

Reports of Finnish corticolous Aphyllophorales (Basidiomycetes)

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Twenty-seven new, rare or little collected species of the Aphyllophorales, mainly Corticiaceae, are reported from Finland. The following species are new to Finland: *Ceratobasidium pseudocornigerum* M.P. Christ., *Confertobasidium olivaceoalbum* (Bourd. & Galz.) Jül., *Hypochnicium erikssonii* Hallenb. & Hjortst., *H. subrigescens* Boid., *Lit-schauerella clematidis* (Bourd. & Galz.) J. Erikss. & Ryv., *Phlebiella lloydii* (Liberta) Hjortst. & Larsson, *Sistotrema heteronemum* (J. Erikss.) Strid, *Sistotremella perpusilla* Hjortst., *Tubulicrinis globisporus* Larsson & Hjortst. and *T. strangulatus* Larsson & Hjortst. Information on the distribution is included for some species in the genera *Asterostroma*, *Botryobasidium*, *Hyphoderma*, *Hyphodontia*, *Hyphodontiella*, *Hypochniciellum*, *Jaapia*, *Kavinia*, *Lobulicium*, *Phlebiella*, *Sistotremastrum*, *Steccherinum*, *Trechispora* and *Tubulicrinis*. Drawings of 21 species are presented.

Key words: Aphyllophorales, Corticiaceae, distribution

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The earlier studies of the Corticiaceae in Finland are listed by Kotiranta and Larsson (1990). The following new reports come mainly from southern Finland, where the author Saarenoksa has collected, especially in the vicinity of the city of Helsinki, and from northern Finland, being based on the collections of Kotiranta. The few notes from central Finland were made by the senior author, and only a few records are based on other herbarium specimens.

Material and methods

The studied material is preserved in the herbaria H, GB or OULU (see Holmgren et al. 1981) and/or in the reference collections of Heikki Kotiranta (H.K.).

The mounting media used in the microscopy were CB, IKI and KOH (5%); for the abbreviations see Niemelä (1985). The biological provinces of Finland used are mapped in Niemelä (1982), and the collect-

ing sites are indicated according to the Finnish national uniform grid system which, is presented by Heikinheimo and Raatikainen (1971). The nomenclature mostly follows Hjortstam (1984) and Hjortstam et al. (1988), and the species are arranged in alphabetical order. Synonyms are mentioned only if they deviate from those given in the papers mentioned above. In this paper the words *Picea* and spruce refer to *Picea abies* (L.) H. Karsten and *Pinus* and pine to *Pinus sylvestris* L.

List of species

Asterostroma laxum Bres. — Fig. 1.

Reported earlier from Finland by Eriksson and Strid (1969) and Ulvinen et al. (1981, *Asterostroma* cf. *laxum*). Fruit body resupinate, smooth, fairly thick (less than 1 mm), loosely attached, pale brownish.

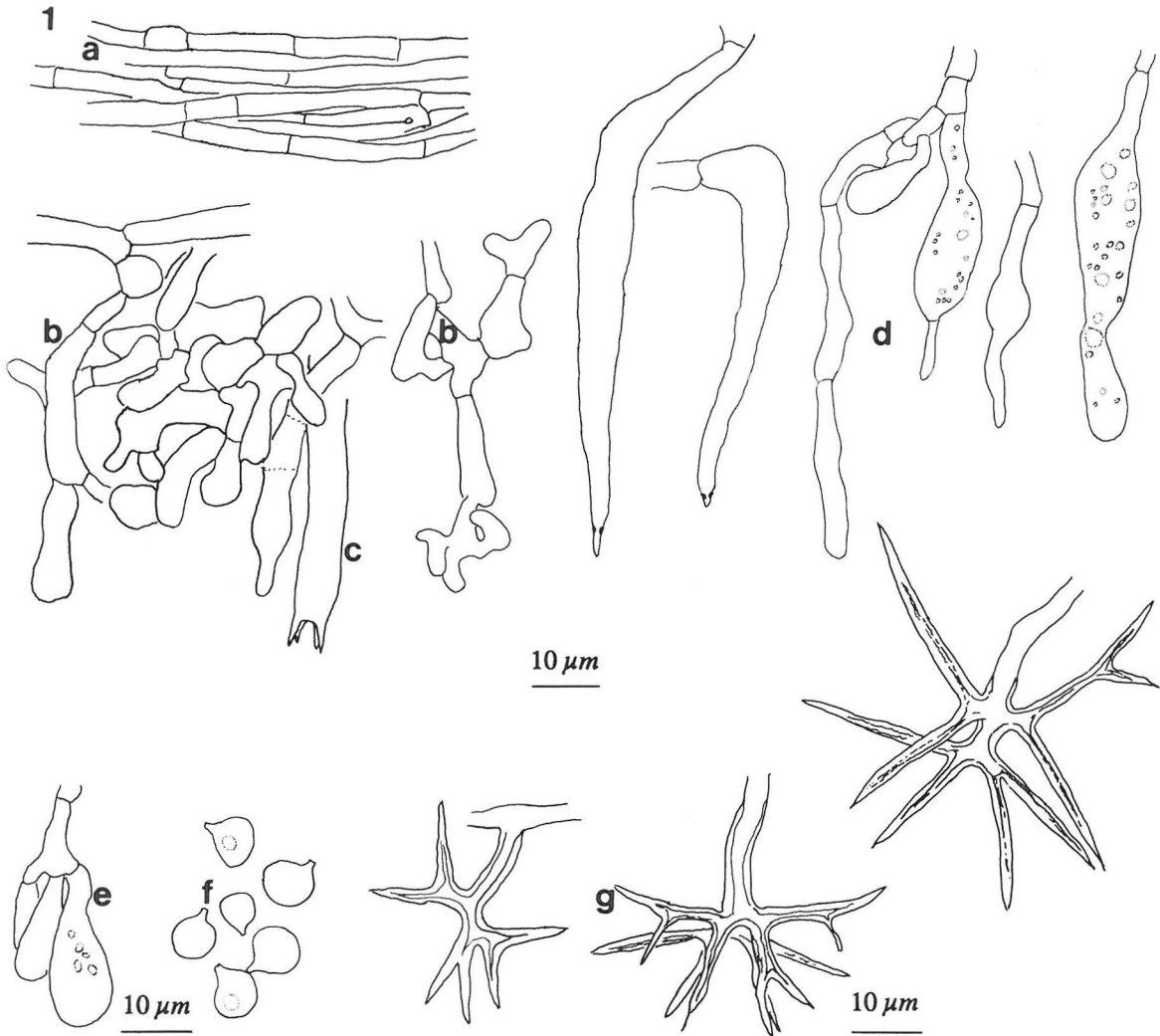


Fig. 1. *Asterostroma laxum* Bres. a) basal hyphae, b) context, c) basidia, d) gloeocystidia, e) basidioles, f) spores, g) asteroetae (specimen Saarenoksa 17389, H, H.K.).

Hyphal system monomitic. Basal hyphae attached to the matrix, thin-walled, simple septate, parallel, sparingly branched, 3–3.5 μm wide. Other subicular hyphae and subhymenial hyphae short, thin-walled, richly branched, randomly oriented, very variable in shape. Asteroetae common throughout the fruit body, light golden brown, CB– (very young CB+), IKI–. Gloeocystidia numerous, tubular, flexuose, thin-walled, very variable in shape, (19–)35–80 \times (4.5–)5–9 μm , often schizopapillate, with a very faint amyloid reaction at the papillary neck. Basidia almost missing in our specimen (only one detected), but according to Parmasto (1971) and Hallenberg

(1985) they are 30–97 \times 6–9 μm , basally simple septate, with four sterigmata. Spores globose or somewhat flattened 5.5–7.5 μm , thin-walled, CB–, amyloid, and with a prominent, up to 2 μm long apiculus.

Rare, but widely distributed. In Europe reported from Sweden (Eriksson 1948, 1958a, Hallenberg 1985, Larsson 1986), Norway (Hallenberg 1973), Denmark (Christiansen 1960, Hallenberg 1985), Estonia (Parmasto 1971), Germany (Doll 1977, 1981), Great Britain (Hallenberg 1973), Switzerland (Breitenbach & Kränzlin 1986), France (Bourdot & Galzin 1928) and outside Europe from Canada (Bondarceva & Parmasto 1986).

A. laxum has a wide range of host species; it has been reported from *Picea* (Parmasto 1971), *Pinus* (Eriksson 1958a, Eriksson & Strid 1969), *Castanea* (Bourdote & Galzin 1928), *Betula* (Eriksson 1948), *Quercus* (Hallenberg 1972–73), *Calluna vulgaris*, *Vaccinium myrtillus* (Christiansen 1960) and the polypore *Inonotus radiatus* (Sow.: Fr.) Karst. (Parmasto 1971).

Specimen examined

Finland. *Uusimaa*: Tuusula, Lahela, decorticated, fairly strongly decayed coniferous wood (*Pinus*?) of an old collapsed barn in deciduous grass–herb forest, together with *Resinicium bicolor* (Alb. & Schw.: Fr.) Parm., Grid 27°E 6698:388, 27.VIII.1989 *Saarenoksa* 17389 (H, H.K.).

Botryobasidium intertextum (Schw.) Jül. & Stalpers — Fig. 2.

B. angustisporum (Boid.) Talbot.

Reported earlier from Finland by Eriksson and Strid (1969). Fruit body resupinate, at first thin, hypochnoid, white; later almost pellicular, yellowish.

Hyphal system monomitic. Basal hyphae with smooth and thickened walls, clamped, 7.5–8 µm wide. Other subicular hyphae thin-walled, fairly richly ramified at right angles, simple septate, 5–7 µm wide. Subhymenial hyphae thin-walled, clamped, 5–7 µm wide. All hyphae CB+. Cystidia none. Basidia mostly subcylindrical, sometimes constricted, (13–)15–21(–23) × 5–6.5 µm wide, basally clamped, with six sterigmata. Spores navicular, 7.0–9.5 × 1.8–2.8 µm, L = 8.3, W = 2.3, Q = 2.9–4.5, Q̄ = 3.7 (*Saarenoksa* 18689), n = 30; 6.5–9.0 × 1.8–2.8 µm, L = 7.5, W = 2.1, Q = 3.0–4.2, Q̄ = 4.2 (*Kotiranta* 7411 & *Mannerkoski*), n = 30, thin-walled, CB+, IKI–.

B. intertextum is widely distributed, but nowhere common. The northernmost collections in Sweden and Finland are close to the Polar circle (Eriksson 1958b, Eriksson & Strid 1969). In Fennoscandia *B. intertextum* seems to prefer coniferous wood in old spruce-dominated forests (Eriksson 1958b, Hjortstam 1973), and reports from angiosperms in deciduous forests are few (Eriksson 1958b, Strid 1975a). The species is known from many European countries, e.g. Czechoslovakia, Norway, Poland (Eriksson 1958b), France (Boidin 1957), the Soviet Union (Parmasto 1965, 1968) and Spain (Hjortstam et al. 1981), where it grows on *Quercus robur*, *Fraxinus excelsior* and *Pinus radiata* (Dueñas & Tellería 1988). It has been reported outside Europe from the United States (Eriksson 1958b).

Specimens examined

Finland. *Uusimaa*: Helsinki, Myllypuro–Puotinharju, decorticated, soft, cut *Salix caprea* in mixed grass–herb forest, Grid 27°E 6680:392, 3.IX.1989 *Saarenoksa* 18689 (H). *Etelä-Häme*: Ruovesi, Keinumäki E, Musturi State Forest Reserve, very strongly decayed moss-covered *Pinus sylvestris* on the ground in mixed virgin *Picea abies*–*Vaccinium myrtillus* forest, Grid 27°E 6865:362, 14.VI.1989 *Kotiranta* 7411 & *Mannerkoski* (H.K.). Tammela, Liesjärvi Nat. Park, Kortenieniemi, corticated, moss-covered *Picea abies* on the ground in mixed spruce–*Vaccinium myrtillus* forest, Grid 27°E 6731:330, 22.X.1983 *Kotiranta* 5243 (H.K.).

Ceratobasidium pseudocornigerum M.P. Christ. — Fig. 3.

New to Finland. Fruit body resupinate, hypochnoid — almost corneous, in the beginning very thin translucent, later thicker, dull brownish grey.

Hyphal system monomitic, hyphae simple septate throughout. Basal hyphae with thickened walls, branches ramified at right angles, (6–)7.5–9 µm wide. Subicular and subhymenial hyphae thin-walled, slightly narrower, with few droplets in KOH. Cystidia none. Basidia terminal, very rarely pleural (young?), more or less obovate, basally simple septate (11–)13–16 × 9–9.5 µm, with four 11–14 µm long sturdy sterigmata. Spores cylindrical–oblong, sometimes slightly curved, often attached in pairs–tetrads, 8.6–14.0 × 3.0–4.2 µm, L = 11.1, W = 3.8, Q = 2.5–3.7, Q̄ = 2.9 (*Saarenoksa* 04689), n = 30; 7.7–11.0 × 3.0–4.2 µm, L = 10.0, W = 3.8, Q = 2.2–3.0, Q̄ = 2.6 (*Saarenoksa* 11389), n = 30, repetitive by an apical sterigma, thin-walled, CB–, IKI–.

Our specimens do not fit exactly with the descriptions given by Christiansen (1959) and Eriksson and Ryvarden (1973). The spores in the Finnish collections are of the same size and shape, but the sterigmata of the spores are mostly apical, as in the drawing of Breitenbach and Kränzlin (1986). Only two laterally placed sterigmata were found, and one basal, which arose just beneath the apiculus. The drawing in Eriksson and Ryvarden (1973) of *C. stridii* Erikss. & Ryv. fits fairly well with our specimens, but the spores are differently shaped, and the basidia too small. The spores of *C. anceps* (Bres. & Syd.) Jacks. are also differently shaped and too wide, viz. 4.5–7 µm (Jackson 1949).

C. pseudocornigerum seems to be a rare species, reported from Denmark (Christiansen 1959), Sweden (Eriksson & Ryvarden 1973, Hjortstam 1979) and Switzerland (Breitenbach & Kränzlin 1986). Its growth sites are luxuriant and the collections come from deciduous trees, such as *Fraxinus* and *Fagus* (Christiansen 1959).

