

# Studies in *Laeticorticium* (Aphylophorales, Corticiaceae) and related genera

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Nineteen species in the genera *Laeticorticium*, *Dendrocorticium*, and *Dentocorticium* are presented. Four species are described as new: *Laeticorticium griseo-effusum* Larsen & Gilbertson, *Dendrocorticium piceinum* Lemke, *D. violaceum* Jacks., and *Dentocorticium brasiliense* Larsen & Gilbertson. One new combination is proposed, *Dendrocorticium roseocarneum*. Basidial ontogeny and position of basidia in basidiocarps are emphasized as primary taxonomic criteria in delimiting these genera. The type of mating system is implicated as possible taxonomic criterion at the generic level, and keys to genera and species are provided. Species descriptions are supplemented with line drawings of microscopic characters, and data on substrate relationships and geographic distributions are given.

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The genus *Laeticorticium* was erected by Donk (1956), who transferred five species into the genus. These are *Thelephora rosea* Pers. per Fr. (nomenclatural type), *Corticium polygonioides* Karst., *C. jonides* Bres. in Brinkm., *Aleurodiscus minnsiae* Jacks., and *A. pini* Jacks. *Stereum roseocarneum* Schw. and *Hydnum sulphurellum* Pk. were transferred to *Laeticorticium* by Boidin (1958) and Gilbertson (1962), respectively. Seven species have recently been described as new. These are *L. lundellii* (Eriksson 1958), *L. ussuricum* and *L. pilatii* (Parmasto 1965), *L. canfieldii*, *L. durangense*, and *L. mississippiense* (Larsen & Gilbertson 1974a), and *L. appalachien- se* (Burdall 1976).

*Laeticorticium* is characterized in part by a catahymenium, below which the basidia originate deep in the subiculum as probasidia, and become greatly elongated while growing through a previously developed layer of dendrohyphidia with more or less intricate terminal branching. It is also characterized by basidiocarps that are typically bright colored, develop as small scattered patches,

and do not mature until the spring or early summer following the season in which development begins. The spores are hyaline, non-amyloid, ellipsoid to broadly ellipsoid, and pink to pinkish rose in mass. Cystidia are usually absent.

The catahymenium may be an adaptation to the relatively dry environmental conditions under which the basidiocarps are formed. The species included in the genus have basidiocarps that usually develop on the lower surface of small dead branches attached to standing trees. These branches tend to dry out very quickly, but probably retain enough moisture to support fungus growth for short periods of time. During wet periods in the fall, basidiocarp development ensues with probasidia forming in or adjacent to the subiculum. Probasidia eventually become noticeably thick-walled, a characteristic which apparently enables them to retain viability under adverse conditions. During more favorable periods these probasidia are stimulated by moisture and higher temperatures to produce metabasidia.

Probasidia are apparently quite resistant to dessiccation. In the laboratory we have observed that portions of basidiocarps from collections made up to 10 years previously, when incubated under more optimal conditions, discharge basidiospores. These portions, attached to petri dish covers and suspended over agar, contained viable probasidia which subsequently had undergone metabasial elongation and sporulated.

In *Dendrocorticium* and *Dentocorticium* a cathymenium is also present, but it is not always a continuous and distinctly recognizable tissue layer. This condition is also found in some species of *Laeticorticium*. In the two former genera, however, basidial ontogeny differs from *Laeticorticium*. In *Dentocorticium*, basidiocarps may or may not be formed in the growing season prior to the year of sporulation. Probasidia are absent. Basidia are typically clavate, show no metabasial elongation, and are found juxtaposed to the dendrohyphidia of the cathymenium.

In *Dendrocorticium*, probasidia are thin-walled and positioned in the subhymenial area. Our data indicate that they are formed in the same growing season in which metabasial elongation and sporulation occurs. The exception is *D. piceinum*, in which a probasidial stage accompanied by metabasial growth is not readily apparent, but basidiospore morphology suggests that it be placed in *Dendrocorticium*. We have observed also that basidiocarps of some species of *Dendrocorticium* may contain viable probasidia after extended periods of herbarium storage as do those of species of *Laeticorticium*.

The probasidium is not a unique character of laeticorticoid fungi, for it appears to be present in a variety of forms in other major fungal groups besides the corticiaceous Aphyllophorales. Its formation, occurrence, and function in the life cycle is suggestive of the teliospore stage in many of the Uredinales. A striking similarity may also be seen with some members of the genus *Septobasidium* (see Couch 1938).

All of the species treated herein produce a white rot and/or positive oxidase reaction in culture. They occur on dead wood on the ground, but more frequently on dead branches attached to standing trees, and play an important role in the decay and natural pruning

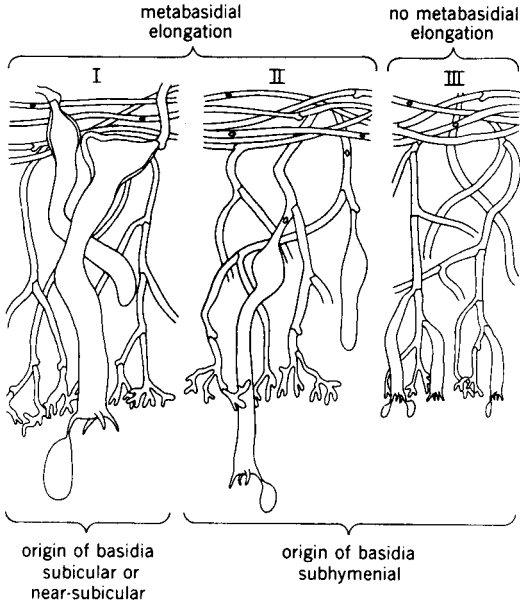
of these branches. There are no observations associating these fungi with heartrot in living trees.

#### TAXONOMY

The distinctive nature of laeticorticoid fungi was first recognized by Bourdot & Galzin (1928), who grouped two of the species recorded from France (*L. roseum* and *L. polygonioides*) in a section *Aleurodiscoidea* in the genus *Corticium*. Jackson (1950) pointed out the close relationship of these species with *Aleurodiscus* and predicted that the group ' . . . will ultimately contain several recognizable species and when better understood it may be found logical to include them in a genus separable from *Aleurodiscus*.' Donk formally proposed *Laeticorticium* in 1956, and subsequently, Lemke (1964a, b) excluded it from his treatment of *Aleurodiscus*.

Parmasto (1968) recognized three sections in the genus. In the section *Laeticorticium* he placed *L. roseum*, *L. pini*, *L. minnsiae*, *L. pilatii*, *L. polygonioides*, *L. jonides*, and *L. lundellii*. This section is characterized by a smooth to radially veined hymenophore, resupinate basidiocarps with a white to purplish brown or ochraceous hymenial surface, and ellipsoid to ovoid basidiospores 4  $\mu\text{m}$  or more wide. His section *Roseocorticium* contains only *L. roseocarneum* and is characterized by reflexed basidiocarps, a smooth, purplish to brownish purple hymenial surface, and ellipsoid spores more than 4  $\mu\text{m}$  wide. The third section, *Dentocorticium*, contains *L. ussuricum*. It is characterized by a hymenial surface that becomes papillose and is purplish brown to yellow. The basidiospores are cylindrical and less than 4  $\mu\text{m}$  wide. *Laeticorticium sulphurellum* was also listed as allied to this section.

Boidin et al. (1968) and Boidin (1971) have proposed taxonomic groupings within *Laeticorticium* based on nuclear behavior and sexuality in the life cycles of various species. They did not include in their groupings *L. minnsiae*, *L. pini*, and *L. roseum* (group A) (the *L. roseum* cited was their group B). Reasons for the exclusion of these species were not given. To date, Boidin's scheme has not lent itself to coordination with taxonomic data and conclusions derived by other methods.



LAETICORTICIUM    DENDROCORTICIUM    DENTOCORTICIUM

Fig. 1. Longitudinal sections of basidiocarps representative of *Laeticorticium*, *Dendrocorticium*, and *Dentocorticium* illustrating comparative positional and ontogenetic relationships of basidia in the three genera (diagrammatic).

In a recent paper by Larsen & Gilbertson (1974b), the taxonomy of *Laeticorticium* was further restructured (Fig. 1) primarily on the basis of positional origin and ontogeny of basidia, previously discussed herein.

The relationship of *L. pilatii* to these genera is still uncertain, as the nature of the basidium remains obscure. For the present it is maintained in *Laeticorticium* as originally described and included here under Species Incertae Sedis.

SEXUALITY

The types of mating systems have been reported for several of the species under consideration and are summarized in Table I. It is apparent that only about half of the presently recognized species treated here have been investigated with regard to mating systems. With the exception of homothallic *L. roseum*, species of *Laeticorticium* which have been investigated are heterothallic and bipolar (with the possible exception of *L. canfieldii*), while those of *Dendrocorticium* and *Dentocorticium* are heterothallic and tetrapolar. The type of mating system appears at present to support the segregation of *Laeticorticium* sensu stricto from the two newly recognized genera.

Table I. Sexuality in species of laeticorticoid fungi

Species	Sexuality	Reported by
<i>Laeticorticium roseum</i> (=group A of Boidin et al., 1968)	homothallic	Jackson, 1950 Eriksson, 1958
<i>L. pini</i>	heterothallic:bipolar	Jackson, <i>ibid.</i>
<i>L. minnsiae</i>	heterothallic:bipolar	Jackson, <i>ibid.</i>
<i>L. roseum</i> -group B	heterothallic:bipolar	Boidin et al., 1968
<i>L. canfieldii</i>	heterothallic:bipolar	Larsen & Gilbertson, 1974
<i>L. durangensis</i>	heterothallic:bipolar	Larsen & Gilbertson, 1974
<i>Dendrocorticium polygonioides</i>	heterothallic:tetrapolar	Eriksson, 1958
<i>D. roseocarneum</i>	heterothallic:tetrapolar	Boidin et al., 1968
<i>Dentocorticium ussuricum</i>	heterothallic:tetrapolar	Boidin et al., 1968

METHODS

Free hand sections of basidiocarps were treated first with 95% ethanol, 10% KOH, and finally stained with 1% phloxine. Melzer's reagent (for formula see Slysh 1960) was used for detection of amyloid or dextrinoid structures and cotton blue for cyanophily. Illustrations were prepared with the aid of a camera lucida and Zeiss drawing tube. Numerical-capital letter color designations are from the Munsell system (1929-1942). Herbarium abbreviations are those of Holmgren & Keuken (1974).

KEY TO GENERA

- 1. Probasidia absent; basidia arising in, or directly adjacent to, cataphyllum; basidiospores rarely exceeding 4 μm in diameter . . . . . *Denticorticium* (p. 117)
- 1. Probasidia present; if absent, then spores ellipsoid; spores usually greater than 4 μm in diameter . . . . . 2
- 2. Thick-walled probasidia formed directly adjacent to, or barely in, the subiculum; basidia usually greater than 8 μm in diameter and frequently 75-100 μm + long; basidiospores usually 12 μm or more long . . . . *Laeticorticium* s. str. (p. 102)
- 2. Probasidia not noticeably thick-walled, usually formed in the subhymenium; basidia usually less than 8 μm diameter and less than 75 μm long, frequently projecting noticeably above the cataphyllum when mature; basidiospores rarely longer than 12 μm *Dendrocorticium* (p. 110)

THE GENUS *LAETICORTICIUM*

*Laeticorticium* Donk, Fungus 26:17. 1956.

Basidiocarps annual or biennial, occurring in small scattered patches; hymenial surface smooth to granulate, brightly colored; hyphal system monomitic; mature basidia formed from outgrowths of thick-walled probasidia, from which originate elongated, flexuous metabasidia growing intrusively through a layer of dendrohyphidia, becoming 75-100 μm+ long; clamp connections present throughout; cystidia and pseudocystidia usually absent; basidiospores hyaline, ovoid, broad to cylindrical-ellipsoid, usually 12 μm or more

long, negative in Melzer's reagent, acyanophilous; spore print pink to rosaceous pink.

Nomenclatural type species *Laeticorticium roseum* (Pers. per Fr.) Donk.

