REVISION OF THE GENUS *XERULA* MAIRE (BASIDIOMYCETES, AGARICALES) IN POLAND

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ABSTRACT

Data concerning morphology, ecology and distribution of Polish representatives of the genus *Xerula* Maire are discussed in the paper. All available specimens of *X. pudens* and *X. melanotricha* from Polish herbaria were reexamined to verify their identity and geographical distribution. Several new localities of *X. melanotricha* in the country are provided. A key to European taxa of the genus is proposed.

KEY WORDS: *Xerula*, *X. melanotricha*, *X. pudens*, *Basidiomycetes*, *Agaricales*, Poland, distribution, morphology, ecology.

INTRODUCTION

The genus *Xerula* Maire is represented in Europe by 6 species, which have the following common characters: fruitbody collybioid; cap gray, brown to black, dry or viscid, glabrous or villose; gills white, distant, broad; stem erect, rooting, glabrous or villose; spore-print white, spores hyaline globose to subglobose or broadly ellipsoid, smooth or with big spines, non-amyloid; pleurocystydia and cheilocystidia present; cap cuticle hymeniderm. In most species cap and stem is covered with hyaline hairs or yellow-brown to blackish-brown macrosetae.

Three species of the genus are present in Poland. *Xerula radicata* (Relhan: Fr.) Dörfelt is the most common among them (as it is in whole Europe). *X. pudens* (Pers.) Sing. has been reported from several localities in the country. In Europe this species is connected with oak. Only two localities of the third one, *X. melanotricha* Dörfelt, have been published in Poland so far. This species occurs on calcareous soils and accompanies fir.

The aim of the present work is to analyze the taxonomy and distribution of the genus *Xerula* in Poland. All available herbarium materials and literature data concerning this genus in Poland were critically revised. It allowed an exhaustive discussion on the presence and frequency of these taxa in the country. Additionally, a key to European species of the genus is provided.

MATERIAL AND METHODS

Revision of herbarium materials of *X. pudens* and *X. melanotricha* from Polish herbaria (KRAM-F, KRA, KTC, LBLM, LOD, POZM, WA, WRSL, ZAMU) was done to verify their identity, presence and distribution in Poland. The note about distribution of *X. radicata* is based on literature data (for detailed map of distribution see: Ronikier 2004c, in press). The description of species and drawings refer to Polish collections. The key to European species is based on other keys from European countries (Knudsen 1992; Bas et al. 1999), works by Dörfelt (1979, 1980a, b), Boekhout and Bas (1986) and author's own observations.

RESULTS

Key to the European taxa of Xerula

Among six European species of *Xerula* the three, which have not been found in Poland so far, are rare or very rare in Europe, but regarding their habitats, they are likely to occur in the country. *X. caussei* Maire grows in beech forests on calcareous bedrock and it was reported from several countries in Western Europe; the locality from eastern part of Germany (Dörfelt 1973) is the closest to Poland, where it could be found in calcareous parts of the Carpathians. *X. xeruloides* (Bon) Dörfelt occurs in sandy habitats, so it is likely to be found in coastal areas of Poland. *X. kuehneri* (Romagn.) Bas et Boekhout is the rarest and the smallest species of the genus and it grows solitarily, therefore its basidiocarps are difficult to spot.

The key to European species of *Xerula* provided below, is based on the most distinctive and the easiest to observe features (in author's opinion). For full descriptions of taxa absent in Poland see: *X. kuehneri* and *X. caussei* (Boekhout, Bas 1986), *X. xeruloides* (Bon 1975; Dörfelt 1980a).

1. Cap glabrous, dry or viscid ..... *X. radicata*
1.* Cap tomentose, covered with hairs or macrosetae 2
2. Hairs hyaline 3
2.* Hairs (macrosetae) coloured 5
3. Spores with subcylindrical to conical spines ... *X. kuehneri*
3.* Spores smooth 4
4. Hairs non-septate .. *X. caussei* (= *X. nigra* Dörfelt, = *X. renati* Clemençon)
4.* Hairs septate ..... *X. xeruloides*
5. Hairs (macrosetae) up to 3 mm long, cystidia thin or slightly thick-walled (walls up to 1 µm thick), incrusted on the top, incrustation soluble in 5% KOH ..... *X. melanotricha*
5.* Hairs (macrosetae) about 1 mm long, cystidia thick-walled (walls 2-5 µm thick), incrusted on the top, incrustation not soluble in 5% KOH 6
6. Hairs dark, chocolate-brown, red-brown ..... *X. pudens* var. *fusca*
6.* Hairs golden-yellow, golden-brown ..... *X. pudens* var. *pudens*

Review of the genus Xerula in Poland

Xerula radicata (Relhan: Fr.) Dörfelt

Synonyms: *Oudemansiella pseudoradicata* M.M. Moser, *O. radicata* (Relhan: Fr.) Singer.