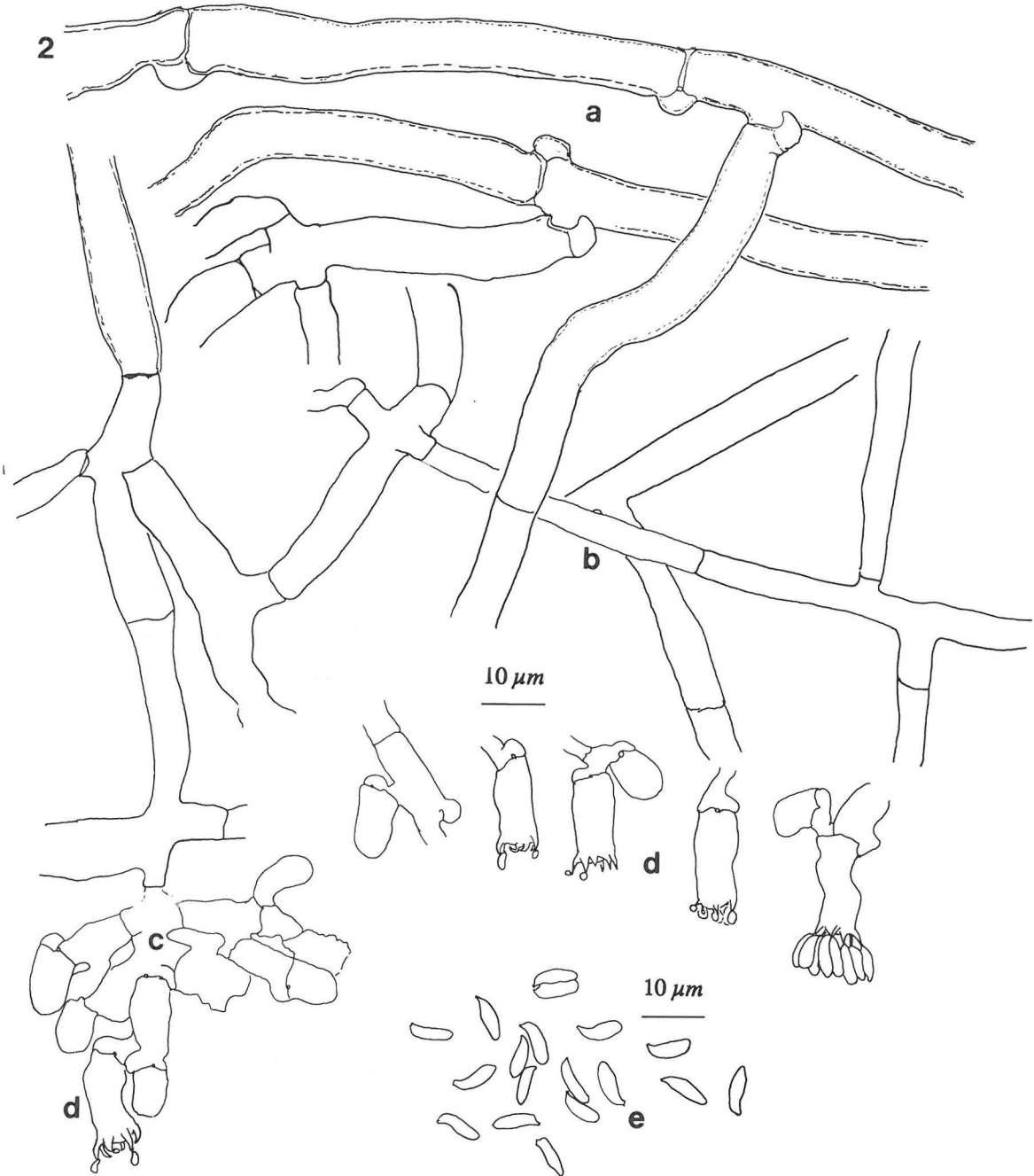


Fig. 2. *Botryobasidium intertextum* (Schw.) Jül. & Stalpers. a) clamped basal hyphae, b) simple septate subicular hyphae, c) clamped subhymenial hyphae, d) basidia, e) spores (specimen Kotiranta 7411 & Mannerkoski, H.K., in KOH).

Specimens examined

Finland. Uusimaa: Helsinki, Viikki (Wiik), on small twigs of deciduous trees, dead *Aegopodium podagraria* and dead *Filipendula ulmaria* in deciduous grass-herb forest intermixed with a

few spruces, Grid 27°E 6682:391, 7.VI.1989 *Saarenoksa 04689* (H, H.K.). Helsinki, Viikki, Hakala, at bases of living *Pteridium aquilinum* in mixed grass-herb forest, Grid 27°E 6680:389, 14.VI.1989 *Saarenoksa 11389* (H).

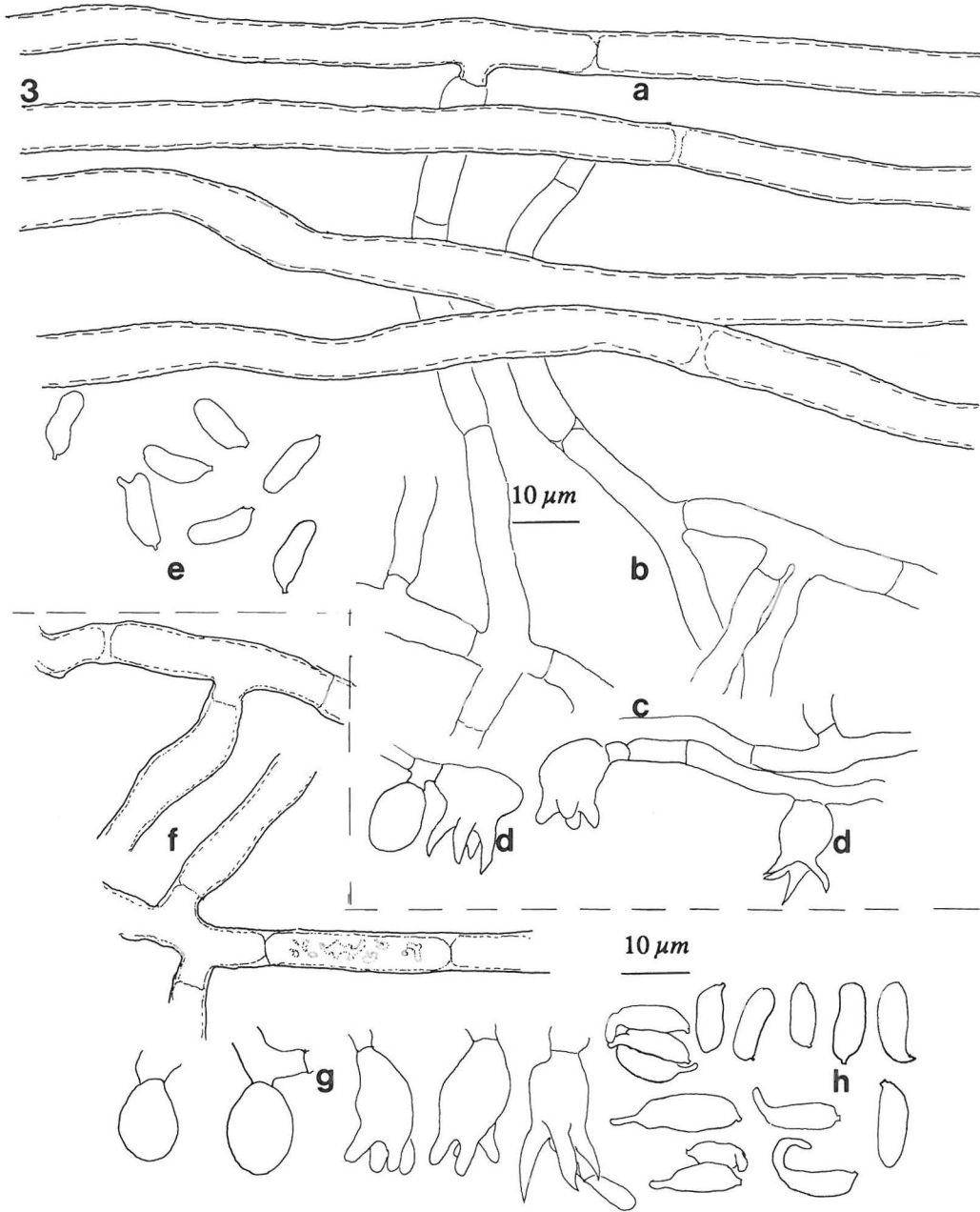


Fig. 3. *Ceratobasidium pseudocornigerum* M.P. Christ. a) basal hyphae, b) subicular hyphae, c) subhymenial hyphae, d) basidia, e) spores (specimen Saarenoksa 11389, H, in KOH).

Confertobasidium olivacealbum (Bourd. & Galz.) Jül. — Fig. 4.

New to Finland. Fruit body resupinate, pellicular, pale cream-coloured, with a few, small, golden brown

patches, soft, cracked when dry, loosely attached to the substrate, subiculum light brown, rhizomorphs light creamy brownish.

Hyphal system monomitic. Basal hyphae and hyphae in strands mostly narrow, 2.0–3.0, in a few

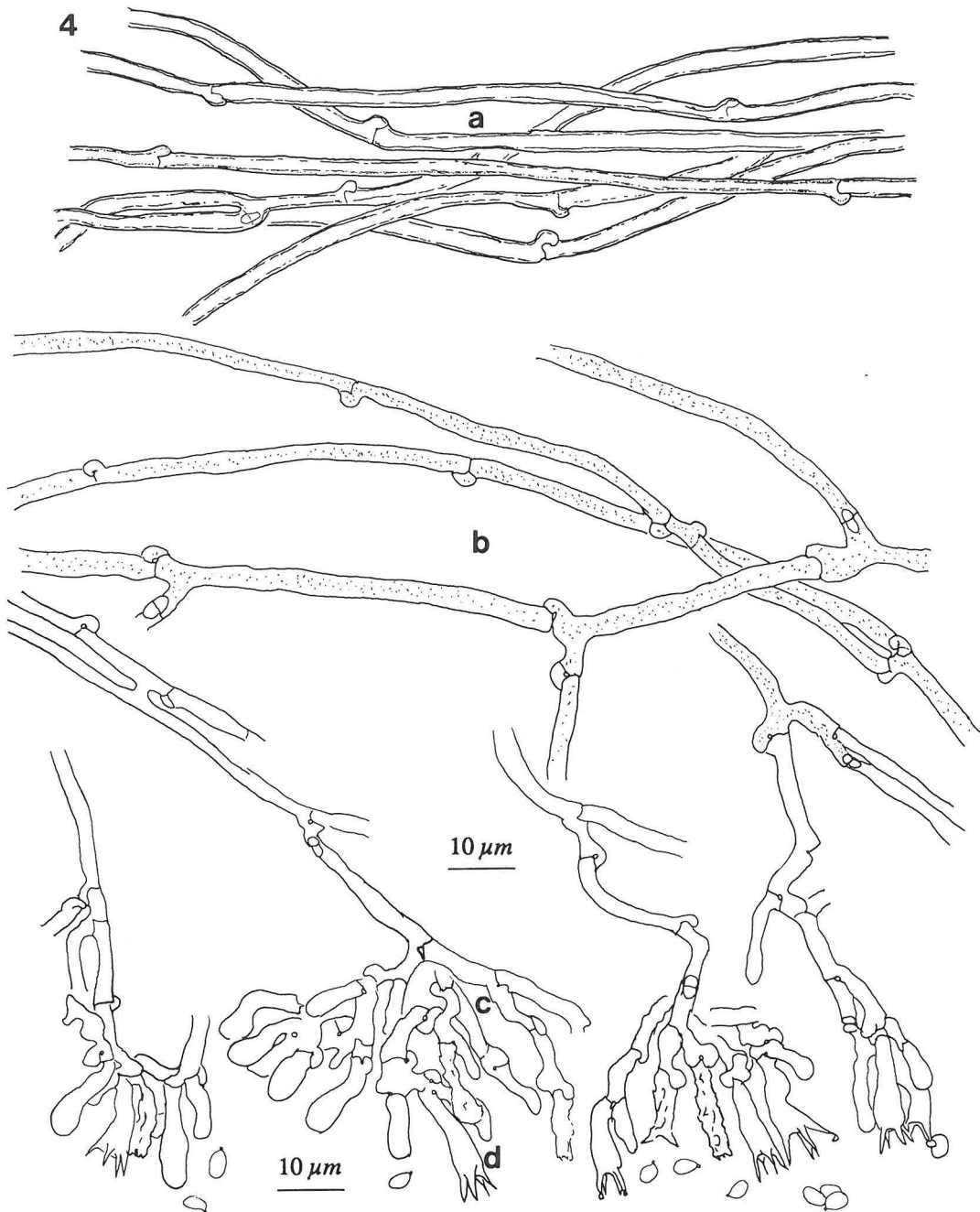


Fig. 4. *Confertobasidium olivaceoalbum* (Bourd. & Galz.) Jül. a) pigmented basal hyphae, b) subicular hyphae, c) subhymenium, d) hymenium with basidia and spores (specimen Kotiranta 7388, H, H.K., in KOH).

cases up to 5.0 μm wide, sparingly septate with clamp connections, cells 75–125 μm long, more or less parallel, with slightly thickened walls, slightly encrusted, golden brown in KOH. Subicular hyphae

fairly sparingly septate with clamp connections, 2.5–3.2 μm wide. Subhymenial hyphae richly branched, clamped, thin-walled. Cystidia none. Basidia narrow, clavate, occasionally constricted, (11–)13–15(–17) x

(3.5–)4–5 μm , basally clamped, with four, up to 5 μm long sterigmata. Spores subcylindrical, 3.2–4.3 \times 1.6–2.5 μm , $L = 3.8$, $W = 2.0$, $Q = 1.4\text{--}2.1$, $\bar{Q} = 1.9$ (Kotiranta 7388), $n = 30$, thin-walled, CB–, IKI–.

Leptosporomyces luteofibrillosus Hjortst. & Ryv. resembles our specimen, but according to Hjortstam and Ryvarden (1985), the yellow rhizomorphs in the former species should be a good character separating *C. olivaceoalbum* from *L. luteofibrillosus*.

Jülich and Stalpers (1980) consider *C. olivaceoalbum* a common species and it is reported from several European countries, e.g. Sweden (Strid 1972–73, Eriksson & Ryvarden 1973), Czechoslovakia, Italy, France, Portugal, Turkey (Jülich 1972), Austria (Jülich 1972, Hallenberg & Michelitsch 1983), Germany (Kreisel 1987), Switzerland (Breitenbach & Kränzlin 1986), and outside Europe from the Asian part of the Soviet Union, the United States (Jülich 1972) and Canada (Jülich 1972, Hallenberg 1985).

C. olivaceoalbum prefers all kinds of coniferous wood, and is only seldom collected from angiosperms or from mosses and herbaceous substrates such as ferns (Jülich 1972).

Specimen examined

Finland. *Etelä-Häme:* Ruovesi, Siikakangas, on strongly decayed, brown-rotted, dry *Pinus sylvestris* in open, sunny *Cladonia-Pinus contorta* (cult.) forest, Grid 27°E 6862:357, 13.VI.1989 Kotiranta 7388 (H, H.K.).

Hyphoderma obtusum J. Erikss. — Fig. 5.

Reported earlier by Eriksson & Strid (1969). Fruit body resupinate, small, thin, at first pale, later greyish pink, also in fresh state.

Hyphal system monomitic, hyphae richly branched, thin-walled, clamped, 3.2–4.0 μm wide. Cystidia thin-walled, clavate, sometimes sinuous, obtuse, (KOH), 43–57 \times 8.5–12 μm . Basidia subclavate (25–)33–37(–53) \times (6.0–)7–8 μm , basally clamped, with four 8–10 μm long, stout sterigmata. Spores hyaline, ellipsoid, 7.7–13.0 \times 5.1–8.5 μm , $L = 9.4$, $W = 6.1$, $Q = 1.3\text{--}1.9$, $\bar{Q} = 1.5$ (Kotiranta 7731), $n = 30$.

H. obtusum is a rare species, only seldom collected outside the Nordic countries: Norway (Eriksson & Ryvarden 1975), Finland (Eriksson & Strid 1969) and Sweden (Eriksson 1958a). It has, however, been reported from the Soviet Union (Jülich & Stalpers 1980) and Spain (Tellería & Truchero 1981, Dueñas & Tellería 1985). The Fennoscandian records are from northern parts of the countries, from undisturbed virgin forests. The hosts are *Picea abies* and *Pinus sylvestris*.

Specimens examined

Finland. *Perä-Pohjanmaa:* Rovaniemi rural comm., Pisavaara Strict Nat. Reserve, on fallen trunk of *Picea abies*, in virgin spruce-dominated *Dryopteris-Vaccinium myrtillus* forest, Grid 27°E 735:41, 28.VIII.1960 Kujala & Eriksson 9418 (GB). *Inarin Lappi:* Inari, Nurkkavaara W, Sarmikuusikot E, on decorticated *Pinus sylvestris* branch on the ground in mixed *Pinus-Picea abies* ssp. *obovata-Betula* forest, with undergrowth of *Empetrum nigrum* ssp. *hermaphroditum*, *Vaccinium uliginosum*, *V. myrtillus*, *Ledum palustre*, *Geranium sylvaticum*, Grid 27°E 7618–9:559, 31.VIII.1989 Kotiranta 7731 (H.K.).

Hyphoderma roseocreum (Bres.) Donk — Fig. 6.

Reported earlier from Finland by Hjortstam (1984). Fruit body resupinate, smooth, fairly thick, not or only partly cracked, at first light creamy, later pale yellowish ochre, with lighter, thinning margin.

