

Spores (4.5)5.5–7.5 × 3.5–4.5 µm, av. 5.8–6.6 × 3.6–4.0 µm, Q = 1.4–1.8, Qav. = 1.55–1.65, not flattened, ellipsoid to ellipsoid-oblong, pale orange-yellow in ammonia, thin-walled, without germ pore but often with small pale spot (callus); basidia 13–21 × 7.0–8.5 µm, 4-spored; cheilocystidia 15–20 × 4.0–9.0 µm, lecythiform with capitulum 3.0–4.5 µm broad; pleurocystidia absent; pileipellis an epithelioid hymeniderm, made up of clavate and spheropedunculate elements, 26–35 × 15–20 µm, occasionally intermixed with lecythiform pileocystidia, similar to cheilocystidia; caulocystidia a mixture of (1) lecythiform cystidia, 15–35 × 4.5–8.0 µm with long neck and capitulum 1.5–5.0 µm broad; (2) subcylindrical, utriform and lageniform elements and (3) slender, cylindrical hairs. Clamp-connections present. Chemical reactions: Ammonia reaction negative.

HABITAT & DISTR. — Saprotrophic, on soil, mostly in poor, open grassland on calcareous loam on sunny slopes, also at edges of forests. Not yet record from the Netherlands, but not uncommon in Austria and also recorded from Germany and Italy. June–Nov. Originally described from rain forest in Mexico.

Conocybe tuxlaensis is very similar to *C. pilosella* in both macroscopic characters, habitat, and spore morphology. The main difference is the mixed covering of the stipe in *C. tuxlaensis* with both cylindrical hairs and lecythiform cystidia in approximately equal proportions. In *C. pilosella* lecythiform caulocystidia are usually completely absent, but occasionally scarce at stipe apex (e.g., Kühner. Genre Galera: 95. 1935). *Conocybe tuxlaensis* may be found in the Netherlands, in particular on calcareous slopes in southern Limburg.

A related species, described from steep, exposed slopes in Austria, is *Conocybe roseipes* A. Hauskn. It is easily recognised by the very small basidiocarps with dark brown, 3–6 mm broad pileus, contrasting with the pink stipe, measuring 15–28(40) × 1 mm, and the small spores measuring (7.0)7.5–9.5 × 4.5–5.5(6.0) µm, with slightly thickened wall and distinct germ pore (Hausknecht in Beih. Sydowia 10: 97–100. 1995). The stipe is mainly covered with lecythiform caulocystidia, but intermixed with clavate elements and cylindrical hairs.

Sect. *Candidae* Sing.

Basidiocarps mycenoid; pileus and lamellae soft and soon deliquescent; stipe slender, up to 5(7) mm thick, pubescent, at least when young, with lageniform to filiform caulocystidia, in addition with small, subglobose elements; lecythiform cystidia absent or scattered near apex; pseudoparaphyses in between basidia prominent and large, at least in young basidiocarps.

30. *Conocybe apala* (Fr.:Fr.) Arnolds in Persoonia 18.: 225. 2003.

Agaricus apalus Fr., Observ. mycol. 2: 142. 1818; *Agaricus apalus* Fr.:Fr., Syst. mycol. 1: 265. 1821; *Pluteolus apalus* (Fr.:Fr.) QuéL., Enchir. Fung.: 105. 1886. — *Bolbitius albipes* Oth in Mitt. naturf. Gesellsch. Bern 711–744: 92. 1871; *Conocybe albipes* (Oth) A. Hauskn. in Österr. Z. Pilzk. 7: 102. 1998. — *Conocybe albipes* var. *rugata* A. Hauskn. in Österr. Z. Pilzk. 7: 110. 1998. — *Bolbitius tener* B. & Br., Outl. Br. Fungology: 183. 1860, non *Conocybe tenera* (Schaeff.:Fr.) Fay. 1889. — *Galera lactea* J. Lange, Fl. agar. dan. 5: IV. 1940; *Conocybe lactea* (J. Lange) Métrod in Bull. trimest. Soc. mycol. Fr. 56: 46. 1940. — *Conocybe huijzmanii* Watling in Nordic J. Bot. 3: 262. 1983. — *Conocybe huijzmanii* var. *conica* Watling in Gdns' Bull. Singapore 45: 377. 1994.

