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Urszula Świderska-Burek

Cercosporoid fungi of Poland

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Abstract
The paper presents characteristics of cercosporoid fungal species from three genera, *Cercospora*, *Passalora*, and *Pseudocercospora*, occurring in Poland and deposited in Polish herbaria or to be expected due to the occurrence of their host plants in the Polish flora. The physiographic literature, but primarily own collections, as well as those gathered in the national herbaria, were the object of the revision.

This monograph provides morphological descriptions, lists of hosts and distribution in Poland and worldwide as well as detailed illustrations for 41 species. Dichotomous keys for identification of fungi parasitizing hosts from different plant families were prepared within the individual fungal genera.

The present study represents a compilation of 115 cercosporoid species, of which 63 are reported from Poland and another 6 were doubtful and excluded. The fungi parasitize 221 taxa of host plants from 131 genera and 47 families, out of which 158 taxa from 94 genera and 29 families have been actually found in Poland. Fourteen species described in this book belong to *Cercospora apii* s. l. Nine quarantine species are listed, from which only three have been published so far.

This study will be helpful to mycologists, plant pathologist, and Polish plant protection services for identification purposes of the fungi concerned.

Keywords
anamorphic fungi; cercosporoid hyphomycete; *Cercospora*; *Passalora*; *Pseudocercospora*; distribution; parasites

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Competing interests
No competing interests have been declared.

1. Introduction

Cercosporoid fungi (hyphomycetes) belong to anamorphic fungi, previously called mitosporic fungi or Fungi imperfecti. According to the *Ainsworth & Bisby's dictionary of the fungi* [1], a majority of anamorphic fungi are conidial stages of ascomycetous fungi (phylum: Ascomycota), and rarely basidiomycetous fungi (phylum: Basidiomycota). This is a huge, continuously increasing group currently comprising about 25 000 species.

Anamorphic fungi comprise asexual, mitotic organisms, i.e. structures connected with sexual reproduction are mostly lacking. On the other hand, in cercosporoid fungi, asexual morphs (now the preferable term for anamorphs) may represent asexual holomorphs, which have lost the ability to form sexual (meiotic) morphs (ascomata), or asexual morphs connected with mycosphaerella-like sexual morphs [2]. Triumphal advances of molecular (phylogenetic) methods in the fungal taxonomy in the last decades led to an enormous increase in the knowledge of phylogenetic affinities of asexual fungi. Hence, in current systems, they are not regarded as separate taxonomic units, but rather incorporated in the kingdom of true fungi (Mycota, Fungi) and, as far as known, assigned to the appropriate taxonomic units based on their phylogenetic affinity. Previously, they were often classified as an informal group (Deuteromycota) with lower units, i.e. classes and orders. Four classes, Blastomycetes, Coelomycetes, Hyphomycetes, and Agonomycetes, were distinguished in the most commonly used classification. This classification and these units are now obsolete, but may be still used as non-taxonomic terms for morphological groups.

Based on the altered situation and challenges of the molecular era, the International Code of Nomenclature (ICN) has recently been fundamentally changed with regard to the nomenclatural treatment of fungi [3–5]. The principle "one fungus one name" has been introduced by the discontinuation of the dual nomenclature for pleomorphic fungi. All fungal names, species, genera, etc., are now treated as names of plants and all other groups ruled by the ICN, i.e. all names, whether based on an asexual or sexual morph, are nomenclaturally equivalent. Therefore, *Cercospora* Fresen., *Passalora* Fr., *Pseudocercospora* Speg. and other accepted names of cercosporoid genera are now recognised holomorph genera. Some species of all of these genera have mycosphaerella-like sexual morphs. However, based on the new Code, the genus *Mycosphaerella* s. str. is now treated as a heterotypic synonym of *Ramularia*, which is the older and preferred name [2,6,7]. The application of genus names is ruled according to their type species, but *Mycosphaerella punctiformis* (Pers.: Fr.) Starbäck, the type species of *Mycosphaerella*, has an asexual morph belonging to *Ramularia*, which clusters in a well supported *Ramularia* clade [8].

The cercosporoid fungi presented herein are hyphomycetes, i.e. they do not form distinct conidiomata. Some of them form mycosphaerella-like sexual morphs, e.g. *Passalora punctum* (Lacroix) S. Petzoldt and *P. rosicola* (Pass.) U. Braun. The name of the group originates from *Cercospora*, a genus with the biggest number of species. The name itself is a combination of two Greek words, *kerkos* (= tail) and *sporos* (= seed), which means acicular conidia [9–12].

Investigations of cercosporoid fungi have been conducted for over 150 years; during this time, the systematic position of some of these fungi has been changed and numerous cercosporoid species have been redefined, sometimes even several times. Comprehensive

monographs published in the 20th century did not provide a clear and unquestionable answer to this issue [13–23]. An attempt was made by Crous and Braun [11] at the beginning of the 21st century. In their monograph, they regarded species from only four genera (*Cercospora*, *Passalora*, *Pseudocercospora*, and *Stenella*) as true cercosporoid fungi. The basic features of these genera included the colour of conidiophores (from pale olivaceous to brown) and holoblastic conidiogenesis. The individual genera were distinguished based on a combination of two traits, i.e. the structure of conidial scars and hila and the presence or absence of colouring of conidiophores and conidia.

All genera of cercosporoid fungi have traditionally been linked to the teleomorph genus *Mycosphaerella* Lindau (Ascomycota, Capnodiales, Mycosphaerellaceae) [11,24]. However, recent phylogenic studies have shown that *Mycosphaerella* genus is polyphyletic, and subsequently it has been split into numerous genera [25–28]. More detailed analyses of Arzanlou et al. [29] confirmed these assumptions and contributed to subsequent changes. Almost all examined species of *Stenella* cluster together with *Zasmidium cellare* (Pers.: Fr.) Pers., a type species of the genus *Zasmidium* in the Mycosphaerellaceae clade. The genus *Stenella* was reduced to its type species, *Stenella araguata* Syd., belonging to the family Teratosphaeriaceae.

Cercospora species are parasitic fungi considered as specific organisms with reference to their host plants, especially at the genus or family level. Accordingly, Chupp [13] formulated the concept that "one species, genus, or family of the host plant equals to one *Cercospora* species". In his monograph, he accepted 1419 *Cercospora* species occurring on 2500 genera of hosts from 155 different families. Pollack [21] reported an even greater number of ca. 3000 names.

An important recent cut in the taxonomy of cercosporoid fungi was the publication of an annotated list of *Cercospora* and *Passalora* emend. names by Crous and Braun [11]. They accepted 659 *Cercospora* species as correctly described and another 281 species names reduced to synonymy with *Cercospora apii* s. l. It is also one of the oldest names within the large *Cercospora* complex, and a species occurring on taxonomically distant hosts belonging to unrelated families, e.g. Adoxaceae, Amaranthaceae, Apiaceae, Compositae, Lamiaceae, Leguminosae, Plantaginaceae, Polygonaceae, and Solanaceae. The species concerned are morphologically indistinguishable from *C. apii* s. str., which is restricted to *Apium graveolens* L. and a few allied hosts of the family Apiaceae. However, in recently published molecular examinations of the *C. apii* s. l. complex, the plurivorous habit of *C. apii* s. str. has been confirmed [24], but with a host range not as wide as supposed by Crous and Braun [11].

Cercosporoid fungi are important pathogens of major agriculture crops (cereals, vegetables, ornamental plants, forest trees, etc.), and they are known to be hyperparasites, e.g. of rust fungi. The results of parasitism of representatives of this group usually include gradual decay of tissue, resulting in necrotic spots on the leaves, but the fungi can cause necrotic lesions of other plant organs as well, e.g. pedicels, stems, fruits [30,31]. They can also be used as biocontrol agents of plants, e.g. weeds [25,32].

Within *Cercospora* species, there are plant pathogens, which produce a toxin called cercosporin. The substance was first isolated in 1957 from fungal cultures of *Cercospora kikuchii* (T. Matsumoto & Tomoy.) M.W. Gardner as a reddish pigment, but its photodynamic (phytotoxicity) properties were first described in 1971 [33,34]. Further studies showed that cercosporin was a red coloured toxin belonging to a group of perylenequinones characterized

by photoactivity. The condition necessary for cercosporin production is the presence of light; it does not exhibit toxicity in the dark. Light induces production of reactive oxygen species (ROS), which causes lipid peroxidation of the cell membrane and results in cell death.

The observation of anamorphic fungi, including cercosporoid species, on infected hosts is sometimes difficult. Symptoms of the diseases observed on infected host plants are non-specific and very often similar to symptoms caused by species belonging to different genera and frequently to other taxonomic groups, e.g. water moulds (Peronosporales), and even to some groups of Ascomycota.

Another problem that appears in studies of anamorphic fungi is the fact that the presence of the sexual stage has not yet been affirmed in most known species. Furthermore, an unknown but probably large number of asexual fungal species, including cercosporoids, represents asexual holomorphs, i.e. they have lost the ability to form sexual morphs at all [2]. The sexual form is known only in about 15% of anamorphic fungi. Most of them were cultured in laboratories without documentation of their presence in field conditions. Considerable progress in this field has been provided by molecular analyses, which facilitate classification of an anamorphic fungal taxon to a specified group of Ascomycota or Basidiomycota. However, a specific teleomorphic stage sometimes appears to have several anamorphic stages regarded as the so-called synanamorphs, which are sometimes assigned to different species and even genera. The results of such studies indicate that, although significant differentiating features should be taken into account in the morphological description of species, the morphological structure does not have exclusive importance in the general taxonomic system.

A significant part of anamorphic fungi is regarded as a group with specific characteristics of adaption to environmental conditions. The vegetative stage is considered as an example of extreme adaptation to stabilized conditions, while the teleomorph as a source of genetic changes [35]. However, it appears that the gene recombination can follow in a parasexual cycle, which, to some extent, makes vegetative growth independent of the sexual process.

Due to the above-mentioned difficulties, anamorphic fungi, including the large and important group of cercosporoid fungi, are only infrequently the subject of detailed taxonomic studies, especially in the form of monographic studies, although they raise interest of researchers of various scientific disciplines, especially those with applied approaches. Monographic papers concerning anamorphic fungi are rare not only at national level, but also worldwide. In Poland, only representatives of the former Dematiaceae [36], *Fusarium* [37], *Ascochyta* [38], *Ramularia* [39], and *Septoria* [40] genera have been investigated so far. Cercosporoid fungi were more frequently examined only when they caused significant damage in field cultivation of crop plants. Detailed research was undertaken especially in the case of diseases caused by dangerous plant pathogens such as *Cercospora beticola* Sacc., *C. apii* Fresen., or *C. carotae* (Pass.) Kazn. & Siemaszko. Knowledge about the occurrence and distribution of most species has been provided by studies of wild-growing plants, including those collected during research in natural conditions in interesting, natural, legally protected areas [41–54].

The objective of this monograph was a critical study of cercosporoid fungi from Poland aiming at improvement of the general knowledge of the fungal groups concerned. An additional argument to conduct the current research was the poor representation of information about cercosporoid fungi of Poland in the international taxonomic literature.

At the beginning of the previous decade, i.e. at the time of commencement of the current research, only 30% of species hitherto known in our country were cited in the worldwide literature.

2. Outline of the history of research on cercosporoid fungi

Passalora, described by Fries in 1849, was the first genus introduced for cercosporoid fungi, followed by *Cercospora* established in 1863 by Fresenius with *Cercospora penicillata* (Ces.) Fresen. [= *C. depazeoides* (Desm.) Sacc.] as type species (the typification of *Cercospora* was discussed in detail by Braun [22]). Within this genus, he included species close to *Passalora* but distinguished by having long, pluriseptate conidia [55]. Later, Saccardo [56] defined the genus as having usually brown conidiophores and brown, olivaceous or rarely subhyaline and vermiform conidia. He did not mention *C. apii*, which has hyaline conidia, as type species.

The first division of *Cercospora* was provided by Spegazzini [57]. He distinguished *Cercosporina* Speg. in order to include species with hyaline conidia. In turn, Saccardo [58] accepted *Cercosporina* and transferred 89 *Cercospora* species to this genus, including some species with pigmented as well as hyaline conidia.

In his monograph, Chupp [13] proposed a broad concept of the genus *Cercospora*. It was based on the morphology of conidial scars (thickened or not) and conidia (pigmented or not, single or in chains). His book *A monograph of the fungus genus Cercospora* contained 1419 *Cercospora* species published before 1954.

A series of papers published by Deighton [14–20] was very important and influential for investigations of cercosporoid fungi. He discussed the development of taxonomic concepts covering the 100 year's history of worldwide research and outlined problems associated with current methods for distinguishing members of individual genera. He placed special emphasis on the presence or absence of thickenings of conidiogenous loci (conidial scars) left on the conidiogenous cells after liberation of conidia. He recognised two distinct taxonomic categories, one comprising species with more or less thickened conidial scars on conidiogenous cells or hila on the conidia. Species included in other categories had unthickened conidial scars. This taxonomic criterion was very adequate and in successive studies it was adopted by most researchers in classifying species belonging to cercosporoid genera.

According to Braun [59], the concept of the genus *Cercospora* adopted by Chupp [13] was too broad and therefore he proposed division of this genus into additional genera. As a result, he reallocated some species with hyaline or subhyaline conidiophores to the *Cercospora* genus and introduced a new subgenus *Hyalocercospora* for such taxa. In a successive paper [22], he discussed in detail the characteristics that distinguish species with hyaline or slightly pigmented conidiophores within *Cercospora* (subgen. *Hyalocercospora*) and *Cercosporella*; in addition, he described the current status of *Cercospora*, *Passalora*, and *Phaeoisariopsis*.

Another comprehensive critical study was prepared at the beginning of the first decade of the 21st century by Crous and Braun [11], who revised more than 3000 names assigned to *Cercospora* and 550 names from the genus *Passalora*. Finally, they accepted 659 names of *Cercospora* s. str. and reduced another 281 species names to synonymy with *C. apii* s. l. Within cercosporoid fungi, they recognised four true cercosporoid genera, viz. *Cercospora*, *Pseudocercospora*, *Passalora*, and *Stenella*, and several others as morphologically similar genera (e.g. *Cladosporiella*, *Phacelium*, *Phaeoisariopsis*, *Sirosporium*, *Stigmina*, *Thedgonia*). The main criterion for the division was the combination of several features: the structure of conidiogenous loci and hila, and the presence or absence of conidiophores and conidia pigmentation.

Another division was introduced for *Stenella*. It was based on molecular studies on the relationships of cercosporoid fungi (as anamorphs) within the ascomycete family Mycosphaerellaceae [25,27,28,60–62]. One of the results of this study was the statement that the type species of *Stenella* clusters in the Teratosphaeriaceae, although representatives of this genus were previously generally considered to be anamorphic stages of *Mycosphaerella* in the Mycosphaerellaceae. However, as far as known, all other former *Stenella* species are actually anamorphic stages belonging in the Mycosphaerellaceae, which were excluded from *Stenella* and included in the genus *Zasmidium* [63].

Recently, cercosporoid species have been investigated using molecular analysis in order to confirm or change their taxonomic position [2,24,64].

The first information about cercosporoid fungi collected in Poland originates from the end of the 19th century. The contributions concerned, published in the form of lists of species found in Poland, were reported by Hennings [65], Schroeter [66], and Hellwig [67] from the surroundings of Świecie, Śląsk, and Węgierki near Września, respectively. At the beginning of the 20th century, numerous papers containing lists of species from different regions of Poland mostly appeared in the *Sprawozdanie Komisji Fizjograficznej* [Reports of the Physiographic Commission] or *Pamiętnik Fizjograficzny* [Physiographic Diary]. The most valuable data from that period are mainly included in the publications of Namysłowski [68–72], Zweigbaumówna [73], Dominik [74], and Stec-Rouppertowa [75,76]. A lot of important information about parasites of cultivated plants (also ornamentals) was provided in the papers of Garbowski [77,78], Garbowski and Juraszkówna [79], and Leszczenko [80].

The second half of the 20th century was the beginning of intensive research conducted in natural plant communities. The first significant data were provided in reports from montane areas, e.g. publications of Starmachowa [41] from the Tatra National Park, and subsequent publications of Kućmierz from the Ojców National Park [42,43] and from the Pieniny National Park [44–48]. Data about Łęczyńsko-Włodawskie Lake District [81], riverine communities in the Middle Bug Valley [82,83], and the Białowieża National Park [49–52] were published in the following decades.

The data about the occurrence of cercosporoid fungi in Poland published in the recent decade refer to the Słowiński National Park [53,84] and Częstochowska Upland [54,85]. In addition, information about rare and new species for Poland has been published [86–92].

3. Material and methods

The physiographic literature, but primarily specimens collected during the present research and preserved in the national herbaria, were the object of the present revision. Collections from 23 Polish and foreign exsiccatae were also studied.

Herbarium collections revised:

- KRA – herbarium of the Institute of Botany, the Jagiellonian University in Kraków
- KRAM – herbarium of the W. Szafer Institute of Botany, Polish Academy of Sciences in Kraków
- LBL – herbarium of the Department of Botany and Mycology, Maria Curie-Skłodowska Uniwersity in Lublin
- LOD – herbarium of the University of Łódź
- SZPA – herbarium of the Department of Plant Pathology, the West Pomeranian University of Technology Szczecin
- WA – herbarium of the Faculty of Biology, Warsaw University
- WAUF – herbarium of the Department of Plant Pathology, the Faculty of Horticulture, Biotechnology and Landscape Architecture, Warsaw University of Life Sciences in Warsaw
- WRSL – herbarium of the Museum of Natural History, Wroclaw University.

Exsiccatae:

- Allescher A., Schnabl J.N., Fungi Bavarici
- Bucholtz F.V., Bondartsev A.S., Fungi Rossici exsiccati Ser. B
- Flora Exsiccata Austro-Hungarica
- Flora Hungarica exsiccate
- Jaczewski A.L.A. de, Komarov V.L.W., Tranzschel W.A., Fungi Rossiae exsiccati
- Klotzsch J.F., Herbarium Vivum Mycologicum = Klotzsch, Herb. Viv. Mycol.
- Krieger K.W., Fungi Saxonici exsiccati
- Kryptogamae Exsiccata
- Kunze J., Fungi selecti exsiccati
- Nevodovskii G.S., Griby Rossii
- Rabenhorst G.L., Herbarium vivum mycologicum
- Rabenhorst G.L., Fungi Europaei exsiccati
- Rabenhorst G.L., Winter G., Fungi Europaei exsiccati
- Rabenhorst G.L., Pazschke, Fungi Europaei exsiccati
- Rabenhorst G.L., Pazschke F.O., Fungi Europaei et Extraeuropaei exsiccati
- Rabenhorst G.L., Winter G., Pazschke F.O., Fungi Europaei exsiccati
- Raciborski M., Fungi parasitici Poloniae exsiccati
- Saccardo P.A., Mycotheca Veneta
- Săvulescu T., Herbarium mycologicum Romanicum
- Siemaszko W., Fungi Bialowiezenses exsiccati
- Sydow H., Mycotheca Germanica
- Thümen F.K.A.E.J. de, Herbarium Mycologicum Oeconomicum
- Thümen F.K.A.E.J. de, Mycotheca universalis.

3.1. Field research

Field studies involved collecting plant specimens infected by cercosporoid fungi as well as conservation and preparation thereof to be deposited in the herbarium. Own collections mainly originated from the Lublin region and the Tatra National Park, where research was conducted under the grant from the Ministry of Science and Higher Education. Traditional methods of research (so-called route method) and modern methods connected with the use of permanent research plots were employed. In both cases, all possible ecological data and frequency of occurrence of both organisms, plants and fungi parasitizing them, were noted.

3.2. Laboratory research

Microscopic preparations for identification of fungi were made in the form of surface slides or cross sections through infected leaves. The fragments obtained were stained with a 50% water solution of cotton blue in lactic acid or placed in 50% water solution of lactic acid in order to determine the colour of conidiophores and conidia. Material prepared in this manner was gently heated and then microscopic observations were performed.

External symptoms of plant diseases were described and data on measurements of conidiophores and conidia were prepared based on the analysed specimens and microscopic preparations. Original diagnostic descriptions of fungi were prepared for 82 fungal species, and descriptions for additional 33 species were based on literature data due to the lack of herbarium specimens.

Stereomicroscopes and light microscopes (Olympus BX41 and BX61) equipped with a drawing apparatus and cameras were used for identification purposes of fungi and plants and the iconographic and photographic documentation (drawings and photographs).

The following references were used for the identification of fungi: Brandenburger [93], Braun [22,23,94,95], Hsieh and Goh [10], Guo and Hsieh [96], Lindau [97], Saccardo [98], and Shin and Kim [31]. Identification of plants was based on Szafer et al. [99], Rutkowski [100], and Rothmaler [101]. Nomenclature of plant families, genera, and species follows The Plant List was used [102]. The abbreviations were used according to Index Fungorum [103] for authors of fungal names and IndExs – Index of Exsiccatae [104] for exsiccatae.

An important complementation of diagnosis and morphological descriptions of fungi are molecular studies, which have become an integrated element, especially in the taxonomic research. Their main objective is to determine the phylogenetic relationship of fungi. They are based mostly on the analysis of gene sequences within the ITS-1 5.8S and ITS-2 rDNA regions. These analyses were not performed during the preparation of the present study; however, cercosporoid fungi have been and are still being extensively investigated by other researchers.

Results of a first important analysis were published by Stewart et al. [60], who reported the affinity of fungi from three genera, *Cercospora*, *Passalora*, and *Pseudocercospora*, which belong to the same phylogenetic group. Simultaneously, they confirmed earlier data that

species belonging to *Ramulispora* and *Mycocentrospora* are not anamorphs associated with the genus *Mycosphaerella*. A little earlier, Crous and Wingfield [105] noticed that *Mycosphaerella* is a polyphyletic genus and the anamorphs of species included in this genus are probably monophyletic. These assumptions were confirmed in subsequent papers [25,26,61]. Significant are also data contained in the first paper [61], in which it was indicated that *Cercospora* s. str. forms a strongly established monophyletic group and, simultaneously, that *Cercospora* species producing cercosporin have the same origin.

As already mentioned, molecular studies are important complementary analyses, but they do not make examinations of morphological structures superfluous, which uniquely distinguish individual taxa from each other. It should always be kept in mind that the genotype and phenotype are two sides of one coin. In the case of cercosporoid fungi, molecular studies have confirmed that taxonomically important features include such structures as the presence or absence of thickened and darkened conidiogenous loci (conidial scars) or hila, which may also be slightly thickened and darkened or inconspicuous. In turn, the main criterion for the establishment of the relationship is the necessity to connect certain genera of cercosporoid fungi with their teleomorphic stages, i.e. with species belonging to the former genus *Mycosphaerella* [11,106–108].

However, the issue of *C. apii* s. l. is still unresolved, both in morphological and molecular terms [11]. Studies of other species included in this complex are urgentlly needed. "Compound species" introduced by the aforementioned authors comprise all cercosporoid species, which are morphologically indistinguishable from *C. apii* described on *Apium graveolens* L. Only a few species included in *C. apii* s. l. have been grown in pure cultures, therefore the molecular data used for phylogenetic relationships within this complex are still insufficient. It is necessary to determine if the species within this complex are monophyletic. As already mentioned, *C. apii* as a monophyletic group (i.e. *C. apii* s. str.) was demonstrated to be plurivorous, occurring on different hosts [24], but the whole host range of this species is still unclear. Until recently, it has been suggested that morphologically indistinguishable *Cercospora* species found on new genera or families of host plants should be included in *C. apii* s. l. and introduction of new names should be avoided [12].

4. Structure and biology

Symptoms of diseases caused by cercosporoid fungi are variable, but usually visible as leaf spots, mostly with a distinct, darker margin or vein-limited. Sometimes the spots are confluent and cover a substantial part of the leaf surface (Fig. 1–Fig. 3). Fructification composed of conidiophores and conidia are visible within the spots and may be distributed on the upper surface (epiphyllous), lower surface (hypophyllous), or both surfaces (amphigenous); they are usually effuse, smooth or floccose, usually dark olivaceous, greyish, brownish or blackish in colour [10,13,31].

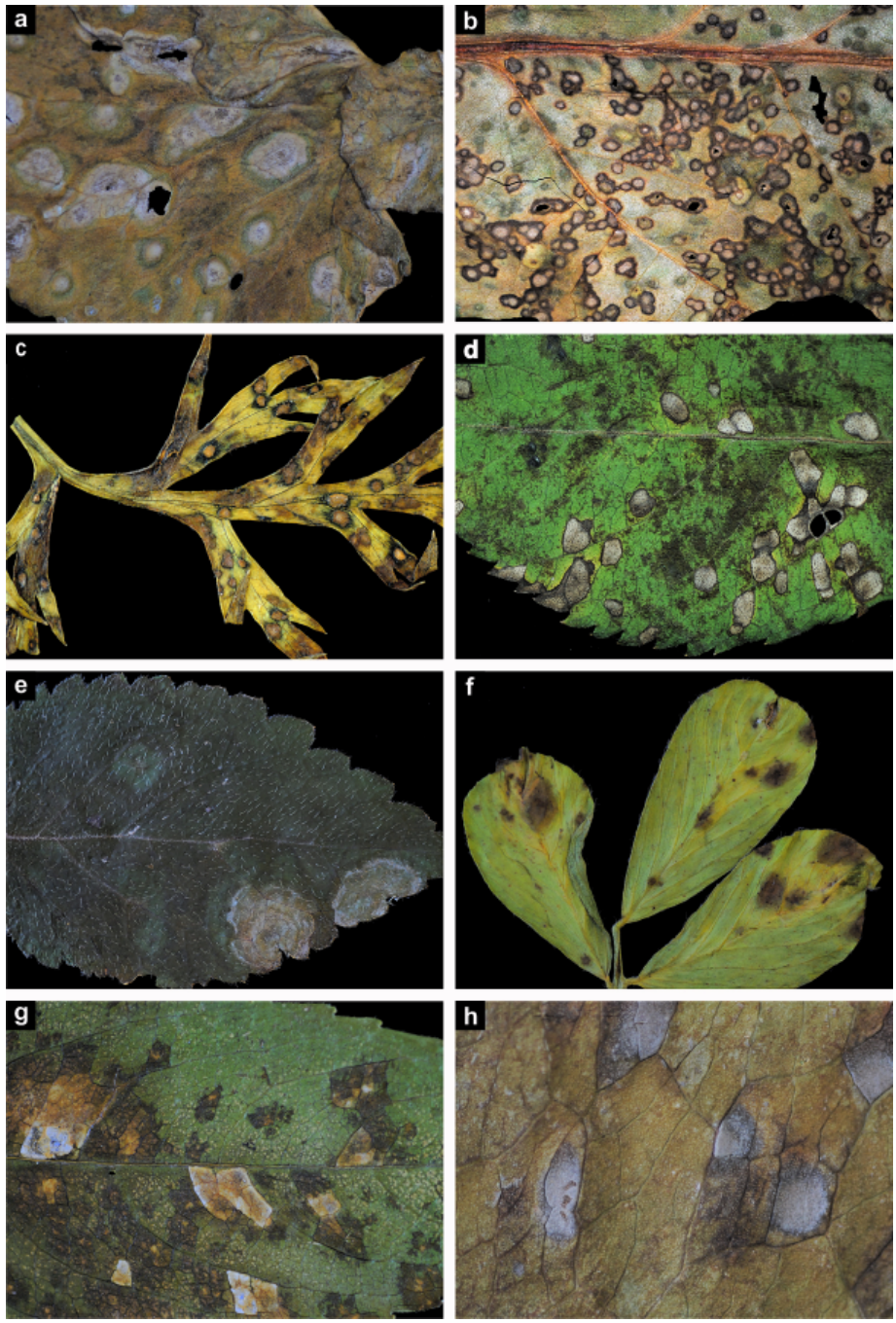

Fig. 1 Symptoms of disease. **a** *Cercospora armoraciae* on *Barbarea vulgaris*. **b** *C. beticola* on *Beta vulgaris*. **c** *C. carotae* on *Daucus carota*. **d** *C. depazeoides* on *Sambucus nigra*. **e** *C. kabatiana* on *Lamium galeobdolon*. **f** *C. medicaginis* on *Medicago lupulina*. **g** *C. mercurialis* on *Mercurialis perennis*. **h** *C. moravica* on *Caltha palustris*.

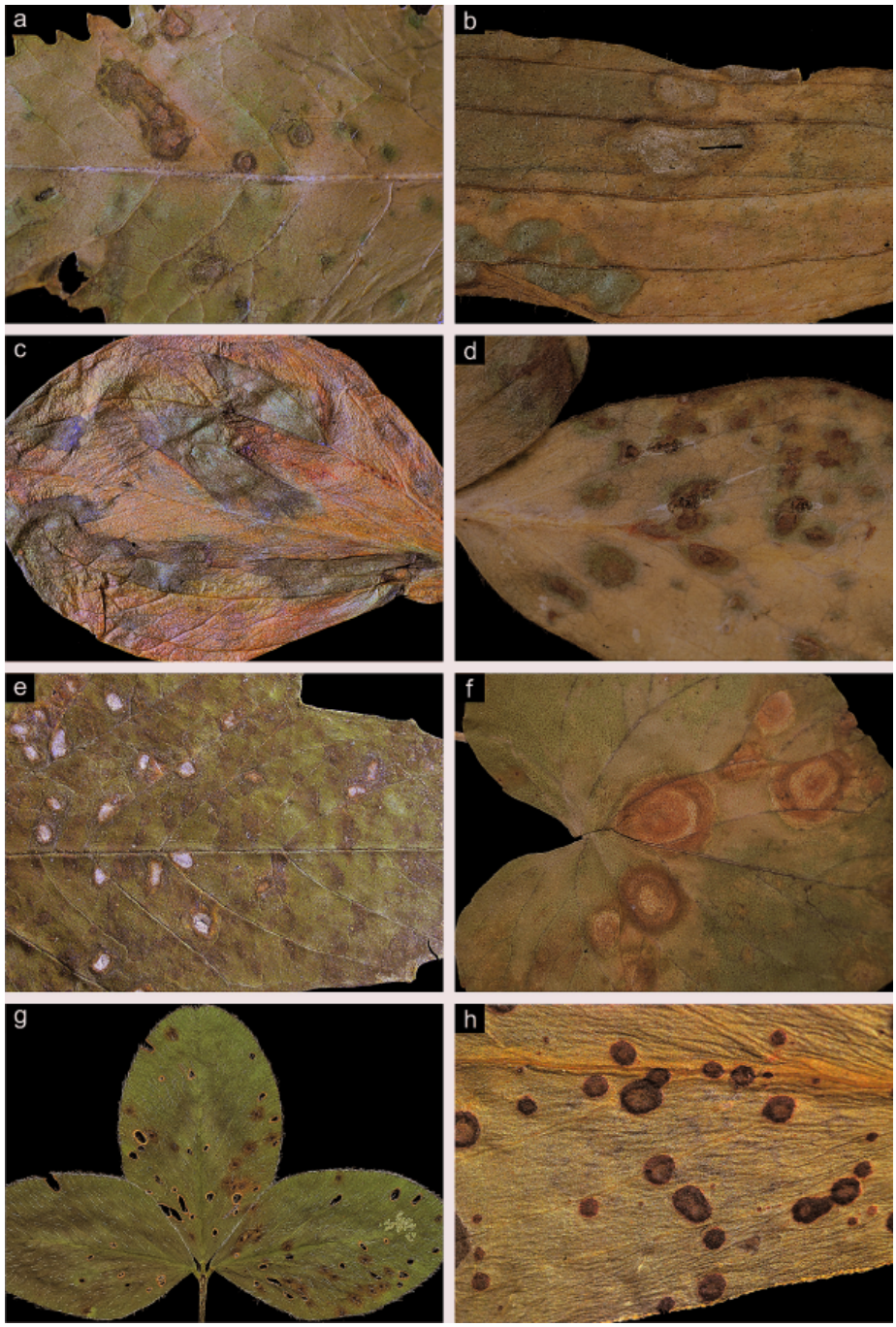

Fig. 2 Symptoms of disease. **a** *Cercospora armoraciae* on *Rorippa amphibia*. **b** *C. pantoleuca* on *Plantago lanceolata*. **c** *C. paridis* on *Paris quadrifolia*. **d** *C. radiata* on *Anthyllis vulneraria*. **e** *C. viburnicola* on *Viburnum opulus*. **f** *C. violae* on *Viola odorata*. **g** *C. zebrina* on *Trifolium repens*. **h** *C. zonata* on *Vicia faba*.

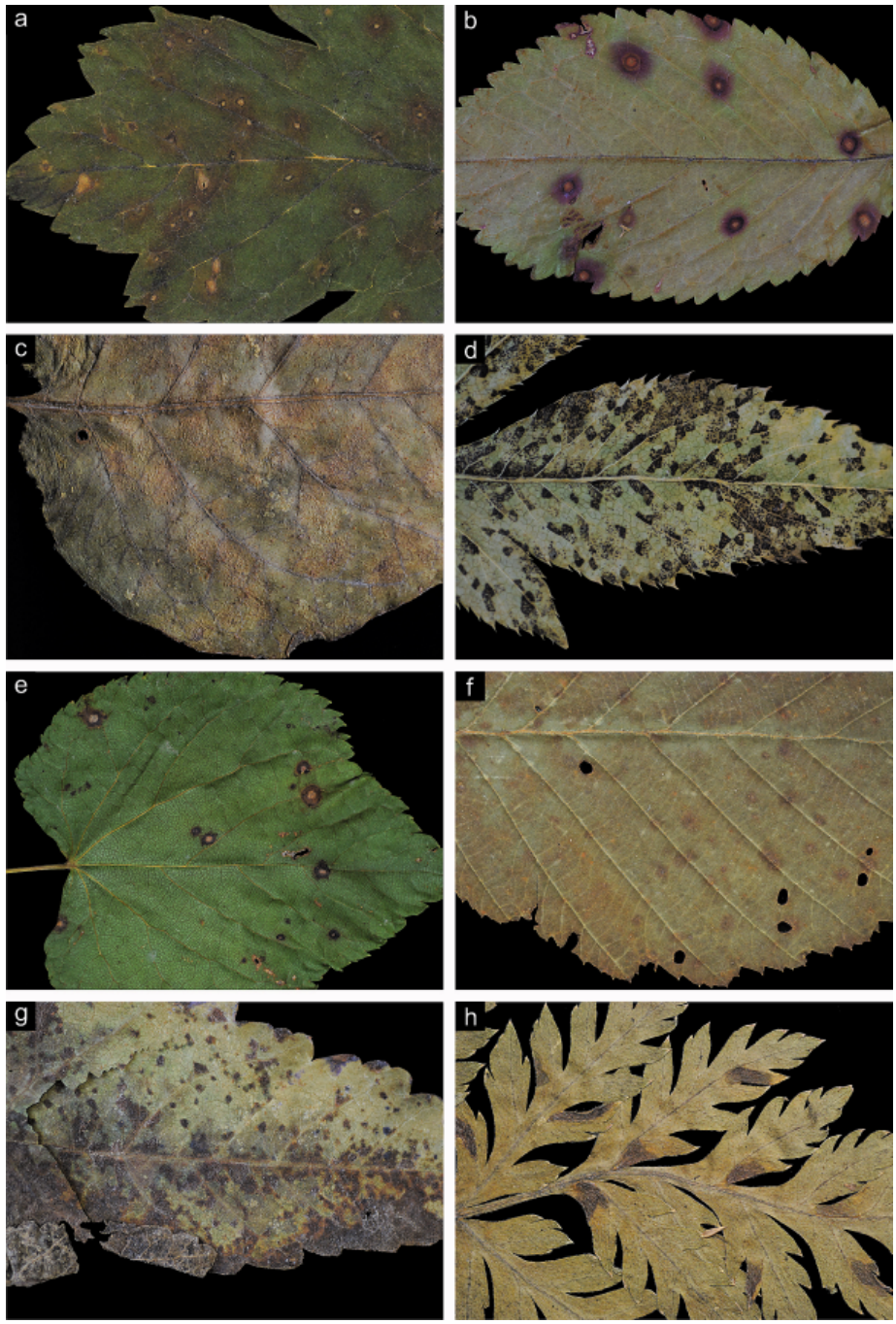

Fig. 3 Symptoms of disease. **a** *Passalora acericola* on *Acer pseudoplatanus*. **b** *P. circumscissa* on *Prunus avium*. **c** *P. concors* on *Solanum tuberosum*. **d** *P. depressa* on *Angelica sylvestris*. **e** *P. microsora* on *Tilia cordata*. **f** *P. microsperma* on *Alnus incana*. **g** *P. pastinacae* on *Pastinaca sativa*. **h** *P. scandicearum* on *Torilis japonica*.

Cercosporoid fungi can produce internal primary and external secondary mycelium. The primary mycelium is usually septate, branched, hyaline, pale olivaceous or olivaceous-brown. The internal mycelium often forms swollen hyphal cells, whose dense aggregations produce stromata [31].

Conidiophores are formed simply or in divergent to dense fascicles and can rarely form synnemata or sporodochia. They emerge through the stomata of an infected leaf or are sometimes erumpent through the cuticle; they are usually simple or sometimes branched, hyaline or variously pigmented (mostly olivaceous, olivaceous-brown or brown); continuous, i.e. one-celled (e.g. some *Passalora* species) or septate (e.g. *Cercospora* species) and composed of few cells (Fig. 4, Fig. 5). After liberating conidia, conidial scars are visible on conidiophores. They are usually conspicuous or inconspicuous, thickened, darkened, protuberant or not, distinctly dark coloured or colourless [10,31].

Conidia are usually straight or curved, sinuous or "vermiform", acicular, clavate, obclavate, cylindrical, filiform or fusiform (Fig. 6), aseptate or usually with numerous, distinct or indistinct septa (Fig. 7). Conidia also vary in colour (from hyaline to olivaceous or brown) and size. The length varies from 10 to over 200 µm (especially in acicular conidia of *Cercospora* species produced under humid conditions). The width can be divided into three ranges: 1–3 µm, 4–6 µm, or 7–10 µm. The surface of conidia is usually smooth, but in some species conidia may be verrucose. The shape of the apical and basal cell plays an important role. In pure culture, growth and sporulation are usually poor [10–12,31].

Conidia are formed through budding of conidiogenous cells, but the conidial wall is built of the same layers as the wall of the conidiophore (holoblastic type of conidiogenesis). Conidium, either formed singly or in chains, may arise from a single conidiogenous locus per conidiogenous cells (monoblastic) or usually from two or several per conidiogenous cells (polyblastic). Sympodial proliferation in cercosporoid fungi occurs by lateral formation of a new axis of the conidiophore after conidium production. Conidia secession being schizolitic involves separation of the wall so that a half becomes the conidial wall, while the other half remains on the conidiogenous cell. Usually thickened and darkened conidiogenous loci (scars) and hila are visible on conidiophores and conidia after conidial secession from conidiophores (Fig. 5a, Fig. 8).

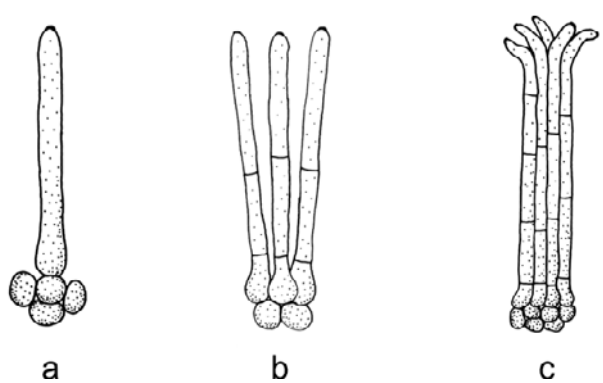

Fig. 4 Conidiophores. **a** Simple. **b** In fascicle. **c** Synnema.

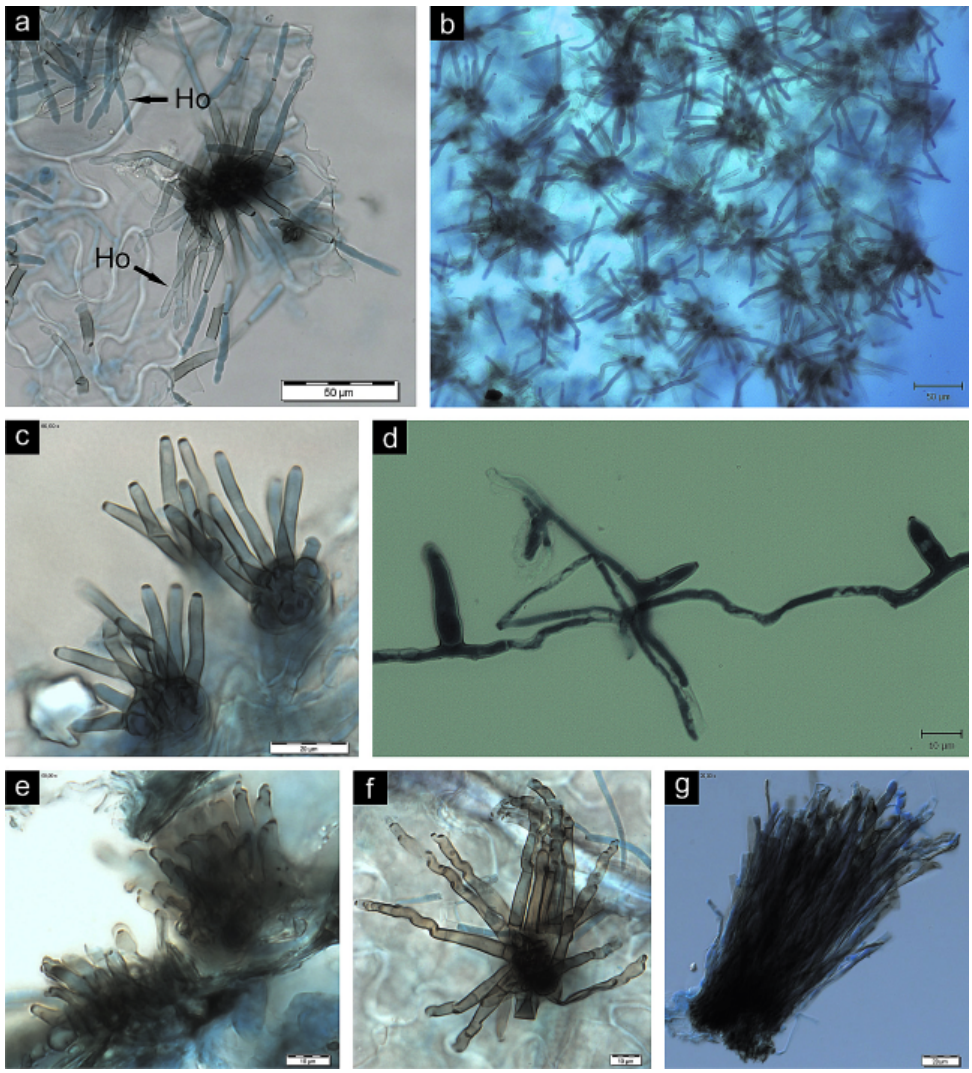

Fig. 5 Conidiophores. **a,c** *Cercospora paridis* on *Paris quadrifolia*. **b** *C. chenopodii* on *Chenopodium album* (caespituli on leaf). **d** *Passalora acericola* on *Acer pseudoplatanus*. **e** *P. avicularis* on *Polygonum aviculare*. **f** *C. mercurialis* on *Mercurialis perennis*. **g** *Pseudocercospora griseola* f. *griseola* on *Phaseolus vulgaris*. Ho – holoblastic conidiogenesis.

Cercosporoid fungi parasitize mostly angiosperms, but hyperparasites of rust fungi (Pucciniales) are also known, e.g. *Passalora acori* (J.M. Yen) U. Braun & Crous parasitizing uredospores of *Uromyces sparmanii* Clint. & Peck [10]. Optimal conditions for development, which are conducive to the formation of conidia, include high relative humidity and moderate temperature. *Cercospora beticola* parasitizing leaves of sugar beets prefers temperatures range from 25 to 30°C during the day, temperatures at night above 16°C and high (95–100%) air humidity for optimal development [109]. Light also plays an important role

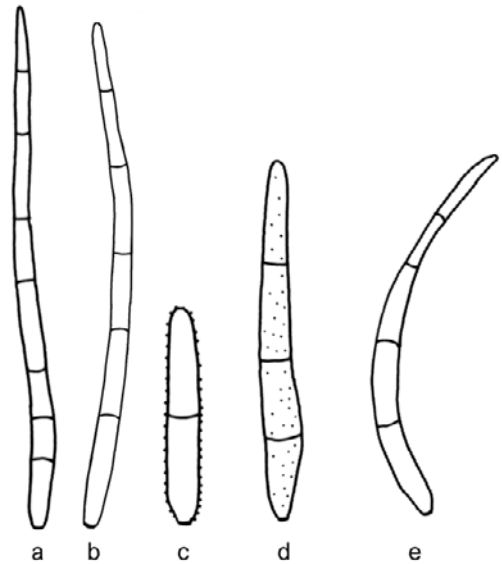

Fig. 6 Conidial shapes. **a** Acicular. **b** Filiform. **c** Cylindrical, straight, verruculose. **d** Obclavate. **e** Curved.

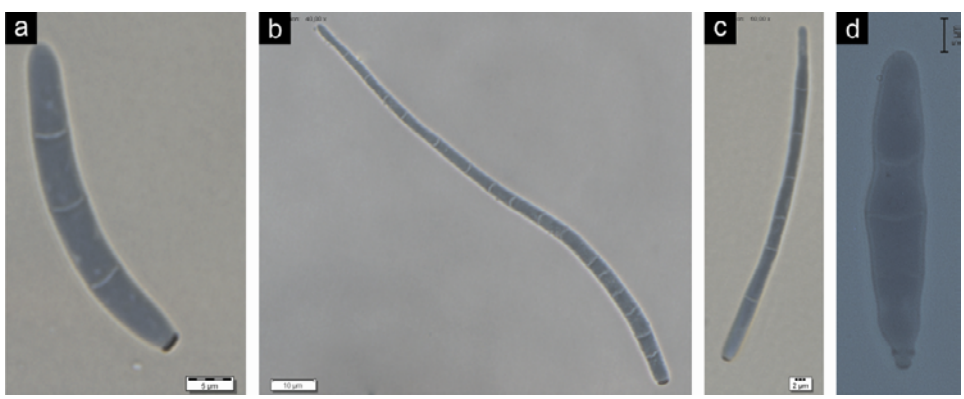

Fig. 7 Conidia. **a** *Cercospora paridis* on *Paris quadrifolia*. **b** *C. violae* on *Viola reichenbachiana*. **c** *C. mercurialis* on *Mercurialis perennis*. **d** *C. chenopodii* on *Chenopodium album*.

in the pathogenesis. A study that involved shading coffee leaves showed that the number of leaf spots produced as a result of *Cercospora coffeicola* Berk & Cooke parasitism was definitely lower. Additionally, the symptoms of infection caused by *C. beticola* were delayed if the sugar beet grew in places with lower light intensity [34].

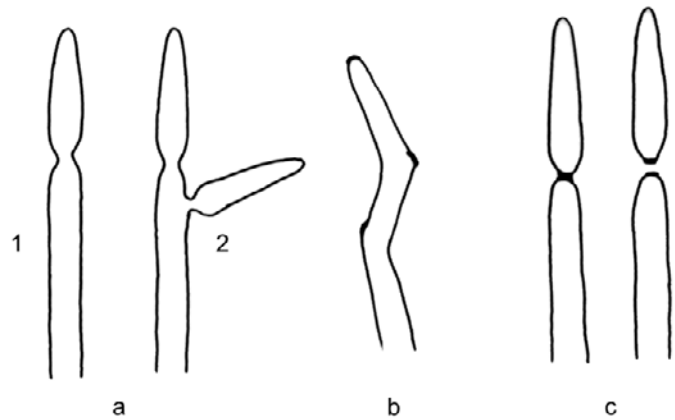

Fig. 8 Emergence of conidia. **a** Holoblastic conidiogenesis (1 – monoblatic; 2 – polyblastic). **b** Sympodial proliferation. **c** Schizolitic secession of conidia.

Anamorphic stages of this fungal group are obligate parasites. Taking into account the whole life cycle, they should be classified as facultative saprotrophs, i.e. parasites with an initial parasitic phase and final saprobic habit, i.e. they finish their life cycles on dead tissue of leaf spots that they have caused themselves. The perfect stage has been documented for a few species of cercosporoid fungi so far. Numerous species, maybe even most of them, are asexual holomorphs, which have lost the ability to form sexual morphs at all, but reliable, scientifically proven results are usually lacking. In Poland, only a single teleomorphic stage is known for a cercosporoid fungus, while worldwide several other cases have been published, but most of them are little reliable, poorely documented and mostly not properly experimentally proven. *Mycosphaerella cerasella* Aderh., which represents the sexual morph of *Passalora circumscissa*, has been recorded from Poland [110].

5. Occurrence

In the present paper, 115 species of cercosporoid fungi are reported. Up to date, 63 species of cercosporoid fungi, including 29 from the genus *Cercospora*, 30 from *Passalora*, and 4 *Pseudocercospora*, have been reported in Poland. They represent only 10% of the taxa known worldwide. The other 46 species are expected to be found in Poland due to the occurrence or cultivation of potential host species in the Polish flora. Nine species represent quarantine fungi included in the regulation of the Minister of Agriculture and Agricultural Reform, regulation of the Minister of Environment, and regulation of the Minister of Agriculture and Rural Development. Additionally, six species (*Cercospora curvata*, *C. fragariae*, *C. meliloti*,

C. ononidis, *C. pietrenii*, *C. violae-sylvaticae*) need taxonomical revision and have possibly to be transferred to different genera.

The fungi listed in this study parasitize 221 taxa of host plants from 131 genera and 47 families, of which 158 taxa belonging to 94 genera and 29 families have been found in Poland. Only one species has been published on a member of Pteridophyta – *Passalora pteridis*, but after revision, the host species was identified as *Dryopteris carthusiana* on which *Cercospora camptosori* or *C. dryopteridis* may occur, which might be found in Poland.

The largest numbers of fungal parasitic species in Poland have been reported from representatives of Apiaceae (8), Leguminosae (7), and Rosaceae (5). The family Poaceae with the largest number of host species (31) was parasitized by two fungal species only. One fungus was found on a single host species within 15 families. A majority of fungal species infects hosts from one genus only, except for *P. graminis* (31 host species), *P. depressa* (9), and *C. apii*, which are polyphagous species.

Cercosporoid fungi are parasites causing diseases of numerous vascular plants. Almost 53% of all Polish hosts of the studied fungi represent usable plants, i.e. wild-growing plants used by humans and cultivated plants (cf. [111]). Among them, the most frequently occurring species include: *Cercospora beticola* on representatives of the genus *Beta*, *C. armoraciae* on *Armoracia rusticana*, and *C. carotae* on *Daucus carota*, *C. chenopodii* on representatives of the family Amaranthaceae, *C. depazeoides* on representatives of *Sambucus*, *Passalora circumscissa* on representatives of the family Rosaceae, *P. concors* on *Solanum tuberosum*, *P. ferruginea* on species of the genus *Artemisia*, *P. graminis* on ture grasses (Poaceae), *P. microsora* on *Tilia*, and *P. punctum* on *Anethum graveolens* and *Petroselinum crispum*.

6. Economic importance and control

Cercosporoid fungi are important economically. Many of them cause significant loss of cultivated plants grown or otherwise used by man. The most important parasites include *Cercospora beticola*, *C. armoraciae*, *C. carotae*, *Passalora circumscissa*, *P. concors*, *P. graminis*, and *P. punctum*. Short characteristics of three most important diseases – *Cercospora* leaf spot (CLS) on sugar beet and carrot, and celery early blight are listed below.

Cercospora leaf spots on sugar beet is a disease caused by *Cercospora beticola*, the most dangerous pathogen of beets (*Beta* spp.). An increased threat from *C. beticola* has been noted in our country since the 90's of the 20th century. This is due to introduction of sugar beet varieties with low resistance to this pathogen to the Polish market [112]. The greatest intensity of prevalence of *C. beticola* (70–98% of infected plants) was noted in Lublin Voivodeship in 1999, especially in the surroundings of Zamość [113,114]. This was a consequence of the changing of harvest technology, limited use of leaf silage as cattle feed, and leaving leaves in the soil as a green fertiliser [109]. At high temperature and humidity, this fungus can destroy up to 50% of crop yield [115]. In the case of severe infections, the foliage is destroyed (Fig. 9), which is then intensively reconstructed by infected plants. This

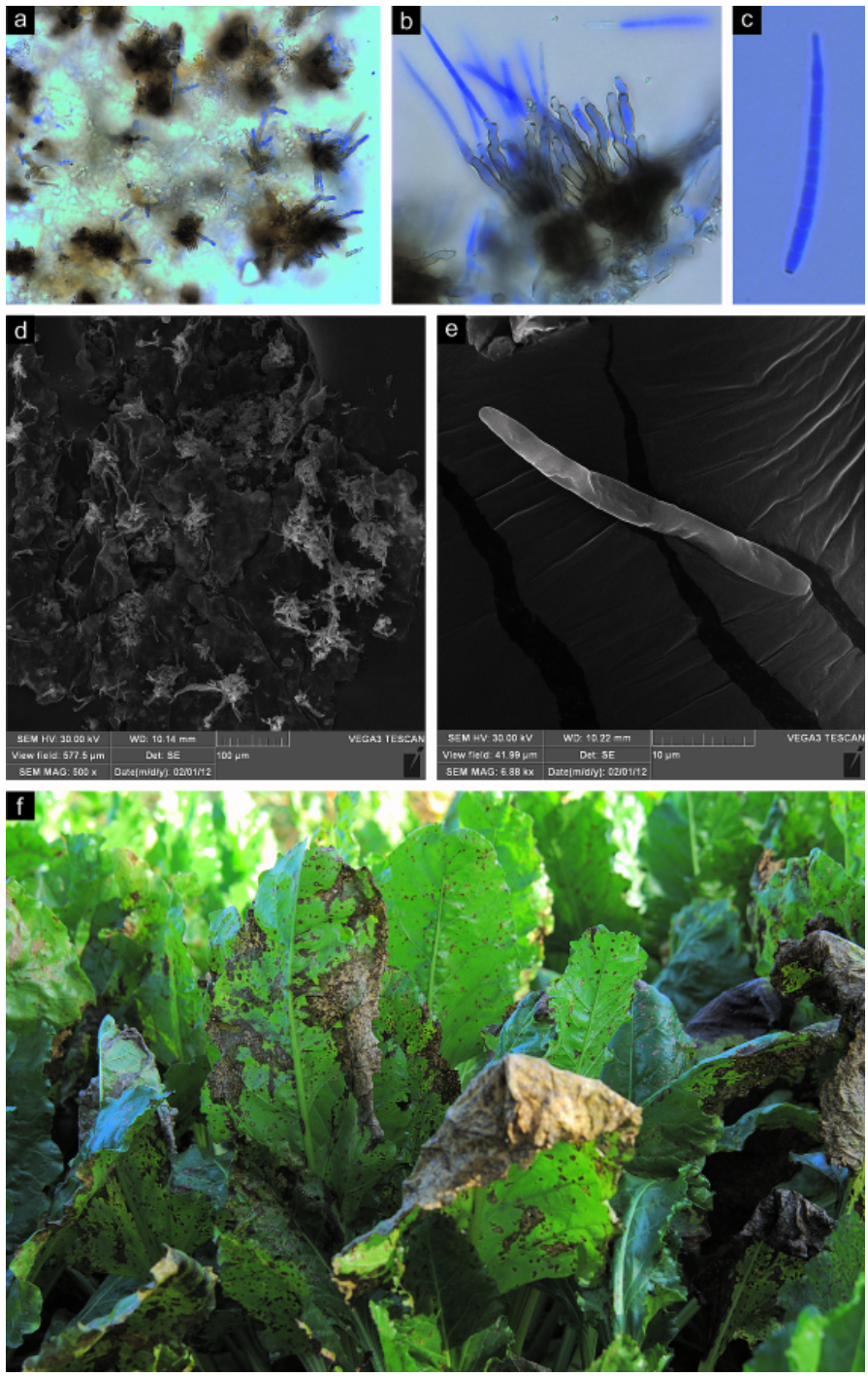

Fig. 9 *Cercospora beticola* on *Beta vulgaris*. **a,b,d** Caespituli formed by conidiophores and conidia. **c,e** Conidia. **f** *Beta vulgaris* infected by *C. beticola*.

happens at the expense of the distribution of sugar accumulated in the root, which is transported to newly forming leaves. The progressive infection process as well as withering of other leaves and production of new leaves lead to formation of distinctive conical roots. As a result, inhibition of the weight increase occurs, accompanied by a decline in the sugar content and technological quality of juice [109,116,117].

Agrotechnical and chemical methods are used for protection of beet against *C. beticola*. The agrotechnical method involves selection of an appropriate position for cultivation. Intervals in the cultivation of beet on the same field should not be shorter than four years. In the case of presence of infested leaves in soil, the first infections occur by up to 4 weeks earlier. Direct neighbourhood with fields, where beets were cultivated in the previous year, should also be avoided. For several years, beet varieties with high resistance to the pathogen have also been available [109]. However, the basic and the best means of direct control of the disease being repeated spraying in plantations with fungicides during the season [114]. *Cercospora beticola* has been placed on the list of pathogenic organisms, causing epidemics among crop plants [regulation of the Minister of the Environment of 29 November 2002 concerning the list of pathogenic organisms and their classification, as well as the measures necessary for the individual degrees of containment, *Dziennik Ustaw* (Journal of laws of the Republic of Poland) of 16 December 2002, No. 212, item 1798, annex No. 1].

