

Wood-inhabiting dematiaceous Hyphomycetes in the Kampinos National Park

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In this work the results of investigations of wood-inhabiting fungal communities in several forest associations are presented. The populations of these fungi on the wood of *Carpinus betulus*, *Quercus robur*, *Betula verrucosa*, *Tilia cordata* and *Pinus sylvestris* are also analyzed.

Numerous *Dematiaceae* are specialized fungi occurring the lignified remains of vascular plants. Due to their frequent occurrence in natural forest communities it seems that they play a large part there. Synecological investigations of this group of *Dematiaceae* have hitherto not been undertaken.

The aim of these investigations which were started in 1967 in the Kampinos National Park was among others to examine the quantitative and qualitative differentiation of the population of these fungi on the wood in *Tilio-Carpinetum* and *Pino-Querecetum*.

MATERIAL AND METHODS OF INVESTIGATIONS

Fungi traditionally included in the family *Dematiaceae* were considered (Saccardo 1886; Lindau 1900, 1907; Barnett 1956; Ainsworth 1963) and some species from the families *Tuberculariaceae* and *Stilbaceae*, according to the suggestion of Ellis (1971, 1976),

especially these fungi which form sporodochia or coremia loose or compact.

On the basis of about 2000 samples, in the years 1967-1970 the qualitative differentiation of the flora of the examined group of fungi in three reservations of the Kampinos National Park were examined. In 1971, from April to October, samples for qualitative and quantitative determinations were taken from five fixed points in the reservations Krzywa Góra, Sieraków and Zamczysko. The surface of the examined areas varied from 400 to 800 square meters depending on the natural extension of the given community in the field. The material was collected every month, at least 20 samples from each available species of tree. The samples were collected from laying trunks and branches of *Carpinus betulus*, *Quercus robur*, *Betula verrucosa*, *Tilia cordata* and *Pinus sylvestris*. Altogether 3040 samples were collected, in this 1459 samples contained *Dematiaceae*.

In the reservation Krzywa Góra located in the western part of the Kampinos forest (forest district Kromnów) samples were taken in a patch of the *Tilio-Carpinetum Masovian* variety (TC I). The locality was on the south-eastern slope of a dune (section 20). The surface area of the patch is about 600 square meters. In the association *Carpinus betulus* was dominant, *Betula verrucosa* and *Quercus robur* were less abundant and *Tilia cordata* was the least abundant. In the same reservation (section 19) on the opposite slope of the dune, a locality was determined in a patch of *Pino-Quercetum typicum* (PQ I). In this community

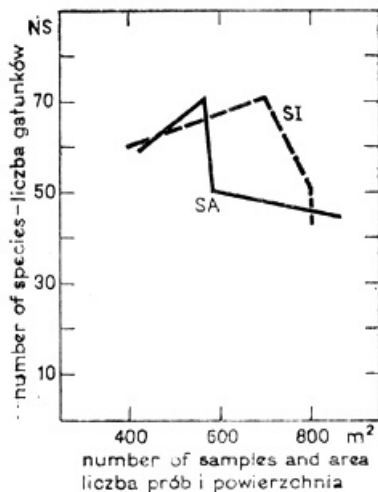


Fig. 1. Number of species (NS) — plot size (SI in m²) and number of samples (SA)

Quercus robur dominated, the abundance of *Betula verrucosa* and *Pinus sylvestris* was slightly lower. This association occupied a surface of about 800 square meters.

The reservation Sieraków in the eastern part of the Kampinos National Park (forest district Laski) about 26 km from the above-mentioned reservation. The patch of the Masovian variety of *Tilio-Carpinetum* with an areas of about 400 square meters is located on a small elevation and surrounded by *Carici elongatae-Alnetum*. It is predominantly composed of *Quercus robur*, while *Carpinus betulus* is less abundant. Fairly numerous specimens of *Betula verrucosa* and several *Pinus sylvestris* trees grow near the edge. Pine forest elements occur.

The reservation Zamczysko is in the central part of the National Park (forest district Kampinos) about 6 km from the reservation Krzywa Góra. Two localities were picked here (section 165). One is in a patch of the Mazovian variety of *Tilio-Carpinetum* (TC III) in which oak dominates whereas the hornbeam and birch were less abundant and several linden trees occurred. This association was next to *Carici elongatae-Alnetum* and *Pino-Quercetum* with oak-hornbeam elements, in which a second locality was fixed. The dominant trees were *Quercus robur* and *Pinus sylvestris*, *Carpinus betulus* was abundant and *Betula verrucosa* grew sporadically.

The number of occurrence of particular species of fungi was noted marking one occurrence of the fungus on a given fragment of wood regardless of the number of colonies formed. In the tables the absolute numbers of occurrence of fungi are given and their abundance as % of all the taxa occurring on a given patch. The relative frequency gives in per cent the number of samples in which *Dematiaceae* were present. The minimal size of a representative surface for samples taken from large fragments of dead tress was found to be a surface of 30 square centimeters per 1 m² of wood surface area. The smallest fragments which were collected had a surface area of 5 cm².

The diversity coefficient was calculated according to the formula $d = S/\sqrt{N}$, where S = number of species, N = number of occurrence. In analysis of the qualitative differentiation of the mycoflora the similarity coefficient $P = 2c/a + b \times 100$ (Matuszkiewicz 1952) was considered where a = sum of species on one area b = sum of species on the second area, c = sum of species common to both areas.

Among dominants taxa whose abundance exceed 5% were included. Species with abundance between 5% and 2% were considered as sub-dominanta. Influents include species with abundance between 1.9-1%, and accessory species have abundance below 1% (Trojan 1975).

The density of the population was evaluated on the average number of occurrences in one sample.

The fungi were identified on the basis of characteristics which they showed growing on natural media, in axenic cultures (PDA, MA), and in moist chambers (Keyworth 1951) especially in cases when conidiogenesis had to be observed. Microscope preparations were made in cotton blue in lactophenol.

Herbarium materials were deposited in the Herbarium of the Plant Taxonomy and Geography Department of the Institute of Botany, University of Warsaw.

DEMATIACEAE IN THE EXAMINED FOREST COMMUNITIES

The highest number of wood-inhabiting *Dematiaceae* — 71 species was observed in *Tilio-Carpinetum* (TC III) in the reservation Zamczysko (Table 1, Fig. 2). In this community also the greatest average number

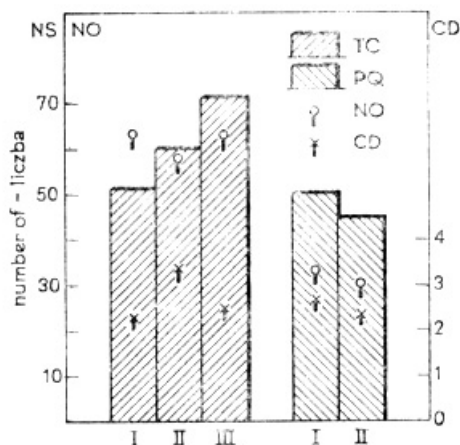


Fig. 2. Number of species (NS), number of their occurrence (NO — %) and diversity coefficient (CD) in investigated communities (TC — *Tilio-Carpinetum*, PQ — *Pino-Quercetum*)

of occurrence of fungi per sample was observed (Table 2). The frequency of fungi was also high, it was only lower than that observed for the *Tilio-Carpinetum* in Krzywa Góra. The dominant species proved to be *Haplographium catenatum*, *Brachysporium nigrum*, *Bispora betulina* and *Cacumisporium capitulatum*. This community had the highest number of occurrences of *Haplographium catenatum* and a two-fold higher abun-

dance of *Bispora betulina* that in other patches of *Tilio-Carpinetum* (Fig. 3). The subdominants were: *Chloridium virescens* var. *chlamydosporum*, *Rhinocladiella atrovirens*, *Chloridium clavaeforme*, *Taeniolella exilis*, *Cladosporium cladosporioides*, *Pseudospiropes longipilus* and *Brachysporium bloxami*, *Chloridium clavaeforme*, *Manispora ciliata* and *Brachysporiella laxa* were noted relatively rarely here. Among influents we should consider e.g. *Cordana pauciseptata*, *Codinaea* st. *Chaetosphaeria callimorpha* and *Periconia cambrensis*.

