

The genus *Athelopsis* (Aphyllophorales, Corticiaceae) in Finland

Heikki Kotiranta¹ & Reima Saarenoksa²

¹ Finnish Environment Institute, Research Department, P.O. Box 140, FI-00251 Helsinki, Finland (e-mail: heikki.kotiranta@ymparisto.fi)

² Department of Biological and Environmental Sciences, P.O. Box 65 (Viikinkaari 1), FI-00014 University of Helsinki, Finland

Received 15 July 2004, revised version received 18 Apr. 2005, accepted 17 June 2005

Kotiranta, H. & Saarenoksa, R. 2005: The genus *Athelopsis* (Aphyllophorales, Corticiaceae) in Finland. — *Ann. Bot. Fennici* 42: 335–342.

The genus *Athelopsis* in Finland consists of three species, viz. *A. glaucina* (Bourdot & Galzin) Oberw. ex Parmasto, *A. lembospora* (Bourdot) Oberw. and *A. subinconspicua* (Litsch.) Jülich. The distribution and habitats are described and the possible relation to the genus *Repetobasidium* is briefly discussed. The micro-morphology of each species is described and illustrated, as well as the formation of spore pairs and tetrads. A few reference specimens from Italy, Norway and Russia were studied.

Key words: Aphyllophorales, *Athelia*, *Athelopsis*, *Repetobasidium*, taxonomy

Material and methods

The material studied is preserved in the herbaria GB, H, OULU and/or in the reference herbarium of Heikki Kotiranta (H.K.).

Thirty spores per specimen are measured if not otherwise stated, and the measurements are made in Cotton Blue (CB) or Melzer's reagent (IKI). In addition, 5% potassium hydroxide (KOH) was used as mounting medium.

The following abbreviations are used: L = spore length, L^* = mean spore length, W = spore width, W^* = mean spore width, Q = range of the variation in L/W ratio, Q^* = quotient of the mean spore length and width (L/W). In Table 1 the L and W values given in boldface include at least 90% of the spores.

In the species descriptions spore measurements are based on mean values from each col-

lection. The variation is given, with the mean value of all collections given in between. None of the measurements derive from a spore print.

Biological provinces and collection sites in Finland are indicated according to the Finnish national uniform grid system (27°E), as applied to biological material by Heikinheimo and Raatikainen (1981).

The nomenclature of Corticiaceae follows Hjortstam (1998) and of vascular plants Hämet-Ahti *et al.* (1998). The authors of vascular plants are found in that publication and are not repeated here. The epithets "*Picea*" and "spruce" refer to *Picea abies*, "*Pinus*" to *Pinus sylvestris*, "birch" to *Betula* spp. and "aspen" to *Populus tremula*, respectively. The species are arranged in alphabetical order.

The authors' names in chapters "Specimens examined" are abbreviated as H.K. (Heikki Koti-

ranta) and R.S. (Reima Saarenoksa), respectively.

Taxonomic treatment

Athelopsis glaucina (Bourdot & Galzin)
Oberw. ex Parmasto (Fig. 1)

Basidiocarp resupinate, thin, porose-reticulate, whitish with a green hue; margin not differentiated, distinct. Hyphal system monomitic, all hyphae clamped, thin-walled. Basal hyphae fairly sparingly ramified, 2–3 μm in diam. Subiculum loose, hyphae 2–3(–3.5) μm wide. Subhy-

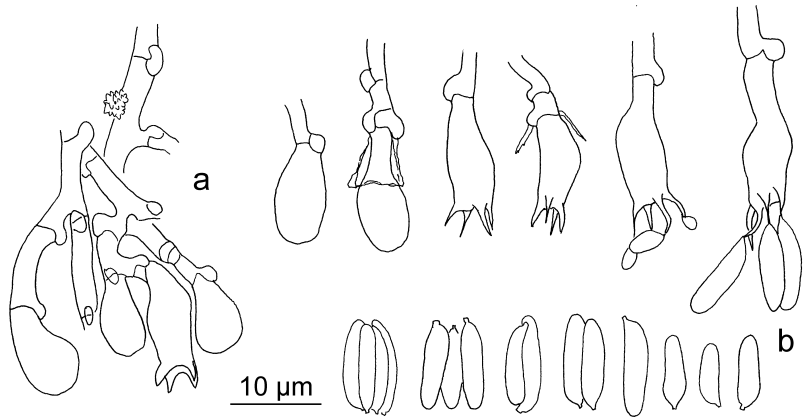
menial hyphae richly branched, 2–2.5 μm wide. Cystidia none. Basidia at first ovoid or pyriform, when mature clavate, stalked, fairly seldom repetitive, 10–14 \times 5–6 μm , with four, relatively thin, up to 4 μm long sterigmata. Spores smooth, cylindrical, sometimes curved, 8–9.7 \times 2.3–2.7 μm , $L^* = 9 \mu\text{m}$, $W^* = 2.4 \mu\text{m}$, $Q = 3.5\text{--}3.9$, $Q^* = 3.7$, mostly glued in pairs or tetrads, very thin-walled, CB+ (very faintly), IKI–.