Celery early blight is caused by *Cercospora apii*; it rapidly develops above all in the first half of the growing season of *Apium graveolens*. The aetiology of the disease is complicated by the fact that another species of the genus *Cercospora* parasitizing celery leaves, viz. *Cercospora apiicola* M. Groenew., Crous & U. Braun, has been recently described [118,119]. The development of this disease is very dynamic, especially in the first half of summer. In favourable, provocative conditions, the pathogen can cause crop infections in a devastating degree. All overground parts of the plant, i.e. leaf blade, petiole, and in the case of seed crops shoots, umbels, and fruits may also be parasitized. Severe infections of overground parts lead to a significant decrease in the weight of storage roots, and the reduction can reach as much as 90% [119,120]. The paralysis of foliar celery by *C. apii* significantly affects its taste value and colour. Diseased plants are characterized by a lower sugar content and less intense colour [121]. All varieties of root and foliar celery studied so far were characterised by a very high susceptibility to infestation by *C. apii*. The main source of primary infection refers to remnants of paralysed plants [120].

Cercospora leaf blight of carrot is a disease observed in carrot cultivations. Symptoms of the disease are visible as spots (necroses), which are sometimes confluent and cover a significant part of the leaf blade, and even may lead to foliage destruction. As in the case of the species mentioned before, production of new leaves proceeds by the expense of roots. Remnants of infected plants from the previous growing seasons, which remain in soil for up to four years, are also the main source of infection caused by *C. carotae*. The use of plant protection products, mainly fungicides, reduces the presence of *C. carotae* [122].

In the case of all the diseases mentioned above, a very important preventive factor is destruction of infected remnants of plants at the end of the growing season and application of fungicides in the case of appearance of the first infection symptoms.

7. Taxonomy

In the present study, cercosporoid species occurring in Poland and additional species deposited in Polish herbaria and to be expected in Poland are reported. The quarantine species listed in the regulation of the Minister of Agriculture and Agricultural Reform of 19 March 1984, regulation of the Minister of Environment of 29 November 2002, and regulation of the Minister of Agriculture and Rural Development of 21 February 2008, are also included. All genera and particular species are listed alphabetically. This chapter contains a dichotomous key to the genera concerned. Additionally, the doubtful species are described in a separate chapter. Each subsection of the "Taxonomy" chapter provides information about synonymy, type species, and short characteristics of the biology of each genus. Additionally, dichotomous keys to the species based on host plant families are presented.

The following data are provided within the genera:

- names of species with references
- synonyms
- full description
- hosts and distribution in Poland
- geographical distribution
- notes (if necessary).

An asterisk (*) placed at the end of the name indicates that the species concerned have not yet been detected in Poland but might be found due to the presence of their hosts species in the Polish flora or cultivation in Poland. According to Crous and Braun [11], species included in *C. apii* s. l. have an additional name "*Cercospora apii* s. l." in brackets under the current name. All known synonymy are mostly based on available monographs and single papers describing and dealing with the species concerned. Descriptions of species are primarily based on herbarium material or literature. Host plant species are listed alphabetically. Information about the distribution of fungal species in Poland is based on literature data from physiographic literature and herbarium collections. All listed localities are grouped into geobotanical regions, marked in the text with the appropriate symbols, according to Matuszkiewicz [123]. Herbarium acronyms given in parentheses refer to revised material. Notes about general distribution are based on the monographs of Chupp [13], Braun and Melnik [55], Crous and Braun [11], single published papers, as well as the fungal database website [124]. Countries listed in the general distribution are arranged in alphabetical order, first European, and then, after semicolon from other continents. In the case of species reported from Poland, drawings were made when the amount of material was sufficient.

Abbreviations:

- auct. = *auctoris*/*auctorum* – of an author(s)
- comb. inval. = *combinatio invalida* – invalid combination
- comb. superfl. = *combinatio superfluum* – superfluous combination
- diam. – diameter
- distr. – district
- emend. = *emendavit* – he/she corrected
- et al. = *et alii* / *et alliorum* – and others / and of others

- exs. = *exsiccata* – exsiccates
- fig. – figure
- leg. = *legit* – collected
- mm – millimetre(s)
- Mt – mount
- Mts – mountains
- n. – near
- N.N. = *nomen nescio* – anonymous/unnamed person
- nom. ambig. = *nomen ambiguum* – ambiguous name
- nom. dub. = *nomen dubium* – doubtful name
- nom. illeg. = *nomen illegitimum* – illegitimate name
- nom. inval. = *nomen invalidum* – invalid name
- nom. nud. = *nomen nudum* – no diagnosis
- nom. rej. = *nomen rejiciendum* – rejected name
- nom. superfl. = *nomen superfluum* – superfluous name
- p./pp. – page/pages
- p.p. = *pro parte* – partially
- s. l. = *sensu lato* – in a wide sense
- s. str. = *sensu stricto* – in a narrow sense
- St. – street
- Teleo. = teleomorph
- var. = *varietas* – variety

Geobotanical regions of Poland (acc. to Matuszkiewicz [123]):

- A1 – Baltic Seaside Geobotanical Region
- A2 – South Baltic Coast Geobotanical Region
- A3 – Szczecin Geobotanical Region
- A4 – Middle Pomeranian Lake Geobotanical Region
- A5 – Sander Foreground of Middle Pomeranian Lake Geobotanical Region
- A6 – East Pomeranian Geobotanical Region
- B1 – Noteć-Lubusz Geobotanical Region
- B2 – Middle Wielkopolska Geobotanical Region
- B3 – Kuyavian Geobotanical Region
- B4 – South Wielkopolska-Lusatia Geobotanical Region
- B5 – Lower Silesia Geobotanical Region
- C1 – Łódź-Wieluń Hills Geobotanical Region
- C2 – Middle Małopolska Uplands Geobotanical Region
- C3 – Upper Silesia Geobotanical Region
- C4 – Kraków-Częstochowa Jurassic Highland Chain
- C5 – Miechów-Sandomierz Uplands Geobotanical Region
- C6 – The Świętokrzyskie Mountains Geobotanical Region
- C7 – Oświęcim Valley Geobotanical Region
- C8 – Sandomierz Valley Geobotanical Region
- C9 – Roztocze Geobotanical Region
- C10 – West Opole Geobotanical Region
- D1 – West Volhynia Geobotanical Region

- E1 – Culmerland-Dobrzyń Geobotanical Region
- E2 – North Masovia-Kurpie Geobotanical Region
- E3 – South Masovia-Podlachia Geobotanical Region
- E4 – Lublin Upland Geobotanical Region
- E5 – South Polesia Geobotanical Region
- F1 – Masuria Geobotanical Region
- F2 – Augustów-Suwałki Geobotanical Region
- F3 – North Podlachia Geobotanical Region
- G1 – Sudetian Geobotanical Region
- G2 – Sudetian Foothills Geobotanical Region
- H1 – West Carpathians Geobotanical Region
- I1 – East Carpathians Geobotanical Region.

Identification key to cercosporoid genera (based on Crous and Braun [11]):

1 Conidiogenous loci (scars) inconspicuous (unthickened, not darkened) or subconspicuous ..... ***Pseudocercospora*** (p. 125)

1* Conidiogenous loci (scars) conspicuous, thickened and darkened **2**

2 Conidia hyaline or subhyaline, mostly scolecosporous, acicular, obclavate, filiform, and usually pluriseptate, occasionally amero- to phragmosporous (but then consistently hyaline) ..... ***Cercospora*** (p. 25)

2* Conidia mostly pigmented (usually olivaceous or olivaceous-brown), ellipsoid-ovoid, cylindrical, fusoid, usually with few septa, occasionally more scolecosporous and pluriseptate (but then consistently pigmented) ..... ***Passalora*** (p. 80)

7.1. *Cercospora* Fresen.

in Fuckel, Hedwigia 1(15): 133. 1863 (and in Fuckel, Fungi Rhen. Exs., Fasc. II, No. 117. 1863).

= *Virgasporium* Cooke, Grevillea 3: 182. 1875.
= *Cercosporina* Speg., Anales Mus. Nac. Buenos Aires 20: 424. 1910.

Type species: *Cercospora penicillata* (Ces.) Fresen.
= *Cercospora depazeoides* (Desm.) Sacc.

Description. Asexual morphs without or with mycosphaerella-like sexual morphs or asexual holomorphs; Mycosphaerellaceae. Mostly phytopathogenic, rarely saprobic or secondary invaders; usually causing leaf spots, rarely symptomless or almost so. Mycelium mostly internal, rarely also external; hyphae hyaline, pale olivaceous or brown, septate, branched, smooth or rarely faintly rough-walled. Stromata lacking to well-developed, pale olivaceous or brown, substomatal or intraepidermal.

Conidiophores solitary or fasciculate, rarely in sporodochial conidiomata, arising from internal hyphae or stromata, emerging through stomata or erumpent through the cuticle, usually olivaceous-brown, rarely hyaline or pale olivaceous, erect, geniculate or geniculate-sinuous, simple or branched, aseptate to pluriseptate, conidiogenesis monoblastic or mostly polyblastic, proliferation sympodial; conidiogenous loci (scars) conspicuous, thickened and darkened-refractive, planate.

Conidia solitary or very rarely catenate, scolecosporous, obclavate, cylindrical, filiform, acicular, occasionally amero- to phragmosporous, hyaline or almost so (with pale greenish tinge/shade), usually pluriseptate, euseptate, rarely with 0–1 or few septa, straight or curved; hila thickened and darkened, planate.

Keys to the *Cercospora* species

Spermatophyta, Angiospermae

Adoxaceae

1 Conidiophores 30–140 × 3–5 µm; conidia pale olivaceous, to 135 µm long; on *Sambucus* ..... ***C. depazeoides***
1* Conidiophores 25–60 × 4–5.5(–6) µm; conidia to 205 µm long; on *Viburnum* ..... ***C. viburnicola***

Alismataceae

A single species ..... ***C. sagittariae***

Amaranthaceae

1 Conidia pluriseptate (3–18-septate), to 225 µm long and 2.5–4.5 µm wide ..... ***C. beticola***
1* Conidia usually 1–3-septate, 4–6(–7.5) µm wide **2**
2 Conidia 17–58 × 4–6 µm; conidiophores aseptate, 25–45 × 3.5–5.5 µm ..... see ***C. pietrenii*** (doubtful and excluded taxa)
2* Conidia mostly 25–85 × 4–7.5 µm; conidiophores 2–3-septate, 30–137 × 4–7 µm ..... ***C. chenopodii***

Apiaceae

1 Caespituli usually hypophyllous; conidiophores 1–3-septate, 30–95 × 3.5–5 µm; conidia acicular or filiform, hyaline 5–15-septate ..... ***C. apii***
1* Caespituli amphigenous; conidiophores aseptate or with 1 septum, 10–37.5(–45) × 3–4.5(–5) µm; conidia 1–6-septate, to 80 µm long ..... ***C. carotae***

Araceae

A single species ..... ***C. ari***

Aristolochiaceae

A single species ..... ***C. olivascens***

Asparagaceae

1 Conidiophores to 175 µm long; conidia pale olivaceous or pale olivaceous-brown, narrowly obclavate, to 140 µm and 5–7 µm wide; on *Maianthemum* ..... ***C. maianthemi***
1* Conidiophores to 90 µm long; conidia hyaline, acicular, to 105 µm long and 2.5–4 µm wide; on *Asparagus* ..... ***C. asparagi***

Balsaminaceae

A single species……***C. campi-silii***

Boraginaceae
A single species……***C. echii***

Brassicaceae
A single species……***C. armoraciae***

Compositae
1 Conidia short, (30–)50–80 µm; on *Calendula*……***C. calendulae***
1* Conidia longer, to 200 µm……**2**
2 Conidia 3–6 µm wide; on *Senecio*……***C. senecionis***
2* Conidia 2–3.5 µm wide; on *Tragopogon*……***C. tragopogonis***

Convolvulaceae
A single species……***C. ipomoeae***

Cyperaceae
A single species……***C. caricis***

Euphorbiaceae
1 Conidiophores 15–65 × 4–5.5 µm; conidia 30–150 × 3–5.5 µm; on *Mercurialis*……
……***C. mercurialis***
1* Conidiophores mostly 50–140 × 3.5–6 µm; conidia (15–)44–176 × 2.5–5 µm; on *Ricinus*……***C. ricinella***

Hydrangeaceae
A single species……***C. angulata***

Leguminosae
1 Conidiophores and conidia dimorphic; on *Ononis*……
……see ***C. ononidis*** (doubtful and excluded taxa)
1* Conidiophores and conidia not dimorphic……**2**
2 Conidiophores in acervuli; conidia filiform, indistinctly septate, 25–55(–60) × 1.5–3 µm; on *Robinia*……see ***C. curvata*** (doubtful and excluded taxa)
2* Conidiophores not in acervuli……**3**
3 Conidiophores to 45 µm long, dark brown; conidia 35–92.5 × 3–5 µm, usually 3-septate; on *Vicia*……***C. zonata***
3* Conidiophores in fascicles, usually longer than 45 µm……**4**
4 Conidiophores to 60 µm long; conidia usually to 65 µm long……**5**
4* Conidiophores usually not longer than 150 µm……**6**
5 Conidiophores 3–4 µm wide; conidia 2–3 µm wide; on *Melilotus*……
……see ***C. meliloti*** (doubtful and excluded taxa)
5* Conidiophores 4–5 µm wide; conidia 3–5 µm wide; on *Securigera*……***C. rautensis***
6 Conidiophores usually not longer than 150 µm……**7**
6* Conidiophores to 220 µm long and 6.5 µm wide; on *Glycine*……**8**

7 Caespituli amphigenous; conidia not wider than 4.5 µm……**10**
7* Caespituli usually epiphyllous; conidia to 5 µm wide……**9**
8 Conidia 50–220(–375) × 2.5–5 µm……***C. sojina***
8* Conidia 20–88 × 4–8 µm……***C. kikuchii***
9 Conidia acicular, 3–18-septate, 30–130 × (2.5–)3–5 µm; on *Lotus*……***C. loti***
9* Conidia acicular, obclavate or cylindrical, 3–16-septate; on *Anthyllis*……***C. radiata***
10 Conidia hyaline, not longer than 120 µm……**11**
10* Conidia hyaline or pale olivaceous, to 147.5 µm long, 5–12-septate, filiform or acicular; on *Trifolium*……***C. zebrina***
11 Conidia acicular……**12**
11* Conidia acicular or cylindrical, 3–11-septate, 25–120 × 3–4.5 µm; on *Trigonella*……
……***C. traversiana***
12 Conidia 20–115 × 3–4.5 µm, 1–10-septate; on *Medicago*……***C. medicaginis***
12* Conidia 45–110 × 2.5–4.5 µm; on *Galega*……***C. galegae***

Juncaceae
A single species……***C. juncina***

Lamiaceae
A single species……***C. kabatiana***

Malvaceae
1 Leaf spots angular or irregular, conidiophores 30–105 × 4–6 µm, conidia (25–)40–140 × 3–5 µm……***C. althaeina***
1* Spots on stems oval or eliptic, conidiophores 20–45 × 4.5–5 µm, conidia 20–70 × 2.5–4.5 µm……***C. nebulosa***

Melanthiaceae
A single species……***C. paridis***

Orchidaceae
A single species……***C. epipactidis***

Plantaginaceae
1 Caespituli amphigenous, but mostly hypophyllous, greyish white; conidiophores 9–47 × 2.5–4(–4.5) µm; conidia aseptate or usually 1–9-septate, 20–90 µm long……
……***C. pantoleuca***
1* Caespituli amphigenous, but mostly epiphyllous, brown to grey; conidiophores 20–104(–300) × 3.5–5.5 µm; conidia 5–18-septate, 40–182 µm long……***C. plantaginis***

Poaceae
A single species……***C. setariae***

Polygonaceae
A single species……***C. fagopyri***

Ranunculaceae

A single species……***C. moravica***

Resedaceae

A single species……***C. resedae***

Rosaceae

A single species……see ***C. fragariae*** (doubtful and excluded taxa)

Solanaceae

1 Conidiophores 35–80 µm; conidia 45–100 µm long; on *Solanum*……***C. solani***
1* Conidiophores and conidia longer……**2**
2 Conidiophores and conidia to 200 µm long; on *Hyoscyamus*, *Nicotiana*…***C. physalidis***
2* Conidiophores and conidia to 200 µm long; conidia up to 250 µm long; on *Lycium*……
……***C. lycii***

Violaceae

1 Conidia hyaline or pale olivaceous, cylindrical or obclavate, usually 3-septate, 35–92.5 × 3–5 µm……***C. violae***
1* Conidia hyaline, cylindrical, 3–7-septate, 45–70 × 4.5 µm……
……see ***C. violae-sylvaticae*** (doubtful and excluded taxa)

***Cercospora althaeina* Sacc.**

Michelia 1: 269. 1878.

= *Cercospora kellermanii* Bubák, J. Mycol. 9: 3. 1903.
= *Cercospora althaeina* var. *praecincta* Davis, Trans. Wisconsin Acad. Sci. 18: 260. 1915.
≡ *Cercospora praecincta* (Davis) Chupp, A monograph of the fungus genus *Cercospora*: 376. 1954.
= *Cercospora ramularia* Siemaszko, Izv. Kavkazsk. Muz. 12: 28. 1919, and Arch. Nauk Biol. Towarz. Nauk. Warszawsk. 1: 49. 1923.
≡ *Cercosporina ramularia* (Siemaszko) Sacc., Syll. Fung. 25: 910. 1931.
= *Cercospora althaeina* var. *althaeae-officinalis* Săvul. & Sandu, Hedwigia 73: 127. 1933.
= *Cercospora althaeicola* J.M. Yen & S.K. Sun, Cryptog. Mycol. 4: 189. 1983.

Exs. on *Alcea rosea*: Rabenhorst-Winter, Fungi Eur. Exs. 3584 (WA 28577); on *Althaea officinalis*: Săvulescu, Herb. Mycol. Roman., Fasc. 9, No. 442 (KRA-F 1931-49).

Description. Leaf spots on the upper surface, scattered or confluent, on the lower surface indistinct, usually angular or irregular, mostly vein-limited, 1–6 mm diam., usually olivaceous-brown, sometimes greyish brown with brown margin. Caespituli amphigenous, but mostly epiphyllous. Mycelium internal; hyphae septate, branched; stromata composed of a few brown, swollen hyphal cells, emerging through stomata or erumpent through the cuticle. Conidiophores 6–18 in divergent fascicles, pale olivaceous-brown at the base and paler upwards, usually 1–3-septate, substraight or mildly sinuous, 0–4 times mildly geniculate, not branched, 30–105 × 4–6 µm. Conidia solitary, hyaline or pale olivaceous, filiform or from obclavate to cylindrical, 3–13-septate, non-constricted at the septa, (25–)40–140 × 3–5 µm (Fig. 10).

Hosts. On Malvaceae. ***Alcea rosea*** L.: B4 – Góra n. Leszno [87].

Geographical distribution. Worldwide: Bulgaria, Germany, Italy, Lithuania, Poland, Romania, Russia, Ukraine; Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Brazil, Canada, China, Cuba, Georgia, Guatemala, India, Iran, Jamaica, Japan, Kazakhstan, Kenya, Kirghizia, Korea, Malawi, Malaysia, Mauritius, Moldova, Myanmar, New Zealand, Pakistan, Tadzhikistan, Taiwan, USA, Zambia, Zimbabwe.

Notes. A true *Cercospora* s. str. close to *C. apii* s. l., but distinguished by obclavate-cylindrical conidia with obconically truncate bases [11].

The fungus has been reported on many representatives of Malvaceae worldwide. Groenewald et al. [24] suggested that an isolate from *Malva* sp. represented a different taxon, as indicated by molecular studies.

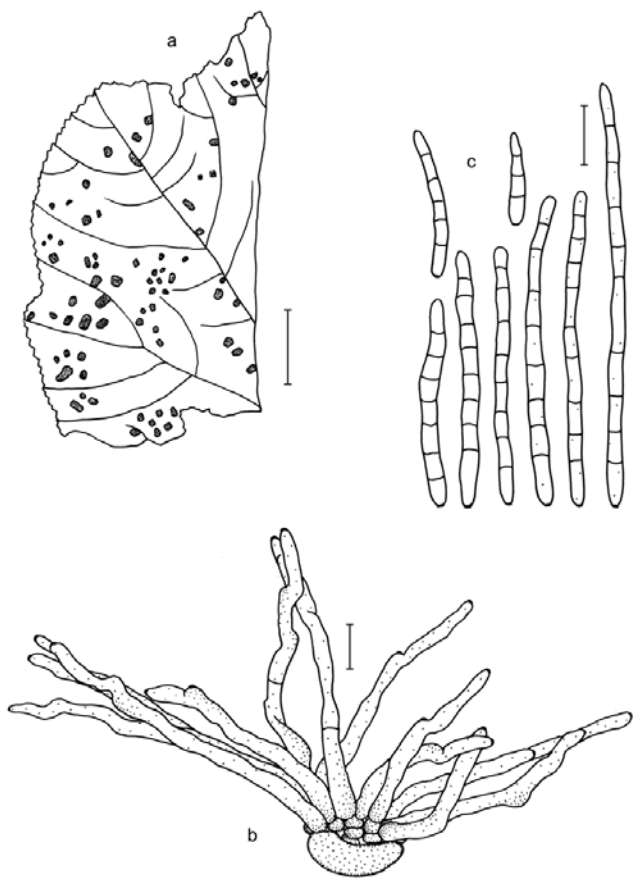

Fig. 10 *Cercospora althaeina* on *Alcea rosea* (WA 28577). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

Cercospora angulata G. Winter*

Hedwigia 24: 202. 1885.

(= *Cercospora apii* s. l.)

Exs. on *Philadelphus coronarius*: Rabenhorst-Winter, Fungi Eur. Exs. 3588 (WA 28822).

Description. Leaf spots circular or angular, 2–4 mm diam., centre greyish, margin dark purple to brown. Caespituli amphigenous, but mostly epiphyllous. Conidiophores in divergent fascicles, pale olivaceous-brown, distinctly pluriseptate, rarely geniculate, 50–5(–120) × 4–5 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, 42.5–120 × 3–3.5 µm.

Hosts. On Hydrangeaceae. ***Philadelphus coronarius*** L.: USA – surroundings of Perryville (Missouri), Aug. 1883, leg. C.H. Demetrio (WA 28822).

Geographical distribution. China, Russia (Asian part), USA.

Notes. The fungus was found outside Poland but deposited in a Polish herbarium.

The host species and two others members of *Philadelphus*, on which the fungus has been reported worldwide, are cultivated in Poland; therefore, it is possible to find this fungus in Poland.

Cercospora apii Fresen.

Beitr. Mykol. 3: 91. 1863, emend. Groenewald et al. Phytopathology 95: 954. 2005.

≡ *Cercospora penicillata* var. *apii* Fuckel, Hedwigia 2: 132. 1863.
= *Cercospora apii* f. *dauci-carotae* Ellis & Everh., N. Amer. Fungi 2482. 1890 (nom. nud.).
= *Cercospora levistici* Kvashnina, Izv. Severo-Kavkazsk. Kraev. Stantsii Zashch. Rast. 4: 38. 1928.
= *Cercospora apii* f. *clerodendri* Sobers & Martinez, Proc. Florida State Hort. Soc. 79: 433. (1966)1967 (nom. inval.).

Exs. on *Apium graveolens*: Saccardo, Mycoth. Ven. 1053 (KRA-F 1876-198).

Description. Leaf spots amphigenous, scattered or confluent, circular or irregular, 2–10 mm diam., greyish or brown, with a narrow, dark margin. Caespituli amphigenous, mostly hypophyllous. Mycelium internal; hyphae septate, branched, hyaline; stromata small, composed of several brown, swollen hyphal cells. Conidiophores 5–10(–18) in divergent fascicles, olivaceous-brown, 1–3-septate, straight or slightly curved, not branched, 30–95 × 3.5–5 µm. Conidia solitary, hyaline, acicular or filiform, shorter obclavate-cylindrical, straight or mildly curved, (3–)5–15-septate, non-constricted at the septa, acute or obtuse at the apex, obconic or truncate at the base, 32.5–125 × 3–4.5 µm.

Hosts. On representatives of several plant families. ***Anethum graveolens*** L.: A3 – surroundings of Szczecin [125]; B2 – Węgierki n. Września [67,74,87]; ***Apium graveolens*** L.: B1 – Poznań [126]; B2 – Gniezno, Kościan [126]; C3 – Węgrzce [87]; E1 – Bydgoszcz [127]; E3 – Mińsk Mazowiecki, Ostrów Mazowiecki, Radzików, Stanisławów, Warszawa – Ursynów distr., Warszawa – Wilanów distr. [87]; ***Daucus carota*** L.: A3 – surroundings of Szczecin [125]; B1 – Dąbroszyn [87]; B5 – Legnica, Wrocław [87].

Geographical distribution. Common worldwide.

Notes. The present description refers only to the data from *C. apii* s. str. occurring on *Apium graveolens* and some additional hosts from the Apiaceae family.

The strong variation in the size and shape of conidiophores and conidia (conidiophores up to 300 µm long and 9 µm wide, conidia up to 315 µm long) is undoubtedly influenced by changes in environmental conditions, especially humidity.

Crous and Braun [11] introduced a concept of *C. apii* s. l. for species morphologically indistinguishable from *C. apii* on *A. graveolens*. They included 281 species in the synonymy of *C. apii* emend. (s. l.). In this study, the name *C. apii* s. l. in brackets was placed below the main fungus name, which indicates that this fungus is included in the *C. apii* complex according to Crous and Braun [11]. *Cercospora apii* has also been reported on *Anethum* sp. from Warszawa by Garbowski and Juraszkówna [79] and later cited by Wakuliński and Marcinkowska [87]. After revision of herbarium specimens the data were included in *Passalora punctum*. Wakuliński and Marcinkowska [87] wrongly cited the data of Michalski [127] on *A. graveolens* from Rynkowo and Bielawy. From the localities mentioned, Michalski reported *Passalora microsora* (= *Cercospora microsora*) on *Tilia cordata* Mill.

Cercospora apii var. *carotae* on *Daucus carota* reported by Michalski [128], Garbowski and Juraszkówna [79], and Leszczenko [80] was cited by Wakuliński and Marcinkowska [87] as *C. apii*. However, this variety is a synonym of *C. carotae* (see notes under *C. carotae*). Similarly, *C. apii* var. *petroselini* published by Garbowski and Juraszkówna [79] was also cited by Wakuliński and Marcinkowska [87] as *C. apii*, but it is also a synonym of *Passalora punctum* (see *P. punctum*).

Cercospora ari (Fautrey) Vasyag.*

in Schwarzman et al., Fl. Spor. Rast. Kazakhstana 8(2): 252. 1975.

≡ *Ramularia ari* Fautrey, Rev. Mycol. 17: 71. 1895.

Description. Leaf spots circular amphigenous, subcircular to irregular, 2–4 mm diam., brownish to grey. Caespituli epiphyllous. Mycelium internal; stromats lacking or small. Conidiophores in small fascicles, brown, 0–1-septate, subcylindrical, straight, 20– 65 × 3–6 µm. Conidia solitary, hyaline, cylindrical, 1–4-septate, apex obtuse to subacute, base truncate, 10–50 × 3–4 µm [129].

Hosts. On *Arum* spp., Araceae.

Geographical distribution. France, Italy, Spain; Kazakhstan, Libya.

Notes. *Cercospora ari* has been reported by Kućmierz [42,43] on *Arum maculatum* L. from Zamkowa Mt in Ojców. After revision, it turned out to be a *Colletotrichium* species [39]. The host should also be checked. Field research in southern Poland and revision of herbarium specimens from this region confirmed the occurrence of *Arum cylindraceum* Gasp. (= *A. alpinum* Schott & Kotschy) as only species. Occurrence of *A. maculatum* in Poland needs to be confirmed, because the species has a distinctly western distribution [130].

It is possible to find this fungus in Poland on *Arum*. *Cercospora ari* is an insufficiently known species with unclear generic affinity [129].

Cercospora armoraciae Sacc.

Nuovo Giorn. Bot. Ital. 8: 188. 1876.

= ?*Cercospora cheiranthi* Sacc., Nuovo Giorn. Bot. Ital. 8: 187. 1876.
= *Cercospora nasturtii* Pass., Hedwigia 16: 124. 1877.
= *Cercospora nasturtii* subsp. *barbareae* Sacc., Michelia 2: 557. 1882.
≡ *Cercospora barbareae* (Sacc.) Chupp, Farlowia 1: 579. 1944.
= *Cercospora bizzozeriana* Sacc. & Berl., Malpighia 2: 248. 1888.
= *Cercospora atrogrisea* Ellis & Everh., Proc. Acad. Nat. Sci. Philadelphia 45: 464. 1894.
= *Cercospora bizzozeriana* var. *drabae* Sousa da Câmara & J.V. Almeida, Revista Agron. (Lisbon) 1: 25. 1903.
= *Cercospora berteroae* Hollós, Ann. Mus. Nat. Hung. 5: 468. 1907.
= *Cercospora drabae* Bubák & Kabát, Hedwigia 52: 362. 1912.
≡ *Cercosporina drabae* (Bubák & Kabát) Sacc., Syll. Fung. 25: 900. 1931.
= *Cercospora camarae* Curzi, Atti Ist. Bot. Univ., Pavia, III, 2: 101. 1925.
= *Cercospora cardamines* Losa (as "*cardaminae*"), Anales Jard. Bot. Madrid 6: 453. 1946.
= *Cercospora lepidii* Niessl, unknown, in herb., HBG fide Chupp (1954, p. 180).

Exs. on *Armoracia rusticana*, Saccardo, Mycoth. Ven. 282 (KRA-F 1874-182); Sydow, Mycoth. Germ. 3396 (KRA-F 1938-70); on *Erysimum cheiri*: Saccardo, Mycoth. Ven. 281 (KRA-F 1874-183); on *Rorippa amphibia*: Sydow, Mycoth. Germ. 3398 (KRA-F 1936-105).

Description. Leaf spots scattered or confluent, circular, subcircular or irregular, (1–)2–6(–10) mm diam., pale brown, olivaceous-brown, grey or dingy grey, without distinct margin or with narrow, pale brown, brown or yellowish green margin. Caespituli amphigenous or sometimes chiefly epiphyllous. Mycelium internal; hyphae septate, branched, hyaline; stromata lacking or poorly developed, composed of a few swollen hyphal cells or up to 50 µm diam. Conidiophores mostly in divergent fascicles, pale yellow, olivaceous-brown or brown, 0–5-septate, straight or 1–2(–4) times geniculate in the upper part, not branched, 20–120(–170) × (3.5–)4–6.5 µm. Conidia solitary, hyaline or pale olivaceous, filiform, acicular, obclavate or cylindrical, straight or slightly curved, 2–14(–18)-septate, apex usually obtuse, base truncate or rounded, (22.5–)30–145 × (2.5–)3–5 µm (Fig. 1a, Fig. 2a, Fig. 11).

Hosts. On Brassicaceae. ***Armoracia rusticana*** P. Gaertn., B. Mey. & Scherb.: A3 – Szczecin [125,131]; Przelewice n. Szczecin [87,132]; B1 – Poznań [74,87]; Nakło, 10 Sep. 1972, leg. A. Michalski (WA) [87,128]; B2 – Węgierki n. Września [67,74]; B3 – Kościelec n. Koło, 22 Sep. 1933, leg. K. Żelazowska (WA 29733) [126]; Rogów [87]; C1 – Łódź [80,87]; C4 – Olsztyn n. Częstochowa – Botaniczna St., 21 Aug. 1998 (LOD 2723) [54]; D1 – Chełm [87,133]; E2 – Myszyniec [134]; Kęczewo n. Mława, 10 Aug. 1933, leg. N.N. (WA 2980) [126]; E3 – Warszawa – Ursynów distr., Węgrów [87]; Warszawa, 23 Aug. 1947, leg. O. Kędzierska (WA 4131); Cyganówka n. Garwolin, 25 Sep. 1975, leg. J. Papaj (LBL); Skryhiczyn on the Bug River, 19 Jul. 1981, leg. M. Danilkiewicz (LBL); Hrebenne, 15 Jul. 1992, leg. B. Hypiak (LBL); Wola Przybysławska, 14 Aug. 2009, leg. U. Świderska-Burek (LBL); Warszawa – Botanical Garden of Warsaw University, 24 Sep. 2013, leg. U. Świderska-Burek (LBL); E4 – Wola Wereszczyńska, 6 Jun. 1984 (LBL) [81,87]; Puławy – Kępa distr., 13 Aug. 1947, leg. O. Kędzierska (WA 4132); Jaszczów n. Lublin, 12 Sep. 2008, leg. U. Świderska-Burek (LBL); Sadurki n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); ***Barbarea***

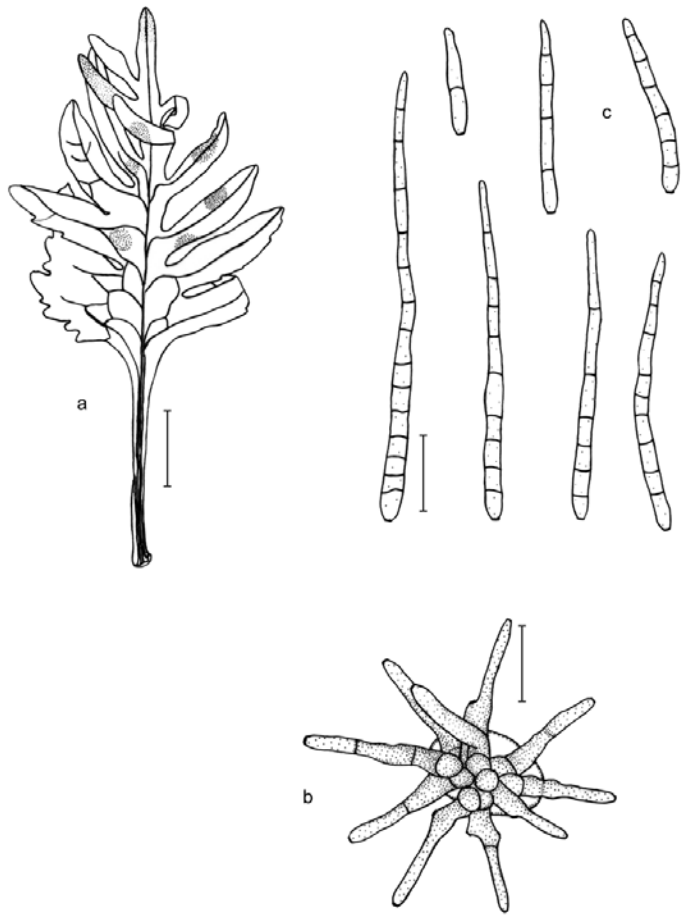

Fig. 11 *Cercospora armoraciae* on *Armoracia rusticana* (LBL, Wola Wereszczyńska, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

vulgaris R. Br.: H1 – surroundings of Żegiestów-Zdroju, 27 Sep. 1957 (WA) [135]; ***Berteroa incana*** (L.) DC.: C1 – Łódź – "Park im. Bolesława Chrobrego" park, 12 Oct. 2006, leg. D. Papierz (LOD 3026 PF) [91]; F3 – Biebrza National Park – Grzędy Protected Unit, 30 Aug. 2012, leg. M. Ruszkiewicz-Michalska (LOD 3387 PF) [85,136]; ***Cardamine amara*** L.: F3 – Białowieża National Park, Sep. 1989, leg. W. Mułenko (LBL) [49,87]; Białowieża National Park, Jun.–Jul. 1989, Oct. 1989, leg. W. Mułenko (LBL) [52]; ***Erysimum cheiri*** (L.) Crantz: Italy – Selva (Treviso), Sep. 1974 (KRA-F 1874-183); ***Rorippa amphibia*** (L.) Besser: E5 – Jezioro Czarne Sosnowickie Reserve, 24 Jun. 1984, leg. W. Mułenko (LBL) [81,87]; ***Rorippa palustris*** (L.) Besser: E3 – Brudno Lake [81,87]; E5 – Spilno Lake – Kodeniec, 5 Sep. 1984, leg. W. Mułenko (LBL) [81,87].

Geographical distribution. Belgium, Bulgaria, Estonia, France, Germany, Great Britain, Italy, Latvia, Lithuania, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden; Angola,

Armenia, Australia, Azerbaijan, Bhutan, Brazil, Canada, China, Cuba, Dominican Republic, Filipiny, India, Iran, Japan, Kirghizia, Korea, Mauritius, Mexico, Morocco, New Caledonia, New Zealand, Panama, Papua New Guinea, São Tomé e Príncipe, Taiwan, Thailand, USA, Vanuatu.

Notes. Wakuliński and Marcinkowska [87] wrongly cited the data of Madej [132] from the Szczecin Province. He mentioned *Cercospora armoraciae* on *Armoracia rusticana* only from Przelewice near Szczecin.

In the paper by Groenewald et al. [24], most *Cercospora* species on Brassicaceae having indistinguishable morphological characteristics were listed as synonymy under *C. armoraciae*. This treatment was proposed previously by Crous and Braun [11].

Cercospora barbareae, *C. cardamines* and *C. nasturtii* collected in Poland and also *C. cheiranthi* collected outside Poland but deposited in the Polish herbarium previously treated as separate species were included here according to Groenewald et al. [24]. Accordingly, the species names are currently listed as synonymy; the host plants, and fungal distribution and descriptions were also compiled.

Cercospora asparagi* Sacc.

Michelia 1: 88. 1877.

= *Cercospora caulicola* G. Winter, J. Mycol. 1: 125. 1885.
= *Cercosporina asparagicola* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 20: 424. 1910.
≡ *Cercospora asparagicola* (Speg.) Vassiljevsky, in Vassiljevsky & Karakulin, Fungi imperfecti parasitici (Hyphomycetes) 1: 196. 1937.

Exs. on *Asparagus officinalis*: Rabenhorst-Winter, Fungi Eur. Exs. 3591 (WA 28602); Saccardo, Mycoth. Ven. 1052 (FRA-F 1875-271).

Description. Spots on cladodes and branches, small, eliptical, 1–4 mm in length, pale brown or dingy grey centre, reddish brown margin. Stromata present. Conidiophores in dense fascicles, pale brown or dark olivaceous-brown, not branched, rarely geniculate, pluriseptate, 30–90 × 4.5–7 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, indistinctly pluriseptate, 42.5–105 × 2.5–4 µm.

Hosts. On *Asparagus* spp., Asparagaceae. ***Asparagus officinalis*** L.: Italy – Selva (Treviso; KRA-F 1875-271); USA – surroundings of Perryville (Missouri), Sep. 1883, leg. C.H. Demetrio (WA 28602).

Geographical distribution. Italy, Ukraine, Argentina; Brazil, Brunei, Cambodia, China, Colombia, Cuba, Ghana, India, Israel, Japan, Kenya, Korea, Laos, Malawi, Malaysia, Nepal, Pakistan, Salomon Islands, South Africa, Taiwan, Thailand, USA, Venezuela, Zambia, Zimbabwe.

Notes. This fungus has been collected outside Poland but deposited in Polish herbaria. The host species occurs in the Polish flora; therefore, it is most likely to find this fungus in Poland.

Cercospora beticola Sacc.

Nuovo Giorn. Bot. Ital. 8: 189. 1876.

(= *Cercospora apii* s. l.)
≡ *Cercosporina beticola* (Sacc.) K. Nakata, T. Nakajima & K. Katimoto, Rep. Agric. Korea 6. 1915.
= *Fusisporium betae* Desm., Ann. Sci. Nat., Bot., 2 Ser., 19: 434. 1843.
= *Fusarium betae* (Desm.) Sacc., Michelia 2: 132. 1880.
= *Pionnotes betae* (Desm.) Sacc., Syll. Fung. 4: 726. 1886.
= *Cercospora betae* A.B. Frank ex Sacc., Syll. Fung. 10: 637. 1892.
= *Cercospora longissima* Cooke & Ellis, Grevillea 17: 65. 1889.
= *Cercospora flagelliformis* Ellis & Halsted, New Jersey Agric. Coll. Exp. Sta., Annual Rep. 11: 355. 1890.
= *Cercospora anthelmintica* G.F. Atk., J. Elisha Mitchell Sci. Soc. 8: 49. 1892.
= *Cercospora spinaciae* Oudem., Ned. Kruidk. Arch. III, 2: 324. 1900.
= *Cercospora chenopodiicola* Bres., Hedwigia 39: 328. 1900.
= *Cercosporina spinaciicola* Sacc., Nuovo Giorn. Bot. Ital., N.S., 22: 73. 1915.
= *Cercospora beticola* var. *poonensis* Chidd., Sydowia 13: 153. 1959 (nom. inval.).

Exs. on *Beta trigyna*: Săvulescu, Herb. Mycol. Roman., Fasc. 13, No. 649 (KRA-F 1932-83); on *Beta vulgaris*: Krieger, Fungi Saxon. Exs. 644 (WRSL); Saccardo, Mycoth. Ven. 597 (KRA-F 1875-272); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 190 (KRA-F 1928-23); Thümen, Mycoth. Univ. 2069 (WA 7060; WRSL); Thümen, Herb. Mycol. Oecon. 62 (WRSL); on *Beta* sp.: Rabenhorst, Fungi Eur. Exs. 69 (KRAF 0-5050, 0-5051; WRSL); on *Chenopodium polyspermum*: Rabenhorst-Pazschke, Fungi Eur. Extraeur. Exs. 4389 (WA 28570).

Description. Leaf spots usually scattered, often confluent, circular, 1–5 mm diam., at first dingy brown, with dark brown margin, later whitish grey centre with reddish brown or purplish brown margin. Mycelium internal; hyphae septate, branched, hyaline; stromata rudimentary. Caespituli amphigenous, but chiefly epiphyllous. Conidiophores 6–12 in divergent or dense fascicles, pale brown at the base, paler upwards, 1–4(–6)-septate, not branched, straight or 1(–3) times geniculate, attenuated upwards, 18–87(–92.5) × (3–)3.5–6 µm. Conidia solitary, hyaline, filiform or acicular, straight or slightly curved, 3–18-septate, non-constricted at the septa, obtuse or acute apex, (27–)40–225 × 2.5–4.5(–5) µm (Fig. 1b, Fig. 9, Fig. 12).

Hosts. On Amaranthaceae and hosts from other families. ***Beta vulgaris*** L.: A3 – Szczecin [125,131]; Przelewice n. Szczecin [132]; A4 – Konikowo [137]; A6 – Gwiździny Małe n. Lubawa [126]; Szembruczek n. Grudziądz [138]; Tczew [80]; B1 – Kurcew n. Jarocin, Poznań – Kobylepole distr., Tarnowo [139]; Poznań [77,139,140]; Chodzież [77]; Wyrzysk [77,80,126]; Gulcz n. Czarnków, Pakosław n. Nowy Tomyśl, Swadzim n. Poznań [141]; Czarnków County, Poznań County [78]; Nowy Tomyśl County, Szamotuły County [79]; Czarnków, Krzyżowniki n. Poznań, Międzychód, Międzychód County, Oborniki, Sołacz n. Poznań, Szamotuły, Wielka Wieś n. Nowy Tomyśl [126]; Nowy Tomyśl [80,126]; Osiek, 22 Sep. 1969, leg. N.N. (WA) [126,128]; Chrząstowo [87]; Przybroda n. Poznań, 7 Oct. 1930, leg. N.N. (WA 29798); B2 – Łabiszynek, Mirosławice, Baruchowo [137]; Gniezno County, 20 Aug. 1926, leg. N.N. (WA 29801) [77–79]; Środa, Wągrowiec [77]; Śrem, Żnin [77,126]; Kopaszewo n. Kościan, Sobiejuchy n. Żnin, Pętkowo, Pomarzany n. Gniezno [141]; Kościan County [78,79]; Żnin County [78]; Borowo n. Środa Wielkopolska, Grodzisk Wielkopolski, Jarocin County, Oborniki County, Śrem County [79]; Wolsztyn County [79,126]; Jarocin, Mogilno, Powiadacze n. Mogilno, Rokosz n. Konin, Skaszyn n. Koło, Słupia Wielka n. Środa Wielkopolska, Wolsztyn, Września, Żabno n. Śrem [126]; Gniezno, Kościan [80,126]; Bruczkowo n. Jarocin [74]; Turew n. Kościan [142]; Gutowo Wielkopolskie [87];

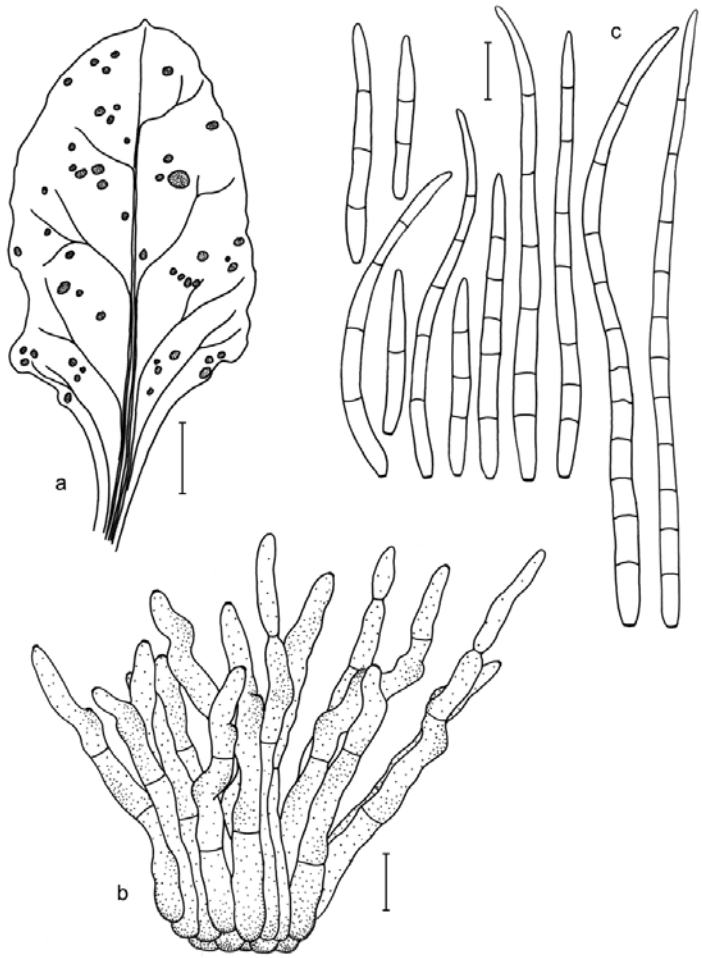

Fig. 12 *Cercospora beticola* on *Beta vulgaris* (LBL, Wola Przybysławska, leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

surroundings of Wągrowiec, 26 Aug. 1926, leg. N.N. (WA 29799); surroundings of Żnin, 9 Aug. 1929, leg. illegible (WA 29765); B3 – Błonie, Budy, Głębokie, Model n. Gostynin, Olganowo, Pontnów, Rutkowice, Wojszyce, Wójcin, Zakrzewo [137]; Głaznów n. Kutno [79,137]; Kościelec n. Koło [79,126,137]; Kutno [79,80,126,137]; Liszkowo n. Inowrocław [141]; Stary Brześć n. Włocławek [79,141]; Sarny, Więcławice n. Inowrocław, 16 Aug. 1934, leg. N.N. (WA 29768), Zagajewice n. Radziejów [79]; surroundings of Kutno [79,126]; Drużbin n. Sieradz, Gołębiew n. Kutno, Gostynin, Sieradz, Włostowice n. Łęczyca [126]; Inowrocław [80,126]; Łęczyca [80]; Dobrzelin, Jackowice, Janice, Kiernozia, Lisiewicz, Łazin, Popów, Rogów, Witonia, Wola Popowa, Żychlin [87]; B4 – surroundings of Kalisz [143]; Gogolewo, Korzkwy [137]; Leszno [77,80,137]; Odolanów, 9 Sep. 1926, leg. N.N. (WA 29766) [77]; Drobnin n. Leszno, Kobylniki n. Krotoszyn, Skarydzew n. Ostrzeszów [141];

Gostyń County, Ostrzeszów County, Pleszew County [78,79]; Rzegocin n. Kalisz, Kępno County, Koźmin Wielkopolski County, Krotoszyn County, Ostrów County, Rawicz County [79]; Antoniny n. Leszno, Gostyń, Hallerowo n. Rawicz, Ostrów Wielkopolski, Sulmierzyce n. Ostrów Wielkopolski [126]; Krotoszyn [80,126]; Głogówko n. Gostyń, Rawicz, Sarnowa n. Rawicz [74]; Gostyń [80]; Trzebnica [144]; B5 – Prószków n. Opole [110]; Strzelin County [78]; Radziechów n. Legnica [80]; C1 – Zakrzew [137]; Łask [79,126]; Łódź [79]; Czarnocin n. Łódź, Jeżewo n. Brzeziny, Lubicz n. Łask, Łódź – Chojny distr., Łódź County, Rzgów n. Łódź, Skomlin n. Wieluń [126]; Piotrków Trybunalski [87,126]; Radomsko [80]; Wojsławice n. Zduńska Wola [144]; Marki, Skrzywno [87]; C2 – Marjówka n. Opoczno [126]; Częstochowa [80,126]; Włoszczowa [75,87,126]; Opoczno [80]; Strzegom [87]; C3 – Koziegłówki n. Zawiercie [79,126]; Porąbka n. Będzin, Rybnik County [79]; Będzin, Rybnik [80,126]; Lubliniec [126]; Michalinki n. Zawiercie [75]; C4 – Kraków – Mydlniki distr., surroundings of Kraków, Polanowice n. Miechów [79]; Kraków [80]; Dębniki n. Kraków [76]; Ojców National Park [42,43]; Kraków, 10 Aug. 1946, leg. W. Zabłocka (WA 22690) [87]; C5 – Sielec n. Pińczów, 6 Sep. 1929, leg. N.N. (WA 29795) [75,79,87,126,137]; Radziemice n. Miechów [75,79,87]; Żurawica n. Sandomierz [75,79,87,126]; Grębocin n. Miechów, Mokorzyn n. Sandomierz [75,126]; Tur Dolny n. Pińczów [75,87,126]; Jędrzejów, Tropiszów, Wierzbno n. Proszowice [126]; Broniszów n. Pińczów [75]; Pińczów [80]; C6 – Gałęziec n. Kielce [75,126]; Kajetanów n. Kielce [126]; Kielce [80,126]; C7 – Pszczyna County [79]; Osiek n. Oświęcim [126]; C8 – Dębica [70]; Urzejowice [137]; Bolestraszyce n. Przemyśl, Iskań n. Przemyśl [79]; Pilzno [75,79,87]; Bogucice n. Kraków, Pudliszki n. Gostyń, surroundings of Rzeszów [126]; Buczyna n. Bochnia, Czarna n. Ropczyce [75,126]; Strzelce Małe n. Brzesko [75,87,126]; Kobierzyn n. Kraków [75,87,126]; Tarnów, 6 Sep. 1927, leg. J. Zabłocki (WA 22696); C9 – Łapiguz [137]; Bortatycze n. Zamość [79]; D1 – Poturzyn [143]; Hostynne n. Werbkowice [87,145]; Zamość – Janowice distr. [126]; E1 – Bydgoszcz, 4 Aug. 1927, leg. N.N. (WA 29767), 6 Aug. 1927, leg. L. Garbowski (WA 029765) [77,78,80,138,146]; Świecie, Wąbrzeźno [77]; Świecie County [78]; Dźwierzno n. Toruń, 1 Sep. 1926, leg. N.N. (WA 29800) [79]; Lipno [80,126]; Mochełek n. Bydgoszcz, 7 Aug. 1947, leg. H. Mikołajczyk (WA 4033), 7 Aug. 1947, leg. H. Mikołajczyk (WA 4032), Nieszawa [126]; Owczarki n. Grudziądz [138]; Chełmża, Włocławek [80]; Koniczynka n. Toruń, 3 Sep. 1956, leg. E. Weber (WA 23131), 20 Oct. 1957, leg. S. Ciesielska (WA 23094), 15 Sep. 1958, leg. E. Weber (WA 23081), 8 Aug. 1961, leg. P. Myjak (WA 23047), 22 Aug. 1963, leg. J. Żelazny (WA 22826) [147]; Bydgoszcz – Bielawy distr., Bydgoszcz – Rynkowo distr. [127]; Minikowo n. Bydgoszcz, 7 Aug. 1947, leg. H. Mikołajczyk (WA 4035); Wojnowo n. Bydgoszcz, 12 Aug. 1947, leg. H. Mikołajczyk (WA 4034); E2 – Chojnowo n. Przasnysz, Łukowo n. Maków Mazowiecki, Szczuki n. Maków Mazowiecki [143]; Płock [79,80]; Płońsk, Mława [79,80,126]; Kiełtyki n. Płock, Kisielnica n. Kolno, Ostrołęka n. Łomża [79]; Poświętne n. Płońsk, Wysokie Mazowieckie [79,126]; Łomża [79,144]; Czarnocin, Gołotczyzna n. Ciechanów [126]; Ciechanów [80,126]; Pułtusk [80]; Gąsówka Oleksin n. Łapy [144]; E3 – Mory n. Warszawa, Sep. 1930, leg. N.N. (WA 29792) [79,148]; Lubartów and surroundings [133,149]; Skierniewice [73,79,80]; Brzoza, Izdebno, Kożuszki, Lasocin, Lenartowo, Pętkowo, Piotrowice Wielkie, Potycz, Ryki n. Radom, Strzykuły, Zaborówek [137]; Bronisze n. Warszawa, Dańków n. Grójec, Kuligów n. Warszawa, Natolin n. Warszawa, Przybyszew n. Grójec, Pszczelin n. Warszawa, surroundings of Warszawa, Rakowiec n. Warszawa, Warszawa – Wilanów distr., Warszawa – Synów distr., Szpanów n. Równe, Zawady n. Warszawa, surroundings of Włodawa ("Dobra Milanowskie") [79]; Grójec, Radzymin, Siedlce, Warszawa

– Natolin distr., Warszawa [126]; Błonie n. Warszawa, Sochaczew [80,126]; Lubartów [80]; Tur Dolny n. Kozienice [75]; Łuków [144]; Bachorza, Dębowa Góra, Drohiczyn, Glinianka, Głowno, Grochów, Józefów, Kawęczyn, Klekotowo, Koczery, Krupice, Lenartów, Łowicz, Łyszkowice, Michałowice, Nieborów, Ostrów Mazowiecki, Otwock, Piasecznica, Piastów, Pruszków, Radzików, Rawa Mazowiecka, Runice, Siemiatycze, Stachlew, Sulejów, Sytki, Warszawa – Mory distr., Warszawa – Ursynów distr., Zajęczniki [87]; Warszawa – Praga distr., 17 Aug. 1947, leg. Kędzierska (WA 4136); Ożarów n. Warszawa, 3 Oct. 1947, leg. H. Mikołajczyk (WA 3914); Piasków n. Lipsko, 3 Oct. 1947, leg. H. Mikołajczyk (WA 3912); Piastów, 5 Oct. 1947, leg. H. Mikołajczyk (WA 3913); Powsinek n. Warszawa, Sep. 1952, leg. J. Kochman (Fungi Poloniae Exsiccati; KRA-F 1952-121); Reguły n. Pruszków, 19 Sep. 1953, leg. H. Zarzycka (WA 18366); Wola Przybysławska, 14 Aug. 2009, leg. U. Świderska-Burek (LBL); Zagrody, 29 Jul. 2009, leg. U. Świderska-Burek (LBL); E4 – Jaszczów [143]; Puławy, 25 Sep. 1930, leg. N.N. (WA 29793), Puławy – Kępa distr., 24 Aug. 1951, leg. Wilamowska (WA 18364) [150]; Ciechanki, Piotrówek n. Krzesimów, Zakrzów n. Krzesimów [137]; Lublin Voivodeship, Motycz n. Lublin, Zemborzyce n. Lublin [79]; Nałęczów n. Puławy [126]; Lublin County [80]; Pożóg n. Puławy, 23 Jul. 1947, leg. O. Kędzierska (WA 1135) [144]; Pliszczyn n. Lublin, 28 Aug. 2009, leg. U. Świderska-Burek (LBL); Bronice n. Nałęczów, 28 Sep. 2009, leg. U. Świderska-Burek (LBL); Tomaszowice n. Lublin, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Czesławice n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Połuszowice n. Lublin 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Sadurki n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); F2 – Suwałki County [126]; F3 – Białystok [79,126]; Supraśl n. Białystok [79]; H1 – Kraków and surroundings [68]; Nowy Sącz – Załubińcze [151]; surroundings of Kraków [152]; Nowa Wieś, Sromowce Niżne, 15 Aug. 1927, leg. W. Zabłocka (WA 22691) [79]; Grodkowice n. Bochnia [126]; Andrychów n. Wadowice, Chocznia n. Wadowice, Korabniki n. Kraków [75,87,126]; Klecza Górna n. Wadowice [75,126]; Muszyna n. Nowy Sącz, Sikornik n. Kraków [75]; Cieszyn, Nowy Sącz, Żywiec [80]; Łopata Polska n. Żegiestów-Zdrój, 24 Sep. 1957 (WA) [135]; Pieniny Mts [45,46]; Czorsztyn, Kluszkowce, Krościenko, Sromowce, Szczawnica [48,153]; I1 – Gorlice and surroundings [69]; Jasło – Ulaszowice [87,151]; Boguszówka, Rozwienica [137]; Moszczenica n. Gorlice [75,126]; Siary n. Gorlice [75,87,126]; Jasło [80]; Kobylanka, Zagórz [87]; without precise localization – the former Lublin Voivodeship [80,154]; Eastern Małopolska [79]; Śląsk region [79,126,140]; the former Kielce Voivodeship, the former Łódź Voivodeship, the former Pomorskie Voivodeship, the former Poznań Voivodeship, the former Warszawa Voivodeship, Polesie region [140]; Belarus – surroundings of Łuniniec, 21 Sep. 1930, leg. N.N. (WA 2979); Germany – n. Rastatt (Baden-Württemberg), Nov. 1877, leg. J. Schroeter (WRSL); Ukraine – Szpanów n. Równe, 1 Aug. 1939, leg. N.N. (WA 29786); ***Chenopodium album*** L.: E3 – Berezówka, Biała Podlaska, Horbów, Kijowice, Międzyrzec Podlaski, Neple, Nowosiółki, Porosiuki, Rogoźnica, Woskrzenice, Wysokie [82].