In this forest patch the highest number of fungal species (13) not noted in other communities was observed. Most of them were isolated only once, at most two times (Table 1).

In *Tilio-Carpinetum* (TC II) in the reservation Sieraków the population of *Dematiaceae* were less varied. The occurrence of 60 species was noted. Their average number of occurrences per sample was two times lower than in the communities discussed above (Table 2). The frequency was the lowest of the examined patches of *Tilio-Carpinetum*. The species diversity was the highest (Table 2). *Brachysporium nigrum*, *Chloridium clavaeforme* and *Haplographium catenatum* should be considered as the dominant species (Table 4, Fig. 2). Relatively more abundant subdominants were e.g. *Cucumisporium capitulatum*, *Rhinocladiella atrovirens*, *Bispora betulina*, *Pseudospiropes longipilus*, *Cladosporium cladosporioides*, *Brachysporiella laxa*, *Chalara breviclavata* and *Septotrullula bacilligera* (Table 1). From the group of influents fungi from the genera *Brachysporium* with species *B. britannicum*, *B. obovatum* and *B. bloxami* and from the genus *Chloridium* especially, *C. virescens* var. *virescens*, *C. botryoideum* var. *botryoideum* and *Oidiodendron tenuissimum*, *Endophragmia hyalosperma* and *Trichocladium opacum*.

Altogether in this community 11 species of fungi were found not isolated from the remaining patches. All were accessory species, among those more frequently noted were *Endophragmiella tenera*, *Rhinotrichum* sp. and *Scolecobasidium* sp. The remaining species were found sporadically (Table 1).

The smallest variety among the *Dematiaceae* was found in the *Tilio-Carpinetum* in Krzywa Góra (TC I). The occurrence of 51 species of examined fungi was observed there. The average of their occurrence in the sample was almost the same as in the *Tilio-Carpinetum* in Sieraków. The index species differentiation was among the lowest ones noted, it was almost the same as that of *Pino-Quercetum* in the reservation Zamczysko (Fig. 2).

The dominant species proved to be *Brachysporium nigrum*, *Haplographium catenatum* and *Cucumisporium capitulatum* (Fig. 3). The subdominants were *Chloridium clavaeforme*, *Taeniolella exilis*, *Rhinocla-*

Table 1 —

Number of occurrence of dematiaceous *Hyphomycetes* on wood in
Liczba wystąpień *Dematiaceae* na drewnie w poszczególnych

Reservation Rezerwat		Krzywa Góra								
Community Zespól		Tilio-Carpinetum (TC I)				Pino-Carpinetum (PQ I)				
Kind of wood Drewno		C	Q	B	T	total (%)	Q	B	P	total (%)
Species Gatunek	1	2	3	4	5	6	7	8	9	10
<i>Haplagraphium catenatum</i> (Preuss) Hol.-Jech.		18	10	20	4	52 (10,3)	20	19	—	39 (10,9)
<i>Brachysporium nigrum</i> (Link) Hughes		22	26	15	11	74 (14,8)	55	11	—	66 (18,6)
<i>Chloridium clavaeforme</i> (Preuss) W. Gams et Hol.-Jech.		7	4	10	4	25 (4,9)	19	7	5	31 (8,6)
<i>Cucumisporium capitulatum</i> (Cda.) Hughes		13	14	6	2	35 (6,9)	18	19	—	37 (10,3)
<i>Bispora betulina</i> (Cda.) Hughes		4	3	9	2	18 (3,6)	11	15	—	26 (7,2)
<i>Rhinocladiella atrovirens</i> Nannf.		10	5	2	3	20 (3,9)	4	2	3	9 (2,5)
<i>Taeniolella exilis</i> (Karst.) Hughes		17	5	—	—	22 (4,4)	—	2	—	2 (0,5)
<i>Cladosporium cladosporioides</i> (Fresen) de Vries		2	—	6	6	14 (2,8)	—	1	6	7 (1,9)
<i>Chloridium virescens</i> (Pers. ex Pers.) W. Gams et Hol.-Jech. var. <i>chlamydosporum</i> (Beyma) W. Gams et Hol.-Jech.		6	8	3	4	21 (4,2)	15	1	—	16 (4,5)
<i>Pleurophragmium rousselianum</i> (Mont.) Hughes		3	7	2	—	12 (2,4)	5	—	—	5 (1,4)
<i>Cordana pauciseptata</i> Preuss		4	4	4	—	12 (2,3)	7	2	—	9 (2,5)
<i>Pseudospiropes longipilus</i> (Cda) Hol.-Jech.		—	—	8	—	8 (1,6)	—	7	—	7 (2,0)
<i>Cladosporium</i> spp.		—	2	3	—	6 (1,0)	1	1	3	5 (1,4)
<i>Brachysporiella laxa</i> (Hudson) M. B. Ellis		—	3	—	2	5 (1,0)	5	—	—	5 (1,4)
<i>Menispora glauca</i> Pers.		2	5	1	1	9 (1,8)	3	2	—	5 (1,4)
<i>Diplococcium spicatum</i> Grove		—	—	3	7	10 (2,0)	—	3	—	3 (0,8)
<i>Alysidium resiniae</i> (Fr.) M. B. Ellis		—	1	—	—	1 (0,2)	1	2	—	3 (0,8)
<i>Helicisporium vegetum</i> Nees		3	3	—	—	6 (1,2)	1	—	—	1 (0,3)
<i>Trimmatostroma betulinum</i> (Cda.) Hughes		1	—	2	—	3 (0,5)	3	4	—	7 (2,0)
<i>Menispora ciliata</i> Cda.		3	1	1	1	6 (1,2)	3	1	—	4 (1,1)

Tabela 1

particular plant associations in the Kampinos National Park
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Sieraków					Zamczysko									
Tilio-Carpinetum (TC II)					Tilio-Carpinetum (TC III)					Pino-Quercetum (PQ II)				
C	Q	B	T	total (%)	C	Q	B	T	total (%)	C	Q	B	T	total (%)
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
2	4	13	2	21 (6,6)	46	42	30	43	161 (19,7)	9	7	9	6	31 (9,6)
14	16	11	—	51 (16,0)	30	42	7	25	104 (12,6)	8	18	4	—	30 (8,6)
9	8	10	5	32 (10,1)	9	10	—	9	28 (3,4)	16	34	—	5	55 (15,5)
3	3	10	—	16 (5,0)	14	18	33	2	67 (8,1)	—	1	1	—	2 (0,4)
1	7	5	—	13 (4,0)	14	16	—	38	68 (8,2)	1	5	—	—	6 (1,6)
3	2	6	3	14 (4,4)	11	11	8	9	39 (4,3)	13	15	4	3	35 (9,6)
2	2	—	—	4 (1,2)	21	—	—	—	31 (2,5)	12	1	—	—	13 (3,6)
1	—	8	—	9 (2,8)	5	9	1	4	19 (2,3)	7	—	1	3	11 (2,7)
1	6	1	—	8 (2,4)	7	22	3	9	41 (5,0)	20	11	1	—	32 (8,8)
3	5	—	—	8 (2,4)	4	3	—	4	11 (1,2)	12	10	—	—	22 (6,2)
—	2	1	—	3 (0,9)	1	4	—	4	9 (1,1)	2	4	—	—	6 (1,6)
—	—	12	—	12 (3,7)	—	—	23	—	123 (2,8)	—	—	2	—	2 (0,6)
—	1	1	—	2 (0,6)	6	3	1	3	13 (1,5)	—	3	1	3	7 (2,0)
7	3	1	—	11 (3,4)	—	—	—	3	3 (0,3)	2	4	—	—	6 (1,6)
1	1	—	—	2 (0,6)	—	—	5	1	6 (0,7)	—	3	—	—	3 (0,8)
—	—	1	—	1 (0,3)	—	—	3	5	8 (1,0)	—	—	1	—	1 (0,3)
1	3	—	—	4 (1,2)	3	3	—	—	6 (0,7)	2	5	—	—	7 (2,0)
1	1	—	1	3 (0,9)	—	4	—	—	4 (0,5)	6	1	—	—	7 (2,0)
—	—	1	—	1 (0,3)	—	—	—	1	1 (0,1)	—	—	2	—	2 (0,6)
—	—	—	1	1 (0,3)	—	—	—	1	1 (0,1)	1	3	—	1	5 (1,4)

