SPECIES OF PHOLIOTA OF THE REGION OF THE GREAT LAKES

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The genus Pholiota includes plants with rusty or ochraceous spores, a well developed annulus, adnate or adnexed lamellae and a fleshy stem. These features are not absolutely distinctive of all the species for the color of the spores runs into the purple brown of Stropharia and the veil is sometimes as scanty as the fibers of a Flammula or clings to the margin of the pileus as in the genus Hypholoma.

Individuals in the same species often vary greatly and some different species are connected by numerous forms. As far as possible we have chosen characteristic plants for the photographs. Striking divergences from published descriptions have been noted but we have not made any new species when our plants failed to agree in all minor points with the descriptions of the species to which we have referred them.

We have endeavored to put together those species most alike in habit, structure and general appearance, arranging them under a series of types. The system of Fries has been followed. His three main divisions: plants growing on the ground, on wood, and among mosses are convenient though by following them some species like Pholiota terrigera and Pholiota angustipes are thrown out of their true relationship and the two similar types represented by Pholiota togularis and Pholiota marginata are widely separated. We have neglected the divisions based on the shade of color of the spores entirely as it is impossible to put similar plants together with that arrangement.

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The genus includes plants of very diverse habits since it is based on only two characters, spore color and annulus. The most typical are the bright colored clusters of the squarroso and squamose group growing on the trunks of trees. They have the characteristic universal veil composed of matted fibers which tear apart as the plant expands leaving the stem annulate and the margin of the pileus appendiculate. Large plants growing on the ground of the type of Pholiota caperata can scarcely be distinguished from Stropharia. Others of the praecoex-dura type are very similar to the appendiculate forms of Hypholoma and some of the species with smooth caps and scanty collars might almost as properly be placed in the genus Flammula. But all divisions are more or less artificial and spore color and annulus are perhaps as well marked characters as can be found on which to base a genus.

The species of Pholiota which grow on the trunks of trees are important from an economic point of view for they are quite as destructive to timber as some of the polypores. The mycelium grows for a long time in the wood before it is prepared to burst forth under favorable weather conditions into the handsome gold and yellow clusters which adorn the trunks of decaying trees in late summer and autumn.

Stevenson remarks that “none of the species of Pholiota can be commended as edible” but none of them are known to be poisonous or harmful. Some of them like Pholiota caperata are very delicious. No one need be afraid to try them.

We have not attempted to make an artificial key to the species but we think that the synopsis together with the pictures will enable anyone to recognize easily the plants we have had in hand. We have added under each type notes on the related species which are reported from the United States as far as they have come to our notice. These notes have been compiled from published descriptions. It is probable that some of the species reported, such as those described by Montagne from dried plants sent to him from Ohio by Sullivan, will never be identified.

Except in the cases noted the illustrations are natural size and give the average for the species. We have given few meas-
urements as it is difficult to fix the limits. There are few species in which very large and very small individuals do not occur.

The plants have been collected and photographed at different places in Michigan, Wisconsin and Illinois during the past four years. The district is quite rich in these plants and there is no reason why many of the species listed in the notes may not also be discovered here as well as a number of others that occur in Europe.

**Synopsis of the Species.**

A. Growing on the ground (Terrigenae).
   1. Large plants with a thick persistent annulus. Type of Pholiota caperata.
      Pholiota caperata (Pers.) p. 476, pl. XXIV.
      Pholiota ........ p. 476, pl. XXV.
      Related species: Pholiota johnsoniana, Pk.

   2. Large plants with a membranous annulus.
      Pholiota howeana, Pk. p. 477, pl. XXVI.
      Related species: Pholiota ventricosa, Earle.

   3. Medium sized plants with a membranous annulus. Type of Pholiota praecox and Pholiota dura.
      Pholiota praecox (Pers.) p. 478, pls. XXVII and XXVIII, A, B.
      Pholiota vermiflua, Pk. p. 478, pl. XXVIII, C-F.
      Pholiota temnophylla, Pk. p. 479, pl. XXXIII, A.
      Pholiota dura, Bolt. p. 480, pl. XXIX.
      Related species: Pholiota mollicula, Bann. and Pk., Pholiota durolides, Pk.

   4. Medium sized plants with a membranous annulus and viscid pileus. Type of Pholiota erebia.
      Pholiota erebia, Fr. p. 481, pl. XXX.
      Pholiota ombrophila, Fr. p. 482, pl. XXXI.
      Related species: Pholiota aggericola, Pk. and Pholiota aggericola var. retriguis, Pk.
5. Small plants with a membranous annulus. Type of Pholiota togularis.
   Pholiota togularis (Bull.) p. 482, pl. XXXII.
   Related species: Pholiota togularis var. filaris, Fr., Pholiota blattaria, Fr., Pholiota rugosa, Pk., Pholiota anomala, Pk., Pholiota sabulosa, Pk.

6. Plants with a universal fibrous veil which leaves a fibrous annulus on the stem when the pileus expands, usually caespitose.
   Pholiota terrigena, Fr. p. 484, pl. XXXIII, B.
   Pholiota augustipes, Pk. p. 484, pl. XXXIV.
   Pholiota speciosa, Clements and Pholiota rubecula, Bann & Pk. belong in the division Terrigenae.

7. Type of Pholiota squarrosa.
   Pholiota squarrosa, Muell. p. 485, pl. XXXV, A.
   Pholiota squarrosa, var. verruculosa, Lasch. p. 486, pl. XXXV, B.
   Pholiota squarrosoides, Pk. p. 486, pls. XXXVI and XXXVII.
   Related species: Pholiota squarrosoides var. faginea, Pk., Pholiota subsquarrosa, Fr., Pholiota dactyliota, B. & M.

8. Type of Pholiota aurivella.
   Pholiota aurivella, Batsch. p. 487, pls. XXXVIII, XXXIX.
   Pholiota adiposa, Fr. p. 487, pl. XL.
   Related species: Pholiota limonella, Pk., Pholiota villosa, Fr.

9. Type of Pholiota flammans.
   Pholiota flammans, Fr. p. 488, pl. XLI, C.
   Pholiota tuberculosa, Fr. p. 489, pl. XLI, A, B.
   Related species: Pholiota curvipes, Fr., Pholiota hormomorpha, Mont.
10. Type of Pholiota albo-crenulata.
   Pholiota albo-crenulata, Pk. p. 490, pls. XLII, XLIII.
   Related species: Pholiota fusca, Quel. (Europe).

11. Type of Pholiota spectabilis.
   Pholiota spectabilis, Fr. p. 490, pl. XLIV.
   Related species: Pholiota aurea, Matt.

12. Type of Pholiota comosa.
   Pholiota comosa, Fr. p. 491, pl. XLV.
   Related species: Pholiota destruens, Boud.

13. Type of Pholiota heteroclita.
   Pholiota heteroclita, Fr. p. 492, pls. XLVI, XLVII.

14. Type of Pholiota luteofolia.
   Pholiota luteofolia, Pk. p. 492, pl. XLVIII.
   Pholiota fulvo-squamosa, Pk. belongs to the section Squamosae.