Geographical distribution. Common in Poland and worldwide.

Notes. This fungus occurs across Poland in places of cultivation of most beet varieties (*Beta* spp.). In the present paper, all varieties of *Beta* spp. are regarded as *Beta vulgaris* L.

In Poland, *C. beticola* is a quarantine species mentioned in the regulation of the Minister of Environment of 29 November 2002.

The combined phylogenetic analyses performed by Groenewald et al. [24] using calmodulin genes (CAL), combined multi-locus data and histone H3 (HIS) have shown that *C. apii* s. str. and *C. beticola* are related sibling species, although *C. beticola* must be retained as a separate species.

Besides new localities, Wakuliński and Marcinkowska [87] cited most data of Moesz [133], Chrzanowski [137], Garbowski and Juraszkówna [79], Garbowski [126], Leszczenko [80], Madej [125,132], Michalski [127,128,135], Kućmierz [44], and Kućmierz and Gondek [153]. However, not all data were cited or were cited imprecisely, therefore these citations have not been included in this paper.

Cercospora calendulae Sacc.

Michelia 1: 267. 1879.

(= *Cercospora apii* s. l.)

Exs. on *Calendula officinalis*: Saccardo, Mycoth. Ven. 1054 (KRA-F 1876-199).

Description. Leaf spots circular or subcircular, 1–4 mm diam., pale brown centre with a darker margin. Caespituli amphigenous; stromata small, composed of several cells or well developed, dark brown. Conidiophores solitary or 2–20 in fascicles, pale olivaceous-brown, pluriseptate, not branched, straight or slightly geniculate, 45–100 × 4–6 µm. Conidia solitary, hyaline, acicular, straight or curved, 4–8-septate, (30–)50–80 × 2.5–5 µm.

Hosts. On *Calendula* spp., Compositae. ***Calendula officinalis*** L.: Italy – Conegliano, Oct. 1876, leg. C. Spegazzini (KRA-F 1876-199).

Geographical distribution. Bulgaria, Germany, Great Britain, Italy, Portugal, Romania, Spain; Bangladesh, Bermuda, Brazil, Brunei, China, Cuba, India, Mauritius, Morocco, Myanmar, Nepal, Sierra Leone, Taiwania, Tanzania, USA.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. *Cercospora officinalis* and *C. arvensis*, on which the fungus has ben noted worldwide, occur in the Polish flora; therefore, its occurrence in Poland seems to be possible.

Cercospora campi-silii Speg.

Michelia 2: 171. 1880.

≡ *Cercosporidium campi-silii* (Speg.) X.J. Liu & Y.L. Guo, Acta Mycol. Sin. 1: 94. 1982.
≡ *Passalora campi-silii* (Speg.) Poonam Srivast., J. Living World 1: 114. 1994 (nom. inval.).
≡ *Passalora campi-silii* (Speg.) U. Braun, Mycotaxon 55: 228.1995.
= *Cercospora impatientis* Bäumler, Verh. K.K. Zool.-Bot. Ges. Wien 38: 717. 1888.

Exs. on *Impatiens noli-tangere*: Săvulescu, Herb. Mycol. Roman., Fasc. 6, No. 299 (KRA-F 1930-65); Sydow, Mycoth. Germ. 3198 (KRA-F 1936-103).

Description. Leaf spots subcircular or irregular, 2–5 mm diam., grey or white centre, pale brown or reddish margin. Caespituli mostly epiphyllous; stromata lacking or composed

of several brown cells. Conidiophores solitary or 2–11 in fascicles, pale olivaceous-brown, paler at the apex, irregular in width, sparingly septate, rarely branched, 35–110 × 3–6 µm. Conidia solitary, hyaline, cylindrical or obclavate, straight or slightly curved, 1–6-septate, 20–65 × 4–6 µm (Fig. 13).

Hosts. On Balsaminaceae. ***Impatiens noli-tangere*** L.: B3 – Marzęcin n. Kłodawa [51,155]; C8 – Łęki Górne n. Tarnów, 11 Aug. 1998, leg. M. Piątek (LBL M-8403) [86]; E4 – n. Kazimierz Dolny [150]; F3 – Białowieża National Park, Jul. 1988, leg. W. Mułenko (LBL – 2 localities) [51,52]; Biebrza National Park – Grzędy Protected Unit, 29 Aug. 2012, leg. M. Ruszkiewicz-Michalska [136]; Germany – Königstein (Saxony), Jul. 1891, leg. W. Krieger (WA 341); n. Freinwalde, leg. P.W. Magnus (KRA-F 1890-266); locality illegible, 24 Aug. 1895, leg. P.W. Magnus (KRA-F 1895-121).

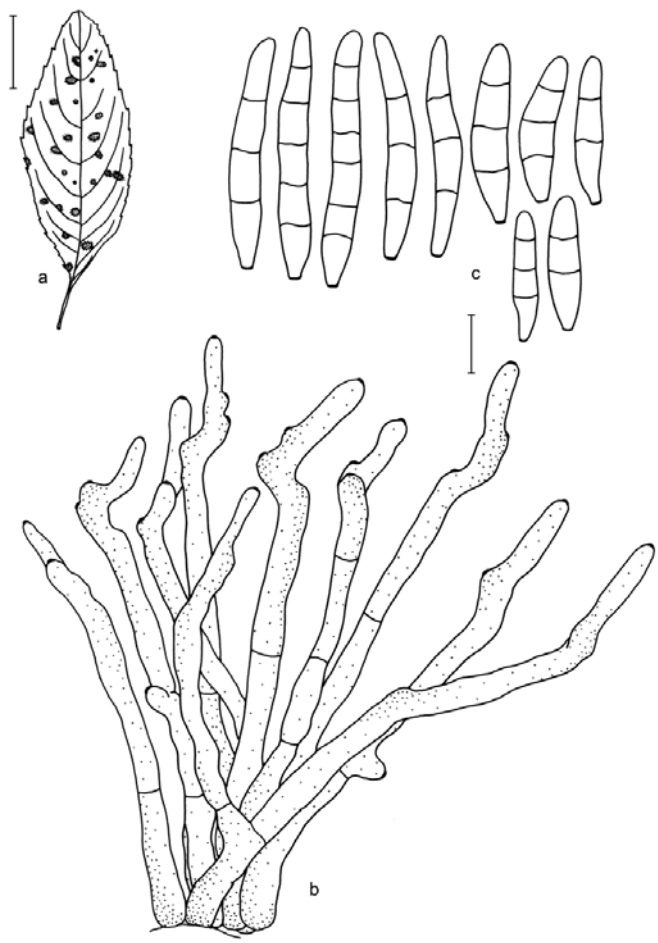

Fig. 13 *Cercospora campi-silii* on *Impatiens noli-tangere* (LBL M-8403). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Geographical distribution. Austria, Belarus, Belgium, Bulgaria, Czech Republic, Estonia, Germany, Hungary, Italy, Latvia, Poland, Romania, Russia (Asian and European part), Slovakia; Armenia, Azerbaijan, Bangladesh, Barbados, Brazil, China, Georgia, Japan, Kyrgyzstan, Morocco, Venezuela.

Notes. *Cercospora campi-silii* was transferred by Braun [95] to *Passalora* based on its pale olivaceous conidia, but according to the phylogenetic studies of three gene regions, namely elongation factor 1-alpha (TEF), actin (ACT), and histone H3 (HIS) *C. campi-silii* has recently been confirmed as species of *Cercospora* s. str. [24]. A Korean collection was used in this examination, therefore European material first described as *C. campi-silii* needs to be compared with the Korean species [24]. In various recently published examinations, based on molecular sequence analyses, it could be demonstrated that species with *Passalora*-like but hyaline conidia cluster in the *Cercospora* clade and have to be retained in or referred to *Cercospora* s. str. [2], i.e. the lacking or present pigmentation is more important for the differentiation between *Cercospora* and *Passalora* than the conidial shape. Hence, in the present paper the fungus on *Impatiens* is treated as *Cercospora* species.

Cercospora caricis Oudem.*

Nederl. Kruidk. Arch. II, 6: 59. 1892.

= *Cercospora caricina* Ellis & Dearn., Proc. Canad. Inst., N.S., Part 3, 1: 91. 1897.
= *Cercospora microstigma* Sacc., Ann. Mycol. 10: 315. 1912.
= *Cercospora caricis* Dearn. & House, New York State Mus. Bull. 188: 29. 1916.
≡ *Cercosporina caricis* (Dearn. & House) Sacc., Syll. Fung. 25: 900. 1931.

Description. Leaf spots elongate, pale brown to tan centre, dark margin or leaf blades darkened over entire width, and in length from a few millimetres to more than an inch. On the under surface of this darkened area are minute black tufts in rows between the parallel veins of the leaf; stromata small, usually filling stomatal opening, pale to dark brown; fascicles mostly 3–15. Conidiophores pale olivaceous-brown, often attenuated towards the apex, rarely septate or once geniculate, straight or nearly so, not branched, 10–30 × 4–6 µm (rarely 45 µm). Conidia solitary, hyaline, acicular to cylindrical-obclavate, base truncate to subtruncate, tip subobtuse, straight or slightly curved, septa indistinct, 20–120 × 2–3.5 µm [13].

Hosts. On Cyperaceae.

Geographical distribution. Great Britain, Ireland, Netherlands; Australia, Brazil, Canada, Georgia, India, Iran, Japan, New Caledonia, South Africa, USA.

Notes. This species was reported by Adamska [156] on *Carex acutiformis* Ehrh. (SZPA 2503) from Kluki and on *Carex pseudocyperus* L. (SZPA 2567) from Gać in the Słowiński National Park. Conidiophores and conidia of *C. caricis* were not found in the revised material. The occurrence of this fungus in Poland on *Carex* spp. is to be expected.

Cercospora carotae (Pass.) Kazn. & Siemaszko

Zentralbl. Bakteriol., 2. Abt., 78: 115. 1929.

≡ *Cercospora apii* var. *carotae* Pass., Atti Reale Accad. Lincei, Rome, Ser. 4, 6: 469. 1889.
≡ *Cercospora carotae* (Pass.) Solheim, Illinois Biol. Monogr. 12: 43. 1929. (comb. superfl.).

Description. Spots on leaves and stems scattered or often confluent, subcircular, elliptic, angular or irregular, 2–8 mm diam., pale brown, greyish, brownish or almost blask. Caespituli amphigenous, floccose-velutinose, greyish; stromata well-developed, globular. Conidiophores solitary or usually 2–3 in fascicles, rarely 5–15, pale olivaceous-brown at the base, paler and usually narrower towards the apex, 0–1-septate at the base, not branched, 0–2 times geniculate in the apical part, usually bulbous at the base, 10–37.5(–45) × 3–4.5(–5) µm. Conidia solitary, hyaline or pale olivaceous, filiform, cylindrical or obclavate, straight or slightly curved, 1–6-septate, mostly 3-septate, obtuse apex, obconic to rounded base, (22.5–)30–80 × (2.5–)3.5–5 µm (Fig. 1c, Fig. 14).

Hosts. On *Daucus* spp., Apiaceae. ***Daucus carota*** L.: A3 – Szczecin [131], surroundings of Szczecin [87,125]; B1 – Chrząstowo [87]; B3 – Kiernozia, Łazin, Rogów [87]; C1 – Głowno, Ksawerów, Piotrków Trybunalski [87]; Łódź, 17 Aug. 2004, leg. E. Połeć (LOD 2405); C2

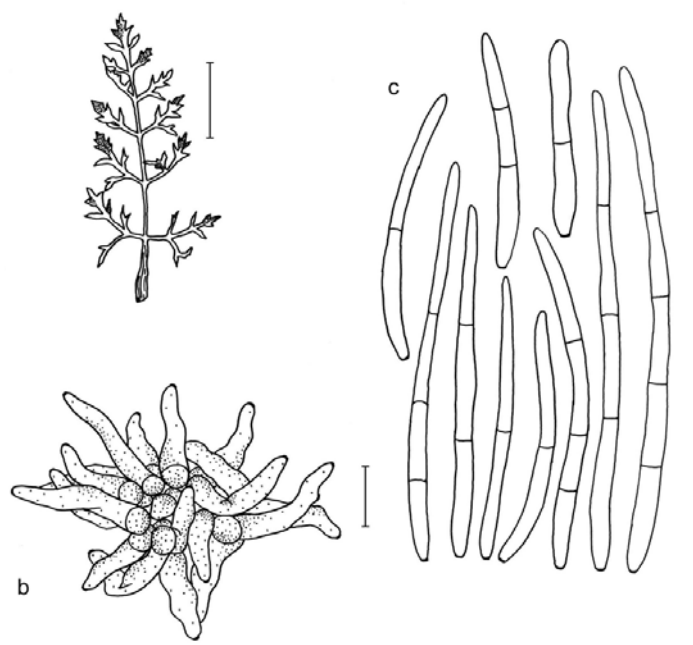

Fig. 14 *Cercospora carotae* on *Daucus carota* (LBL, Puławy, leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

– Dębowa Góra, Strzegom [87]; C4 – Ojców, on the Prądnik River [42]; Ojców National Park [43,87]; C8 – Stubno [87]; D1 – Czołki n. Zamość, 21 Jul. 1989, leg. G. Górska (LBL); E2 – Kęczewo n. Mława, 10 Aug. 1933, leg. N.N. (WA 29878); E3 – Dobre, Drohiczyn, Kawęczyn, Łowicz, Łyszkowice, Ostrów Mazowiecki, Piasecznica, Piastów, Radzików, Runice, Stachlew, Sulejów, Wólka Zamkowa [87]; Czernic n. Ryki, 17 Jul. 2006, leg. U. Świderska-Burek (LBL); E4 – surroundings of Lublin [87,157]; Pliszczyn n. Lublin, 28 Aug. 2008, leg. U. Świderska-Burek (LBL); Bronice n. Nałęczów, 28 Sep. 2009, leg. U. Świderska-Burek (LBL); Czesławice n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Połuszowice n. Lublin, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Puławy, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Sadurki n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Jaszczów n. Lublin, 20 Sep. 2010, leg. U. Świderska-Burek (LBL); H1 – Czorsztyn [45,87,153]; Pieniny Mts [47,87]; Kluszkowce, Krościenko, Sromowce, Szczawnica [87,153]; I1 – Zagórz [87]. ***Daucus*** sp.: B1 – Poznań [126]; B2 – Gniezno, Jarocin, Kościan [126]; B3 – Kutno [79]; C1 – Łódź – Chojny distr., 2 Oct. 1931, leg. K. Żelazowska (WA 29719) [126]; C8 – Rzeszów [80]; E4 – Puławy [79]; F3 – Supraśl n. Białystok [79]; H1 – Pieniny Mts – Czorsztyn, Kluszkowce, Krościenko, Sromowce, Szczawnica [48].

Geographical distribution. Bulgaria, Denmark, Estonia, Italy, Latvia, Lithuania, Norway, Poland, Romania, Russia, Slovakia; additionally common worldwide.

Notes. Leszczenko [80] has also reported *C. carotae* from the "Biała Mał." locality, but this name does not exist in the list of villages in Poland. The name may refer to the Biała village in Tarnów district (Małopolska Voivodeship).

Wakuliński and Marcinkowska [87] reported *C. carotae* on *Barbarea vulgaris* from Wrocław, which is doubtful and needs revision, because according to Crous and Braun [11] *C. barbareae* and *C. nasturtii* are the only cercosporoid species on *Barbarea* (Brassicaceae). The latter two species have recently been reduced to synonymy with *C. armoraciae* [24].

The fungus was also recorded by Michalski [128] from Nakło on the Noteć River, but after revision it proved to be *Pseudocercosporella daucicola* Goh & W.H. Hsieh.

Cercospora chenopodii **Fresen.**

Beitr. Mykol.: 92. 1863.

≡ *Ramularia dubia* Riess, Hedwigia 1: Pl. 4, Fig. 9. 1854.
≡ *Cercospora dubia* (Riess) G. Winter, Fungi Eur. Exs., Ed. nov., Cent. 28, No. 2780. 1882 and Hedwigia 22: 10. 1883 (nom. illeg.), homonym of *C. dubia* Speg., 1880.
≡ *Cercospora dubia* (Riess) Bubák, Ann. Mycol. 6: 29. 1908 (nom. illeg.), homonym of *C. dubia* Speg., 1880.
≡ *Cercosporidium dubium* (Riess) X.J. Liu & Y.L. Guo, Acta Mycol. Sin. 1: 95. 1982.
≡ *Passalora dubia* (Riess) Poonam Srivast., J. Living World 1: 115. 1994 (comb. inval.).
≡ *Passalora dubia* (Riess) U. Braun, Mycotaxon 55: 231. 1995.
= *Cercospora chenopodii* Cooke, Grevillea 12: 22. 1883 (nom. illeg.), homonym of *C. chenopodii* Fresenius, 1863.
= *Cercospora dubia* var. *urbica* Roum., Rev. Mycol. 15: 15. 1893.
= *Cercospora dubia* var. *atriplicis* Bondartsev, Trudy Glavn. Bot. Sada 26: 51. 1910.
= *Cercospora atriplicis* Lobik, Mat. po Fl. Faun. Obsled. Terskogo Okruga: 52. 1928
= *Cercospora chenopodii* var. *micromaculata* Dearn., Mycologia 21: 329. 1929.
= *Cercospora penicillata* f. *chenopodii* Fuckel, Fungi Rhen. Exs., Fasc. II, No. 119. 1863 (nom. nud.).

= *Cercospora chenopodii* var. *atriplicis patulae* Thüm., in herb.
= *Cercospora bondarzevii* Henn., in herb. B.

Exs. on *Atriplex sagittata*: Krieger, Fungi Saxon. Exs. 896 (WRSL); on *Atriplex patula*: Klotzsch, Herb. Viv. Mycol. 1882 (KRA-F 1853-41; WRSL); Krieger, Fungi Saxon. Exs. 645 (WRSL); on *Atriplex prostrata*: Krieger, Fungi Saxon. Exs. 1937 (WRSL); on *Atriplex tatarica*: Săvulescu, Herb. Mycol. Roman., Fasc. 14, No. 651 (KRA-F 1932-84); on *Chenopodium album*: Krieger, Fungi Saxon. Exs. 897 (WRSL); Sydow, Mycoth. Germ. 746 (WRSL); Sydow, Mycoth. Germ. 1194 (WRSL); Thümen, Mycoth. Univ. 374 (WA 6055, as *Cercospora chenopodii* Fres. f. *chenopodii albi*; WRSL); Thümen, Mycoth. Univ. 2279 (WRSL); on *Chenopodium rubrum*: Sydow, Mycoth. Germ. 2595 (KRA-F 1930-66); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 189 (KRA-F 1926-48).

Description. Leaf spots scattered to confluent, circular or subcircular, 1–7 mm diam., at first pale brown or dingy grey with a pale brown margin, later centre greenish brown or pale grey, without a distinct margin. Caespituli mostly amphigenous; stromata small, subhyaline or pale brown. Conidiophores 10–40 in dense or divergent fascicles, olivaceous or pale olivaceous-brown throughout or paler upwards, 2–3-septate, 1–2 times geniculate, not branched, (22.5–)30–137 × 4–7 µm. Conidia solitary, hyaline or pale olivaceous, cylindrical or obclavate, straight or slightly curved, 1–4(–7)-septate (usually with 3 septa), rounded apex, truncate or obconic base, (20–)25–85 × 4–7.5 µm (Fig. 5b, Fig. 7d, Fig. 15).

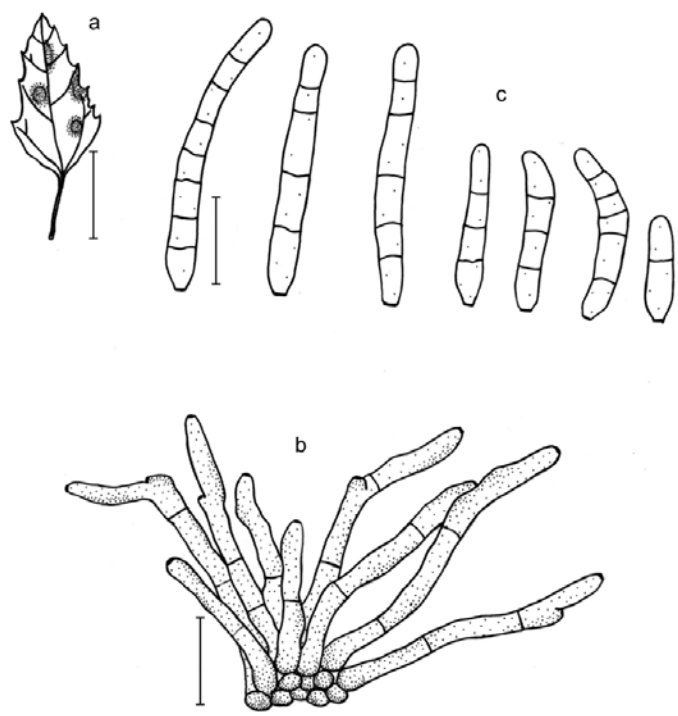

Fig. 15 *Cercospora chenopodii* on *Chenopodium album* (LBL, Lublin – Helenów distr., leg. B. Sałata). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 20 µm.

Hosts. On *Atriplex* and *Chenopodium* spp., Amaranthaceae. ***Atriplex oblongifolia*** Waldt. & Kit.: A1 – Słowiński National Park – Gać, Sep. 1997 (SZPA 773, on *Chenopodium album*) [53]; ***Atriplex patula*** L.: A1 – Słowiński National Park – Gać, Aug. 1998 (SZPA 1154, as *Ramularia dubia* Riess.) [53]; C4 – Olsztyn n. Częstochowa, Aug.–Sep. 1997–1999, 2002–2003, leg. M. Ruszkiewicz, 21 Aug. 1998 (LOD 2739), 26 Sep. 1998, (LOD 2725) [54]; G1 – Kudowa, as *R. dubia* [39,158]; ***Atriplex prostrata*** Boucher ex DC.: H1 – Nowy Sącz on the Dunajec River, 17 Sep. 1988, leg. D. Pancerz (LBL); ***Atriplex sagittata*** Borkh.: B5 – surroundings of Wrocław, Aug. 1880, leg. J. Schroeter (WRSL); C4 – Kraków [68,72]; E3 – Skierniewice [73]; E4 – Lublin – Lipowa St., 27 Sep. 1995, leg. B. Sałata (LBL); Lublin, 20 Sep. 1987, leg. J. Sałata (LBL); ***Chenopodium album*** L.: A1 – Słowiński National Park – Kluki, Gać [39,53,159]; A3 – Szczecin and surroundings [160]; Przelewice n. Szczecin [132]; Szczecin [125]; B2 – Węgierki n. Września [67,74]; C4 – Łobzów, Czarna Wieś [68,72]; C5 – Opatów, 9 Sep. 1996, leg. M. Wicha (LBL); C9 – Narol n. Lubaczów, 3 Sep. 1992, leg. B. Hypiak (LBL); D1 – Tyszowce n. Hrubieszów, 17 Sep. 1988, leg. Z. Mróz (LBL), 20 Jul. 1992, leg. A. Koszuta (LBL); Kryłów n. Hrubieszów, 14 Jul. 1995, leg. A. Zając (LBL); E1 – Koniczynka n. Toruń, 27 Aug. 1954, leg. Mikołajska (WA 23065); E3 – Puznów n. Garwolin, 20 Aug. 1986, leg. H. Maszkiewicz (LBL); Wola Przybysławska, 14 Aug. 2009, leg. U. Świderska-Burek (LBL); E4 – Puławy [161]; Lublin – Helenów distr., 21 Jul. 1970, leg. B. Sałata (LBL); Grabówka n. Annopol, 10 Oct. 1982, leg. B. Sałata (LBL); Lublin, 20 Sep. 1987, leg. B. Sałata (LBL); Puławy, 11 Aug. 2009, leg. Świderska-Burek (LBL), 30 Sep. 2009, leg. Świderska-Burek (LBL); F3 – Białowieża Forest [162]; H1 – Żegiestów-Zdrój, 25 Sep. 1957 (WA), 25 Sep. 1957 (WA) [135]; Nowy Sącz on the Dunajec River, 3 Jul. 1989, leg. D. Pancerz (LBL); I1 – Iwonicz, 9 Sep. 1983, leg. R. Zdybel (LBL); Germany – Königstein (Saxony; Krieger W., Fungi Saxonici), Sep. 1893 (WA 333, 334); Berlin, Sep. 1889 (KRA-F 1889-275); ***Chenopodium bonus-henricus*** L.: C6 – Stara Słupia [145].

Geographical distribution. Worldwide, incl. Austria, Belarus, Bulgaria, Denmark, Estonia, France, Germany, Hungary, Italy, Latvia, Netherlands, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, former Yugoslavia; Argentina, Armenia, Australia, Azerbaijan, Canada, China, Dominican Republic, Georgia, India, Iran, Japan, Kazakhstan, Kenya, Korea, Nepal, New Zealand, South Africa, Tadzhikistan, Taiwan, Turkmenistan, USA.

Notes. The data published as *Ramularia dubia* on *Atriplex patula* and *Chenopodium album* from Kudowa [158] and from the Słowiński National Park (Kluki, Gać) [53,159] were included here.

Braun [22] transferred *Cercospora chenopodii* to the *Passalora* species based on broadly obclavate conidia with visible large loci. The conidia of this fungus are hyaline, and best retained in *Cercospora*, which has been confirmed by results of molecular sequence analyses in the TEF, ACT and HIS phylogenies by Groenewald et al. [24]. In this paper, a similar, confusable species tentatively referred to as *Cercospora* cf. *chenopodii*, was described and illustrated, which is morphologically distinguished from genuine *C. chenopodii* by its denser fascicles and above all genetically distinct in ACT and HIS phylogenies. Based on additional collections found in Iran, this species has recently been described as *Cercospora pseudochenopodii* M. Bakhshi, Arzanlou, Babai-ahari & Crous [163].

Cercospora depazeoides (Desm.) Sacc.

Nuovo Giorn. Bot. Ital. 8:187 1876.

≡ *Exosporium depazeoides* Desm., Ann. Sci. Nat., Bot., Ser. 3, 11: 364. 1849.
= *Passalora penicillata* Ces., in Rabenh., Herb. viv. mycol., No. 587. 1857.
≡ *Cercospora penicillata* (Ces.) Fresen., Beitr. Mykol.: 93. 1863.
≡ *Phaeoramularia penicillata* (Ces.) X.J. Liu & Y.L. Guo, Acta Phytopathol. Sin. 12: 13. 1982 (misapplied!).
= *Cercospora ticinensis* Cavara, in Briosi & Cavara, Funghi paras., No. 336. 1900.
= *Cercospora depazeoides* var. *amphigena* Sousa da Câmara, Revista Agron. (Lisbon) 1: 59. 1903.
= *Cercospora depazeoides* var. *gagrensis* Elenkin & Ohl, Bolez. Rast. 6: 108. 1912.
= *Cercospora sambuci* F. Stevens & King, Illinois Biol. Monogr. 11: 59. 1927.
= *Cercospora sambucina* Ellis & Kellerman, Amer. Naturalist 17: 1166. 1883.
≡ *Cercospora depazeoides* var. *sambucina* (Ellis & Kellerm.) Sacc., Syll. Fung. 4: 469. 1886.

Exs. on *Sambucus nigra*: Rabenhorst, Herb. Viv. Mycol. 587 (KRA-F 1856-84, 1856-85); Saccardo, Mycoth. Ven. 280 (KRA-F 1874-184); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 195 (KRA-F 1925-119).

Description. Leaf spots circular or angular, 1–8 mm diam., greyish, brown or mosaic-like pattern of grey, pale brown or brown. Caespituli amphigenous; stromata globular, dark brown or blackish. Conidiophores in dense fascicles, sometimes coremoid, dark brown, 1–3-septate, longer ones can be sinuous, sometimes 1–2 times geniculate, rarely branched, 30–170 × 3–5 µm. Conidia solitary, usually pale olivaceous, obclavate or cylindrical, straight or slightly curved, 3–8-septate, base obconic, apex obtuse, 32.5–135 × 3.5–5.5 µm (Fig. 1d, Fig. 16).

Hosts. On *Sambucus* spp., Adoxaceae. ***Sambucus canadensis*** L.: Canada – High School Valley, London (Ontario), leg. J. Dearness, DAOM 134191 (WA 20350); ***Sambucus nigra*** L.: A1 – Słowiński National Park – Kluki, Jul. 2004, leg. I. Adamska (SZPA 4136); Słowiński National Park [156]; A3 – Szczecin [87,125,164]; B1 – Zielonka Experimental Forest Division n. Poznań [87,165]; B2 – Mochy n. Wolsztyn, Sep. 1926, leg. N.N. (WA 29816) [77]; B4 – Zielona Góra [87]; B5 – Wrocław – Borek, 8 Oct. 1885, leg. J. Schroeter (WA 331, 332); C4 – Skały Panieńskie Reserve n. Kraków [68,72,87]; Kraków [87,152]; C8 – Bolestraszyce, 30 Oct. 1998 (LBL) [166]; Tarnobrzeg, 1 Nov. 1999, leg. E. Chamerska (LBL); D1 – Lipowiec n. Tyszowce, 11 Aug. 1988, leg. Z. Mróz (LBL); E3 – Omelno Reserve n. Radzyń Podlaski [167]; Jabłeczna on the Bug River, as *Ramularia sambucina* Sacc. [83]; Jezioro Brzeziczno Reserve, 1 Oct. 1983 (LBL), 31 Aug. 1984 (LBL), leg. W. Mułenko [81,87]; Otwock, Wola Karczewska [87]; Jabłeczna on the Bug River, 26 Jul. 1981, leg. M. Danilkiewicz (LBL); Radom, 31 Jul. 1988, leg. E. Kasińska (LBL); E4 – Puławy [87,161]; Lublin – n. Zemborzycki Lake, 16 Oct. 2007, leg. O. Dobrowolska (LBL); Końskowola n. Puławy, 7 Sep. 2008, leg. U. Świderska-Burek (LBL); Stok n. Puławy, 7 Sep. 2008, leg. U. Świderska-Burek (LBL); Czesławice n. Nałęczów, 30 Sep. 2009, leg. U. Świderska-Burek (LBL); Jaszczów n. Łęczna, 12 Sep. 2008, 1 Oct. 2009, leg. U. Świderska-Burek (LBL); Lublin – Czuby distr., Stary Gaj forest, 21 Aug. 2010, 11 Oct. 2013, leg. U. Świderska-Burek (LBL); G2 – Uciechów [87]; H1 – Wolica [70]; Stróże [71,87]; Żegiestów-Zdrój, 25 Sep. 1957, (WA) [135]; Pieniny National Park – Sokolica Mt, n. Ociemny Potok stream [45,87]; Pieniny Mts [46,87]; Krościenko [87]; ***Sambucus nigra*** L. var. ***aureo-marginata***: E4 – Lublin – Botanical Garden, 5 Oct. 2004, leg. U. Świderska-Burek (LBL); ***Sambucus racemosa*** L.: C8 – Bolestraszyce, 30 Oct. 1998 (LBL) [166]; G1 – Jakubowice [158].

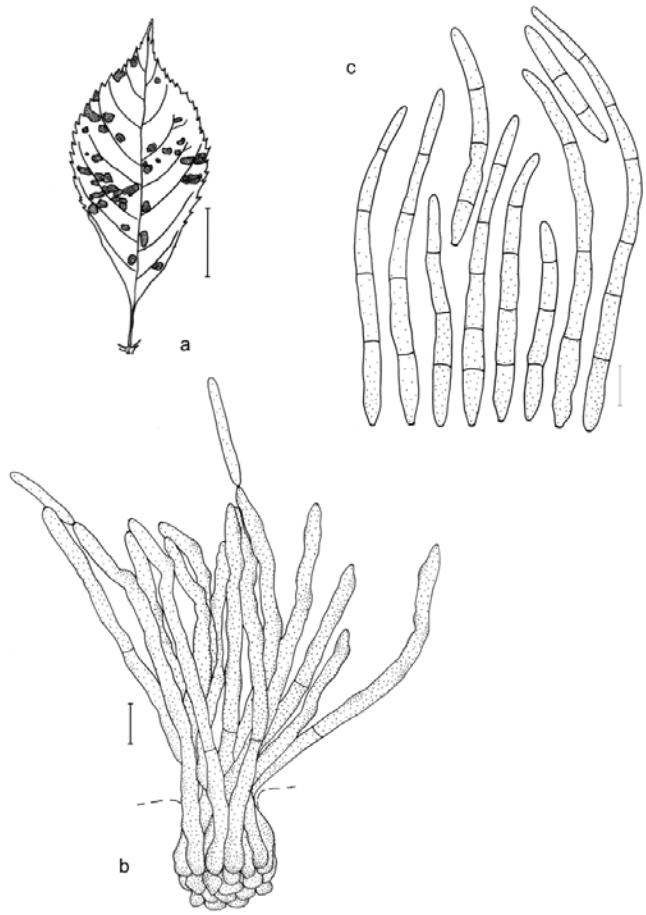

Fig. 16 *Cercospora depazeoides* on *Sambucus nigra* (LBL, Lublin – Stary Gaj forest, leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Geographical distribution. Austria, Bulgaria, Germany, Great Britain, Greece, Italy, Poland, Portugal, Russia, Spain, Ukraine; Armenia, Australia, China, Cypr, Japan, Costa Rica, New Zealand, USA.

Notes. The data of Danilkiewicz [83] published as *Ramularia sambucina* Sacc. from Jabłeczna refer to *C. depazeoides* [39].

Cercospora echii G. Winter

Hedwigia 23:190. 1884.

Description. Leaf spots circular, 2–4 mm diam., dark purplish or almost black centre with a pale margin. Caespituli amphigenous, mostly epiphyllous; stromata lacking or composed of

several brown cells. Conidiophores 1–8 in fascicles, olivaceous-brown, apex sometimes pale olivaceous, often slightly attenuated, pluriseptate, rarely branched, up to 5 times geniculate, 40–142 × 4–5 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, 3–12-septate, 40–125 × 2.5–3.5(–4) µm (Fig. 17).

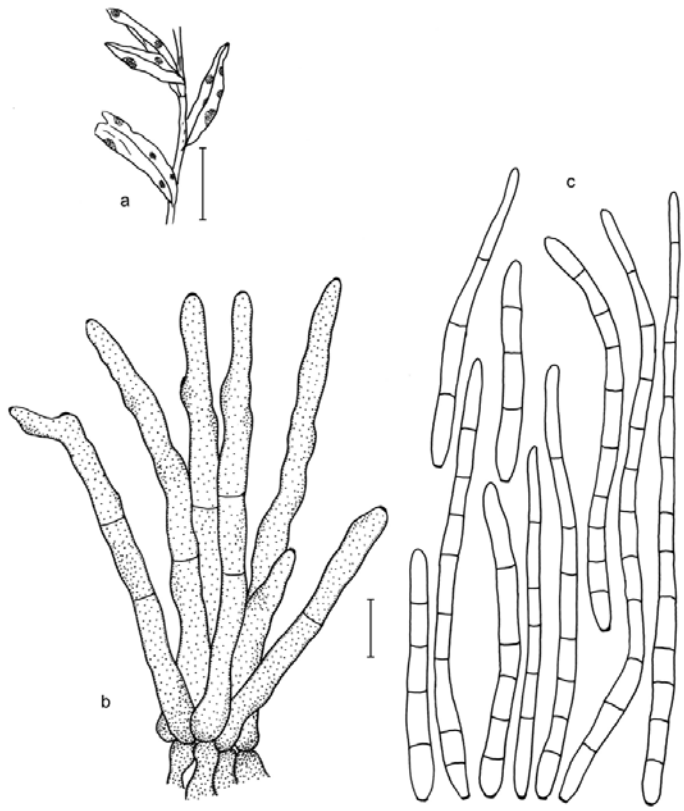

Fig. 17 *Cercospora echii* on *Echium vulgare* (LBL M-12168). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Hosts. On *Echium* spp., Boraginaceae. ***Echium vulgare*** L.: D1 – Czumów n. Hrubieszów, 19 Sep. 1995, leg. A. Zając (LBL M-12168) [92].

Geographical distribution. Bulgaria, Poland, Portugal, Russia, Spain, Ukraine; Canada, South Africa, Turkmenistan, USA.

Cercospora epipactidis **C. Massal.***

Ann. Mycol. 9: 256. 1911.

Exs. on *Epipactis palustris*: Sydow, Mycoth. Germ. 3592 (KRA-F 1936-104).

Description. Leaf spots elongated, vein-limited, reddish brown. Caespituli chiefly hypophyllous; stromata irregular, dark brown, up to 50 µm diam. Conidiophores pale brown, paler and more narrow towards the apex, sparingly septate, not branched, straight or slightly geniculate, 15–60 × 4–6 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, indistinctly septate, 40–135 × 3.5–5 µm.

Hosts. On Orchidaceae. ***Epipactis palustris*** (L.) Crantz: Germany – Glindow n. Werder (Havel), 8 Jul. 1936, leg. H. Sydow (KRA-F 1936-104).

Geographical distribution. Czech Republic, Germany, Italy, Romania, Russia (European and Asian part); USA.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The fungus has been noted worldwide on four from eight species from *Epipactis* genus occuring in the Polish flora; therefore, it is very likely to find this fungus in Poland.

Cercospora euphrasiae Ondřej*

Čas. Slez. Mus. v. Opavě, Ser. A, Hist. Nat., 18: 79. 1969.

(= *Cercospora apii* s. l.)

Description. Leaf spots irregular or angular-eliptic, up to 5 mm diam., yellow or pale brown with reddish brown or purplish brown margin. Conidiophores usually solitary, 2–75 × 3–6 µm. Conidia solitary, obclavate-filiform, 1–7-septate, 26–90 × 3–5 µm [93].

Hosts. On Scrophulariaceae. ***Odontites vulgaris*** Moench: A1 – Słowiński National Park – Czołpino [53,84].

Geographical distribution. Czech Republic.

Notes. According to Crous and Braun [11], *Cercospora melampyri* Nelen. occurs on *Odontites*; in turn, *C. euphrasiae* has been reported on *Euphrasia stricta* D. Wolff ex J.F. Lehm. (Orobanchaceae) so far. The host or fungus was probably wrongly identified and needs revision.

Cercospora fagopyri N. Nakata & S. Takim.

J. Agric. Exp. Stat. Gov. Gen. Chosen 15: 29. 1928.

(= *Cercospora apii* s. l.)
= *Cercospora fagopyri* Abramov, in Lavrov, Opred. rastit. paras. kul′t. i dikor. polezn. rast. Sibiri, Vyp. I: 22. 1932 (nom. nud.).
≡ *Cercospora fagopyri* Abramov, in Vasilevsky & Karakulin, Fungi imperfecti parasitici. 1. Hyphomycetes: 321. 1937 nom. illeg. (homonym).
= *Cercospora fagopyri* Chupp & A.S. Mull., Bol. Soc. Venez. Ci. Nat. 8: 44. 1942 nom. illeg. (homonym).

Description. Leaf spots circular or eliptical, 1–10 mm diam., greyish green, reddish brown or brown. Caespituli amphigenous; stromata lacking or composed of several dark brown cells. Conidiophores solitary or 2–12 in divergent fascicles, usually pale brown, paler and more narrow towards the apex, septate, not branched, straight or up to 5 geniculate, 25–150 × 4–6 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, indistinctly pluriseptate, 45–150(–350) × 2–5 µm [10,13].

Hosts. On *Fagopyrum* spp., Polygonaceae. ***Fagopyrum esculentum*** Moench: A2 – Koszalin [168]; A3 – Szczecin [168]; A4 – Gdańsk [168]; G1 – Wałbrzych, Jelenia Góra [168].

Geographical distribution. Poland, Russia; China, India, Japan, Korea, Taiwan, Uganda, Venezuela, Zambia.

Notes. The molecular studies performed by Groenewald et al. [24] suggested that the name *C. fagopyri* can only tentatively be applied to other isolates than those from *Fagopyrum*.

Cercospora galegae **Sacc.***

Michelia 1: 267. 1878.

= *Cercospora radiata* Sacc., Mycoth. venet. No. 229. 1873 (nom. illeg.), homonym of *C. radiata* Fuckel, 1866.

Exs. on *Galega officinalis*: Saccardo, Mycoth. Ven. 1055 (KRA-F 1876-200).

Description. Leaf spots circular or elliptic, 0.5–1.4 mm diam., grey centre, narrow, reddish or brown margin. Caespituli amphigenous; stromata brown. Conidiophores pale olivaceous-brown, paler towards the apex, 1–7-septate, not branched, slightly geniculate, 20–105 × 4–5 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, septate, 45–110 × 2.5–4.5 µm.

Hosts. On *Galega* spp., Leguminosae. ***Galega officinalis*** L.: Italy – Selva (Treviso), Oct. 1876 (KRA-F 1876-200).

Geographical distribution. Bulgaria, Great Britain, Italy, Romania, Russia, Ukraine; Azerbaijan.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The host occurs in the Polish flora; therefore it might be possible to find this fungus in Poland.

Cercospora ipomoeae **G. Winter***

Hedwigia 26: 34. 1887.

(= *Cercospora apii* s. l.)

= *Cercospora dichondrae* Katsuki, Ann. Phytopathol. Soc. Japan 20: 72. 1995.

Exs. on *Ipomoea lacunosa*: Rabenhorst-Winter, Fungi Eur. Exs. 3585 (WA 342).

Description. Leaf spots scattedred or confluent, distinct, circular, often zonate, 1–8 mm diam., centre pale brown to dingy grey, with purplish brown or dark brown margin. Caespituli amphigenous, but chiefly hypophyllous; stromata rudimentary or slightly developed, composed of several brown hyphal cells. Conidiophores 4–12 in divergent fascicles, usually pale olivaceous-brown, usually 1–2(–3)-septate, 1–3 times geniculate at the apex, not branched, 30–166 × 3.5–5.5 µm. Conidia solitary, hyaline, acicular, rarely obclavate, straight or slightly curved, subacute at the apex, truncate at the base, 35–220 × 3–4.5 µm.

Hosts. On Convolvulaceae. ***Ipomoea lacunosa*** L.: USA – n. Perryville (Missouri), Aug. 1885, leg. C.H. Demetrio (WA 342).

Geographical distribution. Distributed worldwide on different species of Convolvulaceae family.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. Only *Ipomoea purpurea* (L.) Roth occurs in Poland and *C. ipomoeae* has been reported on this host species outside Poland. Therefore, it might be possible to find this fungus in Poland.

Cercospora juncina Sacc.*

Ann. Mycol. 11: 552. 1913.

= *Cercosporina juncicola* Hori & Kasai, Jap. J. Bot. 2: 105. 1923.
≡ *Cercospora juncicola* (Hori & Kasai) Vassiljevsky, in Vassiljevsky & Karakulin, Fungi imperfecti parasitici (Hyphomycetes) 1: 275. 1937.
≡ *Cercospora juncicola* (Hori & Kasai) Chupp, A monograph of the fungus genus *Cercospora*: 263. 1954 (comb. superfl.).
= *Cercospora junci* Davis, Trans. Wisconsin Acad. Sci. 24: 300. 1929.
= *Cercospora junci-filiformis* Mel'nik, Novosti Sist. Nizsh. Rast. 1966: 214. 1966.

Description. Spots at first small, subcircular, elliptical-oval, oblong, 1–10 × 1–3 mm, sometimes diffuse, brown with diffuse yellowish halo, later larger segments of the leaf sheath or stem turning dark brown. Stromata substomatal, 10–40 µm diam, rarely larger, to 75 µm, brown to dark brown, composed of swollen hyphal cells, 2–7 µm diam, rounded to angular in outline. Conidiophores in small to moderately large fascicles, about 3–20, divergent to usually dense or very dense, pale to dark brown or olivaceous-brown, 0–2-septate, erect, straight, subcylindrical to distinctly geniculate-sinuous, unbranched, (5–)10–60(–80) × 2–6 µm, Conidia solitary, hyaline, subhyaline to pale olivaceous, obclavate-cylindrical, 2–6-septate, straight to curved, apex obtuse to pointed, base short obconically truncate, 25–75 × 2.5–5(–6) µm [129].

Hosts. On *Juncus* spp., Juncaceae.

Geographical distribution. Romania, Russia; Armenia, Canada, China, Japan, Morocco, USA.

Notes. This species was reported on *Juncus conglomeratus* L. em. Lee (SZPA 3490) and *Juncus effusus* L. (SZPA 4933) from Kluki in the Słowiński National Park [156]. Conidiophores and conidia of *C. juncina* were not found in the revised material, but the occurrence of this fungus in Poland might be possible.

The fungus was published as *C. juncicola*, but according to Braun et al. [129] this name has recently been reduced to a synonym with *C. juncina*.

Cercospora kabatiana Allesch. ex Lindau

Rabenh. Krypt.-Fl. ed 2, 9: 130. 1910.

(= *Cercospora apii* s. l.)
≡ *Cercospora kabatiana* (Allesch. ex Lindau) Moesz, Magyar Biol. Kutatóint. Munkái 3: 115. 1930.

Description. Leaf spots subcircular or irregular, 5–15 mm diam., grey or greenish grey. Caespituli amphigenous; stromata small, dark brown or almost black. Conidiophores 2–13 in fascicles, olivaceous-brown, usually septate, not branched, 20–60 × 3–4.5 µm. Conidia solitary, hyaline, acicular, 4–16 indistinctly septate, apex acute, base truncate, 40–130 × 2.5–3.5 µm (Fig. 1e, Fig. 18).

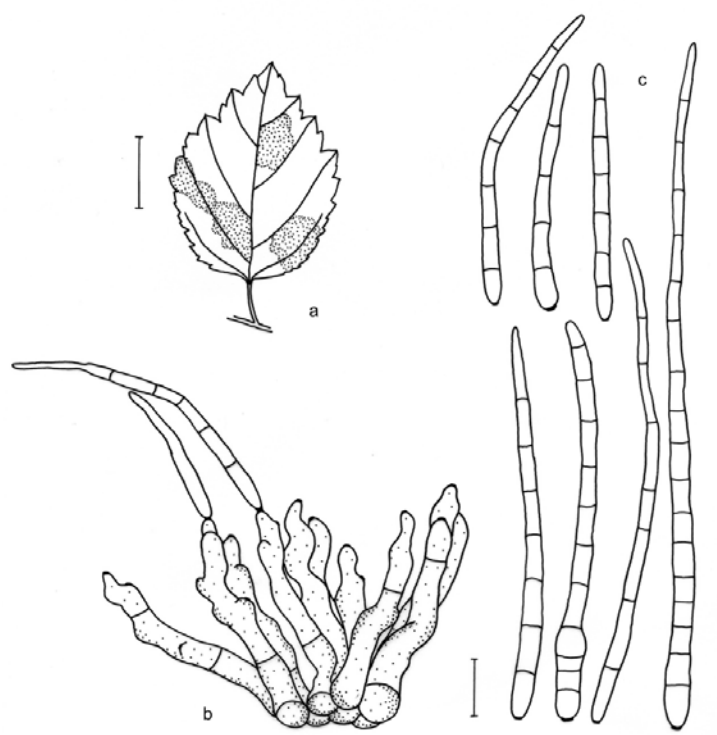

Fig. 18 *Cercospora kabatiana* on *Lamium galeobdolon* (LBL, Nowa Wieś n. Dukla, leg. A. Wołczańska). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Hosts. On Lamiaceae. ***Lamium galeobdolon*** (L.) L.: I1 – Nowa Wieś n. Dukla, Cergowa Mt in the Low Beskidy Mts, 30 Jul. 1992, leg. A. Wołczańska (LBL) [169].

Geographical distribution. Austria, Czech Republic, Poland; Armenia, Lesotho, Thailand, USA.

Cercospora kikuchii T. Matsumoto & Tomoy.*

Ann. Phytopathol. Soc. Japan 1: 1. 1925.

(= *Cercospora apii* s. l.)
≡ *Cercosporina kikuchii* T. Matsumoto & Tomoy., l.c.: 10.
≡ *Cercospora kikuchii* (T. Matsumoto & Tomoy.) M.W. Gardner, Proc. Indian Acad. Sci. 36: 12. (1926) 1927 (comb. superfl.).

Teleo.: *Mycosphaerella phaseoli* Chona & Munjal, Indian Phytopathol. 9: 53. 1956.

Description. Leaf spots amphigenous, scattered to confluent, subcircular to angular, 1–15 mm diam., or up to 10 mm when confluent, initially appearing pale brown, later becoming tan to dingy grey, finally centre turning greyish white to light grey with reddish brown or purplish brown border lines. Caespituli amphigenous, also on stems and pods; stromata small to medium, slightly to moderately developed, dark brown to blackish brown, subglobular to globular, 15–40 μm diam. Conidiophores 2–20 in a divergent fascicle, arising from substomatal cavities and emerging through the cuticle, olivaceous brown throughout, irregular in width, straight to slightly curved, 1–5 times mildly geniculate, not branched, 2–6-septate, 20–220 × 3.5–6 μm. Conidia solitary, hyaline, acicular to filiform, straight to slightly curved, 5–22-septate, obtuse to subacute at the apex, truncate at the base, 50–220(–375) × 2.5–5 μm [13,31].

Hosts. On Leguminosae.

Geographical distribution. Worldwide; reported from over 50 countries.

Notes. This fungus has not been published from Poland so far, but it is a quarantine species mentioned in regulation of the Minister of Agriculture and Agricultural Reform of 19 March 1984 and regulation of the Minister of Environment of 29 November 2002. This information and a fungal diagnosis will be helpful to Polish plant protection services to identify potential collections of this fungus.

Cercospora kikuchii could crop up on *Glycine max* (L.) Merr., occurring in the Polish flora, or other hosts from Leguminosae family introduced to Poland.

Cercospora loti Hollós

Ann. Hist.-Nat. Mus. Natl. Hung. 5: 468. 1907.

Description. Leaf spots circular or oval, reddish brown, 1–8 mm diam. Caespituli usually epiphyllous, effuse, olivaceous; stromata usually composed of few cells, rarely large. Conidiophores pale olivaceous-brown, septate, not branched, straight or slightly geniculate,

30–110(–155) × 3–5 µm. Conidia solitary, hyaline, acicular, 3–18-septate, straight or slightly curved, 30–130 × (2.5–)3–5 µm (Fig. 19).

Hosts. On *Lotus* spp., Leguminosae. ***Lotus corniculatus*** L.: A1 – Słowiński National Park [156]; ***Lotus pedunculatus*** Cav.: A1 – Słowiński National Park – Kluki, leg. I. Adamska, Jul. 2001 (SZPA 4933) [156]; Słowiński National Park – Kluki, leg. I. Adamska, Aug. 2001 (SZPA 2401), Oct. 2002 (SZPA 3239), Jul. 2004 (SZPA 4218), Aug. 2004 (SZPA 4311), Aug. 2004 (SZPA 4335).

Geographical distribution. Great Britain, Hungary, Lithuania, Poland; Morocco, New Zealand, USA.

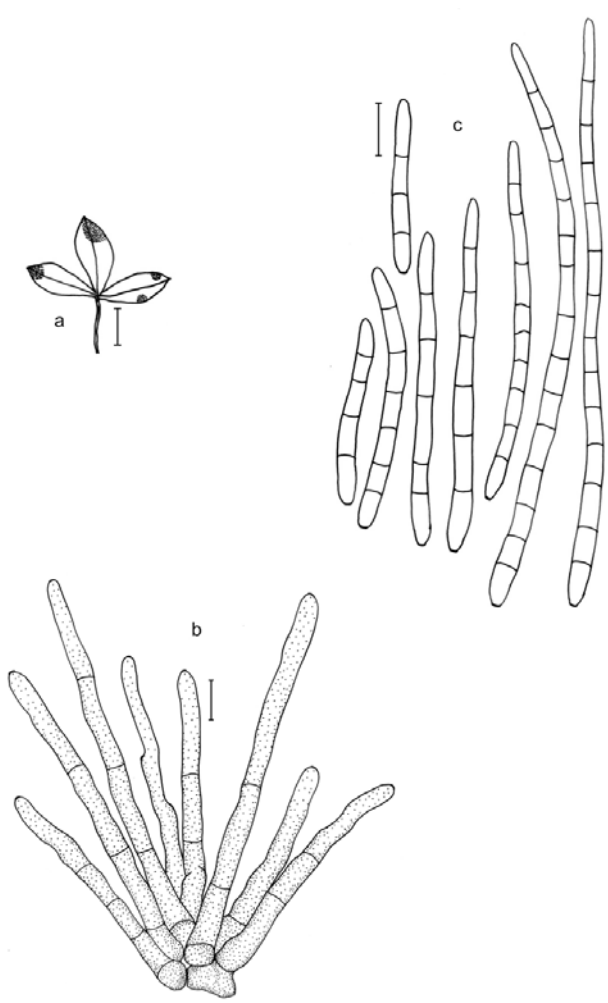

Fig. 19 *Cercospora loti* on *Lotus pedunculatus* (SZPA 3239). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 10 mm; **b,c** 10 µm.

Notes. This species is similar or could be identical with *Cercospora apii* s. l. [11]. The environmental conditions, especially high temperature and humidity have an influence on the length of conidiophores and conidia. Under favourable conditions, e.g. in a moist chamber, the conidiophores and conidia *C. apii* s. l. can reach up to about 500 µm, although under normal conditions they rarely achieve a length between 100 and 150 µm.

Cercospora lycii **Ellis & Halst.**

J. Mycol. 4: 7. 1888.

(= *Cercospora apii* s. l.)

Description. Leaf spots circular or oval, scattered, rarely confluent, 2–12 mm diam., centre pale brown or dingy grey, margin brown. Caespituli usually hypophyllous; stromata small, brown. Conidiophores 2–8 in fascicles, brown, pluriseptate, not branched, up to 4 times geniculate, 45–200 × 4–6 µm. Conidia solitary, hyaline, acicular, filiform or obclavate, straight or slightly curved, indistinctly pluriseptate, truncate to subtruncate base, acute tip, 23–250 × 2–4.5 µm [13,31].

Hosts. On *Lycium* spp., Solanaceae. ***Lycium barbarum*** L.: E4 – Puławy – Włostowice distr. [87,161].

Geographical distribution. Poland, Russia; China, Georgia, Korea, USA.

Cercospora maianthemi **Fuckel (*majanthemi*)**

Hedwigia 5: 30. 1866.

Exs. on *Maianthemum bifolium*: Bucholtz & Bondartsev, Fungi Ross. Exs., Ser. B, 688 (WA 349); Saccardo, Mycoth. Ven. 1565 (KRA-F 1880-71).

Description. Leaf spots circular or irregular, centre brown or dingy grey, margin dingy reddish brown. Caespituli amphigenous, but usually hypophyllous; stromata circular, dark brown or almost black. Conidiophores usually in dense fascicles, pale olivaceous-brown or dark brown, septate, not branched, geniculate or undulate, 45–175 × (4.5–)5–7.5 µm. Conidia solitary, at first hyaline or subhyaline, later greenish to pale olivaceous or pale olivaceous-brown with age, obclavate or cylindrical, straight or slightly curved, 3–22-septate, 42.5–140 × 5–7 µm (Fig. 20).

Hosts. On Asparagaceae. ***Maianthemum bifolium*** (L.) F.W. Schmidt: A1 – Słowiński National Park [156]; B1 – Poznań [74,87]; B5 – Legnica [87]; C4 – Rabsztyn [87,133]; Złoty Potok, n. Twardowski Gate, 12 Jun. 1998 (LOD 2718) [54]; Ojców [87]; C6 – Zagnańsk [87,133]; E1 – Buszyn n. Świecie [65,74,87]; E3 – Białowieża Forest [87,162]; Radziwiłłów Forest on the Rawka River (n. Skierniewice), Zwierzyniec [73,87]; Skierniewice [87]; E4 – Kazimierz Dolny [150]; G1 – Międzygórze [87]; H1 – Czasław n. Kraków [170]; Tuszyna n. Kraków [72]; Germany – Königstein (Saxony), 22 Jul. 1888, leg. W. Krieger (WA 350).

