The Genus *Tricholoma* in North America

Steve Trudell

Note: Most of the material presented in this article has been taken, with modification, from Tricholomas of North America: A Mushroom Field Guide, by *Alan Bessette, Arleen Bessette, Bill Roody, and Steve Trudell, newly published by the University of Texas Press.*

Most tricholomas are large showy mushrooms that readily attract the attention of mushroom hunters. Although only a few are popular edibles, all tricholomas are very important ecologically because of their ectomycorrhizal associations with many of the dominant temperate and boreal forest tree species. Unfortunately, when it comes to naming them, probably every North American field mycologist has struggled with the identification of *Tricholoma* species and "*Tricholoma* sp." is a common feature of foray displays and species lists. By and large, the greatest obstacle has been a lack of readily available reference materials, especially those having illustrations in color, which is particularly valuable for distinguishing many tricholomas that are otherwise similar in size, stature, and other morphological characters.

Far more than 100 species of *Tricholoma* have been reported from North America, although the list of well documented taxa is much shorter. Tricholomas often are referred to as trichs (pronounced either "tricks" or "trikes"), although some field guides call them cavaliers or knights. They grow on the ground near certain types of trees and typically fruit from late summer through early winter or even into spring in warmer areas. A few of them are fine edibles, while others are inedible or even poisonous. However, the edibility of the majority of our tricholomas is not well known.

Tricholoma *(Fries) Staude*

What we know as the genus, *Tricholoma*, originated with Elias Magnus Fries in his 1821–1832 publication, *Systema Mycologicum*. In this early version of Fries's classification system, *Tricholoma* constituted one of 36 tribes (Tribe V) within the huge genus, *Agaricus*, which included nearly all of the gilled mushrooms.

Fries defined *Tricholoma* as including fungi that produce white-spored terrestrial mushrooms that are fleshy and relatively robust. They lack a universal veil (so there is no volva on the stalk base or warts/patches on the cap) and either lack a partial veil or have one that is fibrillose or floccose and disappears early, sometimes leaving remnants on the margin of the cap. The cap is hemispherical to obtusely flattened or, when young, somewhat bell-shaped with a thin incurved margin. The gills are of unequal length and emarginate or rounded where they approach the stalk. The stalk is not smooth, but rather is fibrillose, scaly, or has coarse longitudinal striations formed by aggregated fibrils, and its flesh is confluent with that of the cap. The mushrooms exhibit diverse colors. Including additions in his later publications, Fries's *Tricholoma* eventually included over 100 species.

The name, "tricholoma," is derived from two Greek roots—tricho (thrix) = hairy and loma = border or fringe—referring to the fibrillose partial veil remnants found on the cap margin in several species. Interestingly, however, most tricholomas do not exhibit this feature.

Another of Fries's tribes—Tribe III, *Armillaria*—also is important in the history of *Tricholoma*. The principal difference between Fries's armillarias and tricholomas is the existence in the former of a membranous partial veil that leaves a ring on the stalk. Not surprisingly, over time, taxonomists have done a lot of shuttling of species between *Armillaria* and *Tricholoma*, such that now a number of the Friesian armillarias reside in *Tricholoma*.

Tricholoma is considered to have become a genus in 1857 with the publication of Friedrich Staude's *Die Schwämme Mitteldeutschlands insbesondere des Herzogthums Coburg*. However, Paul Kummer and Lucien Quélet each appear as the genus authority in some publications. The type species for the genus is *Tricholoma flavovirens* (Persoon) S. Lundell, which currently is thought to represent the same species as *T. equestre* (Linnaeus) P. Kummer. A recent analysis concluded that, if the two names are in fact synonyms, then *T. equestre* should be used because it is the earlier of the two (Deng and Yao, 2005).