1	2	3	4	5	6	7	8	9	10
<i>Chaetara breviclavata</i> Nag Raj et Kendrick	—	1	1	—	2 (0,4)	1	2	—	3 (0,8)
<i>Brachysporium britannicum</i> Hughes	—	—	2	—	2 (0,4)	—	1	—	1 (0,3)
<i>Pseudospiropes obclavatus</i> M. B. Ellis	—	2	—	—	2 (0,4)	1	—	—	1 (0,3)
<i>Virgariella atra</i> Hughes	3	5	—	1	9 (1,8)	3	—	—	3 (0,8)
<i>Actinocladium rhodosporum</i> Ehrenb. ex Pers.	6	—	—	1	7 (1,4)	5	—	—	5 (1,4)
<i>Cladosporium herbarum</i> (Pers.) Link	—	1	—	1	2 (0,4)	2	—	—	2 (0,6)
<i>Brachysporium obovatum</i> (Berk.) Sacc.	—	—	5	2	7 (1,4)	—	—	—	—
<i>Chloridium virescens</i> (Pers. ex Pers.) W. Gams et Hol.-Jech. var. <i>virescens</i> W. Gams et Hol.- Jech.	1	4	—	1	6 (1,1)	—	—	—	—
<i>Chloridium lignicola</i> (Mengenot) W. Gams et Hol.-Jech.	—	—	—	—	—	—	1	—	1 (0,3)
<i>Pleurothecium recurvatum</i> (Morgan) Höhnel	2	—	7	—	9 (1,8)	3	—	—	3 (0,8)
<i>Spadicoides atra</i> (Cda.) Hughes	2	—	—	2	4 (0,8)	—	3	—	3 (0,8)
<i>Monodictys casteneae</i> (Wallr.) Hughes	4	4	1	—	9 (1,8)	1	—	2	3 (0,8)
<i>Monodictys levis</i> (Wiltshire) Hughes	—	—	10	1	11 (2)	—	—	—	—
<i>Chaetopsis grisea</i> (Ehrenb. ex Pers.) Sacc.	—	—	1	6	7 (1,4)	—	—	—	—
<i>Corynespora quericola</i> Borowska	7	—	—	—	7 (1,4)	—	—	—	—
<i>Spadicoides bina</i> (Cda.) Hughes	1	—	4	—	5 (1)	—	—	—	—
<i>Cryptocoryneum condensatum</i> (Wallr.) Mason et Hughes	3	—	2	—	5 (1)	—	—	—	—
<i>Septotrullula bacilligera</i> Höhnel	—	—	2	—	2 (0,4)	—	—	—	—
<i>Monodictys paradoxa</i> (Cda.) Hughes	—	4	5	—	9 (1,8)	—	—	—	—
<i>Gonytrichum caesium</i> C. G. et F. Nees ex Leman var. <i>chloridioides</i> W. Gams et Hol.- Jech.	1	—	—	—	1 (0,2)	—	—	—	—
<i>Phaeostalagmus tenuissimus</i> (Cda.) W. Gams	—	—	—	1	1 (0,2)	—	—	—	—
<i>Brachysporium bloxami</i> (Cooke) Sacc.	—	—	—	—	—	—	2	—	2 (0,6)
<i>Spadicoides grovei</i> M. B. Ellis	—	—	—	—	—	—	1	—	1 (0,3)
<i>Oidodendron tenuissimum</i> (Peck) Hughes	—	—	—	—	—	—	—	5	5 (1,4)
<i>Phaestalagmus cyclosporus</i> (Grove) W. Gams	—	—	—	—	—	1	—	—	1 (0,3)

cd. tab. 1

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
—	4	5	—	9 (2,8)	—	1	—	3	4 (0,5)	—	—	—	—	—
3	2	—	—	5 (1,5)	1	2	—	—	3 (0,3)	—	—	—	—	—
—	—	—	1	1 (0,3)	—	—	—	1	1 (0,1)	—	—	—	—	—
—	—	—	—	—	3	5	—	—	9 (1,1)	3	4	—	—	7 (2)
—	—	—	—	—	—	3	—	1	4 (0,5)	1	1	—	—	2 (0,6)
—	—	—	—	—	—	—	1	1	2 (0,2)	2	2	—	—	4 (1,1)
5	—	—	—	5 (1,5)	4	—	2	1	7 (0,9)	—	—	3	—	3 (0,8)
6	—	—	—	6 (1,8)	—	—	—	4	4 (0,5)	—	1	—	—	1 (0,3)
—	—	2	—	2 (0,6)	—	3	—	—	3 (0,4)	—	2	—	—	2 (0,6)
—	—	—	—	—	1	3	—	—	4 (0,5)	—	—	—	—	—
—	—	—	—	—	1	—	—	2	3 (0,3)	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	3	—	—	2	5 (1,4)
1	—	1	—	2 (0,6)	—	—	—	1	1 (0,1)	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	4	4 (0,5)	—	—	—	—	—
—	1	—	—	1 (0,3)	2	1	—	—	3 (0,3)	—	—	—	—	—
—	—	1	—	1 (0,3)	—	—	—	2	2 (0,2)	—	—	—	—	—
1	1	—	—	2 (0,6)	—	—	—	1	1 (0,1)	—	—	—	—	—
2	4	2	—	8 (2,5)	—	—	—	—	—	—	1	—	—	1 (0,3)
—	—	—	—	—	—	2	1	—	3 (0,4)	—	5	2	—	7 (2)
—	—	—	—	—	—	2	—	2	4 (0,5)	6	5	—	—	11 (2,7)
—	—	—	—	—	2	1	—	2	5 (0,6)	—	1	—	—	1 (0,3)
—	2	2	—	4 (1,2)	9	12	4	1	26 (3,2)	—	—	—	—	—
—	1	—	—	1 (0,3)	1	—	—	—	1 (0,1)	—	—	—	—	—
—	—	—	5	5 (1,5)	—	—	—	—	—	—	—	—	5	5 (1,4)
1	—	—	—	1 (0,3)	1	—	—	—	1 (0,5)	1	—	—	1	2 (0,6)