KEY TO THE SPECIES OF *LAETICORTICIUM*

- 1. Basidiospores frequently over 10 μm wide . . . . . 2
- 1. Basidiospores usually less than 10 μm wide . . . . . 5
- 2. Basidiocarps formed primarily on the underside of hemlock branches, sometimes on other conifers, often associated with a sterile sclerotial stage on the upper side of branches; basidiospores 12-15 × 9-11 μm . . . . . *L. minnsiae*
- 2. Basidiocarps formed on other hosts; sterile sclerotial stage absent; basidiospores 16-24 × 8-12 μm . . . . . 3
- 3. Basidiocarps formed on dead branches of standing aspen . . . . . *L. roseum*
- 3. Basidiocarps formed on members of the Pinaceae . . . . . 4
- 4. Basidiospores broadly to narrowly ellipsoid; basidiocarps pale pink; on *Pinus ponderosa* in Mexico . . . . . *L. durangense*
- 4. Basidiospores cylindrical to narrowly ellipsoid; basidiocarps grayish white; on *Pseudotsuga menziesii* in Arizona . . . . . *L. griseo-effusum*
- 5. Basidiocarps occurring only on *Pinus strobus*; basidiospores 9-11 (-13) × 5-7.5 (-9) μm . . . . . *L. pini*
- 5. Basidiocarps occurring on angiosperms; basidiospores various . . . . . 6
- 6. Basidiospores 9-12 × 7-9 μm . . . . . *L. roseum* - group B
- 6. Basidiospores larger, up to 18 × 11 μm 7
- 7. Basidiospores 15-18 × 8-11 μm; basidia 40-65 (-75) × 9-13 μm . . . . . *L. mississippiense*
- 7. Basidiospores 11-15 × 6-8.5 μm; basidia 70-125 × 7-9 μm . . . . . 8
- 8. Dendrohyphidia frequently becoming cystidioid with apices capitulate . . . . . *L. appalachiense*
- 8. Dendrohyphidia not becoming cystidioid . . . . . *L. canfieldii*

*Laeticorticium appalachiensis* Burds. & Larsen in Burds., J. Elisha Mitchell Sci. Soc. 91: 343–345. 1976.

Basidiocarps annual or biennial, effused, beginning as small patches, finally enlarging and coalescing, up to  $4 \times 1$  cm, up to 0.25 mm thick, pruinose; fertile area yellowish white to grayish yellow when dry (near 2.5 Y 8/4), surface smooth; margin up to 1 mm broad, thin, pubescent, concolorous with the fertile area to white; subiculum inconspicuous, concolorous with or paler than the hymenial surface.

Subicular hyphae 2–4  $\mu$ m diam, septate, with clamps, hyaline, smooth or heavily encrusted with hyaline crystals; dendrohyphidia (Fig. 2) arising from subicular hyphae, irregularly branched toward the apex, with ends of branches often cut off by septa and with tips collapsing, smooth or encrusted with hyaline granules, clamped at base and often clamped in branched portion, hyaline, frequently capitulate at apex and appearing cystidioid, up to 7  $\mu$ m across, smooth to somewhat encrusted; probasidia (Fig. 3) formed directly adjacent to or within subicular tissue, variously shaped but often obpyriform, 12–18  $\mu$ m broad, with slight wall thickening at base; basidia (Fig. 4) (including meta- and probasidia) 70–125  $\times$  10–12  $\mu$ m (at apex), narrowly clavate or cylindrical, flexuous, 4-sterigmate, sterigmata up to 7  $\mu$ m long; basidiospores (Fig. 5) 12–15 (–18)  $\times$  7–8  $\mu$ m, ovoid to broadly ovoid, adaxially flattened, with distinct apiculi.

*Laeticorticium appalachiense* is distinguished by the unique form of dendrohyphidia. It appears to be allied to *L. canfieldii* and *L. mississippiense*.

#### *Specimens examined*

U.S.A. TENNESSEE. Sevier County, Great Smoky Mountains National Park, on *Vitis* sp., Burdsall 3890, 3893 (holotype 3893 in CFMR; isotypes in BPI, VPI, and TAA); on *Nyssa silvatica* Marsh., Burdsall 3894 (CFMR).

*Laeticorticium canfieldii* Larsen & Gilbertson, Can. J. Bot. 52:687. 1974.

Basidiocarps apparently biennial, effused in small patches, separable in small pieces. up to 0.25 mm thick; hymenial surface smooth, pinkish buff (near 7.5 YR 8/4);

subiculum white; sterile margin narrow or absent, when present villose and white.

Subicular hyphae 2.5–4  $\mu$ m diam, septate, with clamps, thick-walled, hyaline; dendrohyphidia (Fig. 6) forming a distinct catahymenium of extensively and intricately branched hyphae, clamped; probasidia (Fig. 7) somewhat globose to irregular in outline, frequently thick-walled, usually located directly adjacent to, but not in, subicular tissue; basidia (Fig. 8) 90–120  $\times$  8–9  $\mu$ m, sinuous-clavate, 4-sterigmate, with sterigmata up to 6  $\mu$ m long; basidiospores (Fig. 9) 13–15  $\times$  6–8.5  $\mu$ m, broadly ellipsoid, sometimes tapering noticeably towards the apicular end.

*Laeticorticium canfieldii* is morphologically very similar to *L. roseum*, *L. durangensis*, and *L. roseum*-group B (Boidin et al. 1968). However, the basidiospore size of the homothallic *L. roseum* on *Populus* sp. is 17–24  $\times$  8–12  $\mu$ m, while those of *L. durangensis* (on *Pinus ponderosa* Laws.) and *L. roseum*-group B, are 16–24  $\times$  8–12  $\mu$ m and 9–12  $\times$  7–9  $\mu$ m, respectively.

#### *Specimen examined*

U.S.A. ARIZONA. Graham County, Pinaleno Mts., on *Juglans major* (Torr.) Heller, Canfield 72–11 (holotype in ARIZ; isotype in CFMR).

*Laeticorticium durangense* Larsen & Gilbertson, Can. J. Bot. 52:688. 1974.

Basidiocarps biennial, adnate, occurring in small patches and effused up to  $4 \times 3$  cm, up to 0.4 mm thick; hymenial surface smooth and undulating, becoming pulverulent, pale pinkish buff (near 7.5 YR 4/8), cracking on drying and exposing a pale pink to pale orange layer of tissue below the hymenial surface; subiculum white; sterile margin abrupt, narrow, pruinose, paler than hymenial surface.

Subicular hyphae 2.5–4  $\mu$ m diam, thick-walled, hyaline; dendrohyphidia (Fig. 10) forming a distinct catahymenium, 3–4  $\mu$ m diam, intricately branched, with clamp connections at septa; probasidia (Fig. 11) thick-walled; basidia (Fig. 12) 40–50 (–70)  $\times$  10–12  $\mu$ m, clavate, normally sinuous and contorted, 4-sterigmate, sterigmata up to 5  $\mu$ m long; basidiospores (Fig. 13) (16–) 19–24  $\times$  (8–) 10–12  $\mu$ m distinctly pink in mass (spore



Figs. 2–17. Microscopical characteristics of species of *Laeticorticium*. Scale bars equal  $\mu\text{m}$ . Figs. 2–5. *Laeticorticium appalachiense* (from type). Fig. 2. Dendrohyphidia. Fig. 3. Probasidia. Fig. 4. Basidia. Fig. 5. Basidiospores. Figs. 6–9. *Laeticorticium canfieldii* (from type). Fig. 6. Dendrohyphidia. Fig. 7. Probasidia. Fig. 8. Basidia. Fig. 9. Basidiospores. Figs. 10–13. *Laeticorticium durangense* (from type). Fig. 10. Dendrohyphidia. Fig. 11. Probasidia. Fig. 12. Basidia. Fig. 13. Basidiospores. Figs. 14–17. *Laeticorticium griseo-effusum* (from type). Fig. 14. Dendrohyphidia. Fig. 15. Probasidia. Fig. 16. Basidia. Fig. 17. Basidiospores.

print), hyaline under the microscope, broad to narrowly ellipsoid.

*Laeticorticium durangense* may be readily diagnosed by its usual occurrence on pine cone epiphylls and by the size of its basidiospores.

#### *Specimens examined*

MEXICO, STATE of DURANGO, On cones and branches of *Pinus ponderosa* Laws., Cummins, 13 × 1971 (CFMR FP 133141, holotype; isotype in ARIZ); on cones of *P. ponderosa*, Cummins (CFMR FP 101516); East of Chalco on Hwy 190, on cone epiphylls of *Pinus* sp., Cain (TRTC 37132); near Amecameca, base of Mt. Popocatepetl, on cone epiphylls of *Pinus* sp., Cain (TRTC 37137); and on slopes of Mt. Popocatepetl, on cone epiphylls of *Pinus* sp., Cain (TRTC 37108). U.S.A., TEXAS. El Paso Quarantine Station, on cone epiphylls of *Pinus* sp. (from Mexico), Smith, El Paso Quarantine Station no. 28510 (BPI, TRTC).

*Laeticorticium griseo-effusum* Larsen & Gilbertson, sp. nov. Etymology-From *griseus* (L., adj.) = gray + *effusus* (L., adj.) = effused.

Basidiocarpis 0.2 mm crassis, effusis, pruinosis, griseo-albis; hyphis 1.5–2 (–2.5)  $\mu\text{m}$  diam, fibulatis; probasidiis adsunt; basidiis 65–80 (–100)  $\times$  10–12  $\mu\text{m}$ ; basidiosporis 19–23  $\times$  8–10  $\mu\text{m}$ , cylindraceis vel cylindraceo-ellipsoideis.

Holotypus—U.S.A. ARIZONA. Coronado National Forest, Chiricahua Mts., Cochise County, Turkey Creek, ad ramosa *Pseudotsuga menziesii* (Mirb.) Franco, legit R. L. Gilbertson 10701, 18 VIII 1972 (CFMR); isotypus in ARIZ.

Basidiocarps apparently biennial, effused up to 4  $\times$  2 cm, up to 0.2 mm thick, in patches, pruinose; hymenial surface grayish white (near 10.0 YR 8/2); subiculum grayish white; sterile margin narrow, farinaceous, concolorous with the hymenial surface.

Subicular hyphae thick-walled, hyaline, 1.5–2 (–2.5)  $\mu\text{m}$  diam, septate, clamped; dendrohyphidia (Fig. 14) not forming a well-defined cataphyllum, 1.5–2.5  $\mu\text{m}$  diam, sparingly septate, clamps present, sparingly branched at the apex, associated with abundant crystalline material; probasidia (Fig. 15) subglobose to ovoid, 9–13  $\mu\text{m}$  across; basidia (Fig. 16) 65–80 (–100)  $\times$  10–12  $\mu\text{m}$ , sinuous,

tapered slightly towards the base, 4-sterigmate, sterigmata up to 10  $\mu\text{m}$  long and 2–3  $\mu\text{m}$  diam at the base; basidiospores (Fig. 17) cylindrical to narrowly ellipsoid, bluntly apiculate, hyaline, 19–23  $\times$  8–10  $\mu\text{m}$ .

The diagnostic characters of this species are the thin, effused grayish white basidiocarps, and the cylindrical to narrowly ellipsoid spores.

*Laeticorticium minnsiae* (Jacks.) Donk, Fungus 26:17. 1956. *Aleurodiscus minnsiae* Jacks., Can. J. Res. (C)28:67. 1950.

Basidiocarps biennial, developing in the late summer or fall on underside of small branches on which a sclerotial stage (Fig. 22) appeared on the upperside earlier in the season, not maturing until the following spring or early summer, developing in small coalescing patches up to 1 cm diam, adherent, but tending to peel away from substratum in the mature stage when dried; hymenial surface cream white (near 10.0 YR 8/4), soft and very finely tomentose under a 25  $\times$  lens; margin abrupt.

Subicular hyphae 2–5  $\mu\text{m}$  diam, clamped, hyaline, thin- to moderately thick-walled, with occasional branching; dendrohyphidia (Fig. 18) abundant, even in immature fruiting bodies in which basidia or probasidia are not yet discernible, 2–5  $\mu\text{m}$  diam, often with clamp connections, branched and conspicuously so in some specimens; probasidia (Fig. 19) appearing as variously shaped vesicular bodies, abundant throughout tissue directly adjacent to the subiculum, these often branched or variously contorted; mature basidia (Fig. 20) greatly elongated and contorted, often branched, 100–130  $\times$  8–10  $\mu\text{m}$ , 4-sterigmate, sterigmata 2–3  $\mu\text{m}$  diam at the base and 8–10  $\mu\text{m}$  long; basidiospores (Fig. 21) 12–15  $\times$  9–11  $\mu\text{m}$ , broadly ellipsoid.

Sclerotial Stage (Fig. 22) - Cups laterally or basally attached on upper side of branches, single or confluent and fused with adjacent cups, 500–900  $\mu\text{m}$  diam, white to pale buff, sometimes cottony on outer surface; sclerotial bodies single, slightly darker than cup, spherical, slightly flattened apically, projecting hyphae giving a sparsely cottony appearance to the surface, 300–500  $\mu\text{m}$  in diam.

