ACTA MYCOLOGICA
Vol. 40 (2): 223-250
2005

Phytopathogenic micromycetes in Central Poland. I. Peronosporales and Erysiphales

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Ruszkiewicz-Michalska M., Michalski M.: *Phytopathogenic micromycetes in Central Poland. I. Peronosporales and Erysiphales.* Acta Mycol. 40 (2): 223-250, 2005.

The present paper begins a new series of studies investigating the occurrence of phytopathogenic micromycetes in Central Poland. Fungi of the orders Peronosporales and Erysiphales are discussed in part one. Relevant knowledge on the subject is surveyed, and a list of published records (46 taxa) as well as the findings collected by the present authors (99 taxa) is provided. The list comprises 2 species new for biota of Poland – *Microsphaera deutziae* Bunkina and *Microsphaera elevata* Burrill, 10 rare and many common fungal species that had not been previously recorded in this area as well as 21 plant taxa, mostly species of deliberate or accidental anthropogenic origin, that are new hosts of the parasites formerly listed in Poland.

Key words: parasitic fungi, Peronosporales, Erysiphales, distribution, Central Poland

INTRODUCTION

The species belonging to Peronosporales and Erysiphales in Poland have been studied well. Monographs (Kochman and Majewski 1970; Sałata 1985) provide data on the morphology, ecology and distribution of 200 and 112 representatives, respectively. The studies are based on analyses of herbarium materials as well as on the records reported in 380 Polish sources published between 1830 and 1983.

Extensive research projects on the occurrence of fungi in Poland, including phytopathogenic micromycetes, were carried out in the most important protected areas: national parks and nature reserves. Consequently, the mycoflora has been examined quite well in the following national parks: Kampinoski N. P. (Majewski 1967), Białowieski N. P. (Majewski 1971; Faliński and Mułenko eds 1992-1996), Ojcowski and Pieniński N. P. (Kućmierz 1973, 1977), Poleski N. P. (Mułenko 1989), projected Jurajski N. P. (Ruszkiewicz 2000a), Słowiński N. P. (Adamska and Błaszkowski 2000; Adamska 2001), and Tatrzański N. P. (Mułenko, Kozłowska and Sałata 2004 and the literature cited therein). Areas such as the Noteć valley (Michalski 1965, 1982), the Wyżyna Lubelska Upland (Romasze-

wska-Sałata 1977) and the Bug valley (Danilkiewicz 1987) have also been investigated in relative depth.

Although research on fungi in areas particularly strongly affected by human activity and subjected to constant anthropopressure, that is in urbanised and industrial areas, developed at the same time, projects investigating fungi in such areas are exceptionally rare (Ławrynowicz 1982; Kreisel and Amelang 2001; Ławrynowicz, Bujakiewicz and Mułenko 2004; Milevoj 2004). The occurrence of microscopic plant pathogens has been examined only in few major Polish towns and cities: Olsztyn, Płock, Szczecin, Świnoujście and Toruń (Dynowska 1994; Dynowska, Fiedorowicz and Kubiak 1999; Hołownia and Kostrzewska 1991; Madej 1971, 1972), Sometimes fragmentary data on rare or new species observed in urbanised areas can also be found in other sources (Romaszewska-Sałata, Sałata and Mułenko 1982; Wołczańska and Mułenko 2002; Ruszkiewicz-Michalska and Mułenko 2003). The presence of the diversified flora, including many exotic plant species, both introduced accidentally and cultivated, is an important feature of urban and industrial areas (Gemmell 1980); it is, however, elaborated on by few researchers studying botanical gardens, arboreta and allotment gardens (Zaleski and Madej 1964; Madej 1969, 1971a; Kalinowska-Kucharska 1998; Piątek 2000a, 2003; Mułenko and Wojdyło 2002).

Numerous recent physiographic or mycosociological studies contribute to the knowledge on species richness and the distribution of microscopic parasitic fungi in Poland. As a result, 39 species of downy mildews and 4 taxa of powdery mildews have

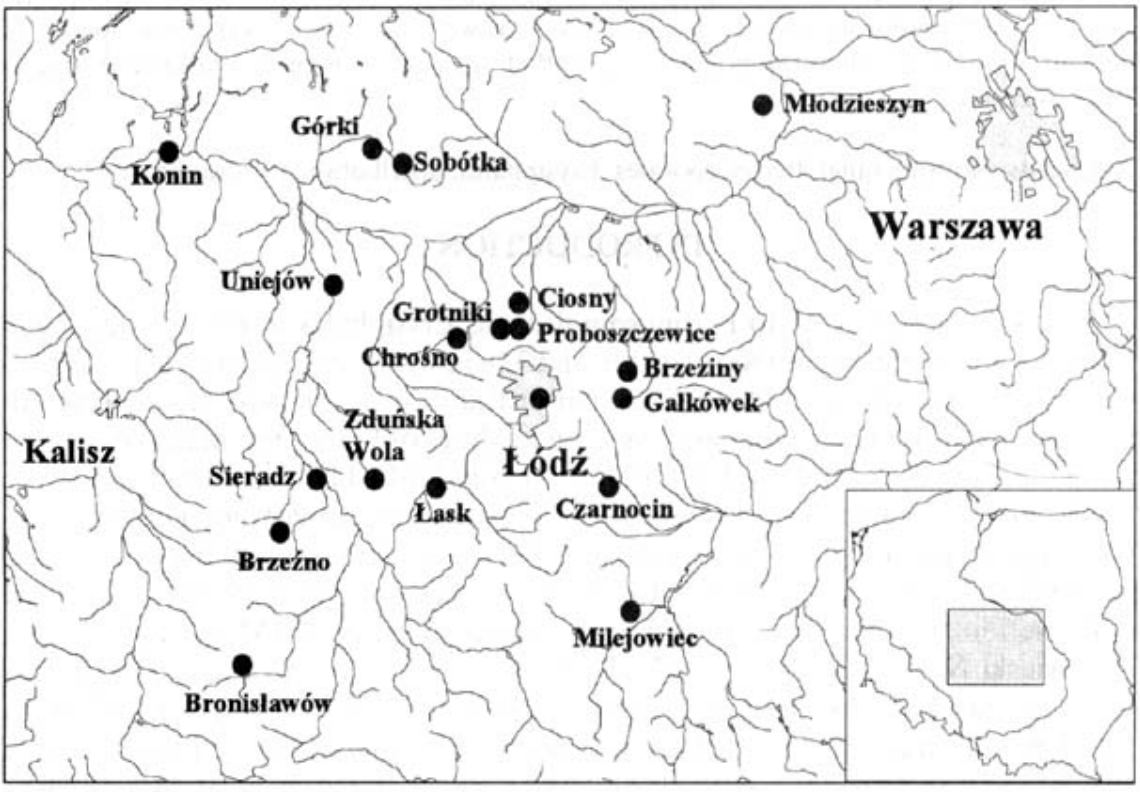

Fig. 1. Distribution of the localities of fungal species in Central Poland based on the literature data.

been added to the list of these fungi known in Poland (Majewski and Ruszkiewicz-Michalska 2005, unpubl.; Ruszkiewicz-Michalska 2005). Although these reports are numerous (Piątek 2000, 2004; Adamska 2002; Wołczańska and Mułenko 2002; Ruszkiewicz-Michalska and Michalska-Hejduk 2003), only few of them provide findings that are consistent, complete, and deal with areas of Poland that have not been examined before. An inclusive approach is adopted by, for instance, Kalinowska-Kucharska and Kadłubowska (1993), Romaszewska-Sałata and Wołczańska (1997), Dynowska et al. (1999) and Czerniawska (2001).

While the mycoflora of macromycetes in Łódź, as one of the few Polish urban agglomerations, has been examined in relative depth (Ławrynowicz 1982, 1990; Stasińska 1994; Ławrynowicz, Kałucka and Sumorok 2001), the occurrence of microscopic fungal pathogens in the area of the city and the Łódź voivodeship, situated in the heart of Central Poland (Papińska 1993), has been poorly studied. A list of published records comprises 46 fungal taxa collected in 19 localities (Fig. 1). The findings are based on two groups of sources: i) reports of the Departments of Plant Conservation published before World War II, and ii) 6 recent floristic studies dealing mostly with powdery mildews.

MATERIALS AND METHODS

For analysis of published data the following studies were used: Garbowski (1925, 1935), Garbowski and Juraszkówna (1933), Leszczenko (1937), Kadłubowska (1963), Kalinowska-Kucharska (1997, 1998), joint publications by Kadłubowska and Kalinowska-Kucharska (1993, 1997) and Ruszkiewicz-Michalska and Mułenko (2003). As the result the list of 43 taxa of Erysiphales and 3 species of Peronosporales was obtained.

Original findings from Łódź and its vicinity (Figs 1, 2) come mostly from the present authors' studies (295 records) carried out in the years 1995-2005. In the area of Łódź 6 sampling sites have been distinguished (Fig. 2).

Unpublished materials deposited in the Herbarium Universitatis Lodziensis collected by Dominika Franoszek (26 records), Ewa Kalinowska-Kucharska (9), Aleksandra Kotynia (3), Anna Marciniak (18) and a number of older exsiccata were also included in the analysis. Available herbarium materials documenting the findings given in sources published between 1963 and 2003 were also reviewed and verified.

The fungal species were determined using the monographs written by Kochman and Majewski (1970) and Braun (1987, 1995); hosts were identified according to Szafer, Kulczyński and Pawłowski (1986) and Rutkowski (2004). The nomenclature of host species follows the checklist of vascular plants of Poland (Mirek et al. 2002), while that of parasites follows the checklist of microscopic fungi (Mułenko and Majewski eds 2005 unpubl.). Host species observed in Poland for the first time are marked with an asterisk (*).

The studied materials are deposited in the Herbarium Universitatis Lodziensis (LOD) in the collection *parasitic fungi* labelled as PF.