1	2	3	4	5	6	7	8	9	10
<i>Bactrodesmium spilomeum</i> (Berk. et Br.) Mason et Hughes	—	—	—	—	—	—	—	1	1 (0,3)
<i>Helicoma</i> sp.	—	—	—	—	—	—	—	1	1 (0,3)
<i>Codinaea</i> st. <i>Chaetosphaeria callimorpha</i> (Mont.) Sacc.	—	—	—	—	—	—	2	—	2 (0,6)
<i>Torula herbarum</i> (Pers.) Link ex Gray	—	—	—	—	—	—	3	—	3 (0,8)
<i>Endophragmia hyalosperma</i> (Cda.) Morgan-Jones et Cole	—	—	—	—	—	—	—	—	—
<i>Menispora caesia</i> Preuss	—	—	—	—	—	—	—	—	—
<i>Septonema binum</i> Borowska	—	—	—	—	—	—	—	—	—
<i>Cladosporium resinae</i> (Lindau) de Vries	3	4	4	—	11 (2)	2	1	—	3 (0,8)
<i>Monodictys putredinis</i> (Wallr.) Hughes	1	—	—	—	1 (0,2)	—	—	—	—
<i>Sporidesmium folliculatum</i> (Cda.) Mason et Huges	2	—	—	—	2 (0,4)	—	—	—	—
<i>Pleurophragmium parvisporum</i> (Preuss) Hol.-Jech.	1	—	—	4	5 (1)	—	—	—	—
<i>Garnaudia elegans</i> Borowska	—	3	—	1	4 (0,8)	—	—	—	—
<i>Acrogenospora sphaerocephala</i> (Berk. et Br.) M. B. Ellis	1	—	—	1	2 (0,4)	—	—	—	—
<i>Berkleasium concinnum</i> (Berk.) Hughes	—	—	1	—	1 (0,2)	—	—	—	—
<i>Periconia byssoides</i> Pers. ex M érat	—	—	—	—	—	—	1	—	1 (0,3)
<i>Camposporium cambrense</i> Hughes	—	—	—	—	—	1	—	—	1 (0,3)
<i>Graphium calicioides</i> (Fr.) Cooke et M assee	—	—	—	—	—	—	1	—	1 (0,3)
<i>Sporidesmium adscendens</i> Berk.	—	—	—	—	—	1	—	—	1 (0,3)
<i>Septonema secedens</i> Cda.	—	—	—	—	—	—	—	—	—
<i>Trichocladium opacum</i> (Cda.) Hughes	—	—	—	—	—	—	—	—	—
<i>Anavirga laxa</i> Sutton	—	—	—	—	—	—	—	—	—
<i>Chloridium botryoideum</i> (Cda.) Hughes var. <i>botryoideum</i> W. Gams et Hol.-Jech.	—	—	—	—	—	—	—	—	—
<i>Chloridium pachytrachelum</i> W. Gams. et Hol.-Jech.	—	—	—	—	—	—	—	—	—
<i>Periconia cambrensis</i> Mason et M. B. Ellis	—	—	—	—	—	—	—	—	—
<i>Geniculosporium serpens</i> Chesters et Greenhalgh.	2	—	—	—	2 (0,4)	—	—	—	—
<i>Cylindrotrichum oligospermum</i> (Cda.) Bonord.	—	—	2	—	2 (0,4)	—	—	—	—
<i>Gomphinarina amoena</i> Preuss	—	—	—	2	2 (0,4)	—	—	—	—
<i>Ceratopodium fasciculare</i> (Preuss) Sacc.	1	—	—	—	1 (0,2)	—	—	—	—

cd. tab. 1

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	3	1	—	8 (2,4)	—	—	—	—	—	—	—	—	—	—
3	—	—	—	3 (0,9)	—	—	—	—	—	—	—	—	—	—
—	—	3	—	3 (0,9)	—	—	—	—	—	—	—	—	—	—
—	1	—	1	2 (0,6)	—	—	—	—	—	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
1	—	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
—	1	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
—	1	—	—	1 (0,3)	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	3	1	—	4 (0,5)	—	—	—	—	—
—	—	—	—	—	—	3	—	—	3 (0,3)	—	—	—	—	—
—	—	—	—	—	—	2	—	—	2 (0,2)	—	—	—	—	—
—	—	—	—	—	—	—	—	2	2 (0,2)	—	—	—	—	—
—	—	—	—	—	—	2	—	—	2 (0,2)	—	—	—	—	—
—	—	—	—	—	—	1	—	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	1	—	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	1	—	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	1	—	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	—	1	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	—	1	—	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	—	—	1	1 (0,1)	—	—	—	—	—
—	—	—	—	—	—	—	—	1	1 (0,1)	—	—	—	—	—

1	2	3	4	5	6	7	8	9	10
Septonema chaetospira (Grove) Hughes	—	—	—	—	—	—	—	—	—
Camposporium pellucidum (Grove) Hughes	—	—	—	—	—	—	—	—	—
Total number of species isolated Ogólna liczba wyizolowanych gatunków	32	25	29	26	51	32	28	10	50

C — *Carpinus betulus*
 Q — *Quercus robur*
 B — *Betula verrucosa*
 T — *Tilia cordata*
 P — *Pinus sylvestris*

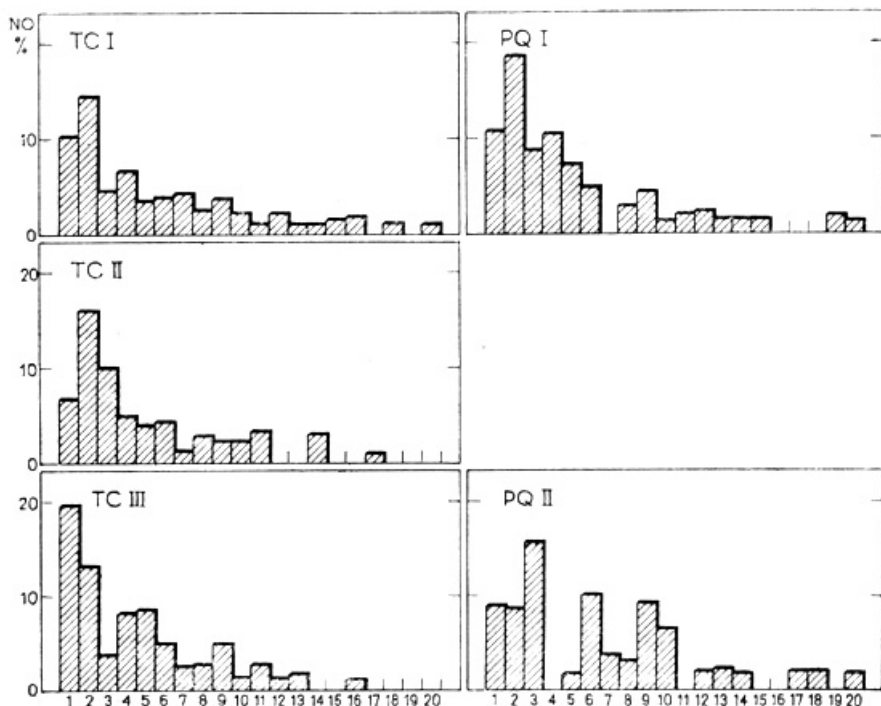


Fig. 3. Structure of domination of 20 species of *Dematiaceae* in examined patches of *Tilio-Carpinetum* (TC) and *Pino-Quercetum* (PQ):

1 — *Haplographium catenatum*, 2 — *Brachysporium nigrum*, 3 — *Chloridium clavaeforme*,
 4 — *Cacumisporium capitulatum*, 5 — *Bispora betulina*, 6 — *Rhinoctadiella atrovirens*,
 7 — *Taeniolella exilis*, 8 — *Cladosporium cladosporioides*, 9 — *Chloridium virescens* var.
chlamydosporum, 10 — *Pleurographium rousselianum*, 11 — *Pseudospiropes longipilus*,
 12 — *Cordana pauciseptata*, 13 — *Cladosporium* sp., 14 — *Brachysporiella laxa*, 15 — *Mentispora*
glauca, 16 — *Diplococcium spicatum*, 17 — *Alysidium resiniae*, 18 — *Helicosporium vegetum*,
 19 — *Trimmatostroma betulinum*, 20 — *Mentispora ciliata*

cd. tab. 1

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
—	—	—	—	—	—	—	—	—	—	—	1	—	—	1 (0,3)
—	—	—	—	—	—	—	—	—	—	—	—	—	1	1 (0,3)
35	31	25	9	60	31	38	24	40	71	23	33	12	13	45

diella atrovirens, *Cloridium virescens* var. *chlamydosporum*, *Bispora betulina*, *Plaurophragmium rousselianum*, *Cordana pauciseptata*, *Cladosporium cladosporioides*, *Diplococcum spicatum* and *Monodictys levis*. Among the group of influents the relative preponderance of *Pseudosporopes longipilus*, *Helicosporium vegetum*, *Virgariella atra*, *Pleurothecium recurvatum*, *Chaetopsis grisea*, *Menispora glauca* and *M. ciliata* and *Monodictys castaneae* and *M. paradoxa* in worth noting (Table 1).