II. Pileus nearly naked, sometimes rimose-rivulose (Aegeritinae).

15. Type of Pholiota aegerita.
   Pholiota aegerita, Brigant. p. 493, pl. XLIX.

16. Type of Pholiota lutea.
   Pholiota lutea, Pk. p. 493, pl. L.
   Related species: Flammula alnicola, Fr.
   Pholiota capistrata, Cke. Pholiota radicosa, Bull., Pholiota ornella, Pk. and Pholiota aeruginosa, Pk. belong to the section Aegeritinae.

III. Small plants with scaly or bristly pileus and stem.

17. Type of Pholiota muricata.
   Pholiota erinaceella, Pk. p. 495, pl. LI.
   Pholiota muricata, Fr. p. 495, pls. LII and LIII.
IV. Small plants with an hygrophanus pileus and membranous annulus (Hygrophanace).

18. Type of Pholiota marginata.
   Pholiota marginata, Batsch p. 496, pls. LIV and LV.
   Related species: Pholiota marginella, Pk., Pholiota unicolor, Fl.
   Dan., Pholiota mutabilis, Schaeff., Pholiota autumnalis, Pk., Pholiota
discolor, Pk.

19. Type of Pholiota confragosa.
   Pholiota confragosa, Fr. p. 497, pl. XLI, D. E.
   Pholiota acericola, Pk. and Pholiota ceracina, Pk. belong to
   the section Hygrophanace.

C. Very small plants growing among mosses.
   Pholiota mycenoides, Fr., Pholiota pumila, Fr., Pholiota
   rufidula, Kalleh., and Pholiota minima, Pk. are reported from
   this country.
A. Growing on the ground.
   I. Large plants with a thick persistent annulus. Type of Pholiota caperata.

**Pholiota caperata**, (Pers.). Pl. XXIV.

**WRINKLED PHOLIOTA.**

A fine large species growing on the ground in woods and open places and moosy swamps, scattered or gregarious, frequent in this country and Europe. The specimens photographed were collected at Neebish, Mich., in September. They show the average size of the plants but the variation is great.

**Pileus** firm and fleshy, small for the size of the stem, ovate when young becoming broadly bell shaped and expanded, obtuse, glabrous, yellow or alutaceous, usually covered with white flocci especially when young. The fibers wash off in wet weather and the pileus becomes somewhat soggy. In the plants I have seen the pileus is deeply striate. **Flesh** whitish, thin toward the margin, mild. **Lamellae** moderately close, adnate or broadly notched, more or less uneven on the edge, whitish becoming rusty with spores. **Stem** solid or stuffed, equal, white, glabrous or floccose, remains of the universal veil sometimes suggesting a volva at the base. **Annulus** thick and white, near the middle of the stem. **Spores** elliptic, 7—8x13—14μ.

**Pholiota** ............. Pl. XXV.

Two collections of these plants were made in Sept., 1910, one at Blue Mounds and the other at Devil’s Lake, Wis. They grew on the ground in thin woods.

They differ from Pholiota caperata in the shorter, floccose stems, the small spores, the squamose pileus and the striate annulus. The annulus is exactly like that of Stropharia bilamellata, Pk., and Dr. Peck to whom photographs and descriptions were submitted considered that the plants might belong to that species but recent collections of what seems to be true Stropharia bilamellata make the reference doubtful; the spores are very small and rusty brown, not purple brown, and the pile-
us is squamose. Striations or ridges on the annulus have been noted in Pholiota aurea, Pholiota rugosa, Pholiota togularis, var. filaris and in Stropharia coronilla. The ridges in our plants are very marked.

Pileus fleshy, convex becoming plane, obtuse, even, slightly viscid when moist, smooth or squamose with innate darker colored fibers, yellowish. Flesh white. Lamellae close, adnate or slightly notched, becoming dark ferruginous brown with white eroded edges. Stem short, enlarged below, white floccose, solid becoming stuffed or hollow. Annulus thick with deep radiating ridges on the upper surface. Spores ferruginous brown, elliptic, 3—4 x 5—6 μ.

The plant photographed is a very large specimen.

Note. Pholiota johnsoniana, Pk., is another species of this type. It is somewhat smaller than Pholiota caperata, has a similar thick annulus and even white stem. It was described and figured by Peck, N. Y. State Mus. Rep’t 23 p. 98 and Pl. Ill. It is also described and photographed by Atkinson, Mushrooms, p. 153. Reported from Michigan by Kauffman.

2. Large plants with a membranous annulus.

Pholiota howeana, Pk. (†).

The plant photographed was found growing on the ground in open damp woods at Glencoe Ill., in June.

Pileus heavy, fleshy, convex to plane or depressed when old, smooth, moist, even, dirty whitish or yellowish becoming dark colored. Flesh thick and white. Lamellae broad, ventricose, adnate, whitish becoming rusty brown with spores. Stem white, much thickened towards the base and fusiform rooted, slightly enlarging towards the apex, scaly and shreddy below the collar. Annulus broad, membranous, entire. Spores 4—5 x 8—9 μ.

The plant is close to Pholiota howeana, Pk., N. Y. State Mus. Rep’t 26, pp. 59—60 (Stropharia howeana) and Mus. Bull. 122 p. 147.

Pholiota ventricosa, Earle, Bull. N. Y. Bot. Garden 1902 p. 341, is another species based on plants very similar to ours.
The plants grow in pine woods at Leland Stanford University, California. The habit, size and shape of the stem are very similar and the spore measurements exactly the same as in our plants but the colors are darker.

3. Medium sized plants with a membranous annulus. Type of Pholiota praecox and Pholiota dura.

**Pholiota praecox**, (Pers.). Pls. XXVII and XXVIII, A, B.

**EARLY PHOLIOTA.**

The early Pholiota is quite common on manured lawns and in grassy places during the spring and summer. The plants photographed were collected near Chicago in June.

Pileus smooth, white with more or less yellowish or tan color, especially in the center, usually convex but sometimes umbonate. Lamellae broadly sinuate adnexed, slightly ventricose, whitish becoming rusty or fuscous brown. Stem white, smooth, more or less striate, even or slightly tapering downward, straight or flexuous. Annulus thin, membranous, separating from the pileus or from the stem. Spores rusty 6—8x10—12 μ.

The species is variable, Peck reports:

Var. sylvestris. Pileus with a brown center. Growing in woods. Var. minor. Small, with the veil separating from the stem and remaining as an appendiculate margin on the pileus.

**Pholiota vermiflua**, Pk. Pl. XXVIII, C—F.

**WORMY PHOLIOTA.**

The species is described in N. Y. State Mus. Rep't 31, p. 34 and figured in Mus. Bull. 75, pl. 86. It is closely related to Pholiota praecox but somewhat larger, cap whiter, often cracking into areas, stem striate above the annulus, lamellae darker brown and spores slightly larger. Its habitat is the same as that of Pholiota praecox but it occurs later in the season. Our plants were collected in the mulching by a fruit tree late in September. The cap was almost white and the lamellae darker brown than in Pholiota praecox. The spores were 8x12—13 μ.
The pilei were only slightly cracked. The veil has almost disappeared from the plant figured. Peck’s description of the plant is as follows:

**Pileus convex or nearly plane, glabrous or sometimes floccose on the margin, commonly rimose areolate, especially in the center, white, sometimes slightly tinged with yellow. Flesh white. Lamellae close, adnerved, white, becoming ferruginous brown, generally minutely eroded on the edge. Stem equal, hollow, striate at the top, white, the white annulus more or less floccose on the lower surface, lacerated, often evanescent. Spores 8x12—13 μ.**

Pileus 2–4 inches broad; Stem 2–3 inches long, 3–5 lines thick.

