

Sweet Chestnut *Rutstroemias* (*Sclerotiniaceae*) on an Acorn and
Oak Cupules, and *Sclerotinia gregoriana* n. sp. on Deer-Grass
(Investigations into the *Sclerotiniaceae*—II)

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This paper is an emended version of the one read at the 4th European Mycological Congress in Warsaw, 1966, and has been enriched by collections made during a congress excursion and after my return to England.

METHODS AND TERMINOLOGY

Measurements of spores, asci etc. have been made in 10% Ammonia or 10% Erythrosin Ammonia (0.5 mg. Erythrosin B in 100 ml. of 10% Ammonia). Sections of apothecia have been cut on a freezing microtome and drawings executed with the aid of a camera lucida.

Korf (1958) has been followed in the terminology used for apothecial anatomy and tissue types.

Herbarium abbreviations are in accordance with Lanjouw & Stafleu (1964): B — Botanisches Museum, Berlin—Dahlem, Germany; BM — British Museum (Natural History), London, England; BPI — National Fungus Collections, U.S. Dept. of Agriculture, Beltsville, USA; CP — Dept. of Plant Pathology, Den kgl. Veterinær-og Landbohøjskole, Copenhagen, Denmark; CUP — Dept. of Plant Pathology, Cornell University, Ithaca, USA; DAOM — Mycological Herbarium, Plant Research Institute, Dept. of Agriculture, Ottawa, Canada; K — Royal Botanic Gardens, Kew, England; KRA — Botanical Institute, Polish Academy of Sciences, Kraków, Poland; Rijksherbarium, Leiden, The Netherlands; LE — Botanický ústav im. V. L. Komarova A. N. SSSR, Leningrad, USSR; M — Botanische Staatssammlung, Munich, German Federal Republic; PC — Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, Paris, France; PR — Botanical Dept., Národní Muzeum, Prague, Czechoslovakia; S — Botanical Dept., Naturhistoriska Riksmuseet, Stockholm, Sweden; TAA — Zoologia ja Botaanika Instituut, Tartu, Estonian SSR; UPS — Institution för systematik Botanik, Uppsala, Sweden; WA — Zakład Systematyki i Geografii Roślin, Warsaw University, Warszawa, Poland; ZA — Institut za Botaniku Sveučilišta, Zagreb, Jugoslavia.

Private herbaria are indicated as follows: G.L.H. — Dr. G. L. Hennebert, Heverlee, Belgium; J.T.P. — the author's collection; K.P. — Dr. K. Pawlenka, Lübeck, German Federal Republic; M.N. — Dr. Mary Noble, Edinburgh, Scotland; P.B. — Dr. P. Berthet, Villeurbanne, France; R.P.K. — Professor R. P. Korf, Ithaca, USA.

Acknowledgements

I wish to express my indebtedness to the following scientific bodies, colleagues and correspondents who have helped me in various ways: The Polish Academy of Sciences and Professor B. Pawlowski (KRA), as well as Professor Alina Skirgiello (WA), whose invitation to visit Poland enabled me to attend the 4th European Mycological Congress; Mr. W. G. Bramley (Pickering, England) for fresh material of *Myriosclerotinia scirpicola*; Dr. R. K. Brummitt (K) for advice regarding hosts, particularly the *Cyperaceae*; Professor N. F. Buchwald (CP) for help with the literature; Dr. S. Ahlen (S) for the loan of Rehm's collection; Professor R. P. Korf (CUP) for helpful advice, loan of material etc.; Dr. R. A. Maas Geesteranus (L) for criticizing my preliminary manuscript; prom. biol. Ludmila Marvanová (Brno, Czechoslovakia) for cupules of *Quercus cerris*; härra A. Raitviir (TAA) for cupules of *Quercus castaneifolia*; Gospodja Mr. Milica Tortić (ZA) for help with the Latin diagnosis; the Director of the Botanisches Museum, Berlin-Dahlem (B) for the loan of material; The Nature Conservancy for permission to collect on the Alnsdale Sand Dunes National Nature Reserve. This research has been aided by a freeing microtome and accessories bought with the aid of a Government Grant for Scientific Investigations from the Royal Society, London, for which I acknowledge support received from Mrs. F. L. Balfour-Browne (BM) and Dr. R. W. G. Dennis (K), and honoraria from Professor R. P. Korf (CUP).

INTRODUCTION

Whilst many fungi are regarded as rare, they are often common in their ecological niches and can be found right under our very noses if we only know where and when to look for them. Two such examples are: A — The *Rutstroemia* species on sweet chestnuts and their capsules, which have now been found to occur on oak cupules and acorns, and have given me the opportunity for joint projects with North American and Czechoslovak mycologists as well as a private mapping of these fungi in Europe; B — *Sclerotinia gregoriana* n. sp. on *Scirpus caspitosus*, which is probably a common species on this widely distributed host.

THE RUTSTROEMIAS ON OAK CUPULES

Arising out of a joint investigation with Professor Korf (CUP) of the *Rutstroemia* species on burrs of *Castanea* and *Castanopsis*, has been the discovery that the three species so far recorded on *Castanea sativa* Mill. in Europe (*Rutstroemia americana* (Dur.) White; *R. echinophila* (Bull. ex Mér.) v. Höhn, and *R. sydowiana* (Rehm) White) also occur on

the fruiting structures of *Quercus*, of which only *R. echinophila* on oak cupules was previously known.

As these fungi are abundant on overwintered *Castanea sativa* burrs in the autumn, some understanding of their distribution where sweet chestnuts occur in Europe and Algeria (N. Africa) has been formed through random samples of burrs sent me from sixteen countries by correspondents, over two-thirds of which contained one to three species of *Rutstroemia*. I gave a preliminary report on these fungi at the 1964 Pilztagung of the Deutsche Gesellschaft für Pilzkunde in Münster — Westphalia, German Federal Republic (Palmer 1965). These collections have produced material of such wide variation that, particularly with *R. americana*, there appear to be 'species complexes' which require careful investigation.