Cap plano-convex 3-7 cm diam., pale yellowish to ochraceous-brown, shiny, glabrous, radially rugose, slightly viscid. Lamellae white, distant, adnate, broad, edge whitish, ciliate. Stipe 10-15 × 0.5-0.8 cm, pale yellowish-brown, cylindrical, longitudinally grooved, with slightly thickened base and tapering root. Flesh whitish, smell and taste none.

Pleurocystidia scattered, 78-105 × 19-30 µm, thin-walled, clavate, often with obtuse or truncate apex. Cheilocystidia similar to pleurocystidia. Pileipellis hymeniderm, consists of clavate cells 30-50 × 14-30 µm with brown intracellular pigment. Basidia 4-spored, 50-65 × 10-15 µm. Spores broadly elliptic 13-16 × 9-11 µm, hyaline, non-amyloid (Fig. 1).

Remarks: The species is very variable as concerns colours, shape of cystidia and structure of pileipellis. Several varieties were described (see Dörfelt 1983). The revision of all Polish materials is needed to verify their presence in the country. *X. radicata* is present on many scattered localities in Poland (Ronikier 2004c, in press), and it is a common species.

Specimen examined: Poland. Centralne Karpaty Zachodnie mts.: Tatry Zachodnie mts. Sarnia Skała massif, Grześkówki ridge (19°56'35"E, 49°16'36"N), *Dentario glandulosae-Fagetum*, on soil, at dead standing stem of *Fagus sylvatica*, ca 960 m., 20 May 2000, *leg.* A. Ronikier (KRAM F-39928).

Xerula pudens (Pers.) Sing.

Synonyms: *Xerula longipes* (Bull.) Maire, *Oudemansiella badia* (Quél.) M.M. Moser ss. Moser, *Oudemansiella longipes* (Bull.) M.M. Moser.

Cap young convex with incurved margin, later campanulate, convex with a broad umbo, then expanded, sometimes slightly depressed in the center, 1.5-11 cm diam., brown, foxy-brown, yellowish-brown, cream-foxy to grayish-brown sometimes with olive tint, velvety-tomentose, covered with golden-foxy hairs (macrosetae). Margin even to inrolled, setose. Lamellae white to cream-coloured, waxy,

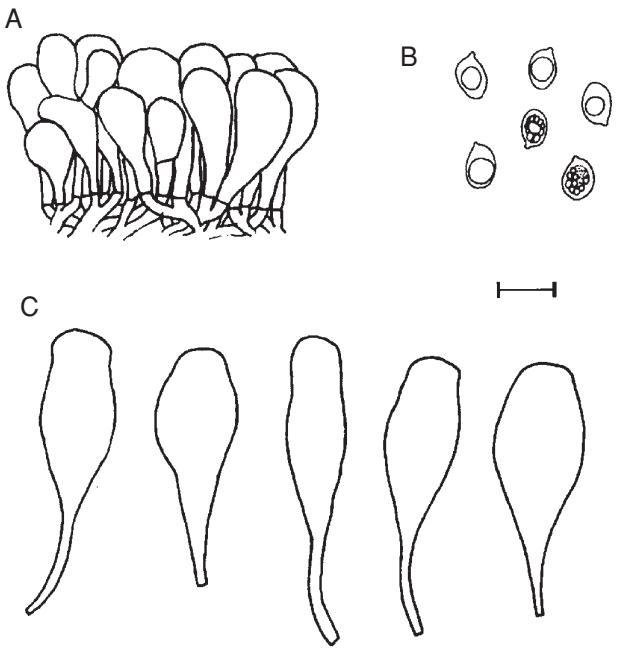

Fig. 1. *Xerula radicata* (Relhan: Fr.) Dörfelt: A – Pileipellis, B – Spores, C – Pleurocystidia; bar = 20 µm.

moderately thick, distant, narrowly adnate, broad, edge smooth. In one collection from Stary Rachów (LBLM, *sine num.*) thick-walled macrosetae are present in the hymenium. Stipe 12-15 × 0.4-1 cm, yellow-brown, grayish-brown, cylindric to slightly clavate, longitudinally grooved, often twisted, with root up to 7 cm long, tomentose, covered with golden-foxy hairs. Flesh thick, whitish to cream-coloured, smell faint, taste mild or slightly bitterish (recorded by a collector in specimen from Stary Rachów).