Hyphae of the cup tissue thin- to thick-walled, clamped, hyaline, 2–8  $\mu\text{m}$  diam; hyphae (Fig. 23) of the sclerotial body very

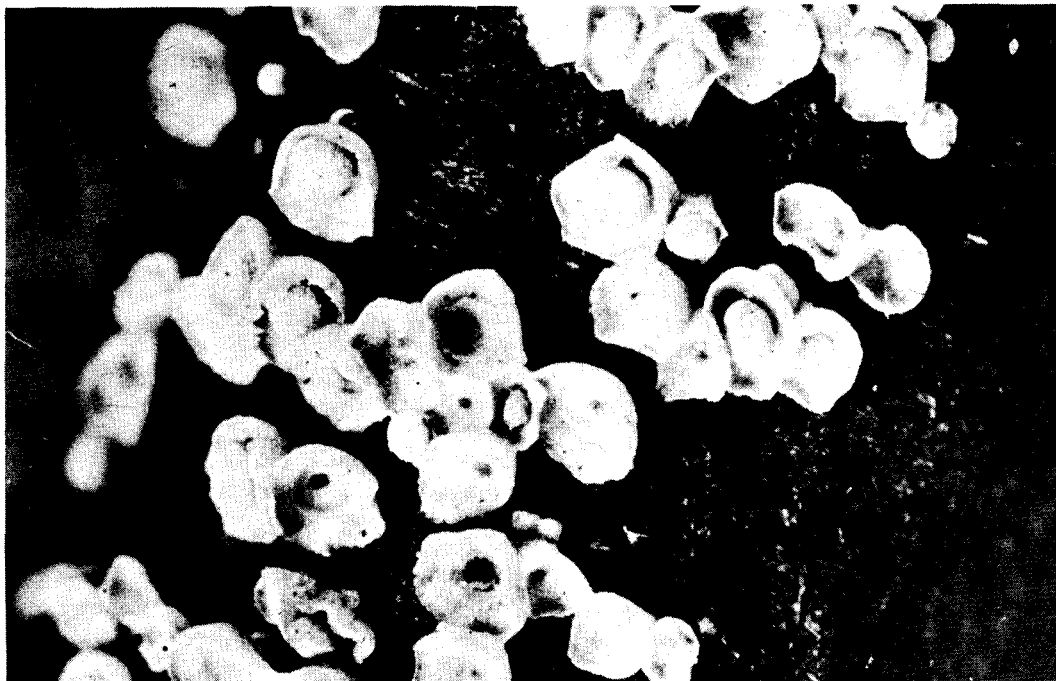


Fig. 22. *Laeticorticium minnsiae*. Sclerotia-coil-containing cups on the upper side of a branch of *Tsuga canadensis* ( $\times 13$ , from type).

thick-walled in the interior portion, contorted and breaking up into short segments, up to  $16\ \mu\text{m}$  diam, with conspicuous swellings and constrictions, thinner walled in tissue around the periphery.

Basidiocarps first appear in the fall as small, sterile patches on the underside of small branches bearing cups with sclerotial bodies on the upper surface. These small patches show abundant well developed dendrohyphidia of typical form although no sign of basidia in any stage of development can be found. Apparently the dendrohyphidia develop rapidly from the inception of the basidiocarp. This is well exemplified by specimen Hansbrough 176 (BPI).

*Laeticorticium minnsiae* is the only known species of *Laeticorticium* that possesses a means of asexual propagation. The sclerotial stage is usually associated with the perfect stage, and is a reliable diagnostic aid.

#### *Specimens examined*

CANADA. BRITISH COLUMBIA. Cinema, on *Tsuga heterophylla* (Raf.) Sarg., Ziller, 23 VII 1949 (NY); D'Arcy, on *Pinus ponderosa* Laws., Hansbrough 174 (NY).

ONTARIO. Woods east of Maple, on *T. canadensis* (L.) Carr., Jackson (TRTC 8232, BPI); Bell's Lake, Parry Sound, on *T. canadensis*, Jackson (TRTC 8233, BPI); Sutton, on *T. canadensis*, Jackson (TRTC 11700, BPI); woods near Holland River Marsh, on *T. canadensis*, Jackson, TYPE (TRTC 11131, BPI, NY); Chalk River, on *T. canadensis*, Jackson (TRTC 17493, NY); woods east of Maple, on *T. canadensis*, Jackson (TRTC 9835, NY); Toronto, on *T. canadensis*, Jackson and Cain (TRTC 8231, NY); west of Aurora, on *T. canadensis*, Jackson (TRTC 13240, NY); Holland River Marsh, on *T. canadensis*, Jackson (TRTC 12176, NY). QUEBEC. Mt. Burnet, on *T. canadensis*, Jackson (TRTC 22948, NY). U.S.A. CALIFORNIA. Darlingtonia, Del Norte County, on *Pseudotsuga menziesii*, Parks, 6947 (NY). MAINE. Brookton, on *T. canadensis*, Eno (FP 88979, BPI); Orient, on *T. canadensis*, Eno & Hansbrough (FP 88986, BPI); Bar Harbor, on *T. canadensis*, Hansbrough (FP 93577, BPI); Dover-Foscroft, on *T. canadensis*, Hansbrough & Eno (FP 88982, BPI); Skowhegan, on *T. canadensis*, Eno (FP 88980, BPI). MICHIGAN. Keweenaw Point,



on *T. canadensis*, Minns 281 (NY); NEW HAMPSHIRE. Waterville, on *T. canadensis*, Hansbrough 176 (BPI); Plainfield, on *T. canadensis*, Eno (FP 69972, BPI); Bottomless Pit, Hanover, on *T. canadensis*, Overholt 20462 (PAC); Intervale, on *T. canadensis*, Thaxter, 1 X 1901 (NY); Thornton, on *T. canadensis*, Hansbrough 177 (NY); Plainfield, on *T. canadensis*, Eno (FP 69972, BPI). NEW YORK. King's Ravine north of Frontenac Point, Lake Cayuga, on *T. canadensis*, Jackson, 13 X 1946 (NY); Eagle's Nest Inlet, on *T. canadensis*, Overholts 18946 (PAC); Lewis on *T. canadensis*, Povah, VIII 1920 (NY); Watkins Glen, on *Picea?*, Beach & Fairchild 4031 (BPI); Alexandria Bay, on *T. canadensis*, Eno & Hansbrough, 12 IX 1935 (BPI); Morish Center, on *T. canadensis*, Eno (FP 88979, BPI). NORTH CAROLINA. Cranberry, on *T. canadensis*, Thaxter, VII-VIII 1887 (NY). OREGON. Rhododendron, on *P. menziesii*, Kimme & Childs (FP 68063, BPI); Rhododendron, on *Pinus contorta* Dougl., Hansbrough 31 III 1931 (BPI); Rhododendron, on *P. menziesii*, Hansbrough 175 (BPI). PENNSYLVANIA. Laurel Run, Huntingdon County, on *T. canadensis*, Overholts & Vesta Green 22819 (PAC); Lamar Gap, Clinton County, on *T. canadensis*, Overholts 22921 (PAC); Stone Creek, Huntingdon County, on *T. canadensis*, Overholts 19734 (PAC); Ross Run, Huntingdon County, on *T. canadensis*, Overholts 16885 (PAC); Laurel Run, Huntingdon County, on *T. canadensis*, Overholts 20207 (BPI). VERMONT. Bethel, on *T. canadensis*, Spaulding (FP 93265, BPI).

*Laeticorticium mississippiense* Lentz, in Larsen & Gilbertson, Can. J. Bot. 52:688. 1974.

Basidiocarps apparently annual, resupinate, occurring in small patches which eventually coalesce, up to 0.2 mm thick, pruinose; fertile area pale yellowish buff (near 2.5 Y 8/4), hymenial surface smooth; subiculum obscure, apparently concolorous with to paler than the fertile area; margin narrow, pruinose, concolorous with to paler than the fertile area.

Subicular hyphae compact, 2–2.5 (–3)  $\mu\text{m}$  diam, becoming 3–3.5  $\mu\text{m}$  towards the hymenium, heavily incrustated with granular material; dendrohyphidia (Fig. 24) arising from the same level as basidia, 2–4  $\mu\text{m}$  diam at base, clamped, becoming extensively and very intricately branched; probasidia (Fig. 25)

formed directly adjacent to subicular tissue, globose to subglobose, often napiform, 12–18  $\mu\text{m}$  across; mature basidia (Fig. 26) 40–65 (–75)  $\times$  9–13  $\mu\text{m}$ , sinuous-clavate, 4-sterigmate, sterigmata up to 5  $\mu\text{m}$  long; basidiospores (Fig. 27) 15–18  $\times$  8–11  $\mu\text{m}$ , obovate to broadly ellipsoid.

*Laeticorticium mississippiense* is separated from other species of the genus by its very thin and scanty basidiocarps, noticeably globoid probasidia, and compact subicular tissue. Its spores are similar to those of *L. canfieldii* in size and shape.

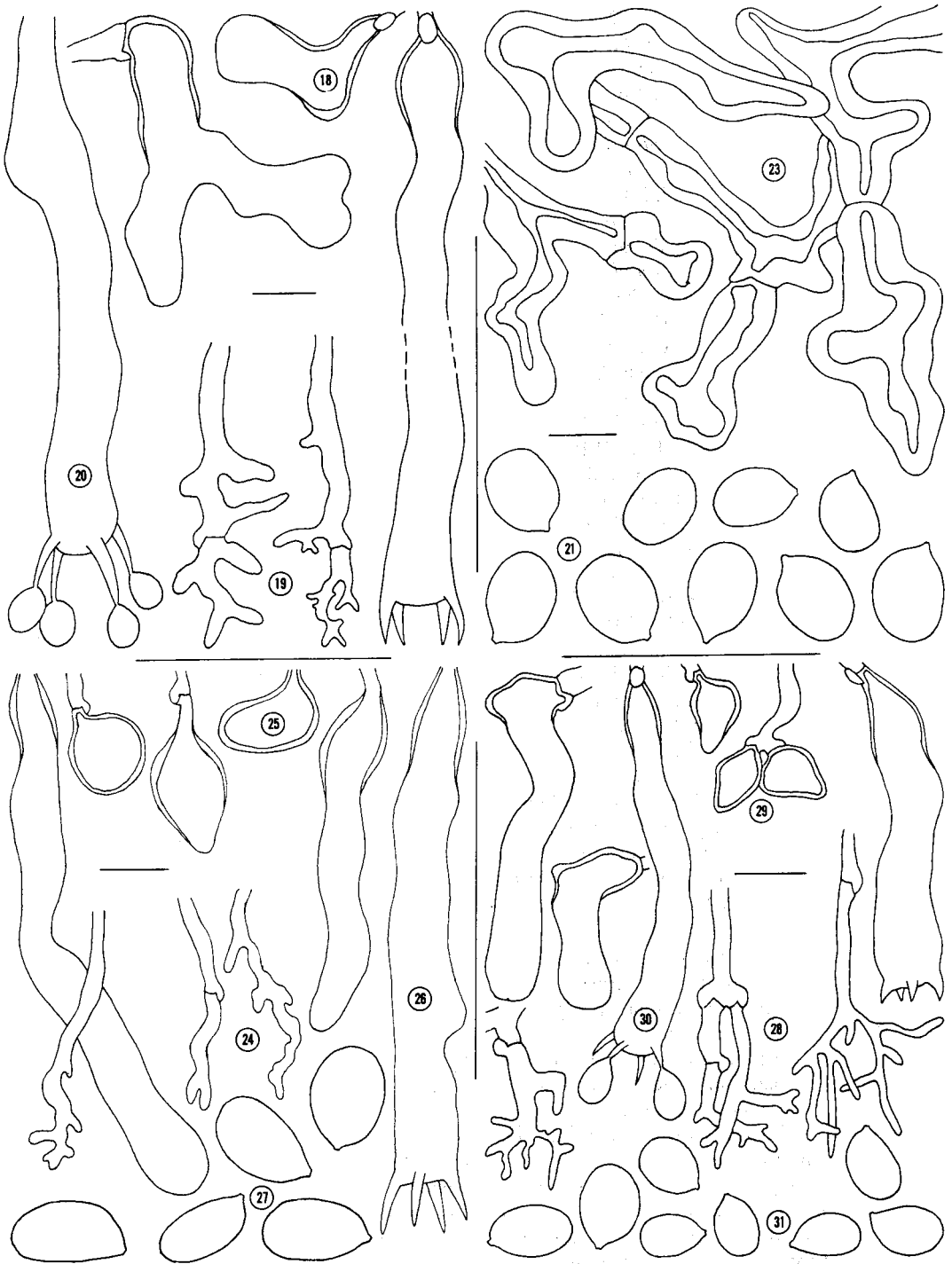
#### *Specimens examined*

U.S.A. ARIZONA. Coronado National Forest, Santa Cruz County, Atascosa Mts., Sycamore Canyon, on *Quercus emoryi* Torr., Canfield 72–162 (ARIZ, CFMR); Santa Catalina Mts., Pima County, on *Juglans major* (Torr.) Heller, Canfield 71–86 (ARIZ, CFMR); MISSISSIPPI. Stoneville, on hardwood (?*Quercus*) on the ground, Lentz (CFMR, FP 106848); on *Cornus*, Lentz (CFMR, FP 106807); on *Morus*, Lentz (holotype in BPI, FP 106664, and isotype in CFMR).