The internal repetition of basidia is similar to that seen in *A. lembospora* (see below), but does not occur so regularly, and mostly remnants of only one previous generation of basidia is seen. Also the formation of pairs or tetrads of spores is similar to that of *A. lembospora*.

Table 1. Spore dimensions of the studied specimens. The values set in boldface include at least 90% of the spores.

	L (μm)	L^* (μm)	W (μm)	W^* (μm)	Q	Q^*
<i>A. glaucina</i>						
Kotiranta 19302	(7–) 7.9–11	9	2–2.5 (–2.7)	2.3	3–4.8	3.9
Kotiranta 19123	(7.2–) 8.3–11.1	9.7	(2.1–) 2.3–3 (–3.2)	2.7	2.8–4.5	3.6
Kotiranta 8495	(7–) 8–10.8 (–11.6)	9.2	2–2.6 (–2.9)	2.3	3.2–4.5	3.9
Kotiranta 13184	7–8.7 (–9)	8	2–2.6 (–2.9)	2.3	2.6–4.5	3.5
<i>A. lembospora</i>						
Saarenoksa 05695	(6.8–) 7–8.5 (–9)	7.7	2.4–3 (–3.2)	2.7	2.3–3.6	2.8
Haikonen 6263b	(5.4–) 6.1–8 (–8.2)	6.9	2.3–3 (–3.4)	2.6	2.1–3.4	2.6
Saarenoksa 47889	(6.5–) 6.8–8.2 (–8.6)	7.3	2.2–2.8	2.4	2.5–3.6	3
Saarenoksa 47389	(6–) 6.2–7.3 (–7.6)	6.7	(2–) 2.2–3 (–3.3)	2.6	2.2–3.3	2.6
Saarenoksa 47989	(6–) 6.5–8.5	7.2	(2–) 2.2–2.9	2.5	2.3–3.9	2.9
Saarenoksa 48089	6–7.3 (–7.6)	6.7	2.1–2.9	2.5	2.2–3.2	2.7
Saarenoksa 47889	(6.1–) 6.3–7.4 (–8)	6.9	(2–) 2.2–2.9	2.6	2.4–3.4	2.7
Saarenoksa 47789	(5.5–) 5.9–7.5 (–8.1)	6.7	(2–) 2.3–2.9	2.5	2.2–3.5	2.7
Saarenoksa 13890	5.6–7.2 (–8.5)	6.5	2.2–2.8 (–3.3)	2.5	2–3	2.6
Saarenoksa 13990	(6.6–) 6.9–8.4 (–9.3)	7.5	2.4–2.8 (–3)	2.7	2.5–3.3	2.8
Saarenoksa 29691	(6–) 6.5–8 (–8.6)	7.2	2.4–3.3 (–3.5)	2.9	2–3.3	2.5
Saarenoksa 29791	6.1–7.5 (–7.8)	7	2.5–3.1 (–3.3)	2.8	2.2–2.9	2.5
Saarenoksa 29891	(5.3–) 5.6–6.9 (–7.3)	6.1	2.3–2.9	2.6	2–2.5	2.4
Kotiranta 12621	(6.4–) 6.6–8.6 (–9.2)	7.5	2.4–2.9 (–3.1)	2.7	2.3–3.2	2.7
Kotiranta 13162	(5.9–) 6.1–8	6.9	(2.2–) 2.4–3.3	2.9	2–3	2.4
Kotiranta 8940	5.9–6.9	6.3	2–2.9 (–3.2)	2.6	1.9–3	2.4
Kotiranta 12725	(6.8–) 7–8 (–8.8)	7.7	(2.3–) 2.6–3.8	3.3	2.1–3	2.4
<i>A. subinconspicua</i>						
Kotiranta 19251	5–6.3 (–6.6)	5.4	(3–) 3.2–3.8 (–4)	3.5	1.4–2	1.6
Kotiranta 19252	(5–) 5.3–6.8	5.9	(3–) 3.2–4.2	3.6	1.4–1.9	1.6
Kotiranta 19253	5.3–6.5 (–6.8)	5.9	3.5–4.5 (–5)	4	1.3–1.7	1.5
Kotiranta 12772	(5–) 5.2–6.1 (–6.3)	5.8	(3.2–) 3.4–4.1 (–4.3)	3.7	1.2–1.7	1.6
Kotiranta 12773	5.2–6.1 (–7.1)	5.8	3–3.9 (–4.1)	3.4	1.5–2	1.7
Hallenberg 14557	4.9–6.2 (–6.5)	5.5	(3–) 3.2–4	3.5	1.4–1.8	1.6
Kotiranta 5410	5–6.5 (–7)	5.7	3.1–3.9 (–4.1)	3.6	1.3–1.9	1.6
Kotiranta 5521	5–6 (–6.3)	5.6	3.2–3.9	3.6	1.4–1.7	1.6
Kulju 2.IX.2003	5.3–6.3 (–7)	5.8	(3–) 3.2–3.9 (–4.1)	3.5	1.5–1.9	1.7

