Key to Species of Inocybaceae from eastern North America – v20 (9 Oct 2025)

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Need to modify *I. nucleata* based on Stuntz' notes of the type. New taxa to incorporate include *I. jucunda* (IN), *I. urceolicystis* (NJ), and *I. nobilis* (QUE and AZ). New taxa to add to key: *Inocybe vaccina* (NC), *Inocybe digitula* (NY), *I. oetziana* (as *I.* cf. *friesii* Canada, GU180296 ECM USA, and "*sindonia*" BC, JK WA), *I. lampetiana* (BC samples as "*I.* cf. *griseolilacina*" and "*I. glabrescens*"). Need to add *I. pseudodestricta* from New York. Need to add bona fide *I. griseovelata* and bona fide *I. sindonia* (both from Pennsylvania). Also need to add *Ps. dulcamaroides* based on USA *Salix* alpine material (Larsson) and Arctic Canadian enviro sample.

Note: Added confirmed members of *I.* sect. Albodiscae and updated that portion of the key. Added *I. caprimulgi* from New York, *I. squalida* from Quebec, and revised entries for *I. lacera* and allies now confirmed from North America and type studies (*I. moravica*, *I. infelix*, *I. gigantispora*, *I. ravenelii*, *I. sublongipes*, *I. cylindrispora*). Revised the key for *Mallocybe*; added entry for *I. perlucida* confirmed from North Carolina. Updated entries for *I. subprominens* Murrill and added an entry for *I. scolopacis* from West Virginia. Substituted *I. ochroalba* for *I. langei sensu* A.H. Smith. Added *I. argenteolutea* and *Is. geraniodorum* to v16. Added a key to genera of Inocybaceae known to occur in North America. Updated "*I.* aff. *margaritispora*" to *I.* aff. *diabolica*. Added *Pseudosperma* cf. *umbrinellum* and *I. striatiformis*, the latter a Murrill species from northern Florida. Added I. *porcorum* under eastern white pine from New York and Finland and *I. oblectabilis*, *I. pallida*, and *I. dunensis*, additional European species, now confirmed from northern Florida, Tennessee, and/or Quebec. Also added *I. paludinella* f. *citrophylla* and *I. soluta*, the latter confirmed from Quebec and British Colombia. *Inocybe nothomixtilis* was added based on confirmation from material sequenced from New Jersey and Pennsylvania by Linas Kudzma and from New York by Sigrid Jakob.

Earlier versions added *I. pararubens* var. *padjelantae* from arctic tundra in Canada and some minor corrections and adjustments. V9 added *I. suecica* reported by Shannon Berch (pers. comm.) under *Quercus garryana* in British Columbia, *I. coelestium* reported by Renée Lebeuf from Quebec, and the recently newly described *I. glaucescens* from New Jersey. I also added *I. goniopusio* (=*I. pseudoasterospora* var. *microsperma*) from North Carolina based on morphology. V8 added updates to the taxonomy of several species such as *In. rosellicaulare* and *I. phaeoleuca* sensu Grund and Stuntz, which is now the same as *I. melleioconica*, now confirmed from northern Europe. V7 incorporated the generic-level taxonomic system proposed by Matheny, Hobbs, & Esteve-Raventós (2020). V7 also added *I. sambucina* confirmed from Massachusetts and an updated entry for *I. subradiata*. V5 (short-lived) and V6 clarified some minor differences between *I. maritimoides* and *I. parceocoacta*. Entries for *I. mixtilis* were updated to *I. occulta* and *I. ceskae* following Esteve-Raventós et al. (2018). *Inocybe acuta sensu* Grund & D.E. Stuntz (1977) is the same as *I. borealis*, and *I. bufonia* was added to the key. The present status of *I. praenodulosa* is not clear in that the type needs to be examined to confirm placement of caulocystidia on the lower part of the stipe. *Inocybe grammopodia* was confirmed from New York by Joel Horman and now included in the key near *I. cincinnata*. *Inocybe tjallingiorum* (syn. *I. subporospora*) was included based on samples from northern Canada.

This unpublished key includes treatment of ca. 225 species, varieties, and forms of Inocybaceae documented from eastern North America, including Central America and the Caribbean Basin (ca. 175 *Inocybe*, 20 *Inosperma*, 11 *Mallocybe*, 18 *Pseudosperma*; a few combinations remain to be done). The number of species included is based on a survey of the literature but also notes from unpublished type studies by D.E. Stuntz, L.R. Hesler, and myself. Ca. 60 taxonomic synonyms are currently accepted, 11 species are considered doubtful, and 5 species are excluded in other genera. 80 North American species recorded only from western North America are listed at the end of this document. Thus, about 300 species of *Inoycbe* are presently accepted from North America. However, this is likely an underestimate as regions such as California, the Gulf Coast, and particularly Mexico are understudied. Moreover, detailed molecular studies have not been performed for most species. The protochecklist of North American non-lichenized fungi (Bates et al. 2018) includes 400 taxa of *Inocybe*, but this figure includes infraspecific taxa and does not exclude known taxonomic synonyms.

Note the key is *not* strictly dichotomous. Undoubtedly, future versions and revisions to this key will be necessary as omissions and errors are corrected and as species concepts become better established. For a glossary

of terminology (e.g., fulvous, fuscous, necrobasidia, rimose, pleurocystidia), see an online glossary at http://inocybaceae.org/glossary.html.

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Key to genera of Inocybaceae from North America

1a. Pleurocystidia present (usually as metuloids) and basidiospores angular, angular-nodulose, spinose, or smooth in outline (if pleurocystidia are absent, then spores are nodulose), apiculus generally distinctive, basidia usually hyaline.....**Inocybe**
1b. Pleurocystidia absent and basidiospores smooth in outline, apiculus generally very small and indistinct, basidia hyaline or necropigmented **2**

2a. Pileus tomentose, coarsely fibrillose, or scaly but *not rimose* **3**
2b. Pileus rimose..... **4**

3a. Stipe considerably longer than pileus diameter, flesh weakly reddening after cut or damage; odor often pronounced like pears, fish, bruised Geranium leaves, wine casks, green corn.....
.....**Inosperma p.p.** (=*Inocybe* sect. *Cervicolores*)
3b. Stipe often shorter or equal to pileus diameter *or* flesh *not* reddening, odor often not distinctive .....
.....**Mallocybe**

4a. Stipe often furfuraceous at least apically, flesh *not reddening*; stipe equal or generally *not* bulbous, brittle or easily breaking at the base; most species with basidiospores >6 µm wide on average; if smaller, then lamellae often oliveaceous or with tropical vegetation in the Caribbean.....
.....**Pseudosperma** (=*Inocybe* sect. *Rimosae sensu stricto*)
4b. Stipe smooth to finely-fibrillose, flesh reddening in species with basidiospores >6 µm wide on average; smaller-spored species with non-reddening flesh or brunnescent stipe; base of stipe often enlarged or bulbous .....
..... **Inosperma p.p.** (clades Adaequatum and Maculatum)

Key to species of Inocybaceae from eastern North America

Spores smooth, yellowish-brown, and pleurocystidia absent
Pileus tomentose, fibrillose-squamulose or squarrose, *not* rimose; basidia necropigmented or hyaline
Basidiomes small; pileus 3-4 mm wide, reddish-brown; spores subreniform, 9-15 x 6-8 µm
Inosperma tenerrimum (G.F. Atk.) Matheny & Esteve-Rav.
Not as above
Basidiomes medium; pileus 25-40 mm wide, with reddish brown scales appressed against yellow ground color; odor not remarkable; spores ovate-elliptic, 9.5-10 x 5.5-6.5 µm; under *Populus*
Pseudosperma squamatum (J.E. Lange) Matheny & Esteve-Rav. (*P. spurium* (Jacobsson & E. Larss.) Matheny & Esteve-Rav. from Europe and western North America is very similar but differs by more narrow spores 8.5-11 x 4.5-6 µm and more robust basidiomes)
Not as above
Odor usually not remarkable; flesh not reddening; basidia necropigmented; stipe *at times* equal to or shorter than the pileus diameter
Pileus granulose-scaly and stipe fibrillose-squamulose, the scales on the stipe darker than the ground color, base of stipe *not* yellow; cheilocystidia >50 µm long, spores 9-11.5 x 4.5-5.5 µm; under hardwoods *Quercus*, *Carya*, *Tilia*, in forests and urban areas, widely distributed throughout eastern North America
Mallocybe unicolor (Peck) Matheny & Esteve-Rav. (Syn. *I. lorillardiana* Murrill, *I. marmoripes* G.F. Atk., *I. caesariata sensu* Lincoff 1981 *non* Kauffman)
Pileus *not* granulose, *or* stipe lacking darker colored bands of fibrils or appressed scales, *or* with cheilocystidia shorter than above
Spores with average Q values >2.0
Fruitbodies robust (mature stipe 8-10 mm wide), flesh tough, lamellae brittle, pileus surface not darkening with KOH, basidiospores pale brown in KOH; on ground under oaks, northern Florida
Mallocybe praevillosa (Murrill) Matheny

Fruitbodies smaller than above, flesh firm or soft but not tough, pileus surface dark with KOH, basidiospores typically darker than above (yellowish brown in KOH)
Cheilocystidia <30 µm long; pileus with very fine fibrillose-scales, spores somewhat angular and narrow (9-12 x 4-5 µm), on acidic soils in northern forests
Mallocybe malenconii (R. Heim) Matheny & Esteve.-Rav.
Cheilocystidia >30 µm long and spores *not* angular
On acidic soils in mixed Appalachian forest (*Pinus*, *Betula*, *Quercus*), pileus convex to broadly convex and not umbonate, cheilocystidia pale brown in mass; montane regions of western North Carolina
Mallocybe montana Matheny
On calcareous soils in oak-pine forests, cheilocystidia hyaline
Cheilocystidia skittle-shaped to subcylindric or slenderly clavate, apices obtuse to subcapitate; odor spermatic when first cut or acidulous; widespread in southern and midwestern regions of the U.S. and Arizona
Mallocybe multispora (Murrill) Matheny & Esteve-Rav.
Cheilocystidia clavate (not slenderly so), utriform, saccate, or obovate; odor mild or "sweet" [protologue]; known from Gulf Coast regions, northern Florida and Louisiana
Mallocybe fulvicpes (Murrill) Matheny & Esteve-Rav.
Spores with average Q values <2.0
Stipe base yellow or with yellow mycelium, *or* stipe flesh pale yellow
Pileus with large appressed scales over the center, stipe base with yellow mycelium, spores 6-6.5 µm wide, cheilocystidia digitform and >50 µm long; on calcareous soils in oak-hickory forests and parks, midwestern and southeastern states
Mallocybe luteobasis Matheny & Kuo
Pileus tomentose-fibrillose, at times cracked-scaly with age, stipe base without yellow mycelium, spores 5-5.5 µm wide, cheilocystidia short-cylindric or clavate and <50 µm long; on acidic soils under oak or pine, widely distributed in eastern North America, Maine to Costa Rica
Mallocybe squamosodisca (Peck) Matheny & Kudzma
Stipe base white and stipe flesh without yellow
Stipe with a cortinate ring-zone
Pileus brown to dark brown; on calcareous soils under oak or pine, widely distributed from Quebec to Mexico; spring or (late) fall
Mallocybe tomentosula Matheny & Esteve-Rav. (nom. nov. for *I. tomentosa* Ellis & Everh., non Quél.)
Pileus brown or bicolorous; on acidic soils under spruce or in mixed forests including spruce, northern regions of the U.S. and southeastern Canada; summer
Mallocybe tomentella Matheny & Kudzma
Stipe without a cortinate ring-zone
Pileus subsmooth in age and often without an umbo, on acidic soils
Under oak and/or pine, common and widely distributed in northern regions (e.g., Alaska, Quebec, Maine) and at higher elevations in the central-southern Appalachians and montane regions of New Mexico (under oak-pine) and Mexico
Mallocybe subtomentosa (Peck) Matheny Kudzma
Under spruce, known from West Virginia and Quebec, also east Asia
Mallocybe sp. PBM4749 et al.
Pileus tomentose-fibrillose to squamulose, at times umbonate, on various soil types
On acidic soils in northern and alpine regions, odor often sweet
Mallocybe fibrillosa (Peck) Matheny & Esteve-Rav. (Syn. *I. dulcamara* (Pers.) P. Kumm. *sensu Am. auct. pl*., *M. subdecurrens*, *I. caesariata sensu* Kauffman; cf. *M. coloradoensis* Kauffman)
On calcareous soils in various regions (Maine, Florida, Arizona) but not in the alpine, odor not remarkable

Pileus with a small but prominent umbo, without a distinct hairy white vesture; spores 8-9 x 4.5-5.5 µm, very pale brown to light yellow in KOH; under oak, known only from the type, northern Florida

Mallocybe fulvoumbonata (Murrill) Matheny & Esteve-Rav. (as *I. fulvi-umbonata*)

Pileus at most weakly umbonate, *with* a distinct hairy white vesture; spores 9-11 x 5.5-6.5 µm, yellowish brown in KOH; under oak or pine, also poplars at high elevations or spruce; widely distributed in the U.S. (Maine, Florida, Arizona), also east Asia and Europe

Mallocybe latifolia (E. Ludw.) Matheny & Esteve-Rav.

Pileus not umbonate, *with* a distinct hairy white vesture; spores 8-10 x 4.5-5.5 µm, yellowish brown in KOH; under oak or pine; Maine, Florida, Arizona [cf. *M. leucoloma*, an alpine and conifer associate in western North America and Quebec]

Mallocybe leucothrix Matheny & M.E. Sm

Odor *often* noticeable – fruity, like bruised Geranium leaves (*Pelargonium*), fishy, green corn, spermatic, or like green corn; flesh reddening or not; basidia typically *not* necropigmented in temperate taxa; stipe length much longer than the pileus diameter

Stipe surface fibrillose, flesh reddening

Odor spermatic or absent, lower part of stipe with green-gray shades; arctic (*Dryas*) to Nova Scotia (*Picea*) and New York (*Betula*, *Picea*)

Inosperma hirsutum (**Lasch) Matheny & Esteve-Rav. *sensu* Grund & D.E. Stuntz**

Odor floral, aromatic, or strong and persistent of green corn, green (or blue) shades absent on stipe

Inosperma subrubescens (G.F. Atk.) Matheny & Esteve-Rav. (=*I. cervicolor sensu* D.E. Stuntz)

Odor like 'old wine' or of 'dank casks', green (or blue) shades absent on stipe

Inosperma cervicolor (Pers.) Matheny & Esteve-Rav. *sensu* Eur. auct.

Stipe surface with recurved scales or fibrillose-scaly, flesh reddening or not

Stipe without blue-green on lower part, odor absent or like *Pelargonium* when cut; in conifer forest under spruce, flesh *not reddening*

Spores on average 10-11 x 5.2-6 µm, under *Picea*, Nova Scotia to North Carolina

Inosperma mutatum (Peck) Matheny & Esteve-Rav. (Syn. *I. leptocystella* G.F. Atk.? See 'doubtful species'; syn. *In. apiosmotum* (Grund & D.E. Stuntz) Matheny & Esteve-Rav.

Spores on average 13.0 x 6.5 µm, under *Picea*, West Virginia

Inosperma geraniodorum J. Favre (cf. *I. leptocystella* G.F. Atk.)

Stipe with blue-green or blackish green on lower part, sometimes throughout the stipe, flesh reddening

Basidiomes large, stipe 55-120 x 6-14 mm

Inosperma maximum (A.H. Sm.) Matheny & Esteve-Rav. (Syn. *I. hirsuta* var. *maxima* A.H. Sm.)

Basidiomes medium, stipe 25-90 x 2.5-6 mm

Odor of green corn

Inosperma mucidiolens (Grund & D.E. Stuntz) Matheny & Esteve-Rav. (Syn. *I. calamisatrata* var. *mucidiolens* Grund & D.E. Stuntz)

Odor fishy or fruity

Odor fishy or like bruised Geranium leaves (*Pelargonium*); under conifers (*Abies*, *Picea*, *Tsuga*), widespread in northern parts of North America, west and east coasts

Inosperma calamistratum (Fr.) Matheny & Esteve-Rav.

Odor like ripe pears; under conifers, Massachusetts, Pennsylvania, Nova Scotia, North Carolina

Inosperma mutatum (Grund & D.E. Stuntz) Matheny & Esteve-Rav.

Pileus finely-fibrillose to rimose, *not* squamulose; basidia hyaline

Stipe smooth or somewhat fibrillose but not furfuraceous, some species staining or with noticeable odor, spores often bean-shaped (phaseoliform, subreniform)

Pileus brownish yellow or whitish beige; stipe white, slowly red where bruised (pileus also turning red), spores 10-13.5 x 5.5-7 µm; rare, known only from a single collection in Michigan under hardwoods (in need of DNA verification; material from New York may be this species [ITS 95% erubescens)

Inocybe patouillardii Bres. sensu D.E. Stuntz (non *I. erubescens* (A. Blytt) Matheny & Esteve-Rav.))