The current concept of *Tricholoma* differs little from Fries's view of it—fleshy terrestrial mushrooms with a white spore-print, smooth, inamyloid spores, parallel gill trama, and (mostly) emarginate or sinuate gill attachment. The typical tricholoma stature features a broadly umbonate cap that is wide relative to the length of the stalk and a

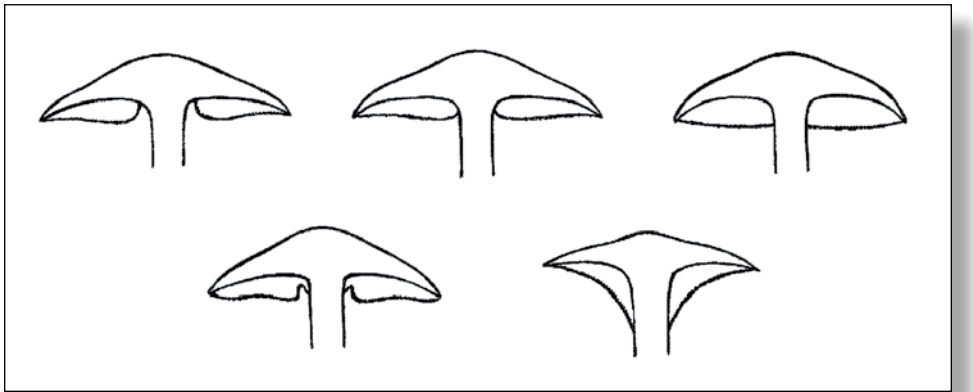

Fig. 1. Examples of gill attachment. Top row, left to right: free, adnexed, adnate. Bottom row, left to right: notched or sinuate, decurrent. Although tricholomas typically have notched or sinuate gills, many will be found with adnexed gills, and some will even appear to be free. Illustration by Marsha Mello.

Fig. 2. *Tricholoma subresplendens*, one of the white-capped tricholomas. It is a W.A. Murrill species that is very similar to, or perhaps the same as, *T. columbetta*. Photo by Bill Roody.

"gutter" around the stalk formed by the emarginate gills. Because the concept now is based in part on microscopic features (mostly their absence), sometimes it is necessary to use a microscope to be certain that you have a tricholoma.

Although gill attachment is rarely, if ever, used to help differentiate species within *Tricholoma*, it is an important character for recognizing the genus. Usually it is described as being emarginate, notched, or sinuate (Fig. 1). Unfortunately, gill attachment can be a rather variable feature and these terms have been interpreted differently from mycologist to mycologist (Leonard, 2000). C.H. Kauffman (1918) described the variability nearly a century ago. "Theoretically, they (the gills) are always *emarginate* behind, but this condition varies considerably. It is true that, in the mature plant, when the pileus is fully expanded, they become either sinuate or emarginate in most cases, although a single specimen may not always be normal in this respect. When young, however, they often do not show this character clearly, but are then adnexed, rounded-adnate, or adnate in such a way that they are merely a little less broad at the attached portion than they are a few millimeters from the stem, and this short distance is often marked by a straight edge rather than a rounded edge... In old stages the gills may even become spuriously decurrent." Thus, when attempting to determine the gill attachment of a putative tricholoma, it is best to examine multiple specimens of different ages and to allow for some latitude in interpretation.

Macroscopic Features Used for Classifying and Identifying Tricholomas

Identification of tricholomas relies heavily on size of the fruitbody and macroscopic features of the cap such as color, the presence or absence of scales or radiating fibrils on the surface, and whether it is dry, moist, or viscid. Odor and taste of the flesh are sometimes defining characters. The gills are white to off-white in most species but can also be grayish, buff, or yellow. Spotting, staining, or discoloring (often reddish brown) of the gills in age (or after damage) is a characteristic feature of many species.

Size of the fruitbodies can vary within a species and so exact measurements are not always useful. However, "small," "medium," and "large," based on the diameter of the mature caps, are handy descriptors. Typically, "small" refers to caps with diameter usually less than 5 cm; "medium" to caps usually between 5 and 10 cm, and "large" to caps usually greater than 10 cm.

The stalk is usually more or less equal but may be swollen in the middle (ventricose), tapered downward, or enlarged to slightly bulbous at the base. It is fleshy or fibrous like the cap and can be solid, stuffed, or hollow. Its surface usually is dry and longitudinally striate, but also can be nearly smooth, appressed-fibrillose, scaly, or slightly scurfy (at the apex only). Stalk color often is white, but it may be tinged with the cap color, or, more rarely, fully concolorous with the cap.