MISAPPL. — *Galera lateritia* sensu Rick., Blätterpilze: 224. 1915; *Conocybe lateritia* sensu Kühner, Genre Galera: 121. 1935, sensu auct. cur. plur.

KEY TO THE VARIETIES

1. Pileus broader than high, obtusely conical to hemispherical, expanding to broadly campanulate, conico-convex or plano-convex
29a. var. *apala*
1. Pileus usually higher than broad, subcylindrical, paraboloid to narrowly campanulate, not or slightly expanding. . . 29b. var. *albipes*

30a. var. *apala* — Fig. 159B.

Conocybe huijzmanii Watling in Nordic J. Bot. 3: 262. 1983. — *Bolbitius huijzmanii* (Watling) M. Bon in Doc. mycol. 20(78): 39. 1990. — *Galera lactea* f. *semiglobata* J. Lange, Fl. agar. dan. 4: 33. 1939 (invalid); *Conocybe albipes* var. *rugata* A. Hauskn. in Österr. Z. Pilzk. 7: 110. 1998

SEL. ICON. — J. Lange, Fl. agar. dan. 4: pl. 128G. 1939 (as *Galera lactea* f. *semiglobata*).

SEL. DESCR. & FIGS. — M. Bon in Doc. mycol. 21(84): 62. 1992 (as *Bolbitius huijzmanii*); A. Hauskn. in Österr. Z. Pilzk. 7: 110–111, figs 6a–d. 1998 (as *C. albipes* var. *rugata*); Watling in Nordic J. Bot. 3: 262–263, fig. 1A–D. 1983 (as *C. huijzmanii*).

VERN. NAME — Bolhoedbreeksteeltje.

Pileus 20–35 mm broad, 10–20 mm high, hemispherical to obtusely conical at first, expanding to broadly campanulate, conico-convex or plano-convex with broad umbo in age, not or weakly hygrophanous, at centre pale orange, pale ochraceous or cream-coloured (K. & W. 5A3, 4), to the margin ivory white, margin not or slightly translucent-striate; brown lamellae becoming translucent in age; surface smooth to radially rugulose, occasionally strongly wrinkled at centre, dry or slightly sticky when moist (but not really viscid). Lamellae, L = 25–46, l = (1)3–7, very crowded, adnexed to free, slightly ventricose, up to 4 mm broad, very thin, in age often becoming wrinkled, finally deliquescent, cream-coloured at first, soon yellow-brown to orange-brown, with white flocculose edge. Stipe (40)50–90 × 1–3 mm, subcylindrical with slightly swollen to bulbous base up to 7 mm broad, fistulose, white to cream-coloured or very pale orange, densely pruinose-pubescent, slightly striate. Context concolorous with surface, in pileus up to 1 mm thick, fragile and soft. Smell and taste weak, not distinctive. Spore print rusty brown.