Cupules of *Quercus cerris* L., collected in August, 1965, at Buková in the Small Carpathian Mountains, Slovakia, by prom. biol. Marvanová yielded *Rutstroemia echinophila*. The remainder of the collection, which had been kept moist, was received later, when, in addition to *R. echinophila*, one cupule bearing about ten apothecia of *R. sydowiana* amongst the spiny scales and one cupule containing a partly stromatized acorn cuticle with about six apothecia of *R. americana* were found. Last autumn, I overwintered a large sample of *Q. cerris* cupules collected near my home, and developing apothecia of *R. americana* were found on one cupule in July, 1966, and on a second cupule in August: further apothecia have since developed on other cupules.

Rutstroemia echinophila was first reported on *Q. cerris* cupules by von Höhnel (1917), who wrote: „Die *Rutstroemia echinophila* ist bisher nur auf den Fruchthüllen von *Castanea vesca* (= synonym of *C. sativa*) gefunden worden. Im Wiener Walde ist dieselbe gar nicht selten auf den faulenden Fruchtbechern von *Quercus cerris*“. His collections were distributed by Rehm as „*Ciboria echinophila*“ in *Ascomycetes Exsiccati* N° 2154. The fungus, however, was previously known from oak cupules in Italy because Saccardo (1877) stated: „In cupulis glandibusque quercinis in sylva Montello, Oct. 1876 legi *Ciboriam echinophilam* (Bull.) Sacc. perfecte eadem ac in involucris *Castaneorum*“, although no mention of *Quercus* cupules was later made by Saccardo (1889). *R. echinophila* does not appear to have been found again on oak cupules until collected by A. Raitviir (TAA) in October, 1962, at Lenkoran, Azerbaijan SSR, on the strobiloid cupules of *Quercus castaneifolia* C. A. Mey.

White (1941) mentioned under *Rutstroemia petiolorum* (Rob. in Desm.) White one collection of *Quercus* petioles in which there were also a few apothecia on cupules and twigs. This collection, by "Whetzel, White, Viegas and Thompson" from Cayota Lake, New York State

U.S.A., 1st September, 1936, CUP 25525, has been examined. The apothecia have now separated from the twigs and most of the petioles. However, those on one cupule and three loose apothecia belong to the *Rutstroemia americana* complex. The remaining apothecia appear to be *R. petiolorum* which, in Europe, I only know from petioles of *Fagus sylvatica* L. The American oak was determined as *Quercus alba* L.

With *Rutstroemia echinophila*, the interiors of the cupules in particular are conspicuously blackened through stromatization but this is less prominent with *R. americana*, whilst the single cupule bearing *R. sydowiana* showed no obvious discolouration. *R. sydowiana* is better known from blackened petioles of *Castanea* and *Quercus* leaves. Similar to the acorn, immature chestnuts bearing apothecia of *R. americana* are blackened or have stromatic lines.

These *Rutstroemias* develop on *Castanea* burrs which, having lain in comparatively dry situations, have escaped the onslaught of other fungi and small animals. Most burrs lying in damp places have disintegrated by the following autumn. However, some degree of dampness is necessary for the development of these fungi, which appear capable of reviving and continuing their growth after dry periods, and it may be significant that the few known records for *Quercus* cupules have been for those oaks whose cupules have conspicuously coarse scales beneath which moisture will undoubtedly linger. Even the collection of two apothecia resembling *Rutstroemia americana* on the comparatively smooth cupule of *Quercus robur* L. at Styperson Park, Pott Shrigley, Cheshire, England, on the 20th August, 1966, cannot be considered an exception as the cupule was amongst moist leaves at the lakeside, where a single apothecium resembling this fungus was found on a decayed *Quercus* petiole in Autumn, 1965.

The occurrence of these fungi on both *Castanea* and *Quercus* was not unexpected as these genera are closely related, often sharing the same parasites and saprophytes. The results of this investigation into these oak *Rutstroemias* will be published jointly with Ludmila Marvanová in *Česká Mykologie*.

Sclerotinia gregoriana n. sp.
on *Scirpus (Trichophorum) cespitosus*

Only *Myriosclerotinia scirpicola* (Rehm) Buchwald on *Scirpus lacustris* L. (= *Schoenoplectus lacustris* (L.) Palla) is known from scirpiculous culms although several species of *Myriosclerotinia* and *Sclerotinia* are described from culms of other members of the *Cyperaceae*: *Myriosclerotinia caricis-ampullaceae* (Nyberg) Buchw., *M. duriaeanae* (Tul.) Buchw., *M. longisclerotialis* (Whetz.) Buchw. and *M. sulcata* (Whetz.) Buchw. on *Carex* spp.; *Sclerotinia arctica* Elliott on *Carex aquatilis*

Wahlenb.: *S. dennisii* Svrček and *S. vahliana* Rostr. on *Eriophorum* spp. In addition, Whetzel (1946) described „*Sclerotinia schoenicola* Whetz. n. sp.” from exsiccati comprising culms of *Schoenus nigricans* L. with spermodochia and sclerotia which, being based on the spermatial and sclerotial stages, was consequently not validly published and the perfect stage of this fungus is yet to be described. *Myriosclerotinia* Buchw. is a genus of stromatic inoperculate discomycetes with a *Myrioconium* spermatial stage. Buchwald (1947) also placed *S. vahliana* in *Myriosclerotinia* but made no mention of spermodochia and, as these structures have not been demonstrated for either *S. dennisii* or *S. vahliana* (Elliott 1964 and my own observations), both fungi are retained in *Sclerotinia* Fuckel.