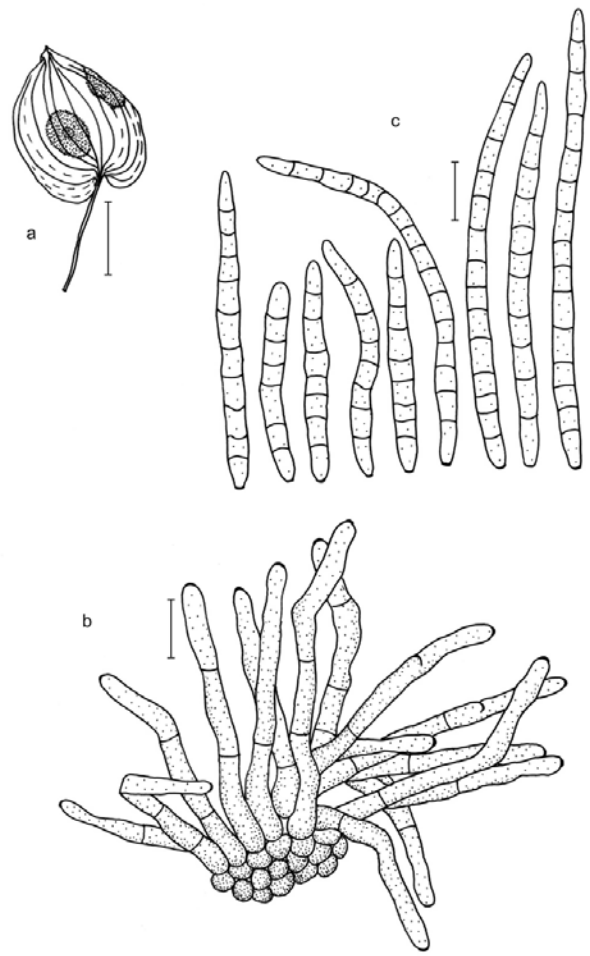

Fig. 20 *Cercospora maianthemi* on *Maianthemum bifolium* (LOD PF-2718). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 10 mm; **b,c** 10 μm.

Geographical distribution. Austria, Belgium, Estonia, Germany, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Romania, Russia, Sweden, Switzerland, Ukraine; Japan, North America (USA).

Notes. *Cercospora maianthemi* was also reported on *Paris quadrifolia* L. from Stanowice [87]. The herbarium material needs revision, because only *C. paridis* is known on *Paris* [11]. Owing to hyaline to pigmented passaloroid conidia, the generic affinity of this species is not yet settled and needs to be confirmed by molecular methods [129].

Cercospora medicaginis Ellis & Everh.

Proc. Acad. Nat. Sci. Philadelphia 43: 91. 1891.

(= *Cercospora apii* s. l.)
= *Cercospora helvola* var. *medicaginis* Gandara, Mem. Acad. Nac. Ci. "Antonia Alzate" 29: 380. 1909.

Description. Leaf spots circular or irregular, 1–5 mm diam., centre yellowish or brown, sometimes with greenish tinge. Caespituli amphigenous; stromata lacking or composed of several dark brown cells. Conidiophores 3–12 in fascicles, usually pale olivaceous-brown, slightly paler and narrower towards the apex, septate, not branched, straight or 1–4 times geniculate, 20–115 × 3.5–5 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, 1–10 indistinctly septate, 30–115 × 3–4.5 µm (Fig. 1f, Fig. 21).

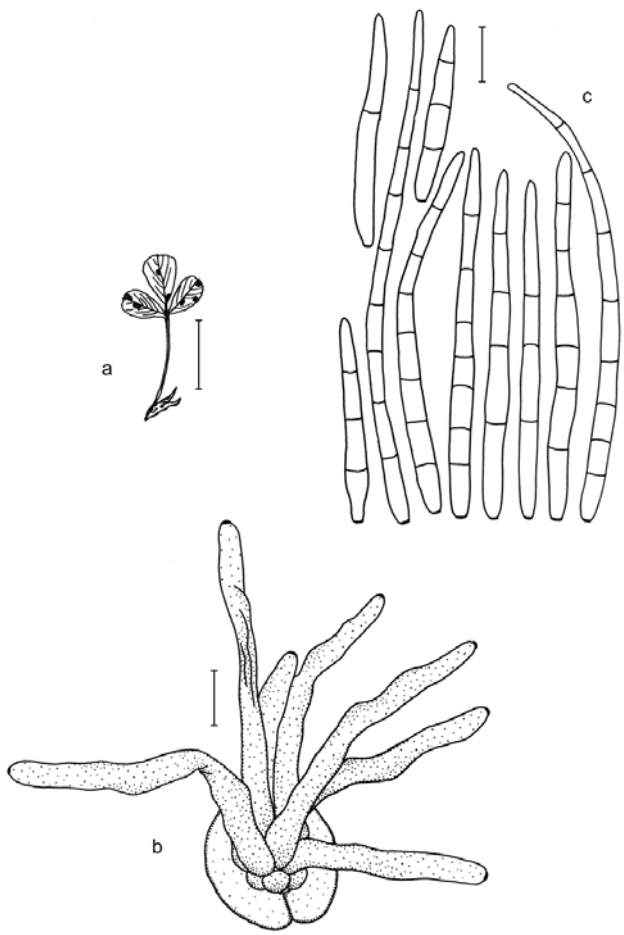

Fig. 21 *Cercospora medicaginis* on *Medicago lupulina* (LBL, Kozubów n. Pińczów, leg. J. Sałata). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Hosts. On Leguminosae. ***Medicago lupulina*** L.: C5 – Kozubów n. Pińczów, 21 Aug. 1984, leg. J. Sałata (LBL); C9 – Izbica, 10 Sep. 1970, leg. J. Sałata (LBL); E4 – Lublin – Czuby distr., 21 Aug. 2010, leg. U. Świderska-Burek (LBL); ***Medicago sativa*** L.: D1 – Zbereże n. Hrubieszów, 23 Jun. 1981, leg. M. Danilkiewicz (LBL, on *Medicago falcata* L.) [83]; E4 – Lublin – Czuby distr., 21 Aug. 2010, leg. U. Świderska-Burek (LBL).

Geographical distribution. Greece, Lithuania, Poland, Romania, Russia (European and Asian part); Angola, Australia, Azerbaijan, Brazil, Chile, China, Cuba, Dominican Republic, Guatemala, India, Iran, Israel, Jordan, Kazakhstan, Kyrgyzstan, Mauritius, Morocco, Panama, Peru, Phillipines, Salvador, South Africa, Sri Lanka, Sudan, Tadzhikistan, Turkmenistan, Uganda, USA, Uzbekistan, Zambia.

Notes. This species is indistinguishable from *C. apii* s. l. Young conidia are mostly obclavate-cylindrical, but older ones are distinctly acicular [11].

In Poland, it is a quarantine species mentioned in the regulation of the Minister of Environment of 29 November 2002.

Cercospora mercurialis **Pass.**

in Thüm., Mycoth. Univ., No. 783. 1877.

= *Cercospora fruticola* Sacc., Fungi Ital., Tab. 674. 1892.
= *Cercospora mercurialis* var. *annuae* Fautrey, in Roumeguere et al., Rev. Mycol. 15: 16. 1893.
= *Cercospora mercurialis* var. *latvici* Leppik, Tartu Ülik. Juures Oleva Loodusuur. Seltsi Arunded 39: 152. 1933.
= *Cercospora mercurialis* var. *multiseptata* Săvul. & Sandu, Hedwigia 75: 225. 1936.

Exs. on *Mercurialis annua*: Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 191 (KRA-F 1929-60); Thümen, Mycoth. Univ. 783 (WA 6576); on *Mercurialis perennis*: Siemaszko, Fungi Bialowiez. Exs. 200 (KRA-F 1923-48).

Description. Leaf spots circular or irregular, 1–5 mm diam., grey, sometimes with brown margin. Caespituli usually hypophyllous; stromata small, dark brown. Conidiophores 3–18 in fascicles, olivaceous-brown, paler towards the apex, septate, not branched, straight or sinuous, sometimes geniculate, 15–65 × 4–5.5 µm. Conidia solitary, hyaline or pale olivaceous, cylindrical or rarely almost acicular, straight or slightly curved, 3–15-septate, base truncate or obconic, apex usually obtuse, 30–150 × 3–5.5 µm (Fig. 1g, Fig. 5f, Fig. 7c, Fig. 22).

Hosts. On *Mercurialis* spp., Euphorbiaceae. ***Mercurialis perennis*** L.: A3 – Witkowo [87]; B1 – Samostrzel, Borek, 21 Sep. 1973, leg. A. Michalski (WA) [87,128]; B4 – Zielona Góra [87]; B5 – Wrocław [87]; C4 – Ojców National Park – Zamkowa Mt [42]; Ojców National Park [43,87]; Sokole Góry Reserve n. Częstochowa, 27 Jul. 2005 (LOD 834), 13 Jul. 1998, leg. M. Ruszkiewicz (LOD 2713) [54,85]; Ojców [87]; Janów Commune n. Częstochowa, leg. M. Ruszkiewicz, 18 Oct. 1997 (LOD 2712), 24 Sep. 1999 (LOD 2740); C5 – Jakubowice n. Kłodzko [87,158]; C6 – Łysica Mt [133]; E3 – Omelno Reserve n. Radzyń Podlaski [167]; F3 – Białowieża Forest, leg. W. Siemaszko, Aug. 1923 (KRA-F 1923-48) [87,171]; Białowieża National Park, Jun.–Jul. 1988, leg. W. Mułenko (LBL) [50,52]; Biebrza National Park – Kapice Protected Unit [136]; G1 – Duszniki Zdrój [172]; H1 – Parkowa Mt in Krynica-Zdrój, Huzary Mt n. Krynica Zdrój [173]; Pieniny National Park – Pieniński Potok Valley [44,87];

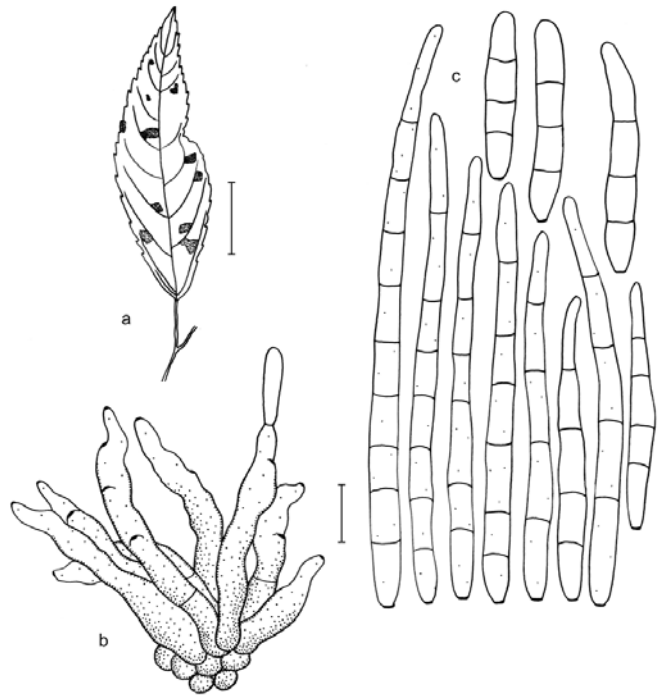

Fig. 22 *Cercospora mercurialis* on *Mercurialis perennis* (LBL, Zakopane, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Pieniny Mts – Ociemny Potok Valley [45,87]; Pieniny Mts [46]; Zakopane, 19 Sep. 1987, leg. W. Mułenko (LBL) [174]; Tatra National Park – Mała Łąka Valley [175]; Krynica [87]; Tatra National Park – tourist rout from Kościeliska Valley to Stoły Glade, 25 Aug. 2005, leg. U. Świderska-Burek (LBL).

Geographical distribution. Austria, Belarus, Belgium, Bulgaria, Denmark, Estonia, France, Germany, Great Britain, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Russia (European part), Slovakia, Spain, Sweden, Switzerland, Ukraine, former Yugoslavia; Australia, Bermuda, Hebrides, Malta, Morocco, Palestine.

Notes. Wakuliński and Marcinkowska [87] wrongly cited the data of Kućmierz [45,46] from the Ojców National Park, because the papers concern the Pieniny Mts.

Cercospora moravica (Petr.) U. Braun

Cryptog. Bot. 3: 235. 1993.

≡ *Cercoseptoria moravica* Petr., Ann. Mycol. 32: 366. 1934.
= *Cercosporella calthae* Lebed., Trudy Bot. Inst. Akad. Nauk SSR, Ser. 2, Sporov. Rast., 1: 398. 1933.
≡ *Cercoseptoria calthae* (Lebed.) Petr., Sydowia 10: 304. (1956)1957.

Description. Leaf spots visible on both sides (amphigenous), angular, irregular, sometimes subcircular, brown, 1–8 mm diam., often confluent, margin indefinite, partialy vein-limited. Caespituli amphigenous, whitish, subeffuse; stromata usually hyaline, 10–50 µm diam. Conidiophores in divergent or dense fascicles, hyaline, subcylindrical or geniculate-sinuous, straight, usually aseptate, 5.5–25 × 2–4 µm. Conidia hyaline, acicular, 1–8 indistinctly septate, 30–135 × 1–2.5 µm (Fig. 1h, Fig. 23).

Hosts. On *Caltha palustris*, Ranunculaceae. ***Caltha palustris*** L.: E3 – Garwolin, 28 Aug. 1986, leg. H. Maszkiewicz (LBL M-12169); Firlej n. Lublin, 12 May 1989, leg. E. Kasińska (LBL M-12170) [92].

Geographical distribution. Czech Republic, Finland, France, Germany, Great Britain, Poland, Russia.

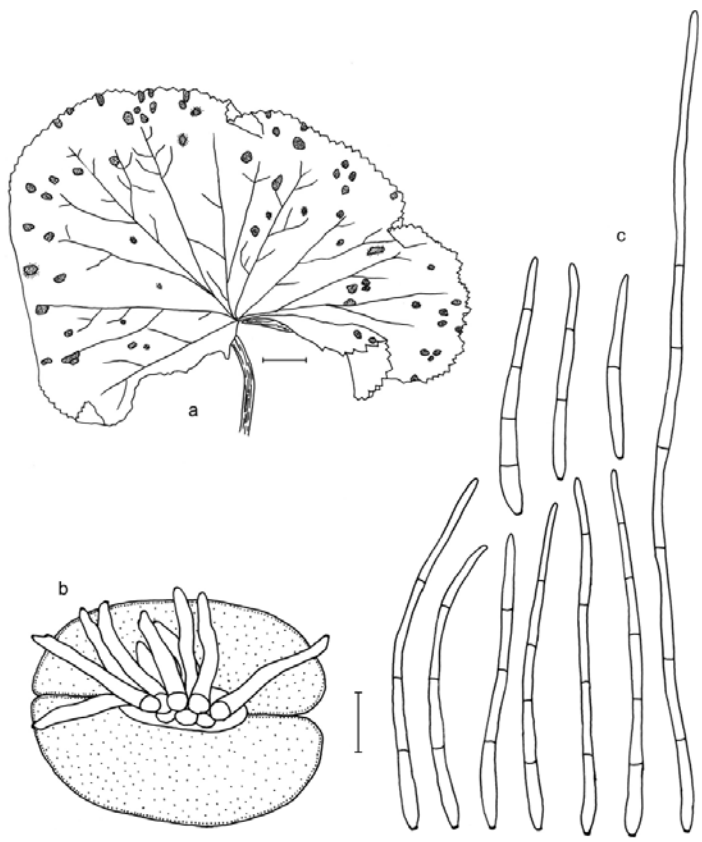

Fig. 23 *Cercospora moravica* on *Caltha palustris* (LBL M-12170). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Cercospora nebulosa Sacc.*

Nuovo Giorn. Bot. Ital. 8: 189. 1876.

Exs. on *Alcea rosea*: Saccardo, Mycoth. Ven. 599 (KRA-F 1875-277).

Description. Spots on stems oval or elliptic, from dark grey to almost black. Caespituli visible as small black points, indistinct; stromata circular, dark brown, 20–40 µm diam. Conidiophores pale olivaceous-brown, apex paler, sparingly septate, not branched, 20–45 × 4.5–5 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, indistinctly pluriseptate, 20–70 × 2.5–4.5 µm.

Hosts. On Malvaceae. ***Alcea rosea*** L.: Italy – Selva (Treviso), Sep. 1875 (KRA-F 1875-277).

Geographical distribution. Italy, Ukraine; Azerbaijan, Cyprus, Georgia, India, Kazakhstan, Pakistan.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The host occurs in the Polish flora; therefore, it is seems to be possible to find this fungus in Poland.

Cercospora olivascens Sacc.*

Michelia 1: 268. 1879.

≡ *Cercosporina olivascens* (Sacc.) Sacc., Syll. Fung. 25: 897. 1931.
= *Cercospora propinqua* C. Massal., Malpighia 25: 59. 1912.
≡ *Cercosporina propinqua* (C. Massal.) Sacc., Syll. Fung. 25: 897. 1931.
= *Cercospora aristolochiae* Roum., Fungi gall. exs., No. 757. 1880 (nom. nud.).
= *Cercospora olivascens* var. *minor* Serebr., Magyarorsz. Virágtalan Növen. Meghat. Kézikönyre 1: 313. 1927.

Exs. on *Aristolochia clematitis*: Saccardo, Mycoth. Ven. 1251 (KRA-F 1877-138); Sydow, Mycoth. Germ. 3199 (KRA-F 1937-66).

Description. Leaf spots angular, vein-limited, 1–10 mm diam., dark brown. Caespituli hypophyllous; stromata slight, brown. Conidiophores 2–16 in fascicles, usually olivaceous-brown, uniformly coloured, pluriseptate, not branched, geniculate, 55–175 × 4–5.5 µm. Conidia solitary, hyaline, cylindrical or obclavate, rarely acicular, straight or slightly curved, 3–9-septate, 37.5–100 × (3.5–)4–5 µm.

Hosts. On *Aristolochia* spp., Aristolochiaceae. ***Aristolochia clematitis*** L.: Italy – Selva (Treviso; KRA-F 1877-138); Germany – Elsholz, 31 Jul. 1937, leg. E. Fahrendorff (KRA-F 1937-66).

Geographical distribution. Bulgaria, France, Germany, Hungary, Italy, Montenegro, Portugal, Romania, Russia (Europaean part), Slovakia, Ukraine; Argentina, Armenia, Azerbaijan, China, Georgia, India, Morocco, Turkey.

Notes. The data of Namysłowski [72] published as *C. olivascens* on *Phaseolus vulgaris* from Dublany near Lwów (KRA-F 1909-285, 1909-286, 1909-287) have to be assigned to *Pseudocercospora griseola* after revision.

This fungus was also collected outside Poland but deposited in a Polish herbarium. The host species occurs in the Polish flora; therefore, its occurrence in Poland might be possible.

Cercospora pantoleuca Sacc.

Michelia 1: 268. 1879.

≡ *Cercosporella pantoleuca* (Sacc.) Sacc., Fungi Ital. Delin., Tab. 679. 1881.
= *Cercosporella pantoleuca* var. *santonensis* Brunaud, in Sacc., Syll. Fung. 10: 565. 1893.

Exs. on *Plantago lanceolata*: Săvulescu, Herb. Mycol. Roman., Fasc. 13, No. 623 (KRA-F 1933-130).

Description. Leaf spots amphigenous, often confluent, circular or irregular, from brown to whitish, with a darker, narrow margin, usually 1–6 mm diam. or wider, often confluent. Caespituli amphigenous, usually hypophyllous, greyish white. Conidiophores in divergent fascicles, hyaline, subcylindrical, aseptate or with few indistinct septa, straight or geniculate sinuous, 9–47 × 2.5–4(–4.5) µm. Conidia solitary, hyaline, cylindrical, acicular or obclavate, aseptate or 1–9-septate (usually 3–6-septate), 20–90 × 2–3.5 µm (Fig. 2b, Fig. 24).

Hosts. On *Plantago* spp., Plantaginaceae. ***Plantago major*** L.: E3 – Derło on the Bug River, 17 Jun. 1981, leg. M. Danilkiewicz (LBL, as *Cercospora plantaginis* Sacc.) [83]; ***Plantago media*** L.: D1 – Kąty n. Zawada, 18 Jul. 1980, leg. J. Sałata (LBL); ***Plantago lanceolata*** L.: A3 – Szczecin [176]; surroundings of Stargard Szczeciński, surroundings of Szczecin [125]; C1 – Łódź – Sielanka Park in Pabianicka St., 19 Oct. 2005, leg. M. Jakiel (LOD 2741, as *C. plantaginis*); D1 – Husynne n. Hrubieszów, 22 Jun. 1981, leg. M. Danilkiewicz (LBL); E3 – Skierniewice [73]; E5 – Durne Bagno Reserve, 20 Sep. 1983, leg. W. Mułenko (LBL, as *C. plantaginis*) [81]; F3 – Białowieża, 29 Aug. 1990, leg. P. Duda (LBL).

Geographical distribution. Denmark, Germany, Italy, Latvia, Poland, Romania, Russia, Sweden, Switzerland; Armenia, Azerbaijan, Georgia, India, Kazakhstan, Philippines, Turkey, USA, Uzbekistan.

Cercospora paridis Erikss.

Hedwigia 22: 158. 1883.

≡ *Cercosporidium paridis* (Erikss.) X.J. Liu & Y.L. Guo, Acta Mycol. Sin. 1: 99. 1982.
≡ *Passalora paridis* (Erikss.) Poonam Srivast., J. Living World 1: 117. 1994 (comb. inval.).
≡ *Passalora paridis* (Erikss.) Y.L. Guo, Mycosystema 20: 157. 2001.
= *Cercospora majanthemi* var. *paridis* Bäumler, Verh. Zool.-Bot. Ges. Wien. 38: 717.1888.

Exs. on *Paris quadrifolia*: Jaczewski, Komarov & Tranzschel, Fungi Ross. Exs. 149 (WA 7416); Sydow, Mycoth. Germ. 3399 (KRA-F 1938-72); Sydow, Mycoth. Germ. 291, 1779 (WRSL).

Description. Leaf spots circular to oval, 3–10 mm diam., pale brown or greyish brown. Caespituli hypophyllous; stromata brown. Conidiophores in dense fascicles, pale

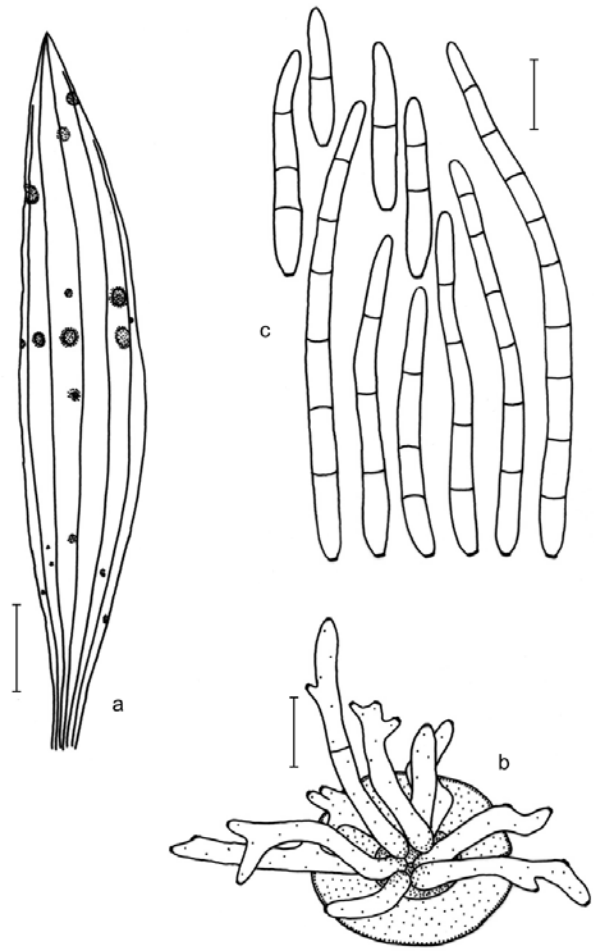

Fig. 24 *Cercospora pantoleuca* on *Plantago lanceolata* (LBL, Białowieża, leg. P. Duda). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

olivaceous-brown, septate, not branched, straight or 0–3 geniculate, 30–90 × 4–6 µm. Conidia solitary, hyaline, obclavate or cylindrical, 1–7-septate, 30–75(–100) × 4–6 µm (Fig. 2c, Fig. 5a,c, Fig. 7a, Fig. 25).

Hosts. On *Paris* spp., Melanthiaceae. ***Paris quadrifolia*** L.: B1 – Zielonka Experimental Forest Division n. Poznań [87,165]; E1 – surroundings of Świecie [65,74,87]; E4 – Kazimierz Dolny [87,150]; F3 – Białowieża [87]; Białowieża Forest, 24 Jun. 2002, leg. M. Wołkowycki (LBL M-9059) [90].

Geographical distribution. Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Italy, Latvia, Norway, Poland, Romania, Russia (European and Asian part), Slovakia, Slovenia, Sweden, Ukraine; China, Japan, Kazakhstan.

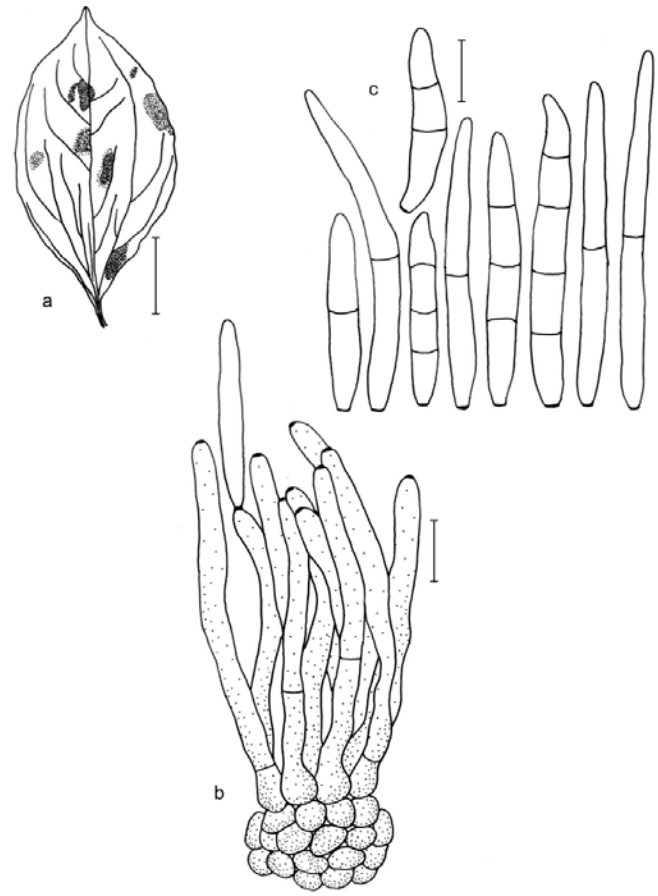

Fig. 25 *Cercospora paridis* on *Paris quadrifolia* (LBL M-9059). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

Cercospora physalidis Ellis

Amer. Naturalist 16: 810. 1882, emend. Braun & Melnik, Trudy Bot. Inst. im. V.L. Komarova 20: 79. 1997.

(= *Cercospora apii* s. l.)
≡ *Cercosporina physalidis* (Ellis) Miura, South Manch. Railway Co. Agric. Rep. 27: 525. 1928.
= *Cercospora solanicola* G.F. Atk., J. Elisha Mitchell Sci. Soc. 8: 53. 1892.
= *Cercospora nicotianae* Ellis & Everh., Proc. Acad. Sci. Philadelphia 45: 170. 1893.
= *Cercospora physalidicola* Ellis & Barthol., Erythea 4: 28. 1896.
= *Cercospora physalidicola* Speg., Anales Mus. Nac. Buenos Aires II, 3: 342. 1899 (nom. illeg.), homonym of *C. physalidicola* Ellis & Barthol., 1896.
= *Cercospora raciborskii* Sacc. & Syd., Syll. Fung. 16: 1070. 1902.
= *Cercosporina physalidicola* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 20: 426. 1910.
= *Cercosporina daturicola* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 20: 425. 1910.
≡ *Cercospora daturicola* (Speg.) Vassiljevsky, in Vassiljevsky & Karakulin, Fungi imperfecti parasitici. 1. Hyphomycetes: 347. 1937.
≡ *Cercospora daturicola* (Speg.) W.W. Ray, Mycologia 36: 175. 1944.
= *Cercospora capsici* Heald & F.A. Wolf, Mycologia 3: 15. 1911.
= *Cercospora abchasica* Siemaszko, Izv. Kavkazsk. Muz. (Tiflis) 12: 26. 1919.

= *Cercospora melongenae* Welles, Phytopathology 12: 63. 1922.
= *Cercospora atropae* Kvash., Izv. Severo-Kavkazsk. Kraev. Stantsii Zashch. Rast. 4: 37. 1928.
= *Cercosporina petuniae* Saito, Trans. Tottori Soc. Agric. Sci. 3: 271. 1931.
≡ *Cercospora petuniae* (Saito) Chupp & A.S. Mull., Ceiba 1: 176. 1950 (nom. illeg.), homonym of *C. petuniae* A.S. Mull. & Chupp, 1936.
= *Cercospora petuniae* A.S. Mull. & Chupp, Arq. Inst. Biol. Veg. Rio de Janeiro 3: 96. 1936 (nom. inval.).
= *Cercospora petuniae* Sandu & Serea, in Sandu et al., Lucr. Şti. Inst. Agron. 1962: 94. 1962 (nom. illeg.), homonym of *C. petuniae* A.S. Muller & Chupp, 1936.
= *Cercospora petuniae* var. *brevipedicellata* Chiddarwar, Indian Phytopathol. 12: 120. (1959) 1960 (nom. inval.).

Description. Leaf spots amphigenous, scattered, sometimes confluent, subcircular to irregular, 2–15 mm diam., on the upper surface yellowish brown with a dark brown margin, on the lower surface brown or greyish brown. Caespituli amphigenous, but mostly hypophyllous; stromata usually small, dark brown to almost black, composed of several dark brown hyphal cells. Conidiophores 2–9 in dense or divergent fascicles, olivaceous-brown or brown, straight or 1–5 times geniculate, not branched, 1–6-septate, 30–192 × 4–5.5 µm. Conidia solitary, pale olivaceous-brown, mature conidia acicular, small and young conidia may be somewhat obclavate or cylindrical, straight to mildly curved, 3–15-septate, 50–195 × 3–4.5 µm [31].

Hosts. On Solanaceae. ***Hyoscyamus*** sp.: E4 – Puławy [177]; ***Nicotiana*** sp.: Java – without precise localization, leg. M. Raciborski [KRA-F 0-4775(J), 0-4776(J), 0-4777(J), 0-4778(J), 0-4779(J)].

Geographical distribution. Distributed worldwide on various Solanaceae species.

Notes. The fungus has been found on *Hyoscyamus* sp. from Poland, but the herbarium material has not been revised. In addition, material on *Nicotiana* sp. from Java, deposited in the Kraków herbarium, was revised. In the Polish flora, three species of the genus *Nicotiana* occur: *N. alata* Link & Otto, *N. rustica* L., *N. tabacum* L. The fungus has been collected on the latter two host species in other parts of the world and also on 10 other hosts occuring in Poland. Therefore, it is very likely that this species might be found on these plants in Poland. "*Cercospora physalidis* emend. Braun & Melnik" is undoubtedly an unresolved complex of specialized as well as plurivorous species. Molecular data are currently not sufficient to define and properly circumscribe acceptable species within this complex [24].

Cercospora plantaginis **Sacc.***

Michelia 1: 267. 1879.

(= *Cercospora apii* s. l.)
= *Cercospora plantaginella* Tehon, Mycologia 16: 139. 1924.

Description. Leaf spots amphigenous, scattered, indistinct, circular to subcircular, 1–4 mm diam., pale brown to grey with an indistinct or brown margin. Caespituli amphigenous, but mostly epiphyllous, punctiform, later greyish brown. Conidiophores 5–12 in divergent fascicles, pale olivaceous-brown, straight or usually 1–3 times geniculate, not branched,

1–3-septate; conidial scars conspicuous, 1.5–2.5 µm wide, 20–104(–300) × 3.5–5.5 µm. Conidia solitary, hyaline, solitary, acicular-filiform or obclavate, straight or mildly curved, 5–18-septate, non constricted at the septa, apex acute or subobtuse, base truncate; hilum conspicuously thickened, darkened and non-protuberant, 40–182 × 2–4 µm [13,31].

Hosts. On *Plantago* spp., Plantaginaceae.

Geographical distribution. Bulgaria, Germany, Great Britain, Italy, Portugal, Romania, Russia (European part), Ukraine; Armenia, Azerbaijan, Brazil, Cuba, Cyprus, Egypt, Japan, Kazakhstan, Korea, Mauritius, Panama, South Africa, USA, Uzbekistan, Venezuela.

Notes. This species has been reported by Danilkiewicz [83] on *Plantago major* from Derło and by Mułenko [81] on *P. lanceolata* from Durne Bagno Reserve. These collections have to be referred to as to *Cercospora pantoleuca* Sacc. after revision. However, *Plantago* spp. are common in Poland; therefore, the occurrence of *C. plantaginis* appears to be most likely.

Cercospora radiata **Fuckel**

Hedwigia 5: 24. 1866.

= *Cercospora brevipes* Penzig & Sacc., Syll. Fung. 4: 438. 1886.
= *Cercospora radiata* var. *dalmatica* Baudyš, Oesterr. Bot. Z. 64: 438. 1914.
= *Cercospora budapestiensis* Penzes, Magyarorsz. Virág. Növén. Vonatkozó Közlem. 1: 297. 1927.

Teleo.: *Mycosphaerella vulnerariae* (Fuckel) Lindau, Hilfsb. Sammeln Ascomyceten: 12. 1903.
≡ *Sphaerella vulnerariae* Fuckel, Jahrb. Nassauischen Ver. Naturk. 27–28: 21. (1873–1874) 1873.

Description. Leaf spots circular or irregular, 0.5–5 mm diam., dark reddish brown. Caespituli epiphyllous; stromata dark brown or almost black, globular. Conidiophores usually in dense fascicles, olivaceous-brown, paler at the apex, usually 1–4-septate, not branched, straight or geniculate, 15–100(–125) × 3.5–5.5 µm (up to 185 µm long). Conidia solitary, hyaline, acicular or obclavate, shorter ones may be cylindrical, straight to slightly curved, 1–16-septate (mostly 4–10-septate), 15–100(–125) × 2.5–5 µm (up to 185 µm long; Fig. 2d, Fig. 26).

Hosts. On *Anthyllis* spp., Leguminosae. ***Anthyllis vulneraria*** L.: A1 – Rąbka n. Łeba in the Słowiński National Park, Jun. 2003, leg. I. Adamska (SZPA 3481); Słowiński National Park [156]; B2 – Węgierki n. Września [67,74,87]; C4 – Bliskie Lipówki Hill, Olsztyn Commune n. Częstochowa, 11 July 1998 (LOD 2731), 22 Aug. 1998 (LOD 407), 26 Sep. 1998 (LOD 2734, 2737), 27 Sep. 1998 (LOD 2738), 10 Jul. 1999 (LOD 2727), 26 Jun. 1999 (LOD 2732), 26 Jul. 1999 (LOD 2735), 28 Jul. 1999 (LOD 2726), 23 Aug. 1999 (LOD 2728, 2730, 2736), 21 Sep. 1999 (LOD 2729, 2733) [54]; D1 – Kąty n. Zamość, 20 Jun. 1983, leg. J. Romaszewska-Sałata (LBL); Dobużek n. Tyszowce, 10 Sep. 1988, leg. Z. Mróz (LBL); E3 – Mielnik, Uszestna Hill, 16 Jun. 1981, leg. J. Romaszewska-Sałata (LBL) [178]; Starachowice [87]; Sadkowice n. Solec on the Wisła River, 7 Jul. 1981, leg. J. Romaszewska-Sałata (LBL); H1 – Parkowa Mt, Szczawnica, Mochnaczka, Krzyżowa Mt n. Krynica [173]; Pieniny National Park – Gródek and the valleys of the PNP [45,87]; Pieniny Mts [46]; Krynica [87].

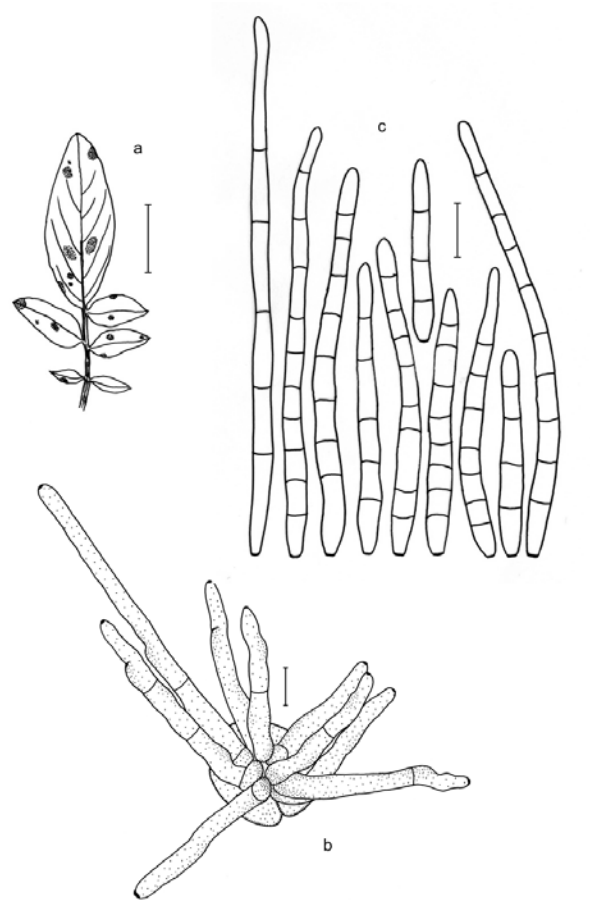

Fig. 26 *Cercospora radiata* on *Anthyllis vulneraria* (LBL, Sadkowice n. Solec, leg. J. Romaszewska-Sałata). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Geographical distribution. Austria, Denmark, Estonia, France, Germany, Great Britain, Greece, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Russia (European part), Slovakia, Spain, Sweden, Switzerland, Ukraine; Armenia, Azerbaijan, Georgia, Israel.

Notes. Wakuliński and Marcinkowska [87] wrongly cited the data of Kućmierz [44] from the Pieniny Mts. Kućmierz did not mention this fungus in his paper.

Cercospora rautensis C. Massal.

Osserv. Fitolog. in Madonna Verona 3: 19. 1909.

= *Cercospora coronillae-scorpiodis* Ferraris, Fl. Ital. Cryptog. I, Fungi, Hyphales: 893. 1910.
≡ *Cercosporina coronillae-scorpiodis* (Ferraris) Sacc., Syll. Fung. 25: 906. 1931.
= *Cercospora coronillae-variae* Lobik, Bolezni Rast. 17: 194. 1928.

Description. Spots on leaves and stems, subcircular or angular, 1.5–3 mm diam., greyish brown or grey centre with reddish margin. Caespituli amphigenous, but mostly epiphyllous; stromata brown. Conidiophores 2–11 in fascicles, pale brown, paler and more narrow towards the apex, sometimes septate, not branched, 20–60 × 4–5 µm. Conidia hyaline or pale olivaceous, acicular, obclavate or cylindrical, straight or slightly curved, (1–)3–5 indistinctly septate, 30–65(–80) × 3–5 µm (Fig. 27).

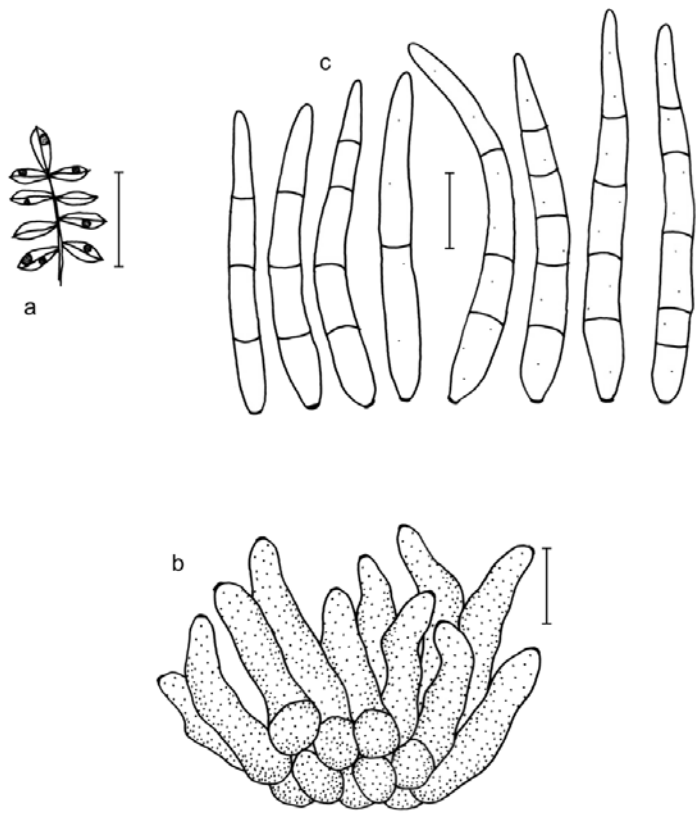

Fig. 27 *Cercospora rautensis* on *Securigera varia* (LOD 2722). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Hosts. On Leguminosae. ***Securigera varia*** (L.) Lassen: C4 – Bliskie Lipówki Hill, 21 Aug. 1998, leg. M. Ruszkiewicz (LOD 2722) [54]; Olsztyn Commune n. Częstochowa, 17 Oct. 1997, leg. M. Ruszkiewicz (LOD 2721).

Geographical distribution. Hungary, Italy, Lithuania, Poland, Romania, Russia, Ukraine; Georgia, USA.

Cercospora resedae Fuckel

Hedwigia 5: 30, Fungi Rhen. No. 1632. 1866.

= *Virgasporium maculatum* Cooke, Grevillea 3(28): 182. 1874.
= *Cercospora resedae* var. *mahonensis* Gonz. Frag., Mem. Real Ac. Ci. Barcelona XV(17): 36. 1920.
= *Cercospora resedae* var. *luteae* Lobik, Bolezni Rast. 17(3–4): 195. 1928.
= *Cercospora resedae* var. *legionensis* Losa, Collect. Bot. (Barcelona) 4: 133. 1954.

Exs. on *Reseda odorata*: Saccardo, Mycoth. Ven. 1250 (KRA-F 1877-139).

Description. Leaf spots circular, 1–4 mm diam., pale brown or yellowish brown, centre darker due to the presence of caespituli. Stromata composed of several dark brown cells, up to 50 µm diam. Conidiophores usually in dense fascicles, pale olivaceous-brown or brown, septate, rarely branched, 15–60 × 3.5–5 µm. Conidia solitary, hyaline or pale olivaceous, acicular or obclavate, shorter conidia can be cylindrical, straight or slightly curved, 1–8 indistinctly septate, 25–100 × 3.5–4.5 µm.

Hosts. On *Reseda* spp., Resedaceae. ***Reseda odorata*** L.: B1 – Dąbroszyn, Nakło [87]; B5 – Wrocław [87].

Geographical distribution. Belgium, Denmark, France, Germany, Great Britain, Hungary, Italy, Netherlands, Poland, Russia (European part), Slovakia, Spain; Australia, Azerbaijan, Georgia, Morocco, New Zealand, South Africa, USA.

Cercospora ricinella Sacc. & Berl.*

Atti Reale Ist. Ven. Sci. Lett. Art., 6, Ser. 3: 721. 1885

≡ *Cercosporina ricinella* (Sacc. & Berl.) Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires 20: 429. 1910.
= *Cercospora albido-maculans* G. Winter, Hedwigia 24: 202. 1885; also in J. Mycol. 1: 124. 1885.
= *Cercospora ricini* Speg., Anales Mus. Nac. Hist. Nat. Buenos Aires Ser. 2. 3: 343. 1899.

Description. Leaf spots amphigenous, scattered to confluent, circular to angular, 0.5–10(–15) mm diam., at first appearing yellowish brown to deep brown, later centre becoming greyish white to greyish brown with reddish brown margins. Caespituli amphigenous, but abundantly hypophyllous, punctiform; stromata lacking to small, rudimentary to slightly developed, subcircular to angular, brown to dark brown, 10–30(–50) µm diam., composed of a few swollen hyphal cells. Conidiophores 3–15 in a divergent to dense fascicle, usually arising from substomatal stromata or sometimes emerging through the cuticle, olivaceous-brown, fairly uniform in colour and width, 1–8 times mildly geniculate above the middle, not branched, straight to slightly curved, truncate at the apex, 1–5-septate, (10–)50–140 × 3.5–6 µm. Conidia solitary, hyaline, solitary, acicular-filiform to obclavate or obclavate-cylindrical, straight to mildly curved, 3–14-septate, non-constricted at the septa, obtuse to subobtuse at the apex, truncate to subtruncate at the base, (15–)44–176 × 2.5–5 µm [10,13,31].

Hosts. On *Ricinus communis*, Euphorbiaceae.

Geographical distribution. Worldwide, reported from over 60 countries, including Bulgaria, Russia (European part), and Ukraine from Europe.

Notes. This fungus has not been published from Poland so far, but it is a quarantine species mentioned in the Regulation of the Minister of Environment of 29 November 2002. This information and a fungal diagnosis will be helpful to Polish plant protection services to identify the fungus concerned when occurring. It might be possible to find this fungus on *Ricinus communis*, which is cultivated in Poland.

Cercospora sagittariae Ellis & Kellerm.*

J. Mycol. 2(1): 1. 1886.

= *Cercosporella macrospora* Bres., Hedwigia 36: 201. 1896.

Exs. on *Sagittaria sagittifolia*: Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 197 (KRA-F 1925-121).

Description. Leaf spots circular, 3–7 mm diam., brownish or greyish, wide pale brown margin. Caespituli amphigenous; stromata lacking or composed of several dark brown cells. Conidiophores usually in dense fascicles, pale olivaceous-brown with a paler apex, sparingly septate, not branched, straight or 1–2 geniculate, 20–60 × 3.5–7 μm. Conidia solitary, hyaline, acicular or obclavate, straight or slightly curved, indistinctly muliseptate, 65–155 × (2.5–)3–5 μm.

Hosts. On Alismataceae. ***Sagittaria sagittifolia*** L.: Romania – Muntenia, 26 Jul. 1925, leg. T. Săvulescu, R.S. Sandu (KRA-F 1925-121); ***Sagittaria*** sp.: Canada – Thelford, London, (Ontario), 12 Aug. 1912, leg. J. Dearness, DAOM 134196 (WA 20328).

Geographical distribution. Czech Republic, Germany, Hungary, Latvia, Romania, Russia (European part), Ukraine; Argentina, Brazil, Canada, China, Cuba, India, Japan, Korea, Puerto Rico, USA, Virgin Islands.

Notes. This fungus has been collected outside Poland, but some material is deposited in Polish herbaria. The host occurs in the Polish flora; therefore, it might be possible to find this fungus in Poland.

Cercospora senecionis Ellis & Everh.

Proc. Acad. Nat. Sci. Philadelphia 43: 90. 1891.

(= *Cercospora apii* s. l.)

Description. Leaf spots amphigenous, circular, angular or irregular, 1–10 mm diam., brown, centre greyish brown or greyish white, brown margin. Caespituli amphigenous, dark, effuse; stromata small, brown. Conidiophores in divergent or dense fascicles, subcylindrical, straight or slightly geniculate near the apex, septate; conidial scars thickened, darkened, 25–120 × 4–8 μm. Conidia solitary, hyaline, acicular, septate; hilum thickened, darkened, 3–4 μm wide, 80–200 × 3–6 μm [55].

Hosts. On *Senecio* spp., Compositae. ***Senecio*** sp.: F1 – Śniardwy Lake n. Niedźwiedzi Róg [179].

Geographical distribution. Poland; Georgia, USA.

Cercospora setariae G.F. Atk.

J. Elisha Mitchell Sci. Soc. 8: 50. 1892.

≡ *Cercosporina setariae* (G.F. Atk.) Hori, J. Pl. Prot. (Tokyo) 4: 1. 1917.
= *Cercospora setariicola* Tehon & E.Y. Daniels, Mycologia 19: 128. 1927.
= *Cercospora paspali* W.W. Ray, Mycologia 36: 173. 1944.

Description. Leaf spots oval, 2–12 × 0.5–2 mm, firstly dark reddish brown, later centre grey, often confluent. Caespituli amphigenous, but mostly hypophyllous; stromata small, brown, filling stomatal opening. Conidiophores 2–15 in divergent fascicles, pale yellowish olivaceous, the longest ones septate, not branched, occasionally 1–2 mildly geniculate; conidial scars small, thickened, 8–45(–85) × (2–)3–5(–6) µm. Conidia solitary, hyaline, cylindrical or obclavate, straight, slightly curved or undulate, indistinctly pluriseptate, 20–150 × 1.5–4 µm [10,13].

Hosts. On Poaceae. ***Setaria pumila*** (Poir.) Roem. & Schult.: E4 – Puławy – Kępa distr. [87,161].

Geographical distribution. Poland, Romania, Russia (European and Asian part), Ukraine; Argentina, Brazil, China, Georgia, Guatemala, Guinea, India, Japan, Korea, Mauritius, New Zealand, Panama, Taiwan, Uganda, USA.

Cercospora sojina Hara*

Nogyokoku (Tokyo) 9: 28. 1915.

≡ *Cercosporina sojina* (Hara) Hara, Jutsuyo-sakumotsu-byorigaku: 112. 1925.
≡ *Cercosporidium sojinum* (Hara) X.J. Liu & Y.L. Guo, Acta Mycol. Sin. 1: 100. 1982.
≡ *Passalora sojina* (Hara) Poonam Srivast., J. Living World 1: 118. 1994 (comb. inval.).
≡ *Passalora sojina* (Hara) H.D. Shin & U. Braun, Mycotaxon 58: 163. 1996.
≡ *Passalora sojina* (Hara) U. Braun, Trudy Bot. Inst. im. V.L. Komarova 20: 93. 1997 (comb. superfl.).
= *Cercosporina daizu* Miura, Manchurian R.R. Agric. Exp. Sta. Bull. 11: 25. 1920.

Description. Leaf spots scattered, often confluent, distinct, circular or subcircular to angular, 0.5–7 mm diam., at first appearing as slightly yellowish grey areas on the upper leaf surface, later turning dirty grey to tan with narrow brown to dark brown margin. Caespituli amphigenous; stromata rudimentary to poorly developed, composed of a few swollen brown hyphal cells. Conidiophores 3–10 in a dense fascicle, straight to sinuous or usually 3–8 times mildly geniculated from the middle upwards, uniformly pale yellowish brown to brown, 2–4-septate, usually not branched, 40–200 × 4–6.5 µm. Conidia solitary, hyaline, cylindro-obclavate to obclavate or narrowly obclavate, sometimes filiform, occasionally acicular, straight to mildly curved, 3–7-septate, obtuse to subobtuse or subacute at the apex, obconically truncate to subtruncate at the base, 20–88 × 4–8.0 µm [13,31].

Hosts. On Leguminosae.

Geographical distribution. Latvia; Argentina, Bolivia, Brazil, Cameroon, Canada, China, Cuba, Egypt, Gabon, Georgia, Guatemala, Hawaii, India, Indonesia, Ivory Coast, Japan, Kenya, Malawi, Mexico, Nepal, Nigeria, Russia, Taiwan, USA, Venezuela, Zambia, Zimbabwe.

Notes. This fungus has not been published from Poland so far, but it is a quarantine species mentioned in the Regulation of the Minister of Environment of 29 November 2002. This information and the description might be helpful to Polish plant protection services for identification of this fungus. It might be possible to find this fungus on *Glycine* spp. (Leguminosae). Based on DNA phylogenetic analysis, Crous et al. [64] recognised *Cercospora sojina* Hara [with a single synonym – *Passalora sojina* (Hara) H.D. Shin & U. Braun] for Korean material on *Glycine soja*.

Cercospora solani Thüm.*

Hedwigia 19: 135. 1880.

= *Cercospora solani* Feuilleaub., Rev. Mycol. 6: 135. 1884 (nom. illeg.).
≡ *Cercospora solani* subsp. *feuilleauboisii* Sacc., Syll. Fung. 4: 449. 1886 (nom. nov.).
= *Cercospora nigrescens* G. Winter, Bol. Soc. Brot. 3: 60. 1885.

Exs. on *Solanum americanum*: Thümen, Mycoth. Univ. 2070 (WA 7061).

Description. Leaf spots indistinct, irregular, brownish. Caespituli hypophyllous, effuse, usually olivaceous; stromata lacking or small, brown. Conidiophores pale olivaceous or olivaceous-brown, paler towards the apex, usually 1–3 times geniculate, septate, rarely branched, 35–80 × 4–6 µm. Conidia solitary, hyaline, acicular, straight or slightly curved, indistinctly pluriseptate, 45–100 × 3.5–5.5 µm.

Hosts. On *Solanum* spp., Solanaceae. ***Solanum americanum*** Mill.: Portugal – n. Coimbra, Jun. 1879, leg. F. Moller (WA 7061).

Geographical distribution. France, Portugal, Russia (European part), Ukraine; Brazil, Canary Islands, Cuba, Ethiopia, Georgia, India, Kenya, Mauritius, Morocco, Myanmar, Nepal, Pakistan, Peru, Sri Lanka, Uganda, USA, Venezuela.

Notes. This fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The host occurs in the Polish flora; therefore, it might be found in Poland.

Cercospora tragopogonis Ellis & Everh.*

Bull. Torrey Bot. Club. 24: 474. 1987.

Description. Leaf spots circular or oval, 1–6 mm in length, grey centre, brown or greyish margin. Caespituli amphigenous; stromata small to 50 µm diam., dark brown. Conidiophores

usually in dense fascicles, sometimes almost coremoid, pale or dark olivaceous-brown, pluriseptate, slightly paler and narrower towards the apex, not branched, 40–125 × 4–7 µm. Conidia solitary, hyaline, acicular, variously curved, indistinctly pluriseptate, 30–200 × 2–3.5 µm [13].

Hosts. On *Tragopogon* spp., Compositae.

Geographical distribution. Estonia; Armenia, Azerbaijan, Tadzhikistan, USA.

Notes. This species was reported on *Tragopogon pratensis* L. from Dołgie Duże Lake near Czołpino in the Słowiński National Park [53,84,159]. Conidiophores and conidia of *C. tragopogonis* were not found in the revised material, but due the occurrence of *Tragopogon* spp. in Poland it might be possible to find this fungus.

Cercospora traversiana* Sacc.

Ann. Mycol. 2: 18. 1904.

= *Cercospora trigonellae* Maubl., Bol. Agric. São Paulo, Ser. 16, 4: 322. 1915.
≡ *Cercosporina trigonellae* (Maubl.) Sacc., Syll. Fung. 25: 908. 1931.
= *Cercospora traversiana* var. *trigonellae-coeruleae* Săvul. & Sandu, Hedwigia 73: 129. 1933.
= *Cercospora radiata* f. *trifolii-coeruli* Viv., unknown, 1879 (fide Săvulescu & Sandu, 1933).

Exs. on *Trigonella coerulea*: Săvulescu, Herb. Mycol. Roman., Fasc. 9, No. 441 (KRA-F 1931-52); on *Trigonella foenum-graecum*: Thümen, Mycoth. Univ. 584, as *Cercospora radiata* Fuckel f. *foenigraeci* (WA 6277).

Description. Leaf spots subcircular, 2–6 mm diam., brown or brownish green. Caespituli amphigenous; stromata small, brown. Conidiophores 2–14 in fascicles, pale olivaceous-brown, paler at the apex, sparingly septate (usually with 2 septa), not branched, straight or slightly curved, 22.5–100 × 3.5–5.5 µm. Conidia solitary, hyaline, acicular or cylindrical, straight or curved, usually 3–11 indistinctly septate, base truncate, apex acute or obtuse, 25–120 × 3–4.5 µm.

Hosts. On Leguminosae. ***Trigonella caerulea*** (L.) Ser.: Romania – Tulcea in Dobrogea, 2 Jun. 1931, leg. T. Săvulescu & R.S. Sandu (KRA-F 1931-52); ***Trigonella foenum-graecum*** L.: Italy – Parma, leg. G. Passerini (WA 6277, as *Cercospora radiata* Fuckel f. *foenigraeci*).

Geographical distribution. Bulgaria, Estonia, Italy, Latvia, Lithuania, Portugal, Romania, Russia; Australia, Azerbaijan, Brazil, Canada, China, Ethiopia, Georgia, India, Iran, Israel, Morocco, Myanmar, Nepal, Pakistan, Turkmenistan, Uganda, USA.

Notes. This fungus has not yet been collected in Poland, but material collected in other countries is deposited in Polish herbaria. The hosts occur in the Polish flora, so the presence of this species is possible in Poland.

Cercospora viburnicola W.W. Ray

Mycologia 33: 174. 1941

(= *Cercospora apii* s. l.)

Exs. on *Viburnum opulus*: Săvulescu, Herb. Mycol. Roman., Fasc. 9, No. 432, as *Pseudocercospora opuli* (Höhn.) U. Braun & Crous (= *Cercospora opuli* Höhn.; KRA-F 1930-67).

Description. Leaf spots angular or irregular, greyish brown with a reddish brown margin. Caespituli amphigenous. Conidiophores mostly in dense fascicles, pale olivaceous-brown, in mass slightly darker, straight, slightly curved or sinuous, sparingly septate, 25–60 × 4–5.5(–6) µm. Conidia solitary, hyaline, acicular or obclavate, straight or slightly curved, 3–11-septate, 30–90(–205) × 3–5(–5.5) µm (Fig. 2e, Fig. 28).

