= Hygrophoropsis aurantiaca =

Hygrophoropsis aurantiaca , commonly known as the false chanterelle , is a species of fungus in the family Hygrophoropsidaceae . It is found across several continents , growing in woodland and heathland , and sometimes on woodchips used in gardening and landscaping . Fruit bodies (mushrooms) are yellow ? orange with a funnel @-@ shaped cap up to 8 cm (3 1 ? 8 in) across that has a felt @-@ like surface . The thin , often forked gills on the underside of the cap run partway down the length of the otherwise smooth stipe . Reports on the mushroom 's edibility vary ? it can serve as food , though not a particularly flavorful one , or it can be mildly poisonous .

Austrian naturalist Franz Xaver von Wulfen described the false chanterelle in 1781 , noting both its resemblance with the true chanterelles and people 's propensity to confuse them . The false chanterelle was then placed in the genus Clitocybe , but it was later observed that its forked gills and dextrinoid spores indicated a relationship to Paxillus . Genetic analysis has confirmed that it belongs to the order Boletales and is more closely related to boletes .

= = Taxonomy = =

Austrian naturalist Franz Xaver von Wulfen described the false chanterelle as Agaricus aurantiacus in 1781 , reporting that it appeared in the fir tree forests around Klagenfurt in October . He added that it could be confused with the chanterelle by the inexperienced , but that its true nature was very different ; in contrast to its edible lookalike , he described it as " kind of pernicious " . The specific epithet is the Latin word aurantiacus , meaning " orange " . James Sowerby illustrated it and gave it the name Agaricus subcantharellus , describing it as a " perhaps unfavourable " variety of A. cantharellus (chanterelle) . The fungus was placed in the genus Merulius by Johann Friedrich Gmelin in 1792 , and then Cantharellus by Elias Fries in 1821 . Bernhard Studer @-@ Steinhäuslin concluded it could only be classified in the genus Clitocybe in 1900 , based on its white spores , decurrent gills and lack of a ring . It was elevated to the status of genus in Emile Martin @-@ Sans ' 1929 publication L 'Empoisonnement par les champignons et particulièrement les intoxications dues aux Agaricacées du groupe des Clitocybe et du groupe des Cortinarius , with authorship attributed to René Maire . Martin @-@ Sans concurred with Maire 's assessment of Hygrophoropsis , suggesting that it represented a form intermediate between Cantharellus and Clitocybe , and was thus worthy of generic ranking . The genus name refers to a resemblance to the genus Hygrophorus . It is commonly known as the false chanterelle .

Two varieties described by Derek Reid in 1972 , H. aurantiaca var. macrospora and H. aurantiaca var. rufa , have since been promoted to distinct species status as H. macrospora (1996) and H. rufa (2008) . Two other varieties of the fungus have been described , but they are not considered to have independent taxonomic significance by Index Fungorum : var. nana (Singer 1946) , characterized by a small fruit body ; and var. robusta (Antonín 2000) , characterized by a robust fruit body and an odour similar to Maggi seasoning sauce . Pale forms of the fungus are sometimes referred to as var. pallida . This taxon was first published by Robert Kühner and Henri Romagnesi in 1953 , but later considered invalid as it did not conform to nomenclatural rules . Variety nigripes , a taxon with a black @-@ brown stipe , is invalid for similar reasons . H. aurantiaca var. pallida was published validly in 1995 .

In 1979 , Egon Horak suggested that H. aurantiaca and the New Zealand taxon H. coacta were the same species , but neither Index Fungorum nor MycoBank accept this synonymy . According to MycoBank , H. aurantiaca has several heterotypic synonyms , that is , they have different types , but are considered the same species :

Agaricus alectorolophoides Schaeff . (1774)
Agaricus subcantharellus Sowerby (1809)
Cantharellus brachypodus Chevall . (1826)
Cantharellus ravenelii Berk . & M.A.Curtis (1853)
Merulius brachypodes (Chevall .) Kuntze (1891)

Hygrophoropsis aurantiaca has been confused with the true chanterelles (genus Cantharellus)

because of overall similarities in appearance . However , the forked gills , frequently off @-@ centre stipe placement , and dextrinoid spores of H. aurantiaca suggested a relationship with Paxillus , prompting Rolf Singer to classify the genus Hygrophoropsis in the family Paxillaceae in 1946 . Several pigments have been identified from the fungus , including the orange variegatic acid , methyl variegate , the red variegatorubin , and several derivatives of pulvinic acid . The presence of these pigments suggests a chemotaxic relationship with the Boletaceae , Coniophoraceae , and Paxillaceae ? families of Boletales with members that have similar compounds . Molecular phylogenetic analysis confirmed its affinity lay in the order Boletales in 1997 , though later research showed it is not closely related to Paxillus or other gilled members of the order .

= = Description = =

The false chanterelle has a golden @-@ orange cap up to 8 cm (3 1 ? 8 in) across , initially convex but becoming funnel @-@ shaped as the mushroom matures . The cap margin , which remains rolled in a little , becomes wavy or lobed in age . The cap surface is covered with a fine down . The decurrent gill @-@ like structures are narrow and forked , which is a distinctive and distinguishing feature . They are generally a more intense shade of orange than the cap . Along the stipe , the gills may be slightly crimped . The orange stipe is 3 ? 5 cm (1 1 ? 8 ? 2 in) high and 0 @.@ 5 ? 1 cm (1 ? 4 ? 3 ? 8 in) thick , and lacks a ring . It often has a darker , brownish , base . The ability to form sclerotia (compact masses of hardened fungal mycelium) has been documented for H. aurantiaca in laboratory studies . These structures contain glycogen and protein that may be used as food reserves during spore germination .