Fig. 1. *Athelopsis glaucina* (from Kotiranta 8495). — **a:** Part of hymenium and basidia of different stages of development. — **b:** Spores.



The habitats of *A. glaucina* are very diverse. It grows in luxuriant grass-herb forests, heath-forest site types and in poor pine-dominated rock outcrops on both deciduous and coniferous wood from southernmost Finland to Lapland. However, it is rare everywhere.

Liberta (1962) listed several host tree species of *A. glaucina* and Oberwinkler (1966) added dead basidiocarps of mushrooms to the substrate list.

The substrates of *A. glaucina* ($n = 4$):

<i>Betula</i> sp.	1
<i>Picea abies</i>	1
<i>Pinus sylvestris</i>	1
<i>Ulmus glabra</i>	1

SPECIMENS EXAMINED. — **Finland.** Åland: Finström, Mangelbo Nat. Res., dryish grass-herb forest, on decorticated *Ulmus glabra*, Grid 27°E 67043-5:1117, 25.X.2001 H.K. 19302 & R.S. (H). Geta, Getaberg, dry pine-dominated rock outcrop, on strongly decayed *Pinus* together with *Hyphodontia breviseta*, Grid 27°E 67183-4:1058-9, 24.X.2001 H.K. 19123 & R.S. (H). Inarin Lappi: Nellim, Haapakuru, luxuriant deciduous forest, on decorticated *Betula* sp., Grid 27°E 7638:552, 26.VIII.1990 H.K. 8495 (H). — **Italy.** South Tyrol: Bolzano, Vipiteno, Val di Fleres, fairly old spruce-dominated forest, on strongly decayed, decorticated *Picea* 1200–1400 m above sea level, 10.IX.1997 H.K. 13184 (H.K.).

***Athelopsis lembospora* (Bourd.) Oberw.**
(Figs. 2–3)

Basidiocarp resupinate, fairly thin, white, greyish white or pale bluish, at first porose-reticulate, later pellicular. Margin not differentiated, thinning out or distinct.

Hyphal system monomitic, all hyphae clamped, CB+, IKI-. Basal hyphae few, parallel to the substrate, thin- or slightly thick-walled, mostly 2.5 µm wide but some almost ampullaceous septa up to 4 µm wide. Subiculum loose, hyphae 2.5 µm wide, thin-walled. Young subhymenial hyphae normally 2 µm wide, but some up to 4 µm in diam. Old subhymenium consists of numerous clamps close to each other because of very common internal repetition of basidia. Cystidia none, but basally swollen, finger-like hyphidia (12.5–)17–22(–30) × (3–)3.5–4(–4.5) µm, common in some specimens, almost absent in some others. Basidia basally clamped, at first ovoid, later clavate, stalked, (11–)13–16 × 4.5–5.5(–6.5) µm, often internally repetitive thus leaving several clamps and remnants of old basidia at the bases of basidioles and basidia. Basidia with (2–)4 stout, up to 6 µm long sterigmata. Spores smooth, subfusiform, subalantoid or subcylindrical, mostly curved, widest at basal part, with a prominent apiculus, often glued in pairs–tetrads, 6.1–7.7 × 2.4–3.3 µm, $L^* = 7$ µm, $W^* = 2.7$ µm, $Q = 2.4–3$, $Q^* = 2.6$, CB– (some very faintly CB+), IKI–.

