

= Bridgeoporus =

Bridgeoporus is a fungal genus in the family Polyporaceae . A monotypic genus , it contains the single polypore species Bridgeoporus nobilissimus , first described to science in 1949 . Commonly known both as the noble polypore and the fuzzy Sandozi , this fungus produces large fruit bodies (or conks) that have been found to weigh up to 130 kilograms (290 lb) . The upper surface of the fruit body has a fuzzy or fibrous texture that often supports the growth of algae , bryophytes , or vascular plants .

This species is found in the Pacific Northwest region of North America where it grows on large (at least 1 m diameter) specimens of noble fir (*Abies procera*) , Pacific silver fir (*Abies amabilis*) , or western hemlock (*Tsuga heterophylla*) . Bridgeoporus nobilissimus causes a brown rot in its tree hosts . Genetic analysis shows that the fungus is more prevalent than fruit body distribution indicates .

= = Taxonomy = =

Bridgeoporus nobilissimus was named for William Bridge Cooke , who originally described the species as *Oxyporus nobilissimus* in 1949 . The fungus was discovered in Clackamas County , Oregon , in 1943 by brothers Ali and Fred Sandoz . Foresters called the species *Fomes fuzzii* @-@ sandozii , referring to the collectors and the fuzzy surface texture of the conk . Several collections were made in Oregon and Washington in subsequent years . A large specimen was collected in Lewis County , Washington in 1946 that weighed about 300 pounds (140 kg) and measured 56 inches (140 cm) by 37 inches (94 cm) . Cooke learned of the fungus in 1948 while visiting Daniel Elliot Stuntz , who kept one of the large fruit bodies that he and Alexander H. Smith had previously collected in Mount Rainier National Park . This fruit body served as the type collection .

Species of genus *Oxyporus* cause white rot in their host trees . Cooke placed the fungus in this genus by despite not knowing definitively what type of rot it caused ; he considered it to be closely related to *Oxyporus populinus* . In 1955 , polypore specialist Josiah Lincoln Lowe transferred *O. nobilissimus* to *Fomes* , before the concept of this genus was narrowed . In 1996 the new genus Bridgeoporus was circumscribed by Harold Burdsall , Tom Volk and Joseph Ammirati to accommodate this species , in order to rectify incompatibilities with placements in *Fomes* and *Oxyporus* . In particular , genus *Oxyporus* features true cystidia arising from the subhymenium (the supportive hyphae underlying the hymenium) , whereas *B. nobilissimus* has pseudocystidia (sterile structures arising deep in the subhymenium and protruding into the hymenium) .

Phylogenetic analyses of mitochondrial small @-@ subunit rDNA sequences suggests that *B. nobilissimus* , which belongs in the hymenochaetoid clade , is closely related to the genera *Oxyporus* and *Schizopora* . The hymenochaetoid clade includes wood @-@ decaying species previously classified variously in the families Corticiaceae , Polyporaceae and Stereaceae .

= = Description = =

Bridgeoporus nobilissimus has perennial , imbricate , sessile fruit bodies that measure 30 ? 140 cm (12 ? 55 in) by 25 ? 95 cm (9 @.@ 8 ? 37 @.@ 4 in) by 30 ? 100 cm (12 ? 39 in) . From 1966 to 1990 , this species was designated the largest pore fungus in the Guinness Book of World Records . Three fruit body shapes are associated with the fungus , depending largely on the location of the fruiting on the host tree . Hoof @-@ shaped and shelf @-@ like conks are located on the sides of hosts ; short , oblong @-@ topped conks with tapering pore surfaces occur on the main roots of the host ; and centrally substipitate (conical) conks are found on the tops of stumps . The cap surface of young fruit bodies are covered with a dense mat of white mycelial fibers (up to several millimeters long) that in age darken in color and often become stuck together at their tips . Although the surface is typically brown or darker , it may appear green due to epiphytic associations with algae such as *Coccomyxa* or *Charicium* species . Bryophytes or sometimes vascular plants grow on the upper surface of the conk . The texture of the fruit body is fibrous ; it is rubbery and tough when fresh , but

becomes hard and brittle when it is dry . The pores on the underside of the fruit body are round , approximately 2 per mm . The tubes comprising the pores becomes stratified , layering over each other with each successive year of growth . There is a 2 ? 3 mm @-@ thick layer of sterile tissue between pore layers , and mature tube layers are 2 ? 7 mm long .