Cheilocystidia abundant, 100-120 × 13-25 µm, lageniform, thick-walled, walls sometimes yellowish, with crystals on the top. Cristals not soluble in 5% KOH. Pleurocystidia numerous, similar to cheilocystidia, 105-135 × 25-37 µm. Pileipellis hymeniderm, consists of clavate to vesicular cells 25-70 × 15-30 µm with brown intracellular pigment. Hairs acute, thick walled, about 1000 × 10-20 µm, walls 2--5 µm thick. Basidia 4-spored, 50-70 × 10-12 µm. Spores globose to subglobose 10-11 × 8-10 µm, hyaline, non-amyloid (Fig. 2).

Remarks: Two varieties of *X. pudens* have been distinguished (Dörfelt 1980a): var. *pudens* – the typical one, and var. *fusca* characterized by darker setae. Only var. *pudens* is present in Poland. According to Dörfelt (1980a) the distribution of var. *fusca* is limited to S-W Europe.

As the species is connected to *Quercus* in Europe, its distribution in Poland could theoretically cover the whole area of the country besides higher parts of the mountains, where oak is not present (Zając A., Zając M. 2001). Based on data available, however, the fungus seems to be rare in Poland, recorded on scattered localities, only locally more common (Ronikier 2004a, in press).

Specimens examined: Poland. Pojezierza Południowobałtyckie lakelands: Pojezierze Chodzieżskie lakeland, Wągrowiec district, Durowo forestry, „Dębina" nature reserve, forest division no. 147, *Galio-Carpinetum corydaletosum,* on oak roots, 16 Sept. 1995, *leg.* M. Połczyńska (POZM, *sine num.*, Lisiewska, Połczyńska 1998); „Dębi-

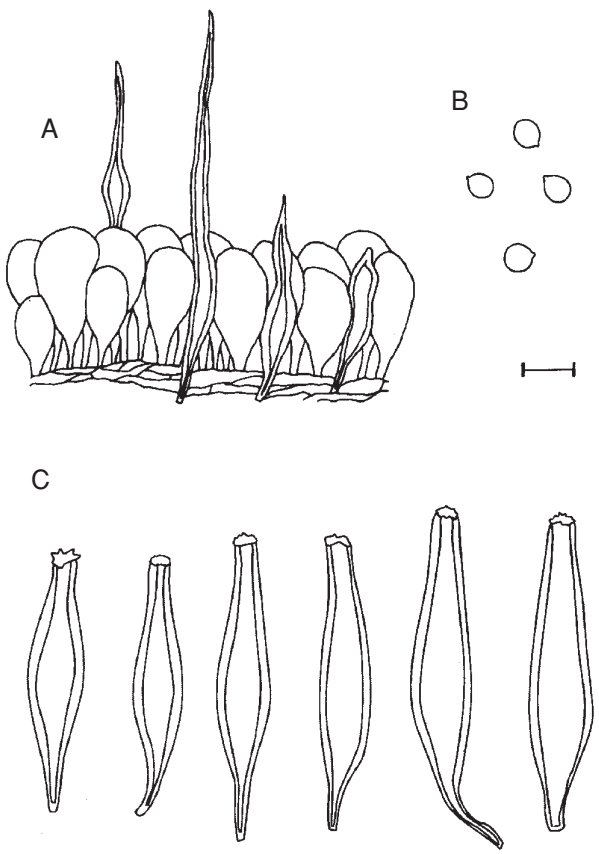

Fig. 2. *Xerula pudens* (Pers.) Sing.: A – Pileipellis, B – Spores, C – Pleurocystidia; bar = 20 µm.

