

Parasitic macrofungi (*Basidiomycetes*) on fruit shrubs and trees in the Tarnów town (S Poland)

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Results of 6 years of research carried out in the Tarnów town, southern Poland, are presented. Total number of 27 species of *Basidiomycetes* were recorded on 7 species of fruit shrubs and trees. Some of them were found on hosts new for Poland, on *Malus domestica* – *Abortiporus biennis*, *Ganoderma australe*, *Meripilus giganteus*, *Stereum hirsutum* and *Volvariella bombycina*; on *Juglans regia* – *Ganoderma applanatum* and *Hirneola auricula-judae*.

Key words: *Basidiomycetes*, urban fungi, wood-rotting fungi, parasitic fungi.

INTRODUCTION

In the Polish phytopathology little is known about macroscopic parasitic fungi which occur on fruit shrubs and trees (e.g. Orłós 1951; Glaser and Suski 1979; Borecki 1990; Kućmierz and Bartyńska 1993). Most data are available in the handbook of Garbowski (1964). Only two fungi, i.e. *Armillaria mellea* (Vahl: Fr.) Kumm. s.l. and *Chondrostereum purpureum* (Schum.: Fr.) Pouz., were described in more detail. Hence in order to recognize the most dangerous pathogens further studies in specific areas are necessary. Some information has been provided by Wojewoda (1974, 1996) from the Ojców National Park and Kraków.

The author carried out his studies on macroscopic parasites in the area of Tarnów, a medium-sized town situated in southern Poland (Fig. 1) in the Sandomierz Basin and partly in the Western Carpathians (Kondracki 1994). The city covers an area of 72 km² and is inhabited by 123 000 people. The built-up area covers ca. 34% of the whole city. An annually precipitation of 750 mm and a mean annual temperature of 8.5°C are noted in the city. It is the warmest city in Poland (Warszyńska 1988).

The present study was concerned with the fungi from the class *Basidiomycetes* sensu Hawksworth et al. (1995). The whole area of Tarnów was visited in the years 1994–1999. The fungi found on the trees were identified in the field or in the laboratory. The host tree, habitat and place of fructification were registered.

The studies concerned parasites on fruit and ornamental shrubs and trees, and yielded 58 species of parasitic *Basidiomycetes*. This paper provides information on 27 species which parasitize fruit shrubs and trees.

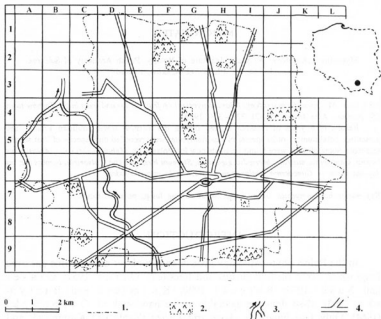


Fig. 1. Key map of the area investigated: 1 – borders of the city; 2 – forests and parks; 3 – rivers; 4 – streets

Fungi were mapped using the cartogramme method. Parallel to other towns, e.g. Kielce (Łuszczynski 1997), the area of Tarnów was divided into a grid of 1 km² squares (Fig. 1). One square was considered as one locality. In addition the number of infected trees was noted in each square.

FUNGI ON TREES

General remarks. Altogether 79 individuals of shrubs and trees infected by 27 species of fungi were recorded. The hosts were represented by seven species: *Juglans regia*, *Malus domestica*, *Prunus avium*, *Prunus cerasus*, *Prunus domestica*, *Pyrus communis* and *Ribes rubrum*. The identified *Basidiomycetes* belong to eight orders (Hawksworth et al. 1995): *Agaricales*, *Auriculariales*, *Ganodermatales*, *Hymenochaetales*, *Poriales*, *Schizophyllales*, *Stereales* and *Tremellales*. As far as the number of species is concerned, *Poriales*, *Hymenochaetales* and *Stereales* were the dominant orders (Table 1).

All the fungi recorded are polyphagous in their geographical range. However, some of them are connected with one host and on others they occur rarely. These are among others: *Inonotus hispidus*, *Sarcodontia crocea* and *Tyromyces fissilis* on *Malus domestica*; *Phellinus pomaceus* on *Prunus domestica*; and *Phylloporia ribis* on *Ribes*.