A number of tricholomas have a cortina. In these species, the veil usually is delicate and may be visible only on very young specimens, leaving just a trace of fibrils as a faint ring-zone on the upper portion of the stalk or a fringed margin on the cap. A few species have a more substantial membranous veil that leaves a more or less prominent ring on the stalk.

Staining of the cap surface or, more commonly, the gills and stalk, from bruising, handling, or with age is sometimes important in distinguishing between species. Color-change reactions following the application of chemicals to the fruitbody ("macrochemical" reactions) are not used widely in identifying

Fig. 3. *Tricholoma arvernense*, one of the yellow-capped tricholomas. It was added to the North American list only recently when a DNA sequence from a collection made in Idaho by Andrew Parker was found to be nearly identical to that of European material. It also has been found in California, Oregon, Washington, Alaska, and possibly Newfoundland. Photo by Sava Krstic.

tricholomas, but can be important in some cases. Potassium hydroxide (KOH), ammonium hydroxide (NH_4OH), and paradimethylaminobenzaldehyde (PDAB) are of most use.

Common odors of tricholomas include farinaceous, cucumber, coal tar, and, of course, the matsutake's spicy cinnamon aroma. In many species, the odor is pleasant, although not easily describable. The more common tastes are mild, bitter, and farinaceous.

In addition to these macromorphological features, knowing which species of tree the mushrooms were growing with can be critical for identifying them. When found beneath isolated trees, or in more or less pure stands, the associate is fairly obvious. However in mixed woodlands containing a variety of ectomycorrhiza-forming trees, it can be more difficult to determine a specific relationship. At a minimum, it is important to know whether the nearby trees were conifers or hardwoods, and so this information should always be included in your field notes.

Microscopic Features Used for Classifying and Identifying Tricholomas

Microscopic features are important for distinguishing the genus *Tricholoma* from other genera that are similar macroscopically. However, they generally are less distinctive, less variable, and less helpful for distinguishing species in *Tricholoma* than they are in many other genera. The spores are smooth and non-amyloid, cystidia are present only in some species (then usually cheilocystidia), and cap cuticle usually is radially filamentous. The shape and size of the spores and cystidia, the presence of clamp connections, and the structure of the cap cuticle (especially the presence of a so-called pseudoparenchymatous hypodermium) are the most commonly used microscopic features.

Fig. 4. *Tricholoma floridanum*, another of the yellow-capped tricholomas. This is one of the many not-well-known species described by W.A. Murrill from Florida. Photo by Alan and Arleen Bessette.

Morphologically Similar Genera

Following Fries's initial definition of *Tricholoma*, some of the species he included in the genus were transferred to other existing or newly created genera, such as *Calocybe, Dermoloma, Lepista/Rhodopaxillus, Leucopaxillus, Lyophyllum, Melanoleuca, Porpoloma, Rhodocybe, Tephrocybe, Tricholomopsis,* and *Tricholosporum*. Because many of the mushrooms in these pale-spored genera share the essential macroscopic features of tricholoma, they can be mistaken for a tricholoma. Thus, the following brief descriptions summarize the key features for distinguishing them from tricholomas.

Amanita—universal veil present, leaving a volva on the stalk base, and often warts or patches on the cap; skirt-like ring often present; gills free or nearly so, often seceding. Cap margin often striate. Most have an elegant gestalt, not easily described, but readily appreciated with a bit of experience.

Armillaria (the honey mushrooms, formerly armillariella)—usually found on wood, often in clusters, tough black "bootlace" rhizomorphs often present in substrate, the typical honey colors of their fruitbodies are rare or absent in tricholomas, gills adnate to decurrent.

Calocybe—white or brightly colored fruitbodies, basidia contain siderophilous granules, spores sometimes roughened, cap cuticle sometimes cellular.

Catathelasma—large, hard-textured mushrooms, adnate to decurrent gills, stalk tapered downward and with double ring, amyloid spores.

Clitocybe—gills usually decurrent and fruitbodies often funnel-shaped, at least at maturity.

Collybia sensu lato (including gymnopus and rhodocollybia)—cap margin incurved to inrolled (at least when young), stalk with a cartilaginous rind, gills adnexed to adnate, spores usually pinkish in rhodocollybia.