A few fungi, only four species, were observed uniquely in this community. All were among accessory species.

In *Pino-Quercetum* in the reservation Krzywa Góra (PQ I) the presence of 50 species of *Dematiaceae* was noted. The average of occurrence of fungi per sample was nearly two times lower than in the *Tilio-Carpinetum* in the same reservation. The species diversity of the mycoflora was lower only than that found for the *Tilio-Carpinetum* in Sieraków. The dominants were *Brachysporium nigrum*, *Haplographium catenatum*, *Cacumisporium capitulatum*, *Cloridium clavaeforme* and *Bispora betulina* (Table 2). Taking into consideration all the examined communities *Brachysporium nigrum* attains the highest abundance here. The subdominants were *Cloridium virescens* var. *chlamydosporum* and *Cordana pauciseptata*, similarly as in the *Tilio-Carpinetum* in the same reservation. In the same species group *Rhinocladiella atrovirens*, *Pseudosporopes longipilus* and *Trimmatostroma betulinum* were found. *Taeniolella exilis*, *Cladosporium cladosporioides* and *Rhinocladiella atrovirens* were among fungi found less frequently in this type of community than in the all the others. *Oidiodendron tenuissimum*, *Menispora glauca*, and *Actinocladium rhodosporum* were slightly more abundant influents.

Seven species were found uniquely in this patch among the more frequent ones were *Cheiromycella microscopica*, *Endophragia glanduliformis* and *Bactrodesmium traversianum* (Table 1).

Table 2 — Tabela 2

Description of populations of dematiaceous *Hyphomycetes*
in examined forest communitiesCharakterystyka populacji *Dematiaceae*
w badanych zbiorowiskach leśnych

Reservation Rezerwat	Krzywa Góra		Siera- ków	Zamczysko	
	TC I	PQ I	TC II	TC III	PQ II
Association Zbiorowisko					
Area of plot (m ²) Powierzchnia płatu (m ²)	600	800	400	700	800
Number of samples Liczba prób	576	609	428	573	854
Number of positive samples Liczba prób pozytywnych	367	201	255	361	275
Number of occurrence of fungi Liczba wystąpień grzybów	499	354	319	810	352
Frequency (‰) Frekwencja (‰)	63,7	33	59,5	62,9	30,8
Mean occurrence of fungi per sample Średnia wystąpień w próbie	0,8	0,5	0,7	1,4	0,4
Number of species Liczba gatunków	51	50	60	71	45
Diversity coefficient Wskaźnik różnorodności gatunkowej	2,3	2,7	3,4	2,5	2,4
Number of species isolated in this patch only Liczba gatunków nie zanotowanych w innych płatach	4	7	11	13	2
Number of dominants Liczba dominantów	3	5	4	4	6
Number of subdominants Liczba subdominantów	10	4	9	6	7
Number of influents Liczba influentów	18	10	11	7	12
Number of accessory species Liczba gatunków akcesorycznych	20	31	36	55	20

TC — *Tilio-Carpinetum*PQ — *Pino-Quercetum*

The least diverse populations of *Dematiaceae* were found in *Pino-Quercetum* with *Carpinus betulus* elements (PQ II) in the reservation in Zamczysko. The examined fungi were represented by 45 species. The mean occurrence in the samples was the lowest one noted, and three times lower than in the *Tilio-Carpinetum* in the same reservation (Table 2).

The dominant species were *Chloridium cavaeforme*, *Rhinoctadiella atrovirens*, *Brachysporium nigrum*, *Haplographium catenatum*, *Chloridium virescens* var. *chlamydosporum* and *Pleurophragmium rousselianum* (Fig. 3). Among subdominants were *Taeniolella exilis*, *Cladosporium cladosporioides*, *Gonytrychium caesium* var. *chloridioides*, *Virgariella atra* and *Monodictys paradoxa*. The very rare occurrence of *Cacumisporium capitulatum*, which was dominant in the remaining communities is remarkable. *Bispora betulina* nad *Pseudospiropes longipilus* also occurred rather sporadically. Among the more numerous influents were eg. *Cordana pauciseptata*, *Brachysporiella laxa*, *Menispora ciliata*, *Oidiodendron tenuissimum*.

Only two species of *Dematiaceae* occurred exclusively in this community, both very rarely (Table 1).

Altogether in all the examined forest communities the occurrence of 106 fungal species was noted. Twenty taxa were found in common, and of these 8 species are dominant. Among dominants there were 3-6 species in particular forest communities, among subdominants 4-10 species (Table 2, Fig. 3). The total numbers of these fungi was altogether about 60% of the fungi in a given forest area.

The qualitative comparison of *Dematiaceae* in the examined communities has shown that the greatest similarities among wood-inhabiting

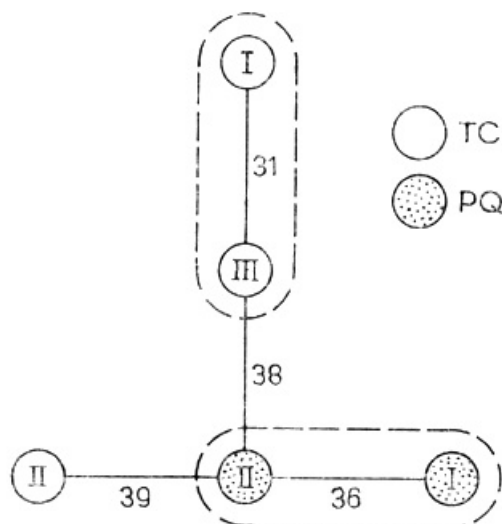


Fig. 4. Dendrite ordination of populations of dematiaceous *Hyphomycetes*:
 TC I — *Tilio-Carpinetum* (I — Krzywa Góra, II — Sieraków, III — Zamezysko), PQ — *Pino-*
-Quercetum (I — Krzywa Góra, II — Zamezysko)
 Dendrytowa ordynacja zbiorowisk *Dematiaceae* w badanych zespołach leśnych.

Table 3 — Tabela 3

Similarity coefficients between *Dematiaceae* populations in examined forest communities
 Współczynniki podobieństwa między populacjami *Dematiaceae* w badanych zbiorowiskach leśnych

	TC I	PQ I	TC II	TC III	PQ II
TC I	100	58	56	69	61
PQ I	58	100	57	57	64
TC II	56	57	100	60	61
TC III	69	57	60	100	62
PQ II	61	64	61	62	100

TC — *Tilio-Carpinetum*PQ — *Pino-Quercetum*

fungi occurred in *Tilio-Carpinetum* I and III and, to a lesser extent, among *Pino-Quercetum* I and II (Table 3, Fig. 4). The populations of these fungi in *Pino-Quercetum* with *Carpinus betulus* (PQ II) are also similar, almost to the same extent to populations in all the considered areas of *Tilio-Carpinetum*. A relatively low similarity was shown by the flora of *Tilio-Carpinetum* I and II.