Pileus darker than above, stipe white with pink or vinaceous colors or brunnescent, spores smaller than above, common and more widespread than above

Pileus dull red-brown, strong brown, to ochraceous tawny; stipe whitish to pinkish, brunnescent; odor spermatic, spores 8-9(11) x 4.5-5 µm, in northern hardwood forest

Inosperm neobrunnescens (Grund & D.E. Stuntz) Matheny & Esteve-Rav. (Syn. *In. rosellicaulare* (Grund & D.E. Stuntz) Matheny & Esteve-Rav.; *I. brunnescens* G.F. Atk., *nom. illegit.*)

Pileus vinaceous-brown, stipe white at first but with pink below and becoming vinaceous throughout with age, odor sickly sweet to aromatic with a green corn component, spores 9.5-11.5 x 6 µm; in cove hardwood forest, also under oaks or cottonwood in rest areas or similar habitats; Oklahoma, Texas, Tennessee, North Carolina, also recorded from Minnesota and Quebec under oaks

Inosperma vinaceobrunneum (Matheny & Kudzma) Haelew. (=*I. jurana* (Pat.) Sacc. *sensu* Hesler

Stipe white and/or brunnescent but *not* turning red, spores smaller than in *I. erubescens*

Pileus yellowish to brownish yellow, odor eventually strong of *green corn*, velipellis present or absent, common; New England, Tennessee, North Carolina, Texas

Inosperma rimosoides (Peck) Matheny & Esteve-Rav. [two strongly divergent genetic variants key here – one may have a spermatic odor at first, the other may have a sweet honey-like odor at first]

Pileus darker than above - tawny to fulvous or yellowish brown to orange-brown, odor *aromatic* with a green corn component or spermatic, velipellis inconspicuous, absent, or present as patches

Pileus tawny to fulvous, distinctly umbonate, velipellis patches often *conspicuous*, odor typically aromatic but with a green corn and/or spermatic component, widespread throughout North America including Mexico and Costa Rica, typically under a wide variety of hardwoods (oak, cottonwood, alder), rarely pine, also disturbed areas such as cemeteries; spores 8-11.5 x 4.5-6 µm, cheilocystidia 38-75 x 11-16 µm, clavate or a mixture of cylindric, utriform, and short clavate cells

Inosperma lanatodiscum (Kauffman) Matheny & Esteve-Rav. (Syn. *In. pallidifolium* (Murrill) Matheny & Esteve-Rav.; *In. fulvum* (Bon) Matheny & Esteve. Rav. is the European form)

Pileus fulvous to yellowish brown, obtusely umbonate in age, velipellis patches *conspicuous*, odor spermatic or mild; under *Quercus* and *Tilia*, known only from New York and Tennessee; spores 9-10 x 5-5.5 µm

Inosperma aff. maculatum 1

Pileus orange-brown or tawny, velipellis inconspicuous or absent, odor aromatic with a green corn component (spermatic also recorded); New England, New York, Tennessee, North Carolina, Indiana; spores 7-10 x 4.5-5.5 µm

Inocybe curreyi (Berk.) Sacc. *sensu* Hesler (non *Pseudosperma curreyi* (Berk.) Matheny & Esteve-Rav. (species requires a new name in *Inosperma*)

Pileus dark brown, chestnut-brown, or brown (umbrinous), odor various (none, green corn, spermatic, or aromatic)

Pileus brown or umbrinous, *with a prominent umbo*, stipe slender, odor none; spores *elliptic*, 7.5-9 x 5-6 µm, with *Abies* or *Betula*; New York, Mexico, China

Inosperma fastigiellum (G.F. Atk.) Matheny & Esteve-Rav.

Pileus dark brown or bicolorous with a dark brown umbonate disc and a radially streaked reddish brown to brown margin, fruitbodies *robust*, odor of green corn, staining dark brown with age, spores (sub)reniform, 7-8 x 4-4.5 µm, in oak-hickory forests mixed with beech; New Jersey, Virginia, Tennessee, North Carolina, Mississippi

Inosperma aff. fastigiellum 2

Pileus center dark yellowish brown, with slight velipellis, shading umbrinous towards the margin, fruitbodies robust, odor spermatic, spores xxxxxxxx, under *Fagus*, *Quercus*; New York, Tennessee, Indiana, Oklahoma, Mexico

Inosperma aff. maculatum 2

Pileus dark brown, chestnut-brown or umbrinous, with or without a prominent umbo, odor *often present* (aromatic or spermatic) but occasionally absent; spores 8-10 x 4.5-5.5 µm, (sub)reniform; habitat various

Odor penetrating, definitely not spermatic, but complex with strongly fungoid (like young *Lycoperdon*), pungent aromatic, and raphanoid components

Inosperma maculatum Boud. *sensu* D.E. Stuntz p.p. (differs from *In. lantodiscum* in odor and pileus color; cf. *Inocybe grabra* with an ochraceous-brown to livid-brown pileus)

Odor spermatic, complex aromatic, or none

Pileus with distinct white patches of velipellis

Inosperma neobrunnescens var. leucothelotum (Grund & D.E. Stuntz) (Syn. *I. lanatodisca* var. *phaeoderma* (D.E. Stuntz) Grund & D.E. Stuntz; specimens *without* an odor belong here; Michigan, Nova Scotia, North Carolina (at higher elevations), on acid soil in mixed and northern hardwood forests including *Quercus*, *Carya*, *Tsuga*, *Pinus*, *Rhododendron*; =*In. rosellicaulare*)

Pileus lacking distinct white patches of velipellis, odor spermatic

Inosperma neobrunnescens (Grund & D.E. Stuntz) Matheny & D.E. Stuntz (Syn. *Inocybe brunnescens* G.F. Atk., *non* Earle; *Inocybe fastigiata* var. *microsperma* Bres. *sensu* A.H. Sm.; *Inocybe glabra* ("*glaber*") Kauffman [1918] has an ochraceous-brown to livid-brown (vinaceous-brown) umbonate (acute or nipple-like) and deeply conical pileus, nauseous or radishy odor, no velipellis, white to pallid bulbous sitpe, and subreniform spores 7-9 x 4-5 µm, under hardwoods, Michigan)

Stipe furfuraceous-pruinose and not staining, odor noticeable or lacking, spores often elliptic but *not* distinctly bean-shaped (phaseoliform, reniform)

Pileus white to pale ivory, pale buff, yellow, grayish brown to pinkish gray, or pinkish brown

Stipe vinaceous-purple at the apex, pileus pale dingy cream with greenish tinges

Pseudosperma vinosistipitatum (**Grund & D.E. Stuntz) Matheny & Esteve-Rav.**

Stipe without vinaceous colors, pileus without greenish tinges

Stipe, pileus, *and* lamellae yellow, odor not perceptible, spores mostly 11-13(15.5) x 6-7(8) µm; under conifers and widely distributed – Nova Scotia, Michigan, Washington

Pseudosperma holoxanthum (Grund & D.E. Stuntz) Matheny & Esteve-Rav.

Lacking the combination of yellow traits above

Stipe pale ochraceous (pileus yellow but lamellae pale brown), odor none, under *Coccoloba*, Caribbean Basin

Pseudsperma littorale (Pegler) Matheny & Esteve.-Rav.

Stipe white to pallid throughout; odor none or of green corn, under other plant associates, location various

Spores narrow, 8-11.5 x 4-5.5 µm, pileus cream-buff, odor none, under *Inga*, Caribbean Basin

Pseudosperma ingae (Pegler) Matheny & Esteve-Rav.

Spores larger than above, pileus color various, odor absent or distinctive, in temperate areas

Stipe abruptly bulbous

Pseudosperma bulbosissimum (**Kühner) Matheny & Esteve-Rav.** (Syn. *Inocybe fastigiata* f. *alpestris* R. Heim *sensu* Stuntz pro parte; confirmed from Michigan, Colorado, Washington, B.C., Mexico)

Stipe even or slightly enlarged at the base

Pileus white or pallid ivory, odor none, spores 11-14 x 5.5-7 µm, in mixed woods

Pseudosperma aurora var. inodoratum (Grund & D.E. Stuntz) Matheny & Esteve-Rav. (Syn. *Inocybe fastigiata* f. *subcandida* Malençon sensu Grund & Stuntz 1981) [pileus is prominently concio-fastigate]

Pileus margin yellowish; lamellae narrow and cream, pale yellow, to olive-brown; odor of green corn, spores 11-15.5 x 6-8 µm, under hardwoods, eastern U.S. [western variant is larger and occurs under conifers and may be more appropriately referred to as *P. holoxanthum*]

Pseudosperma sororium (Kauffman) Matheny & Esteve-Rav.

Pileus yellowish at first, becoming fulvous over the disc, with mixture of yellowish ochraceous and/or isabelline tones; lamellae crowded, whitish at first becoming grayish-whitish often with yellowish tones; odor spermatic, indeterminate, or pleasantly aromatic; spores 9.3-12 x 4.5-6.5 µm; on acidic wet soils under conifers, *Salix*, *Populus*; Quebec, Germany (type), introduced to New Zealand

Pseudosperma merlinii Bandini, B. Oertel & U. Eberh.

Pileus pallid yellowish buff, grayish brown to pinkish gray, or pale pinkish beige, odor aromatic, spores 10-12.5-15 x 5.5-6-7.5 µm, under conifers (*Picea*, *Tsuga*)

Pseudosperma aurora (Grund & D.E. Stuntz) Matheny & Esteve-Rav. (*Ps. obsoletum* (Romagn.) Matheny & Esteve-Rav. is very similar but slightly genetically distinct; Syn. *Inocybe fastigiata* f. *alpestris* R. Heim *sensu* Stuntz pro parte)

Pileus darker than above – brownish orange, olivaceous, yellowish brown, or dark brown, at times with lighter colored margin or center with whitish velipellis

Basidiomes small or slender and fragile, pileus 10-30 mm, conical, stipe 15-55 x 1-4 (-5) mm

Lamellae tinged olivaceous, odor of green corn, pileus yellowish brown shading isabelline towards the margin, long-rimose; spores 8-12 x 5-7 µm; under *Quercus* or in *Quercus-Carya* forests, eastern U.S. (Ohio, New York, New Jersey, Tennessee)

Pseudosperma friabile (Matheny & Kudzma) **Haelew.**

Lamellae tinged olivaceous, odor *none*, pileus yellowish brown to brownish yellow, rimose but *not* long-rimose; spores 9.5-12.5 x 5.5-6 µm; in mixed forests, southeast U.S. (Tennessee, Florida)

Pseudosperma cf. umbrinellum (Bres.) Matheny & Kudzma

Lamellae without olivaceous tones; odor of green corn or none, pileus color, surface, and habitat various

Odor of green corn, pileus dark brown to dark grayish brown at the center, shading brown towards the margin, long-rimose, under *Quercus*, *Carya, Fagus*, Louisiana

Pseudosperma actinocephalum D.E. Stuntz ex Matheny ined.

Odor none, pileus not as dark towards the margin as above, plant associates and distribution various

Odor none, pileus dark brown shading to *fulvous and brownish yellow* towards the margin, *weakly rimose*, spores 10-11 x 6-5.5 µm, in low elevation woods under *Fagus*, *Quercus*, and *Pinus*, east Texas

Pseudosperma brunneicothurnatum D.E. Stuntz ex Matheny ined.

Odor none, pileus center brown (umbrinous) shading to isabelline towards the margin, rimose, spores 11-13 x 5.5-7 µm, at high elevations under *Betula* and *Abies-Picea*, Tennessee-North Carolina

Pseudosperma sp. PBM2601 (close to *Inoccybe friabilis* but differing by the habitat)

Odor none, pileus brownish-orange to pale brown, rimose, spores 12-13 x 5.5-6.5 µm ("with a narrow germ pore"), in tropical rainforest, Yucatan Peninsula, Mexico

Pseudosperma tropicale (Guzmán) Matheny & Esteve-Rav.

Basidiomes larger than above, pileus 20-70 mm, stipe 30-80 x 3-10 mm

Pileus very dark brown to dark brown at the center [darker than type], with acute to obtuse umbo, shading to brown or yellowish-brown towards the margin, long-rimose; lamellae light gray to brown, medium; odor none; spores mostly 9-11.5 x 6-7 µm [somewhat larger than type], cheilocystidia ventricose, clavate, or cylindric; under *Quercus*, Tennessee-Virginia to Oklahoma and Costa Rica (low-elevation)

Pseudosperma notodryinum (Singer, I. J.A. Aguiar & Ivory) Matheny & Esteve. Rav. (=*Inocybe umbrinella* Bres. *sensu* Kauffman (the American version of *Pseudosperma perlatum* (Cooke) Matheny & Esteve-Rav.)

Pileus dark brown to dark yellowish brown at the center, shading umbrinous towards the margin, umbonate, velipellis absent; lamellae narrow, not olivaceous; stipe light buff with a white base, not bulbous; odor none; spores 10-12 x 5.5-6 µm; cheilocystidia 38-43 x 12-14 µm, utriform to somewhat clavate or ventricose; on sandy acid soil under *Tsuga*, *Pinus strobus*, *Quercus*, North Carolina

Pseudosperma sp. PBM4587 [*perlatum*/*notodryinum* clade]

Pileus mostly yellowish to yellowish brown (*Ps. rimosum* (Bull.) Matheny & Esteve-Rav. complex – several unique sequence variants have yet to be characterized)

Pileus dull yellow-ocher to rich yellowish-fuscous, at times bister at the center or pale, odor 'strong and disagreeable' (spermatic most likely), lamellae narrow, whitish but then tinged olivaceous; spores 9-12 x 5-6 µm, cheilocystidia saccate, "in woods", widespread

Inocybe fastigiata (Schaeff.) Quél. *sensu* Kauffman (Kauffman's concept likely was a broad one)

Similar to *Inocybe fastigiata sensu* Kauffman, odor strongly spermatic, lamellae olivaceous and narrow; but spores somewhat larger – 11-13 x 6-6.5 µm; cheilocystidia cylindric, fusiform, or clavate, under hardwoods *Quercus*, *Fagus*, *Betula* mixed with *Pinus strobus*, New England (Vermont, Massachusetts, New Hampshire)

Pseudosperma parafastigiatum D.E. Stuntz ex Matheny ined.
Similar to *I. parafastigiatum* (spore size) but without any odor, lamellae *not* olivaceous, stipe base somewhat enlarged; under *Populus deltoides* or *Quercus* on sandy soil; Oklahoma, Tennessee
Pseudosperma sp. PBM4302 [*Ps. umbrinellum* subclade within clade A]
Pileus yellowish at first, becoming fulvous over the disc, with mixture of yellowish ochraceous and/or isabelline tones; lamellae crowded, whitish at first becoming grayish-whitish often with yellowish tones; odor spermatic, indeterminate, or pleasantly aromatic; spores 9.3-12 x 4.5-6.5 µm; on acidic wet soils under conifers, *Salix*, *Populus*; Quebec, Germany (type), introduced to New Zealand
Pseudosperma merlinii Bandini, B. Oertel & U. Eberh.

Spores smooth, yellowish-brown, and pleurocystidia present
Stipe pruinose at the apex only or not at all; caulocystidia and cauloparacystidia absent or present on upper half of stipe only (rarely caulocystidioid cells below stipe center)
Pileus and stipe white
Basidiomes turning red after bruising or drying, pileus convex, robust, under conifers or in mixed woods under conifers; common in western North America, rarely reported in eastern North America (Nova Scotia)
Inocybe pudica (Syn. *I. geophylla* var. *lateritia* (Berk. & Br.) W.G. Sm., *I. geophylla* f. *perplexa* Kauffman, *I. godeyi* p.p. sensu Kauffman)
Basidiomes drying pink, pileus umbonate, slender; under hardwoods, Tennessee (also Washington under *Populus*)
Inocybe armeniaca Huijsman
Basidiomes not turning red after bruising or drying, slender, widespread, ecology various (species polyphyletic)
Inocybe geophylla (Bull.) P. Kumm *sensu lato* [group polyphyletic and in need of revision]
Pileus convex… ***convex form***
Pileus papillate… ***umbonate form***
Pileus and stipe not white
Pileus tinged violaceous in youth, otherwise mouse-gray to dark brown, scaly; lamellae violaceous in youth, stipe apex with violaceous tinges
Inocybe cincinnata (Fr.) Quél. *sensu* Kauffman (cf. *I. violaceifolia* Peck described with grayish pileus only and white to whitish stipe but with violet lamellae in youth)
Pileus and/or stipe lilac to violaceous or with lilac or pinkish-lavender tinges, *not* scaly; lamellae *not* violaceous in youth
Pileus and stipe lilac or violaceous, odor spermatic
Basidiomes small (stipe 1-3 mm) with persistent dark violet streaks; spores 8-9.5 x 4.5-5.5 µm, subamygdaliform or elliptic; pleurocystidia 45-60 x 14-18 µm; under *Pinus* or hardwoods; New York, North Carolina, Tennessee
Inocybe lilacina (Peck) Kauffman
Basidiomes medium (stipe 2-6 mm), lilac often fading (at times completely), under conifers or hardwoods
Spores mostly *elliptic*, 8-10.5 x 5-6.5 µm; pleurocystidia 50-75 x 11-14 µm, fusiform to subcylindric; relatively rare, with *Picea*, *Abies*, or *Pinus*, southeastern Canada and the Rocky Mountains
Inocybe sublilacina Matheny & A. Voitk
Spores mostly *amygdaliform*, 7.5-10.5 x 4.5-6 µm; pleurocystidia 50-75 x 11-20 µm, fusiform-ventricose; on acidic soils with *Pinus* or *Picea* in boreal, maritime, and high-elevation western localities, also with *Pseudotsuga* and *Tsuga* in the Pacific Northwest, widespread ranging from Alaska to Mexico and norther regions of the eastern U.S. and southeastern Canada
Inocybe pallidicremea Grund & D.E. Stuntz (=*I. lilacina sensu auct. pl.*; cf. two separate undescribed species known only from the Pacific Northwest referable to *I. lilacina* or *I. geophylla*)
Spores amygdaliform to subelliptic; pileus intensely violet-lilac and often reddish tinged when fresh; spores 7-9 x 4-5 µm; hymenial cystidia relatively small and ventricose (38-52 x 9-19 µm); on calcareous soils, in Europe with hardwoods *Betula*, *Fagus*, *Quercus*, *Populus* or with *Corylus* and *Alnus* mixed with *Pinus sylvestris*, in southeastern Canada with *Salix*, *Populus*, and planted *Abies*, also Oregon with *Populus*

Inocybe aphroditeana

Pileus *not* lilac or violaceus, stipe with lilac or pinkish-lavender tinges at the apex

Odor of *Pelargonium*, not spermatic

Pileus yellowish brown, basidiomes slender

Inocybe griseolilacina J.E. Lange

Pileus reddish brown with pale brown margin, basidiomes not slender

Inocybe personata Kühner

Odor spermatic or *not* like *Pelargonium*

Pileus pale ochraceous, stipe apex violet but finely white velutious elsewhere, base with a membranous volva

Inocybe violaceoalbipes G.F. Atk.