Myrioconium maritimum was described by Bubák & Sydow (1915) from spermodochia on culms of *Scirpus maritimus* L. The material was distributed by Sydow as *Mycotheca germanica* N° 1388. *Myrioconium maritimum* Bubák & Sydow nov. spec. in Ann. Mycol. 13:9, 1915: „Auf Halmen von *Scirpus maritimus*. Schleswig-Holstein: Bei Lakolk, Insel Röm. 8. 1911. Leg. H. Sydow”. The former German island Röm in the Northern Friesian Islands is now part of Denmark and known as Rømø. I am at present studying a fungus producing spermodochia on, and sclerotia within culms of *S. maritimus* in the Ainsdale Sand Dunes National Nature Reserve, Massam's Slack, Freshfield, on the Lancashire coast, England, which I shall overwinter for apothecia next year.

During a holiday in Scotland in June, 1966, I collected a small *Sclerotinia* on sclerotia either within the culms of *Scirpus* (*Trichophorum*) *cespitosus* L. or lying loose in the surrounding moss on wet peat with adjacent *Eriophorum* in Glen Spean, Inverness-shire. The fungus was found again in similar damp situations in two localities in Glen Coe, Argyllshire, and on the Lowther Hills, Lanarkshire, and in the Honister Pass, Cumberland, England. After my return home, I sought and collected the same *Sclerotinia* on wet moorland in the Peak National Park, Bleaklow, Derbyshire, England. The six collections were made between the 8th and the 19th June whilst the host was flowering.

From a comparison with fresh specimens of *Myriosclerotinia scirpicola* from Yorkshire and the published descriptions, the *Sclerotinia* on *Scirpus cespitosus* differs by the narrower spores and shorter asci. The sclerotia are slender with blunt ends, as opposed to the compound or lobed sclerotia of *M. scirpicola*. The shape of the sclerotia is, of course, governed by the form of the culm or other component of the host in which they develop. In addition, 1-septate spores, some of which were budding globose secondary spores or spermatia, which have not been reported in *M. scirpicola*, were found in deteriorating apothecia in four

collections. However, as I found a few septate spores in decaying apothecia of the Yorkshire collection of *M. scirpicola*, as well as small globose structures resembling spermatia (which, however, may have come from some hyphomycete), this question requires further investigation.

Ferdinandson & Winge (1911) quoted a report from Rehm of a collection said to be *Sclerotinia scirpicola* on *Scirpus sylvaticus* L. with the spores finally becoming two-celled ("Sporer til sidst to-cellede"). Whetzel (1946) thought this collection doubtfully determined because, as he wrote, "the spores of *S. scirpicola* are uniformly 1-celled". This collection, now preserved in the Rehm herbarium in S., was found by G. Ade at Teufelsgraben bei Prügelnächst, Weismain, German Federal Republic, in 1910, and comprises three reddish-brown apothecia on a leaf fragment, presumably of *S. sylvaticus*. There are no signs of sclerotia and, with asci $155-176 \times 6.5-8.8 \mu$ and ascospores 1-celled to septate, $15.6-17.5 (20.3) \times (3.8) 4.3-5.9 (6.5) \mu$, the fungus appears to be *Rutstroemia paludosa* (Cash & Davidson) Groves & Elliot. Described from old leaves of *Carex exsiccata* Butler by Davidson & Cash (1933) erroneously as *Sclerotinia paludosa*, Whetzel (1946) reported that the sclerotia belonged to a *Typhula* sp. and the apothecia to *Rutstroemia* but made no recombination. Groves & Elliot (1961) reported the fungus on *Carex* leaves in Canada and the U.S.A. with asci (125) $145-160 (180) \times (9) 10-12 (14) \mu$ and ascospores (9) $11-15 (17) \times (3.5) 4.5-6 (6.5) \mu$, mentioning that Whetzel advised Dr. Drayton in 1942 that he had also found it on *Acorus calamus* L. and *Eleocharis palustris* (L.) R. Br. emend. Röm. & Schult. The packet containing the Ade collection, whilst annotated in ink in Rehm's handwriting "*Sclerotinia scirpicola*", has what appears to be "*Rutstroemia Heloti*" faintly written beneath in pencil.

On revisiting the Peak National Park locality in July, I found culms of *S. cespitosus* with their flowers withered and their upper parts turning brown. Brown oblong hyphae were found in the culm tissue but no sign of spermodochia and two immature, pinkish sclerotia were later found within culms which had been kept in water. A further visit was made in August when flowering of the host had long ceased, and I found numerous blighted culms containing developing sclerotia. A large sample of these culms was examined microscopically but no spermodochia were found (only the oblong hyphae previously seen, which were often associated with the sclerotia) and the fungus therefore appears to be a true *Sclerotinia*.

Although only six collections of apothecia have been made, the ease with which they were found where sought suggests that this *Sclerotinia* is probably a common and abundant parasite of *Scirpus cespitosus*, par-

ticularly in wet situations. It appears to be a distinct species which I name in honour of the English mycologist and plant pathologist, Dr. P. H. Gregory, F.R.S., whose early work produced important contributions to the taxonomy of the *Sclerotiniaceae*.