Hyphal system monomitic, hyphae richly branched, 3–4 μm wide, thin-walled, amyloid. Cystidia submerged or slightly projecting, tubular, sometimes with a simple septum near the apical end, 57–110 \times 6–8(–9.5) μm , thin-walled, amyloid. Basidia subclavate, 28–40(–47) \times 5–7 μm , basally clamped, with four sterigmata, amyloid. Spores cylindrical, 7.0–13.0 \times 3.7–5.0 μm , $L = 9.3$, $W = 4.1$, $Q = 1.7\text{--}3$, $\bar{Q} = 2.3$ (Saarenoksa 29089), $n = 45$, normally with one large droplet, CB–, IKI–.

Our specimen differs from the description given by Eriksson and Ryvarden (1975). There are, however, notes of two specimens which deviate from the general species concept, i.e. 17.X.1965 *K. Hauer-slev*, which has amyloid hyphal walls in the context, and 21.X.1973 Jeppson (p. 524), which has sparser cystidia and broader spores. Our specimen has slightly broader spores than those mentioned and illustrated by Eriksson and Ryvarden (1975: 522–523), but they fit well with the drawing on page 524. In addition, our specimen has fairly many cystidia and both the subicular hyphae and the basidia are amyloid.

H. medioburiense (Burt) Donk, which is surely a close relative, has dark dots on the hymenium, and longer spores, 12 μm or more (Eriksson & Ryvarden 1975). We have studied one collection of *H. medioburiense* (Sweden. Västergötland: Göteborg, Backplan, on dead trunk of coniferous tree, 17.VIII.1946 T. Nathorst-Windahl, GB). It is light rose-coloured, has long spores and an inamyloid context, but almost entirely lacks brown dots on the hymenium.

H. roseocreum seems to be common elsewhere, and its distribution is southern (Strid 1975a). It has been reported, from Denmark (Christiansen 1960), Sweden (Eriksson 1948, Hjortstam 1973, 1979b, Strid 1975a, Hallenberg & Sunhede 1979),

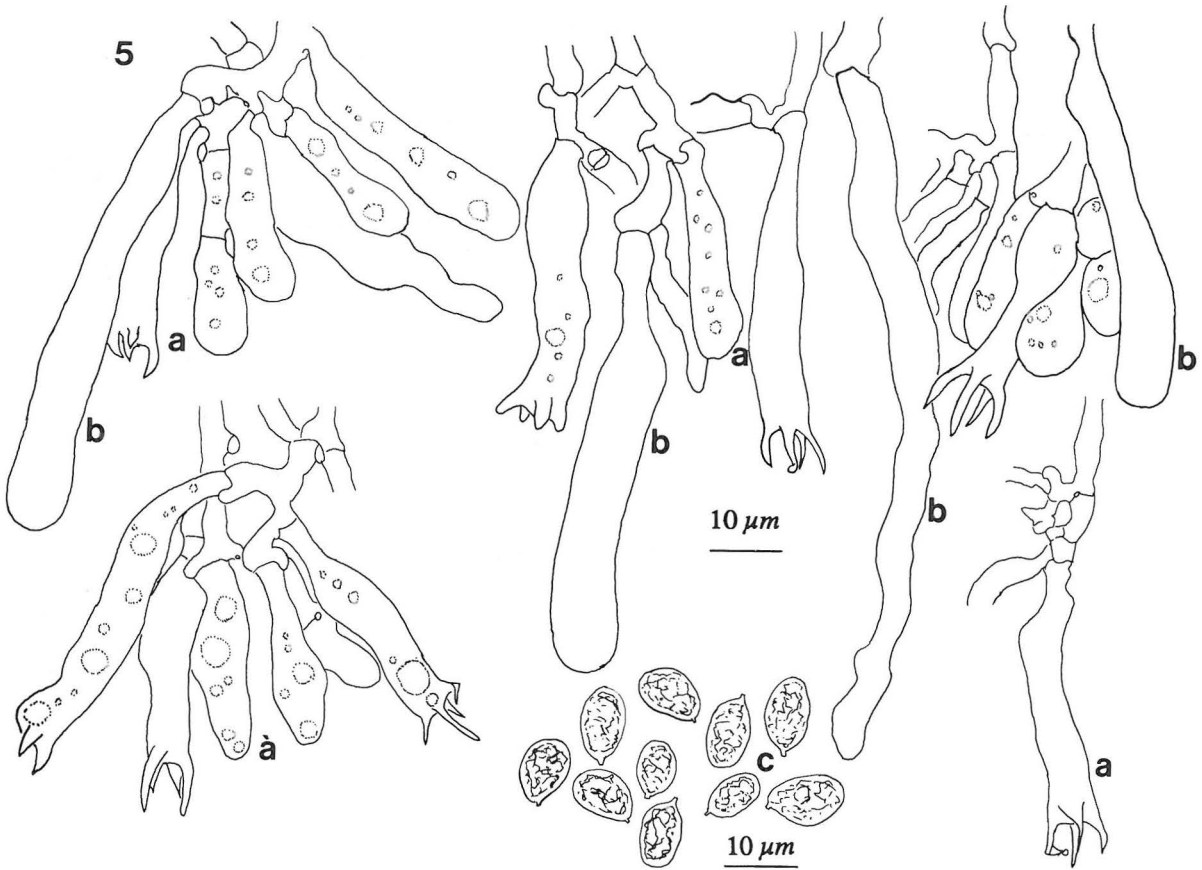


Fig. 5. *Hyphoderma obtusum* J. Erikss. a) basidia, b) cystidia, c) spores (specimen Kotiranta 7731, H.K., in KOH).

Germany (Doll 1979), Austria (Hallenberg & Michelitsch 1982–83), Great Britain (Scotland; Hallenberg 1984a), Spain (Hjortstam & al. 1981, Dueñas & Tellería 1988), France (Jülich 1984) and outside Europe from Iran (Hallenberg 1981), Argentina (Hjortstam & Ryvardean 1985) and Canada (Liberta 1966, Hallenberg 1984a).

H. roseocremeum grows almost exclusively on deciduous trees, and reports from softwood come mainly from Canada (Liberta 1966, Hallenberg 1984a).

Specimen examined

Finland. *Uusimaa*: Vantaa, Tammisto, on fallen, corticated *Corylus avellana* and dead fruit bodies of the polypore *Phellinus punctatus* (Karst.) Pil. (ster.) in mixed grass-herb forest, Grid 27°E 6686:387, 24.IX.1989 Saarenoksa 29089 (H, H.K.).

Hyphodontia alienata (Lund.) J. Erikss. — Fig. 7.

Reported earlier from Finland by Eriksson and Ryvarden (1976). Fruit body resupinate, fairly thin, soft, almost smooth to the naked eye, under the lens papillose, floccose, tomentose due to the projecting cystidia, margin thinning out, pale ochre.

Hyphal system monomitic, all hyphae clamped, IKI-. Basal and subicular hyphae richly branched, with thickened walls, 3.5–4.5 µm wide, subhymenial ones richly clamped, with thinner walls, but of the same width. Cystidia fusiform, 98–150 × 5.5–9.0 µm, often encrusted in the middle part when viewed in CB and IKI, smooth in KOH, sometimes with short and bulbous side branches, thick-walled, except for the apical end, CB+, IKI-. Basidia subcylindrical, 21–26 × 4.5–5 µm, basally clamped, with

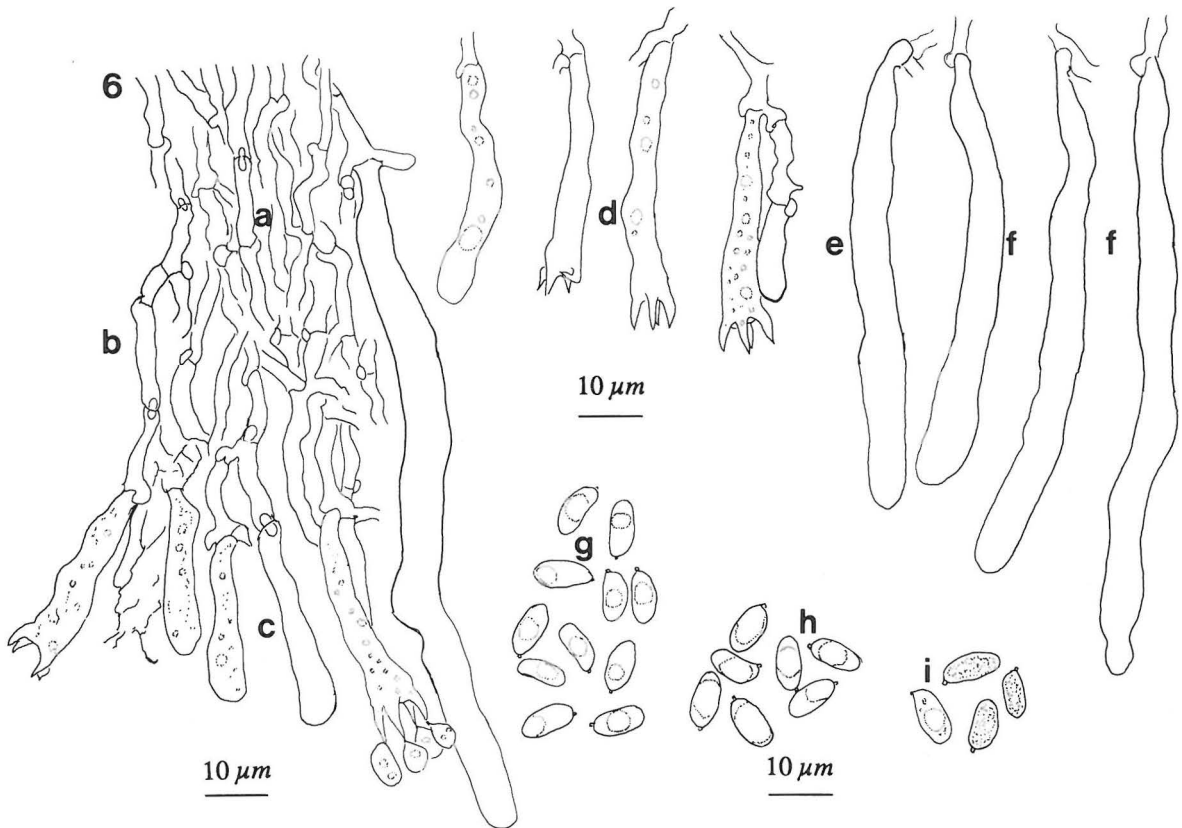


Fig. 6. *Hyphoderma roseocreum* (Bres.) Donk. a) vertical section through fruit body in KOH, b) context, c) hymenium, d) basidia in CB, e) cystidia in CB, f) cystidia in KOH, g) spores in CB, h) spores in IKI, i) spores in KOH (specimen Saarenoksa 29089, H, H.K.).

four sterigmata. Spores ellipsoid, smooth, adaxial side straight or slightly concave, abaxial side convex, $4.9\text{--}5.9 \times 2.8\text{--}3.5 \mu\text{m}$, $L = 5.4$, $W = 3.0$, $Q = 1.5\text{--}2.0$, $\bar{Q} = 1.8$ (Kotiranta 7555), $n = 30$, CB-, IKI-.

H. alienata is a rare species, reported from Sweden, Poland, Czechoslovakia (Eriksson & Ryvarden 1976), Germany (Doll 1979) and Canada (Liberta 1966, Martin & Gilbertson 1977). The spore size mentioned by Martin and Gilbertson (1977) is greater than the European measurements: $6\text{--}7.5 \times 4\text{--}4.5 \mu\text{m}$. In addition, the cystidia in the Canadian material are smooth.

The growth sites are usually luxuriant, and the hosts are mainly deciduous trees.

Specimen examined

Finland. Kittilän Lappi: Kittilä, Homevuotso State Nature Reserve, on wet, fallen *Betula* sp. bark in virgin *Picea abies*-dominated grass-herb forest, Grid 27°E 7519:398-9, 28.VIII.1989 Kotiranta 7555 (H, H.K.).

Hyphodontiella multiseptata Strid

Finland. Etelä-Häme: Luhanka, Lempää, Leppäjoki W parts, on strongly decayed *Prunus padus* on the ground, in broad-leaved (*Alnus glutinosa*, *Populus tremula*, *Betula*, *Tilia cordata*) brook-side grass-herb forest, Grid 27°E 68496:4337-8, 29.IX.1989 Kotiranta 7902 (H.K.). **Perä-Pohjanmaa:** Rovaniemi rural comm., Pisavaara Strict Nat. Res., Sorvannulikka, N slope, on dead fern, together with *Tylospora asterophora* (Bon.) Donk and *T. fibrillosa* (Burt) Donk, also on wet piece of *Populus tremula* in virgin, fairly luxuriant, spruce-dominated forest, Grid 27°E 735:41, 6.IX.1989 Kotiranta 7814b (H), 7815 (H.K.).

For the other collections from Finland, see Kotiranta and Larsson (1990).

Hypochniciellum cremeoisabellinum (Litsch.) Hjortst. — Fig. 8.

Reported earlier from Finland by Hjortstam (1984). Fruit body resupinate, at first hypochnoid, later pellicular, resembling very thin paper, smooth, white

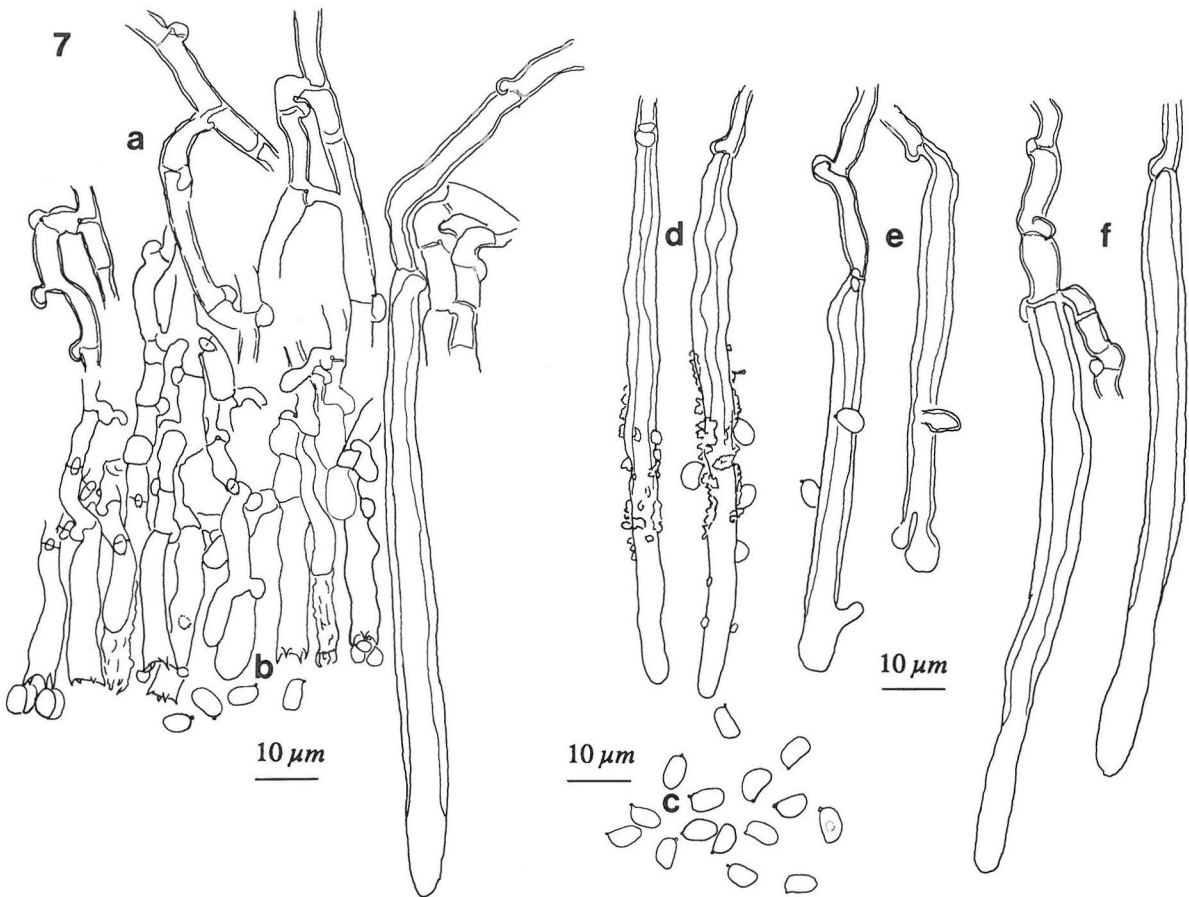


Fig. 7. *Hyphodontia alienata* (Lund.) J. Erikss. a) section through fruit body in CB, b) basidia with spores, c) spores in KOH, d) cystidia in CB, e) cystidia in IKI, f) cystidia in KOH (specimen Kotiranta 7555, H, H.K.).

when fresh, turning slightly cream-brown when dry, easily detachable, margin even, porose-reticulate under lens.