na" nature reserve, *Querco-Carpinetum corydaletosum* at the base of trunk, 25 Aug. 1961, *leg*. M. Lisiewska (POZM, *sine num*., – as *Oudemansiella badia* (Lucand), Lisiewska 1965); „Dębina" nature reserve, *Querco-Carpinetum stachyetosum silvaticae*, at the bottom of decayed trunk, 31 Aug. 1960, *leg*. M. Lisiewska (POZM, *sine num*., – as *Oudemansiella badia*, Lisiewska 1965); Pojezierze Stęszewskie lakeland, Wielkopolski National Park, near Puszczykowo, at Jezioro Góreckie lake, *Querceto-Carpinetum*, on soil, 5 Sept. 1957, *leg*. M. Lisiewska (POZM, *sine num*., Lisiewska 1961); Brda River valley, Bory Tucholskie region, "Piekiełko" (about 5 km SSW of Tuchola), *Tilio-Carpinetum*, on soil, among litter, at a trunk, 31 Aug. 1994, *leg*. T. Dziedziński (LOD 14595, Ławrynowicz et al. 2003, in press); **Niziny Środkowopolskie lowlands:** Wzgórza Dalkowskie hills, Głogów forestry, „Uroczysko Obiszów" nature reserve, forest division no. 149, *Galio silvatici-Carpinetum typicum*, on oak root, 22 Aug. 1994, *leg*. W. Sekuła-Woźniak (POZM, *sine num*., Lisiewska, Sekuła-Woźniak 1998); Równina Warszawska plain, Warsaw-Bielany, Lasek Bielański forest, oak-hornbeam forest with *Quercus robur* and *Pinus sylvestris*, 28 Sept. 1958, *leg*. W. Rudnicka (WA 12542, Rudnicka 1960); Pradolina Wrocławska proglacial valley, Wrocław-Osobowice (Breslau-Oswitz), (WRSL, *sine num*., Schroeter 1885-1889). **Wyżyna Śląsko-Krakowska upland:** Wyżyna Olkuska upland, Ojcowski National Park, Pieskowa Skała, about 1 km NW of the castle in Pieskowa Skała, near Kołowrocie rocks, *Pino-Quercetum* variant with *Pinus*, 16 Sept. 1961, *leg*. W. Wojewoda (KRAM F-52679, Wojewoda 1974); Wyżyna Częstochowska upland, Mstów, communal forest, on roots of deciduous trees, 28 Sept. 1996, *leg*. E. Kowalczyk, (LOD 16003, Kowalczyk 1997); 80-years old oak forest, at the trunk, 22 Aug. 1996, *leg*. M. Ławrynowicz (LOD 17750, Ławrynowicz 2001); Góra 3 Maja hill, Mstów, oak forest, at the oak trunk, 23 July 1996, *leg*. K. Salamon (LOD 16249); 6 Sept. 1995, *leg*. K. Salamon (LOD 16250, Salamon 1997); Wyżyna Wieluńska upland, Dobra hill near Mstów, on the wood covered by soil, 7 July 1995, *leg*. A. Tolak (LOD 15955); 22 July 1996, *leg*. A. Tolak (LOD 15956, Tolak 1997); **Wyżyna Małopolska upland:** Góry Świętokrzyskie mts., Korzecko near Chęciny, Grzywy Korzeckie hills, forest division no. 189, *Potentillo albae-Quercetum*, on soil, 30 Oct. 1994, *leg*. J. Łuszczyński (KTC B485, Łuszczyński 1998). **Wyżyna Lwowska upland:** Wzniesienia Urzędowskie elevations, Stary Rachów near Annopol, on trees' roots, in oak-hornbeam forest, on chalky soil, 10 Sept. 1965, *leg*. B. Sałata (LBLM, *sine num*., Sałata 1968); **Północne Podkarpacie region:** Nizina Nadwiślańska lowland, Puszcza Niepołomicka forest, forest division no. 447, between Chobot and Ispina, about 30 km E from the center of Cracow, *Tilio-Carpinetum*, 30 Aug. 1995, *leg*. Z. Heinrich (KRAM F-36394, Wojewoda et al. 1999); Puszcza Niepołomicka forest, forest division no. 460, „Lipówka" nature reserve, about 2 km NE from Chobot, *Tilio-Carpinetum*, 3 Oct. 1988, *leg*. Z. Heinrich and E. Kot (KRAM F-29073); 20 Oct. 1989, *leg*. W. Wojewoda (KRAM F-52678); Puszcza Niepołomicka forest, forest division no. 426, between Chobot and Ispina, „Koło" nature reserve, *Tilio-Carpinetum*, 17 Sept. 1981, *leg*. H. Komorowska (KRAM F-25991, Komorowska 1991); Puszcza Niepołomicka forest, forest division no. 431, 15 Sept. 1983, *leg*. B. Godzik (KRAM F-52683, Komorowska 1991); Pomost Krakowski region, Cracow, Wzgórza Tynieckie hills, „Skołczanka" nature reserve, deciduous forest (*Tilio-Carpinetum*), 25 Aug. 1990, *leg*. B. Gumińska, (KRA, *sine num*., Gumińska 1991-1992); Wzgórza Tynieckie hills, Sidzińska Góra hill, mixed forest (*Carpinus, Quercus*), 11 Oct. 1998, *leg*. W. Wojewoda (KRAM F-52815); Cracow, Las Wolski forest, about 0.5 km W from Astronomical Observatory of Jagiellonian University, edge of the forest, at the trunk of deciduous tree ?*Quercus*, 29 Aug. 1987, *leg*. W. Wojewoda (KRAM F-52858, Wojewoda 1996).

