Macromycetes in the Dendrological Park of the Warsaw Agricultural University

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A list of 79 species of macromycetes recorded in the Dendrological Park of the Warsaw Agricultural University in Warsaw between 1996 and 2005 is discussed in the paper.

Key words: macromycetes, urban area, park, conservation of fungi, Poland

INTRODUCTION

Warsaw is one of the few Polish urban centres where mycological examinations have been conducted, and its ecology has been investigated. Similarly to other agglomerations in Poland, however, the knowledge on macromycetes occurring in it is unsatisfactory (Adamczyk, Ławrynowicz 1991; Zimny 2000). Studies by Cheelchowski (1888, 1898, 1902) and Błoński (1890, 1896) with records of 467 fungal species in the city at the time, are of fundamental importance for contemporary comparative studies on the occurrence of fungi in Warsaw. Skirgiełło and Domański (1981), and Ławrynowicz (1982), who noticed a decrease in the number of species of parasitic and mycorrhizal fungi in the city centre, greatly contributed to the study of macromycetes in towns.

In urban areas, parks play an important role of habitats for many species, including fungi for which they are often the only natural sites (Ławrynowicz 1990). Although there are over 80 parks and gardens in Warsaw, systematic observations of macromycetes were published only from the Botanical Garden of the University of Warsaw. A total number of 58 species was collected in the entire area of the Garden (ca. 4.5 ha) over three years of studies (Sobier 1965).

The aim of this study is to present the species composition of macromycetes noted in the Dendrological Park of the Warsaw Agricultural University and to define the Park’s role as the environment of macromycetes in Warsaw.
The Dendrological Park is a fenced site located along the Rakowiecka street in the district of Mokotów in the city centre (Fig. 1). Established as a botanical and dendrological garden in the 1920s, it initially covered 0.81 ha (Kęsicka 1932). The Mokotów fields, where it was set up, served as the ground for military exercises and horse races over a few decades (Rewerska 1937). The garden covered over 2.25 ha in 1937, and comprised three sections: systematic, dendrological, and pomological (Staff 1937). Its part was later reclaimed for the construction of one of the adjoining streets (al. Niepodległości) and buildings of the Warsaw School of Economics (Zareba 1977). The Park was neglected after the II World War, and it stayed so until the 1970s when its supervision was reassigned to what now is the Department of Forest Botany, Warsaw Agricultural University. The Park was revitalised and its area was redeveloped. Five hundred and seventeen specimens of trees and shrubs were recorded in the Park survey conducted at the time (Rodek 1976). The Park was enriched with new tree and shrub species or varieties, both native and introduced. The planting material was derived from the Arboretum of the Warsaw Agricultural University in Rogów. Filipczak (1998) reports that 522 trees and shrubs belonging to 99 species and varieties grow in the park. Some of them, such as Fagus sylvatica var. atropurpurea or Corylus colurna, were considered to be nature monuments. In 2003, the Park, covering 1.65 ha, became legally protected as a nature and landscape complex. Taxa belonging to angiosperms (Angiospermae) prevail among trees and shrubs (Fig. 2). Specimens of such genera as Acer, Aesculus, Betula, Fraxinus, Populus, Quercus, Robinia, Tilia occur most numerous. Shrubs include Berberis, Laburnum, Ribes, Spiraea, Symphoricarpos, Syringa. Gymnosperms (Gymnospermae) represent such genera as Ginkgo, Chamaecyparis, Larix, Pinus, Taxus, Thuja. The layer of

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Fig. 1. The location of the Dendrological Park of the Warsaw Agricultural University in Warsaw.
herbaceous vegetation consists of such plants as *Aegopodium podagraria*, *Anemone nemorosa*, *Ficaria verna*, *Gagea lutea*, *Galeobdolon luteum*, *Galium aparine*, *Impatiens parviflora*, *Lamium album*, *Urtica dioica*, *Plantago lanceolata*, *Symphytum officinale*, *Taraxacum officinale*, *Trifolium repens*, *Viola* spp. According to Zielony (2005), elements of the typical oak-lime-hornbeam community, *Tilio-Carpinetum typicum*, may be found in the Park. A poorly preserved network of alleys and paths is still identifiable. A small cemented water reservoir is situated in the central part of the Park. The field layer and lawns are mown every year, and leaves and fallen branches are raked in the autumn. Tree-stand maintenance work was conducted in 1993 and 1997. Tree crowns were thinned, dead limbs and branches were cut, and injuries were treated. Dead or dying trees and shrubs, self-sown seedlings as well as trees or shrubs constituting a risk of damage to the fence and the adjacent University buildings, were felled. Because of progressing tree dying (Fig. 3), Tumiłowicz (1993) emphasised the need to complement the existing tree-stand with new plantings as early as in 1993. Over a decade later, his demands have not been acted upon.

