MYCOTAXON

AN INTERNATIONAL JOURNAL DESIGNED TO EXPEDITE PUBLICATION OF RESEARCH ON TAXONOMY & NOMENCLATURE OF FUNGI & LICHENS

Vol. II April-June 1975 No. 1

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[MYCOTAXON for January-March 1975 (1: 149-264) was issued February 25, 1975]

ISSN 0093-4666 *MYXNAE 2(1) 1-208 (1975)*

Published quarterly by MYCOTAXON, Ltd., P.O. Box 264, Ithaca, NY 14850
Subscription prices per volume: $15 US & Canada, $16 other foreign; reduced rate for individuals only, $6 US & Canada, $7 other foreign
Application to mail at second class postage rates pending at Ithaca, NY

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MYCOTAXON

Vol. II, No. 1, pp. 1-82 April-June 1975

POLYPORACEAE OF NORTH AMERICA
THE GENUS TYROMYCES [1]

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SUMMARY

Forty-eight species are accepted as valid to the flora of North America. These are fully described, and thirteen more are briefly described that have been placed in the genus Tyromyces or could be easily mistaken for members of that genus. Fifteen new combinations are made into the genus, and twelve species or varieties are reduced to synonomy with the valid species. A key to all species treated is included.

[1] In this manual 48 species are accepted as valid to the flora of North America, and 12 new combinations are made into Tyromyces from Polyporus, namely amarus, canadensis, croceus, delectans, hydrophilus, lapponicus, lineatus, semistipitatus, spumeus var. malicola, substuppeus, trichrous, and transmutans; one from Boletus, namely unicolor, one from Poria, namely illudens, and one from Trametes, namely humeana. Synonomy, apparently for the first time, includes Coriolus ochrotinctellus as a synonym of Tyromyces duracinus, Polyporus angolensis, P. pseudosulphureus, and P. sublutescens as synonyms of T. trichrous, P. grantii as a synonym of T. guttulatus, P. abieticola as a synonym of T. illudens, Scutiger tisdalei as a synonym of T. graminicola, T. cinchonensis as a probable synonym of T. floriformis, T. gloeocystidiatus and T. newellianus as synonyms of T. leucomallellus, T. tigertianus as a synonym of T. humeana, and P. tephroleucus var. scruposus reduced to the species.

The Polyporaceae is a family of Homobasidiomycetes with about 3000 described species of which Ainsworth (1971, p. 475) estimates there are about 600 valid species. These fungi grow almost exclusively on wood and consequently are of great economic importance. Until rather recently this highly diverse group could be placed into 8 genera based on characteristics readily visible to the naked eye. The steadily increasing use of the microscope in polypore taxonomy led to proliferation of genera, with more restrictive generic concepts, so much so that Donk (1960) could discuss more than 270 genera that have been proposed for the Polyporaceae.

ECONOMIC IMPORTANCE

Some polypores are major destroyers of standing and down timber, but none of the species of Tyromyces treated here are of such economic importance. They are predominantly beneficial as slash destroyers. Perhaps only one, T. amarus on incense cedar (Libocedrus decurrens Torr.), can be considered of real importance on its highly specific host which grows in a limited area in Oregon and California.

DISTRIBUTION

Distribution records for temperate North America are based on those of Overholts (1953), with supplements from my studies. These records are considered reasonably complete. Records from tropical North America are based on specimens studied and these are decidedly incomplete, both because relatively little collecting has been done there, and because of the unsatisfactory state of the taxonomy of tropical species. It appears well-established that many tropical species have a wide distribution, often however known only from widely separated stations.

MORPHOLOGY OF THE SPOROPHORE

The sporophore consists of the supporting tissue, the context, and the tubes below the context. As these sporophores are annual, there is only one layer of tubes. The upper surface may have projecting hairs, making a tomentose, fibrillose, or strigose upper surface which, in many species, mats down on drying to form a thin pellicle. The context tissue may be homogeneous or, in a few species formerly placed in the genus Spongipellis, show a more or less distinct layering of softer tissue above firmer tissue

which is continued into the tubes. Context hyphae may be radially oriented and the context is often somewhat fibrous, or the hyphae are without particular orientation and so form a somewhat felty tissue. Changes on bruising or drying may be marked, and are good specific characters.

The hymenial characters are of paramount importance. Spore characteristics are so important that it is recommended that sterile specimens be discarded without hesitation, as certain identification cannot be made if the spore characters cannot be obtained. Sterile hymenial structures, such as cystidia, are of diagnostic importance; fortunately they are usually abundant and characteristic.

The hyphae of Tyromyces (Plate I) mostly fall readily into the three hyphal systems defined by Corner (1932a, 1932b; 1953). Generative hyphae are the kind that emerge from germinated spores, and from which all other types arise. The presence of clamp connections is considered an unmistakable indication of generative hyphae, which may be thin- to thick-walled, or apparently solid. Sometimes clamp connections are very rare and then it is difficult, perhaps never wholly certain, whether a rarely branched hypha is a rarely clamped generative hypha, or a non-septate skeletal hypha which differs primarily in the absence of cross walls. Binding hyphae differ from skeletal hyphae in being much branched, but there are intergradations. With experience these distinctions can be made with considerable certainty. These types of hyphae form hyphal systems in the sporophore which, in Tyromyces, may have one or two systems. In this manual the arrangement of the species depends in large measure on the hyphal systems, as all hyphal systems are usually available, although the generative system may be autodigested in the drying process except in the extreme margin. Systems are reasonably consistent, but they do vary, just as all other taxonomic characters vary.

Species may have one, two, or three hyphal systems, and are said to be monomitic, dimitic, or trimitic. The sporophore of a monomitic species consists of a system of generative hyphae, a condition usually easy to recognize. A dimitic species offers more difficulties, as the additional type of hypha, skeletal or binding, may be either in the context, in the trama, or in both. Similarly a trimitic species, with systems of generative, skeletal, and binding hyphae, may have different systems in the context and in

the trama, and offers particular difficulties when one system, usually binding, is poorly developed. The area just above the tubes must be studied, as it may have a system different from the upper half of the context.

METHODS

The descriptions are based on type specimens, where found, supplemented by study of additional material as available. Species whose types are not in existence conform to the current concepts of these in Europe and America, as exemplified by material determined by the leading students of the Polyporaceae.

Methods for morphological study of polypore sporophores have been presented exhaustively by Overholts (1929), Singer (1962), and Teixeira (1962), so will be briefly treated here. Notes on the color, texture, taste, and odor should be taken when the specimen is collected, and then it should be dried quickly. Macroscopic characteristics are based on those seen with the naked eye or with the aid of a low power stereoscopic microscope. Microscopic characteristics were secured in part by study of free-hand sections cut mostly parallel to the course of the hyphae, placed in 95% ethyl alcohol to remove air, then in 2% potassium hydroxide solution to swell the tissue to normal size. For hyphal studies doubtless the best method is dissection as recommended by Corner (1932a; 1953), but few will have the manual dexterity to follow this procedure. It is generally adequate to mount a minute piece of the context about the size of a pinhead or smaller in the mounting medium, add a drop of one percent solution of phloxine, tease apart as much as practicable with a pair of fine needles, then squash under a cover

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Plate I. Hyphal systems in the tissues of various species of polypores. A, simple-septate generative hyphae of T. mollis. B, rarely branched nodose-septate generative hyphae of T. tephroleucus. C, rarely to often branched generative hyphae of T. canadensis. D, hyphae of T. duracinus somewhat doubtfully considered skeletal hyphae. E, skeletal and binding hyphae of Polyporus semipileatus. F, bovistoid binding hyphae of Trametes squalens. G, bovistoid binding hyphae of T. amygdalinus. H, much branched generative hyphae of T. albellus.

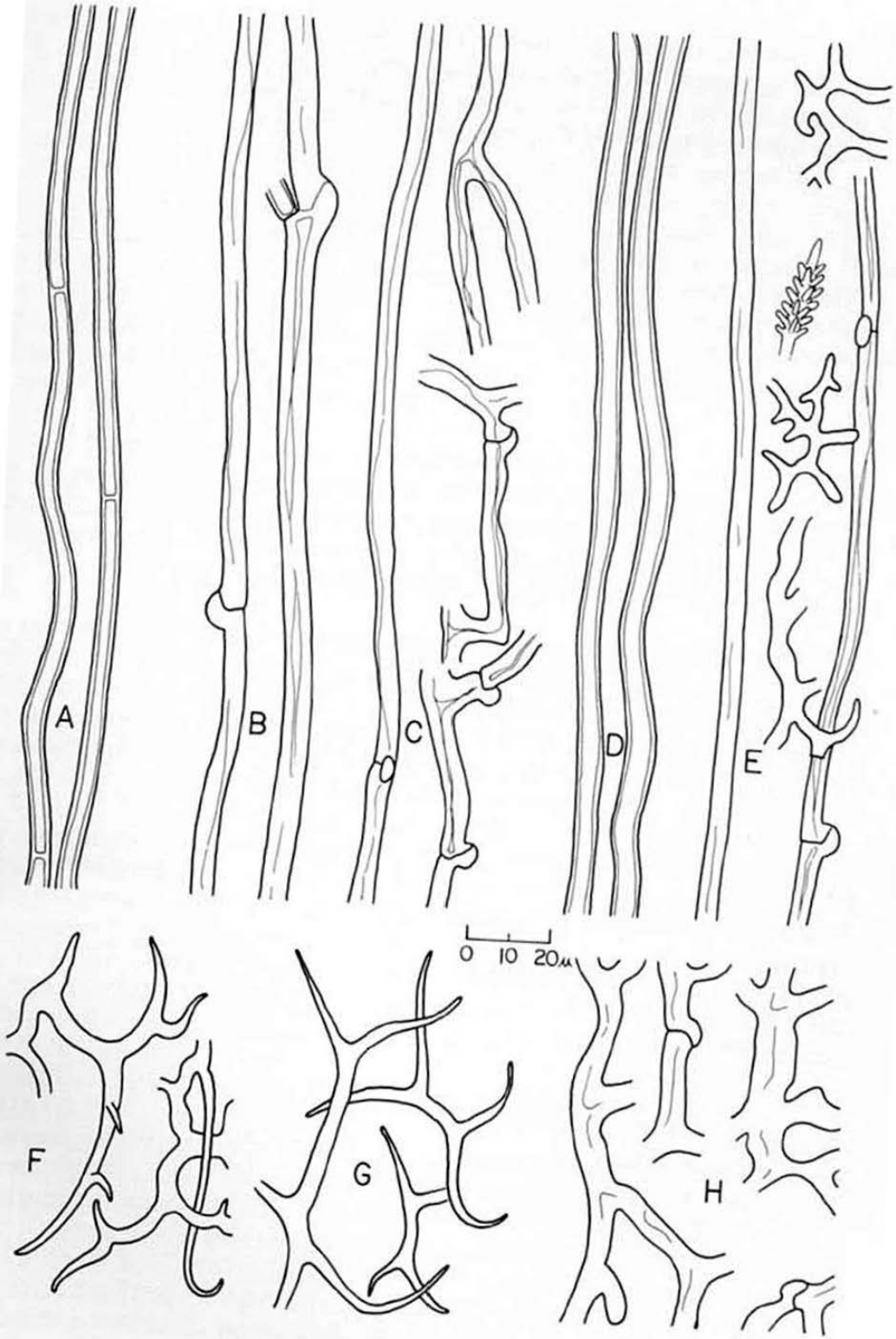


PLATE I

glass. For tramal studies a thin longitudinal section is made, that mounted and squashed as above. To determine the amyloid or dextrinoid reaction sections were mounted in Melzer's reagent (Ainsworth 1971, p. 362).

NOMENCLATURE AND TAXONOMY

The genus Tyromyces was proposed by Karsten in 1881, with Polyporus chioneus Fries cited as the type species for the genus. The most common current European concept of P. chioneus is that presented here under the name Polyporus semipileatus. In an attempt to determine Karsten's concept of P. chioneus seven specimens so identified by Karsten were borrowed from his herbarium at Helsinki. These proved to be a heterogeneous lot, three of them Tyromyces tephroleucus of this manual, two other identifiable species, and two unidentifiable. For the concepts of this manual T. tephroleucus is considered a characteristic species for the genus Tyromyces.

The genera Amylocystis, Amylosporus, and Climacocystis are considered synonyms of Tyromyces, as they are based on a positive chemical reaction to Melzer's solution, a distinction not considered of generic value. Aurantiporus differs only in the color of the sporophore from typical specimens of Tyromyces. Leptoporus much more justifiably could be considered worthy of generic rank, as its type species (T. mollis) is the only species with simple-septate generative hyphae. Parmastomyces is based primarily on chemical reactions in the spores, distinctions not considered of generic value. Spongiporus differs from typical Tyromyces only in having a distinctly softer texture, particularly in the upper half of the context. Spongipellis differs similarly though less markedly.

ACKNOWLEDGMENTS

Grateful acknowledgment is made to the directors or curators of the herbaria cited on page 7 for the opportunity to study specimens at their institutions or through loans. Invaluable financial aid was given by several grants from the National Science Foundation, for both field work and travel to herbaria. A cooperative project involving cultures of wood-decay fungi has been continued since 1947 with the Forest Service of the United States Depart-

ment of Agriculture. Special recognition is due the administrative officials of the National Fungus Collections at Beltsville, Maryland, for financial aid and extensive assistance in other ways. Invaluable aid was rendered by D. N. Pegler of the mycological staff of Kew Herbarium. He was employed to provide macroscopic descriptions and sections of the tubes and context of selected types. The latter were studied microscopically and complete notes were returned to Kew to be filed with the specimens. Restudy was occasionally necessary, for a variety of reasons, and the completeness of the descriptions reflects to a considerable degree his expert assistance. D. Reid also of Kew gave valuable assistance.

Particular acknowledgment is made to R. L. Gilbertson for a careful reading of the manuscript and to E. C. Setliff for numerous constructive suggestions.

DESCRIPTIONS AND KEYS

The Polyporaceae include those Homobasidiomycetes whose hymenium lines the walls of coherent tubes, and those polypores that are white or bright-colored, fleshy, characteristically sessile, and with hyphae in one or two systems (following Pegler 1967, p. 33), are placed in the genus Tyromyces.

The present location of type material is indicated after the citation of the original description. The first herbarium listed 1/ contains the type unless qualified; the

1/ Herbarium abbreviations, with two exceptions, are those of the Index Herbariorum (Lanjouw and Stafleu 1964). They are: BFDL, Center for Forest Mycology Research, Forest Products Laboratory, Madison, Wis. 53705; BPI, National Fungus Collections, Plant Industry Station, Beltsville, Maryland 20705; CUP, Dept. of Plant Pathology, Cornell University, Ithaca, N. Y. 14850; DAOM, Mycological Herbarium, Plant Research Institute, K1A:OC6 Ottawa 3, Ontario, Canada; FH, Farlow Library and Herbarium of Cryptogamic Botany, Harvard University, Cambridge, Mass. 02138; FLAS, Dept. of Botany, Univ. of Florida, Gainesville, Fla. 32601; K, The Herbarium and Library, Royal Botanic Gardens, Kew, Richmond, Surrey, England; MICH, University Herbarium, Univ. of Michigan, Ann Arbor, Mich. 48104; NY, New York Botanical Garden, New York, N. Y. 10458; NYS,

additional listed ones contain isotype material. Synonomy is based upon study of types or the most authentic material available unless otherwise noted. The listing includes only specimens studied; additional isotypes no doubt exist, particularly in European herbaria not visited, or whose contents could not be examined in detail.

In the serial references, the word order is that used in the UNION LIST OF SERIALS, edit. 3.

TYROMYCES P. Karst.

Rev. Myc. 3(9):17. 1881. Leptoporus Quél., Ench. Fung., p. 175. 1886. Spongipellis Pat., Hym. Eur., p. 140. 1887. Aurantiporus Murr., Torrey Bot. Club Bull. 32: 487. 1905. Spongiporus Murr., same reference but page 474. Amylocystis Bond. & Sing. in Singer, Mycologia 36:67. 1944. Climacocystis Kotl. & Pouz., Česká Myk. 12:95 and 103. 1958. Parmastomyces Kotl. & Pouz., Fedde's Repertorium 69(2):138. 1964. Amylosporus Ryv., Norw. Jour. Bot. 20:1. 1973.

Type species: Polyporus chioneus Fries.

Annual, on wood, typically effused-reflexed to sessile, occasionally resupinate or laterally substipitate, fleshy or fleshy-tough drying firm or fragile; context white or rarely somewhat bright-colored when fresh, homogeneous or zonate, in some duplex; tube walls mostly becoming thin; sporophore monomitic with nodose-septate generative hyphae (but one species with simple-septate hyphae), or dimitic with additional either skeletal or binding hyphae; cystidia absent or more rarely present; spores hyaline, smooth, inamyloid or in a few species amyloid or dextrinoid.

In this manual Tyromyces tephroleucus is considered a representative species for the genus Tyromyces.

Herbarium, New York State Museum, Albany, N. Y. 12224; PAC, Buckhout Laboratory, Pennsylvania State Univ., University Park, Pa. 16802; PC, Muséum de Histoire Naturelle, Laboratoire de Cryptogamie, 12 Rue de Buffon, Paris V, France; PR, Botanical Department of the National Museum, Prague, Czechoslovakia; S, Botanical Department, Naturhistoriska Riksmuseum, 104 05 Stockholm 50, Sweden; and SYRF, Department of Forest Botany and Pathology, State University of New York, College of Environmental Science and Forestry, Syracuse, N. Y. 13210.

KEY TO THE SPECIES

1. Distinctive sterile elements present in the hymenium 2
1. Such sterile elements absent from the hymenium 6
2. Context up to 2 cm thick 3
2. Context not over 1 cm thick, mostly much thinner 4
3. Sporophore reddish on bruising or drying; spores cylindrical to cylindric-ellipsoid, 8-10 x 2.5-3.5 μ ..... 13. T. lapponicus
3. Sporophore not becoming reddish; spores ellipsoid to ellipsoid-oval, 5.5-7 x 4-5 μ ..... 35. T. borealis
4. Pores 9-10 per mm; cystidia heavily incrusted . 34. T. semisupiniformis
4. Pores 1-6 per mm; cystidia not heavily incrusted 5
5. Gloeocystidia present; spores cylindrical, 4.5-8 x 1-2 μ ..... 17. T. leucomallellus
5. Gloeocystidia absent; cystidia up to 15 μ in diam; spores amyloid, oval to subglobose, 2.5-3 μ long ..... 36. T. illudens
5. Gloeocystidia absent; cystidia fusoid, smaller; spores inamyloid, oblong, 4-6 μ long ..... 46. T. balsameus
6. Sporophore white or yellowish, turning red on bruising or drying 7
6. Sporophore not markedly red on bruising or drying 11
7. Hyphae simple-septate ..... 1. T. mollis
7. Hyphae nodose-septate 8
8. Spores dextrinoid 9
8. Spores not reacting to Melzer's solution ... 10
9. Soft-tomentose to hispid above; taste very disagreeable ..... 16. T. transmutans
9. Glabrous above; taste slightly acid ... 15. T. subcartilagineus
10. Context not over 1 mm thick; changing color only slightly where bruised when fresh ..... 45. T. lowei
10. Context up to 10 mm thick; quickly red where bruised and red on drying 14. T. fragilis

11. Sporophore more or less pendent 12
11. Sporophore effused-reflexed or sessile, or laterally attached 14
12. Pores 6-8 per mm ..... 24. T. subpendulus
12. Pores 2-4 per mm 13
13. Usually soft and cottony when fresh, small ... 25. T. minusculoides
13. Soft but tough when fresh, much larger ... 26. T. cerifluus
14. Spores ellipsoid to subglobose or, if appearing more narrow, not over 5.5 μ long 15
14. Spores cylindrical to ellipsoid or, if appearing broader, 6 μ or more long 35

SPORES ELLIPSOID TO GLOBOSE

15. Spores rarely over 3 μ wide 16
15. Spores usually over 3 μ wide, usually much more 24
16. Pores usually not over 5 per mm 17
16. Pores usually 5 or more per mm 21
17. Pores 1-3 per mm, rarely more 18
17. Pores 3-5 (-6) per mm 19
18. Pores 1-2 per mm; matted-tomentose above; spores probably 5 x 3 μ; trimitic ... 58. Spongipellis luridescens
18. Pores 2-4 per mm; velvety to glabrous above; spores 3-5.5 x 2.5-3.5 μ; monomitic ..... 12. T. humeana
19. Minutely pubescent to glabrous above; pore surface usually with a greenish tint ... 2. T. fumidiceps
19. Hirsute to strigose above, becoming matted when dry; pore surface white to cream 20
20. On angiosperm substrata; southern; monomitic ..... 11. T. pseudolacteus
20. On gymnosperm substrata; northern; dimitic; spores amyloid; cystidia often inconspicuous ..... 36. T. illudens
21. Sporophore to 3 cm thick; sporophore monomitic ..... 3. T. galactinus
21. Sporophore not over 1 cm thick 22

22. Pileus glabrous above, not over 4 mm thick ..... 37. T. semisupinus
22. Pileus tomentose, strigose, fibrillose, or matted above; to 8 mm thick 23
23. Pores 4-6 per mm; northern, on wood of gymnosperms; context monomitic, trama dimitic ..... 32. T. canadensis
23. Pores 8-10 per mm; tropical; context dimitic, trama monomitic ..... 33. T. hydrophilus
24. Pores 1-2(-3) per mm or larger 25
24. Pores 2-5 (-6) per mm 28
25. Context drying firm to hard throughout 26
25. Context soft above, firmer below 27
26. Context drying conspicuously zonate, often with chlamydospores; applanate to subungulate ..... 4. T. fissilis
26. Context drying azonate, without chlamydospores; ungulate ... 7. T. amarus
27. Pores 1-2 per mm; hyphae thin-walled in upper part of context ..... 5. T. delectans
27. Pores 1 per mm or larger; context hyphae thick-walled throughout ..... 6. T. unicolor
28. Spores 2.5-4 μ wide 29
28. Spores usually 4 μ or more wide 31
29. Sporophore drying very light in weight; context to 2 cm thick 30
29. Sporophore not markedly light; context usually 2 mm or less thick . 9a. T. spumeus var. malicola
30. Spores amyloid; hyphae 2.5-14 μ in diam ..... 39. T. graminicola
30. Spores inamyloid; hyphae 2-7 μ in diam ..... 38. T. trichrous
31. Sporophore buff to orange when fresh, fading on drying; tubes darkening and agglutinating on drying ..... 8. T. croceus
31. Sporophore white, often discoloring somewhat on drying; tubes not collapsing and not agglutinating on drying 32
32. Fibrillose to strigose above, often drying matted; context monomitic 33
32. Appressed-tomentose or velvety to glabrous above; context di- or trimitic 34

33. Sporophore up to 4.5 cm thick; tissue near the tubes drying firm and radially fibrous, the tubes drying firm-waxy to rather soft and fragile; spores 5-6 μ broad ... 9. T. spumeus var. spumeus

33. Sporophore up to 0.8 cm thick; tissue near the tubes drying cartilaginous, the tubes drying rigid and more or less translucent, up to 1.5 mm long; spores 4-4.5 μ broad ... 10. T. substuppeus

34. Pileus conchate, cream color, to 0.3 cm thick ..... 48. T. semistipitatus

34. Pileus applanate to convex, often in part blackening on drying, to 3 cm thick ..... 57. Polyporus spraguei

SPORES CYLINDRICAL TO ELLIPSOID

35. Pores 6-10 per mm 36

35. Pores 1-6 per mm 42

36. Spores 0.5-2 μ wide 37

36. Spores 2-3 μ wide 40

37. Spores 0.5-1.5 μ wide 38

37. Spores 1.5-2 μ wide 39

38. Spores 0.5-1 μ wide; sporophore trimitic ... 51. Polyporus semipileatus

38. Spores 1-1.5 μ wide; sporophore monomitic ... 22. T. leucomallus

39. Skeletals mostly thin-walled; laterally attached by a narrowed base; generative hyphae 2.5-6 μ in diam ..... 40. T. duracinus

39. Skeletals thick-walled; effused-reflexed to sessile; generative hyphae 2-3 μ in diam ... 41. T. versicutis

40. Spores 4-5 μ long; sporophore monomitic ... 30. T. albogilvus

40. Spores 5.5-8 μ long; sporophore trimitic .. 41

41. Spores 5.5-7.5 μ long; pores 6-8 per mm; sporophore white to cream . 53. Polyporus nivosus

41. Spores 6.5-8 μ long; pores 8-9 per mm; sporophore distinctly darker ... 52. Polyporus fulvitinctus

42. Spores rarely over 1.5 μ wide, usually bent and more or less allantoid 43

42. Spores usually 1.5 μ or more wide, mostly oblong 50

43. Pores 1-3 per mm; margin undulate . 44. T. undosus
43. Pores (2-) 3-6 per mm 44
44. Context not over 2 mm thick 45
44. Context much thicker, to 45 mm thick 46
45. Above white, finely tomentose to glabrous; pores 4-6 per mm; taste bitter .18. T. perdelicatus
45. Above with yellowish fibrils; pores 3-4 per mm; taste mild ..... 19. T. lineatus
46. Very soft, particularly in upper part of context; on wood of gymnosperms at high elevations in western North America ..... 23. T. leucospongia
46. Mostly firm; on wood of angiosperms and gymnosperms; widely distributed 47
47. Generative hyphae of context much branched; trama dimitic ..... 31. T. albellus
47. Generative hyphae usually rarely branched; trama monomitic 48
48. With a disagreeable or bitter taste; rot brown ..... 43. T. lacteus
48. With mild taste; rot white or brown 49
49. Above often villose to strigose; externally with more or less bluish tint .. 20. T. caesius
49. Above finely tomentose to glabrous, white to grayish or brownish .... 21. T. tephroleucus
50. Spores to 5 μ long, rarely longer 51
50. Spores usually more than 5 μ long 55
51. Taste at most slightly resinous; matted-fibrillose above ..... 27. T. carbonarius
51. Taste disagreeable or bitter; minutely fibrillose to glabrous above 52
52. Context to 2 mm thick; tubes to 4 mm long . 53
52. Context usually much thicker; tubes to 10 mm long 54
53. Usually imbricate, often spathulate, white when fresh; monomitic ..... 28. T. floriformis
53. Resupinate to effused-reflexed or sessile, with reddish radial streaks; dimitic. 45. T. lowei
54. Above typically with depressed spots, drying smooth and often with a pellicle ..... 29. T. guttulatus
54. Above without spots, typically drying rough ..... 42. T. immitis
55. Bovistoid binding hyphae present 56
55. Bovistoid binding hyphae absent 57

56. Without odor; trimitic ...59. Trametes squalens
56. With almond or vanilla odor when fresh; dimitic ..... 47. T. amygdalinus
57. Pores 3-4 per mm 58
57. Pores 4-6 per mm 59
58. Spores 10-14 x 4-7 µ; sporophore 2-3 cm thick ..... 61. T. magnisporus
58. Spores about 6-8.5 x 2.5-3.5 µ; sporophore to 1 cm thick .... 50. T. palmarum
59. Spores 1.5-2.5 µ wide 60
59. Spores 2.5-4 µ wide 61
60. Sporophore small, to 0.4 cm thick; above pale reddish translucent, glabrous; pores 5-6 per mm .... 49. Polyporus obductus
60. Sporophore medium-sized, to 4 cm thick; above white to discolored, often drying rough ..... 54. Polyporus durescens
61. Tubes drying papery tough ..... 56. T. nivosellus
61. Tubes drying fragile 62
62. Tubes drying rigid; mostly on wood of gymnosperms ..... 55. Polyporus palustris
62. Tubes drying rather soft; on wood of angiosperms ..... 60. T. calkinsii

1a. Hyphal construction monomitic (see also 1b and 1c)
2a. Generative hyphae with simple septa

1. TYROMYCES MOLLIS (Pers. ex Fries) Kotl. & Pouz.
Plate IA and Fig. 1

Česká Myk. 13:27. 1959. Polyporus mollis Pers. ex Fries, Syst. Myc. 1:360. 1821. Boletus mollis Pers., Obs. Myc. 1:22. 1796. P. erubescens Fries, Epicrisis, p. 461. 1836-38 of many European authors. P. weinmanni Fries, Epicrisis, p. 459. 1836-38 of many authors. Tyromyces smallii Murr., N. Amer. Flora 9:32. 1907 (NY). Polyporus pini-ponderosae W. H. Long, N. Mex. Chapt. Phi Kappa Phi Papers 1:3. 1917 (BPI; NY).

Sessile, solitary or imbricate, taste mild; pileus white throughout when fresh, quickly turning red where bruised and pinkish to dull red on drying, convex to subungulate, dimidiate, soft and watery when fresh, drying rigid and fragile, up to 6 x 9 x 4 cm, above finely ap-

pressed-fibrillose to matted-strigose, drying glabrous and smooth or minutely reticulate, usually with a thin pellicle, azonate, the margin rather thick, acute, below fertile to edge; pore surface dull when dry, the pores angular to sinuate, 2-3 (-4) per mm, dissepiments thin, entire to incised; tubes drying translucent, rigid and brittle, up to 6 mm long; context drying rather soft and fibrous-fragile, up to 2.5 cm thick.

Sporophore monomitic, the context of rarely branched, rather thin- to thick-walled, simple-septate generative hyphae 4-7 µ in diam; trama of similar hyphae except 3-5 µ in diam; gloeoplerous hyphae present; cystidia none; basidia clavate, 14-17 x 5-8 µ; spores hyaline, smooth, inamyloid, allantoid, 4.5-5.5 x 1.5-2 µ.

On wood of gymnosperms, widely distributed in the United States and Canada, and in Europe; associated with a brown rot. This species is an atypical member of the genus Tyromyces, as it is the only one having simple septa. For that reason it has been assigned to the subgenus Leptoporus (Quél.) Pouz. (Fol. Geobot. Phytotax. 1:370. 1966). The species is the lectotype of the genus Leptoporus Quél., as selected by Donk (Persoonia 1:236. 1960).

A specimen in Kew Herbarium determined by Fries as Polyporus mollis is T. fragilis as interpreted in this paper. The interpretation of T. mollis as here presented stems from Romell (Sv. Bot. Tidsk. 6:639. 1912 - specimen at S). This concept is the same as in Overholts (1953, p. 277) and in Teston (1953, p. 84 , as Leptoporus erubescens).

2b. Generative hyphae nodose-septate
3a. Spores ellipsoid to globose or, if appearing more narrow, not over 5.5 µ long
4a. Spores 4 µ or less long

2. TYROMYCES FUMIDICEPS Atk. Fig. 2

Ann. Myc. 6:61. 1908 (CUP). Polyporus smaragdinus Lloyd, Myc. Writ. 5:818. 1919 (BPI; PAC).

Effused-reflexed to sessile, solitary to somewhat imbricate, occasionally fragrant, mild in taste, after long storage often covered with whitish crystals; pileus convex,

dimidiate, watery-fleshy to soft and spongy, drying firm, up to 3 x 7 x 1 cm, above whitish or more often grayish or brownish, minutely pubescent to glabrous, azonate, often drying with a thin pellicle, the margin acute, below fertile to edge; pore surface white or pale greenish and usually greenish where bruised, drying cream or with a greenish tint, dull to faintly glancing, the pores angular, 3-5 per mm, dissepiments thin to thick, more or less fimbriate; tubes white or pale lemony, drying soft and fragile, up to 4 mm long; context white to grayish, soft

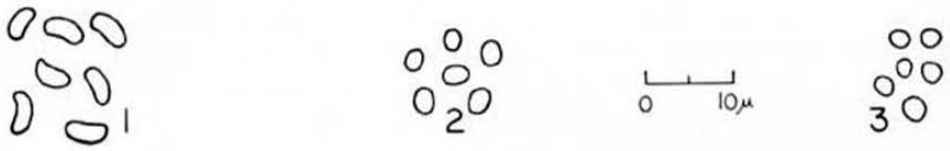


Fig. 1. Spores of T. mollis from CUP 5106 at NY. Fig. 2. Spores of T. fumidiceps from type, CUP 22073. Fig. 3. Spores of T. galactinus from Martin 483 at BPI.

and fragile in the upper half, firmer and radially arranged below, up to 6 mm thick.

Sporophore monomitic, the context of rarely to often branched, thin-walled to more often thick-walled, nodose-septate generative hyphae 3-6 (-7) μ in diam; trama of similar hyphae except 2-4 μ in diam; gloeoplerous hyphae rare, 4-7 μ in diam; hyphal pegs occasional; cystidia none; basidia clavate, 13-21 x 5-6 μ; spores hyaline, smooth, inamyloid, broadly ellipsoid to oval, 2.5-3 (-3.5) x 2-2.5 (-3) μ.

On wood of angiosperms in areas subject to flooding, in Ont., N.Y., Mich., Miss., and Ark., reported in addition by Overholts (1953, p. 306) from Pa., N.J., Del., Md., Tenn., Ohio, Mo., and Quebec. The greenish color of the tubes is unusual in polypores, as is the abundant production of whitish crystals covering the sporophore in stored specimens.

Tyromyces avellanealbus Murr., Torrey Bot. Club Bull. 65:657. 1939 (at FLAS; BPI; SYRF) is an abnormal myriadoporous form similar to T. fumidiceps but perhaps differing in having a slowly developing acrid taste. Described from Florida.

3. TYROMYCES GALACTINUS (Berk.) Bondartsev Fig. 3

Polyporaceae Europe, USSR and Caucasia, p. 189. 1953. Polyporus galactinus Berk., London Jour. Bot. 6:321. 1847 (K; BPI; ?NY). P. iowensis Lloyd, Myc. Writ. 7:1363. 1925 (BPI).

Sessile, imbricate or solitary, with a fragrant odor when fresh, taste mild; pileus convex, dimidiate, watery when fresh, rigid when dry, up to 8 x 10 x 3 cm, above white to gray and tomentose to strigose near base, drying usually yellowish, rough, azonate, the margin thin to obtuse, edge often drying cartilaginous, with a narrow sterile band below; pore surface drying yellowish, pores angular, (4-) 5-6 per mm, dissepiments thin, entire to fimbriate; tubes drying brittle, up to 12 mm long; context drying more or less duplex, upper half soft-fibrous, becoming very firm or cartilaginous in the lower half, often zonate, up to 2 cm thick.

Sporophore monomitic, the context of both frequently branched, thin-walled, nodose-septate generative hyphae 4-7 μ in diam and of similar except rarely branched hyphae in strands; trama of similar hyphae except 2.5-5 μ in diam; cystidia none; basidia clavate, 12-17 x 5-7 μ; spores hyaline, smooth, inamyloid, broadly ellipsoid to oval, 2.5-3 x 2-2.5 μ.

On wood of angiosperms in the eastern half of the United States and Canada.

This species is very similar to T. spumeus var. malicola which differs only in having larger spores, 4-5 x 3.5-4 μ, and that variety intergrades with T. spumeus which typically has still larger spores 6-8 x 5-6 μ.

4b. Spores usually 4 μ or more long, usually much more

5a. Pores mostly 1-3 per mm

4. TYROMYCES FISSILIS (Berk. & Curt.) Donk Fig. 4

Utrecht Rijksun. Bot. Mus. Meded. 9:153. 1933. Polyporus fissilis Berk. & Curt., Jour. Bot. and Kew Misc.

1:234. 1849 (K). P. albosordescens Rom., Sv. Bot. Tidsk. 6:637. 1912 (S; BPI). Polyporus fuscomutans Lloyd, Myc. Writ. 7:1158. 1922 (BPI; K).

Sessile, solitary to subimbricate, without distinctive odor or taste, drying relatively heavy; pileus applanate to subungulate, dimidiate to flabelliform, up to 10 x 17 x 7 cm, above white, drying brownish discolored, minutely spongy-tomentose, drying wrinkled and strigose or fibrillose to subglabrous, azonate, the margin rather thin to thick, fertile below to edge; pore surface white to pale pink, drying brownish yellow or darkening to black, the pores angular, 1-3 per mm, dissepiments thin, entire; tubes becoming resinous and collapsing into a rigid dark brown to black mass on drying, up to 2 cm long; context white and watery when fresh, sometimes duplex, drying sordid, fibrous, very hard and conspicuously zonate, up to 6 cm thick.

Sporophore monomitic, the context of infrequently branched, thin- or mostly thick-walled, nodose-septate generative hyphae 4-8 μ in diam; large numbers of imbedded oval chlamydospores usually present, 3.5-6 μ in diam; trama of similar hyphae except thin-walled and 2.5-5 μ in diam; gloeoplerous hyphae present; hyphal pegs present; cystidia none; basidia cylindric, 17-24 x 5-7 μ; spores hyaline, smooth, inamyloid, apiculate, oval to subglobose, 4-7.5 x 3-6.5 μ.

On the wood of angiosperms from Ontario to Florida and westward to the Mississippi River; associated with a speckled white rot, see Boyce (1961) and Hepting (1971). The sporophore most nearly resembles that of T. croceus which differs in being distinctly orange when fresh, in lacking chlamydospores in the context, drying darker, with pores 3-5 per mm, and lacking gloeoplerous hyphae.

5. TYROMYCES DELECTANS (Peck) Lowe, comb. nov. Fig. 5

Polyporus delectans Peck, Torrey Bot. Club Bull. 11:26. 1884 (NYS; BPI; FH; ?NY). Trametes krekei Lloyd, Myc. Writ. 5, Letter 69:12. 1919 (BPI).

Sessile or effused-reflexed, solitary or sometimes imbricate, taste mild; pileus convex, soft, watery, and

white throughout when fresh, drying firm to rigid and yellowish, up to 10 x 15 x 4 cm, above finely tomentose to almost glabrous or, on drying, becoming coarsely and roughly short-strigose, azonate, the margin usually abruptly thinning, acute; pore surface drying rough, the pores round to sinuous, 1-2 per mm, dissepiments thin, dentate to finely lacerate; tubes up to 15 mm long; context often duplex when dry, soft-fibrous above, usually firm below, azonate, up to 2 cm thick.

Sporophore monomitic, the context in the lower half of rarely branched, thin- or thick-walled, nodose-septate generative hyphae 4-7 μ in diam, upper half similar except all hyphae thin-walled; trama of similar hyphae except 3-5 μ in diam; cystidia none; basidia clavate, 19-31 x 7-9 μ; spores hyaline, smooth, inamyloid, oval to subglobose, 5-7 x 4-6 μ.

On wood of angiosperms in northeastern United States

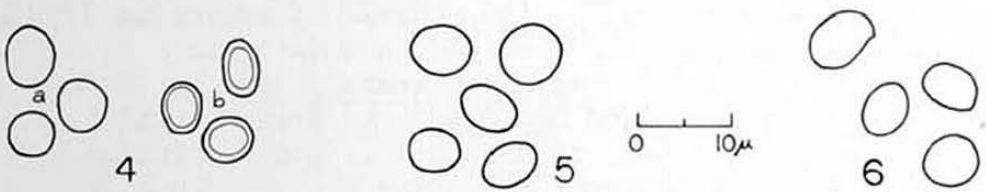


Fig. 4. Spores (a) and chlamydospores (b) of T. fissilis from type at K, Curtis 1441. Fig. 5. Spores of T. delectans from type at NYS. Fig. 6. Spores of T. unicolor from Meschutt collection at SYRF.

and eastern Canada, and reported by Overholts (1953, p. 320) from Oregon; associated with a white ring-shake (Overholts) or a brown rot, see Thomas and Podmore in Can. Jour. Bot. 31:675-692. 1953; also see Hepting (1971).

T. unicolor is very similar but it usually can be separated by its larger pores (1 per mm or larger), and uniformly thick-walled hyphae in the upper softer part of the context. Leptoporus bredecelensis Pilát is very similar; Bondartsev (1971, p. 243) and Domański (1967, p. 97) give somewhat longer spores, 7-8.5 μ long.

6. TYROMYCES UNICOLOR (Schw.) Lowe, comb. nov. Fig. 6

Boletus unicolor Schw., Schr. Nat. Ges. Leipzig 1:97. 1822. Polyporus obtusus Berk., Ann. Nat. Hist. 3:390. 1839. P. tomentoso-quercinus Johns., Minn. Acad. Nat. Sci. Bull. 1:338. 1878.

Sessile, solitary, taste mild; pileus convex to ungulate, dimidiate, spongy to firm, up to 20 x 30 x 8 cm (Overholts), above white or grayish to yellowish, or drying brownish, hirsute-tomentose or rarely becoming glabrous, azonate, the margin obtuse; pore surface concolorous, dull, the pores round to angular or sinuous, 1 per mm or larger, dissepiments thin, entire to slightly lacerate; tubes drying corky, up to 3 cm long; context drying cream to very pale brown, more or less duplex, the upper part rather soft and fibrous, below firmer, faintly zonate, up to 3 cm thick.

Sporophore monomitic, the context of rarely to frequently branched, thick-walled, nodose-septate generative hyphae 4-8 μ in diam; trama of similar hyphae except often thin-walled and 2.5-7 μ in diam; cystidia none; basidia subcylindrical, 24-30 x 6-8 μ; spores hyaline, smooth, inamyloid, broadly ellipsoid to subglobose, 6-8 x 5-6 μ.

On wood of living angiosperms, widely distributed in the United States and in Ontario; the cause of a soft heartrot of oaks, see Boyce (1961) and Hepting (1971), both as P. obtusus.

Type material of P. obtusus or of P. tomentoso-quercinus have not been located.

7. TYROMYCES AMARUS (Hedgc.) Lowe, comb. nov. Fig. 7

Polyporus amarus Hedgc., Mycologia 2:155. 1910 (BFDL; BPI; K). P. libocedris von Schrenk, Science, n.s. 16:138. 1902 (nom. nudem).

Sessile, solitary, taste slowly bitter; pileus ungulate, dimidiate, up to 10 x 16 x 9.5 cm, above cinnamon

when dry, "pubescent when young" (Overholts), becoming glabrous but rough, somewhat sulcate, azonate, the margin rounded; pore surface drying dark cinnamon, the pores angular, about 2 per mm, dissepiments thin, entire to more or less incised; tubes drying rigid, brittle, up to 2.5 cm long; context drying pale tan, firm, radially fissile, azonate, up to 7 cm thick.

Sporophore monomitic, the context of infrequently branched, thin- to thick-walled, nodose-septate generative hyphae 5-12 μ in diam; trama of similar hyphae except thin-walled and 2.5-6 μ in diam; gloeoplerous hyphae present; both tubes and context pale yellow in KOH solution; cystidia none; basidia cylindrical, 17-24 x 6-7(-9) μ; spores hyaline or slightly yellowish, smooth, inamyloid, ellipsoid to oval, 7-9 x 4-5.5 μ.

On the wood of incense cedar (Libocedrus decurrens), rarely on other gymnosperms, in Cal., Ore., and doubtfully from Idaho; associated with a brown pin rot, see Boyce (1961) and Hepting (1971).

5b. Pores mostly 2-5 per mm
6a. Pore surface orange, often drying brown-black

8. TYROMYCES CROCEUS (Pers. ex Fries) Lowe, comb. nov. Fig. 8

Polyporus croceus Pers. ex Fries, Syst. Myc. 1:364. 1821. Boletus croceus Pers., Obs. Myc. 1:87. 1796. Polyporus pilotae Schw., Amer. Phil. Soc. Philadelphia Trans. 2,4:156. 1832. Polyporus hypococcinus Berk., London Jour. Bot. 6:319. 1847. P. castanophilus Atk., Jour. Myc. 8:118. 1902 (CUP).

Sessile, usually solitary, without distinctive taste or odor; pileus convex to subungulate, dimidiate, watery and rather soft when fresh, rigid when dry, up to 20 x 30 x 10 cm, above buff to orange when fresh, fading on drying, minutely tomentose to glabrous, azonate, the margin usually obtuse; pore surface orange often drying brown-black, the pores angular, 3-5 per mm, dissepiments becoming thin and lacerate; tubes drying brown-black, resinous and agglutinated, up to 2 cm long; context pale buff drying

sordid flesh-color to dark red, firm, fibrous, zonate, up to 3 cm thick.

Sporophore monomitic, the context of rarely branched, thin- to thick-walled, nodose-septate generative hyphae with scabrous walls, 4-6 μ in diam; trama of similar hyphae except thin-walled and mostly 3-4 μ in diam;

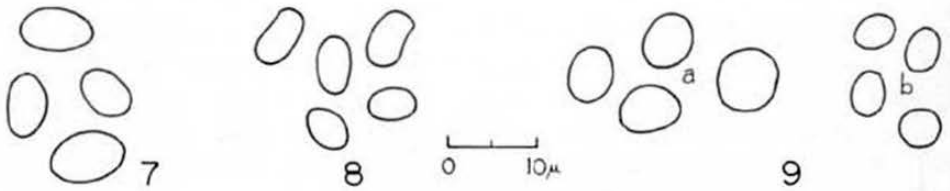


Fig. 7. Spores of T. amarus from isotype at BFDL. Fig. 8. Spores of T. croceus from FP 57092 at BFDL, BPI, and SYRF. Fig. 9. Spores (a) of T. spumeus from isotype of Spongipellis occidentalis, CUP 3346 at NY, and (b) spores of var. malicola from BPI, Lloyd Herb. 39895.

cystidia none; basidia slender-clavate, 17-21 x 5-7 μ; spores hyaline, smooth, inamyloid, short-oblong with rounded ends to oval or ovoid, 5.5-7 x 4-5 μ.

On the wood of angiosperms, usually chestnut and oak; associated with a piped white rot, see Hepting (1971). Dried T. fissilis may be mistaken for this; that species is white drying brownish discolored, has pores 1-3 per mm, and usually has chlamydospores borne in the context. P. pilotae is the type species for the genus Aurantiporus.

6b. Pore surface white, drying yellowish- or blackish-brown

9. TYROMYCES SPUMEUS (Sow. ex Fries) Imaz. var. SPUMEUS Fig. 9a

Tokyo Sci. Mus. Bull. 6:84. 1943. Polyporus spumeus Sow. ex Fries, Syst. Myc. 1:358. 1821. Boletus spumeus Sow., Eng. Fung. 2, t. 211. 1799. Spongipellis occidentalis Murr., N. Amer. Flora 9:38. 1907 (NY; CUP). Polyporus whetstonei Lloyd, Mycol. Writ. 7:1146. 1922 (BPI).

Sessile, sometimes somewhat imbricate, without distinc-

tive odor or taste; pileus white throughout when fresh, applanate to convex, dimidiate, fleshy drying rigid, up to 12 x 23 x 4.5 cm, above drying cream or discolored to pale yellowish brown or grayish or reddish and hispid, fibrillose, or strigose, azonate, the margin obtuse or acute, below fertile to edge; pore surface drying medium yellowish brown, somewhat glancing, the pores angular, (2-) 3-4 (-5) per mm, dissepiments thin to thickened, usually entire; tubes drying dark tan to brown-black and rigid, firm-waxy to rather soft and fragile, up to 15 mm long; context drying pale brown, watery, usually zonate, duplex, the upper part softer than the tissue near the tubes which is firm and radially fibrous, the fibers brittle, the whole up to 3 cm thick.

Sporophore monomitic, the context of rarely branched, frequently nodose-septate generative hyphae, in the firmer portion thin- to thick-walled, upper portion thin-walled, 4-9 μ in diam, often in strands; trama of similar hyphae except 3-5 μ in diam; gloeoplerous hyphae present; cystidia none; basidia clavate, 19-24 x 6-9 μ; spores hyaline, smooth, inamyloid, oval, 6-7 (-8) x 5-5.5 (-6) μ.

On wood of angiosperms in the northern half of the United States and southern part of Canada; associated with a white rot. T. delectans is similar but differs in having larger pores, 1-2 per mm.

9a. TYROMYCES SPUMEUS var. MALICOLA (Lloyd) Lowe, comb. nov. Fig. 9b.

Polyporus spumeus var. malicola Lloyd, Myc. Writ. 4, Apus p. 305. 1915 (BPI).

Applanate to convex, drying yellowish throughout, up to 11 x 8 x 1 cm; much as in the species except the context usually 2 mm or less thick and the spores smaller, 4-5 x 3.5-4 μ.

On wood of angiosperms in northeastern United States, from Mass. to Minn.; associated with a white rot. The variety is much more common than the species. Compare also Leptoporus caseosus Pat., page 72.

The collection selected for the type is Lloyd Herb.

No. 39895, collected on apple at W. Roxbury, Mass., Oct. 1914 by A. Hibbard. The collection selected by Stevenson and Cash (No. 42675) cannot be type as it was collected more than a year after the description was published.

10. TYROMYCES SUBSTUPPEUS (Berk. & Cooke) Lowe, comb. nov. Fig. 10.

Polyporus substuppeus Berk. & Cooke, Linnean Soc. Jour. Bot. 15:380. 1876 (K; BPI; NY).

Effused-reflexed to sessile, solitary or laterally confluent, taste mild; pileus conchate to convex, dimidiate, fragile and friable when dry, up to 4 x 7 x 0.8 cm (Murrill 1907, p. 40), above pale yellowish brown, matted-tomentose to strigose, azonate, the margin recurved, obtuse, entire, below fertile to edge; pore surface brown to blackish brown, dull, the pores angular, 2-4 per mm, dissepiments thin, entire to uneven; tubes drying rigid, brittle, more or less translucent, up to 1.5 mm long; context when dry yellowish brown, duplex, upper half soft and fibrous, below firm and cartilaginous, up to 3 mm thick.

Sporophore monomitic, the context in the upper half of loosely arranged, thin-walled, nodose-septate generative hyphae 2.5-5 μ in diam, in the lower half the hyphae similar except parallel-arranged and strongly coherent; trama of similar hyphae; cystidia none; spores somewhat uncertain, probably hyaline, smooth, inamyloid, oblong with rounded ends to oval, 5-7 x 4-4.5 μ, or "ovate to broadly elliptic, slightly tinted ? stained and measure 4.75-6.2 x 3.2-4.2 (-5) μ" (Reid).

On wood in Cuba and Brazil; rot unknown. The species seems very similar to T. spumeus which is larger and with oval spores 6-8 x 5-6 μ.

11. TYROMYCES PSEUDOLACTEUS Murr. Fig. 11.

Torrey Bot. Club Bull. 67:65. 1940 (FLAS).

Effused-reflexed to sessile, subimbricate, taste disagreeable; pileus convex, dimidiate, up to 3 x 5 x 2.5

cm, above "white", drying cream throughout, "hirsute" or strigose, or where exposed matted and forming a thin, rough pellicle, the margin acute, even; pore surface when fresh "white, unchanging", the pores angular, 4-5 (-6) per mm, dissepiments thin, entire to dentate; tubes drying soft, fragile, up to 2 cm long; context cream color, very soft and fibrous-fragile with faint strands, up to 8 mm thick.

Sporophore monomitic, the context of occasionally branched, thick-walled, frequently nodose-septate generative hyphae 3-5 (-6) μ in diam; trama of similar hyphae except 2.5-4 μ in diam; basidia clavate, 12-14 x 5-6 μ; cystidia none; spores hyaline, smooth, inamyloid, oblong-ellipsoid to ellipsoid, 4-5 x 2.5-3.5 μ from spore print (at FLAS), somewhat shorter and appearing broader in spores

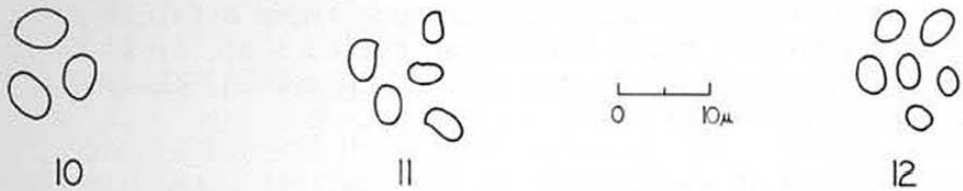


Fig. 10. Spores, of not wholly certain origin, from type of T. substuppeus at K, Trail 123. Fig. 11. Spores of T. pseudolacteus from FLAS, F 17298. Fig. 12. Spores of T. humeana from type at FLAS, F 17978.

found on hymenium.

On wood of angiosperms in Florida. According to its author the sporophore suggests "Polyporus lacteus" of Fries which differs in having allantoid spores and a much smoother upper surface. T. humeana seems similar but differs in having the upper surface somewhat velvety to nearly glabrous and in having larger pores, 2-4 per mm.

12. TYROMYCES HUMEANA (Murr.) Lowe, comb. nov. Fig. 12

Trametes humeana Murr., Torrey Bot. Club Bull. 65:656. 1939 (FLAS; BPI; SYRF). Tyromyces tigertianus Murr., Lloydia 6:228. 1943 (FLAS).

Sessile, solitary to subimbricate, when fresh with a "strong odor of anise" and taste "with nutty flavor"

(Murrill), when dry taste somewhat disagreeable; pileus conchate to convex, dimidiate to somewhat flabelliform, up to 7 x 10 x 3 cm, above grayish or pale yellowish brown, somewhat velvety to nearly glabrous, azonate, the margin acute to obtuse, below fertile nearly to edge; pore surface "white becoming rosy-avellaneous [or brownish] where bruised" (Murrill), drying medium yellowish brown, glistening somewhat, the pores round to somewhat daedaloid or angular, (2-) 3 (-4) per mm, dissepiments somewhat thickened, entire; tubes drying soft and fragile, up to 10 mm long; context drying grayish white to pale grayish brown, rather soft and radially fibrous, up to 2 cm thick.

Sporophore monomitic, the context of rarely branched, nodose-septate generative hyphae 3-6 μ in diam, some very thin-walled and with content staining in phloxine, some with wall thickened and non-staining; trama of similar hyphae; cystidia none; basidia subcylindrical, 17-20 x 5-6 (-7) μ; spores hyaline, smooth, inamyloid, ellipsoid to oval, 3-5 (-5.5) x 2.5-3 (-3.5) μ.

On wood of angiosperms in Florida; rot unknown.

3b. Spores cylindrical to ellipsoid or, if appearing broader, 6μ or more long
7a. Sporophore turning red on bruising or drying
8a. Cystidia present; spores 8-10μ long

13. TYROMYCES LAPPONICUS (Rom.) Lowe, comb. nov. Fig. 13

Polyporus lapponicus Rom., Ark. f. Bot. 11:17. 1912 (S; BPI). Polyporus ursinus Lloyd, Myc. Writ. 4, Apus, p. 319. 1915 (BPI; K).

Effused-reflexed to sessile, solitary, taste mild; pileus white or pinkish throughout when fresh, on bruising or on drying darkening to reddish- or red-brown, applanate to convex, up to 5 x 10 x 2.5 cm, above fibrillose or scabrous to glabrous on drying, azonate, the margin thin, below fertile to edge; pore surface dull, the pores round to angular or sinuate, about 1-3 per mm, dissepiments thin, somewhat lacerate with age; tubes waxy-brittle when dry, up to 7 mm long; context fibrous-fragile when dry, up to 2 cm thick.

Sporophore monomitic, the context of rarely branched, thick-walled to solid, frequently nodose-septate generative hyphae 4-7 μ in diam; trama of similar hyphae except more slender, 2.5-5 μ in diam, amyloid; cystidia usually abundant and conspicuous, sometimes capitate-incrusted, amyloid or dextrinoid, cylindrical, 20-35 x 5-7 μ, imbedded or projecting to 30 μ; basidia clavate, 22-29 x 6-7 μ; spores hyaline, smooth, inamyloid, cylindrical to cylindric-ellipsoid, 8-10 x 2.5-3.5 μ.

On wood of gymnosperms in northern United States and southern Canada; associated with a brown rot, see Hepting (1971). The amyloid reaction of the cystidia with Melzer's solution led Bondartsev and Singer (Ann. Myc. 39:52. 1941) to propose a separate genus (Amylocystis) for this species.

8b. Cystidia absent; spores 4-7 μ long

14. TYROMYCES FRAGILIS (Fries) Donk Fig. 14

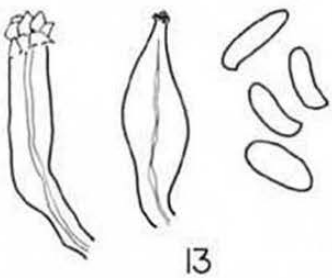
Utrecht Rijksun. Bot. Mus. Meded. 9:148. 1933. Polyporus fragilis Fries, Elench. Fung. 1:86. 1828. Spongipellis sensibilis Murr., Mycologia 4:93. 1912 (NY; BPI; K).

Sessile or more often effused-reflexed, usually solitary, taste mild; pileus when fresh white throughout but quickly turning brownish red on bruising or on drying, convex to subungulate, fleshy and rather soft when fresh, hard and fragile when dry, up to 4 x 7 x 1.5 cm, above finely tomentose to glabrous, azonate, the margin thin, below usually fertile to edge; pore surface glancing, the pores round to angular, 3-5 per mm, dissepiments thin, uneven; tubes quite soft and fragile when dry, up to 7 mm long; context drying more or less white, soft and friable, up to 1 cm thick.

Sporophore monomitic, the context of occasionally to rarely branched, thin- to more commonly thick-walled, abundantly nodose-septate generative hyphae 4-7 μ in diam; trama of similar hyphae except 3-5 μ in diam; gloeoplerous hyphae present; hyphal pegs rather rare; cystidia none; basidia clavate, 14-19 x 4-5 μ; spores hyaline, smooth, inamyloid, cylindrical and usually more or less curved and

allantoid, 4.5-5.5 x 1.5-2.5 μ.

On the wood of gymnosperms, widely distributed; associated with a brown rot, see Hepting (1971). T. mollis and T. lapponicus have somewhat similar sporophores that



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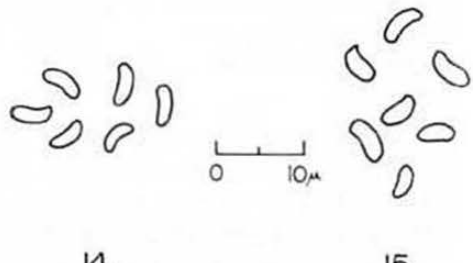

14 15

Fig. 13. Cystidia and spores of T. lapponicus from Lowe 3640 at SYRF. Fig. 14. Spores of T. fragilis from isotype of Spongipellis sensibilis at SYRF, Murrill 43. Fig. 15. Spores of T. subcartilagineus, drawing by R. Macrae from type at DAOM, No. 8852.

turn red on bruising and on drying. The first is sharply distinct as its hyphae are simple-septate; the second differs in having pores 1-3 per mm, spores 8-10 μ long, and in having cystidia.

15. TYROMYCES SUBCARTILAGINEUS (Overh.) Dom. Fig. 15

Grzyby (Mycota), Tom. 3, p. 131. 1967. Polyporus subcartilagineus Overh., Mycologia 33:90. 1941 (DAOM; PAC).

Effused-reflexed to sessile, solitary to somewhat imbricate, without distinctive odor, taste slightly acid; pileus conchate to convex, dimidiate to laterally confluent, somewhat coriaceous except for a cartilaginous-crisp layer, rigid and distorted when dry, up to 1 x 8 x 0.5 cm, above white and slowly reddish where bruised, or pinkish, glabrous, azonate, the margin thin, below fertile to edge; pore surface pinkish, drying pale brown, the pores round, 3-4 per mm, dissepiments rather thin, entire; tubes drying rigid and brittle, up to 4 mm long; context with a more or less distinct cartilaginous layer above the tubes, above that white and soft, the whole up to 2 mm thick.

Sporophore monomitic, the context of rarely branched, thin- to thick-walled, frequently nodose-septate and sometimes also simple-septate generative hyphae 3-6 μ in diam; trama of similar hyphae except 2-4 μ in diam; cystidia none; basidia clavate, 16-18(-24) x (5-) 6-7(-9) μ ; spores hyaline, smooth, strongly dextrinoid, short-cylindric and bent to oblong-ellipsoid, 4-5 (-6) x (1.5-) 2-2.5 (-3) μ.

On wood of gymnosperms, widely distributed in northern United States and southward in the Rockies to Arizona and New Mexico, and in southern Canada; associated with a brown cubical rot. This is very similar to T. transmutans which seems to differ in having a larger and much thicker pileus, and a very disagreeable taste.

Pouzar (Česká Myk. 20:176. 1966) proposes T. kravtzevianus Bond. and Parm. as the more valid name for this fungus, as a Latin diagnosis has never been published for the Overholts' species. This is the type species for the genus Parmastomyces Kotl. & Pouz. (Kotlaba and Pouzar 1964 b).

16. TYROMYCES TRANSMUTANS (Overh.) Lowe, comb. nov. Fig. 16

Polyporus transmutans Overh., Mycologia 44:226. 1952 (PAC;K;SYRF).

Sessile, "odor strongly fungoid" (Overholts), with a very disagreeable taste; pileus convex, dimidiate or somewhat flabelliform, "soft and spongy when fresh, not bending without breaking" (Overholts), drying hard and brittle, up to 5 x 6 x 1.5 cm, above white to very pale buff and discoloring reddish on handling, drying more or less reddish-brown, soft-tomentose to in part hispid, azonate, the margin acute, below with a sterile marginal zone up to 1 mm in width; pore surface "creamy to very pale buff" (Overholts), when dry pink to dark reddish brown, the pores angular, 2-4 per mm, dissepiments becoming thin, dentate; tubes discoloring and agglutinating on drying, up to 5 mm long; context cream, fibrous-fragile, azonate, up to 1 cm thick.

Sporophore monomitic, the context of rarely branched, thin-walled, frequently nodose-septate generative hyphae (3-) 4-8 μ in diam; trama of similar hyphae; gloeoplerous hyphae present; cystidia none; basidia narrowly clavate, 17-24 x 5-7 μ; spores hyaline, smooth, slightly to strongly dextrinoid, oblong to oblong-ellipsoid, 5-6 (-7) x 2.5-3 μ.

On wood of angiosperms in Pa. and Mich.; associated rot unknown. Overholts reports that cultures of this are almost indistinguishable from those of T. subcartilagineus. The sporophores of that are similar but seem to differ in having a slightly acid taste, a glabrous upper surface, and a much thinner context with an imbedded, distinct cartilaginous layer.

7b. Sporophore not turning red where bruised or on drying
9a. Spores 1-1.5 (-2) μ wide, cylindrical, usually bent and allantoid
10a. Gloeocystidia present

17. TYROMYCES LEUCOMALLELLUS Murr. Fig. 17

Torrey Bot. Club Bull. 67:63. 1940 (FLAS). Polyporus trabeus Rostk. sense of Bresadola, Ann. Myc. 6:37. 1908 (S; BPI), and of Lowe and Lundell, Mich. Acad. Sci., Arts, Lett. Papers 41:21-25. 1956. Leptoporus trabeus (Rostk.) Bourd. & Galz., sense of Hym. France, p. 541. 1928 (PC). Tyromyces newellianus Murr., Torrey Bot. Club Bull. 67:64. 1940 (FLAS). T. gloeocystidiatus Kotl. & Pouz., Česká Myk. 18:207. 1964 (PR).