Table 1
Number of species in particular orders of *Basidiomycetes*

Order	Number of species
<i>Agaricales</i>	2
<i>Auriculariales</i>	1
<i>Ganodermatales</i>	2
<i>Hymenochaetales</i>	5
<i>Poriales</i>	11
<i>Schizophyllales</i>	1
<i>Stereales</i>	4
<i>Tremellales</i>	1

The parasitic fungi usually infected old, run-down or weakened trees, often in wounds or hollows, and caused rots in wood. Only two brown-rot fungi were observed: *Fomitopsis pinicola* and *Laetiporus sulphureus*. The remaining species were identified as white-rot fungi.

Fungi on *Juglans regia*. Eight species of fungi were identified on branches and trunks of 13 individuals of *Juglans regia* (Table 2). *Hirneola auricula-judae* and *Pleurotus ostreatus* were the most frequent species. *Hirneola auricula-judae* has not been reported on this host in Poland before. In the study area it occurred in wounds on branches and trunks of trees. The above fungus is a weak parasite and infects old and run-down trees (Kreisel 1961; Mańka 1998). *Pleurotus ostreatus* appeared on trunk of trees only, sometimes in a wound or hollow on trunks. It is regarded as a weak parasite on run-down trees (Hilber 1982; Mańka 1998). *Ganoderma applanatum* has been found for the first time on *Juglans regia* in Poland.

As a rule the fungi occurred singly on *Juglans regia*. On one tree the co-existence of two species: *Bjerkandera adusta* and *Flammulina velutipes* was observed. On another tree the coexistence of four species was noted. *Flammulina velutipes* and *Oxyporus populinus* were observed on the trunk of *J. regia*, whereas *Hirneola auricula-judae* and *Polyporus squamosus* occurred on the branches. The tree was strongly damaged in 1996–97 and was cut down in 1998.

Fungi on *Malus domestica*. Altogether, 17 species of fungi were identified on branches and trunks of *Malus domestica* (Table 2).

Table 2
Parasitic fungi (*Basidiomycetes*) and their hosts in Tarnów town

Species	Jr	Md	Pa	Pc	Pd	Py	Rb
<i>Abortiporus biennis</i>		+					
<i>Bjerkandera adusta</i>	+	+					
<i>Chondrostereum purpureum</i>		+					
<i>Exidia plana</i>		+					
<i>Flammulina velutipes</i>	+						
<i>Fomitopsis pinicola</i>			+				
<i>Ganoderma applanatum</i>	+						
<i>Ganoderma australe</i>		+					
<i>Hirneola auricula-judae</i>	+	+					+
<i>Inonotus hispidus</i>		+					
<i>Laetiporus sulphureus</i>			+		+	+	
<i>Meripilus giganteus</i>		+					
<i>Oxyporus populinus</i>	+						
<i>Phellinus alni</i>		+					
<i>Phellinus pomaceus</i>				+	+		
<i>Phellinus punctatus</i>		+					
<i>Phlebia tremellosa</i>		+					
<i>Phylloporia ribis</i>							+
<i>Pleurotus ostreatus</i>	+						
<i>Polyporus squamosus</i>	+						
<i>Sarcodontia crocea</i>		+					
<i>Schizophyllum commune</i>		+	+		+		
<i>Stereum hirsutum</i>		+	+	+	+		
<i>Trametes hirsuta</i>	+						
<i>Trametes versicolor</i>		+					
<i>Tyromyces fissilis</i>		+					
<i>Volvariella bombycina</i>		+					

Abbreviations: Jr – *Juglans regia*, Md – *Malus domestica*, Pa – *Prunus avium*, Pc – *Prunus cerasus*, Pd – *Prunus domestica*, Py – *Pyrus communis*, Rb – *Ribes rubrum*

They occurred on 25 individuals of this host. *Inonotus hispidus* was the most common fungus on *Malus domestica* in the study area. It is surprising because the species was regarded as rare in Poland. Probably the species is not so rare, but rare recorded. *Inonotus hispidus* is a rather strong pathogen and causes intensive white rot in wood (D o m a ń s k i et al. 1967; Č e r n ý 1976; S z c z e p k a and B e r n a c k i 1988), and consequently the tree run-downs. In Tarnów the defoliation of trees infected by this parasite was observed. Among the fungi found during the studies five species were noted for the first time on *Malus domestica* in Poland. These were: *Abortiporus biennis*, *Ganoderma australe*, *Meripilus giganteus*, *Stereum hirsutum* and *Volvariella bombycina*. Probably *Ganoderma australe* was also noted for the first time on *Malus domestica* in Europe.