Specimens misidentified:

1. *Oudemansiella longipes* – Pojezierze Poznańskie lakeland, Nowy Tomyśl district, Urbanowo, *Querceto-Carpinetum lathyretosum verni* variant with *Betula*, on soil, 22 Aug. 1960, *leg*. H. Bujakiewicz (POZM, *sine num*.); (Bujakiewicz, Fiklewicz 1963) = *Melanoleuca stridula* (Fr.) Métrod,
2. *Oudemansiella longipes* – Płaskowyż Nałęczowski plateau, Lublin, Botanical Garden in Sławinek, 9 Sept.1976, *leg*. Jolanta Lupa-Grzegorczyk (LBLM, *sine num*.); (?Flisińska 1984) = *Flammulina velutipes* (Curtis) Singer.

Xerula melanotricha Dörfelt

Cap young campanulate, later convex with a broad umbo, then plane to concave, 1-6 cm diam., chocolate-brown, grayish-brown, blackish-brown, more rarely yellowish-brown, velvety-tomentose, covered with dark brown to blackish-brown, long hairs (macrosetae). Sometimes two

distinct color zones are visible: yellowish-brown at the center of cap and chocolate-dark brown at the margin. The zones remain visible also in dry specimens. Margin of cap incurved, then even, villose-setose. Lamellae white, waxy, moderately thick, distant, broad, narrowly adnate, edge smooth. Stipe 4-13 × 0.2-0.7 cm, concolourous with cap, cylindric to clavate, often with strongly thickened base up to 1.5 cm diam. and tapering root 4-12 cm long, longitudinally grooved, often twisted. Whole stem covered with brown to blackish-brown hairs. Flesh thick, whitish, smell faint, taste mild.

Cheilocystidia scattered, 100-125 × 20-30 µm, ventricose, fusiform, slightly thick-walled (wall up to 1 µm), some slightly incrusted or with ?amorphous substance on the apex (incrustation soluble in 5% KOH). Pleurocystidia more numerous, similar to cheilocystidia, 75-130 × 22-45 µm. Pileipellis hymeniderm, consists of clavate to vesicular cells 30-85 × 12-35 µm with brown intracellular pigment. Hairs thick-walled 80-2900 × 15-29 µm, walls 2-4 µm thick. Basidia 4-spored, 26-55 × 10-15 µm. Spores globose to subglobose 10-11.5 × 8-11 µm, hyaline, non-amyloid (Fig. 3).

Remarks: The species was not recognized in Poland before. Only two localities are known from the literature (Szczepka, Sokół 1986; Łuszczyński 2002). The revision of herbarium material changed completely the view on occurrence of the species in this part of its distribution. The fungus occurs within the distribution area of fir (see Zając A., Zając M. 2001), in calcareous regions, and it can be considered as locally common (Ronikier 2004b, in press). The northern limit of its distribution range crosses the country.

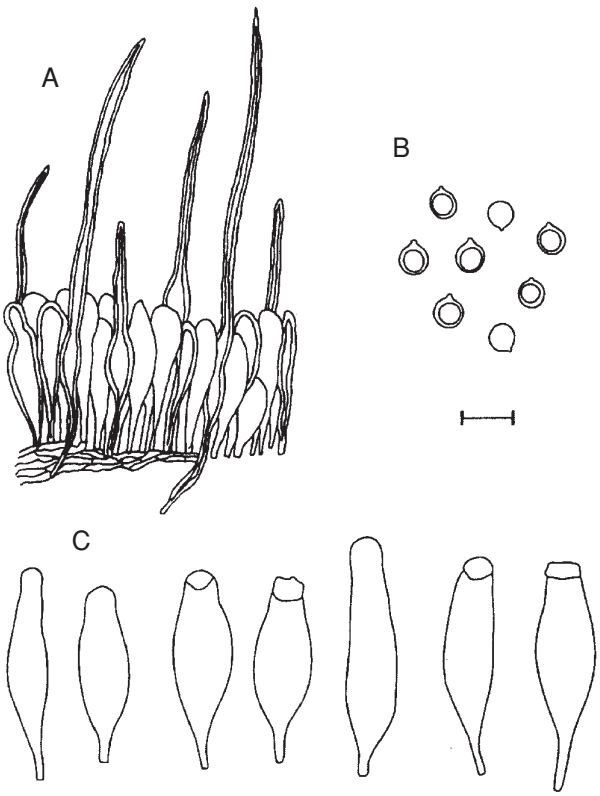

Fig. 3. *Xerula melanotricha* Dörfelt: A – Pileipellis, B – Spores, C – Pleurocystidia; bar = 20 µm.