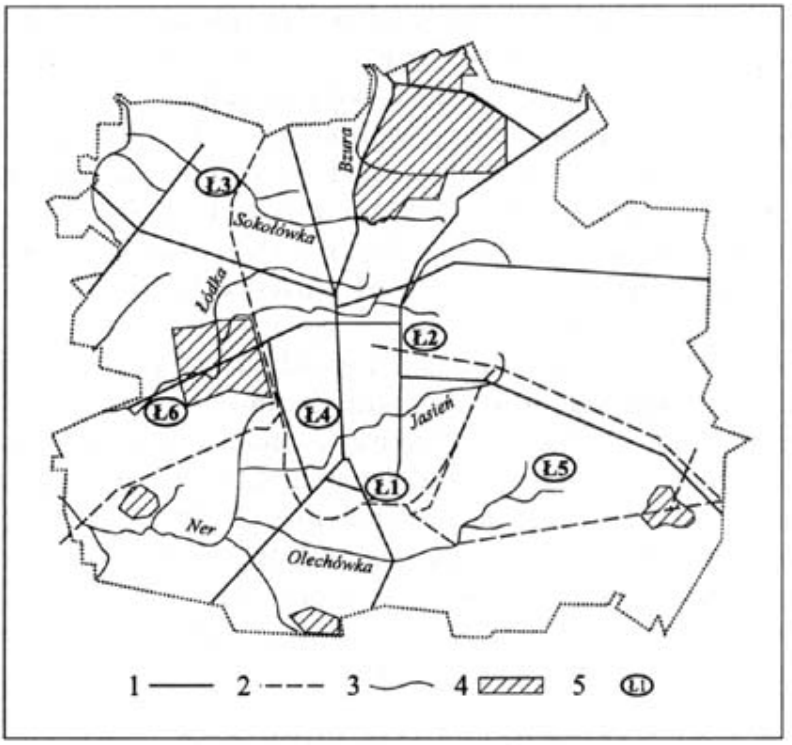

Fig. 2. Localization of sampling sites against a background of the administrative borders of Łódź. 1 – street, 2 – railway, 3 – river, 4 – forest, 5 – sampling site.
List of the sampling sites in Łódź: Ł1 – the district of Chojny; Ł2 – the area delineated by the streets: Pomorska, Narutowicza, Kopcińskiego and Matejki; Ł3 – the area delineated by the streets: Liściasta, Św. Teresy, Traktorowa and Łódź Żabieniec – Zgierz railway; Ł4 – the area delineated by the streets: Jana Pawła II, Piotrkowska, Radwańska and Mickiewicza; Ł5 – the district of Olechów; Ł6 – the area delineated by the streets: Armii Krajowej, Juszczakiewicza, Konstantynowska, Kusocińskiego, Wyszyńskiego.

RESULTS

27 species of the orders Peronosporales and 81 taxa of Erysiphales are listed below. They constitute 11 % and 71 % of species of these groups occurring in Poland, respectively (Majewski and Ruszkiewicz-Michalska 2005 unpubl.). The list comprises two species new for biota of Poland – *Microsphaera deutziae* Bunkina and *Microsphaera elevata* Burrill, 10 rare and many common fungal species; more than a half of them (62 taxa), however, had not been previously recorded in Central Poland.

The majority of plant species that are new hosts of their parasites in Poland are taxa introduced and distributed by man consciously or accidentally. Most documented cases of a rapid transmission of phytopathogenic fungi takes place when a fungus or its host is an exotic species, and they have not coevolved (Deighton 2003). Because of an insufficient number of findings from certain types of habitats and areas subjected to increased human impact, the discussion on the expansion, invasion and hemerophoby of many taxa of parasitic fungi is frequently omitted in relevant literature (Ruszkiewicz-Michalska and Michalski 2005). It is thus necessary to fill in the gap in the knowledge on the occurrence of phytopathogenic micromycetes

by providing localities of common species, given in, for example, unpublished master's theses.

Although the findings given below are based on test studies, and not observations carried out regularly, they do provide information on the taxonomic diversity and spread of phytopathogenic micromycetes in urban areas. As studies by Dynowska (1993, 1994, 1996) and Dynowska and Sucharzewska (2001) show, this type of findings help determine sensitivity of fungi to air pollution. The value of such data can also be assessed by their contribution to comprehensive studies such as checklists, and to studies monitoring changes occurring in artificial ecosystems.

Parts II and III of the series of studies on phytopathogenic micromycetes in Central Poland will deal with successive groups of fungi: rusts, smuts and anamorphic fungi, including a final discussion and conclusion.

LIST OF SPECIES

Explanations:
◆ – species new for biota of Poland; * – the new host species; (a) – anamorph; (t) – teleomorph; AK – Aleksandra Kotynia; AM – Anna Marciniak; DF – Dominika Franoszek; EKK – Ewa Kalinowska-Kucharska.

PERONOSPORALES

Albugo amaratnthi (Schw.) Kuntze
On *Amaranthus retroflexus*, Ł1: lawn, 22 Sept. 2003, LOD 672; Ł2: lawn, 14 July 2005, LOD 671.

Albugo candida (Pers.: Fr.) Kuntze
On *Capsella bursa-pastoris*, Ł6: lawn, 28 April 2005, LOD 547; near a block of flats, 4 July 2005, LOD 692; roadside, 19 June 2005, LOD 693; Łódź, Botanical Garden, 8 Oct. 2005, LOD 804; on **Lunaria annua* cult., Łódź, Krzywickiego, flower garden, burnet-out place, 1 Aug. 2005, *leg. M. Ławrynowicz*, LOD 712; Ł1: garden, 20 Aug. 2005, LOD 802; on *Sisymbrium loeselii*, Ł6: abandoned field, 10 May 2005, LOD 569; lawn, 10 Aug. 2005, LOD 764; on *Sisymbrium officinale*, Ł1: lawn, 30 June 2005, LOD 680.
Notes. The fungus has not been recorded in Poland on *L. annua* and on *S. loeselii* it is known from 3 localities only (Majewski and Ruszkiewicz-Michalska 2005 unpubl.). On this host the parasite was reported from Scotland and England (Farr et al. n.d.) and its epidemic spread has been recently observed in the United States of America (Glawe, Glass and Putnam 2004).

Bremia lactucae Regel
The fungus was recorded by Garbowski (1935) on *Lactuca sativa* in Brzeziny and Gałkówek near Łódź.

Peronospora agrestis Gäum.
On *Veronica arvensis*, Ł6: near bus terminus, abandoned meadow, 5 May 2005, LOD 545.

Peronospora arenariae (Berk.) L. R. Tul.
On *Moehringia trinervia*, Łódź, Łagiewnicki Forest, 11 Oct. 2003, LOD 482.

Peronospora arthuri Farlow
On *Oenothera biennis*, Ł3: roadside, 14 June 1998, LOD 585.
Notes. The species is known from SE Poland (Mułenko and Matejko Gosztyła 1997) and from Wyżyna Częstochowska Upland (Ruszkiewicz 2000).

Peronospora arvensis Gäum.
On *Veronica dillenii*, Ł6: abandoned meadow, 5 May 2005, LOD 548; abandoned field, 10 May 2005, LOD 566; on *Veronica hederifolia*, Ł6: meadow, 5 May 2005, LOD 557.
Notes. On *V. dillenii* the species is known only from the collection of Majewski (1967) from Dąbrowa Stara and Grądy in Kampinoska Forest.

Peronospora chenopodii Schlecht.
On *Chenopodium album*, Czarnocin, garden, 25 June 1995, LOD 2; Łask-Kolumna, roadside, 10 July 2000, LOD 584; Ł4: lawn, 26 July 2000, LOD 475.

Peronospora conglomerata Fuck.
On *Geranium pusillum*, Czarnocin, garden, 10 June 1995, LOD 1; Ł1: lawn, 10 June 1999, LOD 480; Ł6: lawn, 4 Aug. 2002, LOD 859.

Peronospora ficariae L. R. Tul. ex de Bary
On *Ficaria verna*, Ł2: lawn, 6 May 2005, LOD 536; Łódź, Retkińska near the Polesie Konstantynowskie nature reserve, on a fence, 3 May 2005, LOD 559; Łódź, Źródliska park, 5 May 1999, LOD 485.

Peronospora grisea (Ung.) Ung.
On *Veronica serpyllifolia*, Łódź, „Sielanka" park, near the Pabianicka, shaded lawn, 19 July 2005, LOD 729.

Peronospora hiemalis Gäum.
On *Ranunculus acris*, Czarnocin, roadside, 30 Sept. 1995, LOD 4; Ł1: lawn beside a block of flats, 10 April 2005, LOD 643; Ł6: near the Botanical Garden, lawn, 18 May 2005, LOD 563.

Peronospora lamii A. Braun
On *Lamium maculatum*, Ł6: fallow, 12 May 2005, LOD 552.

Peronospora niessleana Berl.
On *Alliaria petiolata*, Łódź, the Zoological Garden, lawn, 3 May 2005, LOD 556.

Peronospora parasitica (Pers.: Fr.) Fr.
On *Capsella bursa-pastoris*, Czarnocin, damp meadow near the river, 7 May 1995, LOD 3; Łódź, Botanical Garden, 8 Oct. 2005, LOD 804.

Peronospora plantaginis Underw.
On *Plantago major*, Struga Dobieszkowska nature reserve, 10 July 1997, LOD 499.

Peronospora ranunculi Gäum.
On *Ranunculus repens*, Ł6: mixed forest, 5 May 2005, LOD 549.

Peronospora rumicis Corda
On *Rumex acetosa*, Czarnocin, damp meadow, 26 July 1995, LOD 5; Ł1: lawn, 10 June 2004, LOD 641; Ł6: near a road, 19 April 2003, LOD 642.

Peronospora sparsa Berk.
The species was reported by Garbowski (1935) on *Rosa* sp. cult. from the town Ruda Pabianicka near Łódź, now within the administrative borders of Łódź.

Peronospora trivialis Gäum.
= *Peronospora conferta* (Ung.) Ung.
On *Cerastium holosteoides* = *Cerastium fontanum* ssp. *triviale*, Ł6: near bus terminus, abandoned meadow, 5 May 2005, LOD 546.

Peronospora viciae (Berk.) Casp.
On *Vicia villosa*, Ł6: fallow, 12 May 2005, LOD 551.

Peronospora violae de Bary ex Schroet.
On *Viola arvensis*, Ł3: allotment garden, 4 July 2002, LOD 473.

Plasmopara pusilla (de Bary) Schroet.
On *Geranium pratense*, Łódź, Botanical Garden, Arboretum section, 18 May 2005, LOD 543.

