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A review of the Polish *Sclerotiniaceae* and some additional species

Investigation into the *Sclerotiniaceae* — V.

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INTRODUCTION

No special study of the *Sclerotinaceae* seems to have been undertaken in Poland in spite of the pioneering activities of Schroeter (1893). Twentynine species have been reported: *Botryotinia fuckeliana, B. squamosa, Botrytis allii, B. byssoidea, Ciboria amentacea, C. betulae, C. caucus, C. rufo-fusca, C. tenuistipes, Ciborinia candolleana, Monilinia baccarum, M. fructigena, M. laxa, M. ledi, M. megalospora, M. oxycocci, M. padi, M. urnula, Rutstroemia bolaris, R. conformata, R. elatina, R. firma, R. sydowiana, Sclerotinia nervisequa, S. sclerotiorum, S. trifoliorum, S. tuberosa, Valdensinia heterodoxa* and *Sclerotina* sp. as *Ciboria uliginosa*. However, it is certain that further species remain to be discovered.

During the 4th European Mycological Congress in Poland, 1966, and the post-congress excursions, various *Sclerotiniaceae* were collected either as apothecia, mummies, sclerotia or stromatized tissue, mainly by the first author but with several collections also by Milica Tortić (Jugoslavia). The non-apothecial stages, when not readily identifiable or of particular interest, were overwintered by the first author and produced apothecia during 1967. Thirteen species were identified with one very sparse collection being tentatively determined as *Sclerotinia nervisequa*. Seven of these species do not appear to have been previously reported for Poland, thus increasing the number of the definitely known Polish *Sclerotiniaceae* to thirtyfive with one probable further species. These additional species are *Myriosclerotinia scirpicola* (= *Sclerotinia scirpicola*), *M. sulcata* (= *S. sulcata*), *Rutstroemia henningsiana, R. luteovirescens, R. petiolorum, Sclerotinia dennisii* and *Verpatinia calthicola*. *Ciboria tenuistipes* was found to be an earlier name for *Ciboriopsis bramleyi* and is therefore transferred to the genus *Ciboriopsis*. Four species were

collected on hosts or substrates not previously recorded in the literature: *Ciboriopsis tenuistipes* on *Potentilla palustris* (L.) Scop., *Myriosclerotinia scirpicola* on *Scirpus sylvaticus* L., *Rutstroemia luteovirescens* on *Acer platanoides* L. and *Verpatinia calthicola* on *P. palustris*.

METHODS

In the present work, the first author (J. T. P.) has dealt with collecting, culturing and identifying the fungi whilst the second author (W. T.) has investigated the Polish records, localities and critical hosts, and has prepared the Polish summary.

The fungi were collected in the field either as sclerotia within culms of *Cyperaceae* (*Myriosclerotinia scirpicola, M. sulcata* and *Sclerotinia dennisi*) and on dead leaves (? *Sclerotinia nervisequa* and *Verpatinia calthicola*), as mummified fruits of *Ericaceae*, either on the host or lying adjacent (*Monilinia megalospora, M. oxycocci* and *M. urnula*), or as apothecia on fallen twigs (*Rutstroemia firma*) and dead leaves, including their petioles (*Ciboriopsis tenuistipes, Rutstroemia luteovirescens, R. petiolorum* and *R. sydowiana*). One species (*Rutstroemia henningsiana*) appeared adventitiously in the three overwintered samples of *Eriophorum vaginatum* culms containing sclerotia of *Sclerotinia dennisii* whilst a few apothecia of *Ciboriopsis tenuistipes* subsequently developed from a leaf of *Potentilla palustris* collected for sclerotia which produced *Verpatinia calthicola*. In one sample of *E. vaginatum* culms, fruits of the same host unexpectedly produced apothecia of *S. dennisii*, previously only known from sclerotia developing within the culms. The elegant manner of collecting *Rutstroemiae* growing on leaf petioles may be worthy of mention: this involves picking up random samples of dead leaves whilst walking through the forest when, held against the light, apothecia growing from the petioles are readily seen.

Overwintering of the hosts or substrates (culms, leaves and mummies) was accomplished amongst damp moss in divided plastic containers. These were placed within ladies' discarded nylon stockings (as a precaution against the accidental introduction of invertebrates, either with the plants or from outside) and maintained under normal atmospheric conditions. Practically every sclerotium developed apothecia but less successful results were achieved with the mummies (P a l m e r 1968 b).

The only control, using one of the same species, i.e., *Sclerotinia dennisii* collected as sclerotia within culms of *Eriophorum vaginatum* on the Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire, England, in the autumn of 1967, produced apothecia whose development coincided reasonably well with those of the Polish collections.

During the first half of 1967, each sample was carefully scrutinized every Monday for developing apothecia and the weekly crop of mature fruitbodies was removed for examination and drying. However, with a few sparse collections, the apothecia were left as long as possible before removal so that their full development could be observed. The first mature apothecia were seen on the 13th February and the last were removed for drying on the 31st July.

Microscopic examination was effected in 10% Erythrosin Ammonia (P a l m e r 1968 a) with measurements made using an oil immersion objective. Sections were cut on a freezing microtome and permanently mounted in Erythrosin Glycerine Jelly. (1) Microtome sections, cut in dilute gum arabic solution, are placed on a slide, the gum arabic is thoroughly washed away with 10% Ammonia, after which the sections are flooded with 10% Erythrosin Ammonia. (2) Small fragments of Glycerine Jelly are then placed in the mountant and the slide is heated until the jelly has dissolved and is completely mixed with the Erythrosin Ammonia, whereupon the cover slip is carefully placed in position, lightly pressed down, the excess jelly removed from the edges and the slide left overnight. Next day, all traces of the solidified jelly are removed with a sharp blade and the slide is wiped clean.

Formula for Glycerine Jelly:

Dissolve 1 part by weight of a high quality gelatin in 6 parts by weight of distilled water for 2 hours or longer. Next add 7 parts glycerine, and to each 100 g add 1 g phenol crystals. Warm for 15 minutes, stirring continually until the flakes produced by the addition of the phenol disappear. While still warm, filter through two or three thicknesses of cheesecloth into a convenient bottle. As the mixture deteriorates with continual remelting, it is recommended that small portions are cut out when required instead of melting the whole quantity.

Dried apothecia and other stages have been deposited in the Herbarium of the Botanical Institute, University of Wrocław (WRSL) with voucher material retained in the personal herbarium of the first author (J. T. P.) in most instances.

The Polish names for localities are consistently used throughout this work except when quoting the annotations on exsiccati. Those requiring their German equivalents, which have mainly been used in the older literature, are referred to R o s p o n d (1951).

The colour terms used are taken from the Methuen Handbook of Colour, 2nd ed., see K o r n e r u p & W a n s c h e r (1967), whilst the herbaria are cited in accordance with L a n j o u w & S t a f l e u (1964). The terminology of K o r f (1958) has been followed when describing the structure of the apothecium.

DEVELOPMENT OF APOTHECIA IN NATURAL CULTURE

A few apothecial fundaments were seen on mummies of *Vaccinium uliginosum* fruits and sclerotia within *Eriophorum vaginatum* culms as early as December 1966 but little further development occurred until the early months of 1967 when, in many instances, new stipes appeared and proceeded to full development.

The first mature apothecia to be found were those of *Sclerotinia dennisii* on fruits of *E. vaginatum* on 13th February with apothecia on sclerotia in the culms from the 20th February to the 31st May. The British control of *S. dennisii* fruited from the 27th February to the 30th May whilst apothecia were collected at Wybunbury Moss National Nature Reserve on the 16th April, but apothecia of this species are difficult to find in the field. The next species to produce mature apothecia was *Rutstroemia henningsiana* on the 6th March with the last fruitbodies being found on the 9th May, followed by *Monilinia megalospora* (27th April to the 8th May), ? *Sclerotinia nervisequa* (13th May to the 12th June), *Verpatinia calthicola* (13th May to the 10th July), *Myriosclerotinia scirpicola* on *Scirpus lacustris* (30th May to the 26th June) and on *S. sylvaticus* (13th May to the 12th June, only two sclerotia). Mature apothecia of *Ciboriopsis tenuistipes* were found on the 31st May and the 23rd June.

THE PREVIOUS POLISH RECORDS OF *SCLEROTINIACEAE*

The following have been traced for Poland in the literature:

Botryotinia fuckeliana (de Bary) Whetz. — as *Sclerotinia*, on leaves of *Vitis vinifera* (Schroeter 1893); on *Solanum tuberosum* (Namysłowski 1914, Schander 1909) as *Botrytis cinerea* Pers. ex Fr. on *Allium cepa* (Lutyńska 1968).

Botryotinia squamosa Viennot-Bourgin — as *Botrytis*, on *Allium cepa* (Lutyńska 1968).

Botrytis allii Munn. on *A. cepa* (Siemaszko 1929 b, Lutyńska 1968).

Botrytis byssoidea Walker on *A. cepa*, as *B. allii* pro parte (Siemaszko 1929 b), as *B. byssoidea* (Viennot-Bourgin 1952, Lutyńska 1968).

Ciboria amentacea (Balb. ex Fr.) Fuck. — as *Ciboria*, on male catkins, *Alnus glutinosa* (Schroeter 1893); *Alnus* sp. (Błoński 1896, Eichler 1902).

Ciboria betulae (Woron.) White — as *Sclerotinia*, on *Betula* (Chełchowski 1902, Zaleski, Domański & Wojciechowski 1948).

Ciboria caucus (Reb. ex Fr.) Fuck. on male catkins, *Populus alba*, *Populus tremula* and ? *Betula* (Schroeter 1893).

Ciboria rufo-fusca (Weberb.) Sacc. on cones of *Abies alba* (Schroeter 1893).

Ciborinia candolleana (Lév.) Whetz. — as *Sclerotinia*, on *Quercus* (Schroeter 1893, Eichler 1904).

Ciboriopsis tenuistipes (Schroet.) J. T. Palmer — as *Ciboria*, on dry leaves of *Rubus fruticosus* (Schroeter 1893).

Monilinia baccarum (Schroet.) Whetz. — on *Vaccinium myrtillus* (Hennings 1891, Ludwig 1892, Schroeter 1893).

Monilinia fructigena (Aderh. & Ruhl.) Honey — on fruit, *Malus sylvestris* (Schroeter 1893).

Monilinia laxa (Aderh. & Ruhl.) Honey — as *Sclerotinia cinerea* Bon., on fruits, *Prunus domestica* and *Prunus spinosa* (Schroeter 1893).

Monilinia ledi (Naw.) Whetz. — as *Sclerotinia*, on mummified fruit of *Ledum palustre* (Magnus 1896); Nawaschin (1894) reported having received the first mummified fruit from the forester Mjassojädow, collected in the Białowieża Forest in the spring of 1893.

Monilinia megalospora (Woron.) Whetz. — as *Sclerotinia*, on *Vaccinium uliginosum* fruits (Ascherson & Magnus 1891, Hennings 1891, Magnus 1896).

Monilinia oxycocci (Woron.) Honey — as *Sclerotinia*, on fruits of *Oxycoccus palustris* (Hennings 1891, Ludwig 1892, Magnus 1896).

Monilinia padi (Woron.) Honey — as *Sclerotinia*, on fruits of *Prunus padus* (Schroeter 1893, Eichler 1904).

Monilinia urnula (Weinm.) Honey — on fruits of *Vaccinium vitis-idaea*, as *Sclerotinia urnula* (Magnus 1896); as *S. vaccinii* Woron. (Ascherson & Magnus 1891, Ludwig 1892, Schroeter 1893, Eichler 1902).

Rutstroemia bolaris (Batsch ex Fr.) Rehm — on *Carpinus* and *Betula*, as *Ciboria* (Schroeter 1893, Eichler 1902, Skirgiełło 1960).

Rutstroemia conformata (Karst.) Nannf. — on *Alnus glutinosa* (Lisiewska 1965).

Rutstroemia elatina (Alb. & Schw. ex Fr.) Rehm — on *Abies alba*, as *Ciboria* (Schroeter 1893).

Rutstroemia firma (Pers. ex Fr.) Karst. — as *Ciboria*, on branches of deciduous trees, especially *Alnus glutinosa* (Schroeter 1893); as *Rutstroemia*, on *Quercus* and *Corylus* (Eichler 1902, Domański et al. 1963); on *Alnus glutinosa* twigs (Nespiak 1965).

Rutstroemia sydowiana (Rehm) White — as *Ciboria petiolorum*, on *Quercus robur* leaves (Schroeter 1893); as *Rutstroemia* (Borowska 1966).

Sclerotinia nervisequa Schroet. — on *Alnus glutinosa* and *Populus tremula* (Schroeter 1893).

Sclerotinia sclerotiorum (Lib.) de Bary — on numerous host plants (Schroeter 1893); as *S. libertiana* Fuck., on *Beta vulgaris* (Trzebiński 1918); on *Solanum lycopersicum* and on *Helianthus annuus* (Zweigbaumówna 1925); as *S. sclerotiorum* (Jankowska 1929).

Sclerotinia trifoliorum Erikss. — on *Trifolium* (Schander 1909, Namysłowski 1914, Stec-Rouppertowa 1936).

Sclerotinia tuberosa (Hedw. ex Fr.) Fuck. — on *Anemone nemorosa* (Schroeter 1893, Eichler 1902, Namysłowski 1910, Wodziczko 1911, Teodorowicz 1933, Stec-Rouppertowa 1936, Skirgiełło 1960, Bujakiewicz & Fiklewicz 1963, Lisiewska 1965, 1966).

Valdensinia heterodoxa Peyr. — as *Valdensia*, on *Vaccinium myrtillus* (Siemaszko 1929 a).

Sclerotinia sp. — as *Ciboria uliginosa* Fr. on *Alnus glutinosa* petioles or twigs (Nespiak 1959, 1965).

Whilst no special attempt has been made to investigate the various exsiccati which must be preserved in the Polish herbaria, the collections of *Ciboria amentacea, Ciboriopsis tenuistipes* and *Rutstroemia firma* of the Schroeter herbarium in WRSL have been studied, see under these species in the section »*Sclerotiniaceae collected and studied*«. Part of Nespiak's collection reported as *Ciboria uliginosa* was also examined and was found to have 4-spored asci. It has therefore been placed under *Sclerotinia* sp. in: »*The previous Polish records of Sclerotiniaceae*« but will form part of a separate study. No authentic material of *Sclerotinia nervisequa* appears to be extant in WRSL.

SCLEROTINIACEAE COLLECTED AND STUDIED

Ciboria amentacea (Balb. ex Fr.) Fuck.

[= *Peziza amentacea* Balbis (1805) Mém. Acad. imp. Sci. Turin 13: 79; *Peziza amentacea* Balb. ex Fries (1822) Syst. mycol. 2: 126; *Peziza julacea* Persoon (1822) Mycol. europ. 2: 285; *Ciboria amentacea* (Balb. ex Fr.) Fuck. (1870) Symb. mycol.: 311; *Helotium amentaceum* (Balb. ex Fr.) Karst. (1870) Not. Sällsk. F. Fl. fenn. Förhandl. 11: 233; *Rutstroemia amentacea* (Balb. ex Fr.) Karst. (1871) Mycol. fenn. 1: 110; *Helotium julaceum* (Pers.) Lambotte (1887) Mém. Soc. r. sci. Liège, 2 (14): 307; *Hymenoscypha amentacea* (Balb. ex Fr.) Phillips (1887) Mon. Brit. Disc.: 120].

Two exsiccati cited by Schroeter (1893) and extant in WRSL have been examined with the following results:

1. A packet with a label bearing the following printed detail: „*Exsiccatum, J. Schroeter, Pilze Schlesiens. 1829 Ciboria amentacea*

(Balbis), Auf alten Kätzchen von Alnus glutinosa. Oels: Peuke, Krypt. Fl. v. Schles. III. 2. S. 61. 646." (Oleśnica: Byków).

The material was sparse but appeared fairly typical of the species. Microscopic measurements: Asci 102—118 × 5,9—9,5 μ (3 measured) and spores 8,7—9,9—11 × 5,4—5,7—6,6 μ (10 measured).

2. A packet annotated in Schroeter's handwriting: „*Rutstroemia amentacea (Balb.) (Februar 1878) (Brinnitz b. Kupp. dis. Oppeln.) ges. v. Pfarrer Schoebel.*" (Brynica near Kup, Opolskie). The material comprised debris mixed with numerous, often partly broken apothecia fairly typical of the species. Microscopic measurements: asci 114—126—139 × × 5,9—7,8—9,8 μ (10 measured) and spores 8,3—9—10,1 × 3,7—4,8—5,5 μ (20 measured).

Some modern authors have regarded *C. amentacea* as being synonymous with *Cibora caucus* (Reb. ex Fr.) Fuck. However, Groves & Elliott (1961), who studied mainly Canadian material, distinguished these two species as (1) *Ciboria amentacea*, usually on *Alnus* male catkins, with spores mostly 10—15 μ long, giving asci as (110)—125—160—(180) × × 8—11—(12) μ and spores (8)—10—15—(17) × (3,5—4,5—6—(8) μ, and (2) *Ciboria caucus*, usually on male catkins of *Populus* and *Salix* but occasionally on *Alnus* catkins, with spores mostly less than 10 μ long, giving asci as (95)—105—140—(160) × (5)—6,5—9—(10,5) μ and spores (6)—7,5—10—(12) × (2,5)—3,5—4,5—(6) μ. On this basis, the collections from Byków and Brynica are referable to *C. caucus* (Reb. ex Fr.) Fuck., which has the following synonymy: *Peziza caucus* Rebentisch (1804) Prodr. Fl. Neomarch: 386; *Peziza caucus* Reb. ex Fr. (1822) Syst. mycol. 2: 126; *Ciboria caucus* (Reb. ex Fr.) Fuckel (1870) Symb. mycol.: 311; *Hymenoscypha caucus* (Reb. ex Fr.) Phillips (1887) Mon. Brit. Disc.: 120; *Phialea caucus* (Reb. ex Fr.) Gillet (1879) Champ. Fr., Discom.: 110.