DIAGNOSIS

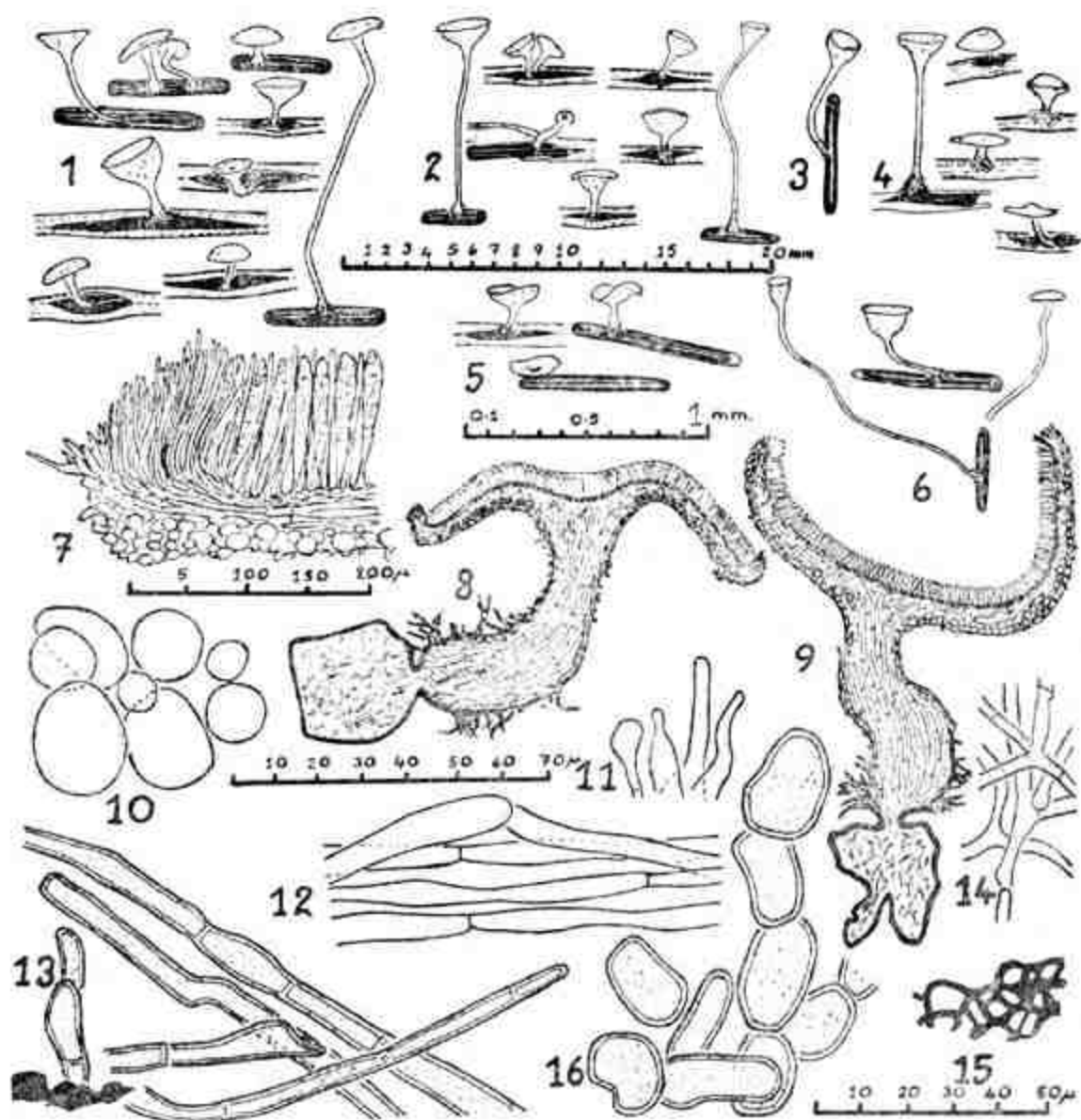
Sclerotinia gregoriana J. T. Palmer n. sp. (Figs 1—34). Apothecia solitaria vel infrequens duplicia, e sclerotii liberis aut inter culmis hospitis. Discus 1—3.5 mm. diam., 0.5—1.7 mm. crass., crateriformis, in primis profundus, deinde expansus et planus, demum recurvatus. Hymenium pallide fulvum vel aurantiaco-brunneum, glabrum. Excipulum concolor vero pallide brunneum, a glabro minute pubescens. Stipes 0.7—14 mm. long., 0.3—5.5 mm. crass., concolor in summa, pinguior et saepe dense brunneo tomentosus ad basis, Hyphis rhizoideis 4—8.3 μ crass., brunneis, septatis, ramosis. Asci 67—123 \times 4.4—8 μ , inoperculati, cylindrici, ad basis attenuati, jodo obscure positivo, octospori. Ascosporae 7.6—14.5 (18) \times 2.3—5.3 μ , hyalinae, laeves, ab ellipsoideis ellipsoideo-fusiformes, pleurumque uniseriatae, interdum biseriatae in parte supera maturitate interdum uniseptae in apothecios deterioribus cum Spermatis hyalina, globosa, 1.9—2.9 μ diam. Paraphyses 1.5—3 μ , hyalines, filiformes, septatae, simplices vel ramosae. Hymenium 90—110 μ crass., e ascis et paraphysis. Subhymenium ca. 10 μ crass., pallide brunneum, e textura intricata. Excipulum extus 30—50 μ crass., pallide brunneum, e textura globulosa, pilis projicientibus, hyalinis vel brunneis, septatis. Excipulum intus 80 μ crass., e textura globulosa. Stipes e textura porrecta a textura intricata. Sclerotia 3—7 mm. long., 0.3—0.5 (1.3) mm. crass., elongato-cylindrica cum terminis obtusis, sulcata vel rugosa, extus nigra, intus pallide rosea vel alba.

Habitat: in paludosis, parasitica in culmis Scirpi (*Trichophori*) cespitosi L., apotheciis e sclerotii post hiemem onnatis.

Distributio: Anglia et Scotia.