Specimens examined: Poland. Niziny Środkowopolskie lowlands: Wysoczyzna Złoczewska high plain, Złoczew forestry, „Nowa Wieś" nature reserve, 7 May 1996, *leg*. J. Makowczyńska (LOD 17760) – as *X. pudens* (Pers.) Sing (Makowczyńska 1997); **Wyżyna Śląsko-Krakowska upland:** Wyżyna Olkuska upland, Ojcowski National Park, Złota Góra hill, *Pino-Quercetum*, variant with *Fagus*, 10 Aug. 1966, *leg*. W. Wojewoda (KRA, *sine num*.) – as *O. longipes* (Bull. ex St-Am.) Mos. (Wojewoda 1974); small valley at the mouth of Jamki gully, near Sąspów valley, *Fagetum carpaticum*, 2 Aug. 1963, *leg*. R. Rejchelówna (KRA, *sine num*.) – as *O. longipes* (Wojewoda 1974); Złota Góra hill, 30 Aug. 1960, *leg*. W. Wojewoda (KRAM F-52666) – as *O. longipes* (Wojewoda 1974); Złota Góra hill, SW slopes, *Pino-Quercetum* variant with *Fagus sylvatica*, 27 July 1961 (KRAM F-52667) – as *O. longipes* (Wojewoda 1974); at the bottom of Złota Góra hill, above Prądnik valley, about 300 m SW from the castle ruins in Ojców, fragments of *Pino-Quercetum* variant with *Abies alba* and *Tilio-Carpinetum*, 17 Aug. 1961, *leg*. W. Wojewoda (KRAM F-52669, KRAM F-52674) – as *O. longipes* (Wojewoda 1974); Złota Góra hill, above Błotny Dół gully, fragments of *Fagetum carpaticum collinum* and *Pino-Quercetum* variant with *Fagus sylvatica*, 9. Aug. 1963, *leg*. W. Wojewoda (KRAM F-52671) – as *O. longipes* (Wojewoda 1974); Złota Góra hill, about 0.5 km NW from the castle ruins in Ojców, 20 Sept. 1962, *leg*. W. Wojewoda (KRAM F-52672) – as *O. longipes* (Wojewoda 1974); at the bottom of Złota Góra hill, near the mouth of Sąspówka stream, *Tilio-Carpinetum*, 13 July 1963, *leg*. W. Wojewoda (KRAM F-52675) – as *O. longipes* (Wojewoda 1974); vicinity of Pochylce and Łamańce rocks, at the fork of the road Kraków-Olkusz to Skała, 12 Oct.?1961, *leg*. W. Wojewoda (KRAM F-52676) – as *O. longipes* (Wojewoda 1974); Chełmowa Góra hill, *Fagetum carpaticum collinum* variant with *Asperula odorata* and *Majanthemum bifolium*, 27 Sept. 1967, *leg*. W. Wojewoda (KRAM F-52668) – as *O. longipes* (Wojewoda 1974); Chełmowa Góra hill, near the top, *Fagetum carpaticum*, 11 Aug. 1961, *leg*. W. Wojewoda (KRA, *sine num*.) – as *O. longipes* (Wojewoda 1974); the top of Chełmowa Góra hill, 14 Sept. 1961, *leg*. W. Wojewoda (KRAM F-52670) – as *O. longipes* (Wojewoda 1974); Góra Okopy hill, *Tilio-Carpinetum*, under *Abies alba*, 14 Sept. 1967, *leg*. W. Wojewoda (KRAM F-52673) – as *O. longipes* (Wojewoda 1974); Chełmowa Góra, about 200 m from the mouth of Sąspówka stream, 26 Aug. 1961, *leg*. W. Wojewoda (KRAM F-52677) – as *O. longipes* (Wojewoda 1974); **Zewnętrzne Karpaty Zachodnie mts.:** Pogórze Śląskie foothils, „Zadni Gaj" nature reserve, between Leszna Górna and Cisownica, near a stump of *Abies alba*, on calcareous bedrock, near the skirt of forest (*Picea abies, Taxus baccata*), ca 500 m., 17 July 1982, *leg*. S. Sokół (KRAM F-29564, Sokół, Szczepka 1986); Beskid Sądecki mts., Góra Kopciowa mt., near Krynica, fir forest, 22 Sept. 1962, *leg*. B. Gumińska (KRA, *sine num*.) – as *O. longipes* (Gumińska 1966); **Centralne Karpaty Zachodnie mts.:** Pieniny mts., Pieniny National Park, Ociemny Żleb gully, beech forest, 9 Aug. 1970, *leg*. E. Łagowska (KRA, *sine num*.); Pieniny mts., above Ociemny Potok stream, beech forest, 27 Sept. 1970, *leg*. B. Gumińska (KRA, *sine num*.); Pieniny mts., Bajków Groń meadow, above Pieniński Potok stream, beech forest, 10 Sept. 1969, *leg*. B. Gumińska (KRA, *sine num*.); Pieniny mts., at yel-