Microscopically , *B. nobilissimus* is characterized by hyphae with a septum , pseudocystidia originating from the trama , closely appressed hyphae in bundles (fascicles) on the upper surface of the fruit body . The spore @-@ bearing cells , the basidia , are 12 ? 18 by 4 ? 10 µm in size , pear @-@ shaped , and four @-@ spored . The roughly ovoid Basidiospores are 5 @. 5 ? 6 @. 5 by 3 @. 5 ? 4 @. 5 µm , hyaline , smooth , and have thin walls .

= = Habitat and distribution = =

The fruit bodies (also called conks) of *Bridgeoporus* are found singly or sometimes in overlapping layers on old trees (1 ? 2 m (3 @. 3 ? 6 @. 6 ft) diameter at breast height) of noble fir (*Abies procera*) , and more rarely Pacific silver fir (*Abies amabilis*) or western hemlock (*Tsuga heterophylla*) . It has also been recorded growing on a snag of redwood . Other tree species often found in *B. nobilissimus* habitats include Douglas @-@ fir (*Pseudotsuga menziesii*) , western redcedar (*Thuja plicata*) , and western hemlock . Common shrubs at these sites include salal (*Gaultheria shallon*) , Sitka alder (*Alnus sinuata*) , rhododendron (*Rhododendron macrophyllum*) , and Alaska blueberry (*Vaccinium ovalifolium*) . The use of molecular genetic techniques has demonstrated that the fungus also lives in Douglas fir , western hemlock , and western redcedar , although its fruit bodies have not been seen on these hosts .

The fungus has been found in the Cascade Range in Washington and Oregon , the Coast Range on the Olympic Peninsula in Washington , and in Redwood National Park in northern California . Specimens have been found at elevations of 1 @, 000 ? 4 @, 000 feet (300 ? 1 @, 220 m) . Because the fungus feeds on both dead and living wood , it is both parasitic and saprophytic . *B. nobilissimus* fruit bodies do not occur on fallen logs or other forms of dead wood lacking roots or some connection to a root system . Conks have been found growing on the still @-@ living roots of an upturned , windthrown tree , while a once @-@ living conk died within several years after the host tree was uprooted by a fallen tree .

= = Conservation = =

Threats to *Bridgeoporus nobilissimus* include extirpation of known and unknown habitats by logging , fire , or other disturbances , and forestry practices that lead to the loss of large @-@ diameter *Abies procera* and *Abies amabilis* trees and large @-@ diameter stumps and snags in managed forests . Due to the scarcity of its mature tree hosts , *B. nobilissimus* was listed in 1995 as an endangered species by the Oregon Natural Heritage Program , making it the first of the fungi to be listed as endangered by any private or public agency in the United States . It is the sole fungus in category A of the survey and management guidelines for fungi under the Northwest Forest Plan , meaning pre @-@ disturbance surveys and site management are needed before developing areas known to harbor the fungus . There were 13 known sites with the fungus before 1998 ; extensive surveying in the Pacific Northwest increased this number to 103 sites by 2006 . Although it is infrequently observed , the fungus is more abundant than fruit body appearance indicates . Using genetic markers to detect the fungus mycelium in hosts , researchers found that *B. nobilissimus* was present at low to moderate levels and widespread in forest stands containing at least a single visible fruit body . It was detected in trees of all sizes , and in species not previously thought to harbor the fungus . *B. nobilissimus* may require decades of mycelial growth in its host before fruit body production is initiated . The fungus has not been successively grown in vitro despite several attempts .