However, whilst no special study has been made of this group by the first author, examination of British material does not show such consistent results.

Ciboriopsis tenuistipes (Schroet.) J. T. Palmer, comb. nov.

[= *Ciboria tenuistipes* Schroet. (1893) Krypt.-Fl. Schles. 3 (2): 61—62. (Basionym); *Ciboriopsis bramleyi* Dennis (1962) Kew Bull. 1962: 319; (1968) Brit. Ascom. 104, Pl. XIVb].

Several leaves of *Potentilla palustris* bearing patelliform apothecia were collected amongst sphagnum moss at the edge of a schwingmoor at Gąsior, from where a single leaf bearing sclerotia of *Verpatinia calthicola* produced a few apothecia of *C. tenuistipes* during the following summer.

The fungus was initially identified as *Ciboriopsis bramleyi*. However a perusal of Schroeter's description indicated that *Ciboria tenuistipes*

was a *Ciboriopsis*. This was confirmed when the plentiful material of the holotype in WRSL was examined and was found so closely to resemble *C. bramleyi* that the latter is considered a synonym. *C. tenuistipes* was previously only known from Schroeter's type collection on leaves of *Rubus fruticosus* in July, 1881, at Groszczowice near Tułowice and was reported as being gregarious, often in large numbers. The fungus was redescribed as *Ciboriopsis bramleyi* by Dennis (1962) from dead stems and leaves of *Chamaenerion angustifolium*, Pickering, Yorkshire, England, September, 1960, who made it the type species of his new genus *Ciboriopsis*, erected for the "small group of Helotioid fungi... in which the ectal excipulum is composed of isodiametric polyhedral or rounded cells instead of parallel hyphae .... not occurring on fruits or catkins ..... uniformly small asci and ascospores .... lacking sclerotia or stromatic tissue". The following six new combinations were made: *Ciboriopsis advenula* (Phill.) Dennis (on *Larix* needles in England and Czechoslovakia), *C. cecropiae* (P. Henn.) Dennis, *C. lenta* (Berk. & Br.) Dennis, *C. microspora* (Seaver) Dennis, *C. phlebophora* (Pat.) Dennis and *C. uleana* (Rehm) Dennis (all non-European). An eighth species, *C. simulata* (Ell.) Dennis (non-European) was added in Dennis (1964).

Both *Ciboriopsis bramleyi* and *Ciboria tenuistipes* were described from single collections with no further collections being known in herbaria but the first author has collected specimens in several British localities on *Chamaenerion angustifolium*, *Filipendula ulmaria* and *Potentilla palustris*, but he has not yet sought the fungus on *Rubus fruticosus*. One English collection also had some apothecia on fruits of *P. palustris* whilst another was on unidentified but similar fruits. Spevak & Korf (1966) studied fresh American material of *Ciboriopsis simulata* and the first author's collections on *C. angustifolium* and *P. palustris*, as well as the holotype of *C. bramleyi* in K., for which they gave an amplified description. They also reported that both species produce a stroma in culture whilst an indistinct discolouration or a thin black line delimiting the stromatized area of the leaf may be noted. The presence of rounded cells in the ectal excipulum and a stroma leave no doubt that the fungus is correctly placed in the *Sclerotiniaceae*.

Polish collections. Herb. J. T. P. 3075. On dead leaves of *Potentilla palustris*, which also bore some rounded sclerotioid structures, amongst sphagnum at edge of Lake Gryżewskie at Gąsior near Kamień, leg. J. T. P. 66214, 2.IX.66. Herb. WRSL and J. T. P. with duplicates in CUP and K.

Herb. J. T. P. 3124. Two apothecia which developed on an overwintered leaf of *P. palustris* (31.V.67 and 23.VI.67), bearing sclerotia of *Verpatinia calthicola*, collected in the above locality, leg. J. T. P. 66223a, 2.IX.66. Herb. WRSL.

Description: Apothecia solitary to numerous, developing from dead leaf tissue with no obvious sign of stromatization, stipitate. Rece-

ptacle patelliform, plane to sub-convex, pale reddish brown, slightly granular to almost smooth. Disc. ca 0.6 mm diam., concolorous. Margin circular, entire. Stipe to 3 mm long, ca 0.2 mm thick, cylindrical, reddish-brown becoming darker below. Asci 39—51 × 4.3—5.1 μ inoperculate, cylindrical-clavate, narrowed at one end, often with a short stalk, pore J+, 8-spored. Ascospores (5.5)—6.9—7.3—7.7—(8.5) × 1.7—2.2—2.8 μ, hyaline, smooth, narrowly ellipsoid, slightly pointed at one end, obliquely uniseriate to irregularly biseriate. Paraphyses 1.3—1.5 μ, thick, hyaline, simple, filiform. In axial section: subhymenium formed of textura angularis, medullary excipulum of horizontally orientated textura intricata, irregularly septate and ectal excipulum of three layers (1) internal textura porrecta, (2) medial textura intricata and (3) external textura angularis to textura globulosa, and stipe of textura porrecta.

Holotype of *Ciboria tenuistipes* Schroet. in WRSL. The collection comprised dried, friable leaves with mainly loose apothecia in a folded newspaper packet annotated in Schroeter's handwriting: *„Rutstroemia Herb. Schroeter auf alten blättern von Rubus fruticosus 11.7.81. Guschwitz bei Falkenberg Dr Schroeter"*. (= Goszczowice near Niemodlin). Affixed to the herbarium sheet is also a label of the *„Herbarium des botan. Gartens zu Breslau"* (= Wrocław) with the name *„C. tenuistipes Schröt."* written in another hand. Apothecia developing from leaf tissue, occasionally from petioles, but often only persisting as stipes, with no evidence of stromatization, stipitate. Receptacle patelliform but occasionally thickened below, smooth, ochraceous-brown. Disc 0.6—1.2—1.8—(2.1) mm (100 apothecia measured), brownish orange (Methuen). Margin circular, mainly entire but occasionally slightly irregular, not elevated. Stipe 2—5 mm (10 apothecia with intact stipes measured), ca. 0.2 mm thick, varying from slightly darker than receptacle to dark brown, smooth but becoming longitudinally wrinkled, slender, cylindrical, often abruptly broadening above into receptacle and below into the host tissue. Asci 43—47—59 × 3.9—5.3—6.1 μ, hyaline, broadly cylindrical, often rounded on one side, sometimes with a distinct neck, 8-spored, J+. Spores 4.8—7.1—8.5 × 1.5—2.2—2.9 μ, hyaline, narrowly elliptical, obliquely uniseriate to irregularly biseriate, especially towards the apex. Paraphyses 1.2—1.4 μ thick, hyaline, simple, filiform. In axial section: subhymenium formed of textura angularis, medullary excipulum of horizontally orientated textura intricata, irregularly septate and ectal excipulum of three layers: internal textura porrecta, medial textura intricata and external textura angularis to textura globulosa, and stipe of textura porrecta.

The above can be compared with the original diagnosis in Schroeter (1893), which reads: *„1833. C. tenuistipes n. sp. Stiel 0.5—1 cm lang, schlank, etwa 0.5 mm breit, dunkelbraun, unten schwärzlich,*

runzlich. Becher anfangs halbkuglig, später scheibenförming, auch trocken flach bleibend, 1 bis 1.5 mm breit, dunkelkastanienbraun. Rand glatt. Schläuche cylindrisch, 40—50 μ lang, 4.5—5.5 μ breit, durch Jod nicht blau werdend. Sporen schief einreihig, länglich-ellipsoidisch, 5—6 μ lang, 2—3 μ breit. Paraphysen fadenförming. Gesellig, oft in grosser Menge aus trockenen Blätern von Rubus fruticosus hervorbrechend. Juli. — Falkenberg: Guschwitz." (= Niemodlin: Goszczowice).

Apart from some differences, such as the rather longer stipes (to 1 cm), the lower limit of 5 μ given for the spore length and the J— reaction of the ascus pore in Schroeter (1893), it is clear that the diagnosis belongs to the collection extant in WRSL.

Through the kindness of Dr R. W. G. Dennis (K), a single apothecium from the holotype of *Ciboriopsis bramleyi* has been examined and appears to agree with the foregoing collections (Tab. 1).

Table 3
Comparison of spores and asci

Ciboria tenuistipes holotype	Asci	(No.)	Spores	(No.)
Schroeter (1893)	40—50×4.5—5.5 μ	(?)	5—6×2—3 μ	(?)
J.T.P. (ref. 241)	37—47—59×3.9—5.0—6.1 μ	(70)	4.8—7.1—8.5×1.5—2.2—2.9 μ	(100)
Ciboriopsis bramleyi				
Dennis (1962) & (1968)	45×5 μ	(?)	6—8×2—3 μ	(?)
	35×5 μ	(?)	5—7×2 μ	(?)
Spevak & Korf (1964)	45—48×3.5—4.5—5.5 μ	(114)	5.5—6.4—7.4×1.8—2.1—2.8 μ	(20)
J.T.P. (ref. 244) holotype				
Polish Collections				
J.T.P. 3075	39—46—542×2.5—4.8—6.3 μ	(24)	6.7—7.7—9.2×1.8—2.1—2.8 μ	(30)
J.T.P. 3124	42—51×4.3—5.1 μ	(3)	5.5—7.1—8.5×1.7—2.2—2.8 μ	(40)

Monilinia megalospora (Woron.) Whetz.

[= *Sclerotinia* megalospora Woronin (1888) Mém. Acad. Sci. St. Pétersb. 36, (6): 36—40; *Stromatinia oxycocci* var. *megalospora* (Woron.) Boudier (1907) Hist. Class. Discom. Europ.: 109; *Monilinia megalospora* (Woron.) Whetzel (1945) Mycologia 37:673; *Stromatinia megalospora* (Woron.) Favre (1948) Mat. Flora Crypt. Suisse 10 (3):25. 28].

Mummified berries, either adjacent to or still hanging on bushes of *Vaccinium uliginosum*, were collected at Lipsk. As the first author had not previously seen this fungus, several mummies were overwintered

and all produced apothecial initials, most of which later decayed, but two developed mature apothecia.

The fungus is recorded from Czechoslovakia, Germany, Norway, Poland, Switzerland and the U.S.S.R., with the conidial stage appearing on blighted leaves and shoots whilst the apothecia develop from the overwintered mummified fruits. Whetzel (1945) also gives *Pyrus* in the host index but, according to Dr J. W. Groves (DAOM) this must be a printers' error. It is well distinguished from other species on ericaceous fruits by its very large spores.

Polish collection. Herb. J. T. P. 3080. (mummified berries) and 3122 (apothecia). Mummified berries of *Vaccinium uliginosum*, sphagnum bog near Lipsk, leg. J. T. P. 66221, 3.IX.66. (7 mummies). 2 apothecia developed 27.IV.67 and 8.V.67.

Development in natural culture. Apothecial initials were first observed in December, 1966, but apothecia did not commence development until 3rd April, 1967. The first apothecium was fully mature on the 27th April and the second mature but not fully expanded on another mummy on the 8th May. Both apothecia were left as long as possible to ensure full maturity and some deterioration occurred as a result.

Description. Apothecia solitary (in both specimens) although several apothecial fundaments were noted on each overwintered mummy. Receptacle 5—7 mm diam. (neither specimen seemed to be fully expanded and both were rather dark in colour), dark to greyish brown, deeply cyathiform, externally smooth. Disc 5—7 mm diam., more or less concolorous with the receptacle, deeply concave. Margin even, at first inturned. Stipe 3.5—4 × ca. 0.1 mm, ± equal but somewhat nodular and irregularly twisted, swollen below and with matted, brown, septate, rhizoidal hyphae forming a broad base. Asci 253—290—330 × × 21.8—24.1—26 μ (10 measured), hyaline, cylindrical, abruptly tapering into a short neck, pore J+, 8-spored. Ascospores (20)—24—28.8—38.4——(40.5) × 12—16.8—19.9—(24) μ (60 measured), hyaline, obovate to limoniform, usually pointed at one end, with densely oleaginous or granular contents, uniseriate. Paraphyses ca. 3 μ diam., hyaline, slenderly clavate, with occasional side branches developing above septum. (The specimens were in a condition too poor for a detailed study of their axial sections, which do not appear to have been described in the literature).

Asci and spores in the literature. Few authors give microscopical measurements but Woronin in the Russian translation by Semenkova & Dunina (1961) reports the spores as (in dry air) 19.6—25.2 × 14—16.8 μ and (in water) 28—30.8 × 16.8—19.6 μ, which dimensions are closely followed by Naumov (1964), i.e. 19—25 × × 14—17 μ and 28—30 × 17—20 μ, who gives the asci as 380 × 38 μ (after Woronin's plate). Schroeter (1893) gives the spores as

28—30 × 16—19 µ, both Saccardo (1889) and Moser (1963) as 19- or 20—25 × 14—16 µ, whilst Favre (1948) reports the spores as 25—26 × × 17—19 µ and the asci as 280—300 × 20—23 µ.

Monilinia oxycocci (Woron.) Honey

[= *Sclerotinia oxycocci* Woron. (1888) Mém. Acad. Sci. St. Pétersb. 36 (6): 28—30; *Stromatinia oxycocci* (Woron.) Boudier (1907) Hist. Class. Disc. Europ.: 109; *Monilinia oxycocci* (Woron.) Honey (1936) Am. J. Bot. 23: 105].

Three collections of mummified berries of *Oxycoccus palustris* were made in widely separated localities but were not overwintered. However, when apothecia started developing from the *Monilinia megalospora* mummies, a few from each of the three collections were moistened and placed in natural culture but, whilst apothecial initials developed, none matured further.

The fungus, which is better known than the preceding, is reported from Czechoslovakia, Germany, Poland, Switzerland and the U.S.S.R. on *Oxycoccus palustris* and is also known from North America.

The life history is similar to the preceding with the conidial stage attacking new shoots, which assume a characteristic crozier-shape, and the apothecia develop from overwintered, mummified fruits in the following early summer. Microscopically, *M. oxycocci* is well distinguished from the related species on *Vaccinium* by the smaller spores, four large (ca. 13 × 6 µ) and four small or undeveloped (ca. 8.5 × 3.5 µ). Asci containing four large and four small spores are also found in *Monilinia baccarum* (Schroet.) Whetz. but are larger than those of *M. oxycocci*.

Polish collections. Herb. J. T. P. 3067. Mummified berries of *Oxycoccus palustris* amongst sphagnum etc. on swampy ground, Kampinos National Park (Puszcza Kampinoska) near Warszawa, leg. J. T. Palmer 66205, 29.VIII.66. 14 mummies. Preserved in WRSL and Herb. J. T. P.

Herb. J. T. P. 3073. Mummified berries of *O. palustris* at edge of Lake Gryżewskie at Gąsior near Kamień, leg. J. T. P. 66211, 2.IX.66, 25 mummies. Herb. WRSL and J. T. P.

Herb. J. T. P. 3079. Mummified berries of *O. palustris* amongst sphagnum, "hochmoor" near Lipsk, leg. J. T. P. 66220. 3.IX.66, 14 mummies. Herb. WRSL and J. T. P.

English collections. Dennis (1956) reported *Monilinia oxycocci* as „still to be sought in Britain". The fungus has been collected by the first author in all stages at the Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire, and as mummified berries of *O. palustris* at Chartley Moss National Nature Reserve, Staffordshire, England. One of the collections of apothecia from Wybunbury Moss is figured for this paper.

Herb. J. T. P. 2993. Apothecia on mummified berries amongst sphagnum of "schwingmoor", Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire, England, leg. J. T. P. 66041. 23.IV.66. Asci: 131—155—173 × 7.8—9.3—10.8 µ. Mature spores: 13.8—14.3—15.6 × 6.7—7.3—7.5 µ. Immature spores: 8.3—9.4—11.1 × 4.4—5.1—6.4 µ (10 of each measured).

Asci and spores in the literature. Ascus dimension have not always been given by authors. Kotlaba & Pilát (1952) and Pilát (1953) report the asci as 150—180 × 13 μ, Seaver (1951) as "reaching a length of 150 μ and a diameter of 5—6 μ" and Naumov (1964) as "154—212 × 17.3 μ".

The eight spores of this species characteristically appear as four large and four small (probably immature), which have not always been noted by authors (Tab. 2).