low hiking trail, below place called „Istebki", near Bajków Groń meadow, the edge of forest, 22 Sept. 1996, *leg*. A. Drozdowicz (KRA, *sine num.*); Pieniny mts., slopes of Góra Zamkowa mt., *Fagetum carpaticum*, 27 Aug. 1987, *leg*. B. Gumińska (KRA, *sine num.*); Pieniny mts., slopes of Czertezik mt., 18 Sept. 1970, *leg*. B. Gumińska (KRA, *sine num.*); Pieniny mts., between Białe Skały rocks and Czertezik mt., 15 Sept. 1987, *leg*. B. Gumińska (KRA, *sine num.*); Pieniny mts., under Kórnikowa Skała rock, beech forest, 6 Sept.1965, *leg*. B. Gumińska (KRA, *sine num.*) – as *O. badia* (Lucand) (Gumińska 1969); Pieniny mts., upstream of Głęboki Potok, fir-spruce forest, 24 June 1967, *leg*. B. Gumińska (KRA, *sine num.*); Western Tatra mts. Sarnia Skała massif, Grześkówki ridge (19°56'35"E, 49°16'36"N), *Dentario glandulosae-Fagetum*, on soil, at dead standing trunk of ?*Abies*, *ca* 960 m., 9 June 2000, *leg*. A. Ronikier (KRAM F-39960); Western Tatra mts. Sarnia Skała massif, western slope of Grześkówki ridge (19°56'27"E, 49°16'37"N), *Dentario glandulosae-Fagetum*, on soil, *ca* 970 m., 16 Aug. 2003, *leg*. A. Ronikier (ZAMU B/97/MT-4358);

DISCUSSION

Most specimens of *X. melanotricha* collected in Poland were published under the names: *Oudemansiella longipes* or *Oudemansiella badia,* before the species was described by Dörfelt (1979); all these materials have not been reexamined later. Nevertheless, during 24 years after describing this taxon, only two localities were reported in Poland (Sokół, Szczepka 1986; Łuszczyński 2002).

At first look the two species of *Xerula*: *X. pudens* and *X. melanotricha*, are similar, especially without comparison to each other. But the differences between them are so clear, that the recognition is not difficult. Very long and almost black setae of *X. melanotricha* are usually easily visible by naked eye, while the setae of *X. pudens* look like tomentose cover on the pileus and stipe. In some younger specimens of *X. melanotricha*, however, the length of the hairs hardly exceed 1 mm and it is sometimes difficult to measure hairs on the cap; they are often broken in herbarium material. Still, the distinction between the two species is additionally facilitated by cystidia shape and thickness of their walls. *X. melanotricha* is characterized by wider cystidia with much thinner walls and incrustation on their apex soluble in 5% KOH, while *X. pudens* has thick-walled cystidia, very similar in shape to those of *Inocybe*, with incrustations not soluble in KOH. Additionally, the number of pleuro- and cheilocystidia is much bigger in case of *X. pudens.*

There are several localities of *Agaricus longipes*, *Collybia longipes*, *Oudemansiella longipes* or *O. badia* reported from Poland. The fungi are listed among other species without any information except the locality. As relevant herbarium materials have not survived or were not available, the material could not be examined. The stands not revised are:

1. *Agaricus longipes* Bull. – Łysica (Błoński 1890: 153)
2. *Agaricus longipes* Bull. – Węglowa Wólka near Warsaw (Błoński 1896: 85)
3. *Agaricus longipes* Bull. – vicinity of Międzyrzec Podlaski, forest of Żabiec? („Lasek Żabiecki" forest), Sept. (Eichler 1900: 198)
4. *Collybia longipes* Bull. – Dubeczno; Hańsk (Kwieciński 1896: 32)
5. *Collybia longipes* (Bull.) Quél. – Ojców valley (Yelenkin 1901: 20)
6. *Collybia longipes* Bull. – Poznań, Sołacki park, under oak trunk, 1.10.1928 (Teodorowicz 1933: 99)
7. *Collybia longipes* Bull. – Kwidzyn, "Liebenthaler Wald"; Mrągowo (Neuhoff 1933: 358)
8. *Collybia longipes* Bull. – Srebrna Góra, 19.09.1915. (Dittrich 1917: 7)
9. *Oudemansiella longipes* – Ojcowski National Park (Anonymous 1968: 193, Wojewoda 1966: 73)
10. *Oudemansiella longipes* (Bull. ex St. Am.) Moser – Zemborzyce near Lublin, pine forest, Sept.-Oct. (Flisińska 1996: 29)
11. *Agaricus longipes* Bull. – Góra (Guhrau: Oberwald), Central Poland Lowlands, Pradolina Wrocławska proglacial valley, Wrocław-Strachocin (Breslau-Strachate), Sudety Mts, Równina Świdnicka plain, Krasków near Świdnica (Schweidnitz, Kratzkau), (Schroeter 1885-1889: 647)
12. *Oudemansiella badia* (Quél.) Moser, *O. longipes* (Bull. ex Fr.) Bours. – Pojezierze Chodzieżskie lakeland, Wągrowiec, „Dębina" nature reserve, *Querco-Carpinetum stachyetosum silvaticae*, *Querco-Carpinetum corydaletosum*, Aug. 1960-1961 (Lisiewska 1961: 61; Lisiewska, Bujakiewicz 1976a: 124, b: 62)
13. *Oudemansiella badia* (Quél.) Moser, *O. longipes* (Bull.) Moser – Równina Bielska plain, Puszcza Białowieska primeval forest (Skirgiełło et al. 1992: 36, (Bujakiewicz 1997: 384, map F883)
14. *Oudemansiella longipes* (Bull. ex Fr.) Bours. – Wielkopolski National Park, Osowa Góra forestry, *Querco-Carpinetum stachyetosum silvaticae,* Sept. 1957; Opalenica, Urbanowo forestry, *Querco-Carpinetum lathyretosum verni*, Aug. 1960 (Lisiewska 1965: 249).

Localities mentioned above were not taken into account in preparing the distribution maps of *X. melanotricha* and *X. pudens* in Poland (Ronikier 2004a, b, in press). As most of that localities are situated in northern part of Poland, beyond the distribution of *Abies alba* (Zając A., Zając M. 2001), in all likelihood most of them refer to *X. pudens.*

Further field investigations are needed to complete the distribution map of representatives of *Xerula* in Poland, especially the two rare species: *X. melanotricha* and *X. pudens*.

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REWIZJA RODZAJU *XERULA* MAIRE (BASIDIOMYCETES, AGARICALES) W POLSCE

STRESZCZENIE

Rodzaj *Xerula* jest reprezentowany w Polsce przez trzy gatunki: *X. radicata* – gatunek pospolity, występujący na rozproszonych stanowiskach na terenie całego kraju, *X. pudens* – rzadszy gatunek przywiązany do dębu, występujący na kilkunastu stanowiskach w obrębie naturalnego zasięgu dębu, oraz *X. melanotricha* – gatunek towarzyszący jodle i występujący na podłożu wapiennym, podawany w Polsce dotychczas zaledwie z dwóch stanowisk. W niniejszej pracy prezentowane są dane na temat morfologii, ekologii i rozmieszczenia w Polsce gatunków z rodzaju *Xerula*. Wszystkie dostępne okazy *X. melanotricha* i *X. pudens* z polskich zielników (KRAM-F, KRA, KTC, LBLM, LOD, POZM, WA, WRSL, ZAMU) zostały zrewidowane; rewizja wykazała, że *X. melanotricha* występuje w Polsce co najmniej na kilkunastu stanowiskach. W pracy podano klucz do europejskich gatunków rodzaju *Xerula*.

SŁOWA KLUCZOWE: *Xerula*, *X. melanotricha*, *X. pudens*, *Basidiomycetes*, *Agaricales*, Polska, rozmieszczenie, morfologia, ekologia.