*Laeticorticium pini* (Jacks.) Donk, Fungus 26:17. 1956. *Aleurodiscus pini* Jacks., Can. J. Res. (C)28:74. 1950.

Basidiocarps annual (? biennial), usually consisting of thin, scattered patches on the underside of small branches, up to 200  $\mu\text{m}$  thick, sometimes confluent to form a more extensive mat, not readily separable; hymenial surface pale buff (near 2.5 Y 8/4 and 10.0 YR 8/4), appearing finely tomentose under a 25  $\times$  lens; subiculum pale buff, soft; margin fertile, abrupt, or thinning out and arachnoid, white.

Subicular hyphae 2–4 (–5.5)  $\mu\text{m}$  diam, hyaline to pale yellowish brown, septate, usually with clamps, with occasional branching, thin to moderately thick-walled; dendrohyphidia (Fig. 28) abundant, clamped, some much-branched, branches 1–2  $\mu\text{m}$  diam; probasidia (Fig. 29) terminal or intercalary, fusiform to spherical, often thick-walled, up to 10  $\mu\text{m}$  diam; mature basidia (Fig. 30) 80–100  $\times$  7–8 (–9)  $\mu\text{m}$ , narrowly clavate, 4-sterigmate, sterigmata up to 4.5  $\mu\text{m}$  long; basidiospores (Fig. 31) 9–11 (–13)  $\times$  5–7.5 (–9)  $\mu\text{m}$ , ovoid to ellipsoid, somewhat flattened on one side, with prominent apiculi.



Figs. 18-21; 23-31. Microscopical characteristics of species of *Laeticorticium*. Scale bars equal 10  $\mu$ m. Figs. 18-21, 23. *Laeticorticium minnsiae* (from type). Fig. 18. Dendrohyphidia. Fig. 19. Probasidia. Fig. 20. Basidia. Fig. 21. Basidiospores. Fig. 23. Thick-walled hyphae of sclerotial body. Figs. 24-27. *Laeticorticium mississippiense* (from type). Fig. 24. Dendrohyphidia. Fig. 25. Probasidia. Fig. 26. Basidia. Fig. 27. Basidiospores. Figs. 28-31. *Laeticorticium pini* (from type). Fig. 28. Dendrohyphidia. Fig. 29. Probasidia. Fig. 30. Basidia. Fig. 31. Basidiospores.

*Laeticorticium pini* may be separated from other species in the genus by its occurrence on *Pinus strobus* and size of basidiospores (9–11 (–13) × 5–7.5 (–9) μm). The fungus is probably distributed throughout the natural range of *P. strobus*.

*Specimens examined*

CANADA, ONTARIO. Woods north of Summit Golf Club, Richmond Hill. on *P. strobus*, Jackson (TRTC 11640, BPI); also (TRTC 8230, SYRF, BPI); Munising, Simcoe County, on *P. strobus*, Cain, (TRTC 32472, BPI); Midhurst, Simcoe County, on *P. strobus*, Cain, (TRTC 30075, BPI); Maple, York County, on *P. strobus*, Linder, 5 V 1936 (TRTC, BPI); Algonquin Park, on *P. strobus*, Jackson (TRTC 17631, BPI); Constance Bay, NW of Ottawa, on *P. strobus*, Jackson, 30 VI 1938 (TRTC, BPI); Oakland Swamp, Brant County, on *P. strobus*, Cain (TRTC 16494, BPI); Richmond Hill, on *P. strobus*, Jackson (TRTC 13241, BPI). U.S.A., NEW HAMPSHIRE. Jeffrey on *P. strobus*, Darker (FP 6822, BPI). NEW YORK. Warrensburg, on *P. strobus*, Gilbertson 5806, 5811 (SYRF); Ithaca, Coy Glen, on *P. strobus*, Nobles (DAOM 31466, SYRF); Minnewaska, on fallen pine limbs, Peck (MO 55980, BPI).

*Laeticorticium roseum* (Pers. per Fr.) Donk, Fungus 26:17. 1956. *Corticium roseum* Pers., Dispos. Meth. Fung., p. 31. 1797 (devaluated name). *Thelephora (Himantia) rosea* (Pers.) per Fr., Syst. Mycol. 1:451. 1821. *Lyomyces roseus* (Pers. per Fr.) Karst., Bidr. Kann, Finl. Nat. Folk. 37:153. 1882. *Hypochnus roseus* (Pers. per Fr.) Schroet., in Cohn, Krypt.-Fl. Schles. 3(1):417. 1889. *Peniophora rosea* (Pers. per Fr.) Masee, auct., J. Linn. Soc. (Bot.) 25:146. 1889–1890 [1890].

*Corticium roseolum* Masee, J. Linn. Soc. (Bot.) 27:140. 1890–1891 [1891].

Basidiocarps biennial, appearing determinant on branches of standing *Populus* sp. and *Salix* sp. and somewhat aleurodiscoid, usually adherent, sometimes separable, soft, sometimes cracking on drying and exposing the white subiculum; hymenial surface cream white to dull pinkish buff (7.5 YR 8/4); sterile margin narrow and abrupt.

Subicular hyphae 2.5–5 μm diam, becoming thick-walled, septate, clamped, branching frequently; dendrohyphidia (Fig. 32) abundant,

especially conspicuous in immature basidiocarps, intricately branched, often clamped, main branches 2–3 μm diam; probasidia (Fig. 33) abundant in late fall and early spring, at first thick-walled, spherical to elongated, some forked or lobed, elongating in late spring and early summer; mature basidia (Fig. 34) 70–100 × 7–10 μm, often sinuous-clavate, 4-sterigmate, sterigmata 2–3 μm diam at the base, up to 8 μm long; basidiospores (Fig. 35) distinctly apiculate, narrowly ellipsoid, mostly flattened on one side, 17–24 × 8–12 μm.

We have referred basidiocarps of what appear to represent several species to the '*L. roseum*-complex.' This complex is characterized by hyphae with clamp connections, deeply imbedded probasidia, a pink to ochraceous hymenial surface, and large ovate to ellipsoid basidiospores that are pink to pinkish red in mass. Numerous specimens from the Mississippi Valley and southwestern, northwestern, and north central United States have been placed in this complex. However, we are now able to state with some certainty the criteria necessary to delimit the species that are placed here. We have arrived at the following:

- (1) Spore shape and dimension must be obtained from freshly discharged basidiospores.
- (2) The type of mating system must be ascertained.
- (3) Interfertility tests must be employed among those similar fungal populations with the same, overlapping, or disparate distributions.
- (4) Degree of host specificity must be recognized.

At present we are reasonably satisfied that *L. roseum* of Persoon is homothallic and is the species he recorded from *Populus* sp. and *Salix* sp. It is also our contention that this fungus is equivalent to *L. roseum*-group A of Boidin et al. (1968).

*Specimens examined*

CANADA, ONTARIO. Sault Ste. Marie District, Kirkwood Management Area north of Thessalon, on *Populus tremuloides* Michx., Larsen 3504 (CFMR, SSMF 695–4580); Sault Ste. Marie, 4th line and Old Goulais Bay Road, on *P. tremuloides*, Larsen 3508 (CFMR, SSMF 695–4581); St. Joe's Island, on *P. tremuloides*, Trieselmann (CFMR. FP 133130).

FRANCE. Drancy (Seine St. Denise), on *Salix* sp., Hesp lede (Boidin herb. 5242, LY); Pr s de Nivolet (Ain), *Salix cinerea* L., Berthier (Boidin herb. 5248, LY); Ermenonville (Oise), *Salix* sp., Hesp lede (Boidin herb. 5774, LY). U.S.A., NEW YORK. Tully, Heiberg Memorial Forest, on *P. tremuloides*, Gilbertson 5802 (CFMR). WISCONSIN. Cambridge, on *P. tremuloides*, Larsen (CFMR, FP 133144); Nicolet National Forest, near Whitefish Lake, on *P. tremuloides*, Larsen (CFMR, FP 133166), and at junction of Forest Service roads 2114 and 2118, on *P. tremuloides*, Larsen (CFMR, FP 133177).

THE GENUS *DENDROCORTICIUM*

*Dendrocorticium* Larsen & Gilbertson, Norw. J. Bot. 21:225. 1974. *Laeticorticium* Donk sect. *Laeticorticium* Parm., pro parte, Consp. Syst. Cortic., p. 151. 1968. Nomenclatural type species *Dendrocorticium polygonioides* (Karst.) Larsen & Gilbertson.

Basidiocarps annual, effused; hymenial surface smooth; hyphal system monomitic; subicular hyphae usually septate with clamp connections and with some wall thickening; dendrohyphidia present, with or without a well defined cataphytenium; probasidia present and formed in the subhymenium; mature basidia formed by intrusive metabasidial growth, up to 75 µm long, frequently projecting noticeably above the cataphytenium; basidiospores rarely exceeding 12 µm in length, subglobose, ellipsoid, or broadly ovoid, smooth, hyaline, thin-walled, negative in Melzer's reagent, acyanophilous. Spore prints usually white, sometimes pale red.

KEY TO THE SPECIES OF *DENDROCORTICIUM*

- 1. Basidiospores usually more than 9 µm long . . . . . 2
- 1. Basidiospores usually less than 9 µm long . . . . . 4
- 2. Basidia 40–70 µm long . . . . . 3
- 2. Basidia 75–100 µm long . . . . . *D. jonides*
- 3. Basidiocarps membranous and separable, up to 0.5 mm thick, not reflexed; buff to yellowish brown *D. lilacinoroseum*
- 3. Basidiocarps often firm and waxy, not readily separable, up to 1.5 mm thick, often reflexed; in part usually some shade of purple or violet *D. roseocarneum*

- 4. Basidiocarp tissue, in part, amyloid in Melzer's reagent . . . . . *D. piceinum*
- 4. Basidiocarp tissue negative in Melzer's reagent . . . . . 5
- 5. Basidiospores subglobose to broadly ovoid, 4–6.5 × 3–5 µm; usually on *Fraxinus nigra* in northeastern North America . . . . . *D. violaceum*
- 5. Basidiospores 6–10 × 3.5–6 µm . . . . . 6
- 6. Basidiocarps with conspicuous white mycelial strands; basidiospores 6–10 × 3.5–4.5 µm . . . . . *D. lundellii*
- 6. Basidiocarps without mycelial strands; basidiospores 6–9 × 1–6 µm . . . . . *D. polygonioides*

*Dendrocorticium jonides* (Bres. in Brinkm.) Larsen & Gilbertson, Norw. J. Bot. 21:225. 1974. *Corticium jonides* Bres. in Brinkm., Jahresber. Westfal. Prov. Ver. Wissen. und Kunst 26:128. 1898. *Aleurodiscus jonides* (Bres. in Brinkm.) Bourd. & Galz., Bull. Soc. Mycol. France 28:353. 1912. *Laeticorticium jonides* (Bres. in Brinkm.) Donk, Fungus 26:17. 1956.

*Corticium jonides* var. *dealbatum* Bres. in Brinkm., Jahresber. Westfal. Prov. Ver. Wissen. und Kunst 26:128. 1898.

Basidiocarps apparently biennial, curling away from the substratum in some portions, effused up to 5 × 3 cm, up to 0.3 mm thick, firm, mostly adherent or separable in small pieces, somewhat waxy, cracking slightly on drying; hymenial surface smooth, slightly powdery or minutely pulverulent under a 10 × lens, pale to dark buff (near 10.0 YR 8/6 and 10.0 YR 8/4); subiculum and subhymenial tissue concolorous to somewhat paler than the hymenial region; sterile margin irregular in outline, narrow, almost white to concolorous with the fertile portion, villose.