**Pholiota temnophylla, Pk. Pl. XXXIII, A.**

**CUT-GILLED PHOLIOTA.**

The species is described in N. Y. State Mus. Rep’t 23, p. 90 and in Mus. Bull. 122 p. 146.

**Pileus fleshy, hemispheric, becoming convex, smooth, ochraceous yellow. Lamellae very broad, adnerved, obliquely truncate at the inner extremity, brownish ferruginous. Stem equal, glabrous, hollow, white, the annulus well developed, membranous, white. Spores brownish ferruginous, broadly elliptic 7—9x10—12 μ.**

Pileus 1–2 inches broad, Stem 1–4 inches long, 2–4 lines thick. Grassy ground by roadsides in June. The plants resemble Nauccoria semiorbicularis and Pholiota praecox.

Peck reports a single collection and Kauffman has found the species in Michigan. The plants photographed grew on the ground in grassy woods at Glencoe, Ills., in June. The gills of plants which were collected on Mackinac Island are even more typical of Dr. Peck’s species, but the spores in both collections are narrower than in the type 6—7x10 μ. The identification has been confirmed by Dr. Peck.
Pholiota dura, (Bolt.). Pl. XXIX.

**Hard Pholiota.**

Pholiota dura is very similar to Pholiota praecox, but the plants are heavier with a shorter, thicker, more irregular stem and the pileus tends to crack into areas. The two are found in similar localities, though Pholiota dura prefers gardens and fields, Pholiota praecox grassy places.

The plants pictured were found in a garden bed in June. They are mature and the pilei are well expanded. M. E. Hard, Mushrooms Edible and Otherwise p. 259 gives a good photograph of younger plants showing the incurved pileus with a rimose areolate surface. In our plants there are striations on the stem above the annulus like those on the stem of Pholiota verniflua.

Pileus firm, fleshy, smooth or cracked into areas, margin incurved when young becoming convex or expanded, obtuse, even on the margin, yellowish tawny or tan color, becoming darker. Flesh firm, brittle, white, mild. Lamellae ventricose, adnected, with a slight sinus and a striate decurrent tooth, whitish, becoming the color of the spores. Stem stuffed or solid, even, tapering downward, more or less ventricose, fibrous, widening to the pileus, whitish. Annulus thin and fragile, entire or torn. Spores rusty brown, 5—6x8—9 μ.

Note. The two following species described by Peck appear to belong to the praecox-dura type.

*Pholiota duroides*, Fk. N. Y. State Mus. Bull. 122 p. 143. It is separated from Pholiota dura by its more ochraceous pileus, softer substance and smaller spores, 4—5x6—7μ.

*Pholiota mollicula* Bann. and Fk., N. Y. State Mus. Rep’t 44 p. 70, is a plant of the same character. It has a whitish pileus with the disk yellowish, gills whitish becoming cinnamon, stem white, stuffed or hollow, annulus large and white and spores rusty 5x8μ. Growing in woods at the roots of trees.

This large number of species shows the great variability of the praecox-dura type of Pholiota. More forms might be distinguished for plants are often collected that do not agree ex-
actly with any of those described. A careful study of the group would probably show that all the species are connected by intermediate forms. A number of European botanists have doubted whether even Pholiota praeox and Pholiota dura should be considered specifically distinct.

4. Medium sized plants with a membranous annulus and viscid pileus. Type of Pholiota erebia.

**Pholiota erebia**, Fr. Pl. XXX.

**DARK PHOLIOTA.**

The plants from which the photographs were made were collected at Blue Mounds, Wis., in September. They grew scattered or in small clusters on the ground in damp woods. More mature plants have been found at Neebish, Mich. Some of them had the pileus slightly umbonate. The margin of the pileus was distinctly striate and the annulus more remote than in the plants from Blue Mounds.

Pileus fleshy in the center, thin on the margin, convex, becoming plane or somewhat umbonate, viscid, smooth or rugose wrinkled, hygrophanous, striate on the margin when mature, brown or blackish when moist, lighter when dry, fully dried specimens are clay color. **Lamellae** adnate with a tooth, pallid or grayish, becoming rusty. **Stem** equal or slightly tapering upward, stuffed or hollow, striate with innate fibers and squamulose especially towards the base, stems often cohering at the base, whitish above the annulus, darker below. **Annulus** near the top of the stem, becoming distant, membranous, reflexed, sulcate, white. **Spores** 6×12—14 μ.

Massee remarks of the European plant that the pileus is sometimes more or less umbonate and Stevenson says that many of the stems cohere at the base where they are squamulose, also that the pileus is often wrinkled. Our plants show these characters.

*Note.* The plants agree with the description of Pholiota aggericola,Pk. N. Y. State Mus. Bull. 122 p. 146 except in the sometimes umbonate pileus, the hollow stem and the slightly longer spores. 12—14 μ
instead of 10—12μ. The hollow stem and longer spores are given as characters of Pholiota decemans, Pk., N. Y. State Mus. Rep't 30, p. 40, which Peck has decided is not distinct from Pholiota aggericola, Mus. Bull. 122, p. 146. Hence it is probable that both Pholiota decemans and Pholiota aggericola are the same as Pholiota erebia, Fr. Pholiota aggericola reiturgis is the form with a wrinkled pileus and is further proof of the identity of the species.


Pholiota ombrophila, Fr. Pl. XXXI.

Rain-Loving Pholiota.

The plants illustrated were collected near brush piles in a grassy pasture at Geneseo, Ills., in June. Others have been found at Lake Geneva, Wis., and elsewhere, always about brush piles and in very wet weather. The plants photographed were somewhat above the average size. They agree well with the description of Pholiota ombrophila but the pilei are not so dark colored as in the figures given by Cooke, illust. pl. 359 and Fries Icones 103. The latter is var. brunneola. The color of the pileus is described as "pale ferruginous."

Pileus fleshy, convex to expanded, smooth, slightly viscid, hygrophanous, irregular or wavy on the margin, striatulate, pale ferruginous. Flesh whitish. Lamellae sinuate attached with a decurrent tooth, narrowing outward from the stem, whitish becoming rusty. Stem stuffed or hollow, whitish, flexuous, somewhat fibrous striate. Anulus membranous, broad, entire, white. Spores ferruginous, 5—6×8—9 μ. (Stevenson gives 4×8 μ and Saccardo 6—7×13—14 μ.)

5. Small plants with a membranous annulus. Type of Pholiota togularis.

Pholiota togularis, (Bull.) Pl. XXXII.

Little Cloak Pholiota.

Pholiota togularis is a common species growing on the ground or attached to sticks in open woods and pastures. We have col-
lected it at Madison, Wis., Genesee, Ills., and elsewhere. The photographs in pl. XXXII, A are from the Madison plants. They are old with the pileus depressed and the annulus almost gone and are not very satisfactory. The plants in pl. XXXII, B were more hygrophanous, with the margin of the pileus slightly striate and the gills bent in the middle. They were quite wrinkled when dry and suggest a form of Pholiota rugosa, Pk. We have no good photograph of Pholiota togularis which is a pretty little plant with a broad membranous annulus, the "little cloak" which suggested the name.