Hyphal system monomitic, all hyphae clamped, thin-walled, CB-, IKI-, collapsing easily in CB. Cystidia none. Basidia clavate, sometimes constricted, (15-)20-27(-30) × (4.8-)5.0-5.5 μm, basally clamped, with four, up to 5 μm long sterigmata. Spores ellipsoid, adaxial side straight or slightly convex, abaxial side concave, 4.9-6.0 × 3.0-3.7 μm, $L = 5.4$, $W = 3.2$, $Q = 1.5-1.9$, $\bar{Q} = 1.6$ (*Saarenoksa 41488*), $n = 30$, with small apiculus, thickened walls, CB+, IKI+ (faint greyish hue).

The greyish reaction of the spores is mentioned by Eriksson and Ryvarde (1976) and Hjortstam (1981), but not, by some other authors, e.g. Jülich and Stalpers (1980) and Jülich (1984). In the Finnish material the reaction varies from specimen to specimen. In

Saarenoksa 41488, the spores are grey in IKI, and in 17.X.1979 Fagerström only some spores become stained.

H. cremeoisabellinum is nowhere common, but is reported from Sweden (Eriksson & Ryvarde 1976, Hjortstam 1981), Norway (Hjortstam 1981, Aanstad & Ryvarde 1987), Spain (Dueñas & Tellería 1984), the Soviet Union (Parmasto 1967, as *Athelia subtessulata* Parm., see Jülich & Stalpers 1980) and Argentina (Hjortstam & Ryvarde 1985).

H. cremeoisabellinum grows mostly on conifers, but also on hardwood, dead herbs and mosses.

Specimens examined

Finland. *Uusimaa*: Helsinki, Vanhakaupunki, Annala, on dead mosses, peat, litter and soil on open rock, Grid 27°E 6679:387, 12.X.1988 *Saarenoksa 41488* (H, H.K.). *Etelä-Karjala*: Vehka-

lahti, Pyhältö, Sirkkamäki, on corticated *Picea abies* in spruce-dominated forest, Grid 27°E 673:51, 17.X.1979 *Fagerström* (H).

***Hypochnicium erikssonii* Hallenb. & Hjortst.** — Fig. 9.

Hypochnicium sphaerosporum (v. Höhn. & Litsch.) J. Erikss. sensu Eriksson & Ryvarde. The Corticiaceae of North Europe 4:727–729 (1976).

New to Finland. Fruit body resupinate, at first thin, hypochnoid, later thicker, subceraceous, almost smooth to the naked eye, with small granules, porose under the lens, margin not differentiated, thinning out, pale cream to light ochre.

Hyphal system monomitic, all hyphae clamped, 4–5 µm wide, richly branched, thin-walled, CB+. Cystidia tubular or clavate or sinuous, sometimes even more or less moniliform, in a few cases bifurcate, (60–)80–131 × (7–)9–12 µm. Basidia subclavate, often constricted, (27–)30–37 × (5–)6–7.5 µm, basally clamped, with four sterigmata. Spores subglobose, 5.2–7.2 × 4.5–6.1, L = 6.7, W = 5.7, Q = 1.1–1.3, $\bar{Q} = 1.2$ (Saarenoksa 29389), n = 30, with small apiculus, with one droplet, smooth, thick-walled, CB+, IKI–, slightly swelling in KOH (measurements made in CB).

The distribution of *H. erikssonii* is not clear, because *H. subrigescens* Boid. (see below) may be included in this taxon. *H. erikssonii*, however, has been reported from Sweden (Eriksson & Ryvarde 1976), Spain (Dueñas & Tellería 1988) and Tanzania (Hjortstam 1987). The literature on *H. erikssonii* is considerable, and records have been published from at least the following countries: Denmark (Christiansen 1960, spores 5.5–7 µm), Germany (Doll 1979, Jülich 1984), Austria (Hallenberg & Michelitsch 1983), Czechoslovakia, France, Norway (Jülich 1984), and the United States (Gilbertson & Budington 1970, Gilbertson 1974, spores 5–6.5 µm). *H. erikssonii* grows on both hard- and softwood.

For the nomenclature see Hallenberg and Hjortstam (1990).

Specimen examined

Finland. *Uusimaa*: Vantaa, Tammisto, on fallen, fairly thin, soft, decorticated *Populus tremula*, in mixed grass–herb forest, Grid 27°E 6686:387, 24.IX.1989 *Saarenoksa* 29389 (H, H.K.).

***Hypochnicium subrigescens* Boid.** — Fig. 10.

New to Finland. Fruit body resupinate, thin, subpellicular, gelatinous–corneous when fresh, corneous

when dry, smooth to the naked eye, finely porose under the lens, margin not differentiated, thinning out, bluish grey when fresh, pale greyish ochre when dry.

Hyphal system monomitic, but in the present specimen in poor condition; firmer than in *H. erikssonii* (see also Hjortstam 1987). Cystidia 50–100 × 5–10 µm, thin-walled, as in *H. erikssonii* (also bifurcate seen). Hymenium disintegrated, but (according to Hjortstam 1986) basidia, 20–25(–30) × 5–6 µm, somewhat constricted, basally clamped, and with four sterigmata. Spores subglobose, 4.2–6.0 × 3.6–

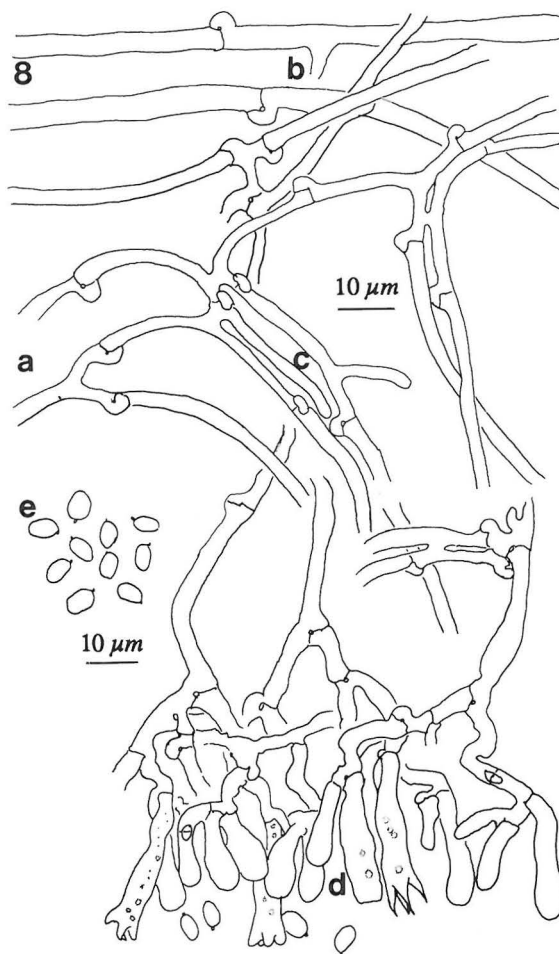


Fig. 8. *Hypochnicium cremeoisabellinum* (Litsch.) Hjortst. a) crush preparation of fruit body, b) basal hyphae, c) context hyphae, d) hymenium with basidia and spores, e) spores (specimen *Saarenoksa* 41488, H, H.K., in IKI).

5.0 μm , $L = 4.7$, $W = 4.1$, $Q = 1.0\text{--}1.5$, $\bar{Q} = 1.2$ (25.IX.1937 *Laurila*), $n = 30$, with a very small apiculus, with one droplet, smooth, thick-walled, CB+, IKI-, swelling in KOH (measurements made in CB).

The description of the fresh fruit body is according to the hand-written note of M. Laurila in the package.

H. subrigescens seems to be easily separated from *H. erikssonii*, mainly by the firmer hyphal texture and smaller spores, with a negligible apiculus. Moreover, the basidia are smaller, 20–26 \times 5–6 μm (Boidin & Lanquetin 1971, Hjortstam 1986).

H. subrigescens is a rare species, hitherto reported from Sweden, Germany (Hjortstam 1986), Central Africa (Boidin & Lanquetin 1971), and Kenya (Hjortstam 1986, 1987). Although reported fairly recently from North Europe (Hjortstam 1986), its oc-

currence has been known longer: see Hjortstam (1973: 113) and Eriksson & Ryvarden (1976).

All but one of the collected specimens are from deciduous trees: *Abizzia* sp. (Mimosaceae, holotypus), *Alnus glutinosa*, *Betula* sp., *Populus tremula* and *Quercus*.

Specimen examined

Finland. Satakunta: Noormarkku, Poosjoki, Enträskijärvi brook, on very large, corticated, fallen *Alnus glutinosa* in spruce-hardwood swamp, Grid 27°E 6848:225, 25.IX.1937 *Laurila* (H-LA). This specimen was determined in 1976 by J. Eriksson as "*H. subsphaerosporum* var.!", and its identity with *H. subrigescens* was noted by K.-H. Larsson (Göteborg) in 1989.

Jaapia ochroleuca (Bres.) Nannf. & J. Erikss.

Finland. Inarin Lappi: Inari, Nurkkavaara W, Sarmikuusikot E part, inside a strongly decayed, brown-rotted (?), wet pine trunk in virgin pine-spruce forest, with *Empetrum nigrum* ssp. *hermaphroditum*, *Vaccinium uliginosum*, *V. myrtilus*, *V. vitis-idaea* and *Ledum palustre*, Grid 27°E 7618-9:559, 31.VIII.1989 *Kotiranta* 7717 (H.K.).

Cystidia up to 205 μm long, basidia 30–36 \times 7–8 μm , basally clamped, spores 11.8–15.0 \times 4.8–7.0 μm , strongly dextrinoid.

For the other collections from Finland, see Kotiranta and Larsson (1990).

Kavinia alboviridis (Morgan) Gilbertson & Budington

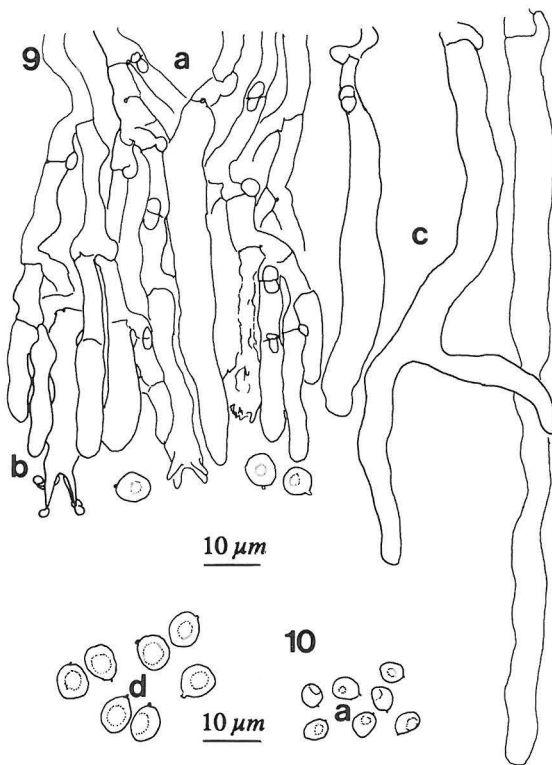
Finland. Kittilän Lappi: Kittilä, Homevuotso State Forest Reserve, on strongly decayed part of fallen *Betula* sp., together with the polypores *Phellinus igniarius* (L.) Quél. and *P. laevigatus* (Fr.) Bourd. & Galz. and *Sistotrema brinkmannii* (Bres.) J. Erikss. in virgin *Picea abies*-dominated grass-herb forest, Grid 27°E 7519:398-9, 27.VIII.1989 *Kotiranta* 7532 (H).

For the other collections from Finland, see Kotiranta and Larsson (1990).

Litschauerella clematidis (Bourd. & Galz.) J. Erikss. & Ryv. — Fig. 11.

New to Finland. Fruit body resupinate, fairly thick, up to 0.2 mm, smooth to the naked eye, hispid under the lens, light cream-coloured with brownish tint, margin not differentiated, clear, abrupt.

Hyphal system monomitic, hyphae clamped, hyaline, thin-walled, CB+, IKI-, 1–2 μm wide. Multi-rooted cystidia numerous, conspicuous, conical, 115–135 \times 11–17 μm , mostly sharp-pointed, thick-walled, CB+, basal part brown and encrusted in IKI, smooth



Figs. 9–10. Fig. 9. *Hypochnicium erikssonii* Hallenb. & Hjortst. a) section through fruit body in KOH, b) hymenium with basidia, cystidia and spores, c) cystidia in KOH, d) spores in CB (specimen Saarenoksa 29389, H, H.K.). — Fig. 10. *Hypochnicium subrigescens* Boid. a) spores in CB (specimen Laurila 25.IX.1927, H-LA).