Usually resupinate and effused to 10 cm, or effused-reflexed to sessile, with an anise odor and a very disagreeable taste; pileus conchate to convex, fleshy, drying brittle, up to 3 x 4 x 1 cm, above "white" (Murrill), drying cream with reddish or brownish discoloration, matted-fibrillose to almost glabrous, azonate, the margin thin, incurved; pore surface dark cream, dull, the pores angular, about 3-4 per mm but varying from 1-6 per mm, dissepiments thin, entire to fimbriate; tubes rather soft, drying soft-fragile, up to 10 mm long; context white to cream, drying soft, friable, up to 3 mm thick.

Sporophore monomitic, the context of infrequently branched, thin- to thick-walled, nodose-septate generative hyphae 2-5 μ in diam; trama of similar hyphae; hyphal pegs present; gloeocystidia rare to abundant, usually somewhat yellowish, imbedded or projecting, up to 40 x 11 μ; basidia clavate, 12-17 x 4.5-6 μ; spores hyaline, smooth, inamyloid, cylindrical and straight to allantoid, 4.5-6 (-8) x 1-1.5 (-2) μ.

On wood of gymnosperms in eastern Canada and the United States west to Michigan, and in Manitoba; associated with a brown checked rot. Kotlaba and Pouzar (1964, p. 215) give this species a wide distribution in Europe.

Polyporus hypocitrinus Berk., Linn. Soc. Bot. 15:50. 1876, described from Brazil, is extremely similar and may be the valid name for this fungus. In the description the type was said to be centrally attached, with a citrine hymenium, and labyrinthiform pores - characters at sufficient variance with American and European material to dictate caution in proposing synonomy.

10b. Gloeocystidia absent
11a. Context not over 2 mm thick

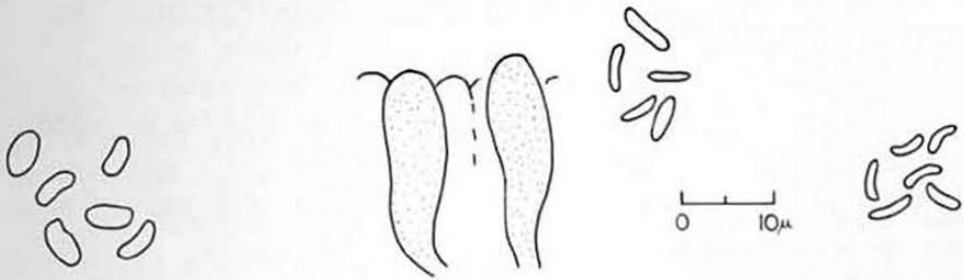

Fig. 16. Spores of T. transmutans from type at PAC, Overholts Herb. 22971. Fig. 17. Spores and gloeocystidia of T. leucomallellus from paratype at FLAS, F 18239. Fig. 18. Spores of T. perdelicatus from isotype at BPI, Murrill 47.

18. TYROMYCES PERDELICATUS Murr. Fig. 18

Mycologia 4:95. 1912 (NY; BPI; FH; K).

Sessile or subresupinate, taste bitter; pileus conchate to thin-convex, soft and rather fragile, up to 1 x 2 x 0.3 cm (Overholts), above white, finely tomentose to glabrous, the margin acute; pore surface white, cream when dry, the pores angular, 4-6 per mm, dissepiments rather thin, fimbriate; tubes up to 2 mm long, when dry rather soft, fragile; context white, when dry rather soft, fibrous, up to 1 mm thick.

Sporophore monomitic, the context of rarely branched, thick-walled, frequently nodose-septate generative hyphae 2-4 μ in diam; trama of similar hyphae; gloeoplerous hyphae present; hyphal pegs present; cystidia hyphoid, 2.5-4 μ in diam; basidia clavate, 12-14 x 4-6 μ; spores hyaline, smooth, inamyloid, allantoid, 4-5 (-6) x 1-1.5 μ.

On wood of gymnosperms in Wash., Ore., Mont., and Idaho; rot unknown. The sporophore is very similar to that of T. caesius which differs in its bluish coloration, its mild taste, larger sporophores, and in having context hyphae 4-8 μ in diam.

19. TYROMYCES LINEATUS (Overh.) Lowe, comb. nov. Fig. 19

Polyporus lineatus Overh.[1/], Mycologia 33:101. 1941 (PAC; BPI; SYRF).

Sessile, laterally confluent, imbricate, taste mild; pileus convex, drying rigid, up to 1 x 3 x 0.5 cm, above with radially arranged yellowish fibrils, the margin acute,

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[1/] As this species has not been validated by a Latin description, a validating diagnosis is supplied here:

POLYPORUS LINEATUS Overholts sp. nov. - Pileo angusto-reflexo, 2-8 cm longo, 1-3.5 cm lato, 0.1-0.3 cm crasso, superne pallido vel cinnamomeo-luteo, tomentoso, margine lineato-radiato; contextu albo, crasso 1-2 mm; hyphis nodoso-septatis, diametro 4-5 μ; poris 2-4 pro mm; sporis cylindratis, laevibus, hyalinis, rectis, 4-5 x 1 μ; cystidia nullis.

In ligno Pinus rigidae, Houserville, Pa., U. S. A., Nov. 24, 1921, typus in herbario Overholtsii ut No. 8023 conservatus.

indurated, dark; pore surface tan, dull, the pores angular, 3-4 per mm, dissepiments rather thin, entire; tubes when dry indurated and brittle, up to 3 mm long; context white, soft, more or less fragile, but with yellowish indurated strands, up to 2 mm thick.

Sporophore monomitic, the context of rarely branched, solid or nearly so, rather rarely nodose-septate generative hyphae 2-3 (-4) μ in diam; trama of similar hyphae; gloeoplerous hyphae 5-7 μ in diam; hyphal pegs present; cystidia absent; basidia slender-clavate, 12-17 x 4-5 (-6) μ; spores hyaline, smooth, inamyloid, cylindrical, often somewhat bent, 3.5-5 x 1.5 μ.

Known only from the type on wood of gymnosperms in Pa. The sporophore resembles that of T. semisupinus which differs in having a dimitic hyphal construction and ellipsoid to oval spores 2.5-4 x 1.5-3 μ. The upper surface closely resembles that of Polyporus biformis Fries which differs in the pore surface usually becoming hydnoid, the pores 1-2 per mm, and the spores 6-8 x 2-2.5 μ.

11b. Context much thicker, to 30 mm thick

20. TYROMYCES CAESIUS (Schrad. ex Fries) Murr. Fig. 20

N. Amer. Flora 9:34. 1907. Polyporus caesius Schrad. ex Fries, Syst. Myc. 1:360. 1821. Boletus caesius Schrad., Spicil. Florae Germ., p. 167. 1794.

Sessile or effused-reflexed, solitary or subimbricate, taste mild; pileus when fresh white or grayish or in part with a bluish tint, sometimes more intensely blue where bruised, convex, dimidiate, soft and watery when fresh, firm when dry, up to 5 x 6 x 1.5 cm, above villous-pubescent or strigose or varying to nearly glabrous, azonate, the margin thin to thick, below fertile to edge; pore surface dull, the pores angular, 3-4 per mm, dissepiments thin, becoming lacerate; tubes rather firm but fragile when dry, up to 7 mm long; context soft and watery when fresh, firm-friable when dry, up to 1 cm thick.

Sporophore monomitic, the context of infrequently branched, thick-walled, nodose-septate generative hyphae 4-8 μ in diam; trama of similar hyphae except 3-5 μ in diam gloeoplerous hyphae present; hyphal pegs present; cystidia

none; basidia clavate, 14-17 x 4-5.5 μ; spores hyaline, smooth, inamyloid, cylindrical, slightly curved to allantoid, 3-5 (-6) x 1-1.5 μ.

19 20 21

Fig. 19. Spores of T. lineatus from type at PAC, Overholts Herb. 8023. Fig. 20. Spores of T. caesius from Lowe 10076 at SYRF. Fig. 21. Spores of T. tephroleucus from 1315 Fung. Exs. Suec., filed as Polyporus lacteus at BPI.

On the wood of both gymnosperms and angiosperms, common and widely distributed; associated with a brown rot, see Hepting (1971). The species is very similar to T. tephroleucus and differs principally in its bluish tint, usually most marked on the pore surface. Compare also P. caesioflavus, page 71.

Tyromyces caesiosimulans Atk., Ann. Myc. 6:61. 1908 (type at CUP), is T. caesius parasitized by Tremella polyporina Reid, see Lowe 1974, and Reid 1970, p. 416.

21. TYROMYCES TEPHROLEUCUS (Fries) Donk
Plate I B and Fig. 21

Utrecht Rijksun. Mus. Herb. Meded. 9:150. 1933. Polyporus tephroleucus Fries, Syst. Myc. 1:360. 1821. Polyporus lacteus Fries of Epicrisis, p. 453. 1836-38 and of Hym. Eur., p. 546. 1874. Polyporus tephroleucus var. scruposus Lloyd, Mycol. Writ. 6:885. 1919 (BPI).

Sessile or effused-reflexed, solitary, without distinctive odor, taste mild to somewhat acid; pileus convex, dimidiate, soft and watery when fresh, rigid and fragile when dry, up to 4 x 8 x 3.5 cm, above white to grayish, drying pale yellowish brown or grayish, finely tomentose to glabrous, usually with a thin pellicle on drying, azonate, the margin abruptly thin, with a sterile marginal zone below; pore surface drying white to yellowish, glancing, the pores round to angular, about 3-5 per mm, dissepiments

thin, dentate to somewhat lacerate; tubes cream or somewhat yellowish, drying rather soft and fragile, up to 10 mm long; context white, when dry usually fibrous and fissile where broken, soft, azonate, up to 3 cm thick.

Sporophore monomitic, the context of rarely branched, thick-walled, nodose-septate generative hyphae 4-6 μ in diam; trama of similar hyphae except some thin-walled; gloeoplerous hyphae present; hyphal pegs present; cystidia none but cystidioles may be present; basidia clavate, 12-17 x 4-5 μ; spores hyaline, smooth, inamyloid, allantoid, 3-5 x 1-1.5 μ.

On the wood of angiosperms or rarely of gymnosperms, common and widely distributed; associated with a white rot. This is extremely similar to T. lacteus which differs in usually having a dimitic hyphal construction, in having a disagreeable taste, and in causing a brown rot. Compare also P. caesioflavus, p. 71.

A specimen at Kew identified by Fries, and the only one known to me so identified by Fries, has the sporophore construction of T. albellus as described in this manual. If the Kew specimen is selected as neotype, another name will have to be selected to apply to the fungus here described as T. tephroleucus. Bjerkandera melina Karst. would be the earliest basionym (1887) known to me.

Donk (1972, p. 297) tentatively favors the above interpretation of T. tephroleucus.

22. TYROMYCES LEUCOMALLUS (Berk. & Curt.) Murr. Fig. 22

N. Amer. Flora 9:36. 1907. Polyporus leucomallus Berk. & Curt., Linnean Soc. Jour. Bot. 10:308. 1868 (K; NY). P. verecundus Berk. & Curt., same except p. 309 (K; BPI; NY). Trametes pura Berk. & Curt., same except p. 320 (K; BPI; FH; NY). Polyporus immaculatus Berk. & Curt. in Lloyd, Myc. Writ. 4, Apus p. 299. 1915 (K; FH; NY).

Sessile, solitary, taste mild; pileus applanate to convex, dimidiate, drying rather soft and brittle, up to 5 x 8 x 1.8 cm, above white drying more or less yellowish, velvety to somewhat fibrillose or strigose, azonate, the margin thin, incurved; pore surface white to tan, the pores rounded to angular, 6-9 per mm, dissepiments thin, entire;

tubes drying rigid, brittle, up to 6 mm long; context white, soft and fibrous-fragile above, often firmer next the tubes, up to 1.5 cm thick.

Sporophore monomitic, the context of rarely branched, thin- to thick-walled, frequently nodose-septate generative hyphae 4-7 (-9) μ in diam; trama of similar hyphae except 1.5-6 μ in diam; gloeoplerous hyphae present; hyphal pegs present; cystidia none; basidia clavate, 10-12 x 4-6 μ; spores hyaline, smooth, inamyloid, cylindrical and usually bent, 4-5.5 x 1-1.5 μ.

On wood of angiosperms in Cuba, Jamaica, and Ala., infrequent. Similar to Polyporus nivosus which differs in having a trimitic hyphal construction, and oblong spores 5.5-7.5 x 2-3 μ. Trametes pura is a myriadoporous form. In an herbarium note Bresadola states that P. verecundus and T. pura differ from P. immaculatus but his basis for the distinction is unknown.

23. TYROMYCES LEUCOSPONGIA (Cooke & Harkn.) Bond. & Sing. Fig. 23

Ann. Myc. 39:52. 1941. Polyporus leucospongia Cooke and Harkn., Grevillea 11:106. 1883 (K; BPI).

Resupinate or effused-reflexed to sessile, solitary, without distinctive odor or taste; pileus conchate to convex, dimidiate, very soft and spongy, up to 5 x 10 x 3 cm, above white to cream or brownish, villose or drying

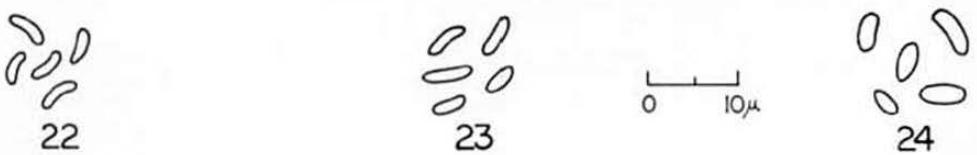


Fig. 22. Spores of T. leucomallus from type at K, Wright 104. Fig. 23. Spores of T. leucospongia from type at K, Ellis 3731. Fig. 24. Spores of T. subpendulus from type, CUP 8252.

with a thin pellicle, azonate, the margin obtuse, often inrolled; pore surface white, drying more or less brown, the pores rounded to angular, (2-) 3-4 per mm, dissepiments

thin, fimbriate to incised; tubes drying rigid and brittle, up to 5 mm long; context white to cream, above very soft, below firmer and soft-felty, up to 2.5 cm thick.

Sporophore monomitic, the context of rarely branched, thick-walled, abundantly nodose-septate generative hyphae 4-9 μ in diam; trama of similar hyphae except more slender, 3-6 μ in diam; hyphal pegs present; cystidia none; basidia cylindrical to narrowly clavate, 14-19 x 4-5 (-6) μ; spores hyaline, smooth, inamyloid, cylindrical, straight to somewhat curved, 4-5 (-6) x 1-1.5 μ.

On wood of gymnosperms at high elevations in western parts of the United States, Alaska, and Canada, closely following the retreating snow line; associated with a brown rot, see Boyce (1961) and Hepting (1971).

Surprisingly, in this very soft fungus, the hyphal walls are very thick. The texture of a polypore depends, not on the thickness of the hyphal wall alone, but also on its chemical nature and the compactness of hyphal arrangement. This is the type species for the genus Spongiporus.

9b. Spores 1.5 μ or more wide, oblong to ellipsoid
12a. Sporophore more or less pendent, small

24. TYROMYCES SUBPENDULUS ATK. Fig. 24

Ann. Myc. 6:61. 1908 (CUP).

Sessile or stipitate and more or less pendent, taste bitter, the stem whitish, glabrous, cylindrical, broadening into the vertex of the pileus, 1-2 mm long; pileus white throughout when fresh, drying cream, ungulate or convex to subapplanate, fibrous-fleshy becoming friable when dry, up to 7 x 10 x 5 mm, above white with sordid pale yellow stains, glabrous, drying subpelliculose, radiately rugose, the margin obtuse, usually entirely surrounding the pore surface and about 1 mm wide; pore surface cream, the pores round to irregular, especially at the margin, 6-8 per mm, dissepiments thin, entire to slightly fimbriate; tubes soft, waxy, up to about 4 mm long; context radiately fibrous-friable, azonate, up to 1 mm thick.

Sporophore monomitic, the context of rarely branched, usually thin-walled, both simple- and nodose-septate generative hyphae 3-6 μ in diam; trama of similar hyphae except 2.5-3 μ in diam; gloeoplerous hyphae up to 12 μ in diam; cystidia none; basidia cylindrical to clavate, 13-18 x 5-7 μ; spores hyaline, smooth, inamyloid, oblong to oblong-ellipsoid, often slightly curved, 4-5 x (1.5-) 2-2.5 μ.

On wood of Tsuga, known only from the type collection from near Ithaca, New York. The sporophore most closely resembles that of T. minusculoides which differs in being much softer when fresh and with much larger pores, 2-3 per mm in fresh specimens.

25. TYROMYCES MINUSCULOIDES (Pil.) Bond. Fig. 25

Polyporaceae Eur., USSR, Caucasia, p. 227. 1953. Leptoporus minusculoides Pil. in Kavina and Pilát, Atlas Champ. Europe 3,1: 193. 1938 (PR).

Usually pendent, sometimes sessile, very weakly attached, taste extremely bitter; stem swelling to form the pileus, the whole more or less turbinate, soft and cottony or rarely firm when fresh, hardening and decidedly shrinking on drying, up to 0.5 x 1 x 0.6 cm, white throughout when fresh, discoloring somewhat yellowish on drying, drying glabrous, the margin rounded, below fertile to edge; pore surface dull, the pores angular, 2-3 (-4) per mm, dissepiments thin, entire to fimbriate; tubes usually extending very nearly the thickness of the sporophore, very fragile when dry; context soft and fragile when dry, not over 2 mm thick.

Sporophore monomitic, the context of rarely branched, very thin-walled and often collapsing, nodose-septate generative hyphae 2-4 (-6) μ in diam; trama of similar hyphae; cystidia none; basidia clavate, 14-19 x 4.5-6 μ; spores hyaline, smooth, inamyloid, minutely apiculate, short-oblong to oblong-ellipsoid, 4-5.5 x 2-2.5 μ.

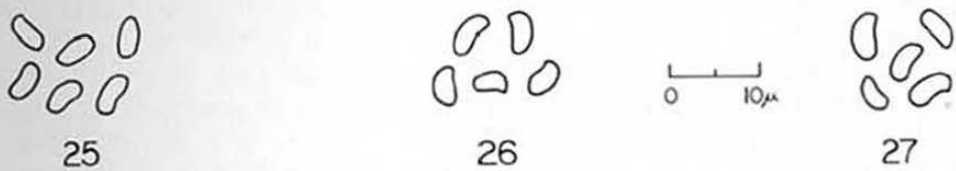
On well-rotted wood of gymnosperms in Quebec, N. Y., Pa., Tenn., Wash., and in Europe. The sporophore is similar to other species of pendent habit. T. subpendulus and

Polyporus gossypinus have a similar hyphal system, but the first has pores 6-8 per mm, and the latter (see p. 72) forms a much larger sporophore and has more slender spores, 1-1.5 μ broad. P. concrescens (see p. 72) and Leptoporus minusculus Boud., from France, have simple-septate context hyphae and the latter, according to Boudier, has rounded spores 4-6 μ wide. P. albomollis Lloyd, from Brazil, is sessile and somewhat similar but differs in having a mild taste, a dimitic hyphal system, and spores 6-7 x 4-5 μ.

26. TYROMYCES CERIFLUUS (Berk. & Curt.) Murr. Fig. 26

N. Amer. Flora 9:33. 1907. Polyporus cerifluus Berk. & Curt., Grevillea 1:50. 1872 (K; BPI; FH; NY).

Pendent or effused-reflexed to sessile, solitary or somewhat imbricate, taste bitter or resinously disagreeable; pileus applanate or conchate to convex, dimidiate or with a



25 26 27

Fig. 25. Spores of T. minusculoides from type, PR 488457. Fig. 26. Spores of T. cerifluus from type at K, Ravenel 2926. Fig. 27. Spores of T. carbonarius from type at NY, Murrill 64.

narrow attachment or attached by a dorsal umbo, rather soft but tough when fresh, up to 2 x 4 x 0.5 cm, above white, drying sordid cream with reddish small spots, indistinctly radiately fibrillose, usually drying with a thin resinous pellicle, azonate, the margin usually rounded, incurved and resinously indurated when dry, poroid to edge; pore surface drying cream to discolored brownish, rough, somewhat glancing, the pores round to more or less angular, distorted on drying, (2-) 3-4 per mm, dissepiments thin, incised and the surface appearing almost hydnoid; tubes darker than the context, drying rigid, fragile, up to 4 mm long; context nearly white, varying from rather soft-fibrous to firm and subcartilaginous, with a thin cartilaginous layer above, up to 2 mm thick.

Sporophore monomitic, the context of occasionally branched, thin- to thick-walled, frequently nodose-septate generative hyphae 3-4 (-6) μ in diam; trama of similar hyphae except 2-4 μ in diam; hyphal pegs rare; cystidia none; basidia somewhat turbinate, 17-24 x 5-6 μ; spores hyaline, smooth, inamyloid, apiculate, oblong to narrowly ellipsoid, 3.5-5 x 1.5-2.5 μ.

On wood in S. Car., known only from the type. Polystictus revolutus Bres., a European species, is very similar, but seems to differ in having a mild taste.

12b. Sporophore laterally attached, rarely small

27. TYROMYCES CARBONARIUS Murr. Fig. 27

Mycologia 4:94. 1912 (NY; BPI; SYRF).

Sessile, taste slightly resinous; pileus "quite irregular in shape, varying from flabelliform to broadly sessile and laterally elongate, juicy, tough" (Murrill), drying hard, up to 1 x 3 x 0.6 cm, above "white or hygrophanus" (Murrill), when dry resinously matted, fibrillose, faintly radiately marked, faintly zoned, the margin drying resinous, acute; pore surface white, dull, the pores round to angular, 3-4 (-5) per mm, dissepiments rather thick to thin, entire to lacerate; tubes when dry firm but fragile, up to 3 mm long; context cream with resinous streaks, firm and waxy-brittle, up to 5 mm thick.

Sporophore monomitic, the context of very compactly arranged, rarely branched, thin- to thick-walled, occasionally nodose-septate generative hyphae 3-8 μ in diam; trama of similar hyphae except 2.5-4 μ in diam; cystidia none; basidia clavate, 15-20 x 5-6.5 μ; spores hyaline, smooth, inamyloid, oblong and usually slightly bent, 4-5 x (1.5-) 2-2.5 μ.

On charred wood of gymnosperms, known only from the type from Washington; associated rot unknown. The California collections cited by Overholts (1953, p. 296) are of uncertain identity.

28. TYROMYCES FLORIFORMIS (Quél.) Bond. & Sing. Fig. 28

Ann. Myc. 39:51. 1941. Polyporus floriformis Quél. in Bresadola, Fung. Trident. 1:61. 1884 (BPI-isotype). Polyporus subsericeomollis Rom., Sv. Bot. Tidskr. 20:17. 1926 p. pt. sec. Kotlaba and Pouzar in Česká Myk. 18:213 and 217. 1964 (S). ? T. cinchonensis Murr., Mycologia 2:192. 1910 (NY; K).

Usually narrowed to a lateral stemlike base, sometimes imbricate in the form of a rosette and with a central stemlike point of attachment, taste bitter; pileus conchate, often spathulate, subcoriaceous, rigid when dry, up to 4 x 5 x 0.4 cm, above white becoming more or less yellow or blackening, on drying sometimes radially streaked, "appressed silky and minutely radiate-fibrillose" (Overholts), azonate or faintly zonate, the margin thin, usually drying incurved, below fertile to edge; pore surface white, yellowish on drying, the pores round to angular, 4-6 (-8) per mm, dissepiments rather thick and entire, becoming thin and somewhat lacerate; tubes drying corky-brittle, up to 3 mm long; context white, subcorky becoming soft or in part hard and indurated on drying, up to 2 mm thick.

Sporophore monomitic, the context of rarely branched, thin- to rather thick-walled, abundantly nodose-septate generative hyphae 2.5-6 μ in diam; trama of similar hyphae except not more than 4 μ in diam; some gloeoplerous hyphae present; hyphal pegs present; cystidia none; basidia clavate, 12-19 x 5-6 μ; spores hyaline, smooth, inamyloid, oblong-ellipsoid to ellipsoid, 3.5-5 x (1.5-) 2-2.5 μ.

On the wood of gymnosperms or rarely of angiosperms, widely distributed in eastern and western United States and Canada; rot unknown. The sporophore closely resembles that of T. semisupinus which differs in having a dimitic hyphal construction, a mild taste, and spores usually 2.5-4 μ long. T. balsameus also resembles it but differs in being somewhat thicker, in having cystidia, and a dimitic hyphal construction.

29. TYROMYCES GUTTULATUS (Peck) Murr. Fig. 29

N. Amer. Flora 9:31. 1907. Polyporus maculatus Peck, N. Y. State Mus. Ann. Rept. 26:69. 1874, not P. maculatus

Berk. 1851 (NYS; BPI). Polyporus guttulatus Peck, N. Y. State Mus. Ann. Rept. 33:37. 1880. T. substipitatus Murr., Mycologia 4:96. 1912 (NY; BPI; SYRF). Polyporus grantii Lloyd, Myc. Writ. 5:763. 1918 (BPI).

Sessile to substipitate, solitary, taste somewhat disagreeable or resinous; pileus conchate to applanate, dimidiate to spathulate, up to 10 x 22 x 1.5 cm, above white drying discolored yellowish or pinkish, faintly zonate, often with a thin pellicle, usually with rounded depressed spots particularly toward the margin, glabrous, smooth, the margin rather thin, rounded; pore surface drying cream color or darkening somewhat, glancing, the pores subangular, 4-6 per mm, dissepiments rather thin, entire to minutely fimbriate; tubes when dry darker than the context, drying rigid, fragile, up to 1 cm long; context white, fissile, fibrous, up to 6 mm thick.

Sporophore monomitic, the context of rarely to moderately branched, thin- to thick-walled, frequently nodose-septate generative hyphae 4-6 (-9) μ in diam; trama of similar hyphae; gloeoplerous hyphae present; hyphal pegs present; cystidia none; basidia narrowly clavate, 14-24 x 4.5-6 μ; spores hyaline, smooth, inamyloid, apiculate, oblong, 4-5 (-6) x 2-2.5 (-3) μ.

On the wood of gymnosperms or more rarely of angiosperms, infrequent but widely distributed; associated with a brown cubical rot, see Hepting (1971). T. immitis differs in not having rounded depressed spots on the upper surface, and in having spores 1.5-2 μ wide.

Tyromyces tiliophila Murr. (N. Amer. Flora 9:33. 1907) is considered a synonym by Overholts (1953, p. 286) but this is somewhat uncertain as the type, at NY and BPI, has a mild taste and lacks spots on the upper surface.

30. TYROMYCES ALBOGILVUS (Berk. & Curt.) Murr. Fig. 30

N. Amer. Flora 9:36. 1907. Polyporus albogilvus Berk. & Curt., Linnean Soc. Jour. Bot. 10:308. 1868 (K; BPI; FH; NY).

Sessile, solitary, without particular odor or taste; pileus applanate to convex, dimidiate, up to 3 x 3.5 x 0.6 cm, above cream with a yellowish- or reddish-brown thin pellicle, "gilvous when fresh" (Murrill), glabrous, azonate, smooth to radially wrinkled, the margin rounded; pore surface sordid cream to dark cream, the pores angular

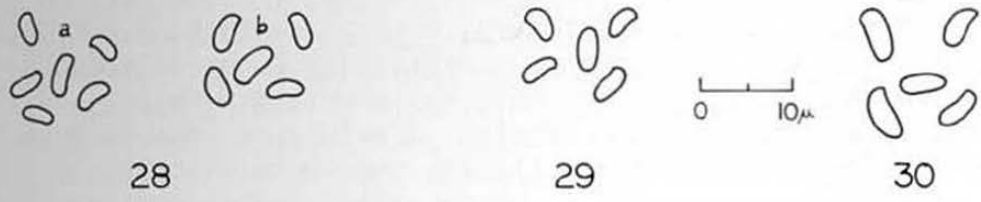


Fig. 28. Spores (a) of T. floriformis from isotype at BPI; spores (b) of T. cinchonensis from type at NY, Murrill 500. Fig. 29. Spores of T. guttulatus from Lowe 15127 at SYRF. Fig. 30. Spores of T. albogilvus from type at K, Wright 415.

or somewhat lamellate near the margin, 6-9 per mm, dissepiments thin, entire to fimbriate; tubes more or less concolorous or somewhat translucent, soft-brittle, up to 4 mm long; context cream, soft fibrous-friable, up to 2 mm thick.

Sporophore monomitic, the context of rarely to frequently branched, thin- to thick-walled, nodose-septate generative hyphae 2-8 μ in diam; trama of similar hyphae except not over 4 μ in diam; gloeoplerous hyphae present; cystidia none; basidia clavate, 19-31 x 5-8 μ; spores hyaline, smooth, oblong-ellipsoid, inamyloid, 4-5 x 2-2.5 μ, or cylindric, "5-6 x 2.2-2.5 μ" (Pegler).

On wood of angiosperms in Cuba, known only from the type collection. Other specimens seen and so named do not agree with the type collection. Externally the sporophore resembles that of Polyporus flavescens Mont. but internally that differs in having a trimitic hyphal construction and in having spores 7-8 μ long. The Kew type of T. albogilvus is annotated by Bresadola, " Ne pas = P. flavescens, structura tout fait diverse".

1b. Hyphal construction dimitic (see also 1c)
13a. Context monomitic; trama with skeletal hyphae

31. TYROMYCES ALBELLUS (Peck) Bond. & Sing.
Plate I H and Fig. 31

Ann. Myc. 39:52. 1941. Polyporus albellus Peck, N. Y. S. Museum Ann. Rept. 30:45. 1878 (NYS-neotype; BPI; K; SYRF). Not P. albellus Massee, 1899.

Sessile, usually solitary, without particular odor, taste mild, drying light in weight; pileus convex, dimidiate, up to 8 x 8 x 3 cm, above white drying usually whitish to yellowish or grayish, finely tomentose to glabrous, often with a thin pellicle, smooth to wrinkled, azonate, the margin acute, below with a narrow sterile zone or fertile to margin; pore surface white to cream, glancing, the pores round, 4-5 (-6) per mm, dissepiments rather thick to thin, entire; tubes drying rather soft, up to 5 mm long; context white to cream, soft to firm when dry, spongy, azonate, up to 2.5 cm thick.

Sporophore dimitic, the context monomitic, of much branched, thick-walled, nodose-septate generative hyphae 3-5 (-12) μ in diam; trama dimitic, of infrequently branched generative hyphae 2-3.5 μ in diam and of skeletal hyphae 2-4 μ in diam; gloeoplerous hyphae present; hyphal pegs infrequent; cystidia none; basidia clavate, 9-14 x 4-6 μ; spores hyaline, smooth, inamyloid, allantoid, 3-5 x 1-1.5 (-2) μ.

On wood of angiosperms, common and widely distributed; associated with a white rot. The type collection from the Helderberg Mountains near Albany, N. Y., appears to be lost; the neotype was selected from Adirondack collections identified by Peck, and with study notes by L. O. Overholts.

A specimen at Kew named Polyporus tephroleucus by Fries, if accepted as authentic and designated as neotype, will put T. albellus in synonomy with T. tephroleucus, as both have the same characteristics.

Donk (1972, p. 289-293), however, believed P. albellus is a synonym of P. chioneus Fries.

32. TYROMYCES CANADENSIS (Overh.) Lowe, comb. nov.
Plate I C and Fig. 32

Polyporus canadensis Overh., Mycologia 33:97. 1941 (PAC)[1/].

Sessile to substipitate, solitary or often imbricate, aromatic when fresh, taste not distinctive; pileus conchate, dimidiate or narrowed at attachment, soft-spongy to watery-tough, drying rigid, up to 5 x 7 x 0.8 cm, above sodden and white to gray or brownish, tomentose to fibrillose, often drying radially striate or strigose and with black dots, the margin thin, sometimes fibrillose, below with sterile border up to 2 mm wide; pore surface white, drying cream to pale brown, somewhat glancing, pores angular, (4-) 5-6 per mm, dissepiments thin, entire to minutely fimbriate; tubes drying darker than context and rigid, very fragile, up to 3 mm long; context white, fissile, soft-fibrous in upper half, much firmer next to the tubes, sometimes with resinous streaks, zonate, up to 5 mm thick.

Sporophore dimitic, the context monomitic, of rarely to often branched, thick-walled, frequently nodose-septate generative hyphae 3-6 µ in diam and often in strands; trama dimitic, of firmly coherent, rarely branched, thin- to thick-walled, rarely nodose-septate and also simple-septate generative hyphae 3-4 µ in diam, and of skeletal hyphae 2.5-5 µ in diam; cystidioles frequent; basidia clavate, 12-19 x 5-6 µ; spores hyaline, smooth, inamyloid, broadly oval to subglobose, 2.5-3 (-3.5) x 2-2.5 µ.

1/ As this species has not been validated by a Latin description, a validating diagnosis is supplied here:

POLYPORUS CANADENSIS Overholts sp. nov. - Pileo imbricato-sessili, aquoso-lento, siccante rigido et fragili, 3-5 cm longo, 3-7 cm lato, 0.3-0.8 cm crasso, superne albo, tomentoso; contextu duplici, albido, crasso 2-4 mm; poris angulatis, 4-6 pro mm; sporis subglobosis vel late ellipsoideis, laevibus, hyalinis, 2-3 x 1.5-2 µ; cystidiis diametro 4-5 µ; hyphis contextis nodoso-septatis, plerumque in diametro 4-6 µ.

In ligno Piceae prope Ottawa, Ontario, Canada, Aug. 16, 1933, legit J. W. Groves, typus in herbario Overholtsii ut No. 16860 in PAC et isotypus in DAOM ut No. 3593 conservatus.

On wood of gymnosperms in Ont. (type), New York, Idaho, Wash., Mont., and Oregon; associated with a white stringy rot. Externally it is somewhat similar to T. immitis which differs in having a bitter taste and oblong spores 4-5.5 x 1.5-2 μ; also sometimes similar to T. fumidiceps which occurs on wood of angiosperms and has tubes that are usually greenish.

13b. Context dimitic
14a. Context with skeletal hyphae
15a. Trama monomitic

33. TYROMYCES HYDROPHILUS (Berk. & Curt.) Lowe, comb. nov. Fig. 33

Polyporus hydrophilus Berk. & Curt., Linnean Soc. Jour. Bot. 10:306. 1868 (K; BPI; FH).

Sessile, solitary, taste mild; pileus conchate to applanate, dimidiate to subspathulate, up to 4 x 6 x 0.6 cm, above grayish-orange or pale brown, somewhat tomentose, mostly drying matted and wrinkled, zonate and sulcate towards margin, the margin thin, undulate, lobed, below fertile to edge; pore surface tan, the pores angular, irregular and somewhat compressed, 8-10 per mm, dissepiments thin, entire to fimbriate or lacerate; tubes cinnamon

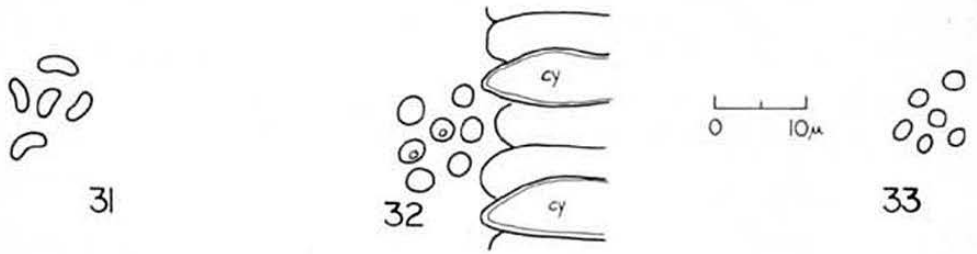


Fig. 31. Spores of T. albellus from neotype at NYS. Fig. 32. Spores and cystidioles (cy) of T. canadensis from isotype at SYRF from Overholts Herb. 16860. Fig. 33. Spores of T. hydrophilus from isotype at BPI, Lloyd Herb. 49611.

to translucent reddish, papery to brittle, up to 3 mm long; context pale brown, rather soft-punky except for a hard gelatinized line running through the middle that may be enlarged to occupy the lower context and make it a strongly

zonate zone, up to 3 mm thick.

Sporophore dimitic, all hyphae more or less agglutinated, in the context above the line monomitic, of thin- to somewhat thick-walled, nodose-septate generative hyphae 2-6 μ in diam, below the line dimitic, of often branched, thin-walled, nodose-septate generative hyphae 1.5-4.5 μ in diam and skeletal hyphae 3-6 μ in diam; trama monomitic, of thin-walled, nodose-septate generative hyphae 1-2.5 μ in diam; gloeoplerous hyphae rather rare; hyphal pegs occasional; cystidia none; spores hyaline, smooth, inamyloid, oval to subglobose, 2-3 x 1.5-2 μ.

On wood in Cuba and British Honduras; type of rot unknown.

15b. Trama dimitic, with skeletal hyphae
16a. Cystidia present

34. TYROMYCES SEMISUPINIFORMIS Murr. Fig. 34

N. Y. Bot. Gard. Bull. 8:148. 1912 (NY; BPI; SYRF).

Effused-reflexed, imbricate, taste mild; pileus conchate, dimidiate or laterally fused, rigid, brittle, up to 1 x 2 x 0.2 cm, above cream to somewhat yellowish, glabrous, azonate, the margin thin, acute, below with a sterile margin up to 1 mm wide; pore surface cream with a pinkish tinge, dull, the pores angular, about 9-10 per mm, dissepiments rather thin, entire; tubes rigid, up to 0.5 mm long; context cream, somewhat soft, somewhat radially fibrous, up to 1.5 mm thick.

Sporophore dimitic, the context dimitic, of rarely branched, thin-walled, nodose-septate generative hyphae mostly 3-5 μ in diam and of rarely branched, thick-walled skeletal hyphae 3-6 μ in diam; trama of similar hyphae; cystidia rare to abundant, more common on the outer half of the tubes, heavily incrusted, clavate, about 5-9 μ in diam, imbedded or projecting up to 20 μ; basidia clavate, 10-14 x 4-5 μ; spores hyaline, smooth, inamyloid, oval to subglobose, 2.5-3.5 x 2-2.5 μ.

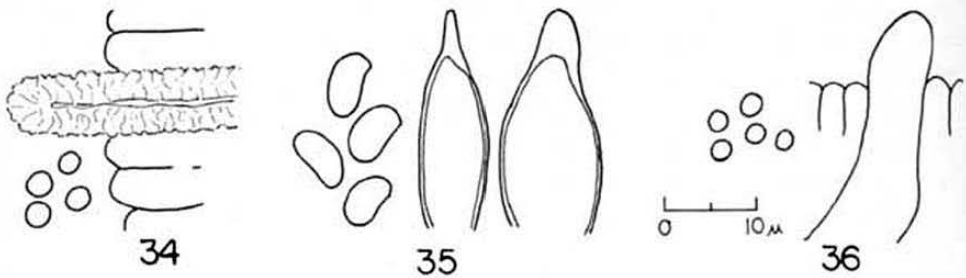
Known only from the type from Mexico; kind of rot unknown. Compare also Polyporus canaliculatus, p. 72.

35. TYROMYCES BOREALIS (Fries) Imaz. Fig. 35

Tokyo Sci. Mus. Bull. 6:84. 1943. Polyporus borealis Fries, Syst. Myc. 1:366. 1821. Polyporus pacificus Kauffm., Mich. Acad. Sci., Arts, Lett. Papers 11:178. 1930 (MICH).

Sessile or narrowed at the base and substipitate, usually more or less imbricate, taste mild; pileus white throughout but drying yellowish, convex, spathulate to dimidiate or umbilicate, watery-fleshy drying rigid, brittle and light in weight, up to 15 x 15 x 4 cm, above hispid to tomentose, drying rough, the margin thin, acute, below fertile to edge; pore surface smooth to rough when dry, the pores angular to daedaloid, 1-4 mostly 2-3 per mm, dissepiments thin, dentate to incised; tubes drying rigid and brittle, up to 15 mm long; context usually duplex when dry, firm next the tubes, coarsely fibrous above, somewhat zonate when dry, up to 2 cm thick.

Sporophore dimitic, the context dimitic, of mostly rarely branched, thin- to occasionally thick-walled, frequently nodose-septate generative hyphae 4-8 μ in diam,



34 35 36

Fig. 34. Spores and cystidium of T. semisupiniformis from type at NY, Murrill 53. Fig. 35. Spores and cystidia of T. borealis from type of Polyporus pacificus at MICH. Fig. 36. Spores and cystidium of Polyporus abieticola from type at PAC, Overholts Herb. 21571.

and of skeletal hyphae 4-6 μ in diam; trama of similar hyphae; gloeoplerous hyphae present; cystidia often with coarse apical incrustations, fusoid to ventricose, pointed, imbedded or exserted, 24-38 x 7-13 μ; basidia cylindrical,

24-36 x 5-8 μ; spores hyaline, smooth, inamyloid, ellipsoid to ellipsoid-oval, 5.5-7 x 4-5 μ.

On wood of gymnosperms across northern United States and southward in the Rockies to Arizona and New Mexico, and in southern Canada; associated with a fine cuboidal heartwood rot, see Boyce (1961), and Hepting (1971). This fungus is the type species for the genus Climacocystis Kotl. & Pouz. (Ceská Myk. 12:95. 1958).

Fidalgo (1958) has intensively investigated this species, which he considers monomitic.

36. TYROMYCES ILLUDENS (Overh. & Lowe) Lowe, comb. nov.
Fig. 36 and 36A

Poria illudens Overh. & Lowe, Mycologia 38:207. 1946.
Polyporus abieticola Overholts, Mycologia 33:93. 1941 (nom. inval.)

Resupinate to effused-reflexed, taste disagreeable; pileus convex, laterally elongated, coriaceous, up to 2 x 7 x 1 cm, above deep cream to brownish, more or less matted, rather smooth, the margin obtuse, below with a sterile zone to 0.5 mm wide; pore surface rather dark cream, dull, the pores rounded, 4-5 per mm, dissepiments rather thick to thin, entire; tubes drying firm, somewhat brittle, up to 4 mm long; context cream, rather soft and fibrous, up to 10 mm thick.

Sporophore dimitic, the context dimitic, of rarely branched, thin-walled, infrequently nodose-septate generative hyphae 2-4 (-5) μ in diam and of skeletal hyphae 2.5-5 μ in diam; trama of similar hyphae; cystidia imbedded or exserted to 15 μ, thin-walled, up to 50 μ long and 14 μ in diam; basidia 2- or 4-sterigmate, clavate, 11-14 x 4-6 μ; spores hyaline, smooth, amyloid, narrowly oval to subglobose, 2.5-3 x 2-2.5 μ.

On wood of gymnosperms in Quebec, Maine, Vermont, and New York; recorded from New Zealand; associated with a white rot. Externally this resembles pale, narrowly reflexed Polyporus nidulans Fries, but the tissue of that turns red or purple in KOH. T. canadensis is more nearly white and has inamyloid spores. Forms of Trametes squalens

with brownish upper surface differ in having binding hyphae and spores 7-9 x 2.5-3 μ.

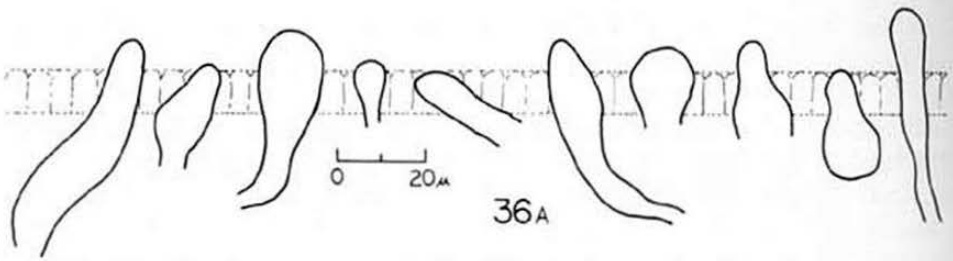


Fig. 36A. Variations in forms of cystidia from type of P. abieticola.

The name Polyporus abieticola is invalid because a Latin diagnosis was not published with the original description.

16b. Cystidia absent
17a. Spores ellipsoid to globose
18a. Context not over 0.5 cm thick, firm, at least below

37. TYROMYCES SEMISUPINUS (Berk. & Curt.) Murr. Fig. 37

N. Amer. Flora 9:34. 1907. Polyporus semisupinus Berk. & Curt., Grevillea 1:50. 1872 (K). Polyporus pachycheiles Ell. & Everh., Acad. Nat. Sci. Philadelphia Proc. for 1894:322. 1894 (NY; BPI). Polyporus pallescens Karst. in Romell, Ark. f. Bot. 11(3):19. 1912 (S). Coriolus genistae Bourd. & Galz., Soc. Myc. France Bull. 41:145. 1925 p. pt.

Resupinate to effused-reflexed or sessile, often imbricate and in the form of a rosette, without distinctive odor or taste; pileus conchate, often narrowed at the base and appearing substipitate, very tough, drying rigid and somewhat coriaceous, up to 2 x 2.5 x 0.4 cm, above whitish to yellowish, often with radial streaks which appear more or less resinous or cartilaginous when dry, glabrous, sometimes with short sterile proliferations, faintly zonate, the margin thin, acute, often resinous and translucent when dry, below fertile to edge; pore surface whitish to yellowish or

yellowish-brown, glancing, the pores angular, (4-) 6-8 per mm, dissepiments thin, entire; tubes drying more or less translucent, waxy-tough, up to 3 mm long; context white to pallid, often with resinous streaks, soft-corky to firm, up to 1 mm thick.

Sporophore dimitic, the context dimitic, of rarely branched, thin-walled, rarely to frequently nodose-septate generative hyphae 2.5-5 μ in diam and of thin- to thick-walled, rarely simple-septate skeletal hyphae 2.5-5 μ in diam; trama of similar hyphae; hyphal pegs present; cystidioles few, hyphoid; basidia clavate, 12-17 x 5-6 μ; spores hyaline, smooth, inamyloid, ellipsoid to narrowly oval, 2.5-4 x 1.5-2.5 (-3) μ.

On the wood of angiosperms or rarely of gymnosperms in eastern Canada and the U. S., and in Europe; associated with a white rot.

This fungus most resembles T. floriformis which differs in having a bitter taste, in typically growing on a gymnosperm substrate, and with frequent cross walls in the context hyphae. T. balsameus differs in having cystidia and occurring on gymnosperm substrata.

This is Lloyd's concept of Polyporus epileucus Fries (Myc. Writ. 4, Apus, p. 309. 1915).

18b. Context up to 2 cm thick, drying soft

38. TYROMYCES TRICHROUS (Berk. & Curt.) Lowe, comb. nov. Fig. 38

Polyporus trichrous Berkeley & Curtis, Ann. Mag. Nat. Hist. 2, 12:434. 1853 (BPI-isotype). Polyporus sublutescens Ellis & Everhart in Langlois, Cat. Pl. Basse-La., p. 33. 1887 n. nudem (BPI-isotype). Polyporus pseudosulphureus W. H. Long, N. Mex. Chapt. Phi Kappa Phi 1:1. 1917 (BFDL; BPI; K; SYRF). Polyporus angolensis Lloyd, Myc. Writ. 6:997. 1920 (BPI).

Laterally stipitate to more or less sessile, solitary, mild in taste, drying very light in weight; pileus convex to applanate, flabelliform to dimidiate, up to 15 x 20 x 3 cm (Overholts as P. amygdalinus), above drying medium

brownish, densely tomentose-velutinous to glabrous, faintly and distantly zonate, the margin acute; pore surface

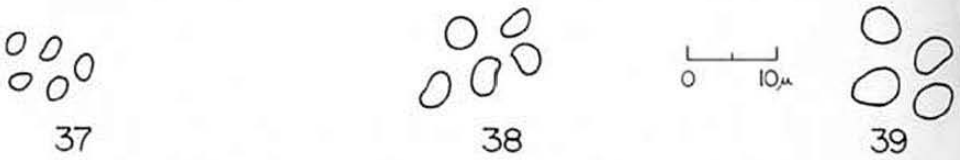


Fig. 37. Spores of T. semisupinus from type at K, Sprague 5860. Fig. 38. Spores of T. trichrous from Lowe 4243 at SYRF. Fig. 39. Spores of T. graminicola from type at NY, Britton and Brown 834.

dark cream, glancing, the pores angular, about 3-4 per mm, dissepiments thin, fimbriate; tubes rather rigid, up to 5 mm long; context soft-felty above, much firmer next the tubes, up to 2 cm thick, according to Overholts "lemon-yellow in KOH" - this not observed.

Sporophore dimitic, the context dimitic, of rarely to much branched, thin-walled, often nodose-septate generative hyphae 2-7 μ in diam, often fragmenting on drying, and of usually rather thin-walled, rarely branched skeletal hyphae 3.5-6 μ in diam whose walls dissolve in part in KOH; trama of similar hyphae; gloeoplerous hyphae up to 9 μ in diam; cystidia none; basidia clavate, 15-25 x 5-8 μ; spores hyaline, smooth, inamyloid, apiculate, oval or one side often plane, 3-5 x 3-3.5 μ.

On wood of angiosperms in S. Carolina, Florida, Alabama, and Africa; associated with a brown piped rot. This is the concept of Polyporus amygdalinus of Lloyd, Murrill (as Trametes), and of Overholts. The type of T. amygdalinus, however, has bovistoid binding hyphae and cylindric spores 6.5-8 x 2.5-3.5 μ. Polyporus sulphureus Bull. ex Fries and P. persicinus Berk. & Curt. resemble this externally but both have simple-septate hyphae and larger spores, 5-8 x 3.5-5 μ. The species has been treated in detail by Lowe and Pegler in Mycologia 65:208-211. 1973 (as P. pseudosulphureus).

39. TYROMYCES GRAMINICOLA Murr. Fig. 39

Tropical Polypores, p. 21. 1915 (NY; BPI; SYRF). Polyporus propinquus Lloyd, Myc. Writ. 7:1109. 1922 (BPI;

K). Scutiger tisdalei Murr., Lloydia 6:227. 1943 (FLAS).

Sessile or laterally to centrally stipitate, solitary or "forming a large oblong cluster about 30 cm long, 15 cm broad and 10 cm high" (Murrill), "odor pungent-fungoid, not unpleasant, slightly chlorine-like, older specimens becoming malodorous like decaying vegetables or garbage" (Gilbertson and Lowe), taste mild, drying very light in weight; pileus applanate to convex, flabelliform to more or less circular, up to 20 cm across, to 2 cm thick, drying very light and brittle, above white drying buff and with darker spots, finely tomentose to glabrous, smooth, with a thin crust, azonate, the margin obtuse to acute, below with a sterile zone up to 1.5 mm wide; pore surface concolorous with upper surface, the pores rounded to angular, 2-4 per mm, dissepiments becoming thin and lacerate; tubes drying rigid and fragile, up to 3 mm long; context fissile, crisp and breaking cleanly, drying soft but brittle and darkening slightly, up to 2 cm thick.

Sporophore dimitic, the context dimitic, of thin-walled, readily collapsed, both simple- and nodose-septate generative hyphae with occasional double or multiple clamps, 3-14 μ in diam, and skeletal hyphae 2.5-7 μ in diam; trama of similar hyphae except more slender and clamps less frequent; gloeoplerous hyphae present; hyphal pegs none; cystidia none; basidia clavate, 16-24 x 5-8 μ; spores hyaline, smooth, weakly to strongly amyloid, ellipsoid to oval, 4.5-5.5 x (2.5-) 3-4 μ.

Attached to various angiosperms in Bermuda, Florida, Texas, Arizona, Brazil, and Africa. This species has been treated in detail by Gilbertson and Lowe in Mycologia 62: 699-706. 1970. Its generic position is uncertain, as evidenced by Murrill's disposition, in various herbaria, to no less than 5 different genera. It is the type species for the genus Amylosporus Ryv. (Ryvarden 1973, p. 1).

17b. Spores cylindric to oblong-ellipsoid

40. TYROMYCES DURACINUS (Pat.) Murr.

Plate I D and Fig. 40

N. Amer. Flora 9:37. 1907. Leptoporus duracinus Pat., Soc. Myc. France Bull. 18:174. 1902 (FH; BPI; NY; S).

Coriolus ochrotinctellus Murr., N. Amer. Flora 9:22. 1907 (NY; BPI; K).

Laterally attached by a narrowed base, solitary, taste mild; pileus conchate to convex, up to 7 x 10 x 0.4 cm (Overholts), above cream with reddish zones to pale brown, glabrous, appearing almost pelliculose, distantly zonate, the margin darker, incurved, thin; pore surface cream-colored, glancing, the pores rounded to angular, 6-8 per mm, dissepiments thick to thin, entire; tubes drying waxy-fragile, up to 2 mm long; context cream, rather soft and spongy-corky, up to 2 mm thick.

Sporophore dimitic, the context dimitic, of rarely branched, thin- to rarely thick-walled, nodose-septate generative hyphae 2.5-6 μ in diam, and of very similar hyphae without cross walls 3-6 μ in diam somewhat doubtfully considered skeletal hyphae; trama of similar hyphae except more commonly thick-walled; hyphal pegs present; cystidia none; basidia clavate, 10-14 x 4-5(-6) μ; spores hyaline, smooth, inamyloid, cylindrical and slightly bent, 4-5 x 1.5-2 μ ("4x1 μ", Patouillard).

On wood of angiosperms in Guadeloupe, Fla., and Miss.; type of rot unknown.

41. TYROMYCES VERSICUTIS (Berk. & Curt.) Murr. Fig. 41

N. Amer. Flora 9:33. 1907. Polyporus versicutis Berk. & Curt., Linn. Soc. Jour. Bot. 10:308. 1868 (K; BPI; FH; NY). P. versipellis Auct.

Sessile or effused-reflexed, solitary, taste mild; pileus convex, dimidiate, "fleshy-tough" (Murrill) drying rigid, up to 3 x 5 x 0.6 cm, above cream to resinous red, more or less reddish-pelliculose, usually smooth, glabrous, azonate, the margin obtuse; pore surface cream or darker to brown-black, the pores round, about 8-10 per mm, dissepiments becoming rather thin, entire; tubes reddish resinous, firm, waxy-brittle when dry, up to 2 mm long; context pale pinkish brown, radially fibrous, somewhat firm, up to 4 mm thick.

Sporophore dimitic, the context dimitic, of thin-walled, nodose-septate generative hyphae 2-3 μ in diam, and of thick-walled skeletal hyphae (2-) 3-5 (-6) μ in diam; trama of similar tissue, with thick-walled skeletal hyphae 2-3.5 μ in diam; hymenial characters lacking in all type material, in other Kew specimens so identified spores "hyaline, inamyloid", cylindric, "4.5-5.5 x 1.5-2.0 μ" (Pegler).

On wood in Cuba, Puerto Rico, Trinidad, Nicaragua, Panama, and in South America. The spore measurements were

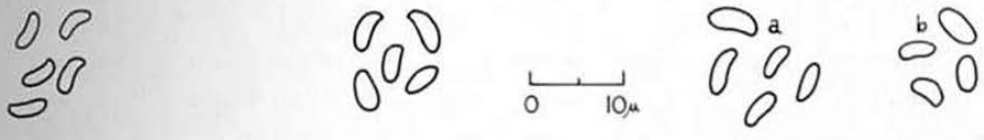


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Fig. 40. Spores of T. duracinus from type at FH, Patouillard Herb sheet 2575. Fig. 41. Spores of T. versicutis from Wakefield 319 at K., drawing by D. Pegler. Fig. 42. Spores (a) of T. immitis from isotype at BPI; spores (b) of Polyporus stipticus from 1316 Fungi Exs. Suec. at BPI.

obtained from a Trinidad collection at Kew, Wakefield 319. D. Reid at Kew has reexamined No. 319 and doubts that it is the same as the type of P. versicutis.

The type selected is Wright 137.

42. TYROMYCES IMMITIS (Peck) Bond. Fig. 42

Polyporaceae Eur. USSR, Caucasia, p. 228. 1953. Polyporus immitis Peck, N. Y. S. Mus. Ann. Rept. 35:135. 1884 (NYS; BPI; FH; PAC). P. epileucus var. candidus Peck, N. Y. S. Mus. Ann. Rept. 38:91. 1885 (NYS; BPI).

Sessile, often imbricate, taste bitter; pileus convex, dimidiate, tender and watery becoming rigid when dry, up to 8 x 15 x 2.5 cm, above dull white, drying pelliculose or rarely powdery, usually rough and scabrous and often with black spots, the margin rounded, below poroid to edge; pore surface drying cream to yellowish, glancing, the pores

angular, 4-6 per mm, dissepiments thin, entire; tubes drying rigid, fragile, up to 10 mm long; context firm, radially fibrous, up to 2 cm thick.

Sporophore dimitic, the context dimitic, of rarely branched, rather thin- to thick-walled, frequently nodose-septate generative hyphae 4-5 (-6) μ in diam and of rather rare skeletal hyphae 4-7 μ in diam; trama dimitic, of generative hyphae 2.5-4 μ in diam and skeletal hyphae 3-5 μ in diam; hyphal pegs present; basidia clavate, 12-18 x 5-6 μ; cystidia none; spores hyaline, smooth, inamyloid, cylindrical, 4-5.5 x 1.5-2 μ.

On wood of angiosperms or more rarely of gymnosperms, common and widely distributed; associated with a brown rot. The concept is very similar to that of T. guttulatus which appears to differ in not having so distinct a bitter taste, in usually drying with depressed spots above, and in having spores 2-3 μ wide. The concepts of Polyporus albidus Schaeff. ex Fries and P. stipticus (Pers.) Fries of European authors is often the same as for T. immitis. T. lacteus differs in having narrower allantoid spores.

14b. Context with binding hyphae
19a. Trama monomitic (see also 53. P. nivosus and 55. P. palustris)

43. TYROMYCES LACTEUS (Fries) Murr. Fig. 43

N. Amer. Flora 9:36. 1907. Polyporus lacteus Fries, Syst. Myc. 1:359. 1821 (nec alibi).

Sessile, usually solitary, sometimes with a sweet odor when fresh, taste instantly or slowly disagreeable or bitter, drying light in weight; pileus convex to ungulate, dimidiate or laterally elongated, watery-fleshy, up to 5 x 9 x 5 cm, above white or grayish to pale grayish brown, minutely velvety or often somewhat sodden, drying with a thin often discontinuous pellicle, azonate, the margin obtuse, below fertile to edge; pore surface white, glancing, the pores usually angular and regular, 4-5 per mm, sometimes irregular and 2-5 per mm, dissepiments thin, entire or more often fimbriate, rarely incised to lacerate; tubes watery-tough drying firm-fragile, up to 2 cm long, rarely longer than the thickness of the context; context

drying soft to firm, radially fibrous, azonate to faintly zonate, up to 4.5 cm thick.

Sporophore dimitic, the context dimitic, of rarely to often branched, rather thin- to thick-walled, nodose-septate generative hyphae 4-7 μ in diam, and of apparently absent to much more often scattered to abundant binding hyphae 2-4 μ in diam, best developed just above the tubes; trama monomitic, of rarely branched, usually thick-walled nodose-septate generative hyphae 3-5 μ in diam; gloeoplerous hyphae 5-17 μ in diam; hyphal pegs present; cystidia none; basidia clavate, 12-21 x 4-5(-6) μ; spores hyaline, smooth, inamyloid, allantoid, 4-5 (-6) x 1-1.5 μ.

On the wood of angiosperms or of gymnosperms from Ontario to North Carolina westward to Montana and Arizona, in Europe and in Japan; associated with a brown rot. This species is discussed in detail by Lowe and Lombard in Mycologia 65:725-732. 1973.

Donk (1972, p. 297) tentatively prefers the interpretation of T. lacteus given above.

44. TYROMYCES UNDOSUS (Peck) Murr. Fig. 44

N. Amer. Flora 9:34. 1907. Polyporus undosus Peck, N. Y. State Mus. Ann. Rept. 34:42. 1881 (NYS; BPI; FH; NY; SYRF). T. pseudotsugae Murr., Mycologia 4:95. 1912 (NY; BPI).

Effused-reflexed or resupinate, often laterally confluent, without distinctive odor or taste; reflexed pileus convex, laterally elongated or dimidiate to elongated forward and somewhat spathulate, subcoriaceous to fibrous-fleshy, drying rigid, up to 2.5 x 11 x 1 cm, above whitish to yellowish or brownish or reddish, slightly spongy-tomentose or in part subpelliculose, obscurely sulcate and zonate, the margin acute to obtuse, characteristically markedly undulate, below fertile to edge; pore surface cream to brownish, dull, the pores angular, 1-3 per mm, dissepiments thin, entire to dentate or incised; tubes white to yellowish, drying rigid, fragile, up to 10 mm long; context white to cream, sometimes with a hard cartilaginous line just above the tubes, otherwise

soft and cottony to fibrous or fragile, up to 1.5 mm thick.

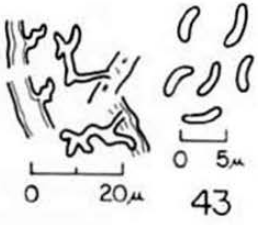
Sporophore dimitic, the context dimitic, of rarely to frequently branched, thick-walled, frequently nodose-septate generative hyphae 4-8 μ in diam, and of poorly developed binding hyphae 2.5-4 μ in diam; trama monomitic, of similar generative hyphae; hyphal pegs present; cystidia none; basidia clavate, 14-19 x 4-5 μ; spores hyaline, smooth, inamyloid, allantoid, 4-5.5 (-6) x 1-1.5 (-2) μ.

On wood of gymnosperms or rarely of angiosperms, widely distributed in the United States and Canada, and in Europe; associated with a brown checked rot, see Brotzman and Gilbertson in Mycopath. and Mycol. Appl. 33:33-42. 1967.

45. TYROMYCES LOWEI (Pil.) Bond. Fig. 45

Polyporaceae Eur. USSR and Caucasia, p. 227. 1953. Leptoporus lowei Pil. in Kavina and Pilát, Atl. Champ. Europe 3,1:205. 1938 pro parte (PR; BPI; SYRF).