**Pileus** thin, soft, convex to plane or depressed, smooth, even on the margin, somewhat hygrophanous, pale ochraceous, almost white when dry. **Lamellae** adnate or toothed-decurrent, ventricose, yellowish-white becoming ochraceous. ** Flesh** thin, soft, yellowish. ** Stem** hollow, flexuous, somewhat fibrillose, colored like the pileus, darker below. ** Annulus** membranous, evanescent, near the middle of the stem. ** Spores** ochraceous, 5×8 μ.

**Note.** Plants of the Pholiota togularis type form a very variable group. A number of species and varieties have been reported from this country. They are all small plants growing on the ground or attached to sticks and very closely related to each other.

*Pholiota togularis*, *var. filaris*, Fr. is reported by Peck and raised to the rank of a species. Mus. Bull., 122, p. 144. It is characterised by its small size slightly striate pileus and very thin stem. Figured in Fries Icon. pl. 104.

*Pholiota biattaria* Fr. is reported in Farlow's Index. It is like a slender form of Pholiota togularis but has the pileus striate on the margin and the gills free.

*Pholiota rugosa*, Pk., N. Y. State Mus. Rep't 50 p. 102 and Mus. Bull. 122, p. 144, is a more hygrophanous plant with the pileus slightly striate on the margin, the annulus with striae on the upper surface and the pileus rugose wrinkled when dry. It is reported from Michigan by Kauffman.

*Pholiota anomala*, Pk., Torr. Bull. 22, p. 202, was described from plants growing on sticks and leaves lying on the ground at Pasadena, California. They are about the size of Pholiota togularis, brown, drying cream color, with adnate lamellae and a fugacious annulus. The stem is hollow with transverse partitions, the internodes stuffed with a cottony substance. Pholiota dissimulans, B. & Br. has such nodes in the stem, Cooke, Illust. pl. 371.
Pholiota sabulosa, Pk., Torr. Bull. 23, p. 414, is another similar plant which grew on sandy soil in Alabama. It is the same size as the others, yellowish brown becoming pale tawny when dry, with a concolorous hollow stem, and a slight annulus, but there were rusty brown scales on the pileus.

6. Plants with an evident universal veil and ragged fibrous annulus. Growing on the ground, scattered or caespitose.

Pholiota terrigena and Pholiota angustipes are placed here because they grow on the ground. The former belongs to the Squarrosae and the latter to the Squamosae.

Pholiota terrigena, Fr. Pl. XXXIII, B.

The plants were found at Devil’s Lake, Wisconsin, September. They grew in clusters on the ground in open woods. The photograph shows a bunch of young plants. The caps expand and become almost plane.

Pileus convex, margin incurved so that in young plants the cap is lens shaped, becoming expanded and plane, dry, covered with a coat of silky matted fibers, more or less torn and fibrillose scaly especially on the margin, dull yellow or tawny, scattered over the surface are tawny, verrucose, easily separable scales like those on the stem. Flesh yellowish, lamellae becoming rusty with an olivaceous tint. Stem stuffed or hollow, squarrose with tawny, verrucose scales in a web of white fibers, silky white above the annulus. Annulus the torn margin of the universal veil part of which adheres to the pileus. Spores ochraceous 4x5—6 μ.

Our plant agrees with the illustration in Fries, Icones, 108. Cooke’s plate 349 is too bright yellow and does not well represent our forms.

Pholiota angustipes, Pk. Pl. XXXIV.

Narrow stem Pholiota.

The plants grew in clusters on the ground in a place where stumps had been removed in a pasture near Madison, Wis., in September. The average size is shown by the photographs. Our
plants agree exactly with the description of Pholiota angustipes except that the spores are a little smaller, 4x6—7 μ.

Pileus fleshy, hemispheric, becoming convex or nearly plane, slightly viscid when moist, squamulose with minute, dot like appressed scales, brown or grayish brown becoming alutaceous brown or subalutaceous. Flesh whitish, taste unpleasant. Lamellae thin, close, sinuate, whitish or creamy yellow, becoming tawny brown. Stem equal or tapering downward, flexuous, stuffed or hollow, squamose, whitish or cinereous. Spores navicular, 4—5x7—8 μ.

Note. Two species of Pholiota which grow on the ground but do not appear to be very closely related to any of the above types have been reported from the United States.

Pholiota speciosa, Clements, University of Nebr. Bot. Sur. 1893, II, p. 41, is said by the author to resemble Pholiota gibberosa, Fr. It is about two inches high and broad, has a sordid white pileus and white stem, smoky gills and umber spores 3.5x5 μ.

Pholiota rubecula, Bann. & Pk. N. Y. State Mus. Rep’t 44, p. 70, is not fully described.

B. Growing on wood.

I. Pileus and stem covered with squarrose or squamose scales.

The plants are clothed with a universal fibrous veil which forms squarrose or squamose tufts of fibers on the pileus and stem. When the margin of the pileus separates from the stem the veil tears apart leaving a floccose ring on the stem and the margin of the pileus ragged.

7. Type of Pholiota squarrosa.

Pholiota squarrosa, Muell. Pl. XXXV, A.

SCaly Pholiota.

One of the most common and best known of the species of Pholiota. It grows in dense clusters on standing trunks, stumps and logs in woods. It sometimes has a very disagreeable odor.

Pileus fleshy, broadly conic or campanulate to convex, dry, background yellowish or tawny covered with darker tawny
squamrose scales. Lamellae adnate or slightly notched decurrent, whitish becoming ferruginous. Stem straight or flexuous, colored and adorned like the pileus, white furfuraceous above the annulus. Spores elliptical 4x7—8 μ.

There are a number of varieties of the scaly Pholiota. Plate XXXV, A shows two plants nearly typical. The pileus was dry with ragged tawny scales on a paler tawny background and Spores 4x7 μ. The plants were collected at Blue Mounds, Wis., in October. Other collections have still darker caps but the spores are usually smaller.

Pholiota squarrosa, var. verruculosa, Lasch. Pl. XXXV, B.

The plants were collected at Frankfort, Mich., in August. The pilei were yellow with hard, sharp, verrucose, tawny scales.

Pholiota squarrosoides, Pk. Pls. XXXVI and XXXVII.

**SHARP SCALE PHOLIOTA.**

Pholiota squarrosoides is described and figured in N. Y. State Mus. Rep't 54, p. 183, pl. 73 and Pholiota squarrosa in Mus. Bull. 54 p. 971 and pl. 79. The former has the background of the pileus whitish and viscid instead of tawny and dry as in Pholiota squarrosa, it has sharp instead of flat scales and smaller spores, 3—4x5 μ instead of 4—5x7—8 μ. The plants illustrated in pls. XXXVI and XXXVII have these characteristics. They were collected on a well decayed log at Frankfort, Mich., in July. The log was covered with large handsome clusters. This form seems to be more common in our regions than Pholiota squarrosa but I have collected plants with white and tawny caps growing side by side. The color becomes darker with age and the viscidity depends much on the weather. Both spore measurements are reported by Stevenson, British Fungi I, p. 230.