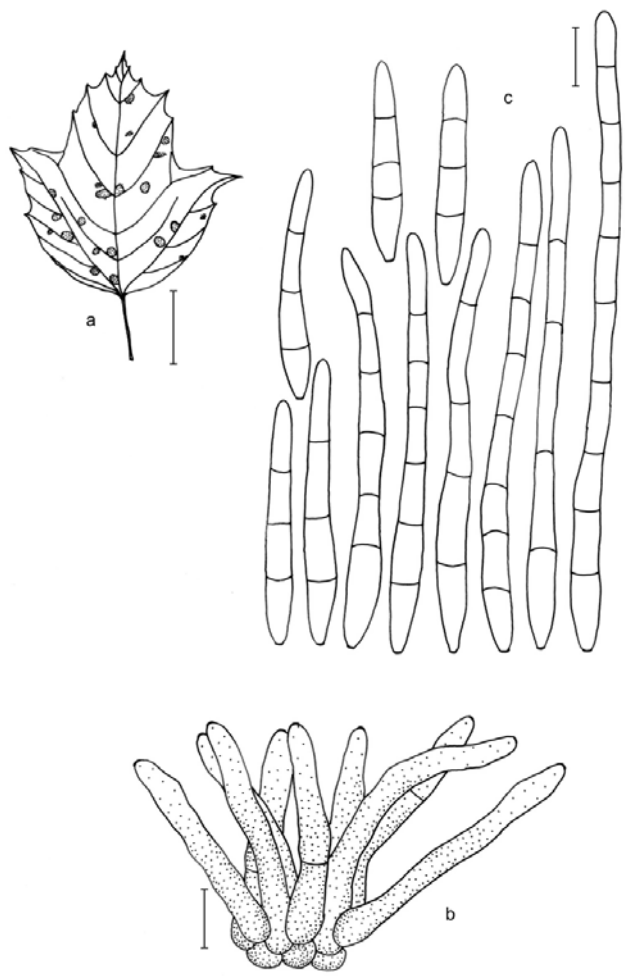

Fig. 28 *Cercospora viburnicola* on *Viburnum opulus* (WA 029863). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Hosts. On *Viburnum* spp., Adoxaceae. ***Viburnum opulus*** L.: E1 – Kadzionka Lake n. Bydgoszcz, 25 Sep. 1926, leg. N.N. (WA 029863) [92].

Geographical distribution. Poland; China, Korea, USA.

Cercospora violae **Sacc.**

Nuovo Giorn. Bot. Ital. 8: 187. 1976

= *Cercospora violae-tricoloris* Briosi & Cavara, Atti Ist. Bot. Univ. Pavia 2: 285. 1892.
= *Cercospora violae* var. *minor* Rota-Rossi, Atti Ist. Bot. Univ. Pavia, Ser. 2, 13: 199. 1914.
= *Cercospora violae-kiusianae* Sawada, Rep. Gov. Agric. Res. Inst. Taiwan 85: 126. 1943 (nom. inval.; as *C. kiusana* in Chupp, 1954).
= *Cercospora difformis* Tehon, Mycologia 40: 322. 1948.
= *Cercospora trinctatis* Pass. (unpublished name cited by Chupp, 1954).

Exs. on *Viola obliqua*: Rabenhorst-Winter, Fungi Eur. Exs. 3683, as *Passalora granuliformis* (Ellis & Holway) U. Braun (= *Cercospora granuliformis* Ellis & Holw.; WA 28572); on *Viola odorata*: Saccardo, Mycoth. Ven. 279 (KRA-F 1874-187).

Description. Leaf spots amphigenous, scattered, rarely confluent, distinct, circular, 1–7 mm diam., pale brown or greyish. Caespituli amphigenous. Conidiophores 3–20 in divergent fascicles, olivaceous-brown, sometimes paler towards the apex, 2–6-septate, straight or slightly curved, usually up to 6 times slightly geniculate, not branched, 20–135(–225) × 3.5–5.5 µm. Conidia solitary, hyaline, filiform or acicular, straight or slightly curved, 2–21-septate, (25–)35–175(–205) × 2.5–5 µm (Fig. 2f, Fig. 7b, Fig. 29).

Hosts. On *Viola* spp., Violaceae. ***Viola canina*** L.: C2 – Włoszczowa [87,133]; ***Viola collina*** Besser: C5 – Wały Reserve n. Racławice, 21 Aug. 1984, leg. J. Romaszewska-Sałata (LBL); ***Viola odorata*** L.: B5 – Głubczyce [87]; E1 – Piotrkówko n. Bydgoszcz, 26 Sep. 1947, leg. H. Mikołajczyk (WA 4036, as *Cercospora althaeina*); E3 – Warszawa – Botanical Garden, 2 Oct. 1947, leg. H. Mikołajczyk (WA 3915, as *C. althaeina*); ***Viola palustris*** L.: E1 – Płochocin n. Świecie [65,74,87]; ***Viola reichenbachiana*** Jord. ex Boreau: C2 – Włoszczowa [133]; D1 – Kosmów n. Hrubieszów, 26 Jul. 1981, leg. M. Danilkiewicz (LBL); E5 – Długie Lake Reserve, Moszne Lake, 6 Jun. 1984, leg. W. Mułenko (LBL) [81,87]; ***Viola rupestris*** F.W. Schmidt: C4 – Olsztyn Commune n. Częstochowa, 27 Sep. 1998, leg. M. Ruszkiewicz (LOD 2719, as *Passalora murina* (Ellis & Kellerm.) U. Braun & Crous [= *Mycovellosiella murina* (Ellis & Kellerm.) Deighton]) [54,180]; ***Viola tricolor*** L.: A3 – Szczecin [125,131]; E3 – Błonie [80,87]; ***Viola*** sp.: C4 – Ojców National Park [42,43,181]; E3 – Warszawa [79].

Geographical distribution. Distributed worldwide on different species of the family Violaceae.

Notes. Wakuliński and Marcinkowska [87] wrongly cited the data of Moesz [133] on *Viola palustris* from Zaklików. The latter author reported the occurrence of *C. violae* on *V. canina* and *V. reichenbachiana* from Włoszczowa. On *V. palustris*, he published *Cercospora ii* Trail, which is currently a synonym of *Passalora murina*. They also wrongly cited the data of Madej [132] on *V. tricolor*, who did not report this fungus species in his paper.

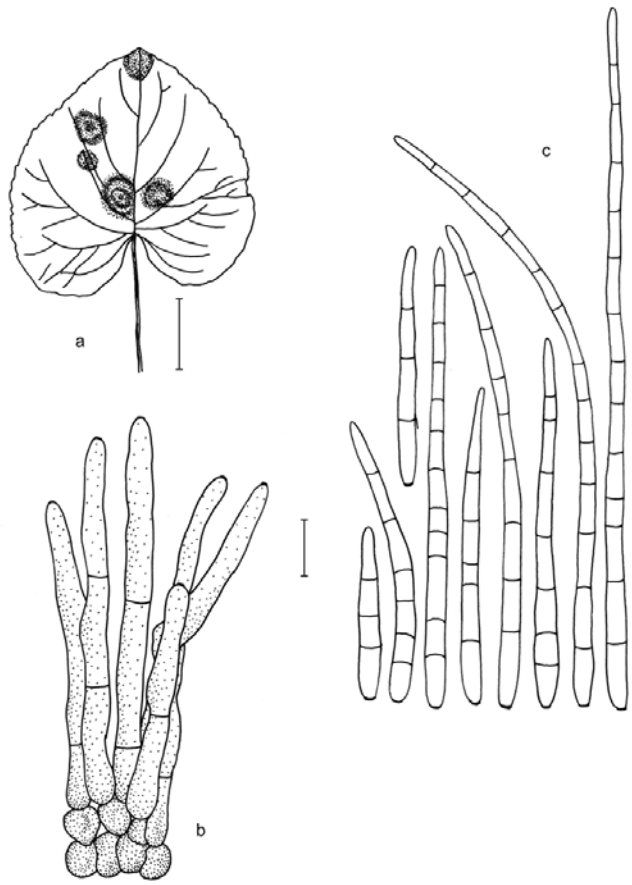

Fig. 29 *Cercospora violae* on *Viola reichenbachiana* (LBL, Kosmów n. Hrubieszów, leg. M. Danilkiewicz). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

Cercospora zebrina Pass.

Hedwigia 16: 124. 1877

≡ *Cercosporina zebrina* (Pass.) Matsuura, J. Pl. Protect. (Tokyo) 17: 1. 1930.
= *Cercospora helvola* Sacc., Michelia 2: 556. 1882.
= *Cercospora stolziana* Magnus, Die Pilze von Tirol (etc.) 3: 558. 1905.
= *Cercospora helvola* var. *zebrina* Ferraris, Fl. Ital. Cryptog. 1: 423. 1910 fide Chupp (1954, p. 341).

Exs. on *Trifolium medium*: Thümen, Mycoth. Univ. 1272 (WA 6820).

Description. Leaf spots amphigenous, scattered, often confluent, distinct, angular or irregular, often vein-limited, 1–10 mm diam., centre pale brown or dingy grey, purplish brown margin. Caespituli amphigenous, but mostly hypophyllous; stromata small, slightly developed, composed of several brown cells. Conidiophores 3–20 in divergent fascicles, pale olivaceous-brown, aseptate or sparingly septate, straight or rarely 1–3 times slightly geniculate, not branched, 20–115 × 3–5.5 μm. Conidia solitary, hyaline or pale olivaceous, filiform

or acicular, straight or slightly curved, 3–12-septate, (30–)50–147.5 × 2.5–4.5 µm (Fig. 2g, Fig. 30).

Hosts. On Leguminosae. ***Trifolium arvense*** L.: E3 – Wola Przybysławska, 14 Aug. 2009, leg. U. Świderska-Burek (LBL); ***Trifolium campestre*** Schreb.: F3 – Białowieża Forest (n. Białowieża National Park), 2 Jul. 2002, leg. M. Wołkowycki (LBL M-9061) [90]; ***Trifolium dubium*** Sibth.: A1 – Rąbka n. Łeba, Jun. 2002, leg. I. Adamska (SZPA 2731); C4 – Ojców [42,43,87]; E5 – Długie Lake Reserve, 24 Jul. 1984, leg. W. Mułenko (LBL) [81,87]; ***Trifolium medium*** L.: B4 – Żary [87]; ***Trifolium montanum*** L.: D1 – Łabunie n. Zamość, 30 Jun. 1983, leg. J. Sałata (LBL); ***Trifolium pratense*** L.: D1 – Lipowiec n. Tyszowce, 11 Aug. 1988, leg. Z. Mróz (LBL); E4 – Lublin – Czuby distr., Stary Gaj forest, 21 Aug. 2010, leg. U. Świderska-Burek (LBL); Maszki n. Nałęczów, 10 Sep. 1975, leg. R. Szarwiło (LBL); ***Trifolium repens*** L.: A1 – Słowiński National Park [156]; Słowiński National Park – Kluki, Jun. 2004, leg. I. Adamska (SZPA 4043); C4 – Olsztyn Commune n. Częstochowa, Botaniczna St., 28 Jun. 1997 (LOD 2720) [54]; E3 – Rogoźnica [82]; E5 – Czarne Sosnowickie Lake, 30 Jun. 1981, leg. W. Mułenko (LBL), Durne Bagno Reserve, 7 Jun. 1985, leg. W. Mułenko (LBL) [81]; I1 – Rymanów, 11 Jun. 1994, leg. A. Wołczańska (LBL M-10053) [89]; ***Trifolium*** sp.: E2 – Kisielnica n. Kolno [79].

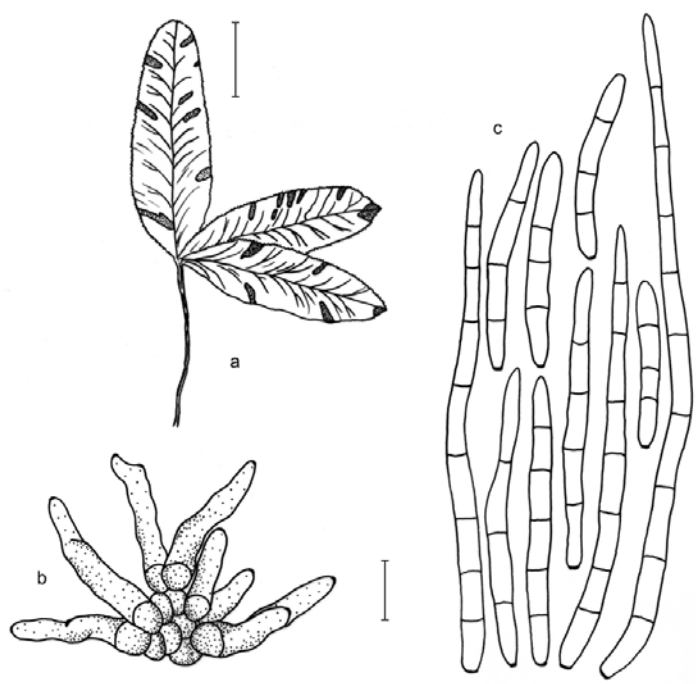

Fig. 30 *Cercospora zebrina* on *Trifolium montanum* (LBL, Łabunie n. Zamość, leg. B. Sałata). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Geographical distribution. Almost in all Europe, in a majority of countries of other continents.

Notes. Wakuliński and Marcinkowska [87] wrongly cited the data of Garbowski and Juraszkówna [79] from Kisielnica near Kolno and Mułenko [81] from Durne Bagno Reserve and Czarne Sosnowickie Lake on *Trifolium dubium*. The authors reported this fungus on *Trifolium* sp. [79] and on *T. repens* [81], respectively.

Cercospora zonata G. Winter

Hedwigia 23: 191. 1884

= *Cercospora viciae* Ellis & Holw., J. Mycol. 1: 5. 1885.
= *Cercospora fabae* Fautrey, Rev. Mycol. 13: 13. 1891.
≡ *Cercosporina fabae* (Fautrey) T. Takah. & Hashio Suzuki, Sci. Bull. Alumni Assoc. Mie Imp. Coll. Agric. Forest. 1: 43. 1929.

Exs. on *Vicia faba*: Rabenhorst-Winter, Fungi Eur. Exs. 3294 (WA 28601).

Description. Leaf spots subcircular or angular, often concentrically zonate, 2–12 mm diam., brown or greyish, dark brown margin. Caespituli amphigenous; stromata small, composed of several dark brown cells, rarely larger, usually about 30 µm diam. Conidiophores in dense fascicles, dark brown, paler towards the apex, sometimes septate, not branched, rarely geniculate, 15–45 × 3.5–5.5 µm. Conidia solitary, hyaline or pale olivaceous, cylindrical or obclavate, usually 3-septate (rarely 4–8-septate), straight or slightly curved, apex obtuse, base truncate or obconic, 35–92.5 × 3–5 µm (Fig. 2h).

Hosts. On *Vicia* spp., Leguminosae. ***Vicia faba*** L.: B5 – Prószków n. Opole [110]; H1 – Pieniny Mts [45,46,87]; Pieniny National Park – Czorsztyn, Kluszkowce, Krościenko, Sromowce, Szczawnica [87,153]; Ukraine – Kosmacz n. Kołomyja, leg. N.N. (WA 29787); ***Vicia faba*** var. ***minor*** Petem.: E4 – Puławy – Kępa distr. [87,161].

Geographical distribution. Bulgaria, France, Germany, Great Britain, Greece, Latvia, Lithuania, Portugal, Romania, Russia (European and Asian part), Sweden, Ukraine; Armenia, Azerbaijan, Brazil, Chile, China, Cyprus, Dominican Republic, Egypt, Ethiopia, Georgia, India, Iran, Japan, Lebanon, Libya, Malawi, Malta, Mauritius, Morocco, Mexico, Nepal, Panama, Taiwan, USA, Venezuela, Yemen, Zambia, Zimbabwe.

Notes. In Poland, it is a quarantine species mentioned in the Regulation of the Minister of Environment of 29 November 2002.

Cercospora sp.

Hosts and distribution. ***Begonia rex*** Putz.: E4 – Puławy [161]; ***Cardamine pratensis*** L.: F1 – Mamry Północne Lake [179]; ***Secale cereale*** L. B1 – Ludwikowo n. Poznań [74]; **soil**, bedding: C3 – Kamień Śląski Reserve [182].

Notes. The collections cited above need to be revised to get accurate identifications at species rank. The following potential species (according to Crous and Braun [11]) may occur on these hosts and have to be taken into consideration: (***i***) on *Secale*: *C. secalis* Chupp and *Passalora graminis*; (***ii***) on *Begonia*: only *C. begoniae* Hori; (***iii***) on *Cardamine*: *C. armoraciae*.

7.2. *Passalora* Fr.

Summa Veg. Scand.: 500. 1849.

= *Cercosporidium* Earle, Muhlenbergia 1: 16. 1901.
= *Vellosiella* Rangel, Bol. Agric. (São Paulo), Ser. 16 A, 2: 151. 1915 (nom. illeg.).
= *Mycovellosiella* Rangel, Arch. Jard. Bot. Rio de Janeiro 2: 71. 1917.
= *Passalora* sect. *Mycovellosiella* (Rangel) A. Hernández Gutiérrez & Dianese, Mycotaxon 108: 3. 2009.
= *Ormathodium* Syd., Ann. Mycol. 26: 138. 1928.
= *Ragnhildiana* Solheim, Mycologia 23: 365. 1931.
= *Cercodeuterospora* Curzi, Boll. Staz. Patol. Veg Roma, Ser. 2, 12: 149. 1932.
= *Fulvia* Cif., Atti Ist. Bot. Univ. Lab. Critt. Pavia, Ser. 5, 10: 245–246. 1954.
= *Mycovellosiella* subgen. *Fulvia* (Cif.) U. Braun, A monograph of *Cercosporella*, *Ramularia* and allied genera (phytopathogenic hyphomycetes) 1: 39. 1995.
= *Berteromyces* Cif., Sydowia 8: 267. 1945.
= *Oreophylla* Cif., Sydowia 8: 259. 1954.
= *Phaeoramularia* Munt.-Cvetk., Lilloa 30: 182. 1960.
= *Passalora* sect. *Phaeoramularia* (Munt.-Cvetk.) A. Hernández Gutiérrez & Dianese, Mycotaxon 108: 3. 2009.
= *Tandonella* S.S. Prasad & R.A.B. Verma, Indian Phytopathol. 23: 111. 1970.
= *Walkeromyces* Thaung, Trans. Brit. Mycol. Soc. 66: 213. 1976.
= *Passalora* sect. *Pseudophaeoisariopsis* U. Braun, Dianese & A. Hernández Gutiérrez, Mycotaxon 108: 3. 2009.

Type species: *Passalora bacilligera* (Mont. & Fr.) Mont. & Fr.

Description. Asexual holomorphs, asexual morphs or asexual morphs with mycosphaerella-like sexual morphs; Mycosphaerellaceae. Phytopathogenic, usually causing distinct or weakly visible leaf spots, sometimes symptomless, rarely hyperparasitic or saprobic. Mycelium mostly primary internal and secondary external; hyphae hyaline or pigmented, branched, septate, usually smooth. Stromata lacking or well-developed, substomatal or intraepidermal, mostly subglobose, composed of aggregated swollen hyphal cells, subhyaline to pigmented.

Conidiophores solitary or usually in divergent to dense fascicles, rarely in sporodochial or synnematous conidiomata, arising from internal hyphae, rarely from superficial hyphae or stromata (substomatal or intraepidermal), emerging through stomata, erumpent through the cuticle or arising from creeping hyphae, pale olivaceous, olivaceous-brown or brown, unbranched or branched, aseptate or pluriseptate, smooth or slightly verruculose, straight or curved (geniculate or geniculate-sinusoid); conidiogenous loci conspicuous, somewhat thickened and darkened-refractive, usually planate.

Conidia solitary or rarely catenate (in simple or branched acropetal chains), usually pale olivaceous, olivaceous-brown or brown, amero- to scolecosporous, aseptate to pluriseptate, euseptate or rarely with a few distosepta, smooth or finely verruculose; hilum somewhat thickened and darkened.

Keys to the *Passalora* species

Pteridophyta

Dennstaedtiaceae

A single species ..... ***P. pteridis***

Spermatophyta, Angiospermae

Apiaceae

1 Conidiophores 4.5–8 µm wide **2**
1* Conidiophores narrower, 3–5 µm wide **4**
2 Conidia (5.5–)7–12 µm wide, with 1 septum; conidiophores 20–70(–100) µm long ..... ***P. depressa***
2* Conidia narrower, 4–7.5 µm wide **3**
3 Conidia hyaline, 1–5-septate; conidiophores 12–48 µm long; caespituli hypophyllous; on *Pastinaca* ..... ***P. pastinacae***
3* Conidia pale olivaceous, 1–3-septate (usually with 1 septum); conidiophores (15–)25–80 µm long; caespituli amphigenous ..... ***P. punctum***
4 Conidiophores aseptate, short, 5–20 µm long; conidia hyaline, 1–5-septate; on *Pimpinella* ..... ***P. malkoffii***
4* Conidiophores with few septa, slightly longer **5**
5 Conidiophores 10–40 µm long; conidia with 1 septum; caespituli on stems and leaves punctate or dense ..... ***P. bupleuri***
5* Conidiophores 22.5–60 µm long; conidia 3–5-septate; caespituli hypophyllous ..... ***P. scandicearum***

Apocynaceae

A single species ..... ***P. bellynckii***

Campanulaceae

A single species ..... ***P. lobeliae-cardinalis***

Betulaceae

1 Conidiophores shorter, not longer than 90 µm; conidia obclavate-cylindric, 20–60 × 3.5–5 µm ..... ***P. alni***
1* Conidiophores longer than 90 µm; conidia composed of narrower apical cell and wider basal cell **2**
2 Conidiophores not longer than 180 µm, 3.5–6 µm wide; conidia 25–57.5 µm long and 2.5–5 µm wide of apical cell ..... ***P. bacilligera***
2* Conidiophores to 250 µm long; conidia 15–33 µm long and 4.5–6 µm wide of apical cell; on *Alnus incana* ..... ***P. microsperma***

Compositae

1 Conidia short, 15–25 µm long; conidiophores short 35–70 µm long; on *Lactuca* ..... ***P. scariolae***

1* Conidia and conidiophores longer……**2**
2 Conidiophores in divergent fascicles, 30–250 µm long; conidia 5–10 µm wide; on *Artemisia*……***P. ferruginea***
2* Conidiophores in dense fascicles; conidia 4–7 µm wide……**3**
3 Conidia 1–5-septate, 25–65 µm long; caespituli amphigenous, mostly epiphyllous; on *Gnaphalium*……***P. gnaphaliaceae***
3* Conidia 4–12-septate, 40–140 µm long; caespituli usually hypophyllous; on *Carlina*……***P. carlinae***

Geraniaceae
A single species……***P. minutissima***

Grossulariaceae
A single species……***P. ribis-rubri***

Lamiaceae
A single species……***P. teucrii***

Leguminosae
1 Conidiophores 70–275 × 3–4.5; conidia to 7 µm wide……***P. cercidicola***
1* Conidiophores 17.5–40 × 4–6 µm; conidia to 5.5 µm wide……***P. chionea***

Malvaceae
A single species……***P. microsora***

Moraceae
A single species……***P. bolleana***

Onagraceae
1 Conidiophores 10–55 × 2.5–6 µm; conidia aseptate or usually 1–2-septate, 10–40(–50) × (2.5–)3–6.5 µm……***P. montana***
1* Conidiophores 28–60 × 5–6 µm; conidia aseptate or usually 1–3-septate, 22–40 × 8–14 µm……***P. heterospora***

Poaceae
A single species……***P. graminis***

Polygonaceae
1 Spots and caespituli amphigenous; conidiophores 7.5–25 × 3–4 µm, usually with 1 septum; conidia 3–4 µm wide……***P. avicularis***
1* Spots weakly visible or non; caespituli hypophyllous; conidiophores 30–85 × 4–6.5 µm, 2–5-septate; conidia 35–70 × 4.5–6(–7.5) µm……***P. effusa***

Ranunculaceae
1 Conidiophores to 80 µm long; conidia catenate, aseptate usually with 1 septum, 10–45 µm long; on *Actaea*……***P. actaeae***

1* Conidiophores to 40 µm long; conidia 1–6-septate, 25–95 µm long; on *Clematis* ..... ***P. squalidula***

Rhamnaceae

A single species ..... ***P. rhamni***

Rosaceae

1 On the representatives of the genus *Rosa* **2**
1* On the representatives of others genera **3**
2 Caespituli hypophyllous; conidiophores 10–40 µm long; conidia hyaline or pale olivaceous, cylindrical ..... ***P. rosae***
2* Caespituli amphigenous, mostly epiphyllous; conidiophores 20–105 µm long; conidia pale brown, obclavate ..... ***P. rosicola***
3 Conidia 2.5–5.5 µm wide **4**
3* Conidia narrower or wider **5**
4 Caespituli hypophyllous; conidia 20–67 µm long, aseptate or 1–4-septate, solitary or catenate; on *Sorbus* ..... ***P. ariae***
4* Caespituli amphigenous, mostly hypophyllous; conidia 22–110 µm long, 1–8-septate; on *Cerasus*, *Prunus* ..... ***P. circumscissa***
5 Conidia narrow, 1.5–3 µm wide; on *Fragaria* ***P. vexans***
5* Conidia 5.5–7.5 µm wide; on *Comarum* ..... ***P. comari***

Rubiaceae

A single species ..... ***P. galii***

Sapindaceae

A single species ..... ***P. acericola***

Solanaceae

1 Stromata lacking or small; conidiophores 15–70 × (3.5–)4–7 µm; conidia usually pale olivaceous, aseptate or 1–5-septate, 20–87.5 × (3–)4–6 µm ..... ***P. concors***
1* Stromata pale brown; conidiophores 57–125(–200) × 2.5–7 µm; conidia pale or dark brown, solitary to catenate, aseptate or 1–3-septate, 12–407 × 4–10 µm ***P. fulva***

Violaceae

A single species ..... ***P. murina***

Vitaceae

1 Leaf spots circular or angular; conidia 32.5–125 µm long; on *Parthenocissus* ..... ***P. ampelopsis***
1* Spots usually indistinct; conidia 16–84 µm long; on *Vitis* ..... ***P. dissiliens***

Passalora acericola (X.J. Liu & Y.L. Guo) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 436. 2003.

≡ *Phaeoramularia acericola* X.J. Liu & Y.L. Guo, Acta Phytopathol. Sin. 12: 3. 1982.
≡ *Mycovellosiella acericola* (X.J. Liu & Y.L. Guo) X.J. Liu & Y.L. Guo Mycosystema 1: 242. 1988.

Description. Leaf spots amphigenous, scattered, sometimes confluent, circular to subcircular, 1–4 mm diam., centre greyish white, with a wider, yellowish brown halo and sometimes with border lines. Conidiophores solitary or 2–6 in fascicles, pale olivaceous-brown, straight or slightly curved, 0–1 indistinctly septate, 15–42.5 × 4.5–6.5(–7) µm. Conidia solitary or occasionally catenate, hyaline or subhyaline, obclavate or cylindrical, straight or slightly curved, usually 1–4-septate, 35–85 × 3.5–5 µm (Fig. 3a, Fig. 5d, Fig. 31).

Hosts. On *Acer* spp., Sapindaceae. ***Acer pseudoplatanus*** L.: D1 – Lipowiec n. Tyszowce, 15 Jun. 1986, leg. Z. Mróz (LBL M-8655) [88]; E5 – Piaseczno Lake n. Łęczna, 7 Aug. 2010, leg. M. Mamczarz (LBL).

Geographical distribution. Germany, Italy, Poland; China.

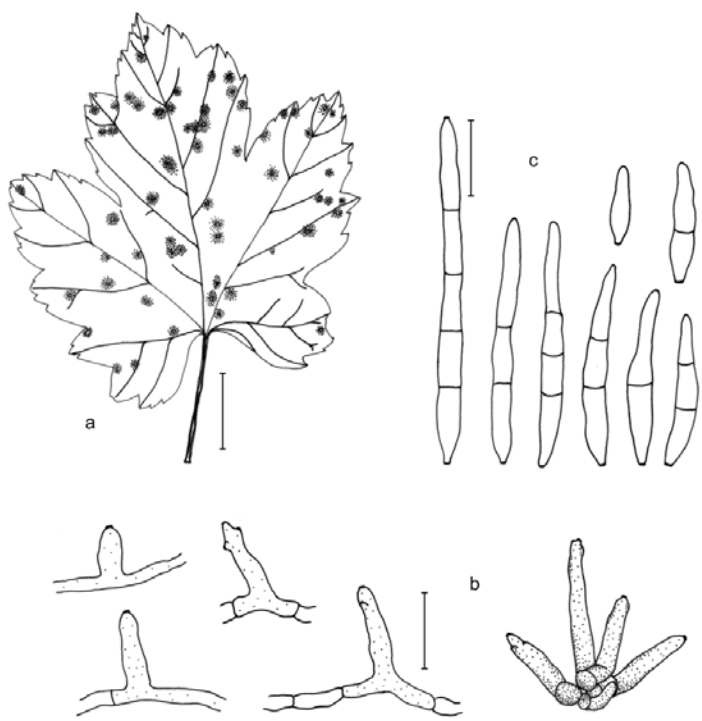

Fig. 31 *Passalora acericola* on *Acer pseudoplatanus* (LBL M-8655). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 20 µm.

Passalora actaeae (Ellis & Holw.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 436. 2003.

≡ *Ramularia actaeae* Ellis & Holw., J. Mycol. 1: 78. 1885.
≡ *Phaeoramularia actaeae* (Ellis & Holw.) U. Braun, Nova Hedwigia 56: 424. 1993.

Description. Leaf spots amphigenous, subcircular, angular or irregular, 1–15 mm diam., yellowish, greyish or dark brown, often vein-limited, sometimes with a diffuse yellowish halo. Caespituli amphigenous, mainly hypophyllous, punctiform, greyish white. Conidiophores in divergent or dense fascicles, arising through stomata, straight, pale olivaceous, yellowish green or olivaceous-brown, subcylindrical or geniculate-sinuous, continuous to sparsely septate, 10–80 × 3–6.5 µm. Conidia catenate, hyaline, greenish, often olivaceous, ellipsoid-ovoid, subcylindrical-fusoid, occasionally in branched chains, 0–1-septate, smooth to faintly rough, (10–)12–40(–45) × 3–6 µm [23].

Hosts. On Ranunculaceae. ***Actaea spicata*** L.: E4 – Kazimierz Dolny [150].

Geographical distribution. Poland, Russia (European and Asian part), Ukraine; Canada, USA.

Passalora alni (Chupp & H.C. Greene) Deighton*

Mycol. Pap. 112: 10. 1967.

≡ *Cercospora alni* Chupp & H.C. Greene, Farlowia 1: 580. 1944.
= *Passalora bacilligera* [(Mont. & Fr.) Mont. & Fr.] f. *alnobetulae* Jaap, Verh. Bot. Vereins Prov. Branderburg 49: 28. 1907.
≡ *Passalora bacilligera* [(Mont. & Fr.) Mont. & Fr.] var. *alnobetulae* (Jaap) Lindau, in Rabenh., Kryptog.-Fl., 2., Aufl., 1. Bd, 8. Abt. (Hyphomycetes 1): 791. 1907.
≡ *Passalora alnobetulae* (Jaap) Jaap, Ann. Mycol. 15: 123. 1917.

Description. Leaf spots none or indistinct. Caespituli hypophyllous, effuse, dark olivaceous, in small irregular patches 0.5–4 mm in length; stromata lacking or composed of only a few dark brown cells; fascicles compact to spreading, 3–20 stalks. Conidiophores in mass dark in colour, singly pale to medium olivaceous brown, near the tip somewhat paler, irregular in width or clavate, indistinctly pluriseptate, rarely branched, top half closely undulate or multigeniculate, tip rounded bluntly, 25–90 × 3–5.5 µm. Conidia solitary, pale to very pale olivaceous, obclavato-cylindrical, mostly 1-septate, often with bulging lower cell, straight to mildly curved, base long obconically truncate, tip obtuse, 20–60 × 3.5–5 µm [13].

Hosts. On *Alnus* spp., Betulaceae.

Geographical distribution. Austria, Bulgaria, Germany, Switzerland, United Kingdom (Hebrides); Canada, USA.

Notes. This fungus has been published by Adamska [156] on *Alnus glutinosa* (L.) Gaertn. (SZPA 2363) from the Słowiński National Park. No conidiophores or conidia have been found in the preserved herbarium material, but it might be possible to find this fungus in Poland.

Passalora ampelopsis (Peck) U. Braun*

Trudy Bot. Inst. im. V.L. Komarova 20: 38. 1997.

≡ *Cercospora ampelopsis* Peck (*ampelopsidis*), Rep. (Annual) New York State Mus. Nat. Hist. 30: 55. 1878.
= *Cercospora pustula* Cooke, Grevillea 12: 30. 1883.
= *Cercospora psedericola* Tehon, Mycologia 16: 139. 1924.

Exs. on *Parthenocissus quinquefolia*: Rabenhorst-Winter, Fungi Eur. Exs. 3291 (WA 358, 359, 28592).

Description. Leaf spots circular or angular, 0.5–5 mm diam., from reddish brown to almost black. Caespituli amphigenous, usually more abundant on the lower surface. Conidiophores brown or olivaceous-brown, pluriseptate, straight, undulate or geniculate, 30–100 × 4–5.5 µm. Conidia solitary, pale olivaceous or dark olivaceous-brown, from obclavate to subcylindrical, pluriseptate, usually mildly curved, 32.5–125 × 4.5–7 µm.

Hosts. On Vitaceae. ***Parthenocissus quinquefolia*** (L.) Planch.: Canada – London (Ontario), leg. J. Dearness, DAOM 134194 (WA 20331); USA: Bethlehem (Pennsylvania), New York, Aug. 1884, leg. E.A. (WA 358, 359, 28592).

Geographical distribution. France, Romania, Russia (European part), Ukraine; Canada, China, Georgia, Japan, USA.

Notes. This fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The host occurs in the Polish flora; therefore, it might be possible to find this fungus in Poland.

Passalora ariae (Fuckel) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 436. 2003.

≡ *Cercospora ariae* Fuckel, Jahrb. Nassauischen Vereins. Naturk. 23–24: 103. (1869) 1870.
≡ *Mycovellosiella ariae* U. Braun, Nova Hedwigia 50: 518. 1990.
= *Cercospora kriegeriana* Bres., Hedwigia 31: 41. 1892.
= *Ramularia sorbi* Karak., in Vassiljevsky & Karakulin, Fungi imperfecti parasitici, Pars 1. Hyphomycetes: 139. 1937.

Exs. on *Sorbus aucuparia*: Krieger, Fungi Saxon. Exs. 747 (WA 343).

Description. Leaf spots amphigenous, scattered or confluent, distinct, angular or irregular, 1–15 mm diam., from yellowish to reddish brown, later centre greyish brown with an indefinite margin. Caespituli hypophyllous, effuse. Conidiophores usually 2–15 in divergent or dense fascicle, olivaceous-brown, straight or sometimes 1–2 times geniculate, not branched, 0–4-septate, 20–70 × 4–6 µm. Conidia solitary or catenate, pale olivaceous or pale olivaceous-brown, cylindrical, obclavate or ellipsoid-fusiform, usually 1–4-septate, 20–67 × 3–5.5 µm (Fig. 32).

Hosts. On Rosaceae. ***Sorbus aucuparia*** L. emend. Hedl.: D1 – Kosmów n. Hrubieszów [83]; E3 – Zwierzyniec n. Skierniewice [73]; E5 – Brudno Lake, 6 Jun. 1983 (LBL), Durne Bagno Reserve, 20 Sep. 1983 (LBL), Moszne Lake, 19 Sep. 1983 (LBL), 3 Sep. 1980 (LBL),

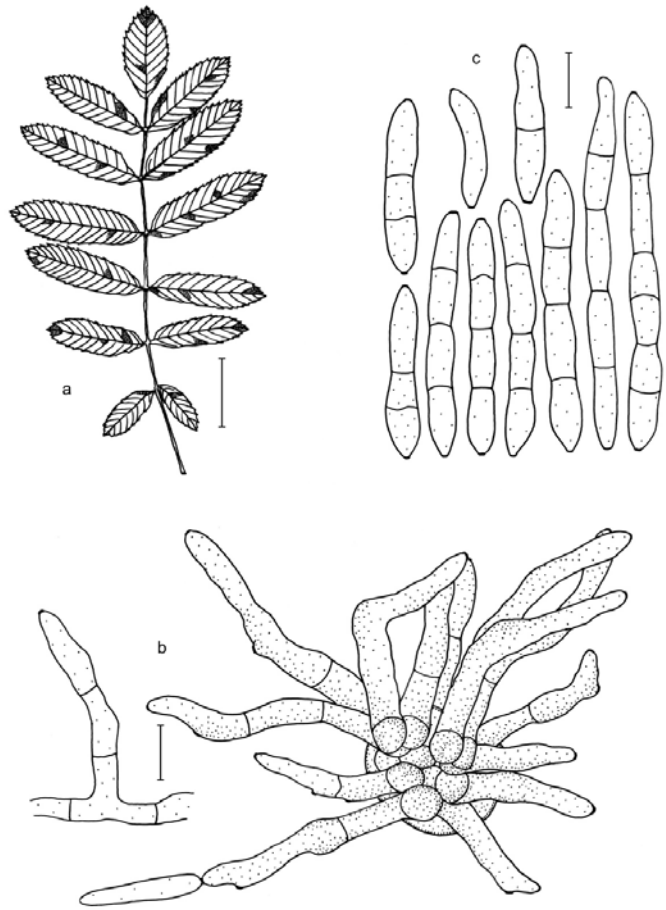

Fig. 32 *Passalora ariae* on *Sorbus aucuparia* (LBL, Moszne Lake, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Perespilno Lake, 21 Sep. 1977, leg. W. Mułenko (LBL) [81]; F3 – Białowieża National Park [51,52].

Geographical distribution. Germany, Poland, Romania, Russia (European part), Ukraine; China, Korea, USA.

Passalora avicularis (G. Winter) Crous, U. Braun & Morris

South African J. Bot. 60: 329. 1994.

≡ *Cercospora avicularis* G. Winter, J. Mycol. 1: 125. 1885, also Hedwigia 24: 202. 1885.
≡ *Pseudocercospora avicularis* (G. Winter) N. Khan & S. Shamsi, Bangladesh J. Bot. 12: 108. 1983.
= *Cercospora arkansana* Barthol., unknown, 1908 fide Chupp (1954, p. 448).
= *Cercospora clavata-polygoni* Dearn. & Barthol., unknown, 1923 fide Chupp (1954, p. 448).

Exs. on *Polygonum aviculare*: Săvulescu, Herb. Mycol. Roman., Fasc. 13, No. 650 (KRA-F 1932-82).

Description. Leaf spots amphigenous, circular, 1–4 mm diam., centre pale brown, margin purplish brown, sometimes with a pale yellowish brown halo. Caespituli amphigenous; stromata substomatal, globular, brown. Conidiophores in dense fascicles, pale olivaceous, uniform in colour, irregular in width, straight or slightly curved, not branched, apex rounded or conic, aseptate or usually with 1 septum, 7.5–25 × 3–4 µm. Conidia solitary, pale olivaceous, obclavate or cylindrical, straight or slightly curved, indistinctly 3–5-septate, 25–65 × 3–4 µm (Fig. 5e, Fig. 33).

Hosts. On Polygonaceae. ***Polygonum aviculare*** L.: C8 – Bolesław n. Tarnów, 21 Aug. 1998, leg. M. Piątek (LBL M-0008415) [86].

Geographical distribution. Bulgaria, Lithuania, Poland, Romania, Russia (European part); Azerbaijan, Bangladesh, Canada, China, Georgia, India, Kirghizia, Korea, Myanmar, Somalia, South Africa, Taiwan, USA, Venezuela.

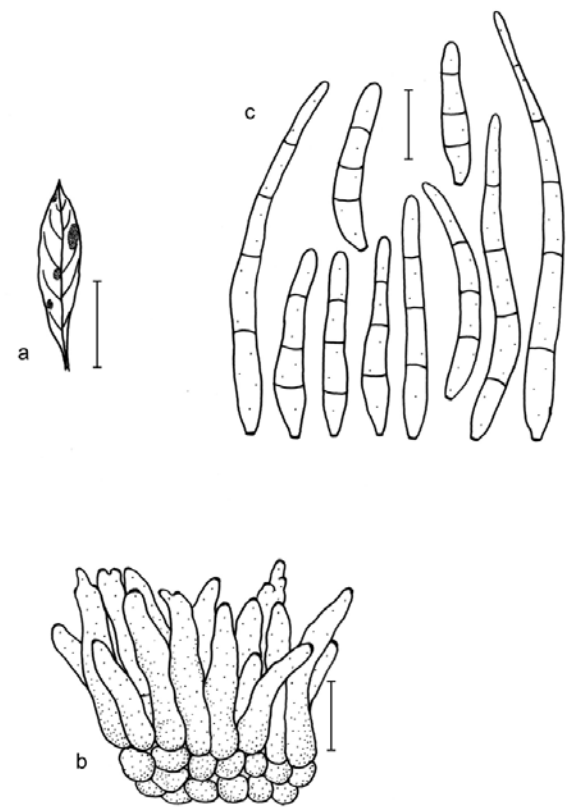

Fig. 33 *Passalora avicularis* on *Polygonum aviculare* (LBL M-0008415). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Passalora bacilligera (Mont. & Fr.) Mont. & Fr.

in Mont., Sylloge generum specierumque cryptogamarum: 305. 1856.

≡ *Cladosporium bacilligerum* Mont. & Fr., in Mont., Ann. Sci. Nat., Sér. 2, Bot. 6: 31. 1836.
≡ *Scolecotrichum bacilligerum* (Mont. & Fr.) J. Schröter, in Cohn, Krypt.-Fl. Schles., Bd. 3, Pilze 2, Lieferung 4: 498. 1897.

Exs. on *Alnus glutinosa*: Krieger, Fungi Saxon. Exs. 745 (WRSL); Rabenhorst, Fungi Eur. Exs. 1357 (WRSL); Saccardo, Mycoth. Ven. 1577 (KRA-F 1879-54); Săvulescu, Herb. Mycol. Roman., Fasc. 6, No. 297 (KRA-F 1930-101); Thümen, Herb. Mycol. Oecon. 385, 748 (WRSL); Fl. Exs. Austro-Hung. 3584 (KRAM-F 8470, 0-5348).

Description. Leaf spots none or angular vein-limited areas, 1–5 mm diam., pale yellowish green, without a distinct margin. Caespituli hypophyllous, olivaceous, velutinous or slightly floccose; stromata lacking. Conidiophores 3–12 in divergent fascicles, pale olivaceous or pale brown, with hyaline apex, usually 1–3 indistinctly septate, geniculate, simple or usually 1–2 times branched, undulate at the apex, swollen at the base, 45–180 × 3.5–6 µm. Conidia solitary, usually pale olivaceous, obclavate, usually 1-septate (rarely aseptate or with 2–3 septa), constricted at the septa, straight or slightly curved, obconical or truncate base, acute or truncate apex, usually 25–57.5 µm length, composed of a wider, 4.5–9 µm wide, ellipsoid-doliiform basal cell and a narrower, 2.5–5 µm wide, long-ellipsoid or subcylindrical apical cell (Fig. 34).

Hosts. On Betulaceae. ***Alnus glutinosa*** (L.) Gaertn.: B5 – Pawłowice Małe n. Legnica [183]; E4 – Puławy [161]; F3 – Białowieża National Park, Jul.–Oct. 1989, leg. W. Mułenko (LBL) [51,52]; G1 – Lwówek Śląski [183]; Kudowa [158]; Georgia – Abkhazia, Caucasus, Nov. 1916, leg. W. Siemaszko (WA 7731).

Geographical distribution. Albania, Austria, Czech Republic, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Poland, Portugal, Romania, Russia, Switzerland; Canada, Korea.

Passalora bellynckii (Westend.) U. Braun

Mycotaxon 55: 228. 1995.

≡ *Cladosporium bellynckii* Westend., Bull. Acad. Roy. Sci. Belgique II, 21: 240. 1854.
≡ *Cercospora bellynckii* (Westend.) Niessl, Hedwigia 15: 1. 1876.
≡ *Cercospora bellynckii* (Westend.) Sacc., Nuovo Giorn. Bot. Ital. 8: 188. 1876.
≡ *Mycovellosiella bellynckii* (Westend.) Constant., Cryptog. Mycol. 3: 67. 1982.
= *Cercospora vincetoxici* Sacc., Syll. Fung. 15: 85. 1901.

Exs. on *Vincetoxicum hirundinaria*: Kunze, Fungi Sel. Exs. 392 (WRSL); Rabenhorst, Fungi Eur. Exs. 2549 (KRA-F 1878-141); Saccardo, Mycoth. Ven. 283 (KRA-F 1874-186); Sydow, Mycoth. Germ. 1044 (WRSL); Thümen, Mycoth. Univ. 1567 (WRSL).

Description. Leaf spots indistinct or large, visible on the upper leaf surface, yellowish or brown, 6–15 mm diam. Caespituli hypophyllous, fuliginous, brown or almost black. Conidiophores olivaceous-brown, uniform in colour, simple or branched, straight or slightly undulate, rounded apex, 22–125(–135) × 4–7 µm. Conidia solitary, pale olivaceous or olivaceous-brown, obclavate to cylindrical, straight or slightly curved, 1–8-septate, constricted at the septa, rounded apex, base sometimes obconic, 20–90 × 4–6 µm.

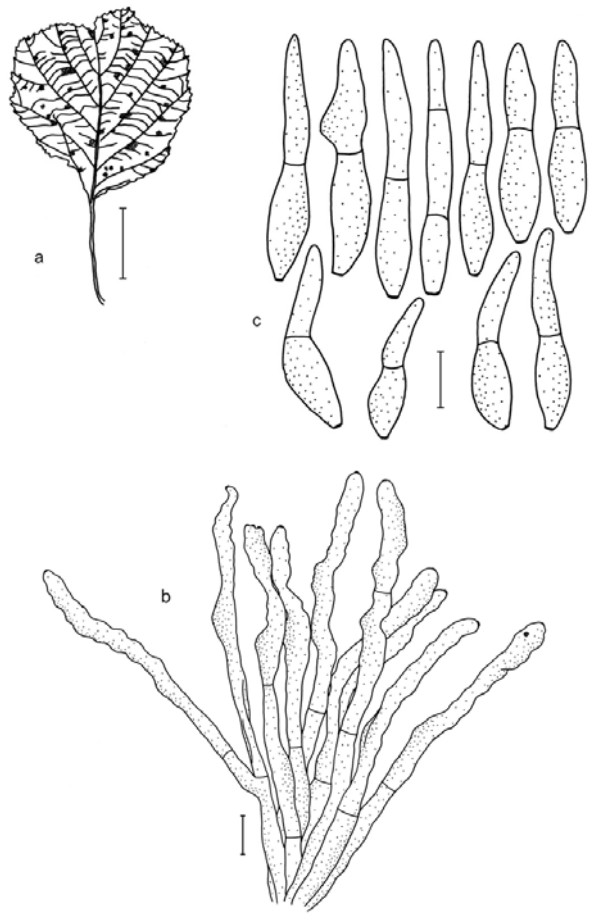

Fig. 34 *Passalora bacilligera* on *Alnus glutinosa* (LBL, Białowieża National Park, leg. W. Mułenko). **a** Caespituli on the lower surface of leaf. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

Hosts. On Apocynaceae. ***Vincetoxicum hirundinaria*** Medik.: C4 – Janów Commune n. Częstochowa, 11 Jul. 1998, leg. M. Ruszkiewicz (LOD 2717) [54]; E4 – Puławy, on *Vincetoxicum* sp. [161]; H1 – Małe Pieniny Mts – Skalskie Reserve [44,45]; Pieniny Mts [46].

Geographical distribution. Belgium, Bulgaria, Estonia, France, Germany, Italy, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Spain, Switzerland, Ukraine; Armenia, Azerbaijan, China, Georgia, Ghana, India, Nigeria, Sierra Leone, Tanzania, Uganda, USA.

Notes. Only one species of *Vincetoxicum* occurs in the Polish flora; therefore, the data on *Vincetoxicum* sp. reported by Jankowska-Barbacka [161] were referred to as *V. hirundinaria*.

Passalora bolleana (Thüm.) U. Braun*

Mycotaxon 55: 228. 1995.

≡ *Septosporium bolleanum* Thüm., Oestrr. Bot. Z. 27: 12. 1877.
≡ *Cercospora bolleana* (Thüm.) Speg., Michelia 1: 475. 1879.
≡ *Cercosporidium bolleanum* (Thüm.) X.J. Liu & Y.L. Guo, Acta Mycol. Sin. 1: 93. 1982.
≡ *Pseudocercospora bolleanum* (Thüm.) Sivan., The Bitunicate Ascomycetes: 206. 1984.
≡ *Passalora bolleana* (Thüm.) Poonam Srivast. (*bollaana*), J. Living World 1: 113. 1994 (nom. inval.).
= *Cercospora sycina* Sacc., Mycoth. ven., No. 1564. 1881.

Teleo.: *Mycosphaerella bolleana* B.B. Higgins, Amer. J. Bot. 7: 443. 1920.

Exs. on *Ficus carica*: Saccardo, Mycoth. Ven. 1564 (KRA-F 1878-140).

Description. Leaf spots usually angular, brown. Caespituli usually hypophyllous. Conidiophores olivaceous-brown, uniform in colour, not branched, straight or slightly geniculate, 15–60 × 5–6 μm. Conidia solitary, olivaceous or olivaceous-brown, obclavate, straight or slightly curved, 1–3-septate, 25–45 × 5–7 μm.

Hosts. On *Ficus* spp., Moraceae. ***Ficus carica*** L.: Italy – Belluno, Sep. 1878, leg. C. Segazzini (KRA-F 1878-140).

Geographical distribution. Bulgaria, Italy, Portugal, Romania, Spain, Ukraine, United Kingdom; Armenia, Azerbaijan, Brazil, China, Cuba, Dominican Republic, Ecuador, El Salwador, Ethiopia, Georgia, Iran, Japan, Malawi, Mexico, Morocco, New Zealand, South Africa, Sudan, USA, Venezuela, Zimbabwe.

Notes. The fungus has been collected outside Poland, but material is deposited in a national herbarium. Due to the occurrence of the host plant in Polish gardens, it is undoubtedly possible to find this fungus in Poland.

Passalora bupleuri (Pass.) U. Braun

Trudy Bot. Inst. im. V.L. Komarova 20: 44. 1997.

≡ *Cercospora bupleuri* Pass., in Thüm., Mycoth. univ., Cent. XIV, No. 1375. 1879.
= *Cercosporella chaerophylli* Aderh., Jahresber. Schles. Ges. Vaterl. Cult., II. Abt., 80: 17. 1902.
≡ *Passalora chaerophylli* (Aderh.) U. Braun, Cryptog. Bot. 3: 238. 1993.
= *Cercospora chaerophylli* Höhn., Ann. Mycol. 1: 530. 1903.
= *Cercospora bupleurina* Lobik, Bolezni Rast. 17: 193. 1928.
= *Cercospora coriandri* Rjach., Zashch. Rast. 8: 185. 1931.
= *Cercospora trachyspermi* Golovin, Trudy Sredne-Aziatsk. Gosud. Univ. im. Lenina, N.S., 14: 24. 1950.
= *Cercospora heraclei* N.P. Golovina, Novosti Sist. Nizsh. Rast. 1964: 211. 1964.
= *Cercospora depressa* auct. p.p.

Exs. on *Bupleurum tenuissimum*: Thümen, Mycoth. Univ. 1375 (WA 6967); on *Chaerophyllum temulum*: Sydow, Mycoth. Germ. 3594 (KRA-F 1931-54).

Description. Spots visible on stems and both surfaces of leaves, fairly variable, subcircular or irregular, 1–13 mm diam., often confluent or covering the entire surface of leaves, brown, without a margin. Caespituli on stems and leaves, usually dense, brownish, on leaves amphigenous, but mostly hypophyllous; stromata small or well developed, brown, composed of

several swollen cells. Conidiophores in dense or divergent fascicles, at first pale olivaceous, yellowish, greenish, later olivaceous or brown, often paler towards the apex, almost cylindrical, straight or usually geniculate, simple, not septate or septate, 10–40 × 3–5 µm. Conidia solitary, usually pale olivaceous, obclavate, subcylindrical or fusiform, 1–3(–5)-septate (usually with 1 septum), 15–65(–92.5) × 2.5–5.5 µm (Fig. 35).

Hosts. On Apiaceae. ***Anthriscus nitida*** (Wahlenb.) Hazsl.: E3 – Skierniewice [73]; ***Anthriscus sylvestris*** (L.) Hoffm.: A1 – Słowiński National Park [156]; I1 – Rymanów, 11 Jun. 1994, leg. A. Wołczańska (LBL M-10056) [89]; ***Coriandrum*** sp.: A2 – Stargard Szczeciński, Nowogard [184]; A4 – Wejherowo [184]; A6 – Nowy Dwór Gdański, Tczew [184]; B5 – Kępa, Wrocław [184]; E1 – surroundings of Bydgoszcz [184]; E3 – Warszawa [184]; E4 – Puławy [184]; ***Chaerophyllum bulbosum*** L.: C5 – Skorocice Reserve n. Busko Zdrój, 13 Jul. 1978, leg. J. Romaszewska-Sałata (LBL) [185]; E3 – Drohiczyn on the Bug River, 17 Jun. 1978–1981, leg. J. Romaszewska-Sałata (LBL) [178]; ***Chaerophyllum hirsutum*** L.: A1 – Słowiński National Park – Czołpino, Sep. 1997 (SZPA 707) [53,84]; H1 – Tatra National Park – Olczyska Valley, White Valley [186]; Zakopane – Pusty Bór, 15 Sep. 1987, leg. W. Mułenko (LBL) [174]; Tatra National Park – Roztoka Valley, 27 Aug. 2005, leg. U. Świderska-Burek (LBL); Tatra National

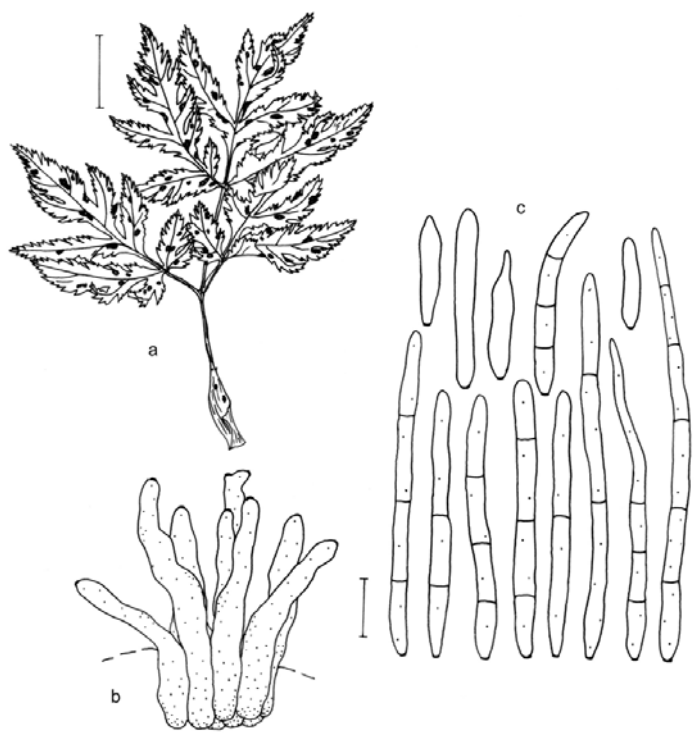

Fig. 35 *Passalora bupleuri* on *Chaerophyllum hirsutum* (LBL, Tatra National Park – Roztoka Valley, leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Park – between Iwaniacka Pass and Chochołowska Valley, 11 Jul. 2006, leg. U. Świderska-Burek, A. Wołczańska (LBL); Tatra National Park – Kościeliska Valley, 5 Jul. 2011, leg. U. Świderska-Burek (LBL); ***Chaerophyllum temulum*** L.: B5 – Prószków n. Opole [187]; E4 – Puławy – Kępa distr. [161].

Geographical distribution. Bulgaria, Estonia, Germany, Italy, Latvia, Poland, Romania, Russia (European part and Asian), Slovakia, Spain, Ukraine; Armenia, Azerbaijan, Chile, Cuba, Georgia, India, Kazakhstan, Kyrgyzstan, Uzbekistan.

Passalora carlinae (Sacc.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 106. 2003.

≡ *Cercospora carlinae* Sacc., Michelia 1: 269. 1879.
≡ *Mycovellosiella carlinae* (Sacc.) Constant., Cryptog. Mycol. 3: 63. 1982.

Description. Leaf spots indistinct. Caespituli hypophyllous or rarely amphigenous, effuse, olivaceous; stromata lacking or slight. Conidiophores in dense fascicles, brown, uniform in colour, irregular in width, pluriseptate, not geniculate, not branched, undulate, 50–145 × 4–7 µm. Conidia solitary, pale olivaceous-brown, cylindral or obclavate, straight to curved, 4–12-septate, 40–140 × 4–6.5 µm [13].