Resupinate to effused-reflexed or sessile, taste slowly disagreeable; pileus conchate to convex, up to 1.5 x 6 x 0.5 cm, above whitish with reddish radial streaks, not much changing on bruising when fresh or on



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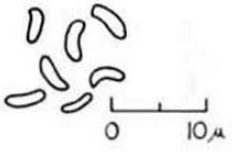

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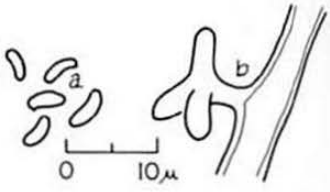

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Fig. 43. Binding hyphae and spores of T. lacteus from Lowe 11783 at SYRF. Fig. 44. Spores of T. undosus from isotype at SYRF. Fig. 45. Spores (a) and binding hyphae (b) of T. lowei from type at Prague, PR 487991.

drying, more or less glabrous, sometimes faintly zonate, the margin acute, thin, often reddish resinous when dry; pore surface cream, drying dull and yellowish or reddish brown, the pores angular, (2-) 3-4 per mm, edges thin,

entire to lacerate; tubes white, drying yellowish, rigid, fragile, up to 4 mm long; context white, fleshy-fibrous and drying soft and friable, or sometimes cartilaginous above, up to 1 mm thick.

Sporophore dimitic, the context dimitic, of infrequently branched, thin- to thick-walled, rather rarely nodose-septate generative hyphae 2-4 (-5) μ in diam and of binding hyphae poorly developed as short side branches; trama monomitic, of similar generative hyphae; cystidia none; basidia clavate, 14-19 x 5-6 (-7) μ; spores hyaline, smooth, inamyloid, cylindrical and more or less curved, 4-5 (-6) x 1.5-2 μ.

On the wood of gymnosperms in N.Y.; associated with a brown checked rot. Monomitic and mild-tasting species of like appearance are T. fragilis and T. lineatus. T. leucomallellus is extremely similar but differs in having gloeocystidia. T. perdelicatus remains more nearly white, and has spores 1-1.5 μ wide.

The Isle Royale, Michigan, specimen cited in the original description is T. leucomallellus.

19b. Trama with binding hyphae

46. TYROMYCES BALSAMEUS (Peck) Murr. Fig. 46

Northern Polypores, p. 13. 1914. Polyporus balsameus Peck, N. Y. State Mus. Ann. Rept. 30:46. 1878 (NYS; BPI; FH). P. crispellus Peck, N. Y. S. Mus. Ann. Rept. 38:91. 1885 (NYS; BPI; FH). Tyromyces cutifractus Murr., Mycologia 4:94. 1912 (NY; BPI; FH).

Sessile or effused-reflexed, often imbricate, taste mild or slightly resinous; pileus conchate to convex, flabelliform to dimidiate, subcoriaceous to fleshy-tough, drying rather rigid, up to 3 x 5 x 0.5 cm, above cream to brownish, subglabrous to slightly and unequally appressed villose-tomentose, more or less zonate, the margin thin; pore surface white, drying gray or yellowish, the pores subcircular to angular, glistening, 3-6 per mm, dissepiments thick and entire to thin and fimbriate; tubes drying rigid, brittle, up to 4 mm long; context white, rather soft, fibrous, up to 2 mm thick.

Sporophore dimitic, the context dimitic, of rarely to frequently branched, thin- to thick-walled, rarely to frequently nodose-septate generative hyphae 4-7 μ in diam, and of rather rare binding hyphae 1.5-2.5 μ in diam; trama dimitic, of similar hyphae except mostly 3-5 μ in diam and

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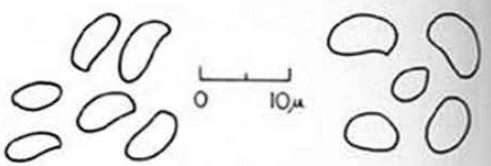

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Fig. 46. Spores and cystidia of T. balsameus from type at NYS. Fig. 47. Spores of T. amygdalinus from type at K, drawing by D. Pegler of Ravenel 1153. Fig. 48. Spores of T. semistipitatus from type at BPI, Lloyd Herb. 56366.

binding hyphae very poorly developed; hyphal pegs present; cystidia abundant to rare, sometimes incrusted at the apex, fusoid, often immersed, 12-40 x 4-9 μ; basidia clavate, 19-24 x 4.5-6 μ; spores hyaline, smooth, inamyloid, oblong, often slightly bent, 4-6 x 2-3 μ.

On the wood of gymnosperms or rarely of angiosperms in northern United States and southward in the Rockies to Arizona and New Mexico, and in southern Canada; associated with a brown cubical rot, see Boyce (1961) and Hepting (1971). T. cutifractus and P. crispellus are forms with rare cystidia.

This species is often treated in European manuals as T. kymatodes (Rostk.) Donk but that, according to Kotlaba and Pouzar (Česká Myk. 22:128. 1968), is Polyporus amorphus Fries sense of Donk (1933, p. 154).

47. TYROMYCES AMYGDALINUS (Berk. & Rav.) Teng
Plate I G and Fig. 47

True Fungi of China, p. 520. 1964. Polyporus amygdalinus Berk. & Rav. in Berk. & Curt., Ann. Mag. Nat. Hist. 2(12):432. 1853, again in Grevillea 1:49. 1872 (K; NY).

Sessile, solitary, when fresh odor "strong, like that of vanilla or almonds" (B. & R.); pileus applanate, subspathulate, up to 7 x 5 x 0.5 cm, above "dingy yellow with irregular darker patches", drying dark fuscous brown except for some yellowish radiating streaks, glabrous to somewhat strigose especially toward the base, azonate, the margin undulate, below fertile to edge; pore surface pale brown, the pores irregularly angular, (2-) 3-4 per mm, dissepiments entire; tubes drying very brittle, up to 2 mm long; context very pale yellowish, firm-corky, slowly darkening in KOH, up to 5 mm thick.

Sporophore dimitic, the context dimitic, of rather frequently branched, thin-walled, nodose-septate generative hyphae 3-5 μ in diam or some swollen to 14 μ, and of abundant, bovistoid, mostly thick-walled binding hyphae up to 12 μ in diam; trama of similar hyphae except 2-9 μ in diam; gloeoplerous hyphae present; hymenium lacking; spores "hyaline", smooth, "inamyloid", oblong to oblong-ellipsoid, "6.5-8 x 2.5-3.7 μ" (Pegler).

On oak (Quercus), known only from the type collection, Ravenel 1153, from S. Car. This species has been confused with P. pseudosulphureus (= T. trichrous), as discussed by Lowe and Pegler in Mycologia 65:208-211. 1973.

48. TYROMYCES SEMISTIPITATUS (Lloyd) Lowe, comb. nov.
Fig. 48

Polyporus semistipitatus Lloyd, Mycol. Writ. 7:1271. 1924 (BPI; K).

Sessile to substipitate, taste mild; pileus "pure white," drying cream color throughout, conchate, dimidiate or more or less turbinate when growing on top of substratum, up to 4 x 5 x 0.3 cm, above minutely velvety, azonate, the margin thin, acute, below with a sterile zone up to 2 mm wide; pore surface dark cream, somewhat glancing, the pores angular, about 6 per mm, dissepiments becoming thin, edge entire; tubes drying soft-corky, up to 1 mm long; context duplex, upper half soft-spongy, lower half firm, up to 2 mm thick.

Sporophore dimitic, the context dimitic, of rarely branched, thin-walled, nodose-septate generative hyphae

2-5 μ in diam, and of binding hyphae 1-4 μ in diam; trama of similar hyphae; cystidia none; basidia clavate, 14-17 x 5-7 μ; spores hyaline, smooth, inamyloid, oblong with rounded ends to oval, 5-7 x 3.5-5 μ.

On wood, known only from the type from Kansas; type of rot unknown. The sporophore resembles that of T. spumeus and var. malicola which have a monomitic hyphal system.

EXCLUDED SPECIES

1c. Hyphal construction trimitic

Species with trimitic hyphal construction are excluded from the genus Tyromyces as defined in this manual. Most of the following species, briefly described, have been placed in the genus Tyromyces or in Spongipellis by some author, and can readily be mistaken for a species of Tyromyces.

20a. Context dimitic, with binding hyphae; trama with skeletals

49. POLYPORUS OBDUCTUS Berk. Fig. 49

Tyromyces obductus (Berk.) Murr.

Sessile, "6 x 12 x 0.3 cm" (Murrill); pileus "expanding from a wedge-shaped base" (Murrill), above pale reddish translucent, glabrous; pore surface cream color, the pores 5-6 per mm; tubes to 2 mm long; context white, to 4 mm thick.

Sporophore trimitic, the context dimitic, of nodose-septate generative hyphae 3-6 μ in diam, and of binding hyphae 4-9 μ in diam; trama dimitic, of generative and skeletal hyphae 2-3 μ in diam; spores presumably hyaline, smooth, oblong, somewhat bent, "4.5-6 x 1.7-2 (-2.5) μ" (Aoshima).

Known only from the type collection from below Latitude 54° in North America. Type material is at K, BPI (with notes by Aoshima), FH, and NY.

20b. Context trimitic
21a. Trama monomitic

50. TYROMYCES PALMARUM Murr. Fig. 50

Sessile, without distinctive odor or taste; pileus convex, up to 10 x 15 x 1 cm, above cream color, glabrous; pores 3-4 per mm; tubes up to 4 mm long; context white, rather soft and somewhat fissile, up to 6 mm thick.

Sporophore trimitic, the context trimitic, of generative hyphae 2.5-4 μ in diam, of skeletals 2.5-5 μ in diam, and of binding hyphae 1.5-3 μ in diam; trama monomitic; cystidia none; spores hyaline, smooth, oblong-ellipsoid, "6-8 x 2.5-3.5 μ" (Setliff), or "6.8-8.8 x 2.8-3.8 μ, averaging 7.7 x 3.3 μ" (Weir).

On palm in Florida, known only from the type material at NY and BPI.

51. POLYPORUS SEMIPILEATUS Peck Plate I E and Fig. 51

Tyromyces semipileatus (Peck) Murr.

Resupinate to effused-reflexed, without distinctive odor or taste; pileus white, on drying discolored yellow-

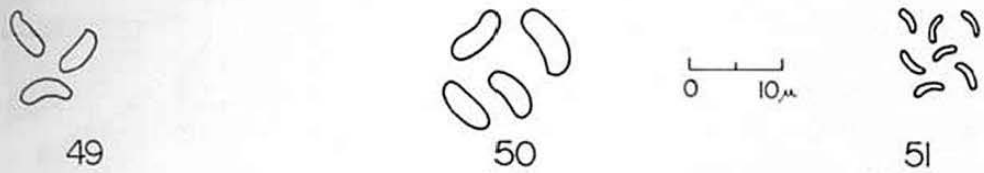

Fig. 49. Spores of Polyporus obductus from isotype at BPI, drawing by K. Aoshima filed with Bresadola Herb. packet. Fig. 50. Spores of T. palmarum from isotype at BPI, drawing by J. R. Weir of Underwood and Earle 1142. Fig. 51. Spores of Polyporus semipileatus from Lowe 2116 at SYRF.

ish, bluish, greenish, or brownish, spongy and watery drying firm, up to 1.5 x 4 x 0.8 cm; below white or in part discolored, the pores 6-8 per mm; tubes up to 2.5 mm long; context drying firm-felty, up to 6 mm thick.

Sporophore trimitic, the context trimitic, of nodose-septate generative hyphae 3-6 μ in diam, of skeletals 2.5-6 μ in diam, and of binding hyphae 2-4 μ in diam; trama monomitic, the hyphae 2.5-4 μ in diam; cystidioles fusoid; spores hyaline, smooth, inamyloid, allantoid, 3-4 x 0.5-1 μ.

On the wood of angiosperms, widely distributed in North America, Europe, and Asia; associated with a white rot. Type material is at NYS and BPI.

In Europe this fungus has been named Polyporus chioneus, "... a name presumed to be misapplied to what is now called Polyporus [Incrustoporia] semipileatus Peck" (Donk 1972, p. 291), and it is the type for Leptotrimitus Pouz.

21b. Trama dimitic, with skeletals (see also 21c)
22a. Pores 6-9 per mm

52. POLYPORUS FULVITINCTUS Berk. & Curt. Fig. 52

Tyromyces fulvitinctus (Berk. & Curt.) Murr.

Sessile; pileus convex, up to 4 x 4 x 0.5 cm, above cream to tan, glabrous or in part appressed-fibrillose, in part thin-pelliculose; pores 8-9 per mm; tubes to 4 mm long; context tan, rather soft-felty, to 2 mm thick.

Sporophore trimitic, the context trimitic, of nodose-septate generative hyphae 1.5-3 μ in diam, of skeletals 3-9 μ in diam, and of binding hyphae 1.5-4 μ in diam; trama dimitic, with skeletal hyphae; cystidia none; spores somewhat uncertain - none seen attached, probably hyaline, smooth, cylindrical, 6.5-8 x 2-3 μ, or "5.5-7.5 x 1.7-2.3 μ" (Pegler), or "subglobose to ovoid, smooth, hyaline, 3-4 μ" (Murrill).

Known from the Caribbean Islands. Type material is at K, BPI, FH, and NY.

53. POLYPORUS NIVOSUS Berk. Fig. 53

Sessile, solitary or imbricate, taste slightly acid, of medium weight when dry; pileus convex, dimidiate, drying rather hard, up to 6 x 5 x 1.2 cm, above whitish to cream or grayish, nearly glabrous, in some places somewhat

resinous and pelliculose, azonate, the margin rather acute, somewhat wavy; pore surface dark cream, dull, the pores angular, about 6-8 per mm, dissepiments rather thin, entire; tubes corky, waxy, up to 6 mm long; context cream, firm, up to 7 mm thick.

Sporophore trimitic, the context trimitic, of thick-walled, occasionally nodose-septate generative hyphae 2.5-4 μ in diam, of skeletal hyphae 2.5-4 (-6) μ in diam, and of binding hyphae 2-4 μ in diam; trama dimitic, of similar generative and skeletal hyphae; gloeoplerous hyphae present; cystidia none; spores hyaline, smooth, inamyloid, oblong, apiculate, 5.5-7.5 x 2-3 μ.

Known from the Caribbean Islands and from South America; type of rot unknown. Type material is at K and BPI.

The hyphae identified above as skeletal differs from the generative hyphae only in the apparent absence of cross walls. If these hyphae are rarely nodose-septate generative hyphae, as D. N. Pegler believes, then this species would be a valid one in Tyromyces.

22b. Pores 4-6 per mm

54. POLYPORUS DURESCENS Overh.[1/] Fig. 54

Sessile, taste slowly disagreeable; pileus convex, corky when dry, up to 10 x 16 x 4 cm, above white or gray-

[1/] As this species has not been validated by a Latin description, a validating diagnosis is supplied here:

POLYPORUS DURESCENS Overholts sp. nov. - Pileo sessili, siccante duro et rigido, dimidiato, 4-12 cm longo, 5-15 cm lato, 1-4 cm crasso, albo vel canescente, superne spongioso-tomentoso et plerumque exsiccante aspero; contextu crasso 1-3 cm; hyphis in diametro (3-) 4-6 μ; poris 3-4 pro mm; sporis cylindratis, hyalinis, 4.5-7 x 1.5-2.5 μ; cystidiis nullis.

In ligno arborum Fagi, West Elkton, Ohio, U. S. A., July 28, 1917, typus in herbario Overholtsii ut No. 4215 in PAC conservatus.

Described in English in Mycologia 33:98. 1941.

ish and discoloring on drying, finely appressed-tomentose or drying rough and somewhat tuberculate; pores round to

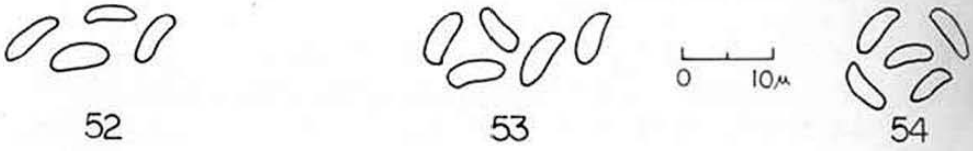

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Fig. 52. Spores of Polyporus fulvitinctus from type at K, drawing by D. Pegler of Wright 136. Fig. 53. Spores of Polyporus nivosus from type at K, Spruce 192. Fig. 54. Spores of Polyporus durescens from Overholts Herb. 2142 at PAC.

angular, about 4-5 per mm; tubes to 1 cm long; context to 3 cm thick.

Sporophore trimitic, the context trimitic, of nodose-septate generative hyphae 2.5-7 μ in diam, of skeletals 2.5-6 μ in diam, and of rather rare binding hyphae in small knots, 2.5-6 μ in diam; trama dimitic, with skeletal hyphae; cystidia none; spores hyaline, smooth, inamyloid, frequently apiculate, cylindrical or sometimes narrowed at one end, 5-7 x (1.5-) 2-2.5 μ.

On the wood of angiosperms from New York westward and southward to Indiana, Florida, and Louisiana; associated with a brown rot. Polyporus palustris is extremely similar, but differs in having spores 6-10 x 1.5-3.5 μ, and in usually occurring on the wood of gymnosperms. Polyporus spraguei is also very similar but its spores are ovoid to subglobose, 4.5-7 x 4-5 μ.

Overholts states (1953, p. 284) that P. durescens differs from P. spraguei most obviously in its spores. The designated type, Overholts Herb. No. 4215 at PAC, is sterile. This designation of type is probably an error; a much better choice would have been No. 2142, from the same locality. Type material is at PAC, BPI, and SYRF.

55. POLYPORUS PALUSTRIS Berk. & Curt. Fig. 55

Tyromyces palustris (Berk. & Curt.) Murr. Polyporus radula Lloyd, Mycol. Writ. 5, Letter 67:12. Note 652. 1918 (BPI; K).

Sessile, solitary to somewhat imbricate, without distinctive odor or taste; pileus convex, dimidiate, up to 10 x 20 x 3 cm (Overholts), above cream to reddish tan, glabrous, azonate, the margin rounded, below with a narrow sterile border; pore surface tan, somewhat glancing, the pores rounded, 4-6 per mm, dissepiments thin, entire; tubes drying rigid, fragile, up to 10 mm long; context cream, firm-felty, up to 2.5 cm thick.

Sporophore trimitic, the context trimitic, of frequently branched, both thin- and thick-walled, nodose-septate generative hyphae 2.5-4 μ in diam, of similar except uniformly thick-walled skeletal hyphae 3-6 μ in diam, and of binding hyphae 2.5-5 μ in diam; trama dimitic, of similar generative and skeletal hyphae; gloeoplerous hyphae present; cystidia none; spores hyaline, smooth, inamyloid, apiculate, oblong, 6-7.5 (-10) x (1.5-) 2.5-3 (-3.5) μ.

On wood of gymnosperms and occasionally of angiosperms in eastern U.S., in the Bahamas, and in Trinidad; associated with a brown rot, see Hepting (1971). Polyporus spraguei is extremely similar externally but that has ovoid to subglobose spores 4.5-7 x 4-5 μ. P. durescens is also very similar but differs in having more slender spores 1.5-2.5 μ wide. Cultural comparison of P. palustris and material identified as P. durescens is presented by McKay (1962).

The hyphae identified above as skeletal differs from the generative hyphae only in the apparent absence of cross walls. If these hyphae are rarely nodose-septate generative hyphae, as D. N. Pegler believes, then this species would be a valid one in Tyromyces.

Type material is at K and NY.

56. TYROMYCES NIVOSELLUS Murr. Fig. 56

Sessile, somewhat acid in taste; pileus convex, up to 3 x 9 x 4 cm, above whitish, glabrous; pore surface sordid cream-brownish, the pores 4-5 per mm; tubes drying papery-tough, up to 1.5 cm long; context cream-white, corky, up to 2.5 cm thick.

Sporophore trimitic, the context trimitic, of nodose-septate generative hyphae 2-5 μ in diam, of skeletals 3-6 μ in diam, and of binding hyphae 2-3 μ in diam; trama

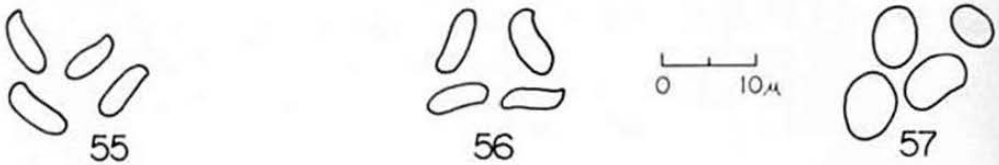

Fig. 55. Spores of Polyporus palustris from type at K, Ravenel 1566. Fig. 56. Spores of T. nivosellus from type at NY, Underwood and Earle 1114. Fig. 57. Spores of Polyporus spraguei from Lowe 3720 at SYRF.

dimitic, with skeletal hyphae; cystidia none; spores hyaline, smooth, inamyloid, oblong-ellipsoid, apiculate, 6.5-8 x 2.5-3 μ.

On palm in Cuba, very similar to P. palustris which occurs on wood of gymnosperms (see comments under that species). Type material is at NY, BPI, K, and SYRF.

21c. Trama trimitic
23a. Spores 3-9 μ long

57. POLYPORUS SPRAGUEI Berk. & Curt. Fig. 57

Tyromyces spraguei (Berk. & Curt.) Murr.

Sessile or effused-reflexed, drying hard, often with a disagreeable odor; pileus applanate to convex, appressed-tomentose to glabrous, up to 10 x 15 x 3 cm, dull white throughout or blackening on drying, particularly at the margin; pores 4-5 per mm; tubes to 10 mm long; context firm, fibrous, to 2.5 cm thick.

Sporophore trimitic in both context and trama, the generative hyphae nodose-septate, 3-5 μ in diam, skeletals 2.5-4 μ in diam, and binding hyphae, often poorly developed 1.5-3 μ in diam; cystidia none; spores hyaline, smooth, inamyloid, ovoid to subglobose, 4.5-7 x 4-5 μ.

On wood of angiosperms or rarely of gymnosperms, widely distributed in the eastern half of the United States and

in Ontario; associated with a brown rot, see Boyce (1961) and Hepting (1971).

Type material is at K and BPI.

58. SPONGIPELLIS LURIDESCENS Murr. Fig. 58

Sessile, when dry light in weight and punky; pileus convex, up to 4 x 5 x 2 cm, above reddish- or grayish-brown, matted-tomentose; pore surface rather dark brown, the pores 1-2 per mm; tubes to 7 mm long; context cinnamon, up to 6 mm thick.

Sporophore trimitic in both context and trama, the generative hyphae unobserved, skeletals 3-7 μ in diam and binding hyphae 2-4 μ in diam; cystidia hyphoid; spores "ellipsoidal, smooth, hyaline, 3-4 x 1-2 μ" (Murrill), or more probably "5 x 3" (author unknown).

On wood in Jamaica and Mexico. Type material is at NY, BPI, K, and SYRF.

59. TRAMETES SQUALENS Karst. Plate I F and Fig. 59

Polyporus anceps Peck. Tyromyces anceps (Peck) Murr.

Sessile or effused-reflexed, with a mild taste; pileus firm-corky, up to 3 x 7 x 1.5 cm, above white or discolored brownish or blackish, often drying rough and somewhat tuberculate; pores 3-4 per mm; tubes to 1 cm long; context corky, up to 5 mm thick.

Sporophore trimitic, the context and trama of nodose-septate generative hyphae 2-5 μ in diam, skeletals 3-6 μ in diam, and with bovistoid binding hyphae; cystidia none; spores hyaline, smooth, inamyloid, oblong, 7-9 x 2.5-3 μ.

On the wood of gymnosperms throughout the temperate parts of the Northern Hemisphere; associated with a rot at first red then becoming a white pocket rot, see Boyce (1961) and Hepting (1971).

This fungus is the type species in a new genus and species combination, Dichomitus squalens Reid, Revista de

Biol. 5:149-150. 1965. Reid considers the hyphal system to be dimitic, with generative and arboriform skeletal hyphae.

60. TYROMYCES CALKINSII Murr. Fig. 60

Sessile, somewhat acid to taste; pileus convex, up to 5 x 7 x 2 cm, above white drying somewhat discolored cream or brownish, glabrous; pores 5-6 per mm; tubes drying rather soft and fragile, up to 1 cm long; context drying rather soft and radially fibrous, up to 1.2 cm thick.

Sporophore trimitic in both context and trama, of nodose-septate generative hyphae 3-8 μ in diam, skeletals 3-7 μ in diam, and of binding hyphae 2.5-4 μ in diam; cystidia none; spores absent in type, in other material hyaline, smooth, inamyloid, oblong to oblong-ellipsoid, 5.5-7 (-8) x 2.5-4 μ.

Fig. 58. Spore of Spongipellis luridescens from drawing filed with type at NY, Earle 114. Fig. 59. Spores of Trametes squalens from Lowe 3097 at SYRF. Fig. 60. Spores of Tyromyces calkinsii from Overholts Herb. 9977 at PAC. Fig. 61. Spores of Tyromyces magnisporus from type at FLAS, F 17916.

On the wood of angiosperms in Florida; for pathological information see Hepting (1971). This is very similar to Trametes submurina Murr. which dries more or less mouse-gray, without a pellicle, has corky context and tubes, and more slender generative hyphae 2.5-4 μ in diam. See comments under P. palustris on similarities to that species and to T. nivosellus and to P. durescens.

Overholts' record (1953, p. 316) of globose spores for this species was probably based on contaminant spores. Spores as given above were found on type material by Setliff, Weir, and myself, and also on Overholts 9977

(at PAC), and on Earle 161 and Martin 4096 (at NY).

Type material is at NY, BPI, K, and SYRF.

23b. Spores 10-14 μ long

61. TYROMYCES MAGNISPORUS Murr. Fig. 61

Sessile, solitary to "subimbricate" (Murrill), taste "very bitter" (Murrill), or when dry somewhat resinous, when fresh "fragrant like anise" (Murrill); pileus applanate or turbinate when encircling substrate, drying rigid, "4-5 cm broad and 2-3 cm thick" (Murrill), above yellowish brown, mostly glabrous, below pale wood-brown; pores 3-4 per mm; tubes up to 1 cm long; context pale wood brown, up to 2 cm thick.

Sporophore trimitic, the context and trama of generative hyphae with clamps, 2.5-4 μ in diam, skeletals 3-5 μ in diam, and binding hyphae 1-3 μ in diam; cystidia none; spores hyaline, smooth, inamyloid or slightly dextrinoid, narrowly ellipsoid and often truncate at end opposite apiculus, 10-14 x 4-7 μ.

On wood of angiosperms in Florida, known only from the type collection at FLAS.

SPECIES OF UNKNOWN AFFINITIES

Leptoporus mexicanus Pat., Soc. Myc. France Bull. 14:55. 1898. Type from Mexico is a very poor sample which may never be known with certainty. Type is at FH.

Leptoporus nauseosus Pat. in Duss, Enum. Méth. Champ. Guadeloupe, p. 27. 1903. Type from Guadeloupe, a specimen without tubes, is doubtfully a polypore. Type is at FH.

ADDENDA

Material of the species discussed below were studied too late to be included in the normal place in the manual.

Polyporus caesio-flavus Pat., described from Ecuador in Soc. Myc. France Bull. 8:114. 1892 - type at FH,

is very similar to T. caesius and T. tephroleucus but seems to differ in having a more yellowish color, and in smaller pores, 6-7 per mm. Patouillard considered it close to "P. lacteus" (= T. tephroleucus of this manual).

Polyporus canaliculatus Pat., described from Java in Soc. Myc. France Bull. 14:153. 1898-type at FH, has large cystidia like those in T. semisupiniformis, but differs from that species in having simple-septate hyphae and larger spores, 4-5 µ in diameter. The specific name refers to radiating reddish resinous streaks in the context.

Leptoporus caseosus Pat., described from Brazil in Ann. Mycol. 5:365. 1907-type at FH, is extremely similar to T. spumeus var. malicola but may differ in having less indurated context and tubes.

Polyporus concrescens Mont. was reported by Duss (1903, p. 26) from Guadeloupe and Martinique, and Duss 665 is in the Patouillard Herbarium at FH. As the specimen is sterile a satisfactory determination cannot be made, but the specimen is noteworthy as it has a pendent habit like T. minusculoides and T. subpendulus but differs decidedly in having simple-septate hyphae. Additional material is at S, probably isotype from Juan Fernandez Is., and from Ecuador. Cystidia are present in some of the Stockholm material.

Polyporus gossypinus Lév., described from France in Ann. Sci. Nat. Bot. 3,9:124. 1848, if correctly represented by a specimen at FH, from Tunisia, identified by Patouillard who annotated it "comparé avec le type ex Lév.!", resembles T. minusculoides in its habit and many other features but differs in forming a much larger sporophore and in having more slender spores, 1-1.5 µ wide. Bresadola (1916, p. 224) however, refers this species to T. caesius and Bourdot and Galzin (1928, p. 541) appear to accept this synonomy.

LITERATURE CITED

Ainsworth, G. C. 1971. Dictionary of the fungi. 6th edit.

Atkinson, G. F. 1902. Preliminary notes on some new species of fungi. Journal of Mycology 8:110-119.

----. 1908. Notes on some new species of fungi from the United States. Annales Mycologici 6:54-62.

Berkeley, M. J. 1839. XLII. Descriptions of exotic fungi in the collection of Sir W. J. Hooker, from memoirs and notes of J. F. Klotzsch, with additions and corrections. Annals and Magazine of Natural History 3:375-401.

----. 1847. Decades of fungi. Decades XII-XIV. Ohio fungi. London Journal of Botany 6:312-326.

----. 1851. ----. Decade XXXIV. Sikkim-Himalayan fungi collected by Dr. Hooker. Hooker's Journal of Botany and Kew Miscellany 3:77-84.

----. 1856. ----. Decades LVII-LVIII. Rio Negro fungi. Same journal, vol. 8:193-200.

----. 1872. Notices of North American fungi. Grevillea 1:49-55.

----. 1876. XXVI. Enumeration of fungi collected during the expedition of H. M. S. 'Challenger' (Second notice). Linnean Society Journal, Botany 15:48-53.

----, and M. C. Cooke. 1876. The fungi of Brazil, including those collected by J. W. H. Trail, Esq., M.A., in 1874. Linnean Society Journal, Botany 15:363-398.

----, and M. A. Curtis. 1849. Decades XXI and XXII. North and South Carolina fungi. Hooker's Journal of Botany and Kew Miscellany 1:97-104.

----, and ----, ----. Decades XXIII and XXIV. Same volume, p. 234-239.

----, and ----. 1853. XLI-Centuries of North American fungi. Annals and Magazine of Natural History 2(12): 417-435.

----, and ----. 1868. Fungi Cubenses (Hymenomycetes). Linnean Society Journal, Botany 10:280-392.

Bondartsev, A. S. 1971. The Polyporaceae of the European USSR and Caucasia. A translation available from U. S. Dept. Commerce, National Technical Information Service, Springfield, Va. 22151 (TT 70-50078). Original in Russian, 1953.

----, and R. Singer. 1941. Zur systematik der Polyporaceen. Annales Mycologici 39:43-65.

Bourdot, H., and A. Galzin. 1925. Hyménomycètes de France (XI. Porés), Société Mycologique de France Bulletin 41:98-255.

----, and ----. 1928. 1. Hyménomycètes de France. Heterobasidies - Homobasidies Gymnocarpes.

Boyce, J. S. 1961. Forest Pathology. 3rd Edit.

Bresadola, J. 1881-1887. Fungi Tridentini, Vol. 1.

----. 1908. Fungi aliquot gallici novi vel minus cogniti. Annales Mycologici 6:37-47.

----. 1916. Synonymia et adnotanda mycologica. Ann. Mycol. 14:221-242.

----. 1920. Selecta mycologica. Same journal, vol. 18: 26-70.

Cooke, M. C. 1883. North American fungi. Grevillea 11: 106-111.

Corner, E. J. H. 1932 a. The fruit-body of Polystictus xanthopus, Fr. Annals of Botany 46:71-111.

----. 1932b. A Fomes with two systems of hyphae. British Mycological Society Transactions 17:51-81.

----. 1953. The construction of polypores - 1. Introduction: Polyporus sulphureus, P. squamosus, P. betulinus and Polystictus microcyclus. Phytomorphology 3:152-167.

Domański, S., H. Orłos, and A. Skirgiełło. 1967. Grzyby (Mycota). Tom. 3.

Donk, M. A. 1933. Revision der niederländischen Homobasidiomycetae-Aphyllophoraceae. II. Utrecht Rijksuniversiteit Botanish Museum en Herbarium Mededeelingen 9:1-278.

----. 1960. The generic names proposed for Polyporaceae. Persoonia 1(2):173-302.

----. 1972. Notes on European polypores - XI. On some species of Tyromyces. Koninkl. Nederl. Akad. van Wetenschap. - Amsterdam Proc. C, 75, No. 4, pp. 287-304.

Duss, Le R.-P. 1903. Énumération méthodique des champignons recueillis a la Guadeloupe & a la Martinique.

Ellis, J. B., and B. M. Everhart. 1894. New species of fungi from various localities. Academy of Natural Sciences of Philadelphia, Proceedings for 1894, pp. 322-386.

Fidalgo, O. 1958. Studies on Spongipellis borealis (Fr.) Pat. Mycopathologia et Mycologia Applicata 10:1-18.

Fries, E. 1821. Systema mycologicum I.

----. 1828. Elenchus fungorum I.

----. 1836-38. Epicrisis systematis mycologici.

----. 1874. Hymenomycetes Europaei.

Gilbertson, R. L., and J. L. Lowe. 1970. Tyromyces graminicola in North America. Mycologia 62:699-706.

Hedgcock, G. G. 1910. A new polypore on incense cedar. Mycologia 2:155-156.

Hepting, G. H. 1971. Diseases of forest and shade trees of the United States. U.S.D.A. Forest Service. Agriculture Handbook 386.

Imazeki, R. 1943. Genera of Polyporaceae of Nippon. Tokyo Science Museum Bulletin 6. 111 p., 3 pl.

Johnson, A. E. 1878. Report of the committee on botany, for 1877. Minnesota Academy of Natural Science Bull. 1:325-344.

Karsten, P. A. 1881. Enumeratio Boletinearum et Polyporearum Fennicarum, systemate novo dispositarum. Revue Mycologique 3(9):16-19.

Kauffman, C. H. 1930. The fungous flora of the Siskiyou Mountains in southern Oregon. Michigan Academy of Science, Arts, and Letters Papers 11:151-210.

Kavina, C., and A. Pilát. 1936-42. Atlas des Champignons de l'Europe. Tome III. Polyporaceae I-III.

Kotlaba, F., and Z. Pouzar. 1958. Polypori novi vel minus cogniti Čechoslovakiae III. Česká Mykologie 12:95-104.

----, and ----. 1959. ---- IV. Same journal, vol. 13:27-37.

----, and ----. 1964a. Tyromyces gloeocystidiatus Kotl. et Pouz. sp. nov. - A name for an old polypore. Same journal, vol. 18:207-218.

----, and ----. 1964b. Preliminary results on the staining of spores and other structures of Homobasidiomycetes in cotton blue and its importance for taxonomy. Fedde's Repertorium 69(2):131-142.

----, and ----. 1968. Tyromyces balsameus (Peck) Murrill in Bohemia. Same journal, vol. 22:121-128.

Langlois, A. B. 1887. Catalogue provisoire de plantes phanérogames et cryptogames de la Basse-Louisiane, États-Unis d'Amérique. 35 pages.

Lanjouw, J., and F. A. Stafleu. 1964. Index herbariorum. Pt. 1. The herbaria of the world. Edit. 5.

Léveillé, J. H. 1848. Fragments mycologiques. Ann. Sci. Nat. Bot. 3,9:119-144; 245-262.

Lloyd, C. G. 1912-1925. Mycological Writings of C. G. Lloyd, Vol. 4-7.

Long, W. H. 1917. Three undescribed species of polypores. New Mexico Chapter Phi Kappa Phi Papers 1:1-3.

Lowe, J. L. 1974. Solution to a mycological mystery. Société Linnéenne de Lyon Bull. 15 Feb., 1974, p. 239-240.

----, and F. F. Lombard. 1973. On the identity of Polyporus lacteus Fries. Mycologia 65:725-732.

----, and S. Lundell. 1956. The identity of Polyporus trabeus Rostk. Michigan Academy of Science, Arts, and Letters Papers 41:21-25.

----, and D. Pegler. 1973. Polyporus amygdalinus and P. pseudosulphureus. Mycologia 65:208-211.
Massee, G. 1899. DCLVIII - Fungi Exotici, II. Royal Gardens, Kew. Bulletin of Miscellaneous Information No. 153-154, p. 164-185.
McKay, H. H. 1962. Interfertility study of Polyporus palustris and other brown rot species occurring on conifers and hardwoods. Plant Disease Reporter 46(1):26-29.
Murrill, W. A. 1905. The Polyporaceae of North America-XII. A synopsis of the white and bright-colored pileate species. Torrey Botanical Club Bulletin 32:469-493.
----. 1907-08. Polyporaceae. North American Flora 9:1-131.
----. 1910. The Polyporaceae of Jamaica. Mycologia 2: 183-197.
----. 1912a. The Polyporaceae of Mexico. New York Botanical Garden Bulletin 8:137-153.
----. 1912b. Polyporaceae and Boletaceae of the Pacific Coast. Mycologia 4:91-100.
----. 1914. Northern polypores.
----. 1915. Tropical polypores.
----. 1939. New Florida polypores. Torrey Botanical Club Bulletin 65:647-661 [1938].
----. 1940. Additions to Florida fungi - II. Same journal, vol. 67:57-66.
----. 1943. More new fungi from Florida. Lloydia 6:207-228.
Overholts, L. O. 1929. Research methods in the taxonomy of the Hymenomycetes. International Congress of Plant Sciences Proceedings 2:1688-1712.
----. 1941. New species of Polyporaceae. Mycologia 33: 90-102.
----. 1952. New species of polypores. Same journal, vol. 44:224-227.
----. 1953. The Polyporaceae of the United States, Alaska and Canada.
Patouillard, N. 1887. Les Hyménomycètes d'Europe. Anatomie générale et classification des champignons supérieurs.
----. 1898a. Quelques champignons nouveaux récoltés au Mexique par Paul Maury. Société Mycologique de France Bulletin 14:53-57.
----. 1898b. Champignons nouveaux ou peu connus. Same volume but pp. 149-156.

----. 1902. Champignons de la Guadeloupe (3e Serie). Same journal, vol. 18:171-186.
----. 1907. Basidiomycètes nouveaux Brésil recueillis par F. Noack. Ann. Mycol. 5:364-366.
----, and G. Lagerheim. 1892. Champignons de l'Equateur. (Pugillus II). Soc. Myc. France Bull. 8:113-140.
Peck, C. H. 1874. Report of the botanist for 1872 . New York State Museum Annual Report 26:35-91.
----. 1878. ---- for 1876 . ---- 30:23-78.
----. 1879. ---- for 1877 . ---- 31:19-60.
----. 1881. ---- for 1880 . ---- 34:24-58.
----. 1884. ---- for 1881 . ---- 35:125-164.
----. 1885. ---- for 1884 . ---- 38:77-138.
----. 1884. New species of fungi. Torrey Botanical Club Bulletin 11:26-28.
Pegler, D. N. 1967. "Polyporaceae" - Part II, with a key to world genera. British Mycological Society Bulletin 1:17-36.
Persoon, C. H. 1796. Observationes mycologicae I.
Pouzar, Z. 1966a. Studies in the taxonomy of the polypores I. Česká Mykologie 20:171-177.
----. 1966b. ---- II. Folia Geobotanica & Phytotaxonomica 1:356-375.
Quélet, L. 1886. Enchiridion fungorum.
Reid, D. A. 1970. New or interesting records of British Hymenomycetes, IV. British Mycological Society Transactions 55:413-441.
Romell, L. 1912a. Hymenomycetes of Lappland. Arkiv för Botanik 11(3):1-35.
----. 1912b. Remarks on some species of the genus Polyporus. Svensk Botanisk Tidskrift 6:635-644.
----. 1926. Remarks on some species of Polyporus. Same journal, vol. 20:1-24.
Ryvarden, L. 1973. New genera in the Polyporaceae. Norwegian Journal of Botany 20:1-5.
Schrader, H. A. 1794. Spicilegium florae germanicae.
Schweinitz, L. D. 1822. Synopsis fungorum Carolinae superioris. Schriften der Naturforschenden Gesellschaft zu Leipzig, Bd. 1:20-131.
----. 1832. Synopsis fungorum in America Boreali media degentium. American Philosophical Society Philadelphia Transactions, n. ser. 4:141-316.
Singer, R. 1944. Notes on taxonomy and nomenclature of the polypores. Mycologia 36:65-69.
----. 1962. The Agaricales in modern taxonomy. Ed. 2.

Sowerby, J. 1799. Coloured figures of English fungi or mushrooms. II. Tab. CXXI-CCXL.

Teixeira, A. R. 1962. The taxonomy of the Polyporaceae. Cambridge Philosophical Society. Cambridge, England Biological Reviews 37:51-81.

Teng, S. C. 1964. True fungi of China (in Chinese).

Teston, D. 1953. Étude de la différenciation des hyphes chez les polypores dimidiés de la flore française. Sóciéte des Naturalistes d'Oyonnax Bulletin 7:80-100.

von Schrenk, H. 1902. Notes on diseases of western Coniferae. Science, n.s. 16:138.

ADDENDUM

Donk, M. A. 1974. Check list of European polypores. Verh. Kon. Nederl. Akad. Wetensch. Naturk. 2,62. 469 pp. This work, received after the manuscript had been substantially typed, is indispensible to serious students of American polypores. The majority of the species in North America were originally described from European collections, and this is the best work available on the correct application of specific names of European origin.

INDEX

The generic combination is with Tyromyces unless qualified. Complete descriptions are given on the pages underlined, and illustrations are on the pages marked with an asterisk (*). Genera are in CAPITAL LETTERS.

MYCOTAXON

Vol. II, No. 1, pp. 83-103 April-June 1975

WOOD-INHABITING HOMOBASIDIOMYCETES ON SAGUARO IN ARIZONA

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SUMMARY

Twelve species of lignicolous Homobasidiomycetes are reported from saguaro in Arizona. Three new species, *Coniophora eremophila*, *Coprinus papagoensis*, and *Nidularia griseolazulina* are described.

The saguaro cactus, *Carnegiea gigantea* (Engelm.) Britt. & Rose, is a prominent element of the Sonoran Desert flora in southern Arizona and northwestern Mexico. It is the only large columnar cactus in great numbers in the United States, and is therefore a major tourist attraction in Arizona. In addition to its biological and aesthetic interest, the saguaro plays a key role in maintaining the ecological balance of the desert. The fibrous roots of the plant bind the loose desert soils together (Shelton, 1972), the trunk and arms act as nesting sites for such birds as the Gila woodpecker and the elf owl, and the fruit has provided a food and beverage source for the Papago Indians for many years (Benson, 1969).

The saguaro prefers well-drained slopes and foothill areas in the Lower Sonoran Desert zone. It ranges from northern Arizona along the Colorado River to northern Sonora, Mexico, and occurs just west of the Colorado River in southeastern California (Shreve and Wiggins, 1964).

Saguaros appear to be on the decline around the Tucson area in particular (Hastings and Turner, 1965), and have been the subject of several studies concerning organisms which might contribute to this decline. Lightle, Standring,

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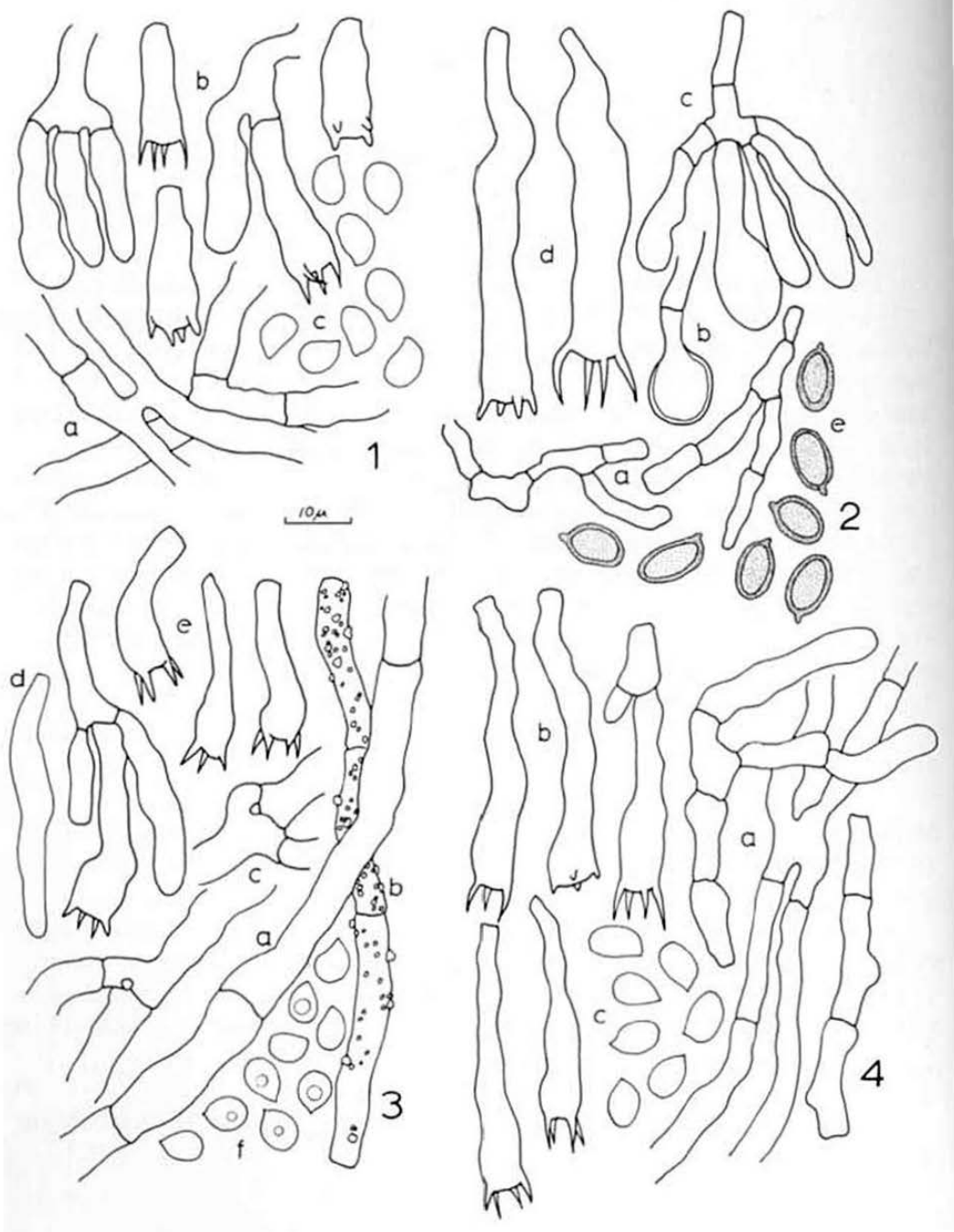
University of Arizona Agricultural Experiment Station Journal article No. 2402.

and Brown (1942), Boyle (1949), and Alcorn and May (1962) investigated a bacterial rot caused by *Erwinia carnegieana* Standring. Davidson and Mielke (1947) worked with a heart rot fungus, *Phellinus texanus* (Murr.) Gilbertson et Canfield, which decays wood in mature standing cacti. Davidson and Mielke referred this fungus to *Fomes robustus* Karst. Gilbertson and Canfield (1972) studied *Poria carnegiea* Baxter, a fungus which apparently enters and weakens roots of standing plants, predisposing them to windthrow.



Hepting (1971) summarizes knowledge of pathology of saguaro and states that it "supports fewer recorded pathogens or otherwise destructive micro-organisms than any other American tree". Other organisms that decay saguaro have not yet been reported. This paper describes 12 Homobasidiomycetes known to decay the woody tissues of saguaro. All collections cited are from saguaro unless otherwise specified. Capitalized color names are from Ridgway (1912). All voucher specimens are in the University of Arizona Herbarium (ARIZ) unless otherwise specified.

ATHELIA DECIPIENS (Hoehn. et Litsch.) John Erikss., Symb. Bot. Upsalienses 16:1, p. 86. 1958.

Corticium decipiens Hoehn. et Litsch., Sitz. ber. Akad. Wiss. Wien Math.-nat. Kl. Bd. 117(1): 1116. 1908.

Basidiocarps pellicular, becoming widely effused, thin, fragile, easily separable from substratum; hymenial surface white to grayish-white, smooth, cracking on drying; hymenial layer very thin, discontinuous; subiculum delicate, whitish, arachnoid, in some areas so inconspicuous the hymenial layer appears to be directly on the substratum; subicular hyphae (Fig. 1a) simple-septate with no clamp connections, thin- to moderately thick-walled, often incrusted, with frequent branching, 2-5 µm in diam, with prominent right angle branching; cystidia lacking; basidia (Fig. 1b) in candelabrums, compactly arranged in a euhymenium, clavate, 10-25 x 6-8 µm, 4-sterigmate, with a basal septum; basidiospores (Fig. 1c) oblong to ellipsoid, hyaline, smooth, negative in Melzer's reagent, (4-)5-8 x 4.5-5.5 µm, with a small but prominent apiculus.

Fig. 1, *Athelia decipiens* (RLG 10814), a, subicular hyphae; b, basidia; c, basidiospores. Fig. 2, *Coniophora eremophila* (JPL 101), a, subicular hyphae; b, inflated hyphal element from subiculum; c, cluster of immature basidia; d, basidia; e, basidiospores. Fig. 3, *Phanerochaete chrysorhizon* (JPL 72), a, simple-septate subicular hypha; b, lightly incrusted simple-septate subicular hypha; c, subicular hyphae with clamp connections; d, cystidium; e, basidia; f, basidiospores. Fig. 4, *Phanerochaete tuberculata* (RLG 10570 and 10544), a, subicular hyphae; b, basidia, c, basidiospores.

Athelia decipiens occurs in all vegetational zones in Arizona from Sonoran Desert to coniferous forests. It is associated with a uniform white rot.

Voucher specimen: RLG 10814, Saguaro Nat. Monument, West unit, Pima County, AZ (ARIZ).

CONIOPHORA EREMOPHILA Lindsey et Gilbertson, sp. nov.

Fructificatio annua, effusa, fragilis; hymenio superficie laevi; area fecunda olivaceo-brunnea; subiculum album, arachnoideum; margo album, cum rhizomorphae; hyphae septatae, afibulatae, 2-6 µm diam; basidia clavata vel utriformes, 4-sterigmatibus, 50-55 x 6-8 µm; basidiosporis pallido-flavus, dextrinoideis, tunicis incrassatis, ovatis vel cylindrico-ellipsoideis, 9-14 x 5-9 µm. HOLOTYPUS: in ligno *Prosopis juliflora* (Sw.) DC., Canyon del Oro, Santa Catalina Mts., Pinal County, AZ, U.S.A.; leg. R. L. Gilbertson no. 10925; in herb. Nat. Fungus Collections, Beltsville, MD, U.S.A. (BPI).

Basidiocarps fragile, easily separated, becoming widely effused; hymenial surface smooth, colored Light Brownish Olive by the massed basidiospores; hymenial tissue soft and floccose over a white, arachnoid subiculum; margin with fine white mycelial strands from subiculum; subicular hyphae (Fig. 2a) simple-septate, hyaline, thin-walled, mostly 2-6 µm diam but with some cells (Fig. 2b) inflated up to 10 µm, some lightly incrusted; cystidia none; basidia (Fig. 2c, 2d) usually utriform, occasionally clavate, usually sinuous, tapering at the base, 50-55 x 6-8 µm, 4-sterigmate, sterigmata up to 7 µm long; basidiospores (Fig. 2e) brownish-olive in mass, pale yellow in KOH, cyanophilous, dextrinoid in Melzer's reagent, thick-walled, oval to broadly cylindric, 7.5-14 x 5-9 µm with a prominent peg-like apiculus.

Coniophora eremophila also occurs on other Sonoran Desert plants, and is associated with a brown rot.

Coniophora arida (Fr.) Karst.) is a similar species, and is commonly found in coniferous forest regions of Arizona. It differs from *C. eremophila* in having adnate basidiocarps, larger basidia, and larger, more narrowly ellipsoid basidiospores. *C. inflata* Burt, described from Mexico, differs in having occasional single to multiple

clamps, hyphoid cystidia, and smaller basidiospores (Ginns, 1973).

Voucher specimens: JPL 101, on saguaro, Saguaro Nat. Monument, West unit, Pima County, AZ; RLG 10925, on dead mesquite (*Prosopis juliflora* (Sw.) DC.), Canyon del Oro, Santa Catalina Mts., Pinal County, AZ. HOLOTYPE, BPI: RLG 10812, on dead ironwood (*Olneya tesota* Gray), Saguaro Nat. Monument, West unit, Pima County, AZ; RLG 10875, on dead ironwood, Santa Rosa Valley, Papago Indian Reservation, Pinal County, AZ; RLG 10936, on Mexican elderberry (*Sambucus mexicana* Presl.), Tanque Verde Wash, Pima County, AZ; ERC 71-344, on desert willow (*Chilopsis linearis* (Cav.) Sweet), Lochiel, Santa Cruz County, AZ; RLG 10894, on Arizona black walnut (*Juglans major* (Torr.) Heller), Gardner Canyon Rd., Santa Cruz County, AZ (ARIZ).

PHANEROCHAETE CHRYSORHIZON (Torr.) Gilbertson et Budington, Southwestern Nat. 17(4): 417. 1973.

Hydnum chrysorhizon Torr. in Eaton, Manual of Botany, ed. 3, p. 309. 1822.

Basidiocarps effused in small patches, fragile, pellicular, easily separated from the substratum; hymenial surface bright orange-yellow to cream-colored, becoming strongly hydnaceous, the teeth cylindric, up to 1 mm long; margin rhizomorphic with white, plumose fans of radiating rhizomorphs in arachnoid mycelium; yellow to cream rhizomorphs usually present on substratum and in adjacent soil and litter; hyphal system monomitic; subicular hyphae smooth or lightly incrusted (Fig. 3b), 4-8 µm diam with abundant simple septa (Fig. 3a) and occasional single or double clamp connections (Fig. 3c), cystidia (Fig. 3d) few, cylindric, thin-walled, 3-4 µm diam, projecting to 25 µm; basidia (Fig. 3e) clavate, 4-sterigmate, septate at the base, 20-30 x 5.5-7 µm; basidiospores (Fig. 3f) broadly ellipsoid, hyaline, negative in Melzer's reagent, smooth, 5-6 x 4-4.5 µm.

Phanerochaete chrysorhizon is found on other native desert plants and is also common on dead cotton stems and roots. The decay is a uniform white rot.

Voucher specimen: JPL 72, Saguaro Nat. Monument, West unit, Pima County, AZ (ARIZ).

PHANEROCHAETE TUBERCULATA (Karst.) Parm., Conspect. Syst. Cortic., p. 83. 1968.

Corticium tuberculatum Karst., Hedwigia 35: 45. 1896.

Basidiocarps annual, adnate, becoming widely effused; hymenial surface tuberculate, deeply cracked when dry, Cinnamon-Buff to Clay-Color; margin thinning out, white, arachnoid; hyphal system monomitic, subicular hyphae (Fig. 4a) thin-walled, hyaline, simple-septate, sometimes incrusted, 2.5-5 µm diam; cystidia none; basidia (Fig. 4b) clavate, 4-sterigmate, simple-septate at base, 35-45 x 6-7 µm; basidiospores (Fig. 4c) 6-9 x 3.5-5 µm, ellipsoid, apiculate, hyaline, smooth, negative in Melzer's reagent.

Phanerochaete tuberculata is associated with a white rot of a number of Sonoran Desert plants and decays dead branches on standing plants as well as wood on the ground. The diagnostic characters are the cracked, tuberculate basidiocarps and absence of clamp connections and cystidia.

Voucher specimens: RLG 10544, Camp Grant Wash, San Pedro River Valley, Pinal County, AZ; RLG 10570, Saguaro Nat. Monument, West unit, Pima County, AZ; JPL 133, Saguaro Nat. Monument, East unit, Pima County, AZ (ARIZ).

PENIOPHORA TAMARICICOLA Boid. et Malençon, Rev. Mycol. 26: 153. 1961.

Basidiocarps becoming widely effused, adnate, drying tough and horny, cracking extensively on drying into small angular blocks; hymenial surface smooth to distinctly tuberculate, pruinose, pink when fresh, pale purplish-gray on dried specimens (Pale Smoke Gray, Pallid Mouse Gray, or Gull Gray); margin abrupt and fertile; subiculum pale brown, hymenial layer distinct and whitish in longitudinal section; hyphal system apparently monomitic; subicular hyphae (Fig. 5a) agglutinated, difficult to separate, 3-4 µm in diam, thin- to thick-walled, with some inconspicuous clamp connections; vesicular gloeocystidia (Fig. 5b) present in subiculum, some with refractive granular contents, dark bluish-black in sulfobenzaldehyde reagent; hymenial gloeocystidia occasional, barely projecting, acuminate, some with refractive contents, light to dark bluish-black in sulfobenzaldehyde reagent; dendrohyphidia present, lightly incrusted, 2-3 µm diam, sparsely branched at apex;

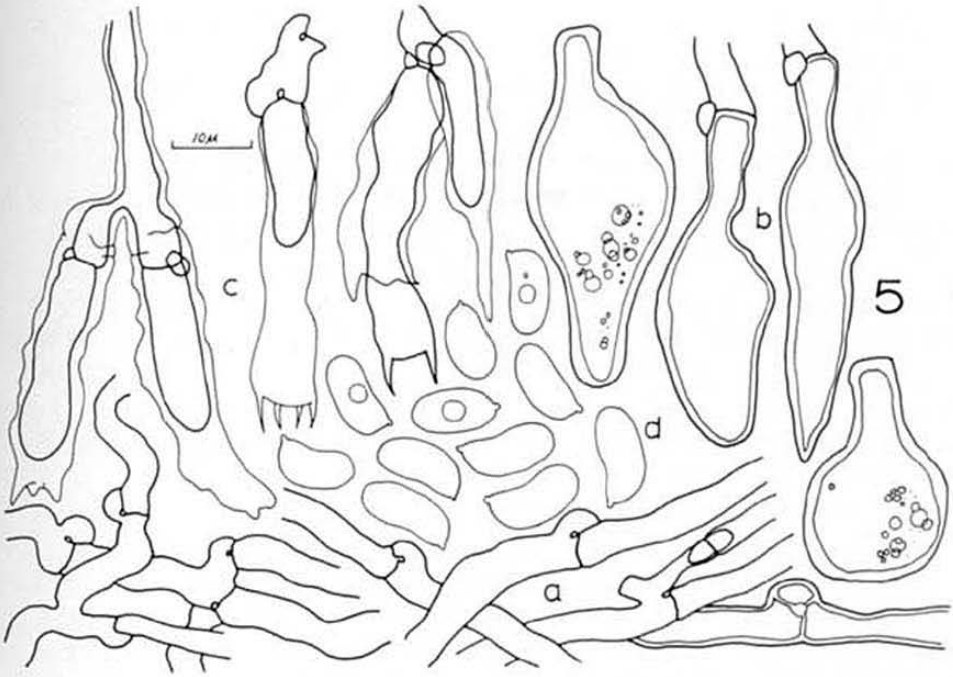


Fig. 5. *Peniophora tamaricicola* (JPL 137), a, subicular hyphae; b, gloeocystidia; c, basidia, showing percurrent development; d, basidiospores.

basidia (Fig. 5c) clavate, 4-sterigmate, 25-40 x 7-7.5 μm, developing percurrently; basidiospores (Fig. 5d) hyaline, negative in Melzer's reagent, smooth, cylindric to allantoid, 10.5-11.5 x 4-4.5 μm.

P. tamaricicola is associated with a white rot of dead branches of a number of desert trees and shrubs (Gilbertson, et al., 1974; Gilbertson and Burdsall, 1975) and is particularly common on mesquite.

Voucher specimen: JPL 137, Saguaro Nat. Monument, East unit, Pima County, AZ (ARIZ).

HYPHODERMA CLAVIGERUM (Bres.) Donk, Fungus 27: 15. 1957.

Kneiffia clavigera Bres., Ann. Mycol. 1: 103. 1903.

Basidiocarps annual, effused, adnate; hymenial surface white, smooth, pilose under 30X lens; hyphal system monomitic, subicular hyphae (Fig. 6a) thin-walled 2.5-4 μm diam

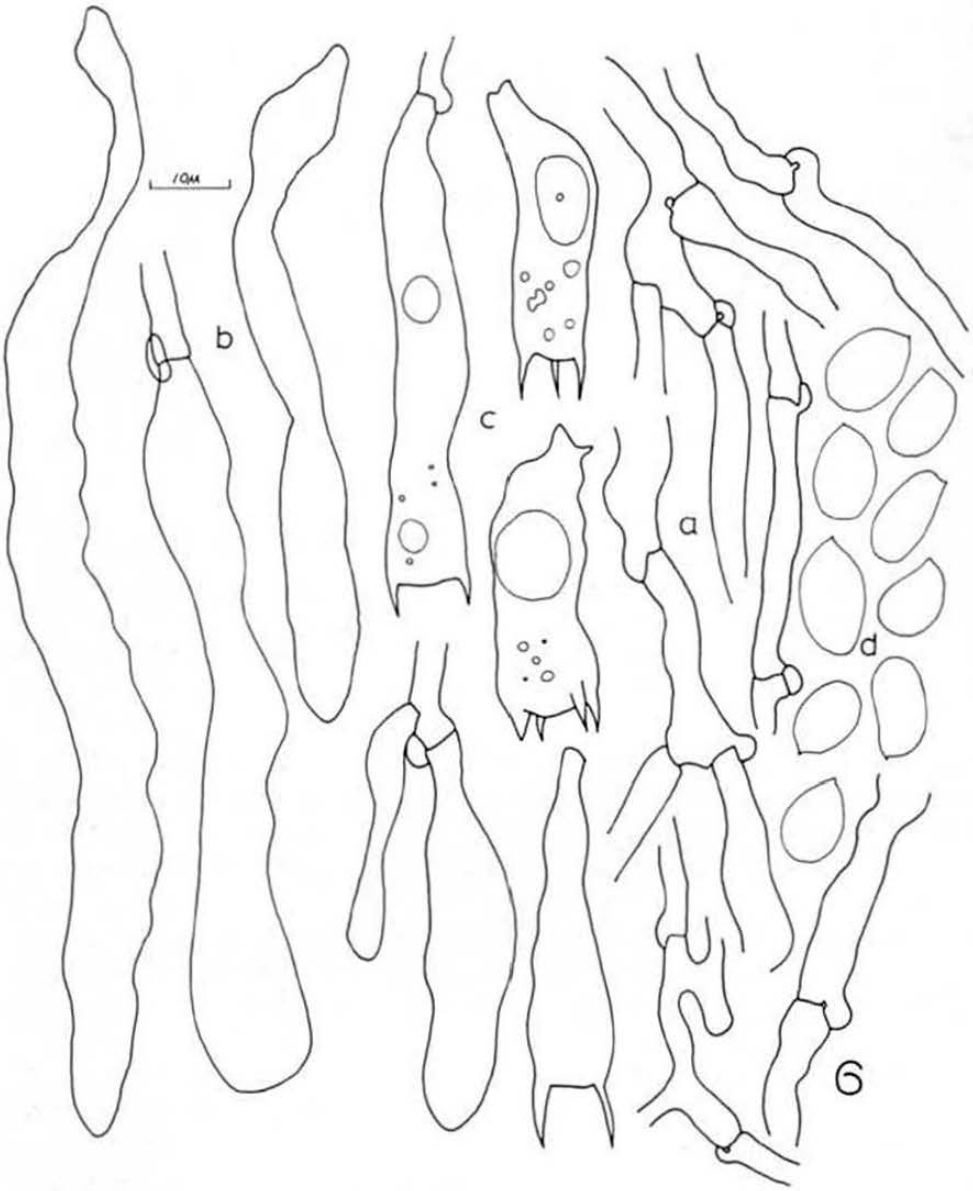


Fig. 6. *Hyphoderma clavigerum* (Alcorn specimen), a subicular hyphae; b, cystidia; c, basidia; d, basidiospores.

or some swollen to 7 µm at the septa, with clamp connections at all septa and frequent branching; cystidia (Fig. 6b) frequent, clavate to fusoid, thin-walled, not incrusted, 70-120 x 9-13 µm; basidia (Fig. 6c) clavate, 4-sterigmate, usually with a slight median constriction, 30-55 x 8-11 µm; basidiospores (Fig. 6d) hyaline, negative in Melzer's reagent, smooth, ellipsoid to cylindric-ellipsoid,

9-13 x 5.5-7 µm.