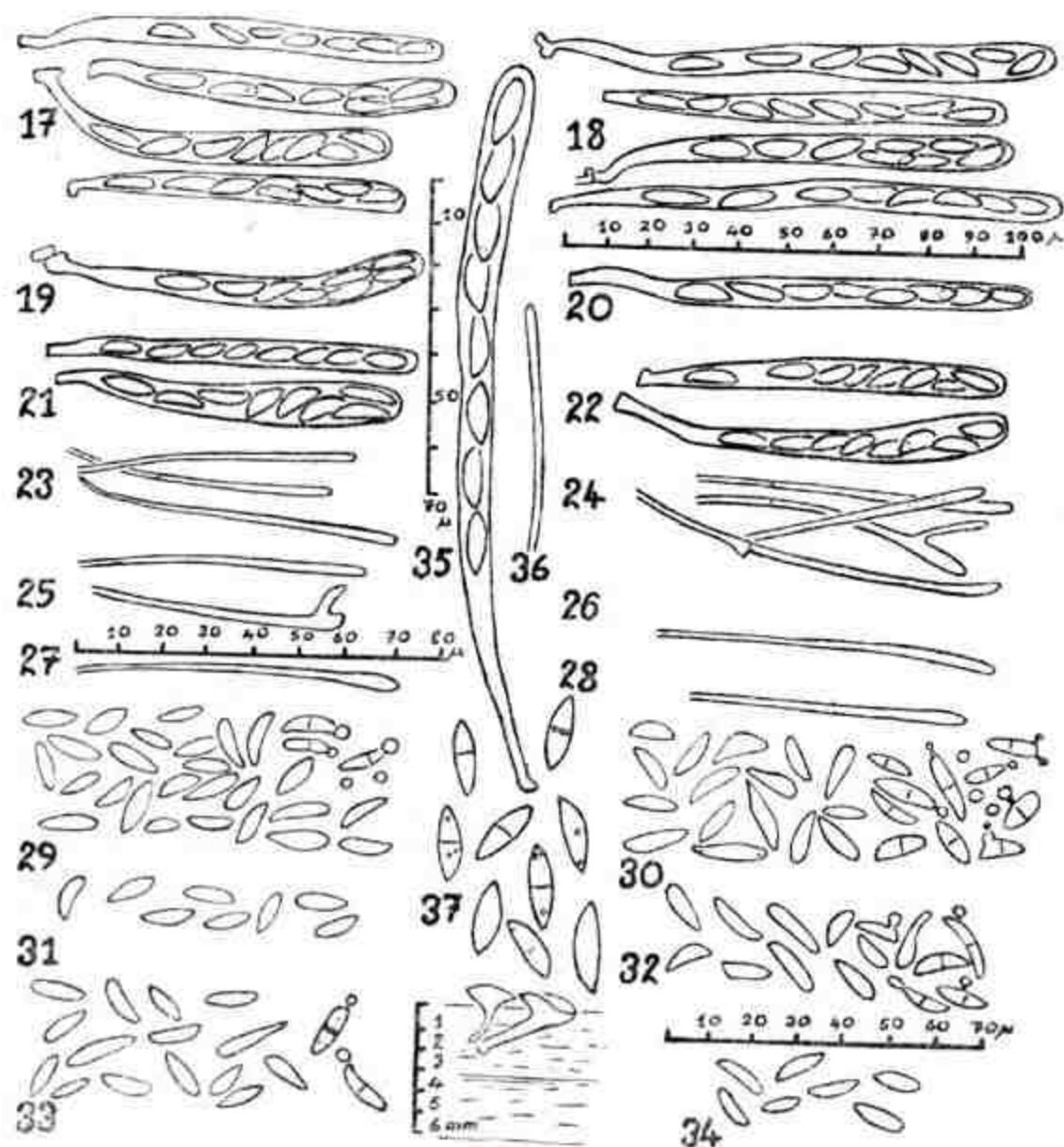
Typus: J.T.P. 3010. The Swamp, Heru Clough, Bleaklow Moor, Derbyshire, Anglia, 19 junio 1966, legit J.T. Palmer N^o 66147.

Apothecia solitary but very occasionally two, developing from narrow, cylindrical, blunt-ended Sclerotia, either within the host culm, when growing through split in wall, or lying free amongst wet mosses or plant debris. Disc. 1—3.5 mm. diam., 0.5—1.7 mm. thick, at first pinhead-shaped, becoming deep cyathiform with margin slightly inturned, expanding to plane, finally often recurved. Hymenium smooth, often with a central depression, pale yellowish to light orange brown, drying darker than the Excipulum. Excipulum smooth to minutely



Sclerotinia gregoriana J. T. Palmer n. sp.

Fruitbodies: 1 — holotypus, J. T. P. 3010; 2 — J. T. P. 3011; 3 — J. T. P. 3012; 4 — J. T. P. 3013; 5 — J. T. P. 3014; 6 — J. T. P. 3015. Axial sections; 7 — margin of apothecium, J. T. P. 3010 (holotypus); 8 — section of apothecium and sclerotium, J. T. P. 3010 (holotypus); 9 — Section of apothecium and sclerotium, J. T. P. 3011. Hyphal structures from J. T. P. 3010 (holotypus); 10 — textura globulosa from ectal excipulum; 11 — tomentum hyphae from ectal excipulum at margin of apothecium; 12 — textura porrecta from medullary excipulum; 13 — rhizoidal hyphae from base of stipe; 14 — textura intricata from medulla of sclerotium J. T. P. 3011; 15 — rind cells from sclerotium, J. T. P. 3012; 16 — hyphal cells from clum tissue, J. T. P. 3017.



Sclerotinia gregoriana J. T. Palmer n. sp.

