

= *Lactarius alnicola* =

*Lactarius alnicola* , commonly known as the golden milkcap , is a species of fungus in the Russulaceae family . The fruit bodies produced by the fungus are characterized by a sticky , vanilla @-@ colored cap up to 20 cm ( 7 @.@ 9 in ) wide with a mixture of yellow tones arranged in faint concentric bands . The stem is up to 5 cm ( 2 @.@ 0 in ) long and has yellow @-@ brown spots . When it is cut or injured , the mushroom oozes a white latex , which has an intensely peppery taste . The acrid taste of the fruit bodies renders them unpalatable . The fungus is found in the western United States and Mexico , where it grows in mycorrhizal associations with various coniferous trees species , such as spruce , pine and fir , and deciduous species such as oak and alder . It has also been collected in India . Two varieties have been named : var. *pitkinensis* , known from Colorado , and var. *pungens* , from Michigan .

= = Taxonomy = =

The species was originally described by American mycologist Alexander H. Smith in 1960 , from a collection made near Warm Lake , Idaho , two years prior . The species was originally collected under alders with conifers nearby , and its specific epithet reflects the presumed association between the species ? *alnicola* means " living with alder " . Researchers subsequently discovered that the species has a relationship with conifers , not with alders , as the name implies . The mushroom is commonly known as the " golden milkcap " .

*Lactarius alnicola* is classified in subsection *Scrobiculati* of section *Piperites* in the genus *Lactarius* . Species in this subsection are characterized by having a milk @-@ white to creamy or whey @-@ like latex that soon turns yellow upon exposure to air , and which may stain freshly cut surfaces of the fruit body yellow . Further , the cap margin is bearded , strigose ( covered with sharp , straight , and stiff hairs ) , and coarsely tomentose or woolly when young . Other species in the subsection include *L. subpaludosus* , *L. delicatus* , *L. torminosus* , *L. payettensis* , *L. gossypinus* , *L. pubescens* , *L. resimus* and *L. scrobiculatus* ( the type species of the subsection ) .

= = Description = =

The cap is 8 ? 20 cm ( 3 @.@ 1 ? 7 @.@ 9 in ) wide , initially convex but becoming depressed to funnel @-@ shaped in maturity . The cap margin is initially rolled inward , then becomes uplifted as the cap expands . The cap surface is sticky to slimy , and near the margin there are matted " hairs " beneath the slimy or sticky layer . The color of the cap surface is yellow @-@ ochre , sometimes with concentric bands of lighter and darker shades ; the color becomes paler near the margin . The gills are adnate ( squarely attached to the stem ) to decurrent ( attached to and running down the length of the stem ) , narrow , and crowded closely together . Forked near the stem , the gills are initially whitish before becoming pale ochraceous @-@ buff . There are many lamellulae ? small gills that do not extend completely to the stem .

The stem is 3 ? 6 cm ( 1 @.@ 2 ? 2 @.@ 4 in ) long and 2 ? 3 cm ( 0 @.@ 8 ? 1 @.@ 2 in ) thick , nearly equal in width throughout or tapered downward , dry , hard , coarsely pitted , and whitish to cream yellowish . It is initially solid , then becomes hollow with age . The flesh is thick , hard , whitish , and slowly stains pale yellow after the mushroom has been cut open . It has no distinctive odor , while the taste is immediately acrid . The latex is sparse , white on exposure to air , and unchanging or very slowly changing color to yellow . It stains cut flesh yellow , and tastes acrid . According to mycologist David Arora , the oak @-@ loving central and southern Californian population of this species has a more latent acrid taste . The spore print may range slightly in color : thin deposits are white , thick deposits are more yellow . The mushroom is considered inedible because of the intensely peppery taste .

= = = Microscopic characters = = =

The spores are 7 @. @ 5 ? 10 by 6 ? 8 @. @ 5 µm , ellipsoid , and ornamented with warts and narrow bands that form a partial reticulum . The surface prominences are up to 1 µm high , but mostly in the range 0 @. @ 3 ? 0 @. @ 6 µm . The spores are hyaline ( translucent ) and amyloid , meaning that they will adsorb iodine when stained with Melzer 's reagent . The basidia , the spore @-@ bearing cells , are four @-@ spored , and measure 37 ? 48 by 8 ? 11 µm . The cap cuticle is an ixocutis ( a tissue layer on the surface of a mushroom made of a layer of gelatinous hyphae ) made of encrusted hyphae that are 3 ? 5 µm wide .