Hosts. On Compositae. ***Carlina vulgaris*** L.: B2 – Węgierki n. Września [67,74].

Geographical distribution. Czech Republic, Denmark, Germany, Italy, Poland, Romania, Russia, Sweden; Iran.

Passalora cercidicola (Ellis) U. Braun*

Mycotaxon 55: 230. 1995.

≡ *Cercospora cercidicola* Ellis, Amer. Naturalist 16: 810. 1882.
= *Cercospora cercidicola* var. *coremioides* Tehon, Mycologia 16: 140. 1924.

Teleo.: *Mycosphaerella cercidicola* (Ellis & Kellerm.) F.A. Wolf, Mycologia 32: 129. 1940.
≡ *Sphaerella cercidicola* Ellis & Kellerm., Bull. Torrey Bot. Club 11: 123. 1884.

Exs. on *Cercis canadensis*: Rabenhorst-Pazschke, Fungi Eur. Extraeur. Exs. 4491 (WA 28616).

Description. Leaf spots circural or subcircular, 1–6 mm diam., dingy reddish brown, larger with a paler centre. Caespituli hypophyllous; stromata small, globular. Conidiophores dark olivaceous-brown, pluriseptate, not branched, apex rounded or truncate, 70–275 × 3–4.5 µm. Conidia solitary, pale olivaceous, cylindrical to obclavate, straight, usually 3-septate, 35–60 × 4.5–7 µm.

Hosts. On Leguminosae. ***Cercis canadensis*** L.: USA – New York – n. Manhattan distr. (Kansas), leg. W. A. Kellerman (WA 28616).

Geographical distribution. Georgia, Japan, New Zealand, USA.

Notes. This fungus has been collected outside Poland, but material is deposited in a Polish herbarium. The host is cultivated in Poland as an ornamental plant; therefore, it might be possible to find this fungus in Poland.

Passalora chionea (Ellis & Kellerm.) U. Braun*

Mycotaxon 48: 290. 1993.

≡ *Cercospora chionea* Ellis & Kellerm., Bull. Torrey Bot. Club. 11: 122. 1884.
≡ *Cercosporella chionea* (Ellis & Kellerm.) Sacc., Syll. Fung. 10: 564. 1892.
≡ *Pseudocercospora chionea* (Ellis & Everh.) X.J. Liu & Y.L. Guo, Mycosystema 2: 231. 1989 (misapplied).
= *Cercospora cercidis* W.W. Ray, Mycologia 33: 175. 1941.

Exs. on *Cercis canadensis*: Rabenhorst-Pazschke, Fungi Eur. Exs. 3789 (WA 28615).

Description. Leaf spots circular or irregular, yellowish brown or reddish brown. Caespituli usually hypophyllous. Conidiophores pale olivaceous-brown, paler at the apex, straight or slightly curved, not branched, 17.5–40 × 4–6 µm. Conidia solitary, hyaline, cylindrical, straight or slightly curved, base truncate, rounded or obconic, apex obtuse, (32.5–)40–75 × 4.5–5.5 µm.

Hosts. On Leguminosae. ***Cercis canadensis*** L.: USA – New York n. Manhattan distr. (Kansas), Jul. 1884, leg. W.A. Kellerman (WA 28615).

Geographical distribution. USA.

Notes. This fungus is hitherto unknown from Poland, but material is deposited in a Polish herbarium. The host is cultivated in Poland as an ornamental plant; therefore, its occurrence in Poland seems to be possible.

Passalora circumscissa (Sacc.) U. Braun

Mycotaxon 55: 230. 1995.

≡ *Cercospora circumscissa* Sacc., Nuovo Giorn. Bot. Italy 8: 189. 1876.
≡ *Pseudocercospora circumscissa* (Sacc.) Y.L. Guo & X.J. Liu, Mycosystema 2: 231. 1989.
= *Cercospora cerasella* Sacc., Michelia 1: 266. 1879.
= *Cercospora cerasella* var. *avium* Roum., Rev. Mycol. 18: 71. 1896.
= *Cercospora padi* Bubàk & Serebrian., Hedwigia 52: 271. 1912.
= *Cercospora padi* var. *mahaleb* Unamuno, Boi. Soc. Esp. Hist. Nat. Madrid 35: 435. 1935.
= *Cercospora pruni-persicae* Sawada, Special Publ. Coll. Agric. Natl. Taiwan Univ. 11: 215 1959 (nom. inval.).

Teleo.: *Mycosphaerella cerasella* Aderh., Ber. Deutsch. Bot. Ges. 18: 246. 1900.
≡ *Sphaerella cerasella* (Aderh.) Sacc. & P. Syd., Syll. Fung. 16: 469. 1902.

Exs. on *Prunus cerasus*: Saccardo, Mycoth. Ven. 1051 (KRA-F 1875-275); Saccardo, Mycoth. Ven. 1563 (KRA-F 1880-70; WRSL); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 192 (KRA-F 1924-42); on *Prunus domestica*: Saccardo, Mycoth. Ven. 600 (KRA-F 1875-276).

Description. Leaf spots amphigenous, circular, distinct, 0.5–6 mm diam., reddish brown or dingy grey centre, dark brown margin. Caespituli amphigenous, but mostly hypophyllous; stromata small or up to 60 µm in width. Conidiophores 10–30 in fascicles, olivaceous-brown,

septate, usually geniculate, 12.5–65 × 3–5 µm. Conidia solitary, yellowish olivaceous or olivaceous, obclavate to cylindrical, straight or slightly curved, 1–8-septate, 22–110 × 2.5–5 µm (Fig. 3b, Fig. 36).

Hosts. On Rosaceae. ***Cerasus*** sp.: E3 – Pruszków – Żbików distr. n. Warszawa, 10 Oct. 1930 (WA 29809) [79]; ***Prunus avium*** (L.) L.: B1 – Kaczory [126]; B2 – n. Gniezno, Żabno n. Śrem [126]; B3 – Konin [80]; B4 – Jutrosin n. Rawicz, Kępno [126]; Kalisz [80]; C1 – Radomsko, Piotrków, Wieluń, Łódź [80]; C8 – Ropczyce [80]; D1 – Lipowiec n. Tyszowce, 15 Jun. 1989, leg. Z. Mróz (LBL); E2 – Chojnowo [143,154]; E3 – Pruszków – Żbików distr. n. Warszawa [79]; Zawady n. Warszawa, Sadłowice n. Puławy [126]; E4 – Pożóg n. Puławy [161]; Ukraine – Przemyślany n. Tarnopol, 15 Nov. 1930, leg. N.N. (WA 29806); ***Prunus cerasus*** L.: Ukraine – Kułaczkowce n. Kołomyja, leg. N.N. (WA 29807); ***Prunus padus*** L.: E4 – Puławy [161]; ***Prunus spinosa*** L.: C8 – Lisia Góra n. Rzeszów, Zasów n. Dębica [75].

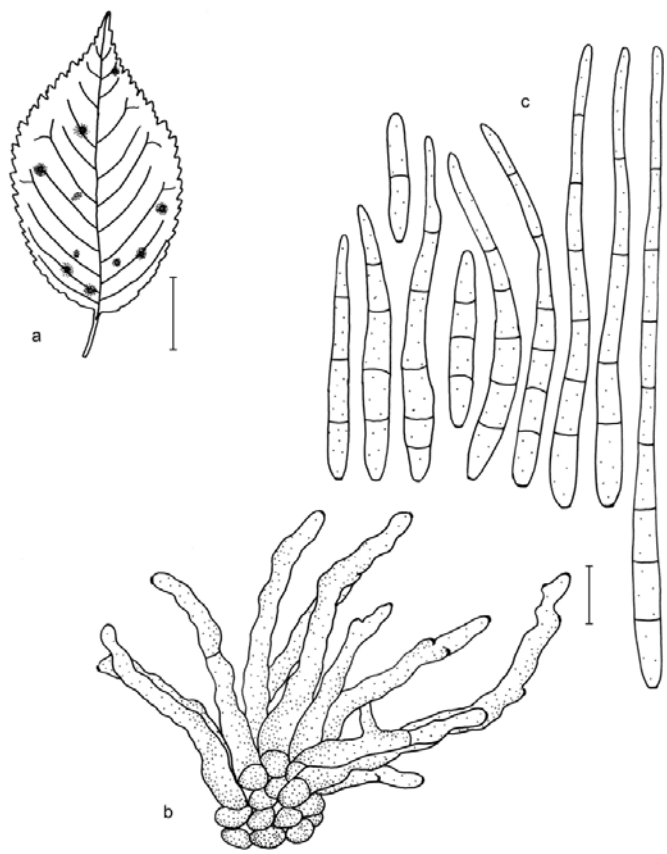

Fig. 36 *Passalora circumscissa* on *Prunus avium* (LBL, Lipowiec n. Tyszowce, leg. Z. Mróz). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Geographical distribution. Bulgaria, Cyprus, Czech Republic, France, Germany, Greece, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, United Kingdom, Ukraine; Armenia, Australia, Azerbaijan, Brazil, Canada, China, Cuba, Georgia, Guatemala, India, Iran, Iraq, Israel, Japan, Kazakhstan, Korea, Libya, Morocco, Myanmar, Paraguay, South Africa, Taiwan, Turkmenistan, USA, Uzbekistan, Zimbabwe.

Passalora comari (Peck) U. Braun

Mycotaxon 55: 230. 1995.

≡ *Cercospora comari* Peck (*comarum*), Rep. (Annual) New York State Mus. Nat. Hist. 38: 101. 1884.

Description. Leaf spots usually circular or irregular, 0.5–4 mm diam., indistinct on the lower surface, reddish brown on the upper surface, sometimes greyish centre. Caespituli amphigenous; stromata small or lacking. Conidiophores usually 3–8 in fascicles, olivaceous-brown, sparingly septate, not branched, up to 2 times geniculate, 50–185 × 4–7 μm. Conidia solitary, olivaceous or brownish, obclavate, straight, 1–5-septate, obtuse apex, obconic base, 30–62 × 5.5–7.5 μm (Fig. 37).

Hosts. On Rosaceae. ***Comarum palustre*** L.: F3 – Białowieża National Park, Jun.–Jul. 1990, leg. W. Mułenko (LBL M-006981) [49,50].

Geographical distribution. Estonia, Great Britain, Latvia, Lithuania, Poland, Russia; Canada, USA.

Notes. *Passalora comari* has been also reported on *Potentilla incana* P. Gaertn., B. Mey. & Scherb. (= *P. arenaria* Borkh.) from Częstochowska Upland [54], but this species occurs only on *Comarum* representatives [11]. According to the latter authors, only *Cercospora potentillae* Chupp & H.C. Greene occurs on *Potentilla*; the fungus has very long (up to 300 μm) conidiophores and hyaline, acicular, and narrower (2–4 μm) conidia [13]. Conidiophores and conidia were not found in the revised material (LOD 2716).

Passalora concors (Casp.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht): 134. 2003.

≡ *Fusisporium concors* Casp., Monatsber. Königl. Preuss. Akad. Wiss. Berlin 1855: 314.1855.
≡ *Cercospora concors* (Casp.) Sacc., Syll. Fung. 4: 449. 1886.
≡ *Mycovellosiella concors* (Casp.) Deighton, Mycol. Pap. 137: 21. 1974.
≡ *Mycovellosiella concors* (Casp.) Constant., Rev. Mycol. 38: 95. (1973) 1975.
= *Cercospora heterosperma* Bres., Ann. Mycol. 1: 129. 1903.

Exs. on *Solanum tuberosum*: Nevodovskii, Griby Ross. 96 (KRA-F 1909-282, 1909-283, 1909-284); Sydow, Mycoth. Germ. 2597 (KRA-F 1931-51).

Description. Leaf spots indistinct or irregular on the upper surface, usually brown. Caespituli hypophyllous, effuse, olivaceous; stromata lacking or small. Conidiophores often in

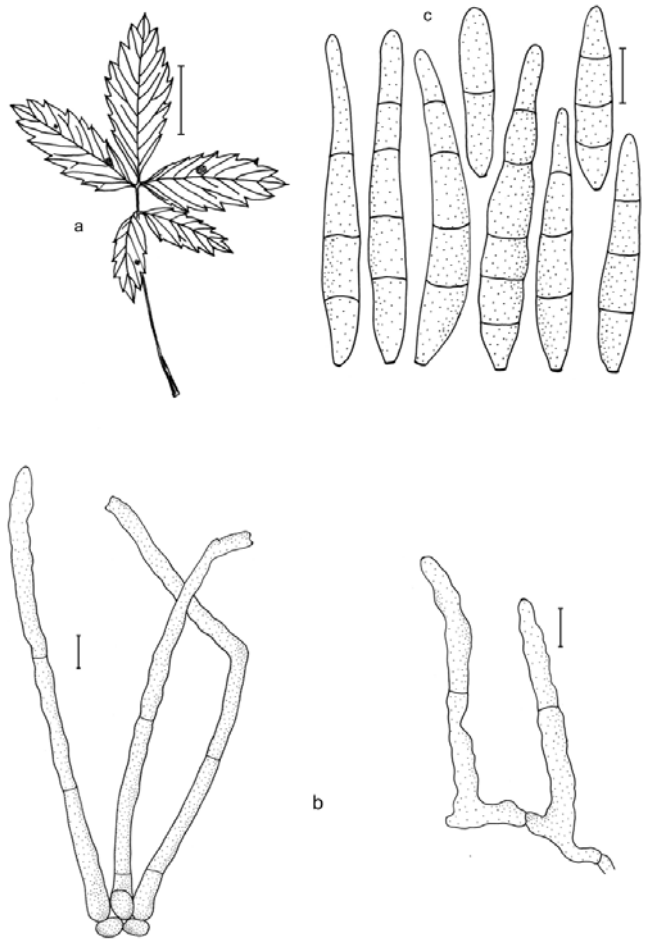

Fig. 37 *Passalora comari* on *Comarum palustre* (LBL M-006981). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

dense or divergent fascicles, pale olivaceous-brown, not branched or sometimes branched, septate, up to 2 times geniculate, often irregular in width, 15–70 × (3.5–)4–7 µm. Conidia solitary, rarely catenate, pale olivaceous, cylindrical or obclavate, straight or slightly curved, usually 1–5-septate, rounded or obconic base, obtuse apex, 20–87.5 × (3–)4–6 µm (Fig. 3c, Fig. 38).

Hosts. On Solanaceae. ***Lycopersicon esculentum*** Mill.: C4 – Kraków [80]; ***Solanum tuberosum*** L.: A2 – Dzisna [80]; A5 – Szydłowo [126]; B1 – Rzadkowo n. Chodzież, 11 Aug. 1932, leg. N.N. (WA 29818) [126]; B2 – Jarocin [126]; B3 – Sarny [79]; Mieczysławów n. Kutno [126]; B4 – Poniec, Luboń n. Gostyń [139]; Leszno [126]; C4 – Kraków [80]; C8 – Sieniawa

[79]; E1 – Bydgoszcz [77]; Bydgoszcz – Bielawy distr., Bydgoszcz – Rynkowo distr. [127]; Lucim n. Bydgoszcz, 27 Aug. 1939, leg. N.N. (WA 29774); E2 – Myszyniec [134]; Krępa n. Mława, Sokołówek n. Ciechanów [126]; E3 – n. Warszawa, Pruszków, Żbików [154]; n. Zwierzyniec [73]; Błonie n. Warszawa, 7 Jul. 1929, leg. N.N. (WA 29855) [79]; Boheń n. Łowicz, Nowy Przybyszew n. Grójec, Sufczyn n. Mińsk Mazowiecki [126]; Warszawa [80]; Góra Puławska, 3 Aug. 1947, leg. O. Kędzierska (WA 4133); E4 – Lublin Voivodeship [79]; F3 – Białowieża Forest [162]; H1 – Bielanka, Bukowina Tatrzańska, Nowy Targ, Raba Wyżna [79]; I1 – Jasło [126]; without precise localization – the former Poznań Voivodeship [79,126]; Germany – Königstein (Saxony), Jul. 1887, leg. W. Krieger (WA 330).

Geographical distribution. Austria, Belarus, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Germany, Italy, Latvia, Lithuania, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Ukraine; Armenia, Azerbaijan, China, Georgia, India, Indonesia, Japan, Kazakhstan, Kenya, Malawi, Mauritius, Nepal, Pakistan, Sudan, Togo, Uganda, USA, Zimbabwe.

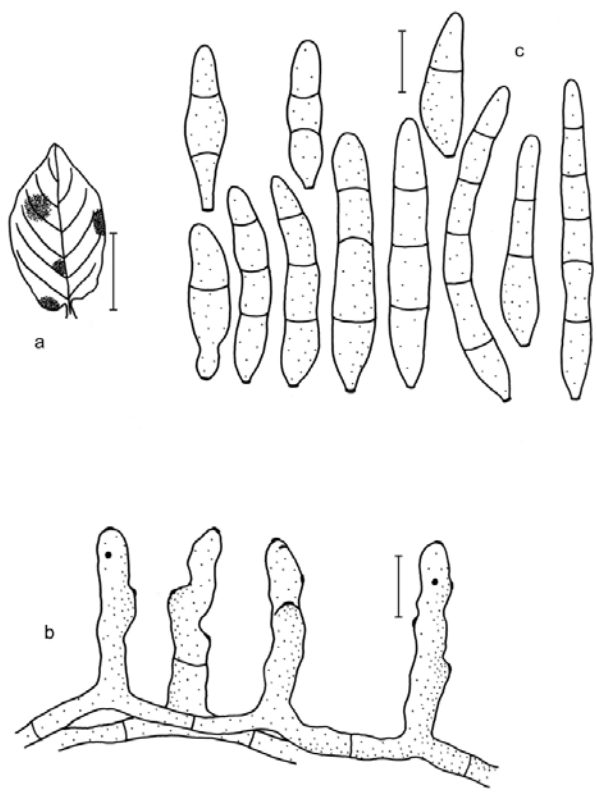

Fig. 38 *Passalora concors* on *Solanum tuberosum* (WA 29774). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Passalora depressa (Berk. & Broome) Sacc.

Nuovo Giorn. Bot. Ital. 8: 187. 1876.

≡ *Cladosporium depressum* Berk. & Broome, Ann. Mag. Nat. Hist. II, 7: 99. 1851.
≡ *Fusicladium depressum* (Berk. & Broome) Roum., Fungi gall. exs., No. 86. 1879.
≡ *Scolecotrichum depressum* (Berk. & Broome) J. Schröter, in Cohn, Kryptog.-Fl. Schles., III. Pilze, 2: 497. 1897.
≡ *Cercospora depressa* (Berk. & Broome) Vassiljevsky, in Vassiljevski & Karakulin, Fungi imperfecti parasitici. 1. Hyphomycetes: 385. 1937.
≡ *Megacladosporium depressum* (Berk. & Broome) Vienn.-Bourg., Les Champignons Parasites Des Plantes Cultivées, II: 1488. 1949 (comb. inval.).
≡ *Cercosporidium depressum* (Berk. & Broome) Deighton, Mycol. Pap. 112: 37. 1967.
≡ *Passalora depressa* (Berk. & Broome) Poonam Srivast., J. Living World 1: 114. 1994 (comb. inval.).
= *Passalora polythrincioides* Fuckel, Jahrb. Nassauischen Vereins Naturk. 23–24: 353. (1869) 1870.
= *Fusicladium peucedani* Ellis & Holw., Bull. Lab. Nat. Hist. Nat. Iowa State Univ. Ia., 3: 42. 1895.
= *Fusicladium peucedani* Syd. & P. Syd., Ann. Mycol. 5: 340. 1907 (nom. illeg.), homonym of *F. peucedani* Ellis & Holw., 1895.
= ?*Cercospora depressa* f. *angelicae* Dzhanuz., Trudy Vsesojuzn. Inst. Zashch. Rast. 19: 9. (1963)1964 (nom. inval.).

Teleo.: *Mycosphaerella angelicae* Woron., Vestn. Tiflissk. Bot. Sada 28: 17. 1913, fide von Arx, 1983.
≡ *Sphaerella angelicae* (Woron.) Trotter, Syll. Fung. 24: 890. 1928 (nom. illeg.)

Exs. on *Angelica archangelica*: Sydow, Mycoth. Germ. 2992 (KRA-F 1934-91); on *Angelica sylvestris*: Bucholtz, Fungi Ross. Exs. 740 (KRAM-F 8595); Saccardo, Mycoth. Ven. 589 (KRA-F 1875-342); Săvulescu, Herb. Mycol. Roman., Fasc. 9, No. 438 (KRA-F 1931-62); Sydow, Mycoth. Germ. 747 (KRAM-F 8712); on *Peucedanum ostruthium*: Rabenhorst-Pazschke, Fungi Eur. Extraeur. Exs. 4295 (WA 28626); Sydow, Mycoth. Germ. 748 (KRAM-F 8710); Sydow, Mycoth. Germ. 2594 (KRA-F 1929-70); on *Tommasinia verticillaris*: Fl. Exs. Austro-Hung. 2373 (KRAM-F 8471; KRA-F 0-5349).

Description. Leaf spots amphigenous, scattered or confluent, circular, elliptical or irregular, 1–8 mm diam., yellowish or brownish. Caespituli hypophyllous; stromata small, composed of several cells. Conidiophores 10–50 or more in dense fascicles, brown or olivaceous-brown, aseptate, not branched, straight or slightly curved, 20–70(–100) × 5–8 µm. Conidia solitary, olivaceous-brown, obclavate, straight or slightly curved, 1-septate, not constricted at the septa, obtuse apex, usually conic base, 20–60 × (5.5–)7–12 µm (Fig. 3d, Fig. 39).

Hosts. On Apiaceae. ***Aegopodium podagraria*** L.: E4 – Kazimierz Dolny [150]; ***Anethum graveolens*** L.: A3 – Szczecin [125,131]; ***Angelica archangelica*** subsp. ***litoralis*** (Wahlenb.) Thell.: B1 – Samostrzel, 27 Jun. 1969, leg. A. Michalski (WA), 13 Aug. 1972 (WA) [128]; Anieliny, 27 Jun. 1969, leg. A. Michalski (WA); E4 – Puławy – Kępa distr., 23 Aug. 1947, leg. O. Kędzierska (WA 4128); ***Angelica palustris*** (Besser) Hoffm.: B1 – Anieliny, 13 Aug. 1972 (WA) [128]; ***Angelica sylvestris*** L.: B2 – Węgierki n. Września [67,74]; B4 – Wojszyn n. Głogów, Głogów [183]; B5 – Namysłów, Szczytniki on the Kaczawa River [183]; C4 – Ojców National Park [42,43,181]; C9 – Kraśnik, 28 Aug. 1974, leg. A. Potocka (LBL); Nowa Wieś n. Turobin, 4 Sep. 1977, leg. T. Bartnik (LBL); E3 – Zwierzyniec n. Skierniewice [73]; Porosiuki, Horbów [82]; F3 – Białowieża National Park, 4 Oct. 1989, Sep.–Oct. 1989, leg. W. Mułenko (LBL, LBL M-002103) [51,52]; G1 – Żerkowie n. Lwówek Śląski, Dzierżoniów, Wałbrzych [183]; Duszniki Zdrój, as *Ramularia angelicae* Höhnel [188]; H1 – Pieniny National Park – Krynica, Biała Skała [45]; Pieniny Mts [46]; Finland – Kerava, Savio, 8 Sep. 1974, leg. L. & H. Roivainen (KRAM-F 18094); Germany – Freiburg, 16 Sep. 1888, leg. P.W. Magnus (KRA-F 1888-99); Ukraine – Kukul n. Worochta in the Carpathian Mts, 13

Jul. 1914, leg. Wróblewski (KRAM-F 8332); Czernelica n. Horodenka, 17 Jul. 1913, leg. A. Wróblewski (KRAM-F 8334); Młodiatyn n. Peczeniżyn, Jun. 1912, leg. A. Wróblewski (KRAM-F 8333); n. Lwów, leg. A. Zalewski (KRA-F 0-5064); ***Angelica*** sp.: B2 – Klęka n. Jarocin [184]; E4 – Puławy – Kępa distr. [184]; ***Foeniculum vulgare*** Mill.: B1 – Plewiska n. Poznań [184]; E4 – Puławy – Kępa distr. [184]; ***Heracleum sphondylium*** subsp. ***sibiricum*** (L.) Simonk.: E3 – Biała Podlaska [83]; ***Peucedanum ostruthium*** (L.) W.D.J. Koch: G1 – Świeradów Zdrój [172].

Geographical distribution. Bulgaria, Czech Republic, Estonia, Finland, Germany, Iceland, Italy, Latvia, Norway, Poland, Romania, Russia, Sweden, Ukraine, United Kingdom; Canada, Canary Islands, Caucasus, China, Cuba, Japan, Kazakhstan, Korea, Kyrgyzstan, Tadzhikistan, USA.

Notes. This species has been also reported by Danilkiewicz [83] on *Sium latifolium* L. from Derło n. Rokitno, but this record has been referred to as *Pseudocercosporella pastinacae*

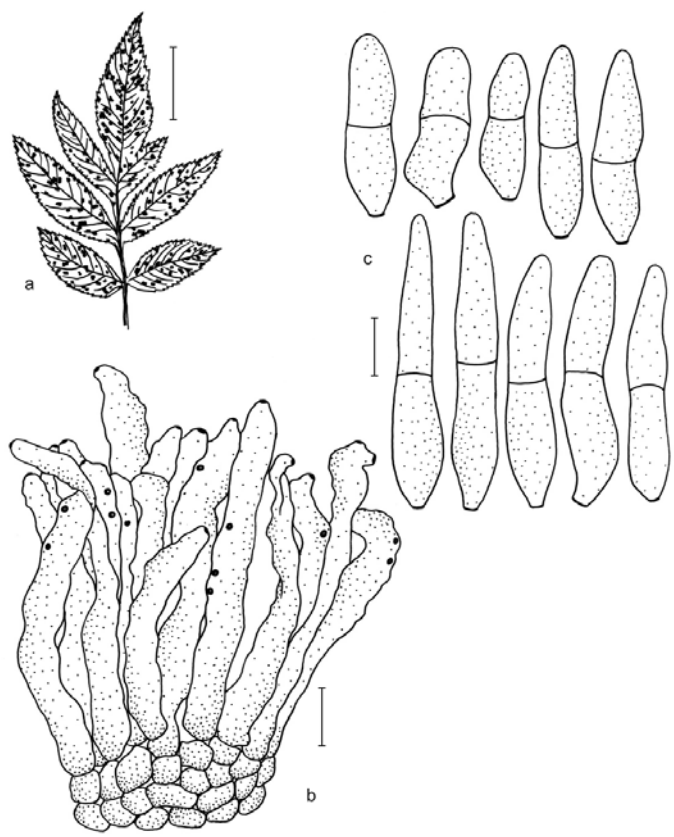

Fig. 39 *Passalora depressa* on *Angelica sylvestris* (LBL, Nowa Wieś n. Turobin, leg. T. Bartnik). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

(P. Karst.) U. Braun after revision. *Passalora depressa* does not occur on *Sium*; only *Passalora sii* (Ellis & Everh.) U. Braun is known on this host plant [11].

The data of Starmachowa [188] published as *Ramularia angelicae* Höhnel on *Angelica sylvestris* L. from Duszniki Zdrój n. Kłodzko belong to the present species as well, which has been confirmed after revision of the herbarium specimen [39].

The records on *Aegopodium* and *Sium* are probably doubtful and represent other species of *Passalora* [11].

***Passalora dissiliens* (Duby) U. Braun & Crous**

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 164. 2003.

≡ *Torula dissiliens* Duby, Mem. Soc. Phys. Genève 7: 128. 1835.
≡ *Septocylindrium dissiliens* (Duby) Sacc., Mycoth. ven., No. 583. 1876.
≡ *Phaeoramularia dissiliens* (Duby) Deighton, in Ellis, More dematiaceous hyphomycetes: 324. 1976.
= *Cladosporium roesleri* Catt., Bol. Commis. Agrar. Voghera 13: 263. 1876.
≡ *Cercospora roesleri* (Catt.) Sacc., Michelia 2: 128. 1880.
≡ *Cercospora roesleri* "f. *typica* (Catt.)" Elenkin, Bolezni Rast. 4: 67. 1909 (nom. inval.).
≡ *Ragnhildiana roesleri* (Catt.) Vassiljevskiy, in Vassiljevskiy & Karakulin, Fungi imperfecti parasitici, 1, Hyphomycetes: 375. 1937.
= ?*Septocylindrium virens* Sacc., Nuovo Giorn. Bot. Ital. 8: 186. 1876.
= *Septosporium fuckelii* Thüm., Oesterr. Bot. Z. 27: 137. 1877.
≡ *Cercospora fuckelii* (Thüm.) Jacz., Parasitic fungal diseases of grape vine, Ed. 2: 81. 1906.
≡ *Isariopsis fuckellii* (Thüm.) du Plessis, Farming S. Afr. 17: 62. 1942.
≡ *Cercospora roesleri* f. *fuckelii* (Thüm.) Elenkin, Bolez. Rast. 4: 68. 1909.
= *Cladosporium pestis* Thüm., Oesterr. Bot. Z. 27: 12. 1877.
= ?*Cercospora coryneoides* Săvul. & Rayss, Rev. Pathol. Veg. Entomol. Agric. France 22: 223. 1935.
= *Cercospora leoni* Săvul. & Rayss, Rev. Pathol. Veg. Entomol. Agric. France 22: 222. 1935.
= *Cercospora judaica* Rayss, Palestine J. Bot., Jerusalem Ser. III, 50: 22. 1943.

Description. Leaf spots usually weakly visible, subcircular or irregular, yellowish or dark brown, later greyish centre, up to 10 mm diam. Caespituli mostly hypophyllous, olivaceous or rusty-brown, velvety. Conidiophores pale brown or olivaceous-brown, 25–90 × 3–7 µm. Conidia catenate, pale olivaceous or golden-brown, usually subcylindrical, smooth or slightly verruculose, 1–5(–7)-septate, 16–84 × 3.5–8 µm [93,189].

Hosts. On Vitaceae. ***Vitis vinifera*** L.: B4 – Zielona Góra, Węgliniec n. Zgorzelec, Góra [66]; B5 – Prószków n. Opole [110].

Geographical distribution. Widely distributed, including Austria, Bulgaria, Cyprus, France, Greece, Italy, Poland, Portugal, Scotland, Slovenia; China, Egypt, India, Iran, Israel, Japan, Pakistan, Palestine, South Africa, Yemen.

Passalora effusa* (Berk. & M.A. Curtis) U.Braun

Mycotaxon 55: 231. 1995.

≡ *Cladosporium effusum* Berk. & M.A. Curtis, Grevillea 3: 106. 1875.
≡ *Cercospora effusa* (Berk. & M.A. Curtis) Ellis, J. Mycol. 1: 53. 1885.
≡ *Didymaria effusa* (Berk. & M.A. Curtis) Solheim, Illinois Biol. Monogr. 12: 65. 1930.

= *Cercospora polygonorum* Cooke, Hedwigia 17: 39. 1878.
≡ *Pseudocercospora polygonorum* (Cooke) Y.L. Guo & X.J. Liu, Mycosystema 4: 110. 1991 (misapplied).
= *Helminthosporium hydropiperis* Thüm., Rev. Mycol. 1: 60. 1879.
≡ *Cercospora hydropiperis* (Thüm.) Speg., Bol. Acad. Ci. (Cordoba) 9: 191. 1880.

Description. Leaf spots weakly visible, sometimes distinct on the upper surface, yellowish brown or olivaceous-brown. Caespituli hyphophyllous; stromata lacking or small, substomatal. Conidiophores in fascicles, olivaceous or olivaceous-brown, clavate, rarely branched, slightly geniculate, 2–5-septate, 30–85 × 4–6.5 µm. Conidia solitary, pale olivaceous, cylindrical or obclavate, 1–4-septate, straight or curved, 35–70 × 4.5–6(–7.5) µm.

Hosts. On Polygonaceae. ***Persicaria hydropiper*** (L.) Delarbre: North America – locality illegible, 1883, leg. C. Earle (WA 28596).

Geographical distribution. France; Brazil, China, Dominican Republic, Georgia, India, Puerto Rico, South Africa, Trinidad and Tobago, USA, Venezuela, Virgin Islands.

Notes. The fungus has been collected outside Poland, but material is deposited in a Polish herbarium. This host and a few others parasitized by this fungus occur in the Polish flora; therefore, it is possible to find this fungus in Poland.

Passalora ferruginea (Fuckel) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 183. 2003.

≡ *Cercospora ferruginea* Fuckel, Beitr. Mykol. 3: 93. 1863.
≡ *Mycovellosiella ferruginea* (Fuckel) Deighton, Mycol. Pap. 144: 14. 1979.
= *Cercospora olivacea* G.H. Otth, Mitth. Naturf. Ges. Bern 1868: 65. 1869.
= *Helminthosporium absinthii* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 30: 54. 1878.
≡ *Cercospora absinthii* (Peck) Sacc., Syll. Fung. 4: 444. 1886.
= *Ramularia absinthii* Laubert, Centralbl. Bacteriol., 2. Abt., 52: 242. 1920.
= *Cercosporidium artemisiae* Sawada, Rep. Gov. Agric. Res. Inst. Taiwan 86: 164. 1943 (nom. inval.).

Exs. on *Artemisia absinthium*: Rabenhorst-Winter-Pazschke, Fungi Eur. Exs. 4090 (WA 28590); on *Artemisia vulgaris*: Raciborski, Fungi Par. Pol. Exs. 125 (KRA-F 1890-265); Saccardo, Mycoth. Ven. 278 (KRA-F 1874-185); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 196 (KRA-F 1926-49); Sydow, Mycoth. Germ. 2798 (KRA-F 1932-85); Thümen, Mycoth. Univ. 286 (WA 5946, 339).

Description. Leaf spots visible on the lower surface, scattered or confluent, subcircular or irregular, 2–10 mm diam., usually dark brown or almost black, without a distinct margin. Caespituli mostly hypophyllous, rarely epiphyllous, velutinous, effuse, blackish brown; stromata composed of several brown cells. Conidiophores 2–13 in divergent fascicles, brown or olivaceous-brown, 4–11-septate, straight or slightly sinuous, sometimes branched at the base or above the middle, 30–250 × 3.5–6 µm. Conidia solitary, pale olivaceous or pale olivaceous-brown, obclavate or ellipsoid-ovoid, straight or slightly curved, usually 1–5-septate, 17–63(–100) × 5–10 µm (Fig. 40).

Hosts. On *Artemisia* spp., Compositae. ***Artemisia absinthium*** L.: E2 – Myszyniec [134]; E5 – Długie Lake Reserve, 19 Jul. 1984 (LBL), 8 Sep. 1984 (LBL), leg. W. Mułenko [81]; ***Artemisia campestris*** subsp. ***inodora*** Nyman: A1 – Słowiński National Park [156]; ***Artemisia***

vulgaris L.: A1 – Słowiński National Park – Czołpino, Gać [53]; A3 – Szczecin and surroundings [160]; Szczecin – Czernik distr. [125]; B4 – Ojców National Park – Zamkowa Mt [42]; C4 – Ojców National Park – Pieskowa Skała, Chełmowa Mt in Ojców [42]; Ojców National Park [43]; Bliskie Lipówki Hill, Olsztyn n. Częstochowa [54]; Kraków, Sep. 1890 (KRA-F 1890-264); E1 – Koniczynka n. Toruń, 24 Aug. 1954, leg. J. Mikołajska (WA 23027, as *Cercospora ferruginea* on *Artemisia* sp.); E3 – Lubartów and surroundings [133,149]; E4 – Puławy – Włostowice distr. [161]; Kolonia Jaszczów n. Milejów, 12 Sep. 2008, leg. U. Świderska-Burek (LBL); Krzczonów Landscape Park – Chmiel Reserve, 20 Sep. 2009, leg. U. Świderska-Burek (LBL); Lublin – Czuby distr., Stary Gaj forest, 11 Oct. 2013, leg. U. Świderska-Burek; E5 – Lake Brzeziczno Reserve, 1 Oct. 1983, leg. W. Mułenko (LBL) [81];

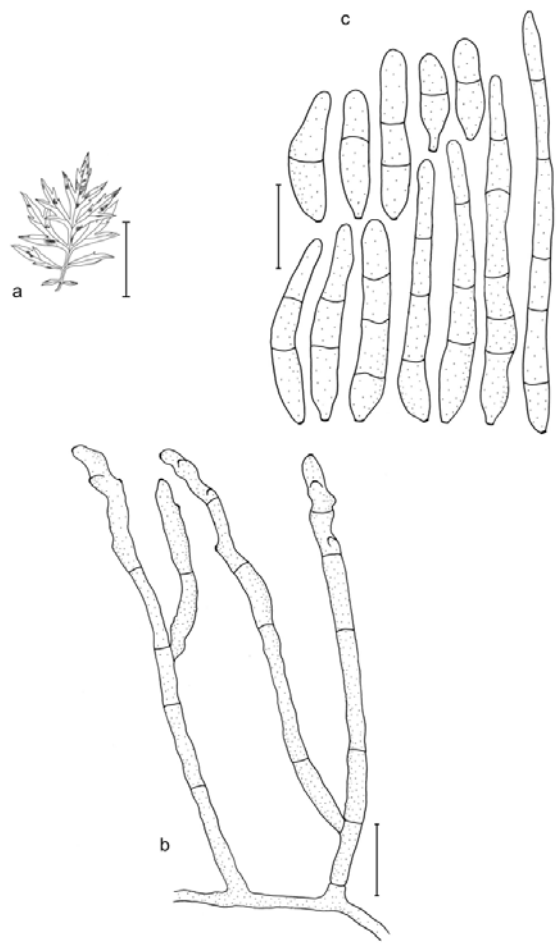

Fig. 40 *Passalora ferruginea* on *Artemisia vulgaris* (Lublin – Czuby distr., leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 20 µm.

F3 – Białowieża Forest [162]; Biebrza National Park – Kapice Protected Unit [136]; Slovakia – Prenčov, 16 Aug. 1887, leg. A. Kmet (WA 335); Prenčov – Sitno Mt, 22 Sep. 1897, leg. A. Kmet (WA 336, 337, 338); ***Artemisia*** sp.: C4 – Ojców National Park [42,43,181].

Geographical distribution. Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Russia (European and Asian part), Slovakia, Sweden, Switzerland, Ukraine; Armenia, Azerbaijan, Canada, China, Chile, Georgia, India, Japan, Kazakhstan, Korea, Kyrgyzstan, Myanmar, Pakistan, Taiwan, USA.

Passalora fulva (Cooke) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 453. 2003.

≡ *Cladosporium fulvum* Cooke, Grevillea 12: 32. 1883.
≡ *Fulvia fulva* (Cooke) Cif., Atti Ist. Bot. Univ. Lab. Critt. Pavia, Ser. 5, 10: 245. 1954.
≡ *Mycovellosiella fulva* (Cooke) Arx, Proc. Kon. Nederl. Akad. Wet., C 86, 1: 48. 1983.
≡ "*Cladosporium fulvum* (Arx) K. Bhalla & A.K. Sarbhoy", Indian Phytopathol. 53(3): 262. 2000. (nom. superfl.).

Description. Leaf spots usually weakly visible. Caespituli amphigenous, but mostly hypophyllous, effuse, olivaceous or brown; stromata usually pale brown. Conidiophores in divergent fascicles, usually pale brown, not branched or sometimes branched at the base, undulate, smooth, septate, 57–125(–200) × 2.5–7 µm. Conidia solitary to catenate, pale or dark brown, cylindrical or ellipsoid, smooth, straight or slightly curved, aseptate or usually 1–3-septate, 12–407 × 4–10 µm [190,191].

Hosts. On Solanaceae. ***Lycopersicon esculentum*** Mill.: A3 – surroundings of Szczecin [125]; B1 – Międzychód County [126]; B2 – Mogilno County [78]; Wolsztyn [80,126]; Gniezno [80]; B4 – Dąbrówka n. Brzeziny [126]; Drzęczewo n. Gostyń [74]; C1 – Ksawerów n. Łask [126]; Łask County [140]; C4 – Kraków County [140]; Kraków – Rakowice distr. [76]; Ojców [42]; Ojców National Park [43]; E1 – Bydgoszcz – Bielawy distr. [127]; E3 – surroundings of Warszawa [192]; Błonie n. Warszawa, Krobów n. Grójec, Mory n. Warszawa, Warszawa, Warszawa – Wilanów distr. [126]; Łuków County [140].

Geographical distribution. Worldwide.

Passalora galii (Ellis & Holw.) Arx

Proc. K. Ned. Akad. Wet. C. 86: 45. 1983.

≡ *Cercospora galii* Ellis & Holw., J. Mycol. 1: 5. 1885.
≡ *Cercosporidium galii* (Ellis & Holw.) Deighton, Mycol. Pap. 112. 76. 1967.
≡ *Passalora galii* (Ellis & Holw.) Poonam Srivast., J. Living World 1: 115. 1994 (comb. inval., Art. 33.2).
= *Fusicladium ruthenicum* Petr., Ann. Mycol. 19: 78. 1921.
≡ *Scolecotrichum ruthenicum* (Petr.) Karak. & Vassiljevsky, in Vassiljevsky & Karakulin, Fungi imperfecti parasitici, I. Hyphomycetes: 215. 1937.
≡ *Passalora ruthenica* (Petr.) Petr., Ann. Mycol. 39: 293. 1941.
= *Cercospora concinna* Syd., Ann. Mycol. 30: 400. 1932.

Exs. on *Galium mollugo*: Sydow, Mycoth. Germ. 2596 (KRA-F 1931-50).

Description. Leaf spots greyish brown or brown, usually without a distinct margin. Caespituli hypophyllous, sometimes almost effuse; stromata globular, dark brown. Conidiophores in dense fascicles, pale olivaceous-brown, undulate or variously curved, rarely or indistinctly septate, sparingly branched, 20–55 × 3–4.5 µm. Conidia solitary, pale olivaceous, cylindrical, straight or slightly curved, usually indistinctly 1–5-septate (mostly with 1 septum), 25–50 × 3–5 µm (Fig. 41).

Hosts. On *Galium* spp., Rubiaceae. ***Galium intermedium*** Schult.: C9 – Roztocze National Park – Maziarki Reserve, 18 Jul. 1980, leg. J. Romaszewska-Sałata (LBL); F3 – Białowieża Forest, 13 Jun. 2002, leg. M. Wołkowycki (LBL M-9062) [90]; ***Galium mollugo*** L. s. str.: E3 – Skierniewice [73]; ***Galium saxatile*** L.: A1 – Słowiński National Park – Kluki [53]; ***Galium sylvaticum*** L.: E4 – Puławy [161]; ***Galium uliginosum*** L.: E5 – Piaseczno Lake [81].

Geographical distribution. Bulgaria, Germany, Poland, Russia (European and Asian part), Ukraine; Canada, Japan, USA.

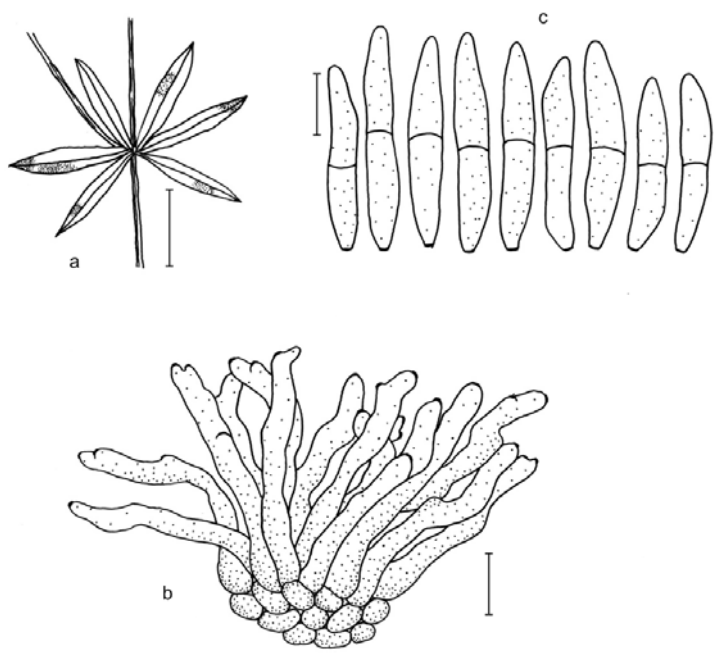

Fig. 41 *Passalora galii* on *Galium intermedium* (LBL M-9062). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Passalora gnaphaliaceae (Cooke) U. Braun & Crous*

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 201. 2003.

≡ *Cercospora gnaphaliaceae* Cooke (*gnaphaliacea*), J. Linn. Soc. London (Bot.) 17: 142. 1880.
≡ *Phaeoisariopsis gnaphaliaceae* (Cooke) Morgan-Jones, Canad. J. Bot. 52: 2635. 1974.
= *Cercospora gnaphalii* Harkn., Calif. Acad. Sci. Bull. 1: 38. 1884.

Description. Leaf spots circular or irregular, 2–5 mm diam., brown, without a distinct margin. Caespituli amphigenous, but mostly epiphyllous; stromata globular, dark brown. Conidiophores in dense fascicles, often coremoid, brown or dark brown, septate, branched, up to 2 times geniculate, 70–135 × 4–5 µm. Conidia solitary, pale olivaceous-brown, usually cylindrical to obclavate, straight or slightly curved, 1–5-septate, obconic base, obtuse apex, 25–65 × 4.5–7 µm.

Hosts. On Compositae. ***Neojeffreya decurrens*** (L.) Cabrera: Canada – Oakland (Ontario), 26 Jul. 1910, leg. J. Dearness, DAOM 134184 (WA 20386).

Geographical distribution. Brazil, Canada, Japan, Puerto Rico, USA, Venezuela.

Notes. The fungus species is known on members of *Gnaphalium* s. l. Six species of *Gnaphalium* genus occur in Poland and on one of these (*Gnaphalium uliginosum* L.) has been recorded as a host of *Passalora gnaphaliaceae*. Therefore, it might be possible to find this fungus in Poland on *Gnaphalium*.

Passalora graminis (Fuckel) Höhn.

Zentralbl. Bakteriol. Parasitenk., Abt. 2, 60: 6. 1923.

≡ *Scolicotrichum graminis* Fuckel, Hedwigia 2(15): 134. 1863.
≡ *Cercospora graminis* (Fuckel) Horsfall, Mem. Cornell Univ. Agric. Exp. Sta. 130: 100. 1930.
≡ *Cercosporidium graminis* (Fuckel) Deighton, Mycol. Pap. 112: 62. 1967.
≡ *Passalora graminis* (Fuckel) Poonam Srivast., J. Living World 1: 116. 1994 (comb. inval. et superfl.).
= *Passalora hordei* G.H. Otth, Mitth. Naturf. Ges. Bern 1868: 66. 1868.
= *Passalora punctiformis* G.H. Otth, Mitth. Naturf. Ges. Bern 1868: 67. 1868.
= *Cladosporium sphaeroideum* Cooke, Grevillea 8(46): 60. 1879.
= *Cercospora graminicola* Tracy & Earle, Bull. Torrey Bot. Club. 22: 179. 1895.
= *Scolecosporium compressum* Allesch., Hedwigia 35: 34. 1896.
≡ *Passalora compressa* (Allesch.) Petr., in Reliquiae Petrakianae, Fasc. 1, 50 (No. 192). 1977 (comb. inval.).
= *Scolicotrichum graminis* var. *nanum* Sacc., Ann. Mycol. 3: 515. 1905.
= *Scolicotrichum graminis* var. *brachypodum* Speg., An. Mus. Nac. Buenos Aires, ser. 3, 13: 436. 1911.
= *Heterosporium secalis* Dippen., South African J. Sci. 28: 286. 1931.

Exs. on *Dactylis glomerata*: Siemaszko, Fungi Bialowiez. Exs. 199 (KRA-F 1922-44); on *Milium effusum*: Krypt. Exs. 1191 (KRA-F 0-5536).

Description. Leaf spots scattered or mostly confluent, usually elongated (oblong), up to 20 mm long, greenish or brownish with a darker, brown margin. Caespituli hypophyllous, punctiform, dark brown or almost black. Conidiophores in dense fascicles, brownish, slightly paler towards the apex, geniculate, aseptate, not branched, (35–)50–105 × 5–8 µm.

Conidia solitary, pale brown, ellipsoidal, obovoid or obclavate, straight, aseptate or usually 1–3-septate, almost smooth or verruculose, slightly thickened wall, usually rounded apex, 20–47(–52.5) × 7.5–13 µm (Fig. 42).

Hosts. On Poaceae. ***Agrostis alba*** L.: B2 – Węgierki n. Września [67,74]; F1 – Łyna River Valley south of Olsztyn [193]; ***Alopecurus aequalis*** Sobol.: B5 – Krapkowice – Otmęt distr. [183]; F3 – Białowieża National Park, Jul. 1988, leg. W. Mułenko (LBL) [51,52]; G2 – Popowice n. Wrocław [183]; ***Alopecurus geniculatus*** L.: D1 – Kosmów [83]; E3 – Skierniewice [73]; Wysokie, Horbów in the Krzna Valley [82]; Janów Podlaski [83]; Helenów, 22 Oct. 1964, leg. B. Durska (WA 13743); ***Alopecurus pratensis*** L.: F1 – Łyna River Valley south of

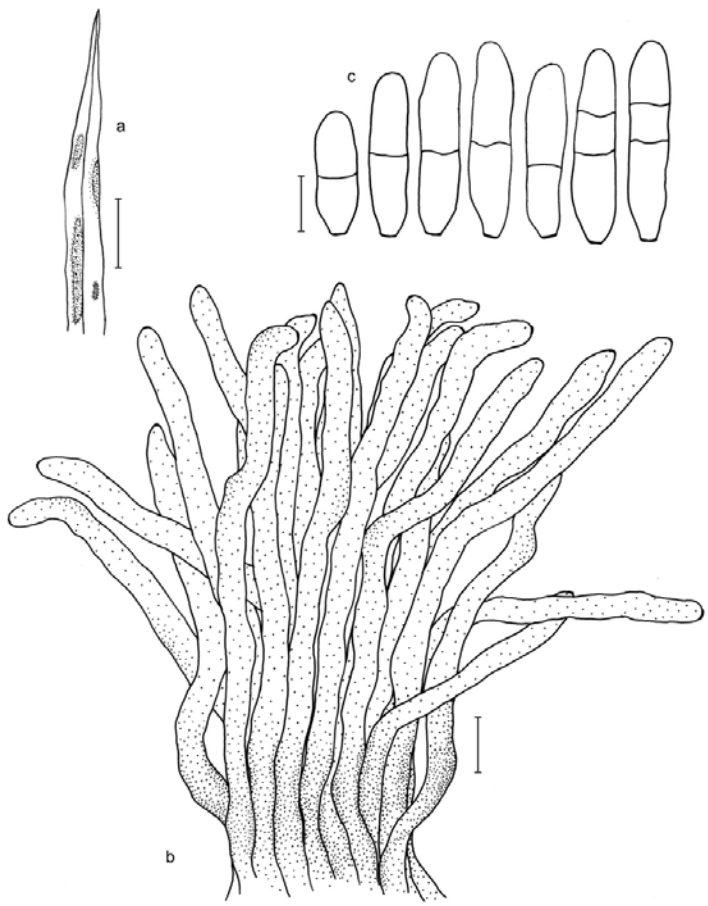

Fig. 42 *Passalora graminis* on *Milium effusum* (LBL, Białowieża National Park, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Olsztyn [193,194]; E3 – Horbów [82]; ***Arrhenatherum elatius*** (L.) P. Beauv. ex J. Presl & C. Presl: A1 – Słowiński National Park – Czołpino, Gać [53]; A3 – surroundings of Szczecin [195]; E1 – Bydgoszcz – Rynkowo distr. [127]; E4 – Puławy [79,161]; F1 – Łyna River Valley south of Olsztyn [194]; H1 – Pieniny Mts [46]; Krościenko, Sromowce Wyżnie [45]; ***Avena*** sp.: E4 – Puławy [79]; ***Brachypodium sylvaticum*** (Huds.) P. Beauv.: E3 – Derło on the Bug River [83]; ***Calamagrostis canescens*** (Weber) Roth: A1 – Słowiński National Park – Czołpino [53]; ***Corynephorus canescens*** (L.) P. Beauv.: A1 – Słowiński National Park [156]; ***Dactylis glomerata*** L.: A1 – Słowiński National Park – Gardno, Dołgie Małe [53]; A3 – n. Szczecin [195]; B1 – Białośliwie on the Noteć River [128]; E1 – Bydgoszcz – Rynkowo distr. [127]; E4 – Puławy [161]; F1 – Łyna River Valley south of Olsztyn [193,194]; Horbów in the Krzna Valley [82]; F3 – Białowieża [171]; ***Dactylis*** sp.: B3 – Sarny [79]; E3 – Mory n. Warszawa, 14 Oct. 1930, leg. H. Juraszkówna (WA 30898); E4 – Puławy [79]; ***Elymus repens*** (L.) Gould: E3 – Biała Podlaska [82]; ***Festuca rubra*** L.: F1 – Łyna River Valley south of Olsztyn [194]; ***Glyceria fluitans*** (L.) R. Br.: B1 – Anieliny on the Noteć River [128]; B4 – n. Zielona Góra, Wrocław – Karłowice distr. [183]; E3 – Porosiuki, Horbów in the Krzna Valley [82]; Derło on the Bug River [83]; E4 – Garbów [161]; F1 – Łyna River Valley south of Olsztyn [193,194]; G2 – Świdnica [183]; ***Glyceria maxima*** (Hartm.) Holmb.: E5 – Wołczyny [83]; F1 – Łyna River Valley south of Olsztyn [193]; Belarus – n. Prużany, 25 Jun. 1929, leg. N.N. (WA 30887) [79]; Ukraine – Werbiąż Wyżny n. Kołomyja, 4 Jun. 1914, leg. A. Wróblewski (KRAM-F 8597); ***Glyceria notata*** Chevall.: B4 – surroundings of Zielona Góra [183]; G1 – Rusinowa n. Wałbrzych [183]; H1 – Tylicz n. Krynica Zdrój [173]; ***Helictotrichon pubescens*** (Huds.) Schult. & Schult. f.: B1 – Anieliny, Samostrzel [128]; F1 – Łyna River Valley, Agricultural Experimental Unit Pozorty n. Olsztyn [193,194]; ***Leersia oryzoides*** (L.) Sw.: B5 – Środa Śląska [183]; ***Lolium perenne*** L.: A6 – Piotrowice n. Biskupiec [196]; E3 – Drwalew n. Grójec [79]; ***Milium effusum*** L.: B5 – Goszczowice n. Niemodlin [183]; F3 – Białowieża National Park, Jul. 1989, leg. W. Mułenko (LBL) [51,52]; G1 – Wojciechowice n. Kłodzko [183]; G2 – Janowiczki n. Niemcza [183]; ***Molinia caerulea*** (L.) Moench: A1 – Słowiński National Park [156]; ***Phalaris arundinacea*** L.: E3 – Janów Podlaski [83]; ***Phleum pratense*** L.: F1 – Łyna River Valley south of Olsztyn [193]; ***Poa compressa*** L.: A1 – Słowiński National Park – Kluki [53]; B1 – Nakło, Paterek on the Noteć River [128]; ***Poa nemoralis*** L.: B4 – surroundings of Trzebnica [183]; B5 – surroundings of Brzeg, Miękinia n. Środa Śląska, Wrocław – Osobowice distr. [183]; G1 – Kłodzko [183]; ***Poa palustris*** L.: E3 – Derło on the Bug River, Neple [83]; ***Poa pratensis*** L. s. str.: A1 – Słowiński National Park – Gać [53]; E3 – Skierniewice [73]; Bohukały, Bubel Stary, Gnojono, Neple on the Bug River [83]; F1 – Łyna River Valley south of Olsztyn [193]; ***Poa*** sp.: B3 – Sarny [79]; E4 – Puławy [79]; F1 – Łyna River Valley south of Olsztyn [194]; ***Poa trivialis*** L.: F1 – Łyna River Valley south of Olsztyn [193]; H1 – Czorsztyn on the Dunajec River [45]; Pieniny Mts [46]; Jaworki n. Szczawnica [47]; ***Secale cereale*** L.: B1 – surroundings of Chojnice [78]; B2 – Zakrzewo n. Gniezno, 19 Jun. 1928, leg. N.N. (WA 30901) [78]; Zbietka n. Wągrowiec [126]; B3 – surroundings of Inowrocław [78]; Błonie n. Łęczyca [79]; C1 – Gałkówek n. Brzeziny, 12 Jun. 1932, leg. K. Żelazowska (WA 30902) [126]; E1 – Książki n. Wąbrzeźno, 29 Jun. 1927, leg. N.N. (WA 30900) [77]; Silno n. Toruń, 8 Jul. 1928, leg. N.N. (WA 30895) [78]; Bydgoszcz – Rynkowo distr. [127]; E2 – Opatówiec n. Płock, Poświętne n. Płońsk, Worowice n. Płock [79]; E3 – Częstoniew n. Grójec, Kawęczyn, Mory n. Warszawa, Ołtarzew n. Warszawa [79]; Drwalew n. Grójec, Góra Puławska [126]; E4 – Puławy [79,126]; Pożóg n. Puławy [126]; ***Triticum aestivum*** L.: G1 – Kudowa Zdrój – Czermna distr. [158]; H1 – Mszana Dolna [197].