The repetition of the basidia is commonly conceived with genera like *Galzinia*, *Repetobasidiellum* and *Repetobasidium*. The repetition of basidia in *A. lembospora* differs from those seen in *Repetobasidiellum* or *Repetobasidium* where the clamps and remnants of old basidia are in rows. In *A. lembospora* such clear rows are very rare, and most often the sub-basidial cells form a complicated structure, with several clamps very close to each other, and hardly visible remnants of old basidia. Typical for several specimens is the somehow malformed (e.g. fur-

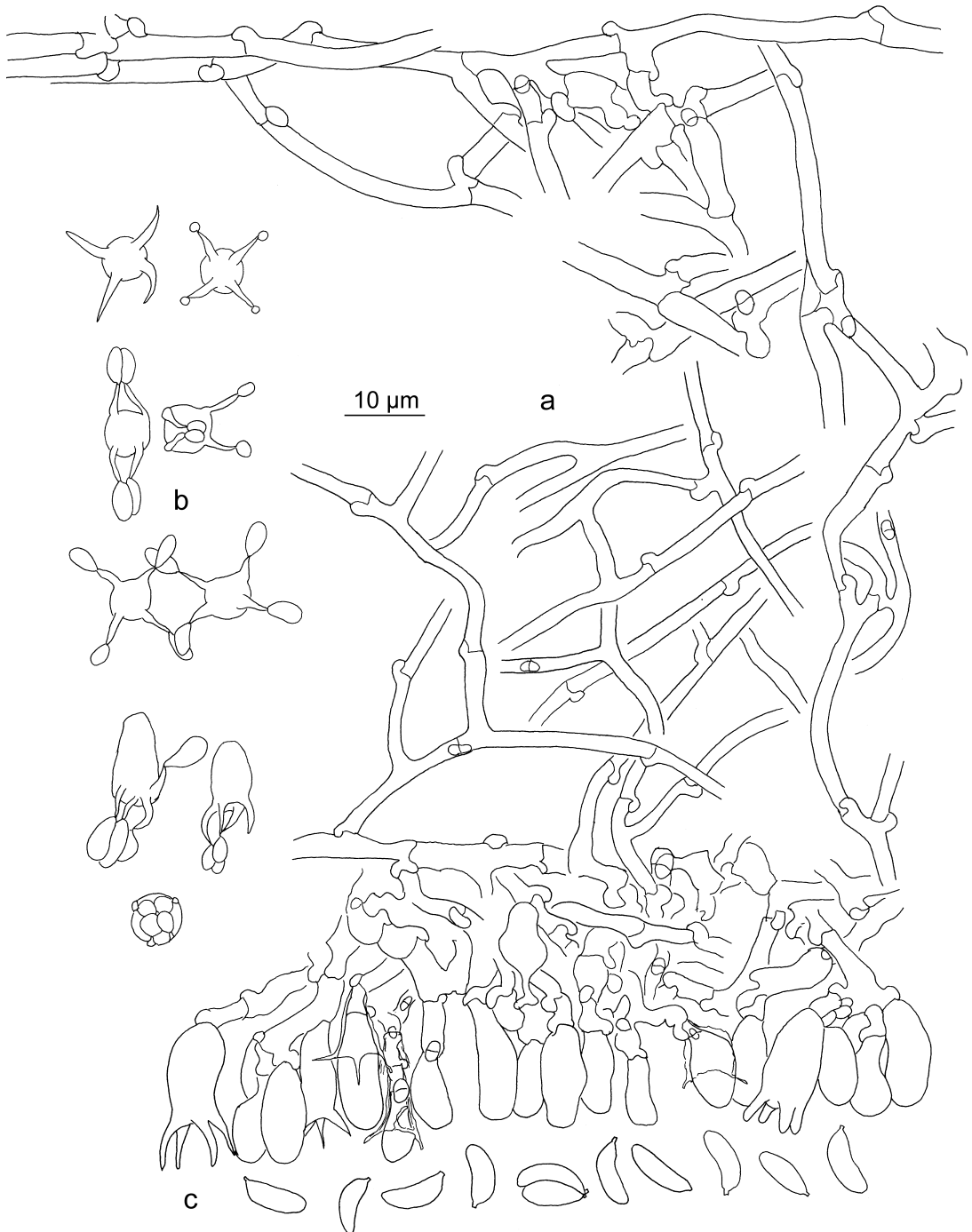


Fig. 2. *Athelopsis lembospora* (from Saarenoksa 13990). — **a:** Section through basidiocarp showing basal hyphae, subiculum and hymenium. — **b:** Formation of spore pairs — tetrads. — **c:** Spores.

cate) sterigmata and very small basidia ($6 \times 3 \mu\text{m}$). The pairs or tetrads of spores are formed when the sterigmata bend inwards and the spores

come in contact with each other. If the sterigmata bend outwards, spores of adjacent basidia join together (Fig. 2b).