Dermoloma—smallish fruitbodies, cap cuticle hymeniform (radially filamentous in tricholomas), spores amyloid in some species.

Floccularia—spores amyloid, stalks typically floccose, usually with a membranous ring.

Hygrophorus (*sensu stricto*, the medium to large, mostly

Fig. 5. *Tricholoma* "*quercetorum,*" another yellow-capped species. As the epithet suggests, it occurs with oaks. It has not yet been described formally and, when it does, it will need a new epithet as "quercetorum" already is in use for a different (European) species. Photo by Noah Siegel.

Fig. 6. *Tricholoma nigrum*, one of the gray-capped tricholomas. This little-known species was described in 1996 by Kris Shanks and Clark Ovrebo from material collected in Oregon. It now is known from Washington, and possibly Newfoundland, as well. Photo by Steve Trudell.

dull-colored species)—gills thick and waxy-looking, adnate to decurrent, gill trama divergent when young.

Laccaria—fruitbodies with distinctive orange-brown, pinkish-brown, or purplish colors that are rare or absent in Tricholomas, gills thick and waxy-looking, usually pinkish brown, lilac, or purple, stalk rather tough and fibrous, spores spiny.

Lepista—spore-print with pinkish tones, spores roughened.

Leucopaxillus—abundant mycelial cords or mat often present at base of stalk, fruitbodies often very firm and slow to rot, spores amyloid, sometimes roughened.

Lyophyllum (including tephrocybe)—basidia contain siderophilous granules, fruitbodies usually dull colored and often with greasy appearance, many species stain black.

Megacollybia—usually found on wood (may be well rotted), gills rather broad, their edges with abundant cystidia.

Melanoleuca—cap hygrophanous and often broad relative to stalk length, spores amyloid, roughened, gills usually with abundant cystidia.

Porpoloma—spores amyloid, gill edges typically with cystidia.

Tricholomopsis—usually found on wood, often bright yellowish, gill edges often with abundant cystidia.

Tricholosporum—spores angular, or shaped like crosses.

In addition to these pale-spored genera, many entolomas and hebelomas have the same stature as a typical tricholoma. However, they are easily recognized by their salmon/pinkish brown and dull brown spores, respectively. Small brownish tricholomas can appear very inocybe-like but, again, spore-color (brown in inocybes) quickly separates them.

Subdivision of Tricholoma

Tricholoma has been divided into subgroups since its creation. In *Systema Mycologicum* (1821–1832), Fries recognized four groups based on the nature of the cap surface. In *Epicrisis Systematis Mycologici* (1836–38), he recognized seven groups, mostly based on the nature of the cap surface, but also including consideration of such things as season of occurrence and the fleshiness, fragility, and shape of the cap. Each of these groups was then divided further based on color, width of the gills, and discoloration of the gills. For the most part, Fries retained this latter classification in his later works, although he did make minor revisions, changed some names, and moved some species around.

Most mycologists of the late 1800's and early 1900's, including Charles Horton Peck and C.H. Kauffman in the United States, divided the genus in ways very similar to Fries's scheme. Additional macroscopic features such as odor, taste, size, and color were utilized in many of these groupings. Of course, as genus definitions evolved and species were moved (mostly) out of *Tricholoma*, the changing species composition of the genus was reflected in its subdivision. In parallel with the new genus alignments based on microscopic features, the subdivision of *Tricholoma* also began to reflect microscopic features, such as the presence of clamp connections, anatomy of the cap cuticle, and location of pigments in the colored species (inside or outside of the hyphae).

Because many of the features that have been used to define the subgroups are gradational and not always easy to apply, Kauffman (1918) observed that, "The grouping of this large genus is fraught with considerable difficulties." At present, perhaps the two most widely used subdivisions of the genus are those by Marcel Bon (1984) and Rolf Singer (1986). These are likely to be revised substantially, or even replaced, as the results of molecular studies and morphological-molecular integration lead to increased understanding of the evolutionary relationships within the group. For identification purposes, division into four groups based on cap color—white/silver, yellow, gray, and brown—provides a practicable, albeit artificial, scheme (Figs. 2–9).