Although the Park has been an important teaching site and an experimental field for a number of faculties of the Warsaw Agricultural University since it was established (Staff 1937; Zaręba 1977), no research study discussing it has been published so far.

The present list of macromycetes is the result of observations conducted between 1996 and 2005. Systematic observations were conducted at least once every month in the vegetative seasons between 1998 and 2003. The Park was visited sporadically outside this period. A thorough survey of the entire area could not be conducted on each visit.

The recorded fungi were classified in three basic ecological groups: terrestrial species – i.e. fungi occurring on soil, both saprotrophic and mycorrhizal; litter-decomposing species – i.e. saprotrophs growing on litter (fallen leaves, fruits and little twigs); lignicolous species – i.e. fungi occurring saprotrophically on wood or parasitizing live trees.


### RESULTS

#### LIST OF SPECIES

Explanations: l – litter decomposing species; lg – lignicolous species; t – terrestrial species; P - protected species; I – indeterminate (category) species; R – rare species, V – vulnerable species


**Auriculariopsis ampla (Lév.) Maire** – lg (on dead branch of *Populus*), 10 2005.


**Boletus luridus** Schaeff. – fr. – t (in neighborhood of *Acer, Aesculus, Quercus*), 07 2004.

**Calocybe gambosa (Fr.) Donk** – fr. – t, 05 2001, 2004.

**Chondrostereum purpureum** (Schum.: Fr.) Pouzar – lg (on trunks and stumps of *Acer and Populus*), 09-10 2001-2003, 10 2004.


**C. disseminatus** (Pers.: Fr.) – lg (on and around stumps and living *Populus*), 06 2001, 05 2003.

**C. micaceus** (Bull.: Fr.) Fr. – lg (on and around stumps); 06 1999, 05, 09 2001, 04, 05 2004.

**C. plicatilis** (Curt.: Fr.) Fr. – fr. – t (among grass), 07 2002, 05 2003.

**Entoloma euchroum** (Pers.: Fr.) Donk – lg (on stump and trunk of *Acer tataricum and Fraxinus ornus*), 09 2003, 2004, 10 2004; I.


**Fomes fomentarius** (L.: Fr.) Kickx - lg (on dead trunk of *Populus*), 06 1997.

**Ganoderma adspersum** (S. Schulz.) Donk – lg (on stump of deciduous tree), 06 2001, 05 2003.

**G. applanatum** (Pers.) Pat. - lg (on stumps and trunks of *Acer, Castanea, also on lying log of Tilia*), 08 1998, 05-09 2000-2003, 10 2004.

**G. pfeifferi** Bres. – lg (on stump of *Acer saccharinum*), 2001-2002 (Szczepkowsk i, Piętka 2003).


**Hypoxylon fragiforme** (Pers.: Fr.) J. Kickx – lg (on dead branch of *Fagus sylvatica*), 09 1996.


**Inonotus radiatus** (Sowerby: Fr.) P. Karst. – lg (on stump of *Alnus*), 10 2003.


**Lactarius quietus** (Fr.) Fr. – fr. – t (in neighbourhood of *Quercus*), 07 2000, 09 2003.
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Lepiota aspera (Pers.: Fr.) Quéhl – t (among grass), 09 2003.


Lepista nuda (Bull.: Fr.) Cooke – t (near compost heap), 10-11 2000.

Lyophyllum decastes (Fr.: Fr.) Singer – t, 09 2003.

Macrolepiota rhacodes (Vittad.) Singer – t (on compost heap and also among grass), 07, 09 2000, 07 2002, 07, 09 2003, 08 2004; I.

Marasmius rotula (Scop.: Fr.) Fr. – l (on lying twigs), 07 1996, 06 1999, 06 2000.