On 15 trees the fungi occurred singly, but on five individuals the coexistence of several species was observed. On three trees two species existed together. The following pairs of fungi were observed: (1) *Schizophyllum commune* – *Stereum hirsutum*, (2) *Tyromyces fissilis* – *Schizophyllum commune* and (3) *Tyromyces fissilis* – *Volvariella bombycina*. On one tree the coexistence of *Sarcodontia crocea*, *Schizophyllum commune* and *Stereum hirsutum* was noted. On another tree also three fungi: *Abortiporus biennis*, *Ganoderma australe* and *Meripilus giganteus*, occurred at the base of the trunk. The tree was strongly damaged in 1996–98 with the following symptoms of disease: dying of twigs and branches, defoliation of branches and desertion of bark. In 1998 the tree was cut down. Afterwards only basidiocarps of *Abortiporus biennis* were observed on the dead stump.

Fungi on *Prunus avium*, *P. cerasus* and *P. domestica*. Four species of fungi were observed on branches and trunks of 10 individuals of *Prunus avium* (Table 2). *Stereum hirsutum* was the most frequently noted fungus. In phytopathological literature it is regarded as a saprobe which sporadically infects living (mostly run-down) trees in injured places (O r ł o ś 1951; K r e i s e l 1961; Č e r n ý 1976; D o m a ń s k i 1982; M a ń k a 1998). During the studies it was observed on branches and rarely trunks, but always in wounds. This is in agreement with the findings of other authors. *Fomitopsis pinicola* found on *Prunus avium* is a fungus which generally occurs in natural forests. Sometimes it appears in orchards on the same tree as in Tarnów.

Two species of fungi, i.e. *Phellinus pomaceus* and *Stereum hirsutum* were recorded on one individual of *Prunus cerasus* (Table 2). Four species of fungi were found on *Prunus domestica* (Table 2). They parasitized on 25 individuals of this species. *Phellinus pomaceus* was found on 19 trees and was the most frequent species on *Prunus domestica* in the study area. The fungus is regarded as a dangerous pathogen in orchards on plum-trees (O r ł o ś 1951; K r e i s e l 1961). According to D o m a ń s k i et al. (1967) it causes an intense rot in wood and leads to the death of branches or trees. The species causes white rot, but the colour of the decay is brownish (N i e m e l ä 1977).

In Tarnów it was observed on trunks and rarely on branches. Its basidiocarps usually grew on bark and rarely in wounds. On the infected trees it caused dying of branches and defoliation.

Altogether, five species of fungi were identified on representatives of *Prunus*. *Fomitopsis pinicola* was found on *Prunus avium* only, *Phellinus pomaceus* on *Prunus cerasus* and *Prunus domestica*. *Laetiporus sulphureus* and *Schizophyllum commune* were recorded on *Prunus avium* and *Prunus domestica*. *Stereum hirsutum* was observed on all the *Prunus* species.

Fungi on *Pyrus communis* and *Ribes rubrum*. Only *Laetiporus sulphureus* was recorded on one individual of *Pyrus communis* (Table 2). No specific symptoms of disease were observed. Four specimens of *Ribes rubrum* were infected by two species, i.e. *Hirneola auricula-judae* and *Phylloporia ribis* (Table 2). The latter parasitizes on old individuals of *Ribes* and causes white rot in roots and at the base of shoots (Domański et al. 1967; Borecki 1990).

LIST OF SPECIES

Nomenclature was adopted according to Kreisel (1987), Ryvarden and Gilbertson (1993, 1994), Telleria (1990), and supplemented on the basis of works of other authors. The symbols: C9, E8, I5, etc. denote the number of the grid square demarcated in Tarnów (Fig. 1).

PHRAGMOBASIDIOMYCETIDAE

Auriculariales

Hirneola auricula judae (Bull.: Fr.) Berk. — Localities: C9 — near Pszenna str., in an orchard, on the shoots of living *Ribes rubrum*, 16.11.1996; E8 — near the crossroads of Czerwona str. and Krakowska str., roadside, on the branch of living *Juglans regia*, 20.07.1997; at Krakowska str. near the crossroads with Warsztatowa str., in an orchard, on the branches of two living *J. regia*, 20.07.1997; I5 — at Jasna str., roadside, in a wound on the trunk of living *Malus domestica*, 25.05.1997; I6 — at Jana Pawła II str. near the crossroads with Słoneczna str., roadside, in a wound on the trunk of living *J. regia*, 06.07.1995.

It is a common fungus in southern and western Poland and very rare in the north-eastern part of the country where its occurrence is probably limited by climatic factors (Wojewoda 1979). It is found on *Sambucus nigra* and on other deciduous trees as well. It has been reported hitherto only once on *Ribes rubrum* (Wojewoda 1979, 1980) and *Malus domestica* (Szczepka and Sokół 1986). *Juglans regia* is a new Polish host species reported in the present study.