Plasmopara umbelliferarum (Casp.) Schroet. ex Wartenw.
On *Aegopodium podagraria*, Ł2: lawn, 15 Sept. 1996, LOD 495; Jan Matejko Park, lawn, 15 Aug. 2004, LOD 484; Ł6: near a block of flats, lawn under the shrubs, 28 June 2005, LOD 667; Stanisław Staszic Park, lawn, 14 April 2003, LOD 471.

Pseudoperonospora cubensis (Berk. et M. A. Curtis) Rostovtsev
= *Peronospora cubensis* Berk. et M. A. Curtis
On *Cucumis sativus* cult., Ł3: allotment garden, 12 Aug. 2005, LOD 767.

Pseudoperonospora urticae (Lib. ex Berk.) E. S. Salmon et Ware
On *Urtica dioica*, Czarnocin, damp and shaded roadside, 22 Oct. 1995, LOD 266.

Pythium debaryanum Hesse
The fungus reported from Łódź on *Lycopersicon esculentum* by Garbowski (1935).

ERYSIPHALES

Arthrocladiella mougeotii (Lév.) Vassilkov
=*Microsphaera mougeotii* Lév.
On *Lycium barbarum*, Ł4: park, 10 Oct. 2005, (a), LOD 856.

Blumeria graminis (DC.) Speer
= *Erysiphe graminis* DC.
On *Poa* sp., Czarnocin, garden, 16 Aug. 1995, (a), LOD 14; on *Poa trivialis*, Ł6: ruderal place, 13 June 2005, (a), LOD 853; on *Secale cereale* cult., Ł6: farmland, 13 June 2005, (a), LOD 651.
The species was previously recorded on *Triticum aestivum* in Łódź-Łagiewniki (Kadłubowska 1963) and on *Deschampsia* sp. in Uniejów (LOD 105; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe aquilegiae DC.
var. ***aquilegiae***
On *Aquilegia vulgaris* cult., Czarnocin, garden, 11 Nov. 1995, (a), LOD 6.

var. ***ranunculi*** (Grev.) Zheng et Chen
= *E. ranunculi* Grev.
On *Delphinium* x *cultorum* cult., Ł3: allotment garden, 10 July 2005, (a), LOD 687 and 12 Aug. 2005, (t), LOD 754; on *Ranunculus acris,* Czarnocin, damp and shaded roadside, 22 Oct. 1995, (t), LOD 20; Ł1: garden, 30 Sept. 1998, (t), LOD 478; lawn, 30 Sept. 1998, (t), LOD 637; on *Ranunculus repens,* (sub *Ranunculus* sp.), Sobótka, roadside, 7 Aug. 1989, (a), *leg. AM, LOD 135* and 16 Oct. 1989, (t), *leg. AM, LOD 136.*
The species was earlier noted on *Delphinium* sp. in Bronisławów (LOD 137) and Zduńska Wola, on *R. acris* in Uniejów (sub *Ranunculus* sp., LOD 133, 134,), and on *Ranunculus* sp. in Łódź-Łagiewniki (LOD 139; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe artemisiae Grev.
On *Artemisia vulgaris,* Czarnocin, roadside, 22 Oct. 1995, (t), LOD 7; Ł1: lawn, 21 Sept. 2004, (t), LOD 633; Ł2: lawn, 21 Oct. 2004, (t), LOD 632; lawn, 29 Oct. 2004, (t), LOD 631; Ł5: meadow roadside, 26 Oct. 1999, (t), *leg. DF,* LOD 375; Ł6: neglected meadow, 12 Oct. 2005, (t), LOD 818.
The species was previously reported on this host from Proboszczewice near Łódź (Garbowski 1935), the Botanical Garden in Łódź (Kadłubowska 1963) and from Bronisławów, Konin, Łask, Łódź, Łagiewniki Sobótka, Uniejów and Zduńska Wola (LOD 59-63, 65-70, 254; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe betae (Vaňha) Weltzien
The fungus was noted only by Kalinowska-Kucharska and Kadłubowska (1993) on *Beta vulgaris* L. in Bronisławów and Sobótka (LOD 71, 72).

Erysiphe biocellata Ehrenb.
= *E. galeopsidis* DC.; *E. salviae* (Jacz.) Blumer

On *Mentha* x *citrata* cult., Koluszki town, Sportowa, flower and vegetable garden, 16 Aug. 2004, (t), *leg. AK*, LOD 541; on *Monarda didyma* cult., Ł3: allotment garden, 18 July 2005, (immature t), LOD 700.

Notes. On *M. didyma* the parasite was observed for two times: in the Botanical Garden in Lublin (Romaszewska-Sałata and Sałata 1978; Sałata 1985) and on *M. hybrida* hort. in the Vegetative Hall of the Agricultural University in Szczecin (Adamska 2002).

Erysiphe buhrii U. Braun

On *Melandrium album,* Czarnocin, roadside, 29 Oct. 1995, (a), LOD 8; Ł2: near the park, lawn, 30 July 2005, (a), LOD 732; Ł5: meadow roadside, 9 Nov. 1999, (t), *leg. DF*, LOD.

The taxon was previously reported by Kalinowska-Kucharska (1998) on *Melandrium album* from the Botanical Garden in Łódź.

Erysiphe cichoracearum DC.
var. ***cichoracearum***

On *Achillea millefolium*, Ł6: lawn, 22 Aug. 2005, (a), with *Ampelomyces quisqualis* Ces., LOD 784; on *Aster novae-angliae* cult., Czarnocin, roadside, 22 Oct.1995, (a), LOD 10; on *Centaurea phrygia*, Ł6: near the school building, beside the wall, 22 July 2005, (a), LOD 701; on **Centaurea pulcherrima* cult., Ł3: allotment garden, 28 July 2005, (t), LOD 696; on *Cichorium intybus*, Ł6: lawn, 22 July 2005, (t), LOD 714; on *Cirsium arvense,* Sobótka, park, 16 Oct. 1989, (t), *leg. AM,* LOD 78; Czarnocin, damp meadow beside the river, 22 Oct. 1995, (t), LOD 11; Ł5: mixed forest edge, 26 Oct.1999, (t), *leg. DF,* LOD 362; on *Cirsium vulgare* (sub *C. arvense*), Sobótka, park, 25 Sept. 1989, (t), *leg. AM,* LOD 79; on **Coreopsis tinctoria* cult., Ł3: allotment garden, 16 Aug. 2005, (a), LOD 774; on *Dahlia hybrida* cult., Ł6: flower garden, 15 Oct. 2005, (a), LOD 814; on *Hieracium pilosella*, Forest district Bełchatów, Adamów, forest compartment 313 a, dump of brown coal mine „Bełchatów", 5-years old pine plantation, 10 Oct. 2001, (a), LOD 615; Ł6: abandoned meadow, 25 Oct. 2005, (a), LOD 843; on *Hieracium aurantiacum*, Ł6: abandoned field, 25 Oct. 2005, (a), LOD 847; on *Inula britannica*, Ł6: lawn, 25 Oct. 2005, (a), LOD 849; on *Lactuca serriola*, Ł4: near a fence, 10 June 2005, (a), LOD 707; Ł6: near a block of flats, in a hedge, 28 June 2005, (a), LOD 647; near the school building, near the wall, 22 July 2005, (a), LOD 698; on *Leontodon autumnalis*, Ł2: lawn, 21 July 2005, (a), LOD 709; on *Solidago gigantea*, Czarnocin, roadside, 24 Sept. 1995, (a), LOD 9; Ł6: abandoned field, 4 Aug. 2005, (a), LOD 759; on *Sonchus arvensis*, Ł2: lawn near a fence, 27 Sept. 2003, (t), LOD 477; on *Sonchus oleraceus*, Ł1: lawn, 14 Aug. 2005, (t), LOD 775; Ł2: lawn beside a fence, 25 July 2005, (a), *leg MRM*, LOD 747; on *Tanacetum parthenium*, Ł1: lawn, 24 July 2005, (a), LOD 741; on *Tanacetum vulgare,* Ł5: mixed forest edge, 1 Oct. 1999, (a), *leg. DF,* LOD 364; Łódź, Bandurskiego, near the stadium of ŁKS, lawn, 29 July 2005, (a), LOD 740; on *Tragopogon pratensis*, Ł1: lawn next to the road, 15 Sept. 2003, (t), LOD 523; Ł6: abandoned field, 21 July, (a), LOD 708; Ł2: roadside, 20 July 2005, (a), LOD 742.

The taxon was several times reported from Central Poland: on *Centaurea phrygia* from Uniejów (LOD 255, sub *Centaurea* sp.), on *Cirsium arvense* from Milejowiec (Kadłubowska 1963), Bronisławów (LOD 75, sub *Cirsium* sp.) and Konin (LOD 76, 77; Kalinowska-Kucharska and Kadłubowska 1993), on *Cirsium vulgare* from Łask (LOD 81), on *Leontodon* sp. from Uniejów (Kalinowska-Kucharska and Kadłubowska 1993), on *Solidago canadensis* from the Botanical Garden in Łódź (Kalinowska-Kucharska 1998), on *Solidago* sp. from Milejowiec (Kadłubowska 1963) and on *Tanacetum vulgare* from Łódź (Kalinowska-Kucharska and Kadłubowska 1993). The material collected on the latter locality (LOD 80) contains probably mislabelled leaves of *Melilotus alba* infected by *Microsphaera trifolii*.

var. ***latispora*** U. Braun

On *Helianthus tuberosus*, Ł5: (sub *Helianthus* sp.), allotment garden, 20 Aug. 1999, (t), *leg. DF*, LOD 363; on **Rudbeckia hirta* cult., Ł3: allotment garden, 18 Aug. 205, (a), LOD 761; on *Rudbeckia laciniata* cult., Ł6: back garden, 27 July 2005, (a), LOD 725. *Erysiphe cichoracearum* var. *latispora* was recorded on *Helianthus tuberosus* in the Botanical Garden in Łódź (Kalinowska-Kucharska 1998).

var. ***fischeri*** (Blumer) U. Braun
= *Erysiphe fischeri* Blumer

On *Senecio sylvaticus*, Ł6: lawn, 7 Sept. 2005, (a), LOD 801;
This taxon has been found in Łódź on *Senecio vulgaris* (Kalinowska-Kucharska and Kadłubowska 1993). The herbarial material of this collection (LOD 100) is hardly crushed and there is no chance to identify the host correctly, but it is not the *S. vulgaris*.

