egg @-@ shaped with margins curled inward ; as the cap expands , it becomes conical and eventually flat or slightly depressed in the center , ultimately reaching a diameter of 6 cm (2 @.@ 4 in) . The fruit bodies are hygrophanous , and so will change color depending on their state of hydration . When the fruit bodies are young and fresh , the caps are reddish brown and can glisten , especially if wet . As the mushroom matures , the outer edge of the cap turn a greyish color while the center remains reddish brown . Radial grooves extend from the center of the cap to the margins . The caps have minute hairs (setae) that are visible through a hand lens .

The gills are free from attachment to the stem , and have a width of 0 @.@ 2 ? 0 @.@ 4 cm (0 @.@ 08 ? 0 @.@ 16 in) . They are initially whitish before turning greyish brown , and eventually become blackish with a dark margin as the spores mature . Unlike some other coprinoid mushrooms , the gills do not deliquesce ? a process whereby the gills dissolve into an inky black mass as they release their spores . The whitish stem is up to 12 cm (4 @.@ 7 in) long and 0 @.@ 4 cm (0 @.@

16 in) thick , hollow , and fragile . Young fruit bodies can have abundant , thick @-@ walled hairs at the base of the stem , but these typically disappear as the mushroom matures . The flesh is thin , fragile , yellowish to brownish , and lacks any appreciable odor or taste . The spore print is brownish @-@ black . The edibility of P. auricoma is not known with certainty , but the fruit bodies are small and insubstantial .

The spores are ellipsoid , have a central germ pore , and measure 10 ? 14 by 5 @.@ 75 ? 8 ?m . The basidia (spore @-@ bearing cells) are club @-@ shaped and four @-@ spored . The colorless pleurocystidia (cystidia on the gill face) measure 70 ? 140 by 20 ? 45 ?m , and are roughly elliptical to flask @-@ shaped , while the similarly shaped cheilocystidia (found on the gill edge) measure 50 ? 95 by 15 ? 25 ?m . Clamp connections are present in the hyphae of all tissues of P. auricoma . The cap cuticle comprises a layer of club @-@ shaped , thin @-@ walled cells measuring 25 ? 40 by 10 ? 30 ?m interspersed with long , dark , thick @-@ walled setae . Yellowish @-@ brown setae are plentiful on the cap surface , and consist of an elongated , hair @-@ like segment up to 315 ?m long , attached to the surface by a bulbous base that is 3 ? 9 ?m wide .

= = = Similar species = = =

Several characters serve to help distinguish Parasola auricoma from similar coprinoid mushrooms that grow in woodchips , including a lack of deliquescence , and the lack of a veil . Microscopically , it is characterized by the long , gold @-@ pigmented , thick @-@ walled setae on the cap , and ellipsoid spores with a germ pore . The distinctly grooved and pleated cap margin indicates that it is allied with the coprinoid species and not with the genus Psathyrella . Similar Parasola species include the common and widespread P. plicatilis , P. leiocephala , P. lilatincta , and P. kuehneri . Only microscopy will definitively separate these from P. auricoma ? none of them have setae on the cap .

= = Habitat and distribution = =

Parasola auricoma is a saprobic species , and so obtains nutrients by breaking down organic matter into simpler molecules . The fruit bodies grow either singly or in groups , often in large numbers , at road sides in deciduous forests , or on grassy areas . The mushrooms are short @-@ lived , usually lasting only for a few hours before collapsing . Common in Europe and North America (including Hawaii) , it has also been recorded from Japan . In Europe , fruit bodies appear most commonly in spring and summer months , while in North America , fruiting is more common in the late summer and autumn , after rains .