Pileus dark brown to brown or fuscous

Pileus and stipe brown, *not* virgate, at times subscaly; stipe fibrillose; spores >11 µm long and minimally angular; odor not spermatic; on gravelly soil along roadside, Massachusetts but overall distribution not clear

Inocybe euthelella Peck (*I. lacera* group)

Pileus reddish brown to umbrinous, *not* virgate (that is, without radiating stripes); stipe pruinose at extreme apex, without scattered brown fibrils; spores <11 µm long; paracystidia hyaline; odor strongly spermatic; New York, Europe (under Betulaceae)

Inocybe paleovenata (Bizio & A. Castellan) Esteve-Rav. & Pancorbo (=*I. grammopodia* sensu Auct. pl).

Pileus dark brown to brown, *not* virgate (without radiating stripes); stipe with scattered brown fibrils against a lighter ground color; spores <11 µm long; paracystidia often brown incrusted

Inocybe cincinnata (Fr.) Quél. (Syn. *I. cincinnatula* Kühner, nom. inval., sensu Grund & Stuntz 1968; cf. *I. retipes* G.F. Atk., *non* Singer)

Pileus fuscous, virgate; stipe with fuscous peronate sheath of fibrils; spores <11 µm long; paracystidia hyaline; odor strongly spermatic; under conifers, Nova Scotia to North Carolina (high-elevation)

Inocybe fuscicothurnata Grund & D.E. Stuntz (*I. virgata* the same but without the lilac stipe apex)

Pileus and stipe without lilac tinges

Pileus *and* stipe squarrose, squamulose, or floccose-squamulose

Scales brown

Pileus and stipe squarrose, spores <11 µm long and amygdaliform, in forests

Inocybe hystrix (Fr.) P. Karst. (a Costa Rican report is a darker independent species, under high-elevation *Quercus*)

Pileus squamulose or squarrose, stipe floccose-scaly (other forms merely densely fibrillose), spores >11 µm long and fusiform or 'boletoid', along roadsides or in disturbed areas

Inocybe lacera (Fr.) P. Kumm. group

Pileus without or with only a low large umbo, surface coarsely fibrillose, at times (sub)squamulose around the center, rarely scaly, odor not remarkable; spores 10-14.5 x 3.7-5.3 µm (average 11.9 x 4.5 µm), some spores longer from 2-sterigmate basidia; pleurocystidia 34-78 x 11-27 µm, generally without or with only a short neck, apices often subacute, conical, or mucronate, walls up to 2.5 µm thick apically; caulocystidia present only at the extreme apex of the stipe or absent; widespread and common in northerly regions on acidic soils under conifers (*Picea*, *Pinus*) and Salicaceae, also in sand dunes and alpine areas, circumboreal

Inocybe lacera (Fr.) P. Kumm. (includes two variants documented from eastern North America below but are considered synonymous with *I. lacera*)

Spores 11-12.5 x 4.5-5 µm, near *Fagus*, *Betula*, Nova Scotia

Inocybe lacera f. subsquarrosa F.H. Møller

Spores extremely variable in size and shape, in roadside gravel, Nova Scotia

Inocybe lacera var. heterosperma Grund D.E. Stuntz

Pileus small (up to 12 mm) and with a small obtuse or acute nipple-like umbo; stipe 12-30 x 1-2 mm, odor spermatic; spores xxxxxx; cystidia xxxxxxx; on acidic soils under *Pinus strobus*, *Betula*, *Abies*; Maine, New York, New Jersey, Indiana (shore of Lake Michigan), British Columbia

Inocybe infelix Peck (includes *I. infelix* var. *brevipes* Peck)
Pileus 15-50 mm, without or with a low obtuse umbo; stipe 20-80 x 2-7 mm; odor indistinct; spores 9.3-17 x 4.5-6.7 µm (ave. 11.8 x 5.2 µm), variable in shape and size, at times minimally angular; pleurocystidia 35-98 x 9-22 µm, apices at times mucronate; under *Quercus* (type and Massachusetts materials) or *Pinus* on sandy acidic soils; Maine, Massachusetts, British Columbia (also Europe);
Inocybe moravica Hruby
Spores on average larger than above, pileus often with a nipple-like or small obtuse umo
Pileus 15-22 mm, uniformly pale isabelline, slightly umbonate; spores wider than above – 12-14 x 5.5-6 µm (ave. 13 x 5.8 µm) but shaped as in *I. lacera* (oblong-cylindric and at times minimally angular in outline); pleurocystidia 48-72 x 18-25 µm, some apices subacute or conical, with a slender basal pedicel (like *I. curvipes*), walls 1-3 µm thick apically; on karst topography, plant associates unknown, northern Florida (type)
Inocybe sublongipes Murrill
Pileus 20-35 mm, with a prominent nipple-like umbo, densely imbricate-scaly with a fibrillose margin, odor absent; stipe 30-40 x 3-5 mm; spores 11.5-15 x 5-6.5 µm (ave. 13.3 x 5.7 µm); pleurocystidia 50-68 x 16-21 µm, without distinct necks, apices often subacute or conical; on karst topography near *Quercus*, northern Florida (type)
Inocybe gigantispora Murrill
Pileus 15-25 mm, with an acute umbo, silky-floccose; stipe 30-45 mm long, slender; spores 10.4-14.5 x 5-6.6 µm (ave. 12.3 x 5.8 µm), oblong, at times like *I. lacera*; pleurocystidia 38-56 x 14-19 µm, apices rounded (not mucronate or acute); coastal Georgia (type)
Inocybe ravenelii Massee
Scales whitish or bright ochraceous, *not* brown
Scales whitish against dull yellowish or dull ochre background, hymenial cystidia hyaline in KOH
Inocybe griseoscabrosa (Peck) Earle
Scales and ground color bright ochraceous, hymenial cystidia bright yellow in KOH
Inocybe subochracea (Peck) Peck (Syn. *I. subochracea* var. *burtii* Peck, which was described to accommodate a variety with a more conspicuous cortina, longer stipe, and more heavily fibrillose pileus margin and stipe surface)
Pileus squamulose, squarrose, floccose, or fibrillose *but* stipe *not* scaly
Pileus squarrose, squamulose, or floccose
Pileus *and* stipe bright yellow-ochre (or ochre and tawny), pleurocystida *bright yellow* in KOH
Inocybe subochracea (Peck) Peck) (Syn. *I. subocrhacea* var. *burtii* Peck, see above for details)
Pileus and stipe *not* bright yellow-ochre, pleurocystidia hyaline or with yellowish contents in KOH
Pileus pale ochraceous, ochraceous-tawny, yellow, or warm buff; stipe similarly colored or pale yellow
Lamellae eventually olivaceous-brown, spores 9-10 x 4-5 µm
Cystidia 40-63 x 10-15 µm, hyaline
Inocybe submuricellata var. stenospermina Grund & D.E. Stuntz (=*I. abjecta sensu* Grund & D.E. Stuntz; eastern version of *I. chondroderma* D.E. Stuntz ex Matheny, Norvell & E.C. Giles)
Cystidia 30-40 x 8-11 µm (color not indicated)
Inocybe cylindrocystis G.F. Atk. (cf. *I. cryptocystis* D.E. Stuntz, which differs by the presence of a bulbous stipe base and fibrillose pileus)
Lamellae *not* olivaceous or pale yellow, spores larger or more broad
Lamellae white to brown, stipe long in relations to pileus width; spores 8-9.5 x 5-5.5 µm, cystidia 60-90 x 12-15 µm, often with yellowish content
Inocybe ochraceomarginata Kauffman (similar to *I. microteroxantha* Grund & D.E. Stuntz but lacking caulocystidia below stipe center)
Lamellae pale yellow, spores mostly 10-11 x 5-6 µm, cystidia 50-70 x 10-15 µm, hyaline
Inocybe submuricellata G.F. Atk.
Pileus darker than above (or lamellae and flesh *reddening*), stipe *not* ochraceous or yellow throughout
Odor sweet-aromatic (like Matsutake) *or* like green corn (“meal” or “cornsilks”)

Pileus yellow-ochre or raw sienna, stipe lighter in color, flesh and lamellae reddening, odor of green corn, ecology not clear ("in mixed woods"),

Inocybe rubellipes G.F. Atk.

Pileus dark brown at the center, yellowish-brown towards the margin, overlain with pallid superficial fibrils, stipe white, flesh and lamellae reddening, odor aromatic (like Matsutake), in hardwoods with *Fagus*, *Tilia*, *Quercus* or mixed forests, limestone soil

Inocybe dulciolens Matheny & Kudzma, (Syn. *I. pyriodora* (Pers.) P. Kumm. *sensu* Am. auct.)

Pileus uniformly dark brown or bister, stipe paler brown – pale umbrinous to cinnamon-buff, flesh *not* reddening, odor aromatic, under *Picea*

Inocybe scabra (O.F. Müll.) Quél. *sensu* Grund & D.E. Stuntz (*sensu* J.E. Lange, M.M. Moser)

Pileus center with blue-green tinged velipellis, elsewhere ochraceous-tawny to ochre, center becoming dark brown with age; lamellae and flesh in stipe reddening, under hardwoods, New Jersey (type) and Minnesota

Inocybe glaucescens Matheny & Kudzma

Odor spermatic or not remarkable

Stipe base or lower part of stipe dark brown or becoming so

Spores with mean Q-value <2.0, amygdaliform, pleurocystidia thin-walled, apices not acute

Inocybe melanopus D.E. Stuntz (orth. variant *I. melanopoda*)

Spores with mean Q-value >2.0, pleurocystidia thick-walled apically, apices acute or rounded

Pileus without or with only a low large umbo, surface coarsely fibrillose, at times (sub)squamulose around the center, rarely scaly, odor not remarkable; spores 10-14.5 x 3.7-5.3 µm (average 11.9 x 4.5 µm), some spores longer from 2-sterigmate basidia; pleurocystidia 34-78 x 11-27 µm, generally without or with only a short neck, apices often subacute, conical, or mucronate, walls up to 2.5 µm thick apically; caulocystidia present only at the extreme apex of the stipe or absent; widespread and common in northerly regions on acidic soils under conifers (*Picea*, *Pinus*) and Salicaceae, also in sand dunes and alpine areas, circumboreal

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Spores 11-12.5 x 4.5-5 µm, near *Fagus*, *Betula*, Nova Scotia

Inocybe lacera f. subsquarrosa F.H. Møller

Spores extremely variable in size and shape, in roadside gravel, Nova Scotia

Inocybe lacera var. heterosperma Grund D.E. Stuntz

Pileus small (up to 12 mm) and with a small obtuse or acute nipple-like umbo; stipe 12-30 x 1-2 mm, odor spermatic; spores xxxxxx; cystidia xxxxxxx; on acidic soils under *Pinus strobus*, *Betula*, *Abies*; Maine, New York, New Jersey, Indiana (shore of Lake Michigan), British Columbia

Inocybe infelix Peck (includes *I. infelix* var. *brevipes* Peck)

Pileus 15-50 mm, without or with a low obtuse umbo; stipe 20-80 x 2-7 mm; odor indistinct; spores 9.3-17 x 4.5-6.7 µm (ave. 11.8 x 5.2 µm), variable in shape and size, at times minimally angular; pleurocystidia 35-98 x 9-22 µm, apices at times mucronate; under *Quercus* (type and Massachusetts materials) or *Pinus* on sandy acidic soils; Maine, Massachusetts, British Columbia (also Europe);

Inocybe moravica Hruby

Spores on average larger than above, pileus often with a nipple-like or small obtuse umo

Pileus 15-22 mm, uniformly pale isabelline, slightly umbonate; spores wider than above – 12-14 x 5.5-6 µm (ave. 13 x 5.8 µm) but shaped as in *I. lacera* (oblong-cylindric and at times minimally angular in outline); pleurocystidia 48-72 x 18-25 µm, some apices subacute or conical, with a slender basal pedicel (like *I. curvipes*), walls 1-3 µm thick apically; on karst topography, plant associates unknown, northern Florida (type)

Inocybe sublongipes Murrill

Pileus 20-35 mm, with a prominent nipple-like umbo, densely imbricate-scaly with a fibrillose margin, odor absent; stipe 30-40 x 3-5 mm; spores 11.5-15 x 5-6.5 µm (ave. 13.3 x 5.7 µm); pleurocystidia 50-68 x 16-21 µm, without distinct necks, apices often subacute or conical; on karst topography near *Quercus*, northern Florida (type)

Inocybe gigantispora Murrill

Pileus 15-25 mm, with an acute umbo, silky-floccose; stipe 30-45 mm long, slender; spores 10.4-14.5 x 5-6.6 µm (ave. 12.3 x 5.8 µm), oblong, at times like *I. lacera*; pleurocystidia 38-56 x 14-19 µm, apices rounded (not mucronate or acute); coastal Georgia (type)

Inocybe ravenelii Massee

Stipe base *not* darker than rest of the stipe

Basidiomes very small (pileus <20 mm, stipe 13-25 x 1-3 mm) *and* pileus dark reddish brown to red-brown *or dull umber*, Nova Scotia to North Carolina to Mexico with pine, also Europe with aspen and alder and in the Pacific Northwest

Inocybe minima Peck, *non* Killerm.

Basidiomes larger than above (pileus >15 mm, stipe >25 x 1-2 mm) *or* pileus not colored as above

Pileus with coarse recurved scales and low umbo, spores >11 µm long, in sand, Greenland

Inocybe ursinella M. Lange

Pileus lacking coarse recurved scales, or, if squarrose, then with small acute umbo, spores <11 µm long, in temperate forests

Pileus without an umbo, pallid at first becoming a dingy straw color or pale brown, in temperate forests, Michigan to Tennessee

Inocybe melanopus D.E. Stuntz (orth. variant *I. melanopoda*)

Pileus obtusely umbonate, disc brown and shading to yellowish or warm buff towards the margin; stipe apex white, elsewhere yellow (walls of cystidia yellow in KOH), temperate

Inocybe flocculosa Sacc. (Syn. *I. stuntzii* Grund; cf. *I. excoriata* Peck with lacerate-excoriate pileus surface and white stipe, New England and New York; cf. *I. abjecta* (P. Karst. Sacc. *sensu* Grund & Stuntz, which differs by its grayish-umber pileus that is mostly fibrillose and hyaline cystidia)

Pileus with a mammilate or papillate umbo, brown or dull dark brown; stipe pallid or white, walls of cystidia *not* distinctly yellow in KOH (but may be brown)

Pileus squarrose, lamellae edges *brown*, stipe with a white annular belt, under *Quercus*, lowland Costa Rica, tropical

Inocybe plocamophora Singer

Pileus appressed-squamulose or with slightly upraised tips towards the margin, lamellae edges *white*, under conifers or *Corylus*, north temperate

Inocybe gausapata Kühner (spores mostly 8-9 x 5-6 µm, walls of pleurocystidia 3-4 µm thick, under *Tsuga*, Nova Scotia)

Inocybe pallidipes Ellis & Everh. (spores somewhat longer and narrower than in *I. gausapata*, walls of pleurocystidia 4-7 µm thick; note that the protologue does *not* mention a mammilate umbo and the spore measurements are incorrect per Grund & Stuntz (1981); under *Corylus*, New Jersey)

Basidiomes not very small and pileus dark brown to dark yellowish brown, margin splitting (stipe *not* white)

Pileus 20-50 mm, convex to plane and umbonate or nearly so; surface diffracted-scaly, rimose to the umbo, chestnut-brown (dark brown); lamellae whitish to brown; stipe 40-50 x 3-4 mm, equal to subbulbous, pruinose at the apex, tinged rufous; odor unknown; spores 6-7.5 x 5-6 µm, ovate to subglobose, at times with obscure angles; cystidia only slightly thick-walled; under hardwoods, Michigan and Tennessee

Inocybe ovalispora Kauffman

Pileus 10-22 mm, conical to campanulate or plane, with a low umbo, velipellis absent; cracked-areolate over the disc in age, fibrillose to finely scaly and rimulose towards the margin; dark yellowish brown, odor spermatic; lamellae subdistant, grayish brown to yellowish brown; stipe 20-35 x 2.5-4 mm, pruinose at the apex with pallid vesture below; ground color light buff to ocher-buff; spores 8-9.5 x 5-5.5 µm, amygdaliform with pointed apices; pleurocystidia only slightly thick walled (-1.0 µm), metuloids present upper-third of stipe; in mixed woods on humus enriched soil under *Quercus*, *Carpinus*, *Pinus*, northern Florida

Inocybe striatiformis Murrill (see PBM4557)

Pileus fibrillose

Pileus with green or glaucous tones, stipe base becoming green where cut, odor aromatic

Pileus 30-60 mm, whitish and streaked with bister-colored fibrils; stipe 30-50 x 2-5 mm, whitish, fuscescent, white within but changing to green where cut; spres 8-9.5 x 5-5.5 um, ovate; pleurocystidia 45-55 x 15-18 um, short, subpyriform to ventricose-subvoid with slender pedicel, paracystidia saccate-clavate; Maryland, New York (also Colorado)

Inocybe corydalina Quél.

Pileus -25 mm wide, center dark olive-bister, light ochraceous towards the margin, surface with scattered appressed white fibrillose patches; stipe 40-50 x 4-5 mm, white above, yellowish brown towards the center, grayish green at base; flesh white, not reddening where cut; spores 7.5-9 x 5=6 um, subamygdaliform to elliptic; pleurocystidia 34-62 x 13-24 um, cylindric, ventricose, or clavate with a slender pedicel; paracystidia abundant, clavate

Inocybe coelestium Kuyper

Pileus 10-30 mm, coarsely fibrillose with appressed scales, center with blue-green tinged velipellis, elsewhere ochraceous-tawny to ochre, center becoming dark brown with age; lamellae with a pinkish brown phase, reddening where damaged. Stipe 30-35 x 4-6 mm at apex, base enlarged up to 9 mm wide with a rounded bulb; yellowish with white furfuraceous fibrils, ochraceous to reddish pink above the base or cinnamon-brown with age, reddening faintly where bruised; spores 7.5-9.5 x 5-6.5 um, subcitroniform to broadly amygdaliform; pleurocystidia 26-38 x 12-17 µm, short and obese or short clavate to short utriform; paracystidia slenderly clavate, abundant; under hardwoods, New Jersey (type).