Hyphoderma clavigerum is associated with a white rot.

Voucher specimen: Stanley M. Alcorn collection, on dead tissue of live saguaro, Saguaro Nat. Monument, East unit, Pima County, AZ (ARIZ).

PHELLINUS TEXANUS (Murr.) Gilbertson et Canfield, Mycologia 65: 1304. 1972.

Pyropolyporus texanus Murr., N. Am. Fl. 9: 104. 1908.

Basidiocarps perennial, sessile, ungulate, up to 15 cm wide; upper surface at first pale brown, matted-tomentose, becoming blackened and deeply rimose with age and weathering, sulcate; margin rounded, pale brown and tomentose; pore surface pale brown (near Buckthorn Brown), smooth, the pores 4-6 per mm; dissepiments finely tomentose, entire context hard and woody, yellowish-brown, appearing mottled with streaks of paler tissue; tube layers stratified, becoming stuffed with light colored mycelium; sections permanently darkening in KOH solution; contextual hyphae thin-walled, hyaline (Fig. 7a) to brown, 2-5 µm in diam, with moderately thickened walls (Fig. 7b), occasional septa, and rare branching; hyphae in the pale-colored areas with a parallel arrangement, easily separated, hyphae in the darker areas densely interwoven, contorted, difficult to separate; tramal hyphae interwoven, 2-4 µm diam, pale yellowish, with slightly thickened walls and occasional septa; setae (Fig. 7d) few, thick-walled at maturity, with inflated base to 10 µm diam and 25-60 µm long, with a slender apical portion; setae apparently developing from hyaline, thin-walled cystidioid hyphal ends (Fig. 7c) similar in shape and size to the setae, common in all sections; basidia (Fig. 7e) ovoid to subglobose, 17-25 x 8.5-12 µm, 4-sterigmate, the sterigmata slender, up to 4 µm long; basidiospores (Fig. 7f) subglobose, hyaline, strongly dextrinoid in Melzer's reagent and with distinctly thickened walls when mature, 7-9 x 6.5-9 µm.

Phellinus texanus decays the heartwood of many desert shrubs and trees (Gilbertson et al., 1974). On saguaro the basidiocarps develop under the arms and are very inconspicuous. Davidson and Mielke (1947) report that *P. texanus* also causes decay in the base of saguaros. The decay is a

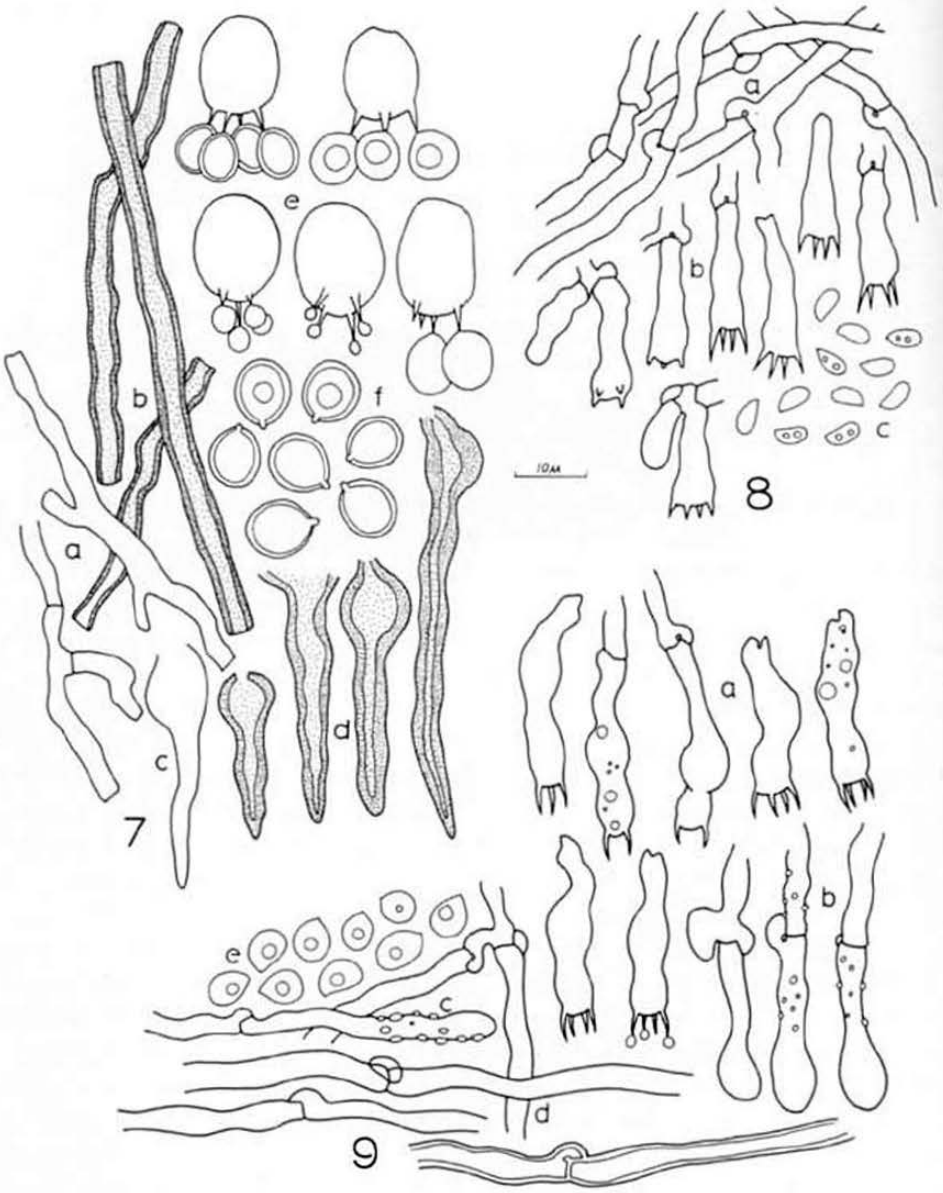


Fig. 7. *Phellinus texanus* (RLG 6959), a, pale thin-walled septate hyphae; b, thick-walled pigmented hyphae; c, thin-walled hyaline immature seta; d, thick-walled pigmented mature setae; e, basidia; f, basidiospores. Fig. 8. *Poria carnegiea* (JPL 342), a, subicular hyphae; b, basidia; c, basidiospores. Fig. 9. *Poria apacheriensis* (RLG 11429), a, basidia; b, apically swollen cystidia; c, cylindric cystidium; d, subicular hyphae; e, basidiospores.

uniform white rot with mats of brown mycelium developing in advanced stages.

Voucher specimens: E. R. Canfield 71-73 and 71-74, Redington Rd., Rincon Mts., Pima County, AZ (ARIZ).

PORIA CARNEGIEA Baxter, Pap. Michigan Acad. Sci. 26: 110. 1941.

Basidiocarps effused up to 3 m, annual, cracking deeply in older specimens; pore surface almost white to ivory-white when fresh, drying tan or Light Buff, the pores angular, 2-4 per mm with thin dissepiments that split on aging or drying; margin sometimes abrupt and fertile, or if sterile then white, finely fimbriate or fibrillose; tube layer soft and easily crushed when fresh, drying buff, brittle, up to 1 cm thick; subiculum less than 1 mm thick, soft-fibrous, ivory-white; subicular hyphae (Fig. 8a) 2-4 µm diam, thin-walled, with abundant clamp connections, with occasional branching; tramal hyphae similar, with more frequent branching; cystidia none; basidia (Fig. 8b) clavate, 4-sterigmate, 16-19 x 7-7.5 µm with a basal clamp connection; basidiospores (Fig. 8c) oblong to short-cylindric, hyaline, smooth, negative in Melzer's reagent, 4.5-5.5 x 2-2.5 µm; spore print white.

Poria carnegiea has never been found on substrata other than saguaro. It enters the root systems in standing plants and continues to decay the other woody tissues after the plant has fallen. The decay is a uniform white rot that becomes stringy or laminated in the advanced stages (Gilbertson and Canfield, 1972).

Voucher specimens: JPL 342, Saguaro Nat. Monument, East unit, Pima County, AZ; JPL 316, Organ Pipe Nat. Monument, Pima County, AZ; RLG 10547, Dripping Springs Mts., Pinal County, AZ (ARIZ).

PORIA APACHERIENSIS Gilbertson et Canfield, Mycologia 65: 1117. 1973.

Basidiocarps annual, effused up to 10 cm, adnate, soft-fibrous; pore surface white to Cream Color or Light Buff; margin sterile, tomentose; pores circular to daedaloid, up to 1 mm in diam, mostly 2-3 per mm; tube layer

soft-fibrous, white to cream-colored, up to 2 mm thick; subiculum soft, white, less than 0.5 mm thick; hyphal system monomitic; subicular hyphae (Fig. 9d) with abundant clamp connections, thin- to moderately thick-walled, with occasional branching, 2-4 µm diam; tramal hyphae similar, incrusted at dissepiment edges; cystidia thin-walled, of two types, some acicular or cylindric (Fig. 9c), smooth to lightly incrusted, 3-5 µm in diam and projecting to 40 µm, others capitate (Fig. 9b), 3-5 µm diam with swollen apex up to 10 µm in diam, projecting up to 45 µm; basidia (Fig. 9a) with a median constriction, 4-sterigmate, 18-21 x 6-7 µm; basidiospores (Fig. 9e) hyaline, negative in Melzer's reagent, broadly ellipsoid to subglobose, smooth, 5-6.5 x 4-5.5 µm.

Poria apacheriensis occurs on a number of Sonoran Desert plants and causes a white rot (Gilbertson and Canfield, 1973). The only record on saguaro is a basidiocarp found at the base of an arm of a living plant.

Voucher specimen: RLG 11429, Catalina Foothills, Pima County, AZ (ARIZ).

PANUS FULVIDUS Bres., Fungi Trid. II, p. 56. 1900.

Basidiocarps centrally stipitate, single to gregarious; pileus circular, 0.5-3 cm in diam; upper surface pale brown (Cinnamon-Buff to Clay Color), dry, with radially arranged fibrillar scales; stipe cream-colored to pale brown, usually darker at the base, glabrous to minutely pubescent, up to 2 mm diam and 20 mm long; gills pinkish-cream to pale buff when dried, distant, free to adnate, continuous with striations on upper stipe, edges sinuous and distinctly granulose under 30 X lens; most context hyphae (Fig. 10a) filamentous, simple-septate, thin- to slightly thick-walled, 2-5 µm in diam, some very thick-walled (Fig. 10c), with occasional branching, 4-10 µm in diam, usually tapering to a rounded, narrowed apex, but occasionally forming swollen vesicular elements (Fig. 10b); tramal hyphae similar to thin-walled type; pleurocystidia (Fig. 10d) fusoid, barely projecting, thin-walled, 45-60 x 5-6 µm; cheilocystidia similar; basidia (Fig. 10e) clavate, simple-septate at base, 4-sterigmate, 38-55 x 9-15 µm; basidiospores (Fig. 10f) 12-16 x 6-7 µm, broadly cylindric, hyaline, negative in Melzer's reagent.

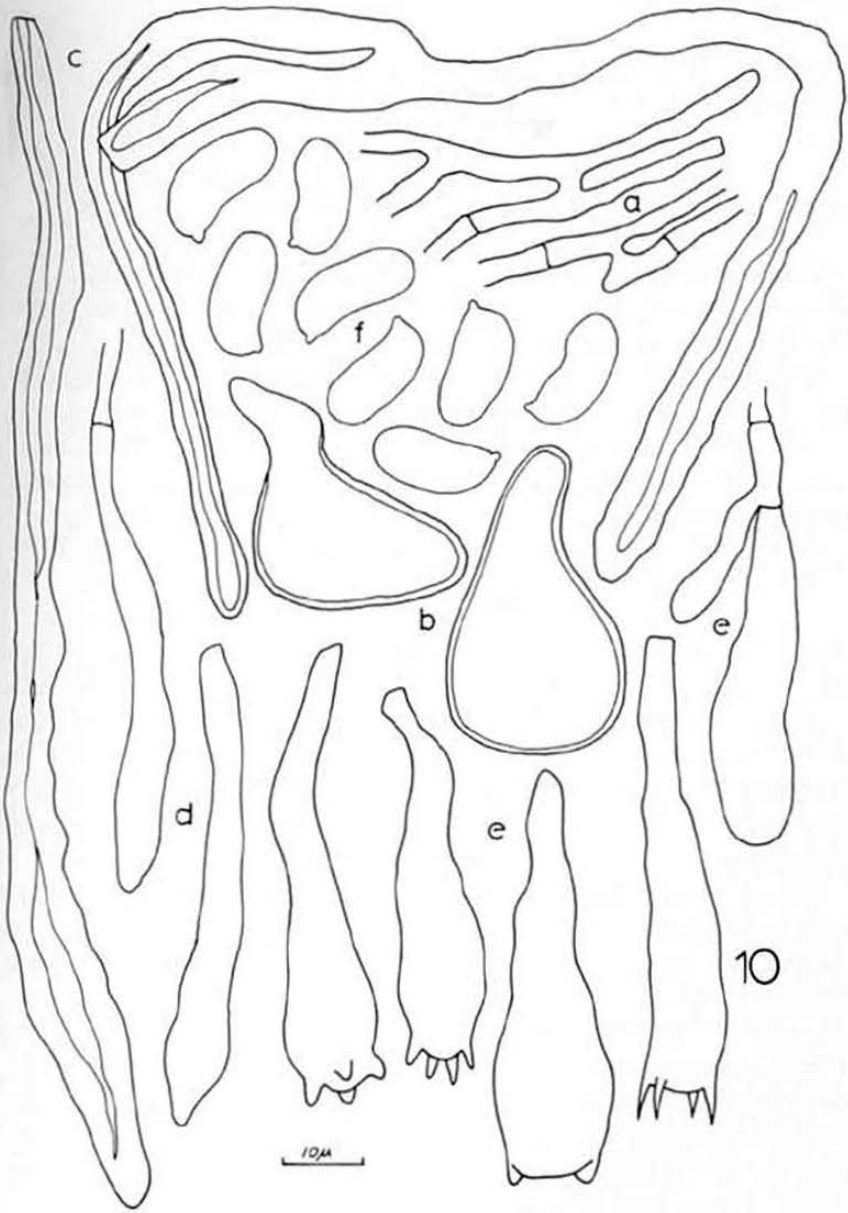


Fig. 10. *Panus fulvidus* (RLG 10258), a, thin-walled septate contextual hyphae; b, swollen vesicular elements from context; c, thick-walled contextual hyphae; d, pleurocystidia; e, basidia; f, basidiospores.

Panus fulvidus also occurs on wood of a number of other plants of the Sonoran Desert and desert grass zones.

It is particularly common on juniper fence posts and causes a brown cubical rot.

Voucher specimen: Gene Milbrath collection, Saguaro Nat. Monument, East unit, Pima County, AZ (ARIZ).

COPRINUS PAPAGOENSIS Lindsey et Gilbertson, sp. nov.

Pileus tenuis, usque ad 3 cm latus, cremicolor, aridus, parvis squamis; stipes pubenti basi, usque ad 8 cm longus, 1.5-2.5 mm crassus; annulo nullo; basidiosporae atri, campanulati, 8-10 µm crassi; basidia 4-sterigmatibus, 9-11 µm diam, 13-21 µm longa; sclerotia rosea vel purpurea, 2-5 mm vel 10 mm diam. HOLOTYPUS: in ligno *Carnegiea gigantea* (Engelm.) Britt. et Rose, Saguaro Nat. Monument, West unit, Tucson Mts., Pima County, AZ, U.S.A.; leg. J. P. Lindsey, no. 97; in herb. Nat. Fungus Collections, Beltsville, MD , U.S.A. (BPI).

Basidiocarps (Fig. 11f) centrally stipitate; pileus up to 3 cm broad, at first convex, becoming plane, upper surface cream-colored to pale buff, dry, with tufts of white to cream-colored tomentum forming scale-like patches on top, distinctly radially striate; margin becoming rolled upward; context thin, whitish; lamellae adnate to slightly decurrent, close, thin, becoming black; stipe up to 8 cm long, 1.5-2.5 mm in diam, white, faintly longitudinally striate, glabrous, with a swollen, densely pubescent base up to 7 mm in diam; contextual hyphae thin-walled, some uniform in diam (Fig. 11d), with clamp connections and simple septa, 2-3 µm diam, others with greatly swollen cells (Fig. 11b), constricted at septa, with distorted and obscure clamp connections, up to 22 µm diam; tramal hyphae similar; pubescence at base of stipe composed of cordons (Fig. 11e) of slender hyphae with clamp connections, cordons 10-20 µm diam; basidia (Fig. 11a) stout, broadly clavate, often with a greatly narrowed base, 4-sterigmate, 13-21 x 9-11 µm, compactly arranged between sterile cells that do not project beyond hymenial surface; basidiospores (Fig. 11c) dark blackish in KOH and Melzer's reagent when mature, bell-shaped, smooth, thick-walled, with an apical germ pore and a blunt, rounded apiculus in the center of the concave, broad base, 8-10 µm wide at the base; spore print jet black.

Sclerotial bodies spherical, 2-5(-10) mm diam when

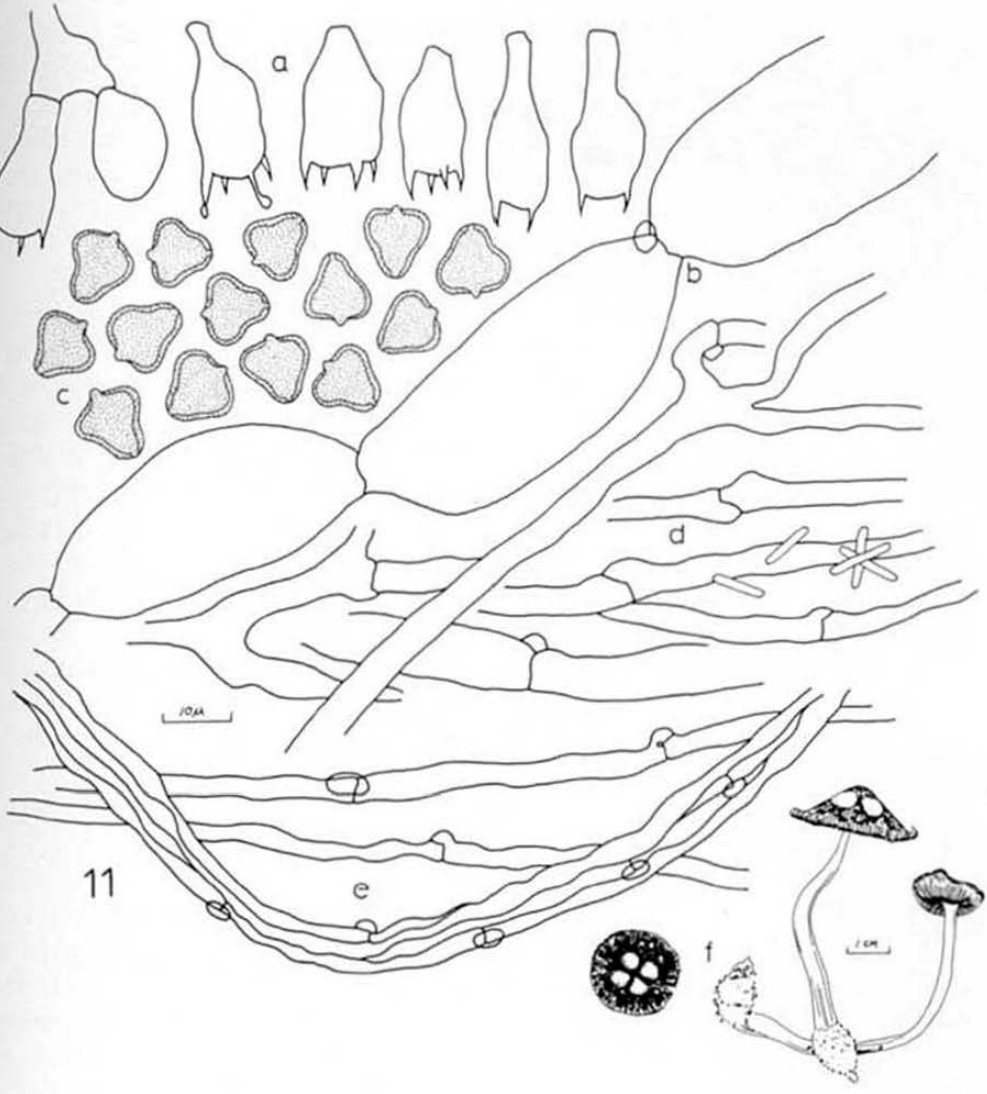


Fig. 11. *Coprinus papagoensis* (basidiocarp stage, JPL 97), a, basidia; b, closely septate swollen contextual hyphae; c, basidiospores; d, slender contextual hyphae; e, cordon; f, basidiocarps.

mature, at first covered by a thin white peridium, becoming pink to dark purple at maturity; immature sclerotial bodies showing a distinct central columella-like structure surrounded by a clearly differentiated zone, this differentiated zone composed of spherical masses (Fig. 12b) of intertwined hyphae, these individual masses 60-80 µm diam; individual hyphae thin-walled, 2.5-5 µm diam with clamp connections; mature sclerotial bodies composed of a solid pink to purplish mass of microsclerotia; mature microsclerotia

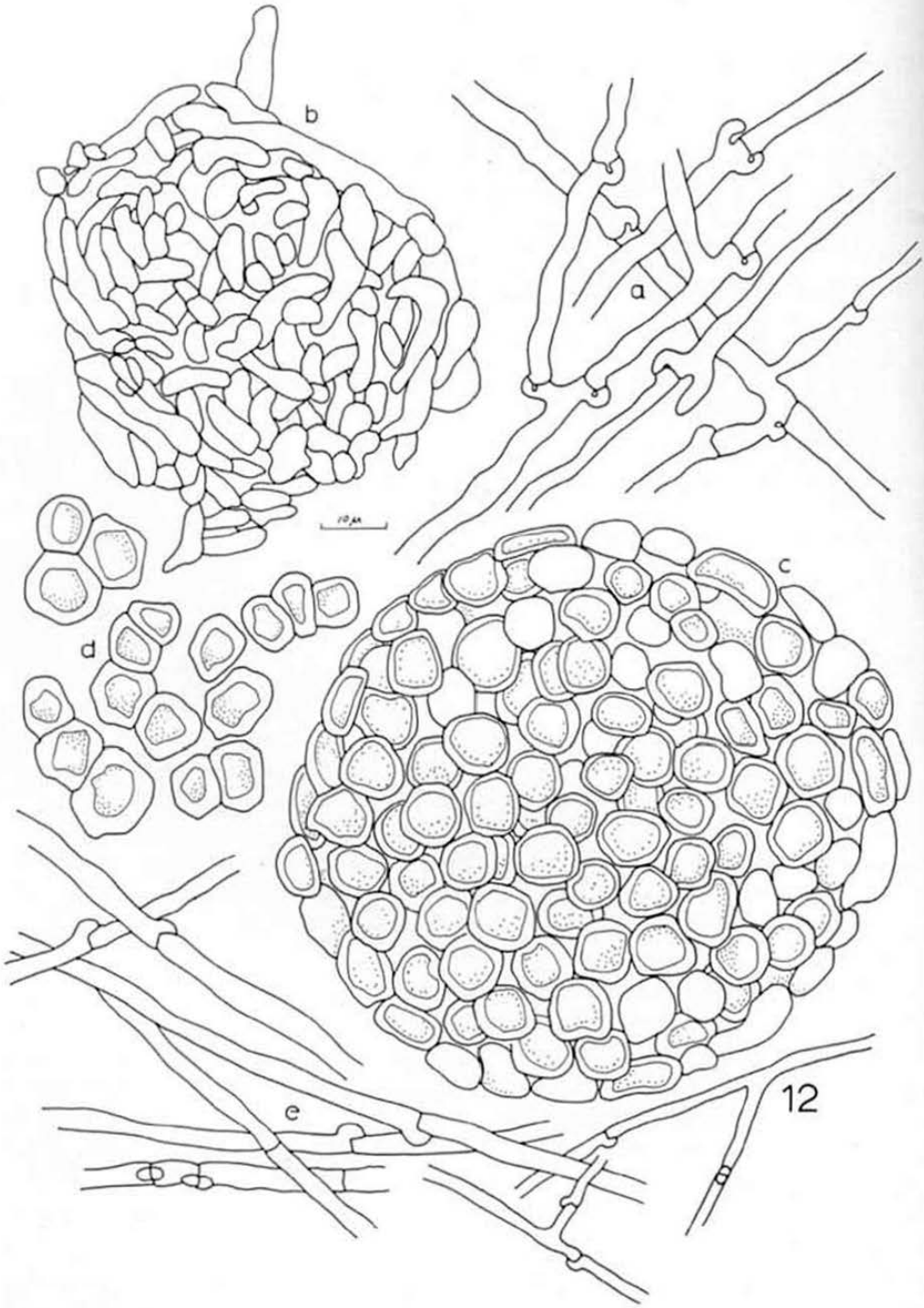


Fig. 12. *Coprinus papagoensis* (vegetative structures, JPL 91 and JPL 403), a, hyphae from advancing zone of culture; b, immature microsclerotium from moist chamber culture; c, mature microsclerotium from moist chamber culture; d, cells from mature microsclerotium; e, hyphae from surface mycelium in field collection.

(Fig. 12c) spherical to ellipsoid, 60-80 µm diam, composed of thick-walled, isodiametric, polyhedral cells (Fig. 12d) 6-12 µm diam; sclerotial bodies on saguaro ribs in the field accompanied by white mycelium and mycelial strands composed of thin-walled hyphae (Fig. 12e) 1.5-4 µm diam, with clamp connections.

Cultures of *C. papagoensis* were readily obtained from microsclerotia and also from tissue from basidiocarps collected on saguaro ribs in the field. Cultures from both sources were identical. They were characterized by a fast-growing, white mycelial mat with concentric zones of sclerotial bodies similar to those found in nature. The hyphae are thin-walled with abundant clamp connections (Fig. 12a). Axenic cultures were also grown on decomposed tissue from the fleshy portion of fallen saguaros and on horse manure. Typical sclerotial bodies developed abundantly on both media. Pieces of saguaro ribs with sclerotial bodies and surface mycelium were placed in moist chambers and incubated at 25 C. Basidiocarps developed in most of these chambers within 2 weeks. Basidiocarp primordia often failed to mature in moist chambers.

Coprinus asterophorus Long et Miller (holotype W. H. Long 9354, UC) was described from desert habitats in New Mexico and Arizona. However, it is not associated with sclerotia and has regularly ellipsoid basidiospores. No other species of *Coprinus* are reported associated with sclerotia like those of *C. papagoensis*. The shape of the basidiospores is also a distinctive character.

Voucher specimens: JPL 91, 92, 98, Saguaro Nat. Monument, West unit, Pima County, AZ; JPL 95 and 97 (HOLOTYPE, BPI), Saguaro Nat. Monument, West unit, Pima County, AZ; RLG 10815, 10840, Saguaro Nat. Monument, West unit, Pima County, AZ; JPL 115 and RLG 10879, 4 mi no. of Gu Komelik, Papago Indian Res., Pinal County, AZ (ARIZ). Collections JPL 95 and 97 include both sclerotial stage and basidiocarps. All other collections contain sclerotial stages only.

NIDULARIA GRISEOLAZULINA Lindsey et Gilbertson, sp. nov.

Fructificatio hemisphaerica, in ligno partim incluso, usque ad 5 mm diam, griseo-lazulinascens; peridium fragili, rumpens, tenue; peridiola polyedrica, griseo-lazulina, 0.5-

1 mm diam, dura; hyphae fibulatae, tunicis crassis vel tenuis; basidiosporae hyalinae, non amyloideae, laeves, ellipsoideae vel ovoideae, 14-18 x 10-14 µm. HOLOTYPUS: in ligno *Carnegiea gigantea* (Engelm.) Britt. et Rose, prope Gu Komelik, Papago Indian Reservation, Pinal County, AZ, U.S.A.; leg. J. P. Lindsey no. 116; in herb. Nat. Fungus Collections, Beltsville, MD, U.S.A. (BPI).

Basidiocarps partially sunken in woody tissue of fallen saguaro ribs, hemispherical, up to 5 mm diam, at first covered with loose, floccose surface mycelium, which also grows over the substratum, this wearing away to expose areas of pale bluish-gray peridium; peridium breaking and fragmenting readily to expose pale bluish-gray inner tissue and a compact mass of peridioles completely filling cavity of basidiocarp; peridioles polyhedral with flat faces adjacent to each other, 0.5-1 mm diam, pale bluish-gray surface appearing pruinose or finely farinaceous; sterile, hard outer layer of peridioles up to 320 µm thick, composed of two zones, outer zone dark bluish in section, 150-220 µm thick, composed of slender, thick-walled, loosely arranged hyphae, 2-4 µm in diam, imbedded in a dark, amorphous material; inner zone hyaline, compact, 70-120 µm thick, composed of thick-walled, almost solid hyphae (Fig. 13b and 13d) these little or much branched, with occasional clamp connections or simple septa, breaking up into short fragments, 6-12 µm in diam; pale inner tissue composed of hyphae of two types, some frequently branched (Fig. 13a) moderately thick-walled, 2.5-5 µm in diam, with abundant clamp connections, others not branched (Fig. 13c), appearing solid, usually lightly incrusted, 1.5-2.5 µm diam, without clamp connections, basidia not seen; basidiospores (Fig. 13e) ellipsoid to ovoid, hyaline, negative in Melzer's reagent, thick-walled, with an apical pore, 14-18 x 10-14 µm.

Other North American species of *Nidularia* have much smaller basidiospores, and also differ in macroscopic characters (White, 1902).

Voucher specimen: JPL 116, on ribs of fallen saguaro, 4 mi north of Gu Komelik, Santa Rosa Valley, Papago Indian Reservation, Pinal County, AZ (HOLOTYPE, BPI).

ACKNOWLEDGMENTS

This research was supported by funds from McIntire-Stennis Project 2016-4166-23. The cooperation of National Park Service personnel at the Saguaro National Monument is also gratefully acknowledged.

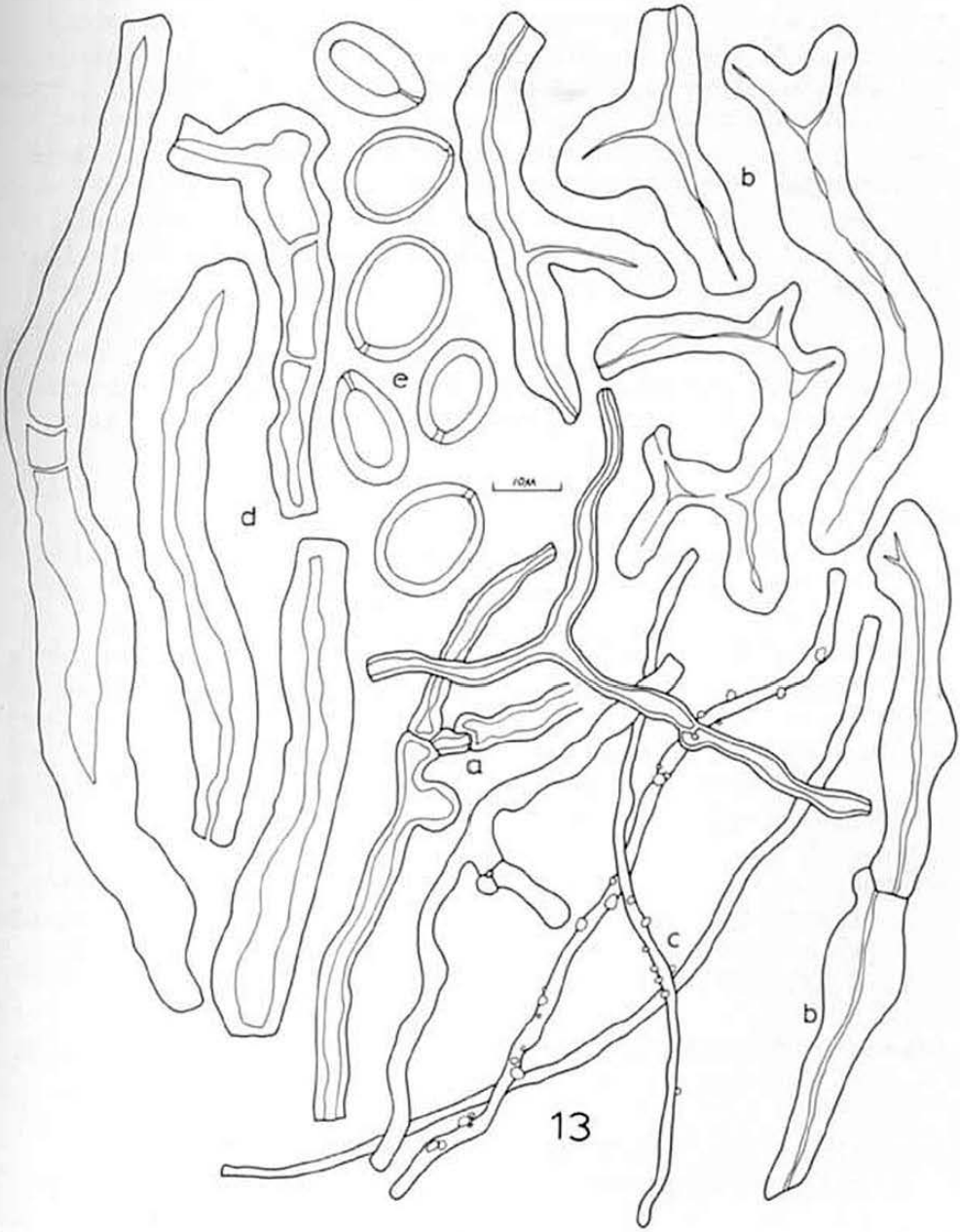


Fig. 13. *Nidularia griseolazulina* (JPL 116), a, slender thick-walled hyphae from interior of peridiole; b, thick-walled hyphae with thread-like lumen from inner layer of peridiole; c, thick-walled, rarely branched hyphae from interior of peridiole; d, thick-walled hyphae from dark outer layer of peridiole; e, basidiospores.

LITERATURE CITED

Alcorn, Stanley M. and Curtis May. 1962. Attrition in a saguaro forest. Plant Dis. Reptr. 56: 156-158.

Benson, Lyman. 1969. The cacti of Arizona. Univ. Ariz. Press, Tucson, Ariz. 218 p.

Boyce, Alice M. 1949. Further studies of the bacterial necrosis of the giant cactus. Phytopathology 39: 1029-1052.

Davidson, R. W. and J. L. Mielke. 1947. *Fomes robustus*, a heart-rot fungus on cacti and other desert plants. Mycologia 39: 210-217.

Gilbertson, R. L. and E. R. Canfield. 1972. *Poria carnegiea* and decay of saguaro cactus in Arizona. Mycologia 64: 1300-1311.

Gilbertson, R. L. and E. R. Canfield. 1973. A new *Poria* from southern Arizona. Mycologia 65: 1117-1124.

Gilbertson, R. L. and H. H. Burdsall, Jr. 1975. *Peniophora tamaricicola* in North America. Mycotaxon 2: 143-150.

Gilbertson, R. L., K. J. Martin and J. P. Lindsey. 1974. Annotated check-list and host index for Arizona wood-rotting fungi. Univ. Ariz. Agr. Expt. Sta. Tech. Bull. 209. 48 p.

Ginns, J. H. 1973. *Coniophora*: study of 22 type specimens. Can. J. Bot. 51: 249-259.

Hastings, J. R. and R. M. Turner. 1965. The changing mile. Univ. Ariz. Press, Tucson, Ariz. 317 p.

Hepting, G. H. 1971. Diseases of forest and shade trees of the United States. U.S. Dept. Agr. Handbook 386. 658 p.

Lightle, Paul C., Elizabeth T. Standring and J. G. Brown. 1942. A bacterial necrosis of the giant cactus. Phytopathology 32:303-313.

Ridgway, Robert. 1912. Color standards and color nomenclature. Washington, D.C. Published by the author.

Shelton, Napier. 1972. Saguaro National Monument. U.S. Government Printing Office. Washington, D.C. 98 p.

Shreve, Forrest and Ira L. Wiggins. 1964. Vegetation and flora of the Sonoran Desert. Stanford Univ. Press, Stanford, Calif. 2 vol.

White, V. S. 1902. The Nidulariaceae of North America. Torrey Bot. Club Bull. 29: 251-280.

MYCOTAXON

Vol. II, No. 1, pp. 104-106 April-June 1975

A NOTE ON EXTRAWETTSTEININA

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Shortly after publication of preliminary studies on the Dothideales (Barr 1972), Dr. von Arx (in litt.) brought to my attention an earlier generic name for my new genus *Extrawettsteinina*. This note acknowledges the validity of Dr. von Arx's observation that *Kriegeriella* von Höhnel is an earlier name for the species which I assigned to *Extrawettsteinina*.

In 1918 von Höhnel described *Kriegeriella* as a genus of the Microthyriaceae. Batista (1959) re-examined the type specimens of the two original species of *Kriegeriella* -- *K. mirabilis* and *K. transiens* -- and assigned them to the subfamily Aulographoideae Bat. of the Microthyriaceae. Luttrell (1973) placed *Kriegeriella* in the family Asterinaceae of the Hemisphaeriales. Members of this family, he observed, appear to be hemisphaeriaceous counterparts of the Dothioraceae in the Dothideales. It is my opinion that the Dothideales can accommodate fungi with dimidiate-scutate ascocarps as well as those with perithecioid ascocarps. For this reason, *Kriegeriella* is considered here to belong in the Dothideales. By virtue of the interthecial tissue in the locule *Kriegeriella* belongs in my interpretation of the family Pseudosphaeriaceae.

Both of the original species of *Kriegeriella* were described from rotting needles of conifers. Von Höhnel (1918) observed that they were closely related and that *K. transiens* was perhaps only a growth form of *K. mirabilis*. The original description indicated that *K. transiens* had shorter ascocarps, more numerous asci and smaller ascospores with fewer septa (3-4 vs. 5) than *K. mirabilis*. Batista's (1959) description and illustrations do not provide any valid specific difference between the two. The

North American specimens described as *Extrawettsteinina pinastri* include all of the minor variations between *K. mirabilis* and *K. transiens* and only a single species can be recognized. The other two species which I had included in *Extrawettsteinina* are certainly congeneric with *K. mirabilis*. However, ascospore shape and position of the primary septum deviate, much as these characters vary in *Wettsteinina*. Sectional status is accorded these characters in *Kriegeriella*, in conformity with my treatment of *Wettsteinina*.

Kriegeriella von Höhnel, Ann. Mycol. 16: 39. 1918.

Syn.: *Extrawettsteinina* Barr, Contr. Univ. Mich. Herb. 9: 538. 1972.

Section *Kriegeriella*

Ascospores asymmetric in shape, primary septum supramedian.

Type species: *Kriegeriella mirabilis* von Höhnel, Ann. Mycol. 16: 39. 1918.

Syn.: *Kriegeriella transiens* von Höhnel, Ann. Mycol. 16: 40. 1918.

Extrawettsteinina pinastri Barr, Contr. Univ. Mich. Herb. 9: 538. 1972.

Section *Extrawettsteinina* (Barr) Barr, status nov.

Basionym: *Extrawettsteinina* Barr, Contr. Univ. Mich. Herb. 9: 538. 1972.

Ascospores symmetric in shape, primary septum median.

Type species: *Kriegeriella minuta* (Barr) Barr, comb. nov.

Basionym: *Extrawettsteinina minuta* Barr, Contr. Univ. Mich. Herb. 9: 538. 1972.

Second species: *Kriegeriella mediterranea* (Müller) Barr, comb. nov.

Basionym: *Wettsteinina mediterranea* Müller, Sydowia 18: 92. 1965 ("1964").

Syn.: *Extrawettsteinina mediterranea* (Müller) Barr, Contr. Univ. Mich. Herb. 9: 538. 1972.

LITERATURE CITED

Barr, M.E. 1972. Preliminary studies on the Dothideales in temperate North America. Contr. Univ. Michigan Herb. 9: 523-638.

Batista, A.C. 1959. Posição taxonomica de *Fraserula*, *Kriegeriella* e *Yatesula*. Anais Soc. Biol. Pernambuco 16: 35-41.

von Höhnel, F. 1918. Mycologische Fragmente Nrn. 191-290. Ann. Mycol. 16: 35-174.

Luttrell, E.S. 1973. Chapter 7. Loculoascomycetes. In Ainsworth, G.L., F.K. Sparrow & A.S. Sussman (Eds.) The Fungi: An Advanced Treatise. Vol. IV-A. Academic Press, New York and London.

ADDED WHILE IN PRESS

The combinations of *Kriegriella minuta* (Barr) von Arx & Müller and *K. mediterranea* (Müller) von Arx & Müller were published in Studies in Mycology, No. 9: 88. March 1975.

MYCOTAXON

Vol. II, No. 1, pp. 107-108 April-June 1975

A NEW SPECIES OF STACHYBOTRYS

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SUMMARY

Stachybotrys indica Misra, a new species isolated from decaying leaves, is described and illustrated.

During a taxonomic study of the dematiaceous hyphomycetes of Gorakhpur (India), an unusual species of *Stachybotrys* Corda was collected on very decomposed leaf fragments lying on the surface of soil. The fungus was readily isolated in pure culture and was found to differ from the described species of *Stachybotrys* (Verona and Mazzuchetti, 1968; Ellis, 1971) in the size and shape of conidia and phialides. It is described here as a new species.

S t a c h y b o t r y s i n d i c a *sp. nov. (Fig. 1)*

Coloniae in agaro cum liquore maltoso composito cultae primo albae, conidiis maturescentibus griseo-nigrae, velutinae. Mycelium et superficiale et immersum, e hyphis ramosis, hyalinis, levibus, 0.7 - 1.0 µ crassis compositum. Conidiophora e hyphis aeriis orta, hyalina, levia haud vel raro ramosa, recta vel flexuosa, septata, 40 - 200 µ longa, 1.7 - -2.4 µ crassa, ad apicem coronam ex 4 - 15 phialidibus compositam sustinentia. Phialides hyalinae, leves, 8.2 - 11.7 µ longae, 2.3 - 3.0 µ in parte latissima crassae. Conidia claviformia, ellipsoidalia vel ovoidea, ad apicem rotundata, ad basim truncata, levia, matura griseo-brunnea, 5.2 - 7.0 x 3.0 -3.5 µ , super phialides in capitulo globoso nigro ad 40 µ diametro congesta.

Typus e foliis putrescentibus Gorakhpur Indiae lectis mense October 1972.

Colonies on malt extract agar 3 - 4 cm in diameter in 10 days at 25° C, white, later turning greyish black with the formation of conidia, velvety. Mycelium superficial and immersed, composed of branched, hyaline, smooth, 0.7 - 1.0 µ thick hyphae. Conidiophores arising from aerial hyphae, hyaline, smooth, unbranched or rarely branched, straight or flexuous, septate, 40 - 200 µ long, 1.7 - 2.4 µ thick, bearing at their apex a crown of 4 - 15 phialides. Phialides hyaline, smooth, 8.2 - 11.7 µ long, 2.3 - 3.0 µ thick in the broadest part. Conidia clavate, ellipsoidal or obovoid, rounded at the apex, truncate at the base, smooth, greyish brown when mature, 5.2 - 7.0 x 3.0 - 3.5 µ , accumulating above the phialides into a black globose head of up to 40 µ in diameter.

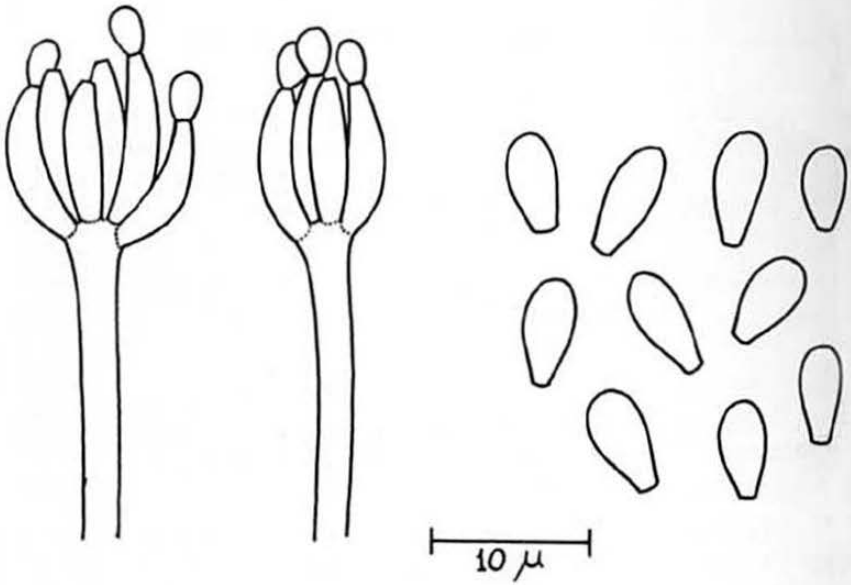

Fig. 1. *Stachybotrys indica*. Conidiophores and conidia.

Type: PCM 550, isolated from decaying leaves, Gorakhpur, U.P., India, October, 1972. A subculture of the type has been deposited in the Commonwealth Mycological Institute, Kew, as IMI 183392.

ACKNOWLEDGEMENTS

The author wishes to thank Dr. M. B. Ellis for examining the fungus and giving helpful suggestions, Prof. K. S. Bhargava for encouragement and facilities, and Dr. Donald P. Rogers for the Latin translation of the diagnosis.

LITERATURE CITED

Ellis, M. B. 1971. Dematiaceous Hyphomycetes. Commonwealth Mycological Institute, Kew, England.

Verona, O. and G. Mazzuchetti. 1968. I generi *Stachybotrys* e *Memnoniella*. Publ. Ente naz. Cellul. Carta.

MYCOTAXON

Vol. II, No. 1, pp. 109-122 April-June 1975

GENERIC SYNONYMS IN THE TUBERALES

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SUMMARY

Generic synonyms are designated for the Tuberales: *Caulocarpa* = *Sarcosphaera* (Pezizales), *Hydnoplicata* = *Peziza* (Pezizales), *Geoporella* and *Gyrocratera* = *Hydnotrya*, *Piersonia* = *Choiromyces*, *Myrmecocystis* = *Genabea*. *Hydnotryopsis* is regarded as distinct from *Choiromyces* by virtue of having amyloid asci and ellipsoid spores. Recombinations are proposed: *Peziza whitei* (Gilkey) Trappe from *Hydnoplicata*; *Hydnotrya michaelis* (Fischer) Trappe from *Geopora*; *Choiromyces alveolatus* (Harkn.) Trappe from *Piersonia*; *Hydnotryopsis compacta* (Gilkey) Trappe from *Choiromyces*; *Genabea cerebriformis* (Harkn.) Trappe and *G. spinospora* (Gilkey) Trappe from *Myrmecocystis*; and *Hydnocystis japonica* (Kobayasi) Trappe from *Protogenea*. Generic synonyms proposed earlier and confirmed in studies reported here are listed.

The hypogeous macromycetes are relatively little known, because few mycologists know how to collect them and even fewer are well acquainted with the orders on a worldwide basis. Partly as a result, several new and seemingly novel genera have been described from single or only a few collections in various parts of the world. The Tuberales in particular includes several small or monotypic genera. As a polyphyletic and recently evolved order, it might be expected to contain a disproportionate array of small and divergent elements. Nonetheless, the existence of so many small genera should excite a quest for their affinities with other, better known groups. My conclusions from a

decade of research on the taxonomy of the Tuberales are presented here.

Herbarium abbreviations are according to Lanjouw and Stafleu (1964). New combinations are indicated by a marginal asterisk.

CAULOCARPA = SARCOSPHAERA (PEZIZALES)

The monotypic genus *Caulocarpa* was described from a single collection by Gilkey (1947) with *C. montana* Gilkey as the type species. Gilkey's superb illustrations of the type material plus my study of the type (Gilkey 284, OSC) as preserved in a glycerol-ethanol solution revealed a strong affinity to the pezizaceous genus *Sarcosphaera*. It differed from *Sarcosphaera* only in its chambered, hypogeous habit and in having nonamyloid asci. I visited the exact type locality in eastern Oregon as described to me by Dr. Gilkey, 30 years to the week after the original collection by A. M. and D. P. Rogers. *C. montana* was fruiting hypogeously in abundance under a felted litter layer in subalpine groves of conifers. Most specimens conformed nicely to Gilkey's description of *Caulocarpa* (fig. 1); some, however, had opened in the typical fashion of *Sarcosphaera crassa* (Santi ex Steud.) Pouzar. Even the closed ascocarps were often mature and would forcibly discharge their spores when broken open. These fresh specimens (Trappe 1933, OSC) had amyloid asci and were clearly *S. crassa* which had simply not emerged and often not opened due to habitat factors. Subsequently, some dried-out, temporary microscope mounts made by Dr. Gilkey from the type collection when it was fresh were discovered in her slide collection. The asci of these were beautifully amyloid; the long immersion in glycerol-ethanol of the type itself had destroyed the reaction. *C. montana* thus can be added to the long list of synonyms of *S. crassa*.

HYDNOPLICATA = PEZIZA (PEZIZALES)

Hydnoplicata whitei Gilkey was described as the type species of a monotypic new genus known only from a single collection from Australia (Gilkey 1954a). The type has strongly amyloid, demonstrably operculate asci. Its spores are 10.5-14x8-11µm rather than 10-11x6.5-8µm as described by Gilkey. It is, in fact, identical in all details to *Hydnocystis convoluta* McAlpine, the type of which has been studied by both me and Burdsall (1968). Burdsall and Korf

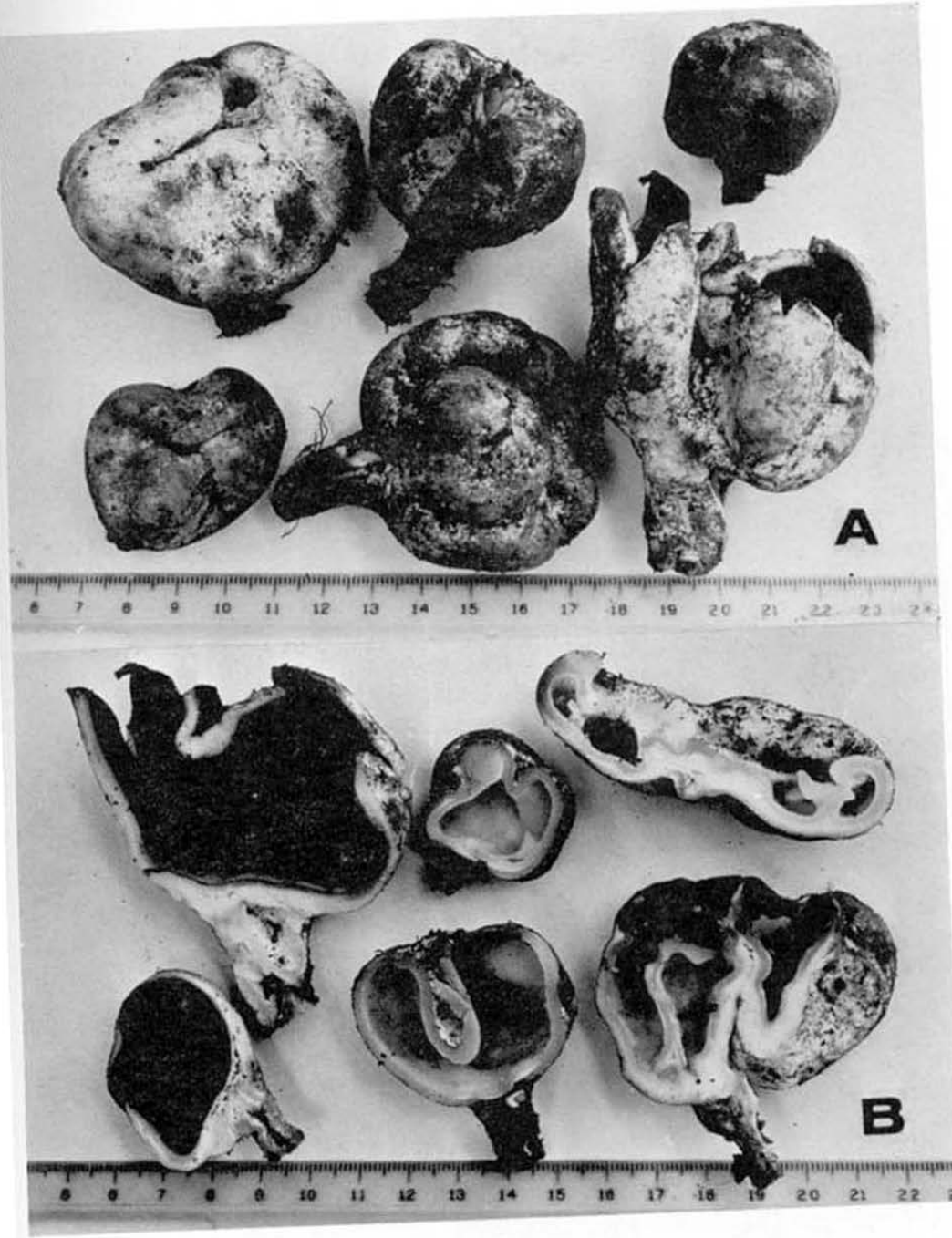

Figure 1. Hypogeous ascocarps of *Sarcosphaera crassa* (scale in mm). A. Intact. B. Sliced in half vertically.

transferred *H. convoluta* to *Peziza* for cogent reasons later elaborated by Korf (1973a). To avoid creating a homonym, their transfer required a new species epithet, *P. jactata* Burds. and Korf. Since *Hydnoplicata whitei* is conspecific, however, the epithet *whitei* has priority.

**PEZIZA WHITEI* (Gilkey) Trappe comb. nov.
≡ *Hydnoplicata whitei* Gilkey, Mycologia 46: 784. 1954. (Type: Gilkey 540, OSC.)

= *Hydnocystis convoluta* McAlpine, Agric. Gaz. N. S. W. 7: 86. 1896. (Type: Rodway 21, K.)

≡ *Hydnotrya convoluta* (McAlpine) McLennan, Proc. R. Soc. Victoria N. S. 74: 115. 1961.

≡ *Peziza jactata* Burdsall and Korf in Burdsall, Mycologia 60: 520. 1968.

The consolidation of these taxa into one species extends its range from Tasmania to mainland Australia. I have examined these collections: NEW SOUTH WALES--Sydney, leg. N. H. White, Gilkey 540 (type of *Hydnoplicata whitei*, OSC); Blue Mountains, leg. B. Menzies, 1958, Gilkey 926 (OSC). QUEENSLAND--Lamington National Park, leg. J. Cribb, 3 July 1951, Gilkey 857 (OSC). TASMANIA--near Hobart: Rodway 21, 1895, type of *Hydnocystis convoluta* (K); leg. Rodway, undated, Lloyd 7238 (BPI). National Park: leg. Rodway, June 1924 (HO).

GEOPORELLA AND GYROCRATERA = HYDNOTRYA

Soehner (1951) erected the genus *Geoporella* to accommodate two species, *G. michaelis* (Fischer) Soehn. and *G. suevica* (Soehn.) Soehn. My study of the type of *G. suevica* (*Hydnotryopsis suevica* Soehn., Soehner 1541, M) led to the conclusion that it is a taxonomic synonym of *Hydnotrya cerebriformis* Harkn. The history of *G. michaelis* is rather more complex. In brief, the species has been described under several generic and species names from several places, apparently because its considerable variability in size and form was not recognized for the infraspecific variation that it actually represented. Such variability is common in *Hydnotrya*, as discussed by Gilkey (1947) for *H. variiformis* Gilkey and by Hawker (1974) for *H. tulasnei* Berk. and Br. Hawker commendably synonymized *Gyrocratera* with *Hydnotrya*. The resulting synonymies listed

below were determined by examination of types or isotypes except in the case of *Hydnotrya dysodes* Kirschstein, the type of which was apparently destroyed in World War II. It was, however, studied by Soehner (1942), who regarded it as unquestionably conspecific with *G. michaelis*.

HYDNOTRYA Berk. and Br., Ann. Mag. Nat. Hist. 18: 78. 1846

= *Gyrocratera* Hennings, Verh. Bot. Ver. Prov. Brandenburg 41: IX. 1899.

= *Geoporella* Soehner, Z. Pilzk. 8: 8. 1951.

**HYDNOTRYA MICHAELIS* (Fischer) Trappe comb. nov.

≡ *Geopora michaelis* Fischer, Hedwigia 37: 57-59. 1898. (Type: E. Michael, Auerbach, TO.)

≡ *Hydnotryopsis michaelis* (Fischer) Soehner, Notizbl. Bot. Gart. Mus. Berlin-Dahlem 15: 771. 1942.

≡ *Geoporella michaelis* (Fischer) Soehner, Z. Pilzk. 8:8. 1951.

= *Gyrocratera ploettneriana* Henn., Verh. Bot. Ver. Prov. Brandenburg 41: IX. 1899. (Type: Rathenau, Mark, leg. Ploettner, BERN.)

≡ *Hydnotrya ploettneriana* (Henn.) Hawker, Trans. Br. Mycol. Soc. 63: 68. 1974.

= *Gyrocratera ploettneriana* var. *sabuletorum* Ramsbottom in Fischer, Mitt. Naturforsch. Ges. Bern 1926: 112. 1927. (Type: Sandy, Bedford, leg. E.J.H. Corner, 16 May 1926, K; isotype, BERN.)

= *Hydnotrya dysodes* Kirschstein, Notizbl. Bot. Gart. Mus. Berlin-Dahlem 15: 612. 1941. (Type lost.)

= *Hydnotrya yukonensis* Gilkey, Mycologia 39: 445. 1947. (Type: Gilkey 353, OSC.)

PIERSONIA = CHOIROMYCES

Piersonia was described by Harkness (1899) as a genus with nests of asci dotting the gleba. Fischer (1908) and

Gilkey (1916) subsequently determined that the gleba of *Piersonia* was formed into tramal tissue (*venae internae*) marbled with paraphysis-lined veins (*venae externae*) that terminated in chambers with fertile hymenia. Fischer's (1908, 1938) illustrations, however, show immature asci among paraphyses beyond the fertile terminations of the veins. *Piersonia bispora* Gilkey, moreover, is clearly illustrated by an immature ascus with two mature spores and two immature spores (Gilkey 1916). Gilkey (1954b) later described a good *Choiromyces*, *C. cookei* Gilkey; my study of the types of both *P. bispora* and *C. cookei* revealed that the former was simply an immature specimen of the latter, the veins of which were fertile along their entire lengths as well as at their terminations. Types or isotypes of all species synonymized below have been examined; they were identical in all features except the degree of ascus maturation. It almost seems that when Harkness made a new collection, he was inclined to describe it as a new species if it differed slightly in stages of development from previous collections.

CHOIROMYCES Vitt., Monogr. Tuberacearum, p. 50-51. 1831.

= *Piersonia* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 275. 1899.

= *Zobelia* Opiz, Lotos Z. Naturwiss. 5: 218. 1855.

**CHOIROMYCES ALVEOLATUS* (Harkn.) Trappe comb. nov.

≡ *Piersonia alveolata* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 275. 1899. (Type: Harkness 183, BPI; isotype, OSC.)

= *Piersonia scabrosa* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 275. 1899. (Type: Harkness 201, BPI; isotype, OSC.)

= *Hydnobolites excavatum* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 266. 1899. (Type: Harkness 189, BPI; isotype, OSC.)

= *Piersonia bispora* Gilkey, Univ. Cal. Publ. Bot. 6: 328. 1916. (Type: N.L. Gardner, U.C. 126, OSC.)

= *Choiromyces cookei* Gilkey, N. Am. Flora ser. 2, 1:17. 1954. (Type: Gilkey 801, OSC.)

C. alveolatus, an American analog of the southern European *C. magnusii* (Matt.) Paol., has distinctive peridial hyphae with walls thickened in bands to give a beaded appearance.

PROTOGENEA = HYDNOCYSTIS

Kobayasi (1963) contrasted his new genus *Protogenea* with *Hydnocystis* on the basis that sporocarps of the former are epigeous, sometimes have two chambers, have an apical opening, and are not tomentose. His data were drawn from a single collection. However, many hypogeous fungi occasionally fruit on the soil surface, especially if leaf litter has fallen prior to fruiting. Several species of Tuberales are characteristically single chambered but occasionally form two or more chambers, e.g., in *Genea* or *Hydnotrya* subgen. *Gyrocratera*. Burdsall (1968) notes that the sporocarp opening of *Hydnocystis* can be oriented in any direction. My studies of an isotype of *Protogenea japonica* Kobayasi confirm the conclusions of Burdsall and Korf (Korf 1973b) that the sporocarp has abundant hyphal tips emergent from the surface. In fact, *P. japonica* is extremely close to *Hydnocystis piligera* Tul. & Tul. in every character of taxonomic significance at the generic level and in most characters at the species level.

HYDNOCYSTIS Tul. & Tul., G. Bot. Ital. 2 Part 1: 59. 1845.

= *Protogenea* Kobayasi, Trans. Mycol. Soc. Japan 4: 119-120. 1963.