Dr. Peck has distinguished and figured the form on beech logs, Pholiota squarrosoides faginea, Pk., N. Y. State Mus. Rep't 54, p. 183 and pl. 73. It is a smaller plant with more scattered scales. He finds Pholiota squarrosoides on maple logs and this form on beech.

*Note.* Two more plants of the Pholiota squarrosa type are reported in this county.
Pholiota subsquarrosa, Fr. McIlvaine. One thousand American Fungi, p. 275. The plants have a viscid pileus and appressed scales. The gills are yellow when young. The species is figured by Fries Icones, 103.

Pholiota doctyiota, B. & Mont. is a little known species described from plants collected by Sullivant in Ohio. It is said to be so similar to Pholiota squarrosa as scarcely to need a description. The only differences are that the annulus is thick and persistent and the gills nearly free.

8. Type of Pholiota aurivella.

Pholiota aurivella, Batsch. Pls. XXXVIII and XXXIX.

Golden Fleece Pholiota.

A very showy plant growing singly or in clusters of few individuals on trunks, stumps and logs. The illustrations are from plants found on a well decayed bass wood log at River Forest, I11s., in October, also collected in Colorado and elsewhere. Very similar to the following species as Cooke’s Illustrations pls. 351 and 353 well show, but much more handsome. Stevenson remarks “Very beautiful. More refined in appearance than any of its allies.”

Pileus broadly convex, gibbous, splitting on the margin, slightly viscid when moist, smooth and almost glassy when dry, bright tawny yellow or orange, scattered over with tufts of dark tawny fibers, appressed with squarrose points. Lamellae ventricose, adnexed with a small sinus, whitish or yellowish becoming rusty brown with spores. Stem even, or somewhat fusiform, solid, curved to match the position of the plant, lighter yellow than the pileus, very smooth and polished above the annulus, shreddy and tawny scaly below. Annulus slight, formed by the torn margin of the veil. Spores rusty brown. 4–6x8–9 µ.

Pholiota adiposa, Fr. Pl. XL.

Fat Pholiota.

The Fat Pholiota is much more common than the preceding and forms large clusters on trunks, stumps and logs. The pho-
tograph is from part of a large cluster taken from the trunk of a maple tree at River Forest, Ills., in June. It is a much less trim plant than the Golden Fleece Pholiota and the colors are not nearly so bright. The two can easily be distinguished even from dried specimens.

Pileus convex or expanded, broadly umbonate, dingy yellow with the scaly tufts of fibers brownish or blackish. Scales easily separable leaving the pileus smooth. Flesh thick, dull yellow. Lamellae slightly notched, dirty yellow becoming brown. Stem even or slightly thickened downward. Scaly below the annulus, furfuraceous above, yellowish with a tawny or brown base. Annulus the slight remains of the torn veil, soon disappearing. Spores rusty brown 5x8 μ.

Note. Two species reported from this country are said to be closely related to Pholiota adiposa.

Pholiota limonella, Pk. N. Y. State Mus. Rep’t 31, p. 33. It grows in clusters on beech trunks and resembles Pholiota adiposa. The plants are about the size of Pholiota flammanis but the spores are twice as large as in that species, 5—6x8—9μ. They are lemon yellow with erect reddish brown scales on the pileus and stem. Morgan reports the plant from Ohio.

Pholiota villosa, Fr. is a rare species in Europe. The plants are about the size of Pholiota adiposa with tawny yellow, floccose, fibrillose pilei and stems. It is reported in Farlow’s Index.

9. Type of Pholiota flammanis.

Pholiota flammanis, Fr. Pl. XLI, C.

Yellow Scale Pholiota.

This beautiful little plant differs from the others of the section Squarrosae in having the scales lighter colored than the background. The pileus is deep yellow or tawny and the scales sulphur yellow. It grows singly or in tufts on stumps and trunks. The one photographed grew on a stump at Neebish, Mich., in September. It is a small plant, the pileus less than two inches broad.

Pileus thin, fleshy, convex to plane, slightly umbonate, dry, yellow or tawny with paler yellow scales. Flesh yellowish.
Lamellae notched attached, yellowish becoming ferruginous. Stem straight or curved, stuffed or hollow, yellow and adorned like the pileus. Anulus near the top of the stem, ragged. Spores rusty $3 \times 5 \mu$.

The plants retain their color when dry. Ours became covered with a yellow powder like the pulverulence on some Boleti. Fries, Icon. 104, beautifully illustrates the plant. It is reported from Michigan by Kauffman.

Pholiota tuberculosa, Fr. Pl. XLI, A. B.

Tuberculate Pholiota.

Pholiota tuberculosa is similar to Pholiota flammanis but the scales are concolorous with the background or darker, and there is a beautiful round bulb at the base of the stem. The illustration in Fries, Icon. 104, represents our plants exactly. They were collected at Neebish, Mich., in September. The photograph is taken from a dried plant.

Pileus fleshy, convex, obtuse, beautiful tawny yellow, with more or less squarrose, scattered tawny scales. Stem hollow, incurved, bulbous at the base, fibrillose scaly, colored like the pileus. Lamellae adnected, yellow becoming rusty. Anulus the ragged upper margin of the scaly part of the stem. Spores rusty ochraceous, inequilateral $3 \times 5-6 \mu$. (Stevenson 4x7 $\mu$, Sacc. Sylloge 4—5x8—10 $\mu$.

Note. Pholiota hormomorpha, Mont., described from plants collected at Columbus, Ohio by Sullivant is said to be very similar to Pholiota tuberculosa. The stem is thickened at the apex as well as bulbous at the base and naked. Spores oblong.

Pholiota curvipes, Fr. is reported from this country by Peck, Hard and others. In Farlow's Index it is given as identical with Pholiota tuberculosa and according to Longyear it has been confused with Pholiota muricata in this country.

10. Type of Pholiota albo-crenulata.
Pholiota albo-crenulata, Pk. Pls. XLII and XLIII.

White Granulated Pholiota.

Single or two or three together on stumps and logs especially maple. The photographs are from plants found on a maple stump at Frankfort, Mich. The characteristic features of the plant are the dark brown color, easily recognized even in dried specimens and the white granules on the margin of the gills.

The species is very closely related to Pholiota fusca, Quel. and may prove to be identical with it. Plants in the Madison herbarium were so referred by Bresadola and the description of the gills of that species as "white granulate" on the edge is better for our plants than "white crenulate." But both the description and figure of Pholiota fusca show that it is strikingly mammillate and it is said to be caespitose. We have seen no American plants with these characteristics.

Pileus, fleshy, convex or with a small umbo, viscid, yellowish brown with dark brown floccose scales which easily rub off. Stem slightly tapering upward, stuffed or hollow, covered up to the annulus with dark brown tufts of fibers on a light colored background. White furfuraceous above the annulus which has the form characteristic of this group. Lamellae with a peculiar appearance, those reaching the margin narrowing toward the stem and those attached to the stem narrowing toward the margin, edge eroded and beaded with white granules, grayish becoming rusty brown. Spores, rusty brown, 6—7x10—12μ.

The plant is reported from Michigan by Kauffman.

11. Type of Pholiota spectabilis.

Pholiota spectabilis, Fr. Pl. XLIV.