Tremellales

Exidia plana (Wigg.) Donk — Localities: E7 — at Ogradowa str., roadside, on the trunk of living but dying *Malus domestica*, 09.11.1996; I5 — at Wojska Polskiego str., in an orchard, in a wound on the trunk of living *M. domestica*, 23.05.1997.

It occurs commonly in Poland on various deciduous trees, sporadically on conifers (Wojewoda 1979, 1980).

*HOLOBASIDIOMYCETIDAE**Agaricales*

Flammulina velutipes (Curt.: Fr.) Karst. — Localities: D8 — at Czerwona str. near the crossroads with Krakowska str., in a garden, on the trunk of living *Juglans regia*, 05.10.1996; E8 — near the crossroads of Czerwona str. and Krakowska str., roadside, on the trunk of living *J. regia*, 11.10.1996; I6 — at Długa str., in a garden, in a wound on the trunk of living *J. regia*, 02.01.1998.

It is widespread in Poland on many deciduous trees, both as a saprobe and parasite.

Volvariella bombycina (Schaeff.: Fr.) Sing. — Locality: D8 — at Czerwona str. near the crossroads with Krakowska str., in an orchard, in a hollow on the trunk of living *Malus domestica*, 27.07.1998.

Skirgiełło (1972) mentioned some localities of the fungus in Poland on some deciduous trees. In Poland *Malus domestica* is a host new for *Volvariella bombycina*. The species is listed in the red list of threatened macrofungi in Poland, where it has been placed in "I" (indeterminate) category (Wojewoda and Ławrynowicz 1992).

Ganodermatales

Ganoderma applanatum (Pers.) Pat. — Locality: G7 — at S. Konarskiego str., roadside, on the trunk of living *Juglans regia*, 08.08.1997.

It is a common species in Poland and is found on various host trees, mainly deciduous and rarely conifers (Skirgiełło 1970). So far it has not been reported on *Juglans regia* in Poland.

Ganoderma australe (Fr.) Pat. — Locality: C6 — at E. Kwiatkowskiego str., in a group of trees, at the base of the trunk of living *Malus domestica*, 19.08.1997.

In Poland it has been reported from a few localities, namely: Dąbroszyn near Kostrzyn (Jahn 1963), Białowieża (Domanski et al. 1967), Starożyn reserve (Anonimowo 1968), Kórnik (Lisiewska and Nowicka 1979), Stębark near Grunwald (Olesiński and

Wojewoda 1987), Lublin — Botanical Garden (Flisińska and Sałata 1991) and the Old Forest (Flisińska 1996), Kraków (Wojewoda 1996) and Warszawa—Żoliborz (Domanski 1997). Probably it is not such a rare species but has been confused with *Ganoderma applanatum*. *Ganoderma australe* has been reported to be present on *Acer saccharinum*, *Betula*, *Fagus sylvatica*, *Quercus* and *Ulmus campestris*. *Malus domestica* is a host new for this fungus in Poland and probably in Europe. Ryvar den and Gilbertson (1993) did not report it in Europe on this host. *Ganoderma australe* is included in the red list of Polish macrofungi, where it has been placed in "I" (indeterminate) category (Wojewoda and Ławrynowicz 1992).

Hymenochaetales

Inonotus hispidus (Bull.: Fr.) Karst. — Localities: E3 — at Niedomicka str., in an orchard, on the trunks of two living *Malus domestica*, 20.09.1999; F7 — at K. Pułaskiego str. near the crossroads with I. Mościckiego str., in a garden, on the branch and trunk of living *M. domestica*, 10.09.1996 and 29.08.1997; H3 — at Krzyska str. near the crossroads with Morełowa str., in a garden, on the trunk of living *M. domestica*, 31.08.1996; at Traktorowa str., in a garden, on the trunk of living *M. domestica*, 20.09.1999; I5 — at Jasna str., in a group of trees, on the trunk of living *M. domestica*, 11.07.1999; J6 — at Lwowska str. near the crossroads with Okrężna str., in a garden, in a wound on the trunk and branch of living *M. domestica*, 25.08.1995 and 02.09.1996.