Inocybe glaucescens Matheny & Kudzma

Pileus lacking green tones, stipe base *not* becoming green, odor different

Pileus whitish, yellowish, or yellow-ochre, some species with short pleurocystidia (<50 µm long)

Pileus yellowish, spores *not* minimally angular

Pileus buff to chamois or pale yellow [rarely grayish forms can be found], conical, dry or somewhat tacky, margin without veil remnants, lamellae *not* purplish, stipe equal or with swollen base, somewhat tacky-viscid; on soil under *Picea* or *Pinus*, widespread – New York, Vermont, Maine, as well as Washington, nearctic regions, Colorado, New Mexico, Mexico, also Europe (Netherlands, Finland)

Inocybe sambucella G.F. Atk.

Pileus pale yellowish to brownish yellow, with whitish velipellis, spores mostly 7-9 x 5 µm, hymenial cystidia often (sub)capitate and utriform; on acidic soils under conifers such as *Picea*, *Abies*, or *Pseudotsuga*; widespread – Newfoundland and Labrador, Pennsylvania, Alaska, British Columbia, California, also Europe

Inocybe elysii Bandini & B. Oertel

Pileus pearly-white with a yellowish umbo, margin appendiculate with veil remnants, lamellae with a purplish tint, on dead wood, Xalapa (Mexico)

Inocybe jalapensis Murrill

Pileus whitish to pale ochraceous, spores *minimally angular*, stipe base enlarged or subbulbous but not marginate, pleurocystidia *not* short, on sandy poor soil, Massachusetts

Inocybe sambucina (Fr.) Quél.

Pileus yellow, viscid (with adhering dirt particles), margin without veil remants, stipe even (pleurocystidia up to 65 um), spores *not* minimally angular

Inocybe hebelomoides Murrill, *non* Kühner [*Hebeloma floridanum* Murrill 1940, non Murrill 1945 has the same description and type as *I. hebelomoides*. *Inocybe floridana*, however, is already occupied in *Inocybe* by Murrill 1945, possible syn. *I. olpidiocystis* G.F. Atk.; see also Eberhardt et al. 2023]

Pileus pale yellow, cream-buff, or yellow-ochre, dry, stipe clavate with a bulbous base or with a napiform bulb

Stipe with a napiform bulb, pale yellow shading downward to dull brown, pleurocystidia very short (mostly 30-40 x 12-13 µm), in mixed woods of *Fagus* and *Tsuga*

Inocybe cryptocystis D.E. Stuntz (cf. *I. cylindrocystis* G.F. Atk. but with numerous small fibrillose-scales towards the margin)

Stipe clavate-bulbous, pallid, pleurocystidia larger than above (mostly 45-50 x 13-17 µm), under conifers

Pileus pale yellow, cystidia thick-walled, odor spermatic

Inocybe pallidicremea Grund & D.E. Stuntz (same as faded forms of *I. lilacina sensu auct. pl.*)

Pileus yellow-ochre, cystidia predominately thin-walled (some also thick), odor "farinaceous"

Inocybe kauffmanii (Syn. *I. longipes* Kauffman, non Massee)

Pileus light yellowish brown, tawny, brown (umbrinous), red-brown, dark brown, or fuscous, pleurocystidia *not* short (>50 um long)

Fibrils on pileus and lower part of stipe agglutinated *and* spores ovate-elliptic

Pileus and lower part of stipe pale-tawny or fulvous

Inocybe agglutinata Peck (Syn. *I. geophylla* var. *fulva* (Pat.) Sacc. *sensu* Perez Silva?)

Pileus and lower part of stipe fuscous

Inocybe fuscodisca (Peck) Massee (spore apices bluntly pointed, occ. obtuse; cf. *I. virgata* G.F. Atk.)

Fibrils on pileus and lower part of stipe *not* agglutinated, spores elliptic, cylindric, or amygdaliform

Pleurocystidia thin-walled and pileus some shade of red-brown

Basidiomes more robust than below; stipe 30-60 x 2-6 mm, pallid or tinged dingy pinkish; odor faint, raphanoid with saponaceous or farinaceous components; spores 7-10 x 5-6 µm, in hardwood stands or mixed stands

Inocybe leptocystis G.F. Atk.

Basidiomes more slender than above; stipe 15-60 x 0.5-3 mm, pinkish; odor raphanoid-spermatic; spores 9.5-12 x 5-6 µm, in swampy areas under hardwoods, (type Michigan; Stz2777 from Michigan is same as environmental sample from arctic Alaska and very similar to *I.* cf. *griseolilacina* EL12006))

Inocybe rufidula Kauffman

Pleurocystidia slightly thick-walled (0-1.5 µm) or thick-walled (>1.5 µm)

Pileus very dark brown, bister, or sepia

Pileus streaked very dark brown, similar to lower part of stipe

Inocybe virgata G.F. Atk. (similar to *I. fuscicothurnata* Grund & D.E. Stuntz but without the lilac apex; *I. striatiformis* Murrill has stiff upturned fibrils on pileus and pale rosy-isabelline stipe)

Pileus and stipe not as above

Spores 10.5-14.5 x 4.5-5.5 µm, Q ave. >2.00, narrowly cylindric or with slight irregular outline (similar to *I. lacera*), pileus context whitish but turning slightly reddish brown, velipellis present, basidiomes stout overall, under *Salix* or *Populus*, Greenland and Montana

Inocybe longispora M. Lange

Spores 9-12 x 4-4.5 µm, Q ave > 2.00, narrowly cylindric, pileus context not changing color, velipellis present, basidiomes not stout; caulocystidia present upper 1/6 of stipe; under *Pinus palustris*, northern Florida (type)

Inocybe cylindrispora Murrill

Spores <11 µm and Q ave. < 2.00, amygdaliform, basidiomes *not* stout, velipellis present or absent, stipe surface and context rubescent or not, under conifers or *Fagus*

Stipe with faint pinkish floccules that *become red* where handled, context slightly *rubescent*; pileus with a dingy brown velipellis; spores 7-9 x 5-6 µm; under *Picea*, Nova Scotia

Inocybe erythrospilota Grund & D.E. Stuntz (original spelling '*erythospilota*'; type sequences on GenBank are inaccurate – these are *I. brunneolipes*)

Stipe *and* context *not* rubescent, velipellis absent, odor spermatic; spores mostly 9-11 x 6 µm, under conifers or *Fagus*

Inocybe nemorosa (R. Heim) Grund & D.E. Stuntz (cf. *I. pseudodestricta* Stangl & J. Veselský)

Stipe and context not rubescent, velipellis absent, odor of *Pelargonium*, in cove hardwood forest

Inocybe sp. PBM2633 [flocculosa/cincinnata clade]

Pileus red-brown, dark reddish brown or lighter than above – light yellowish brown, brown (umbrinous or tawny-olive), grayish brown, isabelline, or bicolorous

Pileus bicolorous – tawny at the center, dull yellow towards the margin; under hardwoods (e.g., *Salix*) and reported under conifers, southeast Canada, Pacific Northwest, Europe, Argentina, introduced in New Zealand

Inocybe semifulva Grund & D.E. Stuntz [syn. *I. obscuromellea* Poirier; cf. *I. phaeodisca* Kühner, which differs by the pallid stipe with incarnate context and thin-walled pleurocystidia]

Pileus not bicolorous – light yellowish brown, red-brown, or dark reddish-brown

Pileus 10-20 mm, dark reddish brown, silky fibrillose; lamellae brown tinged olive; stipe base *bulbous* (12 mm), brownish incarnate; spores 7-9.5 x 4.5-5.5 µm; pleurocystidia slightly thick-walled (0.5-1.5 µm), in mixed hardwoods and conifers, Nova Scotia

Inocybe obscurobadia (J. Favre) Grund & D.E. Stuntz *sensu* Grund & D.E. Stuntz (*I. furfurea sensu* Favre from Europe is similar but has an entirely pruinose stipe)

Pileus 30-50 mm, red-brown, surface at length somewhat lacerate or excoriate; lamellae white to brownish-gray or avellaneous; stipe even, *not* bulbous, white or whitish; spores 7-9 x 4.5-5.5 um; pleurocystidia thick-walled, hyaline, "in ground in woods", Mass. and New York

Inocybe excoriata Peck (cf. *I. rimosa* (Bull.) P. Kumm. *sensu* Kauffman but with spores 9-11 x 4.5-6 µm, New York)

Pileus 25-40 mm, brown (dark brown) to reddish brown, with patches of grayish velipellis, *not rimose*, at times slightly scaly around the center, odor faintly spermatic; lamellae without olivaceous tones; stipe even or somewhat bulbous, whitish to pale yellowish buff, at times with pinkish tints at the apex, spores 9-11 x 5.5-6.5 µm, cystidia thick-walled; under hardwoods and conifers, New York and Tennessee (based on PBM2442 and JK120; name misapplied, nearest to *I. grusiana*)

Inocybe griseovelata Kühner sensu Matheny (cf. *I. rimosa sensu* Kauffman may be similar)

Pileus umbrinous, light brown, grayish brown, light yellowish brown, yellowish brown, or isabelline

Odor none, spores small – 6-7 x 4 µm, under *Quercus*, Florida

Inocybe glabripes Ricken (Syn. *I. parvispora* Murrill)

Odor none; spores 12-15 x 5-6 µm, oblong-cylindric to minimally angular, pileus with distinct patches of white velipellis, stipe pruinose at least half-way; under *Tsuga*, *Abies*, *Betula*, New York

Inocybe inodora Velen. (Syn. *I. pruinosa* R. Heim)

Odor often spermatic or spores 6.5-12.5 µm long, plant associates various

Spores 9.5-11.5 x 4-4.5 µm, narrowly oblong-elliptic or fusiform (like *I. lacera*), mean Q: 2.5

Inocybe cylindrospora Murrill (on a lawn under *Pinus palustris*, Florida)

Spores not as long and narrow as above, often amygdaliform, mean Q < 2.0

Spores 7-9.5 x 4.5-5 µm; pileus grayish-umber or light brown with a pallid persistent velipellis, the margin with few broad flat scales; in woods including *Tsuga*, Nova Scotia

Inocybe submuricellata var. stenospermina (Syn. *I. abjecta sensu* Grund & D.E. Stuntz, *non* P. Karst.)

Spores 6.5-9 x 4-5 µm, *pip-shaped* to amygdaliform; pileus *small* (<20 mm), umbrinous, velipellis absent, odor spermatic, PDAB negative; pleurocystidia thick-walled apically; under *Tsuga*, *Pinus strobus*, *Quercus*, widespread – Nova Scotia to Mexico, also Europe [note also red-brown forms with a slight lilac apex also occur]

Inocybe minima Peck, *non* Killerm.

Spores 8.5-10 x 4.5-5 µm, pileus uniformly isabelline, velipellis absent, under *Pinus*, Florida

Inocybe praenucleata Murrill

Spores mostly 8-9 x 5 µm, pileus brown but shading lighter towards the margin, with or without a nipple-like umbo, velipellis typically absent, stipe ochraceous-buff to light buff; under *Betula* on acidic soils in Eastern hemlock woods and in beech-maple forests, but also with *Pinus* and *Picea* (Indiana, West Virginia, New York, Arizona, Mexico also Canada, Europe, east Asia), pleurocystida *not* slender

Inocybe plurabellae Bandini, B. Oertel & U. Eberh.

Spores 8-10(-12) x 5-5.5 µm (ave. <10 µm long), pileus conical with a nipple-like umbo, umbrinous throughout, velipellis absent; stipe light ochraceous-buff with a white base; odor spermatic; pleurocystidia 63-69 x 21-28 µm, *not slender*, thick-walled (walls 3-4 µm thick); on acidic soil under spruce mixed with *Rhododendron* and mountain laurel (West Virginia), also arctic regions of Alaska and Greenland; also Europe on calcareous soils or pebbled trails under spruce or pine and purportedly Indiana (ecology not clear)

Inocybe scolopacis Bandini & B. Oertel

Spores 9-10 x 5-5.5 µm, pileus uniformly umbrinous (tawny-olive) to cinnamon, velipellis absent; pleurocystidia *slender* (subfusiform, sublageniform, subcylindric) and with only slightly thickened walls (type Michigan)

Inocybe pallidobrunnea Kauffman

Spores >10 µm, pileus umbrinous, without a velipellis, stipe with pinkish tinges; pleurocystidia ventricose to fusiform and thick-walled

Spores 9-11 x 4.5-5.5 µm, odor nauseous, in mixed woods (type Michigan)

Inocybe subdestricta Kauffman (cf. *I. griseovelata* Kühner with distinct grayish velipelis and wider spores)

Spores 9-12.5 x 5.5-6 µm, odor mild, under conifers such as *Abies*, *Picea*, *Pinus* or *Alnus* on acidic soils, circumboreal and descending into Mexico

Inocybe nitidiuscula (Britzelm.) Lapl. (=*I. descissa* var. *macrospora* R. Heim *sensu* D.E. Stuntz; cf. *I. involuta*)

Spores mostly 9-11 x 6 µm, odor spermatic, under conifers (*Pinus*) or *Fagus* on acidic soils, not as common as above, widespread occurring in Nova Scotia, New York, Tennessee, Arizona, and Europe

Inocybe nemorosa (R. Heim) Grund & D.E. Stuntz (cf. *I. pseudodestricta* Stangl & J. Veselský)

Stipe pruinose below the stipe center but sometimes this may not be obvious; caulocystidia and cauloparacystidia present on lower part of stipe

Basidiomes reddening

Under *Quercus*, Florida, Oklahoma, Arizona; odor absent, lamellae pink [per protologue stipe is *not bulbous*]

Inocybe roseifolia Murrill

Under conifers, Michigan; odor strongly spermatic, lamellae pallid to olivaceous but spotted or stained reddish, stipe base bulbous

Inocybe godeyi Gillet *sensu* D.E. Stuntz (in Europe *I. godeyi* occurs under hardwoods)

Basidiomes *not* reddening

Basidiomes very small (pileus <10 mm), pileus with whitish or grayish strigose hairs, stipe reddish brown to cinnamon brown, under hardwoods, Quebec, New York (type), Tennessee, west to Michigan and Washington

Inocybe comatella (Peck) Sacc. (Syn. *I. agordina* Bizio)

Basidiomes larger than above, pileus without strigose hairs

Lower part of stipe fuscescent (becoming sepia, very dark brown, or blackish brown), lamellae with a yellowish phase

Stipe densely pruinose, spores 6-8 x 4-5 µm, under *Populus* (Aspen), *Fagus*, and possibly other trees such as *Quercus*, *Carya*, *Pinus*

Inocybe luteifolia A.H. Sm.

Stipe velutinous to scabrous, spores 7-9 x 4.5-6 µm, under *Betula* on acidic soil

Inocybe atripes G.F. Atk. (European *I. tenebrosa* Quél. Is similar but phylogenetically distinct from both *luteifolia* and *atripes*, but some interpretations of *tenebrosa* are the same as *I. metrodii*, which lacks the fuscescent stipe)

Lower part of stipe *not* fuscescent (occasionally brunnescent), lamellae without a yellowish phase
Odor of bitter almonds
Inocybe hirtella Bres. sensu Kauffman (1924) (this may be *Inocybe microteroxantha*)
Odor not as above
Basidiomes robust, pileus up to 60-70 mm wide, stipe (3-) 5-10-15 mm wide
Pileus *viscid* when moist, pale clay brown but darker at the center; stipe 10-12.5 mm wide, white; spores 9-12 x 5-6 µm, New York
Inocybe olpidiocystis G.F. Atk. (Syn.? *I. hebelomoides* Murrill, if caulocystidia below stipe center).
Pileus *dry* or with persistent sand grains attached
Pileus whitish tinged brownish at center, yellowish towards margin; stipe 6-15 mm wide, white; spores *large* (10-16 x 6-8 µm), on sandy shores, sand dunes (cf. *I. similis* below)
Inocybe serotina Peck (Syn. *I. bulbosa* Peck, *I. ammophila* G.F. Atk., *non* Hongo & Matsuda; cf. *I. praefarinacea* Murrill under *Quercus*, Florida)
Pileus colored different than above *or* spores smaller (7-11 x 5-6 µm), in forests or under trees
Pileus uniformly brown or orange brown towards the margin
Pileus dry, uniformly brown (umbrinous) or somewhat darker at the center, stipe 5-8 mm wide, white or pallid, at times flushed with yellow tones; spores 8-11 x 5-6 µm; in mixed woods often under *Picea*, Nova Scotia, also in alpine zone of northern Europe with *Salix*
Inocybe melleiconica Grund & D.E. Stuntz (=*I. phaeoleuca* Kühner *sensu* Grund & Stuntz, *non sensu* Euro. auct.)
Pileus dark brown, brown, to reddish brown, initially fibrillose becoming noticeably tomentose-scaly and cracked toward the center, velipellis absent; stipe up 10 mm wide, equal or slightly swollen to subbulbous; odor none; spores mostly 12.5-15 x 7.5-8.5 µm, variable in outline and shape – elliptic to oblong or at times slightly irregular to slightly gibbous in outline; pleurocystidia variable in shape, thick-walled (up to 6 µm thick) and yellow in KOH; caulocystidia less abundant on lower part of stipe compared to the apex; on sandy soil with Betulaceae, Orchidaceae, Pinaceae, and Salicaceae; Canada (Ontario), Asia, Europe
Inocybe chondrospora Einhell. & Stangl (Syn. *I. immigrans Malloch*; =*I. vulpinella* auct. pl., non TYPE; cf. *I. similis*, which differs by the lighter colored pileus, smaller fruitbodies, and smaller spores)
Pileus lighter in color than above, at least when young
Pileus whitish at first, becoming straw yellow to dingy ocher with age, at first floccose-fibrillose; stipe 4-9 mm wide, white or whitish with a submarginate bulb; spores 8-10 x 5-6 µm, pleurocystidia 60-80 x 15-20 µm, in forests under conifers or hardwoods, throughout eastern states, confirmed molecularly from Pennsylvania
Inocybe sindonia (Fr.) P. Karst. *sensu* Kauffman
Pleurocystidia shorter than above
Pileus cream to chamois or isabelline, fibrillose-scaly becoming long-rimose; stipe more or less equal or enlarged toward the base, 4-10 mm wide, same color as the pileus or paler; spores 8-10 (-12) x 5-6 µm; pleurocystidia 45-50 x 12-16 µm, in coniferous woods, Michigan (also western states)
Inocybe kauffmani A.H. Sm. (Syn. *I. longipes* Kauffman)
Pileus cinnamon-buff to clay color, occasionally darker and more tawny, stipe 3-8 mm wide, white turning sordid brownish below with a subbulbous base, odor spermatic to fabceous; spores 7-9 x 5-6 µm, pleurocystidia short (<50 µm long), under *Picea*; widespread in northern regions of the U.S. (New York, Michigan, Pacific Northwest) and Europe
Inocybe ochroalba Bruyl. (=*I. langei* R. Heim *sensu* A.H. Sm.)
Basidiomes *not* robust, pileus up to 35-45 (-50) mm wide, stipe up to 6 mm wide
Pileus brown (umbrinous) or reddish brown, often darker at the center
Spores 11-13 x 7.5-9 µm, noticeably thick-walled, stipe whitish at apex and at the base but yellowish-brown elsewhere, base slightly bulbous, odor indistinct, in alpine zone under *Dryas*, *Salix* (known only from arctic areas of North America
Inocybe ohenojae Vauras & E. Larss.