DEMATIACEAE ON THE WOOD OF VARIOUS TREES

On the wood of *Carpinus betulus* the growth of 65 species was observed. Their average frequency was higher than on the wood of other trees. The mean abundance of the fungi was also relatively high, but lower than on the wood of *Quercus robur*. The mean index of species variation was the same as on the wood of *Quercus robur*, but lower than on the wood of *Tilia cordata* (Table 4).

Haplographium catenatum and *Chloridium virescens* var. *chlamydo-sporum* were occasionally dominants on the wood of *Carpinus betulus* (Table 1). *Brachysporium nigrum* was among subdominant fungi in all communities. *Chloridium clavaeforme*, *Haplographium catenatum*, less frequently *Pleurophragmium rousselianum*, *Cacumisporium capitulatum*, *Rhinocladiella atrovirens*, *Taeniolella exilis* and *Brachysporiella laxa* were found subdominants in some areas. Among influents one of the more abundant was eg. *Corynospora quercicola* (Table 1).

Thirteen species of *Dematiaceae* were found exclusively on the wood of *Carpinus betulus* (Table 1). All were accessory species. It does not seem that any one of them is limited to the wood of this one tree, as

most of them have been noted on other types of trees (Ellis 1971, 1976). One-half of these species were isolated from the *Tilio-Carpinetum* in Sieraków.

A similar diversity of the *Dematiaceae* flora was observed on the dead remains of *Quercus robur*, altogether 64 taxa (Table 1, 4). On the wood of this tree *Dematiaceae* reached the highest mean abundance and their average frequency was the same as on the wood of *Tilia cordata*, but lower than on *Carpinus betulus* (Table 4).

Brachysporium nigrum was the dominant fungus on oak wood in all communities (Table 4). *Haplographium catenatum* was dominant in *Tilio-Carpinetum* in Zamczysko (TC I) and *Pino-Quercetum* in Krzywa Góra (PQ I). *Chloridium claviforme* and *Cacumisporium capitulatum* proved to be dominant or subdominant on oak wood in some communities. Other subdominants were *Chloridium virescens* var. *chlamydosporum*, *Bispora betulina*, *Rhinochloidiella atrovirens*, *Cladosporium cladosporoides*, *Pleurophragmium rousselianum* and *Cardana pauciseptata* (Fig. 3). Among the more numerous influents *Brachysporium bloxami* was noted (Table 1).

On the wood of *Quercus robur* 13 species not observed on other trees were found (Table 1). All were among not abundant species — accessory species. These fungi grow on the wood of other trees outside of Kampinos National Park.

The wood of *Betula verrucosa* was a convenient substrate for the development of 54 species of *Dematiaceae*. Their average abundance and the index of species diversity were the lowest of those observed for deciduous trees (Table 4).

Among fungi dominant on the wood of *Betula verrucosa* — *Haplographium catenatum* and *Cacumisporium capitulatum* may be considered, but only in the *Pino-Quercetum* in Krzywa Góra (PQ I). In the remaining associations *H. catenatum* was only a subdominant on the wood (Fig. 3). Usually on the wood of this tree *Pseudospiropes longipilus* and *Brachysporium nigrum* were subdominant. Sometimes among subdominants *Chloridium claviforme* was found, especially in *Tilio-Carpinetum*, while in *Pino-Quercetum*, *Cladosporium cladosporoides* and *Bispora betulina* were subdominant.

Among the more numerous influents on the wood of *Betula verrucosa* were *Pelurothecium recurvatum*, *Codinaea* st. *Chaetosphaeria callimorpha* and *Monodictys levis*. Seven species of fungi grew uniquely on the wood of this tree (Table 1). Only *Pseudospiropes longipilus* is a fungus connected with birch, especially with its bark. This confirms earlier observations by other mycologists (Hughes 1951, Ellis 1975). Other

Table 4 — Tabela 4

Description populations of *Dematiaceae* on particular kind of wood
in the examined plant associations

Charakterystyka populacji *Dematiaceae* na drewnie różnych rodzajów drzew
w badanych zbiorowiskach leśnych

Wood of Drewno	Association Zespół	Tilio-Carpinetum			Pino-Quercetum		
	Reservation Rezerwat	Krzywa Góra	Siera- ków	Zamczy- sko	Krzywa Góra	Zamczy- sko	
1	2	3	4	5	6	7	
Carpinus betulus	Number of samples Liczba prób	239	108	126	—	346	
	Number of species Liczba gatunków	32	35	31	—	23	
	Abundance (%) Liczebność (%)	31,2	28,2	25,6	—	36,9	
	Frequency (%) Frekwencja (%)	25,8	15,8	19,2	—	11,2	
	Diversity coefficient Wskaźnik różnorodności	2,5	3,4	2,1	—	2	
	Mean occurrence per sample	0,2	0,2	0,3	—	0,1	
	Średnia wystąpień w próbie						
	Quercus robur	Number of samples	102	144	147	279	212
		Number of species	25	33	38	32	33
Abundance (%)		25,6	33,2	31,6	57,9	44,6	
Frequency (%)		11,9	19,6	16,9	21,1	13,1	
Diversity coefficient		2,1	3,1	2,7	2,1	2,5	
Mean occurrence per sample		0,2	0,2	0,4	0,3	0,1	
Betula verrucosa	Number of samples	155	119	128	210	127	
	Number of species	29	26	24	28	12	
	Abundance (%)	28,2	32,6	17,9	31,6	8,2	
	Frequency (%)	14,9	16,1	11,5	9	9,1	
	Diversity coefficient	2,5	2,5	2	2,5	1,9	
	Mean occurrence per sample	0,2	0,2	0,2	0,1	0,03	
Tilia cordata	Number of samples	80	—	172	—	—	
	Number of species	26	—	40	—	—	
	Abundance (%)	14,8	—	24,8	—	—	
	Frequency (%)	10,9	—	21,2	—	—	
	Diversity coefficient	3	—	2,8	—	—	
	Mean occurrence per sample	0,1	—	0,3	—	—	

1	2	3	4	5	6	7
Pinus sylvestris	Number of samples	—	57	—	117	169
	Number of species	—	9	—	10	14
	Abundance (%)	—	5,9	—	10,4	10,2
	Frequency (%)	—	5,6	—	2,1	7,8
	Diversity coefficient	—	1,9	—	1,8	2,7
	Mean occurrence per sample	—	0,04	—	0,06	0,04

fungi are also known from the wood of other trees especially deciduous ones.

The woody remains of *Tilia cordata* were occupied by 42 fungal species. Their mean abundance was relatively small, only higher than that observed on *Pinus sylvestris* wood. The frequency was relatively high, almost as high as on the wood of *Quercus robur*. The average diversity of species was among the highest noted (Table 4).

Haplographium catenatum was dominant or subdominant on wood of *Tilia cordata*. *Bispora betulina* and *Brachysporium nigrum* were subdominants. Among more abundant influents were *Diplococcium spicatum* and *Chaetopsis grisea*. Three species of *Dematiaceae* grew only on the wood of this tree (Table 1), of them only *Exosporium tiliae* is strictly connected with this substrate due to its parasitic mode of life.

Nineteen species of *Dematiaceae* were observed on *Pinus sylvestris* wood. These populations had the lowest observed abundance, frequency and diversity. These indices turned out to be, except for diversity, two or even four times lower than those observed for deciduous trees (Table 4, Fig. 5).

None of the fungi inhabiting the wood of *Pinus sylvestris* was a dominant or subdominant (Table 1). Among influents *Chloridium claviforme*, *Haplographium catenatum*, *Cladosporium cladosporoides*, *Rhinocladiella atrovirens*, *Oidiodendron tenuissimum* and *Cheiromycella microscopica* were the more numerous (Table 1).