Geographical distribution. On various species of numerous genera of the Poaceae, worldwide.

Notes. *Passalora graminis* has been also reported on *Phleum pratense* from Krzyżowa Mt n. Krynica (KRAM-F 9739) [173] and on *Avena* sp. from Smętowo Graniczne n. Gniew (WA 30896) [77]. No conidiophores or conidia have been found in the preserved herbarium material.

According to Mirek et al. [130], the host *Agrostis alba* L. has been divided into *A. gigantea* Roth. and *A. stolonifera* L. In The Plant List database [102], *A. alba* is a synonym of *Poa nemoralis*. The material was not available, therefore the name under which the host was published is tentatively maintained in the present paper.

Garbowski and Juraszkówna [79] provided only Polish generic names of the plants. In this paper, *Secale cereale* for rye, *Avena* sp. for oats, *Dactylis* sp. for cock's-foot and *Poa* sp. for tussock grass have been used.

***Passalora heterospora* (Höhn.) Höhn.**

Zbl. Bakt. Parasitenkd., 2. Abt., 60: 1. 1923.

≡ *Fusicladium heterosporum* Höhn., Ann. Mycol. 3: 337. 1905.
≡ *Scolecotrichum heterosporum* (Höhn.) Karak. & Vassiljevsky, in Vassiljevsky & Karakulin, Fungi imperfecti parasitici. 1. Hyphomycetes: 214. 1937.
≡ *Phaeoramularia hoehnelii* S. Petzoldt, in Braun, Nova Hedwigia 55: 214. 1992.
= *Didymaria epilobii* Hollós, Ann. Mus. Nat. Hung. 7: 57. 1909.

Description. Leaf spots usually elongated, from several to 30 mm long, smaller vein-limited, larger without a distinct limit with a wider yellowish halo, often confluent, brown. Caespituli hypophyllous, greyish brown. Conidiophores cylindrical, aseptate or 1–2-septate, longer ones branched, 28–60 × 5–6 µm. Conidia catenate, pale brown, cylindrical clavate, usually 1-septate (rarely with 2–3 septa), constricted at the septa, 22–40 × 8–14 µm [97].

Hosts. On Onagraceae. ***Epilobium angustifolium*** (L.) Scop.: C2 – Włoszczowa [133,198].

Geographical distribution. Austria, Czech Republic, Germany, Hungary, Poland, Ukraine; Russia (Caucasus).

Passalora lobeliae-cardinalis* (Schwein.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 254. 2003.

≡ *Caeoma lobeliae-cardinalis* Schwein., Trans. Amer. Phil. Soc., Ser. 2, 4: 291. 1832.
≡ *Mycovellosiella lobeliae-cardinalis* (Schwein.) Deighton, Trans. Brit. Mycol. Soc. 86: 637. 1986.
= *Cercospora ochracea* Sacc. & Malbr., Michelia 2: 128. 1880.
= *Cercospora lobeliicola* Solheim (*lobeliaecola*), Illinois Biol. Monogr. 12: 64. 1929.
= *Cercospora diffusa* auct.
= *Cladosporium pelliculosum* Berk. & M.A. Curtis, Grevillea 17(83): 67. 1889 (according to Schubert & Braun, Fungal Divers. 20: 201. 2005).

Exs. on *Lobelia cardinalis*: Rabenhorst-Pazschke, Fungi Eur. Exs. 3791, as *Cercospora effusa* Berkeley et Curtis (WA 28618).

Description. Leaf spots usually indistinct, sometimes scattered or confluent, angular, yellowish brown to reddish brown. Caespituli hypophyllous; stromata lacking or small. Conidiophores in small, dense fascicles, brown or reddish brown, septate, sometimes branched, often geniculate, curved, (35–)40–70 × 3.5–5 µm. Conidia solitary, pale olivaceous or pale brown, cylindrical to obclavate, straight, usually 2–3-septate, 22.5–62.5 × 2.5–5 µm.

Hosts. On *Lobelia* spp., Campanulaceae. ***Lobelia cardinalis*** L.: USA – New York – Manhattan distr. (Kansas), Aug. 1884, leg. W.A. Kellerman (WA 28618).

Geographical distribution. France, Russia, Ukraine; India, USA.

Notes. This species has not been collected in Poland, but material is deposited in a Polish herbarium. *Passalora lobeliae-cardinalis* occurs worldwide on *Lobelia* spp. Two species of this genus, i.e. *L. dortmanna* L. and *L. erinus* L. occur in Poland. Thus, the occurrence of this species on *Lobelia* in Poland cannot be excluded.

Passalora malkoffii **(Bubák) U. Braun**

Trudy Bot. Inst. im. V.L. Komarova 20: 71. 1997.

= *Cercospora malkoffii* Bubák, Ann. Mycol. 4: 121. 1906.

Description. Leaf spots elongated, sometimes covering the entire leaf surface, brownish. Caespituli amphigenous; stromata composed of several swollen, closely aggregated bases of conidiophores. Conidiophores 3–25 in fascicles, pale yellowish olivaceous, uniform in colour, highly attenuated towards the apex, aseptate, not branched, 5–20 × 3–5 µm. Conidia solitary, hyaline, cylindrical, 1–5-septate, straight or slightly curved, obconically truncate base, obtuse apex, 20–90 × 2–4.5 µm [13].

Hosts. On *Pimpinella* spp., Apiaceae. ***Pimpinella anisum*** L. (on seeds): without localization [177].

Geographical distribution. Bulgaria, Estonia, Greece, Poland, Romania, Russia; Armenia, Cuba, Tadzhikistan, Turkey, USA.

Passalora microsora **(Sacc.) U. Braun**

Mycotaxon 55: 233. 1995.

≡ *Cercospora microsora* Sacc., Michelia 2: 128. 1880.
= *Cercospora tiliae* Peck, Bot. Gaz. 6: 277. 1881.
= *Cercospora exitiosa* Syd. & P. Syd., Ann. Mycol. 4: 485. 1906.
= *Cercospora zahariadii* Săvul. & Sandu, Hedwigia 75: 226. 1935 and Herb. Mycol. Rom., Fasc. XXIV, No. 1191. 1939.
≡ *Cercospora microsora* var. *tiliae-platyphyllae* Roum., Rev. Mycol. 16: 109. 1894.

Teleo.: *Mycosphaerella microsora* Syd., Ann. Mycol. 38: 465. 1940.

Exs. on *Tilia cordata*: Allescher & Schnabl, Fungi Bavar. 595 (KRA-F 1895-122); Săvulescu, Herb. Mycol. Roman., Fasc. 4, No. 193 (KRA-F 1929-61); on *Tilia ulmifolia*: Krypt. Exs. 1192 (KRA-F 0-4780).

Description. Leaf spots usually oval, with a paler, greyish centre and a dark brown margin, sometimes circular, brown or reddish brown with a darker margin, 1–5 mm diam. Caespituli usually amphigenous, rarely only epiphyllous or hypophyllous. Conidiophores pale olivaceous, pale olivaceous-brown or brown, paler at the apex, usually geniculate, not branched, 10–45 × 2.5–3.5 µm. Conidia solitary, pale olivaceous, cylindrical or obclavate, straight or slightly curved, 1–6-septate (usually with 3–5 septa), 20–67.5 × 2.5–4.5(–5) µm (Fig. 3e, Fig. 43).

Hosts. On *Tilia* spp., Malvaceae. ***Tilia cordata*** Mill.: B1 – Zielonka n. Poznań [165]; C9 – Narol, 20 Aug. 1992, leg. B. Hypiak (LBL); D1 – Lipowiec n. Tyszowce, 11 Aug. 1988, leg. Z. Mróz (LBL); Tyszowce, 13 Sep. 1988, leg. Z. Mróz (LBL); Cześniki n. Zamość, 3 Aug. 1989, leg. G. Górska (LBL); E1 – Bydgoszcz – Bielawy distr., Rynkowo distr. [127]; E3 – n. Skierniewice [73]; Neple, 8 Oct. 1981, leg. M. Danilkiewicz (LBL) [83]; Radom, 4 Nov. 1988, leg. E. Kasińska (LBL); Wólka Profecka n. Puławy, 10 Aug. 2010. leg. U. Świderska-Burek (LBL); Kolonia Góra Puławska n. Puławy, 18 Aug. 2013, leg. U. Świderska-Burek (LBL); E4 – Kazimierz Dolny, Puławy [150]; Lublin – Rury distr., 10 Oct. 1980, leg. E. Murawska (LBL); Zemborzyce n. Lublin, 13 Sep. 2010, leg. U. Świderska-Burek (LBL); Rąblów n. Nałęczów, 15 Jun. 2012, leg. U. Świderska-Burek (LBL); Polanówka n. Lublin, 17 Aug. 2012, leg. F. Fabiański; F1 – Krutyń n. Mrągowo, 12 Sep. 2009, leg. U. Świderska-Burek (LBL); F3 – Białowieża National Park [199]; Białowieża National Park, Jun.–Jul., Sep. 1990, leg. W. Mułenko (LBL – 2 localities) [51,52]; Biebrza National Park – Grzędy Protected Unit [136]; H1 – Muszyna [75]; I1 – Pietrusza Wola, 25 Aug. 1999, leg. B. Winiarska (LBL); Germany – Bad Schandau (Saxony), Jul. 1980, Sep. 1890, leg. W. Krieger (WA 344, 345, 348); Slovakia – Prenčow – Sitno Mt, 22 Sep. 1897, leg. A. Kmet (WA 346, 347); Ukraine

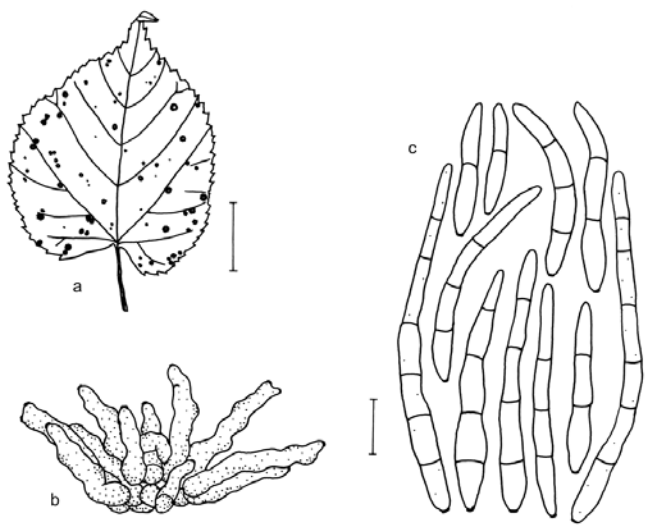

Fig. 43 *Passalora microsora* on *Tilia cordata* (LBL, Wólka Profecka n. Puławy, leg. U. Świderska-Burek). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

– Podhorce n. Stryj, 1931, leg. N.N. (WA 29739); Kołaczkowce n. Kołomyja, leg. N.N. (WA 29721); ***Tilia platyphyllos*** Scop.: A3 – Szczecin and surroundings [160]; Szczecin [125]; C4 – Parkowe Reserve, 23 Aug. 1998, leg. M. Ruszkiewicz (LOD 2724) [54]; ***Tilia*** sp.: A5 – Gołąbek n. Tuchola [77]; B1 – Grabówno n. Wyrzysk [126]; Poznań, Szubin n. Nakło [80]; B3 – Sieradz, Mieczysławów n. Kutno [126]; Kutno [80]; B5 – Prószków n. Opole [110]; C1 – Brzeziny [79]; Łódź – Chojny distr., 2 Oct. 1931, leg. Żelazowska (WA 29720) [126]; C2 – Częstochowa [80]; C3 – Będzin [80]; C8 – Wólka Grodziska n. Leżajsk, 10 Jul. 2012, leg. S. Karaś (LBL); E1 – Warlubie, Świecie [65]; Świecie and surroundings [74]; E2 – Kęczewo n. Mława, Niegłosy n. Płock [126]; Ciechanów, Mława, Pułtusk [80]; E3 – Wójtówka n. Sochaczew, Choszczówka n. Warszawa [126]; Rawa Mazowiecka, Siedlce, Warszawa [80]; Rozwadówka, 10 Aug. 2012, leg. A. Korpysz; E4 – Puławy [154]; F2 – Bargłów n. Augustów [126]; F3 – Supraśl n. Białystok, n. Szczuczyn [79].

Geographical distribution. Austria, Belarus, Bulgaria, Czech Republic, Denmark, Estonia, France, Germany, Great Britain, Greece, Italy, Latvia, Lithuania, Moldova, Norway, Poland, Romania, Russia (European and Asian part), Slovakia, Spain, Sweden, Switzerland, Ukraine; Armenia, Australia, Azerbaijan, Canada, Chile, China, Colombia, Georgia, Iran, Japan, Kazakhstan, Sierra Leone, USA, West Indies.

Passalora microsperma Fuckel

Jahrb. Nassauischen Ver. Naturk. 27–28: 77. 1873.

Exs. on *Alnus incana*: Rabenhorst-Pazschke, Fungi Eur. Extreaeur. Exs. 4198 (WA 28809); Sydow, Mycoth. Germ. 1145 (KRAM-F 10334); Sydow, Mycoth. Germ. 3591 (KRA-F 1940-69).

Description. Leaf spots indistinct. Caespituli hypophyllous, at first paler, later dark olivaceous; stromata lacking. Conidiophores up to 13 in fascicles, pale or dark olivaceous, septate, not branched or sometimes branched, 80–250 × 2.5–5.5 µm. Conidia solitary, olivaceous or olivaceous-brown, smooth, fusiform or obclavate, straight or slightly curved, 1-septate, usually constricted at the septa, apex variable (broadly rounded or obtuse to acute), base rounded, attenuated or truncate, 15–33 × 4.5–8 µm (basal cell usually 5.5–8 µm wide, apical cell 4.5–6 µm wide; Fig. 3f).

Hosts. On *Alnus* spp., Betulaceae. ***Alnus incana*** (L.) Moench: I1 – Cergowa Mt [200].

Geographical distribution. Denmark, Germany, Latvia, Poland, Russia, Switzerland.

Passalora minutissima (Desm.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 276. 2003.

≡ *Selenosporium minutissimum* Desm., Pl. Cryptog. France, Fasc. X, No. 456. 1857 (description on label).
≡ *Fusarium minutissimum* (Desm.) Sacc., Syll. Fung. 4: 703. 1886.
≡ *Phaeoramularia minutissima* (Desm.) U. Braun, Nova Hedwigia 55: 214. 1992.
= *Ramularia geranii-sanguinei* C. Massal., Atti R. Ist. Ven. 59(2): 688. 1900.
= *Cercospora geranii-sanguinei* Henn., Nyt Mag. Naturvidensk. 42: 33. 1904.

Description. Leaf spots circular or irregular, dark brown, at first small, finally cause death of the entire leaflet. Caespituli hypophyllous; stromata small, brown. Conidiophores in dense fascicles, pale olivaceous-brown, indistinctly septate, not branched, sinusoid, 15–125 × 3–6 µm. Conidia catenate, hyaline or pale olivaceous, cylindrical, 1–3-septate, straight or slightly curved, base obconic or truncate, rounded apex, 20–60 × 4–6 µm [13,23].

Hosts. On *Geranium* spp., Geraniaceae. ***Geranium sanguineum*** L.: F3 – Białowieża Forest – Stoczek distr. [171].

Geographical distribution. France, Italy, Norway, Poland.

Notes. The report of Siemaszko [171] published from Białowieża Forest as *Ramularia geranii* (Westendorp) Fuckel var. *geranii* is referred to as *P. minutissima* after revision of herbarium material by Wołczańska [39]. The material has not been available to be examined; therefore, the present description has been based on available literature.

Passalora montana **(Speg.) U. Braun & Crous**

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 280. 2003.

= *Ramularia montana* Speg., Decad. Mycol. Ital., No. 104. 1880 and Michelia 2: 169. 1880.
≡ *Cercospora montana* (Speg.) Sacc., Fungi Ital. Del., Tab. 968. 1881.
≡ *Phaeoramularia montana* (Speg.) Y.L. Guo & X.J. Liu, Fungi & Lichens of Shennongijian: 362. 1989.
= *Fusidium punctiforme* Schltdl., Bot. Z. 10: 617. 1857.
≡ *Ramularia punctiformis* (Schltdl.) Höhn., Ann. Mycol. 6: 214. 1908 (nom. illeg.), homonym of *R. punctiformis* Sacc., 1904.
≡ *Phaeoramularia punctiformis* (Schltdl.) U. Braun, Nova Hedwigia 55: 215. 1992.
= *Cercospora epilobii* W.G. Schneid., in Thüm., Fungi austr., No. 532. 1872 (nom. nud.).
≡ *Ramularia epilobii* (W.G. Schneid.) Trail, Scott Nat. 10: 74. 1889.
= *Cercospora therryana* Roum., Rev. Mycol. 4: 219. 1882.
= *Cercospora epilobii* W.G. Schneid. f. *epilobii-montani* Thüm., Mycoth. univ. 2191. 1883 (nom. nud.).
= *Ramularia epilobii* Thüm., in Magnus, Jahresb. Naturf. Ges. Graubündens, N.F. 34:68. 1891 (nom. nud.)
= *Ramularia epilobii* Allesch., Ber. Bayr. Bot. Ges. 2: 18. 1892 (nom. illeg.) homonym of *R. epilobii* (W.G. Schneid.) Trail, 1889.
= *Ramularia epilobii-palustris* Allesch., Fungi bavar. 293. 1892.
= *Ramularia epilobii* P. Karst., Hedwigia 31: 296. 1892 (nom. illeg.). homonym of *R. epilobii* (W.G. Schneid.) Trail, 1889.
≡ *Ramularia karstenii* Sacc., Syll. Fung. 11: 603. 1895.
= *Ramularia enecans* Magnus, Hedwigia 34: 102. 1895.
= *Ramularia cercosporioides* Ellis & Everh., Proc. Acad. Philadelphia 47: 437. 1895.
= *Ramularia epilobii-parviflori* Lindr., Acta Soc. Fauna Fl. Fenn. 23: 24. 1902.
= *Ramularia hornemannii* Lindroth, l.c.
= *Ramularia epilobii-rosei* Lindau, in Rabenh., Krypt.-Fl. Deutschl., Pilze, VIII: 474. 1906.
= *Ramularia karakulinii* N. Golovina, Novosti Sist. Nizsh. Rast. 1964: 213. 1964 (nom. superfl.).
= *Ramularia karakulinii* var. *chamaenerii* Vimba, Griby roda *Ramularia* Sacc. v Latvijskoj SSR: 86. 1970 (nom. inval.).
= *Ramularia karakulinii* var. *epilobii* Vimba, l.c. (nom. inval.).

Exs. on *Epilobium montanum*: Săvulescu, Herb. Mycol. Roman., Fasc. 9, No. 419 (KRA-F 1931-90); Sydow, Mycoth. Germ. 2592 (KRA-F 1929-72); Thümen, Mycoth. Univ. 2191 (WA 7180).

Description. Leaf spots amphigenous, scattered or confluent, subcircular, elongated or angular-irregular, often vein-limited, 0.5–8 mm diam., at first pale greenish or yellowish

ocharaceous, later brown or greyish, margin indefinite or spots surrounded by a purplish violet or reddish brown border. Caespituli amphigenous, punctiform, greyish white or brown. Conidiophores in dense or divergent fascicles, hyaline or pale olivaceous-brown, subcylindrical, straight or geniculate-sinuous, aseptate or sparingly septate, 10–55 × 2.5–6 µm. Conidia catenate, hyaline or yellowish, elipsoid-ovoid, cylindrical-fusiform or cylindrical, aseptate or usually 1–2-septate, smooth or rough, 10–40(–50) × (2.5–)3–6.5 µm (Fig. 44).

Hosts. On Onagraceae. ***Epilobium angustifolium*** L.: E3 – surroundings of Skierniewice [73]; E5 – Durne Bagno Reserve, Czarne Sosnowickie Lake, Piaseczno Lake [81]; F3 – Białowieża National Park [52]; Białowieża, Aug. 1922, leg. W. Siemaszko (WAUF); H1 – Zakopane – Księży Las distr. [174]; Tatra National Park – between Trzydniowiański Wierch Mt and Chochołowska Valley, 12 Jul. 2006, leg. U. Świderska-Burek, A. Wołczańska (LBL); Tatra National Park – between Przysłop Miętusi pass and Małołączniak Mt, 4 Aug. 2006, leg. U. Świderska-Burek, A. Wołczańska (LBL); Tatra National Park – Roztoka Valley, 10

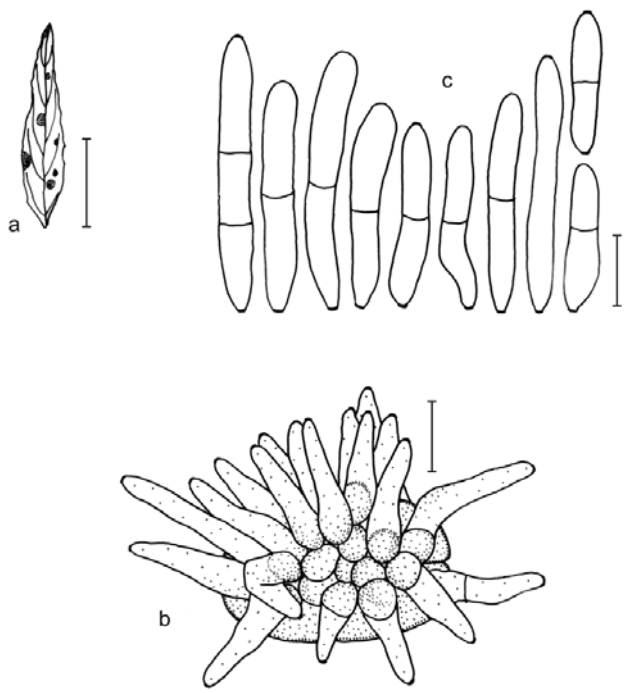

Fig. 44 *Passalora montana* on *Epilobium palustre* (LBL, Świerszczów Reserve, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Jul. 2006, leg. U. Świderska-Burek, A. Wołczańska (LBL); Canada – Marathon, Thunder Bay distr. (Ontario), 12 Jul. 1966, leg. J.A. Parmelee, DAOM 114415 (WA 15243); ***Epilobium collinum*** C.C. Gmel: C4 – Parkowe Reserve, Twardowski Gate [85]; ***Epilobium hirsutum*** L.: E3 – Skierniewice [73]; ***Epilobium montanum*** L.: E4 – Kazimierz Dolny [150]; F3 – Białowieża National Park [51,52]; G1 – Kudowa [158]; H1 – Małe Pieniny Mts – Skalskie Reserve [45]; Tatra National Park – Biała Valley [175]; Finland – Fennia, Nylandia, Kerava, Alikerava, Havjuka, 22 Aug. 1957, leg. H. Roivainen (WA 20483); ***Epilobium palustre*** L.: E5 – Durne Bagno Reserve, Długie Lake, Brudno Lake, Świerszczów Reserve, 31 Aug. 1977, leg. W. Mułenko (LBL) [81]; ***Epilobium parviflorum*** Schreb.: A1 – Słowiński National Park – Dołgie Małe Lake [53,159]; ***Epilobium roseum*** (Schreb.) Schreb.: A1 – Słowiński National Park – Czołpino [53]; E3 – Skierniewice [73]; C4 – Ojców National Park – Pieskowa Skała on the Prądnik Valley [42]; Ojców National Park [43]; H1 – Mszana Dolna [197]; Pieniny Mts [46]; Zakopane – Pusty Bór [174].

Geographical distribution. Azores, Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Iceland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia (European and Asian part), Slovakia, Sweden, Switzerland, Ukraine, former Yugoslavia; Armenia, Azerbaijan, Canada, China, Georgia, Japan, Kazakhstan, Kyrgyzstan, Turkmenistan, USA.

Passalora murina (Ellis & Kellerm.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 285. 2003.

≡ *Cercospora murina* Ellis & Kellerm., Bull. Torrey Bot. Club 11: 122. 1884.
≡ *Mycovellosiella murina* (Ellis & Kellerm.) Deighton, Mycol. Pap. 144: 23. 1979.
= *Cercospora ii* Trail, Scott. Naturalist (Perth) 10: 75. 1889.
= *Cercospora lilacina* Bres., Hedwigia 31:41. 1892.

Description. Leaf spots indistinct or distinct, circular or irregular, 1–10 mm diam., greyish brown or pale greenish, usually with a wide yellowish halo. Caespituli hypophyllous, effuse, olivaceous; stromata lacking. Conidiophores growing as lateral branches of primary mycelium hyphae, usually pale olivaceous, septate, straight, branched, 50–140 × 3–5 µm. Conidia solitary, very pale olivaceous, cylindrical or clavate, straight or slightly curved (subfalcate), 1–9-septate, obconic base, bluntly rounded apex, 25–105 × 4–5.5 µm (Fig. 45).

Hosts. On *Viola* spp., Violaceae. ***Viola epipsila*** Ledeb.: F3 – Białowieża National Park, 23 Jul. 1988, leg. W. Mułenko (LBL) [51,52]; ***Viola palustris*** L.: C8 – Zaklików [133]; ***Viola reichenbachiana*** Jord. ex Boreau: E5 – Moszne Lake, as *Ramularia lactea* (Desm.) Sacc. [81].

Geographical distribution. Germany, Hebrides, Netherlands, Poland, Russia, Sweden, United Kingdom; China, USA.

Notes. Ruszkiewicz [180] incorrectly cited the record of Jankowska-Barbacka [161] on *Viola sylvatica*. On this host, only *Cercospora violae-sylvaticae* has been reported, which is not a synonym of *Passalora murina*.

The material of Ruszkiewicz-Michalska [54] on *Viola rupestris* from Brodło Mt has been referred to as *Cercospora violae* Sacc. after revision.

The record of Mułenko [81] published as *Ramularia lactea* (Desm.) Sacc. on *Viola reichenbachiana* Jord. ex Boreau from Moszne Lake has been also included here [39].

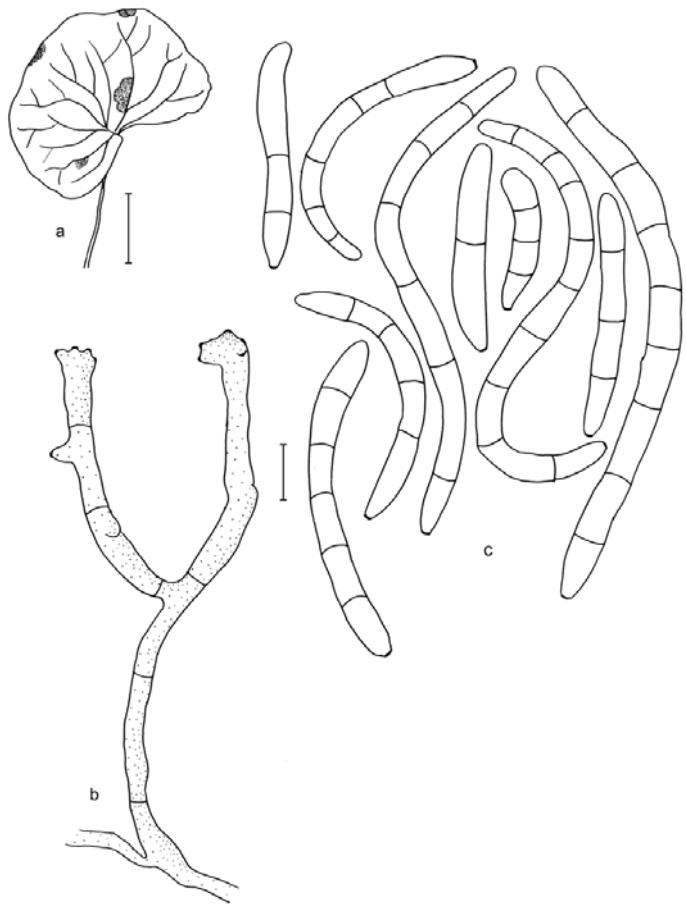

Fig. 45 *Passalora murina* on *Viola epipsila* (LBL, Białowieża National Park, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores formed from external mycelium. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 μm.

Passalora pastinacae **(Sacc.) U. Braun**

Nova Hedwigia 55: 213. 1992.

≡ *Cercospora apii* var. *pastinacae* Sacc., Syll. Fung. 4: 442. 1886.
≡ *Cercospora pastinacae* (Sacc.) Peck, Bull. New York State Mus. 157: 45. 1912.
= *Cercospora geniculata* Ellis, in herb. B.

Description. Leaf spots angular, vein-limited, 1–3 mm diam., mostly yellowish green or dark brown. Caespituli mostly hypophyllous. Conidiophores solitary or 2–11 in fascicles, pale olivaceous, olivaceous-brown or yellowish brown, usually 1–2 geniculate, septate, not branched, 12–48 × 5–7 µm. Conidia solitary, subhyaline, cylindrical to obclavate, straight or slightly curved, 1–5-septate, 25–75 × 4–7 µm (Fig. 3g, Fig. 46).

Hosts. On *Pastinaca sativa*, Apiaceae. ***Pastinaca sativa*** L.: C5 – Skorocice Reserve n. Busko Zdrój, 14 Sep. 1979, leg. J. Sałata (LBL M-12171) [92].

Geographical distribution. Austria, Italy, Poland, Romania, Russia; Australia, Canada, India, South Africa, USA, Zimbabwe.

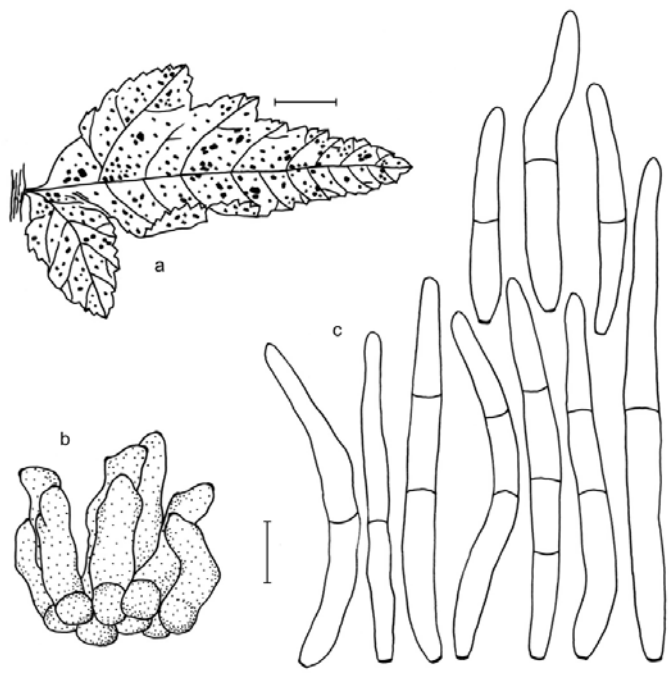

Fig. 46 *Passalora pastinacae* on *Pastinaca sativa* (LBL M-12171). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Passalora pteridis **(Siemaszko) U. Braun & Crous***

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 340. 2003.

≡ *Cercospora pteridis* Siemaszko, Arch. Nauk Biol. Towarz. Nauk. Warszaw, 1: 48. 1923.
≡ *Pseudocercospora pteridis* (Siemaszko) Y.L. Guo & X.J. Liu, Acta Mycol. Sin. 11: 298. 1992 (misapplied).
≡ *Mycovellosiella pteridis* (Siemaszko) U. Braun, Trudy Bot. Inst. im. V.L. Komarova 20: 83. 1997.
= *Cercospora pteridicola* Gonz. Frag., Mem. Real Acad. Ci. Exact. Madrid, Ser. 2, 6: 227. 1927.

Description. Leaf spots subcircular, 3–6 mm diam., yellowish brown to grey, with a wide, dark red border. Caespituli hypophyllous; stromata dark brown, filling the stomatal openings; fascicles dense, spreading. Conidiophores medium dark brown near the base, pale brown above, uniform in diameter, plainly 3–7-septate, not branched, rarely geniculate, straight to mildly undulate, conic to conically truncate tip, 30–80 × 3–5 µm. Conidia solitary, subhyaline to very pale olivaceous, obclavate, indistinctly pluriseptate, curved, base obconically truncate, tip subacute, 40–210 × 2–4 µm, almost never 5 µm in width [13].

Hosts. On *Pteridium aquilinum*, Dennstaedtiaceae.

Geographical distribution. Spain, China, Colombia, Georgia, Japan, Myanmar, Russia; USA.

Notes. The fungus has been reported by Adamska [156] as *Cercospora pteridis* Siem. (SZPA 3040) on *Pteridium* spp. (Pteridophyta, Dennstaedtiaceae). After revision, the host species was identified as *Dryopteris carthusiana* (Vill.) H.P. Fuchs on which *Cercospora camptosori* Davis or *C. dryopteridis* Y.L. Guo can occur [11], but the available material did not contain any conidia and conidiophores. The occurrence of this species in Poland on *Pteridium aquilinum* (L.) Kuhn seems to be possible.

Passalora punctum **(Lacroix) S. Petzoldt (*puncta*)**

in von Arx, Plant pathogenic fungi: 288. 1987.

≡ *Azosma punctum* Lacroix, in Desm., Pl. Cryptog. France, Ed. 2, Fasc. XVI, No. 757. 1860.
≡ *Cercosporidium punctum* (Lacroix) Deighton, Mycol. Pap. 112: 48. 1967.
≡ *Passalora punctum* (Lacroix) Poonam Srivast. (*puncta*), J. Living World 1: 117. 1994 (comb. superfl.).
= *Cercospora apii* var. *petroselini* Sacc., Syll. Fung. 4: 442. 1886.
= *Fusicladium depressum* f. *petroselini* Sacc., Rev. Mycol. 19: 53. 1897.
= *Cercospora foeniculi* Magnus, Hedwigia 50: 185. 1911.
= *Marssonina kirchneri* Hegyi, Magyar Bot. Lapok 10: 317. 1911.
≡ *Passalora kirchneri* (Hegyi) Petr., Ann. Mycol. 39: 295. 1941.
= *Cercospora petroselini* Sacc., Ann. Mycol. 10: 321. 1912.
= *Cercospora petroselini* f. *melitensis* Ferraris, Flora Italica Cryptogama, I Fungi, Hyphales: 894. 1912.
= *Cercospora* (*Cercosporina*) *anethi* Sacc., Nuovo Giorn. Bot. Ital., N.S., 23: 219. 1916.
≡ *Cercosporina anethi* (Sacc.) Sacc. ex Trotter in Saccardo, Syll. Fung. 25: 916. 1931.
≡ *Cercosporella anethi* Sacc. apud Brenkle, Mycologia 10: 216. 1918 (nom. nud.).
= *Fusicladium anethi* Nevod., Griby Ross. [Russian fungi] IV, No. 191. 1917.
= *Cercospora apii* var. *foeniculi* Sacc., in Oudem., Enum. Syst. Fung. 4: 242. 1923 (nom nud.).
= *Ramularia foeniculi* Sibilia, Boll. Staz. Patol. Veg. Roma, N.S., 12: 233. 1932.
= *Cercospora depressa* f. *foeniculi* Komirn., Uchen. Zap. Saratovsk. Gosud. Univ. Chernyshevskogo, Ser. Biol. 1952 (nom. inval.).
= *Passalora foeniculi* M. Kamal & S.A. Khan, Biologia (Lahore) 8: 62. 1962.
= *Cercospora depressa* f. *anethi* Dzhanuz., Trudy Vsesojuzn. Inst. Zashch. Rast. 19: 69 (1963) 1964 (nom. inval.).

Teleo.: *Mycosphaerella anethi* (Pers.: Fr,) Petr., Ann. Mycol. 25: 229. 1927.
≡ *Sphaeria anethi* Pers., Syn. meth. fung.: 30. 1801.
≡ *Sphaeria anethi* Pers.: Fr., Syst. mycol. 2: 429. 1823.
= *Mycosphaerella foeniculi* Komirn., Uchen. Zap. Moskovsk. Gosud. Univ. 35: 138. 1952.

Exs. on *Petroselinum crispum*: Thümen, Mycoth. Univ. 483 (WA 6169); Thümen, Mycoth. Univ. 1296, as *Septoria petroselini* (WA 6799).

Description. Spots on leaves, stems and pedicles, usually subcircular on leaves, elliptical on stems, sometimes indistinct, pale brown or yellowish, sometimes dark brown without a distinct margin, 2–5 mm in length and 1–2 mm in width. Caespituli amphigenous, more abundant on the lower surface, dark, punctiform, dense; stromata small, brown. Conidiophores in dense fascicles, pale brown base, pale olivaceous apex, sparingly septate, not branched, straight, geniculate or sinuous, conic apex, (15–)25–80 × 4.5–7 µm. Conidia solitary, pale olivaceous, obclavate or cylindrical, straight or slightly curved, 1–3-septate (usually with 1 septum), 20–68 × 4.5–7.5 µm (Fig. 47).

Hosts. On Apiaceae. ***Anethum graveolens*** L.: E1 – Bydgoszcz, 25 Aug. 1947, leg. H. Mikołajczyk [WA 4028, as *Passalora depressa* (Berk. & Broome) Sacc. [= *Cercospora depressa* (Berk. & Broome) Vassiljevsky]]; Koniczynka n. Toruń, 9 Oct. 1953, leg. J. Mikołajska (WA 23128, as *C. depressa* Vasil.); E3 – Warszawa – Mory distr., 1 Oct. 1930, leg. N.N. (WA 29860, as *C. apii*) [79]; Reguły n. Pruszków, 19 Sep. 1953, leg. H. Zarzycka (WA 018367, as *C. depressa*); E4 – Puławy, 23 Aug. 1947, leg. O. Kędzierska (WA 4129, as *C. depressa*); Dąbrowica n. Lublin, 20 Sep. 2009, leg. U. Świderska-Burek (LBL); ***Petroselinum crispum*** (Mill.) Fuss: B3 – Kutno [79]; E1 – Bydgoszcz, 10 Sep. 1947, leg. H. Mikołajczyk (WA 4030,

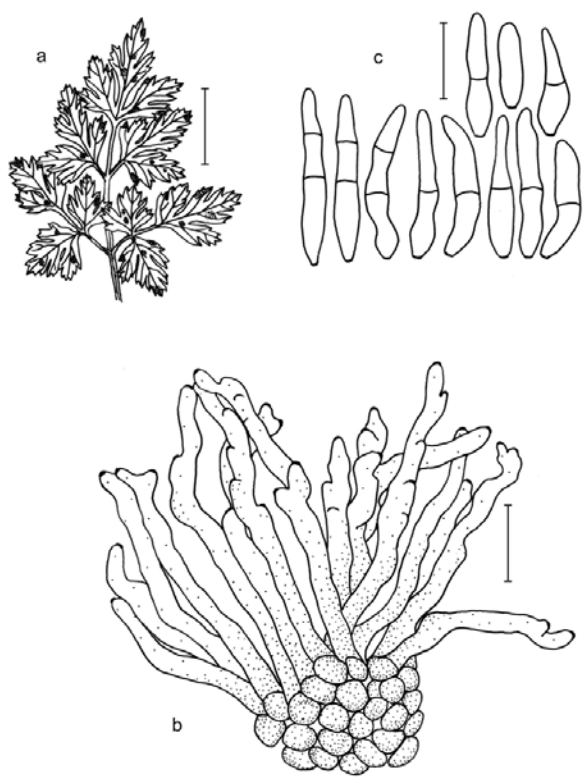

Fig. 47 *Passalora punctum* on *Petroselinum crispum* (WA 29825). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 40 µm.

as *C. depressa*); Bydgoszcz, 17 Sep. 1947, leg. H. Mikołajczyk (WA 4060, as *Septoria petroselini* Desm.); Piotrkówek n. Bydgoszcz, 29 Sep. 1947, leg. H. Mikołajczyk (WA 4029, as *C. depressa*); Koniczynka n. Toruń, 9 Oct. 1953, leg. J. Mikołajska (WA 023087, as *C. depressa*); E2 – Rataje, 15 Sep. 1930 (WAUF); E3 – Ożarów n. Warszawa, 20 Sep. 1946, leg. H. Mikołajczyk (WA 3910, as *C. depressa*), 12 Oct. 1946, leg. H. Mikołajczyk (WA 3941, as *S. petroselini*); Warszawa – Włochy distr., 18 Sep. 1947, leg. O. Kędzierska (WA 4127, as *C. depressa*); Piastów n. Warszawa, 7 Sep. 1947, leg. H. Mikołajczyk (WA 3942, as *S. petroselini*); E4 – Puławy, 25 Sep. 1930, leg. N.N. (WA 29825), 1 Oct. 1947, leg. O. Kędzierska (WA 4134) [79,161]; F3 – Supraśl n. Białystok [79].

Geographical distribution. Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Greece, Italy, Latvia, Lithuania, Malta, Poland, Romania, Russia (European and Asian part), Ukraine; Australia, Azerbaijan, Canary Islands, China, Egypt, Ethiopia, Georgia, India, Iran, Israel, Jamaica, Japan, Kazakhstan, Kenya, Kyrgyzstan, Libya, Morocco, Myanmar, New Zealand, Pakistan, Togo, Uganda, USA.

Passalora rhamni **(Fuckel) U. Braun**

Mycotaxon 55: 233. 1995.

≡ *Cercospora rhamni* Fuckel, Hedwigia 5: 24. 1866.

Teleo.: *Mycosphaerella vogelii* (Syd.) Tomilin, Opredelitel' gribov roda *Mycosphaerella* Johans.: 212. 1979.
≡ *Sphaerella vogelii* Syd., Ann. Mycol. 6: 480. 1908.

Exs. on *Rhamnus cathartica*: Saccardo, Mycoth. Ven. 594 (KRA-F 1875-279); Sydow, Mycoth. Germ. 3593 (KRA-F 1940-186).

Description. Leaf spots circular or elongated, usually at the leaf margin, 2–10 mm in length, brown, without a distinct margin. Caespituli hypophyllous; stromata lacking or dark brown, globular. Conidiophores dark brown, uniform in colour, septate, sometimes geniculate, rarely branched, 10–60 × 4–7 µm. Conidia solitary, usually pale olivaceous, obclavate, subcylindrical or fusiform, straight or slightly curved, 3–8-septate, 42–145 × 4.5–6 µm.

Hosts. On Rhamnaceae. ***Rhamnus cathartica*** L.: H1 – Pieniny National Park – n. Biała Skała [44,45]; Pieniny Mts [46].

Geographical distribution. Austria, Czech Republic, Germany, Great Britain, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Russia, Slovakia, Switzerland, Ukraine; Canada, China, Georgia, Iran, Kazakhstan, USA.

Passalora ribis-rubri **(Săvul. & Sandu) U. Braun**

Trudy Bot. Inst. im. V.L. Komarova: 20: 89. 1997.

≡ *Cercospora ribis-rubri* Săvul. & Sandu, Hedwigia 75: 224. 1934 and Herb. Mycol. Rom., Fasc. XIV, No. 652. 1934.
= ?*Cercospora marginalis* Thüm., Bol. Soc. Adriat. Sci. Nat. Trieste 9: 68. 1885 (nom. dub.).

Exs. on *Ribes rubrum*: Săvulescu, Herb. Mycol. Roman., Fasc. 14, No. 652 (KRA-F 1933-129).

Description. Leaf spots circular or irregular, 1–7 mm diam., pale brown with a darker margin or olivaceous. Caespituli amphigenous, mostly hypophyllous, olivaceous-brown; stromata small, globular, fuliginous. Conidiophores solitary or in dense fascicles, aseptate or sparingly septate, apex pale olivaceous, base pale brown, 10–60 × 3–6 µm. Conidia solitary, pale olivaceous or brownish, cylindrical to obclavate, 1–6-septate, solitary or catenate, (35–)50–90 × 3–5 µm (Fig. 48).

Hosts. On *Ribes* spp., Grossulariaceae. ***Ribes*** spp.: E2 – Chojnowo n. Przasnysz [143,154]; ***Ribes nigrum*** L.: F3 – Białowieża National Park, Jul., Oct. 1989, leg. W. Mułenko (LBL) [50,52]; ***Ribes rubrum*** L.: Ukraine – Kułaczkowce n. Kołomyja, leg. N.N. (WA 29796); ***Ribes uva-crispa*** L.: E2 – Chojnowo n. Przasnysz [143,154].

Geographical distribution. Austria, Poland, Romania, Russia; USA.

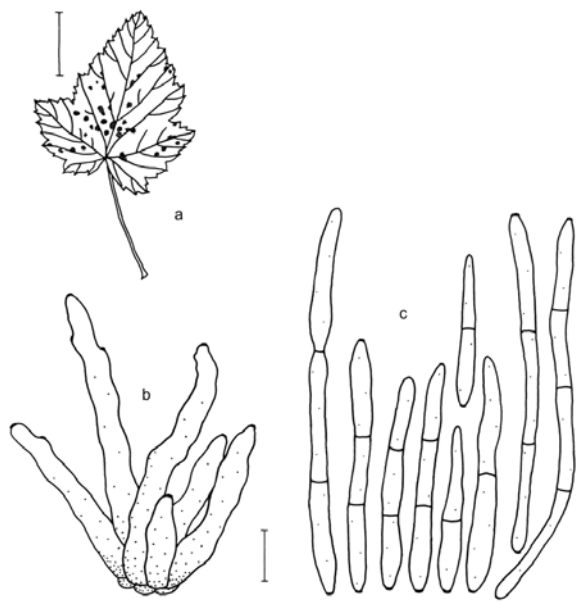

Fig. 48 *Passalora ribis-rubri* on *Ribes nigrum* (LBL, Białowieża National Park, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 10 µm.

Passalora rosae **(Fuckel) U. Braun***

Mycotaxon 55: 234. 1995.

≡ *Exosporium rosae* Fuckel, Jahrb. Nassauischen Vereins Naturk. 23–24: 373. (1869)1870.
≡ *Cercospora rosae* (Fuckel) Höhn., Ann. Mycol. 1: 412. 1903.
= *Cercospora hypophylla* Cavara, Rev. Mycol. 21: 103. 1899.
= *Cercospora rosae-alpinae* C. Massal., Atti Reale Ist. Veneto Sci., Lett. Arti. VIII, 2: 684. 1900.

Exs. on *Rosa* sp. (on *Rosa pumila* et *R. collina*): Thümen, Mycoth. Univ. 90, as *Septoria rosarum* Westend. (WA 5765).

Description. Leaf spots usually along the leaf margin, brown. Caespituli hypophyllous; stromata subglobular, pale brown. Conidiophores in dense fascicles, pale olivaceous-brown, paler at the apex, aseptate or rarely septate, not branched, straight or slightly curved, 10–40 × 2.5–4 µm. Conidia solitary, hyaline or pale olivaceous, usually cylindrical, straight or slightly curved, aseptate or usually 1–5-septate (often with 1 septum), rounded apex, subtruncate base, 15–50 × 3–4.5 µm.

Hosts. On *Rosa* spp., Rosaceae. ***Rosa*** sp.: Italy – Parma, Jul. 1874, leg. G. Passerini (WA 5765, as *Septoria rosarum* on *Rosa pumila* et *R. collina*).

Geographical distribution. Austria, Bulgaria, Cyprus, France, Germany, Italy, Romania, Russia, Switzerland; Angola, Azerbaijan, China, Egypt, India, Iran, Kazakhstan, Moldova, USA.

Notes. This fungus is hitherto not known from Poland, but material from Italy is deposited in a Polish herbarium. *Passalora rosae* is known from many *Rosa* spp. The occurrence of this species on *Rosa* spp. in Poland is very probable.

Passalora rosicola **(Pass.) U. Braun***

Mycotaxon 55: 234. 1995.

≡ *Cercospora rosicola* Pass., in Thümen (*rosaecola*), Herb. mycol. oec., Fasc. VII, No. 333. 1875 (description on label).
= *Cercospora rosigena* Tharp, Mycologia 9: 114. 1917.
= *Cercospora rosicola* var. *undosa* Davis, Trans.Wisconsin Acad. Sci. 20: 405. 1921.
= *Cercospora rosae* J.M. Hook, Proc. Indiana Acad. Sci. 38: 131. 1929 (nom. illeg.), homonym of *C. rosae* (Fuckel) Höhn., 1903.
= *Cercospora rosae-indiananensis* J.M. Hook, Proc. Indiana Acad. Sci. 39: 82. 1930.

Teleo.: *Mycosphaerella rosicola* B.H. Davis, Mycologia 30: 296. 1938.
≡ *Phaeosporella rosicola* (B.H. Davis) Tomilin, Opredelitel' ribov roda *Mycosphaerella* Johans.: 285. 1979.

Exs. on *Rosa* sp. (cult.): Thümen, Mycoth. Univ. 1086 (WA 6605).

Description. Leaf spots circular or irregular, scattered or confluent, single spots 1–4 mm diam., reddish brown, brown or greyish. Caespituli amphigenous, mostly epiphyllous; stromata lacking or composed of several brown cells. Conidiophores 3–15 in fascicles, dark olivaceous-brown, paler towards to apex, septate, sinuous or geniculate, 25–105 × 3–4.5 µm. Conidia solitary, brownish, obclavate, straight or slightly curved, usually 1–4-septate, 27.5–65 × 4–5 µm.

Hosts. On Rosaceae. ***Rosa*** sp. (cult.): Italy: Parma, Aug. 1874, leg. G. Passerini (WA 6605).

Geographical distribution. On different species of *Rosa*, Rosaceae, worldwide.

Notes. *Passalora rosicola* has been reported by Danilkiewicz [83] on *Rosa tomentosa* Sm. from Hanna. After revision, it turned out to be *Septoria rosae* Desm.

This fungus is known from numerous other countries, but material from Italy is deposited in a Polish herbarium. This species has to be expected in Poland on *Rosa* spp.

Passalora scandicearum (Magnus) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 368. 2003.

≡ *Cercospora scandicearum* Magnus, Verh. Bot. Vereins Prov. Brandenburg 35: 68. 1894.
≡ *Ragnhildiana scandicearum* (Magnus) Vassiljevsky, in Vasiljevsky & Karakulin, Fungi imperfecti parasitici. 1. Hyphomycetes: 374. 1937.
≡ *Phaeoramularia scandicearum* (Magnus) U. Braun, Cryptog. Bot. 3: 240. 1993.
= *Cercospora torilidis* Chupp, A monograph of the fungus genus *Cercospora*: 581. 1954.

Exs. on *Torilis japonica*: Rabenhorst-Pazschke, Fungi Eur. Extraeur. Exs. 4193 (WA 2857).

Description. Leaf spots angular or irregular, 2–8 mm diam., scattered or confluent, cover most of the leaflet, brown or almost black. Caespituli hypophyllous; stromata (if present) small, dark brown. Conidiophores solitary or 2–20 in fascicles, pale brown, paler towards the apex, sparingly septate, often geniculate, 22.5–67 × 3–4.5 µm. Conidia catenate, hyaline or pale olivaceous, usually cylindrical, straight or slightly curved, 3–5-septate, 30–75 × 3–5 µm (Fig. 3h).

Hosts. On Apiaceae. ***Chaerophyllum hirsutum*** L.: H1 – Krzyżowa Mt n. Krynica [173]; ***Torilis japonica*** (Houtt.) DC.: Germany – Königstein (Saxony), Aug. 1894, leg. W. Krieger (WA 354, 355).

Geographical distribution. Denmark, Germany, Great Britain, Hungary, Latvia, Poland, Romania, Switzerland, former Yugoslavia; Iran, Japan.

Passalora scariolae Syd.*

Ann. Mycol. 34: 401. 1936

≡ *Cercosporidium scariolae* (Syd.) Deighton, Mycol. Pap. 112: 74. 1967.
≡ *Passalora scariolae* (Syd.) Poonam Srivast., J. Living World 1: 118. 1994 (comb. superfl.).
= *Scolecotrichum lactucae* Munjal & Karpoor, Indian Phytopathol. 16: 91. 1963.

Exs. on *Lactuca serriola*: Sydow, Mycoth. Germ. 2993 (KRA-F 1936-121).

Description. Leaf spots amphigenous, irregular or angular, usually vein-limited, up to 5 mm wide, reddish purple. Caespituli amphigenous, mostly hypophyllous, dark olivaceous. Conidiophores 10–25 in fascicles, dark olivaceous, smooth or usually verruculose, straight or sinuous, often septate, 35–70 × 4.5–6 µm. Conidia solitary, pale olivaceous, obclavate, broadly ellipsoid or subcylindrical, slightly verruculose, straight, 15–25 × 6–9 µm.

Hosts. On *Lactuca* spp., Compositae. ***Lactuca serriola*** L.: Germany – Bavaria, Bergmatting, n. Kelheim, 13 Jun. 1936, 4 Jul. 1936, leg. E. Eichhorn (KRA-F 1936-121).

Geographical distribution. Germany; India, Iran.

Notes. Unknown from Poland, but German material is deposited in a Polish herbarium. The host occurs in the Polish flora; therefore, the occurrence of this species might be possible in Poland.

Passalora squalidula (Peck) U. Braun*

Trudy Bot. Inst. im. V.L. Komarova 20: 95. 1997.

≡ *Cercospora squalidula* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 33: 29. 1880.
≡ *Pseudocercospora squalidula* (Peck) Y.L. Guo & X.J. Liu, Fungi and Lichenes of Shennongjia: 366. 1989.

Exs. on *Clematis virginiana*: Rabenhorst-Winter, Fungi Eur. Exs. 3288 (WA 356).

Description. Leaf spots circular or subcircular, 0.5–5 mm diam., centre pale brown or dingy grey, brown margin. Caespituli amphigenous. Conidiophores brown, septate, not branched, 1–2 times geniculate, 17.5–40 × 3–5 µm. Conidia solitary, hyaline or pale olivaceous, obclavate to cylindrical, straight or slightly curved, 1–6 indistinctly septate, obtuse apex, 25–95 × 4–5 µm.

Hosts. On *Clematis* spp., Ranunculaceae. ***Clematis virginiana*** L.: USA – Deborah (Iowa), Jul. 1884, leg. E.W.D. Holway (WA 356).

Geographical distribution. Russia, Ukraine; Canada, China, Etiopia, Georgia, India, USA.

Notes. This fungus is not known from Poland, but material is deposited in a Polish herbarium. The host species do not naturally occur in the Polish flora, but six cultivated members of the *Clematis*, viz. *C. alpina* (L.) Mill., *C. recta* L., *C. tangutica* (Maxim.) Korsh., *C. vitalba* L., *C. viticella* L., and *C.* ×*jackmanii* T. Moore, can be found in Poland. This fungus was recorded on *Clematis vitalba* L., which naturally grows in Poland. Therefore, it might be possible to find this species in Poland on *Clematis* spp.

Passalora teucrii (Schwein.) U. Braun*

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 400. 2003.

≡ *Caeoma* (*Uredo*) *teucrii* Schwein., Trans. Amer. Philos. Soc., Ser. 2, 4: 291. 1832.
≡ *Cercospora teucrii* (Schwein.) Arthur & Bisby, Proc. Philos. Soc. 57: 201. 1918 (nom. illeg.), homonym of *C. teucrii* Ellis & Kellerm., 1884.
≡ *Mycovellosiella teucrii* (Schwein.) Deighton, Mycol. Pap. 137: 28. 1974.
= *Cercospora racemosa* Ellis & G. Martin, Amer. Naturalist 19: 76. 1885, also J. Mycol. 1:55. 1885.

Exs. on *Teucrium canadense*: Rbenhorst-Winter-Pazschke, Fungi Eur. Exs. 4097 (WA 28587, 28612).

Description. Leaf spots circular, 1–2.5 mm diam., centre grey or whitish, dark brown margin. Caespituli amphigenous; stromata composed of several dark brown cells. Conidiophores in dense fascicles, yellowish brown, sparingly septate, not branched, straight or 1–3 times geniculate, 10–21 × 4.5–5 µm. Conidia solitary, hyaline or pale olivaceous, acicular, straight or slightly curved, 1–6 indistinctly septate, 25–57.5 × 3.5–5.5 µm.

Hosts. On Lamiaceae. ***Teucrium canadense*** L.: USA – Lodge, Piatt (Illinois), 9 Aug. 1886, leg. A.B. Seymour (WA 28587, 28612).

Geographical distribution. Russia; China, India, USA.

Notes. This fungus has not yet been collected in Poland, but North American material is deposited in a Polish herbarium. The host species concerned does not occur naturally in the Polish flora, but five other species of *Teucrium* are distributed in Poland. Therefore, it might be possible to find this species on *Teucrium* spp. in Poland.

Passalora vexans **(C. Massal.) U. Braun & Crous**

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 420. 2003.

≡ *Cercospora vexans* C. Massal., Ann. Mycol. 4: 494. 1906.
≡ *Cercosporina vexans* (C. Massal.) Moesz, Magyar Biol. Kutatóint. Munkái 3: 115. 1930.
≡ *Phaeoramularia vexans* (C. Massal.) Y.L. Guo, Mycosystema 8: 93. 1995.

Description. Leaf spots circular or angular, 0.5–15 mm diam., uniformly brown or brown with a whitish centre, sometimes with a red margin. Caespituli amphigenous; stromata small or well developed, almost black. Conidiophores 25–130 × 3.5–5 µm, dark brown, paler and attenuated towards the apex, pluriseptate, not branched, straight or slightly geniculate. Conidia catenate, 15–40 × 1.5–3 µm, hyaline or pale olivaceous, cylindrical or obclavate, straight or slightly curved, 1–5-septate, rounded base, obtuse apex [13].