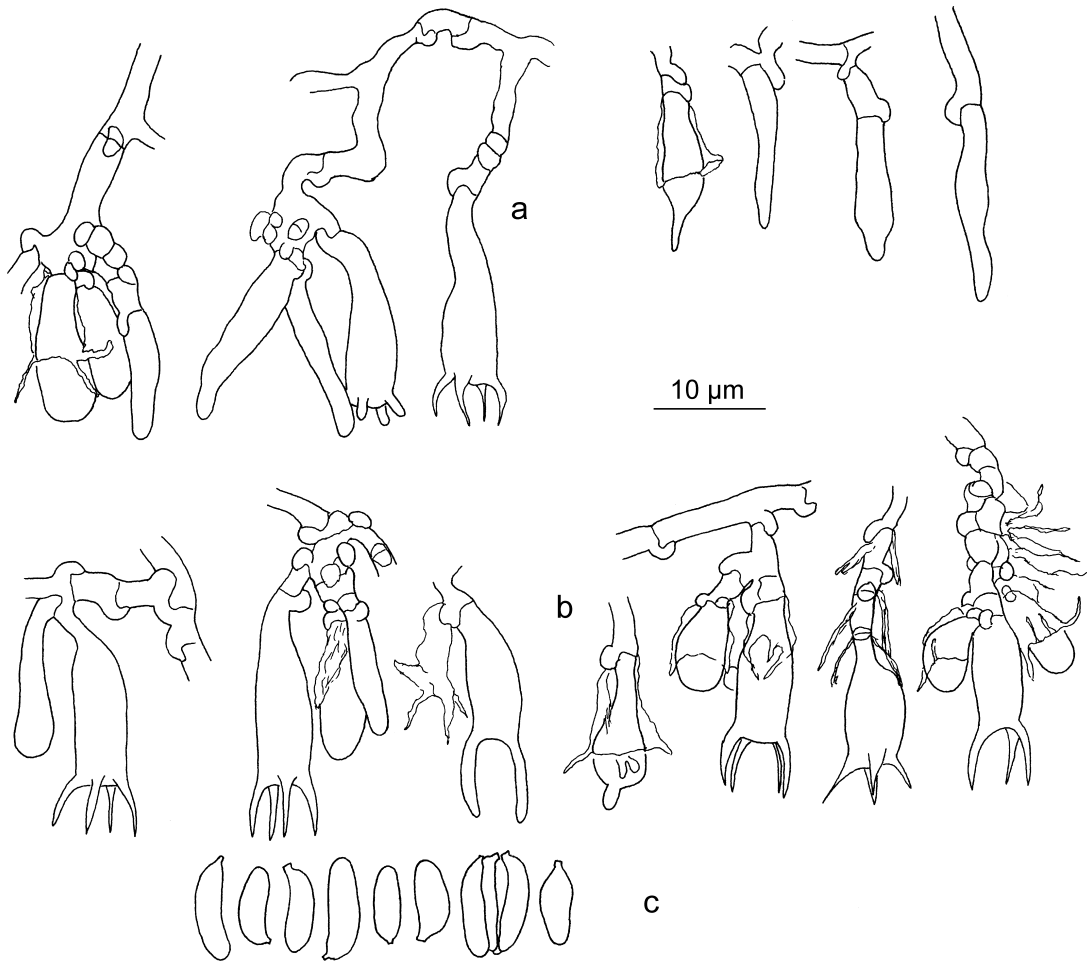


Fig. 3. *Athelopsis lembospora* (from Saarenoksa 47889). — **a:** Basidioles, basidia and finger-like hyphidia. — **b:** Basidia at different stages of development and remnants of old basidia. — **c:** Spores.

Athelopsis baculifera is according to the description (Jülich 1971) very similar to *A. lembospora*, but the spores are slightly narrower and evenly cylindrical/allantoid. The identity of *Corticium confusum* is unclear and it is perhaps a synonym of *A. lembospora* (see Roberts 1993: p. 155). Hjortstam (1998) does not include *C. confusum* in *Athelopsis*. *Athelopsis bananispora* has almost identical spores with *A. lembospora* (Boidin & Gilles 1986, Roberts 1995) and it often grows on ferns (Roberts 1995), too. However, the hymenophore of *A. bananispora* is tufted due to hyphal pegs and it grows, at least in Great Britain, in winter and spring (Roberts 1995).

The habitats of *A. lembospora* are luxuriant grass-herb forests, yards or mesic coniferous

forests. The highest frequency is along brookside grass-herb forests where *A. lembospora* grows on dead leaves of *Matteuccia struthiopteris* and *Athyrium* species. Our records from conifers derive from North Italy (South Tyrol) and Russia, Polar Ural Mountains, and according to de Vries (2001) *A. lembospora* is not rare in The Netherlands on *Juniperus communis*. For some reasons there are no collections from the central- or northern parts of Finland. Hjortstam and Larsson (1997) consider *A. lembospora* to be one of the most common species on ferns and some collections derive from deciduous wood, horsetail and grasses (Hjortstam & Ryvarden 1979, Roberts 1993) as well as from *Abies* and *Tsuga heterophylla* (Liberta 1962).