Asci: 17 — holotypus, J. T. P. 3010; 18 — J. T. P. 3011; 19 — J. T. P. 3012; 20 — J. T. P. 3013; 21 — J. T. P. 3014; 22 — J. T. P. 3015. Paraphyses: 23 — holotypus, J. T. P. 3010; 24 — J. T. P. 3011; 25 — J. T. P. 3012; 26 — J. T. P. 3013; 27 — J. T. P. 3014; 28 — J. T. P. 3015. Ascospores: 29 — holotypus, with occasional septa and spermatia, J. T. P. 3010; 30 — with some showing septa and spermatia, J. T. P. 3011; 31 — J. T. P. 3012; 32 — with occasional septa and spermatia, J. T. P. 3013; 33 — with occasional septa and spermatia, J. T. P. 3014; 34 — J. T. P. 3015.

Rutstroemia paludosa (Cash & Davidson) Groves & Elliott
from Rehm's Herbarium in S.

35 — ascus; 36 — paraphysis; 37 — ascospores; 38 — apothecia in situ on fragment of *Scirpus sylvaticus* leaf.

pubescent, concolorous with Disc but drying paler. Stipe 0.7—14 mm. long, 0.3—5.5 mm. thick, tapering downwards from Disc, with a swollen base, smooth to granular or minutely pubescent, lower parts densely clothed with brown, ramose, thick-walled, septate Rhizoidal Hyphae, 4—8.3 μ diam., base merging with Medulla of Sclerotium, concolorous with Excipulum but progressively darkening below to almost black. Asci 67—123 \times 4.4—8 μ , inoperculate, cylindrical, narrowed below to a short stalk, pore faintly J+, 8-spored. Ascospores 7.6—14.5 (18) \times 2.3—5.3 μ , smooth, ellipsoid to fusiform or occasionally irregular, often broader at one end and flattened on one side, hyaline, mostly uniseriate, occasionally biseriate in upper part; in deteriorating Apothecia becoming 1-septate and budding globose, hyaline Spermata 1.9—2.9 μ diam. Paraphyses 1.5—3 μ , filiform, septate, simple to branched, hyaline. In axial section: Hymenium 90—110 μ thick, of parallel Asci and Paraphyses, tips of latter often protruding. Subhymenium ca. 10 μ thick, of pale brown, dense textura intricata. Ectal Excipulum 30—50 μ thick, of pale brown, thin-walled textura globulosa with occasional protruding, blunt Tomentum Hyphae; Margin of Disc formed of dense, brown, paraphysis-like hyphae. Medullary Excipulum 30—80 μ thick, diminishing towards Margin, of subhyaline textura porrecta continuing down into the Stipe. Ectal Layer of Stipe of closely compressed textura porrecta to textura intricata, developing into occasional Tomentum Hyphae, becoming sclerotized below and merging with the sclerotial rind. Sclerotia 3—7 mm. long, 0.3—0.5 (1.3) mm. thick, elongated cylindrical, often slightly broader at one end, with blunt, rounded ends, sulcate to rugose, externally dull black, internally pale pink to white. Rind of sclerotized, thick-walled, black cells, 5—10 μ thick. Medulla of hyaline to occasionally brownish, ramose, septate hyphae, ca. 4 μ diam., forming textura intricata.

Habitat: parasitic in culms of *Scirpus (Trichophorum) cespitosus* L. in acid, swampy areas with apothecia developing from overwintered sclerotia.

Known Distribution: Europe (England and Scotland).

Type: Apothecia and sclerotia (J.T.P. 3010 — Holotype) on *Scirpus cespitosus* L. amongst mosses, *Eriophorum* etc., on wet moorland, The Swamp, Hern Clough, Bleaklow Moor, Derbyshire, England, (Peak National Park), leg. J.T. Palmer N^o 66147, 19th June, 1966. Isotypes in CUP, K, and Herbarium R.P.K. This collection comprised apothecia, mainly on sclerotia within culms, distributed over a small area. Apothecia 1.3—1.8 mm. diam. Stipes 0.8—7 mm. long. Asci 67—94 \times 5.8—7.5 μ , average 76 \times 6.7 μ . Spores 8.2—14.5 \times 2.3—4.6 μ , average 10.9 \times 3.5 μ (100 spores measured).

Further collections studied

J.T.P. 3011. Near Roughburn, south side of Glen Spean, Inverness-shire, Scotland. On sclerotia loose or in culms of *S. cespitosus* amongst *Sphagnum*, *Eriophorum* etc., on wet, open, peaty ground, leg. Palmer N° 66126, 8.VI.1966. Duplicates in B, BM, BPI, CP, CUP, DAOM, L, LE, PR, S, TAA, UPS, WA, ZA and Herbaria K.P., M.N. This was a rich collection within about 1 sq.m. Apothecia 1—3.2 mm. diam. Stipes 0.9—13 mm. long. Asci 81—123 × 6.1—7.9 μ, average 99 × 6.8 μ. Spores 7.6—14 (18) × 2.3—5.3 μ, average 11.5 × 3.2 μ (55 spores measured).

J.T.P. 3012. South side of main road, near Pass of Glen Coe (16 km. from Glencoe), Argyllshire, Scotland. On sclerotia within culms of *S. cespitosus* amongst *Eriophorum* etc. on wet moorland, sparse, leg. Palmer N° 66131, 8.VI.1966. Apothecia 1.9—2 mm. diam. Stipes 0.8—5 mm. long. Asci 83—108 × 5.5—7.8 μ, average 94 × 6.5 μ. Spores 9.8—13.1 × 2.5—3.6 μ, average 10.7 × 3.1 μ (20 spores measured).