In Poland it is a rather rare species and has been reported from 24 localities. Recently 11 new localities have been recorded in Tarnów (including the data given in this paper) and its surroundings. Hence the fungus is more frequent than is the case nowadays. It has probably been overlooked because the species prefers special kind of habitats such as orchards, gardens, alleys and similar places. *Inonotus hispidus* has been observed on such trees as: *Acer*, *Carpinus*, *Fraxinus*, *Malus*, *Morus*, *Platanus*, *Prunus*, *Quercus* and *Ulmus*. It is included in the red list of threatened macrofungi in Poland in "R" (rare) category (Wojewoda and Ławrynowicz 1992).

Phellinus alni (Bond.) Parm. — Localities: B8 — at Czarna Droga str., in an orchard, on the trunk of living *Malus domestica*, 22.08.1997; C9 — at Owsiana str., roadside, on the trunk of living *M. domestica*, 11.09.1994 and 16.11.1996; G5 — at J. Piłsudskiego str. near the crossroads with T. Romanowicza str., in an orchard, on the trunk of living *M. domestica*, 15.09.1997; at the end of J. Piłsudskiego str., in an orchard, on the trunk of living *M. domestica*, 15.09.1997.

Evidently a rather common fungus in Poland, but until recently it was regarded as *Phellinus igniarius* (L.: Fr.) Quél. or its variety — var. *alni* (Bond.) Niemelä. According to V a m p o l a (1993) *Phellinus igniarius* parasitizes *Salix*. The collections from other hosts represent other species. *Phellinus alni* occurs on *Alnus incana*, *Corylus*, *Malus domestica*, *Padus avium* and *Sorbus aucuparia*, whereas *Phellinus nigricans* (Fr.) Karst. sensu Č e r n ý (1989) parasitizes on *Carpinus betulus*, *Fagus sylvatica* and other deciduous trees (V a m p o l a 1993).

Phellinus pomaceus (Pers.) Maire — Localities: **B7** — at Azotowa str., in a garden, on the trunk of living *Prunus domestica*, 22.08.1997; **B8** — at Zbylitowska str., in a garden, on the trunk of living *P. domestica*, 30.10.1999; **C6** — at E. Kwiatkowskiego str. near the crossroads with A. Zawadzkiego str., in a group of trees, on the trunk of living *P. domestica*, 12.09.1996; **C7** — E. Kwiatkowski Park, in a tree-stand, on the trunk of living *P. domestica*, 12.09.1996; **C8** — at Czarna Droga str., in a garden, on the trunk of living *P. domestica*, 17.08.1997; **D3** — at the crossroads of Klikowska str. and Zagumnie str., in a garden, on the trunk of living *P. domestica*, 25.04.1997; **D8** — at Czerwona str. near the crossroads with Krakowska str., in an orchard, on the branch of living *P. cerasus*, 27.07.1998; **E8** — at the crossroads of Krakowska str. and Kapielowa str., in a garden, on the trunk of living *P. domestica*, 17.09.1997; **F7** — at the crossroads of K. Pułaskiego str. and Krakowska str., in a group of trees, on the trunk of living *P. domestica*, 27.06.1996; Planty Kolejowe park at Dworcowa str., in a tree-stand, on the trunk of living *P. domestica*, 01.04.1997; **G6** — at A. Asnyka str., roadside, on the trunk of living *P. domestica*, 03.07.1997; **G8** — at Tuchowska str. near the crossroads with Zamkowa str., in a garden, on the trunk of living *P. domestica*, 26.08.1994; **H1** — at Wiśniowa str. between Krzyska str. and Nowodąbrowska str., roadside, on the trunk of living *P. domestica*, 31.08.1996; **H4** — at Krzyska str. near the crossroads with Górna str., in a garden, on the trunk of living *P. domestica*, 04.09.1997; **H9** — at Wypoczynkowa str., in an orchard, on the branches and trunks of two living *P. domestica*, 02.04.1997; Miejski Park Kultury i Wypoczynku at PTTK str., in a group of trees, on the trunks of two living *P. domestica*, 02.04.1997; **I7** — at J. Kossaka str., in a garden, on the trunks of two living *P. domestica*, 14.06.1997.

The fungus is widespread in Poland on *Prunus domestica*. According to D o m a n ś k i et al. (1967) it occurs mainly on *Prunus* and *Cerasus*, rarely on *Malus* and *Pyrus*. Ł a w r y n o w i c z (1978) reported it from *Malus*. According to R y v a r d e n and G i l b e r t s o n (1994) it rarely occurs on some other deciduous trees in Europe.

Phellinus punctatus (Karst.) Pil. — Locality: **C9** — Klasztorny Park at Pszenna street, in a tree-stand, on the trunk of living *Malus domestica*, 06.07.1995.