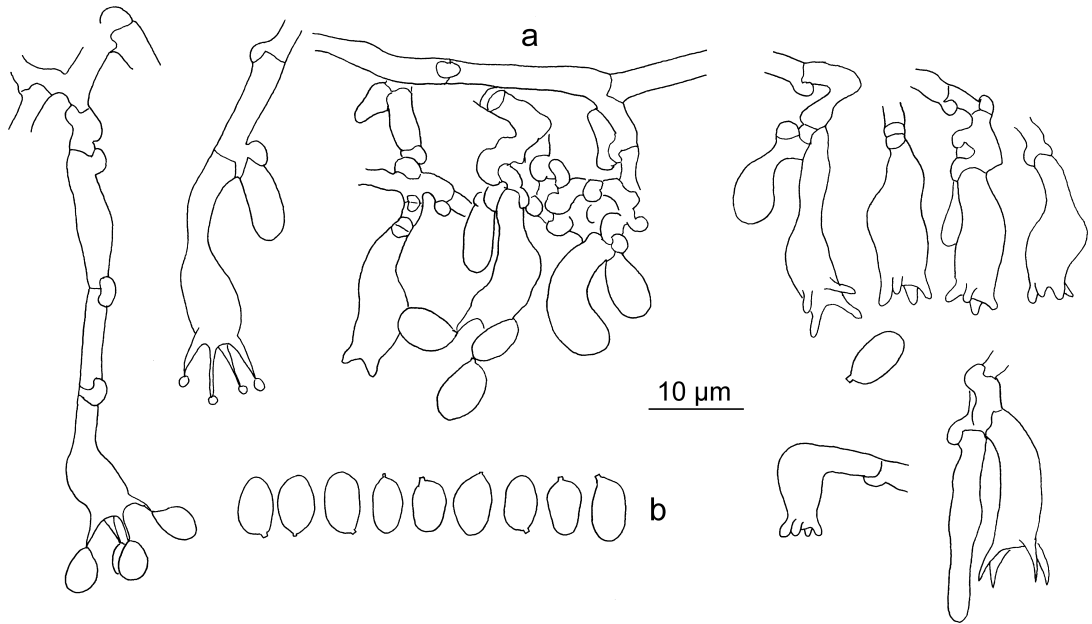


Fig. 4. *Athelopsis subinconspicua* (from Kotiranta 5410). — a: Basidia at different stages of development. — b: Spores.

The substrates of *A. lembospora* ($n = 17$):

<i>Matteuccia struthiopteris</i>	12
<i>Athyrium</i> sp.	2
<i>A. filix-femina</i>	1
<i>Larix sibirica</i>	1
<i>Syringa vulgaris</i> (cult.)	1

SPECIMENS EXAMINED. — **Finland.** Uusimaa: Helsinki, Toukola, Arabia park, abandoned yard, inside a fallen, hollow *Syringa vulgaris*, Grid 27°E 6679:387, 3.IX.1995 R.S. 05695 (H). Lapinjärvi, Latokartano, brook-side grass-herb forest, on dead *M. struthiopteris*, Grid 27°E 6729:451, 6.IX.1985 Haikonen 6263b (H). Tuusula, Lahela, brook-side grass-herb forest, on dead *M. struthiopteris*, Grid 27° 6698:388, 28.X.1989 R.S. 47389, 47689, 47789, 47889, 47989, 48089 (H), and 26.VII.1990 R.S. 13890, 13990 (H), and 8.IX.1991 R.S. 29691, 29791, 29891 (H). Etelä-Häme: Lammi, Pappilankylä, Biol. Stat., dryish grass-herb forest, on dead *Athyrium* sp., Grid 27°E 67731:3945, 14.IX.1995 H.K. 12621 (H.K.). — **Italy.** South Tyrol: Bolzano, Vipiteno, Val di Fleres, fairly old spruce-dominated managed forest, on dead *Athyrium* sp., 10.IX.1997 H.K. 13162 (H.K.). — **Norway.** Akershus: Nannestad, Gardemoen, luxuriant brook-side, on dead *A. filix-femina*, 20.IX.1990 H.K. 8940 (H.K.). — **Russia.** Polar Ural: Jangana, mixed old-growth forest, on hard *L. sibirica*, 67°43'N, 67°50'E, 26.VIII.1996 H.K. 12725 & Penzina (H.K.).