J.T.P. 3013. South side of main road (16 km. from Tyndrum), continuation of Glen Coe, Rannoch Moor, Argyllshire, Scotland. On sclerotia within culms surrounding solitary large tuft of *Scirpus cespitosus* on edge of peaty pool, leg. Palmer N° 66132, 8.VI.1966. Duplicate in Herb. G.L.H. Apothecia 1.5—3.6 mm. diam. Stipes 1—6 mm. long. Asci 85—115 × 4.4—7.5 μ, average 94 × 6 μ. Spores 8.6—11.7 (15.4) × 2.8—4.4 μ, average 10.7 × 3.2 μ (20 spores measured).

J.T.P. 3014. Ca. 100 m. east of main road between Uddington and Abington, base of Roberton Low, Lowther Hills, Lanarkshire, Scotland. On sclerotia within old culms around tufts of *S. cespitosus* amongst mosses in damp hollows on heathy ground, leg. Palmer N° 66135, 9.VI.1966. Duplicate in KRA and M. Apothecia 1—3.5 mm. diam. Stipes 1—14 mm. long. Asci 74—90 × 4.8—8 μ, average 82—6.8 μ. Spores 7.9—13.5 × 2.8—4.6 μ, average 11.1 × 3.5 μ (20 spores measured).

J.T.P. 3015. East of Honister House, Honister Pass (between Buttermere and Borrowdale), Cumberland, England. On sclerotia within dead culms of *S. cespitosus* amongst mosses and host tufts at edge of draining *Juncetum*, sparse collection, leg. Palmer N° 66142, 10.VI.1966. Duplicates in PC, and Herb. P.B. Apothecia 1.2—2.7 mm. diam. Stipes 6—13 mm. long. Asci 74—103 × 6—7.8 μ, average 85 × 7.1 μ. Spores 9.4—12.4 × 2.6—4.4 μ, average 11.2 × 3.4 μ (20 spores measured).

J.T.P. 3016. Type locality, centre of the Swamp, Hern Clough, Bleaklow Moor (Peak National Park), Derbyshire, England. Immature sclerotia developed later within current season's culms of *S. cespitosus*, leg. Palmer N° 66164, 24.VII.1966.

J.T.P. 3017. Type locality, centre of the Swamp, Hern Clough, Bleaklow Moor (Peak National Park), Derbyshire, England. Developing

sclerotia within current season's culms of *S. cespitosus*, leg. Palmer N° 66180, 14.VIII.1966. Duplicates in B, BM, BPI, CP, CUP, DAOM, KRAL, LE, M, PC, PR, S, TAA, UPS, WA, ZA and Herbaria G.L.H., M.N., P.B. and R.P.K. Mature sclerotia ranged from 2 mm. to 7.5 mm. long, spaced as close as 1.5 cm. apart with up to four sclerotia in a culm.

Whilst J.T.P. 3010 was the last and not the largest collection made of apothecia, it has been selected as the Type because the locality, situated about 2 km. from the nearest road and in the middle of wild moorland in the Peak National Park, is the most likely area to remain undisturbed. Its situation also gives me the opportunity to make further studies on material from the type locality.

No experiments have been formed such as those mentioned by Whetzel (1946), who infected freshly opened flowers of *Scirpus lacustris* with ascospores and observed the development of the fungus in the flowering head and culm. However, similar to *Myriosclerotinia scirpicola*, the infection appears to take place via the flowers with the head shrivelling and the upper part of the culm turning brown and the remainder gradually bleaching as the fungus grows downwards. Sclerotia were found developing in the culm from 1 cm. to 10 cm. below the head, usually associated with brownish, irregularly oblong cells in the culm wall. Splitting of the culm to expose the sclerotia probably due to tumescence under moist conditions, was frequent during my visit to the type locality in August. However, most sclerotia were still within their culms in the six collections of apothecia.

Isolations on PDA were made on test-tube slopes from mass ascospore shoots of each collection. A white to buffy mycelial mat tardily grew over the surface and 3 to 5 flattened, rounded, sometimes elongated or compound sclerotia, up to 5 mm. diam. and usually covered with a thin, whitish, hyphal weft, developed during the following four months on the surface of the agar. A few sclerotia developed within the agar. The rind of the sclerotia was black and the medulla pale rose to whitish. No appressoria or conidia were seen.

ADDITIONAL MYRIOSCLEROTINIAE ON SCIRPICOLOUS CULMS

On my way to the 4th European Mycological Congress in Poland, I visited the Botanisches Museum in Berlin-Dahlem where, in addition to Sydow's exsiccati of *Myrioconium maritimum* Bubák & Sydow, I found three collections from Latvia comprising culms of *Scirpus sylvaticus* with spermodochia and sclerotia:

1. Ex Herbario A. Kirulis / FUNGI LATVICI / A. 689 / *Sclerotinia Curreyana* / Berk. / Karsten. / Sclerotium! Reichard / in *Juncus*

(deleted and corrected to) *Scirpus silvaticus* L. / LATVIA, prov. Zemgale, Sauka. / 1.8.1933 / (V. Tumšs). legit. / Botanisches Museum Berlin Sammlung W. Kirschstein Berlin-Pankow occ. 25. Okt. 1945.

2. Ex Herbario A. Kirulis / FUNGI LATVICI 947 / *Sclerotinia curreyana* / Berk. / Karst. / Scler. / in *Scirpus silvaticus* L. / LATVIA, prov. Zemgala, Sauka / 1933 / V. Tumšs legit. (The locality and collector were incorrectly given as "prov. Lemgale: Sanka, leg. V. Tumšs", and I should like to thank Dr. Edgars Vimba, Riga, for correcting the spelling).