Notes. *E. cichoracearum* is very common polyphagous parasite known to infect 114 host species in Poland (Majewski and Ruszkiewicz-Michalska 2005a unpubl.), but on 6 plant species listed above it is very rarely recorded, e.g. *A. novae-angliae, D. hybrida, H. aurantiacum, H. pilosella, R. laciniata, T. parthenium*. *Coreopsis tinctoria* and *Rudbeckia hirta* are new host species for this powdery mildew fungus in Poland. On these hosts only *Sphaerotheca fusca* has been reported so far (Adamska 2002).

Erysiphe circaeae Junell

On *Circaea* sp., Ł6: deciduous forest, 28 Aug. 2005, (a), LOD 786.
The species was previously found on *Circaea lutetiana* in Łódź-Łagiewniki (LOD 82; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe convolvuli DC.
var. ***calystegiae*** U. Braun

On *Calystegia sepium*, Warszawa-Wola, 18 Sept. 1999, (immature t), *leg. M. Kryńska, det. MRM*, LOD 90; Ł2: on a fence, 29 Aug. 2005, (immature t), LOD 755; Ł4: on a fence, 25 July 2005, (a), LOD 743.

var. ***convolvuli***

On *Convolvulus arvensis*, Sobótka, 21 Aug. 1989, (a), *leg. AM*, LOD 84 and 9 Oct. 1989, (t), LOD 85; Czarnocin, damp meadow near the river, 12 Oct. 1995, (t), LOD 12; Ł2: on a fence, 3 Oct. 1994, (t), LOD 532; on a fence, 25 July 2005, (a), LOD 744; Ł4: lawn, 15 July 2005, (a), LOD 670; Ł5: front garden, 1 Oct. 1999, (t), *leg. DF*, LOD 357; Ł6: near a block of flats, in a hedge, 28 June 2005, (a), LOD 666.

E. convolvuli was previously reported twice on this host from Łódź (Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993; LOD 89) and several times from other localities: Brzeźno, Konin, Łask, Młodzieszyn and Zduńska Wola (LOD 88, 91-94; Kalinowska-Kucharska and Kadłubowska 1993). The material from Warsaw (LOD 86) collected by *M. Kryńska* consists of the leaves of *Convolvulus arvensis* infected by *E. convolvuli* var. *convolvuli* and *Calystegia sepium* with immature cleistothecia of *E. c.* var. *calystegiae* (LOD 90).

Erysiphe cruciferarum Opiz ex Junell

On *Alliaria petiolata*, Ł1: front garden, 13 July 2002, (t), LOD 593; Ł4: shrubs, 20 Aug. 2005, (t), LOD 765; in park, 12 Oct. 2005, (t), with *Ampelomyces quisqualis* Ces., LOD 816; on *Berteroa incana*, Ł3: lawn, 10 Aug. 2005, (a), LOD 763; on *Capsella bursa-pastoris*, Ł6: lawn under a block of flats, 17 July 2005, (a), LOD 690; Piłsudskiego near the intersection with Mickiewicza, 10 Sept. 2003, (a), LOD 518; on *Lepidium ruderale*, Ł6: lawn, 25 Aug. 2005, (a), LOD 781; on *Sisymbrium officinale*, Ł1: lawn, 7 Aug. 2005, (a), LOD 771; roadside, 7 Aug. 2005, (a), LOD 772.

Earlier this species was noted on *Sisymbrium* sp. in Uniejów (Kalinowska-Kucharska and Kadłubowska 1993).

Notes. On *L. ruderale* the fungus was observed only in Sędziszów Małopolski (Sałata 1985). Recently the fungus has been found for the first time on the second species of *Lepidium*: *L. latifolium* (Piątek 2004).

Erysiphe cynoglossi (Wallr.) U. Braun
= *E. asperifoliorum* Grev.

On *Symphytum officinale*, Ł2: near a fence, 12 July 2005, (t), LOD 799.

Erysiphe depressa (Wallr.) Schlecht.

On *Arctium lappa*, Sobótka, 28 Aug. 1989, (t), *leg. AM*, LOD 98 and 9 Oct. 1989, (t), LOD 99; Czarnocin, roadside, 19 Aug. 1995, (t), LOD 13; Ł4: lawn, 15 July 2005, (t), LOD 705; on *Arctium minus*, Ł5: mixed forest edge, 21 Aug. 1998, (t), *leg. DF et EKK*, LOD 356.

The fungus was previously reported from several localities: on *Arctium lappa* from Bronisławów (sub *Arctium* sp., *rev. EKK*), Łask, Łódź and Młodzieszyn (LOD 95, 96; Kalinowska-Kucharska and Kadłubowska 1993; Kalinowska-Kucharska 1998) and on *Arctium minus* from Łódź (Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993; LOD 96).

Erysiphe echinopis U. Braun

On **Echinops ritro* cult., Ł3: allotment garden, 20 July 2005, (t), LOD 697.

Notes. The species is known to parasitize *E. ritro* in Bulgaria, France, Spain, United Kingdom and former USSR (Braun 1995). In Poland it was recorded on *E. exaltatus* and *E. sphaerocephalus* (Sałata 1985; Piątek 2000; Czerniawska 2001).

Erysiphe galeopsidis DC.

On *Ballota nigra*, Ł6: lawn near a block of flats, 22 July 2005, (a), LOD 746; on *Galeopsis bifida*, Ł3: deciduous forest edge, 18 Sept. 2003, (t), LOD 461; on *Glechoma hederacea*, Ł1: lawn, 24 Oct. 2004, (a), LOD 510; on *Lamium album*, Łódź, the Zoological Garden, weed, 20 Aug. 2005, (a), LOD 783; on *Lamium amplexicaule*, Ł6: near a block of flats, lawn, 27 June 2005, (a), LOD 660; on *Lamium purpureum*, Ł4: lawn, 20 Aug. 2005, (a), LOD 757; on *Stachys sylvatica*, Ł6: deciduous forest, 28 Aug. 2005, (t), LOD 785.

The earlier records of the species have come from papers of Kadłubowska (1963), Kalinowska-Kucharska and Kadłubowska (1993) and Kalinowska-Kucharska (1998) who noted it on *Ballota nigra* ssp. *nigra* (sub *Clinopodium vulgare*, LOD 104), *Galeopsis* sp. (sub *Lamium* sp., in Uniejów, LOD 102, 103), *Galeopsis tetrahit* (Łódź-Helenówek), *Lamium album* (the Botanical Garden in Łódź), *Lamium* sp. (Młodzieszyn) and *Leonorus cardiaca* (sub *Leonurus* sp., in Uniejów, LOD 101).

Erysiphe geraniacearum U. Braun et S. Simonjan

Kadłubowska (1963) in her paper dealing with *Erysiphaceae* of Łódź voivodeship reported from Górki near Koło on *Geranium pratense* powdery mildew fungus, which she identified as *Erysiphe communis* Grev. f. *geraniacearum* Roum.

Notes. Sałata (1985) using the description given by Kadłubowska, assumed that the fungus should be classified as *Leveillula geraniacearum* Eliade, but because of the lack of the herbarial material he could not verify this record. According to the newer taxonomy of powdery mildews (Braun 1995), the fungi reported on *Geranium* spp. sub *E. communis* or *E. polygoni* should belong to the *Erysiphe geraniacearum*. The majority of these records cannot be verified and that is why the morphology and distribution of the species is insufficiently known; this taxon appears to be not rare. Braun (l.c.) mentioned Poland among countries in which the taxon has been reported only on *G. pratense* and he presumably have made this on the basis of Kadłubowska's record. In Poland *E. geraniacearum* has beenhowever recorded also (sub *E. communis*) by Jacky (1900) from Prószków near Opole on *Geranium molle* and from Wierzbno near Warszawa by Błoński (1896) on *G. robertianum*, which has not been mentioned by Braun (1995) and Farr et al. (n.d) as the host for this fungal species.

Erysiphe heraclei DC.

On *Daucus carota*, Ł6: beside the wall, 12 Sept. 2005, (a), with *Ampelomyces quisqualis* Ces., LOD 791; on *Heracleum sphondylium,* Bronisławów, scrubs next to the road, 16 Aug. 1988, (a), *leg. E. Murzyńska,* LOD 109; Młodzieszyn, roadside, 20 Aug. 1988, (t), *leg. M. Malczewska,* LOD 113; Sieradz, roadside, 16 Oct. 1989, (t), *leg. EKK*, LOD 111; Czarnocin, roadside, 12 Aug. 1995, (t), LOD 15; Ł3: mixed forest edge, 29 July

1999, (t), LOD 460; on *Pastinaca sativa*, Ł4: lawn, 24 July 2004, (t), LOD 468; Ł6: abandoned field, 22 July 2005, (t), LOD 715; abandoned meadow, 6 Aug. 2005, (t), LOD 750; on *Petroselinum crispum* cult., Czarnocin, vegetable garden, 30 Sept. 1995, (a), LOD 16; Ł3: allotment garden, 5 Oct. 2005, (a), *leg. M. Michalska*, LOD 811.
This fungus was previously reported on *Heracleum sphondylium* from Łask town and the Botanical Garden in Łódź (Kalinowska-Kucharska and Kadłubowska 1993; Kalinowska-Kucharska 1998) and on *Petroselinum crispum* from Chojny near Łódź (Garbowski and Juraszkówna 1933), which is now within the admistrative borders of Łódź. Besides that it was noted on two other hosts: *Heracleum* sp. in the Botanical Garden in Łódź by Kadłubowska (1963) and on *Torilis japonica* in Łódź-Łagiewniki and Bronisławów by Kalinowska-Kucharska and Kadłubowska (1993). The material of this two last collections (LOD 106, 107, 112) is incomplete and the host cannot be verified.

Erysiphe howeana U. Braun
On *Oenothera biennis*, Ł2: lawn, 12 June 2003, (a), LOD 522; Ł3: roadside, 10 Aug. 2005, (a), LOD 770; Ł4: lawn, 7 Oct. 2005, (a), LOD 797.