***Athelopsis subinconspicua* (Litsch.) Jülich (Figs. 4–5)**

Athelopsis hypochnoidea Jülich

Basidiocarp resupinate, thin, hypochnoid or porose-reticulate, very pale greenish or cream coloured; margin not differentiated, distinct. Hyphal system monomitic, all hyphae clamped, CB+. Subiculum consists of a few straight, sparsely clamped, 2–3 μm wide, very thin-walled hyphae and the branches originate mostly directly from the clamps. Subhymenial hyphae very thin-walled, 2.5–3 μm wide, extremely richly clamped forming a “mess” of clamps which follow each others in tight chains. Cystidia none, but subulate, 23–40 \times 4.5–5 μm , cystidiolate-like organs in some specimens. Basidia basally clamped, not repetitive, clavate, stalked, (11.5–)14–17(–19) \times (4.5–)5–6 μm with four, originally stout, up to 6 μm long sterigmata, which often arise close to the top of the basidium. Spores smooth, cylindrical or ellipsoid or broadly ellipsoid, the widest part normally close to the apiculus, sometimes glued in pairs or tetrads, 5.4–5.9 \times 3.4–4.0 μm ,

$L^* = 5.7 \mu\text{m}$, $W^* = 3.6 \mu\text{m}$, $Q = 1.5\text{--}1.7$, $Q^* = 1.6$, slightly thick-walled, CB+, IKI–, KOH–.

The cystidiolate-like organs which are even common in some specimens, give the impression that they are just results of secondary growth of basidioles (Fig. 5). The spore size, $6.5\text{--}8 \times 4\text{--}4.5 \mu\text{m}$, given by Eriksson and Ryvar den (1973) deviates fairly much from our measurements, but the shape is characteristic in Eriksson's drawing.

Athelopsis subinconspectua grows on decorticated coniferous trees, predominantly on spruce, and very often inside brown-rotted large logs, like also *Sphaerobasidium minutum* and *Lobulicium occultum*. The habitats are often mesic spruce-dominated old-growth forests and the distribution in Finland reaches at least the Polar Circle in the north.

The substrates of *A. subinconspectua* ($n = 9$):

<i>Picea abies</i>	8
<i>Pinus sylvestris</i>	1

SPECIMENS EXAMINED. — **Finland.** Åland: Sund, Lillnäsberget Nat. Res., old spruce-dominated luxuriant forest, inside brown-rotted large *Picea*, Grid 27°E 6698-9:115, H.K. 19251, 19252, 19253 & R.S. (H, H.K.). Varsinais-Suomi: Karjalohja, Karkali Strict Nat. Res., old luxuriant spruce-dominated forest, on large decorticated *Picea* together with *Phlebia subulata* J. Erikss. & Hjortstam, Grid 27°E 6685:323, 2.X.1996 H.K. 12772, 12773 & Oivanen (H, H.K.). Etelä-Häme: Lammi, Evo, Kotinen Nat. Res., spruce-dominated old-growth forest, on *Picea*, Grid 27°E 679:39, 10.IX.2001 Hallenberg 14557 (GB, H.K.). Pohjois-Häme: Saarijärvi, Pyhä-Häkki Nat. Park, spruce-dominated old-growth forest, on partly decorticated *Pinus* together with *Phlebiella pseudotsugae*, Grid 27°E 697:42, 3.IX.1984, H.K. 5410 (H.K.). Perä-Pohjanmaa: Rovaniemi comm., Pisavaara Strict. Nat. Res., spruce-dominated, luxuriant old-growth forest, on strongly decayed *Picea* together with *Sphaerobasidium minutum*, Grid 27°E 735:41, 7.IX.1984 H.K. 5521 (H.K.). Koillismaa: Taivalkoski, Jokijärvi, dryish heath-forest site type, on strongly decayed *Picea*, Grid 27°E 72768:5616, 4.IX.2003 *Kulju 18/03* (OULU).

Discussion

If only microscopical features are observed, the genus *Athelopsis* seems to be most closely related to the genus *Repetobasidium*, but in our opinion not to *Athelia*, in which hymenium is differently composed, leaving open space after the fading

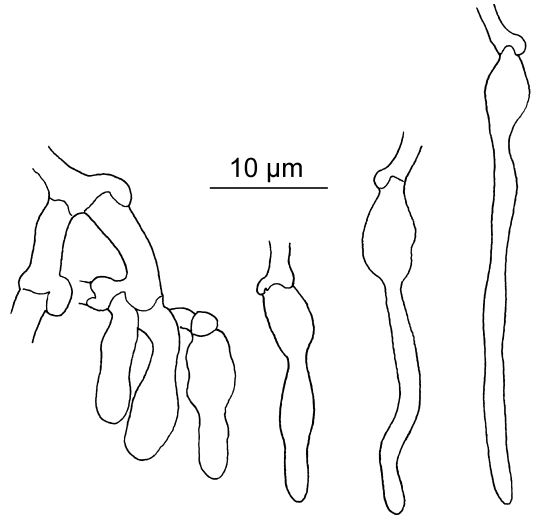


Fig. 5. *Athelopsis subinconspectua* (from Kotiranta 12772). Formation of cystidiolate-like organs from basidioles.