Table 2
Asci and spores in the literature

Author	Spores	
	large	small
Schroeter (1893)	12—14 × 6.6 μ	
Rehm (1893)	12—14 μ	8×3—4 μ
Favre (1948)	12.1—14.3 × 6.6 μ	8.8×3.3—4.4 μ
Seaver (1951)	12—14 × 6 μ	
Kotlaba & Pilát (1952) Pilát (1953)	16.5—18.5×8—9.5 μ	
Naumov (1964)	12—14 × 6.6 μ	8.8×3.3—4.4 μ
Moser (1963 a)	15—16 × 6.5—7 μ	
Moser (1963 b)	12—16 × 5.5—7 μ	
Buchwald (1956)	15.2 × 7.2 μ (14.3—16.5 × 6—8.3 μ)	8.1 × 4.3 μ (6—9.8 × 3.8—4.5 μ)

Monilinia urnula (Weinm.) Honey

[= *Peziza urnula* Weinm. (1832) Flora 15:455; *Sclerotinia vaccinii* Woron. (1888) Mém. Acad. Sci. St. Pétersb. 7, 36: 3—27; *Ciboria urnula* (Weinm.) Saccardo (1889) Syll. fung. 8: 202; *Sclerotinia urnula* (Weinm.) Rehm in Rabenh. Krypt.-Fl. 2, 1 (3): 804—805; *Stromatinia urnula* (Weinm.) Boudier (1907) Hist. Class. Discom. Europ.: 109; *Monilinia urnula* (Weinm.) Honey (1936) Am. J. Bot. 23: 103; *Monilinia vaccinii* (Weinm.) Buchwald (1949) Kgl. Vet. Land. Aarsk. 1949: 103].

The species was collected as mummified berries of *Vaccinium vitis-idaea*. They were not overwintered but, when apothecia were found developing from *V. uliginosum* mummies, a sample was moistened and placed in natural culture. However, only apothecial initials appeared and no further development occurred.

The fungus is known from Czechoslovakia, France, Germany, Poland, Switzerland and the U.S.S.R. on *V. vitis-idaea*, and also from Japan on *V. vitis-idaea var. minus*.

The life history is similar to that for *Monilinia megalospora* and *M. oxycocci* with the conidial stage affecting the young shoots and the apothecia developing next summer from overwintered mummified fruit.

It is well separated from the related species on *Oxycoccus* and *Vaccinium* by the uniformly sized spores, ca. 14 × 5.5 µ.

Polish collection. Herb. J. T. P. 3072. As mummified berries of *Vaccinium vitis-idaea* on dry ground at edge of Lake Gryżewskie, Gąsior near Kamień, leg. J. T. P. 66210, 2.IX.66, 4 mummies. Herb. WRSL and J. T. P.

English collections. Dennis (1968) includes this species without locality, presumably based on material deposited in K by the first author who has made several collections of all stages in a patch of *V. vitis-idaea* in the Peak National Park, Derbyshire, England, where it appears to occur annually. One of these collections is figured for this paper.

Herb. J. T. P. 2996. Apothecia on mummified berries of *Vaccinium vitis-idaea* amongst dead leaves beneath the host on sloping side of a peaty, moorland hill, White Brow, Leygatehead Moor (Kinder Scout), near Hayfield, Derbyshire, England, leg. J. T. P. 66042, 23.IV.66. Asci: 175—196—210 × 5.9—9.3—11.8 µ. Spores (10 measured): 11.1—14.1—17.5 × 4.7—5.5—6.3 µ.

Asci and spores in the literature. Microscopical measurements given by various authors are as follows:

Table 3

Author	Asci	Spores	
		small	large
Woronin (1888) (*Sclerotinia vaccini*)			14—17 × 5.6—9 µ
Schroeter (1893) (*S. vaccini*)	130—200 × 11—14 µ		
Rehm (1893) (*S. urnula*)	150—180 × 5—6 µ		12—15 × 5—6 µ
Favre (1948) (*Stromatinia urnula*) and Dennis (1968) (*Molinia urnula*)	190—200 × 12.5—13.5 µ		15—18 × 7.5—9 µ
Pilat & Kotlaba (1952)	140—170 × 13—15 µ	13—14 × 6.5—6.7 µ	15—18 × 7—8 µ
Naumov (1964)	(140)—150—180 × × 5.6—9 µ		12—15 × 5—6 µ

Myriosclerotinia scirpicola (Rehm) Buchw.

[= *Sclerotinia scirpicola* Rehm (1893) Krypt. Fl. Deutschl. 2, 1 (3): 822—823; *Myriosclerotinia scirpicola* (Rehm) Buchwald (1947) Friesia 3: 296—299. St. microconidioph: *Myrioconium scirpicola* (Ferd. & Winge) Ferd. & Winge (= *Sphacelia scirpicola* Ferdinandsen & Winge (1911) Biol. Arbejd. Tilegn. Eug. Warm. 1911: 290 = *Myrioconium scirpi* Sydow (1912) Ann. Mycol. 10: 449—450 = *Myrioconium scirpicola* (Ferd. & Winge) Ferdinandsen & Winge (1913) Ann. Mycol. 11: 21—24). St. sclerotioph: *Sclerotium roseum* Moug. in. Fr. (= *Sclerotium roseum* Moungeot in Fries (1828) Elench. fung. 2: 43)].

This species was collected as sclerotia and spermodochidia in culms of a very heavily infected stand of the type host, *Scirpus lacustris*, but a very sparse collection of sclerotia and spermodochidia in culms of *Scirpus sylvaticus* is tentatively referred here. They were overwintered in natural culture and apothecia developed from both collections.

The fungus parasitizing *Scirpus lacustris* is known from the British Isles, Denmark, Finland, France, Germany and Sweden. Ellis (1965) reports it as causing a summer dieback of the host in the Norfolk Broads, England. The earlier reports of this fungus on *Scirpus sylvaticus* in Ferdinansen & Winge (1911) and Rehm (1915) were found from dried specimens in the Rehm collection in Herb. S, examined by the first author, to be a *Rutstroemia* on the leaves but sclerotia and spermodochidia, as exsiccati from Latvia, were found in Herb. B (Palmer 1968 a). Buchwald (1949) referred *Myrioconium maritimum* Bub. & Syd. on *Scirpus maritimus* to *M. scirpicola*. However, English and Irish material of the *S. maritimus* fungus are being studied by the first author: the spermodochidial and sclerotial stages of this fungus and, also, the one on *S. sylvaticus* closely resemble those of *Myriosclerotinia sulcata* (Whetz.) Buchw. on *Carex* spp. rather than *M. scirpicola*, and further investigations are necessary. Similar fungi from England infecting *Scirpus tabernaemontani* and *Eleocharis palustris* are also being studied by the first author. However, although the apothecia are similar to those of *M. scirpicola*, the sclerotia are rather different.

A characteristic feature of *M. scirpicola* on *Scirpus lacustris* is the compound form of the sclerotium, whilst the culms characteristically fragment and the sclerotia float ashore, where large numbers are found developing apothecia in May and June (Whetzel 1946). It was too early to observe this situation on Lake Bełdany at Gąsior near Kamień, where the fungus was found in Poland, but large numbers of sclerotia were present amongst *Scirpus lacustris* debris at the water's edge of Lough Derg, Co. Tipperary, Irish Republic, in October, 1967. *S. lacustris* has culms which are typically stout and internally chambered would explain the compound form of the sclerotium of *M. scirpicola* infecting this host as, whilst often appearing to be characteristic for a particular species, the sclerotia of the culm-inhabiting *Sclerotiniaceae* are undoubtedly moulded to the internal form of the structure within which they develop. Evidence of this can be seen in those sclerotia developing within different parts of the same host culm. These fungi infect the flowers and apothecial development therefore appears to coincide with the flowering of the host: it was consequently interesting to observe that apothecia from sclerotia of the various *Scirpus* species under study in natural culture developed whilst their hosts were flowering in nature, with those from

S. lacustris fruiting from the middle of May to the middle of June and only the odd apothecium developing as late as 26th June. Whetzel (1946) reported Danish specimens reaching their maximum abundance in the first week of June with only an occasional apothecium being found on 17th June. On the other hand, apothecia on sclerotia from *S. tabernaemontani*, both in natural culture and in the field, fruited abundantly in July. If these fungi do turn out to be the same species, it is highly probable that there are different strains.

Polish collection on *Scirpus lacustris*. Herb. J. T. P. 3070 (sclerotia and spermodochidia) and 3115 (apothecia). Sclerotia and spermodochidia in culms of *Scirpus lacustris* near jetty on shore of Lake Bełdany near Kamień, leg. J. T. P. 66208, 2.IX.66, with mature apothecia from 30.V.67 to 26.VI.67, 41 specimens. Herb. WRSL and J. T. P.

Apothecia mainly solitary but occasionally in pairs, developing from an irregularly shaped, usually compound sclerotium, either loose or within the host culm, when generally through splits in the culm wall although this is sometimes obscured by rhizoidal hyphae. Receptacle at first pin-head-shaped, becoming deeply cyathiform with the margin recurving, often finally plane or revolute. Disc 4.2—12 mm diam., smooth to pubescent, light brown (Methuen), with the cup varying from 1.6 mm (when almost plane) to 7 mm deep, at first smooth but later becoming wrinkled with a deep central depression concolorous with the preceding. Stipe 9—35 × 0.5—1.8 mm, mainly ± equal but often thickening slightly upwards, at first densely hairy but later appearing almost smooth with a dense mat of rhizoidal hyphae which frequently entangle with adjacent debris, concolorous with the preceding structures but becoming darker below. Stroma a definite sclerotium of the tuberoid type, 4.5—9 × 2.4 × × 2.5 mm, usually irregular and appearing to comprise several sclerotia joined together, externally deeply sulcate to rugose, with a black rind and a pale pink to whitish medulla. Asci 120—149—196 × 6.3—8.7—12 μ (40 measured), hyaline, inoperculate, long-cylindrical, narrowed at one end into a short stalk, pore doubtfully J+, 8-spored. Ascospores 9.2—12.6—15.6 × 4.6—6.0—7.5 μ (80 measured), hyaline, smooth, elliptical but often narrower at one end and flattened at one side, faintly biguttulate; with older spores budding germ tubes from ends or side, when often internally granular to multiguttulate within, sometimes septate and producing spermatia on phialides (measurements of 10 germinating ascospores: 11.8—13.7—15.6 × 5.5—5.9—6.6 μ); uniseriate but sometimes with the spores gathered towards one end. Paraphyses 2—2.7 μ, hyaline, slightly clavate, septate towards the base and sometimes branched. Spermodochidia 1—5 mm long, dull black, usually elongated-rounded and somewhat irregular, probably owing to several fusing together, but

mainly oval, very slightly raised. Spermatia 2—2.8 μ (6 measured), hyaline to pale brown, globose, developing from phialides.

Development of apothecia. 17.IV.67. Apothecial fundaments on two sclerotia; 8.V.67. Stipes lengthening and apothecia starting to form; 13.V.67. Many sclerotia sprouting; 22.V.67. Most sclerotia sprouted and discs of some starting to form; 30.V.67. 3 fully mature apothecia; 6.VI.67. 3 more fully mature apothecia; 13.VI.67. 26 fully mature apothecia 20.VI.67. 3 fully mature apothecia; 26.VI.67. 6 last fully mature apothecia.

Measurements of various structures in the literature. Sclerotia were given by Buchwald (1947) as 3—11 × 1.5—7 μ, with "1—10—(15)" apothecia developing from each sclerotium. In the Polish collection, the apothecia were mainly single with a few in pairs, but more might have developed if the specimens had not been promptly removed for drying as they matured. The stipes of the Polish collection were somewhat longer than the published measurements. The maximum length given was by Ferdinandsen & Winge (1911) i.e. "indtill 30 mm", but it was observed that other apothecia which were developed within plastic boxes often had longer stipes than usually found in nature.

The asci were given by Boudier (1911) as 180—200 μ long and by Dennis (1956) as 111—180 μ with most other published measurements falling within the latter. The spores were reported by Rehm (1893) as 10—12 × 4.5—5 μ and Whetzel (1946) as 11.2—14.4—17.8 × 5.3——6.6—7.9 μ. All other published measurements seen are within these limits.

Polish Collection on *Scirpus sylvaticus*. Herb. J. T. P. 3022. (spermodochidia) and 3119 (2 sclerotia with apothecia). Sclerotia and spermodochidia in culms of *Scirpus sylvaticus* in dry stream bed of small wood at edge of the Starożyn Reserve, leg. J. T. P. 66216, 3.IX.66. 2 culms with spermodochidia and a sclerotium in each. 2 apothecia matured from 20.V.67 to 25.V.67.

This was a sparse collection comprising culms of *Scirpus sylvaticus* containing spermodochidia and two diminutive sclerotia which may not have been fully developed when collected. The host plants were in scattered clumps adjacent to *Carex acutiformis* with rather similar spermodochidia and sclerotia of *Myriosclerotinia sulcata* (Whetz.) Buchw. This collection on *S. sylvaticus* was of special interest as the first author (after having previously satisfied himself that the fungus reported by Rehm on *S. sylvaticus* was, in fact, a *Rutstroemia* on the leaves) had found specimens of *S. sylvaticus* culms with spermodochidia and sclerotia in Latvian exsiccati in Herb. B whilst on his way to Warszawa and he was therefore looking for fresh material of this fungus, see Palmer (1968 a).

Description. Apothecia solitary but an apothecial initial was present on the sclerotium of the first apothecium when it was removed

for drying whilst two further apothecia started to develop on the second sclerotium after the mature apothecium had been cut off for drying but they soon collapsed, probably due to exhaustion of nutriment. Receptacle at first pinhead-shaped, expanding after the elongation of the stipe to form a shallow cup with the rim incurved and tending to split, light brown (Methuen), externally smooth to pubescent. Disc 4—5.5 × × 1.5—2 mm, concolorous with the preceding structure, shallowly cupulate. Stipe 7 × 1 mm, ± equal, concolorous with the preceding structures, at first densely coated with pale hairs, later becoming almost smooth but with basal rhizoidal hyphae persisting. Stroma a definite sclerotium of the tuberoid type, 5—7 × 2—2.5 mm, bluntly ellipsoid, almost smooth, with a deep purplish brown rind and a pinkish to whitish medulla. Asci 133—160—193 × 5.4—8.5—11.4 µ (20 measured), hyaline, narrowly cylindrical, narrowing to a neck, 8-spored, appearing to be J+. Ascospores 9.4—12.8—15.6 × 3.8—6.1—8.3 µ (40 measured), hyaline, smooth, broadly ellipsoid, sometimes flattened at one side, with two faint oil globules, uniseriate. Paraphyses 2—3.7 µ, hyaline, clavate with slightly swollen ends, occasionally with a side branch and 1-septate towards the base. Spermodochidia 1—6 mm long, dark brown, developing longitudinally within grooves of the culm surface, ca. 0.5 mm broad but often fusing with adjacently developing structures, somewhat irregular in outline and scattered over the culm surface. Spermatia 1.7—2 µ (16 measured), hyaline but probably somewhat brownish as appearing dark in the mass, globose. The material was too sparse to be studied in axial section.

Development of apothecia. 17.IV.67. 2 apothecial initials, one on each sclerotium; 24.IV.67. Stipes lengthening; 8.V.67. Stipes long with silky hairs at bases; 13.V.67. Apothecia almost fully developed; 20.V.67. First apothecium fully mature and removed for drying; 25.V.67. Second apothecium fully mature and removed for drying; 30.V.67. 3 apothecial initials developing from second sclerotium; 5.VI.67. Stipes developing; 12.VI.67. Stipes collapsed. Sclerotium apparently exhausted.

Myriosclerotinia sulcata (Whetz.) Buchw.

[= *Sclerotinia duriaeana* "Affine form" Whetzel (1929) Mycologia 21: 6, 10—13; *Sclerotinia sulcata* Whetzel (1929) Mycologia 21: 15—23; *Myriosclerotinia sulcata* (Whetz.) Buchwald (1947) Friesia 3: 301—302; St. microconidioph.: *Myrioconium affine* (Desm.) Buchw.; (= *Epidochium affine* Desm. (1853) Annls Sci. Nat. (Bot.) sér. 3, 20: 232; = *Myrioconium affine* (Desm.) Buchwald (1947) Friesia 3: 301); St. sclerotioph.: *Sclerotium sulcatum* Rob. in Desm.; (= *Sclerotium sulcatum* Rob. in Desm. (1851) Annls Sci. Nat. (Bot.) sér. 3, 16: 329; = *Claviceps* (?) *caricina* Griffiths (1902) Bull. Torrey bot. Cl. 29: 300)].

The Polish collection comprised the spermatial and sclerotial stages in culms of *Carex acutiformis*. This appears to be a new host record

for this species although Buchwald (1947) doubtfully gave *C. acutiformis* as the host for a Danish collection of *Myriosclerotinia duriaeana* (Tul.) Buchw., with which species this fungus was previously confused.

As the fungus is readily recognised from the appearance of the spermodochidia (indeed, it is regarded as difficult to separate from *M. duriaeana* on apothecial characters alone), the sclerotia were not overwintered in natural culture. This now seems unfortunate as it would have been interesting to have compared apothecia from this collection with those which subsequently developed from sclerotia within culms of *Scirpus sylvaticus* growing adjacent which have been referred in this paper to *Myriosclerotinia scirpicola*.

Whetzel (1946) reported *M. sulcata* from various parts of North America and stated that it was apparently common throughout north-western Europe. It is specifically reported for Britain, Denmark, Holland and Norway.

Myriosclerotinia sulcata was separated by Whetzel (1929) as *Sclerotinia* from *Myriosclerotinia duriaeana* (Tul.) Buchw. solely on the arrangement of the spermodochidia on the culm. *M. sulcata* has the spermodochidia irregularly scattered along the upper part of the affected culm whereas *M. duriaeana* has spermodochidia in pairs at more or less regular intervals along the culm. Both species were previously treated under *Sclerotinia duriaeana*.

Polish Collection. Herb. J. T. P. 3076. Spermodochidia and sclerotia in culms of *Carex acutiformis* Ehrb., Starożyn Reserve, leg. J. T. P. 66215, 3.IX.66.