**HYDNOCYSTIS JAPONICA* (Kobayasi) Trappe comb. nov.

≡ *Protogenea japonica* Kobayasi, Trans. Mycol. Soc. Japan 4: 120. 1963. (Type: Japan, Utizume, 12-14 Nov. 1962, TNS; isotype, CUP.)

THE INTEGRITY OF HYDNOTRYOPSIS

The genus *Hydnotryopsis*, erected to accommodate *H. setchellii* Gilkey (Type: Harkness 173, BPI; isotype, OSC) with relatively small, ellipsoid spores (Gilkey 1916), was later synonymized with the globose-spored *Choiromyces* by Gilkey (1939). Unbeknown to Gilkey, *Hydnotryopsis* also proves to have amyloid asci, a feature virtually undetectable on the pickled type collections of its two species but

striking on dried or fresh material. Accordingly, Gilkey's first judgment of *Hydnotryopsis* as a separate genus is appropriate. It is, incidentally, the only American genus discovered to date to have amyloid asci. Since the second species was described as a *Choiromyces*, it is recombined here:

**HYDNOTRYOPSIS COMPACTA* (Gilkey) Trappe comb. nov.

≡ *Choiromyces compactus* Gilkey, Oreg. State Monogr. Stud. Bot. 1: 34. 1939. (Type: Gilkey 28, OSC.)

MYRMECOCYSTIS = GENABEA

The case for separating *Myrmecocystis* from *Genea* on the one hand and from *Genabea* on the other is detailed by Gilkey (1954a, 1961). The three genera form a continuum and are said to differ thus:

Genea: Spores ellipsoid, basal mycelial tuft present, fertile hymenium continuous or occasionally interrupted by sterile zones of paraphyses.

Myrmecocystis: Spores globose, basal mycelial tuft lacking, fertile hymenium interrupted by sterile zones of paraphyses.

Genabea: Spores globose or ellipsoid, basal mycelial tuft lacking, hymenium interrupted by sterile zones of pseudoparenchyma.

The distinctions thus drawn between the genera are blurred by the inclusion of two discordant species in *Myrmecocystis*: *M. cerebriformis* Harkn. (the type species) and *M. compacta* (Harkn.) Gilkey. Both species are common in western Oregon, so I have been able to examine fresh collections in all in their phenotypic diversity. Small ascocarps of *M. cerebriformis* tend to be evenly globose, singly chambered, lined with fertile pockets of hymenium separated mostly by sterile zones of paraphyses. Large, well-developed ascocarps, on the other hand, tend to be fused clusters of rounded protuberances, each lined with a fertile hymenial pocket separated from adjacent protuberances by zones of isodiametric cells. The latter form resembles that illustrated for *Genabea* by Fischer (1938, fig. 8). *M. compacta*, on the other hand, is always typically *Genea-*

like in form and structure (as recognized also by Gilkey (1916) who included it in that genus as *G. intermedia* Gilk.).

Strictly from the standpoint of ascocarp structure, all three genera might well be consolidated into *Genea* sensu lato, as suggested by Korf (1973b). Although I regard the genus *Myrmecocystis* as superfluous, the retention of *Genea* and *Genabea* has the merit of spotlighting the phylogenetic progression of *Genea* to *Genabea*. This progression accords with ideas expressed by Trappe (1971) and Korf (1973a) on evolution of the Tuberales. Moreover, synonymization of *Myrmecocystis* with *Genabea* eliminates ambiguities between the genera involved, which can then be readily differentiated:

Genea: spores verrucose, uniseriate; asci cylindric; hymenia only occasionally interrupted by sterile zones of paraphyses.

Genabea: spores echinulate, uniseriate, biseriate or randomly arranged; asci clavate to ellipsoid; hymenia regularly separated into pockets by sterile zones of paraphyses or isodiametric cells.

Species synonyms listed below are based on my examination of the types.

GENEA Vitt., Monogr. Tuberacearium, p. 27. 1831.

= *Hydnocaryon* Wallr., Flora Cryptogam. Ger. 2: 860. 1833.

Genea intermedia Gilkey, Univ. Cal. Publ. Bot. 6: 303. 1916.

≡ *Hydnocystis compacta* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 262. 1899. (Type: Harkness 98, BPI; isotype, OSC.) Non *Genea compacta* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 262. 1899.

≡ *Myrmecocystis compacta* (Harkn.) Gilkey, N. Am. Flora ser. 2, 1: 7. 1954.

GENEABEA Tul. & Tul., G. Bot. Ital. I, 2: 60. 1845.

= *Myrmecocystis* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 269. 1899.

≡ *Genea* subgen. *Myrmecocystis* (Harkn.) Gilkey, Univ. Cal. Publ. Bot. 6: 297. 1916.

= *Pseudogenea* Buch. in Matt., Malpighia 14: 250. 1900.

*GENABEA CEREBRIFORMIS (Hark.) Trappe comb. nov.

≡ *Myrmecocystis cerebriformis* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 269. 1899. (Type: Harkness 25, BPI; isotype, OSC.)

≡ *Genea cerebriformis* (Harkn.) Gilkey, Univ. Cal. Publ. Bot. 6: 304. 1916.

= *Myrmecocystis candida* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 269. 1899. (Type: Harkness 18, BPI; isotype, OSC.)

= *Pseudogenea vallombrosae* Buch. in Matt., Malpighia 14: 250. 1900. (Type: Italy, Vallombrosa, 20 June 1900, TO.)

≡ *Pseudogenea vallisumbrosae* Buch., Hedwigia 40: 129-141. 1901.

≡ *Myrmecocystis vallombrosae* (Buch. in Matt.) Fischer, Bot. Ztg. 66: 147. 1908.

= *Pseudogenea californica* Fischer, Ber. Dtsch. Bot. Ges. 25: 372-373. 1907. (Type: U.C. 272, BERN; isotype, OSC.)

*GENABEA SPINOSPORA (Gilkey) Trappe comb. nov.

≡ *Myrmecocystis spinospora* Gilkey, Mycologia 53: 215. 1961. (Type: CUP 43847; isotype, Gilkey 867, OSC.)

PREVIOUSLY DETERMINED SYNONYMS

Numerous generic synonymies in the Tuberales and Pezizales have been proposed in addition to those discussed above (Fischer 1938; Gilkey 1954b, 1961; Korf 1956; Szemere 1965; Burdsall 1968; Trappe 1971). Studies of type or isotype collections of type species, or of descriptions when such collections have not been located, permit confirmation of these synonymies:

BALSAMIA Vitt., Monogr. Tuberacearum, p. 30, 1831.

= *Pseudobalsamia* Fischer, Ber. Dtsch. Bot. Ges. 25: 374. 1907.

GEOPORA Harkn., Bull. Cal. Acad. Sci. 1: 168. 1885.

= *Sepultaria* (Cooke) Boudier, Bull. Soc. Mycol. Fr. 1: 104. 1885.

= *Pseudohydnotrya* Fischer in Engler & Prantl, Nat. Pflanzenfam. Teil I, 1: 282. 1897.

LESPIAULTINIA Zobel, Corda Icones Fungorum 6: 55-65. 1854.

≡ *Delastreopsis* Matt. Bol. Soc. Broteriana 21: 95-97. 1906.

PACHYPHLOEUS Tul. & Tul., G. Bot. Ital. pt. 2, 1: 60-61. 1845.

≡ *Pachyphlodes* Zobel, Corda Icones Fungorum 6: 63. 1854.

= *Cryptica* Hesse, Pringsheims Jahrb. Wiss. Bot. 15: 198-206. 1884.

PICOA Vitt., Monogr. Tuberacearum, p. 54-55. 1831.

= *Leucangium* Quél., C. R. Assoc. Fr. Av. Sci. 11: 404. 1883.

≡ *Picoa* subgen. *Leucangium* (Quél.) Trappe, Trans. Br. Mycol. Soc. 57: 89. 1971.

= *Phaeangium* Pat., J. Bot. 8: 155. 1894. Non Saccardo, Sylloge Fungorum 16: 764. 1902.

STEPHENSIA Tul. & Tul., C. R. Acad. Sci. Paris 21: 1433. 1845.

= *Densocarpa* Gilkey, N. Am. Flora ser. 2, 1: 15. 1954.

TERFEZIA (Tul. & Tul.) Tul. & Tul., Fungi Hypogaei, p. 172. 1851.

≡ *Choiromyces* subgen. *Terfezia* Tul. & Tul., Ann. Sci. Nat. ser. 3, 3: 350. 1845.

≡ *Tulasneinia* Zobel, Corda Icones Fungorum 6: 64. 1854.

= *Mattirolomyces* Fischer, Engler & Harms Nat. Pflanzenfam. ed. 2, 5b (8): 39. 1938.

≡ *Terfezia* subgen. *Mattirolomyces* (Fischer) Trappe, Trans. Br. Mycol. Soc. 57: 91. 1971.

TUBER Mich. ex Fries, Syst. Mycol. 2: 289. 1823.

≡ *Aschion* Wallr., Flora Cryptogam. Ger. 2: 865. 1833.

= *Ensaluta* Zobel, Corda Icones Fungorum 6: 54. 1854.

= *Oogaster* Corda in Zobel, Corda Icones Fungorum 6: 70. 1854.

= *Tuber* subgen. *Vittadinion* Zobel, Corda Icones Fungorum 6: 75. 1854.

= *Terfeziopsis* Harkn., Proc. Cal. Acad. Sci. ser. 3, 1: 278. 1899.

ACKNOWLEDGEMENTS

These studies were financed in part by National Science Foundation grant GB-27378, American Philosophical Society Penrose Grant 4439, and the Society of the Sigma Xi. Particular appreciation is due Professor Arturo Ceruti and staff of the Istituto ed Orto Botanico, Universitá de Torino, for providing facilities and hospitality for extended research, as well as to the Directors and staffs of the Botanisches Institut und Garten der Universitat, Bern; the Botanische Staatssammlung, Munich; the Laboratoire de Cryptogamie, Paris; and the Royal Botanical Gardens, Kew.

REFERENCES CITED

BURDSALL, H.H. Jr. 1968. A revision of the genus *Hydnocystis* (Tuberales) and of the hypogeous species of *Geopora* (Pezizales). Mycologia 60: 496-525.

FISCHER, E. 1908. Zur Morphologie der Hypogaeen. Bot. Ztg. 66: 149-154.

_____. 1938. Tuberineae. Engler & Harms Nat. Pflanzenfam. ed. 2, 5b (8): 1-42.

GILKEY, H.M. 1916. A revision of the Tuberales of California. Univ. Cal. Publ. Bot. 6: 275-356.

_____. 1939. Tuberales of North America. Oreg. State Monogr. Stud. Bot. 1: 1-63.

_____. 1947. New or otherwise noteworthy species of Tuberales. Mycologia 39: 441-452.

_____. 1954a. Taxonomic notes on Tuberales. Mycologia 46: 783-793.

_____. 1954b. Tuberales. N. Am. Flora ser. 2, 1: 1-36.

_____. 1961. New species and revisions in the order Tuberales. Mycologia 53: 215-220.

HARKNESS, H.W. 1899. California hypogaeous fungi. Proc. Cal. Acad. Sci. ser. 3, 1:240-292.

HAWKER, L.E. 1974. Revised annotated list of British hypogeous fungi. Trans. Br. Mycol. Soc. 63: 67-76.

KOBAYASI, Y. 1963. On a new genus *Protogenea* of the Tuberales. Trans. Mycol. Soc. Japan 4: 119-120.

KORF, R.P. 1956. *Daleomyces*, *Durandiomyces*, and other sparassoid forms of operculate Discomycetes. Mycologia 48: 711-718.

_____. 1973a. Sparassoid ascocarps in Pezizales and Tuberales. Rep. Tottori Mycol. Inst. 10: 389-403.

_____. 1973b. Discomycetes and Tuberales. *In* G.C. Ainsworth, F.K. Sparrow, and A.S. Sussman (eds.), The fungi IVA: 249-319.

LANJOUW, J., and F. STAFLEU. 1964. Index herbariorum. Part 1. The herbaria of the world. Regnum Veg. 31: 1-251.

SOEHNER, E. 1942. Tuberaceen-Studien. Notizbl. Bot. Gart. Mus. Berlin-Dahlem 15: 762-782.

_____. 1951. Tuberaceen-Studien. III. Z. Pilzk. 8: 7-16.

SZEMERE, L. 1965. Die unterirdischen Pilze des Karpatenbeckens. Akad. Kiadó, Budapest. 319 p.

TRAPPE, J.M. 1971. A synopsis of the Carbomycetaceae and Terfeziaceae (Tuberales). Trans. Br. Mycol. Soc. 57: 85-92.

MYCOTAXON

Vol. II, No. 1, pp. 123-126 April-June 1975

BISPORELLA DISCEDENS AND ITS CYSTODENDRON STATE

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On a recent expedition to the island of Guadeloupe, French West Indies, the author had the opportunity to collect specimens of *Calycella discedens* (Karst.) Dennis. This fungus was first described from Brazil as *Helotium discedens* by Karsten (1889). It is widespread in the American tropics, and known from the Asian tropics and Europe.

Seaver (1924) redescribed the same organism as *Niptera subiculata* Seaver from St. Thomas. Rick (1931) also described the same fungus as new, as *Trichopeziza aurea* Rick from Brazil. Since the anatomical structure of the apothecia of *H. discedens* and *N. subiculata* agreed with the then current concept of *Calycella*, Dennis (1954) made the combination *Calycella discedens* (Karst.) Dennis. He stated that the only difference between Karsten's type and Seaver's type was the presence of septate ascospores in *N. subiculata* in contrast to the non-septate ascospores in Karsten's material.

Since there seemed to be some question as to the identity of *H. discedens* and *N. subiculata*, this author turned to Karsten's herbarium in order to compare the type collection of *H. discedens* with that of *N. subiculata*. Presently, there are two collections of *H. discedens* in Karsten's herbarium. One is labelled "no 1268 *Helotium discedens* Karst. BRASILIA. Minas Geraes, Sitio 1885 leg. Edw. Wainio," the other "no 1267 *Helotium discedens* Karst. BRASILIA. Minas Geraes, Sitio leg. Edw. Wainio." The only difference between the labels of these two collections is the citation of the date "1885" in #1268, which is absent in #1267. In collection #1267 there are large yellowish apothecia growing on wood amongst a dense growth of crustose and fruticose lichens. The apothecia in this collection are immature. In collection #1268 I found numerous apothecia, somewhat smaller than those in the other collection, scattered over bare wood. The apothecia in this collection are fully mature, with a gelatinized ectal excipulum and 1-septate ascospores. Dennis (1954) stated that he could find no septate ascospores in the type collection, and it is possible that he only examined #1267; no annotation labels were found with the specimens.

Since Karsten (1889) did not designate a holotype, and the two specimens in his herbarium bear almost the same collection data, a lectotype must be designated. Therefore, I select specimen #1268, deposited at the University of

Helsinki (H), as lectotype specimen for *Helotium discedens* Karst.

Examination of the isotype specimen of *Niptera subiculata*, deposited at Cornell University (CUP), showed that both it and the Guadeloupe specimens are identical to Karsten's *H. discedens*. As Dennis (1954) indicated, there is no true subiculum in Seaver's collection. The blackening of the substrate is due to both the presence of Pyrenomycetes and numerous dematiaceous Hyphomycetes covering the surface of the wood. Korf and Carpenter (1974) have indicated that this genus of Discomycetes is often associated with other fungi.

A search for tropical collections of *Calycella* in the CUP herbarium revealed that a portion of a presumed isotype specimen of *Trichopeziza aurea* Rick from the Farlow Herbarium (FH) had been identified as a *Calycella* by Dr. J. R. Dixon. It is identical to Karsten's *H. discedens*. His annotation label reads: "This is the same as *Coryne flavovirens* (Pers. ex Fr.) Rehm, Ascomycetes Exsiccatae No.1109, 1895 which is to me a *Calycella*. One interested in this fungus should also see *Calycella callorioides* (Rehm) Boud. in Ic. Myc. ser. 6:11. 1909." Examination of two packets of Rehm's exsiccatum in the CUP herbarium revealed that his specimens are also identical to *H. discedens*. This collection from ZÜrich is the only temperate collection known to me. A discussion of the nomenclature of *Coryne flavovirens* was given by Korf (1974), who showed it to be a *Vibrissea*. Examination of the holotype of *Calycella callorioides* from Stockholm (S) revealed that although the ascospores are similar to those of *H. discedens*, the apothecial structure is that of a *Hymenoscyphus*.

Korf and Carpenter (1974) have indicated that the generic name *Bisporella* Fuckel must be used for those species previously placed in *Calycella*. Thus, it is necessary to transfer *C. discedens* to the genus *Bisporella*:

Bisporella discedens (Karst.) Carpenter, *comb. nov.*

≡ *Helotium discedens* Karst., Hedwigia 28: 191, 1889.
≡ *Calycella discedens* (Karst.) Dennis, Kew Bull. 1954: 320, 1954.
= *Niptera subiculata* Seaver, Mycologia 16: 8, 1924.
= *Trichopeziza aurea* Rick, Brotéria, Sér. Bot. 25: 103, 1931.

From a study of a number of specimens from the Neotropics, it is apparent that *B. discedens* is a fairly common Discomycete, often mistaken by collectors for a small *Mollisia* or *Orbilia*. Most collections of this fungus have been made in late June through July, although the Guadeloupe collections were made early in January. *Bisporella discedens* fruits on various kinds of wood (usually unidentified) and has been reported on *Piper*, *Rubus* and palms.

There is a great variability in both size and coloration of the apothecia of *B. discedens*. The color ranges from almost completely white, to bright yellow and sometimes tan. The apothecial diameter ranges from 0.5 to 2.0 mm, and the apothecia may be sessile to strongly stipitate.

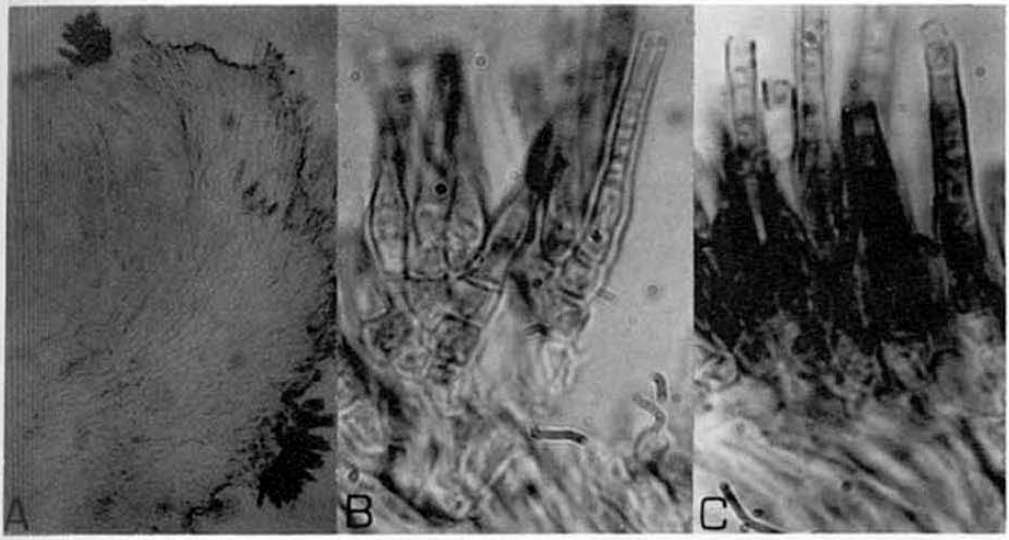
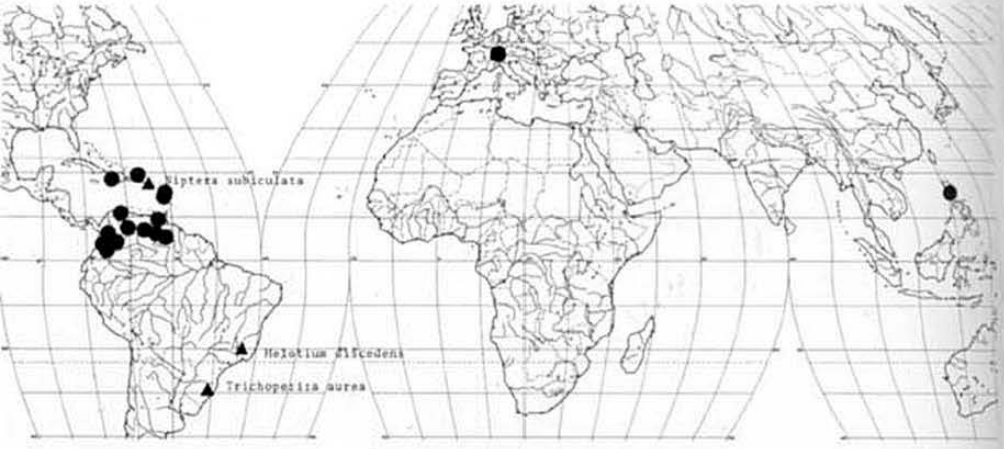


FIG. 1. Photomicrographs of *Cystodendron* state of *Bisporella discedens*, Dumont-VE 1120 (NY). A. Phialides arising near the paraphysis apices at the margin of and along the flanks of an apothecium, × 250. B. Branching phialide bases, × 1550. C. Phialides and phialospores, × 1550.

The ectal excipulum of the apothecium is composed of interwoven gelatinized hyphae, forming a highly refractive tissue as viewed in bright-field microscopy. The ascospores are 1-septate, with one to two guttules in each cell, fusiform, hyaline, and (6.0-) 8-10 (-11) × (1.0-) 1.5-2.0 (-2.5) µm. Asci are 65-75 × 5-6 µm and J-. Paraphyses are cylindrical, septate, slightly wider than 1.0 µm at the tip and tapering to slightly less than 1.0 µm near the base, extending 8.0-10.0 µm above the asci.

I have found an imperfect state, which should probably be assigned to the genus *Cystodendron* Bubák (although affinities with *Chalara* (Corda) Rabenh. should not be overlooked), often associated with the apothecia of this fungus (Fig. 1). The brown phialides arise from a series of angular, branching, hyaline cells which are 2.5-3.0 µm across. These cells appear to have their origin in the excipular tissues, although I have been unable to trace them completely. The phialides are 20-25 × 2.0 µm, with a slightly bulbous base. Phialides occur in clusters of 3 to 15. The conidia are hyaline, 2-2.5 × 2.0 µm, usually rectangular but sometimes spherical. The clusters of phialides are visible with a 10× hand lens and appear as a brownish fringe covering the outer surface of the apothecia. The phialides are also responsible for the tan coloration of the apothecia in some collections. I will refrain from naming the *Cystodendron* state until cultural work can be undertaken.



KNOWN DISTRIBUTION of *Bisporella discedens*. Type localities marked with with triangles, other localities marked with circles.

SPECIMENS EXAMINED: Those specimens with the *Cystodendron* state observed are denoted with an asterisk (*). BRAZIL: Lectotype specimen of *Helotium discedens*, Karsten 1268 (H); Karsten 1267 (H); *Presumed Isotype specimen of *Trichopeziza aurea*, Rick, São Leopoldo, Rio Grande do Sul, 1929 (FH, = CUP 52695). COLOMBIA: Dumont-CO-13, 39, *231, 452, 1113, 1238, 1387, *1590, 1597, 1667, 1683, 1831, 1934, 1949 (all at NY). DOMINICA: *CUP-DO-15, 25, *200. GUADELOUPE: D.H. Pfister 1040 et al. (FH); Pfister 1066a et al. (FH). HAITI: CUP-HA 12. PHILIPPINES: CUP-SA 783, *848. PUERTO RICO: *CUP-PR-4164, *4183; A.Y. Rossman 194 (= OSC-28951). ST. THOMAS, V.I.: Isotype specimen of *Niptera subiculata*, CUP-WI-829. SWITZERLAND: Rehm, Ascomycetes Exsiccatae 1109, sub *Coryne flavovirens* (ex FH = *CUP-52694, *CUP-D-8544). VENEZUELA: Dumont-VE-35, 49, 116, 155, 162, 244, 250, 363, 578, *780, 913, 967, 1027, 1033, 1045, 1046, *1047, *1099, *1114, *1120, 1125, *1127, *1136, 1276, 1481, 1624, 1735, 1766, 1860, 2010, 2105, 2119, 2157, 2396, 2439, 2614, 2786, 2821, 2825, 2977, 3221, 3246, 3302, 3314, 3329, 3432, *3562, *3563, *3589, 3591, 3755, *3759, 5007, 5335, 5834, 5852, 5870, 6198, 6277, 6376, 6426 (all at NY).

ACKNOWLEDGEMENTS

The author would like to thank Drs. K. P. Dumont, R. P. Korf and D. H. Pfister for critical suggestions during the preparation of this manuscript. Further appreciation is expressed to the directors of the University of Helsinki Botanical Museum (H), the Naturhistoriska Riksmuseum (S) and the New York Botanical Garden (NY) for supplying me with critical specimens. This study was supported in part by National Science Foundation Grants GB-28593 to K. P. Dumont, GB-8548 to R. P. Korf, and GB-36162 to D. H. Pfister.

REFERENCES CITED: DENNIS, R.W.G. (1954) Some inoperculate Discomycetes of tropical America. Kew Bull. 1954: 289-348. — KARSTEN, P.A. (1889) Fungi aliquot novi in Brasilia a Dre. Edw. Wainio anno 1885 lecti. Hedwigia 28: 190-195. — KORF, R.P. (1974) *Peziza flavovirens*, an older name for *Vibrissea pezizoides*. Mycotaxon 1: 134. — KORF, R.P. & S.E. CARPENTER. (1974) *Bisporella*, a generic name for *Helotium citrinum* and its allies, and the generic names *Calycella* and *Calycina*. Mycotaxon 1: 51-62. — RICK, S.J. (1931) Monographia Pezizinearum Riograndensium. Brotéria, Sér. Bot. 25: 77-122. — SEAVER, F.J. (1924) The fungous flora of St. Thomas. Mycologia 16: 1-15.

MYCOTAXON

Vol. II, No. 1, pp. 127-131 April-June 1975

A NEW DORATOMYCES FROM WATERHYACINTH[1]

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A project to survey fungi associated with waterhyacinth, Eichhornia crassipes, was begun in November 1973. The purpose of this project was to find organisms that could be utilized as biocontrols of the prolific waterhyacinth. In February 1974, in a collection of decaying waterhyacinth laminae many light-buff colored synnemata were noted. As far as we know, this is the first report of a synnematal fungus occurring on waterhyacinth. Pathogenicity studies on waterhyacinth indicated that the organism was a saprophyte. The conidiogenous cells appeared to be phialides but closer examination revealed annellations on which conidia are held in a dry loose head. The organism was assigned to the genus Doratomyces Corda sensu Morton and Smith (1963).

There is a controversy concerning the correct name to apply to our organism. In 1797, the type specimen of the genus was originally called Isaria stemonitis by Persoon. Later, in 1801 Persoon reevaluated this specimen and transferred the organism to Periconia. In 1809, Link established the genus Cephalotrichum with C. rigescens as type and transferred P. stemonitis to the genus Cephalotrichum with no description. Hughes (1958), while proposing the observation of 1801 as the starting point for Hyphomycete nomenclature, adopted Cephalotrichum Link with C. stemonitis (Pers.) Link as the lectotype. No specimen of C. rigescens has been found or is known to exist. If. C. rigescens is a nomen dubium the genus Cephalotrichum Link ex Fr. based on that species is also nomen dubium. Fries (1832) while accepting the genus Cephalotrichum stated that Doratomyces neesii Corda (1829) was an aging specimen of C. stemonitis.

Morton and Smith (1963) challenged the typification of Cephalotrichum Link ex Fr. by C. stemonitis (as lectotype) because they felt that Links description of C. rigescens was of a group that was not congeneric with Periconia

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[1]Florida Agricultural Experiment Station No. 5834.

stemonitis. They agreed with Fries that the type specimen of Doratomyces was the same species as C. stemonitis and adopted Doratomyces Corda for D. stemonitis (Pers. ex Fr.) Morton and Smith.

Barron (1972) used the name Doratomyces but recognized the need for further clarification. Kendrick and Carmichael (1973) recognized Cephalotrichum as the valid name. There have been no further reports on the genus. Therefore, we agree with Morton and Smith and the arguments of Weresub and Pirozynski (Pers. Comm.) in recognizing Doratomyces as the valid name for the genus.

In Morton and Smith's monograph the species that most clearly corresponds to the organism considered herein is D. putredinis. This relationship is based on the light-buff coloration of the synnemata. Both organisms differ from other species of Doratomyces by their lack of dematiaceous coloration. In studies utilizing a variety of media, colony coloration could be varied; however, the synnmata of our fungus retained their light-buff color.

Colonies on oatmeal agar at 25 C grew slowly and attained a diameter of 34 mm in 3 weeks. The mycelium was at first light-buff turning later to cocoa[1] (Plate 7, A-10). The colony became funiculose with the synnemata forming at irregular intervals. The reverse coloration was a light purple-brown (Rose ebony, Plate 8, E-6).

Colonies on potato dextrose agar plus yeast extract at 25 C attained the greatest diameter (45 mm) in 3 weeks. Colonies were light-buff later turning a light brown (Golden brown, Plate 14, F-12) with a dark brown exudate. Synnemata were not formed as abundantly as on oatmeal agar. The reverse coloration was a dark purple-brown.

Colonies on potato dextrose agar and cornmeal-malt extract-yeast extract agar at 25 C were slow growing, 29 mm and 25 mm, respectively. Colony colorations were light-buff. Synnemata were rarely produced on either medium.

A comparison of our organism with D. putredinis (Morton and Smith, 1963) leads us to believe that existing differences warrant establishment of a new species (Table I).

Doratomyces eichhornius sp. nov. (Figs. 1-4).

Myceliales hyphae hyalinae plerumque superficiales; synnemata in greges conferta, cum conidiophoris 120-800 μ longa, cum apice expanso simili soluti capitis; annellophora 15-25 X 4-5 μ timidula in base et paulatim attenuata ad zonam annellatam; conidium primum ovatum cum altero ex extremis truncato;

[1]Color designations are taken from Maerz and Paul (1930).

TABLE I

A comparison of measurements of
D. putredinis and *D. eichhornius*

	D. putredinis	*D. eichhornius*
Conidium size	4.5-6 X 2-3 μ	7-9 X 3.5-5 μ
Conidium ornamentation	smooth	minutely verrucose
Length of annellophores	6-20 X 2.5-3.5 μ	15-25 X 4-5 μ
Length of synnemata	12-120 μ	120-800 μ

Figs. 1-3. *Doratomyces eichhornius*. 1. A young developing synnema. X 100. 2. A mature synnema. X 100. 3. Annellophores and catenulate conidia. X 500.

conidia secundaria ovalia cum utroque extremo truncato, subtiliter verrucosa 7-9 X 3.5-5 μ, formantia catenas cum 7-8 conidiis.

Habitat: saprophyticum in laminis Eichhorniae crassipedis (Mart.) Solms.

Mycelial hyphae hyaline, mostly superficial; synnemata formed in clumps, with conidiophores 120-180 μ in length, with the top splayed out into a loose head; annellophores 15-25 X 4-5 μ slightly swollen at the base and gradually tapering to the annellate zone; primary conidium ovate with one end truncate, secondary conidia oval with both ends truncate, minutely verrucose 7-9 X 3.5-5 μ, forming chains of 7-8 conidia.

Habitat: saprophytic on laminae of Eichhornia crassipes (Mart.) Solms. Collected by F. W. Zettler, Lake Alice, University of Florida campus, Gainesville, Florida.

Holotype: University of Florida Herbarium No. FLAS F 50399. American Type Culture Collection No. 28418.

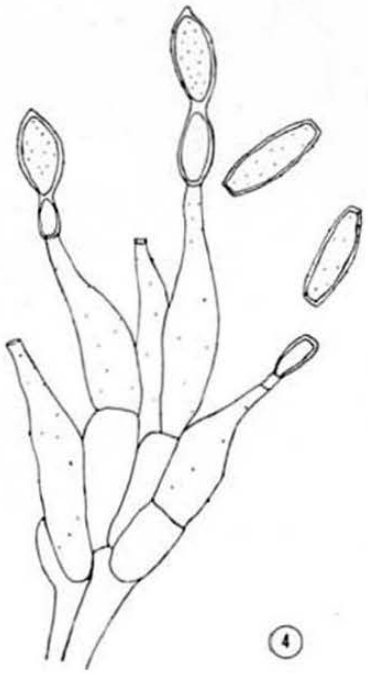

Fig. 4. Camera lucida drawing of a portion of a synnema showing verruculose conidia. X 1,000.

ACKNOWLEDGEMENTS

The authors are indebted to Drs. K. A. Pirozynski and L. Weresub for their generous time in providing nomenclatural arguments. We also wish to thank Drs. T. E. Freeman and H. H. Luke for their review and comments on the manuscript. This research was supported by U. S. Army Corps of Engineers Contract No. DACW 73-73-C-0049, Florida Department of Natural Resources, and by the U. S. Department of Interior, Office of Water Resources as authorized by the Water Resources Act of 1964.

LITERATURE CITED

Barron, G. L. 1972. The genera of Hyphomycetes from the Soil. Krieger Publishing Co., New York. 364 p.

Corda, A. C. J. 1829. in Sturm, J. Deutschlands Flora, iii (Pilze), Bd. 2, Heft. 7.

Fries, E. M. 1832. Systema mycologicum 3.

Hughes, S. J. 1958. Revisiones hyphomycetum aliquot cum appendice de nominibus rejiciendis. Canad. J. Bot. 36:727-836.

Kendrick, W. B. and J. W. Carmichael. 1973. Chapter 10. Hyphomycetes. In Ainsworth, G. L., F. K. Sparrow and A. S. Sussman (Eds.). The Fungi: An Advanced Treatise. Vol. IV-A. Academic Press, New York and London.

Link, H. F. 1809. Observationes in ordines plantarum naturales. Dissertatio I. Mag. Ges. Naturf. Freunde, Berl. 3:3-42.

Maerz, A. and M. Rea Paul. 1930. A dictionary of color. McGraw-Hill Book Co. Inc., New York. 207 p.

Morton, F. J. and G. Smith. 1963. The genera Scopulariopsis Bainier, Microascus Zukal, and Doratomyces Corda. Mycological Papers No. 86. Commonwealth Mycological Institute, Kew, England.

Persoon, D. C. H. 1797. Commentatio de fungis clavaeformibus. In combined edition with Holmskiold, T. Coryphaei clavarias ramariasque complectentes cum brevi structurae interioris expositione.

_____ 1801. Synopsis methodica fungorum. Göttingen.

MYCOTAXON

Vol. II; No. 1, pp. 132-134 April-June 1975

SCOLECOBASIDIUM MACROSPORUM AS A SYNONYM OF SCOLECOBASIDIUM TSHAWYTSCHAE

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SUMMARY

Study of subcultures of type strains of Scolecobasidium tshawytschae and S. macrosporum demonstrated that S. macrosporum is conspecific with S. tshawytschae.

In connection with a study concerning Scolecobasidium tshawytschae (Doty and Slater) McGinnis and Ajello, 1974 (3) authentic living subcultures of S. macrosporum Roy, Dwivedi and Mishra, 1962 were unavailable for reference. We have since obtained a living subculture of the type strain of S. macrosporum labelled as S. variabile Barron and Busch, 1962 (IMI 98296) through the courtesy of the Commonwealth Mycological Institute. The affinity of S. macrosporum to S. tshawytschae is discussed in this note.

The genus Scolecobasidium was created by Abbott (1) to accommodate two new fungi isolated from Louisiana soils, S. terreum Abbott, 1927 and

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S. constrictum Abbott, 1927. The genus is characterized by having light olivaceous septate sympodioconidia that develop solitarily or in clusters upon thread-like denticles. The conidiophores are short, unbranched, smooth and light olivaceous brown in color.

Heterosporium tshawytschae Doty and Slater, 1946 was isolated from a case of phaeohyphomycosis in young chinook salmon (2). McGinnis and Ajello (3) proposed that H. tshawytschae be transferred to Scolecobasidium and that S. tshawytschae and S. variabile are conspecific.

Study of S. macrosporum (IMI 98296) and S. tshawytschae (ATCC 9915) revealed that the two isolates are essentially identical (Table 1). Thus, S. macrosporum is a synonym of S. tshawytschae.

Table 1. Characteristics of Scolecobasidium tshawytschae and S. macrosporum

	S. tshawytschae ATCC 9915	S. macrosporum IMI 98296
Growth at 37°C	-	+
Colony diameter at 25°C after 21 days on Potato dextrose agar	32 mm	40 mm
Colony color (Ridgeway)	deep olive, dark olive reverse	deep olive, dark olive reverse
Conidial size	9.0-19.8 x 2.2-3.6u (average 13.6 x 3.5u)	10.4-21.9 x 2.3-4.8u (average 14.0 x 3.5u)
Conidial septation	1-3	1-3
Conidiogenous cells	sympodial	sympodial

The nomenclator is as follows:

Scolecobasidium tshawytschae (Doty and Slater) McGinnis and Ajello, 1974. Trans. Brit. Mycol. Soc. 63: 202-203.

≡ Heterosporium tshawytschae Doty and Slater, 1946. Amer. Midl. Natur. 36: 663.

= Scolecobasidium macrosporum Roy, Dwivedi and Mishra, 1962. Lloydia 25: 164-166.

= Scolecobasidium variabile Barron and Busch, 1963. Can. J. Bot. 40: 83-84.

ACKNOWLEDGEMENTS

The authors wish to thank the Commonwealth Mycological Institute for their courtesy in supplying a living subculture of the type strain of S. macrosporum.

LITERATURE CITED

1. Abbott, E. V. 1927. Scolecobasidium, a new genus of soil fungi. Mycologia 19: 29-31.

2. Doty, M. S. and D. W. Slater. 1946. A new species of Heterosporium pathogenic on young chinook salmon. American Midland Naturalist 36: 663-665.

3. McGinnis, M. R. and L. Ajello. 1974. Scolecobasidium tshawytschae. Transactions of the British Mycological Society 63: 202-203.

MYCOTAXON

Vol. II, No. 1, pp. 135-141 April-June 1975

STUDIES IN THE APHYLLOPHORALES OF AFRICA 5
CYSTOSTEREUM ARTOCREAS, NEW TO AFRICA

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INTRODUCTION

In a large collection of wood-inhabiting fungi brought back from East Africa by L. Ryvarden, there were 13 specimens of a hydnoid, resupinate species in which the tissue was conspicuously dextrinoid.

After a lengthy search in the literature and in the herbaria in Stockholm (S) and London (K) it became apparent that all specimens represented *Hydnum artocreas* Berk. & Curt. This species has previously been reported from South America and Java (see list of specimens examined). The dextrinoid reaction was lacking in the South-American material (probably due to the age and/or possibly due to some sort of chemical treatment – a most common feature when fungi were collected in the tropics in the last century when drying equipment was badly developed). The material from Java gave a weak dextrinoid reaction. Except for the dextrinoid reaction the material from Africa was in full accordance with the type of *H. artocreas*.

DESCRIPTION

Cystostereum artocreas (Berk. & Curt. ex Cooke) Hallenb. & Ryv. comb. nov.

Basionym: *Hydnum artocreas* Berk. & Curt. ex Cooke, Grevillea 20:1, 1891.

Fruitbody effused, hydnoid, as dry very firm, crustaceous, colour cream to light brownish, margin indeterminate. Teeth when young simple with fimbriate apices, when older branched, up to 3 mm long, more or less flattened, often with smaller lateral projections, which are apically fimbriate.

Hyphal system dimitic. Generative hyphae hyaline, thinwalled, with clamps, branched, 2–3 μm in diam. Skeletal hyphae with thickened walls

and a few scattered adventitious septa, branched and in the centre of a tooth running in all directions, 1–3 µm wide, hyaline and stained reddish-brown in Melzer's solution. The walls are cyanophilous. In a section of the fruitbody, not only the skeletal hyphae show the dextrinoid reaction, but also adjacent amorphous masses obviously exudated from the hyphae. In the apex of a tooth, skeletal hyphae are tortuously branched and appear as dendrohyphidia. Hyphal tissue very dense, especially in the subhymenial region. In the centre of a tooth there is much crystalline material.

Basidia cylindrical to clavate, mostly somewhat constricted in the middle, 12–20 x 3,5–4,5 µm, with 4 straight sterigmata.

Gloeocystidia cylindrical to fusiform, 21–53 x 5,5–10 µm, with a rounded apex or with an apical rounded bulb, a little protruding beyond the hymenial surface. They have a yellow resinous content and do not react to sulfovanilline.

Spores broadly ellipsoid, 2,8–3,1–4,0 x 2,2–2,7–3,5 µm, non-amyloid, adaxial side flattened, spore walls cyanophilous. Sometimes the spores are glued together in groups of 4, sometimes they adhere to protruding cystidia and dendrohyphidia.

In Africa the species is found on dead wood, altitudes 1100–2400 m.s.m., in Ethiopia, Kenya, Tanzania, and Malawi.

Among the old specimens examined, there are some which lack the crystalline material and have less frequently branched, parallely growing skeletal hyphae in the centre of the teeth. These specimens may belong to another taxon, but as no further differences are evident they are here treated as the same species.

DISCUSSION

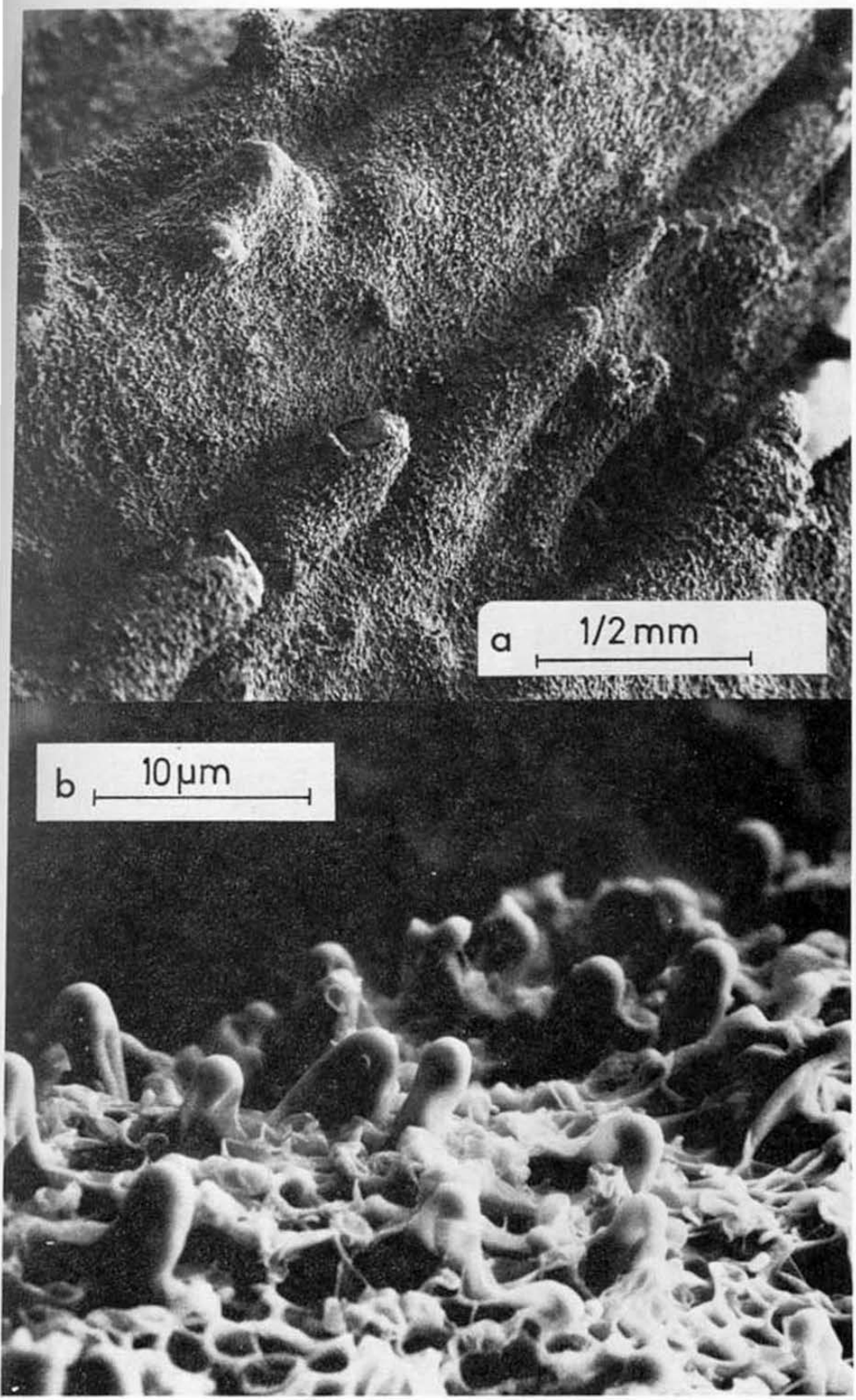
C. artocreas is close to *C. subabruptum* (Bourd. & Galz.) Eriksss. & Ryv. and *C. pini-canadense* (Schw.) Parm. (Sunhede, 1972; Eriksson & Ryvarden, 1975).

They are characterized by a dimitic hyphal system, presence of dendrohyphidia, gloeocystidia with a yellow resinous content and small elliptical, non-amyloid spores.

The hymenophore of C. *pini-canadense* is almost smooth, that of *C. subabruptum* odontioid and of *C. artocreas* hydnoid. The latter also differs by having dextrinoid skeletal hyphae and more rounded spores.

These three species differ from the type of the genus, *C. murraii* (Berk. & Curt.) Pouz., which has no dendrohyphidia, lots of gloeocystidia in the subiculum and oily instead of resinous content in the gloeocystidia. From these reasons we suggest a new subgenus:

Figure 1. *Cystostereum artocreas.* a) lower part of large, slightly flattened tooth with typical lateral protuberances or "sideteeth" b) part of hymenium with collapsed basidia and projecting gloeocystidia. – Coll. Ryvarden 5136.


a
1/2 mm
b
10 µm

Cystostereum subg. **Dendrohyphidium** subgen. nov.

Subgeneri Cystostereo affine sed cum dendrohyphidiis, gloeocystidia materiam resinosam vice substantiae oleaceae continentia, gloeocystidia in subiculo desunt. Hymenophorum plus minusve leve, vel hydnoideum.

Hyphae skeleticae non dextrinoideae, interdum dextrinoideae. Subgeneric type: *Cystostereum subabruptum* (Bourd. & Galz.) Erikss. & Ryv., Corticiceae of N. Europe, vol. 3, p. 327, 1975 *(Odontia subabrupta* Bourd & Galz., Hym. de France, p. 430, 1928).

Included species: *C. pini-canadense* (Schw.) Parm., *C. artocreas* (Berk & Curt. ex Cooke) Hallenb. & Ryv.

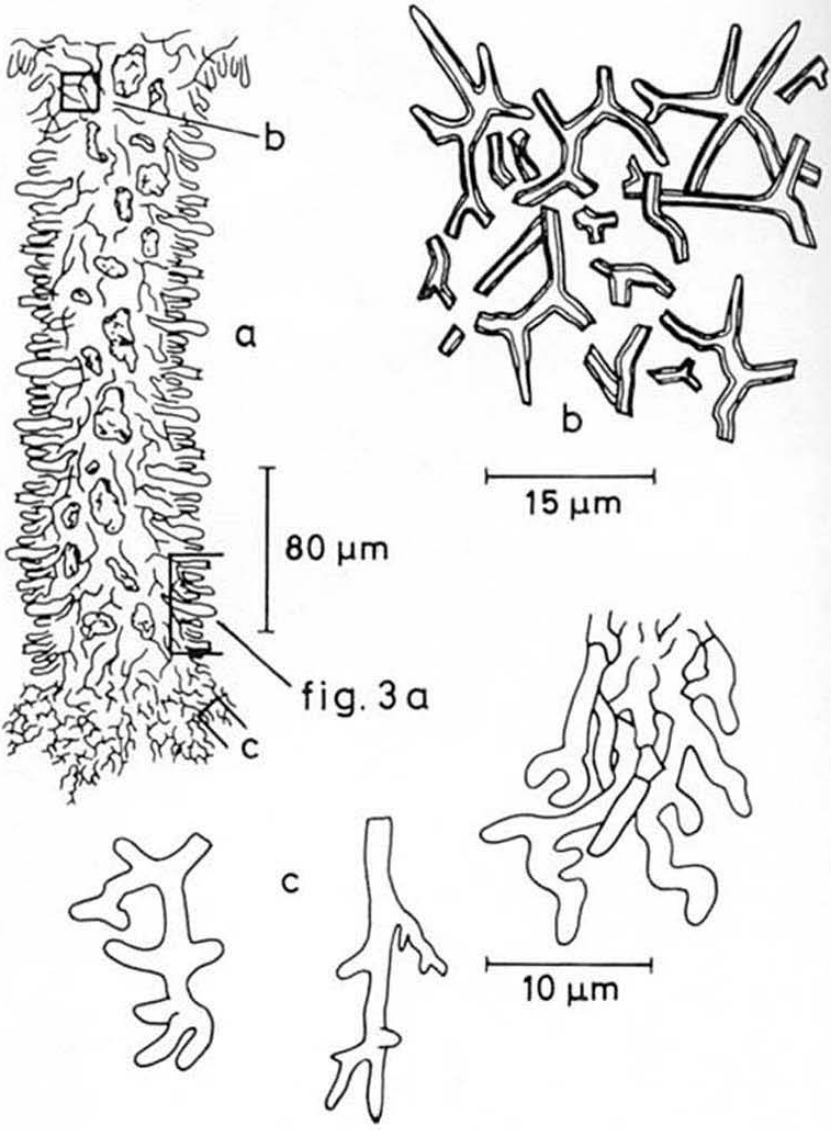


Figure 2. *Cystostereum artocreas.* a) section through tooth showing positions of sections b and fig. 3a b) skeletal hyphae from the centre of the tooth c) dendrohyphidia – Coll. Ryvarden 10350.

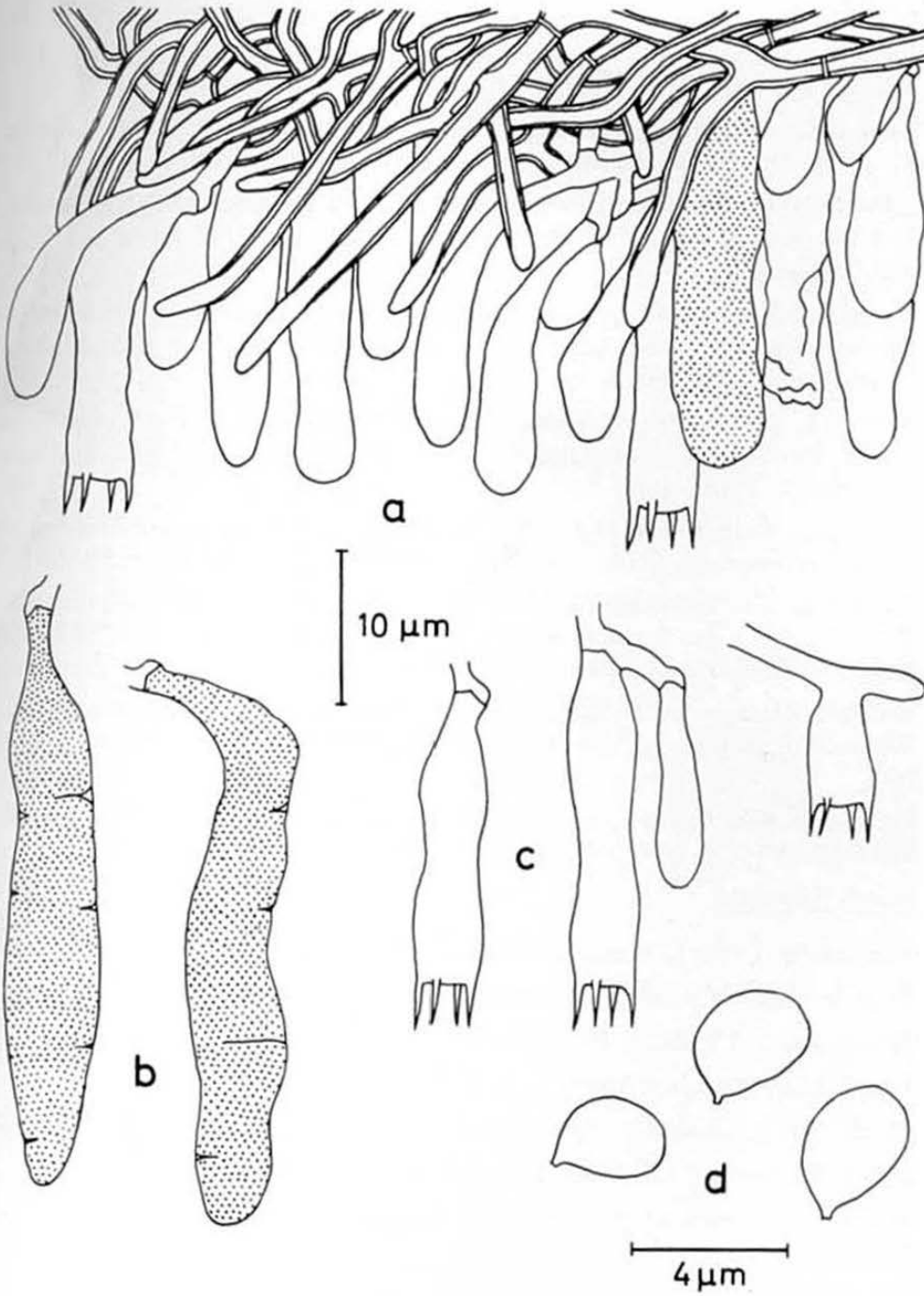


Figure 3. *Cystostereum artocreas.* a) section through hymenium with basidia and gloeocystidia b) gloeocystidia c) basidia d) spores. – Coll. Ryvarden 10350.

SPECIMENS EXAMINED

Africa:

Ethiopia, Arussi prov., Wondo Genet, 12 km SE Shashemene, alt. c. 1900 m.s.m., 7° 5' N 38° 45' E, 1973-01-08, L. Ryvarden 8735 (O).

Kenya, Central prov., Mt. Elgon, Suam Forest Sta., alt. c. 2100 m.s.m., 1° 15' N 34° 50' E, 1973-01-23, L. Ryvarden 9201 (O).

Kenya, Western prov., Kakamega Forest, c. 13 km E-SE of Kakamega, alt. c. 1500 m.s.m., 0° 15' N 34° 50' E, 1973-01-25/27, L. Ryvarden 9416, 9523, 9582 (O).

Tanzania, Kilimanjaro prov., Mt. Kilimanjaro, W slope, E of Lemosho Glades, montane forest, alt. c. 2400 m.s.m., 3° 1' S 37° 9' E, 1971-01-17, L. Ryvarden 5136, 5159 (O).

Tanzania, Arusha prov., Arusha Nat.park, Mt. Meru, E slope, road to the crater, alt. 1800-2300 m.s.m., 3° 14' S 36° 47' E, 1973-02-08, L. Ryvarden 10020, 10061 (O).

Tanzania, Kilimanjaro prov., Mt. Kilimanjaro, S slope above Mweka, alt. 1800-2300 m.s.m., 3° 14' S 37° 20' E, 1973-02-12, L. Ryvarden 10350 (O).

Tanzania, Morogoro prov., Morogoro distr., Uluguri Mts. Morning Side Res. Sta., c. 5 km S of Morogoro, alt. 1500-2100 m.s.m., 6° 55' S 37° 40' E, 1973-02-24/26, L. Ryvarden 11052 (O).

Malawi, Southern prov., Mulanje distr., Mulanje Mts. Lichenya Plateau, alt. 1800-2000 m.s.m., 15° 58' S 35° 30' E, 1973-03-09, L. Ryvarden 11299 (O).

Malawi, Southern prov., Thyolo distr., Thyolo mt., alt. 1100-1400 m.s.m., 16° 5' S 35° 4' E, 1973-03-13, L. Ryvarden 11551 (O).

South America:

Venezuela, 1879, Berkeley and Curtis 139 (Type) (K, BPI).

Saint Vincent (K) (without date and collector).

Brazil, Parecy, 1924, J. Rick (BPI).

Brazil, Sao Leopoldo, 1903, J. Rick (Hb. Bresadola 29) (S).

Brazil, Sao Leopoldo, in ligno frondoso, 1906, J. Rick 116 (BPI, UPS, S).

Brazil, Blumenau, A. Möller 111, 330 (S).

Brazil, Rio Grande do Sul, 1906, Sao Leopoldo, J. Rick (Theissen no. 163) (S).

Asia:

Java, Tjibodas, 1908, comm. v. Höhnel (BPI).

The herbaria are abbreviated in accordance with Index Herbariorum (Regnum Vegetabile, Vol. 92).

ACKNOWLEDGEMENT

We are much indebted to Dr. John Eriksson, Göteborg, for valuable discussions.

REFERENCES

Bourdot, H. & Galzin, A. 1928. Hyménomycètes de France. Paris.

Eriksson, J. & Ryvarden, L. 1975. The Corticiaceae of North Europe. Vol. 3. Oslo.

Sunhede, S. 1972. Odontia subabrupta Bourd. & Galz. (Basidiomycetes), a Species of Corticiaceae New to Sweden. Sv. Bot. Tidskr. 66:285-289.

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NOTICES

LICHEN EXCHANGE ESTABLISHED

The American Bryological and Lichenological Society established its first Lichen Exchange during 1974, with Claire Schmitt as Director.

Students as well as professionals are invited to participate. Interested persons may write to Mrs. Claire Schmitt at 1 Cedar Lane, Scotia, New York 12302, for information.

RECENT WORK ON THE MYCOLOGICAL COLLECTIONS OF THE FARLOW HERBARIUM

Through several decades of prudent purchases, donations and exchange, the Farlow Reference Library and Herbarium of Cryptogamic Botany has become one of the largest depositories of critically studied cryptogamic specimens in North America. Under a National Science Foundation Grant, this large and invaluable reference collection has been receiving long needed curatorial attention. Dr. Geneva Sayre, Research Associate at the Farlow Herbarium, has recently outlined the progress of these activities in the bryophyte herbaria (Taxon 23: 215-216. 1974) where most of the work had been concentrated previously. This is a similar review of the progress in the mycological collections. I hope that such information will encourage mycologists to use the collections both as a source and as a depository. The Farlow Herbarium and Library welcomes reprints, specimens, and loan requests.

Traditionally, the fungus collections have been divided into three categories: (1) the general herbarium; (2) the special, separately maintained herbaria; and (3) the undistributed exsiccati.

The General Herbarium — This collection contains the incorporated herbaria of W.G. Farlow, R. Thaxter, D.H. Linder, J.H. Faull (in part), W.L. White, F.V. Bucholtz, and F. Theissen. The mycological collections of W.H. Weston have also been sorted and added to the general herbarium. The Weston herbarium contains authentic and type material of species of *Sclerospora* and also contains collections from the Philippines and Barro Colorado. Many specimens in the general collection recently have been protectively repacketed. The index to types is also being updated.

With the aid of Dr. Josiah Lowe, Honorary Research Associate of the Farlow Herbarium, the Polyporaceae have been

(continued on page 184)

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PENIOPHORA TAMARICICOLA IN NORTH AMERICA[1/]

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Field work over the past 5 years in southern Arizona has disclosed the presence of a fungus previously unreported from North America. This fungus is *Peniophora tamaricicola*, described in 1961 by Boidin and Malençon from Morocco, where it was reported as common on *Tamarix*.

Peniophora tamaricicola is one of the important decay fungi on dead branches of several Sonoran Desert shrubs and trees. It is particularly common in Arizona on mesquite (*Prosopis juliflora* (Sw.) DC.) and can generally be found in all areas where mesquite with dead branches is present.

The following description is based on the collections cited from Arizona.

PENIOPHORA TAMARICICOLA Boidin et Malençon in Boidin, Rev. Mycol. 26: 153. 1961.

Basidiocarps resupinate, becoming widely effused, adnate, drying tough and horny in consistency and cracking extensively into small angular blocks; hymenial surface smooth to distinctly tuberculate, pruinose, pink when fresh, pale purplish-gray on dried specimens (Pale Smoke

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1/ University of Arizona Agricultural Experiment Station Journal Article No. 2419.

Gray, Pallid Mouse Gray or Light Gull Gray)[2]; margin abrupt and fertile; subiculum pale brown, hymenial layer lighter in color and distinct in longitudinal sections; hyphal system monomitic; subicular hyphae (Fig. 1a) 3-4 μ

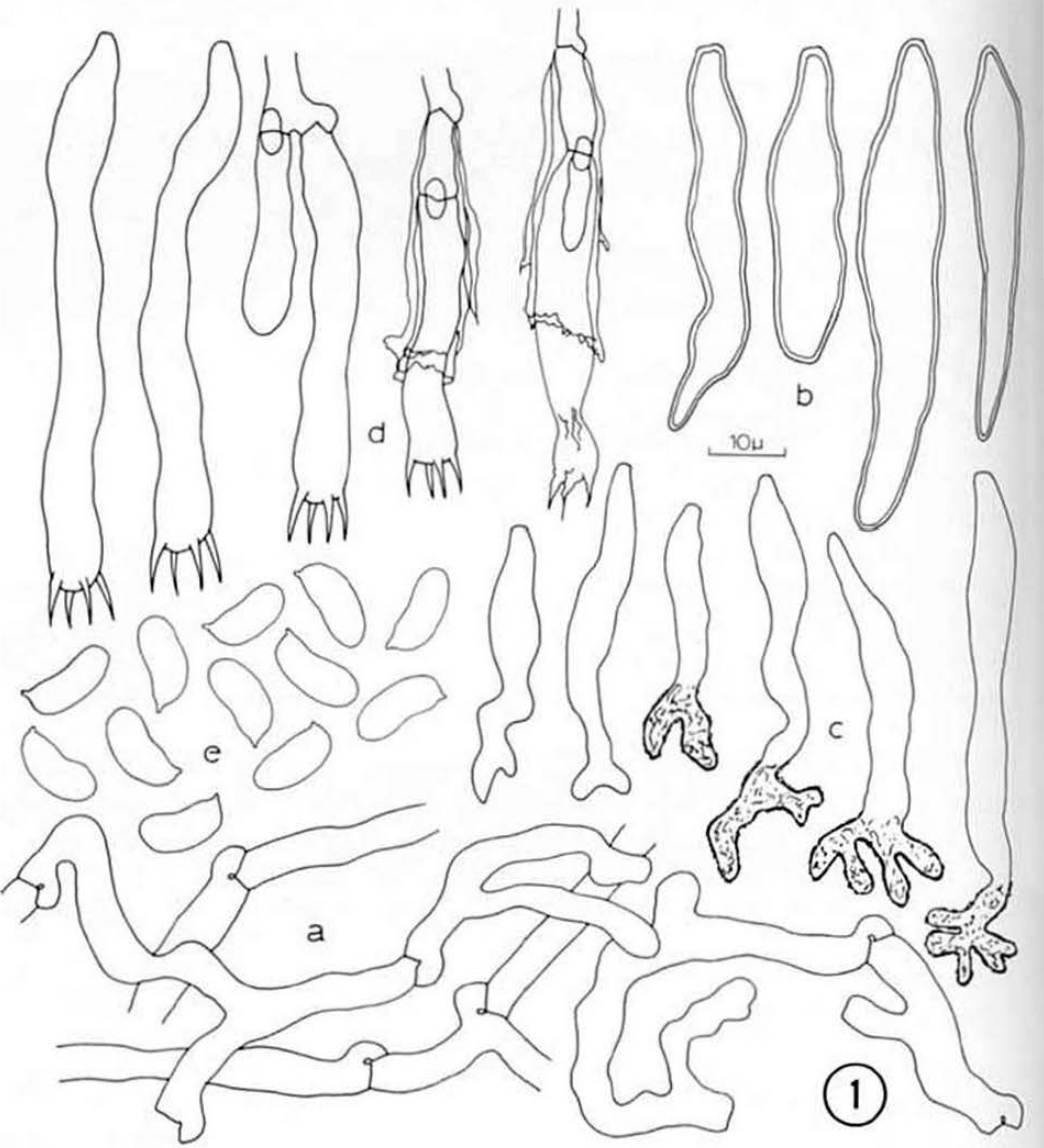

Fig. 1. Microscopic characters of basidiocarp of *Peniophora tamaricicola*. a. subicular hyphae; b. gloeocystidia; c. dendrohyphidia; d. basidia; e. basidiospores.