Erysiphe knautiae Duby
On *Knautia arvensis*, Ł3: roadside, 10 Aug. 2005, (t), LOD 769.

Erysiphe lycopsidis Zheng et Chen
On *Anchusa officinalis*, Ł2: lawn, 30 July 2005, (a), LOD 735; Ł6: near a fence, 11 Sept. 2005, (t), LOD 788.

Erysiphe magnicellulata U. Braun var. ***magnicellulata***
On *Phlox paniculata* cult., Ł3: allotment garden, 13 Aug. 2002, (t), LOD 496; the same place, 18 Aug. 2005, (a), with *Ampelomyces quisqualis* Ces., LOD 762; Ł5: front garden, 17 Sept. 1999, (t), *leg. DF*, LOD 369.
Fungus was reported previously on *Phlox paniculata* from Grotniki (LOD 110; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe mayorii Blumer var. ***mayorii***
On *Cirsium arvense*, Czarnocin, damp meadow near the river, 22 Oct. 1995, (t), LOD 18.

Erysiphe orontii Cast.
On **Campanula rapunculoides*, Ł1: beside the wall, 16 June 2002, (t), with *Ampelomyces quisqualis* Ces., LOD 515; Ł3: allotment garden, 14 Sept. 2000, (a), LOD 600; on **Capsella bursa pastoris*, Ł2: lawn, 25 July 2005, (a), LOD 716; on *Cucumis sativus* cult., Ł3: allotment garden, 12 Aug. 2005, (a), LOD 767; on *Cucurbita pepo*, Ł3: allotment garden, 22 July 2001, (a), LOD 649; on **Echinocystis lobata*, Ł6: on a fence, 26 Aug. 2005, (a), LOD 782; on *Petunia* x *hybrida* cult., Ł4: Bp M. Klepacz park, flower bed, 22 Oct. 2004, (a), LOD 470; on *Saintpaulia ionantha* cult., Ł4: window sill in a office, 27 Sept. 2005, (a), LOD 820; on *Viola arvensis*, Ł2: lawn, 28 June 2005, (a), LOD 629; on *Viola* x *wittrockiana* cult., Ł6: back garden, 20 Oct. 2005, (a), LOD 807.

Notes. The fungus is reported on 3 host species for the first time in Poland. On *C. rapunculoides* it has been recorded in several European countries (Braun 1995). In Poland only Piątek (2004) reported this fungus on undetermined *Campanula* species. On *C. bursa-pastoris*, which is in Poland commonly parasitized by *Erysiphe cruciferarum*, the fungus is known only from Germany (Braun 1995) and on *E. lobata* it has been reported from United Kingdom only (Farr et al. n.d.). Other listed above plant species, excluding cucumber and pumpkin, have been recorded sporadically as hosts of *E. orontii* (Dynowska et al. 1999; Adamska and Błaszkowski 2000; Adamska 2001, 2002; Piątek 2004).

Erysiphe pisi DC. var. ***pisi***

On *Medicago lupulina*, Ł3: forest edge, 10 Aug. 2005, (t), LOD 773; on *Pisum sativum* var. *arvense*, Ł6: back garden, 9 Oct. 2005, (a), LOD 796.

This fungus was recorded on *Lupinus polyphyllus* in Milejowiec and on *Vicia* sp. in the Botanical Garden in Łódź (Kadłubowska 1963), on *Vicia cracca* in Zduńska Wola (Kalinowska-Kucharska and Kadłubowska 1993) and on *Medicago sativa* in the Botanical Garden in Łódź (Kalinowska-Kucharska 1998). As there are no herbarium materials of these records, it is impossible to confirm their taxonomic status within the genera *Erysiphe* or *Microsphaera*.

Erysiphe polygoni DC.

On *Polygonum aviculare*, Sobótka, 25 Sept. 1988, (t), *leg. AM,* LOD 122 and 18 Sept. 1989, (t) LOD 123; Czarnocin, roadside, 10 Sept. 1995, (t), LOD 19; Ł1: lawn, 20 Sept. 2004, (t), LOD 630; Ł5: meadow roadside, 21 Aug., (a), *leg. DF,* LOD 359; Ł6: lawn, 15 June 2005, (a), LOD 656; Łódź, Bandurskiego, lawn, 16 July 2005, (t), LOD 673; on *Rumex acetosa*, Ł6: abandoned meadow, 4 Aug. 2005, (a), LOD 748; on *Rumex acetosella,* Ł1: lawn, 14 Aug. 2004, (a), LOD 507; Ł2: lawn, 25 July 2005, (a), LOD 731; Ł5: 18 Sept. 1998, (t), meadow roadside, *leg. DF*, LOD 374; on *Rumex confertus*, Łódź, 10 Sept. 1992, (t), *leg. EKK*, LOD 128 – the host is unverifiable due to its incompleteness.

The species was noted repeatedly on *Polygonum aviculare* and *Rumex acetosella* at nine localities: in Proboszczowice near Łódź (Garbowski 1935), the Botanical Garden in Łódź, Bronisławów, Konin (LOD 124, 125), Łask (LOD 131, 132), Łódź (LOD 117, 126, 127), Młodzieszyn (LOD 121), Uniejów and Zduńska Wola (LOD 118-120; Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe sordida Junell

On *Plantago major,* Uniejów, park, glade, 9 Sept. 1988, (a), *leg. W. Sasiak,* LOD 154; Sobótka, 31 Aug. 1989, (a), *leg. AM*, LOD 144 and 16 Oct. 1989, (t), LOD 145; Czarnocin, damp and shaded roadside, 8 Oct. 1995, (t), LOD 21; Ł5: meadow roadside, 21 Aug. 1998, (t), *leg. DF,* LOD 365; Ł6: lawn, 15 July 2005, (a), LOD 800; lawn, 30 June 2005, (a), LOD 659.

The fungus was recorded in Central Poland on the host for several times (Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993; Kalinowska-Kucharska 1998). The list of its localities includes nine places: Bronisławów (LOD 153), Grotniki (LOD 147), Konin (LOD 142, 143), Łagiewniki

(LOD 155); Łask (LOD 148, 149), Łódź (LOD 140, 141), Młodzieszyn (LOD 146), Sieradz and Zduńska Wola (LOD 150, 151). In the materials from Łódź and Zduńska Wola we have observed the *Ampelomyces quisqualis* Ces.

Erysiphe urticae (Wallr.) Blumer

On *Urtica dioica,* Sobótka, beside a house, 18 Sept. 1989, (t), *leg. AM*, LOD 167 and 168; Czarnocin, damp and shaded roadside, 5 Oct. 1995, (t), LOD 23; Ł3: allotment garden, weed, 12 Aug. 2005, (t), LOD 752.

This powdery mildew was earlier found on *U. dioica* in Konin (LOD 169, 170) and Łódź (Kalinowska-Kucharska and Kadłubowska 1993).

Erysiphe verbasci (Jacz.) Blumer

The occurrence of the species in Central Poland is known only from the paper of Garbowski and Juraszkówna (1933), who reported it on *Verbascum* sp. from Łódź.

Microsphaera alphitoides Griff. et Maubl. var. ***alphitoides***

On *Quercus robur*, Sobótka, roadside, 9 Oct. 1989, (t), *leg. AM*, LOD 273; Młodzieszyn, roadside, 16 Sept. 1989, (t), *leg. EKK*, LOD 198; Czarnocin, mixed forest, 5 Oct. 1995, (t), LOD 24; Ł5: mixed forest, 27 Oct. 1999, (t), *leg. DF*, LOD 367; Ł6: near the school building, 28 June 2005, (a), LOD 658; on *Quercus petraea*, Sobótka, roadside, 14 Aug. 1989, (a), *leg. AM*, LOD 274; Ł1: roadside, 12 Sept. 2003, (t), LOD 539; on *Quercus robur* × *petraea* [= *Q.* × *rosacea*], Ł1: near the school building, 21 Sept. 2001, (t), LOD 493; Ł5: (sub *Q. petraea*), mixed forest, 1 Sept. 1998, (a), *leg. DF,* LOD 376; Łódź, Łagiewnicki Forest, Wycieczkowa, roadside, 12 Oct. 2004, (t), LOD 538.

The fungus was reported repeatedly on various representatives of the genus *Quercus:* on *Q. robur* in Łódź and Milejów near Piotrków Trybunalski (Kadłubowska 1963), on *Quercus petraea* in Łódź-Łagiewniki (Kadłubowska 1963) and on *Quercus pubescens* in the Botanical Garden in Łódź (Kalinowska-Kucharska 1998). The critical revision of the materials documenting records from Bronisławów, Grotniki, Konin, Łask, Łódź and Zduńska Wola (Kalinowska-Kucharska and Kadłubowska 1993; Kalinowska-Kucharska 1998) has revealed that the hosts determined as *Quercus* sp. belong mainly to *Q. robur* (LOD 185, 186, 190-192, 194-197, 199) and some of them are representatives of the hybrid *Q. robur* × *petraea* (LOD 187, 188, 193, 200, 201, 272).

Microsphaera astragali (DC.) Trev.

On **Astragalus cicer*, Łódź, Bandurskiego, near the Łódź-Kaliska railway station, roadside, 20 Sept. 2004, (a), LOD 464; on *Astragalus glycyphyllos*, Łódź, roadside, (sub *Erysiphe pisi* on *Vicia* sp.), 10 Oct. 1989, (t), *leg. EKK*, LOD 114; Banacha, roadside, (sub *Erysiphe trifolii* on *Coronilla varia*), 16 Oct. 1992, (t), *leg. EKK*, LOD 177; Ł5: arable field, 7 Aug. 1998, (t), *leg. DF,* LOD 379; Ł6: near the Botanical Garden, lawn, 22 July 2005, (t), LOD 737.

The species was previously noted twice on *Astragalus glycyphyllos* in Łódź (Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993; LOD 202, 203).

Notes. The parasite was recorded on *A. cicer* in France, Germany, Hungary, Romania, Switzerland, Turkey and the former USSR (Braun 1995; Farr et al. n.d.).

Microsphaera azaleae U. Braun

On *Rhododendron* cf. *luteum* cult., Łódź, Źródliska park, near the Palm house, 28 Sept. 2003, (t), LOD 526.