Four species of *Dematiaceae* grew uniquely on *Pinus sylvestris* wood (Table 1). It seems that *Oidiodendron tenuissimum* and *Cheiromycella microscopica* are in the examined area more frequent on the wood of coniferous than on deciduous trees.

Populations of *Dematiaceae* on the wood of the examined trees differed depending on the community in which the wood underwent decomposition (Fig. 5). These differences were particularly visible when the participation of dominants and subdominants is taken into consideration (Fig. 3). In *Tilio-Carpinetum* in Krzywa Góra (TC I) *Brachysporium nigrum* was dominant on the wood of *Quercus robur* and subdo-

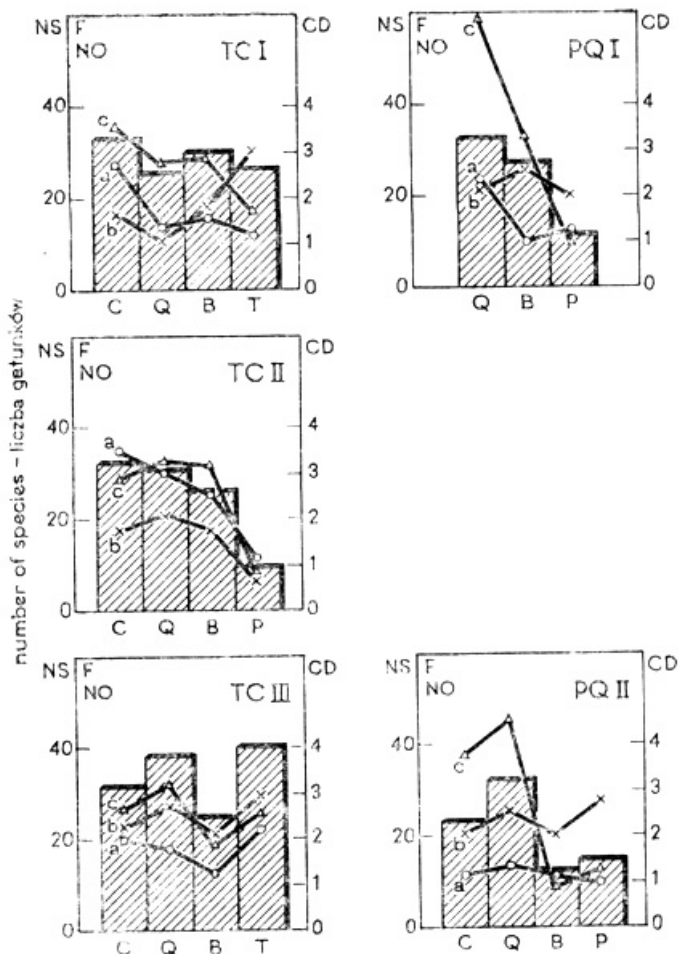


Fig. 5. Populations of dematiaceous *Hyphomycetes* on the wood in examined patches of *Tilio-Carpinetum* (TC) and *Pino-Quercetum* (PQ); number of species (NS), frequency (a — in %), number of occurrence (c — in %) and diversity coefficient (b)

C — *Carpinus betulus*, Q — *Quercus robur*, B — *Betula verrucosa*, T — *Tilia cordata*, P — *Pinus sylvestris*

minant on the wood of *Carpinus betulus*, *Betula verrucosa* and *Tilia cordata*. *Haplographium catenatum* was included in the group of subdominants and was at least two times more abundant on the wood of *Betula verrucosa* and *Carpinus betulus* than on the wood of *Quercus robur* and *Tilia cordata*. *Cacumisporium capitulatum* was in this community subdominant on oak and hornbeam wood.

Brachysporium nigrum in the *Tilio-Carpinetum* in Zamczysko — was dominant on oak wood and was subdominant on hornbeam and linden wood, while it was an accessory species on birch wood. *Haplographium catenatum* dominated in this patch on the wood of *Carpinus betulus*, *Tilia cordata* and *Quercus robur* and was subdominant on the wood of *Betula verrucosa*. *Cacumisporium capitulatum* was two times more numerous on birch wood than in the *Tilio-Carpinetum* in Krzywa Góra (TC I). On linden wood in *Tilio-Carpinetum* in Zamczysko (TC III) *Bispora betulina* was subdominant but in *Tilio-Carpinetum* in Krzywa Góra (TC I) it was ten times less abundant (Fig. 3).

In *Tilio-Carpinetum* in Sieraków (TC II) *Chloridium clavaeforme* was almost equally abundant as a subdominant on the wood of all deciduous trees, while in Krzywa Góra (TC I) it only dominated on the wood of *Carpinus betulus* (Table 4). *Bispora betulina* was subdominant on *Quercus robur* wood in the first community and in the second it was an influent growing five times less frequently. In the *Tilio-Carpinetum* in Zamczysko (TC III) this fungus was subdominant only on the wood of *Tilia cordata*.

The populations of *Dematiaceae* in the *Pino-Quercetum* in Krzywa Góra (PQ I) are distinguished by the dominance of four species of fungi on the wood of *Quercus robur*, two of them, *Haplographium catenatum* and *Cacumisporium capitulatum*, were also dominant on the wood of *Betula verrucosa* (Table 1). The subdominance of *Bispora betulina* on birch wood and oak wood is worth noting especially as in the *Pino-Quercetum* in Zamczysko (PQ II) this fungus was not noted on birch wood, and was two times less abundant on oak wood.

Similarly as in the communities discussed above, also in the *Pino-Quercetum* in Zamczysko (PQ II) *Dematiaceae* populations on the wood of the examined trees have specific characteristics. The decided dominant was *Chloridium clavaeforme* on the wood of *Quercus robur*. *Pleurophragmium rousselianum* was subdominant on the wood of *Carpinus betulus* and *Quercus robur*. *Cacumisporium capitulatum* which was dominant on the wood of these trees in *Pino-Quercetum* in Krzywa Góra (PQ I) was not noted on *Carpinus betulus* wood in the *Pino-Quercetum* in Zamczysko (PQ II) and was among accessory species on the wood of *Quercus robur*.

On the wood of *Carpinus betulus* in all patches of *Tilio-Carpinetum* the number of *Dematiaceae* is a very stable and varies from 31 to 35 species (Table 1, Fig. 5). The populations of these fungi are distinctly less varied on this wood in *Pino-Quercetum* (PQ II) — there are 23 taxa. The highest frequency of fungi was observed on hornbeam wood in the *Tilio-Carpinetum* in Krzywa Góra (TC I) and the lowest in the *Pino-*

-*Quercetum* in Zamczysko (PQ II). The highest abundance was reached by the *Dematiaceae* in the *Pino-Quercetum* in Zamczysko, and the lowest in the *Tilio-Carpinetum* in the same reservation (TC III). The diversity of species was maximum for the population of *Dematiaceae* on the wood of *Carpinus betulus* in *Tilio-Carpinetum* in the Sieraków reservation and was very low on the same wood in *Pino-Quercetum* in Zamczysko (PQ II).

The highest number of species of *Dematiaceae*, 38, was observed on the wood of *Quercus robur* in *Tilio-Carpinetum* in Zamczysko (TC III). In the remaining patches of this community it varied from 25-33 species. In the two patches of *Pino-Quercetum* it was equal and fairly high — 33 and 32 species. The abundance of these species was distinctly higher on oak wood in the patches of *Pino-Quercetum* than in the patches of *Tilio-Carpinetum*. The highest frequency was found in the *Pino-Quercetum* in Krzywa Góra (PQ I), a fairly high frequency in the *Tilio-Carpinetum* in Sieraków (TC II) a lower one in the *Tilio-Carpinetum* in Zamczysko and in the *Pino-Quercetum* in the same reservation and was similarly low in the remaining communities (Table 5).