Spores 10-12 x 6.5-8 µm, *not* noticeably thick-walled, stipe whitish but becoming slightly yellowish or brownish, base bulbous but not marginate, odor indistinct or slightly spermatic, in alpine zone under *Salix* and *Bistorta vivipara* (known only from arctic areas of North America – District of Keewatin)

Inocybe pararubens var. padjelantae Vauras & E. Larss.

Spores mostly 11.5-13.5 x 6.5-7.5 µm, *not* noticeably thick-walled as in *I. ohenojae*; pileus ochraceous, yellowish brown to cinnamon-brown, lighter at the center when velipellis present, finely to coarsely squamulose with initial grayish cobwebby velipellis; stipe 50-65 x 4-5 mm, clavate to submarginately bulbous, yellowish brown to orange brown above, dark brown above the base, bulb white; odor none; caulocystidia sometimes not observed on lower part; inserted deeply in sandy soil in woods under *Salix*, *Populus*, Pinaceae (Quebec with *Picea*, Europe, East Asia)

Inocybe similis Bres. (Syn. *I. vulpinella* Bruyl. TYPE, non auct. pl.; cf. *I. chondrospora* Einhell. & Stangl (=*I. immigrans* Malloch) but the latter features a very dark brown to dark brown pileus and larger spores)

Spores <10 µm long *or* <7 µm wide

Pileus dark brown to brown or ochraceous brown, *not* hygrophanous; stipe whitish to pale ochraceous all over when young, even, odor not very distinctive, spores 7.5-10 x 5-6 µm, at times with small indistinct germ pore; with *Salix* in far north regions (Canadian Arctic, Quebec), also Europe (=*I. subporospora*; *I. ovalispora* sensu Kühner)

Inocybe tjallingiorum Kuyper

Pileus dark brown at the center, brown elsewhere *not* hygrophanous; stipe pale cinnamon-brown, even, odor spermatic, spores mostly 8-9 x 5-5.5 µm; in sandy soil under conifers, Nova Scotia to West Virginia (under Fagus), also Washington)

Inocybe brunneolipes Grund & D.E. Stuntz

Pileus dark brown at center shading to brown or tawny-olive to the margin, fibrillose, not hygrophanous; stipe ochraceous, slightly bulbous; odor spermatic; spores 8-10 x 4.5-5.5 µm, (sub)amygdaliform, pleurocystidia narrow; under hardwoods in parks, cemeteries, woods, northern Europe, under *Quercus garryana* in British Columbia (S. Berch, pers. Comm.)

Inocybe suecica Vauras & E. Larss.

Pileus chestnut-brown (reddish brown), diffracted-scaly at the margin, *not* hygrophanous; stipe white at apex, tinged rufous elsewhere, base subbulbous or marginate; odor none or faintly spermatic; spores 6-7 x 5-6 µm, ovate to subglobose; in hardwoods, Michigan and New York (spores reported by Kauffman 1924 are slightly wider than by Kuyper 1986)

Inocybe ovalispora Kauffman (Syn. *I. albomarginata* Velen. but Stuntz' type notes indicate the absence of caulocystidia on the lower part of the stipe in *I. ovalispora*)

Pileus dark brown at the center, elsewhere reddish brown to dingy yellowish-brown, at times uniformly reddish brown, *hygrophanous* in appearance; stipe incarnate, equal or (sub)bulbous; odor none or faintly spermatic; spores 9-11.5 x 5.5-7 µm; in mixed hardwood forests or under *Salix* in arctic-alpine, Michigan, Canada, Greenland (also in western montane conifer forests and alpine areas under conifers or *Salix*)

Inocybe leiocephala D.E. Stuntz (cf. *I. subbrunea* Kühner under western conifers, Wyoming to Mexico, spores with obtuse apices; cf. *I. brunnea* Quél. *sensu* Perez Silva, Mexico)

Pileus tawny, yellowish brown, isabelline, dull honey color, or whitish to pale ochraceous

Basidiomes short and stout (pileus 30-35 mm, stipe 25 x 7 mm), pileus isabelline and stipe white, spores >10 µm long, Florida

Inocybe subconnexa Murrill

Basidiomes *not* short and stout

Velipellis absent or indistinct, pileus whitish to pale ochraceous, *lower half of stipe with caulocystidiod cells only*, spores *minimally angular* in outline, odor not remarkable, under hardwoods or conifers but on sandy acidic soils, confirmed from Massachusetts, also Europe

Inocybe sambucina (Fr.) Quél.

Velipellis absent, pileus center fulvous (tawny), margin yellow, scaly with age; spores *amygdaliform*, odor like almonds, under hardwoods or mixture of hardwoods and conifers; Nova Scotia, Michigan (type), and Tennessee

Inocybe microteroxantha Grund & D.E. Stuntz (close to *I. ochraceomarginata* Kauffman but the latter is pruinose only at apex of stipe) [phylogenetically part of *I. hirtella* group]

Velipellis present, spores *not* minimally angular in outline, odor strongly of green corn or spermatic, under conifers (*Tsuga*, *Pinus*)

Odor strongly spermatic, lamellae dull yellowish brown with olivaceous tinge, stipe pale dull yellow

Inocybe chalcodoxantha Grund & D.E. Stuntz

Odor strong of green corn but becoming spermatic, lamellae grayish pallid with faint yellowish cast, becoming darker brown, stipe pallid or with slight tinge of brown

Inocybe melleiconica Grund & D.E. Stuntz [phylogenetically part of *I. hirtella* group; confirmed from Ontario, type Nova Scotia; misapplied as *I. phaeoleuca sensu* Grund & Stuntz]

Spores angular, nodulose, stellate, or spinose and yellowish brown; pleurocystidia present (but see *I. leptophylla*)

Stipe pruinose at the apex only *or* not at all (caulocystidia, if present, restricted to stipe apex)

Pileus *and* stipe squarrose, squamulose or fibrillose-scaly, floccose-scaly, or woolly fibrillose

Pileus dark grayish-olive or fuscous-olivaceous, in degraded xerophytic forest, Guadeloupe

Inocybe viridiumbonata Pegler

Pileus reddish brown, dark purplish-fuscous, brown, or dark brown, in temperate or boreal forests, widespread

Basidiomes red to reddish brown *or* dark purplish-fuscous, at least some spores cruciate

Basidiomes red to reddish brown, under *Abies* in spruce-fir zone, North Carolina

Inocybe carolinensis Matheny & Kudzma

Basidiomes with shades of reddish brown occurring as patches distributed on the pileus and stipe, odor like chocolate, pleurocystidia absent, on acidic soil in mixed forests under *Fagus*, *Quercus*, *Betula*, *Pinus*, *Tsuga* – western North Carolina (Celo) and Connecticut (iNat93776621)

Inocybe sp. [PBM4770]

Basidiomes dark purplish-fuscous, in mixed hardwood forests throughout eastern North America

Inocybe tahquamenonensis D. E. Stuntz (Syn. *I. stellatospora* (Peck) Massee *sensu* Kauffman, *non* Peck)

Basidiomes dark brown to brown, spores *not* cruciate

In *Sphagnum* under conifers, spores 10-12.5 x 7.5-10 µm, coarsely nodulose about an elliptic outline with 11-20 nodules; Great Lakes region

Inocybe teraturgus M.M. Moser

On soil or rotten wood in coniferous forests; if spores as large as above, then pleurocystidia absent, more widespread than above

Pleurocystidia absent, on rotten wood, spores >10 um long

Inocybe leptophylla G.F. Atk. (Syn. *I. leptophylla* var. *cystomarginata* G.F. Atk., *I. casimiri* Velen.)

Pleurocystidia present, on soil or rotten wood, on soil, spores <10 µm long

Basidiomes small, pileus 8-9 mm wide, stipe 12-22 x 1-2 mm, stipe grayish violaceous at the apex

Inocybe aff. fulvella Bres. *sensu* Grund & D.E. Stuntz (*non* D.E. Stuntz 1947)

If basidiomes small, then stipe lacking any violaceous tones, otherwise larger than above

Basidiomes small, pileus 7-13 mm wide, stipe 10-30 x 1-2 mm, spores weakly nodulose

Inocybe diminuta Peck

Basidiomes medium, larger than above; spores with 8-14 distinct nodules

Pleurocystidia thin-walled and elongate (>50 µm long), stipe squarrose to floccose-scaly

Inocybe stellatospora (Peck) Massee (Syn. *I. longicystis* G.F. Atk., *I. lanuginosa* (Bull.: Fr.) P. Kumm. *sensu* Euro. auct., *non* Kauffman; note two different species have been detected (i) northerly occurring species – Pacific Northwest, Minnesota, to Quebec and northern Europe – this likely will need a new name; (ii) eastern U.S. species – New York to North Carolina, also northern Europe, Japan – this may encompass both *I. longicystis* and *I. stellatospora* types)

Pleurocystidia thick-walled and short-obovate to pyriform (<50 µm long), stipe woolly fibrillose

Inocybe lanuginosa (Bull.) P. Kumm. *sensu* Amer. auct. (Syn. *I. nodulospora* (Peck) Sacc., *I. ovatocystis* Boursier & Kühner*, non* Perez Silva)

Pileus fibrillose *or* scaly, stipe *not* scaly

Young lamellae and/or stipe grayish-lavender, basidiomes small
Pileus 8-10 mm, obtusely umbonate, squarrose at the center, uniformly reddish umber, lamellae at first grayish lavender becoming pale grayish olivaceous beige; stipe 20 x 1-1.5 mm, grayish lavender, spores 8-10 x 6-7 µm with about 7-8 prominent obtuse nodules; on soil under *Betula*, *Fagus*, Nova Scotia, temperate
Inocybe fulvella Bres. *sensu* Grund & D.E. Stuntz (*non* D.E. Stuntz 1947)
Similar to above but pileus with a very dark brown disc and a pale brown to brown margin; lavender tones not observed on lamellae; on soil in mixed forests (*Pinus*, *Tsuga*, *Quercus*, *Betula*), North Carolina
Inocybe aff. fulvella Bres. *sensu* Grund & D.E. Stuntz (*non* D.E. Stuntz 1947)
Pileus 15-17 mm, with small papillate umbo, reddish brown (Mars Brown), appressed fibrillose-squamulose, lamellae light violet gray becoming grayish-ocher; stipe 27-30 x 2.5-4 mm, robust, pale buff becoming brown below; spores 8.5-11.5 x 6-7.5 µm, ovate with 11-14 small nodules; in xerophytic forest, Guadeloupe, Caribbean Basin
Inocybe ianthinofolia Pegler
Young lamellae and stipe *not* grayish-lavender, basidiome size various
On logs or rotten wood *and* pileus hygrophanous
Inocybe tubarioides G.F. Atk.
On soil, pileus *not* or rarely hygrophanous
Spores mostly oblong and smooth to irregular in outline, 12-15.5 x 4.5-6.5 µm, some with a few basal nodules, under *Pinus*
Inocybe texensis Thiers
Spores nodulose or angular, shorter than above, habitat various
Stipe base distinctly bulbous
Pileus with a prominent acute umbo, spores 6-8 x 4-6 µm, nodules not very distinct, "on ground in woods"
Inocybe prominens Kauffman (Syn. *I. umboninota* Peck 1910, *non* 1885 (type); cf. *I. prominens* f. *longistriata* Kauffman (type Oregon); cf. *I. sphagnophila* with similar sized-spores but with 8-11 distinct nodules and a widened stipe base, not distinctly bulbous, under conifers)
Pileus with an obtuse umbo, if present, on ground under conifers
Pileus *viscid to subviscid*, umbrinous with a pale ochraceous or yellow umbo [umbo is darker than margin on some specimens among the type]; stipe flavescent, white-mycelioid at the base, odor not recorded; spores 7-9 x 4-7 µm, irregularly angular with rather distinct obtuse nodules; cystidia often thin-walled or slightly thickened, under *Pinus*, Massachusetts [possibly in mixtilis group? Per Quebec team, this is the same as European *I. aurea*]
Inocybe davisiana Kauffman
Pileus *dry*, pileus darker than above or uniform in color; stipe *not* flavescent, odor none or indistinctive; spores various; cystidia thin-walled or slightly thickened, under conifers
Stipe base napiform, spores 8-10.5 x 6-7.5 µm, angular-nodulose with 6-10 coarse nodules, under *Tsuga*, possibly also *Abies*, widespread
Inocybe napipes J.E. Lange
Stipe base marginate, odor not distinctive; spores mostly 7-8 x 5-6 µm in diam, irregular in outline, polygonal, with 5-7(8) coarse obtuse nodules; under conifers (*Abies*), southeast Canada to Tennessee and North Carolina
Inocybe nodulosa Kauffman
Stipe base swollen to somewhat bulbous but not napiform or marginate, cortina white and conspicuous, spores 6.5-9 x 4.5-7 µm, at times (sub)isodiametric, with 8-11 prominent obtuse nodules, in high elevation coniferous woods (*Abies*, *Picea*), North Carolina and Tennessee
Inocybe sphagnophila Bandini & B. Oertel
Stipe base somewhat rounded bulbous (not napiform or marginate), cortina inconspicuous, stipe pallid at first due to superficial coating of fibrils, these wearing away, stipe becoming brown to yellowish brown, in Beech-Hemlock forest (*Fagus*, *Tsuga*), New York and Pennsylvania [ITS 95% similar to *I. sphagnophila* above]
Inocybe aff. sphagnophila Bandini & B. Oertel

Stipe base with an ovate bulb, spores 6-9 x 5-6 µm, coarsely nodulose about a globose to elliptic outline, under *Pinus* or in mixed woods, Florida

Inocybe subnodulosa Murrill

Stipe even or swollen below, base not distinctly bulbous

Pileus and stipe yellow; spores somewhat angular-nodulose, 6-9 x 5-6 µm; cystidia mostly thin-walled, less often -1.5 or 2 µm thick, ventricose; in hardwood or mixed forests, Nova Scotia, Massachusetts, New York, North Carolina

Inocybe ventricosa G.F. Atk.

Pileus pinkish buff (light ochraceous-salmon) with a brownish center, stipe pale brown to almost white at the base (subbulbous but not marginate), spores 8-10 x 6.5-8 µm with 10-14 nodules, in degraded xerophytic forest, Guadeloupe, Caribbean Basin

Inocybe paralanuginosa Pegler

Pileus vivid reddish brown (Sanford's Brown), lamellae ochraceous-orange, apricot-buff or ochraceous-tawny, stipe pinkish to light orange, base enlarged but not bulbous or marginate; spores 6.5-8 x 4-5.5 um with 10-12 nodules, in woods under *Quercus* and *Coccoloba*, Florida to lowland Costa Rica (type), also Iowa, Tennessee, Texas under *Quercus*

Inocybe neotropicalis Singer

Pileus dark brown, reddish brown, brown, or grayish brown, stipe *not* yellow or light orange; spores various; arctic, boreal, or temperate in distribution

Pileus reddish brown throughout or at the center and paler towards the margin

Pileus conical with a small umbo, habit mycenoid, velipellis absent, translucent-striate when fresh, *hygrophanous*, fading to brown or umbrinous, odor none; stipe long and slender; spores 10-13.5 x 8-10.5 µm, angular-nodulse with 7-8 prominent nodules; on acidic soils under spruce and fir, western North Carolina, also Europe

Inocybe perlucida Bandinia & Ferrari

Pileus with a low broad umbo, lamellae yellowish brown, stipe olive-brown to umber with a yellow cortina; spores 7.5-10 x 5.5-7 µm, angular-trapeziform, weakly nodulose with 4-7 corners or few small nodules; cystidia thin- to slightly thick-walled apically, ventricose with subacute apices; under young *Abies fraseri*, North Carolina [ITS 97-98% similar to *I. ventricosa*)

Inocybe aff. ventricosa G.F. Atk.

Pileus with a low or mammilate umbo, lamellae tinged olivaceous, stipe often pale brown; spores 8-9.5 x 5.5-6.5 µm, polyhedral with 7-10 coarse nodules; mostly with *Picea*, *Betula*, boreal to arctic

Inocybe borealis J.E. Lange (Syn. *I. heterochrominea* Grund & D.E. Stuntz; *I. acuta sensu* Grund & D.E. Stuntz 1977)

Pileus conical, with a small or low broad umbo, lamellae pale gray to dark brown; stipe light brownish, becoming brown to dark brown; spores *9.5-12 x 6.5-8 µm*, angular-nodulose with 5-10 small nodules; cystidia thick-walled, on calcareous ground under pines; known only from New York (Brooklyn), Finland (type), late fall in the U.S.