Notes. This North American fungus was introduced in Europe and its expanding through the continent has been observed since 1997. Piątek (2003) reported this fungus from the Botanical Garden in Kraków, suggesting that the species is spreading eastwards in Europe.

Microsphaera baeumleri Magn.

On *Vicia villosa*, Ł6: neglected meadow, 10 Aug. 2005, (a), LOD 753 and 29 Sept. 2005, (t), LOD 819.

The species was noted by Kalinowska-Kucharska and Kadłubowska (1993) on *Vicia cracca* in Łask (LOD 204).

Microsphaera berberidis (DC.) Lév. var. ***berberidis***

On *Berberis koreana* cult., Ł6: flower bed, 5 Nov. 2005, (t), LOD 607; on *Berberis thunbergii* cult., Ł6: 27 July 2005, (t), LOD 730; on **Berberis wilsoniae* cult., Ł6: hedge, 5 Oct. 2005, (t), with *Ampelomyces quisqualis* Ces., LOD 803; on *Berberis vulgaris*, Łódź, Łagiewnicka, roadside, 27 Oct. 1996, (t), *leg. EKK*, LOD 207; on *B. vulgaris* 'Atropurpurea' cult., Ł2: hedge, 7 July 2005, (a), *leg MRM*, LOD 704; Ł5: front garden, 9 Nov. 1999, (t), *leg. DF*, LOD 355; Ł6: hedge, 5 July 2005, (a), LOD 661; near a block of flats, hedge, 28 June 2005, (a), LOD 657; on **Berberis* × *ottawensis* cult., Ł2: hedge, 22 July 2005, (t), LOD 734; on *Mahonia aquifolium* cult., Ł2: Jan Matejko park, 12 Oct. 2000, (t), LOD 611 and 11 Nov. 2001, (t), LOD 610.

The parasite was earlier recorded on *Berberis vulgaris* in Łódź (Kadłubowska 1963; Kalinowska-Kucharska 1998) and in Łask (LOD 205, 206; Kalinowska-Kucharska and Kadłubowska 1993).

Notes. It is the first time the fungus has been reported on *B.* × *ottawensis* and *B. wilsoniae* (Majewski and Ruszkiewicz-Michalska 2005a unpubl.). *Berberis* × *ottawensis* is commonly cultivated spontaneous hybrid of *B. vulgaris* and *B. thunbergii* and is rarely distinguished from its parent species (Seneta 1991). A number of previous Polish records of *Microsphaera berberidis* may in fact relate to this host taxon. This parasite is known on *B.* × *ottawensis* from Sweden only and on *B. wilsoniae* from Bulgaria and United Kingdom (Farr et al. n.d.). *B. koreana* is another very rare host species for *M. berberidis*, known from Korea, Romania (Farr et al. n.d.) and Poland (Dynowska et al. 1999).

◆ ***Microsphaera deutziae*** Bunkina

On *Deutzia scabra* cult., Ł1: in a hedge, 12 Sept. 2005, (a), *et MRM*, LOD 778; 9 Oct. 2005, (a), LOD 808; 15 Oct. 2005, (a), LOD 854; 23 Oct. 2005, (a), LOD 810.

Notes. The species has been reported in Poland for the first time (Majewski and Ruszkiewicz-Michalska 2005a unpubl.). Morphological features of the fungus from collected material correspond with the description given by Braun (1987). It is known from Far East of the former USSR and Japan on the following species of

the genus *Deutzia*: *D. amurensis, D. crenata, D. gracilis, D. scabra, D. sieboldii* var. *dippeliana* (Braun 1987; Farr et al. n.d.).

Microsphaera divaricata (Wallr.) Lév.

On *Frangula alnus*, Czarnocin, damp and shaded roadside, 5 Oct. 1995, (t), LOD 25; Ł5: mixed forest, 30 Sept. 1998, (t), *leg. DF,* LOD 373.

The fungus was earlier recorded three times on *Frangula alnus*: in Ciosny near Łódź (Garbowski 1935), Łódź-Łagiewniki (Kadłubowska 1963) and in Łask (LOD 208; Kalinowska-Kucharska and Kadłubowska 1993).

◆ ***Microsphaera elevata*** Burrill

= *Erysiphe elevata* (Burrill) U.Braun et S.Takam.

On *Catalpa bignonioides*, Ł6: urban greenery, 14 Oct. 2005, (t), LOD 604 and 11 Nov. 2005, (t), LOD 861.

Notes. The species has been recorded in Europe for the first time in September 2002 (Vajna, Fischl and Kiss 2004) and the molecular data support the assumption that this North American fungus has only recently spread to the European continent and British Isles (Cook, Henricot and Kiss 2004). It has been reported from Czech Republic, Germany, Hungary, Slovakia and Switzerland on *C. bignonioides*, *C. erubescens* and *C. speciosa* (Ale-Agha et al. 2004). This is the first report of the fungus in Poland.

Microsphaera euonymi (DC.) Sacc.

On *Euonymus europaea*, Ł6: near the school building, cultivated, 28 June 2005, (a), LOD 662.

The occurring of the species is known from paper by Garbowski (1935) who noted it on *Euonymus europaea* in Czarnocin near Łódź and by Kadłubowska (1963) who found it on *E. verrucosa* in Łódź.

Microsphaera friesii Lév. var. ***friesii***

This parasite was reported by Kalinowska-Kucharska (1998) on *Rhamnus cathartica* from the Botanical Garden in Łódź.

Microsphaera grossulariae (Wallr.) Lév.

On *Ribes uva-crispa* cult., Czarnocin, vegetable garden, 22 Oct. 1995, (t), LOD 26.

The species was previously known from Łask and Łódź (LOD 209, 210; Kalinowska-Kucharska and Kadłubowska 1993).

Microsphaera hedwigii Lév.

On *Viburnum opulus*, Ł4: front garden, cultivated, 28 Oct. 2004, (t), LOD 508.

Microsphaera hypericacearum U. Braun

= *Erysiphe hyperici* Wallr. ex Blumer

On *Hypericum perforatum*, Czarnocin, roadside, 19 Sept. 1995, (a), LOD 17; Ł6: ruderal place, 22 July 2005, (t), LOD 702.

Microsphaera hypophylla Nevod.

On *Quercus robur,* Czarnocin, mixed forest, 8 Oct. 1995, (t), LOD 27; on *Quercus robur* x *petraea*, Ł1: 21 Sept. 2001, (t), LOD 493.

Microsphaera lonicerae (DC.) Wint.

var. ***lonicerae***

On *Lonicera periclymenum* 'Serotina' cult., Łódź, the Zoological Garden, near the lion's pen, 11 July 2005, (a), LOD 686.

Notes. This taxon was found in Poland on *L. caprifolium, L. periclymenum* and on *L. xylosteum*, but on the second host it was collected at 3 localities only: Kożuchów (Schroeter 1893), the Botanical Garden in Lublin (Romaszewska-Sałata and Sałata 1978) and Nowa Sól (Sałata 1985).

var. ***ehrenbergii*** (Lév.) U. Braun

On *Lonicera tatarica* cult., Ł1: urban greenery, 12 Aug. 2005, (t), LOD 777; Ł6: near block of flats, 21 July 2005, (t), LOD 679.

Microsphaera palczewskii Jacz.

On *Caragana arborescens* cult., Ł2: flower bed, 16 Sept. 2004, (t), LOD 634; Ł5: front garden, 13 Sept. 1999, (t), *leg. DF et EKK,* LOD 380; Ł6: shopping center, flower bed, 14 June 2005, (t), LOD 663.

This widespread in Poland powdery mildew was repeatedly found on the host (in some records the host was determined as *Caragana* sp.) at several localities: Bronisławów, Czerwonka, Grotniki, Łódź, Konin, Łódź and Sieradz (LOD 211-216; Kalinowska-Kucharska and Kadłubowska 1993; Kadłubowska and Kalinowska-Kucharska 1997).

Microspharea russellii Clint

= *Oidium oxalidis* McAlpine

On **Oxalis fontana* [= *O. europaea*], Łódź, Narutowicza near the intersection with Kilińskiego, 23 Aug. 2003, (t), LOD 524; Ł2: near a fence, 21 Aug. 2004, (t), LOD 703; Ł3: allotment garden, weed, 6 Sept. 1998, (t), LOD 606.

Notes. The fungus was observed in Poland on *O. corniculata* and *O. stricta* (Sałata 1985; Wołczańska 1995; Piątek 2000).

Microsphaera symphoricarpi Howe

On *Symphoricarpos albus* cult., Ł2: roadside, 12 Oct. 2000, (a), LOD 612; Łódź, Strykowska near the intersection with Źródłowa, roadside, 8 Oct. 2001, (a), LOD 613.

Notes. The species has been observed on the host in Poland since 1998 (Czerniawska and Madej 1998; Czerniawska 2001) and recently it has been found in other European countries, but the ascomata were found only in the material recorded Germany. Sequence analysis as well as similarity in morphology of ascomata confirmed the co-identity of an English and a North American snowberry powdery mildew fungus (Kiss et al. 2002).

Microsphaera syringae (Schw.) Magn.

On *Ligustrum vulgare* cult., Łódź, Ł1: hedge, 27 Aug. 2002, (a), LOD 520; Ł6: hedge, 12 Oct. 2005, (t), LOD 603; 19 Oct. 2005, (a), LOD 608; on *Syringa vulgaris* cult., Ł1: roadside, 25 Sept. 2003, (t), LOD 691; Ł2: roadside, 4 Nov. 2001, (t), LOD 614; urban greenery, 10 Aug. 2005, (t), LOD 756.

Notes. The spreading of the species is observed in Poland for several years, but on *L. vulgare* it has been recorded only in Lublin (Wołczańska and Mułenko 2002).

Microsphaera syringae-japonicae U. Braun

On **Syringa josikaea* cult., Łódź, Paderewskiego near the intersection with Rzgowska, 17 July 2003, (t), LOD 519; Łódź, Narutowicza near the intersection with Kilińskiego, 23 Aug. 2003, (t), LOD 525.