Morchella semilibera DC.: Fr. – t (under Populus), 04 2003, 05 2004; P, I.


Nectria cinabarina (Tode) Fr. – lg (on lying branches of deciduous trees), 03 2001, 05 2003.


Perenniporia fraxinea (Bull.: Fr.) Ryv. – lg (at the base of Populus), 08 2003, 10 2004.


Phellinus igniarius (L.: Fr.) Quéhl. – lg (on branch of Salix fragilis), 09 2004.

Ph. robustus (P. Karst.) Bourdot & Galzin – lg (on trunk of Quercus robur), Jan-12 1998-2005.

Ph. pomaceus (Pers.) Maire – lg (on branch of Prunus), 01-12 2000-2003.


Ph. tremellosa (Schrad.: Fr.) Nakasone & Burds. – lg (on lying log of Tilia), 09-11 2002-2003.


Ph. populnea (Pers.: Fr.) Kuyper & Tjall. – lg (on trunk of Populus), 09 2000.


Polyporus squamosus (Huds.) Fr. – lg (on stumps and trunks of Acer, Salix, Juglans), 04-09 1997-2004.


Ramaria stricta (Pers.: Fr.) Quéhl. – t (on rotten stump of Populus), 09 2002.

Russula foetens (Pers.: Fr.) Fr. – t, 07 2000.
Sarcodontia crocea (Schwein.: Fr.) Kotl. – lg (on branch of Malus), 09 2003; R.
Suillus grevillei (Klotzsch: Fr.) Singer – t (under Larix decidua), 07-08 2000.
Trametes hirsuta (Wulf.: Fr.) Pilát - lg (on lying branch of Populus and Betula), 09-11 2003, 10 2004-2005.
T. gibbosa (Pers.: Fr.) Fr. – lg (on trunk of Acer platanoides), 10 2005.
Tyromyces fissilis (Berk. & M. A. Curtis) Donk – lg (on trunk of Acer tataricum), 08-09 2002; R.
Volvariella bombycina (Schaeff.: Fr.) Singer – lg (on trunks of living Acer negundo, Acer platanoides, Fraxinus excelsior), 06-07 2002-2003, 08 2004; I.
V. pusilla (Pers.: Fr.) Quél. – t (among grass), 07 2004; I.
X. pascuus (Pers.) Krombh. – t, 06-08 2000, 06-07 2003.

**FINAL REMARKS**

1. A total number of 79 species of macrofungi was recorded in the Dendrological Park of the Warsaw Agricultural University, mostly the Basidiomycetes (88.6%).
2. Lignicolous species were the dominating ecological group (58.3% of all species). Terrestrial species and litter-decomposing species constituted 39.2% and 2.5%, respectively.
3. Nine species, that is 11.4% of the fungi examined, are red-listed in Poland (Wojewoda, Ławryniewicz 2006): Entoloma euchroum, Geastrum coronatum, Morchella semilibera, Macrolepiota rhacodes, Pleurotus dryinus, Sarcodontia crocea, Tyromyces fissilis, Volvariella bombycina, Volvariella pusilla and five species of strictly protected fungi in Poland: Geastrum coronatum (Fig. 4), Langermannia gigantea (Fig. 5), Meripilus giganteus (Fig. 6), Morchella semilibera (Fig. 7), Phallus hadrianii (Fig. 8) were recorded in the Park.
4. The locality of Perenniporia fraxinea (Fig. 9) in the Park is its second published occurrence site in Warsaw and, at the same time, in Poland (Szczechowski 2004), while Populus is a new host in the Polish population of this rare fungus.
5. The results show that the Dendrological Park of the Warsaw Agricultural University in the city centre is an important natural site of many macromycetes, including a few species protected in Poland.

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REFERENCES

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Streszczenie

Fig. 4. Geastrum coronatum. Phot. A. Szczepkowski.

Fig. 5. Langermannia gigantea. Phot. A. Szczepkowski.
Fig. 2. Snow-covered Dendrological Park. Phot. A. Szczepkowski.

Fig. 3. The largest glade, formed after the removal of dying trees in the Dendrological Park, and its surrounding area. Phot. A. Szczepkowski.
Fig. 6. *Meripilus giganteus*. Phot. A. Szczepkowski.

Fig. 7. *Morchella semilibera*. Phot. A. Szczepkowski.