It is not a rare species in Poland. The fungus was observed on various deciduous trees (D o m a ń s k i 1965). *Phellinus pseudopunctatus* David, Dequatre et Fiasson is similar macroscopically, but it has a characteristic hymenial setae (R y v a r d e n and G i l b e r t s o n 1994). Hence, careful microscopical examination is necessary to separate the two species. So far *Phellinus pseudopunctatus* has not been reported from Poland, but its occurrence is possible, particularly in regions with xerothermic plants.

Phylloporia ribis (Schum.: Fr.) Ryv. — Localities: G6 — at Na Łakach str., in a garden, on the roots and at the base of shoots of two living *Ribes rubrum*, 02.04.1997; I5 — at Jana Pawła II str., in an orchard, at the base of a shoot of living *R. rubrum*, 27.05.1995.

The species is rare in Poland and occurs at the base or on the roots of living *Ribes* and *Euonymus*. In other European countries it has also been reported on other hosts (R y v a r d e n and G i l b e r t s o n 1994). It is included in the Polish red list in "I" (indeterminate) category (W o j e w o d a and Ł a w r y n o w i c z 1992).

Poriales

Abortiporus biennis (Bull.: Fr.) Sing. — Locality: C6 — at E. Kwiatkowskiego str., in a group of trees, on the root and at the base of the trunk of living *Malus domestica*, 12.09.1996.

It is an extremely rare fungus in Poland. The species has been reported from Lower Silesia: Wrocław, Wołów, Brzeg, Głogów, and also in Babice near Warszawa (D o m a ń s k i et al. 1967), Ojców (W o j e w o d a 1974), Kraków—Branice and Wola Justowska (W o j e w o d a 1996), and the Chełmowa Mount in the Świętokrzyski National Park (D o m a ń s k i 1997). The host plants are unknown in all of these sites. In Poland *Malus domestica* is a host new for *Abortiporus biennis*. The species is strongly threatened and it has been placed in the "E" (endangered) category (W o j e w o d a and Ł a w r y n o w i c z 1992).

Bjerkandera adusta (Willd.: Fr.) Karst. — Localities: D8 — at Czerwona str. near the crossroads with Krakowska str., in a garden, in a wound on the trunk of living *Juglans regia*, 05.10.1996; E3 — at Niedomicka str., in an orchard, in a wound on the trunk of living *Malus domestica*, 20.09.1999.

This is a very common fungus in Poland. It occurs on various deciduous trees, mainly as a saprobe.

Fomitopsis pinicola (Sw.: Fr.) Karst. — Locality: C7 — at Czerwona str. near the crossroads with Czerwonych Klonów str., in a garden, on the branch and trunk of living but dying *Prunus avium*, 07.04.1996.

It occurs commonly in Poland on coniferous and deciduous trees, mainly in natural forests.

Laetiporus sulphureus (Bull.: Fr.) Murr. — Localities: **F6** — at I. Mościckiego str. near the crossroads with J. Szujskiego str., in a group of trees, on the trunk of living *Pyrus communis*, 21.05.1999; **I6** — at Skowronków str., in a group of trees, on the trunk of living *Prunus avium*, 31.08.1994; **J7** — at Okrężna str., in an orchard, on the trunk of living *P. domestica*, 14.06.1997.

In Poland it is widespread, usually as a parasite on various deciduous trees.

Meripilus giganteus (Pers.: Fr.) Karst. — Locality: **C6** — at E. Kwiatkowskiego str., in a group of trees, at the base of the trunk of living *Malus domestica*, 19.08.1997.

So far it has rarely been reported from Poland. Szczepka and Grzegorzek (1984) mentioned 24 localities. Afterwards it was also found in other localities, among others: Śliwice near Rychliki (Olesiński and Wojewoda 1987), Szczecin (Friedrich 1989), the Cedynia Landscape Park (Friedrich 1991), Tarnów (Piątek 1995), the Oliwa Forests near Gdańsk (Wilga 1996), Kielce (Łuszczzyński 1997) and the Marynopol reserve (Flisińska 1997). It occurs on various deciduous trees, but shows preference for *Aesculus hippocastanum* and *Fagus sylvatica*. So far it has not been observed on *Malus domestica* in Poland.

Oxyporus populinus (Schum.: Fr.) Donk — Locality: **E8** — near the crossroads of Czerwona str. and Krakowska str., roadside, on the trunk of living *Juglans regia*, 11.10.1996.

A rather common fungus on various deciduous tree species. Skirgillo (1986) reported it from 16 host plants.