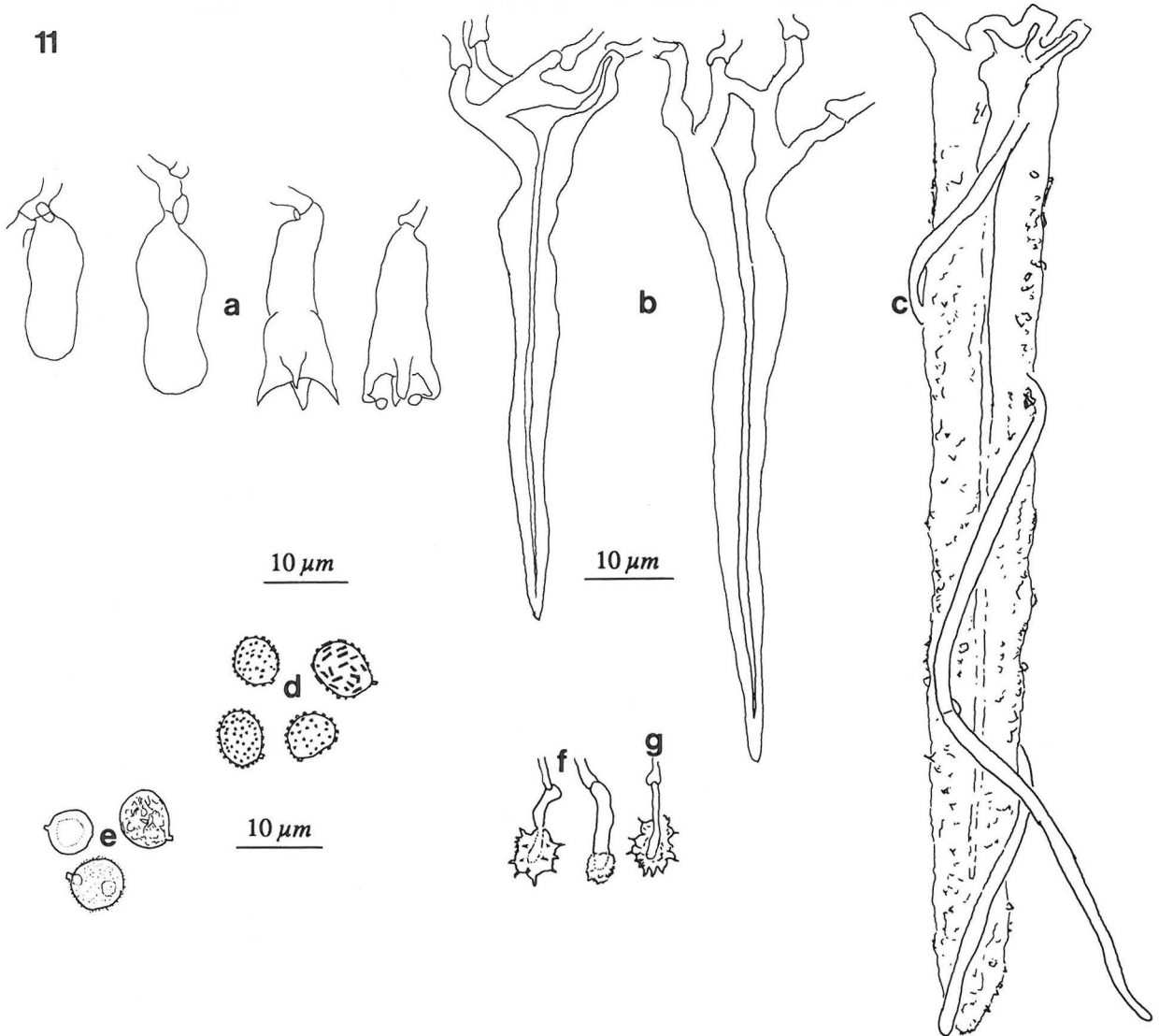


Fig. 11. *Litschauerella clematitidis* (Bourd. & Galz.) Erikss. & Ryv. a) basidia in KOH, b) cystidia in CB, c) cystidia in IKI, d) spores in IKI, e) spores in CB, f) paraphysate hyphae, capped with rose-thorn shaped crystals in CB, and g) in IKI (specimen Kotiranta 7511 & Saarenoksa 13589, H, H.K.).

in CB, occasionally covered with single, clamped, climbing-liane hyphae. Paraphysate hyphae fairly numerous, bearing a cap of acicular crystals, projecting more than 10 μm , the encrusted part up to 8 x 4 μm , single crystals acute conical, or sharp-pointed "rose-thorn"-like. Basidia usually terminal, mostly basally encrusted, 16–21 x 6.5–8 μm , cylindrical, when immature often constricted, basally clamped, with four, up to 5 μm long, basally stout sterigmata. Spores subglobose, 5.0–7.8 x 4.6–6.3 μm , $L = 6.8$, $\bar{W} = 5.5$, $Q = 1.1$ –1.4, $Q = 1.2$ (Kotiranta 7511 &

Saarenoksa 13589) $n = 30$, with a fairly large apiculus, mostly finely warted in IKI, smooth or almost so in CB, smooth in KOH, CB– (contents blue), IKI–.

Bourdot and Galzin (1928) describe the basidia and spores of two closely related species as follows: "*Peniophora clematitidis* B. & G. ... basides 9–12 x 4–4.5 μ , à 2–4 stérigmates longs de 4–4.5 μ ; spores subglobuleuses, brièvement apiculées à la base, 4–5 x 4–4.5 μ , 1-guttulées." and "*Peniophora abietis* B. & G. ... basides 18–21 x 6–9 μ ... spores globuleuses, 6–8–11 μ diam., très finement ruguleuses."

Thus, it seems, there are two species, which differ from each other in spore shape and size, and in the size of the basidia. However, Weresub (1961) studied both species and *Peniophora gladiola* Cunningham, and drew the conclusion that the species do not differ microscopically, but represent one taxon only, which "must be called *P. clematidis*" (for the spelling of the epithet see Eriksson & Ryvarde 1976: 841). Boidin (1958) measured over 5 500 spores of *L. clematidis* and noted that the variation in spore size is great, ranging within a single sample from 4.5 to 16 µm. This phenomenon is explained by the possibility of polyploidy in *L. clematidis* (Boidin 1958). Weresub's (1961) opinion was accepted later, e.g. by Liberta (1962), Jülich & Stalpers (1980) and Jülich (1984). However, Weresub (1961) overlooked the only collection of *P. abietis* mentioned by Boidin and Galzin (1928), viz. that made by L. Corbière = Bourdot 32350 (see Eriksson & Ryvarde 1976: 841). Eriksson and Ryvarde (1976) studied spores of that specimen under the scanning electron microscope and noted differences in spore ornamentation between it and *P. clematidis* s.str. (Bourdot 15690). They left the Corbière specimen unnamed (*Litschauerella* sp.) until more material is available. They did not exclude the possibility that *Peniophora hastata* Cunningham is identical with it. Weresub (1961) studied the holotype of *P. hastata* and noted the more pronounced projections of the spore wall.

Oberwinkler (1966b) strongly disagreed with Weresub's (1961) solution of synonymizing *P. abietis* with *P. clematidis*, and placed (invalidly, see Jülich 1979: 334–335) the species in separate genera, mainly because of the different basidial morphology. According to Oberwinkler (1966b) the basidia in *Litschauerella abietis* (Bourd. & Galz.) Oberw. ex Jül. are pleural and in *Tubulicium "clematidis"* (Bourd. & Galz.) Oberw. terminal.

Apart from our collection, we have studied only one specimen of *L. clematidis*: Sweden. Västergötland, *Hjortstam 6648* (GB). That specimen is very thin, white, and finely porose and pilose under the lens. Microscopically, it also differs from our collection: the cystidia are thinner, the basidia clearly pleural, 12 x 6 µm, basally not encrusted, the spores globose, smooth or very finely warted, 5–8 µm in diam. It also lacks the paraphysate hyphae with crystalline caps.

None of the descriptions given above fits exactly with our material, though the description of *Litschauerella* sp. (Bourdot 32350) in Eriksson and Ryvarde (1976) comes fairly close. That species has broadly ellipsoid spores (Eriksson & Ryvarde 1976) of the same size as ours, but the spore ornamentation is

different: the warts are small, but clearly larger than in *Hjortstam 6648*. Surprisingly, in the Finnish specimen there were *two* spores which had the same ornamentation as Bourdot 32350. Although the spores were not investigated with the SEM, the shape of the warts was visible in IKI mounts studied with the light microscope. Moreover, Eriksson & Ryvarde claim that the basidia are terminal in Bourdot 32350, like the majority in our collection. Oberwinkler (1966b) described the spores of *L. abietis* as globose and finely warted, and the basidia as pleural. He did not study Bourdot 32350, but puts *Peniophora gladiola* in the synonymy of *L. abietis* (like Weresub 1961), which according to Cunningham (1955) is a smooth-spored species. It seems that *P. gladiola* is a synonym of *L. clematidis*.

Cunningham's (1955) drawing of *P. gladiola* shows crystal-capped paraphysoid hyphae similar to those in the Finnish specimen. To us, it seemed that some of the individual crystals had a rose-thorn shape, a character so far reported only from the polypore genus *Skeletocutis* Pouz. (e.g. Keller 1979, David 1982, Kotiranta 1984). If this is actually the case, it casts doubt on the taxonomic status of these peculiar crystals. Eriksson and Ryvarde (1976) do not mention crystal-capped hyphidia in *Litschauerella* sp. (Bourdot 32350), nor did Cunningham (1955) or Weresub (1961) observe them in *P. hastata*. The staining of the spores observed by Eriksson (1954) in *P. abietis* was not noted in our specimen.

The Finnish specimen is referred to *L. clematidis*, although there are some deviating features, e.g. the variation in the shape of the spore warts, the size of the basidia and the morphology.

The Finnish collection was found on a large wooden (*Picea/Pinus*) flower pot of *Sabal palmetto* (Arecaceae) in a greenhouse for tropical plants, where the temperature and air humidity are fairly constant (+17–30°C and 70%) all the year round. Whether this exceptional habitat is the reason for the peculiarities observed in our specimen is not clear. We examined the same flower pot half a year later, to make observations on fresh material, but *Litschauerella* had been overgrown by sterile *Hyphodontia breviseta* (Karst.) Erikss. and only the cystidia could be observed.

If there is only one rough-spored species of *Litschauerella*, it is enormously variable. A solution to the problem should be sought with the aid of the SEM and compatibility tests.

Because of the taxonomical problems, the distribution of *L. clematidis* is unclear. In the "wide" sense it has been reported from Denmark (Christiansen 1960), Sweden, Poland (Eriksson & Ryvarde 1976),

Germany (Oberwinkler 1966b), France (Bourdot & Galzin 1928), Spain (Hjortstam et al. 1981, Manjón & Moreno 1983), the United States (Liberta 1962, Gilbertson & Blackwell 1987), Canada (Liberta 1962) and New Zealand (Cunningham 1955).

Specimens examined

Sweden. *Västergötland*: Töllesjö par., SW of the lake Kulsjön, on well-decayed trunk of *Picea abies* in mixed *Picea* forest, 30.V.1976 Hjortstam 6648 (GB). Finland. *Uusimaa*: Helsinki, Kaisaniemi, Univ. Bot. Garden, green house, on wooden (*Picea/Pinus*) flower pot of *Sabal palmetto* (Arecaceae), Grid 27°E 6675:386, 22.VIII.1989 Kotiranta 7511 & Saarenoksa 13589 (H, H.K.).

Lobulicium occultum Larss. & Hjortst.

Finland. *Kittilän Lappi*: Kittilä, Homevuoiso State Forest Reserve, in swamp, on fallen, partly hard, decorticated *Picea abies* together with *Phellinus nigrolimitatus* (Rom.) Bourd. & Galz. and inside a wet, strongly brown-rotted (*Fomitopsis pinicola* (Sw.) Karst.) *Picea abies* together with *Resinicium furfuraceum* (Bres.) Parm., in virgin spruce-dominated grass-herb forest, Grid 27°E:7519:398-9, 28.VIII.1989 Kotiranta 7571 (H.K.), 7579 (H, H.K.) and 7580 (H).

For the other collections from Finland, see Kotiranta and Larsson (1990).

Phlebiella lloydii (Liberta) Hjortst. & Larsson — Fig. 12.

New to Finland. Fruit body resupinate, effused, closely adnate, fairly thin, finely granulose, subceraceous, fairly hard when dry, olive greenish, margin not differentiated, thinning out.

Hyphal system monomitic, hyphae clamped, thin-walled, parallel next to the substrate, more randomly oriented in lower part of subiculum and subhymenium, indefinitely inflated, thin-walled, (1.5–)2.0(–3.0) µm wide, clamps very difficult to discern. Cystidia none. Basidia short-cylindrical, finely granulous with golden brown encrustations in CB and IKI, smooth in KOH, pleural, (11–)13–14 × (4.7–)5–5.5 µm, basally clamped, at first with two or three stout sterigmata, at maturity with four, which are apically very thin, up to 7 µm long. Spores short-ellipsoid, 5.0–6.3 × 2.0–2.9 µm, $L = 5.7$, $\bar{W} = 2.3$, $Q = 2.1–3.0$, $\bar{Q} = 2.5$ (Kotiranta 8097a), $n = 30$, smooth, thin-walled, CB–, amyloid, except the apiculus.

According to Liberta (1962), the olive-greenish colour of the fruit body is due to the minute olivaceous granules on the basidia. Our specimen however, contains numerous small unicellular algae, which give the colour. The spores of *Corticium lloydii* drawn

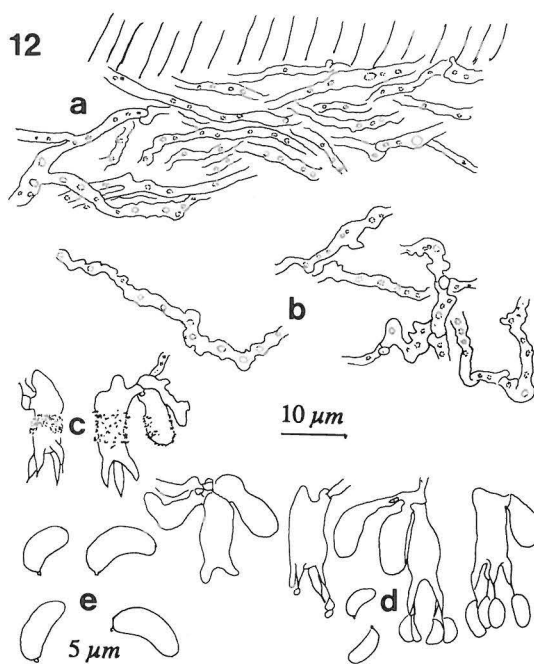


Fig. 12. *Phlebiella lloydii* (Liberta) Hjortstam & Larsson. a) basal hyphae in KOH, b) subhymenial hyphae in KOH, c) basidia in IKI, d) basidia in KOH, e) spores in IKI (specimen Kotiranta 8097a, H, H.K.).

by Bourdot and Galzin (1928) are in fact small green algae (Liberta 1962, Oberwinkler 1966b), very similar to those seen by us. The Swedish collection that we studied (see below) is partly greyish, partly faint olive-greenish. The sections made from the greyish part showed mature basidia with typical granules, but no algae. The greenish part contained small cylindrical and globose algae.

P. lloydii is a very rare species. It has been reported from Sweden (Bourdot & Galzin 1928, Hjortstam et al. 1988) and Canada (Liberta 1962), and grows on decorticated, fairly hard pine wood.

Specimens examined

Sweden. *Västergötland*: Sydbillingen, N of Sääkullen, on decorticated, decayed (fairly hard) trunk of *Pinus sylvestris*, in coniferous forest, 11.XI.1976 Hjortstam 7658 & Hallingbäck (GB); Finland. *Etelä-Häme*: Luhanka, Lempää, Leppäjoki W part, on 3-cm-thick, decorticated, hard *Pinus sylvestris* together with *Tubulicrinis subulatus* (Bourd. & Galz.) Donk, in young pine forest with *Vaccinium vitis-idaea*, Grid 27°E 68496:4337, 23.II.1990 Kotiranta 8097a (H, H.K.).

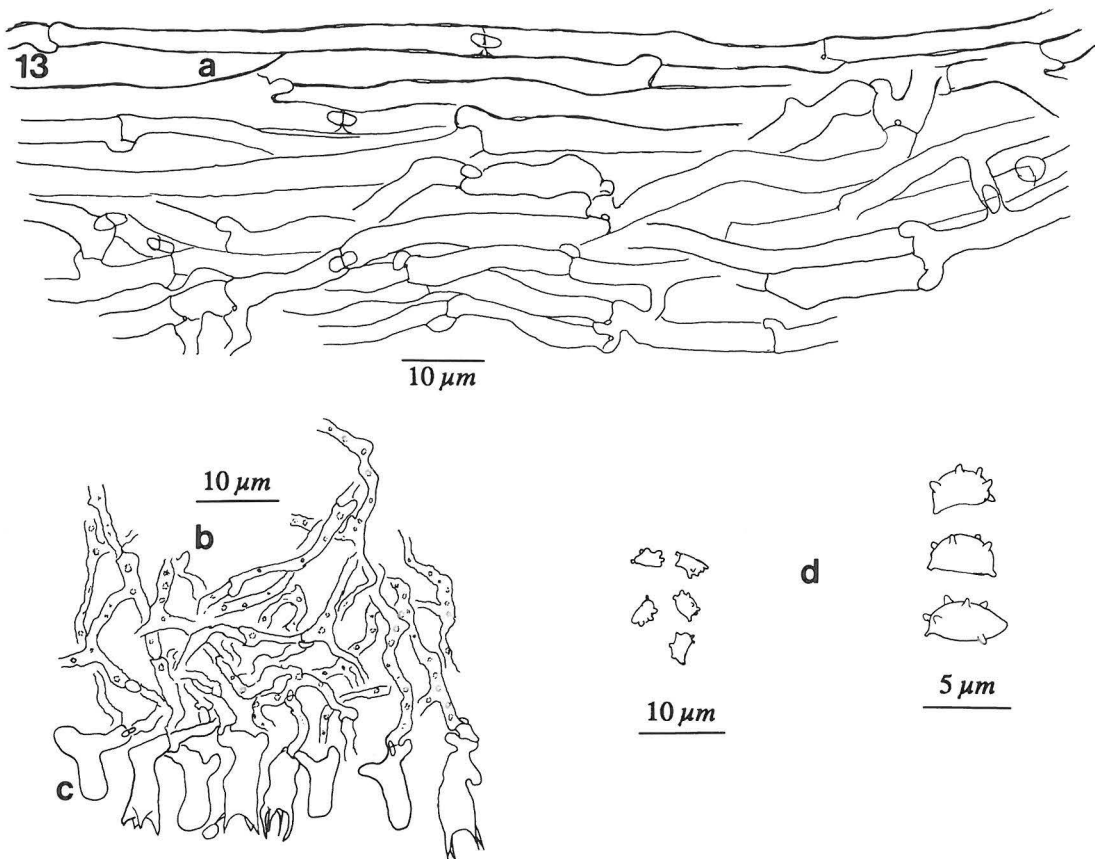


Fig. 13. *Phlebiella subflavidogrisea* (Litsch.) Oberw. a) basal hyphae, b) context, c) hymenium with basidia, d) spores (specimen Saarenoksa 16989, H, H.K., in KOH).