Subicular hyphae 2–3.5 µm diam, parallel to the substratum, compact, clamped, hyaline, somewhat thick-walled, walls appearing gelatinous in KOH; subhymenial hyphae 2.5–3.5 µm diam, septate, clamped, hyaline, thin-walled; other hyphae 3–5 µm diam, clamped, with rare branching, vertically oriented, giving rise to hymenial dendrohyphidia (Fig. 36); probasidia (Fig. 37) napiform, becoming elongated; mature basidia (Fig. 38) 75–79 (–110) × 5–8 µm, clavate, with constrictions and swellings, 4-sterigmate, sterigmata up to 6 µm long; basidiospores (Fig. 39) 8.5–10

(-12)  $\times$  6.5-7  $\mu\text{m}$ , conspicuously apiculate, broadly ellipsoid to ovoid.

This species has been widely treated in the European literature and is reported from North America by Moffatt (1909) as *Corticium jonoides* Bres., but this report is probably based on a specimen of *D. roseocarneum*. We have seen no North American specimens of *D. jonoides*.

In the original description of the species, the specific epithet was spelled 'jonides', and this same orthography is followed in Brinkmann's exsiccati. However, Pilát (1926), Bourdot & Galzin (1928), Litschauer (1944), and Boidin (1971) have spelled the epithet as 'ionides'. In Brinkmann's diagnosis the color of basidiocarps is given as 'lilacino-amethysteum vel isabellino-testaceum.' The prefix 'ion-' (Gr.) in the word 'ionides' means violet colored. We consider Brinkmann's name, therefore, as one containing questionable orthography, but are reluctant to adopt a change involving the initial letter of the epithet (see Article 73, Note 2 of the Code). We recommend the continued use of 'jonides'.

#### *Specimens examined*

GERMANY. Lengerich, an Rinde und Holz von *Fagus* sp., Winter 1899/1900; no. 6 in Brinkmann, Vorarbeiten zu einer Pilzflora Westfalens (type of *C. jonoides*); Lengerich, an Rinde von *Salix* sp., Winter, 1899-1900; no. 7 in Brinkmann, Vorarbeiten zu einer Pilzflora Westfalens (type of *C. jonoides* var. *dealbatum*); Lengerich, in cortice *Salicis*, Brinkmann, I 1898 (TRTC ex S); Lengerich, on *Fagus* sp., Brinkmann, I 1898 (TRTC ex S); Lengerich, ad corticem *Fagi*, Brinkmann, IV 1897 (TRTC ex S); Tirol, Brandenbergerthal bei Brixlegg, Litschauer, 10 X 1920 (TRTC ex S, herb. Litschauer). SWEDEN. Öland; Persnäs parish, Stenninge, on *Rosa* sp., Nannfeldt, 20 VII 1953 (TRTC ex S, Flora Suecica).

*Dendrocorticium lilacinroseum* (Pat.) Larsen & Gilbertson, Norw. J. Bot. 21:225. 1974. *Hypochnus lilacinroseus* Pat., Catal. Raisonné Plant. Cellul. Tunis., p. 62. 1897.

Basidiocarps annual, up to 0.5 mm thick, effused in small patches up to 5 mm diam, often anastomosing and becoming laterally confluent, membranous, somewhat separable; hymenial surface smooth, buff or pinkish buff

to yellowish brown (near 7.5 YR 8/4); subiculum white; sterile margin narrow, white, arachnoid.

Subicular hyphae hyaline, moderately thick-walled, clamped, 2.5-3.5 (-4)  $\mu\text{m}$  diam; dendrohyphidia (Fig. 40) abundant but apparently not forming an obvious and distinct catahymenium, coarsely branched and lobed, clamped, sometimes lightly incrustated with granular material, 3-4  $\mu\text{m}$  diam; probasidia (Fig. 41) frequently napiform; basidia (Fig. 42) (40-) 60-70  $\times$  6-8  $\mu\text{m}$ , long clavate, sometimes tortuous and constricted and somewhat swollen, 4-sterigmate, sterigmata up to 5  $\mu\text{m}$  long; basidiospores (Fig. 43) 9-11 (-12)  $\times$  4-6.5  $\mu\text{m}$ , ellipsoid, blunt-apiculate.

This species is well characterized by size of spores, and size of soft, separable, fruiting bodies. The spores resemble those of *L. roseum* in shape, but in the latter they are much larger.

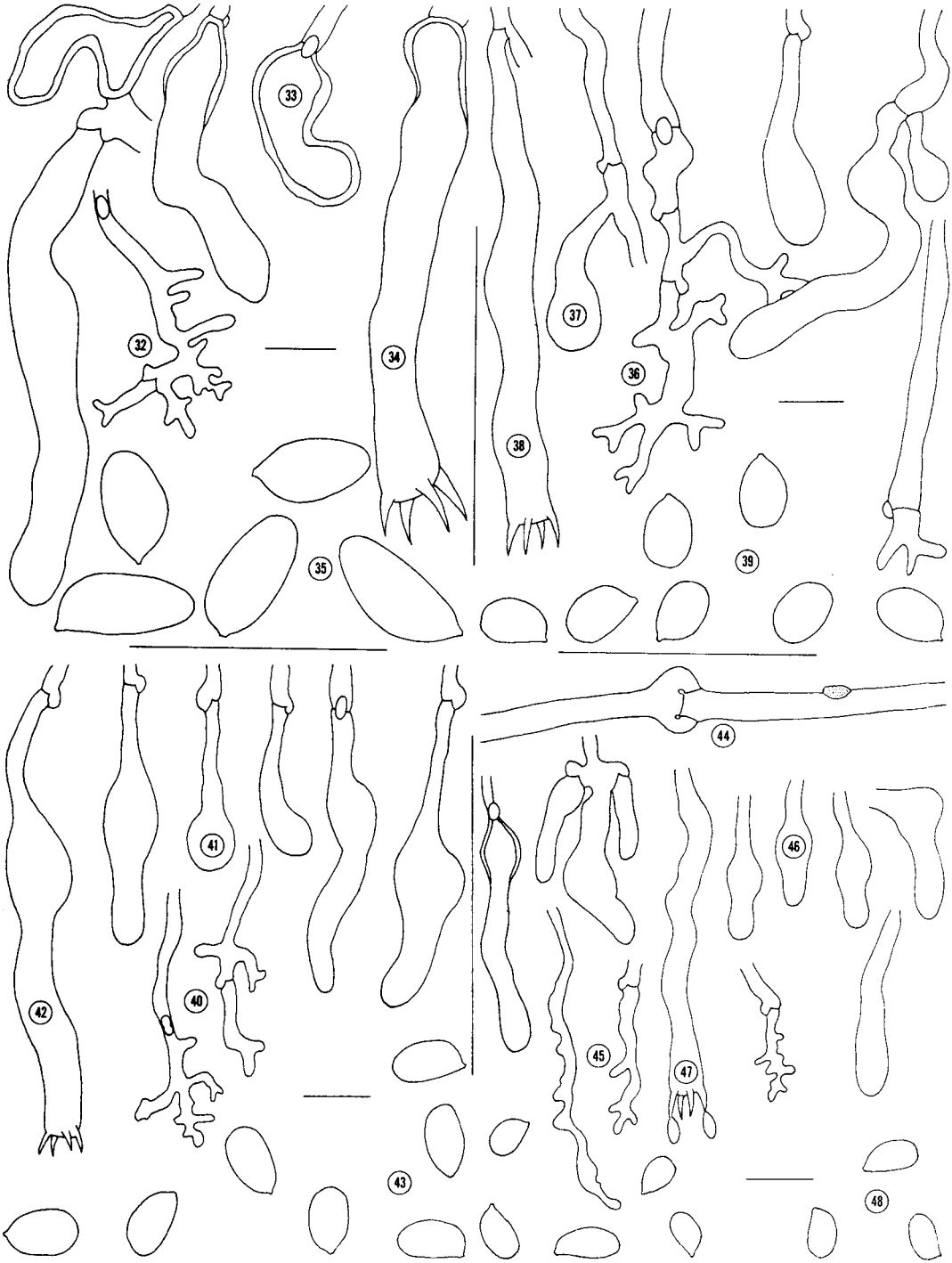
#### *Specimens examined*

TUNISIA. El Fedja, on oak, Patouillard, January 1893 (holotype in Patouillard herb., FH).

*Dendrocorticium lundellii* (J. Erikss.) Larsen & Gilbertson, Norw. J. Bot. 21:225. 1974. *Laeticorticium lundellii* J. Erikss., Symb. Bot. Upsal. 16:(1) 74. 1958.

Basidiocarps effused, up to 0.5 mm thick, readily separable from substratum; hymenial surface pale buff (near 2.5 Y 8/2), in some areas appearing reticulate, with white mycelial strands and thicker pink rhizomorphs visible in the underlying subiculum, in better developed areas with an unbroken, continuous surface, farinaceous under 10  $\times$  lens; margin strikingly fimbriate with the white, feathery mycelial strands extending out up to 5 mm beyond the fertile area, a few thicker, pink rhizomorphs also present; subiculum soft, white, very thin.

Subicular hyphae (Fig. 44) 2-4  $\mu\text{m}$  diam, hyaline, thin-walled, clamped, with scattered incrustation, multiple clamps frequent; dendrohyphidia (Fig. 45) numerous, up to 2.5  $\mu\text{m}$  diam, thin-walled, some with rather extensive and irregular branching, others with little or no branching but contorted; probasidia (Fig. 46) somewhat napiform, wall thickening infrequent; basidia (Fig. 47) narrowly clavate, 30-50  $\times$  4-6  $\mu\text{m}$ , 4-sterigmate,



Figs. 32-48. Microscopical characteristics of species of *Laeticorticium* and *Dendrocorticium*. Scale bars equal 10  $\mu$ m. Figs. 32-35. *Laeticorticium roseum* (from MJL 3504). Fig. 32. Dendrohyphidia. Fig. 33. Probasidia. Fig. 34. Basidia. Fig. 35. Basidiospores. Figs. 36-39. *Dendrocorticium jonides* (from type). Fig. 36. Dendrohyphidia. Fig. 37. Probasidia. Fig. 38. Basidia. Fig. 39. Basidiospores. Figs. 40-43. *Dendrocorticium lilacinoroseum* (from type). Fig. 40. Dendrohyphidia. Fig. 41. Probasidia. Fig. 42. Basidia. Fig. 43. Basidiospores. Figs. 44-48. *Dendrocorticium lundellii* (from RLG 4757). Fig. 44. Subicular hyphae. Fig. 45. Dendrohyphidia. Fig. 46. Probasidia. Fig. 47. Basidia. Fig. 48. Basidiospores.

sterigmata slender, curved, up to 5  $\mu\text{m}$  long; basidiospores (Fig. 48) 6–10  $\times$  3.5–4.5  $\mu\text{m}$ , with a large apiculus, ovoid to oblong.

In the original description Eriksson gives the color of the fresh basidiocarps as 'Grenadine Pink' or 'Venetian Pink'. He also reports the spore print as being pale red. Basidiocarps of *D. lundellii* are distinguished by their pale pink color and the conspicuous white mycelial strands at the margin.

#### *Specimens examined*

CANADA, ALBERTA. Whitecourt, on *Populus balsamifera* L., Gilbertson 3439 (SYRF); Whitecourt, on *Picea glauca* (Moench) Voss, Gilbertson 6652 (SYRF); Athabasca River, Jasper National Park, on *Pinus contorta* Dougl., Gilbertson 4757 (SYRF); YUKON TERRITORY. Mile 1005, Alcan Highway, on *Salix* sp., Gilbertson 8804 (ARIZ). SWEDEN. Uppland, Uppsala, 1 km. S of Hågaborg, Nilsson (SYRF ex herb. John Eriksson 2012); Uppland, Bondkyrka parish, near Uppsala, on dead stems of *Rubus* sp., Lundell, Fungi Suecici 189 (TRTC); Hälsingland, Harmånger parish, Stränsbruk, on coniferous wood, Eriksson 90 (TRTC); Djurö, Runmarö, Vägen Södersunda-Skogsberga ödetorp, vid första kalkhällen, Eriksson & Haglund, 3 XI 1949 (TRTC ex S).

#### *Dendrocorticium piceinum* Lemke, sp. nov. Etymology—from *Picea*.

Basidiocarpis effusis, albis e alboluteis e luteis; hyphis subculis et subhymeniis amyloideis in IKI; hyphis sterilibus in hymeniis subulatis vel obclavatis; basidiosporis 7.5–8  $\times$  5–6  $\mu\text{m}$ , late ellipsoideis e subglobois.