[2] Color notations are those of Ridgeway (1912).

in diam, agglutinated and difficult to separate, yellow-brown near substrate, thin- to thick-walled, all with inconspicuous clamp connections, swollen vesicular gloeocystidia present in subiculum, some with refractive granular contents, strongly positive in sulphuric benzaldehyde reagent; hymenial gloeocystidia (Fig. 1b) occasional, projecting slightly, acuminate, some with refractive contents, weakly to distinctly positive in sulfuric benzaldehyde reagent, up to 60 x 10 μ; dendrohyphidia (Fig. 1c) present, lightly to heavily incrusted, sparsely branched, stalk 2-5 μ in diam; basidia (Fig. 1d) narrowly clavate or slightly swollen at the base, 4-sterigmate, 40-65 x 7-7.5 μ, developing by percurrent proliferation, with new basidia developing through old basal septa and ensheathed in collapsed walls of old basidia; basidiospores (Fig. 1e) cylindric to allantoid, hyaline, smooth, thin-walled, negative in Melzer's reagent, 10.5-11.5 x 4-4.5 μ; spore print orange-white to light orange. Associated with a white rot of dead branches.

Specimens Examined from Arizona:--(at ARIZ or CFMR)[3]

- on *Baccharis sarothroides* Gray (desert broom): RLG 10056 and 10061, Madera Canyon, Santa Rita Mts., Pima County.
- on *Celtis reticulata* Torr. (western hackberry): ERC 71-245,and 71-247, Guadalupe Canyon, Peloncillo Mts., Cochise County.
- on *Cercidium microphyllum* (Torr.) Rose et Johnst. (yellow palo verde): RLG 10237 and HHB 5952, Redington Rd., Rincon Mts., Pima County.
- on *Condalia mexicana* Schlect. (Mexican blue-wood): RLG 10585, Peck Canyon Rd., Tumacacori Mts., Santa Cruz County.
- on *Fouquieria splendens* Engelm. (Ocotillo): RLG 7741, Guadalupe Canyon, Peloncillo Mts., Cochise County.
- on *Fraxinus velutina* Torr. (velvet ash): ERC 71-248 and HHB 6225, Guadalupe Canyon, Peloncillo Mts., Cochise County; HHB 5994, 5995, Sycamore Canyon, Atascosa Mts., Santa Cruz County.

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[3] Herbarium abbreviations are those of Stafleu (1974).

on *Juglans major* (Torr.) Heller (Arizona black walnut): RLG 10257, Sycamore Canyon, Atascosa Mts., Santa Cruz County.

on *Prosopis juliflora* (Sw.) DC. (common mesquite): RLG 7182, Sonoita Cr., Patagonia, Santa Cruz County; RLG 8368A, Kelley's Wash, Santa Catalina Foothills, Pima County; ERC 70, Cottonwood Springs, Sonoita Cr., Santa Cruz County; ERC 176, Box Canyon 10 mi. east of Florence, Pinal County; RLG 10040, Patagonia Mts., Santa Cruz County; RLG 10055, HHB 5849 and 5855, Santa Rita Experimental Range, Santa Rita Mts., Pima County; HHB 5883, highway 90, S.E. of Sierra Vista, Cochise County; RLG 10234, HHB 5948 and 5953, Redington Rd., Pima County; RLG 10361 and ERC 71-250, and HHB 6223, Guadalupe Canyon, Peloncillo Mts., Cochise County; RLG 10388 and ERC 71-254, Aravaipa Canyon, Pinal County; ERC 71-271, Peppersauce Canyon, Santa Catalina Mts., Pima County; ERC 71-327, near Kitt Peak Rd. on highway 86, Papago Indian Res., Pima County; ERC 71-355, Camp Grant Wash, Pinal County; RLG 10577, Peck Canyon Rd., Tumacacori Mts., Santa Cruz County; RLG 10792, highway 90, N. of Sierra Vista, Cochise County; HHB 7263, Old Spanish Trail near Collossal Cave, Pima County; HHB 6221, Guadalupe Canyon, Sonora, Mexico.

Peniophora tamaricicola was originally described as common on *Tamarix* in Morroco. *Tamarix aphylla* (L.) Karst. (athel) and *T. gallica* L. (salt-cedar) are both common introduced plants in southern Arizona, but we have not yet found *P. tamaricicola* on them.

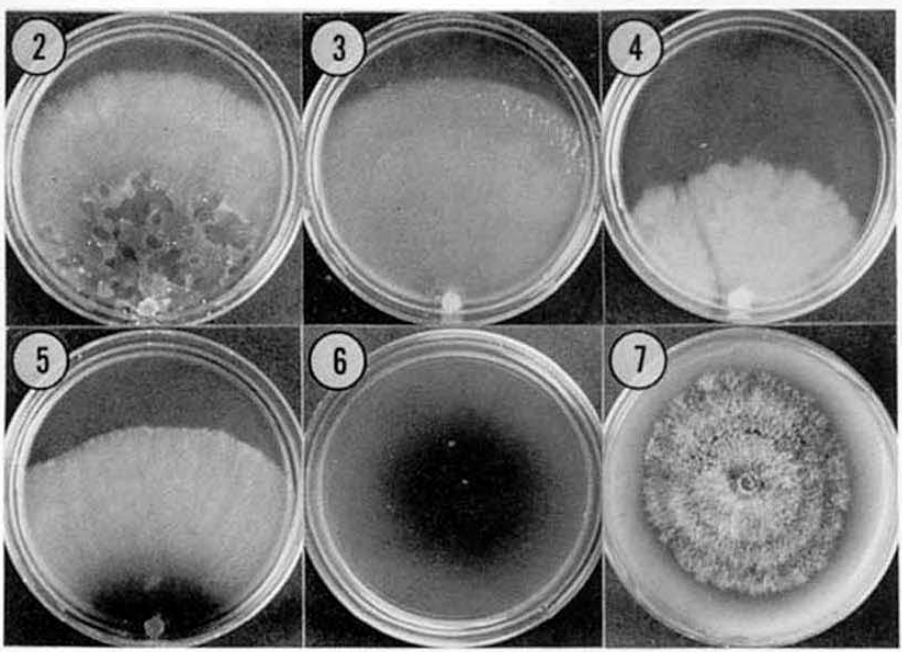
Of special interest is the development of the basidia by means of percurrent proliferation. This phenomenon has never been reported for a member of *Peniophora* Cke. sect. *Coloratae* Bourd. et Galz.

The Arizona specimens have been compared with an isotype of *P. tamaricicola* (LY No. 3928) sent by Dr. Boidin and found to agree well in all respects.

Peniophora tamaricicola was readily isolated from mass basidiospore deposits and grew vigorously on 1.5% Difco Bacto malt extract-agar medium.

Cultural Characteristics:

Growth on malt extract-agar (MEA) slow to medium, 15-30 mm diam/week at 25°C; advancing zone white and woolly, mat (Figs. 2,3,4,5) after two weeks with white, appressed powdery surface, sometimes with appressed, sodden circular areas; powdery layer forming a tough membrane on agar surface, and remaining white for several weeks; later becoming tan, some areas with sparse loosely interwoven aerial hyphae developing above surface, especially at the edge of dish, producing a thick woolly rim; agar stained brown in most isolates, sometimes only after 3 weeks, one isolate lost this ability; odor of apricots; on gallic acid medium (Fig. 6) no growth in two weeks, the agar stained up to 1 cm from inoculum; on tannic acid medium (Fig. 7) growth 5-12 mm in radius/week, mat white, becoming tan, texture appressed woolly, margin irregular, abrupt; agar stained about 5 mm beyond margin of mat; reaction to syringaldazine (Harkin and Obst, 1973) strongly positive (Spinel Red to Acajou Red) indicating laccase production.



Figs.2-7. Cultures of *P. tamaricicola* after 2 weeks. 2. HHB 5948 on MEA; 3. HHB 5883 on MEA; 4. HHB 5953 on MEA; 5. RLG 10792 on MEA; 6. RLG 10792 on gallic acid medium; 7. RLG 10792 on tannic acid medium.

Hyphae of two types throughout cultures; some 2.5-4 μ broad, thin-walled, hyaline, clamped, frequently branched, with some irregular swelling, these constant in the marginal, aerial (Fig. 8a) and submerged hyphae (Fig. 8c);

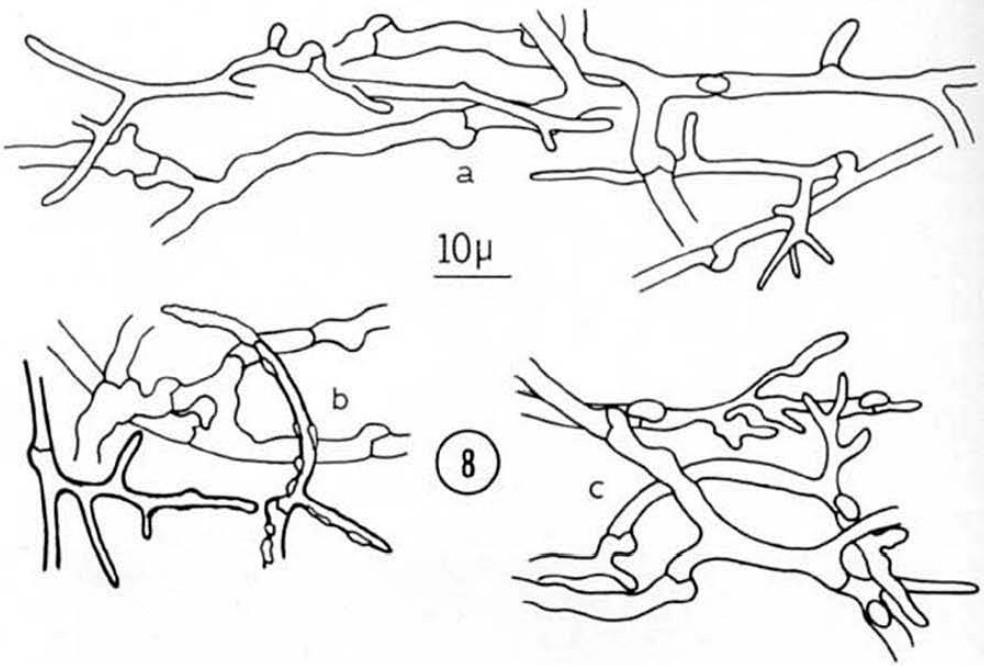


Fig. 8. Microscopic characters of culture of *P. tamaricicola*. a. hyphae from aerial mycelium; b. hyphae from membranous mat; c. hyphae from submerged mycelium. All from HHB 5883.

others 0.5-2 μ broad, hyaline, clamped, thin-walled or with slight wall thickening; in membranous mat (Fig. 8b) hyphae agglutinated and densely entangled, walls up to 0.5 μ thick, with yellow tint and yellow encrusting material appearing as irregular wall thickening after several weeks.

Temperature Relations: Average mat diameters in 21 days in the dark (except for measuring time) at constant temperature follow: 4°, no growth; 12°, 26-40 mm; 16°, 31-49 mm; 20°, 49-75+mm; 28°, 56-75+mm; 32°, 33-64 mm; 36°, 1-3 mm; 38 and above, no growth.

Cultures studied: HHB 5883, 5948, 5953, RLG 10792, all at CFMR.

Remarks: The appressed, powdery, tough membrane with the sodden "poc-like" areas combined with the brown staining of the malt agar is distinctive for this fungus. These isolates have a tendency to vary substantially in growth rate. Other characters, such as the mat texture and coloration vary among individual runs on the same isolate more than is usually experienced. The ability to stain the agar has been lost in one isolate (5953) while another (5883) bleaches the agar and stains the agar brown only in age.

The key pattern according to the system used by Davidson, et al. (1938) is A-P-I-1-10-14. The species code according to the system used by Nobles (1965) is 2.3.7.8.36.39.43.44.50.54.

Acknowledgments

Work at the University of Arizona was supported by McIntire-Stennis funds allocated through the University of Arizona Agricultural Experiment Station. Collections designated with the initials ERC were made by Dr. E. R. Canfield whose participation in the field work is gratefully acknowledged. Thanks is also extended to Ms. Teresa E. Scotton for her technical assistance.

Literature Cited

Boidin, J. 1961. Hétérobasidiomycètes saprophytes et Homobasidiomycètes résupinés: VIII. *Peniophora* Cke. à dendrophyses. Rev. Mycol. 26: 153-172.

Davidson, R. W., W. A. Campbell and D. J. Blaisdell. 1938. Differentiation of wood-decaying fungi by their reactions on gallic or tannic acid medium. Jour. Agr. Res. 57: 683-695.

Harkin, J. M. and J. R. Obst. 1973. Syringaldazine, an effective agent for detecting laccase and peroxidase in fungi. Experimentia 29: 381-387.

Ridgeway, R. 1912. Color Standards and Color Nomenclature. Washington, D.C. 44 p. + I-LIII pl.

Stafleu, F. A. [ed.]. 1974. Index Herbariorum. I. The Herbaria of the World. 6th ed. Oosthoek, Scheltema and Holkema, Utrecht, 397 p.

MYCOTAXON

Vol. II, No. 1, pp. 151-165 April-June 1975

SPECIFIC AND INFRASPECIFIC NAMES FOR FUNGI USED IN 1821.

PART II. C, AND SUPPLEMENT TO PART I.[1]

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In Part I of this series (Mycotaxon vol. 1, no. 3), the 1821 system of starting dates for "Fungi Caeteri" was examined, with a summary of the 1821 literature (as discovered to that writing) and some pre-1821 literature sources. The present "chapter" takes up names starting with C.

No additional 1821 references have been uncovered since the writing of Part I, but a number of additional pre-1821 citations have been examined, and these are reported below. They by no means begin to summarize *all* the pre-1821 literature dealing with fungi, which would include literally scores of obscure floras and summaries of the known species, all "according to the system of Linnaeus", but those included here have all been cited by the 1821 authors. Finally, some literature which should have appeared in Part I was inadvertantly omitted, and has been added here.

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[1]This paper represents contribution No. 445 from the Botanical Laboratories, University of Tennessee.

Some notes:

On one hand, an announcement in Römer's "Neues Magazin für die Botanik" (1: 129-137) states a date for Bulliard's "Histoire ..." (BH) as 1791. In BH, the preface to Part I (page v) reads: "C'est en 1790 que j'ai commencé à publier les planches de cet ouvrage ...." In the errata following page 368, however, there appears a footnote: "Errata. Preface, page v, ligne 28 ... *au lieu de*, c'est en 1790 in j'ai commencé à publier les planches .. *lisez*, c'est in 1780." Presumably, one could surmize that the *plates* for Part I appeared in 1780, but the text perhaps later, or perhaps the plates were *printed* in 1780, but were not issued until 1791. The situation is not yet clear in my mind.

The dating of Schaeffer's "Fungorum ..." (Sch), especially volume 4 where binomials are used, is uncertain. this volume has been widely cited as 1800 (as appears on the title page), but the preface is dated April, 1774. It was probably issued in that year, and citations to Schaeffer binomials by subsequent authors occur shortly thereafter, and well before 1800. In Jacquin's "Collectae ..." (WJ 2: 106, for example), however, Schaeffer's names are quoted as polynomials. WJ appeared in 1781. Did Sch 4 appear *after* that date, and if not, why did WJ use the polynomials from Sch 1-3 rather than binomials from Sch 4?

Additional pre-1821 literature

EHor: Ehrenberg, C.G. 1820. Enumeratio fungorum, a viro clarissimo A. d. de Chamisso sub auspiciis Romanzoffianis in itinere circa terrarum globum collectorum. *in* Link, H., C. Asm. Rudolph, W. Fr. Klug, C.G. Nees von Esenbeck, Adalb. Chamisso, Fr. Hornschuch, D. Schlechtendal & C.G. Ehrenberg. Horae physciae Berolinensis collectae ex symbolis vivorum doctorum. pp. 77-104 + xvii-xx. [preface dated 15 May, 1819.]

JFA: Jacquin, N.J. Florae Austriacae sive plantarum selectarum in Austriae archiducatu sponte crescentium, icones, ad vivum coloratae, et descriptionibus, ac synonymis illustratae. Vienna.

Volume 1.	1773.	61 + pls. 1-100
Volume 2.	1774.	60 + pls. 101-200
Volume 3.	1775.	55 + pls. 201-300
Volume 4.	1776.	53 + pls. 301-400
Volume 5.	1778.	56 + index + pls. 401-500 + 50 pls.

LFF: Lamarck, "1778" [1779, cf. p. 1]. Flore Francoise, ou description succincte de toutes les plantes qui croissent naturellement en France, disposée selon une nouvelle methode d'analyse, & à laquelle on a joint la citation de leurs vertus les moins équivoques en médecine, & de leur utilité dans les arts. Volume 1: cxix + 223 [principes] + 132 [methode analytique] + xxix [indices] + 8 plates.

PFO: Palisot-Beauvois, A.M.F.J. Flore d'Oware et de Benin, en Afrique. Paris.
Volume 1. 1804. xii + 100 p + 60 pls.
Volume 2. 1807. 95 pp + pls. 61-120.

PJB: Persoon, C.H. 1809. Memoire sur les Vesse-loups ou *Lycoperdon*. Jour de Bot. 2: 5-31 + 1 pl.

PRNB: Persoon, C. H. 1794. Neuer Versuch einer systematischen Eintheilung der Schwämme. Neues Mag. f. d. Bot., Römer 1: 63-128.

PRR: Pallas, P.S. Reise durch verschiedene provinzen des Russischen Reichs in einem ausfuhrlichen Auszuge. Frankfurt & Leipzig.
Volume 1. 1776. 304 + 52 anhang + 15 pls.
Volume 2. 1777. 464 + 51 anhang + 26 pls.
Volume 3. 1778. 488 + 80 anhang + 40 pls.

Sae: Schumacher, Christ. Frieder. Enumeratio plantarum in partibus Saellandiae septentrionalis et orientalis. Hafniae.
Volume 1. 1801. vii + 304.
Volume 2. 1803. 489 pp.

Sch: Schaeffer, Jacob Christian. Fungorum qui in Bavaria et Palatinatu circa Ratisbonam nascuntur icones nativis coloribus expressae. Ratisbonam.
Volume 1. 1762. pls. 1-100 + accom. text.
Volume 2. "1767" [1763]. pls. 101-200 + accom. text.
Volume 3. "1770" pls. 201-300 + accom. text.
Volume 4. undated [1774]. pls. 301-330 + 136 pp. "index" + index to plates [preface dated April, 1774].
[In the copy of volume 2 at NY is found the following handwritten note: "Apparently this and the following (German) one are revised title-pages with new date. The preface is dated 1763, and the entire volume was *certainly* issued *that year*. (see

review in Comment. Sci. Nat. Gleditsch 12: 98-101. 1764.)"]

SEB: Smith, James E. English botany, or, coloured figures of British plants, with their essential characters, synonyms and places of growth; to which will be added, occasional remarks.
Volume 25 (1807). Pls. 1729-1800. London.

SEF: Sowerby, James. Coloured figures of English fungi or mushrooms.
Volume 1. 1797. pls. 1-120 + accom. text.
Volume 2. 1799. pls. 121-240 + accom. text.
Volume 3. 1803. pls. 241-400 + accom. text.
Supplement (undated). pls. 401-439 + accom. text.

SpM: Sprengel, Curt. 1807. Mantissa prima. Florae Halensis, addita novarum plantarum centuria. 58 pp. Halae.

SS: Schultz, Carolo Friederico. 1806. Prodromus florae Stargardiensis continens plantas in ducatu Megapolitano-Stargardiensi s. Strelitzensi sponte provenientes. 530 pp. Berolini.

WBA: Withering, William. A botanical arrangement of British plants including the uses of each species, in medicine, diet, rural oeconomy, and the arts. With an easy introduction to the study of botany, etc., etc. The second edition. London.
Vol. 3 (1792) introduction + 503 + 4 pls.

WFL: Wahlenberg, Georgii. 1812. Flora Lapponica exhibens plantas geographice et botanicae consideratas, in Lapponiis Suecicis scilicet Umensi, Pitensi, Lulensi, Tornensi et Kemensi, nec non Lapponiis Norvegicis scilicet Norlandia et Finmarkia utraque indigenas, et itineribus annorum 1800, 1802, 1807 et 1810 denuo investigatas. lxvi + 550 + 30 pls. Berolini.

WH: Wiggers, Fridericus Henricus. 1780. Primitiae Florae Holsaticae. Kiliae. introd. + 112 pp.

WJ 1: Wulfen, Francisci Xaverii. 1778. Plantae rariores Carinthiacae, *in* Jacquin, N.J., Miscellanae Austriaca ad Botanicam, Chemiam, et historiam

naturalem spectantia, cum figuris partim coloratis. 1: 147-163.

WJ 2: Wulfen, F.X. 1781. Plantae rariores Carinthiacae, *in* Jacquin, N.J., ibid. 2: 25-273.

WSA: Withering, William. 1801. A systematic arrangement of British plants, with an easy introduction to the study of botany. The fourth edition, in four volumes. Vol. 4: 409 pp. London.

-- A --

Additions and corrections (cf. Part I)

abietinum (Hericium) Schl: 57 ← [Schr: 181 (Hydnum)]
abietinus (Boletus) Schl: 56, P: 242, G: 643 ← [PS: 541 ← Dick 3: 21]
abietinus (Polyporus) Fr: 370 ← [PS: 541 (Boletus) ← Dick 3: 21 (Boletus)]
acris (Agaricus) P: 397, N&B: 326, R: 30 ← [Bolt: pl. 60]
aeruginosum (Fusidium) G: 544 ← [LM 3: 8]
aggregatus (Agaricus gymnopus) Z: 98† ← [Sch 4: 72]
alba (Clavaria muscoides var.) M: 32, var. nov.
alba (Helvella mitra var.) SA: 537, M: 29 ← [BH: 298, pl. 190, figs. A, B, C, F; pl. 466]
alba (Peziza imberbis var.) M: 22-23 ← [BH: 245, pl. 467, fig. 2]
alba (Peziza labellum var.) M: 25-26 ← [BH: 262, pl. 204]
alba (Peziza stipitata var.) M: 24 ← [BH: 271, pl. 457, fig. 2]
alba (Peziza vesiculosa var.) M: 25 ← [BH: 270, pl. 457, fig. 1E-F]: Fr 2: 52
alba (Tremella mesenteriformis var.) M: 28-29 ← [BH: 230, pl. 406, fig. c]
albus (Agaricus muscarius var.) P: 201-202, var. nov.†
albus (Agaricus pectinatus [var.]) SA: 562, var. nov.
allochroa (Botrytis) G: 553 ← [LM 3: 14]: Fr 3: 402
alni (Erysiphe) Re: 55, M: 131, G: 589, as "Erysibe" ← [LDC: 57]
alternatum (Acremonium) G: 550 ← [LM 3: 15]: Fr 3: 425
amanitae (Agaricus tuberosus var.) M: 72 ← [BEPC 1: 109 (Agaricus _____)]
amethystea (Auricularia reflexa var.) M: 34 ← [BH: 282, pl. 483, figs. 1A-F]
artocreas (Sphaeria) PSS no. 151 ← [TM 2: 20]: Fr 2: 523
asclepiadicola (Sphaeria lichenoides var.) M: 146, var. nov.
aucupariae (Hypoderma xylomoides var.) M: 152, var. nov. ?†
aurantiaca (Byssus) SA: 526, M: 12 ← [LDC: 13]
aurantiaca (Clavaria muscoides var.) M: 32, var. nov. ?†
aurantiaca (Himantia) LD 21: 165 ← [LDC: 13(Byssus)]
aureum (Sporotrichum) G: 551 ← [LM 3: 13, as "Sporothrichum"]: Fr 3: 418

-- B --

Additions and corrections (cf. Part I)

badium (Sporotrichum) G: 551 ← [LM 3: 12, as "Sporothrichum"]
ballotaecola (Sphaeria lichenoides var.) M: 146, var. nov.
barbajobi (Hydnum) M: 37 ← [With III 4: 337 "barba-jovis" ← BH: 303, pl. 481, fig. 2 "barbajovis"]
berberidis (Hypoderma xylomoides var.) M: 152, var. nov. ?†
betaecola (Sphaeria lichenoides var.) M: 146, var. nov.
bicolor (Stachylidium) G: 553 ← [LM 3: 15]: Fr 3: 391
brassicae (Astoma) G: 524 ← [Dick 1: 23 (Sphaeria) ← "Bergius, Acta Holm. 1765: 213" (Lycoperdon)]
buccinalis (Merulius) P: 180 ← [With IV 4: 149]
buxicola (Sphaeria lichenoides var.) M: 147, var. nov.

-- C --

caerulea (Auricularia) M: 35-36 ← ["Lamarck, Fl. Franc. 1: 103"]
caerulea (Peziza) G: 665 ← [Bolt: 108, pl. 108, fig. 2]: Fr 2: 86 "coerulea"
caerulea (Thelephora) SA: 544 ← ["Lamarck, Fl. Franc. 1: 103"]
caeruleum (Hydnum suaveolens [var.]) Fr: 402, not through 406 ← [FD 22: 7, pl. 1374 "coeruleum"]
caerulescens (Cortinaria cyana [var.]) G: 627 ← [PS: 277 (Agaricus cyanus [var.] _____) ← Sch 4: 17 (Agaricus _____)]
caerulescens (Agaricus pratensis _____) HFD: 12, t. 1731, fig. 1† ← [Fr: 100 (Agaricus pratensis β ericosus b. _____)]
caeruleus (Hypochnus) Schl: 58, LD 22: 368 ← [DC 2: 107 ← "Schrader in Schleicher, Crypt. Exs."]
caesarea ([Agaricus] aurantiacus var.) M: 88 ← [PS: 252 (Amanita)]
caesarius (Agaricus) Fr: 15, not 5 ← ["Scopoli, Fl. Carn. II p. II, p. 419"]
caesia (Peziza) G: 665 ← [PS: 657]: Fr 2: 108
caesia (Thelephora) Fr: 449 ← [PS: 579 ← POM 1: 15, t. 3, fig. 6 (Corticium)]
caesium (Gonytrichum) LD: 19: 194 ← ["Nova Acta Akad. Leop.-Carol. Nat. Cur. 9: 244"]: Fr 3: 348 (Myxotrichum)
caesium (Boletus) G: 640 ← [Schr: 167]
caesius (Polyporus) Fr: 360 ← [Schr: 167 (Boletus)]
caespitosa (Monilia) P: 320-321 ← ["Relhan, ed. alt. no. 1342"]
caespitosa (Onygena) M: 127 ← [PJB 2: 30]
caespitosa (Sphaeria) Spr: 279 ← [TM 2: 41]
calamistratus (Agaricus) Fr: 256, sp. nov.
calcea (Auricularia) M: 35 ← [PS: 581 (Thelephora)]
calcea (Thelephora) L: 469, SA: 543 ← [PS: 581]
calceoliformis (Grifola badia [var.]) G: 644 ← [BH: 338 (Boletus "calceolus")]
calceolus (Boletus) M: 43, SA: 552 ← [BH: 338, pl. 360]
calciiformis (Crinula) Fr: 493, sp. nov.
calicioides (Peziza) M: 23 ← [DC 2: 81]: Fr 2: 115
callisteus (Agaricus) Fr: 228 ← [PO 2: 51]
callochroa (Cortinaria) G: 629 ← [PS: 282-283 (Agaricus)]
callosa (Peziza) M: 21, SA: 530-531 ← [BH: 254, pl. 416, fig. 1]
callosus (Agaricus) Fr: 292, nom. nov.
callosus (Polyporus) Fr: 381, nom. nov.
calochrous (Agaricus) Fr: 224 ← [SpM: 16, "callochrous"]
calophyllus (Agaricus) Fr: 210 ← [PS: 464]
calopus (Agaricus) Fr: 130 ← [PS: 373, "callopus"]
calopus (Boletus) Fr: 390 ← [PS: 513]

calthaecola (Sphaeria lichenoides var.) M: 147, var. nov.
calva (Sphaeria) Schl: 59 ← [TM 2: 16]: Fr 2: 451
calyculus (Peziza) P: 458 ← [BEF: 123, pl. 12, fig. 57]
camarophyllus (Agaricus) Fr: 99 ← [A&S: 177]
cameleo (Agaricus) M: 73 ← [BH: pl. 545, fig. 1, "cameleon"]
campanella (Agaricus) Fr: 166, not 167 ← [BEF: 74]
campanulae (Xyloma) SA: 518 ← [DC 6: 159]
campanulaeformis (Agaricus) P: 239, sp. nov.
campanulata (Agaricus) Fr: 295, not 296 ← [BH: 431, pl. 552, fig. 1]
campanulata (Helvella fuliginosa var.) P: 257-258, nom. nov.†
campanulata (Peziza cerea var.) M: 25, var. nov.
campanulatus (Agaricus) M: 59, H: 24, P: 230-231, L: 473 ← [LSP: 1175]
campanulatus (Agaricus filopes var.) M: 63 ← [LSP: 1175 (Agaricus _____)]
campestris (Agaricus) Fr: 281, K: 17-18, P: 409, H: 21 ← [LSP: 1173]
campestris (Agaricus pratella) Z: 310† ← [LSP: 1173 (Agaricus _____)]
campestris (Agaricus edulis var.) M: 61 ← [LSP: 1173 (Agaricus _____)]
campestris (Pratella) G: 626 ← [LSP: 1173 (Agaricus)]
campestris, vaporarius (Agaricus [Pratella]) K: 19†
camphoratus (Agaricus) Fr: 218, sp. nov.
camphoratus (Agaricus) P: 193-194† ← [BH: 493, pl. 567 fig. 1]
canaliculata (Clavaria) Fr: 484 ← [FO 2: 294]
canaliculata (Clavaria) ENA: 213, sp. nov.
canaliculatus (Agaricus) Fr: 46, not 40 ← [Sae 2: 331]
candicans (Agaricus) Fr: 91 ← [PS: 456]
candicans (Omphalia) G: 613 ← [PS: 456 (Agaricus)]
candida (Aegerita) G: 546 ← [PD: 40]: Fr 3: 220
candida (Byssus) L: 466, SA: 525, M: 11 ← [HFA: 607]
candida (Himantia) Schl: 57, H: 35, LD 21: 162 ← [HFA: 607 (Byssus)]
candida (Solenia) Schl: 59 ← [HDF: p.f. pl. 8]
candidum (Byssocladium) G: 551 ← ["LM 7: 13"]
candidum (Coremium) G: 563 ← [PD: 40]
candidum (Fusidium) G: 544 ← [LM 3: 8]: Fr 3: 481
candidum (Geotrichum) LD 18: 445 ← [LM 3: 17]
candidum (Hydnum) Fr: 400 ← [SMH 1: 89]
candidum (Penicillium) G: 553 ← [LM 3: 17]: Fr 2: 409
candidum (Sporotrichum) G: 551 ← [LM 3: 13 ("Sporothichum")]
candidus (Agaricus) Fr: 249 ← [BEFC 1: 133]
candollianus (Agaricus) Fr: 296 ← [FO 2:.182]
caninus (Mucor) G: 561 ← [POM 1: 96]: Fr 3: 320
canobrunneus (Agaricus) Fr: 294, not 299 ← [BEFC 1: 133]
cantharelloides (Merulius) P: 392 ← [SEF: t. 47 (Agaricus) BH: 297, pl. 473 fig. 3 (Helvella)]
cantharellus (Agaricus) Schl: 56 ← [LSP: 1171 "chantarellus"]
cantharellus (Agaricus [Merulius]) K: 13-14 ← [LSP: 1171 (Agaricus "chantarellus")]
cantharellus (Merulius) SA: 556, H: 25, N&B: 332, R: 53, M: 47, P: 392, L: 471 ← [LSP: 1171 (Agaricus "chantarellus")]
caperatus (Agaricus) Fr: 241 ← [POM 1: 48]
capillaris (Agaricus) Fr: 160 ← [Sae 2: 268]
capitatum (Geoglossum hirsutum [var.]) H: 30, ?var. nov.
capitatus (Thamnomyces) E: 519 ← ["Link"]: Fr 3: index
capniocephalus (Agaricus) M: 71† ← [BH: 570, pl. 547, fig. 2]
capnoides (Agaricus) Fr: 289, nom nov.
caput-medusae (Hydnum) Fr: 409†, M: 37†, LD 22: 96† ← [BH: 210 "caput-medusae" (Clavaria)]
carbonaceum (Phacidium) FSS no. 210 ← ["Fries. Vetensk, Akad. Handl. 1817: 106"]: Fr 2: 574
carbonarium (Astoma) G: 524, sp. nov.
carbonarius (Agaricus) Fr: 252 ← [FO 2: 33]
carbonarius (Polyporus) Fr: 349, nom. nov.
cardarella (Agaricus) Fr: 84 ← ["Batt," polynomial]
caricinum (Leptostroma) FSS no. 176 ← [FO 2: 361 (Xyloma)]: Fr 2: 598
cariophyllea (Auricularia) M: 33-34 ← [BH: 284 "caryophyllea" ← Sch 4: 115 (Elvela "caryophyllaea")]

cariophyllea (Thelephora) SA: 542 ← [BH: 284 "caryophyllea (Auricularia)← Sch 4: 115 (Elvela "caryophyllaea")]
carnea (Isaria) M: 13 ← [POM 1: 13, not 3]
carneum (Geoglossum) Fr: 490 ← [SS: 496]
carneum (Hydnum) Fr: 420 ← [PO 2: 268 (Sistotrema)]
carneus (Agaricus) Fr: 130, M: 74 ← [BH: 555, pl. 533, fig. 1]
carphosperma (Cytispora) FSS no. 155, sp. nov.: Fr 2: 543
carpinea (Sphaeria) Schl: 59 ← [SEF: pl. 376, "carpina"]
carpineus (Boletus) G: 641 ← [SEF: pl. 231]
carpini (Nemaspora) G: 532 ← [SEF: pl. 376, "carpina" (Sphaeria)]
carpini (Sclerotium pustullata var.) M: 130, ?var. nov.
carpini (Sphaeria) P: 286-287, M: 143 ← [SEF: pl. 376, "carpina"]
cartilaginea (Patellaria) G: 664 ← [Bolt: 101, pl. 101 (Peziza)]
cartilagineus (Agaricus) Fr: 46, M: 77 ← [BH: 596, pl. 589 fig. 2 "cartilaginosus" of index]
caryophyllea (Auricularia) P: 261 ← [BH: 284 ← Sch 4: 115 (Elvela "caryophyllaea")]
caryophyllea (Craterella, as "Cratella") G: 652 ← [Sch 4: 115 (Elvela "caryophyllaea")]
caryophyllea (Thelephora) Fr: 430, H: 29 ← [Sch 4: 115 (Elvela "caryophyllaea")]
caseus (Mucor) P: 502 ← [WSA 4: 396]
casispermum (Helmisporium) LD 20: 496 ← ["LM 3: ?"]
castanea (Sclerotium pustullata var.) M: 130, ?var. nov.
castaneae (Sphaeria) Schl: 59, ?sp. nov.: Fr 2: 525
castaneae (Sphaeria punctiformis var.) Schl: 59, ?var. nov.
castaneae (Xyloma) Schl: 60, ?sp. nov.
castaneaecola (Sphaeria lichenoides var.) M: 146, var. nov.
castaneus (Agaricus) Fr: 235, not 236, R: 38, P: 394, M: 82-83 ← [BH: 658, pl. 268]
castaneus (Boletus) Fr: 392, M: 45, SA: 554 ← [BH: 324, pl. 328]
castaneus (Polyporus) Fr: 369, nom. nov.
caudicina (Lepiota) G: 603 ← [PD: 19 (Agaricus)]
caudicinus (Agaricus) N&B: 310 ← [PD: 19]
caudicinus (Agaricus annularius var.) M: 85 ← [PD: 19 (Agaricus _____)]
caudicinus (Agaricus [Lepiota]) K: 10-11 ← [PD: 19 (Agaricus _____)]
caulicinalis (Agaricus) M: 79 ← [BH: 545, pl. 522, fig. 1]
cellare (Raccdium) H: 34, G: 557-558 ← [PD: 43]
cellulariaeformis (Peziza) G: 666 ← [SEF: pl. 91, "cellularia"]
centrifugus (Agaricus) Fr: 222, sp. nov.
centro adfixus (Agaricus epixylon var.) M: 50†
centunculus (Agaricus) Fr: 262, sp. nov.
cepaestipes (Agaricus) M: 84 ← [SEF: pl. 2]
cepaestipes (Coprinus) G: 633 ← [SEF: pl. 2 (Agaricus)]
ceraceus (Agaricus) Fr: 102, H: 23 ← [WJ 2: 105]
ceraceus (Gymnopus) G: 607 ← [WJ 2: 105 (Agaricus)]
ceranoides (Clavaria) Fr: 481, with Sowerby as author, = C. rugosa ← [PS: 594]
ceranoides (Ramaria) G: 665 ← [PS: 594 (Clavaria)]
cerasi (Peziza) P: 264†, M: 20 ← [PD: 35]
cerasi (Hydnum) M: 37-38 ← [PS: 552 (Sistotrema) ← POM 2: 16 (Odontia)]
cerasi (Polyporus) Fr: 382 ← [PS: 552 (Sistotrema) ← POM 2: 16 (Odontia)]
cerato-sperma (Nemania) G: 518 ← [BH: 184 (Variolaria "ceratosperma")]
ceratosperma (Sphaeria) N&B: 297, Schl: 59, SA: 522-523, M: 142 ← [BH: 184 (Variolaria)]
cerea (Peziza) Re: 49, P: 461, M: 25 ← [BH: pl. 44, not p. 270]
cerebrina (Tremella) P: 176, M: 28, SA: 536 ← [BH: 221, pl. 386]
cereolus (Agaricus pratella) Z: 309† ← [Sch 4: 22]
cereus (Macroscyphus) G: 672 ← [BH: pl. 44, not p. 270 (Peziza)]
cernuus (Agaricus) Fr: 298, with Vahl as author ← [FD 17: 9, pl. 1008, fig. 1]
cernuus (Agaricus pratella) Z: 310† ← [FD 17: 9, pl. 1008, fig. 1 (Agaricus _____)]
cespititia (Amanita) R: 36 ← ["Dubois"]
cetratus (Agaricus) Fr: 207 ← [PO 2: 218]
cerussatus (Agaricus) Fr: 92, sp. nov.
cervinus (Agaricus) Fr: 82, "cerinus" of index ← [PS: 451 ← "Hoffmann. Nomenclator 119"]
chalybeus (Agaricus) Fr: 203, "chalybaeus" of index ← [PS: 343]

chalybeus (Gymnopus) G: 608 ← [PS: 343 (Agaricus)]
chama (Agaricus) Fr: 181, not 131 ← [Bosc: 85]
chamaeformis (Agaricus) Schl: 56, ?sp. nov.
chamissonis (Thamnomyces) E: 519, ?sp. nov. : Fr 3: index
chartacea (Thelephora) Fr: 437 ← ["Mey. Ess.: 305"]
chelidonicola (Sphaeria lichenoides var.) M: 146, var. nov.
chionea (Peziza) LD 20: 509† ← [?] : Fr 2: 132
chioneus (Polyporus) Fr: 359 ← [FO 1: 125]
chloranthus (Agaricus) Fr: 152 ← [FO 1: 156]
chlorophanus (Agaricus) Fr: 103, sp. nov.
chrisenterus (Agaricus) M: 74-75 ← [BH: 565, pl. 556, fig. 1, "chrysenteron"]
chrysenteron (Boletus) M: 45, SA: 555, R: 24 ← [BH: 328, pl. 490, fig. 3]
chrysenterus (Agaricus) Fr: 126 ← [BH: 565, pl. 556, fig. 1, "chrysenteron"]
chrysocoma (Hymenoscyphus) G: 674 ← [BH: 254, pl. 376, fig. 2 (Peziza)]
chrysocoma (Peziza) P: 462, M: 21-22, SA: 532 ← [BH: 254, pl. 376, fig. 2] : Fr 2: 140
chrysocoma (Peziza chrysocoma var.) M: 21 ← [BH: 254]
chrysodon (Agaricus) Fr: 32 ← [BEFC 2: 79]
chrysodon (Agaricus gymnopus) Z: 95† ← [BEFC 2: 79 (Agaricus _____)]
chrysoleucus (Agaricus) Fr: 167 ← [PS: 457]
chrysophyllus (Agaricus) Fr: 167, nom. nov.
chrysosperma (Cytispora) FSS no. 154 ← [PRNB 1: 82 (Sphaeria)]: Fr 2: 542
chrysosperma (Naemaspora) LD 22: 386, M: 148 ← [PRNB 1: 82 (Sphaeria)]
chrysosperma (Nemaspora) G: 532, SA: 524, Spr: 278† ← [PRNB 1: 82 (Sphaeria)]
chrysospermus (Mucor) P: 502 ← [BH: 99, pl. 504, fig. 1] : Fr 3: 438 (Sepedonium)
cibarium (Tuber) L: 485, R: 54, H: 10, N&B: 351, SA: 619, K: 39-40, G: 592 ← [BH: 74] : Fr 2: 290
cibarius (Cantharellus) Fr: 318, nom. nov.
cichoraceum (Erysiphe) M: 132-133 ← [DC 2: 274]
ciliaris (Coprinus) G: 633 ← [Bolt: 53, pl. 53 (Agaricus)]
ciliaris (Sphaeria) P: 493, LD 22: 386, SA: 524, M: 143 ← [BH: 173, pl. 468, fig. 1 (Hypoxylon)] : Fr 3: 355†
ciliata (Peziza) M: 21, SA: 531-532 ← [BH: 257, pl. 438, fig. 2]
ciliatula (Sphaeria) FSS no. 147, sp. nov.: Fr 2: 406
ciliatum (Engizostoma) G: 520 ← [PS: 35 (Sphaeria) ← POM 2: 67 (Sphaeria)] : Fr 2: 394
ciliatus (Polyporus) Fr: 349 ← [FO 1: 123]
cilicioides (Agaricus) Fr: 63, not 65, sp. nov.
cimicarius (Agaricus) P: 191-192 ← [BEFC 1: 22, 59, pl. 15]
cimicarius (Lactarius subdulcis [var.]) G: 625 ← [BEFC 1: 59 (Agaricus _____)]
cimmerius (Agaricus) Fr: 150, sp. nov.
cincinnatus (Agaricus) Fr: 256, nom. nov.
cinctulus (Agaricus) P: 229-230 ← [Bolt: 152, pl. 152]
cinctulus (Coprinus) G: 633 ← [BH: 152, pl. 152 (Agaricus)]
cinerea (Auricularia) M: 35, as sp. nov. ← [PS: 579 (Thelephora) ← PD: 31 (Corticium)]
cinerea (Auricularia cariophyllea var.) M: 33 ← [BH: 284]
cinerea (Auricularia papyrina var.) M: 35 ← [BH: 280]
cinerea (Auricularia reflexa var.) M: 34 ← [BH: 282]
cinerea (Botrytis) N&B: 367 ← [PD: 40, "cinerascens", :47 as "cinerea"] : Fr 3: 396
cinerea (Cerrena) G: 649 ← [PS: 551 (Sistotrema) ← PD: 29 (Sistotrema)]
cinerea (Clavaria) Fr: 468, M: 32, L: 468 ← [BH: 204, pl. 354]
cinerea (Cortinaria) G: 628 ← [PS: 279 "violaceo-cinereus" ← PC: 2 "violaceo-cinereus" ← Sch 4: 2 "violaceus"]
cinerea (Daedalea) Fr: 336 ← [FO 1: 105]
cinerea (Morchella esculenta var.) M: 90 ← [BH: 274]
cinerea (Octospora) G: 667 ← [PS: 634 (Peziza) ← BEFC 1: 197 (Peziza)]
cinerea (Peziza) M: 20, P: 463 ← [BEFC 1: 197] : Fr 2: 142
cinerea (Peziza imberbis var.) M: 22-23 ← [BH: 245]
cinerea (Ramaria) G: 656 ← [BH: 204 (Clavaria)]
cinerea (Thelephora) Fr: 453, not 435 ← [PD: 31 (Corticium)]
cinerescens (Agaricus) M: 76-77, SA: 580 ← [BH: 598, pl. 428 fig. 2]
cinereum (Hydnum) Fr: 404, M: 38 ← [BH: 309, pl. 419]

cinereum (Xyloma) M: 150 ← [A&S: 61 (Xyloma pini [var.] _____)]
cinereus (Agaricus) Fr: 310, with Bulliard as author ← [BH: index, not 398]
cinereus (Agaricus) P: 233†, P: 419, L: 472, M: 56, H: 24 ← [Sch 4: 44]
cinereus (Agaricus coprinus) Z: 110† ← [Sch 4: 44 (Agaricus _____)]
cinereus (Cantharellus) Fr: 320 [PD: 26]
cinereus (Coprinus) G: 634 ← [Sch 4: 44 (Agaricus)]
cinereus (Merulius hydrolips var.) M: 48 [PID: 10]
cinnabarina (Aegerita) M: 15 ← [PS: 697 (Dematium)]
cinnabarina (Gyraria) G: 595 ← [BH: 218 (Tremella)]
cinnabarina (Torula) Schl: 60 ← ["Mart."]
cinnabarina (Tuberculariа) M: 129 ← [BH: 218 (Tremella)] : Fr 2: 233?
cinnabarinus (Agaricus araneosus var.) M: 82, SA: 583 ← [DC 2: 198]
cinnabarinus (Coniocarpon) Re: 48 ← [LDC: 68]
cinnabarinus (Polyporus) Fr: 371 ← [JFA 4: 2]
cinnamomea (Strilia) G: 645 ← [JOB: 116 (Boletus)]
cinnamomeus (Agaricus) H: 22, P: 220 ← [LSP: 1173]
cinnamomeus (Agaricus cinnamomeus [var.]) Fr: 229 ← [LSP: 1173, (Agaricus _____)]
cinnamomea (Cortinaria) G: 630 ← [LSP: 1173 (Agaricus)]
circeus (Agaricus) SA: 576† ← [BH: 523, "criceus"]
circinnata (Amanita) G: 600 ← [PS: 255 (Amanita rubescens [var.] _____)]
circumvallatum (Astoma) G: 525 ← [SEF: pl. 373 (Sphaeria)]
cirrhatum (Hydnum) Fr: 411 ← [PD: 29, "cirratum"]
citrina (Amanita) G: 599, R: 47 ← [Sch 4: 11 (Agaricus)]
citrina (Calycina) G: 670 ← [PD: 34 (Peziza) ← "Hedwig. Musc. 28, t. 8, fig. B"]
citrina (Peziza) P: 457 ← [PD: 34 ← "Hedwig. Musc. 28, t. 8, fig. B"] : Fr 2: 131
citrinellus (Agaricus) Fr: 155 ← [PID: 44]
citrinus (Boletus) G: 643 ← [PS: 524 ← "Plan. Fung. Erfurt 26"]
clandestina (Peziza) M: 23, SA: 533 ← [BH: 251, pl. 416, fig. 5] : Fr 2: 94
clandestinus (Agaricus) Fr: 206 ← [PO 2: 166]
clathroides (Hydnum) Fr: 409, with Bulliard as author ← [PRR 2: an. p. 51]
clavariae formis (Tremella) LD 20: 140† ← [?, not validly published]
clavata (Sphaeria) SA: 523, LD 22: 386, M: 142-143 ← [BH: 171, pl. 444, fig. 4 (Hypoxylon)]
clavatum (Coryne) G: 595 ← [PCC: 90 (Acrospermum)]
clavatus (Cantharellus) Fr: 322, nom. nov.
clavatus (Gomphus) G: 638 ← [PS: 498 (Merulius) ← POM 1: 21 (Merulius)]
clavicularis (Agaricus) Fr: 158, sp. nov.
claviformis (Merulius) LD 19: 194†
claviformis (Mycena) G: 621 ← [HFA: 622, "clavus" (Agaricus)]
claviformis (Sphaeria) P: 279, G: 529 ← [SEF: pl. 337]
clavipes (Agaricus) Fr: 86 ← [PS: 353]
clavus (Agaricus) Fr: 134, with Bulliard as author ← [BH: pl. 148 "clavis" ← ← LSpPl: 1644]
clavus (Agaricus) L: 474, SA: 572, N&B: 318, H: 21, M: 65, P: 236-237 ← ← [LSpPl: 1644]
clavus (Sclerotium) M: 129-130, PBR: 43, SA: 618, N&B: 303 ← [DC 6: 115 ← "Bibl. Banks 3: 429"]
clypeatus (Agaricus) H: 22 ← [LSP: 1174]
clypeolarius (Agaricus) Fr: 21, H: 23, M: 86, N&B: 309, P: 420-421, SA:587, HFD: 12, pl. 1732, fig. 1, R: 39 ← [BH: 482, pl. 506, fig. 2; pl. 405]
coccinea (Cucurbitaria) G: 519 ← [PS: 49 (Sphaeria) ← PID: 47 (Sphaeria)]
coccinea (Peziza) N&B: 347, P: 458, SA: 533-534, M: 24-25 ← [Sch 4: 100 (Elvela)]
coccinea (Sphaeria) Schl: 59, PSS no. 183, H: 7 ← [PS: 49 (Sphaeria) ← PID: 47 (Sphaeria)] : Fr 2: 412
coccinea (Thelactis) MNA: 509, sp. nov.
coccineus (Agaricus) Fr: 105, not 108, with Wulfen as author ← [DC 2: 186 ← Sch 4: 70]
coccineus (Agaricus) L: 474, M: 76, SA: 579-580 ← [DC 2: 186 ← Sch 4: 70]
coccineus (Agaricus gymnopus) Z: 97† ← [WJ 2: 106 (Agaricus _____)]
coccineus (Boletus) M: 40, SA: 549 ← [BH: 364, pl. 501, fig. 1)]
coccineus (Clavaria) P: 476-477 ← [SEF: pl. 294]
coccineus (Macroscyphus) G: 672 ← [Sch 4: 100 (Elvela)]

cochleata (Omphalia) G: 612 ← [PD: 22 (Agaricus) ← "Abbild. d. Schwämme 3"]
cochleata (Peziza) P: 461-462, M: 26†, L: 467, SA: 534 [LSP: 1181] : Fr 2: 50†
cochleata (Peziza) N&B: 348 ← [LDC: 18]
cochleatus (Agaricus) Fr: 177 ← [PD: 22 ← "Abbild. d. Schwämme 3"]
cochleatus (Agaricus (Omphalia)) K: 15 ← [PD: 22 (Agaricus _____) ← "Abbild. d. Schwämme 3"]
coeruleus (Agaricus Gymnopus) Z: 96†
coffeatus (Agaricus) Fr: 85, sp. nov.
cohaerens (Agaricus) Fr: 253 ← [PS: 306]
cohaerens (Sphaeria) Schl: 59, N&B: 296 ← [PD: 2] : Fr 2: 333.
collariatum (Micromphale) G: 622 ← [With: 148 (Merulius)]
collariatus (Merulius) H: 25, P: 390 ← [With: 148]
collematiformis (Tremella) Schl: 60, ? sp. nov.
collinita (Cortinaria) G: 628 ← [SEP: pl. 9 (Agaricus)]
collinitus (Agaricus) Fr: 248, P: 181-182 ← [SEP: pl. 9]
collinus (Agaricus) Fr: 124 ← [Sch 4: 52, not Scopoli (polynomial)]
collinus (Agaricus gymnopus) Z: 91† ← Sch 4: 52 (Agaricus _____)]
collinus (Gymnopus) G: 607 ← [Sch 4: 52 (Agaricus)]
colubrina (Lepiota) G: 601-602 ← [PS: 258 (Agaricus)]
colubinus (Agaricus) M: 86 ← [BH: 484, pl. 583]
columbarius (Agaricus) M: 78 [BH: index]
columbetta (Agaricus) Fr: 44, nom. nov.
colus (Agaricus) P: 221 (P: 422) ← [With 4: 282]
comata (Sphaeria) M: 144-145 ← [TM 2: 15] : Fr 2: 504
comatus (Agaricus coprinus) Fr: 307†, with Müller as author ← [Schmidel, ic.: 42, pl. 10]
comatus (Agaricus coprinus) Z: 108† ← [PD: 62 (Coprinus)]
comatus (Coprinus) G: 633-634 ← [PD: 62]
comedens (Thelephora) Fr: 447 ← ["Nees Syst. 239"]
comitialis (Agaricus) Fr: 86 ← [PS: 352]
commune (Schizophyllum) Fr: 330, nom. nov.
communis (Agaricus fistulosus var.) M: 63, var. nov.
communis (Boletus) P: 242 ← [SEP: p. f. pl. 225 ← BH: index†]
communis (Sphaeria) G: 528 ← [SEP: pl. 295]
commutatum (Phacidium) FSS no. 164, ? sp. nov. (not in Syst. Mycol.)
compactum (Hydnum) Fr: 402, LD 22: 94 ← [PC 2: 57]
compactum (Sclerotium) FBR: 45, M: 130 ← [DC 6: 112] : Fr 2: 258
compactus (Agaricus) Fr: 290 ← [Sae 2: 285]
complanata (Sphaeria) M: 146 ← [DC 2: 299] : Fr 2: 508
complanata (Sphaeria herbarum [var.] H: 7 ← [DC 2: 299 (Sphaeria _____)]
complanatum (Sclerotium) G: 592 ← [TM: 5] : Fr 2: 248
composita (Nemaspora) G: 532 ← [SEP: pl. 237 (Sphaeria)]
compressa (Clavaria tomentosa var.) M: 33, var. nov.
compressa (Peziza) Schl: 58 ← [PD: 35] : Fr 2: 152
compressa (Rhizomorpha fragilis var.) M: 136, var. nov.
compressa (Sphaeria) G: 531 ← [PS: 56, not 54] : Fr 2: 470
compressus (Agaricus) Fr: 115, P: 413 ← [With III 3: 354]
compressus (Gymnopus) G: 610 ← [With III 3: 354 (Agaricus)]
concava (Sphaeria) P: 494 ← [SEP: pl. 317]
concavum (Astoma) G: 526 ← [SEP: pl. 317 (Sphaeria)]
concentrica (Sphaeria) H: 4, FSS no. 141 ← [Bolt: 180, pl. 180]
concentrica (Thelephora) Fr: 446 ← [A&S: 279]
concentricum (Peripherostoma) G: 513 ← [Bolt: 180, pl. 180 (Sphaeria)]
concentricum (Xyloma) P: 316-317, N&B: 302 ← [POM 2: 101] : Fr 2: 331 (Sphaeria)
conchata (Thelephora) Fr: 438, sp. nov.
conchatus (Agaricus) Fr: 181, P: 239 (P: 429) ← [BH: index†]
conchatus (Agaricus inconstans var.) M: 51 ← [BH: index† (Agaricus _____)]
conchatus (Agaricus inconstans [var.]) SA: 561 ← [BH: index† (Agaricus _____)]
conchatus (Boletus) M: 41 ← [POM 1: 24]
conchatus (Polyporus) Fr: 376 ← [POM 1: 24]
concinnus (Polyporus) Fr: 350 ← [PPO 1: 73]

confertus (Prunulus) G: 631 ← [Bolt: 18, pl. 18 (Agaricus)]
confluens (Agaricus) Fr: 123 ← [POM 1: 8]
confluens (Agaricus gymnopus) Z: 95† ← [POM 1: 8 (Agaricus _____)]
confluens (Peripherostoma) G: 514, sp. nov.
confluens (Polyporus) Fr: 355, not 358 ← [A&S: 244 (Boletus)]
confluens (Sclerotium) M: 131, nom. nov.
confluens (Sistotrema) Fr: 426, G: 649 ← [PD: 28]
confluens (Thelephora) Fr: 447 ← [FO 1: 152]
confluens (Tuberculariа) H: 9, M: 129, Schl: 60 ← [PS: 113]
confluens (Xyloma acerina [var.]) G: 545, var. nov.
confluens (Xyloma salicinum [var.]) G: 545, var. nov.
confragrosa (Daedalea) Fr: 336, G: 638, P: 249-250 ← [Bolt: 160, pl. 160]
congregatus (Agaricus) P: 232†, (P: 235, 422), H: 23 ← [With 4: 280]
congregatus (Agaricus) N&B: 321, M: 57, L: 473, SA: 568 ← [BH: index†]
conica (Sphaeria) Spr: 279 ← [TM 2: 43] : Fr 2: 538 (Sphaeronema)
conicum (Relhanum) G: 661 ← [PS: 613 ← "Timm, Fl. Megap.: 263"]
conicus (Agaricus) Fr: 103, not 105, N&B: 315, R: 50 ← [Sch 4: 2, not Scopoli (Polynomial)]
conicus (Agaricus gymnopus) Z: 96† ← [Sch 4: 2 (Agaricus _____)]
conicus (Agaricus filopes var.) M: 63 ← [DC: 161]
conigenum (Hypoderma) M: 152 ← [PS: 102 (Hypoderma) ← POM 1: 30 (Hysterium)]
conigenus (Agaricus) Fr: 132 ← [PS: 388]
conjunctum (Circinostoma) G: 521 ← ["Nees Syst. 80" (Sphaeria)]
connata (Coltricia) G: 644, nom. nov.
connatum (Hydnum) Fr: 405 ← [SS: 491]
connatus (Agaricus) Fr: 97 ← [Sae 2: 299]
conocephalus (Agaricus) Fr: 304, M: 58-59 ← [BH: 449, pl. 563, fig. 1]
conopilus (Agaricus) Fr: 504, sp. nov.†
conopus (Agaricus) Fr: 219 ← [PS: 285]
consobrinus (Agaricus) Fr: 60 ← [FO 2: 195]
conspersum (Cenangium) FSS no. 171 ← ["Fries. Vetensk. Akad. Handl. 1817: 112"] Fr 2: 175.
conspersus (Agaricus) Fr: 260 ← [PID: 50]
conspersus (Agaricus) P: 234, 419 ← [With 4: 293]
constrictum (Leccinum) G: 647 ← [PS: 508 (Boletus)]
constrictus (Agaricus) Fr: 28, not 38, sp. nov.
contiguus (Agaricus) SA: 574, N&B: 328, M: 68, P: 398 ← [BH: 518, pl. 576, fig. 2; pl. 240]
contiguus (Boletus) Re: 51 ← [PS: 544]
contiguus (Polyporus) Fr: 378 ← [PS: 544 (Boletus)]
contorta (Clavaria) Fr: 478 ← [HBR 1: 29]
contorta (Phlebia) Fr: 427, not 417, sp. nov.
contortus (Agaricus) Fr: 122, M: 76, SA: 579 ← [BH: table of figs., not 612]
controversus (Agaricus) Fr: 62, R: 30 ← [PS: 430 (Agaricus lactifluus _____) ← POM 2: 39 (Lactarius _____)]
convallariae (Xyloma) Schl: 60, sp. nov. ?
convallariaecola (Sphaeria lichenoides var.) M: 146, var. nov.
convergens (Circinostoma) G: 521 ← [TM 2: 39 (Sphaeria)] : Fr 2: 410
convolvuli (Erysibe) G: 589 ← [DC 2: 274 (Erysiphe) ← LDC: 57]
convolvuli (Erysiphe) M: 133, SA: 615 ← [DC 2: 274 ← LDC: 57]
convolvulicola (Sphaeria lichenoides var.) M: 146, var. nov.
coprinus (Agaricus) Fr: 279 ← [FO 2: 2 (Amanita)]
coprophilus (Agaricus) Fr: 297, M: 58 ← [BH: 423, pl. 566, fig. 3]
copulatus (Agaricus) Fr: 504, E: 519, Spr: 310 ← [EHor: 86]
coralloides (Clavaria) Fr: 467, P: 269, 474-475, H: 29, SA: 540, L: 468, N&B: 343, M: 32, Schl: 56 ← [LSP: 1182]
coralloides (Hericium) G: 652 ← [Sch 4: 95 (Hydnum), not scopoli (Polynomial)]
coralloides (Hydnum) Fr: 408, LD 22: 96, N&B: 342, P: 450 ← [Sch 4: 95]
coralloides (Thelephora) Fr: 432, nom. nov.
coreacea (Tremella) Schl: 60, sp. nov. ?
coriacea (Clavaria) M: 33 ← [BH: 198, pl. 452, fig. 2]
coriacea (Peziza) M: 19 ← [BH: 258, pl. 438, fig. 1] : Fr 2: 159†
coriacea (Ramaria, as "Ramalaria") G: 656 ← [BH: 198, pl. 452, fig. 2 (Clavaria)]