= = = Varieties = = =

In their 1979 monograph of North American *Lactarius* species , Hesler and Smith named two varieties of *L. alnicola* . *Lactarius alnicola* var. *pitkinensis* , reported under mixed aspen and conifers from Ashcroft , Colorado , is very similar to the nominate variety , but it has a white to cream @-@ colored cap and white , unchanging latex . It has slightly smaller fruit bodies , with caps up to 10 cm ( 3 @. @ 9 in ) wide , and stems up to 4 cm ( 1 @. @ 6 in ) long ; its spores are slightly larger , measuring 9 ? 10 @. @ 5 by 7 @. @ 5 ? 9 µm . *Lactarius alnicola* var. *pungens* , reported only from mixed forests in Michigan , is similar but has a tacky surface that soon dries , a dull ochraceous to ochraceous @-@ tan cap with an ochraceous @-@ tawny center . It has whitish flesh , with a pungent odor described as " distinct and peculiar " .

= = = Similar species = = =

Novice mushroom hunters may mistake *L. alnicola* for the edible species *Cantharellus cibarius* , a choice edible species that has a vase @-@ shaped fruit body with strongly decurrent gills . Other similar *Lactarius* species include *L. zonarius* , *L. payettensis* , *L. yazooensis* , *L. olympianus* , and *L. psammicola* f. *glaber* . *L. olympianus* also associates with conifers , and has a pale yellow @-@ ochre , frequently zonate cap , but may be distinguished by its stem , which is usually covered with spots . *L. payettensis* has a roughened , not smooth , cap margin . *L. yazooensis* has a zonate cap and extremely acrid flesh . Its gills change color from pale vinaceous to light pinkish @-@ brown in maturity . *L. psammicola* f. *glaber* has a pinkish @-@ buff spore print . Mature fruit bodies of *L. scrobiculatus* var. *montanus* have been confused with *L. alnicola* . Its fruit bodies feature a smooth cap margin , acrid taste , white latex which slowly ( over several minutes ) turns yellow on exposure or stains the flesh yellow , and do not turn " clay color " when bruised .

= = Ecology , habitat , and distribution = =

*Lactarius alnicola* is an ectomycorrhizal species , and engages in a mutualistic association with certain plant species . In this association , the hyphae of the fungus permeate large volumes of soil and obtain scarce elements , especially phosphorus ? which is often limiting for plant growth ? which they pass on to the plant in exchange for metabolic products of the plant 's photosynthesis . The ectomycorrhizae that the fungus forms in association with *Picea engelmannii* have been shown to contain lactifers ( latex @-@ producing cells ) and pigments similar to the fruit body . Fruit bodies of the fungus grow in groups on the ground under alders and conifers , usually appearing between July and October . It is a fairly common species in the western United States and Baja California . Additional collection locations in Mexico include Veracruz , Villarreal , and Tapia . A population in central and southern California is known to associate with oak trees . In the Rocky Mountains it is associated with the subalpine tree species Englemann Spruce ( *Picea engelmannii* ) , while at lower elevations it is commonly found with white spruce ( *Picea glauca* ) . It is also known to associate with Ponderosa Pine ( *Pinus ponderosa* ) and Douglas @-@ fir ( genus *Pseudotsuga* ) . The mushroom has also been collected from Bageshwar , in the state of Uttarakhand , India .

= = = Cited books = = =

Bessette AR , Bessette A , Harris DM ( 2009 ) . Milk Mushrooms of North America : A Field Guide to the Genus *Lactarius* . Syracuse : Syracuse University Press . ISBN 0 8156 3229 0 .

Hesler LR , Smith AH ( 1979 ) . North American Species of *Lactarius* . Michigan : The University of Michigan Press . ISBN 0 472 08440 2 .