History of the Study of Tricholoma *in North America*

Despite the fact that tricholomas are among the more conspicuous of our woodland fungi, the genus historically has received relatively little attention in North America.

Fig. 7. *Tricholoma niveipes*, another gray-capped species. It occurs in sandy quartz-rich soils and like many mushrooms in such habitats, has a strong farinaceous odor in the mycelium as well as the fruitbody. Photo by Bill Roody.

Fig. 8. *Tricholoma transmutans*, one of the brown-capped tricholomas. This relatively little-known species, described by C.H. Peck, appears to be widespread in the northern USA and Canada. For instance, it is said to be perhaps the most common tricholoma in Québec. Photo by Bill Roody.

Charles Horton Peck described over 60 *Tricholoma* species in the late 1800's and early 1900's, although many of them later were transferred to other genera. In what still is the only comprehensive treatment of the genus in North America, William Alphonso Murrill prepared the "*Tricholoma*" section of the North American Flora (1914), under the genus names *Melanoleuca* and *Cortinellus*. Thus, many non-tricholomas (in the current sense) were included in Murrill's compilation.

C.H. Kauffman's *Agaricaceae of Michigan* (1918) included an extensive treatment of the tricholomas of the Great Lakes region. During his prolific career, Alexander Smith of course studied the genus and described a number of species. However, he did not deal with it in a comprehensive fashion.

Probably the most active North American student of *Tricholoma* over the past few decades has been Clark Ovrebo. His master's thesis (1973) and Ph.D. dissertation (1980) covered the tricholomas of the Pacific Northwest and the Great Lakes region, respectively. Since completing his graduate studies, Ovrebo has continued work on the genus and has published a number of articles, describing new species and interpreting some of Peck's species concepts.

Kris Shanks surveyed the tricholomas of California for her master's degree (1994) and later published the bulk of her thesis as a fascicle of the *Agaricales of California* series (1997). A number of other mycologists, including Tim Baroni, Howard Bigelow, Roy Halling, and Scott Redhead have made contributions to our knowledge of *Tricholoma* in North America. In addition, amateur mycologists have helped expand our understanding in areas such as the northeastern USA (Ed Bosman), southeastern Canada (Yves Lamoureux and Jean Després), and Pacific Northwest (Charles Volz, Coleman Leuthy, Paul Kroeger, and Andrew Parker).

Ecology of Tricholomas

It is believed that all tricholomas are ectomycorrhizal or, in some cases, arbutoid mycorrhizal, forming a mutually beneficial association with many trees, some shrubs, and possibly even some herbaceous plants. Thus, they are nearly always found where trees are present, most often in forests and parks. Among the trees known to partner with tricholomas are oak, beech, birch, willow, aspen, cottonwood/poplar, pine, spruce, fir, hemlock, and Douglas-fir.

Beyond their association with forest trees, not much is known about the habitat requirements of tricholomas. However many of them, such as the matsutake, occur in very nutrient-poor soils such as those with a high proportion of quartz sand. In many areas, tricholomas are among the late-season fruiters, along with species of *Cortinarius* and *Hygrophorus*. For instance, in a 5-year survey of Gwaii Haanas National Park in Haida Gwaii (formerly known as the Queen Charlotte Islands, located off the coast of British Columbia) conducted by Paul Kroeger, Bryce Kendrick, and others, the *Tricholoma* species count increased from 2 to 13 in a single season when collecting extended beyond September into late October and November (in most years, access to Gwaii Haanas National Park is not allowed after mid-September).

Interestingly, some tricholomas serve as hosts for myco-heterotrophic plants such as *Monotropa hypopitys* (pinesap, Fig. 10) and *Allotropa virgatum* (candystick, Fig. 11). In these associations the plants, which do not contain chlorophyll and thus cannot make their own food via photosynthesis, obtain both their carbon compounds and other nutrients from the fungus partner. Consequently, these plants are considered parasites, although the possibility that they are contributing some as-yet unrecognized benefit to the fungi cannot be ruled out.

Edibility of Tricholomas

Tricholoma includes many large fleshy mushrooms, and some of them are common and often abundant. Because of this, they are likely to attract the attention of those who collect wild mushrooms for food. Unfortunately, tempting as they

Fig. 9. *Tricholoma grave*, another brown-capped species. It is a very large and not-well-known species described by C.H. Peck. Photo by Noah Siegel.