Spores 10.0–14 × 6.5–9.0 × 6.0–8.0 µm, av. 11.2–13.0 × 7.0–8.4 × 6.6–7.2 µm, very weakly to distinctly flattened, in frontal view ellipsoid to ovoid (Q = 1.3–1.6(1.7), Qav. = 1.35–1.5), in side-view ellipsoid to ellipsoid-oblong (Q = 1.5–1.8, Qav. = 1.55–1.7), yellow-brown to orange-brown in ammonia, more or less thick-walled (0.5–1.5 µm), with central germ pore, 1.0–2.0 µm wide. Basidia 20–31 × 10–13 µm, clavate to spheropedunculate, 4-spored. Lamella edge sterile or heterogeneous. Cheilocystidia 20–26 × 7.0–11 µm, lecythiform with ellipsoid to clavate basal part, short to rather long neck (1.5–4.5 × 1.0–1.5 µm) and small capitulum, 2.5–4.5 µm broad. Pleurocystidia absent, but basidia surrounded by 5–6 clavate to spheropedunculate pseudoparaphyses (pavement cells), 15–20 × 7.0–18 µm. Hymenophoral trama made up of hyaline, cylindrical and inflated elements, 5–20 µm broad. Pileipellis an epithelioid hymeniderm, made up of clavate and spheropedunculate elements, 25–55 × 10–25 µm, hyaline or pedicel with slightly thickened, yellowish wall, usually intermixed with cylindrical hairs. Pileocystidia scarce to scattered, filiform,

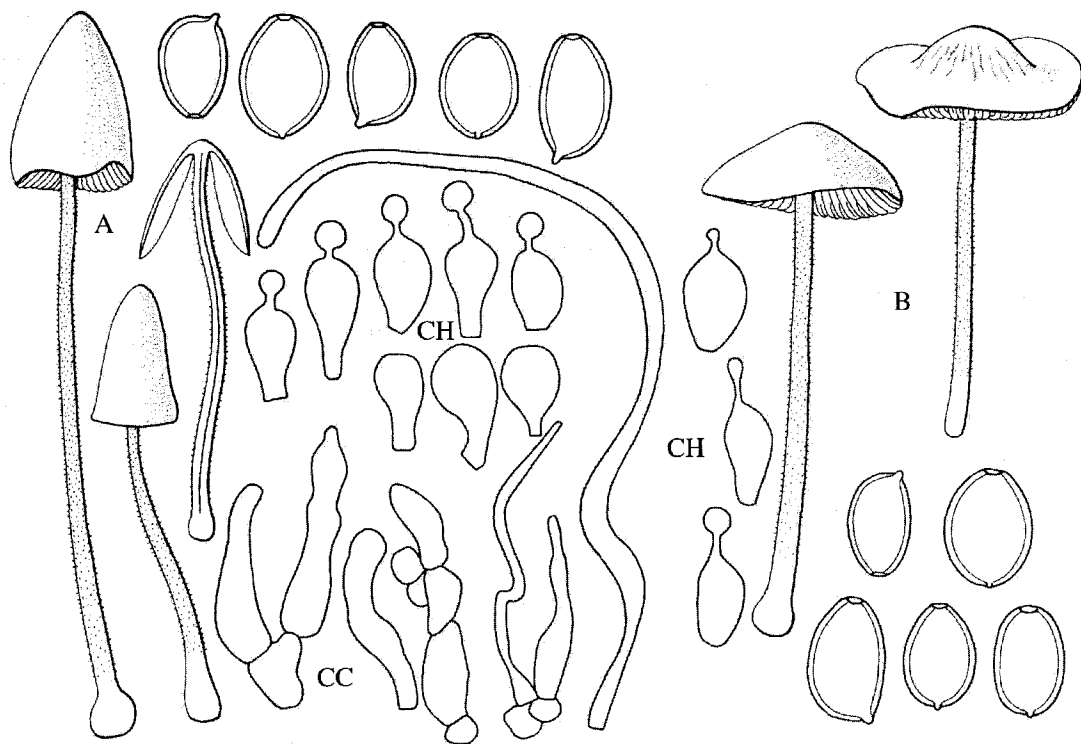


Fig. 159. *Conocybe apala*. A. var. *albipes*. B. var. *apala*

30–150 × 2.0–4.0 μm, straight or tortuous, hyaline with refractive content. Stipitipellis a cutis of repent, hyaline hyphae, 2.0–7.0 μm broad, with clusters of caulocystidia. Caulocystidia a mixture of (1) cylindrical, lageniform to clavate cystidia, 18–35 × 5.0–8.0 μm; (2) numerous small subglobose elements, 6.0–12 μm broad; (3) straight or tortuous, cylindrical hairs, up to 200 × 1.5–4.5 μm; lecythiform cystidia absent or very rare at extreme apex of stipe. Clamp-connections present, although scarce. Chemical reactions: Ammonia reaction negative.