3. Duplicate of the preceding "ex Herb. E. Fehrendorff occ. 30.3.1960".

It was clear from these collections that a *Myriosclerotinia* grows on *Scirpus sylvaticus* and may have been known to Rehm. During the Congress excursion on the 3rd September, 1966, several standing culms of *Scirpus sylvaticus* with spermodochia and a few developing sclerotia were found in a dried stream bed (J.T.P. 3022) together with similar stages of presumably *Myriosclerotinia sulcata* on *Carex* culms in a wooded part of the Starożyn Reserve, Poland. This fungus is now being sought on *Scirpus silvaticus* in England, though so far unsuccessfully, as the chances of apothecia developing from the sclerotia in the Polish collection are remote.

Since returning from the Congress, I have searched for these fungi and have found two further scirpiculous hosts with spermodochia and sclerotia on the Ainsdale Sand Dunes National Nature Reserve, Lancashire, England:

a. *Eleocharis (Scirpus) palustris* (L.) R. Br. emend. Röm. & Schult. — a very small collection on only four infected culms, 17 IX 1966, J.T.P. 3023.

b. *Scirpus (Schoenoplectus) tabernaemontani* C. C. Gmel. — two good collections of infected culms in wet slacks behind the outer dunes about 1 km. apart. Ainsdale Sand Dunes National Nature Reserve, Ainsdale, Lancs., 15 X 1966, J.T.P. 3024 and 3025. The infected culms were readily recognized by their bleached appearance and had often fallen over where a swollen sclerotium had split the culm wall about half-way up the plant. This was in marked contrast to the manner in which infected culms of *Scirpus lacustris* were characteristically bowed in a heavily parasitized stand where the boat moored at Kamień on Lake Beldan during the Congress excursion on the 2nd September, but *S. lacustris* is, of course, a more robust plant than *S. tabernaemontani*. It is, unfortunately, not possible to determine from the spermatial and sclerotial stages whether these collections represent several distinct species or a single species on several related hosts. Whilst the appear-

ance of the spermodochia is similar in some instances, and Whetzel (1946) used their arrangement on the culm as the prime means of distinguishing between *Myriosclerotinia duriaeana* and *M. sulcata*, the development of apothecia is essential and, with this aim, culms containing sclerotia are being overwintered in natural conditions in the hope that apothecia may appear when the host is flowering next year.

Note. — P. A. Saccardo & H. Sydow (Sylloge fungorum 14: 1153, 1899) place "*Scl[erotium] Eleocharidis* Thüm. M.N.n. 2298 (1883)" as a synonym of *Sclerotium nigricans* (Tul.) Sacc. with the habitat „intra calamos *Caricis paniculatae*, *Heleocharidis palustris* etc. in Gallia, Dania etc.". Through the kindness of Dr. Z. Urban, I have examined the exsiccatum in PRC: „de Thümen, Mycotheca universalis. 2298. *Sclerotium Eleocharidis* Thüm. — *Claviceps nigricans* Tul. in Ann. sc. nat. 1853. XX. Dania: Klingstrup — ins. Fioniae — in *Eleocharidis palustris* R. Br. spicis vivis. Sept. 1882. leg. Rostrup". There are no spermodochidia or sclerotia within the culms and, as the curved sclerotia are confined to the fruiting heads, the collection clearly represents *Claviceps nigricans* Tul.

SUMMARY

Three species of *Rutstroemia* (*R. americana*, *R. echinophila*, and *R. sydowiana*), previously reported on *Castanea sativa* burrs and (with *R. americana*) nuts, are now known from *Quercus* cupules with a collection of *R. americana* on a *Q. cerris* acorn cuticle. *Sclerotinia gregoriana* n. sp. in culms of *Scirpus (Trichophorum) cespitosus* is described from Northwest England and Scotland. Spermatial and sclerotial stages of a *Myriosclerotinia* on *Scirpus silvaticus* are reported from Latvia and Poland, whilst similar stages have been found on *Eleocharis (Scirpus) palustris*, *Scirpus maritimus* and *Scirpus (Schoenoplectus) tabernaemontani* in England.

ZUSAMMENFASSUNG

Drei Arten von *Rutstroemia* (*R. americana*, *R. echinophila* und *R. sydowiana*) auf Edelkastanienkupulen und (*R. americana*) auf Kastaniensamen sind nun auf *Quercus*-Kupulen bekannt, mit einer Sammlung von *R. americana* auf der Epidermis einer Eichel. *Sclerotinia gregoriana* n. sp. in Halmen von *Scirpus (Trichophorum) cespitosus* aus Nordwestengland und Schottland ist beschrieben. Die spermatische und sklerotische Stadien einer *Myriosclerotinia* auf *Scirpus silvaticus* aus Lettland und Polen sind berichtet, während ähnliche Stadien auf *Eleocharis (Scirpus) palustris*, *Scirpus maritimus* und *S. (Schoenoplectus) tabernaemontani* in England gefunden wurden.

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Sclerotiniaceae na kasztanie jadalnym i dębie oraz
Sclerotinia gregoriana n. sp. na welnianeczce darniowej
 (Badania nad *Sclerotiniaceae* — II.)

Streszczenie

Autor omawia przypadki występowania trzech gatunków *Rutstroemia* (*R. americana*, *R. echinata*, *R. sydoviana*) na okrywach i nasionach *Castanea sativa* oraz na miseczkach żołądźli *Quercus*. Opisuje nowy gatunek *Sclerotinia gregoriana* na pędach *Scirpus cespitosus* z pn.-zach. Anglii i Szkocji. Odnotowuje fakty znalezienia stadium przetrwalnikowego i stadium związanego z występowaniem spermacji u *Myriosclerotinia* na *Scirpus silvaticus* z Lotwy i Polski, podkreślając, że podobne stadia były już znalezione w Anglii, ale na *Eleocharis palustris* i *Scirpus tabernaemontani*.