Description. Spermodochidia 1—5 mm long, brownish pustules, developing in surface grooves (0.2 mm broad), usually on one side of the triquetrous culms, irregularly distributed, often with two or more fused together, splitting longitudinally to expose the spermodochidia. Spermodochia comprising globose masses with spermatia developing apically on phialides. Spermatia 1.5—2.2—2.8 µ (20 measured), hyaline to pale brown, globose. Stroma of the tuberoid sclerotium type, 10.5—29.5 × × 2.0—2.5 × 2.5—3.5 mm (3 measured), triquetrously cylindrical, longitudinally grooved, somewhat rounded at one end and pointed at the other, rind black, medulla pinkish to whitish. Host culm usually splitting from pressure of swelling sclerotium.

As the species has not been previously reported for Poland, apothecial material is figured from Wybunbury Moss, where the fungus is common.

British Collection. Herb. J. T. P. 3159. Culms of *Carex paniculata* with spermodochidia and sclerotia, Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire, 24.IX.66, leg. J. T. P. 66188. Overwintered, with mature apothecia 3.IV.67 to 16.V.67 and optimum development 1.V.67. Asci: 135—162—205 × 7.5—9.7—12.2 µ (40 measured). Spores: 10.1—13.0—15.6—(18.4) × 4.2—6.1—8.3 µ (70 measured).

Measurements in the literature. Whetzel (1926) described the sclerotia as 4—5 × 1.5—2 mm for small hosts such as *Carex interior* and 20—25 × 3—4 mm for larger species, i.e. *Carex riparia var. lacustris*, whilst others give dimensions within these limits. The apothecia given by Whetzel (1946) are 2—10 mm broad but Daams & Gremmen (1958) and Korf in Kobayasi et al. (1967) report them up to 15 mm wide. Whetzel (1946) reported stipes to 20 mm long but other authors rarely exceed 12 mm for their lengths. Ascus measurements are given by Whetzel (1946) as 128—161—183 × × 7.3—8.6—11 µ, Buchwald (1947) as 130—170 × 7—10 µ, Dennis (1956) as 115—128—183 × 7—11 µ, Daams & Gremmen (1958) as 165 × 11.5 µ and Korf in Kobayasi et al. (1967) as 160—170 × × 13—14 µ. The spores are reported by Whetzel (1946) as 8.8—12.6—17.5 × 5.3—6.9—8.8 µ, Buchwald (1947) as 9—12.9—16.5 × 4.5—5.6 µ, Dennis (1956) as 9—13.1—17 × 5.3—7.1—8.8 µ, Daams & Gremmen (1958) as 9—13.1—17 × 5.3—7.1—8.8 µ, Jørstad (1964) as 13—15.5 × 4.5—6.5 µ and Korf in Kobayasi et al. (1967) as 14—18 × 6.7 µ.

Whetzel (1946) reported apothecia as developing from April to May.

Rutstroemia firma (Pers. ex Fr.) Karst.

[= *Peziza ochroleuca* Bolton (1789) Hist. fung. Halifax 3: 105; ? *Peziza explanata* Holmskjold (1799) Beata rur. ot. fung. 2: 35; *Peziza firma* Persoon (1801) Syn. meth. fung.: 658; ? *Peziza globosa* Schumacher (1803) plant. part. Saell. 2: 420; *Peziza tomentosa* Schum. (1803) Eunum. plant. part. Saell. 2: 426; *Calycina firma* (Pers.) S. F. Gray (1821) Nat. Arr. Brit. Plants 1: 671; *Peziza firma* Pers. ex Fries (1823) Syst. myc. 2: 117; ? *Peziza globosa* Schum. ex Fries (1823) Syst. myc. 2: 60; ? *Peziza tomentosa* Schum. ex Fries (1823) Syst. myc. 2: 79; *Ciboria firma* (Pers. ex Fr.) Fuckel (1870) Symb. Mycol. 1: 312; *Helotium firmum* (Pers. ex Fr.) Karst. (1870) Not Sällsk. F. Fl. fenn. 11: 233; *Phialea firma* (Pers. ex Fr.) Gill. (1879) Champ. France. Discom.: 101—102; *Rutstroemia firma* (Pers. ex Fr.) Karst. (1871) Bidr. Finl. Nat. Folk 19: 108—109; *Rutstroemia firma* (Pers. ex Fr.) Karst. (1873) Not. Sällsk. F. Fl. fenn. Förh. 13: 233; *Hymenoscypha firma* (Pers. ex Fr.) Phill. (1887) Brit. Discom.: 123—124; ? *Geopyxis globosa* (Schum. ex Fr.) Sacc. (1889) Syll. fung. 8: 64; *Macropodia tomentosa* (Schum. ex Fr.) Sacc. (1889) Syll. fung. 8: 160; *Ciboria ochroleuca* (Bolt.) Mass. (1895) Brit. Fung. Fl. 4: 274; *Cyathipodia tomentosa* (Schum. ex Fr.) Boud. (1901) Hist. Class. Discom. Europe: 39].

Two collections were made at Białowieża on twigs of *Quercus robur*. Whilst the fungus is regarded in the British literature as a species inhabiting *Quercus* twigs, no specific tree was mentioned with the earliest published descriptions and *R. firma* has also been reported from twigs of *Alnus glutinosa, A. incana* and *A. viridis, Betula verrucosa, Carpinus betulus, Corylus avellana, Populus alba, Ribes sp., Rubus sp., Sarothamnus sp.* and *Ulmus sp.* Nespiak (1965), whilst discussing

material on *A. glutinosa* twigs, suggested that *Rutstroemia macrospora* Velen. might be a synonym. However, material on *Alnus incana* examined by the first author has much larger spores and asci than the typical quercicolous fungus and may be a distinct taxon. It is therefore clear that the collections on the various hosts are in need of a thorough revision.

R. firma has been reported from Austria, Belgium, Britain, Czechoslovakia, Denmark, Finland, France, Germany, Italy, Luxembourg, Poland, Sweden, Switzerland and the U.S.S.R.

Polish Collections. Herb. J. T. P. 3262. On partly buried twigs of *Quercus robur* in shrubbery of the Botanical Park, Białowieża, leg. J. T. P. 66227, 5.IX.66, 6 specimens. Herb. WRSL and J. T. P.

Herb. J. T. P. 3263. On partly buried twigs of *Quercus robur* beneath solitary oak within main entrance to the National Park, Białowieża, leg. J. T. P. 66232, 5.IX.66, 5 specimens. Herb. WRSL and J. T. P.

Description. Apothecia mainly solitary, developing from bark-covered twigs, often in wound or where the bark is broken away, from a stromatized surface. Disc 3.5—5.5 mm diam., shallowly cupulate, yellowish-brown, drying darker. Receptacle brown to reddish-brown, becoming wrinkled when dry. Stipe 5—7 mm, ± cylindrical, enlarged into receptacle, dark brown below. Asci 118—137—157 × 6.1—9.3—10.8 µ, hyaline, narrowly cylindrical, sometimes with granular, golden contents where spores have apparently deteriorated, 8-spored, J+. Spores 12—14.6—17.7 × 3.7—4.6—6.4 µ, hyaline, narrowly ellipsoid, with pointed ends, 2- to multiguttulate, becoming septate and budding globose spermatia from apices, uniseriate. Paraphyses 1.8—2.8 µ, narrowly clavate, simple. Stroma of the substratal type, not always apparent, but present in some twigs (usually old and decorticated) as a black, stromatized surface which sometimes delimits the internal wood by a black line (Tab. 4).

Asci and spores in the literature. Micro measurements are mainly given as being within the limits of 115—170 × 7—12 µ for asci and 12—20 × 4—6.5 µ for spores but several authors, particularly when dealing with collections on *Alnus*, give larger measurements: asci: 120—230 × 12—15 µ and spores 18—20 × 7—10 µ in Boudier (1911) and asci 182—192 × 14—15 µ and spores 23—26 × 5.5—6.5 µ in Favre (1960).

Rutstroemia henningsiana (Plöttn. in Hennings) Dennis

[= *Ciboria henningsiana* Plöttn. in Hennings (1900) Verh. bot. Prov. Brandenb. 41: X; *Ciboria henningiana* „Plöttn." in Velen. (1934) Mon. Discom. Bohem.: 219; *Rutstroemia henningsiana* (Plöttn. in Hennings) Dennis (1956) Mycol. Papers 62: 134—135].

This fungus appeared in all three collections of culms of *Eriophorum vaginatum* containing sclerotia of *Sclerotinia dennisii* Svrček but did not

Table 4

Comparison of asci and spores

Collection	Asci	(No.)	Spores	(No.)
3262/66227	118—132—157 × 7.8—9.1—10.8 μ	(10)	12.0—14.2—15.7 × 4.1—4.6—6.4 μ	(20)
3266/66232	121—141—154 × 6.1—9.5—10.2 μ	(10)	12.7—15.0—17.7 × 3.7—4.6—5.9 μ	(20)

Table 5

Comparison of asci and spores

Collection	Asci	(No.)	Spores	(No.)
3117	136—173—196—(240) × 7.8—11.5—16.5 μ	(64)	(11)—12.9—15.8—19.5—(21) × 4.3—6.0—8.5 μ	(145)
3121	122—155—181 × 8.3—10.3—12.0 μ	(13)	(10.2)—11.1—12.6—14.6 × 4.4—5.5—6.7 μ	(40)
3126	134—153—174 × 11.8—13.4—15.7 μ	(10)	14.0—15.5—16.5 × 5.8—6.3—6.6 μ	(10)

Table 6

Comparison of asci and spores

Collection	Asci	(No.)	Spores	(No.)
3088	84— 96—104 × 8.2—8.3— 8.9 μ	(10)	12.0—13.7—15.7 × 2.8—3.9—4.6 μ	(20)
3095	90—101—110 × 6.3—8.1— 9.8 μ	(10)	12.9—13.9—14.7 × 3.5—3.8—4.6 μ	(10)
3096	94—107—122 × 7.4—8.7—11.0 μ	(10)	11.1—13.4—15.6 × 3.2—3.6—3.7 μ	(10)

occur in the British collection of *E. vaginatum* culms with *S. dennisii* sclerotia which was overwintered as a control. However, as the culms of all four collections were kept in the same plastic container, a cross infection cannot be ruled out but it seems most unlikely that the fungus originated from the British material and it was more likely present in the Polish culms when collected.

R. henningsiana is only reported from the type locality of Rathenow a/H., Germany, on culms of *Eriophorum vaginatum*, May, 1899, by Hennings (1900), by Velenovský (1934) „*ad folia Caricum et graminum*", which may therefore represent another species, and by Dennis (1956) on "dead leaves of *Eriophorum*" in Norfolk, England. The first author has collected a similar species on dead leaves of *Eriophorum angustifolium* in the Peak National Park, Derbyshire, England.

Polish Collections. Herb. J. T. P. 3117. On culms of *Eriophorum vaginatum* amongst sphagnum at edge of Lake Gryżewskie, Gąsior near Kamień, leg. J. T. P. 66209 (part), 2.IX.66. Apothecia developed from 6.III.67 to 9.V.67, 22 specimens. Herb. WRSL and J. T. P.

Herb. J. T. P. 3121. On culms of *E. vaginatum*, sphagnum bog near Lipsk, leg. J. T. P. 66219 (part), 3.IX.66. Apothecia developed 21.III.67 to 21.IV.67, 4 specimens. Herb. WRSL and J. T. P.

Herb. J. T. P. 3126. On culms of *E. vaginatum*, sphagnum bog, National Park, Białowieża, leg. J. T. P. 66234 (part.). Single specimen, developed 2.V.67 and is deposited in Herb. WRSL.

Description. Apothecia solitary to occasionally social but usually scattered, stipitate, often developing from a bleached or pale area clearly demarcated from the darker tissue by an irregular black line. Disc 1—2 mm diam., thick, varying from slightly cupulate through plane to slightly recurved, pale yellowish brown. Receptacle varying from shallowly cupulate to patelliform, usually abruptly turning into stipe, smooth, slightly darker than the disc. Stipe 1.5—6 mm, cylindrical to swollen at the base, often curved, sometimes spirally twisted, pubescent, concolorous with the excipulum above but often darker below. Asci 122—196 × 7.8—16.5 µ, hyaline, narrowly cylindrical, 8-spored, faintly J+. Spores 11.1—19.5 × × 4.3—8.5 µ, hyaline, amygdaliform, often narrower at one end and flattened on one side, biguttulate at first but occasionally uniguttulate or multiguttulate, often becoming 1-septate with germ tube developing from end or side. One collection (3117) had some spores with granular, golden contents. Paraphyses 1.7—3.8 µ, clavate but occasionally swollen at the tip, septate below and often with a side branch. Stroma of the substratal type, often evident as a black stromatic line in the host tissue (Tab. 5).

Asci and spores in the literature. Hennings (1900) gave no ascus measurements but the spores as „*saepe 2-guttulatis, conti-*

nuis ... 15—18 × 7—8 μ", Velenovský (1934) reported the asci as 150—200 × 12 μ and the spores as 15—18 (μ) „*guttulis binis, magnis polaribus*" and Dennis (1956) has asci 145—160 × 10 μ and spores „*biguttulate, non-septate,* 13—15 × 5—6 μ", which all fall within the limits for the Polish material. The spore measurements for individual samples from the Polish collections show such wide variations that one might be tempted to consider that more than one taxon was involved if the largest collection (3117) had not produced a large range of measurements in which individual samples were sometimes widely separated.

Rutstroemia luteovirescens (Rob. in Desm.) White

[= *Peziza (Phialea) luteo-virescens* Roberge in Desmazières (1847) Annls. Sci. Nat. (Bot.) sér. 3, 8: 188—189; *Helotium subolivaceum* Karsten (1873) Not. Fl. fenn. Förh. 12: 449; *Peziza pallido-virescens* Phill. & Plowr. (1877) Grevillea 6: 24; *Phialea luteo-virescens* (Rob. in Desm.) Gillet (1879) Champ. Fr. Discom.: 108; *Helotium luteo-virescens* (Rob. in Desm.) Karsten (1883) Hedwigia 22: 164; *Calycella luteo-virescens* (Rob. in Desm.) Quélet (1886) Enchirid. fung.: 306; *Hymenoscypha luteo-virescens* (Rob. in Desm.) Phillips (1887) Mon. Brit. Disc.: 121—122; *Helotium pallido-virescens* (Phill. & Plowr.) Lambotte (1887) Fl. Myc. Belg. Suppl. 1: 311; *Ciboria luteo-virescens* (Rob. in Desm.) Sacc. (1889) Syll. fung. 8: 206; *Calycina subolivacea* (Karst.) Kuntze (1898) Rev. gen. plant. 3 (2): 449; *Rutstroemia luteo-virescens* (Rob. in Desm.) White (1941) Lloydia 4: 211].

A single specimen was found on an *Acer* petiole and a careful search failed to reveal further apothecia.

The fungus is common on petioles of *Acer pseudoplatanus* in England and has been reported from the following European countries: Czechoslovakia, France, Germany and Holland but has been collected by the first author also in Austria and Switzerland. The species was originally described by Desmazières (1847) from petioles of mainly *Tilia* but also *Acer*. However, the current records seem to be mostly on *Acer*, chiefly *A. pseudoplatanus*, but Šmarda (1944) reported it on *Populus* petioles whilst both Whetzel (1945) and von Höhnel (1918) give *Platanus*.

Polish Collection. Herb. J. T. P. 3083. On single stromatized petiole, probably of *Acer platanoides*, in shrubbery of Botanical Park, Białowieża, leg. J. T. P. 66226, 5.IX.66.

Description. Apothecium solitary, stipitate, developing from a blackened petiole. Receptacle yellowish-green, shallowly cupulate, smooth. Disc 2.5 mm diam., yellowish-green, concave. Stipe 2 mm × ca. 0.3 mm, ± equal, curving below at right angles into petiole, concolorous with the receptacle. Asci 132—139—145 × 7.8—9.5—11.4 μ (10 measured), cylindrical, often with a narrow neck, 8-spored, J+. Spores 11.6—13.2——14 × 5.4—6.2—7.4 μ, hyaline, mainly broadly elliptical but often pointed at one end, usually with two large guttules. Paraphyses ca. 2.5—3 μ,

cylindrical but slightly broadened at the tip, containing small oil globules, hyaline. Stroma of the substratal type and evident as the blackened petiole surface.

Asci and spores in the literature. The fungus is readily recognised by its petiolicolous habit and yellowish-green apothecia. Most published descriptions give micro measurements close to or within the limits of White (1941): 120—145 × 9—13 μ for asci and 12—16.5 × × 5—7 μ for spores. Major deviations are those of Maas Geesteranus (1954): asci 132—177 × 12—13 μ and spores 13.4—18.8 × 6.3—7.6—(9) μ, Rehm (1893): asci 90—120 × 7—10 μ and spores 12—17 × 4.5—5 μ, Velenovský (1934): asci 180 × 16—18 μ and spores 18—22 μ (no width), Schieffendecker (1954): spores 20—24 × 7 μ and Naumov (1964) in key: asci 90—120 × 7—10 μ and spores 12—17 × 4.5—5 μ. Dennis (1968) reported asci as "up to 150 μ". Seaver (1951) apparently confused the species with another in North America.