Holotypus—Canada, Ontario, Kenora District, N. Vermillion Bay, ad lignum *Picea* sp., leg. R. F. Cain, 6 V 1956 (TRTC 33417); isotypi in herb. NO, J. Eriksson, BPI, CFMR, DAOM, FH, K, L, LE et NY.

Basidiocarps apparently annual, effused up to 8  $\times$  3 cm, occurring in small patches which eventually coalesce, firm, separable, up to 0.8 mm thick; hymenial surface smooth, pruinose, cracking upon drying, pale buff to pale yellowish buff (near 2.5 YR 8/4 and 2.5 YR 8/6); subiculum white; margin pale yellow to white, abrupt to becoming villose or pruinose.

Subicular hyphae 2–4  $\mu\text{m}$  diam, septate, clamped, hyaline, wall thickening apparent,

branching frequently; other hyphae 1–2  $\mu\text{m}$  diam, branching extensively and occurring throughout the subiculum and subhymenium, amyloid in Melzer's reagent; dendrohyphidia (Fig. 49) abundant (catahymenial development discontinuous), arising from tissue directly adjacent to the subiculum, degree of branching at apices variable, 2–3  $\mu\text{m}$  diam, clamped; sterile elements (Fig. 50) in the hymenium subulate to obclavate, often tortuous and constricted, up to 40  $\mu\text{m}$  long, not projecting above the hymenium; probasidia (Fig. 51) not readily discernible; mature basidia (Fig. 52) 45–55  $\times$  7–8  $\mu\text{m}$ , often with a median swelling (? probasidium), upper part of the basidium approximately cylindrical, 4-sterigmate, sterigmata up to 8  $\mu\text{m}$  long; basidiospores (Fig. 53) 7.5–8  $\times$  5–6  $\mu\text{m}$ , broadly ellipsoid to subglobose, hyaline.

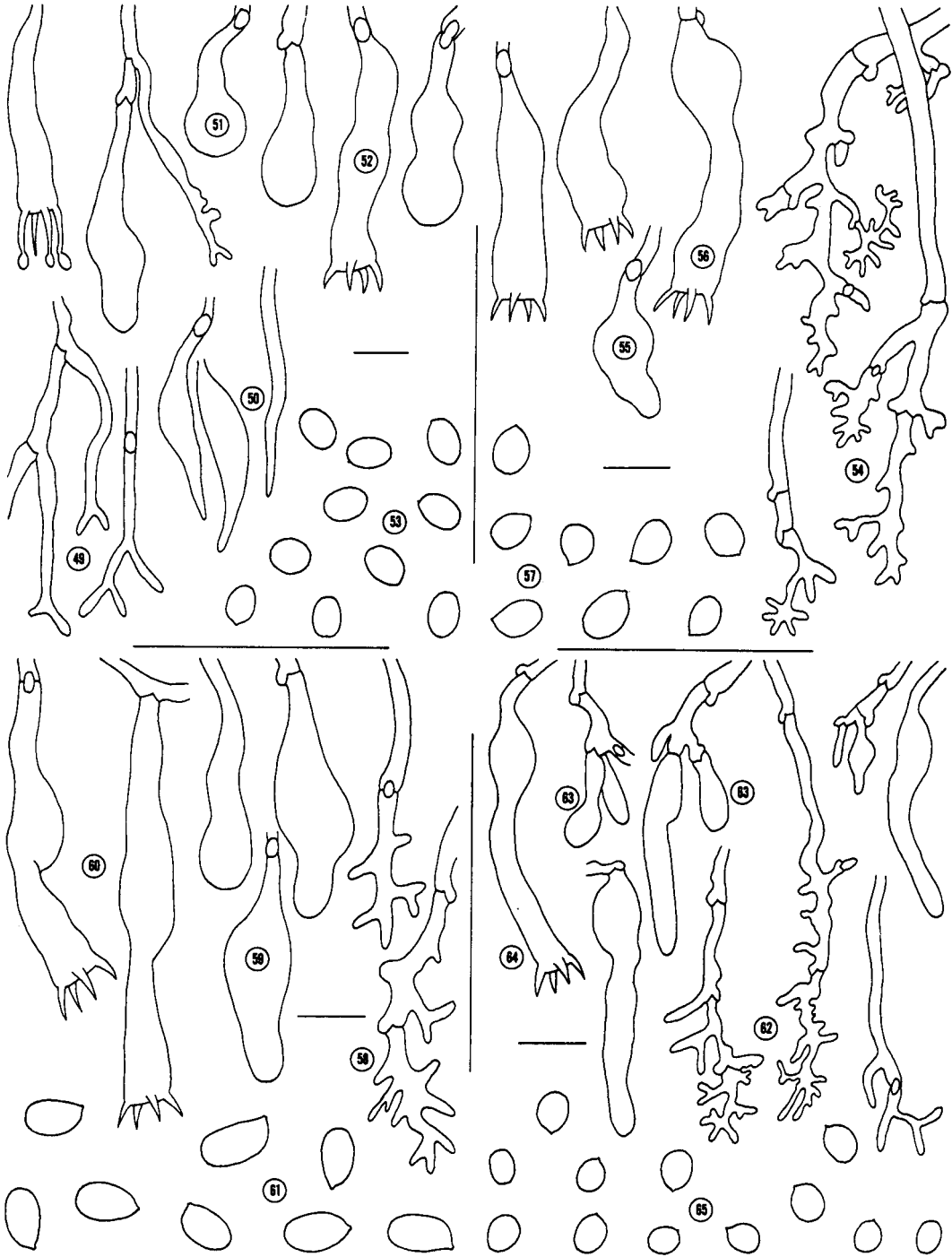
Basidial development of *D. piceinum* is somewhat atypical for the genus. Basidial initials are positioned in the subhymenium at the base of the branching portion of dendrohyphidia, and in this respect can be likened to *Dentocorticium*. The basidial ontogeny in the material studied suggests, however, that probasidial and metabasidial stages are present, but the typical form is not as accentuated as it is in other species. This and the shape and size of the spores suggest the affinity with *Dendrocorticium*.

#### *Other specimens examined*

CANADA, ONTARIO. Algoma District, Little White River, on *Picea* sp., Cain (TRTC 32513, NO, CFMR); U.S.A., SOUTH CAROLINA. Sand Hills State Forest, Cheraw, on *Taxodium distichum* (L.) Rich, Hodges, 25 IX 1960 (CFMR).

*Dendrocorticium Polygonioides* (Karst.) Larsen & Gilbertson, Norw. J. Bot. 21:225. 1974. *Corticium Polygonioides* Karst., Medd. Soc. Fauna Fl. Fenn. 6:12. 1881. *Xerocarpus polygonioides* (Karst.) Karst., Rev. Mycol. 3:22. 1881. *Xerocarpus polygonium* var. *polygonioides* (Karst.) Karst., Acta Soc. Fauna Fl. Fenn. 2:38. 1881. *Lyomyces polygonioides* (Karst.) Karst., Finska Vet. soc. Bidr. Nat. Folk 58:419. 1889. *Laeticorticium polygonioides* (Karst.) Donk, Fungus 26:17. 1956.

Basidiocarps annual or (?) biennial, resupinate, effused up to 9  $\times$  5 cm, up to 1.0 mm thick, mostly dark buff to medium brown



Figs. 49-65. Microscopical characteristics of species of *Dendrocorticium*. Scale bars equal 10  $\mu\text{m}$ . Figs. 49-53, *Dendrocorticium piceinum* (from type). Fig. 49. Dendrohyphidia. Fig. 50. Sterile hymenial elements. Fig. 51. Probasidia. Fig. 52. Basidia. Fig. 53. Basidiospores. Figs. 54-57. *Dendrocorticium polygonioides* (from Parmasto 66). Fig. 54. Dendrohyphidia. Fig. 55. Probasidia. Fig. 56. Basidia. Fig. 57. Basidiospores. Figs. 58-61, *Dendrocorticium roseocarneau* (from JLL 3477). Fig. 58. Dendrohyphidia. Fig. 59. Probasidia. Fig. 60. Basidia. Fig. 61. Basidiospores. Figs. 62-65. *Dendrocorticium violaceum* (from type). Fig. 62. Dendrohyphidia. Fig. 63. Probasidia. Fig. 64. Basidia. Fig. 65. Basidiospores.



(near 7.5 YR 7/2, 7/4, and 8/4; and 10.0 YR 7/8), cracking extensively on drying and exposing fibrous subiculum, velvety or finely tomentose; subiculum soft, white next to the substratum, becoming increasingly buff colored towards the hymenial region; margin cottony, villose to fimbriate, usually paler than older parts, but some parts becoming dark buff.

Subicular hyphae 2–4.5  $\mu\text{m}$  diam, the diameter decreasing with subsequent hyphal branching to 1–1.5  $\mu\text{m}$  diam, septate, clamped, hyaline; dendrohyphidia (Fig. 54) arising from upright hyphae in the subiculum, mostly under 40  $\mu\text{m}$  long, 1–2.5  $\mu\text{m}$  diam, clamped; probasidia (Fig. 55) usually napiform; mature basidia (Fig. 56) 50–60  $\times$  5–7 (–8.5)  $\mu\text{m}$ , tortuous, hyaline, 4-sterigmate, sterigmata up to 7  $\mu\text{m}$  long; basidiospores (Fig. 57) 6–9  $\times$  4–6  $\mu\text{m}$ , prominently apiculate, ovoid, sometimes appearing flattened on one side.

*Dendrocorticium polygonioides* is readily characterized by the extensively cracked basidiocarps, which are dark buff to medium brown, and ovoid basidiospores. Litschauer (1944) has indicated synonymy of this species with *D. jonides*.

#### *Specimens examined*

AUSTRIA. Innsbruck, on *Fagus* sp., Litschauer 25 (TRTC ex herb. Litschauer); Tirol, near Seefeld, on *Fagus* sp., Litschauer, 25\* (TRTC ex herb. Litschauer). ESTONIA RPSS. District Rakvere, Porkuni, ad truncum *Coryli* sp. emortuum in piceeto, Parmasto (66, Corticiaceae URSS. I.), 2 X 1956 (BPI). FINLAND. Mustiala, on *Salix* sp., Karsten, X 1881 (TRTC ex S ex herb. Sydow. Rabenhorst–Winter Fungi Europaei 2821), and on angiospermous wood, Karsten (TRTC ex S ex H). ITALY. [Trento], on angiospermous wood, Bresadola, XI 1893 (TRTC ex S). NORWAY. Kristiania, auf Laubholz-rinde, Egeland, 7 XI 1909 (TRTC ex S). SWEDEN. Uppland, Uppsala by Hägeborg, on decaying fence, Melderis & Eriksson 1301 (DAOM 69161); Uppland, Hägeborg, on *P. tremula*, Melderis (DAOM 69162); Åsele Lappmark: Dorotea Parish, on *Salix* sp., B. & J. Eriksson 3524 (DAOM 69163).

*Dendrocorticium roseocarneum* (Schw.) Larsen & Gilbertson, comb. nov. *Thelephora roseocarnea* Schw., Naturf. Gesel. Leipz.

Schrift 1:107. 1822 (basionym). *Stereum roseocarneum* (Schw.) Fr., Acta Soc. Sci. Upsala (III) 1:112. 1851. *Laxitextum roseocarneum* (Schw.) Lentz, Agric. Monograph No. 24, U.S.D.A., p. 22. 1955. *Laeticorticium roseocarneum* (Schw.) Boid., Bull. Soc. Mycol. France 74:479. 1958.

*Corticium lilacinofuscum* Berk. & Curt., Grevillea 1:180. 1873.

*Corticium subrepandum* Berk. & Cke., Grevillea 6:81. 1878.

*Stereum sendaiense* Lloyd, Mycol. Writ. 5, Mycol. Notes 48:680. 1917.

Basidiocarps annual or biennial, apparently not maturing at the end of first growing season, effused or narrowly reflexed, often firm and waxy, not readily separable, occurring in small patches and becoming confluent, frequently covering large substrate surfaces, up to 1.5 mm thick; hymenial surface smooth, color variable in dried specimens, dark purplish brown to pale violet buff (near 5.0 YR 614, 10.0 YR 514, 5.0 YR 712, 5.0 YR 3/4, 7.5 YR 614) to pale brownish yellow (near 10.0 YR 8/6), cracking on drying and exposing a pale brown to pale buff subhymenium and a white subiculum; sterile margin thin, abrupt, pruinose to fibrillose.