Showy Pholiota.

The whole plant including the flesh is some shade of bright yellow or orange and retains its color when dry. The plants photographed were collected at Neebish, Mich., in September. They are young but show the characteristics of the plant well.
The thick matted veil covers the whole plant when young. It tears apart at the separation of the pileus from the stem and leaves the stem peronate and the margin of the pileus covered with bunches of fibers. The pileus is scaly but not squarrose.

**Pileus** fleshy, compact, hemispherical, becoming nearly plane, dry, silky fibrillose, yellow to tawny orange. **Flesh** thick, pale yellow, bitter. **Lamellae** close, narrow, adnate or slightly decurrent, yellow becoming ferruginous. **Stem** ventricose or thickened below, solid, peronate, mealy above the annulus, fibrillose like the pileus below. **Spores** elliptic, ochraceous, 5—6x8—9μ.

Fries, Icones 102, gives a good illustration of our plant.

**Note.** Pholiota aurea, Matt., which is the type of the genus and its most gorgeous species, is closely related to Pholiota spectabilis. It grows on the ground. The plant is reported from this country in Farlow's Index but we have never seen it.

12. Type of Pholiota comosa.

**Pholiota comosa,** Fr. Pl. XLV.

**Hairy Pholiota.**

A firm fleshy species growing on trunks and stumps of deciduous trees. The pictures are from plants collected at Frankfort, Mich., in August and at River Forest, Ill., in October.

**Pileus** firm, convex, obtuse, viscid, covered with white hairy fibrous easily separable scales on a tawny ground. **Flesh** white. **Lamellae** broad, adnexed decurrent, white becoming argillaceons or reddish brown. **Stem** somewhat bulbous with an abrupt pointed root becoming long and curved, white fibrous striate with the characteristic slight annulus of the section. **Spores** rusty brown 5—6x8—9μ.

**Note.** Pholiota destructor, Brou. is reported from Missouri by Glattfelter and dried specimens in the herbarium at Madison seem to be referable to this species. The pileus is yellowish white with a few floccose scales and a fibrillose margin. The stem is concolorous and thickened below. The lamellae are pallid becoming cinnamon.
13. Type of Pholiota heteroclita.

Pholiota heteroclita, Fr. Pls. XLVI and XLVII.

ECCENTRIC STEMMED PHOLIOTA.

A large, heavy, dull colored plant, often with an eccentric stem, growing on stumps and logs of deciduous trees. Our plants were deeply rooted in a crack on the top of a poplar stump at Frankfort, Michigan. They were fully mature. Hard, Mushrooms Edible and Otherwise, fig. 214, has published a photograph of young plants which shows the characteristic veil and annulus.

Pileus whitish, covered with dirty yellow, or tawny fibrous scales, incurved when young, becoming convex and plane, margin incurved, often irregular and cracked or split. Stem often eccentric, solid, bulbous at the base, rooting below the bulb, whitish fibrous below the annulus which is near the top of the stem, mealy above. Flesh thick, white. Lamellae broad, rounded at the stem, pallid becoming ferruginous brown. Spores rusty, 5—6x8—10μ.

14. Type of Pholiota luteofolia.

Pholiota luteofolia, Pk. Pl. XLVIII.

YELLOW GILLED PHOLIOTA.

We photographed some individual plants taken from a cluster which grew on a decayed log at River Forest, Ill., in June. The plants were fully mature and the pilei depressed showing the brilliant reddish yellow gills as the clusters stood erect on the top of the log attracting the attention at some distance.

Peck's description reads “Pileus fleshy, firm, convex (ours were depressed and moist from the wet weather), dry, squamulose, fibrillose on the margin, pale red or yellowish. Lamellae broad, subdistant, sinuate, serrate on the edge, yellow becoming bright ferruginous. Stem firm, fibrillose, solid, often curved from its place of growth. Annulus slight, fugacious. Spores bright ferruginous 4x7μ” (ours were 4—5x7—8μ).
Note. Pholiota fulvosquamosa, Pk., Torr. Bull. 30 pp. 95-96, be-
songs in the section Squamosae. The plants on which the species is
founded were collected about the base of oak trees near the Agricul-
tural College at Lansing, Michigan. The pileus is 6-12 cm broad,
the stem is 5-8 cm. long, and 8-10 mm. thick. The pileus, the stem
and the under side of the annulus are covered with tawny fibrillosc
scales. The lamellae are attached to a narrow collar, whitish becom-
ing pinkish cinnamon.

II. Pileus naked, sometimes rimosely rivulose.

15. Type of Pholiota aegerita.

Pholiota aegerita, Brigant. Pl. XLIX.

The plants photographed were not very satisfactory and the
pictures are poor. They grew on a poplar trunk at Nebish,
Mich. The dried specimens are characteristic. The pileus is
inrolled, hard, cracked into tawny areas on a whitish back-
ground, smoother and whitish toward the margin. The stem
tapers upward and is brownish at the base.

Pileus fleshy, convex to plane, rivulose with tawny scales in
the center, smoothish and white or pallid toward the margin,
with slight greenish tints. Lamellae adnate toothed, pallid
becoming reddish brick color. Stem equal or tapering upward,
solid or stuffed, whitish with silky, brownish or reddish fibers.
Annulus superior, fibrous. Spores 5x7 μ (Sacc. Sylloge,
5x8—9μ).

16. Type of Pholiota lutea.

Pholiota lutea, Pk. Pl. I.

YELLOW PHOLIOTA.

The plants referred to this species were very abundant and
grew in large clusters on the trunks and roots of black birch at
Spring Green and The Dells, Wis., during September and Octo-
ber, 1910. The mature pilei were broadly conical or campanu-
late, buff yellow, nearly smooth, wavy, somewhat scaly and
striate on the edge. The stem was brown or ferruginous toward
the base and had a well defined annulus. The spores were 5x8—9μ. The plants are very closely related to Flammula alnicola and may belong to that species, but they differ very decidedly in the shape and color of the pileus and the evident annulus from the forms of Flammula alnicola collected in northern Michigan. The shape of the pileus and the dark base of the stems which are sometimes hollow do not agree with the description of Pholiota lutea. Glatfelter has reported Pholiota lutea from Missouri. Peck’s description is as follows:

“Pileus fleshy, firm, convex, dry, slightly silky and sometimes minutely floccose squamulose in the center, buff yellow, often a little darker in the center, the thin incurved margin slightly surpassing the lamellae. Flesh pale yellow. Odor pleasant. Taste bitter. Lamellae thin, close, rounded behind, adnexed, pale yellow, becoming dark ferruginous. Stem firm, solid, thickened at the base, fibrillose, colored like the pileus. Annulus superior, slight, fugacious. Spores ferruginous 5x8μ. Pileus 2–4 inches broad; stem 2–3 inches long, 3–5 lines thick. Decaying wood and trunks of trees in woods.”

Note. The following species, reported from this country, appear to belong in this section.

Pholiota ornella, Pk. is a small plant found growing on decayed wood or sawdust. Pileus dark red when young fading to pink and then yellowish brown, appressed scaly, veil annulate appendiculate. Its history is given in N. Y. State Mus. Bul. 122, p. 151. It was first described as a Hypholoma.