Inocybe porcorum Vauras & Kokkonen

Pileus with prominent conical umbo, lamellae pallid to brownish, stipe white; spores angular, 7-9 x 4-5 um; under *Quercus*, Florida (type) [Murrill's micro observations were not accurate per annotation of holotype by D.E. Stuntz; likely *I. subprominens* is a caulocystidiate species with a basal bulb, brownish stipe and larger spores]

Inocybe subprominens Murrill

Pileus dark brown, brown, light brown, or grayish brown, if hygrophanous, see above

Pileus with an acute umbo (pale brown at margin) *and* cystidia *without* acute apices, *not* the *curvipes*-type (see below)

Spores 7.5-10 x 5.5-7 µm, polyhedral with mostly 7-10 moderate-sized nodules, under *Betula* or *Picea*, Quebec, British Columbia, Alaska, New Mexico

Inocybe bufonia Kokkonen & Vauras (=*I. alpigenes* sensu Larsson)

Spores 9-12 x 6.5-9 µm, mostly 11-12 x 7-8 µm, polygonal-nodulose with 10-15 very prominent nodules ("star-shaped" per Esteve-Raventós 1987), "mossy ground in woods"

Inocybe umboninota (Peck) Sacc. *sensu* Peck 1885, ***non* Peck 1910** (cf. *I. porcorum*)

Pileus with a low obtuse umbo or *not* umbonate; if acutely umbonate, then cystidia saccate or broadly fusiform and with acute apices

Pileus scaly (squarrose or squamose)

Pileus squarrose to squamose at the center, dark umbrinous or sepia; stipe slightly bulbous, with pallid fibrils over dark brown ground color; spores 6.5-10 x 4.5-5 µm, irregularly polygonal with few nodules; pleurocystidia ventricose above a slender pedicel, thin-walled to slightly thick-walled (-1.5 µm), apices bluntly pointed to broadly rounded; under *Picea*, *Tsuga*; compare to *I. soluta*, which generally has a fibrillose pileus that can form scales.

Inocybe maritimoides (Peck) Sacc.

Pileus conical in youth, fibrillose-scale, umbrinous; stipe more lightly colored than the pileus, base enlarged; spores 7.5-10 x 5.5-7 µm, polyhedral with mostly 7-10 moderate-sized nodules, under *Betula* or *Picea*, Quebec, British Columbia, Alaska, New Mexico

Inocybe bufonia Kokkonen & Vauras (=*I. alpigenes* sensu Larsson; a complex of populations with some genetic divergence in the western U.S and Canada)

Pileus at times scaly at the center or appressed-scaly throughout, umbrinous or tawny; stipe even, pallid above, brown below, spores 9-12 x 5-6.5 µm, trapeziform with 6-10 moderate to small nodules; pleurocystidia saccate or broadly fusiform with long slender basal pedicel and (sub)acute apices, thick-walled (-2.5 µm); often under planted hardwoods or *Pinus*

Inocybe curvipes P. Karst. (Syn. *I. decipientoides* Peck, *I. radiata* Peck, *I. astoriana* Murrill, *I. jamaicaensis* Murrill, *I. ochraceoscabra* G.F. Atk.; *I. rennyi* (Berk. & Broome) Sacc. is an unusually elongated-spored form)

Fruitbodies smaller than *I. curvipes* (pileus 8-15 mm), lamellae cream-yellow when young, stipe non-darkening below; spores like *I. curvipes*, 10.5-13 x 6-7 µm; pleurocystidia fusiform to saccate, apices rounded or conical; on calcareous soil under *Fagus* and *Betula*; Quebec (type), also Japan (ectomycorrhizal *Abies* environmental sample)

Inocybe squalida Kaufholtz-Couture

Pileus fibrillose, not scaly

Spores >10 um long; pileus at times bicolorous with a very dark brown (bister to sepia) disc, brown towards the margin, odor spermatic where cut; spores 9-13 x 7-11 µm, many shaped like jacks or substellate; cystidia *without* acute apices; at high elevation forests under *Picea, Abies, Tsuga, Betula* in North Carolina and Tennessee

Inocybe pseudoasterospora Kühner & Boursier

Spores >10 um long, trapeziform in outline; cystidia saccate or broadly fusiform *with* acute apices; at low elevations under planted hardwoods or pine; pileus not as dark as above, odor spermatic

Inocybe curvipes P. Karst.

Spores >10 um long; pileus uniformly dark brown to brown, odor acidulous; spores 9.5-12 x 6.5-8 µm, angular-nodulose with 5-10 small nodules; cystidia *without* acute apices; under pines, known only from New York (Brooklyn) and Finland (type)

Inocybe porcorum Vauras & Kokkonen

Spores <10 um long; pileus, spores, or habitat not as above

Pileus without a velipellis, brown to dark brown, *disc often darker than the margin*, silky fibrillose to weakly rimulose, *odor spermatic*, stipe swollen but not distinctly bulbous (base white), *not darkening with age*; spores 7-10 x 6-7 µm, some shaped like jacks or angular, mostly with 5-7 nodules; pleurocystidia *thick-walled* (1-2.5 µm), lageniform to fusiform-ventricose, apices obtuse; under *Abies*

Inocybe goniopusio Stangl (Syn. *I. pseudoasterospora* var. *microsperma* Kuyper & P-J Keizer)

Pileus dark brown, no velipellis, fibrillose-finely scaly, rimulose near margin, odor *not* noticeable, *not nigresent*, spores 7-10 x 4-6 µm and angular like an *Entoloma*, under conifers (Washington, North Carolina)

Inocybe alpigenes (E. Horak) Bon (= *I. tetragonospora* Kühner)

Pileus with a thin felty brown superficial layer, otherwise dark brown ("Mummy Brown"), not rimose, *odor aromatic*, stipe even (not bulbous), *not darkening with age*, lower part peronate with felty superficial layer; spores 6.5-9 x 4.5-6 µm, angular-nodulose with 4-7 large nodules or at times only angular; pleurocystidia *thin-walled*, utriform above a slender pedicel, apices rounded or subcapitate; under *Picea*

Inocybe parceocoacta Grund & D.E. Stuntz (*I. subcarpta* Kühner & Boursier is somewhat similar but has a squamulose pileus, no distinctive odor, and somewhat larger and much more nodulose spores; compare carefully with *I. maritimoides*)

Pileus at times with pale velipellis at the center, otherwise dark brown to blackish brown, reddish brown to brown towards the margin, often rimose, odor indistinct or weakly acidulous; stipe even to subbulbous, *nigrescent* or becoming dark brown, blackish brown, or blackish red-brown below; spores 8-9.5 x 5.5-7 µm, with 6-8 distinct nodules; in gravelly soil or dry sandy habitats in mixed forests under *Betula*, *Picea*, *Larix*, *Populus*, *Pinus*; confirmed from Wisconsin, eastern Canada

Inocybe ericetorum Vauras & Kokkonen

Pileus without a thin felty brown superficial layer, rimose, odor *not* aromatic, stipe swollen or subbulbous, *not nigrescent*, spores 7-10 x 5.5-8 µm with 8-12 small but distinct nodules, under conifers

Inocybe assimilata Britzelm. (Syn. *I. umbrina* Bres, *non* Massee; *I. castaneoides* Peck fide Kauffman 1924)

Pileus 15-25 mm, conical or convex becoming plane with a low broad umbo, scaly on the disc, rimulose towards the margin, chestnut to reddish brown; stipe brittle, fibrillose, flexuous, white becoming reddish brown, not nigrescent, with a fugacious white partial veil; spores 8-10 x 6-8 µm, coarsely nodulose with 9-12 distinct nodules; pleurocystidia 40-50 x 15-20 µm, thin-walled, ventricose to bladder-shaped, at times with subacute apices; on roadside under grass and ferns, known only from the type locality, Massachusetts (Sep) (cf. PBM3328, ACAD19494 as *"umbrina*")

Inocybe castaneoides Peck

Pileus conical-plane with an umbo, velipellis absent, at times forming scales, grayish brown, *not nigresent*, odor not diagnostic; spores 6-8 x 5-6.5 µm, angular to angular-nodulose with 5-7 nodules or corners, in coniferous forests, also with *Betula*, *Salix* ranging from Quebec to the Pacific Northwest, also Europe. *Inocybe maritimoides* is phylogenetically very closely related.

Inocybe soluta Velen. (Syn. *I. brevispora* Huijsman)

Pileus with grayish remnants of velipellis at center when young, rimulose to rimose, odor *none* or almost spermatic, *not nigresent*, spores 6.5-9 x 4.5-7 µm with 8-11 distinct rounded nodules, in *Sphagnum* under *Picea* (recorded at Mt. Love, near Clingmans Dome, Tennessee and Mt. Mitchell State Park, North Carolina)

Inocybe sphagnophila Bandini & B. Oertel

Stipe pruinose below the stipe center or with caulocystidia and cauloparacystidia present below the stipe center

Stipe even or tapered downward

Spores globose or elliptic with bifid or multicoronate saddle-shaped nodules *or* spinose

Spores globose to elliptic with numerous blunt, wedge-shaped, or truncate nodules, these often bifid or saddle-shaped *or* multicoronate

Spores 12-14.5 x 10-12 µm, nodules multicoronate, cheilocystidia metuloid (thin-walled per the protologue), under *Picea*; Nova Scotia and New York, southwards to North Carolina under high-elevation spruce-fir

Inocybe multicoronta A.H. Sm.

Spores 8-10.5 x 7-9 µm, nodules bifid, wedge-shaped or crested, cheilocystidia thin-walled, under hardwoods, Guadeloupe (type Venezuela, also reported from Guyana but with larger spores), Caribbean Basin

Inocybe lasseri Dennis *sensu* Pegler

Spores spinose, nodules *not* bifid; under hardwoods

Pileus squarrose-scaly, dark reddish brown, spores globose (9-12 µm diam), hymenial cystidia not rare

Inocybe calospora Quél. (Syn. *I. rigidipes* Peck)

Pileus appressed-scaly, cinnamon (umbrinous) to ochraceous-tawny (fulvous), spores subelliptic to subglobose (10-13.5 x 9-11 µm), hymenial cystidia rare

Inocybe subfulva Peck (Syn. *I. calospora sensu* Grund & D.E. Stuntz, *I. echinocarpa* Ellis & Everh., *I. praeechinulata* Murrill, *I. subfulviformis* Murrill; cf. *I. pseudocoronata* Matheny, nom. prov. with a *bulbous* stipe base and spines that are occasionally bifid or multicoronate)

Spores angular-nodulose or nodulose, *not* spinose

Temperate in distribution, basidiomes often stout and robust or stately; pileus ivory yellow, pale yellow, to light yellowish brown, at times with a distinct white velipelis, subsmooth; stipe pure white, equal or weakly bulbous but not distinctly marginate; spores 8.5-10 x 6-7.5 µm, coarsely nodulose with 7-10 prominent conical nodules; in Oak-Hickory woods mixed with *Fagus* or in suburban areas and rest areas under planted *Quercus* and/or *Quercus-Pinus* [PBM2987, RAS424 et al.]

Inocybe leucocaulis Matheny & Canan [Praetervisa clade]

Temperate in distribution, similar to *I. leucoaculis* but with a yellowish brown pileus that at times may be two-toned with a darker center; Indian, Louisiana, Ohio [Praetervisa clade]

Inocybe monachella Matheny & Canana [Praetervisa clade]

Temperate in distribution, basidiomes *not* stout and robust, pileus white or light silvery-gray, stipe white or yellowish

Basidiomes white; spores mostly 7.5-8 x 5 µm; New York (type)

Inocybe paludinella (Peck) Sacc. (cf. *I. infida* (Peck) Massee, which has a bulbous stipe base)

Basidiomes with a yellow stipe or yellow throughout

Pileus light silvery-gray, stipe yellowish; spores 8-10 x 4-5 µm, many elongate-trapeziform in outline and with few nodules or corners, some with up to 9 nodules; pleurocystidia often fusiform to ventricose, thick-walled, under *Quercus*, Texas to Florida

Inocybe alabamensis Kauffman (cf. *I. paludinella* sensu Vauras and *I. paludinella* f. *citrophylla* sensu Can. auct.; uncertain if these are just yellowish tinged variants of *I. paludinella*; if so, Peck's *I. paludinella* would have priority)

Basidomes yellow throughout; type from France; reported from Quebec

Inocybe paludinella f. citrophylla Guinb.

Yellow throughout with copious silvery velipellis; spores 7.5-9 x 5-6 µm, subangular with small nodules; pleurocystidia 50-80 x 11-22 µm, thick-walled (walls yellow); on acid soils mainly under *Betula*, *Salix* (northern Europe) and in mixed hardwoods-conifers (*Quercus* absent; New York); ITS 96% similar to *I. alabamensis*

Inocybe argenteolutea Vauras

Tropical in distribution *or* pileus and stipe darker than above

Martinique (Caribbean Basin), likely associated with Nyctaginaceae or *Coccoloba*

Spores 7.5 x 5.5-7.5 µm, cystidia 40-55 µm long, odor strongly spermatic

Inocybe antillana Pegler (Syn. *Inocybe crassicystidiata* Pegler)

Spores 8-11 x 5-7.5 µm, cystidia 45-70 µm long, odor not described

Inocybe martinica Pegler

Boreal or temperate in distribution (eastern Canada and U.S.A.), associated with conifers or temperate hardwoods

Pileus uniformly cinnamon brown to umbrinous (tawny-olive) *or* with a brownish-black disc *and* spores 6.5-8 x 4.5-5.5 µm, under hardwoods or conifers, also in *Sphagnum*

Pileus uniformly cinnamon brown to umbrinous (tawny-olive); confirmed only from Europe (North American *petiginosa* genetically divergent and with a bicolorous pileus (viz, HRL2094)

Inocybe petiginosa (Fr.) Gillet

Pileus colored as above but with a brownish black disc, margin grayish or ashy gray and floccose; stipe reddish brown; New York (type), Michigan, and Washington, also Europe but misidentifed as *I. petiginosa* and *I. subexilis*

Inocybe nigrodisca Peck

Pileus reddish brown or chestnut-brown *and* spores <8 µm long, under conifers or in mixed conifer-hardwood stands

Pleurocystidia lanceolate, spores 5-7 x 4-6 µm with variable number of nodules (0, 3-4, or 8-10), under conifers

Inocybe castanea Peck, *non* Velen. (Syn. *I. euganea*)

Pleurocystidia ventricose or jug-shaped, spores 6-8 x 5-6 µm with 10 or more small rounded nodules, in swampy places or among mosses under conifers or in mixed conifer-hardwood stands

Inocybe subexilis (Peck) Sacc. (*non subexilis sensu* Grund & Stuntz 1980, Nova Scotia)

Pileus pale brown to brown (umbrinous) *and* spores >8 µm long, under conifers (but see *I. praenodulosa*)

Stipe brown with pinkish tinges, with a distinct odor, in *Picea* forests or under other conifers

Odor penetrating and unpleasant, not spermatic; spores with 5-8 low obtuse nodules; northeast U.S.

Inocybe acriolens Grund & D.E. Stuntz [*I.* sect. *Albodiscae*]

Odor spermatic, spores with 6-10 distinct nodules, under conifers; widespread northern U.S. and southern Canada but also Mexico (Pacific Northwest, Montana, Nova Scotia, Mexico, central and northern Europe, also Argentina)

Inocybe jacobi Kühner (=*I. subexilis sensu* Grund & Stuntz 1980)

Stipe brown or white, *lacking* pinkish tinges, odor unknown, *in Pinus* forests or habitat unknown

Pileus not umbonate, stipe brown, spores with 5-8 low obtuse nodules, in sandy *Pinus* forests, Carolinas

Inocybe sabuletorum (Berk. & M.A. Curtis) Sacc.

Pileus umbonate, stipe white, spores coarsely nodulose, Florida (plant associates unknown)

Inocybe praenodulosa Murrill

Stipe base bulbous with a marginate, rounded, turbinate, or napiform bulb

Spores spinose (spines occasionally bifid or multicoronate), stipe base napiform (or turbinate); pleurocystidia 40-50 x 11-15 µm, broadly clavate, utriform, or obovate; habit small tricholomatoid; under *Pinus* and *Quercus*, Texas (Gulf Coast)

Inocybe pseudocoronata Matheny inded.

Spores spinose (15-20 spines, none bifid), stipe base rounded bulbous, habit mycenoid, under *Tilia*, *Fagus*, Tennessee

Inocybe sp. PBM4428 [this is just I. subfulva]

Spores stellate, stipe base marginate, pleurocystidia >50 µm long; ecology various

Basidiomes staining *greenish blue* where bruised, odor aromatic but with spermatic component, in oak-hickory forests under *Quercus*, *Carya*, rare, known only from Tennessee (type), South Carolina, Illinois, Pennsylvania

Inocybe insignis A.H. Sm.