***Phlebiella subflavidogrisea* (Litsch.) Oberw. — Fig. 13.**

Reported earlier from Finland by Hjortstam et al. (1988). Fruit body resupinate, effused, thin, almost smooth to the naked eye, porous with threads under the lens, whitish grey-brown, with pinkish hue, dark red-brown in KOH, margin not differentiated, thinning out.

Hyphal system monomitic, hyphae clamped, sub-parallel next to the substrate fairly thick-walled, 3.5–5 µm wide, lower subicular hyphae and subhymenial hyphae irregularly inflated, with small droplets in KOH, thin-walled, 1–1.5 µm wide, clamps hardly discernible. Cystidia none. Basidia short-cylindrical, pleural, 10–12 × 4–5 µm, basally clamped, with four,

up to 5 µm long sterigmata. Spores ellipsoid or even navicular, dorsally sparingly warted, ventrally smooth or with one–two warts only, 3.5–4.5 × 2.0–2.6 µm, $L = 4.0$, $W = 2.4$, $Q = 1.5–2.0$, $\bar{Q} = 1.7$ (Saarenoksa 16989), $n = 30$, including the up to 0.5 µm long warts, CB– (contents blue), IKI–, often attached in pairs–tetrads.

We were not able to see the brownish colour of the spores mentioned by Hjortstam (1983). *P. subflavidogrisea* grows on strongly decayed coniferous wood and is a fairly rare species, reported from Sweden (Litschauer 1941, Hjortstam 1973, Larsson 1986), Norway (Hjortstam et al. 1988), Germany (Oberwinkler 1966b), Austria (Oberwinkler 1966b, Hallenberg & Michelitsch 1983) and Spain (Hjortstam et al. 1981).

Specimen examined

Finland. *Uusimaa*: Tuusula, Lahela, on strongly decayed brown-rotted coniferous log of a small collapsed building, in mixed grass-herb forest, Grid 27°E 6698:388, 27.VIII.1989 *Saarenoksa 16989* (H, H.K.).

***Sistotrema heteronemum* (J. Erikss.) Strid — Fig. 14.**

New to Finland. Fruit body resupinate, thin, loosely attached, smooth, porous to reticulate, white.

Hyphal system monomitic, basal hyphae next to the substrate sparsely clamped, individual cells up to 360 μm long, pigmented, with thickened walls, CB+, 7.5–10 μm wide, outer subicular hyphae thin-walled, CB+, 5.3–6.5 μm wide, subhymenial hyphae hyaline, richly branched, thin-walled, CB+, 4–4.5 μm wide. Cystidia none. Basidia urniform, (14–)16–20 \times (4–)4.5–5.0 μm , with (6–)8 sterigmata, basally clamped. Spores narrowly ellipsoid, 4.0–5.5 \times 2.0–2.8, \bar{L} = 4.7, \bar{W} = 2.3, Q = 1.7–2.4, \bar{Q} = 2.1 (19.VIII.1986 *Issakainen*), n = 30, with a prominent apiculus, often glued in octads, thin-walled, CB+, IKI–.

As pointed out by Eriksson (1958b), Eriksson and Ryvarden (1973), Strid (1975a) and Eriksson et al. (1984) *S. heteronemum* is a problematic species, combining the characteristics of two closely related genera, *Botryobasidium* Donk and *Sistotrema* Fr. The pigmented basal hyphae, the staining of the hyphal walls in CB and the shape of the spores point to *Botryobasidium*, and the spores in *Botryobasidium* are cyanophilous (Jülich & Stalpers 1980) as in *S. heteronemum*. On the other hand, the characteristic basidial morphology is similar to that of *Sistotrema*.

S. heteronemum is a very rare species, reported from Sweden, Norway and Czechoslovakia (Eriksson et al. 1984) and grows on all kinds of debris.

Specimen examined

Finland. *Pohjois-Häme*: Konnevesi, Siikakoski, on dead fern(?), in herb-rich mixed forest, alt. 95–110 m, Grid 27°E 6945:466, 19.VIII.1986 *Issakainen* (OULU, H.K.).

***Sistotrema* sp. Kotiranta 7817 — Fig. 15.**

Fruit body resupinate, smooth, very thin, when fresh appearing as a greyish bloom, when dry invisible to the naked eye.

Hyphal system monomitic, hyphae more or less straight, clamped, 3–4 μm wide, thin-walled, CB–, IKI–. Cystidia none. Basidia emerging from the basal

hyphae, urniform, (10–)12–14(–17) \times (4–)5–6(–7) μm , basally clamped, with (4–)6–8, up to 6 μm long sterigmata. Spores small, ovoid, somewhat pip-shaped, widest at the apical part, 2.8–4.0 \times 2.0–2.8, \bar{L} = 3.3, \bar{W} = 2.3, Q = 1.1–1.7, \bar{Q} = 1.4 (Kotiranta 7817), n = 30, with a relatively large apiculus, up to 0.8 μm long, thin-walled, CB–, IKI–.

The basidia of this specimen are similar to those seen in *Sistotrema*. However, the sparse hyphae observed were not oil-filled, or contained only a little oil. In one mount there was a bulbil-like structure,

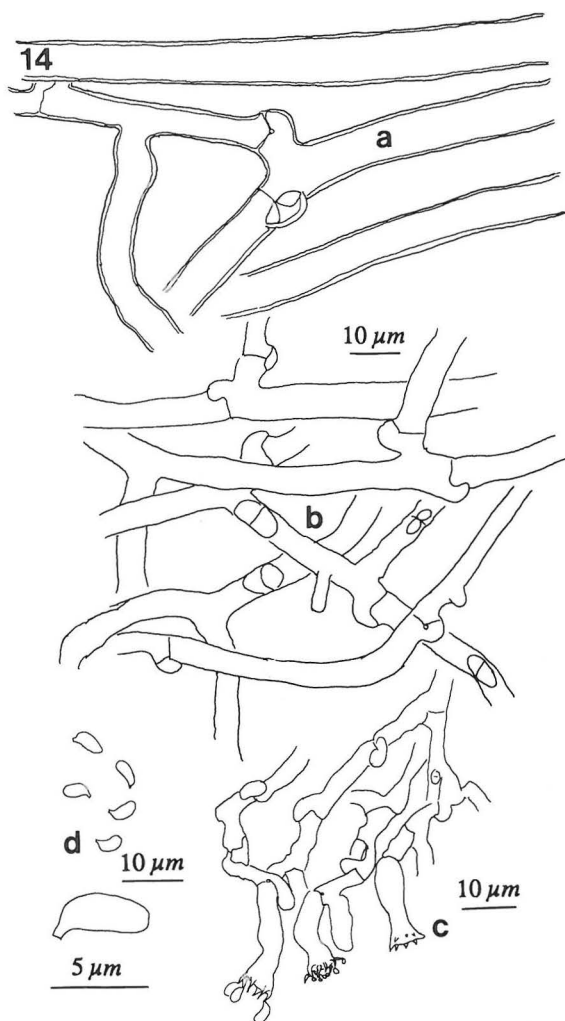


Fig. 14. *Sistotrema heteronemum* (J. Erikss.) Strid. a) pigmented basal hyphae, b) hymenium with basidia, d) spores in IKI (specimen *Issakainen* 19.VIII.1986, OULU, H.K., in CB).

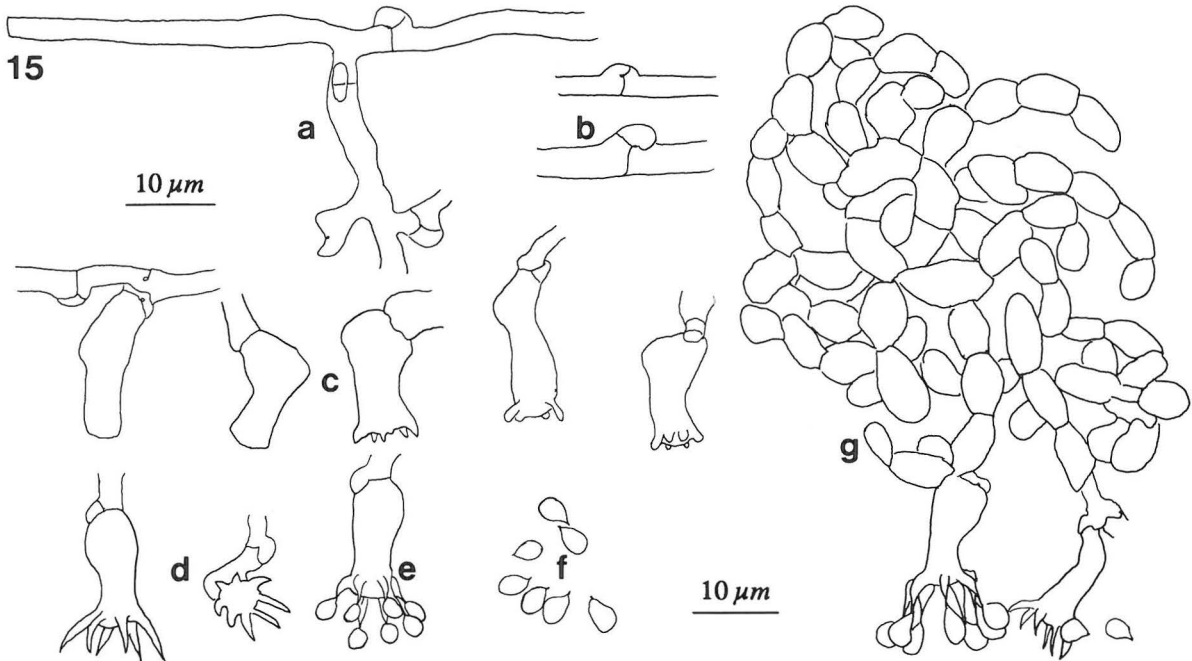


Fig. 15. *Sistotrema* sp. Kotiranta 7817. a) basal hyphae in IKI, b) clamps in KOH, c) unripe basidia in KOH, d) ripe basidia in IKI and e) in CB, f) spores in KOH, g) *Burgoa* (?) with *Sistotrema* sp. (see text) in KOH (specimen Kotiranta 7817, H.K.).

somewhat reminiscent of the drawing of *Burgoa* sp. (Eriksson et al. 1984: 1348) in a culture of *Sistotrema oblongisporum* M.P. Christ. & K. Hauersl. In our specimen, however, the cells were simple septate. Whether the basidia really arose from clampless hyphae could not be confirmed. The possibility that this is a clampless *Burgoa* Goid. cannot be excluded (see e.g. Weresub & LeClair 1971: 2206).

In Hallenberg's (1984b) study of the *Sistotrema brinkmannii* complex, one species (*S. farinaceum* Hallenb.) has spores of the same size as the Finnish collection, but they are subglobose. Moreover, the fruit body of *S. farinaceum* is farinaceous, loosely attached and whitish. *Paullicorticium delicatissimum* (Jacks.) Liberta has obovate to obpyriform basidia and oblong to ellipsoid spores (Liberta 1962).

Specimen examined

Finland. *Perä-Pohjanmaa*: Rovaniemi rural comm., Pisavaara Strict Nat. Res., Sorvannulikka N slope, on dead leaves of *Populus tremula* and needles of *Picea abies*, in virgin spruce-dominated forest, Grid 27°E 7358-9:415-6, 6.IX.1989 Kotiranta 7817 (H.K.).

Sistotremastrum niveocreum (v. Höhn. & Litsch.) J. Erikss. — Fig. 16.

Reported earlier from Finland by Ulvinen et al. (1981) and Kotiranta and Larsson (1990). Fruit body resupinate, thin, almost smooth to the naked eye, porose under the lens, white, margin not differentiated, thinning out.

Hyphal system monomitic, basal hyphae richly branched, clamped, 3–4 µm wide, with slightly thickened walls, CB–, IKI–, subhymenial hyphae richly branched, clamped, 3–4 µm wide, thin-walled, CB–, IKI–. Cystidia none. Basidia tubular, slightly constricted, (16–)20–26(–29) × 6–8 µm, basal part with thickened walls, basally clamped, with six sterigmata that disintegrate after spore liberation. Spores ellipsoid or subcylindrical or suballantoid, 5.6–8.0 × 2.2–4.2 µm, $\bar{L} = 6.9$, $\bar{W} = 3.2$, $Q = 1.8–2.8$, $\bar{Q} = 2.1$ (Kotiranta 8060), $n = 30$, thin-walled, CB–, IKI–.

S. niveocreum varies in its fruit body thickness in Europe and North America (Hallenberg 1984a), and the size of the spores is variable. Specimens with shorter spores than usual have been reported from Iran (Hallenberg 1978; sp. 4–6.5 × 2–3 µm)

and Brazil (Hjortstam & Bononi 1987), and a long-spored ($8.5\text{--}11 \times 3.5\text{--}4.5 \mu\text{m}$) specimen were found in Sweden (Hallenberg 1984a). Hallenberg (1984a) tested four European and three Canadian specimens and found only two Canadian ones to be intercompatible.

S. niveocreureum is nowhere particularly rare. It has been reported from Sweden (Eriksson 1958a, Hjortstam 1973, Strid 1975a), Norway (Strid 1975b), Denmark (Christiansen 1960), Germany (Oberwinkler 1966b, Kreisel 1987), Austria (v. Höhnel & Litschauer 1908, Hallenberg & Michelitsch 1983), Switzerland (Breitenbach & Kränzlin 1986), Czechoslovakia, Great Britain (Jülich 1984), France (Bourdote & Galzin 1928), Spain (Hjortstam et al. 1981, Tellería & Truchero 1981, Dueñas & Tellería 1988), and outside Europe from the Soviet Union, Iran (Hallenberg 1978), Argentina (Hjortstam & Ryvarde 1985), Brazil (Hjortstam & Bononi 1987) and Canada (Oberwinkler 1966b, Hallenberg 1984a).

S. niveocreureum has a wide range of host species. It is usually collected from deciduous trees, and records from softwood are rare (e.g. Eriksson 1958a, Hallenberg 1984a, Ginns 1986).

Specimen examined

Finland. *Etelä-Häme*: Luhanka, Lempää, Leppäjoki W part, on strongly decayed, white-rotted deciduous branch on ground, in deciduous, brook-side grass-herb forest, Grid $27^{\circ}\text{E } 68496:4337\text{--}8$, *Kotiranta* 8060 (H.K.).

Sistotremella perpusilla Hjortst. — Fig. 17.

New to Finland. Fruit body resupinate, thin, smooth to the naked eye, pruinose under the lens, soft when dry, margin not differentiated, thinning out, pale greyish ochre.