Pleurotus ostreatus (Jacq.: Fr.) Kumm. — Localities: **C8** — at C. K. Norwida str., in a garden, in a hollow on the trunk of living *Juglans regia*, 31.03.1997; **C9** — near Pszenna str., in an orchard, in a wound on the trunk of living *J. regia*, 16.11.1996; **E4** — at Klikowska str. near the crossroads with Niedomicka str., in a garden, on the trunk of living *J. regia*, 25.04.1997; **E8** — at Krakowska str. near the crossroads with Warsztatowa str., in an orchard, on the trunk of living *J. regia*, 09.11.1996. Common fungus in Poland. It occurs on various deciduous trees.

Polyporus squamosus (Huds.): Fr. — Localities: **E8** — near the crossroads of Krakowska str. and Czerwona str., roadside, on the branch of living *Juglans regia*, 20.07.1997; **G6** — at Solidarności str., roadside, on the trunk of living but dying *J. regia*, 15.09.1997.

The fungus is widespread in Poland on various deciduous trees. Its basidiocarps usually appear on single trees.

Trametes hirsuta (Wulf.: Fr.) Pil. [= *Coriolus hirsutus* (Wulf.: Fr.) Qué.] — Locality: **I7** — near Łyczków str., in an orchard, on the trunk of living *Juglans regia*, 10.06.1995.

It appears commonly in Poland on many deciduous trees.

Trametes versicolor (L.: Fr.) Pil. [= *Coriolus versicolor* (L.: Fr.) Quél.]
 – Locality: **I5** – at Jasna str., in a group of trees, in a wound on the trunk of living *Malus domestica*, 14.06.1997.

In Poland it is widespread on various deciduous trees and shrubs.

Tyromyces fissilis (Berk. et Curt.) Donk – Localities: **D8** – at Czerwona str. near the crossroads with Krakowska str., in an orchard, in a hollow on the trunk of living *Malus domestica*, 27.07.1998 (Piątek 1999); **H3** – at Nowodąbrowska str. near the crossroads with L. Schillera str., in a garden, in a hollow on the trunk of living *M. domestica*, 31.08.1996 (Piątek 1999).

Piątek (1999) reported it from 28 localities. Unfortunately he omitted one locality, i. e. near Międzyrzec Podlaski (Bresadola 1903). Bresadola reported the fungus under the old name *Polyporus albus* (Huds.) Fr. Donk (1974) considered that it was *Tyromyces fissilis*. This is the oldest known locality of the fungus in Poland. The species has been reported from Poland on such species as *Aesculus hippocastanum*, *Fraxinus excelsior*, *Malus domestica* and *Populus tremula*. It is included in the red list of Polish macrofungi where it has been placed in "R" (rare) category (Wojewoda and Ławrynowicz 1992).

Schizophyllales

Schizophyllum commune Fr.: Fr. – Localities: **C6** – at E. Kwiatkowskiego str. near the crossroads with Czerwonych Klonów str., in a group of trees, in a wound at the base of the trunk of living *Malus domestica*, 28.06.1997; **G7** – at Łazienna str., in a group of trees, in a wound on the trunk of living *Prunus avium*, 28.07.1997; **H3** – at Nowodąbrowska str. near the crossroads with L. Schillera str., in a garden, on the trunk of living *M. domestica*, 23.09.1997; **H9** – at Wypoczynkowa str., in an orchard, on the trunk of living *P. domestica*, 02.04.1997; **I5** – at Wojska Polskiego str., in an orchard, on the branch of living *P. avium*, 05.09.1994; at the end of Do Prochowni str., in an orchard, in a wounds on the trunks of two living *M. domestica*, 17.05.1997.

The fungus is very common in Poland. It was observed on numerous deciduous trees. *Schizophyllum commune* occurs rarely on conifers and other special substrates.

Stereales

Chondrostereum purpureum (Schum.: Fr.) Pouz. [= *Stereum purpureum* (Pers.: Fr.) Fr.] – Locality: **H7** – at Gumńska str., in a garden, on the trunk of living but dying *Malus domestica*, 14.09.1996 (in 1997 the tree died).

The fungus is a common decayer of angiosperms in Poland. Domański (1991) reported it from 14 genera of deciduous trees but he did not mention *Malus*. On this host the species was reported by Wojewoda (1996) in Kraków. Borecki (1990) and Kucmierz and Bartynska (1993) indicated that *Chondrostereum purpureum* "occurs commonly in orchards on stone-fruit bearing and seedling trees". Hence, it probably occurs on *Malus domestica* as well.