Rutstroemia petiolorum (Rob. in Desm.) White

[= *Peziza petiolorum* Rob. in Desmazières (1842) Annls Sci. Nat. (Bot.) sér. 2, 17: 96—97; *Helotium petiolorum* (Rob. in Desm.) de Notaris (1864) Comm. critt. Ital. 1: 378; ? *Peziza denigrans* Fuckel (1870) J. Nass. Ver. Nat. 23—24: 309; *Phialea petiolorum* (Rob. in Desm.) Gillet (1879) Champ. Fr. Disc.: 102; *Calycella petiolorum* (Rob. in Desm.) Quélet (1886) Enchirid. fung.: 305; *Hymenoscypha petiolorum* (Rob. in Desm. Phillips (1887) Mon. Brit. Discom.: 132; *Cyathicula petiolorum* (Rob. in Desm.) Saccardo (1889) Syll. fung. 8: 305; ? *Cyathicula denigrans* (Fuck.) Saccardo (1889) Syll. fung. 8: 306; ? *Ciboria petiolorum* (Rob. in Desm.) Schroeter (1893) Krypt. Fl. Schles. 3: 61; *Rutstroemia petiolorum* (Rob. in Desm.) White (1941) Lloydia 4: 197].

Four collections, all on petioles of *Fagus sylvatica*, were made in different parts of Poland, one of which comprised immature apothecia.

Although reported for Poland by Schroeter (1893), who recombined the epithet with *Ciboria*, the broad spores (5—6 μ) and occurrence on leaves of *Quercus robur* suggests *R. sydowiana*. There appear to be no extant specimens in Schroeter's herbarium in WRSL. The fungus was described by Desmazières (1842) „*in petiolis foliorum emortuorum Fagi, etc.*", who added „*quelquefois aussi sur celles du Chêne et du Chataignier*". The first author has, however, seen no specimens on this species on petioles of either *Castanea* or *Quercus*, only apothecia which he would refer to *Rutstroemia sydowiana*. White (1941) reported the fungus from petioles of *Betula alba*, *Fagus sylvatica* and *Quercus robur*.

R. petiolorum is reported from Britain, France, Germany and Scandinavia but has been collected by the first author also in Austria, the Netherlands and Switzerland and by M. Tortić (unpublished) in Jugoslavia, whilst White (1941) reports it from North America.

Polish collections. J.T.P. 3088. On petioles of *Fagus sylvatica* on wooded slopes of Agataberg near Święta Katarzyna, leg. J.T.P. 66236, 7.IX.66. 2 specimens. Herb. WRSL and J.T.P.

J.T.P. 3095. On petioles of *F. sylvatica* above Krościenko, Pieniny Mountain, leg. M. Tortić N° 1, 12.IX.66, 7 specimens. Herb. WRSL and J.T.P.

J.T.P. 3096. On petioles of *F. sylvatica*, Szopka Pass, Pieniny Mountain, leg. M. Tortić N° 2, 12.IX.66. 9 specimens. Herb. WRSL and J.T.P.

J.T.P. 3349. Immature apothecia on petioles of *F. sylvatica* amongst limestone scree of gorge, Ojców, National Park, Chełmowa Góra, leg. J. T. P. 66240, 8.IX.66. Herb. WRSL and J. T. P.

Description. Apothecia usually developing singly from stromatized petiole, stipitate. Receptacle shallowly cupulate, usually gradually merging into the stipe, reddish brown, somewhat felted to fibrous. Disc 1—3 mm diam., lilaceous fawn with a dentate margin. Stipe ca. 2 mm but variable in length, concolorous with the excipulum although usually darker below, ± equal. Asci 84—122 × 6.3—11 µ, hyaline, cylindrical with a narrow neck, 8-spored, usually with 4 spores biseriate and 4 spores uniseriate. Spores 11.1—15.7 ± 2,8—4.6 µ, hyaline, narrowly reniform, usually with two oil guttules but occasionally with several guttules and with a few appearing to be septate. Paraphyses 1.4—3.3 µ, narrowly cylindrical with a slightly swollen tip (Tab. 6).

Asci and spores in the literature. Desmazières (1842) reported the spores as „1/100 de millimètre", Phillips (1887) as „17 × 4 µ", and Saccardo (1889) for *Cyathicula petiolorum* as „10 µ longis" (probably taken from Desmazière's original diagnosis). Most modern authors give dimensions falling within those of White (1941), i.e. 14—17 × 4.5—5.5 µ. The measurements of the spores in the Polish collections, whilst somewhat smaller, are mainly in agreement with those found by the first author for British and continental material. Fuckel (1870) reported *Peziza denigrans* from petioles of *Fagus sylvatica* with spores „*8 Mik. long., 2—3 Mik. crass.*" but, whilst this fungus is often placed in the synonymy of *R. petiolorum*, the reported occurrence of the apothecia as „*sehr selten im Frühling*" suggests some other species.

Rutstroemia sydowiana (Rehm) White

[= *Ombrophila sydowiana* Rehm ap. Sydow (1884) Mycoth. march. N° 666; *Ciboria sydowiana* (Rehm) Rehm (1885) Hedwigia 24: 226; *Rutstroemia sydowiana* (Rehm) White (1941) Lloydia 4: 200].

Ten collections of this fungus were made on oak leaves: eight were characteristically on the petioles but two were on the leaf surface adjacent to pale areas delimited by black stromatic lines. The oaks were

Quercus robur and *Q. rubra* L. sec. Duroi (syn. = *Q. borealis* Michx. f. var. *maxima* (Marsh.). Ashe and *Q. maxima* (Marsh.) which are readily distinguished by the shapes of their leaves. The latter is a North American oak which is frequently planted in Europe.

The only known Polish record published under the epithet *„sydowiana"*, is by Borowska (1966) but the description of Schroeter (1893) for *Ciboria petiolorum* on main nerves of fallen leaves of *Q. robur* with broad spores (10—13 × 5—6 µ) seems to have been *R. sydowiana*. No material is extant in WRSL.

Although reported in the literature as occurring on *Quercus* leaves in Europe, *R. sydowiana* is not uncommon on petioles and involucres of *Castanea sativa* (Palmer 1964) whilst a cupule of *Quercus cerris* from Slovakia also bore this species (Palmer 1968 a). *R. sydowiana* has undoubtedly been confused in the past with *R. petiolorum*, which was described by Desmazières (1842) from leaves of *Fagus sylvatica* as *„quelquefois aussi sur celles du Chêne et du Chataignier"*. According to the literature and the first author's collections, *R. sydowiana* is known from North America and Europe (Austria, Belgium, Britain, Czechoslovakia, Denmark, France, Germany, Hungary, Italy, Jugoslavia, the Netherlands, Switzerland and Turkey).

Polish Collections. J.T.P. 3026. Adjacent to pale areas demarcated by black lines on fallen leaves of *Quercus rubra* in Botanical Park, Białowieża, leg. J.T.P. 66274, 6.IX.66, 5 specimens. Herb. WRSL and J.T.P.

J.T.P. 3068. On petioles of *Quercus robur* in Kampinos National Park (Puszcza Kampinoska) near Warszawa, leg. J.T.P. 66206, 29.VIII.66, 10 specimens. Herb. WRSL and J.T.P.

J.T.P. 3069. On petioles of *Q. robur* in wood adjacent hostel, Mikołajki, leg. J.T.P. 66207, 28.VIII.66, 3 specimens. Herb. WRSL and J.T.P.

J.T.P. 3077. On petioles of *Q. robur* in wood, Starożyn Reserve, leg. J.T.P. 66217, 3.IX.66, 24 specimens. Herb. WRSL and J.T.P.

J.T.P. 3081. On petioles of *Q. robur* in wood Gąsior, near Kamień, leg. J.T.P. 66222, 2.IX.66, 2 specimens, Herb. WRSL and J.T.P.

J.T.P. 3082. On petioles of *Q. robur* in forest, Majdan near Białowieża, leg. J.T.P. 66224, 4.IX.66, 26 specimens. Herb. WRSL and J.T.P.

J.T.P. 3084. On petioles of *Q. robur* in National Park, Białowieża, leg. J.T.P. 66228, 5.IX.66, 20 specimens. Herb. WRSL and J.T.P.

J.T.P. 3085. Adjacent to pale areas demarcated by black lines on fallen leaves of *Q. robur* in National Park, Białowieża, leg. J.T.P. 66229, 5.IX.66, 31 specimens. Herb. WRSL and J.T.P.

J.T.P. 3087. On petioles of *Q. rubra* in Botanical Park, Białowieża, leg. J.T.P. 66235, 5.IX.66, 5 specimens. Herb. WRSL and J.T.P.

J.T.P. 3089. On petioles of *Q. robur* in copse at wayside stop during coach journey to Ojców, leg. J.T.P. 66239, 8.IX.66, 2 specimens. Herb. WRSL and J.T.P.

Description. Apothecia mainly single but occasionally in pairs, erumpent from the petiole, which is often blackened, particularly be-

neath the cuticle, or from the leaf surface (in J.T.P. 3026 and 3085), when they are scattered and adjacent to or bordering pale areas delimited by black stromatic lines. Receptacle shallowly cupulate, brownish orange (Methuen), smooth with surface faintly longitudinally fibrillose. Disc 1.3—3 mm diam., pale brownish orange (Methuen), plane, at first incurved, then opening to become disciform. Margin elevated and beset with pointed brownish orange teeth. Stipe 0.5—4.5 mm × ca. 0.2 mm, tapering from disc into a cylindrical structure sometimes narrowing below, smooth, concolorous with the exipulum but often darker, sometimes almost black, at the base. Asci 90—147 × 5.8—15.4 µ, hyaline, cylindrical, usually narrowing into a curved or bent neck, 8-spored, J+. Ascospores 10.4—16.7 × 4.2—8.2 µ, hyaline, broadly obovoid-reniform, usually with one large guttule but smaller guttules occasionally present, mainly uniseriate but occasionally partly biseriate. (Whilst none were seen in the Polish collections, 1-septate spores budding spermatia have been observed in old, deteriorating apothecia from England and elsewhere). Paraphyses 2.4—3.9 µ, slenderly clavate, simple, septate below, hyaline. Stromata of the substratal type, evident as the blackened petiole surface or as the pale areas of leaf tissue demarcated by black stromatic lines in two collections (Tab. 7).

Spores and other criteria in the literature. Spore dimensions given by various authors are mainly within those of Rehm (1885), i.e. 10—12 × 5—7 µ. Slight variations are those of Buchwald (1947) 10—13 × 5—7 µ (his *R. petiolorum* on *Quercus* petioles seems to belong here), Dennis (1956) 12—16 × 5—6.5 µ, Charvát (1957) 13—14 × 6 µ, Velenovský (1934) 12—15 µ and White (1941) 11.5—15 × 5.5—6.5 µ, who also reports the species on *Acer* petioles in North America.

The occurrence of apothecia adjacent to pale areas bordered by a black line on fallen leaves of *Quercus robur* and *Q. rubra* in the Białowieża district requires comment. In both collections, apothecia were completely absent from the petioles although leaves with apothecia confined to their petioles were lying close by. However, no other difference has so far been detected and the two collections are treated under *R. sydowiana* although further investigation is desirable.

According to White (1941), *R. sydowiana* occurs "on petioles, midribs, lateral veins and blades of fallen overwintered leaves of *Quercus*" but *R. petiolorum*, which he also reports on *Quercus* petioles "and occasionally midribs or blades" in North America with spores 4.5—5.5 µ broad (European collections of *Fagus sylvatica* examined by the first author have had mainly narrower spores) is stated to have "Stromata

rudimentary, sometimes appearing as slight indefinite discolored zones in the subcuticular tissue, more often as narrow lines in the substrate tissue some distance from the origin of the apothecia". Further, *Rutstroemia renispora* (Ellis) White, known only from leaves of *Nyssa sylvatica* (Walt.) Sarg. in North America (although previously confused with *R. sydowiana* and reported from oak petioles in Europe) with spores 3.5—4.5 μ broad, is described by White (1941) as having "Stromata appearing as very thin irregular, circular, black lines in the tissue of the leaf blade" whilst *Rutstroemia pruni-serotinae* Whetz. & White, also only known from North America, forms similar structures in the leaves of *Prunus serotina*.

Sclerotinia dennisii Svrček

[= *Sclerotinia eriphori* Whetz. ap. Buchwald (1947) Friesia 3: 303, nom. nud.; *Sclerotinia sp.* 1. Dennis (1956) Mycol. Papers 62: 154; *Sclerotinia dennisii* Svrček (1961) Česká mykol. 15: 35—39].

Three collections of this fungus, as sclerotia within bleached culms of *Eriophorum vaginatum*, the type host, were made in widely separated localities in Poland, where it appeared to be common and abundant. The culms were individually scrutinized for spermodochidia but none were found. They were overwintered under cool, moist conditions and apothecia developed from the sclerotia early in the following year. A collection of British culms containing sclerotia, collected on the Wybunbury Moss National Nature Reserve, England, was overwintered as a control and apothecia developed almost simultaneously with those from the Polish collections. In addition, apothecia also developed from fruits of *E. vaginatum* on culms collected at Gąsior (Poland) and whilst at first thought to be *Ciboria aschersoniana* (Henn. & Plöttn.) Whetz., which has spores ca. 10 × 4 μ, was found to be microscopically identical with *Sclerotinia dennisii* and also produced sclerotia in several cultures on PDA. This is the first known occurrence of *S. dennisii* on *Eriophorum* fruits. Finally, apothecia of *Rutstroemia henningsiana* also developed from culms in all three Polish collections, see under that species.

Sclerotinia dennisii was described from a sparse collection on sclerotia in culms of *Eriophorum vaginatum* in Czechoslovakia by Svrček (1961), from where it had been previously reported by Pilát & Kotlaba (1952) as *Sclerotinia vahliana* Rostr., an arctic species which forms shell-like sclerotia. *S. dennisii* has been officially reported also from the Canadian Arctic, England and the Netherlands but it also appears to occur in Denmark, whilst I have seen material on *Eriophorum angustifolium* from England which probably belongs to this spe-

cies. Although Buchwald (1949) placed *Sclerotinia vahliana* in his new genus *Myriosclerotinia,* no spermodochidia (the main character of this genus) have been found on the culms of *Eriophorum* hence the present species has been retained in *Sclerotinia.*

Polish Collections. J.T.P. 3071 (sclerotia) and (apothecia) 3116. On sclerotia within culms of *Eriophorum vaginatum* amongst *sphagnum* at edge of Lake Gryżewskie at Gąsior near Kamień, leg. J.T.P. 66209 (part), 2.IX.66, 15 specimens, developed 6.II. to 30.V.67. Herb. WRSL and J.T.P.

J.T.P. 3118. On fruits of *E. vaginatum* amongst culms from the above, leg. J.T.P. 66209 (part), 2.IX.66, 6 specimens, developed 13.II. to 3.IV.67. Herb. WRSL and J.T.P.

J.T.P. 3078 (sclerotia) and 3120 (apothecia). On sclerotia within culms of *E. vaginatum* amongst sphagnum of "hochmoor" near Lipsk, leg. J.T.P. 66219 (part), 3.IX.66, 21 specimens, developed 20.II. to 15.V.67. Herb. WRSL and J. T. P.

J. T. P. 3086 (sclerotia) and 3129 (apothecia). On sclerotia within culms of *E. vaginatum* amongst sphagnum in small "hochmoor" in forest, National Park, Białowieża, leg. J. T. P. 66234 (part), 5.IX.66, 18 specimens, developed 13.III to 24.IV.67. Herb. WSRL and J. T. P.

Description. Apothecia mainly single but up to 3 per sclerotium, developing from sclerotia either loose or within culm (when culm usually split) but occasionally from fruiting heads or overwintered fruits, stipitate. Receptacle ochraceous brown with a yellowish tinge to reddish brown, cupulate to cyathiform or (when growing from fruits) patelliform, externally pubescent. Disc 1.2—6 mm diam. (1.2—2.1 mm diam. when developing from fruits), concolorous with receptacle, shallowly to deeply concave, often with a central depression, lower part often radially ribbed in fully mature specimens, often finally becoming convex. Margin circular, mainly entire but sometimes splitting. Stipe 6—20 mm (2—10 mm when growing from fruits), merging gradually to abruptly into receptacle, pubescent to hairy at first, particularly towards the base but finally often silkily smooth, concolorous with receptacle but becoming darker to blackish below, more or less equal but often twisted or irregular, base sometimes slightly swollen. Asci (77)—106—147—(149) × 4.9—13.9 µ, hyaline, clavate, narrowing to a definite neck, 8-spored, J+. Spores (9.2)—9.9—17.7—(19.3) × 3.5—6.9——(7.5) µ, hyaline, typically elongated-ellipsoid, usually flattened on one side, pointed at one end, mainly uniseriate but occasionally irregularly biseriate in upper part of ascus. Paraphyses 2.1—4 µ broad, hyaline, simple, often with a clavate head. Stroma of the tuberoid sclerotium type, (2.1)—7.5—18 × 0.6—1.6 mm (not apparent when within fruits), rounded to bluntly pointed at the ends, longitudinally sulcate, rind black, medulla pinkish to whitish (Tab. 8).