Subicular hyphae 2–3.5 (–4)  $\mu\text{m}$  diam, septate, clamped, hyaline, with some wall thickening; dendrohyphidia (Fig. 58) abundant and usually forming a distinct cataphymenium, 2–3.5  $\mu\text{m}$  diam, septate, clamped, hyaline to pale brown; probasidia (Fig. 59) not usually discernible, but typical when present; mature basidia (Fig. 60) 45–60  $\times$  7–9  $\mu\text{m}$ , often with a noticeable distension 15–20  $\mu\text{m}$  above the basal septum, 4-sterigmate, sterigmata up to 5  $\mu\text{m}$  long; basidiospores (Fig. 61) 8–12  $\times$  4–6  $\mu\text{m}$ , ovoid to broadly ellipsoid.

*Dendrocorticium roseocarneum* is well characterized by the color of the hymenial surface, size of spores, stratification of tissue in basidiocarps, and its apparent restriction to angiospermous substrate. It is widely distributed in eastern North America, reported from Japan as *Stereum sendaiense* Lloyd, and not yet known from Europe. Burt (1920) reported *S. sendaiense* as a synonym of *D. roseocarneum*, and cites a specimen (G. O. Malme 75) from Brazil. We have not, however, seen the Brazilian collection. Lentz (1955) also notes that it is reported from China.

Burt (1920) cites collections from the fol-

lowing stations in states other than those given below: Indiana, Massachusetts, Michigan, New Jersey, Virginia, and West Virginia.

#### *Specimens examined*

CANADA. NEW BRUNSWICK. Fredrickton, New Brunswick Forest, on *Acer* sp., Pongress 4321 (DAOM 99575). NOVA SCOTIA, Kentville, on *Fagus* sp., Harrison (DAOM F 5461); Ravine, on *Quercus* sp., Harrison 3050 (DAOM 99574). ONTARIO. London, on hardwood, Dearness 9451 (BPI, MBG 14251); Petawawa Forest Experiment Station, on *Acer* sp., Eriksson 8901 (DAOM 141288). JAPAN. Sendai, on *Fraxinus* sp., Yasuda, 17 X 1918 (BPI). SIBERIA. U.R.S.S.: oriens extremis, regio Chabarovsk, distr. Lazo, on *Corylus* sp., Parmasto 14170 (LY 4326, CFMR). U.S.A., CONNECTICUT. North Bloomfield, on *Acer rubrum* L., Eno (BPI FP 81375, TRTC). NEW HAMPSHIRE. North Conway, on *Acer* sp., Overholts 5161 (BPI). NEW YORK. Brookton, on hardwood, Muen-scher 215 (BPI); Newcomb, on *Fagus grandifolia* Ehrh., Lowe 3477 (SYRF). NORTH CAROLINA. Salem, on hardwood, Schweinitz (as *Thelephora anthocroa* in PH). PENNSYLVANIA. Spruce Creek, on hardwood, Faull (TRTC 312, BPI). WISCONSIN. Oneida County, Kemp Biological Station, Minocqua, on hardwood, Lombard & Payne (CFMR FP 101403). VERMONT. Burlington, on *Alnus rugosa* (DuRoi) Spring., Spaulding (BPI FP 43994).

*Dendrocorticium violaceurn* Jacks., sp. nov. Etymology—From *violaceus* (L., adj.) = violet colored.

Basidiocarpis effusus, rimosescenti, area fecunda pallidolilacina vel ochracea (in horto sicco); hymenio superficie laevi; margine pallido-luteo; hyphis subiculis 1.5–3.5  $\mu$ m, fibulatis, compactis; probasidiis adsunt; basidiis 30–45  $\times$  4–6  $\mu$ m; basidiospores 4–6.5  $\times$  3–5  $\mu$ m, subglobosis vel late ovoideis.

Holotypus—Canada, Ontario, Lake Timagami, Bear Island, ad ligna *Fraxinus nigra* Marsh., legit. H. S. Jackson 2 IX 1946, TRTC 21116, et isotypi in CFMR, NO, et herb. J. Eriksson.

Basidiocarpis annual, effused, margin frequently curling away from the substratum, up to 0.3 mm thick, occurring in patches

which eventually coalesce, brittle, often cracking extensively upon drying; fertile area pale lilac-brown (near 2.5 Y 814 and 10.0 YR 814); hymenial surface smooth; subiculum white; sterile margin up to 6 mm wide or absent, yellowish tan.

Subicular hyphae 1.5–3.5  $\mu$ m diam, compactly arranged and difficult to separate, clamped: dendrohyphidia (Fig. 62) 2–3 (–4)  $\mu$ m diam, clamped near point of origin, arising from hyphae directly adjacent to subicular tissue, forming a discontinuous catahymenium; probasidia (Fig. 63) napiform to short clavipedunculate; basidia (Fig. 64) 30–45  $\times$  4–6  $\mu$ m, somewhat tortuous and with median swelling, 4-sterigmate, sterigmata up to 5  $\mu$ m long; basidiospores (Fig. 65) 4–6.5  $\times$  3–5  $\mu$ m, subglobose to broadly ovoid, hyaline.

*Dendrocorticium violaceurn* is well characterized by its small spores (4–6.5  $\times$  3–5  $\mu$ m). Though we have not seen fresh specimens of this fungus, it is apparent, from the application of the name by H. S. Jackson and from annotations (dealing with the fresh condition) on a few collections, that the color of basidiocarps is frequently lilac to violet colored when encountered in the field. The color fades noticeably upon drying and with subsequent herbarium storage.

As indicated by annotations on the packet of the type, portions of the specimen were sent to NO and Dr. J. Eriksson in Sweden. These portions, if still extant, should be considered isotypic.

Based on distribution data that are available, *D. violaceum* is apparently confined to eastern Canada in the Great Lakes–St. Lawrence and Acadian Forest Regions (Halliday 1937), and occurs primarily on *Fraxinus nigra*. It is associated with a white rot.

#### *Additional specimens examined*

CANADA, NOVA SCOTIA. Anna County, Melvern Sq. Vault, on *Alnus*, Harrison 4276 and 4277 (DAOM 99462 and 99463, respectively); Kings County, Cape Split, on *Alnus* sp., Harrison 4275 (DAOM 99461). ONTARIO. Lake Timagami, on *Acer saccharum* Marsh., Jackson (TRTC 11621); Bella Lake, on *Betula alleghaniensis* Britt., Jackson (TRTC 23446); Lake Timagami, on *Fraxinus nigra*, Jackson (TRTC 11937, TRTC 11619, TRTC 11620, TRTC 11618, TRTC 20042, TRTC 13306, and TRTC 13331); Lake Tima-

gami, on *Fraxinus* sp., Jackson (TRTC 21116 and TRTC 17964); Petawawa, on *Fraxinus* sp., Jackson (TRTC 18045); S. Aurora, on *Fraxinus* sp., Jackson (TRTC 5457); Chalk River, Cory Lake, on *Fraxinus* sp., Jackson (TRTC 18035); Bella Lake, on *Fraxinus* sp., Jackson (TRTC 23176); Lake Timagami, Kokoko Bay, on *Picea*, Biggs (TRTC 10458); Beaverton, on *Populus* sp., Jackson (TRTC 20596); Lake Timagami, Bear Island, on *Prunus* sp., Jackson (TRTC 17946). QUEBEC. Gatineau Park, King Mountain, Black Lake, on hardwood, Weresub, 62-42B (DAOM 73601).

THE GENUS *DENTOCORTICIUM*

*Dentocorticium* (Parm.) Larsen & Gilbertson, *Norw. J. Bot.* 21:225. 1974. *Laeticorticium* Donk sect. *Dentocorticium* Parm., *Consp. Syst. Cortic.*, p. 151. 1968. Nomenclatural type species *Dentocorticium ussuricum* (Parm.) Larsen & Gilbertson.

Basidiocarps annual, effused; hymenial surface smooth and undulating or dentate; hyphal system monomitic or dimitic; subicular hyphae usually clamped and with some wall thicken-

ing; dendrohyphidia present, with or without a distinct and well defined catahymenium; probasidia absent; basidia clavate, 4-sterigmate, 30-50  $\mu\text{m}$  long; basidiospores rarely exceeding 4  $\mu\text{m}$  in diameter, ellipsoid to cylindrical, sometimes allantoid, smooth, hyaline, negative in Melzer's reagent, acyanophilous.

KEY TO THE SPECIES OF *DENTOCORTICIUM*

- 1. Basidiospores 5-6  $\times$  2-2.5  $\mu\text{m}$  . . . . . *D. ussuricum*
- 1. Basidiospores 6-10  $\times$  2.5-4  $\mu\text{m}$  . . . . . 2
- 2. Basidiospores allantoid . . . . . *D. sulphurellum*
- 2. Basidiospores cylindrical to ellipsoid . . . . . *D. brasiliense*

*Dentocorticium brasiliense* Larsen & Gilbertson, sp. nov. Etymology—From *brasil* (Brazil, South America) + *-ense* (L., suff. indic. origin) = *brasiliense*.

Basidiocarpa effuso, rimosescenti; area fecunda brunneopurpurascenti; hymenio superficie laevi; hyphis subiculis brunneis, 3-5 (-6)  $\mu\text{m}$  diam, fibulatis; hyphis fasciculis adsunt;

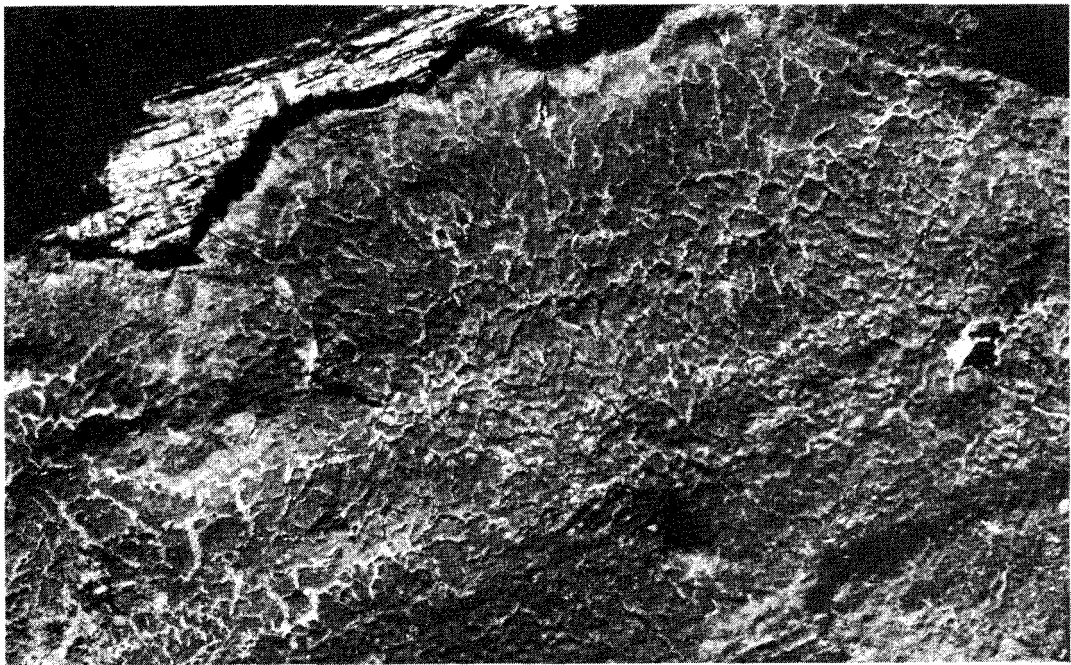


Fig. 66. Portion of the holotype of *Dentocorticium brasiliense* depicting the fissured hymenial surface ( $\times 5$ ).