Pholiota aeruginosa, Pk. is a plant with a greenish pileus and stem, less than two inches broad and one and one-half inches high. Distinguished from Stropharia aeruginosa by its solid stem, dry pileus and bright ferruginous spores. The type specimens were found by Dr. Herbst growing in clusters on oak railroad ties in Pennsylvania. N. Y. State Mus. Rep’t 43, p. 81. The plant is also reported from Connecticut, White, and Michigan, Longyear.

Pholiota copistrata, Che is reported in Farlow’s Index. It is figured in Cooke, Illust. 364. A large subcaespitose plant with a viscid livid pileus, a subsquamulose stem and persistent annulus, growing on fragments of wood.

Pholiota radicosa, Bull. is also reported in Farlow’s Index. It is a large plant with smooth pileus, squarrose scaly stem and a long root. It appears to grow on the ground though placed among the Truncigenae in Sylloge.
III. Small plants with scaly or bristly pileus and stem.

The plants in this division are squarrose or squamose, but they are small, grow on logs in woods and resemble those of the following section much more closely than the showy forms of the type of Pholiota squarrosa.

17. Type of Pholiota muricata.

**Pholiota erinacea**, Pk. Pl. LI.

**Little Bristly Pholiota.**

The plant was described as Agaricus (Pholiota) detersibilis, Pk. in N. Y. State Mus. Rep't, 28, and the name was changed to Pholiota erinacea in Mus. Bull. 192, p. 152. The bristly pileus and stem is well shown in the photographs. The plants agree with the description exactly. They grew on logs in woods at Frankfort, Mich., in August. Peck's description reads:

"Pileus thin, hemispheric or convex, dry, densely coated with small, erect, separable, pyramidal or spinelike scales, tawny brown. Lamellae broad, close, adnexed, pallid becoming cinnamon brown. Stem equal, stuffed or hollow, densely squamulose below the slight annulus, often curved, colored like the pileus. Spores ferruginous, naviculoid 4-5x8-9μ. Pileus 6-12 lines broad, stem 6-12 lines long, 1 line thick."

**Pholiota muricata**, Fr. Pls. LII and LIII.

The plants pictured in Pl. LII were collected at River Forest, Ill., in June, those in Pl. LIII at Neebish, Mich., in September. The River Forest plants are slightly heavier, neater, and more squarrose than those found at Neebish but they seem to be the same species. All were tawny yellow with bunches of bright yellow mycelium at the base of the stems. The plants represented in Pl. LII, B, had long straggling stems due to their position emerging from a crack in the bark of the log.

Pileus convex to plane, obtuse, slightly umbilicate, covered with small closely packed tufts of tawny fibers making the sur-
face appear almost granulate or muralate, the yellow background of the pileus shows in the cracks. Lamellae adnexe, yellow, becoming rusty. Stem concolorous, stuffed or hollow, densely clothed with scaly fibers which are more or less squarrose, with tufts of bright yellow mycelium at the base. Annu-lus slight of the character of that of the Squarrosae. Spores 4–5×7–8μ.

The plant is reported from Michigan by Longyear.

IV. Small plants with an hygrophanous pileus and a membranous annulus.

The plants are closely related to the Pholiota togularis type but grow on logs and stumps.

18. Type of Pholiota marginata.

Pholiota marginata, Batsch. Pls. LIV and LV.

Margined Pholiota.

The plants are common on decayed logs in damp woods late in the autumn. In our region they are usually almost even on the margin of the pileus and very rarely sufficiently striate to justify their name. In this respect they agree with the New York type which Peck has described as Pholiota marginella. The forms are very various as the illustrations show but we have not been able to separate any of the allied species such as Pholiota unicolor or Pholiota mutabilis. The plants in Pl. LIV, C closely resemble those in Hard’s photograph of Pholiota unicolor but they do not agree with the plant figured in Flora Danica.

Pileus watery brown or honey colored, from incurved to convex or expanded, smooth, margin even or slightly striate, sometimes recurved. Lamellae adnate or decurrent toothed, watery cinnamon becoming rusty ochraceous. Stem equal or slightly tapering upward, hollow, sometimes inflated, more or less white pruinose, fibrous striate, somewhat mealy at the apex and white velutine at the base. Annu-lus membranous, usually adhering to the stem but sometimes to the margin of
the pileus. Spores elliptic or obovate 5—6×8—10μ. (Sylloge gives 3—4×6—7μ or 4—6×10—14μ.)

Note. A number of small species of Pholiota with hygrophanous pilei growing on decayed logs have been reported from this country.

Pholiota mutabilis, Schaeff. Somewhat larger than Pholiota marginata with the stem covered with squarrose scales. Morgan and Hard report it from Ohio.

Pholiota unicolor, Pl. Dan. Similar to Pholiota marginata but smaller and lamellae decurrent. Reported from Ohio by Morgan and Hard.

Pholiota marginella, Pk. Mus. Bull., 122, pp. 157—158. It is distinguished from Pholiota marginata by "its even fibrillose margin, adnexed lamellae and paler uniformly colored stem."

Pholiota autumnalis, Pk. N. Y. State Mus. Rep't 23, p. 32 (as Nauccoria) and Mus. Bull. 122, p. 156. Glaffelter reports it from St. Louis with the remark "It appears to me the same as Pholiota marginata."

Pholiota discolor, Pk., N. Y. State Mus. Rep't 25, p. 78, is characterized by the change of color from cinnamon rufus when moist to bright ochraceous yellow when dry. Otherwise like Pholiota marginata.

19. Type of Pholiota confragosa.

Pholiota confragosa, Fr. Pl. XLI, D. E.

The plants grew on a log at Neebish, Mich., in September. The enlargement, Pl. XLI, E, shows the peculiar white floccose covering of the pileus. It is different from that of any other species of Pholiota. The plants were brick red but a little duller than in the illustration in Fries, Icon, 105. Otherwise the illustration represents our plants well. The plants photographed are young and smaller than the average.

Pileus convex becoming plane, obtuse, ground color almost brick red, covered with a white flocculose coat easily rubbed off and which disappears when the plants become old, margin slightly striate when moist. Lamellae adnate, narrow, edge eroded. Stem equal, straight or slightly flexuous, ground color similar to the pileus, peronate with a fibrous scaly white coat which terminates in a spreading membranous white ring. Spores rusty 5—6×7—8μ.
Note. Two species described by Peck belong to the Hygrophanum, but differ from the above types.

*Pholiota acericola*, Pk., N. Y. State Mus. Rep't 25, p. 77, is a large plant with a yellow or smoky yellow rugosely reticulated pileus, lamellae becoming longitudinally wrinkled when dry, a fibrillose whitish stem sometimes enlarged at the base and a large white deflexed annulus. It is reported from Michigan by Kauffman.

*Pholiota cerasina*, Pk., N. Y. State Mus. Rep't 26, p. 57 is a plant about the size of the former with a marked amygdaline odor.