The soft , thin flesh ranges from white to yellowish to golden @-@ orange . It has an odour and taste described variously as indistinct , or unpleasant and earthy . The spore print is white to cream . The oval spores are 5 @.@ 5 ? 7 by 4 ? 4 @.@ 5 micrometres (µm) , with walls that tend to thicken in age . The spores are cyanophilous , meaning that they will readily stain dark blue in methyl blue solution . Staining with Melzer 's reagent often produces a dextrinoid (reddish @-@ brown) colour reaction . Basidia (spore @-@ bearing cells) measure 25 ? 40 by 5 ? 8 µm , and can be two- , three- , or four @-@ spored . Cystidia (large sterile cells on the hymenium) are absent . The cap cuticle is in the form of a trichoderm , where the outermost hyphae are roughly parallel , like hairs , perpendicular to the cap surface . These hyphae are 4 ? 15 µm in diameter , and contain intracellular pigments that impart an orange @-@ brown to yellow @-@ brown colouring to the cells . Clamp connections are present in the hyphae .

Teratological (developmentally abnormal) forms of H. aurantiaca were reported to occur in the United Kingdom . The fruit bodies of these specimens were club @-@ shaped with a wrinkled upper surface of convoluted gill tissue . The overall morphology of these forms somewhat resembles species of Clavariadelphus . Although the cause of this abnormal development is not known with certainty , environmental pollutants or virus infection have been suggested as contributing factors .

= = = Similar species = = =

Characteristics typically used in the field to distinguish Hygrophoropsis aurantiaca from lookalike species include : the soft , dry consistency of its cap ; the crowded , decurrent , and forked gills that are saffron to orange coloured ; and the lack of any distinctive taste or odour . The false chanterelle can be distinguished from the true chanterelle (Cantharellus cibarius) by its deeper orange colour , brown base to the stipe , velvety cap surface , forked gills rather than gill @-@ like ridges , softer (and thinner) flesh , and lack of the characteristic apricot @-@ smell . The cap surface of Hygrophoropsis fuscosquamula , found in Britain , has fine brown scales overlaying a dull orange background . H. rufa has velvety brown fur covering its cap , while H. macrospora has cream gills and stipe . Microscopically , these three species have larger spores than H. aurantiaca . H. tapinia , found in a range extending from southern Florida to Central America , is set apart from H. aurantiaca by its growth on or under deciduous trees (never conifers) , and smaller spores , which measure 3 @.@ 3 ? 4 @.@ 8 by 2 @.@ 5 ? 3 @.@ 3 µm .

Formerly a member of Hygrophoropsis , Aphroditeola olida is also similar in appearance to H. aurantiaca but can be distinguished from the false chanterelle by its smaller , pinkish fruit bodies and candy @-@ like odour . It also has smaller spores . Chrysomphalina chrysophylla has a yellowish brown cap and unforked yellow gills . Cortinarius hesleri , an eastern North American species that associates with oaks , has a rusty brown spore print and a cortina in young specimens . The poisonous jack @-@ o ' -lantern mushrooms (genus Omphalotus) comprise another group of lookalikes ; however , they have straight , non @-@ forked true gills . The European wood @-@ rotting species Haasiella splendidissima , sometimes confused with H. aurantiaca , is most readily distinguished from the latter by its pink spore print and gills that do not fork .

= = Distribution , habitat , and ecology = =

Hygrophoropsis aurantiaca is a widely distributed species . In Europe and North America , it is found in both hardwood and conifer forests , as well as heathland , in summer and autumn . In Mexico , it is common in coniferous forests . It fruits from the ground or from decaying wood , on burned areas in forests , and is often found near fallen trees and tree stumps . The fungus can also grow on woodchips used in gardening and landscaping , and so it also appears on roadsides and other locations where this material is used . Fruit bodies occur singly to scattered , or in clusters , and can be very abundant . Generally considered a dry weather mushroom , it can be plentiful when other mushrooms are scarce . Other locations where the false chanterelle has been recorded include Africa , Central and South America , northern Asia , Australia and New Zealand . Populations in California represent a complex of undescribed species that are collectively referred to as Hygrophoropsis aurantiaca sensu lato .

A saprophytic fungus , H. aurantiaca obtains nutrients from forest litter and decomposing wood , causing a brown rot on the wood upon which it grows . A Finnish field study on tree stumps in a forest near Helsinki found that the species colonised them after 6 ? 7 years .

H. aurantiaca secretes large amounts of oxalic acid , a reducing agent and relatively strong acid . This stimulates weathering of the humus layer of forest soil , and influences the solubility and turnover of nutrients (particularly phosphorus and nitrogen) , which in turn affects their availability for use by forest trees .

= = Edibility = =

The false chanterelle has been described as edible (though not tasty) by some experts , but other authors report it as potentially poisonous . Indeed , Fries described it as venenatus , meaning " poisonous " , in 1821 . David Arora speculates that the confusion about edibility may be a result of misidentification with the similar @-@ looking but definitely poisonous Omphalotus species . However , extracts made from Nigerian collections were mildly toxic to mice . Some people experience gastrointestinal symptoms after eating the mushroom , possibly due to its high levels of the sugar alcohol arabitol . It was eaten , though not especially highly regarded , by the Zapotec people of Ixtlán de Juárez in Oaxaca . The Tepehuán people of northwestern Mexico also occasionally eat the mushroom , which they refer to in their native language as guin 'xacan (" delightful ") or kia 's gio ' (" iguana lard ") ; there , it is commonly prepared by roasting over charcoal , or boiling and garnishing with cheese .