Basidiomes *not* staining greenish blue where bruised, odor other than above, more common than above

Pileus chestnut-brown to cinnamon-rufous, odor spermatic

Stipe cinnamon or tinged rufous to pale brown, in *Tsuga* dominated forest or under *Pinus strobus*

Inocybe asterospora Quél. *sensu* Kauffman

Stipe dull yellow to olive-yellow, under *Tilia*, *Fagus*

Inocybe aff. asterospora Quél. *non* Kauffman

Pileus brown to light brown or mixed more with yellowish shades or reddish umber to orange-yellow, stipe yellow becoming dull brown or white or faintly tinged with yellow, odor none or unclear

Pileus brown to light brown with a distinct velipellis, stipe light brown; under *Oreomunnea* or *Quercus*, Panama

Inocybe sp. AC573 [sister lineage to *I. insignis*]

Pileus light brown or mixed more with yellowish shades, stipe yellow becoming dull brown; widespread in mixed forest including birch, spruce, fir – Michigan, New York (type), south to North Carolina and Tennessee at high elevations (>5000 ft)

Inocybe intricata Peck (cf. *I. obtusiuscula* Quebec)

Pileus reddish umber to orange-yellow (raw sienna), duller in age, stipe white or faintly tinged with yellow; in hardwood or mixed forests, Nova Scotia and Washington (type)

Inocybe intricata var. pallidistipitata Grund & D.E. Stuntz

Spores angular-nodulose or nodulose

Pileus white, pallid, cream, ivory, tinged straw-colored, or dull pale yellow
Pileus whitish and stipe whitish, slightly scaly on the disc, often split towards the margin, similar to *I. geophylla* in habit, New York
Inocybe infida (Peck) Earle (cf. *I. paludinella* (Peck) Sacc., which has an even stipe]
Pileus smooth and not often split or larger than above
Pileus up to 30 mm wide, stipe 30-55 x 3.5-6 mm (base -12 mm), spores <10 µm long
Stipe solid, spores mostly 7-9 x 5.5-6.5 µm, odor spermatic or disagreeable in eastern populations
Inocybe umbratica Quél. (Syn. *I. alachuana* Murrill, *I. suaveolens* D.E. Stuntz, *I. abundans* Murrill *sensu* Grund & D.E. Stuntz)
Stipe hollow, spores mostly 9-10 x 6.5 µm
Inocybe fallax Peck
Pileus 40-100 mm wide, stipe 40-100 x 6-20 mm, spores 9-12 x 5-7 µm
Inocybe fibrosa (Sowerby) Gillet (cf. *I. fibrosa* var. *trivialis* J.E. Lange *sensu* Perez Silva, Mexico)
Pileus 25-50 mm wide; stipe 40-80 x 6-11 mm, white to tinged cream; odor absent or mild, under hardwoods (*Quercus*, *Carya*) on calcareous ground, spores 7.5-9.5 x 6-7.5 um, pleurocystidia very thick-walled (4-6 µm); Tennessee, Indiana, Pennsylvania; *I. leucocaulis* is very similar but differs by the more or less equal stipe and base *not* a marginate bulb
Inocybe fatiscens Matheny & Canan
Pileus bicolorous due to whitish disc *or* honey yellow, yellowish brown, brown, reddish brown, or with very dark brown disc
Pileus bicolorous due to whitish disc, margin avellaneous or brownish
Under mixture of conifers and/or *Betula* on acidic soils
Inocybe grammata Quél. *sensu stricto* (Syn. *I. albodisca* Peck, *I. permucida* Grund & D.E. Stuntz *pro parte*; northerly (SE Cananda, Washington) extending south to Tennessee; west coast *I. albodiscoides* differs by shorter spores; cf. *I. acriolens*, which is very similar but has non-bulbous stipe and unpleasant odor, ITS 98% similar; *I. grammatoides* occurs under *Populus* (Aspen) in northern regions
Under *Tsuga* and *Pinus* in northeast states and southeast Canada, pileus margin often with persistent whitish superficial fibrils, stipe base not noticeably bulblous
Inocybe acriolens Grund & D.E. Stuntz
Under *Populus* (aspen) in southeast Canada and in the northeast U.S. (also Europe)
Inocybe grammatoides Esteve-Rav., Pancorbo & E. Rubio
Under *Quercus*, *Castanea*, *Fagus*, *Carya*, *Tilia* (New York to Michigan, southwards to Georgia and Alabama, extending into Central America) on karst topography (where known)
Inocybe velicopia Matheny & Kudzma (Syn. *I.* aff. *angustifolia* (Corner & E. Horak) Garrido *sensu* Singer), spores 6-8.5 x 5-5.5 µm with 8-10 moderate-sized nodules
Under *Quercus* or *Oreommunea* (Panama, Costa Rica) on acidic soils
Inocybe panamica Matheny & Corrales
Under *Quercus* and *Pinus*, spores longer than above and more narrow, 8.5-11.5 x 5-6 µm with few nodules, known only from northern Florida
Inocybe floridana Murrill
Pileus honey yellow, yellowish brown, brown, reddish brown, or with very dark brown disc
Spores <10 (-10.5) µm long
Pileus lubricous or viscid when moist
Pileus with a cracked cuticle, scaly but scales disappearing with age except on the umbo, parts reddening or becoming brownish red with age, odor sweet or fruity; spores mostly 7-7.5 x 5.5 µm, angular-nodulose with 6-8 moderate-sized nodules; under *Quercus*, *Tilia*; Missouri (type), Indiana, Tennessee
Inocybe desquamans Peck (Syn. *I. repanda* (Bull.) Quél. *sensu* Kauffman)
Pilues not cracked and scaly, parts *not* reddening, odor spermatic (if known)
Pileus honey yellow, stipe white, odor spermatic, spores mostly 9-10 x 6-6.5 µm, angular in outline with 9-10 rather prominent nodules; cystidia thick-walled, widespread and in varied habitats including mixed *Tsuga* forests, low-elevation *Pinus taeda* forests, high-elevation *Pinus*, *Abies*, *Quercus* forest, Rocky Mountain alpine (with *Salix*) and montane conifer forests, and with

Pseudotsuga and *Arbutus* in the Pacific Northwest; also Nova Scotia southwards to North Carolina and at high-elevations in Mexico; muscarine positive

Inocybe occulta Esteve-Rav, Bandini, B. Oertel & G. Moreno (Syn. *I. mixtilis* (Britzelm.) Sacc. *sensu* Am. auct. p.p.; *I. trechispora* (Berk) P. Karst.)

Same as above but with whitish velipellis easily observed on the pileus and edge of the stipe bulb when young, spores 7-*8.5*-10 x 5-*5.9*-7 µm with 10-13 low obtuse nodules, short cystidia with average length < 50 µm; in hardwoods of *Fagus*, *Quercus*, Cistaceae stands at times mixed with *Pinus*, also mixed forests with hardwoods (*Betula*, *Carpinus*, *Tilia*) or conifers (*Pinus*, *Abies*), also in parks and urban habitats; New York, New Jersey, Pennsylvania, also southern and central Europe

Inocybe nothomixtilis Esteve-Rav., Bandini & V. González [cf. *I. abundans* Murrill]

Same as *I. occulta* but with somewhat smaller spores mostly 7-7.5-8 x 5.5-6 µm and 5% divergence at the ITS locus, sympatric with *I. occulta* in Nova Scotia, also Pacific Northwest, California, Europe and east Asia

Inocybe ceskae Bandini, Esteve-Rav., & B. Oertel. (Syn. *I. mixtilis sensu* Am. auct. p.p.)

Pileus fulvous (darker than honey yellow) or brownish yellow with an isabelline margin, stipe white with dull yellow tinge, in mixed forest under *Pinus strobus* on calcareous soil, New York (Sep), also British Columbia and Washington, in grass May to July; implicated in death of a dog

Inocybe aff. mixtilis

Pileus avellaneous-isabelline; stipe white, odor not recorded, spores est. 6-8 x 5-6 µm with mostly 4-7 small nodules or corners (orig. reported as "5-6 x 3-4" µm), cystidia thick-walled, in sandy soil, Florida

Inocybe minutispora Murrill

Pileus dry

Pileus becoming brownish red with age or upon drying, the umbo often darker, forming scales; stipe reddish or brownish below apex, odor sweet and fruity; spores mostly 7-7.5 x 5.5 µm, angular-nodulose with 6-8 moderate-sized nodules; under *Quercus*, *Tilia* in Missouri (type), Indiana

Inocybe desquamans Peck (Syn. *I. repanda* (Bull.) Quél. *sensu* Kauffman)

Pileus *not* discoloring brownish red, scales absent; stipe without red, distribution various, odor *not* sweet or fruity (but see *I. earleana* below)

Pileus margin cream-buff to chamois, *not* reddish brown or dark brown; stipe white, resembling *I. geophylla* in habit (small, slender, white, and typically with an umbonate pileus)

Inocybe infida (Peck) Massee (cf. *I. paludinella* (Peck) Sacc., which has an even stipe]

Pileus darker than above, *not* resembling *I. geophylla*

Odor disagreeable, strong, or spermatic

Pileus yellowish brown with appressed scales or cracked-areolate, stipe cream colored or pale yellow; spores 8-9 x 6-7 µm with 8-10 moderate-sized nodules; pleurocystidia utriform to ventricose or obese, very thick-walled apically, hyaline; in mixed woods under conifers (*Abies*, *Pinus*, *Picea*), widespread in eastern and western North America, including Mexico, probably common

Inocybe occulta Esteve-Rav, Bandini, B. Oertel & G. Moreno

Same as above but with whitish velipellis easily observed on the pileus and edge of the stipe bulb when young, spores 7-*8.5*-10 x 5-*5.9*-7 µm with 10-13 low obtuse nodules, short cystidia with average length < 50 µm; in hardwoods of *Fagus*, *Quercus*, Cistaceae stands at times mixed with *Pinus*, also mixed forests with hardwoods (*Betula*, *Carpinus*, *Tilia*) or conifers (*Pinus*, *Abies*), also in parks and urban habitats; New Jersey and Pennsylvania, also southern and central Europe

Inocybe nothomixtilis Esteve-Rav., Bandini & V. González

Pileus isabelline; stipe pallid above, dull brownish-yellow below, odor "rather strong fungous", spores 5.5-*6.5*-7.5 x 4.5-*5*-6 µm with mostly 7-10 moderate to small nodules; pleurocystidia fusiform, thick-walled, short, 45-50 x 15-18 µm; caulocystidia slenderly fusiform to cylindric, in woods, New York City

Inocybe abundans Murrill (per Smith (1939) same as *I. mixtilis*; note Murrill described the presence of an evanescent veil in the protologue but caulocystidia are present below the stipe center in the type; *I. abundans sensu* Grund & Stuntz =*I. umbratica*)

Pileus light buff with brownish margin, stipe white to pale buff, odor strong spermatic, in xerophytic tropical forest under *Coccoloba*, Guadeloupe (Caribbean basin)

Inocybe xerophytica Pegler

Odor somewhat fruity, acidulous, mild, or none

Pileus pale ochraceous-tawny to light pinkish-tan, dry; stipe white or pallid, odor somewhat fruity, acidulous, or mild, *not* spermatic; spores with numerous (10–12) small nodules; pleurocystidia and caulocystidia thick-walled, broadly lageniform; in mixed woods, Alabama to Tennessee

Inocybe earleana Kauffman

Pileus yellowish-brown or clay color, with a prominent umbo, stipe white and hollow, odor not described; spores with scattered indistinct nodules; pleurocystidia thin-walled [thick-walled per Atkinson's notes of the type]; in mixed woods under *Picea*, *Fagus*, New York

Inocybe paludosella G.F. Atk.

Pileus up to 30 mm, brown to yellowish brown (umbrinous), with a low obtuse umbo, light grayish velipellis present; PDAB negative; stipe 25-35 x 2-4 mm, white, odor (weakly) acidulous; spores 7-8 x 5-6 µm, angular-nodulose with mostly 5-7 small nodules; pleurocystidia thick-walled; on acidic soil in mixed woods under *Tsuga*, *Pinus strobus*, *Quercus*, North Carolina, Texas [PBM4586, PBM4594, DPL12129]

Inocybe aff. paludosella G.F. Atk.

Pileus up to 30 mm, umbrinous (Tawny-Olive) with a slight umbo, pallid to grayish velipellis present; PDAB *positive* (flesh exuding yellow pigment); stipe 34-37 x 4-5 mm, base with a slight marginate bulb 7-8 mm wide, cream-buff or with pale yellow tinge; odor none; spores 8-8.5 x 5.5-6.5 µm, angular-nodulose with 6-7 moderate to small nodules or corners; pleurocystidia 55-76 x 15-18 µm, fusiform to ventricose, thick-walled (walls 2.5-3 µm thick, hyaline); New York, northern Europe (type – Finland)

Inocybe caprimulgi Vauras & E. Larss.

Pileus reddish brown (castaneous) to dark brown

Pileus 20-40 mm; stipe 25-70 x 3-7 mm, with conspicuous marginate bulb 7-13 mm wide, white with pinkish tinges; odor none; spores 9-11 x 6.5-8 µm, mostly *angular in outline* with 8-10 *coarse prominent nodules*; under hardwoods in Nova Scotia, under conifers mixed with *Betula* in New York (pileus umbrinous and under conifers in Washington)

Inocybe decemgibbosa (Kühner) Vauras sensu Grund & Stuntz (Syn. *I. oblectabilis* f. *decemgibossa* Kühner)

Pileus 10-25 mm; stipe 15-60 x 1.5-5 mm with a marginate bulb -8 mm wide, cinnamon-buff to light brown; odor not remarkable; spores 9-10(-11) x 6-8 µm, mostly *elliptic in outline with 11-12 small conical nodules*; under *Quercus* in lawns and rest areas, *on karst topography*, Florida (type), Tennessee, Indiana, Ohio, Arkansas, Oklahoma, Texas also under *Quercus oleoides* in Costa Rica

Inocybe subradiata Murrill

Pileus up to 25 mm; stipe up to 45 x 2-3 mm with a small marginate bulb -5 mm wide, light reddish brown to cinnamon brown; odor not remarkable; spores 8-10.5 x 6-7.5 µm, angular-nodulose with mostly 6-8 conical nodules (not stellate); pleurocystidia 58-63 x 17-18 µm, fusiform to sublageniform with thick-walls (3-3.5 µm thick); on *acidic soils* where known, near Blue Ridge Parkway, also Cades Cove – North Carolina and Tennessee

Inocybe fuligineoatra Huijsman *sensu* Matheny [European *I. fuligineoatra* has not been sequenced; PBM2603 on GenBank is not the same – this is *Albodiscae*]

Spores >10 µm long

Stipe drying ashy-gray [dark yellowish brown?] or black

Pileus 15–30 mm, *finely squamulose*, not distinctly rimose towards the margin, grayish brown; stipe pruinose at apex, slightly villose below, abruptly bulbous, pallid becoming dark or black (bone-brown

to fuscous) when dried; spores 9–11 × 7–10 µm; pleurocystidia *large* (55–96 × 13–23 µm), subhyaline or tinted brownish, New York

Inocybe nigrescens G.F. Atk. (*cf. I. xanthomelas* Bournier & Kühner with the pileus never scaly and pleurocystidia with distinct yellow walls; cf. *I. umbrinescens* Murrill with stellate spores)

Pileus –30 mm, not distinctly rimose on the outer half; with small scales around the umbo; stipe distinctly pruinose throughout, pale yellow, becoming gray; spores 9–12 × 7–9 µm; pleurocystidia *not large* (45–72 × 15–25 µm); 12–17 µm); under *Tsuga*, Nova Scotia

Inocybe xanthomelas *sensu* Grund & D.E. Stuntz, *non* Boursier & Kühner

Pileus –50 mm, conic-campanulate to expanded-umbonate, dry, rimose-fibrillose, fulvous-castaneous on the prominent conical umbo, elsewhere fulvous-isabelline, margin splitting with age; flesh white, odor none, taste nutty; lamellae broad, rather distant [close on dried specimen], entire, pallid to brownish; stipe tapering upward, smooth, flocculent above, white when fresh [dried specimen shows dark yellowish brown stipe, so presumably darkening after drying]; spores 9–11 × 6.5–8.5 µm with ca. 10 rather prominent nodules [in contrast to the protologue]; pleurocystidia 45–65 × 16–31 µm, utriform to saccate, thick-walled; type from low ground, April, Gainesville, Florida [note that other collections assigned this name by Murrill are not contaxic, e.g. *Entoloma*]

Inocybe subprominens Murrill

Pileus 20–40 mm, not distinctly rimose on the outer half; stipe distinctly pruinose throughout, flesh and stipe surface turning *ashy gray to dark gray* on aged specimens or after drying; spores 9–13 × 6.5–10 µm; pleurocystidia *large* (65–100 × 12–25 µm); under conifers, *Salix* in montane, alpine, and boreal forests including Alaska to lower regions of the Pacific Norwest, Rocky Mountains, Europe

Inocybe phaeocystidiosa Esteve-Rav., G. Moreno & Bon (=*I. praetervisa* Quél. *sensu auct. p.p.*)

Stipe *not* drying ashy-gray or black, but may dry brown or not at all

Fruitbodies generally robust - pileus mixture of isabelline and honey yellow, stipe pallid (staining dirty pinkish or brownish), lamellae pale clay buff; spores oblong-angular with few nodules, in grass on urban campus (in sand dunes under willows in Europe), confirmed from norther Florida, also Europe

Inocybe dunensis P.D. Orton (=*I. heimiana* Bon)

Fruitbodies not robust, of if so, then spores not as above - pileus pale fulvous to light yellowish brown or yellowish brown (umbrinous); stipe pinkish or not, may dry brown

Pileus disc very dark brown, margin reddish brown to umbrinous, odor of green corn

Inocybe cicatricata Ellis & Everh. (Maine, New Jersey, Illinois, Indiana, Tennessee, Florida)

Not as above

Pileus reddish brown, odor not of green corn

Stipe with pinkish tinges

Inocybe decemgibbosa (Kühner) Vauras

Stipe pallid to very pale yellow; Quebec, Europe

Inocybe obtusiuscula Kühner (Syn. *I. rufofusca* (J. Favre) Bon)

Pileus *not* reddish brown

Stipe and stipe flesh pinkish buff, odor spermatic

Pileus -30 mm wide, brown to yellowish brown (umbrinous), velipellis *absent*; lamellae pale brown to clay brown; spores 9.5–11 × 7–8 µm, angular-nodulose with 7–8 low nodules or corners; pleurocystidia thick-walled; in mixed forest on limestone under *Pinus*, *Quercus*, confirmed from northern Florida, Europe

Inocybe oblectabilis (Britzelm.) Sacc.

Pileus -25 mm, conical to campanulate, yellowish brown, when young *with a white velipellis*; lamellae grayish to light brown; spores ?????, cystidia thick-walled ????; under *Pinus strobus* on limestone or in mixed pine-oak forests; confirmed from Tennessee, reported from Quebec, also Europe (probably same as *I. nobilis* (R. Heim) Alessio)

Inocybe pallida Velen.