Fig. 10. *Monotropa hypopitys* (pine sap), a myco-heterotrophic plant that associates with species of *Tricholoma* such as *T. flavovirens*, *T. portentosum*, *T. saponaceum*, *T. sejunctum*, and *T. terreum*. Photo by Steve Trudell.

Fig. 11. *Allotropa virgata* (candystick), a myco-heterotrophic plant that apparently associates exclusively with *Tricholoma magnivelare*, the American matsutake. Photo by Steve Trudell.

may appear, relatively few members of the genus are known to be particularly good edibles. The edibility of many species is unknown, some are decidedly toxic, and one has proven deadly under certain circumstances. Add to this that edible tricholomas can be difficult to distinguish from those that are suspect or poisonous, and it becomes clear why they are not widely gathered for the table.

The principal exceptions are *T. magnivelare*, *T. portentosum*, and *T. equestre*/*flavovirens*. *Tricholoma magnivelare* (Fig. 12) is the highly prized American matsutake, which some mycophagists consider to be among the best of all edible wild mushrooms. Its characteristic spicy aroma has been famously described by David Arora as "a provocative compromise between 'red hots' and dirty socks."

The gastronomic quality of matsutake's close relative, *T. caligatum*, has received mixed reviews. Often it has been described as intensely bitter and/or acrid and unpalatable. However, at other times it has been said to be mild, palatable, and even an excellent edible. *Tricholoma caligatum* is highly variable morphologically and it may be that different populations differ in their palatability. It also is possible that there is more than one species going by that name.

Tricholoma portentosum (Fig. 13) is a widely distributed edible that, particularly in the East, can be quite common beneath pines from late fall into winter. It is appreciated both for its flavor and availability well after most other edible wild mushrooms have finished fruiting for the season. Sometimes it

can be found together with the lesser known *T. intermedium*, also a good edible.

Although no tricholoma is known to be dangerously poisonous when consumed in small amounts, one widely eaten species, *T. equestre*/*flavovirens* (Fig. 14), surprisingly has been implicated in fatal incidents in Europe. Historically, this seemingly widespread mushroom has been regarded by many (outside of Japan, at least) as the best edible in the genus. However, in 2001, Bedry and others reported a dozen cases of poisoning, including three fatalities, in France, all following consumption of several consecutive meals that included large amounts of *T. equestre*/*flavovirens*. The victims experienced severe rhabdomyolysis, a disease that destroys muscle tissue. Similar poisonings also have been reported from Poland. Nothing resembling the European incidents has been reported from North America. However, despite the clean record here, caution would suggest avoiding *T. equestre*/*flavovirens* until the reasons behind the puzzling occurrence of the European poisonings are known. At a minimum, one should not eat large amounts of this, or any other, mushroom repeatedly over a short (on the order of a few days) time.

The North American Species

Currently, it is not possible to provide complete or definitive coverage of *Tricholoma* for a number of reasons. For one, compared to the situation in Europe, North American mushrooms are poorly known and nearly all groups are in need of much additional study, particularly the brown-capped species around *T. pessundatum* and the gray-capped species around *T. myomyces*. For another, mushroom systematics (naming, classifying, and study of their evolutionary relationships) is in a state of rapid flux. Analysis of the large amount of DNA sequence and other molecular data being produced is leading to many changes in how we view the evolutionary relationships among mushroom fungi and, as a result, in their classification and names. Fortunately, *Tricholoma* has been affected much less by these developments so far than many other mushroom groups and so the impact on mushroom hunters has not been great—but that is likely to change before long, so be prepared.

For now, a bigger issue comes from not knowing whether the North American fungi to which European names have been applied really do belong to the same species. Few, if any, mycologists have spent enough time on both continents to have firsthand comparative knowledge of large numbers of their respective fungi and few critical studies have been done to evaluate our use of European names. The more comprehensive studies that have been done, which unfortunately do not include *Tricholoma*, suggest that many of our species are essentially the same as their European counterparts. However, for many others, our fungi do not quite fit the European concepts and thus probably should be given new names or have existing, but unused, North American names resurrected. For now, we have no alternative but to continue with our use of European *Tricholoma* names, but with the recognition that many might not be good ones for our fungi.