Hyphal system monomitic, hyphae richly branched, clamped, thin-walled, $1.5\text{--}2.5 \mu\text{m}$ wide. Cystidia none. Basidia at first pyriform, later urniform, $9\text{--}12(-15) \times 4\text{--}5 \mu\text{m}$, basally clamped, with 6–8 sterigmata. Spores abundant, short-ellipsoid, $3.0\text{--}4.0 \times 2.0\text{--}2.9 \mu\text{m}$, $L = 3.2$, $W = 2.3$, $Q = 1.2\text{--}1.6$, $\bar{Q} = 1.4$ (*Kotiranta* 6793), $n = 30$, often attached in pairs–octads or chains, uniguttulate, thick-walled, CB+, IKI–.

S. perpusilla is a rare species, reported from Sweden, Norway, Denmark, Germany (Eriksson et al. 1984) and Spain (Dueñas & Tellería 1988). It grows on both angiosperms and gymnosperms.

Specimen examined

Finland. *Uusimaa*: Inkoo, Sommaröarna (Sommarn), on old, partly charred coniferous timber, together with *Hyphoderma*

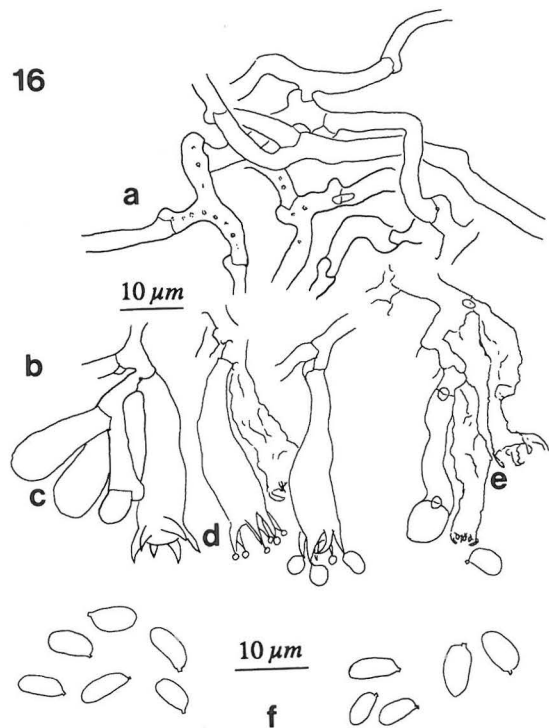


Fig. 16. *Sistotremastrum niveocreureum* (v. Höhn. & Litsch.) J. Erikss. a) subicular hyphae, b) hymenium, c) basidioles, d) ripe basidia, e) collapsed basidia, f) spores (specimen *Kotiranta* 8060, H.K., in IKI).

praetermissum (Karst.) J. Erikss. & Strid, in a small collapsed house, Grid $27^{\circ}\text{E } 6648:346$, 25.V.1988 *Kotiranta* 6793 (H.K.).

Steccherinum litschaueri (Bourd. & Galz.) J. Erikss.

Finland. *Varsinais-Suomi*: Karjalohja, Karkali Strict Nat. Res., on small, strongly decayed *Picea abies* on ground, in spruce-dominated grass-herb forest, Grid $27^{\circ}\text{E } 6686:322$, 19.VIII.1980 *Kotiranta* 2097, Kauppila & Niemelä (H.K.). *Oulun Pohjanmaa*: Kiiminki, Keskikylä, Pöksälänkangas, on decayed *Alnus* in spruce-dominated grass-herb forest, Grid $27^{\circ}\text{E } 7227:445$, 14.IX.1974 *M. Ohenoja* 3 (GB 24681, OULU). *Kittilän Lappi*: Kittilä, Homevuotso State For. Res., on *Prunus padus* litter, in virgin spruce-dominated grass-herb forest, Grid $27^{\circ}\text{E } 7519:398\text{--}9$, 27.VIII.1989 *Kotiranta* 7551 (H.K.).

Steccherinum oreophilum Linds. & Gilbertson

Finland. *Pohjois-Häme*: Toivakka, Huikko, Koskela 300 m SW, on *Populus tremula* branches, in mixed forest of *Vaccinium myrtillus* site type, Grid $27^{\circ}\text{E } 689:45$, 20.X.1979 *E. Ohenoja* (OULU).

For the other collections from Finland, see Niemelä and Saarenoksa (1985).

Trechispora praefocata (Bourd. & Galz.) Liberta —Fig. 18.

Reported earlier from Finland by Kotiranta and Larsson (1990). Fruit body resupinate, fairly thin, loosely adnate, finely byssoid to farinaceous to the naked eye, arachnoid to finely porose under the lens, margin fibrillose or rhizomorphic, white to pale olive-greenish.

Hyphal system monomitic, hyphae mostly 1.0–1.5 μm wide, covered with scattered, normally acrose crystals, sparingly clamped, with ampullaceous swellings at septa, up to 7.5 μm wide, thin-walled. Cystidia none. Basidia terminal, cylindrical, slightly constricted, (11–)12–15(–18) \times 5–6 μm , basally clamped, with four sterigmata. Spores ellipsoid, covered with spines up to 1.0 μm long, 5.7–7.1 \times 4.1–5.6 μm , $L = 6.3$, $W = 5.0$, $Q = 1.1–1.5$, $Q = 1.3$

(Kotiranta 7344 & Saarenoksa), $n = 30$; spines up to 1.0 μm long, 5.0–6.0 \times 3.6–5.0 μm , $L = 5.3$, $W = 4.0$, $Q = 1.1–1.4$, $Q = 1.2$ (Saarenoksa 51989), $n = 30$; spines up to 1.3 μm long, 5.0–6.0 \times 4.0–5.0 μm , $L = 5.6$, $W = 4.8$, $Q = 1.1–1.4$, $Q = 1.2$ (Saarenoksa 40589) $n = 30$, CB–, IKI– (measurements include the spines).

One of the specimens (Kotiranta 7344 & Saarenoksa), reported already by Kotiranta and Larsson (1990), differs slightly from the other specimens examined. Its basidia are slightly longer (13.5–18 \times 5.5–6.0 μm) and the spores are also bigger. The basal hyphae are up to 3.5 μm wide, and are covered by crystals similar to those in *T. fastidiosa* (Pers.) Liberta (drawn by Liberta 1973: 1886). Hjortstam et al. (1988), however, do not mention any kind of crystals in *T. fastidiosa*, and the basidia of *T. fastidiosa* are (14.5–)25–30(–35) μm long (Liberta 1973, Hjortstam et al. 1988).

T. praefocata is nowhere common, but has been reported from Sweden, Norway (Hjortstam et al.

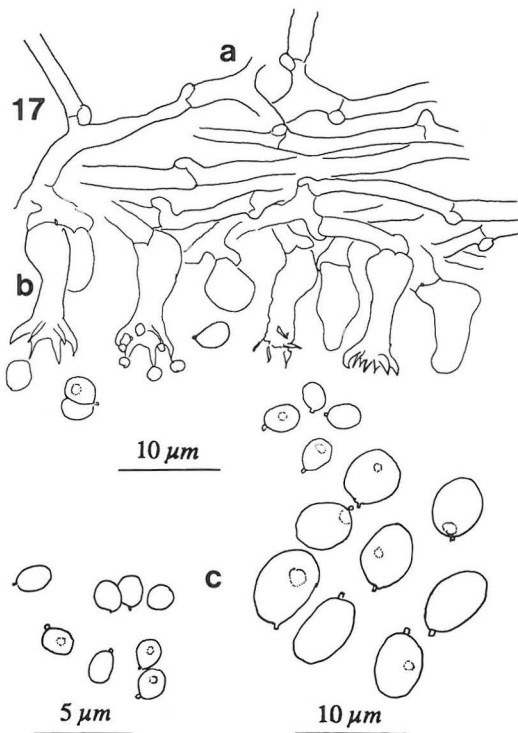


Fig. 17. *Sistotremella perpusilla* Hjortst. a) context hyphae, b) hymenium with basidia and spores, c) spores (specimen Kotiranta 6793, H.K., in CB).

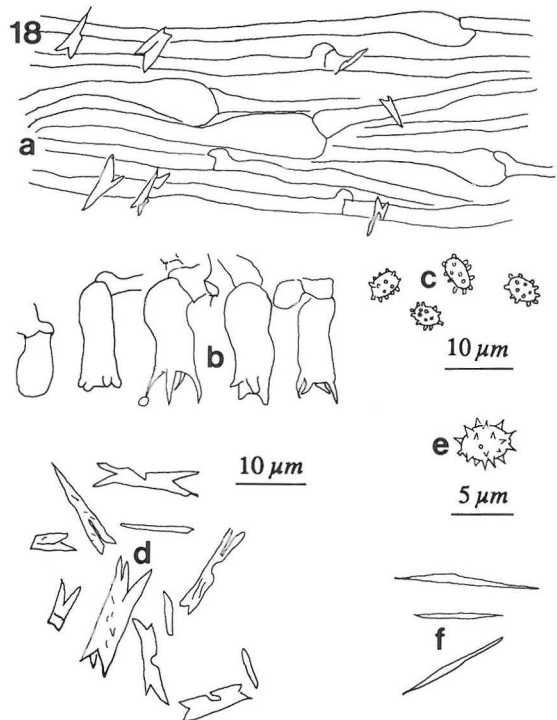


Fig. 18. *Trechispora praefocata* (Bourd. & Galz.) Liberta. a) subicular hyphae, b) basidia, c) spores, d) crystals (specimen Kotiranta 7344 & Saarenoksa, H, H.K., in KOH), e) spore (specimen Saarenoksa 40589, H, in KOH), f) crystals (specimen Saarenoksa 51989, H, in KOH).

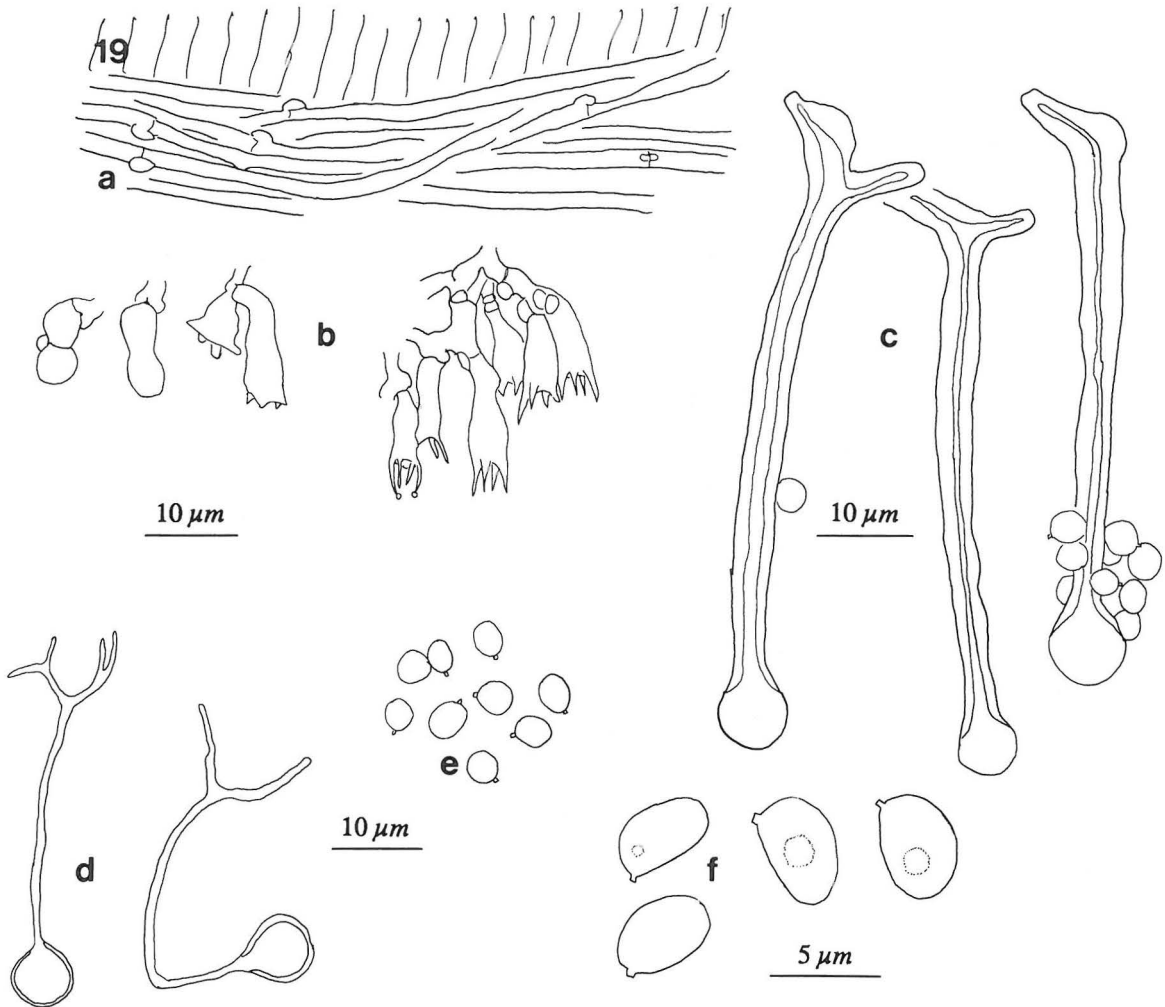


Fig. 19. *Tubulicrinis accedens* (Bourd. & Galz.) Donk. a) basal hyphae in KOH, b) basidia in IKI, c) cystidia in IKI, d) cystidia in KOH, e) spores in IKI (specimen Kotiranta 5859, K-H. Larsson & Hjortstam, H.K.), f) spores in CB (specimen Kotiranta 7319, H.K.).

1988), Denmark (Christiansen 1960), France (Bourdot & Galzin 1928), Spain (Dueñas 1986) and outside Europe from Iran (Hallenberg 1981) and the United States (Gilbertson & Budington 1970, Gilbertson 1974). *T. praefocata* grows on all kinds of debris.

Specimens examined

Finland. *Uusimaa*: Helsinki, Viikki, on *Picea abies*, 9.VI.1989 Kotiranta 7344 & Saarenoksa (see Kotiranta & Larsson 1990). Helsinki, Viikki, Säynäslahti, on decorticated, soft *Sambucus racemosa* branches, in moist broad-leaved grass-herb forest, Grid 27°E 6680:388, 8.X.1989 Saarenoksa 51989 (H). Helsinki, Viikki, Säynäslahti, on decaying leaves of *Matteuccia stru-*

thiopteris together with *Trechispora* sp., in moist deciduous (*Alnus glutinosa*, *Prunus padus*, *Salix caprea*) shore grass-herb forest, Grid 27°E 6680:388, 14.X.1989 Saarenoksa 40589 (H).

Tubulicrinis accedens (Bourd. & Galz.) Donk — Fig. 19.

Reported earlier from Finland by Hjortstam (1984). Fruit body resupinate, thin, smooth to the naked eye, hypochnoid, glancing under the lens due to the protruding cystidia, margin not differentiated, very thin but clear, pale whitish to pale olivaceous green.

Hyphal system monomitic, hyphae next to the substrate parallel, fairly sparingly clamped, up to

2 µm wide, thin-walled, CB-, IKI-, subhymenial hyphae richly branched, clamped, 2.5–3.0 µm wide, thin-walled, CB-, IKI-. Cystidia numerous, capitate, (42–)51–66(–72) × 3–4.5 µm, cystidial neck 2.1–3.0(–3.7) µm wide, apex (5.0–)6.0–8.5 µm wide, basally thick-walled, capillary lumen gradually expanded, cystidial walls CB- (plasma CB+), IKI pale grey, or with a greyish hue only, dissolving in KOH. Basidia conical, at first constricted, later almost stalked, (8–)9–12(–14) × (3–)3.5–4.5 µm, basally clamped, with four sterigmata, very thin-walled, CB-, IKI-. Spores broadly ellipsoid–subglobose, 3.7–5.0 × 2.5–3.4 µm, $L = 4.2$, $W = 2.9$, $Q = 1.2–1.7$, $Q = 1.4$ (Kotiranta 7319), $n = 30$; 3.5–4.3 × 2.7–3.5 µm, $L = 4.0$, $W = 3.2$, $Q = 1.1–1.4$, $Q = 1.2$ (Kotiranta 5859, Larsson & Hjortstam), $n = 30$, often attached around the cystidial apices, uniguttulate (CB), thin-walled, CB-, IKI-.