HABITAT & DISTR. — Saprotrophic, solitary or in small groups, on soil and compost in gardens, fertilised meadows, roadsides, and ruderal sites, also in nonheated glasshouses, on humus-rich, weakly acid to basic sandy, loamy and clayey soils, rich in nutrients. June–Sept. In the Netherlands rare in the Holocene part of the country. Also recorded from Denmark, Germany, Great Britain, and Switzerland.

Conocybe apala is characterised by the very pale basidiocarps with very thin and crowded lamellae, pubescent stipe, and remarkably soft, easily collapsing context in pileus. The variety *apala* differs from the more common var. *albipes* only in the different shape of the pileus that is considerably broader than high and expanding during development. This is a striking character on population level and populations with both subcylindrical and hemispherical pilei were observed neither in the Netherlands, nor by Hausknecht (in Österr. Z. Pilzk. 7: 104. 1998) in his extensive, comparative study of sect. *Candidae*. However,

Hausknecht recorded some collections that were difficult to assign to one of the two taxa by intermediate shape of pileus.

Conocybe apala var. *apala* may occur with a smooth to strongly rugulose-wrinkled pileus. The smooth variant has been described by Watling (in Nordic J. Bot. 3: 262. 1983) as *C. huijsmanii*. That taxon was said to be different from *C. apala* var. *albipes* also in narrower spores, but this could be confirmed neither by Hausknecht (in Österr. Z. Pilzk. 7: 104. 1998) nor in the present revision. Hausknecht included collections of *C. huijsmanii* in his description of *C. apala* var. *albipes*, in contrast to this Flora.

Variants with a rugulose pileus have been described by Hausknecht as *Conocybe albipes* var. *rugata*, also because of slightly smaller spores with thicker wall. However, in Dutch collections of *C. apala* var. *apala*, basidiocarps with a smooth pileus occasionally occurred side by side with basidiocarps with a radially wrinkled pileus. Some basidiocarps with a smooth surface had thick-walled spores in the range of var. *rugata*. Therefore, *C. albipes* var. *rugata* is considered here synonymous with var. *apala*.

In some basidiocarps of both varieties of *C. apala* normal spores are mixed with a small proportion (less than 5%) of considerably smaller spores, measuring 6.0–9.0 × 4.5–6.5 μm, with the same colour and structure of normal spores. According to Hausknecht (in Österr. Z. Pilzk. 7: 103. 1998) the presence of these “microspores” is a constant character of *C. apala*, but this could not be confirmed in the studied

collections. It is questionable whether the occurrence of microspores has any taxonomic significance.

C. apala is better known under the names *C. lactea* and *C. huysmanii*. Hausknecht (in Österr. Z. Pilzk. 7: 102. 1998) found out that the name *Bolbitius albipes* Othh has priority over these two names. However, the latter name is preceded by the sanctioned name *Agaricus apalus* Fr.:Fr. (Arnolds in Persoonia 18: 225–226. 2003).

30b. var. **albipes** (Othh) Arnolds in Persoonia 18: 227. 2003. – Fig. 159A.

EXCL. — *Conocybe lactea* sensu Zuccherelli, *Funghi Pinete Zone* medit.: pl. 317. 1993 (= *C. pseudocrispa*).

SEL. ICON. — M. Bon, Champ. Eur. occ.: 261. 1987 (as *Bolbitius lacteus*); Breitenb. & Kränzl., Pilze Schweiz 4: pl. 381. 1995; Gerhardt, Gr. Pilzf.: 385 (top). 1999; G.J. Keizer, Paddestoelenencyclopedie: 235. 1997; J. Lange, Fl. agar. dan. 4: pl. 128F. 1939; Michael et al., Handb. Pilzfr., 3. Aufl., 4: pl. 200. 1985; R. Phillips, Paddest. Schimm.: 155. 1981 (all as *C. lactea*).