Table 7

Comparison of asci and spores

Collection	Asci	(No.)	Spores	(No.)
3026	114—120—126 × 8.2— 9.7—12.1 μ	(10)	11.1—12.9—15.2 × 4.6—6.2—7.4 μ	(20)
3068	90—115—129 × 8.5—10.0—12.2 μ	(10)	10.4—11.7—13.3 × 4.2—5.7—6.5 μ	(10)
3069	104—118—129 × 10.0—11.5—12.8 μ	(10)	11.2—13.5—16.6 × 4.7—6.2—7.2 μ	(20)
3077	114—126—136 × 9.4—12.1—15.4 μ	(10)	11.3—13.6—15.7 × 5.7—6.3—6.9 μ	(20)
3081	100—117—140 × 8.8—10.7—13.6 μ	(10)	12.1—13.6—14.9 × 6.2—7.0—8.2 μ	(10)
3082	102—113—126 × 9.8—11.2—13.4 μ	(10)	12.7—14.4—15.9 × 6.1—6.5—7.4 μ	(10)
3084	108—118—132 × 5.8—10.6—11.9 μ	(10)	12.3—13.7—15.1 × 5.7—6.3—7.1 μ	(10)
3085	120—127—147 × 9.8—11.0—13.5 μ	(10)	11.8—13.6—16.7 × 5.5—6.4—7.4 μ	(20)
3087	110—115—120 × 9.4—10.5—11.9 μ	(10)	11.8—13.9—15.7 × 6.1—6.4—7.0 μ	(10)
3089	112—117—124 × 8.8— 9.7—10.8 μ	(10)	11.8—13.1—14.6 × 5.3—6.1—6.7 μ	(10)

Table 8

Comparison of asci and spores

Herb. J.T.P/PR.	Asci	(No.)	Spores	(No.)
3116	(99)—110—123—140—(159) × 5.4—9.5—12.0 μ	(45)	(9.4)—11.4—14.3—17.6—(18.7) × 3.7—5.5—6.8 μ	(140)
3118	(104)—110—120—144—(150) × 5.4—9.6—10.0 μ	(23)	(9.4)—11.1—14.5—17.7—(19.3) × 4.5—5.5—6.8—(7) μ	(100)
3120	(77)—100—115—139 × 5.5—9.0—11.8 μ	(37)	(9.2)— 9.9—12.4—16.6—(17.5) × 3.5—5.2—6.7—(7.5) μ	(150)
3125	106—128—147—(156) × 4.9—9.5—13.9 μ	(50)	11.0—14.1—16.5—(18.6) × 4.2—5.4—6.9 μ	(120)
3158	80—103—125 × 6.7—9.4—12.4 μ	(40)	10.1—12.5—15.9 × 3.9—5.0—6.4 μ	(80)
173959	82— 98—108 × 5.8—7.0— 8.0 μ	(15)	8.2—12.0—13.9 × 2.5—4.1—5.5 μ	(20)
629536	88—101—116 × 3.9—5.2— 6.1 μ	(4)	10.1—12.6—14.8 × 3.3—3.9—4.6 μ	(10)
629537	(83)—100—107—118 × 5.9—7.5— 9.8 μ	(10)	10.2—11.5—13.0 × 3.5—3.9—4.6—(5.5) μ	(50)

British Collection. J.T.P. 3158. On sclerotia within culms of *Eriophorum vaginatum*, Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire, leg. J.T.P. 66187, 24.IX.66. Specimens developed 13.IV. to 30.V.67.

Collections of *S. dennisii* in Herb. PR. 173959. *Flora bohemica. Ad folia emortua Eriophori vaginati* L. *in turfosis, „Blata" prope Soběslav Legit: F. Kotlaba 15.IV.1952. det. Sclerotinia Vahliana Rostr. per Pilát, revid. S. dennisii per M. Svrček, 1960.*

629536. *Flora moravica. Montes Jeseníky, in sphagnetis „Rejviz" prope Zlate Hory (Cukmantl) in vicinitate lacu „Velké jezírko" ca 750 m.s.m. Legit: F. Kotlaba 9.V.1960. det. M. Svrček Sclerotinia dennisii* Svrček.

629537. *Typus! Flora Bohemiae merid. Soběslav, loco „Sobéslavská blata" dicto. Ad culmos emort. Eriophori vaginati in turfosis. Legit: F. Kotlaba 24.IV.1960. Det. M. Svrček Sclerotinia dennisii* Svrček (tab. 8).

Table 9

Comparison of asci and spores

Herb. J.T.P.	Asci	(No)	Spores	(No)
1848	105—117—125 × 7.8—9.0—10.2 μ	(10)	9.3—11.3—13.1 × 4.8—5.5—6.5 μ	(20)
1874	102—112—121 × 6.9—8.8— 9.5 μ	(10)	11.2—12.8—15.0 × 4.7—6.0—7.4 μ	(20)
1875	98—111—116 × 7.8—8.5— 9.5 μ	(10)	(8.3)—10.1—11.3—12.9 × 5.1—5.7—6.5 μ	(20)
3127	119—133—142 × 8.2—10.7—11.9 μ	(10)	10.1—11.0—13.8 × 4.6—5.8—6.4 μ	(20)

Table 10

Comparison of asci and spores

Herb. J.T.P. /CUP	Asci	(No.)	Spores	(No.)
3123	23—45—59 × 3.8—4.9—6.3 μ	(47)	5.2—6.6—8.4 × 1.7—2.4—3.1 μ	(100)
3247	47—49—52 × 4.3—5.1—5.7 μ	(5)	5.7—6.5—7.4 × 2.2—2.6—3.6 μ	(10)
25926	43—51 × 3.9—5.9 μ	(2)	6.5—7.7—8.5—(9.2) × 1.8—2.1—2.3—(2.8) μ	(20)

The spores in the literature. Pilát & Kotlaba (1952) report the spores as 14.5—16.5 × 4.5—5.2 μ, Dennis (1956) 10—12 × 3.5—4 μ, Svrček (1961) as 10—17.5 × 3.5—5.5 μ and El-

liott (1964) as 11.5—17.5 × 4.5—6 μ, which are in reasonable agreement with the measurements shown above.

? *Sclerotinia nervisequa* Schroet.

[= *Sclerotinia nervisequa* Schroeter (1893) Krypt. Fl. Schles. 3 (2): 65; *Rutstroemia nervisequa* (Schroet.) White (1941) Lloydia 4: 223; *Stromatinia nervisequa* (Schroet.) N. A. Naumov (1964) Fl. grib. Leningradsk. Obł. 2: 126, 128—129].

Several leaves of *Acer pseudoplatanus* bearing long sclerotia along their nerves were collected amongst scree in a limestone gorge. They resembled sclerotia of an undetermined species which has been collected on several occasions in two adjacent limestone dales in Derbyshire, England, on fallen leaves of the same host. The Polish collection was overwintered under moist conditions but, whilst several stipes appeared, only two apothecia reached full development and these were in poor condition when examined.

Comparison of development of apothecia from sclerotia in natural culture

Week beginning	3116	3118	3120	3125	3158
13.II.67	—	1	—	—	—
20.II.67	—	—	1	—	—
27.II.67	—	1	2	—	—
6.III.67	—	—	—	—	2
13.III.67	5	2	5	5	—
20.III.67	—	—	—	1	—
27.III.67	—	—	6	8	—
3.IV.67	2	1	4	1	—
10.IV.67	1	—	1	1	—
17.IV.67	—	1	—	1	1
24.IV.67	1	—	1	1	—
1.V.67	4	—	—	—	—
8.V.67	—	—	1	—	—
15.V.67	—	—	—	—	—
22.V.67	—	—	—	—	—
30.V.67	2	—	—	—	1
Apothecia	15	6	21	18	4

Sclerotinia nervisequa was described by Schroeter (1893) as forming sclerotia (4—10 mm long but also longer, 1—2 mm broad, externally black, longitudinally wrinkled, internally white) on the underside of leaves (various broadleaved trees with localities being given only for *Alnus glutinosa* and *Populus tremula)* in October and Novem-

ber with ripe apothecia „im Zimmer"! — which indicated that the collections were overwintered indoors) in March. There is no material extant under this name in Herb. WRSL.

Polish Collection. J.T.P. 3127. Sclerotia on nerves of leaves of *Acer pseudoplatanus* amongst scree in limestone gorge, Ojców, National Park, Chełmowa Góra, leg. J.T.P. 66241, 8.IX.66, 2 apothecia, mature on 13.V.67 and 12.VI.67.

English Collections. J.T.P. 1848. Apothecia on sclerotia on veins of fallen leaves of *A. pseudoplatanus* amongst limestone scree, Monks Dale, Derbyshire, leg. J.T.P. 11241, 19.V.1962.

J.T.P. 1874. As above, leg. J.T.P. 6.V.1961. Part in Herb. LIVU Myc. 2224, K and DAOM.

J.T.P. 1875. As above, leg. J.T.P. 6.V.1961. Part in Herb. LIVU Myc. 2224. and DAOM.

Description. In view of the very poor condition of the Polish apothecia, the following description has been mainly drawn up from the English collections.

Apothecia solitary to occasionally up to 3, developing from the sclerotium, stipitate. Receptacle creamy white becoming darker, often brownish with age, at first cupulate, becoming expanded to finally repand, externally pubescent. Disc 1.2—2.5—4.9 mm, concolorous with receptacle, sometimes with a slight central depression. Margin entire, often slightly darker than the disc. Stipe 1.1—5.2—15.2 × 0.4—1.3 mm, varying from concolorous with receptacle to somewhat reddish, equal to tapering upwards, mainly pubescent with creamy hairs but appearing smooth in occasional (usually very short) specimens. Asci 98—142 × × 6.9—11.9 µ, hyaline, narrowly cylindrical, narrowing to a neck, where occasionally forked, 8-spored, J+. Spores 9.3—15 × 4.6—7.4 µ, hyaline, ellipsoid, often slightly pointed at one end and flattened on one side, (British specimens) sometimes with a faint septum and starting to bud at the ends, usually uniseriate but occasionally partly biseriate. Paraphyses 1.5—2.7 µ, hyaline, cylindrical, occasionally with a side branch. Stroma a definite sclerotium of the tuberoid type, 4.2—11 × 0.6—1.2 mm (3—6 mm long in the Polish collection), elongated, more or less smooth, closely adhering to the nerve, rind black, medula white (Tab. 9).

Sclerotinia nervisequa in the literature. Schroeter (1893) gave the asci as 90—110 × 6—7 µ, which are somewhat smaller than those found in the Polish and English collections but the spores were stated to be 11—12 × 6—7 µ and agree substantially with the material studied.

S. nervisequa was placed by Lundell & Nannfeldt (1942) as a synonym of *Rutstroemia conformata* (Karst.) Nannf. and, indeed, Schroeter's description of leather-brown apothecia rather suggests this species than the present collections. Material of *R. conformata* on leaves of *Alnus glutinosa*, the type host, from Wybunbury Moss National Na-

ture Reserve, where the fungus is common, has been studied and, whilst the veins are blackened through stromatization, no structures resembling sclerotia were found. White (1941) transferred *S. nervisequa* to *Rutstroemia* but he had seen no authentic material. *S. nervisequa* was discussed by Groves & Bowerman (1955) when describing *Ciborinia pseudobifrons* Whetz. in Groves & Bowerm., which has avellaneous apothecia, very pale when young, asci (100)—110—150—(180) × (6)——7—9—(10.5) µ, spores (7.5)—9—13—(16.5) × 3.5—5 µ and developed from 10—15 × 3—5 mm sclerotia embedded in leaves of poplars with *Populus tremuloides* being specifically mentioned, and *Ulmus* spp. in North America. They considered *S. nervisequa* to be the only species with which *C. pseudobifrons* could be confused but rejected it on account of the dark colour of the apothecia (leather brown), the smaller size of the asci (90—110 µ) and the nervisequent habit of the sclerotia. They concluded that "*S. nervisequa* Schroet. is almost certainly to be referred to the genus *Ciboria* rather than to *Sclerotinia* or *Ciborinia*". G. W. Groves (DAOM), to whom the first author sent duplicates of English collections on *Acer pseudoplatanus* some years ago, replied that the fungus differed from *Ciborinia pseudobifrons* by the definitely broader spores, which seemed to have a septum, and the different sclerotia.

Naumov (1964) made the new combination *Stromatinia nervisequa*, mis-spelling the specific name, and his description is based on material collected on leaves of *Populus tremula* at Krasnye Gory, which he had earlier described as *Sclerotinia foliicola* N. Naum. (1920). He reported light brown apothecia, asci (90)—110—125—(140) × 6—7 µ, spores 9.6—11—(12) × 5.5 µ and sclerotica „2—6 MM v poperečnike, inogda do 4—5 × 12 MM" (a misprint for 1.2 mm ?).

Verpatinia calthicola Whetz.
[= *Verpatinia calthicola* Whetzel (1945) Mycologia 37: 692—694].

A single leaf of *Potentilla palustris* bearing rounded sclerotia was collected amongst sphagnum at Gąsior (Poland). The leaf was overwintered under damp conditions and verpiform apothecia developed from the sclerotia during the following year, when a few apothecia of *Ciboriopsis tenuistipes* also appeared from the leaf tissue, see under that species.

Verpatinia calthicola was described by Whetzel (1945) from sclerotia on overwintered petioles of *Caltha palustris* in Canada and the U.S.A., whilst Groves & Elliott (1961) reported a further collection in Canada from an area where *C. palustris* was abundant. Svrček (1966) recorded *V. calthicola* on *C. palustris* in Czechoslovakia. In Britain, the first author has collected apothecia closely re-

sembling this species on sclerotia in the decayed spathes of *Iris pseudacorus* in Cornwall, Northwest England (Cheshire, Derbyshire and Lancashire) and Galway, Irish Republic, with a single, sparse collection on a leaf of *Potentilla palustris* near Pott Shrigley, Cheshire. Whetzel (1945) described a further species, *V. duchesnayensis*, known only from leaves of *Betula lutea* near Duchesnay, Co. Quebec, Canada, which differs by its larger spores, 9.5—12 × 3.4 µ. Dennis (1956) published a third species, *Verpatinia spiraeicola*, on leaves of *Filipendula ulmaria* and *Calystegia sepium*, which has smaller spores, 5—6.5 × 1.5—2 µ. The first author has collected the latter species on *F. ulmaria* leaves in various British localities ranging from Cornwall through Northwest England to Scotland.

Polish Collection. Herb. J.T.P. 3123. Sclerotia on a single leaf of *Potentilla palustris* amongst sphagnum at edge of "schwingmoor", Lake Gryżewskie, Gąsior, near Kamień, leg. J.T.P. 66223, 2.IX.66, 20 specimens (apothecia), developed 13.V. to 10.VII.67.

Description. Apothecia growing singly from sclerotia. Receptacle verpiform to morchelliform, free from the stipe by a collar, at first smooth (when olive in colour) but later becoming rugulose to deeply lobed (when often pale yellowish brown), 1.4—3.5 × 0.7—1.5 mm. Stipe 8—20 × ca. 0.2 mm, at first greenish yellow with rigid pale hairs pointing outwards which soon disappear, when silkily smooth and whitish, equal. Asci 32—59 × 3.8—6.3 µ, hyaline, clavate, 8-spored, J+. Spores 5.2—8.4 × 1.7—3.1 µ, ellipsoid, often flattened at one side and pointed at the ends, uniseriate to irregularly biseriate. Paraphyses 1.8—2.2 µ, hyaline, cylindrical, occasionally branched below. Stroma an evident sclerotium of the discoid type, 1—3.5 × 1 mm, usually rounded above, rind black and medulla white.

The Polish collection was compared with the first author's notes on the holotype in Herb. CUP and an English collection on *Potentilla palustris*.

CUP 25926 (Holotype). On overwintered petioles of *Caltha palustris* swamp north of Woods Road, Labrador Lake, New York, U.S.A., leg. H. H. Whetzel & Viegas, 23.V.1937.

J.T.P. 3247. On leaf of *Potentilla palustris*, silted end of lake, Styperson Park near Pott Shrigley, Cheshire, England, leg. J.T.P. 66157, 17.VII.1966 (Tab. 10).

Whetzel (1945) reported the asci as 30—32—38 × 3—5.5—6 µ and the spores as 6—8—10 × 2.0—2.5—3.0 µ, whilst Svrček (1966) gave the asci as 45—55 × 5—6 µ and the spores as 7—9 × 2.5—3 µ. The Czechoslovak collection comprised only two sclerotia with 4 apothecia.

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Przegląd polskich *Sclerotiniaceae* ze szczególnym uwzględnieniem zanotowanych po raz pierwszy
Badania nad *Sclerotiniaceae* – V.

Streszczenie

Pionierskie badania polskich *Sclerotiniaceae* zawdzięcza się Schroeterowi (1893). Dotychczas zostało opisanych przez autorów polskich i obcych ogółem 25 gatunków.

Podczas IV Kongresu Europejskich Mikologów w Polsce oraz wycieczek pokongresowych zebrano (J. T. Palmer) materiały obejmujące niektóre grzyby z rodziny *Sclerotiniaceae* w formie apotecjów, sklerocjów lub zmumifikowanych organów roślinnych.

Zbiór materiału, hodowlę grzybów i oznaczanie wykonał J. T. Palmer, analizę materiałów polskich, identyfikowanie niektórych materiałów roślinnych oraz polskie streszczenie — W. Truszkowska.

Zebrane materiały pozostawiono do przezimowania wraz z organami roślinnymi z którymi były związane. Zimowanie odbywało się w wilgotnym mchu; każdy okaz pozostawał w osobnej przegródce plastykowego pudełka. W efekcie tego zabiegu wszystkie sklerocja wytworzyły apotecja. Mniej zadowalające rezultaty uzyskano w przypadku zimowania mumii. Pierwsze dojrzałe apotecja uzyskano 13.II. 1967, a ostatnie 31.VI.1967 r.