T. accedens, as pointed out by Hjortstam et al. (1988), has some variation in its spore shape. The two collections examined by us differ in their spore morphology. The one collected in spring (see below), has the same shape as drawn in Hjortstam et al. (1988: 1526, $i = Hjortstam\ 3049$), and the Q value is 1.4. The other collection is similar to Larsson 1231 (Hjortstam et al. 1988: 1526, g), with the Q value of 1.2. The specimens are otherwise similar.

T. accedens grows preferably on conifers (Hjortstam et al. 1988), and is nowhere common. It has been reported from Sweden (Hjortstam 1973, 1979a, Strid 1975a), Norway, Denmark (Hjortstam et al. 1988), Germany (Oberwinkler 1966a), Austria (Hallenberg & Michelitsch 1983), Switzerland (Breitenbach & Kränzlin 1986), Czechoslovakia (Julich 1984), France (Bourdote & Galzin 1928), Spain (Tellería & Truchero 1981) and outside Europe from the Soviet Union (Parmasto 1966), Canada (Weresub 1953, Liberta 1966, Martin & Gilbertson 1977) and the United States (Weresub 1953, Liberta 1964).

Specimens examined

Finland. *Uusimaa*: Inkoo, Sommaröarna (Sommarö), on strongly decayed coniferous (?*Pinus*) timber, of a small collapsed house, Grid 27°E 6648:346, 25.V.1989 Kotiranta 7319 (H.K.). *Etelä-Häme*: Padasjoki, Vesijako Strict Nat. Res., on decorticated, strongly decayed *Picea abies*, in virgin spruce-dominated forest with *Vaccinium myrtillus*, Grid 27°E 6808:398, 2.X.1984 Kotiranta 5859, Larsson & Hjortstam (H.K.).

Tubulicrinis globisporus Larsson & Hjortst. — Fig. 20.

New to Finland. Fruit body resupinate, very thin, almost invisible to the naked eye, under the lens pilose, margin not differentiated, white.

Hyphal system monomitic, basal hyphae clamped, not especially richly branched, (2.5–)3.5 µm wide, with slightly thickened walls, CB-, IKI-, subhymenial hyphae richly branched, clamped, 3.5 µm wide, thin-walled, CB-, IKI-. Cystidia abundant, cylindrical, (73–)85–112 × 5–6 µm (middle part), thick-walled, CB-, strongly amyloid, partly dissolving (mostly the basal part) or swelling in KOH or unchanged; capillary lumen gradually expanding to the thin-walled, obtuse apex (12–)15–22 × 4.5–6 µm. Basidia terminal, subclavate, (11–)13–17 × 5.0–5.5 µm, basally clamped, with four, up to 5 µm long sterigmata, thin-walled, CB-, IKI-. Spores almost globose, 4.0–5.0 µm in diam, often attached around the cystidia, thin-walled, CB-, IKI-.

T. globisporus is a rare species, reported from Sweden (Hjortstam & Larsson 1978, Hjortstam 1979a, Hjortstam et al. 1988), Norway (Aanstad & Ryvarden 1987, Hjortstam et al. 1988), Austria (Hjortstam et al. 1988), Germany, France, Italy (Oberwinkler 1966a, as *T. cf. callosus* G.H. Cunningham) and Canada (Hjortstam & Larsson 1978). All the reports are from coniferous wood, mostly pine.

Specimen examined

Finland. *Inarin Lappi*: Inari, Kessi, Paloselkäjärvi, on small decorticated *Pinus sylvestris* branch on the ground, together with *Globulicium hiemale* (Laurila) Hjortstam in virgin, poor pine heath forest with *Empetrum nigrum* ssp. *hermaphroditum*, *Ledum palustre* and *Vaccinium vitis-idaea*, Grid 27°E 7653:558, 29.VIII.1989 Kotiranta 7613b (H.K.).

Tubulicrinis strangulatus Larsson & Hjortst. — Fig. 21.

New to Finland. Fruit body resupinate, at first very thin, appearing to the naked eye as whitish or greyish bloom, later greyish ochre, porose, pilose under the lens.

Hyphal system monomitic, basal hyphae parallel to the substrate, clamped, 3.5–4.0 µm wide, with thickened walls, CB-, IKI-, subhymenial hyphae richly branched, clamped, 3.5 µm wide, thin-walled, CB-, IKI-. Cystidia numerous, cylindrical, 55–96 × 6–8 µm (middle part), thick-walled, CB-, amyloid, in KOH strongly swelling (up to 16 µm), soon disappearing, leaving only the 2 µm wide, gradually widening or abrupt capillary lumen and the thin-walled, 5.5–8 µm wide, crystal-covered, obtuse apex visible. Basidia subclavate, sometimes constricted and stalked, 10–14.5 × 4–6 µm, with four, up to 4.5 µm long, very thin sterigmata, basally clamped, very

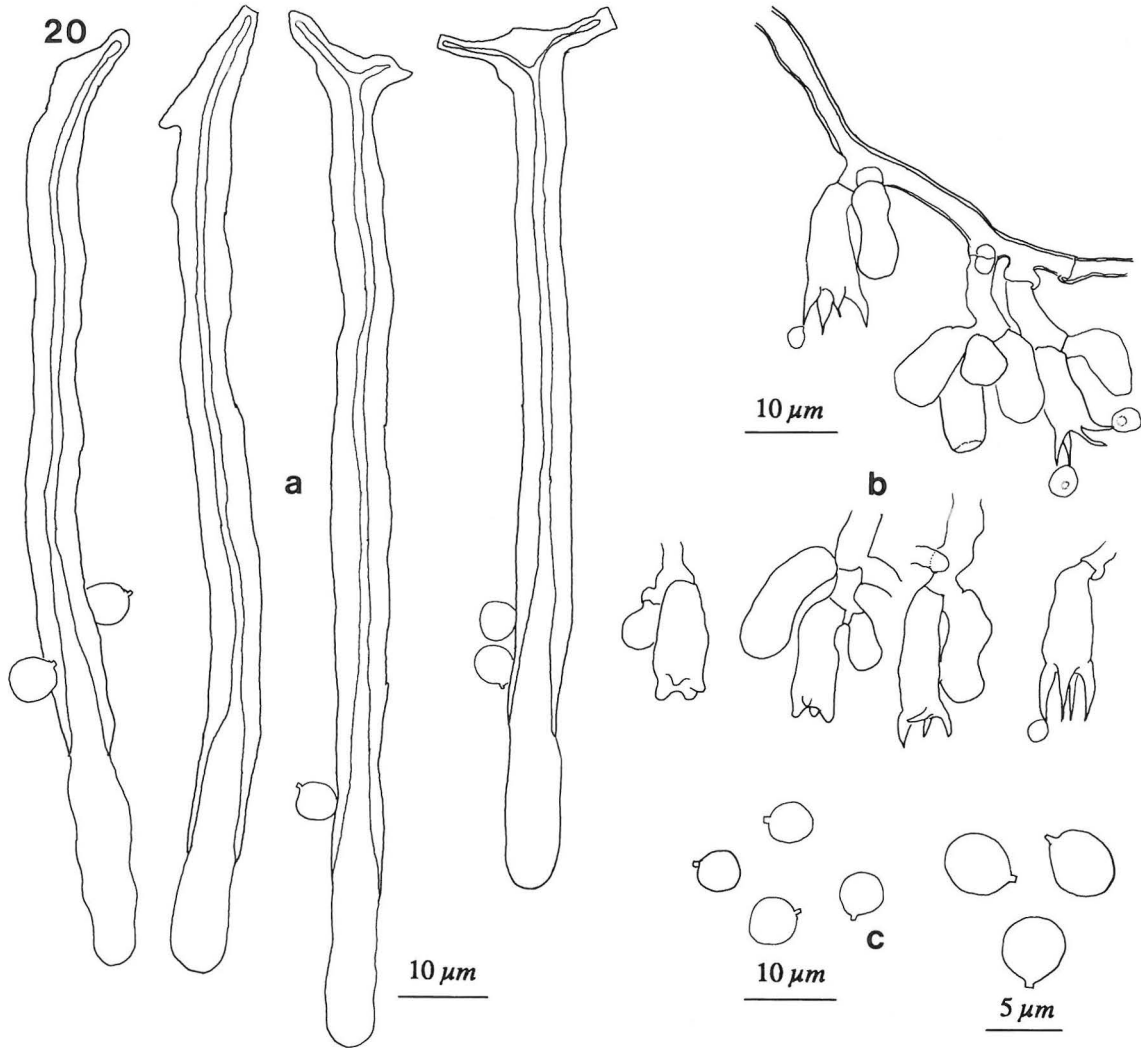


Fig. 20. *Tubulicrinis globisporus* Larsson & Hjortst. a) cystidia, b) basidia with spores, c) spores (specimen Kotiranta 7613b, H.K., in IKI).

thin-walled, CB-, IKI-. Spores short-allantoid, adaxial side concave, $4.6\text{--}6.8 \times 2.2\text{--}3.0 \mu\text{m}$, $L = 5.3$, $W = 2.6$, $Q = 1.8\text{--}2.3$, $Q = 2.0$ (Kotiranta 7409 & Mannerkoski), $n = 30$; $4.6\text{--}6.1 \times 2.1\text{--}2.7 \mu\text{m}$, $L = 5.2$, $W = 2.5$, $Q = 1.8\text{--}2.4$, $Q = 2.1$ (Kotiranta 7796), $n = 30$, thin-walled, CB-, IKI-.

The Finnish material of *T. strangulatus* deviates from the common *T. borealis* J. Erikss. in having thin-walled, inamyloid basidia and wider spores. *T. strangulatus* is rare, but has been reported from Sweden, Norway (Hjortstam & Larsson 1986) and Romania (Hallenberg 1986). It grows mainly on

coniferous trees in undisturbed forests (Hjortstam et al. 1988).

Specimens examined

Finland. Etelä-Häme: Ruovesi, Keinumäki E, Musturi State Forest Res., on very decayed, decorticated *Picea abies* on ground, together with *Hyphoderma praetermissum*, in virgin, spruce-dominated forest with *Vaccinium myrtillus*, Grid 27°E 6865:362, 14.VI.1989 Kotiranta 7409 & Mannerkoski (H, H.K.). **Perä-Pohjanmaa:** Rovaniemi rural comm., Hyypiökivälo, on decorticated, wet *Picea abies* fallen over a small brook, in virgin spruce forest with *Hylocomium* and *Vaccinium myrtillus*, Grid 27°E 7358:487, 4.IX.1989 Kotiranta 7796 (H.K.).

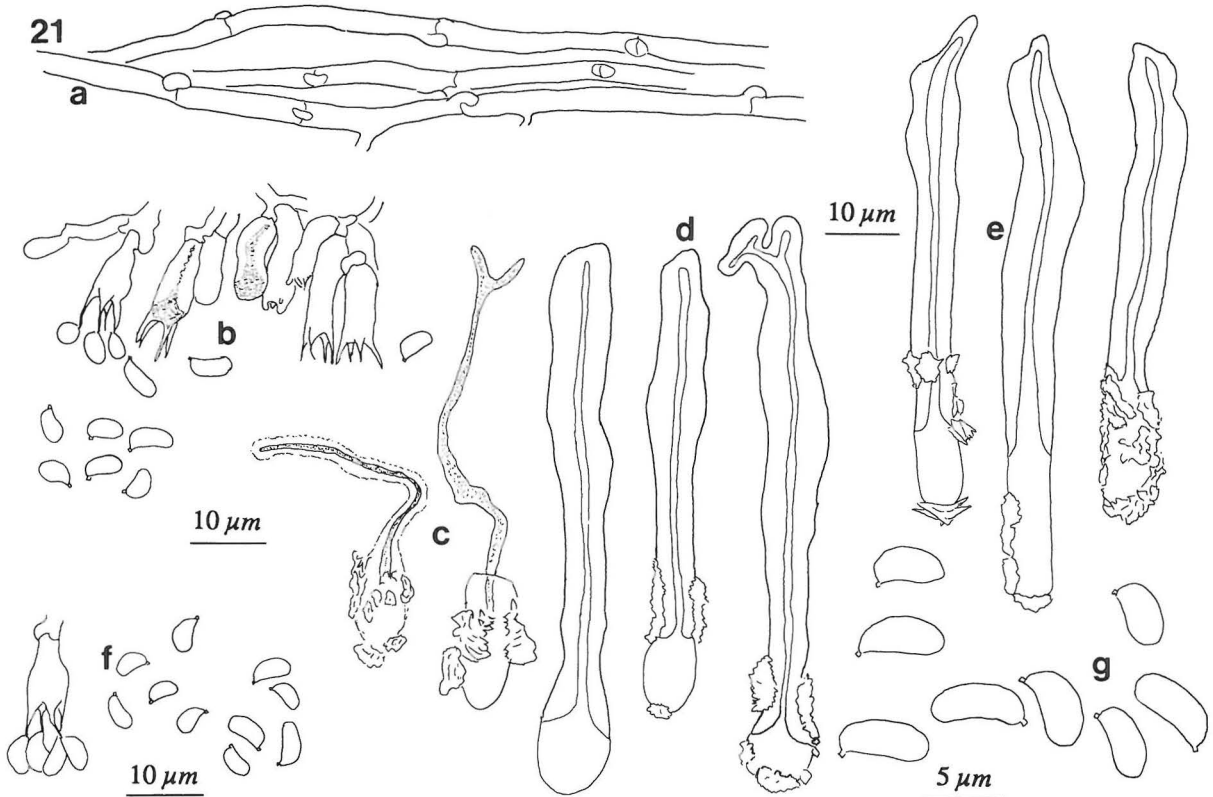


Fig. 21. *Tubulicrinis strangulatus* Larsson & Hjortst. a) basal hyphae in KOH, b) basidia and spores in KOH, c) cystidia in KOH, d) cystidia in IKI, e) cystidia in IKI, f) basidia and spores in IKI, g) spores in IKI (specimens Kotiranta 7409 & Mannerkoski, H, H.K., a, b, e, g; Kotiranta 7796, H.K., c, d, f).

Discussion

A considerable number of the species reported in this paper, were collected either in virgin forests or from the timber of collapsed houses. Nowadays, unexploited forests are situated mainly in northern Finland, whereas ruined hay barns and other buildings can be found anywhere.

An interesting phenomenon is in the similarity of the species composition of the Aphyllophorales of virgin forests and old timber. Common, widely distributed species with a wide ecological range are naturally found in both "biotopes" and, of course, the diversity of species is greater in old forests. However, some species such as *Asterostroma laxum* and *Phlebiella subflavidogrisea* were reported earlier only from the virgin forest of the Pisavaara Strict Nature Reserve near the Polar circle. Now, they were collected in southern Finland on the timber of collapsed houses. The remains of such houses also harbour

some other species usually considered inhabitants of undisturbed forests. The southernmost Finnish collection of *Crustoderma dryinum* (Berk. & Curt.) Parm. originated from the same building as the finds of *A. laxum* and *P. subflavidogrisea*. Also *Tubulicrinis accedens*, earlier reported from the Vesijako Strict Nature Reserve in Padasjoki, has now been reported on the remains of a cabin on a small, almost treeless island in the Gulf of Finland.

Similar occurrence, in both virgin forests and collapsed houses, is known among some polypores, e.g. *Phellinus nigrolimitatus* (Rom.) Bourd. & Galz. (Niemelä & Kotiranta 1982). In Estonia also the author Kotiranta found *P. nigrolimitatus* on the strongly decayed logs of an old abandoned building.

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