of basidia. Especially *A. lembospora* often has repetitive basidia, *A. glaucina* less often and *A. subinconspectua* seems to lack this feature. Its spores are also clearly cyanophilous and not very often glued together. However, the shape of the basidia is very similar to those of the other species. According to Larsson *et al.* (2004) *A. subinconspectua* belongs to the Athelioid clade. We agree with Eriksson and Ryvar den (1973) that *Grandinia lunata* Bourd. & Galz. (*Trechispora lunata* (Bourd. & Galz.) Jülich) is not an *Athelopsis* species. Its hymenophore is densely grandinoid or odontoid and the spores are (very) finely verruculose.

The *Athelopsis* species are fairly seldom collected in Finland, but are most probably not rare. The small basidiocarps are easily overlooked and therefore there are only a few collections in the Finnish herbaria. *Athelopsis subinconspectua* seems to be the only one which grows almost solely in old-growth forests, whereas the other two species have a wider ecological amplitude. None of the species is considered to be threatened in Finland (Rassi *et al.* 2001) nor in Sweden (Gärdenfors 2000) and in Norway they are distributed all over the country (Ryvar den *et al.* 2003).

Acknowledgements

This study is a part of a Biodiversity Research Programme (MOSSE) which is financed by the Ministry of Environment, grant YM131/5512/2002.

References

- Boidin, J. & Gilles, G. 1986: Basidiomycètes aphylophorales de L'île de la Réunion 4. Les genres *Epithele* (Pat.) Pat. et *Pteridomyces* Jülich. — *Bull. Soc. Myc. France* 102: 299–304.
- de Vries, B. 2001: Resupinate fungi op Jeneverbes, voorlopige balans. — *Coolia* 44: 208–214.
- Eriksson, J. & Ryvarden, L. 1973: *The Corticiaceae of North Europe 2. Aleurodiscus to Confertobasidium*. — Fungiflora, Oslo.
- Gärdenfors, U. (ed.) 2000: *Rödlistade arter i Sverige. The 2000 Red List of Swedish Species*. — ArtDatabanken, SLU, Uppsala.
- Hämet-Ahti, L., Suominen, J., Ulvinen, T. & Uotila, P. (eds.) 1998: *Retkeilykasvio [Field flora of Finland, 4th ed.]*. — Finnish Mus. Nat. Hist., Bot. Mus., Helsinki. [In Finnish with English summary].
- Heikinheimo, O. & Raatikainen, M. 1981: Ruutukoordinaattien ja paikannimien käyttö Suomessa. — *Notul. Entomol.* 61: 133–154.
- Hjortstam, K. 1998 (1997): A checklist to genera and species of corticioid fungi (Basidiomycotina, Aphylophorales). — *Windahlia* 23: 1–54.
- Hjortstam, K. & Larsson, K.-H. 1997: Corticioid fungi growing on ferns in northern Europe. — *Windahlia* 22: 49–55.
- Hjortstam, K. & Ryvarden, L. 1979: Notes on Corticiaceae (Basidiomycetes) 5. — *Mycotaxon* 10: 201–209.
- Jülich, W. 1971: Einige neue oder unbekannte Corticiaceae (Basidiomycetes). — *Willdenowia* 6: 215–224.
- Larsson, K.-H., Larsson, E. & Kõljalg, U. 2004: High phylogenetic diversity among corticioid homobasidiomycetes. — *Mycol. Res.* 108: 983–1002.
- Liberta, A. E. 1962 (1961): A taxonomic analysis of the section *Athele* of the genus *Corticium*, II. — *Mycologia* 53: 443–450.
- Oberwinkler, F. 1966 (1965): Primitive Basidiomyceten. Revision einiger Formkreise von Basidienpilzen mit plastischer Basidia. — *Sydowia* 19: 1–72, 21 pls.
- Rassi, P., Alanen, A., Kanerva, T. & Mannerkoski, I. (eds.) 2001: *Suomen lajien uhanalaisuus 2000*. — Min. Env. & Finnish Env. Inst.
- Roberts, P. 1993: Interesting and unusual corticioid fungi from Slapton, Devon. — *Mycologist* 7: 152–155.
- Roberts, P. 1995: Interesting & unusual corticioid fungi from Slapton, Devon 3. — *Mycologist* 9: 161–164.
- Ryvarden, L., Stokland, J. & Larsson, K.-H. 2003: A critical checklist of corticioid and poroid fungi of Norway. — *Syn. Fungorum* 17: 1–108.