Preparaty do badań mikroskopowych wykonywano na mikrotomie z materiału zamrażanego. Z uzyskanych skrawków wykonano trwałe preparaty w żelatyno-glicerynie z erytrozyną (Erythrosin Glycerin Jelly). Wysuszone materiały dokumentarne znajdują się w zielniku Instytutu Botanicznego Uniwersytetu we Wrocławiu (WRSL) oraz prywatnym zielniku J. T. Palmera (J.T.P.).

Opracowane grzyby zebrano w postaci sklerocjów tkwiących wewnątrz łodyg *Cyperaceae* (*Myriosclerotinia scirpicola, M. sulcata* i *Sclerotinia dennisii*), na martwych liściach (? *Sclerotinia nervisequa* i *Verpatinia calthicola*) jak również na zmunifikowanych owocach *Ericaceae* (*Monilinia megalospora, M. oxycocci, M. urnula*) — albo jako apotecja na opadłych gałązkach (*Rutstroemia firma*) i martwych liściach wraz z ogonkami (*Ciboriopsis tenuistipes, Rutstroemia luteovirescens, R. petiolorum, R. sydowiana*), *Rutstroemia henningsiana* znaleziono po przezimowaniu jedynie na trzech okazach *Eriophorum vaginatum*, które zawierały

sklerocja *Sclerotinia dennisii*. Kilka natomiast apotecjów *Ciboriopsis tenuistipes* rozwinęło się na liściach *Potentilla palustris* zebranych ze względu na wytworzone na nich sklerocja *Verpatinia calthicola*.

Na jednym okazie *Eriophorum vaginatum*, na owocach wytworzyły się apotecja *Sclerotinia dennisii*; wcześniej znane były tylko sklerocja tworzące się wewnątrz łodyg. Tylko jeden okaz *S. dennisii* zebrany w jesieni 1967 w postaci sklerocjów z łodyg *Eriophorum vaginatum* (pochodzący z Wybunbury Moss National Nature Reserve, Wybunbury, Cheshire w Anglii) wykazał rozwój identyczny z zaobserwowanym na polskich materiałach.

Na podstawie zgromadzonych podczas Kongresu materiałów określono ogółem 15 gatunków. O siedmiu z nich (*Myrioscleriotinia scirpicola, M. sulcata, Rutstroemia henningsiana, R. luteovirescens, R. petiolorum, Sclerotinia dennisii, Verpatinia calthicola*) nie było dotychczas wzmianki w polskiej literaturze. Trzy spośród wyżej wymienionych gatunków zostały znalezione na niecytowanych dotychczas w literaturze roślinach, a mianowicie: *Myriosclerotinia scirpicola* — na *Scirpus sylvaticus*, *Rutstroemia luteovirescens* — na *Acer platanoides* oraz *Verpatinia calthicola* — na *Potentilla palustris*.

Spośród opracowanych gatunków pewne wątpliwości nasuwa pogląd na przynależność do rodzaju *Sclerotinia nervisequa*. Dokonana została również kombinacja nomenklatoryczna *Ciboriopsis tenuistipes* (Schroeter) comb. nov. J. T. Palmer.

Polskie materiały zostały w szeregu przypadków porównane z pochodzącymi z Anglii.

Niewątpliwie nie są to jeszcze wszystkie gatunki spośród *Sclerotiniaceae* z jakimi można się spotkać w Polsce.

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EXPLANATIONS OF THE PLATES I—VI

Plate I

Ciboria tenuistipes — 3075: 1 — Apothecia, 2 — Excipular cells, 3 — Surface excipular cells, 4 — Asci and paraphysis, 5 — Ascospores; 3124: 6 — Apothecium, 7 — Excipular cells, 8 — Surface excipular cells, 9 — Ascospores, 10 — Asci; K (*Ciboriopsis bramleyi* typus): 11 — Excipular cells, 12 — Asci and paraphyses, 13 — Ascospores; WRSL (*Ciboria tenuistipes* typus): 14 — Apothecia, 15 ⊢ Excipular cells, 16 — Surface excipular cells, 17 — Ascospores, 18 — Asci and Paraphyses, 19 — Section of Apothecium.

Plate II

Monilinia megalospora — 3122: 20 — Apothecium on mummied berry, 21 — Ascospores, 22 — Paraphysis, 23 — Ascus.
Monilinia oxycocci — 2993: 24 — Asci and Paraphysis, 25 — Ascospores, 26 — Apothecium on mummied fruit (England).
Monilinia urnula — 2996: 27 — Ascospores, 28 — Ascus and Paraphysis, 29 — Apothecia on mummied fruit (England).
Ciboria caucus — WRSL (256): 30 — Apothecium on remains of male *Alnus* catkin, 31 — Ascus, 32 — Ascospores; WRSL (258): 33 — Ascus and Paraphysis.

Plate III

Myriosclerotinia scirpicola — 3070 (*Scirpus lacustris*): 34 — Culm with Spermodochidia, 35 — Spermatia and Spermatiophores; 3115 (*S. lacustris*): 36 — Apothecia, 37 — Ascospores, 38 — Germinating ascospores, 39 — Paraphyses,

40 — Asci; 3022 (*Scirpus sylvaticus*): 41 — Culm with Spermodochidia, 42 — Spermatia and Spermatiophores; 3119 (*S. sylvaticus*): 43 — Asci, 44 — Paraphyses, 45 — Ascospores, 46 — Apothecia.

Myriosclerotinia sulcata — 3076 (*Carex acutiformis*): 47 — Culm with Spermodochidia, 48 — Sclerotium, 49 — Spermatiophores and Spermatia; 3159 (*Carex paniculata*, England): 50 — Ascus and Paraphysis, 51 — Ascospores, 52 — Apothecia.

Plate IV

Rutstroemia firma — 3262: 53 — Ascus and Paraphysis, 54 — Ascus with golden granular contents, 55 — Ascospores both septate and budding Spermatia, 56 — Apothecium; 3263: 57 — Ascus and Paraphysis, 58 — Ascospores, both septate and budding Spermatia, 59 — Apothecium.

Rutstroemia henningsiana — 3117: 60 — Ascospores, some septate, 61 — Ascus and Paraphyses, 62 — Apothecia on culms, some showing a pale area demarcated by a black stromatic line; 3121: 63 — Ascospores, some septate, some germinating, 64 — Ascus and Paraphysis, 65 — Apothecia, both showing pale area demarcated by a black stromatic line; 3126: 66 — Ascospores, 67 — Ascus and Paraphysis, 68 — Apothecium.

Rutstroemia luteovirescens — 3083: 69 — Apothecium on petiole, 70 — Ascospores, 71 — Asci and Paraphyses.

Rutstroemia petiolorum — 3088: 72 — Apothecium on petiole, 73 — Ascospores, 74 — Ascus and Paraphysis; 3095: 75 — Apothecium on petiole, 76 — Ascospores, 77 — Ascus and Paraphysis; 3096: 78 — Apothecium on petiole, 79 — Ascospores, 80 — Ascus and Paraphysis.

Plate V

Sclerotinia dennisii — 3116: 81 — Apothecia, 82 — Ascospores, 83 — Ascus and Paraphyses; 3118: 84 — Apothecia on fruits, 85 — Ascospores, 86 — Ascus and Paraphysis; 3120: 87 — Apothecia, 88 — Ascospores, 89 — Ascus and Paraphysis; 3125: 90 — Apothecia, 91 — Ascospores, 92 — Ascus and Paraphysis; 3158 (England): 93 — Apothecia, 94 — Ascospores, 95 — Ascus and Paraphysis; PR 629537 (Typus): 96 — Ascospores, 97 — Ascus and Paraphysis.

Plate VI

Rutstroemia sydowiana — 3026: 98 — Ascospores, Ascus and Paraphysis, 99 — Apothecium; 3068: 100 — Ascospores, Ascus and Paraphysis, 101 — Apothecium; 3069: 102 — Ascospores, Ascus and Paraphysis, 103 — Apothecium; 3077: 104 — Ascospores, Ascus and Paraphysis, 105 — Apothecium; 3081: 106 — Ascospores, Ascus and Paraphysis, 107 — Apothecium; 3082: 108 — Ascospores, Ascus and Paraphysis, 109 — Apothecium; 3084: 110 — Ascospores, Ascus and Paraphysis, 111 — Apothecium; 3085: 112 — Ascospores, Ascus and Paraphysis, 113 — Apothecium; 3087: 114 — Ascospores, Ascus and Paraphysis, 115 — Apothecium; 3089: 116 —Ascospores, Ascus and Paraphysis, 117 — Apothecium.

? *Sclerotinia nervisequa* — 3127: 118 — Ascospores, 119 — Asci, 120 — Excipular cells, 121 — Sclerotium; 1874: 122 — Ascospores; 1848: 123 — Ascospores, 124 — Apothecia, 125 — Excipular cells, 126 — Ascus and Paraphysis.

Verpatinia calthicola — 3123: 127 — Apothecia, 128 — Ascospores, 129 — Asci, 130 — Paraphyses, 131 — Excipular cells; 3247 (England): 132 — Ascospores, Ascus and Paraphysis; CUP 25926 (typus): 133 — Apothecium, 134 — Ascospores, Ascus and Paraphysis.