So, with these caveats, Table 1 presents a preliminary listing of North American tricholomas, with emphasis on "preliminary." Inclusion on the list indicates that there is good evidence of its status as a species and its existence in North America. However, the literature contains mention of

Fig. 12. *Tricholoma magnivelare*, the American matsutake, popular as an edible in North America and collected in large amounts in the West for export to Japan, where it has great value and cultural significance. Photo by Steve Trudell.

Fig. 13. *Tricholoma portentosum*, popular as a late-season edible in eastern North America. Photo by Bill Roody.

many more species than are on this list. Those have not been included for one or more of a number of possible reasons: (1) the species has not been widely or commonly recognized, and its original description is too brief to provide a well defined concept that would allow confident identification; (2) although the species has been reported as occurring here, those reports have been scattered, not thoroughly documented, and often involve the application of European names; (3) the species is thought to be a new taxon, but has not yet been formally described.

Many of the not-included species were described by the American mycologist, William Alphonso Murrill. The combination of the brevity of his original descriptions and the fact that many of his collections were made in areas, particularly Florida, that have been little studied by other mycologists makes it very difficult to apply many of his names. Many of Charles Horton Peck's species descriptions are similarly brief and difficult to interpret and apply. Keep in

Fig. 14. *Tricholoma equestre*, popular as an edible in North America. However, fatal poisonings caused by this species in Europe suggest that considerable caution should be exercised when consuming it. Photo by Steve Trudell.

mind, though, that absence from the list does not necessarily mean a species does not occur in North America. Indeed it is quite likely that some of them do and, hopefully, future work will confirm their presence.

Efforts are now underway to initiate a long-term comprehensive survey of North American macrofungi—the North American Mycoflora Project (http://www.northamericanmycoflora.org/). The website for the project includes links to background documents that explain the need for and rationale behind this ambitious undertaking. If sufficient funding can be secured and, across the continent, mushroom hunters get involved, this would provide a great opportunity to develop a better understanding of the tricholomas and other mushrooms that inhabit North America and help make our lives not only enjoyable, but possible. Please take time to learn about the project and then join us!

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Table 1. Preliminary non-exhaustive list of *Tricholoma* species in North America. See text for discussion. For each species, the cap-color group(s) and general distribution in North America are indicated. Cap-color groups: Wh (white/silver), Y (yellow), G (gray), B (brown). Distribution: E (east of the Rocky Mountains), W (Rocky Mountains and westward).

- *T. acre* Peck/Hot gray trich (G/E, W)
- *T. aestuans* (Fries) Gillet (Y/E, W)
- *T. albidulum* N. Ayala, G. Moreno and Esteve-Raventós (Wh/W)
- *T. albidum* Bon (Wh/E)
- *T. apium* Jul. Schäffer (Wh, B/E, W)
- *T. argenteum* Ovrebo (Wh, G/E, W)
- *T. arvernense* Bon (Y, B/W)
- *T. atrodiscum* Ovrebo (G/E)
- *T. atrosquamosum* (Chevalier) Saccardo/Black-scaled trich (Wh, G/E, W)
- *T. atroviolaceum* A.H. Smith (G/W)
- *T. aurantio-olivaceum* A.H. Smith (Y, B/W)
- *T. aurantium* (Schaeffer) Ricken/Orange-sheathed trich (B/E, W)
- *T. caligatum* (Viviani) Ricken/Brown matsutake (Wh, B/E, W)
- *T. cingulatum* (Almfelt) Jacobasch/Belted trich, girdled trich (Wh, G/E, W)
- *T. colossus* (Fries) Quélet/Giant trich (B/E)
- *T. davisiae* Peck (Y, B/E, W)
- *T. dryophilum* (Murrill) Murrill (Wh, B/W)
- *T. equestre* (Linnaeus) P. Kummer/ Man-on-horseback, canary trich, yellow trich (Y/E, W)
- *T. farinaceum* (Murrill) Murrill (Wh/W)
- *T. floridanum* (Murrill) Murrill (Y/E)
- *T. focale* (Fries) Ricken (B/E, W)
- *T. fracticum* (Britzelmayr) Kreisel (B/W)
- *T. fulvimarginatum* Ovrebo and Halling (B/E)
- *T. fulvum* (Bulliard) Saccardo/Brown birch trich (B/E, W)
- *T. fumosoluteum* Peck (Y/E)
- *T. grave* Peck (B/E)
- *T. griseoviolaceum* Shanks (Wh, G/W)
- *T. hordum* (Fries) Quélet (G/E)
- *T. huronense* A.H. Smith (G/E)
- *T. imbricatum* (Fries) P. Kummer/ Shingled trich (B/E, W)
- *T. inamoenum* (Fries) Quélet (Wh/E, W)
- *T. insigne* Ovrebo (G, B/E)
- *T. intermedium* Peck (Y/E, W)