coriacea (Sphaeria) G: 528 ← [SEF: pl. 371, fig. 1]
coriaceum (Merisma) N&B: 343 ← [LDC: 21 (Clavaria) ← BH: 198, pl. 452, fig. 2]
coriaceus (Agaricus) M: 50, N&B: 332, L: 471, SA: 559 ← [BH: 373, pl. 537, 394]
coriaceus (Apus) G: 617 ← [BH: 373, pl. 394, 537 (Agaricus)]
cornea (Auricularia) Spr: 310 ← [EHor: 91]
cornea (Clavaria) Fr: 486, P: 473, H: 30 ← [BEF: 139]
cornea (Corynoides) G: 654 ← [BEP: 139 (Clavaria)]
cornea(Tremella) Schl: 60, sp. nov. ?
cornicola (Sphaeria lichenoides var.) M: 146, var. nov.
corniculata (Clavaria) Fr: 471, ENA: 218 ← [Sch 4: 117]
corniculata (Ramaria) G: 655 ← [Sch 4: 117 (Clavaria)]
corniculata (Sphaeria) H: 6, Schl: 59 ← ["Ehrenberg. Pl. Crypt. Dec. 30, no. 300"] : Fr 2: 384
corniculatum (Engizostoma) G: 520 ← ["Ehrenberg. Pl. Crypt. Dec. 30, no. 300" (Sphaeria)]
cornucopioides (Agaricus) P: 189-190 ← [Bolt: 8, pl. 8]
cornucopioides (Cantharellus) Fr: 321, G: 636-637 ← [PS: 491 (Merulius) ← LSP: 1181 (Peziza)]
cornucopioides (Merulius) M: 48, L: 471 ← [PS: 491 (Merulius) ← LSP: 1181 (Peziza)]
cornucopioides (Omphalia cochleata [var.]) G: 612 ← [Bolt: 8, pl. 8 (Agaricus _____)]
cornucopioides (Peziza) Schl: 58, P: 465† ← [PS: 491 (Merulius) ← LSP: 1181 (Peziza)]
cornuta (Hypoxylon cornutum var. Sphaeria _____) M: 137-138†
cornuta (Sphaeria) SA: 520, L: 485-486 ← [BH: 193 ← "Hoffmann, Crypt. II, pl. 3, fig. 1, fasc. 1"]
cornutum (Hypoxylon) G: 512 ← [BH: 193 ← "Hoffmann, Crypt., II, pl. 3, fig. 1, fasc. 1" (Sphaeria)]
cornutum (Hypoxylon) M: 137-138, sp. nov. ?
cornutum (Sclerotium) FBR: 44, in obs.† ← [?]
coronata (Peziza) M: 23 ← [BH: 251, pl. 416, fig. 4] : Fr 2: 120
coronata (Sphaeria) P: 489, M: 142 ← [With: 394 ← "Hoffmann, Pl. Crypt. fasc. 1, pl. 5, figs. 4, 5"] : Fr 2: 395
coronatum (Phacidium) FSS no. 165 ← [Sae 2: 437 (Ascobolus)] : Fr 2: 577
coronatum (Phacidium) Schl: 58† ← ["K"]
coronilla (Agaricus) M: 84 ← [BH: 633, pl. 597, fig. 1]
coronillae (Corynium) Schl: 57, sp. nov. ?
coronillus (Agaricus) Fr: 282 ← [BH: 633, pl. 597, fig. 1]
corrugatum (Hydnum) Fr: 414 ← [FO 2: 269]
corrugis (Agaricus) Fr: 298 ← [PD: 24]
corticalis (Agaricus) N&B: 318, M: 69 ← [BH: 475, pl. 519, fig. 1]
corticalis (Agaricus) P: 213 (211†), stat. nov.
corticalis (Auricularia) P: 455, M: 35 ← [BH: 285, pl. 436]
corticalis (Peziza) M: 22 ← [PD: 33] : Fr 2: 96
corticalis (Rhizomorpha) P: 306-307, sp. nov.
corticalis (Sphaeria) P: 281-282 ← [With 4: 394]
corticalis (Sphaeria byssiseda var.) M: 144, var. nov.
corticalis (Thelephora) L: 469, SA: 543-544 ← [BH: 285, pl. 436 (Auricularia)]
corticatus (Agaricus) Fr: 179 ← [FO 1: 92]
corticisedum (Hysterium octraceum var.) M: 153, var. nov.?
corticola (Agaricus) Fr: 159 ← [PS: 394 "corticalis" ← BH: 475 "corticalis"]
corticola (Mycena) G: 621 ← [BH: 475, pl. 519, fig. 1 (Agaricus "corticalis")]
corticola (Polyporus) Fr: 385, sp. nov.
coruscans (Agaricus) Fr: 227, sp. nov.
corylaria (Sphaeria punctiformis var.) M: 146, var. nov.: Fr 2: 525
corylea (Sclerotium erysiphe [var.]) H: 10 ← [LDC: 57 (Erysiphe _____)]
coryli (Erysiphe) Re: 55, SA: 614, M: 131 ← [LDC: 57]
coryli (Peziza) Schl: 58, sp. nov.?
coryli (Sphaeria) FSS no. 201 ← [BEFC 2: 131] : Fr 2: 436
coryli (Sphaeria fusca var.) M: 139 ← [DC 2: 287 (Sphaeria _____)]
coryli (Thelephora) Schl: 59, sp. nov.?
cotini (Hypoderma xylomoides var.) M: 152, var. nov. ?†

cotini (Hysterium) Schl: 58, sp. nov. ?
cotini (Sphaeria) Schl: 59, sp. nov. ?
cotoneastris (Xyloma) Schl: 60, sp. nov. ?
crampylus (Agaricus) Fr: 65 ← ["Otto, Ag. 67"]
craspedius (Agaricus) Fr: 187, nom. nov.
crassa (Isaria) G: 562 ← [PHC: 231]
crassipes (Agaricus) P: 199, 400, H: 20 ← [Sch 4: 38]
crassipes (Agaricus araneosus var.) SA: 583, M: 82 ← [DC 2: 198]
crassipes (Morchella) M: 90-91 ← [PS: 621 ← "Ventenat, Mem. Inst. Nat., France 1: 509" (Phallus)] : Fr 2: 9
craterium (Sphaeria) M: 145-146 ← [DC 2: 298]
crenata (Peziza) M: 25 ← [BH: 261, pl. 396, fig. 3]
crenatus (Agaricus mammosus var.) P: 219 ← [WSA 3: 248 (Agaricus _____)]
crenulatus (Agaricus) Fr: 112 ← [Sae 2: 293]
cretaceus (Agaricus) Fr: 95, not 195† ← [PS: 369]
cretaceus (Agaricus) Fr: 280†, P: 211-212, SA: 585, SB no. 594, pl. 594, fig. 2 ← [BH: 636, pl. 374]
cretaceus (Agaricus cepaestipes var.) M: 84 ← [DC 2: 202 ← BH: 636, pl. 374 (Agaricus _____)]
cretaceus (Coprinus cepaestipes [var.]) G: 633 ← [DC 2: 202 (Agaricus cepaestipes var. ___) ← BH: 636, pl. 374 (Agaricus _____)]
crinata (Peziza) M: 21 ← [BH: 249, "crinita"] : Fr 2: 89
crinitus (Agaricus) Fr: 175 ← [LSpPl: 1644]
crinitus (Polyporus) Fr: 362 ← ["Sprengel, Vetensk. Akad. Handl. 1820: 51"]
criptarum (Byssus) L: 466 ← [LFF 1: 102, as alga, "cryptarum"]
crispa (Peziza) P: 468 ← [SEF: pl. 427, "425"]
crispa (Sparassis) Fr: 465 ← [WJ 2: 100 (Clavaria)]
crispa (Thelephora) Fr: 437 ← [PS: 568]
crispatus (Merulius) Fr: 328 ← [FD 12: 6, pl. 716, fig. 2†, polynomial]
crispula (Clavaria) Fr: 470, sp. nov.
crispum (Hydnum) Fr: 415 ← [Sch 4: 97, not 98]
crispum (Hypoderma) SA: 516, G: 509 ← [PS: 101 (Hysterium)]
crispus (Cantharellus) Fr: 323, HFD: 13 ← [PD: 26 as "Cantarellus"]
crispus(Merulius) M: 49, Schl: 58 (as "Meruleus") ← [PD: 26 (Cantharellus, as "Cantarellus")]
crispus (Polyporus) Fr: 363 ← [PS: 529 (Boletus adustus var. _____) ← POM 2: 8 (Boletus _____)]
cristata (Clavaria) Fr: 473 ← [HBR 1: 92]
cristata (Grifola) G: 643 ← [Sch 4: 93 (Boletus)]
cristata (Lepiota colubrina [var.]) G: 602 ← ["Willdenow, Berol. 1104" (Agaricus _____)]
cristata (Sphaeria) Spr: 278, G: 531 ← [PS: 54, not 56]
cristata (Thelephora) Fr: 434 (with Fries as author) ← [PCC: 228 (Merisma, not Merulius)]
cristatum (Merisma) G: 653 ← [PCC: 228]
cristatus (Agaricus) Fr: 22† (with Batsch as author) ← [Bolt: 7, pl. 7]
cristatus (Polyporus) Fr: 356 ← [Sch 4: 93 (Boletus)]
cristulatum (Hydnum) Fr: 422, sp. nov.
crocatus (Agaricus) Fr: 148 ← [Schr: 126]
crocea (Clavaria) Fr: 472, Schl: 56 ← [PIC: 36]
crocea (Cortinaria) G: 630 ← [BEF: 71, (Agaricus "crocatus") ← Sch 4: 3, (Agaricus "croceus")]
crocea (Naemaspora) M: 148, Re: 48, Schl: 58 (as "Nemospora") ← [POM 1: 81] : Fr 3: 479
croceocaeruleus (Agaricus) Fr: 238 ← [PS: 341 "croceo-coeruleus" ← PID: 2 "croceo-caeruleus"]
croceofulvus (Agaricus) Fr: 214 ← [DC 6: 49, "croceo-fulvus"]
croceus (Agaricus) M: 78-79, L: 474, SA: 581 ← [BH: 553, pl. 524, fig. 3; pl. 50]
croceus (Agaricus) P: 197-198 (405) ← [Bolt: 51, pl. 51, fig. 2]
croceus (Polyporus) Fr: 364 ← [POM 1: 87 (Boletus)]
crocorum (Rhizoctonia) M: 134-135 ← [PS: 119 (Sclerotium)] : Fr 2: 265
crocorum (Sclerotium) FBR: 43 ← [PS: 119]

crocorum (Thanatophytum) G: 590 ← [PS: 119 (Sclerotium)]
cruciferarum (Albugo) G: 540 ← [LDC: 49 (Uredo)]
crucigerus (Agaricus) SA: 577-578, sp. nov.†
cruenta (Sphaeria) Schl: 59 ← [Kunze?] : Fr 2: 531
cruenta (Thelephora) Fr: 444, HFD: 13† ← [PS: 575]
cruenta (Tremella) P: 512, H: 32† ← [SEB 25: p.f. pl. 1800]
cruentus (Agaricus) Fr: 149, sp. nov.
cruentus (Hypochnus) Schl: 58 ← [SEB: p.f. pl. 1800 (Tremella)]
crustacea (Aegerita) M: 15, SA: 528 (as "Egerita") ← [DC 2: 72 ← BH: 100, pl. 504, fig. 2 (Mucor)]
crustacea (Nemania) G: 517 ← [SEF: pl. 372, fig. 11]
crustacea (Thelephora) Fr: 450 ← [Sae 2: 396]
crustosum (Hydnum) Fr: 419 ← [POM 2: 16 (Odontia)]
crustuliniformis (Agaricus) P: 196, M: 78, SA: 581 ← [BH: 589, pl. 308, 546]
cryptarum (Boletus) SA: 547, M: 39, L: 470 ← [BH: 350, pl. 478]
cryptarum (Byssus) SA: 526, M: 12 ← [LPF 1: 102, as alga]
cryptarum (Polyporus) Fr: 376 ← [BH: 350, pl. 478 (Boletus)]
cryptarum (Poria) G: 639 ← [BH: 350, pl. 478 (Boletus)]
crysantheron (Boletus) N&B: 334 ← [LDC: 26, "chrysenteron"]
crystallinus (Pilobolus) M: 128, H: 9-10, G: 562 ← [WH: 110 (Hydrogera)] : Fr 2: 308
cucullatus (Agaricus) Fr: 158 ← [PS: 372]
cucumis (Agaricus) Fr: 231 ← [POM 1: 45]
cuneifolius (Agaricus) Fr: 116 ← [PO 2: 99]
cupressiforme (Hypoxylon cornutum [var.]) G: 512 ← [WBA 3: 457 (Clavaria _____)]
cupularis (Agaricus) Fr: 269, M: 66 ← [BH: 529, pl. 554, fig. 2]
cupularis (Cantharellus) Fr: 325 ← [WFL: 529 (Merulius)]
cupularis (Cucurbitaria) G: 519 ← [POM 1: 65 (Sphaeria)] : Fr 2: 416
curtipes (Agaricus) Fr: 88, sp. nov.
curvirostra (Sphaeria) G: 530 ← [SEF: pl. 373, fig. 5] : Fr 2: 507
cuspidata (Prunulus gracilis [var.]) G: 631 ← [Bolt: 66, pl. 66, fig. 2 (Agaricus _____)]
cuticularis (Boletus) Re: 51, P: 445, M: 42 ← [BH: 350, pl. 462]
cuticularis (Polyporus) Fr: 363 ← [BH: 350, pl. 462 (Boletus)]
cuticulosa (Peziza) P: 263 ← [Dick 3: 22]
cyana (Cortinaria) G: 627 ← [PS: 276, not Sch]
cyanescens (Boletus) Fr: 395, M: 45, SA: 554 ← [BH: 329, pl. 369]
cyaneus (Agaricus) M: 60-61 ← [BH: 641, pl. 170, 530, fig. 1]
cyanocephalus (Mucor) MNA: 505, sp. nov. : Fr 3: 324
cyanoxanthus (Agaricus) N&B: 327 ← [PS: 445, "Agar. russ. cynoxanthus" ← Sch 4: 40]
cyanoxanthus (Agaricus [Russula]) K: 19-20 ← [PS: 445, "Agar. russ. cynoxanthus" ← Sch 4: 40]
cyathiforme (Hydnum) Fr: 405 ← [BH: 308 ← Sch 4: 93]
cyathiforme (Hydnum) SA: 545-546, LD 22: 94, M: 38 ← [Sch 4: 93]
cyathiformis (Agaricus) Fr: 173 ← [BH: 512, pls. 575, 568, fig. 1 (not pl. 248)]
cyathiformis (Agaricus) P: 207 ← [BH: 512, pl. 568, fig. 1 (not pls. 575, 248)]
cyathiformis (Agaricus) M: 67-68, P: 182-183 ← [BH: 512, pl. 248 (not pls. 568, 575)]
cyathiformis (Agaricus) SA: 574 ← [BH: 512, pls. 248, 575, 568, fig. 1]
cyathoidea (Peziza) M: 23 ← [LSP: 1181 "cyathoides"]
cyathoides (Omphalia) G: 614 ← [Bolt: 145, pl. 145 (Agaricus) ← BH: 512, "cyathiformis"]
cyathoides (Peziza) P: 264-265 ← [LSP: 1181]
cyathoideus (Hymenoscyphus) G: 674 ← [LSP: 1181 (Peziza)]
cyatiformis (Agaricus) N&B: 329 ← [BH: 512, "cyathiformis"]
cylindrica (Clavaria) SA: 538-539, M: 30-31 ← [BH: 212, pl. 463, fig. 1]
cylindrica (Clavaria) P: 472, G: 656 ← [SEF: pl. 90 ← BH: 212, pl. 463, fig. 1]
cylindrica (Clavaria lutea var.) M: 31 ← [BH: 212, pl. 463, fig. 1 (Clavaria cylindrica var. lutea)]
cylindrica (Xylaria albicans [var.]) G: 511 ← [SEF: pl. 90 (Clavaria _____) ← BH: 212, pl. 463, fig. 1 (Clavaria _____)]
cylindricum (Astoma) G: 523 ← [TM 2: 42 (Sphaeria)] : Fr 2: 538 (Sphaeronema)
cylindricus (Agaricus) P: 423 (232-233†), H: 23 ← [Sch 4: 5]
cynoxanthus (Agaricus russula) Z: 352† ← [PS: 445, not PCS: 37, not Sch]
cyparissiae (Sclerotium) SA: 618, FBR: 45 ← [DC 6: 114] : Fr 2: 256

MYCOTAXON

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BOOK REVIEWS

by

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INTRODUCTION TO BRITISH LICHENS, par Ursula K. DUNCAN, lxxiv + 292 p., 128 figs., 15 × 22 cm, toilé. Arbroath, T. Bunde & Co., distribué par The Richmond Publishers, Orchard Road, Richmond, Surrey, U.K., 1970. £ 4.00.

Conçu sur le modèle de la flore bien connu de A. L. Smith "A monograph of the British Lichens" (2e éd. 1918 & 1926), le livre de U. Duncan est une mise à jour utile de 65% de la flore lichénique de Grande Bretagne. Les 900 espèces, variétés et formes décrites ont été choisies pour leur fréquence et leur intérêt taxonomique et écologique.

En présentant cette flore abrégée, l'auteur a destiné son ouvrage aux non-spécialistes.

Cette flore s'écarte aussi de celle de A. L. Smith par l'arrangement taxonomique qui, selon la conception moderne proposée par Santesson en 1952 et adoptée par Hale en 1967, intègre les ascolichens dans la classification des Ascomycètes, les départageant entre les Ascomycetidae à asques unituniquées et les Loculoascomycetidae à asques bituniquées. Une table de correspondence de l'ancienne classification à la nouvelle eut certainement aidé l'utilisateur moins averti.

INDEX HERBARIORUM, A GUIDE TO THE LOCATION AND CONTENTS OF THE WORLD'S PUBLIC HERBARIA, édite par F. A. STAFLEU, publié par l'I.A.P.T., Intern. Bureau for Plant Taxonomy and Nomenclature, par Oosthoek, Scheltema & Holkema, Emmelaan 27, Utrecht.

Part I. THE HERBARIA OF THE WORLD, 6e éd., par P. K. HOLGREM et W. E. KEUKEN, *in* Regnum vegetabile vol. 92, 397 p., 1974, toilé. Fl. 65.00.

Part II (3). COLLECTORS' INDEX I-L, par M. N. CHAUDHRI, I. H. VEGTER et C. M. de WAL, *in* Regnum vegetabile vol. 86, xxii + 177 p. (pp. 297-473), broché, 1972. Fl. 32.50

La nouvelle édition, revisée et élargie, de la partie I. THE HERBARIA OF THE WORLD, fait suite à la cinquième édition par J. Lanjouw et F. A. Stafleu, parue en 1964 avec 251 pages

Plus de 1500 herbiers publics du monde sont maintenant répertoriés, par ordre alphabétique de lieu, avec le nom officiel, le nom et l'adresse de l'institution, le sigle de l'herbier, le nom, la nature et l'importance des collections,

(continued on page 194)

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NOTES ON COELOMYCETES. I. CERATOPYCNIS, CLYPEOPYCNIS, MACRODIPLODIOPSIS, MASTIGOSPORELLA, PARADISCULA AND SEPTOPATELLA

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ABSTRACT

The genera *Ceratopycnis* Höhnel, *Clypeopycnis* Petrak, *Macrodiplodiopsis* Petrak, *Mastigosporella* Höhnel, *Paradiscula* Petrak and *Septopatella* Petrak, each based on a single species, are redescribed and illustrated. Emended diagnoses are provided.

INTRODUCTION

A considerable number of generic names of coelomycetes based on single species exist in the literature. Many of these were described in the first quarter of this century by such authors as Franz von Höhnel and Franz Petrak. During recent studies on coelomycetes type collections of some of these genera have been examined. In most cases no illustrations of them exist and the published descriptions, although sometimes quite elaborate are by no means fully adequate by modern standards, particularly with regard to the structure of the conidium bearing cells and the details of conidium ontogeny. In this series of papers it is intended to redescribe the species on which some of these and other genera are based as well as provide incidental notes on, and new descriptions and illustrations of, a wide range of coelomycetes.

In this first paper six genera are treated. Brief generic descriptions of these taxa were provided by Morgan-Jones and Kendrick (1972) and Morgan-Jones et al. (1972a, 1972b, 1972c).

TAXONOMIC PART

Ceratopycnis Höhnel, Sitzungsber. Kais. Akad. Wein Math.-Naturwiss. Kl. Abt. 1. 124:86, 1915.

Pycnidia scattered or sub-gregarious, at first immersed, later becoming erumpent, black, glabrous, beaked, ostiolate, unilocular. Pycnidial wall pseudoparenchymatic. Conidiogenous cells phialidic, hyaline, smooth-walled, cylindrical to ampulliform, frequently proliferating percurrently. Conidia ellipsoid, thick-walled, septate, yellowish-brown, verruculose.

TYPE SPECIES: *C. clematidis* Hohnel.

Ceratopycnis clematidis Höhnel, Sitzungsber. Kais. Akad. Wiss. Wein, Math.-Naturwiss. Kl. Abt. 1. 124:86, 1915 (Figure 1).

Immersed mycelium abundant, extensive in woody tissue, composed of hyaline to pale brown, septate, branched, smooth-walled hyphae, 3-4.5µm wide. Pycnidia globose to subglobose, solitary, scattered or somewhat gregarious, at first immersed, later erumpent through the periderm and becoming almost superficial, black, glabrous, unilocular, with a well developed, tapering, erect neck, 130-250µm in diameter, neck up to 370µm long, 60-75µm wide at the base, 30-50µm wide at the apex. Pycnidial wall composed of an outer layer of thick-walled, somewhat sclerotioid, brown, more or less isodiametric, pseudoparenchymatous cells, and an inner layer of pale brown to subhyaline cells lining the venter, 20-26µm wide; cells in the neck area elongated and the inner cells giving rise to short, septate, pale brown periphyses, 12-25 X 2-3.5µm. Conidiophores short, micronematous to semi-macronematous, mononematous, subhyaline to hyaline, smooth, lining the pycnidium venter up to the base of the neck. Conidiogenous cells phialidic, integrated, cylindrical to ampulliform, hyaline,

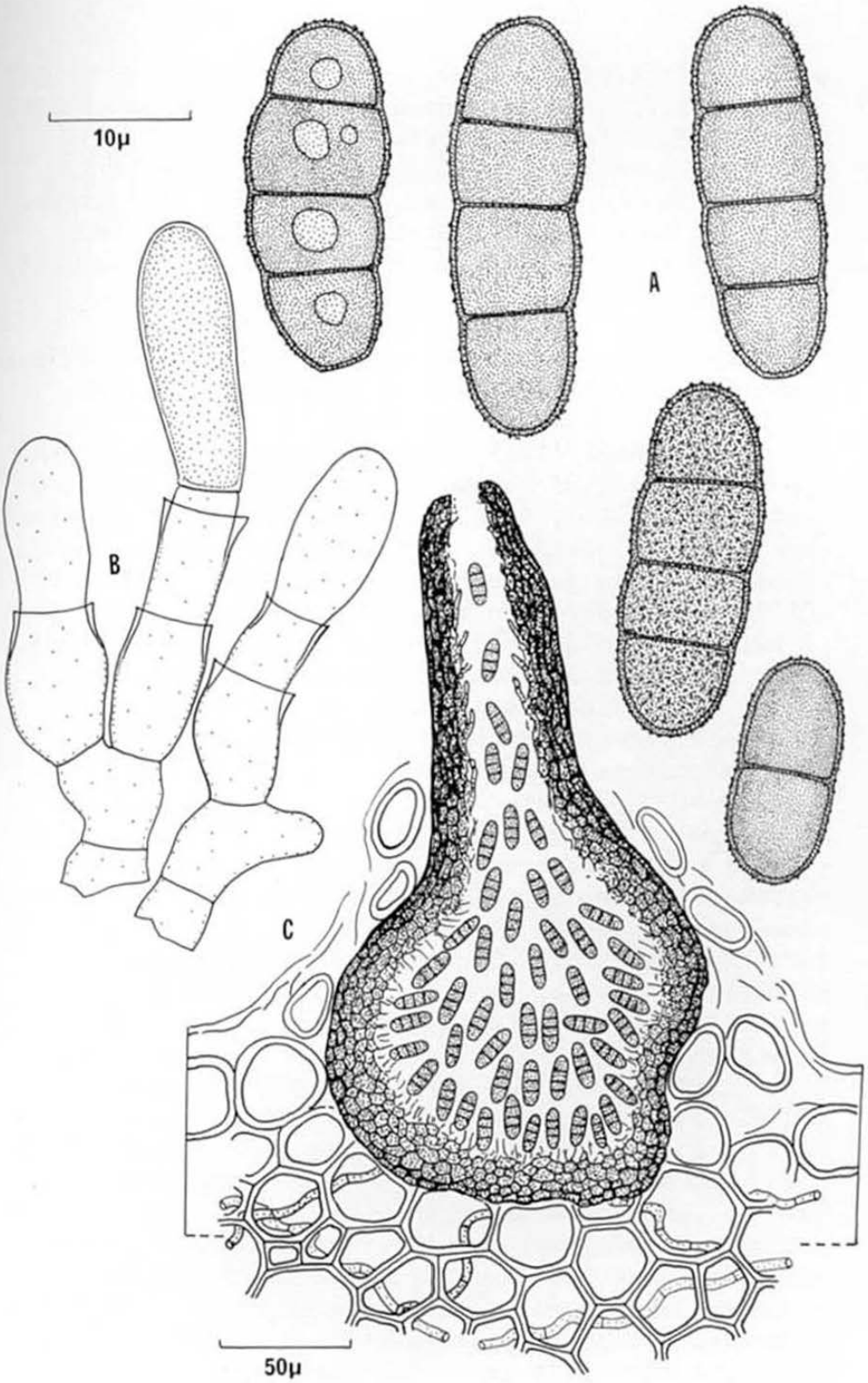

FIGURE 1. *Ceratopycnis clematidis*. A, Conidia; B, conidiophores; C, v.s. pycnidium.

smooth, of varying length, proliferating percurrently, sometimes to a distance equal in length to the original cell, initial phialides and proliferations flaring slightly distally, 6-11 X 4-5μm. Conidia cylindrical, or somewhat elliptical, obtuse at each end, 3-septate, rarely 1-septate, constricted very slightly at the septa, thick-walled, mid-brown, verruculose, 18-26 X 7-9μm.

On twigs of *Clematis vitalba*; Europe.

COLLECTION EXAMINED: On *C. vitalba*, Sonntagsberg, Lower Austria, XII 1914, P.P. Strasser, Type, FH.

Von Höhnel (1915) described the ostiole at the tip of the neck of *Ceratopycnis clematidis* as often having pale cilia, 60 X 1.5μm in size. Such structures have not been observed in this study. Many of the pycnidial necks in the material examined had broken off and, in order to preserve the type which consists of but few pycnidia, only one pycnidium still bearing a neck was used for microscopic examination. Von Höhnel also noted the presence of small, poorly developed pycnidia with paler conidia intermixed with the mature form.

Clypeopycnis Petrak, Ann. Mycol. 23:76, 1915.

Pycnidia scattered, immersed, subcuticular, ostiolate, glabrous, unilocular. Pycnidial wall thin, pseudoparenchymatic, extending above to form a thick, dark-brown to black clypeus. Conidiogenous cells phialidic, hyaline, smooth-walled, narrowly ampulliform. Conidia cylindrical, hyaline, 1-septate, smooth-walled.

TYPE SPECIES: *C. aeruginascens* Petrak.

Clypeopycnis aeruginascens Petrak, Ann. Mycol. 23:76, 1925 (Figure 2).

Immersed mycelium sparse, composed of branched, hyaline, smooth-walled hyphae, 1.5-3μm wide. Pycnidia globose to subglobose or somewhat flattened and elongate along the longitudinal axis of the host, solitary, scattered or densely gregarious, immersed, glabrous, unilocular, ostiolate and slightly papillate through a brown intraepidermal clypeus which covers the pycnidium above, 150-200μm in

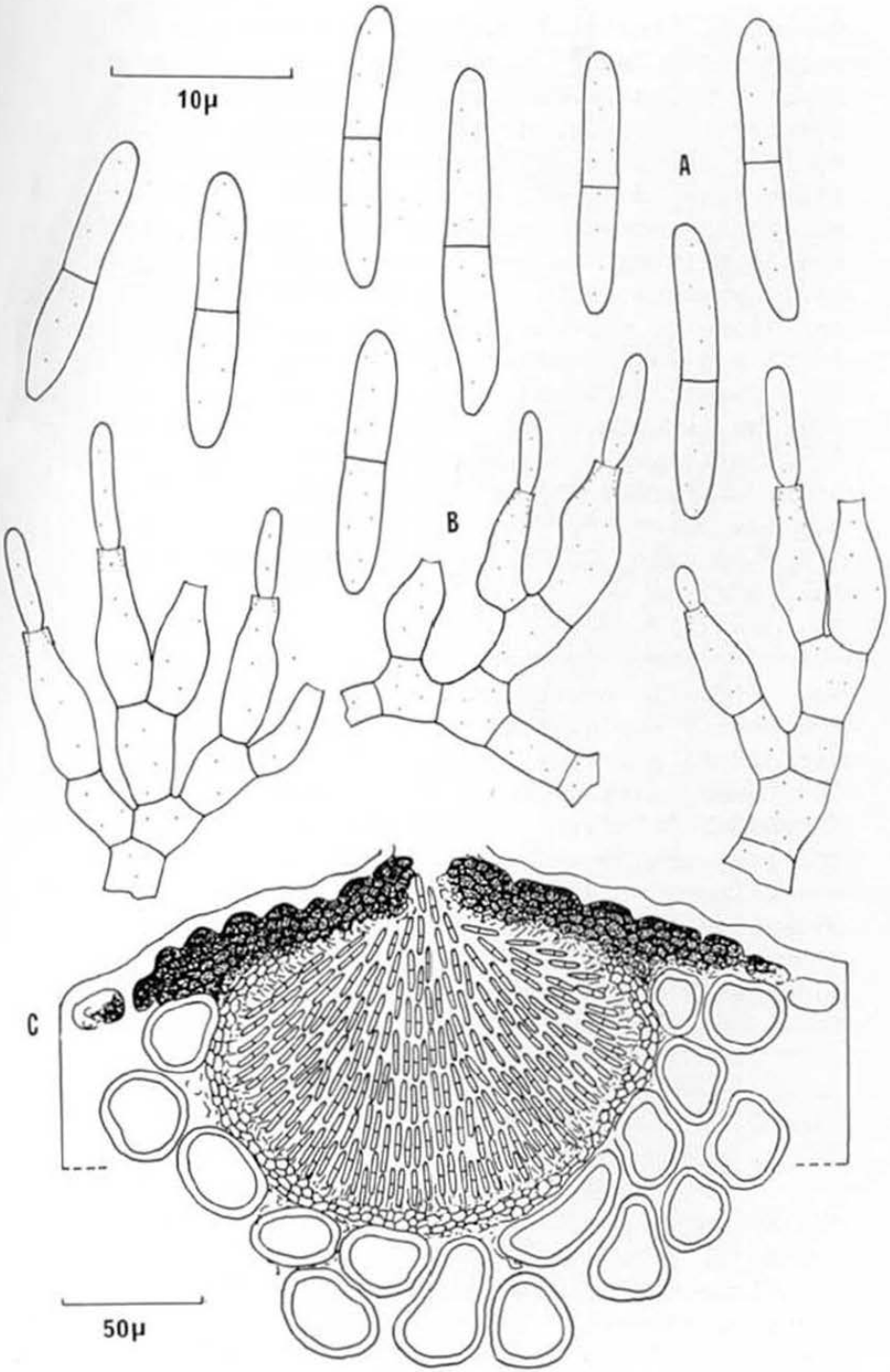

FIGURE 2. *Clypeopycnis aeruginascens*. A, Conidia; B, conidiophores; C, v.s. pycnidium.

diameter. Pycnidial wall narrow, composed of thin-walled, isodiametric, pseudoparenchymatous, sub-hyaline to hyaline cells, continuous with the overlying clypeus. Clypeus composed of brown, thick-walled, elongate cells, plectenchymatous, up to 280µm wide, 8-14µm thick. Conidiophores short, semimacronematous, mononematous, hyaline, septate, smooth, lining the entire pycnidium venter. Conidiogenous cells phialidic, integrated, terminal, obclavate to narrowly ampulliform, hyaline, smooth, 3-6 X 1.5-2µm. Conidia cylindrical, straight or very slightly curved, obtuse at each end, 1-septate, hyaline, smooth, 9-15 X 1-1.5µm.

On twigs of *Ribes missouriensis*; N. America.

COLLECTION EXAMINED: On twigs of *R. missouriensis*, Northville, N. Dakota, U.S.A., V 1924, J.F. Brenckle, F. Petrak - Mycotheca generalis 67, Type, FH.

Macrodiplodiopsis Petrak, Ann. Mycol. 20:343, 1922.

Pycnidia mostly gregarious in dense groups, frequently almost confluent, immersed in periderm, ostiolate, glabrous, unilocular, subglobose, flattened, dark brown to black. Pycnidial wall pseudoparenchymatic. Conidiogenous cells phialidic, hyaline, smooth-walled, cylindrical to narrowly ampulliform, frequently proliferating percurrently. Conidia ellipsoid to obovoid, obtuse at the apex, somewhat truncate at the base, yellowish brown, outer wall verruculose, enclosing three, or usually four, thick-walled endoconidial cells.

TYPE SPECIES: *M. desmazieri* (Mont.) Petrak.

Macrodiplodiopsis desmazieri (Mont.) Petrak, Ann. Mycol. 20:343, 1922 (Figure 3).

≡ *Hendersonia desmazieri* Montagne, Ann. Sci. Nat. Sér. 3, 12:310, 1849.

= *Stegonosporium platani* Preuss, Linnaea 26:723, 1853.

Immersed mycelium composed of pale brown, septate, branched, smooth-walled or sometimes roughened, 3-4µm wide hyphae. Pycnidia subglobose, distinctly flattened, gregarious, unilocular, ostiolate, with a short apical papilla which emerges

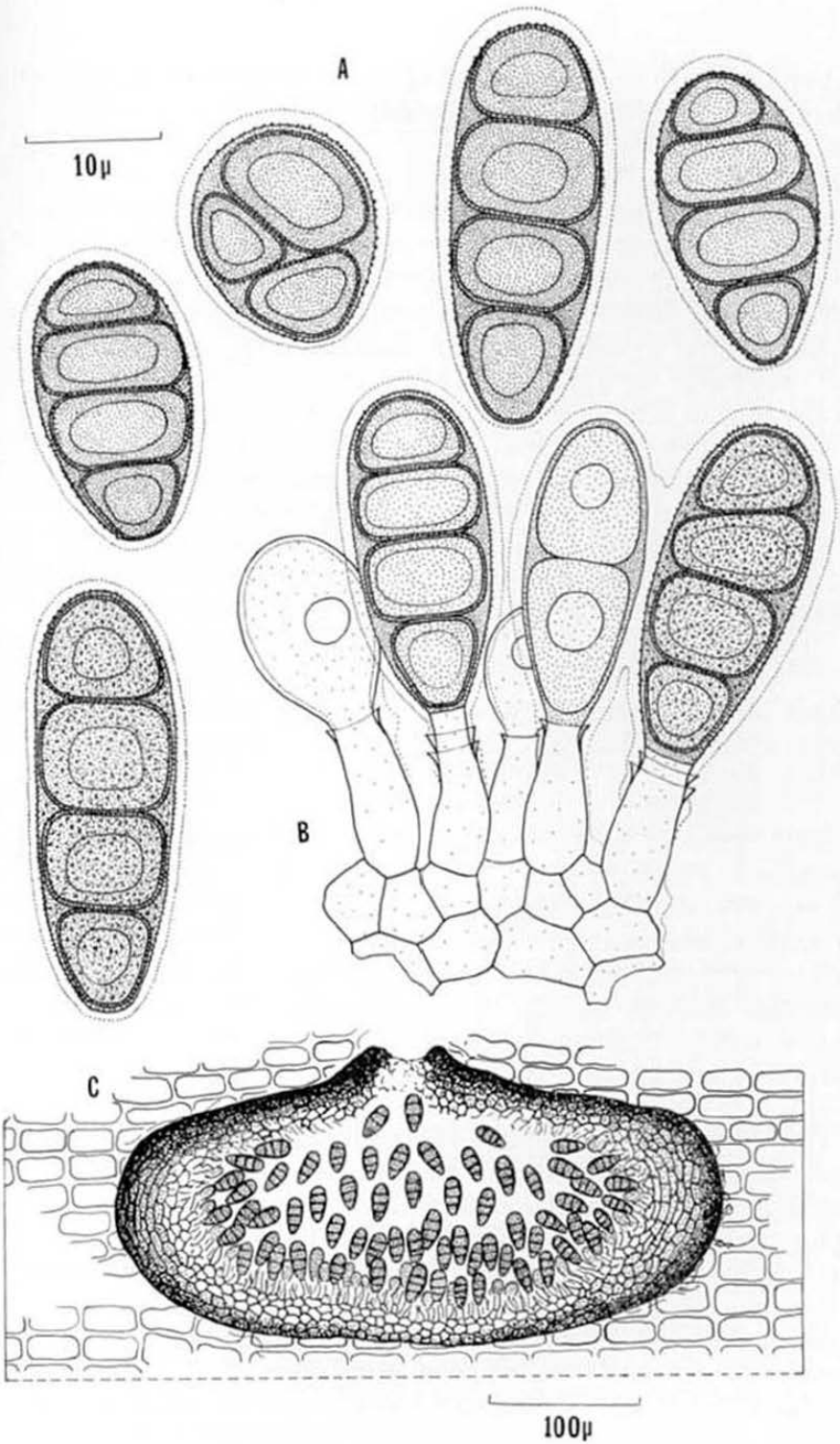

FIGURE 3. *Macrodiplodiopsis desmazieri*. A, Conidia; B, conidiophores; C, v.s. pycnidium.

through the periderm, 350-600µm in diameter, 250-300µm high. Pycnidial wall composed of two ill-defined layers; an outer layer of thick-walled, mid-brown, isodiametric, or, at the sides, elongate, pseudoparenchymatous cells, and an inner layer of thinner-walled, isodiametric, pale brown to subhyaline cells lining the pycnidium venter, 25-30µm wide at the base, 40-80µm wide above. Conidiogenous cells phialidic, cylindrical to ampulliform, hyaline, smooth, of varying length, proliferating percurrently, flaring slightly distally, 8-14 X 2-3µm. Conidia solitary, ellipsoid to obovoid, straight, obtuse at the apex, somewhat truncate at the base, yellowish-brown, covered with a gelatinous sheath, with an outer verruculose wall enclosing three, or usually four, thick-walled, compressed endoconidial cells, each containing a large guttule; 40-48 X 18-20µm.

On twigs of *Platanus* spp.; Europe and N. America.

COLLECTION EXAMINED: On *P. orientalis*, Parklangen, Mähr-Weisskirchen, Czechoslovakia, VII 1938, F. Petrak, Petrak - Mycotheca generalis 595, FH.

Preuss (1853) described his *Stegonosporium platani* from a collection on *Platanus* made at Hoyerswerda, Saxony, as follows "Gregarium; peritheciis cortici immersis, tectis, atris; basidiis filiformibus, albis; sporis subpyriformibus, fuscis; nucleo quater in una serie posito." Although the type collection has not been seen there can be no doubt that he had the same fungus as Montagne.

Petrak (1922) considered the possibility of classifying *M. desmazieri* in either *Macrodiplodia* Sacc., or in his *Neohendersonia* Petrak, proposed the previous year (Petrak 1921) to accommodate *N. pyriformis*, another fungus originally classified in *Hendersonia* Sacc. In deciding to erect a new genus for *M. desmazieri* he recognized certain morphological distinctions that serve to separate it from the other two genera, although he admitted their probable relationship as conidial states of *Massaria* de Notaris and related genera.

M. desmazieri differs from *Macrodiplodia* in possessing several-celled conidia with well developed cross walls, and from *Neohendersonia* in that the conidial cells are more or less equal in size and the whole conidium is enveloped by a mucilaginous sheath.

Sutton and Pollack (1974) have recently redescribed *Neohendersonia* and recognized the name *Stilbospora kicksii* Westendorp as being the earliest to be applied to the fungus on which the genus is based. They accepted the genus and provided the name *Neohendersonia kicksii* (West.) Sutton and Pollack for the type species. A thickened basal scar on the conidia was noted as a distinctive feature, this being rarely encountered in the pycnidial fungi. The conidiogenous cells were described as being annellidic but they have essentially the same structure as the proliferating phialides described above.

There is little difference between *Macrodiplodiopsis* and *Neohendersonia* and it may well be that the absence of a distinctly thickened basal scar and the possession of a conidial gelatinous sheath are insufficient reasons for maintaining them as separate genera. If they were considered congeneric *Neohendersonia* would have date priority. For the present a conservative attitude is adopted and *Macrodiplodiopsis* is maintained.

Macrodiplodiopsis desmazieri is considered to be the conidial state of *Massaria platani* Cesati.

Mastigosporella Höhnel, Sitzungsber. Kais. Akad. Wiss. Wien, Math.-Naturwiss. Kl. Abt. 1. 123:135, 1914.

Acervuli scattered or somewhat gregarious, pale yellowish brown, intra or subepidermal, rupturing the cuticle and epidermis irregularly, cup-shaped, stroma composed of isodiametric, thin-walled, very pale brown cells. Conidiogenous cells phialidic, cylindrical to ampulliform, hyaline, smooth-walled,

occasionally proliferating percurrently. Conidia narrowly ellipsoid to fusiform, straight or very slightly curved, unicellular, guttulate, hyaline, smooth-walled, with one apical, simple appendage, truncate at the base with a minute marginal frill.

TYPE SPECIES: *M. hyalina* (Ell. and Everh.) Höhnel.

Mastigosporella hyalina (Ell. and Everh.) Höhnel, Sitzungsber. Kais. Akad. Wiss. Wien, Math.-Naturwiss. Kl. Abt. 1. 123:135, 1914 (Figure 4).

≡ *Harknessia hyalina* Ellis and Everhart, J. Mycol. 1:92, 1885.

Immersed mycelium composed of subhyaline to very pale brown, septate, branched, smooth-walled hyphae, 2-3µm wide. Acervuli abundant, scattered or somewhat gregarious, intra or subepidermal, hypophyllous, pulvinate when mature, pale yellowish-brown, rupturing the cuticle and epidermis irregularly, frequently giving a stellate appearance when viewed from above, 230-280µm in diameter. Stroma pseudoparenchymatous, immersed in the substratum or exposed where it extends upwards to form a wide, sometimes cup-shaped fructification, intra or subepidermal, composed of isodiametric, thin-walled, very pale brown cells, 10-16µm thick. Conidiophores short or somewhat elongate, micronematous to semimacronematous, made up of a column of short, horizontal cells, bearing conidiogenous cells terminally and laterally. Conidiogenous cells phialidic, cylindrical to ampulliform, hyaline, smooth, with a minute terminal collar; occasionally proliferating percurrently, 4-10 X 2.5-4µm. Conidia narrowly ellipsoid to fusiform, straight or very slightly curved, unicellular, relatively thick-walled when mature, guttulate, hyaline, smooth, with one apical, simple appendage which is delimited from the conidium by an indistinct, distal, transverse septum; truncate at the base with a marginal frill, the septum delimiting the conidium laid down above the level of the conidiogenous cell collar; 18-24 X 3.5-5µm, appendages 8-17 X 1µm.

On leaves of *Quercus coccinea*; N. America.

COLLECTION EXAMINED: On *Q. coccinea*, Newfield,

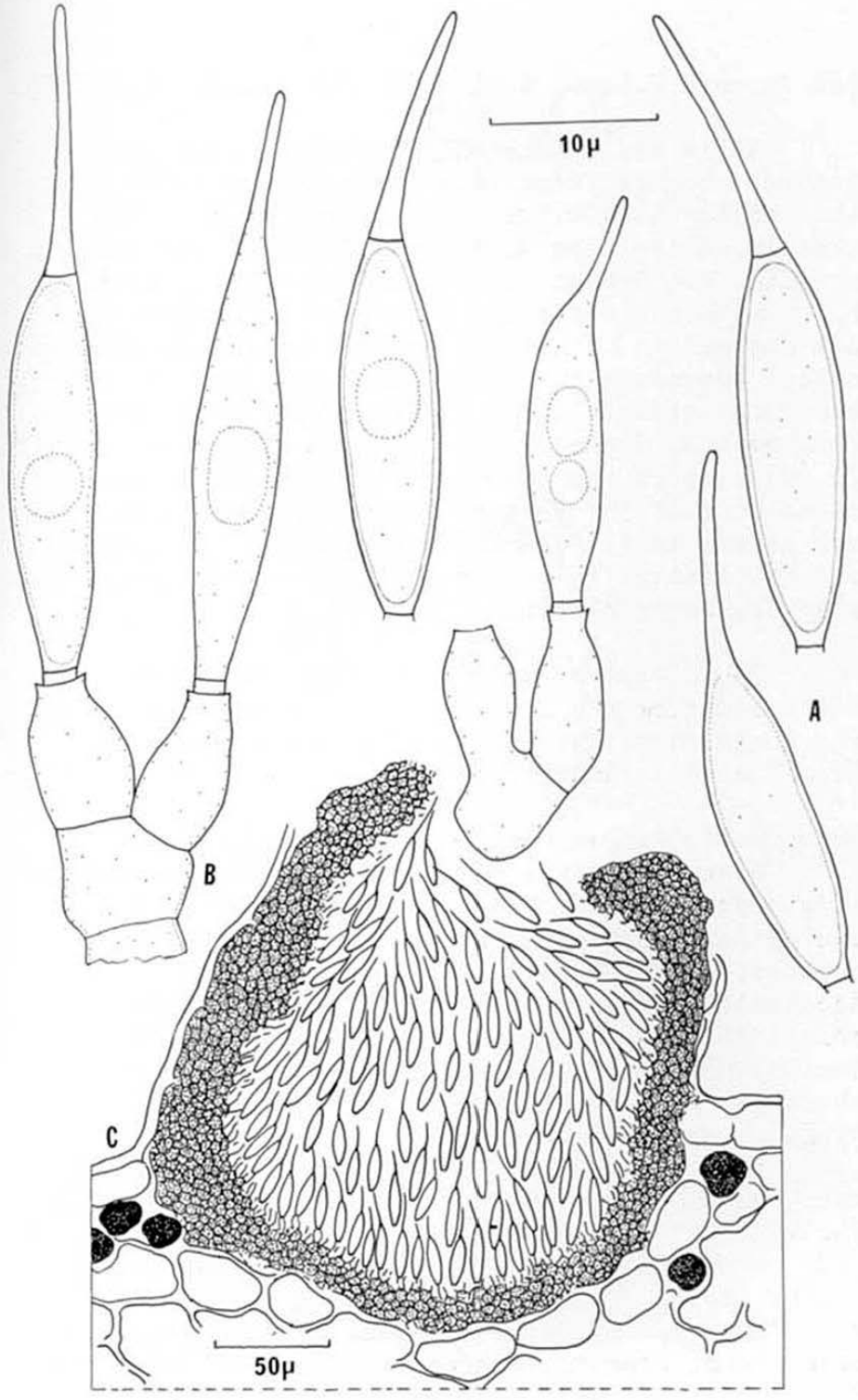

FIGURE 4. *Mastigosporella hyalina*. A, Conidia; B, conidiophores; C, v.s. acervulus.

New Jersey, U.S.A., 6 VI 1885, J.B. Ellis, Type, NY.

Ellis and Everhart (1885) noted that the general appearance of this taxon is very much like that of *Harknessia caudata* Ell. and Everh., but that it varies from *Harknessia* Cooke by its hyaline conidia. Von Höhnel (1914) concluded that, although *H. hyalina* has a similar structure to *Harknessia*, the possession of hyaline conidia bearing a long apical appendage justified its recognition as a separate entity. Sutton (1971) in his mongraphic treatment of *Harknessia* accepted von Höhnel's opinion. In addition to the colour of the conidia it should be noted that the pattern of conidiogenesis in the two genera is different. In *Harknessia* the conidia are holoblastic in origin, whereas in *Mastigosporella* they are enteroblastic.

Physalospora quercifolia Ell. and Everh. was described from the same leaves as *H. hyalina*, with the suggestion that it might be the "stylospore stage" of this ascomycete.

Paradiscula Petrak, Ann. Mycol. 39:307, 1941.

Acervuli scattered or occasionally gregarious in groups of a few, black, subepidermal, rupturing the epidermis at maturity, at first completely covered, later discoid, stroma composed of isodiametric, brown cells. Conidiogenous cells phialidic, ampulliform, hyaline, smooth-walled. Conidia oblong to somewhat ellipsoid, straight, obtuse at each end, unicellular, guttulate, hyaline, smooth-walled.

TYPE SPECIES: *P. spuria* (Vesterg.) Petrak.

Paradiscula spuria (Vesterg.) Petrak, Ann. Mycol. 39:308, 1941 (Figure 5).

≡ *Phoma spuria* Vestergren, Jahreskat. Wien Krypt. Tauschanst. 4, 1897.

Immersed mycelium composed of subhyaline to pale brown, septate, branched, smooth-walled hyphae, 2-3µm wide. Acervuli abundant, scattered or occasionally gregarious in groups of a few, rarely confluent, subepidermal, immersed at first, later becoming erumpent and rupturing the epidermis

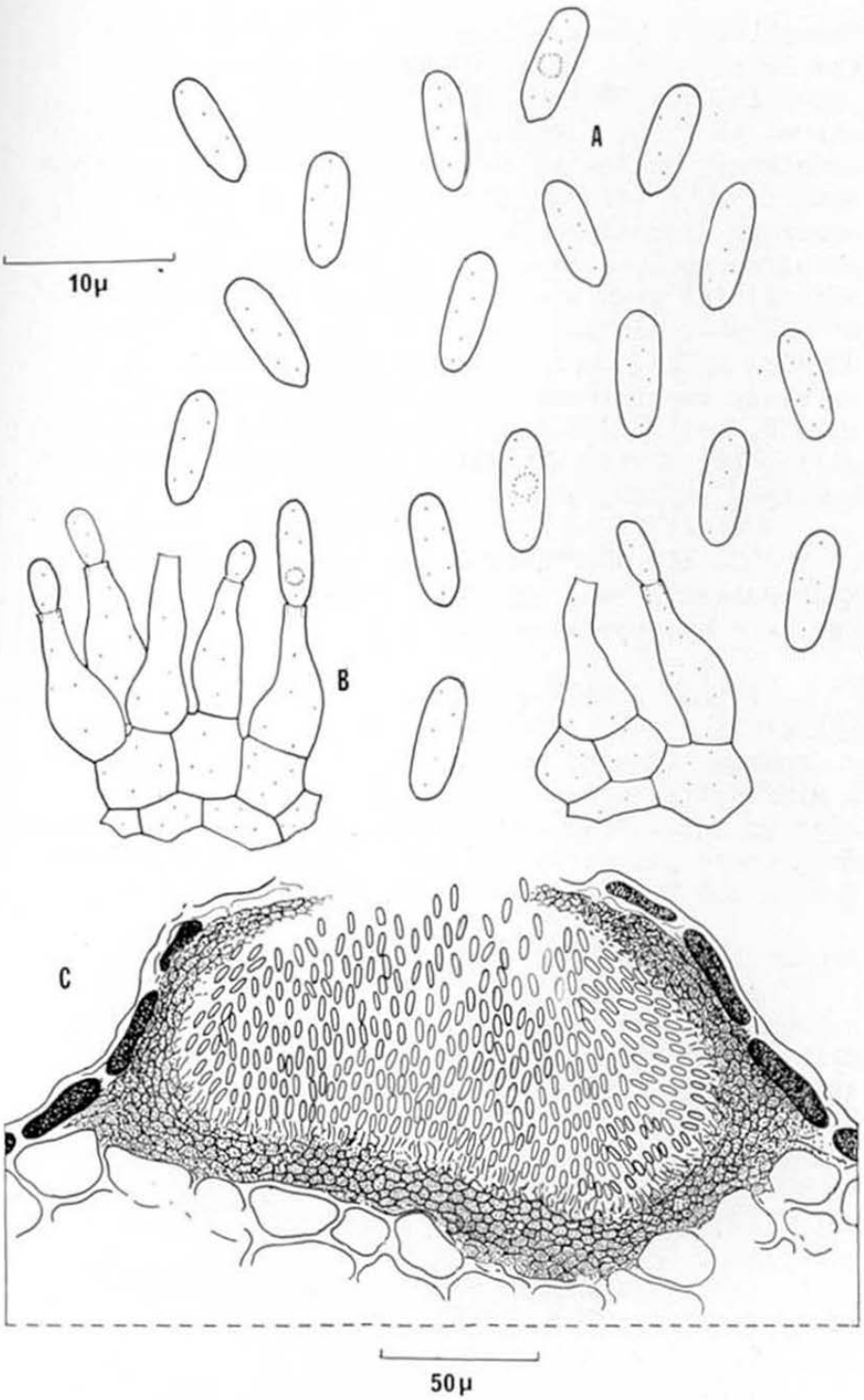

FIGURE 5. *Paradiscula spuria*. A, Conidia; B, conidiophores; C, v.s. acervulus.

irregularly; black, elliptical, elongate along the longitudinal axis of the host substrate, pulvinate when mature, 200-500µm in diameter. Stroma at first forming a flattened hollow ball, completely enclosing the conidiogenous cells, then opening by a slit to give the fructification a somewhat discoid appearance in section, pseudoparenchymatous, partly immersed, partly superficial when old, composed of isodiametric or somewhat elongate, pale to mid brown cells; 30-70µm thick. Conidiogenous cells phialidic, narrowly ampulliform to ampulliform, hyaline, smooth, 5-14 X 2-3.5µm. Conidia oblong to somewhat ellipsoid, short, straight, unicellular, guttulate, hyaline, smooth, obtuse at each end, 4-6 X 1.5-2.5µm.

On stalks of *Potentilla argentea*; Europe.

COLLECTION EXAMINED: On *P. argentea*, Svrcow, Mähr-Weisskirchen, Czechoslovakia, V 1936, F. Petrak, Petrak - Mycotheca generalis 195, FH.

Petrak (1941) at first considered reclassifying this species in *Plenodomus* Preuss as *P. spurius* (Vestergr.) Petrak. He also recognized a similarity between it, *Sporonema* Desm., and *Discula* Sacc. However he pointed out that it differs from these genera by the thick basal layer of the stroma and by the cover which opens in a slit.

Septopatella Petrak, Ann. Mycol. 23:128, 1925.

Acervuli widely scattered, superficial, pulvinate, dark reddish-brown to black, discoid, with a flat basal stroma composed of small, isodiametric, brown cells and a lateral excipulum composed of olive-brown hyphae. Conidiogenous cells phialidic, cylindrical, straight or slightly flexuous, hyaline, smooth. Conidia long-cylindrical, acicular, falcate, filiform, hyaline, septate, guttulate, smooth.

TYPE SPECIES: *S. septata* (Jaap) Petrak.

Septopatella septata (Jaap) Petrak, Ann. Mycol. 23: 128, 1925 (Figure 6).

≡ *Pseudocenangium septatum* Jaap, Ann. Mycol. 6:219, 1908.

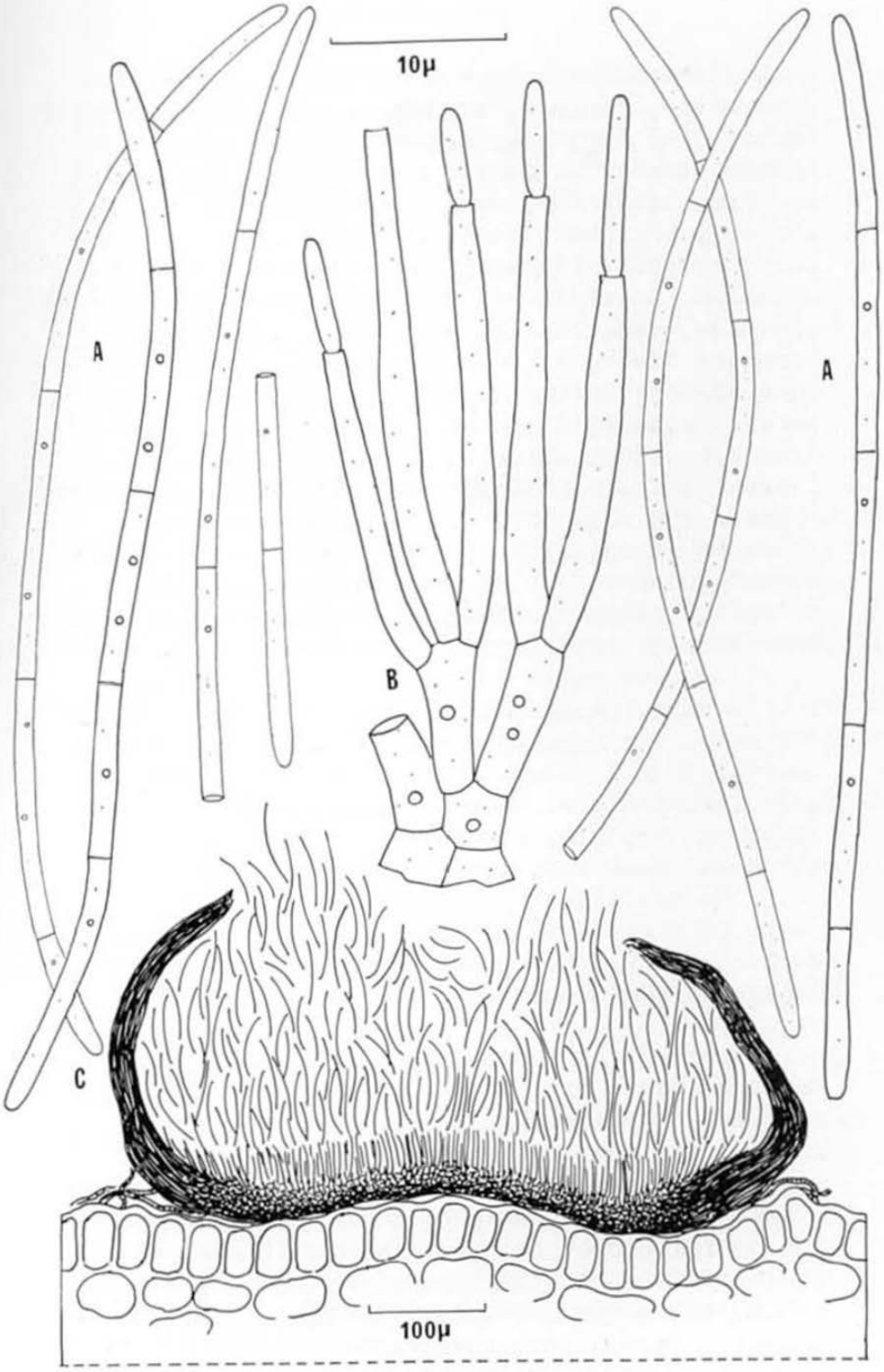

FIGURE 6. *Septopatella septata*. A, Conidia; B, conidiophores; C, v.s. acervulus.

Immersed mycelium composed of hyaline to subhyaline, septate, branched, smooth-walled hyphae, 2-2.5µm wide; superficial mycelium forming a network around the base of the side of the fructification, composed of olive-brown, septate, branched, smooth-walled hyphae, 2-3µm wide, slightly thicker walled than the immersed mycelium. Acervuli scattered or sometimes in groups of a few, superficial, pulvinate, dark reddish brown to black, discoid when mature, 500-900µm in diameter. Stroma at the base flat, pseudo-parenchymatous, composed of more or less iso-diametric, subhyaline to mid olive brown cells, 15-25µm wide, becoming up to 70µm wide and darker towards the edge, and composed of elongate, olive brown cells; extending laterally to form a covering layer of closely adpressed, parallel, mid olive brown hyphae. Conidiophores macronematous, mononematous, cylindrical, hyaline, smooth, branched. Conidiogenous cells phialidic, in verticils of two to four, long cylindrical, tapering slightly distally, straight or somewhat flexuous, hyaline, smooth, 9-28 X 2-3µm. Conidia long cylindrical, acicular, falcate, or sometimes almost straight, filiform, septate, guttulate, hyaline, smooth, obtuse at each end, 30-68 X 1.5-2µm.

On needles of *Pinus pumila*; Europe.

COLLECTION EXAMINED: On *P. pumila*, Hochgesenke, Hochschar., Czechoslovakia, 10 VIII 1924, F. Petrak, Petrak - Fungi Boh. et Mor. 1965, FH.

Petrak (1925) stated that *Pseudocenangium* Karsten, based on *P. pinastri* Karsten, should be restricted to forms with comparatively short, narrow, cylindrical, mostly straight conidia, arising by 'decay' of long hyphae. Morgan-Jones et al. (1972c) redescribed this genus and showed the conidia to be holoblastic-annellidic. The genus differs from *Septopatella*, whose conidiogenous cells are enteroblastic-phialidic, on this account. In addition the texture of the lateral excipulum in the two genera is quite different. In *Pseudocenangium* the tissue is less distinctly hyphal.

ACKNOWLEDGMENTS

I am grateful to Dr. I.M. Lamb for allowing me free access to the collections while on a visit to the Farlow Herbarium, Harvard University, and to Dr. C.T. Rogerson, New York, for making available for study the collection in his keeping.

LITERATURE CITED

ELLIS, J.B. and B.M. EVERHART. 1885. New species of fungi. J. Mycol. 1: 88-93.

HÖHNEL, F. von. 1914. Fragmente zur Mykologie 864. Über *Mastigonetron fuscum* Klebahn. Sitzungsber. Kais. Akad. Wiss. Wien, Math.-Naturwiss. Kl. Abt. 1, 123: 134.

_____. 1915. Fragmente zur Mykologie 902. *Ceratopycnis* v.H. n.g. Sitzungsber. Kais. Akad. Wiss. Wien, Math.-Naturwiss. Kl. Abt. 1, 124: 86-87.

MORGAN-JONES, G. and B. KENDRICK. 1972. Icones generum coelomycetum. III. Univ. Waterloo Biol. Ser. 5: 1-42.

MORGAN-JONES, G., T.R. NAG RAJ and B. KENDRICK. 1972*a*. Icones genera coelomycetarum. II. Univ. Waterloo Biol. Ser. 4: 1-40.

_____. 1972*b*. Icones generum coelomycetum. IV. Univ. Waterloo Biol. Ser. 6: 1-42.

_____. 1972*c*. Icones generum coelomycetum. V. Univ. Waterloo Biol. Ser. 7: 1-52.

PETRAK, F. 1921. Mykologische Notizen. III. Ann. Mycol. 19: 176-223.

_____. 1922. Mykologische Notizen. IV. Ann. Mycol. 20: 300-345.

_____. 1925. Mykologische Notizen. VIII. Ann. mycol. 23: 1-143.

_____. 1941. Mykologische Notizen. XIV. Ann. Mycol. 39: 251-349.

PREUSS, G.T. 1853. Uebersicht untersuchter Pilze, besonders aus der Umgegend von Hoyerswerda. Linnaea 26: 723.

SUTTON, B.C. 1971. Coelomycetes. IV. The genus *Harknessia* and similar fungi on *Eucalyptus*. Commonw. Mycol. Inst. Mycol. Pap. 123: 1-46.