Plate I

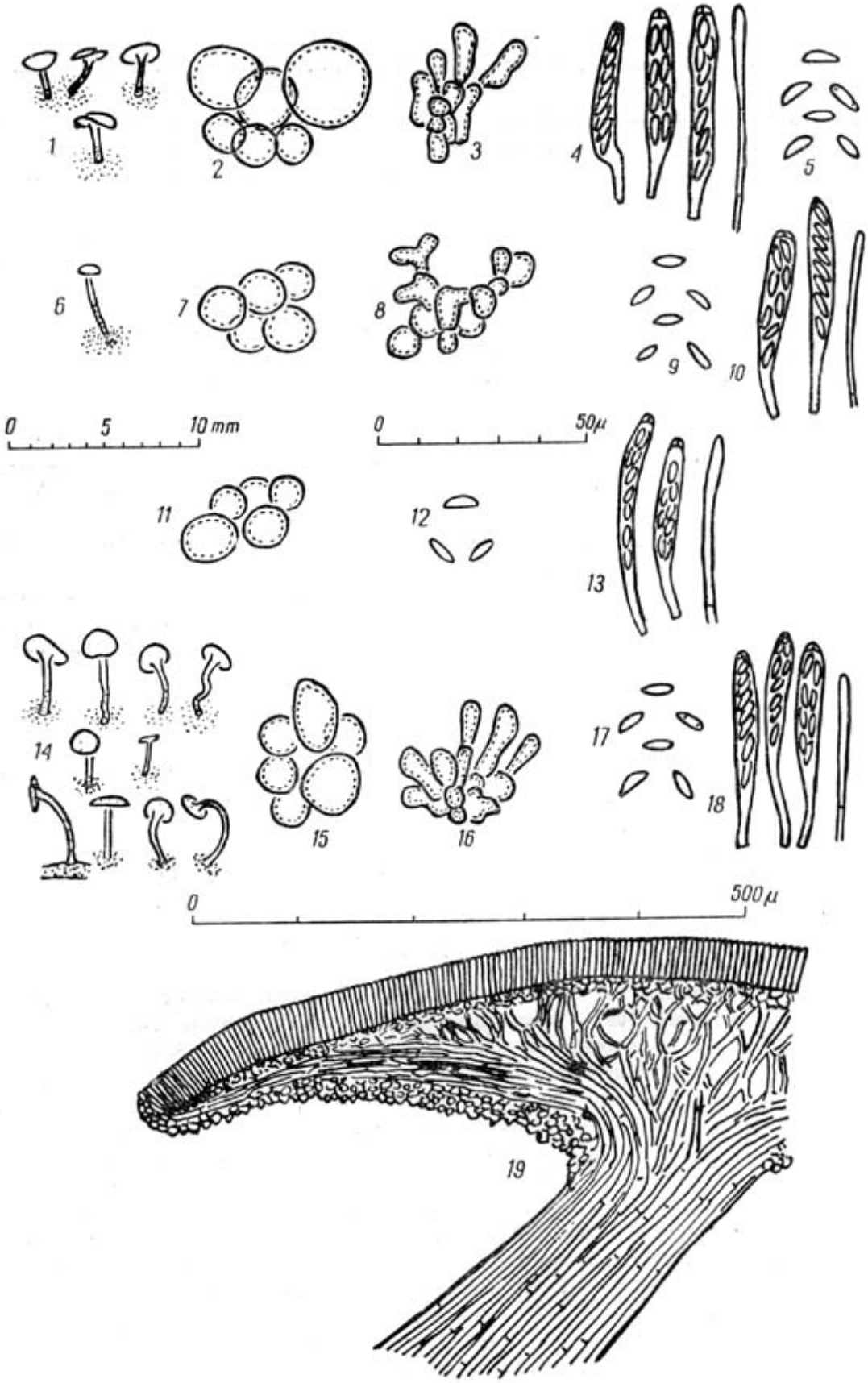


Plate II

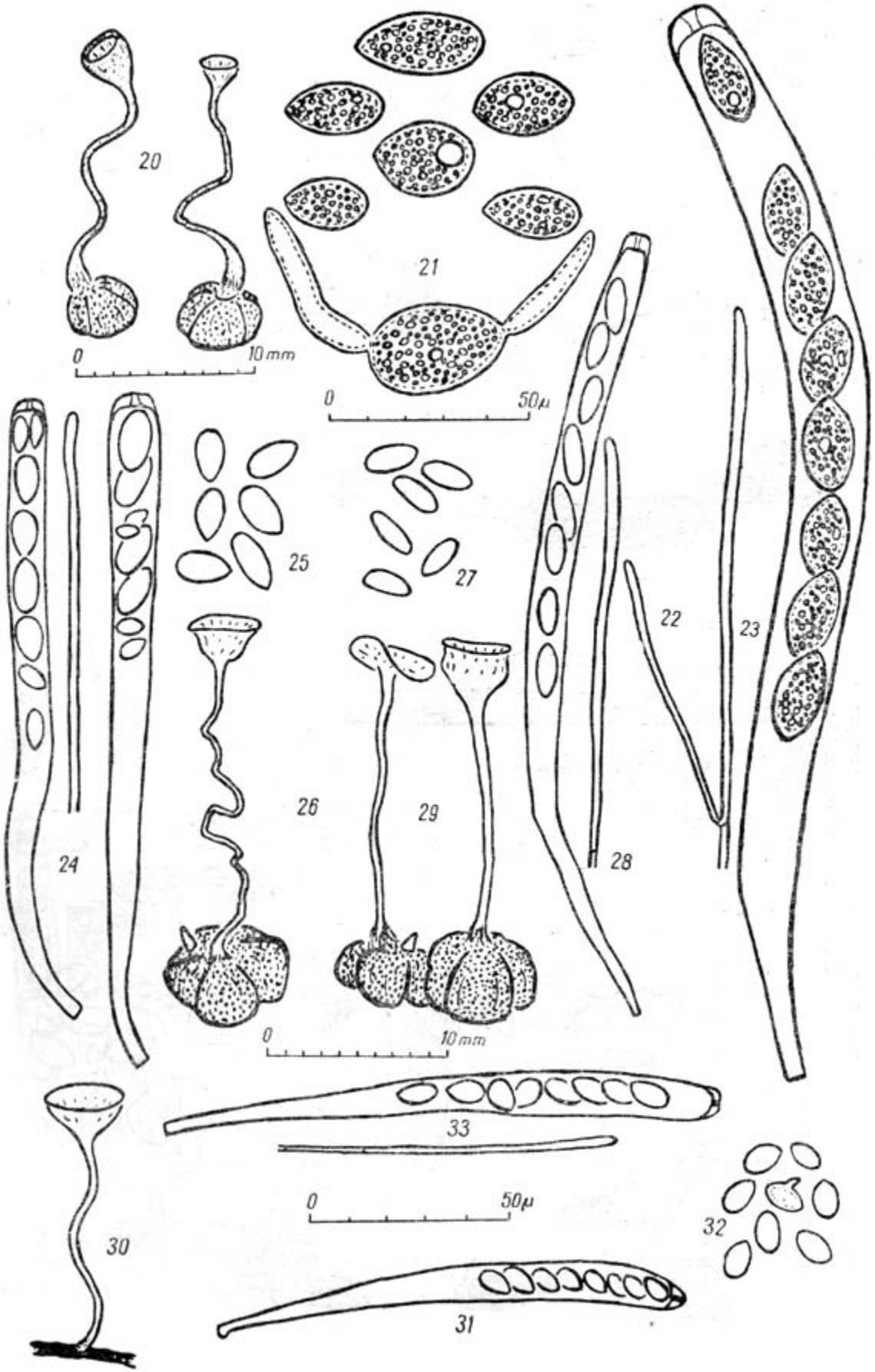


Plate III

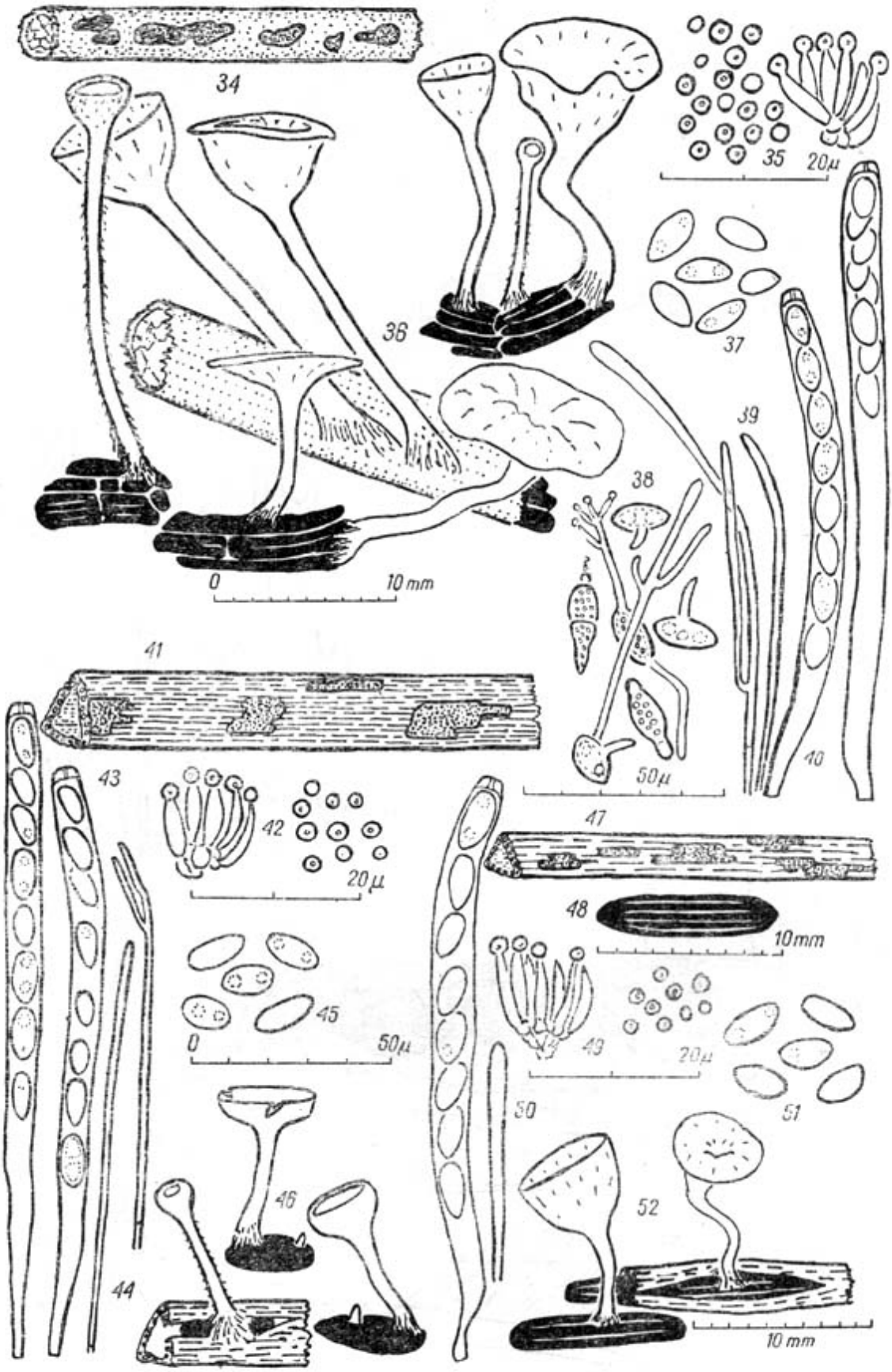

34
35
20μ
36
37
39
38
0
10 mm
41
40
50μ
43
42
20μ
47
48
10mm
45
0
50μ
49
20μ
50
51
46
52
44
10 mm

Plate IV

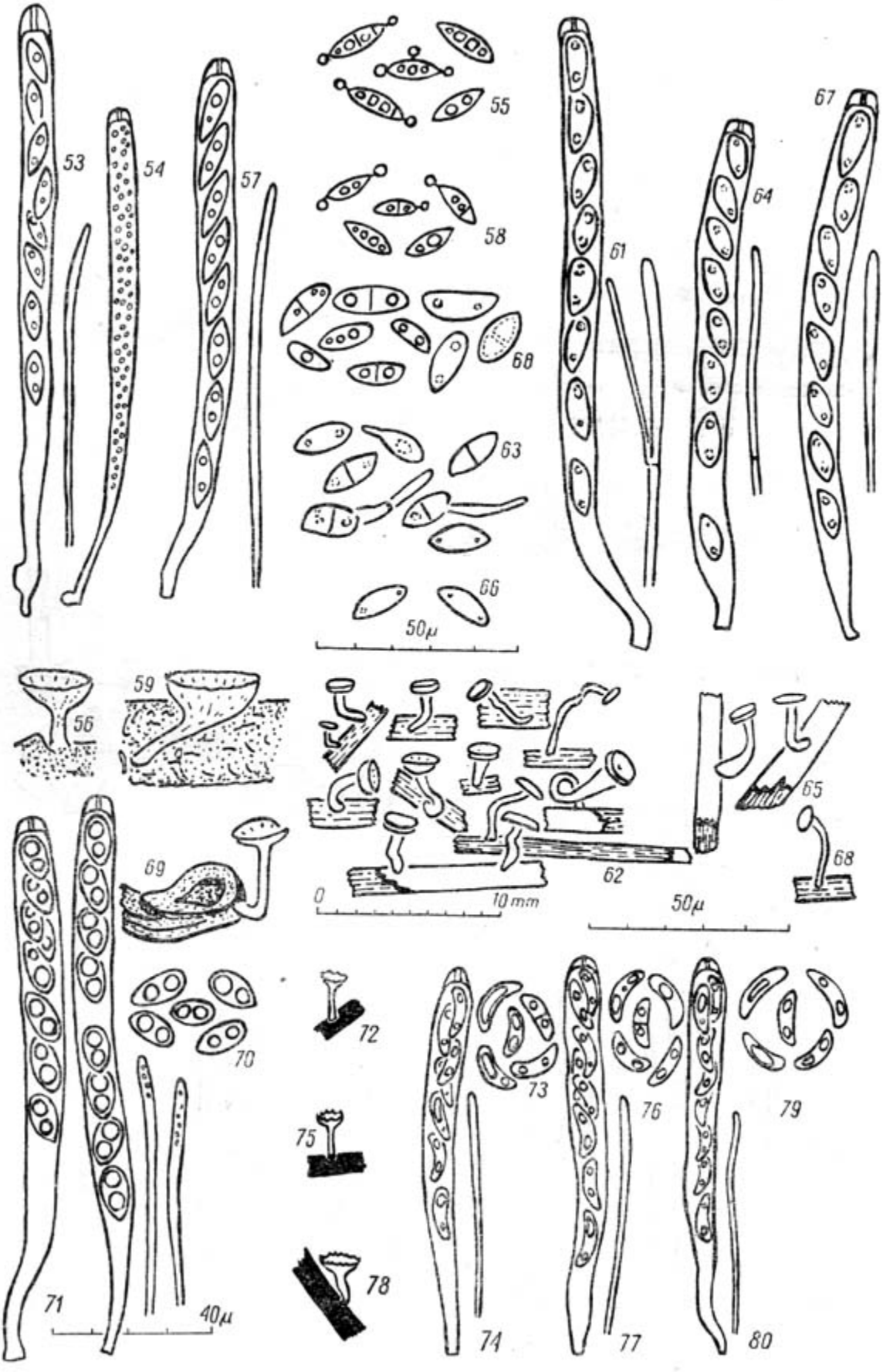

53
54
57
55
58
68
63
66
50μ
61
64
67
56
59
69
0
10 mm
62
50μ
65
68
70
72
75
78
71
40μ
73
74
76
77
79
80

Plate V

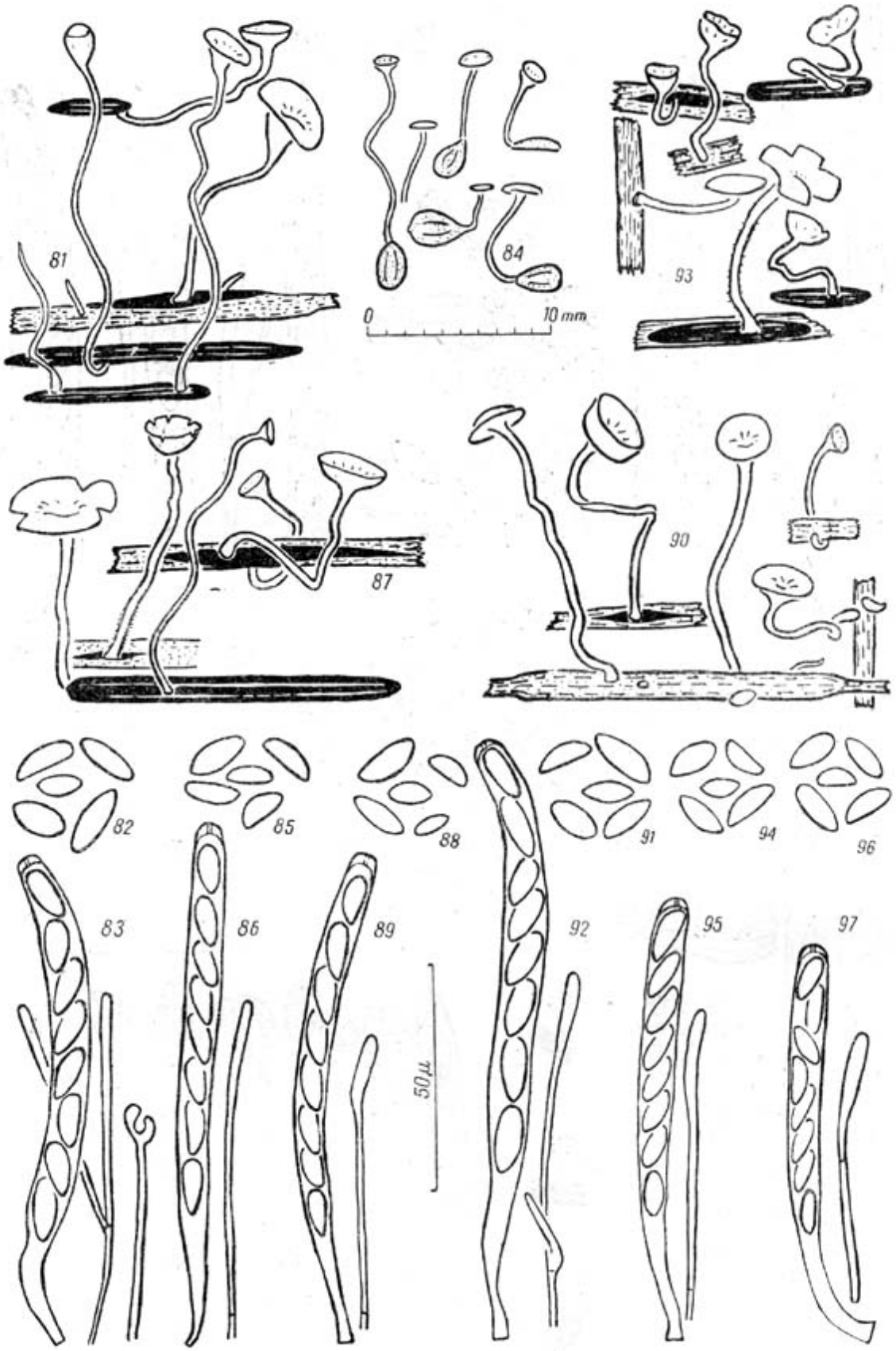
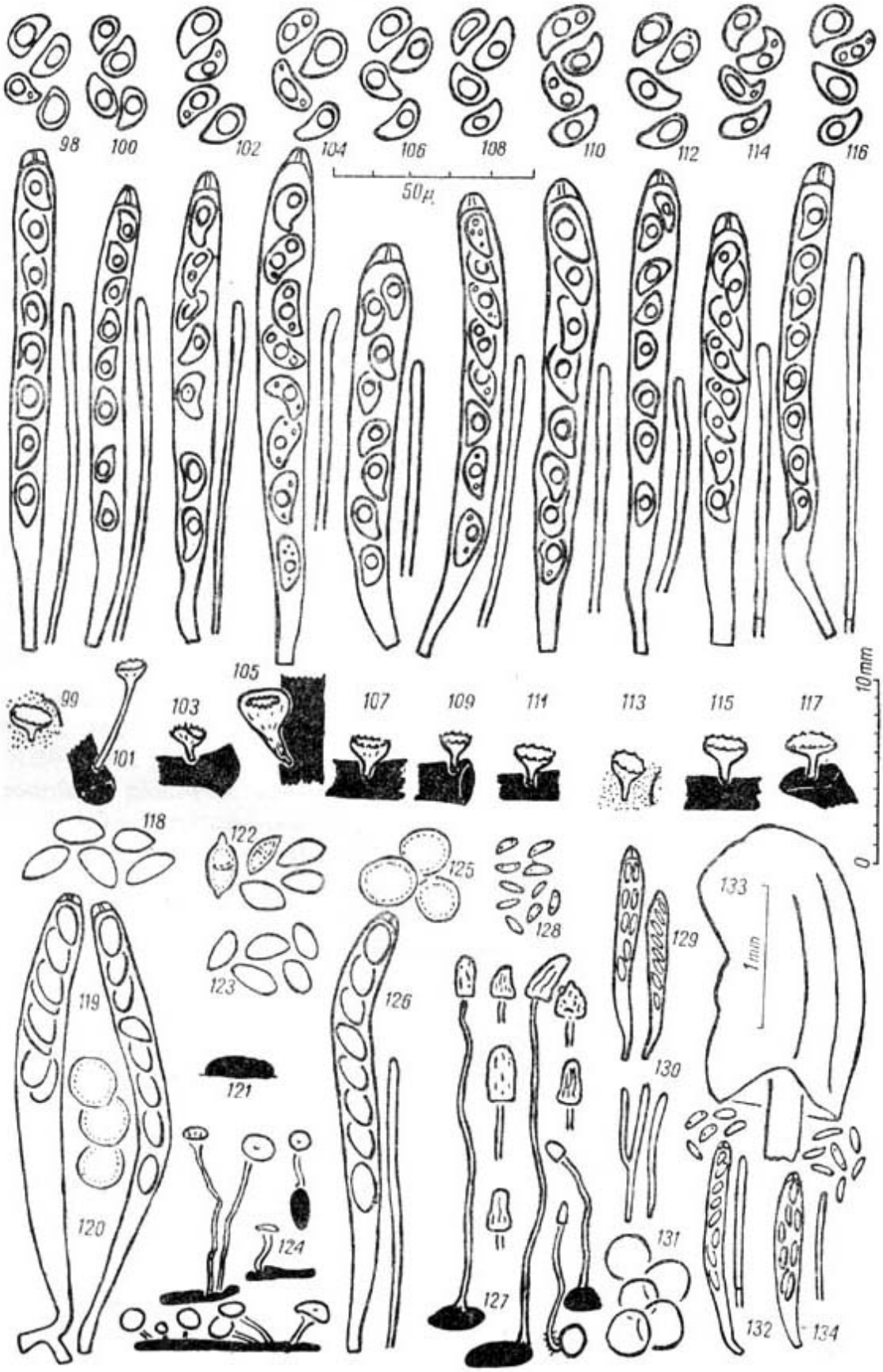


Plate VI


98
100
102
104
106
108
110
112
114
116
50μ
99
101
103
105
107
109
111
113
115
117
10mm
0
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
1mm
134

CORRECTIONS TO "POLISH SCLEROTINIACEAE" A.E. 5:245-293.

TITLE	Investigations into the ...
245/14	... Sclerotinia sp. as Ciboria
253/31	into the host tissue. Asci 37-47 ...
254/ 6	Menge aus trockenen Blättern von ...
254/15	Table I
254/25	Spevak & Korf 35x5µ (?) 5-7x2µ (?)
254/27	J.T.P. (ref.244) 45-48-54x3.5-4.5-5.5µ (14) 5.5-..
254/30	J.T.P. 3075 39-46-54x2.5- ...
257/ 1	... Ascus dimensions
258/21	(Sclerotinia vaccinii) ... 14-17x5.6-9µ
258/22-23	Schroeter (1893) 130-200x11-14µ 14-17x5.6-9µ (S. vaccinii)
258/28	nis (1968) (Monilinia ur-
258/40	tioph: Sclerotium ... roseum Mougeot ...
259/32	has culms ... chambered and would
264/25	tomentosa Schum. (1803) Enum. ...
264/36	ochroleuca [Bolt.] Mass. ...
264/37	ex Fr.) Boud. (1907) ...
266/ 2	(Rutstroemia firma) Table 4
266/ 5	3263/66232 ...
266/ 7	(Rutstroemia henningsiana) Table 5
266/13	(Rutstroemia petiolorum) Table 6
270/18	biseriate and 4 spores ... 15.7 x 2.8- ...
271/ 2	f. var. maxima ... maxima Marsh) ...
271/12	of Castanea sativa (Palmer 1965) whilst ...
274/15	J.T.P. 3086 (sclerotia) and 3125 (apothecia) ..
275/ 2	(Rutstroemia sydowiana) Table 7
275/15	(Sclerotinia dennisii) Table 8
276/ 8	629536. ... "Rejvíz" prope Zlaté
276/15	(? Sclerotinia nervisequa) Table 9
276/23	(Verpatinia calthicola) Table 10
277/ 5	nervisequa (Schroet.) ... Stromatinia nervisequia
277/14-15	(Sclerotinia dennisii)
279/17	J. W. Groves ...
279/23	sequia, mis-spelling the specific name, ...
279/27	spores 9.6-11-(12)x5.5µ and sclerotia ...
283/41	Groves, J. W. & Elliott, M. E. ...
284/11	London 2nd ed.
285/ 2	rotien auf natürlichem Substrat. ...
285/13	von Deutschland, .. Schweiz 1(3): 721-912. Leipzig

_____ = CORRECTION _ _ _ _ = ADDITION