T. luteomaculosum A.H. Smith (Y, G/E, W)
T. magnivelare (Peck) Redhead/ Matsutake, pine mushroom, American matsutake, white matsutake (Wh, B/E, W)
T. manzanitae Baroni and Ovrebo (Wh, B/W)
T. marquettense Ovrebo (Wh, G/E)
T. moseri Singer (G, B/W)
T. muricatum Shanks (B/W)
T. muskokense nom. prov. (Ovrebo) (B/E)
T. mutabile Shanks (G/W)
T. myomyces (Persoon) J.E. Lange (G/E, W)
T. nigrum Shanks and Ovrebo (G/W)
T. niveipes Peck (G, B/E)
T. odorum Peck (Y/E, W)
T. olivaceobrunneum Ovrebo (G, B/E)
T. palustre A.H. Smith (Y/E)
T. pardinum (Persoon) Quélet/Dirty trich, poisonous trich (Wh, G/E, W)
T. pessundatum (Fries) Quélet/Red-brown trich (B/E, W)
T. populinum J.E. Lange/The sandy, sand mushroom, poplar trich (B/E, W)
T. portentosum (Fries) Quélet/Sticky gray trich (G/E, W)
T. pudorinum nom. prov. (Ovrebo) B/E)
T. pullum Ovrebo / Dusky trich (G/E)
T. quercetorum nom. prov. (*sensu* Lamoureux)[(1)](Y/E)
T. roseoacerbum A. Riva (B/E)
T. saponaceum (Fries) P. Kummer/ Soap-scented trich (Y, G, B/E, W)
T. scalpturatum (Fries) Quélet (G, B/E, W)
T. sejunctum (Sowerby) Quélet (Y/E, W)
T. serratifolium Peck/Saw-tooth trich (Wh, B/E)
T. silvaticoides (Murrill) Murrill (Wh/E)
T. squarrulosum Bresadola (G/E, W)
T. subaureum Ovrebo (Y, B/E)
T. subluteum Peck (Y/E)
T. subresplendens (Murrill) Murrill (Wh/E)
T. sulphurescens Bresadola (Wh, Y/E, W)
T. sulphureum (Bulliard) P. Kummer/ Sulfur trich (Y/E, W)
T. terreum (Schaeffer) P. Kummer/Earth-colored trich, gray trich (G, B/E, W)
T. transmutans Peck (B/E, W)
T. tumidum (Persoon) Ricken (Y/W)
T. ustale (Fries) P. Kummer (B/E, W)
T. vaccinum (Schaeffer) P. Kummer/ Scaly trich, russet-scaly trich (B/E, W)
T. venenatum G.F. Atkinson (Wh, B/E, W)
T. vernaticum Shanks (Wh, B/W)
T. virgatum (Fries) P. Kummer/Fibril trich, streaked trich (Wh, G/E, W)

[(1)] Should this taxon be formally described as a new species, it will require a different epithet, as '*quercetorum*' already has been used for a species that occurs in the Mediterranean region (*T. quercetorum* Contu).

Watercolor painting by Lily Rankin who writes: *"I am 17 years old and live in Copley, Ohio. I attended Spring Garden Waldorf School as a child. I have always loved nature. Mushrooms are beautiful and ancient looking. I love to paint and hope to be an artist or a medical illustrator."* Email: lilyrnkn@gmail.com