Notes. This taxon infects several species of the genus *Syringa,* including *S. josikaea,* in Japan and Far East of the former USSR (Braun 1987). In Poland it was found on 5 representatives of the genus *Syringa* (Piątek 2003) and on *Ligustrum vulgare* as well (Piątek 2005).

Microsphaera tortilis (Wallr.) Speer

= *Erysiphe tortilis* Wallr.

On *Cornus alba* cult., Ł2: 30 July 2005, (a), LOD 736.

Microsphaera trifolii (Grev.) U. Braun

= *Erysiphe pisi* DC.; *E. trifolii* Grev.

On **Amorpha fruticosa*, Ł4: hedge, 31 Oct. 2005, (t), LOD 855; on *Lupinus polyphyllus* cult., Sobótka, flower bed, 21 Aug 1989, (t), *leg. AM,* LOD 181 and 16 Oct. 1989, LOD 182; Czarnocin, flower garden, 19 Aug. 1995, (a), LOD 22; on *Melilotus alba,* Łódź, Matejki, roadside, 10 Oct. 1991, (t), *leg. EKK*, LOD 80; Ł6: roadside, 14 Oct. 2005, (t), LOD 794; on *Robinia pseudoacacia* cult., Ł4: hedge, 25 Oct. 2005, (t), LOD 852; Ł6: near a block of flats, 14 Oct. 2005, (a), LOD 795; on *Trifolium pratense*, Ł5: meadow, 18 Sept. 1998, (t), *leg. DF,* LOD 358; Ł6: abandoned meadow, 10 June 2005, (a), LOD 677; 14 June 2005, (t), LOD 678; roadside, 5 Aug. 2005, (t), LOD 749; abandoned field, 18 Aug. 2005, (t), LOD 776.

This parasite was repeatedly recorded by Kalinowska-Kucharska and Kadłubowska (1993) and Kalinowska-Kucharska (1998) on: *Lupinus polyphyllus* (LOD 171 and LOD 183 sub *Lupinus* sp., *rev. EKK*), *Lupinus* sp. (LOD 178), *Melilotus officinalis*, *Trifolium arvense*, *T. medium* (sub *T. pratense*, LOD 173, 174), *T. pratense* (LOD 179, 180, 175, sub *T.* sp. LOD 176, *rev. EKK*) and on *Trifolium* sp. from few localities: the Botanical Garden in Łódź, Brzeźno, Grotniki, Konin, Łask, Łódź, Młodzieszyn and Zduńska Wola.

Notes. Infection of *Amorpha fruticosa* by powdery mildew fungus is observed in Poland for the first time. *M. trifolii* var. *trifolii* is known on this host from Romania, former USSR and former Yugoslavia (Braun 1995; Farr et al. n.d.).

Oidium carpini Foitzik

On *Carpinus betulus* cult., Ł2: Jan Matejko park, in a hedge, 18 Oct. 2005, (a), LOD 798; Ł4: hedge, 20 Aug. 2005, (a), LOD 766.

Notes. The only Polish records of this fungus come from Tarnów and Kraków (Piątek 2004a).

Phyllactinia fraxini (DC.) Fuss

On *Fraxinus excelsior*, Ł1: 27 Sept. 2001, (t), LOD 530; near a road, 20 Sept. 2004, (t), LOD 669; Ł2: 20 Sept. 2003, (t), LOD 467.

Phyllactinia guttata (Wallr.) Lév.

On *Betula pendula*, Łódź, 4 Nov. 1989, (t), *leg. EKK*, LOD 218; Czarnocin, mixed forest, 29 Oct. 1995, (t), LOD 28; Łask-Kolumna, 19 Sept. 2000, (t), LOD 598; Ł2: roadside, 5 Sept. 1998, (t), LOD 596; Ł3: deciduous forest edge, 16 Sept. 2003, (t), LOD 492; roadside, 9 Oct. 2001, (t), LOD 597; Ł5: mixed forest, 26 Oct. 1999, (t), *leg. DF et MRM*, LOD 354, 370; on *Corylus avellana*, Ł1: in a hedge, 20 Sept. 2005, (t), LOD 790; on *Padus serotina*, Łódź, Lublinek wood, forest compartment 54cx, mixed stand, 28 Oct. 2001, (a), with *Ampelomyces quisqualis* Ces., LOD 676; Łódź-Brus, deciduous forest, 2 July 2002, (t), LOD 466.

The fungus was earlier reported on *Betula* species: on *B. pendula* from Łask (LOD 219, 220) and Grotniki (LOD 217, sub *Betula* sp.; Kalinowska-Kucharska and Kadłubowska 1993), on *B. pubescens* from Łódź-Łagiewniki (Kadłubowska 1963) and on *Betula* sp. from Chrośno near Łódź (Garbowski 1935). It was noted also on *Padus serotina* in Czarnocin near Łódź (LOD 29, 448, 449; Ruszkiewicz-Michalska and Mułenko 2003).

Podosphaera clandestina (Wallr.) Lév. var. ***clandestina***

On *Cydonia oblonga* cult., Ł6: hedge, 22 July 2005, (a), LOD 723; on *Crataegus monogyna*, Ł6: hedge near a block of flats, 21 July 2005, (a), LOD 724; 10 Oct. 2005, (t), LOD 815.

Notes. This fungus is common parasite of the representatives of *Crataegus* in Poland. On *Cydonia oblonga* it has been observed in anamorphic stage in the Botanical Garden in Kraków (Piątek 2004).

Podosphaera leucotricha (Ell. et Ev.) Salmon

On *Malus domestica*, Ł6: back garden, 29 July 2005, (a), LOD 722.

Podosphaera tridactyla (Wallr.) de Bary var. ***tridactyla***

On *Padus avium*, Ł4: park, 12 Oct. 2005, (t), LOD 817; on *Prunus domestica*, Ł6: hedge, 29 July 2005, (t), LOD 721; on *Prunus* sp., Ł6: near a block of flats, 27 July 2005, (t), LOD 726.

Sawadaea bicornis (Wallr.) Homma

= *Uncinula bicornis* (Wallr.) Lév.

On *Acer campestre*, Łódź, the Zoological Garden, in a hedge, 20 Aug. 2005, (t), with *Ampelomyces quisqualis* Ces., LOD 780; Ł4: urban greenery, 25 Oct. 2005, (t), LOD 851; on *Acer negundo*, Czarnocin, mixed forest, 19 Aug. 1995, (a), LOD 32; Ł2: front garden, 10 Aug. 1997, (a), LOD 590; 10 July 2005, (a), LOD 688; Ł5: roadside, 27 July 1999, (a), *leg. DF*, LOD 372; Ł6: near a block of flats, in a hedge, 28 June 2005, (a), LOD 654; on *Acer platanoides*, Ł2: urban greenery, 27 Sept. 2003, (t), LOD 528;

on *Acer pseudoplatanus*, Ł2: urban greenery, 15 June 2005, (a), LOD 675; on **Acer saccharinum* cult., Ł4: park, 22 Oct. 2004, (t), LOD 463; in a hedge, 14 Oct. 2005, (a), LOD 793.

The powdery mildew has been found in Łódź on *Acer negundo* (LOD 248, 249; Kalinowska-Kucharska and Kadłubowska 1993) and on *A. campestre* (Kalinowska-Kucharska 1998).

Notes. On *A. saccharinum* the fungus was reported from Bulgaria, France and Germany (Braun 1995; Farr et al. n.d.).

Sawadaea tulasnei (Fuck.) Homma
= *Uncinula tulasnei* Fuck.

On **Acer ginnala* cult., Łódź, Rokicińska, urban greenery, 14 Oct. 2002, (t), LOD 462; on *Acer platanoides*, Ł2: near a fence, 30 Oct. 2004, (t), LOD 635; Ł5: mixed forest, 1 Oct. 1999, (t), *leg. DF,* LOD 381; Ł6: near a road, 21 Oct. 2004, (t), LOD 588; on *Acer tataricum* cult., Łódź, Rokicińska, urban greenery, 14 Oct. 2002, (t), LOD 469.

There are eight earlier notes on occurrence of the fungus in Central Poland. Kalinowska-Kucharska and Kadłubowska (1993) and Kalinowska-Kucharska (1997, 1998) recorded it on *Acer platanoides* in Grotniki, Łódź (LOD 233, 256, 257, 263), Łask (LOD 258, 259) and Zduńska Wola (LOD 252, 262).

Notes. It is the second report of *S. tulasnei* on *A. tataricum* in Poland (Piątek 2004) and the first on *A. ginnala*. On the last species it is known from Estonia and Ukraine (Braun 1995; Farr et al. n.d.).

Sphaerotheca aphanis (Wallr.) U. Braun var. ***aphanis***
= *S. alchemillae* (Grev.) Junell

On *Geum urbanum*, Ł6: near a block of flats, 28 June 2005, (a), LOD 664; on *Potentilla anserina*, Ł6: lawn, 20 Oct. 2005, (t), LOD 806; on *Potentilla fruticosa* cult., Ł6: urban greenery, 21 July 2005, (t), with *Ampelomyces quisqualis* Ces., LOD 710.

Garbowski (1935) reported this species on *Rubus* sp. from Ciosny near Łodź and Kalinowska-Kucharska (1998) found it on *Alchemilla pastoralis* and *Geum urbanum* in the Botanical Garden in Łódź.

Notes. On *P. fruticosa* the fungus has been observed in Warszawa-Śródmieście (Romaszewska-Sałata, Sałata and Mułenko 1986).

Sphaerotheca balsaminae (Wallr.) Kari

Previously the fungus was noted by Kalinowska-Kucharska and Kadłubowska (1993) on *Impatiens noli-tangere* in Łagiewniki (LOD 221, 222).

Sphaerotheca dipsacearum (R. L. Tul. et C. Tul.) Junell

On **Dipsacus sylvestris* x *D. laciniatus*, Łódź, the Botanical Garden, 23 July 2005, (t), LOD 695.

The species infecting *Dipsacus* sp. in Uniejów was noted by Kalinowska-Kucharska and Kadłubowska (1993). One of the exsiccata preserved in the herbarium (LOD 223) is incomplete and may not be identified, but the second belongs to *Dipsacus sativus* (LOD 224).

Sphaerotheca epilobii (Wallr.) Sacc.