The highest number of taxa on the wood of *Betula verrucosa* was noted in the *Tilio-Carpinetum* community in Krzywa Góra (TC I) — 29 species. But the frequency and abundance of fungi was the highest in the *Tilio-Carpinetum* in Sieraków (TC II). In both patches of *Pino-Quercetum* the same frequency of species were observed on birch wood, but in the Zamczysko reservation the abundance of *Dematiaceae* was three times lower and the species diversity and the mean frequency in the sample were also lower. Among the examined patches of *Tilio-Carpinetum* these indices were the lowest in the *Tilio-Carpinetum* in Zamczysko (TC III).

On the wood of *Tilia cordata* in the *Tilio-Carpinetum* in Zamczysko (TC III) 40 species of fungi were noted (Table 4). This was their maximum number noted on the wood of one species in the examined communities. In the *Tilio-Carpinetum* in Krzywa Góra (TC I) only 26 species of fungi were found on the same type of wood. Their frequency was two times lower, and their abundance was 40% lower, and the average number of occurrence in the sample was lower as well.

The most propitious conditions for the development on the wood of *Pinus sylvestris* occurred for *Dematiaceae* in the *Pino-Quercetum* in Zamczysko (PQ II). This is indicated by the highest number of species — 14 and the remaining indices (Tables 1, 4). The least favorable conditions were found in the *Tilio-Carpinetum* in Sieraków (TC II).

The populations of the examined species on *Pinus sylvestris* wood differ from almost all those noted on the wood of deciduous trees by

the low number of species and at least two times lower frequency and abundance.

SUMMARY AND CONCLUSIONS

1. The investigations were performed in the years 1967-1971 on 5 constant areas in three reservations of the Kampinos National Park. The analysis of the population of *Dematiaceae* in three patches of *Tilio-Carpinetum* and two patches of *Pino-Quercetum* was based on the analysis of 3040 samples taken in the 1971 vegetative season.

2. The used method seems proper and the obtained results give a relatively full picture of the qualitative-quantitative differentiation of the mycoflora of the examined fungi. The best method proved to be collecting a minimum of 600 samples from forest patches with a surface area of about 700 m² (Fig. 1) with a minimum representatives surface area — 30 cm² per 1 m² of wood.

In the case of the *Tilio-Carpinetum* in Sieraków (TC II) its small natural extensiveness and the lower amount of available wood could have affected the isolation of a lower number of fungal species and their lower frequency.

3. The flora of wood-inhabiting *Dematiaceae* in the examined reservations includes 106 taxa; 20 are common to all the communities.

4. Investigations have shown that populations of *Dematiaceae* which inhabit wood depend on the forest community in which they occur. A similar dependence has frequently been noted for fungi from the group *Basidiomycetes*, especially terrestrial ones (eg. Höfler 1938, 1955; Pirk, Tüxen 1957; Wojewoda 1957; Lisiewska 1978) and for some wood-inhabiting groups of *Basidiomycetes* (eg. Domański 1967; Wojewoda 1980). A similar dependence for the soil mycoflora has been shown by eg. Peyronel and Dal Vasco (1955), Badura (1966), Kowalski (1980).

5. Populations of *Dematiaceae* in *Tilio-Carpinetum* are generally more varied in their species content and the frequency of the fungi is also higher than in *Pino-Quercetum*.

6. The evaluation of the population on the basis of species diversity supports the statement of Odum (1977) that this diversity is small in ecosystems undergoing the action of limiting physico-chemical factors. The lowest species diversity was noted in the *Tilio-Carpinetum* in the reservation Krzywa Góra (TC I) lying on the southern slope of a dune and in the patch of *Pino-Quercetum* in the reservation in Zamczysko (PQ II) also located on the slope and the top of a dune where the microclimate was indubitably not favorable for development of *Dematiaceae*.

The diversity was also relatively low in the most humid patch of *Tilio-Carpinetum* in the reservation Zamczysko (TC III).

A large species diversity depends on biotic factors, in the *Tilio-Carpinetum* in Sieraków (TC II) it was the highest and the factors playing a biotic part here were the admixture of *Pino-Quercetum* and *Carici elongatae-Alnetum* elements.

7. The analysis of populations of fungi in particular patches of vegetation showed some of their particular characteristics concerning the structure of domination, species diversity, frequency of fungi or species occurring only in a given association.

However it is difficult at present to show characteristic species or distinctive ones for each of these communities especially as other edaphic and climatic factors affected the formation of these populations and there was interaction among *Dematiaceae* and other wood-inhabiting fungi.

8. A certain degree of the independence of wood-inhabiting fungi on the community was noted (for example 8 species of dominant or subdominant species) this supports a hypothesis on the formation of micro-communities of sporophytes on the wood within communities of higher plants (Karnaś 1957, Wojewoda 1978).

9. It seems that *Dematiaceae* because of their frequency, abundance diversity and biological properties eg. persistence of colonies, formation of teleomorpha, play an important role in the communities of wood-inhabiting plants. Most probably they are strictly dependent on other fungi especially *Basidiomycetes* which decompose lignin, as their possibilities in this field are rather limited (Holubová-Jechová 1971).

10. The dominance structure of the *Dematiaceae* population in all communities proved to be rather correct. The dominants form the smallest group, the subdominants a slightly larger one, the influents an even larger one and the accessory species are the most numerous.

11. A detailed analysis of the *Dematiaceae* mycoflora on the wood of various trees has shown that these fungi mind better conditions for development on the wood of deciduous trees than on that of *Pinus sylvestris*. The populations of fungi on the wood of *Carpinus betulus*, *Quercus robur* and *Betula verrucosa* are the closest to each other on the basis of quality. A certain specificity is shown by the flora of these fungi on the wood of *Tilia cordata*. The mycoflora of *Dematiaceae* on *Pinus sylvestris* is characterized by a large species specificity.

The coefficients of qualitative similarity are relatively small, the largest is about 58%. It seems that this indicates a strict trophic dependence of the investigated fungi on the substrate and its anatomical, chemical and physical properties. Nevertheless the influence of the phy-

toçoena on the formation *Dematiaceae* populations with a specific structure on the wood of particular trees has proved important.

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Epiksyliczne Dematiaceae Kampinoskiego Parku Narodowego

Streszczenie

Autorka przedstawia wyniki kilkuletnich badań nad grzybami z rodziny *Dematiaceae* zasiedlającymi drewno dębu, graba, brzozy, lipy i sosny w płatach *Tilio-Carpinetum* i *Pino-Quercetum* w Kampinoskim Parku Narodowym.

Dla uzyskania stosunkowo pełnego obrazu jakościowo-ilościowego zróżnicowania populacji badanych grzybów niezbędne okazało się pobieranie minimum 600 prób z płatów o powierzchni 700 m², przy minimalnej powierzchni reprezentatywnej 30 cm² z 1 m² powierzchni drewna.

Wykazano, że populacje *Dematiaceae* w poszczególnych płatach leśnych charakteryzuje swoista różnorodność gatunkowa, struktura dominacji, frekwencja oraz gatunki występujące wyłącznie w danym zbiorowisku. Populacje badanych grzybów w płatach *Tilio-Carpinetum* okazały się bardziej zróżnicowane niż w *Pino-Quercetum*.

Analiza mikoflory *Dematiaceae* na drewnie drzew wziętych pod uwagę, wskazuje iż grzyby te częściej i liczniej zasiedlają drewno drzew liściastych aniżeli sosny.

Wydaje się, że *Dematiaceae*, ze względu na częstość ich występowania, liczebność i różnorodność oraz właściwości biologiczne, odgrywają istotną rolę w tworzeniu mikrozespołów roślin epiksylicznych.