Hosts. On *Fragaria* spp., Rosaceae. ***Fragaria vesca*** L.: A3 – Przelewice n. Szczecin [125,132,201]; E3 – Zwierzyniec n. Skierniewice [73].

Geographical distribution. Italy, Hungary, Poland, Russia; China, Georgia, Guinea, Indonesia, Malawi, Malaysia, Papua New Guinea, Togo, USA, Venezuela.

Notes. Madej [125] reports *Cercospora fragariae* Lobik as a synonym of *Cercospora vexans*. Crous and Braun [11] classified *C. fragariae* as a separate species (nom. dub.).

7.3. *Pseudocercospora* Speg.

Anales Mus. Nac. Hist. Nat. Buenos Aires 20: 438. 1910, emend. Deighton. 1976.

= *Stigmina* Sacc., Michelia 2: 22. 1880 (nom. rej.).
= *Phaeoisariopsis* Ferraris, Ann. Mycol. 7: 280. 1909 (nom. rej.).
= *Cercosporiopsis* Miura, Flora of Manchuria and East Mongolia, 3, Cryptogams: 527. 1928 (nom. illeg.).
= *Septoriopsis* F. Stevens & Dalbey, Mycologia 11: 4. 1918 (nom. illeg.).
= *Cercoseptoria* Petr., Ann. Mycol. 23: 69. 1925.
= *Ancylospora* Sawada, Rep. Govt. Agric. Res. Inst. Taiwan 87: 78. 1944 (nom. illeg.).
= *Helicomina* L.S. O1ive, Mycologia 40: 17. 1948.
= *Macraea* Subram., Proc. Proc 26: 366. 1956. Indian acad. Sci, Section B, Biol. Sci., 36: 164. "1952" 1953 (nom. illeg.).
= *Prathigada* Subram., in Subramanian & Ramakrishnan, J. Madras Univ., B, 26: 366. 1956.

= *Cercocladospora* G.P. Agarwal & S.M. Singh, Proc. Natl. Acad. Sci. India, B, 42: 439. "1972" 1974.
= *Cercostigmina* U. Braun, Cryptog. Bot. 4: 107. 1993.
= *Pseudophaeoramularia* U. Braun, Trudy Bot. Inst. im. V.L. Komarova 20: 18. 1997.
= *Paracercospora* p.p.

Type species: *Pseudocercospora vitis* (Lév.) Speg.

Description. Asexual holomorphs, asexual morphs or asexual morphs with mycosphaerella-like sexual morphs; Mycosphaerellaceae. Usually phytopathogenic, causing distinct leaf and fruit spots, occasionally symptomless. Mycelium internal and/or external; hyphae branched, septate, hyaline, olivaceous or olivaceous-brown, mostly smooth. Stromata lacking or well-developed, pigmented, substomatal or intraepidermal.

Conidiophores in dense to divergent fascicles, arising from internal hyphae or stromata, emerging through stomata or erumpent, or conidiophores solitary, arising from superficial hyphae, lateral or terminal, sometimes forming sporodochial conidiomata or synnemata, emerging through stomata, straight, cylindrical to filiform, aseptate to pluriseptate, subhyaline to brown, smooth to somewhat rough-walled; conidiogenous loci usually inconspicuous, unthickened or almost so, neither darkened nor refractive, rarely subconspicuous by being more rigid, denticle-like or somewhat refractive, but not darkened or only very slightly thickened and darked around the ultimate rim (paracercosporoid).

Conidia formed singly or rarely catenate, acicular, filiform, cylindrical, obclavate, usually plurisepate, rarely amero- to phragmosporous, hyaline or pigmented (pale olivaceous, olivaceous-brown or brown), smooth to faintly verruculose, hila unthickened or almost so, planate.

Keys to the *Pseudocercospora* species

Spermatophyta, Angiospermae

Adoxaceae
1 Conidiophores aseptate, 3–5.5 µm wide; conidia obclavate or cylindrical, 3.5–5.5 µm wide ..... ***Ps. opuli***
1* Conidiophores septate, 2–3 µm wide; conidia usually obclavate, 2–3 µm wide ..... ***Ps. viburnigena***

Anacardiaceae
A single species ..... ***Ps. rhoina***

Convolvulaceae
A single species ..... ***Ps. timorensis***

Ericaceae
A single species ..... ***Ps. handelii***

Leguminosae
A single species ..... ***Ps. griseola***

Moraceae

A single species ..... ***Ps. pulvinulata***

Pinaceae

A single species ..... ***Ps. pini-densiflorae***

Rhamnaceae

A single species ..... ***Ps. bacilligera***

Rosaceae

1 Conidia 5–7.5 µm wide; conidiophores to 135 µm long; on *Prunus* ..... ***Ps. graphioides***
1* Conidia narrower, 2–4 µm wide; conidiophores shorter **2**
2 Conidia 25–45 µm long, septa weakly visible; on *Rosa* ..... ***Ps. puderi***
2* Conidia longer, septa distinct **3**
3 Conidia usually not longer than 75 µm long and 4 µm wide **4**
3* Conidia to 150 µm long, 1–10-septate; conidiophores 25–100 × 3–6 µm ..... ***Ps. laxipes***
4 Conidia 1–6-septate; conidiophores 10–30 × 2–3.5 µm; on *Geum* ..... ***Ps. geicola***
4* Conidia 3–11-septate; conidiophores 20–40 × 2.5–4 µm; on *Rubus* ..... ***Ps. rubi***

Rutaceae

A single species ..... ***Ps. angolensis***

Vitaceae

A single species ..... ***Ps. vitis***

Pseudocercospora angolensis (T. Carvalho & O. Mendes) Crous & U. Braun*

Sydowia 55: 301. 2003.

≡ *Cercospora angolensis* T. Carvalho & O. Mendes, Bol. Soc. Brot. 27: 201. 1953.
≡ *Phaeoramularia angolensis* (T. Carvalho & O. Mendes) P.M. Kirk, Mycopathologia 94: 177. 1986.
≡ *Pseudophaeoramularia angolensis* (T. Carvalho & O. Mendes) U. Braun, Cryptog. Mycol. 20: 171. 1999.

Description. Leaf spots amphigenous, mainly hypophyllous, 4–10 mm diam., pale brown to brown, blackish brown when sporulation is dense, surrounded by a dark brown margin and a yellow halo, the centre often becoming detached resulting in a shot-hole spot. Conidiophores solitary, in fascicles, or forming loose synnemata, arising from a usually large stroma 30–60 µm, simple, septate, smooth, pale brown to brown, (60–)120–240 × 4.5–7 µm. Conidia solitary or catenate, borne in simple or branched chains of 2–4 conidia, cylindrical to obclavate, rounded at the apex, truncate at the base, straight or slightly flexuous to more or less curved, smooth, hyaline to very pale-brown, (1–)3–4(–6)-septate, 24–79 × 4–5(–6.5) µm, hilum inconspicuous or slightly thickened [202–204].

Hosts. On *Citrus* spp., Rutaceae.

Geographical distribution. Angola, Burundi, Cameroon, Central African Republic, Comoros, Congo, Ethiopia, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Mozambique, Nigeria, Sierra Leone, Tanzania, Togo, Uganda, USA, Yemen, Zambia, Zimbabwe.

Notes. This fungus has not been recorded from Poland, but it is a quarantine species mentioned in the Regulation of the Minister of Agriculture and Rural Development of 21 February 2008. This information and a diagnosis will be helpful to Polish plant protection services to identify potential collections of this fungus.

Pseudocercospora bacilligera (Berk. & Broome) X.J. Liu & Y.L. Guo*

Mycosystema 2: 229. 1989.

≡ *Fusisporium bacilligera* Berk. & Broome, Ann. Mag. Nat. Hist. II, 7: 176. 1851.
≡ *Cercospora bacilligera* (Berk. & Broome) Fresen., Beitr. Mykol. 3: 91, 1863.
≡ *Fusarium bacilligerum* (Berk. & Broome) Sacc., Syll. Fung. 4: 711. 1886.
= *Cercospora aeruginosa* Cooke, Hedwigia 17: 39. 1878.

Exs. on *Rhamnus alaternus*: Rabenhorst, Fungi Eur. Exs. 177 (WRSL).

Description. Leaf spots amphigenous, subcircular, 1–3 mm diam., often confluent, centre greyish brown or almost black, dark reddish brown margin. Caespituli amphigenous. Conidiophores usually in dense fascicles, pale olivaceous or olivaceous-brown, uniform in colour, not branched, straight or curved, conic apex, aseptate or usually with 1 septum, 12.5–30 × 2.5–4 µm. Conidia solitary, pale olivaceous, cylindrical to obclavate, straight or curved, 3–7-septate, 25–60 × 2.5–3 µm.

Hosts. On *Rhamnus* spp., Rhamnaceae. ***Rhamnus alaternus*** L.: Great Britain – Spye Park (Wiltshire), leg. C.E. Broome (WRSL).

Geographical distribution. Great Britain; China, Taiwan, USA.

Notes. The fungus has been collected outside Poland but a specimens is deposited in a Polish herbarium. The host species cited above does not occur naturally in the Polish flora. In Poland, *Rhamnus carthartica* is distributed, but untill now *Pseudocercospora bacilligera* has not been reported on this potential host species.

Pseudocercospora geicola U. Braun

Nova Hedwigia 53: 294. 1991.

Leaf spots amphigenous, scattered or confluent, subcircular or irregular, 1.5–8 mm diam., greyish brown, sometimes centre greyish white with a dark purple-red margin or with a yellowish halo on the upper surface, usually greyish brown on the lower surface. Caespituli amphigenous; stromata large, brown, usually 20–60 µm diam. Conidiophores 20–50 in dense fascicles, arising from substomatal stromata, and erumpent through the cuticle, olivaceous-brown, paler towards the apex, irregular in width, usually straight, not branched, aseptate, 10–30 × 2–3.5 µm; conidial scars inconspicuous. Conidia solitary, pale olivaceous or olivaceous-brown, subcylindrical or acicular-filiform, straight or slightly curved, 1–6-septate, sometimes slightly attenuated at the apex, not constricted at the septa, obtuse apex, truncate base, 10–70 × 2–4 µm; hila unthickened, not darkened [13,31,96].

Hosts. On *Geum* spp., Rosaceae. ***Geum montanum*** L.: H1 – Tatra National Park – Rakoń Mt, as *Ramularia gei* (A.G. Ellisson) Lindr. [41,170]; ***Geum urbanum*** L.: A1 – Słowiński National Park [156].

Geographical distribution. Austria, Denmark, France, Poland, Sweden; China, Georgia, Kazakhstan, Korea, New Zealand, Asian part of Russia, USA.

Notes. This species was reported as *Ramularia gei* on *Geum montanum* from the Tatra Mts [41,170] and has been reallocated here after revision of Wołczańska [39]. The material has not been re-examined; therefore, the diagnosis has been based on available literature.

Pseudocercospora graphioides **U. Braun***

Bibl. Lichenol. 86: 83. 2003.

≡ *Cercospora graphioides* Ellis, North American Fungi, Cent. 7, No. 646. 1881 (nom. nud.).
≡ *Cercospora graphioides* Ellis ex Chupp, A monograph of the fungus genus *Cercospora*: 478. 1954 (nom. inval.).

Description. Leaf spots amphigenous, mostly circular, 1–10 mm diam., brown or reddish brown. Caespituli amphigenous; stromata dark reddish brown to almost black, globular. Conidiophores mostly in dense fascicles or synnemata, olivaceous-brown, not branched, indistinctly pluriseptate, slightly undulate or mildly geniculate, apex often slightly paler, 30–135 × 4.5–6 µm. Conidia solitary, pale olivaceous-brown, obclavate, 3–8-septate, straight to curved, 32.5–90 × 5–7.5 µm.

Hosts. On Rosaceae. ***Prunus serotina*** Ehrh.: Canada – Redmond's Bog, London (Ontario), 19 Sep. 1908, leg. J. Dearness (DAOM 129887; WA 18118).

Geographical distribution. Canada, Kenya, USA.

Notes. This fungus was collected in Canada, but material is deposited in a Polish herbarium. The host species occurs in Poland as an invasive species almost throughout the country. Therefore, it is possible to find this fungus on *Prunus* s. l. in Poland.

Pseudocercospora griseola **(Sacc.) Crous & U. Braun f.** ***griseola***

in Crous, Liebenberg, Braun & Groenewald, Stud. Mycol. 55: 168. 2006.

≡ *Isariopsis griseola* Sacc., Michelia 1(2): 273. 1878.
≡ *Phaeoisariopsis griseola* (Sacc.) Ferraris, Ann. Mycol. 7: 273. 1909.
≡ *Lindauomyces griseolus* (Sacc.) Gonz. Frag. (as "*griseola*"), Mem. R. Acad. Ci. Exact. Madrid, Ser. 2, 6: 339. 1927.
≡ *Phaeoisaria griseola* (Sacc.) Sacc., Sylloge Fungorum 25: 942. 1931.
≡ *Cercospora griseola* (Sacc.) Ragunathan & K. Ramakr., J. Madras Univ. 35–36: 11. (1965–1966)1968.
= *Graphium laxum* Ellis, Bull. Torrey Bot. Club 8: 64. 1881.
≡ *Isariopsis laxa* (Ellis) Sacc., Syll. Fung. 4: 631. 1886.
≡ *Phaeoisariopsis laxa* (Ellis) S.C. Jong & E.F. Morris, Mycopathol. Mycol. Appl. 34: 269. 1968.
= *Cercospora solimanii* Speg. (*solimani*), Anales Soc. Ci. Argent. 16: 167. 1883.

= *Cercospora solimanii* Speg., Anales de la Sociedad Científica Argentina 22(4): 214. 1886.
= *Cercospora columnaris* Ellis & Everh. (as "*columnare*"), Proc. Acad. Nat. Sci. Philadelphia 46: 380. 1894.
≡ *Pseudocercospora columnaris* (Ellis & Everh.) J.M. Yen, in Yen & Lim, Gard. Bull., Singapore 33: 172. 1980.
= *Arthrobotryum puttemansii* Henn., Hedwigia 41: 309. 1902.
= *Cercospora stuhlmannii* Henn., Bot. Jahrb. Syst. 33: 40. 1902.

Description. Leaf spots amphigenous, angular or irregular, rarely almost subcircular-elliptical, usually vein-limited, 1–8 mm wide, sometimes confluent, pale olivaceous, olivaceous-brown or brown, margin delimited by veins or surrounded by a narrow, dark brown border. Caespituli amphigenous, mostly hypophyllous, usually scattered, ocassionally dense, punctiform, dark brown or blackish grey; stromata rudimentary or well-developed, subglobose, brown. Conidiophores in dense fascicles, often forming synnemata, pale olivaceous or olivaceous-brown, pluriseptate, 100–250 × 3–5 µm; conidial scars inconspicuous to subconspicuous. Conidia solitary, pale olivaceous or olivaceous-brown, obclavate, subcylindrical, broadly fusiform, short conidia sometimes ellipsoid-ovoid, straight or slightly curved, 1–5-septate, smooth or sometimes rough-walled, obtuse apex, truncate or rounded base, solitary, 35–65 × 5–8 µm; hila unthickened, inconspicuous (Fig. 5g, Fig. 49).

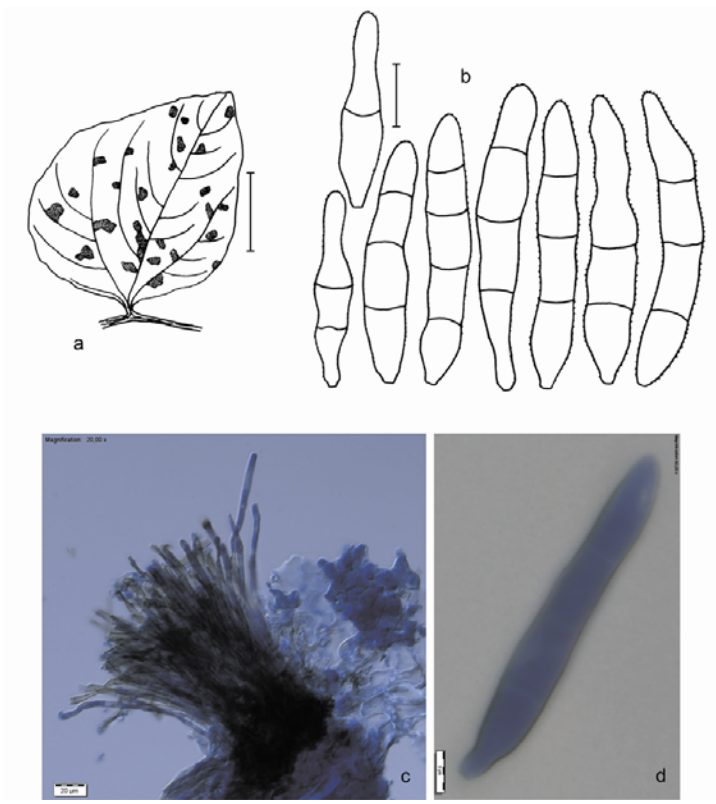

Fig. 49 *Pseudocercospora griseola* f. *griseola* on *Phaseolus vulgaris* (WA 4130). **a** Leaf spots. **b** Conidia. **c** Conidiophores. **d** Conidium. Scale bars: **a** 20 mm; **b** 20 µm; **c** 20 µm; **d** 5 µm.

Hosts. On *Phaseolus* spp., Leguminosae. ***Phaseolus coccineus*** L.: E4 – Puławy [205]; ***Phaseolus vulgaris*** L.: E4 – Puławy – Kępa distr., 6 Sep. 1947, leg. O. Kędzierska (WA 4130) [72,205]; Ukraine – Dublany n. Lwów, 8 Sep. 1909, leg. P. Wiśniewski (KRA-F 1909-285, 1909-286, 1909-287, as *Cercospora olivascens* Sacc.) [72].

Geographical distribution. Distributed on various *Phaseolus* spp., (Leguminosae) species worldwide.

Notes. Crous and Braun [11] accepted the name *Phaeoisariopsis griseola* (Sacc.) Ferrais for this species, but the latest research of Crous et al. [206] indicated the phylogenetic affinity of this fungus to the *Pseudocercospora*. Based on DNA sequence analysis of the ITS, calmodulin (CAL), and actin (ACT) gene regions two groups within *Pseudocercospora griseola* were distinguished, which were recognised as two formae, viz. f. *griseola* and f. *mesoamericana*.

Pseudocercospora handelii **(Bubák) Deighton***

Trans. Brit. Mycol. Soc. 88: 390. 1987.

≡ *Cercospora handelii* Bubák, Ann. Naturhist. Hofmus. Wien 23: 106. 1909.
≡ *Cercoseptoria handelii* (Bubák) Deighton, Mycol. Pap. 140: 166. 1976.
= *Cercospora rhododendri* Ferraris, Fl. Ital. Cryptog. I: Fungi, Hyphales: 895. 1910.
≡ *Cercosporina rhododendri* (Ferraris) Sacc., Syll. Fung. 25: 901. 1931.
= *Cercospora rhododendri* Marchal & Verpl., Bull. Soc. Roy. Belg. 59: 24. 1924 (nom. illeg.), homonym of *C. rhododendri* Ferraris, 1910.

Teleo.: *Mycosphaerella handelii* Crous & U. Braun, in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 211. 2003.

Description. Leaf spots amphigenous, scattered to confluent, subcircular, angular or irregular, 12–10 mm diam., brownish or centre greyish white with a reddish brown margin. Caespituli amphigenous, abundantly epiphyllous, punctiform or effuse; stromata small or well-developed, subglobular, dark brown, 20–60 mm diam. Conidiophores 10–40 in dense fascicles, usually erumpent through the cuticle, pale olivaceous-brown, straight or slightly curved, not branched, aseptate, 15–30 × 2.5–3.5 µm; conidial scars inconspicuous. Conidia solitary, hyaline or pale olivaceous, acicular or filiform, straight or slightly curved, 3–13-septate, 40–105 × 2.5–3 µm; hila unthickened and not darkened.

Hosts. On *Rhododendron* spp., Ericaceae. ***Rhododendron catawbiense*** Michx.: Canada – Ottawa (Ontario), 9 Jul. 1973, leg. K.A. Pirozynski, DAOM 144283 (WA 21887).

Geographical distribution. Belgium, Bulgaria, Czech Republic, Great Britain, Greece, Netherlands, Russia; Australia, Brazil, Canada, China, Japan, Korea, New Zealand, South Africa, USA.

Notes. The revised material, collected in Canada, is deposited in a Polish herbarium. This fungus occurs on *Rhododendron* spp. *Rhododendron luteum* Sweet and *Rhododendron* ×*hybridum* hort. occur in the Polish flora; however, *Pseudocercospora handelii* has not yet been

reported on these plant species. Nevertheless, it is very likely to find this fungus in Poland on the cultivated species of *Rhododendron*.

In Poland, it is a quarantine species mentioned in the Regulation of the Minister of Environment of 29 November 2002.

Pseudocercospora laxipes U. Braun & Crous*

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 245. 2003.

≡ *Cercospora laxipes* Davis, Trans. Wisconsin Akad. Sci. 30: 11. 1937 (nom. inval.).

Description. Leaf spots amphigenous, subcircular to angular-irregular, 2–8 mm diam., brown, reddish brown, often vein-limited. Caespituli hypophyllous, brown, subeffuse; stromata lacking. Conidiophores solitary, arising from superficial hyphae, lateral, erect, straight, subcylindrical to strongly geniculate-sinuous, not branched, pluriseptate, pale to medium brown, tips paler, wall somewhat thickened, smooth, 25–100 × 3–6 µm; conidiogenous loci integrated, terminal, 10–30 µm long, conidiogenous loci inconspicuous or subdenticulate, but wall neither thickened nor darkened. Conidia solitary, obclavate, 1–10-septate, subhyaline to pale olivaceous, smooth, apex subacute or subobtuse, base obconically truncate, 30–150 × 2–5 µm; hilum 1.5–2 µm wide, unthickened, not darkened [11].

Hosts. On *Spiraea* spp., Rosaceae.

Notes. Adamska [156] published *Cercospora laxipes* Davis (currently *Pseudocercospora laxipes*) on *Filipendula ulmaria* (L.) Maxim. from the Słowiński National Park. *Pseudocercospora laxipes* has been noted only on *Spiraea* spp. so far [11,124]. According to Crous and Braun [11], *Pseudocercospora rubi* and a doubtful species – *Cercospora laxipes* f. *filipendulae* Melnik [currently *Pseudocercosporella filipendulae* (Melnik) U. Braun & Melnik [207]] occur on *Filipendula*. Probably, the host or fungus were wrongly identified and need revision.

Pseudocercospora opuli (Höhn.) U. Braun & Crous

in Crous & Braun, CBS Diversity Ser. (Utrecht) 1: 299. 2003.

≡ *Cercospora opuli* Höhn., in Kabát & Bubák, Fungi imp. exs., Fasc. IX, No. 445. 1907.
≡ *Pseudophaeoramularia opuli* (Höhn.) U. Braun, Trudy Bot. Inst. im. V.L. Komarova 20: 19. 1997.
= *Cercospora penicillata* (Ces.) Fresen. var. *opuli* Fuckel, Fungi rhen., No. 118. 1863.
= *Cercospora viburni* Sacc., Mycoth. march., No. 2773. 1889 (nom. nud.).
= *Pseudocercospora viburni* U. Braun, Nova Hedwigia 55: 219. 1992.

Exs. on *Viburnum opulus*: Thümen, Mycoth. Univ. 668 (WA 6429).

Description. Leaf spots subcircular or circular, 1–7 mm diam., centre grey-brown with a brown margin. Caespituli amphigenous. Conidiophores pale olivaceous to pale olivaceous-brown, usually attenuated towards the apex, aseptate (rarely with 1 septum), sometimes slightly geniculate, not branched, 12.5–45 × 3–5.5 µm; conidial scars inconspicuous. Conidia solitary to catenate, hyaline or pale olivaceous, obclavate or cylindrical, usually 3–12-septate, straight or slightly curved, 35–120 × 3.5–5.5 µm; hila inconspicuous, not darkened (Fig. 50).

Hosts. On *Viburnum* spp., Adoxaceae. ***Viburnum opulus*** L.: E3 – Skierniewice, Zwierzyniec n. Skierniewice [73]; E4 – Puławy – Kępa distr., 19 Sep. 1928, leg. J. Kochman [161]; E5 – Bikcze Lake, 30 Aug. 1984, leg. W. Mułenko (LBL) [81]; F3 – Białowieża National Park, Jun.–Oct. 1987, leg. W. Mułenko (LBL) [50,52].

Geographical distribution. Austria, Belarus, Bulgaria, Denmark, Estonia, Finland, Germany, Great Britain, Italy, Latvia, Poland, Portugal, Romania, Russia (European and Asian part), Slovakia, Sweden, Ukraine; Armenia, Azerbaijan, Canada, Costa Rica, Georgia, Kazakhstan, USA.

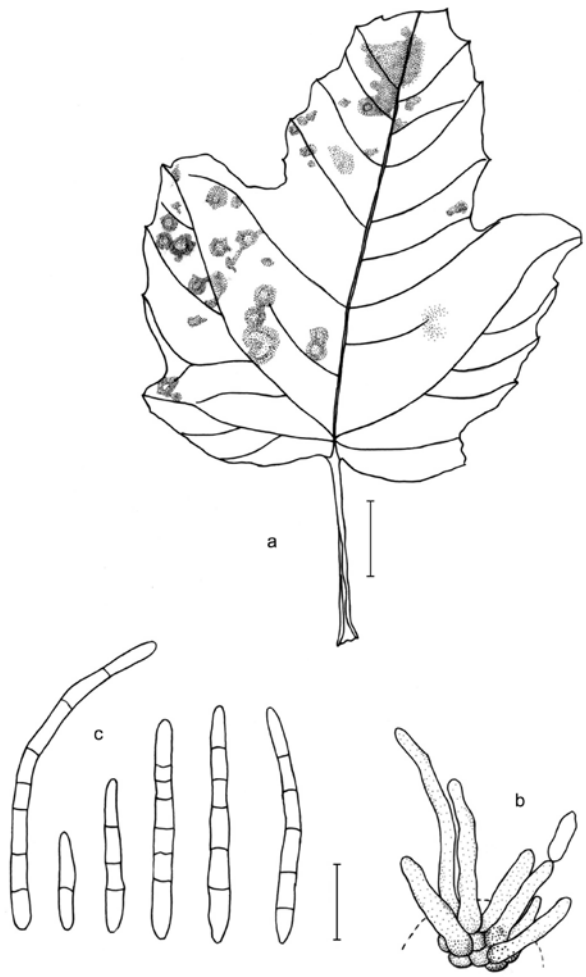

Fig. 50 *Pseudocercospora opuli* on *Viburnum opulus* (LBL, Bikcze Lake, leg. W. Mułenko). **a** Leaf spots. **b** Conidiophores. **c** Conidia. Scale bars: **a** 20 mm; **b,c** 20 µm.

Pseudocercospora pini-densiflorae (Hori & Nambu) Deighton*

Trans. Brit. Mycol. Soc. 88: 390. 1987.

= *Cercospora pini-densiflorae* Hori & Nambu, J. Pl. Protect. (Tokyo) 4: 353. 1917.
= *Cercoseptoria pini-densiflorae* (Hori & Nambu) Deighton, Mycol. Pap. 140: 167. 1976.

Teleo.: *Mycosphaerella gibsonii* H.C. Evans, Mycol. Pap. 153: 61. 1984.

Description. Spots mostly on the upper half of the needle, as the disease progresses especially on 2-year-old trees, yellowish brown to greyish lesions appear the needles die to such an extent that it is known as "leaf-blight". Stromata dark brown, stomatal or erumpent, up to 60 µm diam. Conidiophores in dense fascicles, dark brown, rarely septate, not branched, sparingly geniculate, 10–45 × 2.5–5 µm. Conidia solitary, pale yellowish olivaceous, obclavate to obclavato-cylindrical, straight to curved, 1–7-septate, rounded to obconically truncate base, obtuse tip, 20–65 × 2.5–6 µm [10,13].

Hosts. On *Pinus* spp., Pinaceae.

Geographical distribution. Widely distributed, but it has not been reported from Europe so far.

Notes. This fungus has not yet been found in Poland, but it is a quarantine species mentioned in the Regulation of the Minister of Agriculture and Agricultural Reform of 19 March 1984. This information and a diagnosis will be helpful to Polish plant protection services for identification of the fungus.

Pseudocercospora puderi Deighton*

Mycol. Pap. 140: 90. 1976.

≡ *Cercospora puderi* B.H. Davis (*puderii*), Mycologia 30: 291. 1938 (nom. inval.).

Exs. on *Rosa gallica*: Săvulescu, Herb. Mycol. Roman., Fasc. 6, No. 300, as *Passalora rosae* (= *Cercospora rosae*) (KRA-F 1930-68).

Description. Leaf spots amphigenous, circular or subcircular, 0.5–5 mm diam., dark greyish brown with a purplish brown margin. Caespituli amphigenous; stromata subglobular or globular, dark brown, 15–45 mm diam. Conidiophores pale olivaceous or brown, sometimes septate, not branched, 7.5–25 × 2.5–3.5 µm; conidial scars inconspicuous. Conidia solitary, subhyaline or pale olivaceous, obclavate or subcylindrical, straight or slightly curved, indistinctly septate, 25–45 × 2.5–4 µm; hila unthickened, not darkened.

Hosts. On *Rosa* spp., Rosaceae. ***Rosa gallica*** L.: Romania – Muntenia distr. Muscel-Pământeni, 24 Jun. 1930, leg. T. Săvulescu, R.S. Sandu (KRA-F 1930-68).

Geographical distribution. Netherlands, Romania; Cambodia, China, Cuba, Cyprus, Dominican Republic, Haiti, India, Jamaica, Korea, Malaysia, Mauritius, Mexico, Papua New Guinea, Philippines, Sierra Leone, USA, Venezuela.

Notes. This fungus has not yet been found in Poland, but a specimen is deposited in a Polish herbarium. The host species occurs in the Polish flora; therefore, it is possible to find this fungus on this plant and on other members of *Rosa* in Poland.

Pseudocercospora pulvinulata **(Sacc. & G. Winter) U. Braun***

Trudy Bot. Inst. im. V.L. Komarova 20: 85. 1997.

≡ *Cercospora pulvinulata* Sacc. & G. Winter, Hedwigia 24: 205. 1885.
≡ *Cercospora missouriensis* G. Winter, Hedwigia 24: 258. 1885.

Description. Leaf spots weakly visible, usually yellowish discoloration, greyish or brownish, 1–3 mm wide. Caespituli hypophyllous; stromata lacking. Conidiophores in fascicles, usually 1–2-septate, (7.5–)15–30 × 2–3.5 μm; conidial scars unthickened. Conidia solitary, pale olivaceous, obclavate to cylindrical, straight or slightly curved, 1–4-septate, obtuse apex; hila subconspicuous, not darkened, (20–)25–55(–70) × 2–3.5 μm.

Hosts. On *Morus* spp., Moraceae. ***Morus alba*** L.: Ukraine – Chorostków n. Kopyczyńce, leg. N.N. (WA 29856).

Geographical distribution. Romania, Switzerland, Ukraine; Australia, China, Georgia, Japan, Morocco, Taiwan, USA.

Pseudocercospora rhoina **(Cooke & Ellis) Deighton***

Mycol. Pap. 140: 152. 1976.

≡ *Cercospora rhoina* Cooke & Ellis, Grevillea 6: 89. 1878.
= *Cercospora copallina* Cooke, Grevillea 12: 31. 1883.
= *Cercospora rhoina* var. *nigromaculans* Peck, Rep. (Annual) New York State Mus. Nat. Hist. 42: 129. 1889.

Exs. on *Rhus glabra*: Rabenhorst-Pazschke, Fungi. Eur. Extraeur. Exs. 4393 (WA 28608).

Description. Leaf spots distinct, scattered, sometimes confluent, angular or irregular, usually vein-limited, 1–6 mm diam., centre reddish brown, margin yellowish, narrow. Caespituli amphigenous, rarely only hypophyllous. Conidiophores in fascicles, erumpent through the cuticle, olivaceous or brown, usually aseptate, 7.5–28.5 × 2–3.5 μm; conidial scars inconspicuous. Conidia solitary, pale olivaceous or olivaceous-brown, filiform, cylindrical or obclavate, straight or slightly curved, 3–7-septate, 40–68 × 2.5–3.5 μm; hila unthickened, not darkened.

Hosts. On Anacardiaceae. ***Rhus glabra*** L.: USA – New York – Manhattan distr., Riley (Kansas), leg. W. A. Kellerman (WA 28608).

Geographical distribution. Ukraine; Canada, China, India, Japan, Kenya, Korea, Malawi, USA.

Notes. This fungus has not yet been collected in Poland, but material is deposited in a Polish herbarium. *Rhus toxicodendron* L. and *Rhus typhina* L. occur in Poland. On the latter

plant, *Pseudocercospora rhoina* has been reported as host; therefore, it is possible to find this fungus on this host in Poland.

Pseudocercospora rubi **(Sacc.) Deighton***

Mycol. Pap. 140: 152. 1976.

≡ *Cercospora rubi* Sacc., Nuovo Giorn. Bot. Ital. 8: 188. 1876.
≡ *Pseudocercospora rubi* (Sacc.) Sivan., Bitunicate Ascomycetes and their anamorphs: 207. 1984.
= *Cercospora septorioides* Ellis & Everh., Publ. Field Columbian Mus., Bot. Ser., 1: 94. 1896.
= *Cercospora garbiniana* C. Massal., Atti Mem. Acad. Agric. Sci. Lett. Verona, Ser. 4, 3: 147. 1902.

Teleo.: *Mycosphaerella confusa* F.A. Wolf, Mycologia 28: 85. 1936.
≡ *Mycosphaerella dubia* F.A. Wolf, Mycologia 27: 355. 1935 (nom. illeg.), homonym of *M. dubia* L.E. Miles, 1918.

Exs. on *Rubus fruticosus*: Saccardo, Mycoth. Ven. 595 (KRA-F 1875-280).

Description. Leaf spots amphigenous, scattered or confluent, subcircular or angular, 3–10 mm diam., dingy brown, reddish brown or greyish, often with a brown or purplish margin. Caespituli amphigenous, mostly epiphyllous; stromata globular, dark brown. Conidiophores in dense fascicles, usually pale olivaceous or olivaceous-brown, uniform in colour, sometimes irregular in width, straight, slightly curved or sinuous, 20–40 × 2.5–4 µm. Conidia solitary, pale olivaceous, obclavate or cylindrical, straight or slightly curved, 3–11-septate, 25–75 × 2.5–4 µm.

Hosts. On *Rubus* spp., Rosaceae. ***Rubus fruticosus*** L. nom. ambig.: Italy – Selva (Treviso), Sep. 1875, leg. Saccardo (KRA-F 1875-280).

Geographical distribution. Austria, Cyprus, France, Great Britain, Greece, Italy, Russia, Spain, Ukraine, former Yugoslavia; Argentina, Australia, Azerbaijan, Bermuda, Brazil, Canary Islands, China, Columbia, Georgia, India, Iran, Japan, Korea, Nepal, New Zealand, Panama, South Africa, USA, Zimbabwe.

Notes. This fungus has not yet been found in Poland, but material is deposited in a Polish herbarium. Numerous *Rubus* species occur in the Polish flora; therefore, it is possible to find this fungus in Poland.

Pseudocercospora timorensis **(Cooke) Deighton***

Mycol. Pap. 140: 154. 1976.

≡ *Cercospora timorensis* Cooke, Grevillea 12: 38. 1883.
= *Ramularia batatae* Racib., Paras. Algen Pilze Javas, Batavia 1: 35. 1900.
= *Cercospora batatae* Zimm., Ber. Land.–Forstw. Deutsch Ostafrikas 2: 28. 1904.
= *Cercospora batatae* Henn., Bot. Jahrb. Syst. 38: 118. 1907 (nom. illeg.).
= *Cercospora ipomoeae-purpureae* J.M. Yen, Rev. Mycol. 30: 173. 1965.
≡ *Pseudocercospora ipomea-purpureae* (J.M. Yen) J.M. Yen, in Yen & Lim, Gard. Bull., Singapore 33: 177. 1980.

Description. Leaf spots amphigenous, subcircular, angular or irregular, 1–8 mm wide, yellowish brown to dark brown, margin distinct, dark brown. Caespituli amphigenous,

mostly hypophyllous; stromata lacking or small, rudimentary. Conidiophores 5–18 in fascicles, pale olivaceous-brown, paler towards the apex, straight or slightly geniculate, rarely branched, aseptate or 1–2-septate, 17.5–50(–55) × 3–4.5 μm. Conidia solitary, subhyaline or pale olivaceous, obclavate to cylindrical, straight or slightly curved, 3–8-septate, 45–90 × 3–4.5 μm.

Hosts. On Convolvulaceae. ***Ipomoea batatas*** (L.) Lam.: Java – Klaten, Sep. 1899 [KRA-F 1899-216(J)].

Geographical distribution. Not reported from Europe; found on various species of genera belonging to the Convolvulaceae outside Europe.

Notes. This fungus is not known from Poland, but material is deposited in a Polish herbarium. Most potential host species do not occur in the Polish flora except for cultivated *Ipomoea purpurea* (L.) Roth. which has been reported as a host of this fungus outside Europe. Therefore, it might be possible to find this fungus on this plant in Poland.

Pseudocercospora viburnigena **U. Braun & Crous**

Mycol. Progress 1(1): 23. 2002.

≡ *Cercospora tinea* Sacc., Michelia 1: 268. 1878, non *Pseudocercospora tinea* Y.L. Guo & W.H. Hsieh, 1994.
≡ *Cercoseptoria tinea* (Sacc.) Deighton, Mycol. Pap. 140: 167. 1976.
≡ *Stigmina tinea* (Sacc.) M.B. Ellis, More dematiaceous hyphomycetes: 118. 1976.
≡ *Stigmina tinea* (Sacc.) M.B. Ellis, Mycol. Pap. 151: 1. 1983 (comb. superfl.).
≡ *Cercostigmina tinea* (Sacc.) U. Braun, Cryptog. Bot. 4: 108. 1993.

Exs. on *Viburnum tinus*: Saccardo, Mycoth. Ven. 1252 (KRA-F 1877-141).

Description. Leaf spots subcircular or angular, 4–6 mm diam., dark brown or dingy grey. Caespituli amphigenous; stromata small, dark brown. Conidiophores pale olivaceous, uniform in colour, curved or undulate, septate, 10–40 × 2–3 μm; conidial scars inconspicuous. Conidia solitary, hyaline or pale olivaceous, usually obclavate, slightly curved, 35–95 × 2–3 μm; hila unthickened, not darkened.

Hosts. On *Viburnum* spp., Adoxaceae. ***Viburnum tinus*** L.: Italy – Padua (Venice), Sep. 1877, leg. G. Bizzozero (KRA-F 1877-141).

Geographical distribution. Germany, Great Britain, Italy, Netherlands, Portugal, Spain.

Notes. This species is probably confirmed to *Viburnum tinus*. *Pseudocercospora tinea* Y.L. Guo & W.H. Hsieh is quite distinct from *Cercospora tinea* by having superficial hyphae with solitary conidiophores and sympodially proliferating conidiogenous cells [11].

This fungus has not yet been found in Poland, but material is deposited in a Polish herbarium. The host species occurs in Poland as a cultivated plant; therefore, it is possible to find this fungus in Poland.

Pseudocercospora vitis (Lév.) Speg.

Annales Mus. Nac. Hist. Nat. Buenos Aires 20: 438. 1910

≡ *Septonema vitis* Lév., Ann. Sci. Nat., Bot., Ser. 3, 9: 261. 1848.
≡ *Cladosporium vitis* (Lév.) Sacc., Mycoth. venet., No. 284. 1875.
≡ *Cercospora vitis* (Lév.) Sacc., Nuovo Giorn. Bot. Ital. 8: 188. 1876.
≡ *Helminthosporium vitis* (Lév.) Pirotta, Rev. Mycol. 11: 185. 1889.
≡ *Phaeoisariopsis vitis* (Lév.) Sawada, Rep. Dept. Agric. Gov. Res. Inst. Formosa 2: 164. 1922.
≡ *Cercosporiopsis vitis* (Lév.) Miura, Flora of Manchuria and East Mongolia, III. Cryptog. Fungi: 527. 1928.
= *Cercosporiopsis viticolum* Ces., Flora 38: 206. 1854.
≡ *Cercospora viticola* (Ces.) Sacc., Syll. Fung. 4: 485. 1886.
= *Cladosporium ampelinum* Pass., Erb. Critt. Ital., Ser. 2, No. 595. 1872.
= *Graphium clavisporum* Berk. & Cooke, Grevillea 3: 100. 1874.
≡ *Isariopsis clavispora* (Berk. & Cooke) Sacc., Syll. Fung. 4: 631. 1886.
= *Cercospora vitis* (Lév.) Sacc. var. *rupestris* Cif., Ann. Mycol. 20: 45. 1922.
= *Cercospora vitis* f. *parthenocissi* Docea, Lucr. Şti. Inst. Agron. "N. Bălescu", Ser. A. 11:406. 1968.

Teleo.: *Mycosphaerella personata* B.B. Higgins, Amer. J. Bot. 16: 287. 1929.

Exs. on *Vitis cordifolia*: Rabenhorst-Pazschke, Fungi. Eur. Extraeur. Exs. 4394 (WA 28603); on *Vitis vinifera*: Saccardo, Mycoth. Ven. 363 (KRA-F 1874-188).

Description. Leaf spots scattered, subcircular to irregular, 1–11 mm diam., greyish brown or purplish brown with purplish margin. Caespituli amphigenous, but mostly hypophyllous; stromata well-developed, globular, pale brown or dark brown. Conidiophores 6–34 in dense fascicles, synnematous, pale olivaceous or dark brown, septate, not branched, usually curved, mildly sinuous or slightly geniculate at the apex, 90–300(–350) × 3–5.5 μm; conidial scars inconspicuous. Conidia solitary, pale olivaceous to dark brown, obclavate or subcylindrical, straight to mildly curved, 5–11-septate, rounded apex, obconical base, 40–75 × 5–7.5 μm; hilum unthickened, not darkened.

Hosts. On Vitaceae. ***Vitis vinifera*** L.: B5 – Prószków n. Opole [110].

Geographical distribution. Worldwide on host of various genera belonging to the Vitaceae.

7.4. Doubtful and excluded taxa

Cercospora curvata (Rabenh. & A. Braun) Wollenw.

Fusaria Autographice Delineata, 1 ed.: 451.1916.

≡ *Septosporium curvatum* Rabenh. & A. Braun, in Braun, Ueber einige neue oder weniger bekannte Krankheiten der Pflanzen: 14. 1854.
≡ *Septoria curvata* (Rabenh. & A. Braun) Sacc., Syll. Fung. 3: 484. 1884.
≡ *Fusarium vogelii* Henn., Z. Pflanzenkr. 12: 14. 1902.

Exs. on *Robinia pseudacacia*: Krieger, Fungi Saxon. Exs. 1550 (WRSL); Sydow, Mycoth. Germ. 1694, 1695 (WRSL); Thümen, Herb. Mycol. Oecon. 738 (WRSL); Thümen, Mycoth. Univ. 1770 (WRSL); Fl. Hung. Exs. 104 (WRSL).

Description. Leaf spots irregular, brown with darker margin. Acervuli amphigenous, 75–115 µm diam. Conidia filiform, indistinctly septate, 25–55(–60) × 1.5–3 µm.

Hosts. On *Robinia* spp., Leguminosae. ***Robinia pseudoacacia*** L.: A1 – Łeba [208]; A4 – Sopot [208]; A5 – Dąbroszyn [13]; B1 – Zielonka Experimental Forest Division n. Poznań [165].

Geographical distribution. Bulgaria, England, Germany, Hungary, Italy, Poland, Russia; Armenia, Azerbaijan.

Notes. This species is doubtful and excluded; the name does not refer to a true species of *Cercospora* s. str. [11,13]. The revised exiccata should be included in *Phloeospora robiniae* (Lib.) Höhn.

Cercospora fragariae Lobik

Bolezni Rast. 17: 195. 1928 (nom. dub.).

Description. Leaf spots 1.5–3 mm diam., brown, later becoming white, with dark purple diffuse margin, grey-brown on the lower surface. Caespituli amphigenous, mostly hypophyllous, brown. Conidiophores in fascicles, olivaceous-brown, hyaline at the apex, 1–2-septate, variously curved, arising through the stomata, on the upper side 32.9–54.6 × 3.9–4.9 µm, on the lower side 54.6–98.7 × 4.9–5.9 µm. Conidia hyaline or subhyaline, 1–3-septate, narrower towards the apex, rounded ends, 36.2–49.4 × 6.6–7.2 µm [209].

Hosts. On Rosaceae. ***Fragaria vesca*** L.: A3 – surroundings of Szczecin [87,125].

Geographical distribution. Russia.

Notes. Two *Cercospora* species – *C. fragariae* Lobik and *C. potentillae* Chupp & H.C. Greene occur on *Fragaria*. The description by Chupp [13] does not agree with that published by Lobik in 1928, therefore, *C. fragariae* species have been regarded as doubtful [11]. Type material of *C. fragariae* was examined by Braun & Mel'nik (1997), but *Ramularia grevilleana* (Tul. & C. Tul.) Jørst. was the only traceable fungus. The material from Szczecin has not been available, but needs revision.

Cercospora meliloti Oudem.

Nederl. Kruidk. Arch., Ser. 2, 4: 551. 1886.

Description. Leaf spots circular or elongate, 2–4 mm diam., whitish. Conidiophores in fascicles, septate, slightly geniculate, brownish, 20–60 × 3–4 µm. Conidia hyaline, cylindrical or obclavate, septate, 23–65 × 2–3 µm [97].

Hosts. On *Melilotus* spp., Leguminosae. ***Melilotus albus*** Medik.: H1 – Czorsztyn, between Krościenko and Szczawnica [44,45,87]; Pieniny Mts [46,87].

Geographical distribution. Bulgaria, Germany, Netherlands, Poland, Ukraine.

Notes. The systematic position of this species is doubtful; the name does not refer to *Cercospora* s. str. species [11,13]. Probably it should be included to *Stagonospora meliloti* (Lasch) Petr.

Cercospora davisii Ellis & Everh. is an additional species on *Melilotus* spp. with similar description.

Cercospora ononidis **(Auersw.) Höhn.**

Ann. Mycol. 3: 190. 1905.

Description. Conidiophores in fascicles, hyaline, arising through the stomata, dimorphic, first hyaline, unicellular, 10–12 × 1.5–3 µm, later dense, grey-brown, 2–4-septate, 20–32 × 3–5 µm. Conidia formed on hyaline conidiophores are hyaline, 20–22 × 5–5.5 µm; conidia formed on brown conidiophores firstly are hyaline, later pale brown, long cylindrical, straight, apex and base rounded, 1–4-septate, usually 13–28 × 6–8.5 µm [97].

Hosts. On *Ononis spinosa* subsp. *hircina*, Leguminosae. ***Ononis spinosa*** subsp. ***hircina*** (Jacq.) Gams: B1 – Nakło on the Noteć River [87,128].

Geographical distribution. Germany, Poland.

Notes. The systematic position of this species is doubtful; the name does not refer to *Cercospora* s. str. species [11,13].

Cercospora pietrenii **Dominik (*pietreni*)**

Spraw. Komis. Fizjogr. 70: 59. 1936.

Description. Leaf spots circular, distinct, 3–20 mm diam., yellow or brownish grey. Caespituli pale greyish violet or dingy white. Conidiophores aseptate, not branched, with 1–3 conidial scars, 25–45 × 3.3–5.5 µm. Conidia hyaline, fusiform or cylindrical, ends mildly rounded, straight or vermiformly curved, 1–3-septate, 17–58 × 4–6 µm [74].

Hosts. On *Chenopodium album*, Amaranthaceae. *Chenopodium album* L.: B4 – Głogówek n. Gostyń [74,87].

Geographical distribution. Reported only from Poland until recently.

Notes. According to Crous and Braun [11], this species probably belongs to *Cercospora chenopodii* (= *Passalora dubia*), but the conidiophores and conidia are smaller.

***Cercospora violae-sylvaticae* Oudem.**

Verslagen Meded. Afd. Naturk. Kon. Akad. Wettensch., Ser. 3, 7: 323. 1890.

Description. Spots amphigenous subcircular, palescent. Mycelium internal, fuligineous, branched, septate. Conidiophores erect. Conidia hyaline, cylindrical, 3–7-septate, curved, apex obtuse, base truncate, 45–70 × 4.5 µm [210].

Hosts. On *Viola* spp., Violaceae. ***Viola reichenbachiana*** Jord. ex Boreau: E4 – Puławy [161].

Geographical distribution. Netherlands, Poland.

Notes. This species is doubtful and has been excluded; the name does not refer to true species of *Cercospora* s. str. [11]. Chupp [13] referred *C. violae-sylvaticae* to *Ramularia*, although he did not see original material of this species. He studied some other specimens from Oudeman's herbarium which belonged to *Ramularia lactea*.

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9. Index to fungus names by host genus

The plant families were arranged alphabetically.

Pteridophyta
- Dennstaedtiaceae
  - *Pteridium*
    - *Passalora pteridis*

Spermatophyta
- Adoxaceae
  - *Sambucus*
    - *Cercospora depazeoides*
  - *Viburnum*
    - *Cercospora viburnicola*
    - *Pseudocercospora opuli*
    - *Pseudocercospora viburnigena*
- Alismataceae
  - *Sagittaria*
    - *Cercospora sagittariae*
- Amaranthaceae
  - *Atriplex*
    - *Cercospora chenopodii*
  - *Beta*
    - *Cercospora beticola*
  - *Chenopodium*
    - *Cercospora beticola*
    - *Cercospora chenopodii*
    - *Cercospora pietrenii*
- Anacardiaceae
  - *Rhus*
    - *Pseudocercospora rhoina*
- Apiaceae
  - *Aegopodium*
    - *Passalora depressa*
  - *Anethum*
    - *Cercospora apii*
    - *Passalora depressa*
    - *Passalora punctum*
  - *Angelica*
    - *Passalora depressa*
  - *Anthriscus*
    - *Passalora bupleuri*
  - *Apium*
    - *Cercospora apii*
  - *Bupleurum*
    - *Passalora bupleuri*
  - *Chaerophyllum*
    - *Passalora bupleuri*
    - *Passalora scandicearum*
  - *Coriandrum*
    - *Passalora bupleuri*
  - *Daucus*
    - *Cercospora apii*
    - *Cercospora carotae*
  - *Foeniculum*
    - *Passalora depressa*
  - *Heracleum*
    - *Passalora depressa*
  - *Pastinaca*
    - *Passalora pastinacae*
  - *Petroselinum*
    - *Passalora punctum*
  - *Peucedanum*
    - *Passalora depressa*
  - *Pimpinella*
    - *Passalora malkoffii*
  - *Torilis*
    - *Passalora scandicearum*
- Apocynaceae
  - *Vincetoxicum*
    - *Passalora bellynckii*
- Araceae
  - *Arum*
    - *Cercospora ari*
- Aristolochiaceae
  - *Aristolochia*
    - *Cercospora olivascens*
- Asparagaceae
  - *Asparagus*
    - *Cercospora asparagi*
  - *Maianthemum*
    - *Cercospora maianthemi*
- Balsaminaceae
  - *Impatiens*

- *Cercospora campi-silii*

Betulaceae
- *Alnus*
  - *Passalora alni*
  - *Passalora bacilligera*
  - *Passalora microsperma*

Boraginaceae
- *Echium*
  - *Cercospora echii*

Brassicaceae
- *Armoracia*
  - *Cercospora armoraciae*
- *Barbarea*
  - *Cercospora armoraciae*
- *Berteroa*
  - *Cercospora armoraciae*
- *Cardamine*
  - *Cercospora armoraciae*
- *Erysimum*
  - *Cercospora armoraciae*
- *Rorippa*
  - *Cercospora armoraciae*

Campanulaceae
- *Lobelia*
  - *Passalora lobeliae-cardinalis*

Compositae
- *Artemisia*
  - *Passalora ferruginea*
- *Calendula*
  - *Cercospora calendulae*
- *Carlina*
  - *Passalora carlinae*
- *Lactuca*
  - *Passalora scariolae*
- *Neojeffreya*
  - *Passalora gnaphaliaceae*
- *Senecio*
  - *Cercospora senecionis*
- *Tragopogon*
  - *Cercospora tragopogonis*

Convolvulaceae
- *Ipomoea*
  - *Cercospora ipomoeae*
  - *Pseudocercospora timorensis*

Cyperaceae
- *Carex*
  - *Cercospora caricis*

Ericaceae
- *Rhododendron*
  - *Pseudocercospora handelii*

Euphorbiaceae
- *Mercurialis*
  - *Cercospora mercurialis*
- *Ricinus*
  - *Cercospora ricinella*

Geraniaceae
- *Geranium*
  - *Passalora minutissima*

Grossulariaceae
- *Ribes*
  - *Passalora ribis-rubri*

Hydrangaceae
- *Philadelphus*
  - *Cercospora angulata*

Juncaceae
- *Juncus*
  - *Cercospora juncina*

Lamiaceae
- *Lamium*
  - *Cercospora kabatiana*
- *Teucrium*
  - *Passalora teucrii*

Leguminosae
- *Anthyllis*
  - *Cercospora radiata*
- *Cercis*
  - *Passalora cercidicola*
  - *Passalora chionea*
- *Galega*
  - *Cercospora galegae*
- *Glycine*
  - *Cercospora kikuchii*
  - *Cercospora sojina*
- *Lotus*
  - *Cercospora loti*
- *Medicago*
  - *Cercospora medicaginis*
- *Melilotus*
  - *Cercospora meliloti*
- *Ononis*
  - *Cercospora ononidis*
- *Phaseolus*

Pseudocercospora griseola
Robinia
Cercospora curvata
Securigera
Cercospora rautensis
Trifolium
Cercospora zebrina
Trigonella
Cercospora traversiana
Vicia
Cercospora zonata
Malvaceae
Alcea
Cercospora althaeina
Cercospora nebulosa
Althaea
Cercospora althaeina
Tilia
Passalora microsora
Melanthiaceae
Paris
Cercospora paridis
Moraceae
Ficus
Passalora bolleana
Morus
Pseudocercospora pulvinulata
Onagraceae
Epilobium
Passalora heterospora
Passalora montana
Orchidaceae
Epipactis
Cercospora epipactidis
Orobanchaceae
Euphrasia
Cercospora euphrasiae
Pinaceae
Pinus
Pseudocercospora pini-densiflorae
Plantaginaceae
Plantago
Cercospora pantoleuca
Cercospora plantaginis
Poaceae
Agrostis
Passalora graminis
Alopecurus
Passalora graminis
Arrhenatherum
Passalora graminis
Avena
Passalora graminis
Brachypodium
Passalora graminis
Calamagrostis
Passalora graminis
Corynephorus
Passalora graminis
Dactylis
Passalora graminis
Elymus
Passalora graminis
Festuca
Passalora graminis
Glyceria
Passalora graminis
Helictotrichon
Passalora graminis
Leersia
Passalora graminis
Lolium
Passalora graminis
Milium
Passalora graminis
Molinia
Passalora graminis
Phalaris
Passalora graminis
Phleum
Passalora graminis
Poa
Passalora graminis
Secale
Passalora graminis
Setaria
Cercospora setariae
Triticum
Passalora graminis
Polygonaceae
Fagopyrum
Cercospora fagopyri

- *Persicaria*
  - *Passalora effusa*
- *Polygonum*
  - *Passalora avicularis*

Ranunculaceae
- *Actaea*
  - *Passalora actaeae*
- *Caltha*
  - *Cercospora moravica*
- *Clematis*
  - *Passalora squalidula*

Resedaceae
- *Reseda*
  - *Cercospora resedae*

Rhamnaceae
- *Rhamnus*
  - *Passalora rhamni*
  - *Pseudocercospora bacilligera*

Rosaceae
- *Cerasus*
  - *Passalora circumscissa*
- *Comarum*
  - *Passalora comari*
- *Fragaria*
  - *Cercospora fragariae*
  - *Passalora vexans*
- *Geum*
  - *Pseudocercospora geicola*
- *Prunus*
  - *Passalora circumscissa*
  - *Pseudocercospora graphioides*
- *Rosa*
  - *Passalora rosae*
  - *Passalora rosicola*
  - *Pseudocercospora puderi*
- *Rubus*
  - *Pseudocercospora rubi*
- *Sorbus*
  - *Passalora ariae*
- *Spiraea*
  - *Pseudocercospora laxipes*

Rubiaceae
- *Galium*
  - *Passalora galii*

Rutaceae
- *Citrus*
  - *Pseudocercospora angolensis*

Sapindaceae
- *Acer*
  - *Passalora acericola*

Solanaceae
- *Hyoscyamus*
  - *Cercospora physalidis*
- *Lycium*
  - *Cercospora lycii*
- *Lycopersicon*
  - *Passalora concors*
  - *Passalora fulva*
- *Nicotiana*
  - *Cercospora physalidis*
- *Solanum*
  - *Cercospora solani*
  - *Passalora concors*

Violaceae
- *Viola*
  - *Cercospora violae*
  - *Cercospora violae-sylvaticae*
  - *Passalora murina*

Vitaceae
- *Parthenocissus*
  - *Passalora ampelopsis*
- *Vitis*
  - *Passalora dissiliens*
  - *Pseudocercospora vitis*

10. Index of fungus names

11. Index of hosts genera and families