On *Epilobium roseum*, Ł6: near a block of flats, lawn, 11 Sept. 2005, (a), LOD 789.

Sphaerotheca euphorbiae (Cast.) Salmon

On *Euphorbia esula*, Ł3: roadside, 10 Aug. 2005, (a), LOD 758.

Sphaerotheca ferruginea (Schlecht.) Junell

The occurrence of the fungus is known only from the published data. Kalinowska-Kucharska (1998) reported it on *Sanguisorba officinalis* from the Botanical Garden in Łódź.

Sphaerotheca fugax Penz. et Sacc.

On *Geranium pratense* cult., Łódź, The Botanical Garden, Rock garden section, on the rock, cultivated, 2 July 2005, (t), LOD 648.

Sphaerotheca fuliginea (Schlecht.) Poll.

On *Veronica chamaedrys*, Łódź-Zdrowie, near a fence of the Zoological Garden, 11 July 2005, (a), LOD 689; on **Veronica serpyllifolia*, Łódź, „Sielanka" park, near the Pabianicka, shaded lawn, 14 July 2005, (a), LOD 728; 19 July 2005, (a), LOD 729 and 2 Aug. 2005, (a), LOD 727.

Notes. On *V. serpyllifolia* the parasite was recorded in Estonia, Finland, France, Romania and Switzerland (Braun 1995; Farr et al. n.d.).

Sphaerotheca fusca (Fr.) Blumer emend. U. Braun

= *S. erigerontis-canadensis* (Lév.) Junell; *S. phtheirospermi* P. Henn. et Shirai; *S. xanthii* (Cast.) Junell

On *Calendula officinalis* cult., Sobótka, flower bed, 28 Aug. 1989, (a), *leg. AM*, LOD 243 and 23 Oct. 1989, (t), LOD 244; Łódź, garden, 10 Oct. 1991, (t), *leg. EKK*, LOD 246; Czarnocin, flower garden, 24 Sept. 1995, (t), LOD 31; Koluszki town, Sportowa, back garden, 16 Aug. 2004, (a), *leg. AK*, LOD 540; Ł6: in the garden, 16 Aug. 2005, (t), LOD 760; on *Chamomilla suaveolens*, Ł4: near the buildings of Technical University, 14 July 2005, (t), LOD 685; Sochaczew town, near the railway station, shaded lawn, 12 Aug. 2000, (t), LOD 616; on *Conyza canadensis*, Ł2: lawn, 19 June 2005, (a), LOD 625; on **Cosmos bipinnatus* cult., Ł1: lawn, 9 Oct. 2005, (a), *et MRM*, LOD 812; Ł4: front garden, 17 Aug. 2004, (t), LOD 646; on *Senecio jacobaea*, Ł6: abandoned field, 8 Aug. 2005, (a), LOD 768; on *Taraxacum officinale* s.l., Uniejów, park, roadside, 9 Sept. 1988, (t), *leg. W. Sasiak*, LOD 232; Czarnocin, damp meadow near the river, 17 Sept. 1995, (t), LOD 30; Ł1: lawn, 21 July 2000, (a), LOD 483; lawn, 19 June 1999, (a), LOD 621; Ł5: lawn, 26 Oct. 1999, (t), *leg. DF et EKK*, LOD 382.

The parasite was recorded many times on its common host *Taraxacum officinale* (Kadłubowska 1963; Kalinowska-Kucharska and Kadłubowska 1993; Kalinowska-Kucharska 1998) from the Botanical Garden in Łódź, Bronisławów (LOD 225, 226), Grotniki, Górki, Konin (LOD 236, 237), Łask (LOD 231), Łódź (LOD 235), Sieradz (LOD 227) and Zduńska Wola (LOD 228, 234). It is also known to parasitize *Bidens tripartita* in Milejowiec (Kadłubowska 1963) and Łask (LOD 245) and other host – *Calendula officinalis* in Brzeźno, Młodzieszyn and Zduńska Wola (LOD 240-242; Kalinowska-Kucharska and Kadłubowska 1993).

Notes. On *C. bipinnatus* the fungus was observed in Asia, South Africa and Romania (Farr et al. n.d.).

Sphaerotheca lini Zvetkov

The occurring of the species is proved only by literature data: it was found by Kalinowska-Kucharska (1998) on *Linum catharticum* in the Botanical Garden in Łódź. There is no herbarium material.

Sphaerotheca macularis (Wallr.) Lind

On *Humulus lupulus*, Ł6: near a block of flats, in a hedge, 28 June 2005, (a), LOD 665; hedge, 18 Oct. 2005 (t), LOD 809.

Sphaerotheca mors-uvae (Schw.) Berk. et Curt.

On *Ribes uva-crispa*, Ł6: lawn, 21 May 2005, (a), LOD 568; on *Ribes nigrum* cult., Ł6: near a block of flats, front garden, 26 June 2005, (t), LOD 627.
The fungus is known to parasitize *Ribes uva-crispa* in Łódź (Kadłubowska 1963).

Sphaerotheca pannosa (Wallr. ex Fr.) Lév.

On *Rosa* cf. *canina*, Ł6: near a block of flats, 26 June 2005, (a), LOD 653; on *Rosa multiflora*, Ł6: lawn, 29 July 2005, (a), LOD 720; on *Rosa rugosa*, Ł5: front garden, 2 Nov. 1999, (t), *leg. DF*, LOD 378.
This parasite was previously reported on *Rosa canina* from Łask (LOD 247; Kalinowska-Kucharska and Kadłubowska 1993).
Notes. On *R. multiflora* and *R. rugosa* this fungus was recorded twice in Poland (Stec-Rouppertowa 1936; Sałata 1985; Danilkiewicz 1987).

Sphaerotheca plantaginis (Cast.) Junell

On *Plantago lanceolata*, Ł1: lawn, 20 July 2004, (t), LOD 591.

Sphaerotheca spiraeae Sawada
= *S. alchemillae* (Grev.) Junell

On *Spiraea* cf. *japonica* cult., Ł1: lawn near a block of flats, 22 Oct. 1999, (a), with *Ampelomyces quisqualis* Ces., LOD 620; flower bed, 10 Oct. 2000, (a), with *A. quisqualis* Ces., LOD 602; urban greenery, 14 Aug. 2004, LOD 504; lawn, 13 July 2005, (a), LOD 674; on **Spiraea* cf. *salicifolia* cult., Ł6: in a hedge, 22 July 2005, (a), LOD 699; 10 Oct. 2005, (a), LOD 813; on *Spiraea* x *vanhouttei* cult., Ł2: urban greenery, 29 Sept. 2001, (a), LOD 516.
Notes. The species has been recently reported in Poland on 3 species of the genus *Spiraea*: *S.* x *bumalda*, *S.* x *vanhouttei* and repeatedly on *S. japonica* (Piątek 2000, 2004; Wołczańska and Mułenko 2002).

Uncinula adunca (Wallr.) Lév. var. ***adunca***

On *Populus nigra* 'Italica', Ł2: urban greenery, 12 Oct. 2000, (t), LOD 601; roadside, 18 Oct. 2005, (t), LOD 792; Ł5: roadside, 2 Nov. 1999, (t), *leg. DF*, LOD 371.

Uncinula flexuosa Peck
= *Erysiphe flexuosa* (Peck) U. Braun et S. Takamatsu

On *Aesculus hippocastanum* cult., Ł6: near a block of flats, 11 Sept. 2005, (t), LOD 787; on *Aesculus* x *carnea*, Łódź, Struga near the intersection with Gdańska, urban greenery, near the road, 15 Nov. 2005, (t), LOD 860.

Notes. The epidemic spread of the parasite has been recently observed in Europe (Zimmermannová-Pastirčáková et al. 2002). In Poland it is known to parasitize *Aesculus hippocastanum, A. pavia* and *A.* x *carnea* (Wołczańska and Mułenko 2002).

Uncinula necator (Schw.) Burrill var. ***necator***

On *Vitis vinifera*, Sobótka, beside the building, 18 Sept. 1989, (t), *leg. AM*, LOD 253 and 23 Oct. 1989, (t), LOD 250; Aleksandrów Łódzki, near a fence, 1 Oct. 1995, (t), *leg. EKK*, LOD 251; Koluszki town, Sportowa, vegetable garden, 15 June 2004, (t), *leg. AK*, LOD 513.

The taxon was earlier noted on the host in Łódź (Kadłubowska 1963).

Acknowledgements: We are greatly indebted to Professor Maria Ławrynowicz (Department of Algology and Mycology, University of Łódź, Curator of the fungal collection of the Herbarium Universitatis Lodziensis) for her insightful comments on the manuscript and her kind permission to analise the materials preserved in the Herbarium. Many special thanks are also due to Professor Tomasz Majewski (Department of Plant Pathology, Warsaw Agricultural University) for his valuable comments on the manuscript and his kind permission to use unpublished data from his Mycological file. We are very indebted also to Dr Joanna Kazik (English translator) who's contribution to the English version of the paper cannot be overestimated. We are grateful to all of the collectors of exsiccata from fungal collection of Herbarium Universitatis Lodziensis as well.

The study was partially supported by University of Łódź (grant no 505/397).

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Fitopatogeniczne micromycetes Polski Środkowej. I. Peronosporales i Erysiphales

Streszczenie

W pracy przedstawiono stan poznania fitopatogenicznych mikromycetes na obszarze Polski Środkowej, a zwłaszcza aglomeracji łódzkiej. Dane zestawione w wykazie gatunków pochodzą z nielicznych publikacji (10) dotyczących tego obszaru, w których wymieniono łącznie 46 taksonów, w tym 3 gatunki Peronosporales i 43 przedstawicieli Erysiphales oraz notowania pochodzące z badań własnych (99 gatunków). Stwierdzono dwa gatunki nowe dla bioty Polski – *Microsphaera deutziae* Bunkina i *Microsphaera elevata* Burrill oraz 10 taksonów rzadkich. Większość taksonów grzybów są to gatunki w Polsce pospolite (64), ale notowane na badanym obszarze po raz pierwszy. Na 21 gatunkach żywicielskich występowanie wymienionych pasożytów obserwowano po raz pierwszy w Polsce. Są to głównie gatunki roślin wprowadzone przez człowieka w sposób celowy lub przypadkowy.