Phlebia tremellosa (Schrad.: Fr.) Nakas. et Burds. [= *Merulius tremellosus* Schrad.: Fr.] — Locality: **G6** — at Nowy Świat str. near the crossroads with T. Romanowicza str., in an orchard, at the base of the trunk of living *Malus domestica*, 09.09.1996.

Evidently a rather common fungus in Poland, but its distribution and ecological spectrum are hardly known.

Sarcodontia crocea (Schw.: Fr.) Kotl. [= *S. setosa* (Pers.) Donk] — Locality: **C6** — at E. Kwiatkowskiego str. near the crossroads with Czerwonych Klonów str., in a group of trees, in a wound on the trunk of living *Malus domestica*, 28.06.1997.

Wojewoda (1973) published a map of distribution of the fungus in Poland, where he introduced 15 localities. Afterwards it was found in Grabówka near Annopol (Flisińska and Sałata 1991), Lublin (Flisińska 1996), Imielin (Sokół 1997) and Łosie in the Beskid Niski Mts (Wojewoda 1998). At present 20 localities of the species are known in Poland. In all the localities the fungus has been reported on *M. domestica*. The species is listed in the red list of threatened macrofungi in Poland in "R" (rare) category (Wojewoda and Ławrynowicz 1992).

Stereum hirsutum (Willd.: Fr.) Gray — Localities: **B4** — at Chemiczna str. near the city border, in a group of trees, in a wound on the trunk of living *Prunus avium*, 29.07.1997; **B7** — at J. Kilińskiego str., roadside, in a wound on the trunk of living *P. avium*, 25.10.1996; **C6** — at the crossroads of E. Kwiatkowskiego str. and Czerwonych Klonów str., in a group of trees, in a wound at the base of the trunk of living *Malus domestica*, 28.06.1997; **C7** — at Jarzębinowa str., in a group of trees, in a wound on the trunk of living *P. avium*, 28.06.1997; at the crossroads of Czerwona str. and Kolejowa str., roadside, on the trunk of living *P. domestica*, 23.07.1997; **C8** — at Czarna Droga str. near the crossroads with Ludowa str., in a group of trees, on the trunk of living but dying *P. domestica*, 05.10.1996; **D8** — at Czerwona str. near the crossroads with Krakowska str., in an orchard, on the trunk of living *P. cerasus*, 27.07.1998; **E7** — at S. Kassali str., in a group of trees, on the branch of living *P. avium*, 23.07.1997; **F6** — near W. Wilsona str., in a group of trees, in a wound on the trunk of living *P. avium*, 30.07.1997; **G4** — Piaskówka near the end of J. Kasprowicza str., in a group of trees, on the trunk of living *P. domestica*, 15.09.1997; **G6** — at M. Kopernika str., in a group of trees, on the trunk

of living *P. domestica*, 27.09.1996; H7 — at the crossroads of S. Konarskiego str. and J. Dąbrowskiego str., in a group of trees, on the trunk of living *M. domestica*, 22.07.1997; I5 — at Wojska Polskiego str., in an orchard, on the branch and trunk of living *P. avium*, 16.10.1994; at the end of Do Prochowni str., roadside, in a wound on the trunk of living but dying *M. domestica*, 31.07.1997.

It is a very common fungus in Poland. The species is found on many host species. Domański (1991) reported it from 15 genera of deciduous shrubs and trees. He did not mention *Malus*, so this is probably a host new for *Stereum hirsutum* in Poland.

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Wielkoowocnikowe grzyby pasożytnicze (*Basidiomycetes*) na drzewach i krzewach owocowych w Tarnowie (Polska Południowa)

Streszczenie

W pracy przedstawiono wyniki badań nad grzybami pasożytniczymi z klasy *Basidiomycetes* na drzewach i krzewach owocowych. Badania prowadzono w latach 1994–1999 w Tarnowie. Na siedmiu gatunkach żywicielskich: *Juglans regia*, *Malus domestica*, *Prunus avium*, *P. cerasus*, *P. domestica*, *Pyrus communis* i *Ribes rubrum* znaleziono 27 gatunków grzybów pasożytniczych. Niektóre z nich znaleziono na nowych dla Polski żywicielach, na *Malus domestica* – *Abortiporus biennis*, *Ganoderma australe*, *Meripilus giganteus*, *Stereum hirsutum* i *Volvariella bombycina*, na *Juglans regia* – *Ganoderma applanatum* i *Hirneola auricula-judae*.