SEL. DESCR. & FIGS. — Breitenb. & Kränzl., Pilze Schweiz 4: 302, figs A–E. 1995 (as *C. lactea*); Enderle in Beitr. Kenntn. Pilze Mitteleur. 2: 102–103, figs A–E. 1986 (as *C. lactea*); A. Hauskn. in Österr. Z. Pilzk. 7: 102–106, figs 4F–j, 5a–d. 1998; Kühner, Genre Galera 121–124, fig. 37. 1935 (as *C. lateritia*); Watling in Br. Fung. Fl. 3: 80–81, figs 91, 92, 96–100. 1982 (as *C. lactea*).

VERN. NAME — Izabelkleurig breeksteltje.

CHARACTERISTICS — Differing from var. *apala* in the subcylindrical, paraboloid to narrowly campanulate, not or very slightly expanding pileus (8)10–25(30) mm broad, (10)12–35 mm high, usually higher than broad, occasionally with wavy-lobed margin; lamellae, L = 20–40, l = 3–7, very crowded, adnexed to free, strongly ascending, very thin, in age often becoming wavy to wrinkled or sticking together, finally deliquescent, cream-coloured at first, soon yellow-brown to rusty brown, with white flocculose edge; stipe (40)50–110 × 1–3 mm, subcylindrical with bulbous base up to 7 mm broad, fistulose, white throughout at first, in age becoming cream-coloured in lower half, densely pruinose-pubescent.

Spores (9.0)10.0–15.0(16.5) × 7.0–9.0(9.5) × 6.0–8.0 μm, av. 11.5–13.5(14.5) × 7.5–8.3(9.0) × 6.7–7.6 μm, weakly to strongly flattened, in frontal view ovoid or ellipsoid(-oblong), sometimes slightly angular, Q = 1.3–1.7, Q_{av} = 1.4–1.6, in side-view ellipsoid-oblong to ovoid-oblong, rarely slightly phaseoliform, Q = 1.5–1.9, Q_{av} = 1.6–1.8, yellow-brown to orange-brown in ammonia (5C7,8; 6C8), slightly to clearly thick-walled (0.5–1.2 μm) with large, truncate germ pore, 1.7–2.5 μm wide; basidia 4-spored; lamella edge sterile or heterogeneous; cheilocystidia 17–26 × 7.0–12 μm, lecythiform with short to rather long neck (1.5–4.0 × 1.0–1.5 μm) and small capitulum, 3.5–5.0 (5.5) μm broad; pleurocystidia absent, but basidia surrounded by 5–6 clavate to spheropedunculate pseudoparaphyses (pavement cells), 14–20 × 7.0–15 μm; pileipellis is an epithelioid hymeniderm, made up of clavate and spheropedunculate elements, 22–60 × 10–28 μm, hyaline or pedicel with slightly thickened, yellowish wall, usually intermixed with cylindrical hairs; pileocystidia scarce to scattered, filiform, 30–200 × 2.0–5.0 μm, straight or tortuous, hyaline with refractive content; caulocystidia a mixture of (1) cylindrical, lageniform to clavate cystidia, 17–32 × 4.0–8.0 μm, sometimes with narrow neck, 2.0–4.0 μm broad; (2) numerous small subglobose elements, 6.0–13 μm broad; (3) straight or tortuous, cylindrical hairs, 45–260 × 1.8–3.5 μm; lecythiform cystidia absent or very rare at extreme apex of stipe; clamp-connections present, although scarce. Chemical reactions: Ammonia reaction negative.