C. Very small species growing among mosses.

We have no photographs of species in this division. They are known by the rusty spores and the annulus on the stem. *Pholiota mycenoides*, Fr. is reported from Michigan by Longyear. *Pholiota pumila* is in Farlow's Index and Peck has described *Pholiota minima* from New York state and reported *Pholiota rufidula*, Kalch, from Massachusetts.
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<td>Lutea</td>
<td>495</td>
<td>XLI</td>
<td>XXXI</td>
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<td>Luteofolia</td>
<td>494</td>
<td>XLVII</td>
<td>XXXII</td>
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EXPLANATION OF PLATES

Plate XXIV. Pholiota caperata, (Pers.) A. Mature plant of average size. B. Young plant with ovate cap covered with white flocci.

Plate XXV. Pholiota ................. A. Mature plant a little above average size showing the scaly bulbous stem, the ridges on the annulus and the erose denticulate gills. B. Part of the surface of a pileus showing the innate scaly fibers. C. Part of the annulus of a dried specimen x 4.

Plate XXVI. Pholiota howea, Pk. Mature plant.

Plate XXVII. Pholiota praecox, (Pers.) A. Mature plant showing the gill surface. B. Upper side of a pileus. C. Plant with the annulus tearing from the stem. D. Plant with an umbonate pileus and twisted striate stem.

Plate XXVIII. A. B. Pholiota, praecox (Pers.) C—F. Pholiota vermicifus, Pk. A. Plant with an annulus on the stem. B. Underside of a pileus showing veil separating from the margin. C. Mature plant. D. Section showing the thick flesh and ventricose gills. E. Gill surface. F. Surface of a pileus.

Plate XXIX. Pholiota dura, (Bolt.) A. Mature plant with expanded pilei. B. Younger plant showing membranous annulus. C. Plant showing the gill surface.

Plate XXX. Pholiota erebia, Fr. A. Cluster of plants showing adhering scaly stems and membranous annulus. B. Underside of a pileus showing the gill surface and hollow stem. C. Upper side of a pileus showing rugose surface. D. Section showing flesh and gills.

Plate XXXI. Pholiota ombrophila, Fr. Two mature plants.

Plate XXXII. Pholiota togularis (Bull.) A. Old plants with depressed pilei. B. Younger plants some of which grew on sticks.

Plate XXXIII. A. Pholiota temnophylla, Pk. The under side of the pileus shows the shape of the gills. B. Pholiota terrigena, Fr. Cluster of young plants.
Plate XXXIV. Pholiota angustipes, Pk. A. Cluster showing hemispheric pilei and scaly stems tapering downward. B. Parts of plants showing the gill surface and the squamose-dotted pileus.

Plate XXXV. A. Pholiota squarrosa, Muell. Two plants showing the stems and the under surface of the pilei. B. Pholiota Squarrosa, var. verruculosa, Lasch. Two plants showing the sharp verrucose scales on the pilei and shaggy scales on the stems.

Plates XXXVI and XXXVII. Pholiota squarrosoides, Pk. A cluster of young plants is shown on plate XXXVI and a cluster of older plants giving different view on plate XXXVII.

Plates XXXVIII and XXXIX. Pholiota aurivella, Batsch. The first shows the surface of the pileus and the stem of a medium sized plant, the second shows the under side of two plants with the gill surface and the stems smooth above and scaly below.

Plate XL. Pholiota adiposa, Fr. The under side of three plants taken from a large cluster showing the gill surface and the scaly stems which are darker colored below.

Plate XLI. A. B. Pholiota tuberculosa, Fr. Plant showing the bulbous scaly stem, and the surface of a pileus. Both taken from dried plants. C. A plant of Pholiota fiammans, Fr. D. E. Pholiota confragosa, Fr. Three plants natural size, the underside of a pileus and one of the plants x 4 showing the floccose surface.

Plates XLII and XLIII. Pholiota albo-crenulata, Pk. XLII. A. The underside of a mature plant. B. Part of the gill surface x 4 showing the white granules on the edges of the lamellae. XLIII. A. The gill surface of a mature plant. B. The surface of a pileus. C. Young plant showing the method of tearing of the veil.

Plate XLIV. Pholiota spectabilis, Fr. A. Young plant showing the tearing of the veil. B. Young plant showing the fibrous surface of the pileus. C. Section showing the thick flesh and narrow gills. D. Very young plants covered with the universal veil.

Plate XLV. Pholiota comosa, Fr. A. Surface of the pileus covered with white hairy scales. B. Section showing flesh and gills. C. Mature plant with an elongated stem. D. Part of a plant reduced one half showing the bulbous stem.
Plates XLVI and XLVII. Pholiota heteroclita, Fr. The first plate shows a mature plant and the second a section of a plant with an eccentric stem, thick white flesh and broad lamellae, also part of the surface of a pileus showing the scales.

Plate XLVIII. Pholiota luteofolia, Pk. A. Two old plants with depressed pilei and a section of another plant showing wide gills. B. Underside of a pileus showing the gills and the stem hollow from age. C. Part of a pileus showing the scaly surface.

Plate XLIX. Pholiota aegerita, Brigant. Two mature plants.

Plate L. Pholiota lutea, Pk. A. Cluster of large plants. B. Young plants covered with the universal veil.

Plate LI. Pholiota erinaceella, Pk. Plants of various ages showing the shape at the different stages of development and the bristly scaly universal veil.

Plates LII and LIII. Pholiota muricata, Fr. In plate LII, A shows a cluster of plants growing from a piece of rotten wood, the upper and under surface of the pileus and a young plant with the veil separating from the pileus, B shows plants with long straggling stems. Plate XXX shows plants in different stages of development with bunches of mycelium at the base of the stems.

Plates LIV and LV. Pholiota marginata, Batsch. Plate LIV. A. A very large plant. B. Young pileus showing separation of the veil. C. Cluster of plants with inflated white pruinose stems. D. Three plants growing on bark. Plate LV. Plants showing different stages of development.
PHOLIOTA CAPERATA (PERS.)
PHOLIOTA PRAECOX, (PERS.)

HARPER - PHOLIOTA
HARPER—PHOLIOTA
PHOLIOTA TOGULARIS (BULL.)

HARPER—PHOLIOTA

COCKAYNE, BOSTON
A PHOLIOTA TEMNOPHYLLA, PK.
B PHOLIOTA TERRIGENA, FR.

HARPER—PHOLIOTA
PHOLIOTA ANGUSTIPES, PK.

HARPER—PHOLIOTA
A PHOLIOTA SQUARROSA, MUELL.
B PHOLIOTA SQUARROSA, VAR. VERRUCULOSA, LASCH.

HARPER—PHOLIOTA
A B PHOLIOTA TUBERCULOSA, FR.
C PHOLIOTA FLAMMANS, FR.
D E PHOLIOTA CONFRAGOSA, FR.

HARPER—PHOLIOTA
PHOLIOTA ALBO-CRENULATA, PK.

HARPER—PHOLIOTA

COCKAYNE, BOSTON
PHOLIOTA ALBO-CRENULATA, PK

HARPER—PHOLIOTA

COCKAYNE, BOSTON
PHOLIOTA SPECTABILIS, FR.

HARPER—PHOLIOTA

COCKAYNE, BOSTON
PHOLIOTA COMOSA, FR.

HARPER—PHOLIOTA

COCKAYNE, BOSTON
PHOLIOTA MURICATA, FR.

HARPER—PHOLIOTA
PHOLIOTA MARGINATA, BATSCH.

HARPER—PHOLIOTA

COCKAYNE, BOSTON