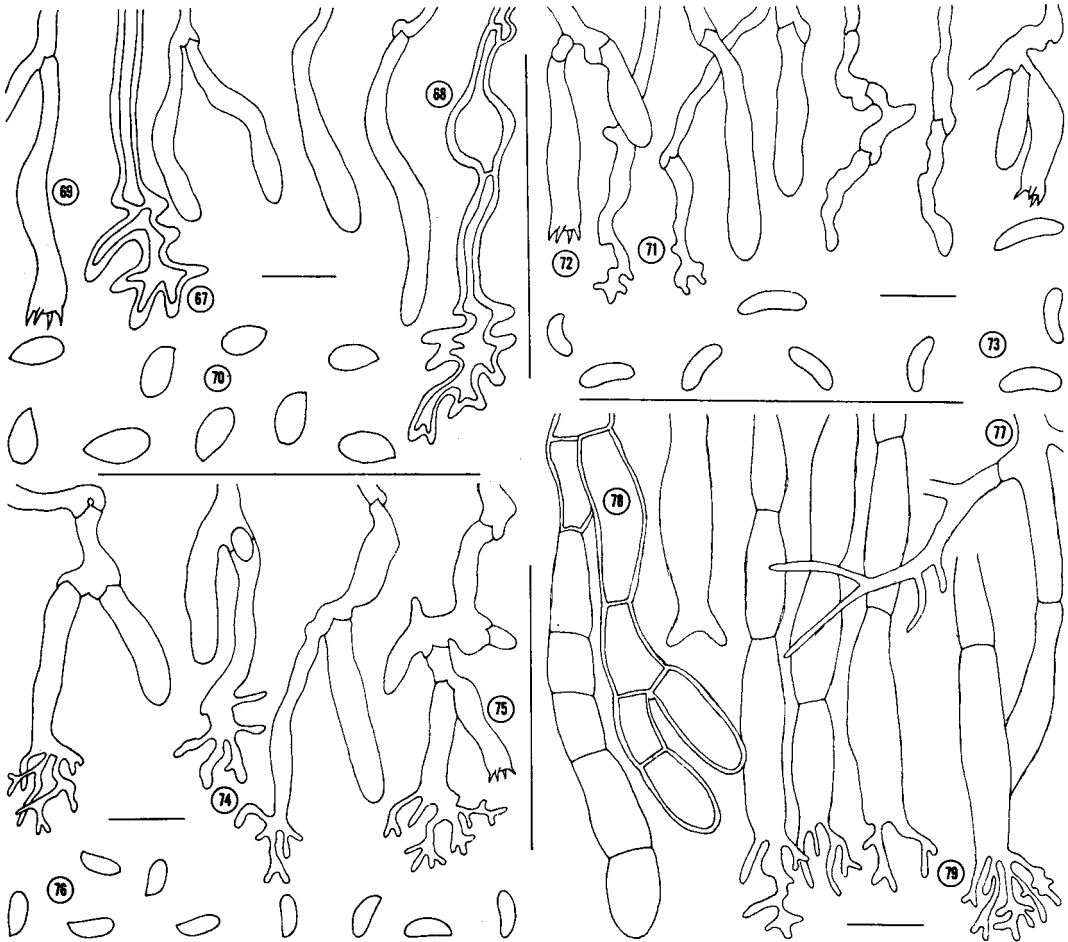
probasidiis nullis; basidiis 30–40 (–45) × 4–6 μm, longoclavatis; basidiosporis 6–10 × 2.5–4 μm, cylindricis, cylindrico-ellipsoideis vel ellipsoideis, hyalinis.

Holotypus—Brasilia, ad ligna angiosperma, (?) Rio Grande du Sul, legit. J. Kick, 1936 (FH, nominato '*Merulius patellaeformis* B. & C.').

Basidiocarp (Fig. 66) annual, effused up to 6 × 2 cm, up to 0.5 mm thick, adherent, cracking on drying and becoming deeply

fissured, exposing a bistratose subhymenial tissue; hymenial surface smooth, dark brownish purple (near 5.0 YR 3/2), tissue below the hymenium of two distinct layers, a pale pinkish buff subhymenial zone above a dark brown subicular layer of loosely interwoven hyphae; sterile margin up to 2 mm wide, pale pinkish buff, surface tomentose, matted, edge fimbriate.

Hyphal system monomitic: subicular hyphae 3–5 (–6) μm, thick-walled, yellowish brown,



Figs. 67–79. Microscopical characteristics of species of *Dentocorticium* and *Laeticorticium*. Scale bars equal 10 μm. Figs. 67–70. *Dentocorticium brasiliense* (from type). Fig. 67. Dendrohyphidia. Fig. 68. Thick-walled vesicular structures. Fig. 69. Basidia. Fig. 70. Basidiospores. Figs. 71–73. *Dentocorticium sulphurellum* (from Cain 3357). Fig. 71. Dendrohyphidia. Fig. 72. Basidia. Fig. 73. Basidiospores. Figs. 74–76. *Dentocorticium ussuricum* (from type). Fig. 74. Dendrohyphidia. Fig. 75. Basidia. Fig. 76. Basidiospores. Figs. 77–79. *Laeticorticium pilatii* (from type). Fig. 77. Subicular hyphae. Fig. 78. Compactly arranged, vertically oriented hyphal elements. Fig. 79. Dendrohyphidia.

clamped, frequently aggregated into hyphal strands; dendrohyphidia (Fig. 67) abundant and forming a distinct catayahmenium, 3–7  $\mu\text{m}$  diam, variously branched and lobed, clamped, septa without clamps towards the extremities, olive brown, sometimes associated with thick-walled vesicular structures (Fig. 68) from which they originate; basidia (Fig. 69) 30–40 (–45)  $\times$  4–6  $\mu\text{m}$ , becoming tortuous, long-clavate, 4-sterigmate, sterigmata up to 4  $\mu\text{m}$  long; basidiospores (Fig. 70) 6–10  $\times$  2.5–4  $\mu\text{m}$ , cylindrical, cylindrical-ellipsoid, to ellipsoid, hyaline.

This species, known only from the type, is so morphologically distinct that it warrants recognition. *Dentocorticium brasiliense* is readily diagnosed by a heavily fissured hymenial surface, color of fertile areas, brown subicular hyphae, and size and shape of spores. It is associated with a white rot.

*Dentocorticium sulphurellum* (Pk.) Larsen & Gilbertson, Norw. J. Bot. 21:226. 1974. *Hydnum sulphurellum* Pk., N.Y. State Mus. Rept. 31:38. 1879. *Grandinia sulphurellum* (Pk.) Burt in House, N.Y. State Mus. Bull. 266:44. 1925. *Laeticorticium sulphurellum* (Pk.) Gilbertson, Mycologia 54:673. 1962.

Basidiocarps apparently annual, up to 0.5 mm thick, not easily separable, yellow to almost white when dry; hymenial surface almost smooth or with hemispherical, wart-like papilli; subiculum thin, soft, tending to crack on drying; sterile margin finely fimbriate to tomentose, abrupt, not thinning out.

Hyphal system dimitic; subicular hyphae 3–4  $\mu\text{m}$  diam, compactly interwoven, of two kinds; some generative, thin to moderately thick-walled, sometimes branched, occasionally with clamp connections; some skeletal (? fiber hyphae) thick-walled, aseptate, profusely branched, 1–1.5  $\mu\text{m}$  diam; dendrohyphidia (Fig. 71) abundant in the hymenial layer, 1–2  $\mu\text{m}$  diam, often imbedded; basidia (Fig. 72) 30–40  $\times$  4–6  $\mu\text{m}$ , clavate, 4-sterigmate, sterigmata up to 5  $\mu\text{m}$  long; basidiospores (Fig. 73) 7–9.5  $\times$  2.5–4  $\mu\text{m}$ , allantoid.

This species is probably widely distributed throughout central and northeastern United States and adjacent areas of Canada, and southward in the Appalachian Mountains to North Carolina. Fresh specimens in the field are bright sulfur yellow but the color fades in dried specimens, which are often almost

white. Microscopically, the large allantoid spores and branched hyphidia are distinctive. The spore print (JLL 11855) is white.

#### *Specimens examined*

CANADA, ONTARIO. Toronto, on *Salix* sp., Cain (TRTC 3387, BPI); Toronto, on *Salix* sp., Jackson & Cain (TRTC 6373, BPI). QUEBEC. Blue Sea Lake, on hardwood, Macrae (DAOM 53115); Iberville, on hardwood, Br. Marie-Anselme 172 (DAOM 22960 SYRF). U.S.A. MINNESOTA, Itasca State Park, on hardwood, Lombard, French & Gilbertson (CFMR, FP 100778). NEW YORK. Griffins, on *Acer spiculum* Lam., Peck, IV 1878, TYPE (NY); Tully, on *Tilia americana* L., Lowe 11855 (SYRF); Phoenix, on *Acer* sp., Pennington, 20 X 1917 (SYRF); Cazenovia, on *Acer* sp., Czabator 2225 (SYRF); Clark Reservation, Jamesville, on hardwood, Lowe 14474 (SYRF); on hardwood, Roskin 52 (CFMR). NORTH CAROLINA. Bernardsville, on hardwood, Lowe 4434 (SYRF); Pisgah National Forest, on *Liriodendron tulipifera* L., Lowe & Gilbertson (Lowe 11174) (SYRF).

*Dentocorticium ussuricum* (Parm.) Larsen & Gilbertson, Norw. J. Bot. 21:226. 1974. *Laeticorticium ussuricum* Parm., Acad. Sci. Estonian SSR, Biol. Ser. 14(2):229. 1965.

Basidiocarp annual, effused up to 3 cm, up to 400  $\mu\text{m}$  thick, adherent, firm; hymenial surface dark ochraceous brown (near 5.0 YR 4/2) with scattered bluntly conical warts up to 100  $\mu\text{m}$  long, the apices entire, white colorous; subiculum white, firm-fibrous, up to 300  $\mu\text{m}$  thick; sterile margin narrow, white, fibrillose, curling away in places.

Hyphal system monomitic; subicular hyphae 2–4  $\mu\text{m}$  diam, septate, clamped, moderately thick-walled; dendrohyphidia (Fig. 74) abundant, intricately branched at the apex, originating in candelabrams with the basidia; basidia (Fig. 75) 30  $\times$  3–4.5  $\mu\text{m}$ , clavate, 4-sterigmate, sterigmata up to 4  $\mu\text{m}$  long; basidiospores (Fig. 76) 5–6  $\times$  2.5  $\mu\text{m}$ , cylindrical, slightly curved.

This species, reported only from Estonia, resembles the North American species *L. sulphurellum* in having a warted or grandinoid hymenial surface and cylindrical spores. It differs distinctly from that species in its smaller spores and darker colored basidiocarp.

*Specimens examined*

ESTONIA RPSS. Regio Primorsk, reservatum Kedrovaia Padj., ad ramum emortuum Ligu-strinae amurensis in silva mixta, Parmasto TAA 13, 836, in Corticiaceae URSS 73, 'paratypus' (BPI).

## SPECIES INCERTAE SEDIS

*Laeticorticium pilatii* Parm., Acad. Sci. Estonian SSR, Biol. Ser. 14(2):228. 1065.

Basidiocarps annual, effused up to 10 × 5 cm, up to 800 µm thick, firm, somewhat fragile in spots, adherent, becoming deeply fissured and then exposing the subiculum; hymenial surface somewhat viridescens (near 10.0 YR 6/8 or 10.0 YR 5/6: to 5/8), nearly smooth to faintly merulioid, often waxy at the apices of folds; subiculum concolorous with the hymenial surface to pale brown; margin narrow, thin; basidiocarps dull violet-red in KOH.

Subicular hyphae (Fig. 77) (1–) 2–4 µm diam, septate, clamps lacking, hyaline to pale yellow, branching extensively and becoming narrower with successive branching; cata-hyemenium composed of compactly arranged vertically oriented hyphal elements (Fig. 78) that are up to 6.5 µm diam, moderately thick-walled, yellow, septate, clamps lacking, often constricted at the septa and then the individual hyphal cells swollen, usually branching directly below the septa; dendrohyphidia (Fig. 79) intricately branched, apparently aseptate and dissolving to some extent in KOH, incrusting reddish brown granular material also dissolving in KOH; basidiospores, probasidia, and mature basidia not observed ('sporae oblongo-ovatae, uno latere depressae, non amyloidea, (7.5)–8–10 × 4–4.5 µm' – Parmasto).

As pointed out by Larsen & Gilbertson (1974), the taxonomic position of this species is uncertain because of a lack of precise data on basidial ontogeny in the type collections. Parmasto (1965) described the probasidia for this species as 'obovoidea, deinde subfusioidea, clavata, non optime visibilia.' When his illustration (p. 227, Fig. 13) is taken into account, one may conclude that the species is closely related to *Dendrocorticium*.

*Specimens examined*

ESTONIA RPSS. Regio Primorsk, reservatum Kedrovaia Padj., ad ramum *Fraxini mans-*

*buricae*, Parmasto TAA 14451 (paratype, exsiccati 65 in Corticiaceae URSS I); regio Primorsk, distr. Lazovski, insula Petrovna, ad ramum arboris frondosae deiectioni in taxeto, Parmasto TAA 15927 (paratype, exsiccati 64 in Corticiaceae URSS I).

## ACKNOWLEDGEMENTS

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