HABITAT & DISTR. — Saprotrophic, solitary or in small groups, on soil in meadows, hayfields, grassy roadside verges, gardens, lawns, ruderal, places and parks, rarely in forests, on moist to dry, weakly acid to basic, sandy, loamy and clayey soils. In the Netherlands widespread and rather common but never in large numbers. June–Aug. (Sept.). Widespread in Europe and in most regions, including the Netherlands, much more common than var. *apala*. Recorded from most continents, but possibly related species are involved.

Conocybe apala var. *albipes* is in West Europe a typical summer fungus. The elegant basidiocarps show up after heavy rains and disappear soon due to their fragile consistency. It is one of the few *Conocybe* taxa that can be easily identified in the field by the remarkably elongate shape of the pileus, pale colours, pubescent stipe, and very soft texture of pileus and lamellae.

In Europe, *Conocybe apala* var. *albipes* is by far the most common representative of sect. *Candidae*, comprising species with pale basidiocarps with very soft context and more or less deliquescent, almost free lamellae, bearing large pseudoparaphyses in between the basidia. The presence of pseudoparaphyses and free lamellae are in common with the genus *Bolbitius*. For that reason Bon (in Doc. mycol. 21 (84): 62. 1992) transferred sect. *Candidae* to *Bolbitius*. However, in agreement with Hausknecht (in Österr. Z. Pilzk. 7: 101. 1998) it is thought that this group is more closely related to *Conocybe* in view of the lecythiform cheilocystidia and the lack of a gelatinous pellicle on the pileus. Moreover, some unrelated *Conocybe* species also have less prominent pseudoparaphyses in the hymenium.

See also notes on var. *apala* and *C. pseudocrispa*.

31. **Conocybe pseudocrispa** (A. Hauskn.) Arnolds in Persoonia 18: 227. 2003.

Conocybe albipes var. *pseudocrispa* A. Hauskn. in Österr. Z. Pilzk. 7: 106. 1998.

MISAPPL. — *Conocybe crispa* sensu Enderle in Z. Mykol. 57: 66. 1991; sensu Arnolds et al., Overz. Paddest. Nederland: 105. 1995; sensu auct. eur. p.p. (non sensu Watling in Br. Fung. Fl. 3: 80. 1982); *Conocybe lactea* sensu Zuccherelli, *Funghi Pinete Zone* medit.: pl. 317. 1993.

SEL. ICON. — Zuccherelli, *Funghi Pinete Zone* medit.: pl. 317. 1993 (as *C. lactea*).

SEL. DESCR. & FIGS. — A. Hauskn. in Österr. Z. Pilzk. 7: 106–108, figs 5e–h. 1998.

CHARACTERISTICS — Pileus 5–12(20) mm broad, 4–11(15) mm high, obtusely conical, campanulate-convex to hemispherical, not hygrophalous, at centre at first pale isabella, pale yellow or cream-coloured (K. & W. 5B5, 4A3–4, 4A3), to the margin slightly paler, soon pallescent to yellowish white or milk-white, not striate but brown lamellae translucent at margin in age, smooth to slightly rugulose; lamellae moderately crowded to crowded, adnexed, slightly ventricose, in age becoming slightly wavy, not anastomosing, yellow-brown to orange-brown; stipe 35–60(100) × 1–1.5(2) mm, cylindrical with slightly thicker base, white at first, then cream-coloured to pale greyish ochre, entirely pubescent; smell and taste weak, not distinctive.

Spores (10.0)10.5–15 × 6.5–9.5 μm, av. 11.9–13.5 × 7.5–8.5 μm, Q = c. 1.5–1.7, not flattened, ellipsoid to ellipsoid-oblong in side-view and frontal view, yellow-brown to orange-brown in ammonia, rather thick-walled (0.5–1.5 μm) with apical germ pore, 1.2–2.0 μm wide; basidia 18–27 × 9.0–13 μm, 2-(1-)spored; lamella edge sterile; cheilocystidia 15–24 × 7.5–12 μm, lecythiform with subglobose to ellipsoid