= Mycena polygramma =

Mycena polygramma , commonly known as the grooved bonnet , is a species of mushroom in the Mycenaceae family . The inedible fruit bodies are small , pale gray @-@ brown mushrooms with broadly conical caps , pinkish gills . They are found in small troops on stumps and branches of deciduous and occasionally coniferous trees . The mushroom is found in Asia , Europe , and North America , where it is typically found on twigs or buried wood , carrying out its role in the forest ecosystem by decomposing organic matter , recycling nutrients , and forming humus in the soil . M. polygramma contains two uncommon hydroxy fatty acids and is also a bioluminescent fungus whose intensity of light emission follows a diurnal pattern .

= = Taxonomy = =

First called Agaricus polygrammus by French mycologist Jean Bulliard in 1789 , the species was later sanctioned under that name by Elias Magnus Fries in his Systema Mycologicum . It was soon after transferred into the genus Mycena in 1821 by Samuel Frederick Gray , who raised many of Fries ' sub @-@ generic divisions to the genus level . Agaricus chloroticus , described by Friedrich Franz Wilhelm Junghuhn in 1830 , is the only known taxonomic synonym . The specific epithet is derived from the Greek ????? meaning " many " and ?????? , or " foot " . It is commonly known as the " grooved bonnet " .

= = Description = =

The cap of the M. polygramma fruit body is 2 to 4 cm (0 @.@ 8 to 1 @.@ 6 in) in diameter , and initially egg- to cone @-@ shaped , but expands to become conic to bell @-@ shaped or nearly convex with an abrupt small umbo , or at times plane with a conic umbo . On young fruit bodies , the cap margin is slightly curved inward , and frequently has scalloped edges ; in maturity the margin flares out , or is recurved and wavy . The surface of the cap is initially covered with short , fine whitish or grayish hairs that often persist until near maturity . With age , the cap surface becomes smooth , the color dark brownish @-@ gray to black beneath the bloom , fading slowly to a pale gray , and nearly pinkish @-@ buff at times . The cap margin is opaque and frequently has narrow , deep furrows or grooves , with the surface often more or less uneven and appearing as if streaked with glistening lines . The flesh is very hard and cartilaginous , watery grayish to white , rather thin , and with no distinctive odor and a mild taste .

The gills are narrowly adnate (attached squarely to the stem) or have a short decurrent tooth , and are packed close together , with 30 ? 38 gills reaching the stem . They are broad anteriorly (4 ? 7 mm) , white or whitish , in age flushed with pink , often with sordid @-@ brownish stains , and with edges pallid and even . The stem is 6 to 15 cm (2 @.@ 4 to 5 @.@ 9 in) long , 0 @.@ 2 to 0 @.@ 5 cm (0 @.@ 1 to 0 @.@ 2 in) thick , very brittle and cartilaginous , equal , and tubular . It sometimes has a well @-@ developed pseudorrhiza that resembles white cotton , and the base is covered with stiff white hairs , and often it stains reddish brown . The surface has fine straight or sometimes twisted longitudinal striations . The surface is ashy @-@ gray or paler grayish @-@ brown beneath the silvery covering , at times nearly smooth , with the apex pallid and faintly powdered .

Mycena polygramma is a bioluminescent mushroom , although the extent of luminescence can vary considerably . The mushroom is inedible , and has a mild to slightly acrid taste and a " pleasant " odor .

= = = Microscopic features = = =

Collected in deposit , such as in a spore print , the spores appear white . Viewed with a light microscope , the spores are broadly ellipsoid in shape , smooth , amyloid , with dimensions of 7 @.@ 5 ? 10 by 5 ? 6 µm . Occasionally the spores contain oil droplets . The basidia (pore @-@

bearing cells) are four @-@ spored , 26 ? 30 by 7 ? 8 µm . The cheilocystidia are scattered to abundant , aciculate or with the midportion somewhat enlarged and the apex forked or branched , and give rise to two or several contorted finger @-@ like projections . Pleurocystidia are not differentiated .

= = = Similar species = = =

Tall and slender forms of Mycena polygramma somewhat resemble M. pullata or M. praelonga . The former species is distinguished by its color , and the latter by its relationship to M. alcalina and its habitat on sphagnum .

= = Ecology , habitat and distribution = =

The fruit bodies of M. polygramma grow in groups or sub @-@ clusters under hardwoods , particularly deciduous trees such as oak , maple , and basswood . In North America , it has been collected from North Carolina , Massachusetts , New York , and Michigan , where it fruits from June to October . The fruit bodies are susceptible to attack by the parasitic fungi Spinellus fusiger and S. macrocarpus .

Typically found on twigs or buried wood , the fungus is known to be a vigorous decomposer of lignin and cellulose in leaf litter . Mycena polygramma is a saprobic fungus , and is one of many fungi that contribute to plant litter decomposition in forest ecosystems through nutrient recycling and humus formation in soil . It is a lignocellulose decomposer of larch litter , and can break down both lignin and carbohydrates , although it has a preference for carbohydrates . In an experiment testing the ability of several litter @-@ decomposing fungi to remove lignin from leaves of the perennial grass Miscanthus sinensis , under pure culture conditions , M. polygramma showed limited ability to cause the mass loss of lignin .

Rare in North America , the fungus is common in Europe , including Great Britain . They have been collected on the Falkland Islands , and Japan .

= = Chemistry and bioluminescence = =

Mycena polygramma contains the unusual hydroxy fatty acids 7 @-@ hydroxy @-@ 8 @,@ 14 @-@ dimethyl @-@ 9 @-@ hexadecenoic acid (0 @.@ 05 % of the total fatty acids) and 7 @-@ hydroxy @-@ 8 @,@ 16 @-@ dimethyl @-@ 9 @-@ octadecenoic acid (0 @.@ 01 %) .

The fungus is one of several dozen Mycena species that are bioluminescent . Unlike most luminescent organisms , M. polygramma has a diurnal rhythm of luminescence intensity , and has rises and falls of light intensity as high as 35 percent . However , this light emission is not typically noticed , as it can not be detected visually by the dark @-@ adapted eye ; sensitive photomultipliers or long exposure times are required to measure the phenomenon . The wavelength of spectral emissions from the fungus grown in pure culture is in the range 470 ? 640 m? .

= = = Cited books = = =

Smith AH . (1947) . North American species of Mycena . Ann Arbor , Michigan : University of Michigan Press .