SUTTON, B.C. and F.G. POLLACK. 1974. Microfungi on *Cercocarpus*. Mycopath. et Mycol. Appl. 52: 331-351.

NOTICES *(continued from page 142)*

completely rearranged and indexed. Specimens are now easily locatable and logically filed.

The Special Collections – Several large herbaria are kept as separate units; these are the herbaria of M.A. Curtis, N.T. Patouillard, E.A. Burt, E. Bartholomew, F. von Höhnel, and J.B. Ellis (Herbarium Mycologicum), as well as the smaller C.J. Sprague and Thomas Taylor herbaria. Of these, the Burt Herbarium (30,000 specimens) and Patouillard Herbarium (50,000 specimens) are currently receiving attention. The greatly neglected Burt Herbarium, purchased in 1931, has been rearranged, remounted, and reconditioned. Bibliographic work is now nearing completion on the publications of N. Patouillard and soon work will begin on marking the previously unindicated type material in this collection.

The voucher specimens of the fungi illustrated by Joseph Bridgham and Louis C.C. Krieger, also treated as separate collections, have been rearranged as have been their magnificent color illustrations. There are about 600 illustrations of which 103 were published in the *Icones Farlowianae*. Voucher specimens are available for most specimens illustrated.

The Exsiccati – The undistributed bound exsiccati, which were previously indexed, are also undergoing reconditioning and repair. Bindings are being mended or replaced, specimens are being repacketed, and the index to the exsiccati is being checked. There are about 143 exsiccati sets containing well over 100,000 fungus specimens.

With continued work along these lines and with the cooperation of the users of these collections the large backlog of specimens will be sorted and inserted, inventories of holdings will be completed, and special collections organized and indexed. The result will be a more accessible and useable resource.

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MYCOTAXON

Vol. II, No. 1, pp. 185-193 April-June 1975

AQUATIC FUNGI OF SCANDINAVIA: AN UNUSUAL WATERMOLD FROM NORWAY

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SUMMARY

A watermold producing ornamented oögonia and ovoid or oval sporangia renewed internally or sympodially is described. The sporangia release laterally biflagellate planonts that become subapically biflagellate without prior encystment. Generic affinities are uncertain, but the fungus is assigned provisionally to *Saprolegnia* (without a specific epithet). The sporangia may be parasitized by a chytrid tentatively identified as *Phlyctochytrium zygnematis*.

Samples of sediment, water, insect exuviae, and decaying *Sphagnum* spp. from acid lakes in southern Norway have yielded a diverse flora of zoösporic fungi. A watermold from two such lakes northeast of Oslo is described.

The fungus, tentatively assigned to *Saprolegnia*, was first found on exuviae of a chironomid collected among emergent vegetation in Bakketjernet. Subsequently, the watermold grew on snakeskin bait in water and debris expressed from shoreline populations of *Sphagnum* spp. The fungus would not grow on Emerson's YpSs agar (1/4, 1/2, full strength), Barksdale's (1962) medium, Seymour's (1970) chemically defined medium, or on the media formulated by Booth & Miller (1961) and Fuller, *et al.* (1964). The latter two media were prepared in distilled and in filtered lake water rather than seawater. Hempseed, the usual bait for saprolegniaceous fungi, failed to support growth as well.

Unifungal cultures were established by using strips of sterile snakeskin as the substratum. A sporangium and subtending hypha (along with a bit of the original bait) was transferred to 1 ml of sterile lake water in the bottom of a plastic Petri plate. Squares (2 mm) of autoclaved (121° C, 15 min) snakeskin were added, and the cultures incubated for 52 hours. Infested baits were subsequently transferred to sterile Petri plates containing 40 ml of filtered, autoclaved pond water, and the cultures baited with 2-3 strips (1 cm long) of sterile snakeskin. Within 3-7 days mature thalli developed and the fungus was then examined and characterized. The organism would not grow in water (from any of several sources) or

on any medium in which 0.01% potassium tellurite (Willoughby, 1958) was used as a bacterial suppressant.

OBSERVATIONS

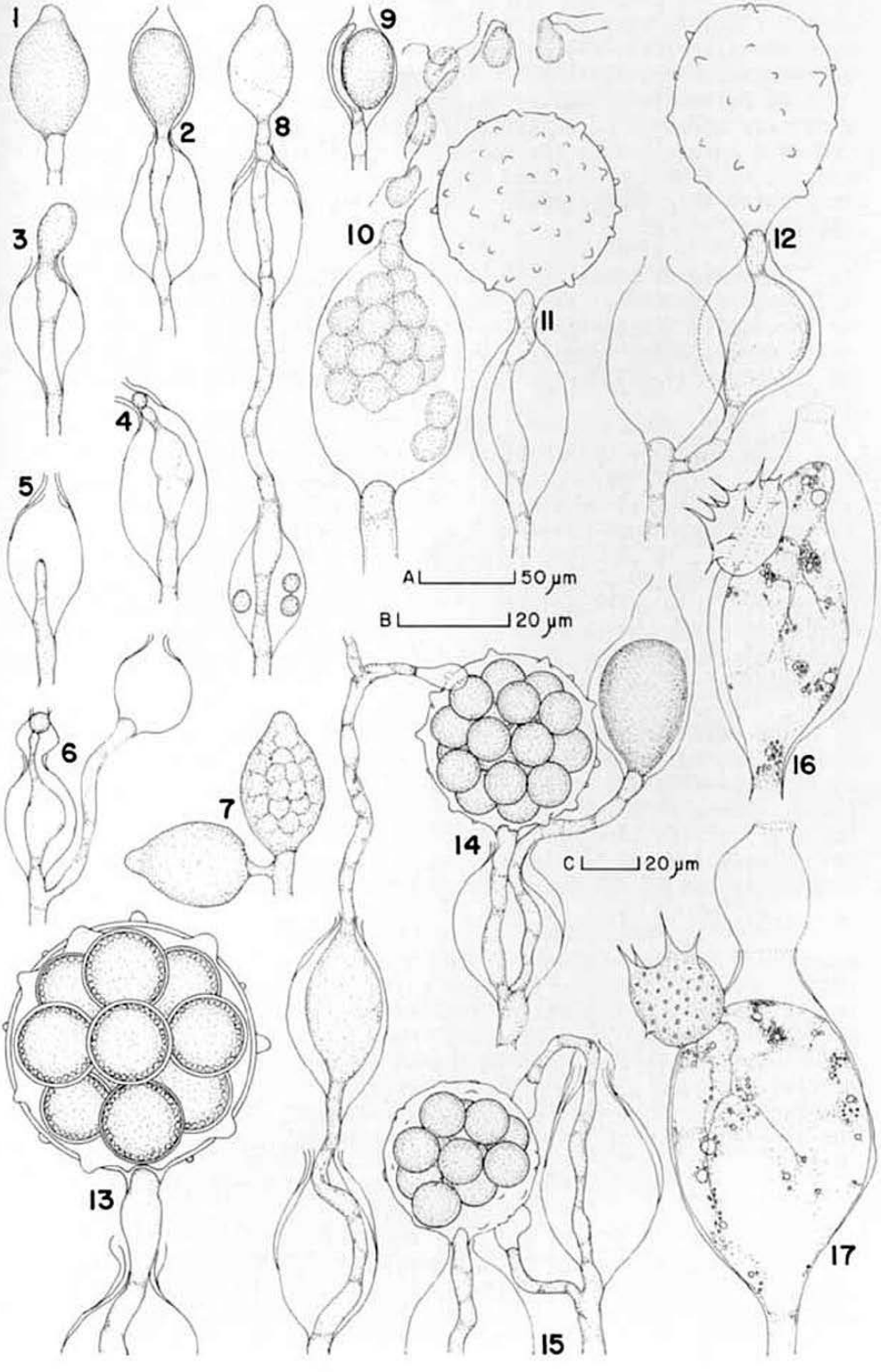
The primary sporangia of the *Saprolegnia* were oval, ovoid (Fig. 1) or obpyriform, and had a conspicuous apical discharge papilla (Figs. 1, 7). Secondary sporangia were usually similarly shaped, but could be nearly spherical or irregularly oval (Figs. 6, 12) as well. While the sporangia were predominantly terminal on the main hyphae (Figs. 2, 8), ones on short lateral branches (Figs. 6, 7) were also formed.

Planonts were cleaved endogenously (Fig. 7), and escaped singly through an apical pore. Under the culture conditions employed, sporangia required 1-2 hours or more for complete evacuation. This time could not be shortened substantially even if sporangia were flooded occasionally with fresh pond or distilled water during discharge. Until released, the planonts maintained a slight rocking and circulating motion.

At discharge, the planonts emerged sluggishly through the confining orifice, and slowly swam away (with a tumbling, twisting action) as laterally biflagellate cells. Subsequently, they assumed a nearly spherical shape, then elongated slightly, and became subapically biflagellate (Fig. 10). After varying periods of motility, the planonts encysted and, when settled on the substratum, produced new hyphae directly. Repeated encystment and emergence (of motile cells) -- as is common in some watermolds -- was not observed.

What appeared to be gemmae (Fig. 14) were present in some cultures. These were densely cytoplasmic cells that evidently developed simply as terminal enlargements of hyphae proliferating through emptied sporangia. In some discharged sporangia there were large oval cells (Fig. 9) that were not attached to the sporangium wall or to the proliferating hypha. These bodies appeared to be remnants of undifferentiated sporangial protoplast rather than gemmae.

FIGS. 1-15. *Saprolegnia* sp. 12241. 1. Immature primary sporangium. 2-5. Internal proliferation. 6, 7. Sympodial branching (for sporangial renewal). 8. Repeated proliferation and hyphal elongation. 9. Growth of hypha around a sporangial protoplast. 10. Planont discharge, and sequential changes in flagellum orientation. 11, 12. Surface views of oögonia. 13. Mature oögonium showing papillae (protrusions through the wall "pits") and centric oöspores. 14. Spherical oögonium and its attendant diclinous antheridial branch. Sporangium to right of oögonium contains a gemma. 15. Oögonium and attendant diclinous antheridia originating from an internal and a sympodial hyphal branch. FIGS. 16, 17. *Phlyctochytrium zygnematis*. 16. A discharged thallus on a secondary sporangium of *Saprolegnia* sp. 12241. 17. An immature thallus. Figures 1-9, scale A; figs. 10, 13, 16, 17, scale B; others, scale C.


1
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12
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16
17
A 50 µm
B 20 µm
C 20 µm

Oögonia (Figs. 11-15) were sparse in all cultures. Immature ones were smooth walled, but as oöspore cleavage proceeded, the wall became slightly wavy (Fig. 15) or sparsely or densely ornamented with papillae (Fig. 11). These were thin-walled, and appeared to be membranous protrusions through pits (Fig. 13). The papillae did not become thick walled as the oögonium matured, nor did they disappear as would be expected if they were merely expressions of changing turgor within the oögonium. In the specimens at hand (including those on infested chironomid exuviae) the oögonia terminated only those hyphae proliferating through discharged sporangia.

Antheridial branches, like the oögonia, were few. The diclinous antheridial filaments originated sympodially (Fig. 15) or internally through an empty sporangium (Fig. 14). Antheridial cells were simple, terminal, and appressed apically or laterally to the oögonial wall (Fig. 15). The mature oöspores were centric (Fig. 13).

Some immature sporangia in the original gross cultures (Herb. No. 12241) were parasitized by an ornamented *Phlyctochytrium* (Figs. 16, 17) that developed (though sparsely) along with the host in several unifungal cultures. The sporangia were small (9-15 µm in diameter by 7-12 µm high, exclusive of ornamentations), epibiotic, and were subtended by an apophysate, endobiotic rhizoidal system. The posteriorly uniflagellate planonts (2-3 µm in diameter) emerged through a subapical orifice (Fig. 16), clustered momentarily in a loose mass outside the opening, then swam away. Stages in inoculation and penetration were not observed.

The wall ornamentation pattern of this *Phlyctochytrium* was varied, but an apical collarette of 4 (rarely 3) slender, acute, nonconverging spines appeared on all thalli observed. In some plants, there were 1-2 rows of lateral spines around the outer periphery of the sporangium (Fig. 16), but in others, such spines were few and scattered (Fig. 17). Less than 18% of the ornamentations on all sporangia observed were bipartite.

This *Phlyctochytrium* also grew on the snakeskin substratum supporting the *Saprolegnia*, and developed as well on pine pollen (Herb. No. 12222) seeded in water expressed from *Sphagnum* sp. In the cultures on snakeskin, the infected watermold was accompanied by two other chytrids. One produced large thalli with dense enations (often bifurcate) that fused basally to form a partial reticulum on the sporangium surface. The second formed sporangia bearing simple and bifurcate lateral enations, in rows, but lacking an apical collarette of ornamentations.

TAXONOMY

The release, without prior encystment, of laterally biflagellate planonts from primary sporangia is not by itself unique among the aquatic fungi, but this characteristic coupled with an obviously

saprolegniaceous thallus emerges as a significant taxonomic problem. The flagellum insertion pattern recalls pythiaceous fungi or the Thraustochytriaceae. Oöspore type (among other features) is not that of the former, and the hyphal development precludes assignment to the latter family. An affinity of the Norwegian fungus with the Saprolegniaceae seems more logically indicated, though this is by no means a fully satisfactory disposition.

Sporangium shape in this watermold resembles that common to species of *Pythiopsis* deBary (Coker, 1923). In *P. humphreyana* Coker (1914) sporangia are renewed sympodially as are those of this fungus from Norway. *Pythiopsis cymosa* deBary (1888) also has sympodial branching, but its frequency is not pronounced. Oögonium structure and the pattern of flagellum insertion in emerging planonts bars assignment to *Pythiopsis*. In members of this genus the planonts released from primary sporangia are apically biflagellate.

Species of *Protoachlya* (Coker, 1923) exhibit some variations in patterns of planont emergence and flagellation. Coker (1923: p. 92) reports several variants in *P. paradoxa*, noting in one instance that the released planonts were elongate, but bent "...backward at the ends and then fuse(d) into a pear-shaped spore..." With this exception, however, the planonts in *P. paradoxa* are initially apically biflagellate if saprolegnoid discharge is effected or encyst immediately outside the orifice if emergence is achlyoid. While the sporangia of *P. paradoxa* (Coker, 1923) are internally and sympodially renewed, they are cylindrical. Sporangium shape and absence of achlyoid discharge prevent identification of my specimens as either *P. hypogyna* (Shanor & Conover, 1942) or *P. polysporus* (Apinis, 1930). Moreover, in these Protoachlyas the planonts are anteriorly biflagellate, and in the latter, dictyoid discharge may occur. In *P. hypogyna* some oögonia are produced terminally on hyphae growing through old sporangia; the watermold from Norway has a similar pattern although this is more frequently expressed than in the *Pythiopsis*.

The affinities of the Norwegian plants are more with *Saprolegnia* than with any other known genus in the family. Thallus habit, oögonium and oöspore structure, as well as sporangium renewal patterns, readily admit the fungus to *Saprolegnia*. It should be noted also that even some primary planonts of recognized species in this genus swim with subapically attached flagella. None produces laterally biflagellate primary planonts, and yet it is on the basis of release pattern and flagellation insertion that most genera of Saprolegniaceae are recognized. Until such time as specimens can be grown as single spore isolates in pure culture and studied extensively under a variety of conditions, assignment to a new genus would be of dubious merit. The unusual characteristic of laterally biflagellate primary planonts may not persist in other culture conditions.

The watermold from acid lakes does not resemble closely any of the recognized species of *Saprolegnia* (Seymour, 1970). Its ornamented oögonia suggest an alliance with *S. asterophora* deBary, but the characteristics of wall pitting and antheridial origin (among other features) are quite different. Were the oögonia not ornamented,

identification with *S. ferax* (Gruith.) Thuret or *S. diclina* Humphrey might be attempted since these two species, broadly conceived, are highly variable. Species identification, too, must await successful unisporal culturing of the fungus.

A formal description of *Saprolegnia* sp. 12241 follows.

Primary sporangia oval, ovoid, obpyriform, or broadly fusiform, occasionally subspherical; apex a broad, nearly truncate exit papilla; 44-81 μm long by 20-51 μm in diameter. Secondary sporangia oval, ovoid, obpyriform, or broadly fusiform, and often delimited in shape by the confines of previously produced ones; apical portion occasionally protruding beyond the primary sporangia, and then constricted, expanded or bent, and often irregular; renewal by internal proliferation or, infrequently, by sympodial branching; apical pore often enlarging as successive sporangia are produced internally. Planonts endogenously formed; emerging slowly and singly through the apical orifice as laterally biflagellate cells, swimming sluggishly, and by slight amoeboid motion becoming subapically (anteriorly) biflagellate; encysting before germinating to form new hyphae; occasionally encysting in a sporangium. Gemmae very sparse; pyriform; confined to discharged sporangia; germination not observed. Oögonia sparse; spherical or pyriform; at first smooth-walled, but becoming papillate or undulate as maturation proceeds; single; pitted; produced terminally on hyphae proliferating through discharged sporangia; spherical ones (43-)55-72(-107) μm in diameter, including ornamentations, pyriform ones (38-)49-77(-121) μm long by (30-)41-55(-66) μm in diameter. Antheridial branches sparse; slender, unbranched or sparingly branched; diclinous, originating as hyphae proliferating internally through sporangia or as sympodial branches; antheridial cells terminal, clavate, simple, attached apically or laterally to the oögonial wall; fertilization tubes not observed. Oöspores centric; (3-)12-24(-64) in number; (14-)16(-19) μm in diameter; germination not observed.

On exuviae (chironomid): Bakketjernet, 6 August 1974 (Herb. No. 12241); on snakeskin bait: water expressed from *Sphagnum* sp., Bakketjernet, 6 August 1974 (Herb. No. 12247), in water and sediment, edge of Gravtjernet, 7 August 1974 (Herb. No. 12255), and in soil, edge of Bakketjernet, 17 August 1974 (Herb. No. 12380).

The fungus (Figs. 16, 17) parasitizing the sporangia of *Saprolegnia* sp. 12241 is accommodated in *Phlyctochytrium* Schroeter (*sensu strictu*). Assigning a proper specific name to this chytrid is troublesome.

Among the ornamented species of *Phlyctochytrium* (Sparrow, 1960) are several with bipartite teeth, or with simple spines in whorls. The presence of a terminal set of spines in the Norwegian specimens recalls *P. planicorne* Atkinson (1909), but in that species (Johnson, 1973; Umphlett & Holland, 1960), the apical processes are convergent and there are no lateral enations. Some sporangia of *P. aureliae* Ajello (1942) from Iceland (Johnson, 1973) have sparse, scattered ornamentations, and this species is evidently notorious for its

variability in this regard. However, all thalli of Ajello's species that I have collected generally produce bipartite enations. Although *P. mucronatum* Canter (1949) forms undivided teeth (as well as bipartite ones), its sporangia also possess a prominent apical spine. None of my specimens on the watermold has such a sporangial configuration.

Rosen's (1887: fig. 23) account of *Chytridium* (= *Phlyctochytrium*) *zygnematis* characterizes this species as having a terminal collarette of enations, and some lateral ornamentations as well. This is precisely the configuration of the epibiotic sporangia on the watermold. In Rosen's species, the wall ornamentations are figured as bipartite, yet such structures are not common in my material. Other characteristics of the Norwegian plants agree with those of *P. zygnematis* save for substratum. In my experience with phlyctidiaceous fungi (Johnson, 1973), substratum type has not proven to be a dependable taxonomic criterion.

Miller's (1968) account of ornamentation variation in a chytrid designated simply as "Dentate" bears prominently on identification in the dentigerate group of *Phlyctochytrium*. He shows (Miller 1958: figs. 17-20) sporangia with ornamentation patterns indistinguishable from those of my plants, yet the variations he illustrates developed in larger populations of ornamented forms identifiable both with *P. aureliae* and *P. mucronatum*.

This Norwegian chytrid digresses from the strictest interpretation of *Phlyctochytrium zygnematis*. The weight of evidence, however, particularly from general configuration of the sporangia, favors provisional identification of my specimens as Rosen's species. Certainly there exists insufficient grounds on which to propose a new taxon. The several ornamented forms accompanying on the same bait as this one on the watermold must be isolated, cultured, and examined thoroughly to determine if they are variants of one species or are a complex of one or more taxa with rather consistent patterns of ornamentation. Perhaps a critical sorting within the populations at hand will provide clues to the true identity of this parasitic chytrid.

ACKNOWLEDGEMENTS

I am grateful to Dr. Dag Klaveness, Institutt for Marinbiologi og Limnologi, University of Oslo, for his unselfish cooperation, and to his Institute for the generous laboratory space and supplies. To Dr. Roland L. Seymour, Ohio State University, go my special thanks for his review of the manuscript and resultant meaningful comments. The Duke University Research Council awarded travel funds.

REFERENCES CITED

AJELLO, L. 1942. *Phlyctochytrium aureliae* parasitized by *Rhizophydium chytriophagum*. Mycologia 37: 109-119.

APINIS, A. 1930. Untersuchungen über die in Lettland gefundenen Saprolegniaceen nebst Bemerkungen über andere Wasserpilze. Acta Horti Bot. Univ. Latv. 4: 201-246.

ATKINSON, G. F. 1909. Some fungus parasites of algae. Bot. Gaz. 48: 321-338.

BARKSDALE, A. W. 1962. Effect of nutritional deficiency on growth and sexual reproduction of *Achlya ambisexualis*. Amer. J. Bot. 49: 633-638.

BARY, A. de 1888. Species der Saprolegnieen. Bot. Zeit. 46: 629-636.

BOOTH, T. & MILLER, C. E. 1968. Comparative morphologic and taxonomic studies in the genus *Thraustochytrium*. Mycologia 60: 480-495.

CANTER, H. M. 1949. Studies on British Chytrids. VII. On *Phlyctochytrium mucronatum* n. sp. Trans. Brit. Mycol. Soc. 32: 236-240.

COKER, W. C. 1914. Two new species of water molds. Mycologia 6: 285-302.

COKER, W. C. 1923. The Saprolegniaceae, with notes on other water molds. 201 pp., Univ. of North Carolina Press, Chapel Hill.

FULLER, M. S., FOWLES, B. E. & MCLAUGHLIN, D. J. 1964. Isolation and pure culture study of marine Phycomycetes. Mycologia 56: 745-756.

JOHNSON, T. W., JR. 1973. Aquatic fungi of Iceland: uniflagellate species. Acta Nat. Islandica 22: 1-48.

MILLER, C. E. 1968. Observations concerning taxonomic characteristics in chytridiaceous fungi. J. Elisha Mitchell Sci. Soc. 84: 100-107.

ROSEN, F. 1887. Ein Beitrag zur Kenntnis der Chytridiaceen. Cohn, Beitr. Biol. Pflanzen 4: 253-266.

SEYMOUR, R. L. 1970. The genus *Saprolegnia*. Nova Hedwigia (Beiheft) 19: 1-124.

SHANOR, L. & CONOVER, R. A. 1942. A new *Protoachlya*. Amer. Midl. Nat. 28: 746-751.

SPARROW, F. K., JR. 1960. Aquatic Phycomycetes. 2nd Ed. 1187 pp., Univ. Michigan Press, Ann Arbor.

UMPHLETT, C. J. & HOLLAND, M. M. 1960. Resting spores in *Phlyctochytrium planicorne*. Mycologia 52: 429-435.

WILLOUGHBY, L. G. 1958. Studies on soil chytrids. III. On *Karlingia rosea* Johanson and a multioperculate chytrid parasitic on *Mucor*. Trans. Brit. Mycol. Soc. 41: 309-319.

le nom et la spécialité du personnel scientifique, les publications, et les possibilités de prêt et d'échange.

Le troisième fascicule de la seconde partie, COLLECTORS' INDEX I-L, fait suite aux fascicules A-D (1954, 174 p.) et E-H (1957, 121 p.). Cette index donne les noms de récolteurs botanistes du monde entier, les aires de récoltes, les groupes végétaux récoltés, l'importance des collections et les herbiers qui les préservent. Le présent fascicule répertorie plus de 330 noms de récolteurs mycologues et lichénologues.

L'INDEX HERBARIORUM est un de ces ouvrages dont le taxonomiste ne peut se passer.

LES CHAMPIGNONS, by Patrick JOLY, 256 p., 50 figs., with 112 color photographs by P. JOLY and H. SCHREMPP, 13 × 19 cm., bound, *in* Couleurs de la Nature, edited by Hatier s.a., 8 Rue d'Assas, 75278 Paris, 1972. FF 26.00.

This beautifully illustrated book is meant for beginners in mycology. It enlarges in a nice way the collection of small pocket manuals for field work. The coloured illustrations of the mushrooms described surpass in quality those of most field manuals.

The authors not only respected perfectly the relation of the species to their environment but they also managed to capture with accuracy the correct color tinges and the most typical characters.

Of the 110 species shown, 81 have a half-page illustration, the others a full or a double page. The half-page description given to each species includes the Latin name (without author's name), the French vernacular name, the group to which the species belongs, and a description of the species by field characters only. There are also useful comments about edibility and how to avoid confusion with related species.

The color illustrations are not grouped, perhaps unfortunately, but distributed in 120 pages of text. Indeed, the book is not a flora, but is meant as an introduction to the world of fungi, their groups, reproduction and ecology. The author's aim is to stimulate curiosity and to permit anyone to initiate himself in the knowledge of fungi.

CHECK LIST OF EUROPEAN POLYPORES, by M. A. DONK, Koninklijke Nederlandse Akademie van Wetenschappen, Afd. Natuurkunde, Verhandelingen 2, 62, 469 pp., 1974, North Holland Publishing Co., P.O. Box 3489, Amsterdam, Fl. 110.–

Cette publication posthume de M.A. Donk est une compilation commentée de tout ce qui a été publié sur les polypores européens. L'auteur a voulu présenter la documentation qu'il a analysée dans une arrangement taxonomique conservatoire et aussi cohérent que possible, sur la seule base de taxa véri-

(continued on page 204)

MYCOTAXON

Vol. II, No. 1, pp. 195-203 April-June 1975

NEW SPECIES OF RAVENELIA (UREDINALES)[1/]

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SUMMARY

New species of *Ravenelia*, on the Mimosoideae of Continental North America, are described: *R. aurea* on *Acacia*, *R. hermosa* on *Leucaena*, *R. bajacalensis* on *Lysiloma*, *R. verrucata* on *Mimosa*, and *R. alamosensis*, *R. multispinosa*, *R. striatispora* on *Pithecellobium* (Mexico); *R. linda* on *Calliandra* (Honduras); *R. floridana* on *Pithecellobium* (U.S.A.).

This paper presents diagnoses and illustrations of nine new species of *Ravenelia*. All parasitize plants of the subfamily Mimosoideae of the Leguminosae in south temperate to tropical Continental North America. Six of the species are from the western side of Mexico, where the population and diversity of woody legumes are great. Collecting in this area has been mostly that of the senior author.

Ravenelia aurea sp. nov. (Fig. 1)

Spermogoniis amphigenis, conicis, subcuticularibus, in maculis minutis incrassatis dense aggregatis. Aeciis amphigenis, subepidermalibus, uredinoidibus, spermogoniis circumcirca, brunneis, paraphysibus numerosis, capitatis,

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1/ University of Arizona, Agricultural Experiment Station Journal Article No. 2434.

usque ad 22 µm diametro, ad apicem castaneo-brunneis basim versus hyalinis, membrana plus minusve uniformiter 3.5-5 µm crassa; sporis (22-)25-32(-35) x (11-)13-17(-18) µm, plerumque ellipsoideis vel anguste obovoideis, membrana 1.5-2 µm vel ad apicem leniter incrassata, ad apicem aureo-brunnea deorsum pallidiore, echinulata, poris germinationis 8, bizonatis. Urediniis aeciis conformibus (vel nullis?). Capitulis teliosporarum in aeciis (55-)60-70(-75) µm diametro, ex cellulis 4 vel 5 in omni directione compositis aureo-brunneis, facile secedens, levis, cellulis centralis (14-)18-22(-24) µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis vel semipendulis.

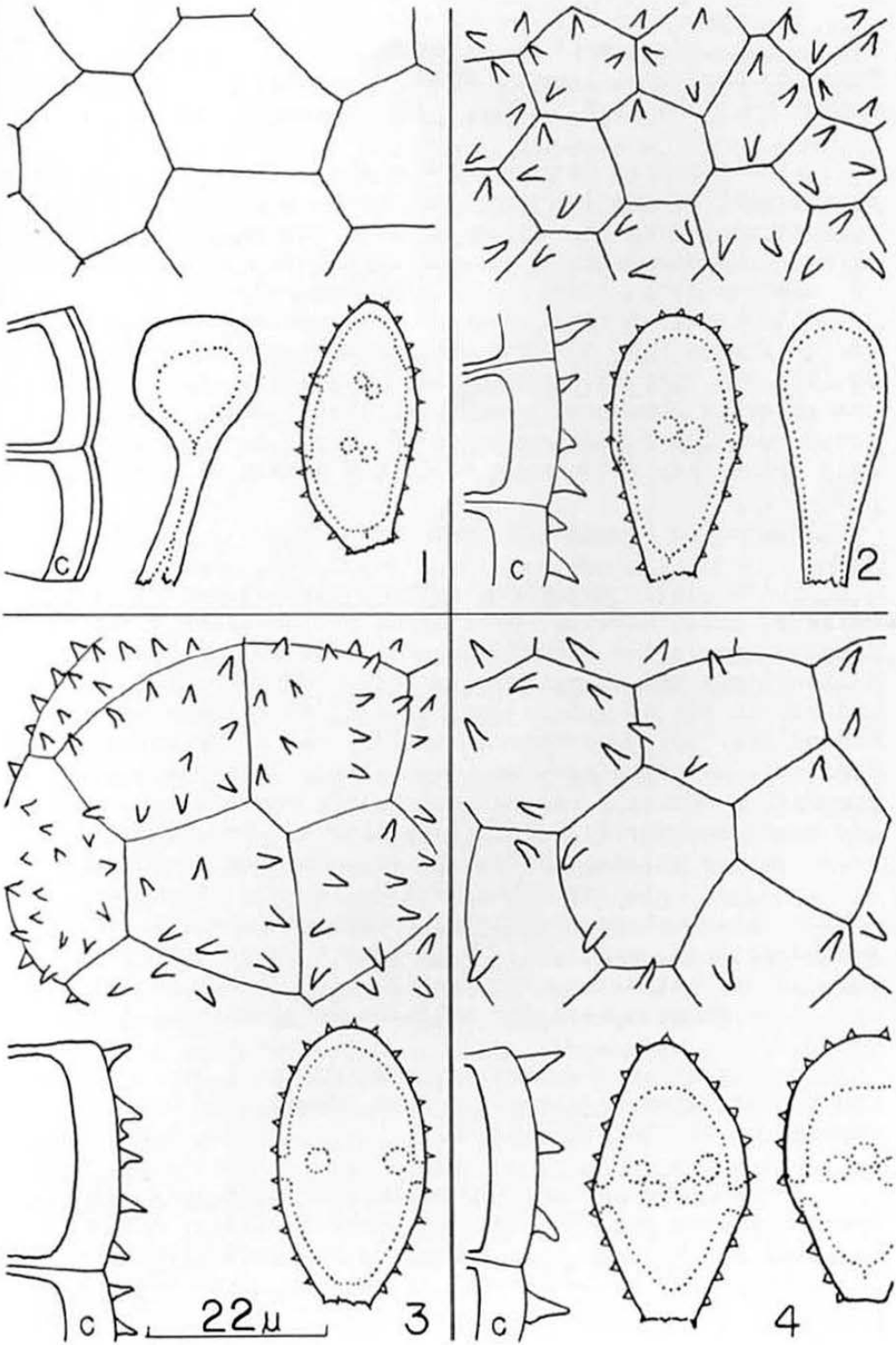
Holotype: on *Acacia pringlei* Rose, Mex hgw 190, km 786 w of Tehuantepec, Oaxaca, Mexico, 23 Feb. 1963, Barr No. 63-51 ex ARIZ 171780 (PUR 63746). Not otherwise known.

There are three other North American species on *Acacia* that have smooth teliospore heads, urediniospores with bizonate pores and paraphyses: *R. spegazziniana* Lindq., *R. thornberiana* Long and *R. versatilis* Diet. These have subcuticular uredinia and paraphyses with thinner walls. The golden teliospores, which separate easily, further distinquish *R. aurea*.

R. linda sp. nov. (Fig. 3)

Spermogoniis et aeciis ignotis. Urediniis amphigenis, sparsis, subcuticularibus, tarde dehiscentibus, brunneis, paraphysibus nullis; sporis (26-)30-36(-40) x (15-)17-20(-24) µm, ellipsoideis vel anguste obovoideis, membrana uniformiter 1-1.5 µm crassa vel ad apicem usque ad 2.5 µm crassa, pallide cinnamomeo-brunnea, echinulata, poris germinationis 4 vel 5, aequatorialibus. Teliis urediniis conformibus sed atro-brunneis; capitulis teliosporarum 55-70(-80) µm diametro, plerumque ex cellulis 4 in omni directione, pro parte maxima ex cellulis 4 centralis et 6 peripheralis compositis, castaneo-brunneis, quaque cellula (6-)10-20 spinae vel tuberculae ornatae, cellulis centralis

Figures 1-4. Species of *Ravenelia:* central cells of the teliospore head (top); margin of spore head (left); urediniospore and a paraphysis, when produced (right). 1. *R. aurea* on *Acacia*. 2. *R. hermosa* on *Leucaena*. 3. *R. linda* on *Calliandra*. 4. *R. floridana* on *Pithecellobium*. (All from types and to the same scale.)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(16-)19-24(-28) µm latis, cystidiis eodem numero quo cellulis marginalibus, globosis, plus minusve pendulis.

Holotype: on *Calliandra tapirorum* Standl., 5 km s of Ojo de Aqua, Region of Quebrada de dantas, Dept. El Paraiso, Honduras, 11 Dec. 1946, Standley, Williams and Molina No. 1254 (PUR 51702). Not otherwise known.

Eight species have spinose teliospore heads, urediniospores with equatorial pores and no paraphyses. Four have subcuticular sori (*R. linda, R. alamosensis, R. havanensis* Arth., *R. siderocarpi* Long) and four have subepidermal sori (*R. distans* Arth. & Holw., *R. floridana, R. multispinosa, R. pithecolobii* Arth.). Only *R. distans* and *R. linda* occur on *Calliandra*. *R. distans* has urediniospores mostly 22-26 µm long and apiculately thickened apically. *R. havanensis* has apically thickened urediniospores as does, but less conspicuously, *R. siderocarpi*. *R. linda* has about twice as many spines per teliospore as do the others of the group.

Ravenelia hermosa sp. nov (Fig. 2)

Spermogoniis subcuticularibus. Aeciis subepidermalibus, uredinoidibus, paraphyses peripherales clavatis, paucis; sporis (25-)28-35(-38) x 15-18(-20) µm, plerumque ellipsoideis vel obovoideis, membrana ad laterum 1.5-2 µm crassa, ad apicem 3-5 µm crassa, pallide castaneo-brunnea, echinulata, poris germinationis (3)4 vel 5, aequatorialibus. Urediniis amphigenis, subepidermalibus, paraphysibus brunneis numerosis; sporis aeciosporis conformibus. Teliis plerumque hypophyllis, subepidermalibus, atro-brunneis, paraphysibus nullis; capitulis teliosporarum 70-105 µm diametro, ex cellulis (5)6 vel 7(8) in omni directione compositis, castaneo-brunneis, quaque cellula (0-)2-4(-5) spinae ornatae, spinae 3-4.5 µm longae, ad apicem anguste rotundatae, cellulis centralis (10-)12-17(-20) µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis.

Holotype: on *Leucaena palmeri* Britt. & Rose, along stream, Mt. Alamos, Alamos, Sonora, Mexico, 14 Oct. 1970, Cummins No. 70-142 (PUR 63574).

Three other species (*R. expansa* Diet. & Holw., *R. leucaenae* Long and *R. verrucosa* Cooke & Ellis) occur on *Leucaena* in the area. *R. leucaenae* has urediniospores 38-50 µm long with subequatorial pores; the other two have spores in the range of 15-20 µm long and scattered pores.

All have paraphyses.

Ravenelia bajacalensis sp. nov. (Fig. 5)

Spermogoniis et aeciis ignotis. Urediniis subcuticularibus, pleumque hypophyllis nervus medius consociatis, flavo-brunneis, paraphysibus nullis; sporis (15-)16-19(-21) x (11-)13-16(-17) µm, oblongo-ellipsoideis, late ellipsideis vel late obovoideis, membrana (1.5-)2(-2.5) µm crassa, echinulata vel verrucoso-echinulata, pallide aureo-brunnea vel flavida, poris germinationis obscuris, sparsis vel plus minusve bizonatis, verosimiliter 8. Teliis urediniis similis sed atro-brunneis; capitulis teliosporarum (74-)80-110(-120) µm diametro, ex cellulis (6)7-9(10) in omni directione compositis, castaneo-brunneis, quaque cellula cum tuberculum unicum 2-3.5 µm latus (2-)3-5(-6) µm altus, cellulis centralis (11-)13-18(-22) µm latis, cystidiis numerosis, multiseriatis, pendulis.

Holotype: on *Lysiloma candida* Brand., Los Encinos, Sierra Giganta, Baja California Sur, Mexico, 28 Feb. 1939, Gentry No. 4263 ex ARIZ 66230 (PUR 64928).

R. arizonica Ellis & Ever. also has one tubercle or spine per cell but it has urediniospores that mostly are 33-46 µm long and have equatorial pores.

Ravenelia floridana sp. nov. (Fig. 4)

Spermogoniis et aeciis ignotis. Urediniis epiphyllis, aggregatis, subepidermalibus, plus minusve indehiscentibus, paraphysibus nullis; sporis (24-)26-35(-40) x (15-)18-22(-24) µm, valde variabiles sed plerumque obovoideis, membrana ad laterum (2-)2.5-3.5(-4) µm crassa ad apicem (3.5-)5-7(-9) µm crassa, aureo-brunnea vel fere hyalina, echinulata, poris germinationis (4)5 vel 6, aequatorialibus. Teliis urediniis conformibus; capitulis teliosporarum (55-)60-75(-83) µm diametro, ex cellulis (3)4-6 in omni directione compositis, atro-brunneis, quaque cellula (0-)2-5(-6) spinae 3-6 x 2-3 µm ornatae, cellulis centralis (17-)19-24(-26) µm latis, cystidiis eodem numero quo cellulis marginalibus, pendulis.

Holotype: on *Pithecellobium unguis-cati* (L.) Mart., Matheson's Hammock, Dade County, Florida, U.S.A., 23 Feb. 1922, Stevenson No. 1817 (PUR 6115).

This species is distinctive because of the irregular and thick-walled urediniospores. The side wall of the urediniospores of *R. pithecolobii*, *R. siderocarpi* and *R. multispinosa* is about 1.5-2 µm thick. Also see discussion under *R. alamosensis* and *R. linda*. This fungus has been treated previously as *R. pithecolobii* which, in addition to the thin-walled urediniospores, has central cells of the teliospore heads that are only 12-16(-18) µm across.

Ravenelia alamosensis sp. nov. (Fig. 6)

Spermogoniis et aeciis ignotis. Urediniis amphigenis, subcuticularibus, brunneis, paraphysibus nullis; sporis (16-)18-21(-23) x (11-)13-14(-15) µm, plerumque ellipsoideis, membrana 1.5(-2) µm crassa, cinnamomeo-brunnea vel aureo-brunnea, echinulata, poris germinationis 4-6 frequenter 5 vel 6, aequatorialibus. Teliis urediniis similis sed atro-brunneis; capitulis teliosporarum (48-) 60-80(-85) µm diametro, ex cellulis 5 vel 6 in omni directione compositis, castaneo-brunneis, quaque cellula 3-6 spinae 2.5-4(-5) µm longae ornatae, cellulis centralis 12-22 µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis.

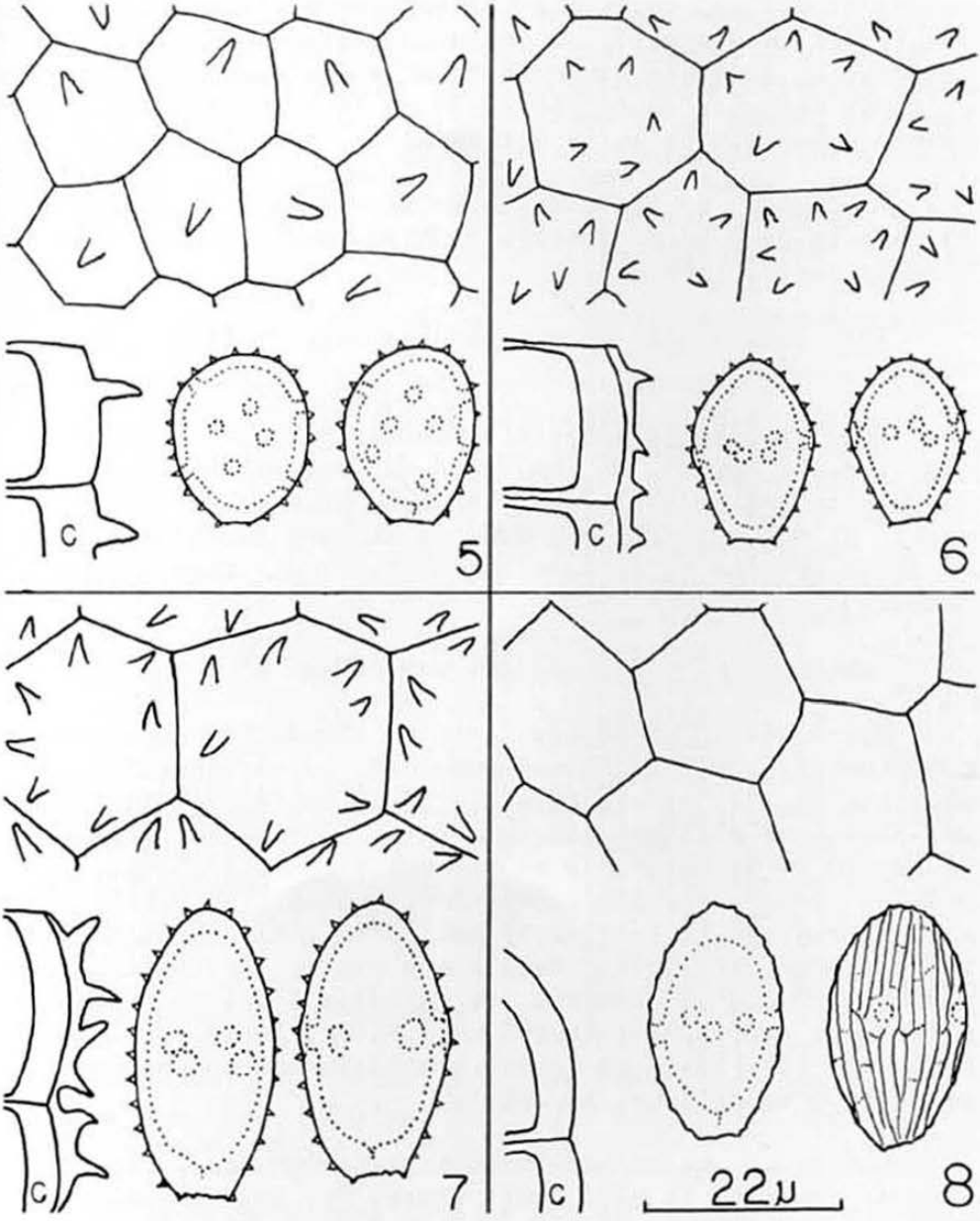
Holotype: on *Pithecellobium tortum* Mart., trail to Mt. Alamos, Alamos, Sonora, Mexico, 10 Oct. 1970, Cummins No. 70-106 (PUR 63539).

The fungus also occurs in Sinaloa State.

Including the new species, there are seven that parasitize *Pithecellobium* in North America. All have urediniospores with equatorial pores. Only *R. bifenestrata* Mains and *R. striatispora* have smooth teliospores. *R. alamosensis* has small urediniospores; the other four that have sculptured teliospores have urediniospores in the range of 26-35 µm long.

Ravenelia multispinosa sp. nov. (Fig. 7).

Spermogoniis et aeciis ignotis. Urediniis plerumque epiphyllis, subepidermalibus, cinnamomeo-brunneis, paraphysibus nullis; sporis (26-)29-35(-38) x (16-)18-21(-23) µm, ellipsoideis, membrana ad basim 2.5-3.5 µm crassa ad apicem 2-3 µm crassa ad laterum 1-1.5 µm crassa, obscure cinnamomeo-brunnea, echinulata, poris germinationis 4, equatorialibus. Teliis plerumque epiphyllis, atro-brunneis,



Figures 5-8. Species of *Ravenelia:* central cells of the teliospore head (top); margin of spore head (left); urediniospores (right). 5. *R. bajacalensis* on *Lysiloma*. 6. *R. alamosensis* on *Pithecellobium*. 7. *R. multispinosa* on *Pithecellobium*. 8. *R. striatispora* on *Pithecellobium*. (All from types and to the same scale.)

subepidermalibus; capitulis teliosporarum plerumque (60-) 65-85(-90) µm diametro, ex cellulis 4(5) in omni directione compositis, castaneo-brunneis, quaque cellula 5-10 spinae ornatae, cellulis centralis 22-30 µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis.

Holotype: on *Pithecellobium tortum* Mart., Sinaloa hgw 59 near km 86 e of El Fuerte, Sinaloa, Mexico, 6 Dec. 1971, Cummins 71-612 (PUR 64165).

This fungus also occurs in Baja California Sur and Sonora.

This species is generally similar to *R. siderocarpi* (on *Pithecellobium*), *R. linda* (on *Calliandra*) and *R. havanensis* (on *Enterolobium*) but they have subcuticular sori. *R. multispinosa* has more spines per teliospore than do other species on *Pithecellobium* but fewer than does *R. linda*.

Ravenelia striatispora sp. nov. (Fig. 8)

Spermogoniis et aeciis ignotis. Urediniis amphigenis, subepidermalibus, cinnamomeo-brunneis, pulverulentis, paraphysibus nullis; sporis (19-)21-25(-27) x (12-)13-15(-16) µm, plerumque ellipsoideis, membrana ad apicem et basem (2.5-)3-3.5(-4) µm crassa ad laterum (1.5-)2(-2.5) µm crassa, obscure aureo-brunnea, longitudinaliter striata, striae inter se (1.5-)2(-2.5) µm, poris germinationis (4)5 vel 6, aequatorialibus. Teliis non visis; capitulis teliosporarum 80-110 µm diametro, ex cellulis 5 vel 6 in omni directione compositis, castaneo-brunneis, levis, cellulis centralis (16-)18-22 µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis.

Holotype: on *Pithecellobium mexicanum* Rose, Comanito, Sinaloa, Mexico, 15 Mar. 1941, Gentry No. 5927 ex ARIZ 66892 (PUR 64929).

The longitudinally striated spores, which may have some fine cross connections, are unique. *R. corbula* J. W. Baxt. has spirally verrucose spores and paraphyses. It occurs on *Caesalpinia* (subfamily Caesalpinioideae).

Ravenelia verrucata sp. nov. (Fig. 9)

Spermogoniis et aeciis ignotis. Urediniis epiphyllis,

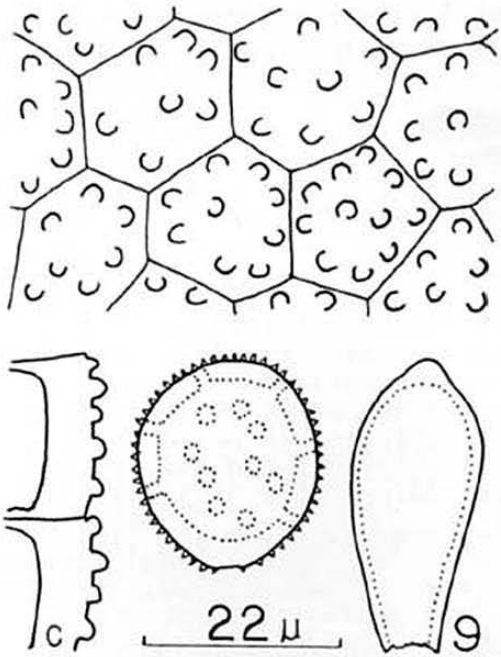


Fig. 9. *Ravenelia verrucata* on *Mimosa:* central cells of teliospore head (top); margin of spore head (left); one urediniospore and one paraphysis (right). (From type.)

flavo-brunneis, subcuticularibus, paraphysibus plerumque clavatis usque ad 14 µm latis, membrana uniformiter 1 µm crassa vel ad apicem usque ad 6 µm crassa, hyalina vel flavida; sporis (17-)19-22(-23) x (16-)17-19 (-20) µm, late ellipsoideae vel globoideae, membrana 2-2.5(-3) µm crassa, flavo-brunnea, densique verrucoso-echinulata, poris germinationis 10-15, sparsis. Teliis urediniis consociatis atro-brunneis, sine paraphysibus; capitulis teliosporarum 60-90 µm diametro, ex cellulis 4-7 in omni directione compositis, castaneo-brunneis, quaque cellula tuberculae (4-)7-11 ornatae, cellulis centralis (15-)17-21 µm latis, cystidiis eodem numero quo cellulis marginalibus, adpressis vel semipendulis.

Holotype: on *Mimosa spirocarpa* Rose, Mex hgw 15, km 41 n of Mazatlan, Sinaloa, Mexico, 2 Dec. 1971, Cummins No. 71-591 (PUR 64152).

The species occurs also on *Mimosa guatemalensis* (Hook. & Arn.) Benth. and in Nayarit State.

R. verrucata differs from others on *Mimosa* because of the thicker wall and greater number of pores of the urediniospores, the nearly colorless, thin-walled paraphyses and the more numerous tubercles on the teliospores.

fiés, laissant de côté toute tentative de revision taxonomique, de recherche ou de d'étude monographique.

Dans cette perspective, l'auteur s'est éfforcé de démentir cet aspect de la littérature botanique que, déjà en 1821, Purton (App. Midl. Fl. p. 335) regrettait en ces termes "The practice of accurately examining the synonyms, instead of copying them from other authors, has been too long neglected." Le contenu taxonomique de chaque taxon dénommé a été vérifié afin de certifier les synonymies et de dépister les mésapplications des noms à travers une littérature de plus de 200 ans. Grâce à un système original d'abréviation succinte, les innombrables références aux noms de genre ou d'espèce acceptée, à leurs synonymes et leurs mésapplications sont condensées dans une première partie (184 p.). Par ailleurs, la liste bibliographique se limite à une sélection de plus de mille publications relatives aux polypores européens.

Ensuite l'auteur propose ses remarques sur les taxa acceptés, non pas pour trancher le doute ou donner une interprétation, mais pour attirer l'attention du chercheur sur les problèmes taxonomiques latents (85 p.).

Enfin une très longue liste avec commentaire (103 p.) des noms génériques et spécifiques rejetés pour des raisons d'invalidité et de doute, et un index des noms et synonymes terminent l'ouvrage.

C'est le résultat d'un travail précis, patient et méthodique, la part la plus rebutante de la tache du taxonomiste. Bien qu'il ait regretté n'avoir pu s'étendre aux polypores extra-européens, le Dr. M.A. Donk a réalisé pour nous ce premier pas indispensable à toute future monographie des polypores.

THE TREE RUSTS OF WESTERN CANADA, by Wolf G. ZILLER, Canadian Forestry Service Publication n° 1329, viii + 272 p., 157 figs., Victoria, 1974. Obtainable from Information Canada, Ottawa K1A 0S9. Canadian $5.00.

L'auteur a assemblé dans ce livre toute l'information publiée à ce jour et le fruit de ces 25 années de recherches personnelles sur les rouilles (Urédinales) et les maladies qu'elles causent aux arbres dans le Canada occidental. Il fournit les descriptions taxonomiques et les clés d'identification de 70 espèces. Il en donne le cycle évolutif illustré dans des diagrammes en spirale, la pathogénie, l'épidémiologie, la distribution géographique et les hôtes. Il ajoute des notes sur les moyens de lutte. Illustré d'excellentes photographies couleurs et de microphotos, le livre est rendu plus accessible encore grâce à un glossaire des termes techniques. Utile aux spécialistes, ce livre intéressera aussi les mycologues, naturalistes et forestiers.

MYCOLOGIST'S HANDBOOK, par D.L. HAWKSWORTH, recensé dans MYCOTAXON 1(3): 238, 259, peut aussi être obtenu en version brochée à £ 2.75.

MYCOTAXON

Vol. II, No. 1, pp. 205-208 April-June 1975

DEUX NOUVEAUX HAMASPORA (UREDINALES) DE L'HIMALAYA

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L'examen de matériel récemment collecté au Népal (1) m'a révélé la présence de parasites du genre *Hamaspora* sur un certain nombre de *Rubus*. Ces récoltes sont particulièrement intéressantes puisque ces Urédinales n'étaient pas connues dans l'Himalaya (DURRIEU). D'autre part deux d'entre elles présentant des téliospores, leur détermination était possible, or elles ne correspondent à aucune des espèces actuellement décrites (MONOSON).

Hamaspora dobremezii n. sp.

Sur *Rubus fockeanus* KURZ., forêt dans la vallée de Lantang, en aval de Gora Tabela, vers 2800 m, 26 mai 1974.

Urédos inconnus. Téliosores situés à la face inférieure des feuilles, souvent en groupe, formant des filaments très contournés, atteignant 7 mm de long et 0,2 mm de diamètre, jaune pâle ou blancs. Les téliospores (fig. 1) sont cylindriques, atténuées en longue pointe à partir de la moitié ou du tiers supérieur. Elles comportent 4 (dans 56% des cas) ou 5 cellules (dans 40% des cas), bien plus rarement (4%) 3 seulement. Elles mesurent de 120 à 183 µm de long (et parfois jusqu'à 202 µm) et de 13 à 18 µm de diamètre. Leur paroi est mince, sauf à l'apex où elle s'épaissit pour former une pointe de 5 à 9 µm, rarement

(1) La récolte de ce matériel a été réalisée au cours d'une mission effectuée dans le cadre de la RCP 253 "Ecologie et Géologie de l'Himalaya central" du C.N.R.S.

jusqu'à 12 µm . La cellule terminale est souvent 2 à 3 fois plus longue que les autres. Ces téliospores germent sur place mais il n'y a pas de pore germinatif visible.

La présence d'urédospores dans le cycle n'est pas impossible du fait de l'observation d'une téliospore anormale (fig. 2) dont la cellule terminale a l'aspect d'une urédospore. Mais il peut s'agir d'une anomalie sans signification sur le cycle actuel du parasite, car il faut aussi tenir compte que la date de la récolte (mai) est relativement précoce, donc si l'espèce n'était pas microcyclique il aurait été normal de trouver d'autres formes de sporulation que les seules téliospores.

Comparée aux autres espèces d'*Hamaspora*, celle dont *H. dobremezii* semble la plus voisine est *H. taiwaniana* HIRATS. et HASH., mais ses téliospores sont formées de 4 à 6 cellules (5 le plus souvent) et sont plus courtes : 113 - 178 µm.

Je suis heureux de dédier cette espèce au botaniste grenoblois J.F. DOBREMEZ en amical hommage à son oeuvre botanique au Népal.

Uredia ignota. Telia numerosa, solitaria vel caespitosa ; filiformia. 7 x 0,2 mm, pallido-flavida vel albida. Teliosporae cylindraceae, dimidia superiore attenuatae, acutae, 3 aut 4-septatae (raro 2-septatae) 120-183 (202 µm) x 13-18 µm ; epispora levis, tenuis, apice incrassata 5-9 (12 µm). Holotypus : in foliis vivis Rubi fockeani KURZ., Nepal, prope Gora Tabela 2800 m in Langtang valle 26/6/1974, G. DURRIEU, T.L.A.
Nomen in honorem J.F. DOBREMEZ vegetationis nepalensis investigatoris.

Hamaspora nepalensis n. sp.
Sur *Rubus biflorus* BUCH.-HAM., vallée de la Seti Khola en amont de Bharbhare, 1700 m, 11 mai 1974.

Les urédospores et téliospores naissent successivement dans les mêmes sores, qui sont petits et dispersés à la face inférieure des feuilles. Les urédospores (fig. 3) hyalines, ovoïdes ou sphériques mesurent 22-30 x 19-27 µm Elles sont couvertes de fortes épines coniques, excepté une

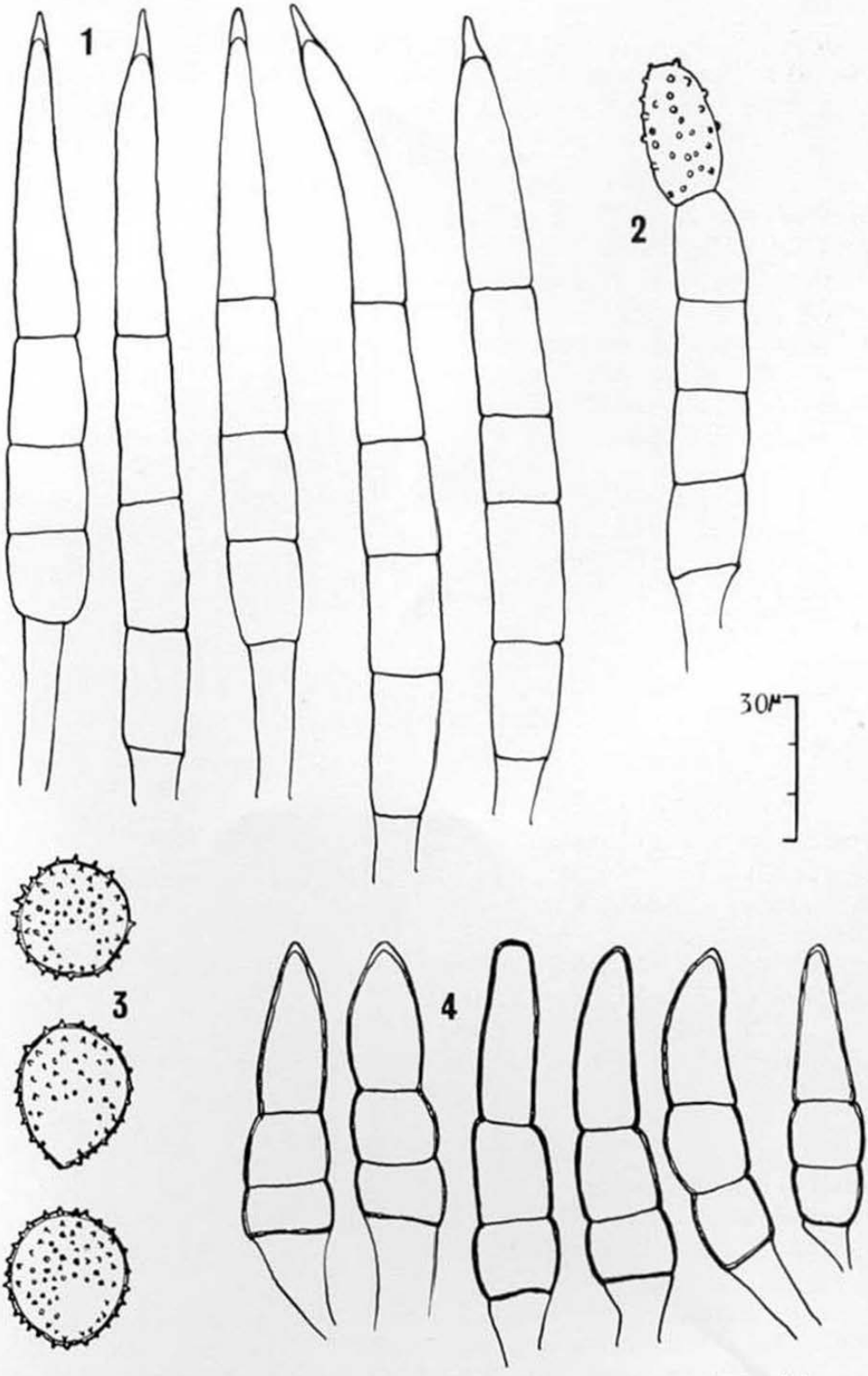

Fig. 1 - *Hamaspora dobremezii* : téliospores. Fig. 2 - *H. dobremezii* : téliospore anormale. Fig. 3 - *H. nepalensis* : urédospores. Fig. 4 - *H. nepalensis* : téliospores.

plage basale lisse qui correspond peut-être à l'emplacement d'un pore germinatif. Ces épines mesurent 2 µm de haut, elles sont plus fortes vers la partie apicale que vers la base et sont espacées de 2,5 à 4 µm . La paroi est mince ; de 0,75 à 1 µm .

Les téliospores (fig. 4), hyalines, sont agglomérées en filaments courts, ne dépassant pas 1 mm. Elles sont fusiformes, arrondies ou subarrondies à l'extrémité, tricellulaires (très rarement bicellulaires), rétrécies de façon notable au niveau des cloisons. Leur longueur varie entre 60 et 80 µm , leur diamètre entre 18 et 24 µm . La paroi est mince, inférieure ou égale à 1 µm , elle peut être légèrement épaissie à l'apex : 2 à 3 µm , qui ne forme jamais un apicule plein comme c'est le cas de beaucoup d'autres espèces. La cellule terminale atteint trois fois la longueur de la basale.

Cette Rouille ne se rapproche d'aucune espèce connue d'*Hamaspora*. Par les dimensions des téliospores elle pourrait sembler voisine de *H. hashiokai* (3-cellulaires : 50-85 x 12-19 µm), mais l'épaississement apical y est bien plus net et les dimensions des urédospores sont largement supérieures : 32-56 x 12-42 µm .

Uredosporae et teliosporae in eisdem soris. Uredosporae hyalinae, ovatae vel sphericae, 22-30 x 19-27 µm echinatae, spinae ca. 2µm altae, 2,5-4 µm distantes, epispora 1µm crassa. Teliosporae hyalinae, fusiformes apice rotundatae vel subrotundatae, plerumque biseptatae, ad septa constrictae, 60-80 x 18-24 µm , epispora tenuissima apice non vel vix incrassata (3 µm).

Holotypus in foliis vivis Rubi biflori BUCH.-HAM., *Nepal in Seti khola valle prope Bharbhare, 1700 m, 17-5-1974* G. DURRIEU - T.L.A.

BIBLIOGRAPHIE

DURRIEU, G., 1975 - Les champignons phytopathogènes du Népal. Aspects biogéographiques - *Bull. Soc. Hist. nat. Toulouse.*, 111 (1-2) - Sous presse.

MONOSON, H.L., 1969 - The species of Hamaspora - *Mycopathol. Mycol. applic.*, 37 (3) 263-272.

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