Stipe and stipe flesh *not* pinkish buff, odor not distinctive (where known)

Pileus 15–35 mm with a prominent subacute umbo, clay brown, margin eventually rimose; stipe 40–50 × 1.5–2.5 mm wide, white; odor unknown; spores 8–10 (–12) × 5–6 (–7) µm with scattered indistinct nodule; cystidia thin-walled; in mixed woods under *Picea*, *Fagus*, New York

Inocybe paludosella G.F. Atk.

Pileus up to 30 mm wide, without a prominent umbo, stipe white when fresh, usually drying a darker color but not always blackening; flesh exuding *yellow pigment in PDAB*; odor not distinctive; spores mostly 9–11 × 7.5–8.5 µm, cystidia thick-walled; under *Pinus strobus* or mixed hardwoods including *Pinus strobus*, widespread – Quebec to North Carolina

Inocybe aff. xanthomelas Boursier & Kühner (formerly as *I.* aff. *straminipes*)

Pileus 30-40 mm wide, umbrinous, fulvous, or pale brown, at times bicolorous with dark brown disc, rimose but developing appressed scales around the disc; stipe 50-80 x 3-5 mm at apex, rounded bulb up 9 mm wide, cream buff or light ocher buff, odor spermatic or not remarkable; PDAB negative; spores 10.5-12.5 x 8-10 µm, coarsely angular-nodulose with 8-10 coarse nodule, at times with a wedge or bifid nodule; pleurocystidia 55-67 x 17-18 µm, fusiform to ventricose, thick-walled (walls up to 5 µm thick and hyaline); under *Quercus*, *Carya*, *Castanea*, or *Pinus strobus* in urban or forest settings; common and widespread – New York, New Jersey, Wisconsin, Arkansas, Tennessee, North Carolina, Georgia, Florida

Inocybe communis, nom. prov. (formerly as *I.* aff. *margaritispora*; on GenBank known as "*Inocybe radiata*" - sister to *I. diabolica* and *I. corsica* in the Xanthomelas clade)

Pileus 30–60 mm wide, conical when young, distinctly rimose throughout; stipe 4–10 mm wide, not distinctly pruinose on lower half; odor not distinctive; spores on average >10 µm long, yellowish intracellular pigment present in some hymenial cells; under conifers, *Betula*, or alpine-arctic, slightly acidic soils, Canada, Europe)

Inocybe praetervisa Quél. group (=*I. glabrodisca* sensu Kropp & Matheny 2004)

In forests under conifers, spores mostly 10-10.5 × 6.5-7 µm on average, confirmed to date only from the Pacific Northwest

Inocybe praetervisa Quél.

In forests under *Betula*, spores mostly 10.5-12.5 × 7-8 µm on average, confirmation for North American specimens lacking

Inocybe rivularis Jacobsson & Vauras

In alpine or arctic systems, spores mostly 11-11.5 × 7-7.5 µm on average, Alaska (environmental samples only)

Inocybe favrei Bon, *non* Nespiak (=*I. taxocystis* (J. Favre) Senn-Irlet)

Spores nodulose and hyaline; pleurocystidia present

One species - basidiomes entirely white, similar to *I. paludinella* but spores nodulose about a subangular to subelliptic outline *(Lanuginosa*-like) with 9-12 distinct conical nodules, 8.5-10.5 x 6.5-8 µm; pleurocystidia thick-walled, hyaline; caulocystidia present below stipe center?

Inocybe pernivosa (Murrill) Matheny ined. (Syn. *Entoloma pernivosum* Murrill)

Doubtful taxa

Hebeloma alachuanum Murrill was found to contain elements of *Inocybe* and *Pholiota* In the type (Hesler, unpublished notes; Eberhardt et al. 2023). The species was treated as doubtful by Eberhardt et al. 2023.

Inocybe cinchonensis (Murrill) Dennis, *Kew Bull.* 22: 80. 1968 (*Hebeloma cinchonense* Murrill, *Mycologia* 4: 82. 1912). Collected in Dec. 1908 on the ground in high-elevation (1500 m) forest in Jamaica. Attempts to generate DNA data from the type failed (Eberhardt et al. 2023). This is a smooth-spored species with somewhat small spores and hyaline thick-walled pleurocystidia. An icon was reproduced by Eberhardt et al. 2023.

Inocybe connexa Kauffman, *N. Am. Flora* 10: 254. 1924. Kauffman described the cystidia as thin-walled in the protologue, the odor as "farinaceous", the pileus as yellow-ocher, and the stipe subbulbous. Stuntz included an annotation in the type that describes the cystidia as thick-walled. Need to determine if Smith (1939) sheds

any light on the status of the type. Need to ascertain the distribution of caulocystidia on the stipe as well. Possibly near *I. sindonia*. Originally collected under pines in New England.

Inocybe eutheloides (Peck) Peck, *N.Y. St. Mus. Bull.* 1: 13. 1888 (*Agaricus eutheloides* Peck, *Ann. Rep. N.Y. St. Mus.* 32: 29. 1879). No published data on the type exist to my knowledge. In Peck's protologue, the spores are described as "even, uninucleate, gibbous or unequally elliptical". Until the type is examined, I would consider application of this name (e.g., Hesler 1936) as doubtful. Kauffman (1924), however, treated *I. eutheloides* as a smooth-spored species near *I. pallidipes*. It's not clear if his treatment is based on the type.

Inocybe fulvelliceps Murrill, *Quart. J. Florida Acad. Sci.* 8: 186. 1945. Data on the stipe covering are lacking. Murrill described the stipe as bulbous, white, and smooth. The spores are nodulose with 7-12 moderate-sized conical nodules about a subelliptic to subangular outline and less than 10 µm long. The thick-walled pleurocystidia appear rather short and fusiform to broadly so or utriform. Basidia are 4-sterigmate. The species was described by Murrill under *Quercus* in Florida. If the stipe is pruinose and bears caulocystidia the entire length, the species would be close to *I. abundans*, the latter close to, if not conspecific with, *I. mixtilis*.

Inocybe leptocystella G.F. Atk., *Am. J. Bot.* 5: 212. 1918. The type was designated by Atkinson as CUP19844. Kauffman and Stuntz concluded the data presented in the protologue were derived from other specimens not CUP19844 given the large spores of the latter. Kauffman considered CUP19844 as the same as *In. mutatum*, but again the spores are much too large. In my opinion, Atkinson's protologue is consistent with that of *In. mutatum* or possibly *In. geraniodorum*, but CUP material that match this species has not been located.

Inocybe murinolilacina Ellis & Everh., *J. Mycol.* 5: 25. 1889. Stuntz, in his unpublished notes, considered this a species of *Cortinarius* due to the presence of punctate-roughened spores in the isotype.

Inocybe nucleata Murrill, *Quart. J. Florida Acad. Sci.* 8: 188. 1945. Stuntz' unpublished notes on the type indicate the absence of caulocystidia on the lower part of the stipe. Murrill, however, described the stipe as equal and whitish-pulverulent, especially above. More data from the type, including the spore morphology, are necessary to include it in the key.

Inocybe scabella P. Kumm. sensu Kauffman (1918, 1924). The overall gross morphology and ecology would suggest *I. lacera*, but Kauffman (1918, 1924) described the spores as "almond-shaped" or "ellipsoid-almond-shaped". Material was not studied by Smith (1939). *Inocybe scabella* var. *rufa* is described in Kauffman (1918) and distinguished by its pale rufous to sordid brick color, more slender stipe (50-60 x 1-2 mm), and common occurrence in swampy or mossy wet places on rich soil in cedar and hemlock forests (Kauffman 1918). No one to my knowledge has re-assessed the taxonomy of these taxa.

Inocybe strigosa (Peck) Peck, Bull. N.Y. St. Mus. 131: 116. 1909 (*Paxillus strigous* Peck, *Bull. Buffalo Soc. Nat. Sci*. 1: 56. 1873). In the protologue the pileus is described as brittle, strigose with scattered stiff hairs, whitish, the lamellae as subdecurrent and at times forked, the stipe pruinose, the spores subglobose. Peck also mentions the lamellae are not easily removed from the pileus, and suggests a morphological similarity with *Clitocybe* and *Lepista*. The species was originally described in *Paxillus*. Without a modern assessment based on a study of the type, the species is doubtfully *Inocybe*.

Inocybe subeuthelloides Murrill, Mycologia 33: 282. 1941. The pileus is small (up to 25 mm wide) and described as finely hispid-squamulose and slightly rimose-lacerate with age. The color of the pileus is not clear (isabelline but with a subfuliginous umbo). The stipe is 25-30 x 3-4 mm, equal, subsmooth, and white. Pleurocystidia are ostensibly present, and the spores are described as smooth about 9 x 4.5 µm. The type is recorded under in woods of *Quercus* and *Pinus*, Florida. I have not studied the type, and Stuntz' unpublished notes only indicate the presence of lageniform caulocystidia at the stipe apex mixed with shorter clavate cells. The species appears to key most closely to the *I. flocculosa* group. Aside from the white stipe, it shares many affinities with *I. stuntzii* (=*I. flocculosa*) per Grund & Stuntz (1975).

Inocybe subroindica Banning & Peck, Ann. Rep. N.Y. St. Mus. 44: 182. 1892 [1890]. "Pileus at first campanulate, obtuse, dry, cracked longitudinally, glossy, fleshy at the disk, then at the margin, flesh white or slightly pinkish; lamellae adnate, close, forked, lanceolate, cream color, turning brownish ochre; stem nearly regular, twisted, marked with reddish fibrils, stuffed, hard, brittle. In open places in woods. August and September." A plate (Pl. 61) is indicated but is not included in the 1985 reprint of Peck's reports. The species was described from Maryland, however, it may conform better with *Entoloma* than with *Inocybe.* No unpublished data on the type are present among Stuntz' works.

Inocybe rubroindica Banning & Peck, Ann. Rep. N.Y. St. Mus. 44: 70. 1891. Saccardo (1895) makes reference to the epithet "*rubroindica*" in the 44th report, but such a reference cannot be found. The epithet is also not

present in Stuntz' note card library. I can only speculate that "*subroindica*" was in error and meant to be "*rubroindica*".

Inocybe tuberosa Clements, *Bot. Surv. Neb.* 2: 40. 1893. In Saccardo (1895) the pileus is desribed as 30 mm wide, squamose, fleshy, and brown; the stipe 40 mm long, 7-10 mm wide, bulbous or "tuberoso", gilvous; and the lamellae as brown; spores obtuse ovoid-ellipsoid, 6 x 4 µm. The species was described from Sioux County, in northwest Nebraska with an affinity to *I. insequenti* (Britzelm) Sacc. Likely plant associates could have included *Pinus,* Salicaceae, or possibly *Pseudotsuga*. The type was not studied by Kauffman (1924), and I could find no mention of it in Stuntz' unpublished notes.

Excluded taxa

Inocybe angustispora Bessette & Fatto (*Cortinarius aureifolius*)
Inocybe ferruginosa A.H. Sm. (*Cortinarius uliginosus* var. *nauseosus*, *C. ferruginosus*)
Inocybe sterlingii Peck (*Hebeloma excedens* (Peck) Sacc.)
Inocybe taedophila Murrill (*Cortinarius aureifolius* Peck)
Inocybe vatricosoides Peck (*Hebeloma excedens* (Peck) Sacc.)
Inocybe weberi Murrill (This is a species of *Cortinarius* – in need of replacement name?)

Western North American taxa of Inocybaceae not treated here (82 total)

Inocybe acystidiosa (Kauffman 1924)
Inocybe alpinomarginata (Cripps et al. 2020)
Inocybe amblyospora (Nishida 1989)
Inocybe amicta (Bandini et al. 2021; equates to UBCF18031)
Inocybe anomala (Murrill 1913, Kauffman 1924)
Inocybe appendiculata (Matheny, unpubl.)
Inocybe arctica (Cripps et al. 2020)
Inocybe auricoma (Nishida 1989)
Inocybe bakeri (Kropp et al. 2010)
Inocybe boltonii (molecular confirmation; same as BJ920816 from Sweden)
Inocybe bresadolae (Nishida 1989)
Inocybe brunnescens (Earle 1904, Kauffman 1924, *non brunnescens* G.F. Atk. 1918; spores phaseoliform)
Inocybe californica (Kauffman 1924)
Inocybe candidipes (Kropp & Matheny 2004; ITS sequences of "chelanensis" on GenBank are actually *I. candidipes*)
Inocybe cf. *candidipes* (Larsson et al. 2017)
Inocybe chelanensis (Stuntz 1947, Nishida 1989, Kropp & Matheny 2004; ITS sequences mislabeled on GenBank – these conform to *I. candidipes*)
Inocybe chondroderma (Matheny et al. 2013; =*I. viscidula* sensu D.E. Stuntz)
Inocybe chrysocephala (Nishida 1988, 1989)
Inocybe cinnamomea (Nishida 1989)
Inocybe culicis (molecular confirmation; Arctic Alaskan root sample same as type)
Inocybe cystidiosa (Smith 1941 as *'Tricholoma cystidiosum'*)
Inocybe dryophila (Murrill) Beker & U. Eberh. (Eberhardt et al. 2023)
Inocybe eutheles sensu A.H. Sm. (Smith 1939)
Inocybe fulvella sensu D.E. Stuntz, *non* Grund & Stuntz (Stuntz 1947)
Inocybe fuscescentipes (Larsson et al. 2014)
Inocybe geophylla var. *lilacina* sensu Nishida (Nishida 1989, *I. ionocephala* Matheny & Swenie 2018)
Inocybe giacomi (Cripps et al. 2020; as *Inocybe boltonii* ssp. *giacomi* Miller 1987)
Inocybe hemileuca (Nishida 1988)
Inocybe hotsoniana (Stuntz 1947)
Inocybe humilis (iNat181492273 – Barge; Idaho)
Inocybe ionocephala (Matheny & Swenie 2018)
Inocybe insinuata (Kauffman 1924, Nishida 1989)

Inocybe laetior (Smith & Stuntz 1950)
Inocybe laurina (Bandini et al. 2020) – Mexico, New Mexico
Inocybe lemmi (Larsson et al. 2017)
Inocybe leonine (Cripps et al. 2020)
Inocybe lucifuga sensu D.E. Stuntz (Stuntz 1947, Perez Silva 1967)
Inocybe menthigustans Nishida (Nishida 1988, 1989)
Inocybe monticola Kropp & Matheny (Kropp et al. 2010)
Inocybe mutifolia (Braaten et al. 2014)
Inocybe multifolia f. *cryptophylla* (Braaten et al. 2014)
Inocybe muricellata (Nishida 1989)
Inocybe murina (Cripps et al. 2020)
Inocybe mytiliodora (Matheny unpubl.)
Inocybe oblectabilis (Nishida 1989; now also confirmed from Florida)
Inocybe obscura var. *rubens* (Stuntz 1947)
Inocybe obscura var. *obscura* (Stuntz 1947, Perez Silva 1967)
Inocybe olida (Nishida 1989)
Inocybe olympiana (Smith 1938)
Inocybe paragiacomi (Cripps et al. 2020)
Inocybe phaeocomis var. *major* (Nishida 1989, Cripps 1997)
Inocybe phaeodisca (Nishida 1989)
Inocybe picrosma (Smith & Stuntz 1950)
Inocybe praecox (Kropp et al. 2010)
Inocybe prominens f. *longistriata* (Kauffman 1925)
Inocybe pseudodestricta (Bandini et al. 2019; =*I. glabrescens sensu* B.C. auct.)
Inocybe purpureobadia (Cripps et al. 2020)
Inocybe pusio (Perez Silva 1967, Nishida 1989)
Inocybe pyrotricha (Smith & Stuntz 1950)
Inocybe rainierensis (Smith & Stuntz 1950, Kropp & Matheny 2004)
Inocybe rufoalba sensu Lange (Miller 1987)
Inocybe rupestroides E. Larss. & Vauras (Cripps ITS of alpine *Salix* sample from Colorado)
Inocybe sierrensis (Kropp & Matheny 2004 as "*sierraensis*")
Inocybe siskiyouensis (Kauffman 1929, Smith 1939)
Inocybe splendens sensu Nishida (Nishida 1989)
Inocybe subcarpta (molecular confirmation; BC PK3820 same as epitype)
Inocybe subgiacomi (Cripps et al. 2020)
Ioncybe subporospora (Seres et al. 2015, Alaska, north-western Canada; =*I. tjallingiorum*)
Inocybe vaccina (Nishida 1989)
Inocybe venustissima Bandini & B. Oertel (Bandini et al. 2019; =*I. auricoma sensu* B.C. auct.)
Inocybe viscidula sensu Stuntz (Stuntz 1947; this is *I. chondroderma*)
Inocybe volvata (Stuntz 1947)
Inosperma adaequatum sensu Nishida (Nishida 1989)
Inosperma quietiodor (Nishida 1989)
Mallocybe agardhii (Nishida 1989, Matheny 2003)
Mallocybe arthrocystis (Cripps et al. 2010)
Mallocybe coloradoensis Kauffman 1924 (=*I. caesariata* sensu Kauffman)
Mallocybe pygmaea (Miller 1987)
Mallocybe leucoblema (Cripps et al. 2010)
Mallocybe leucoloma (Cripps et al. 2010)
Mallocybe substraminipes (Cripps et al. 2010)
Mallocybe terrigena (Matheny 2003)
Pseudosperma aestivum (Kropp et al. 2013)
Pseudosperma breviterincarnatum (Kropp et al. 2013)
Pseudosperma californicum (Eberhardt et al. 2023)

Pseudosperma cercocarpi (Kropp et al. 2013)
Pseudosperma flavellum sensu Cripps (Cripps 1997)
Pseudosperma niveivelatum (Kropp et al. 2013)
Pseudosperma occidentale (Kropp et al. 2013)
Pseudosperma spurium (Cripps 1997 *as I. squamata*; Kropp et al. 2013)

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