
Some species of *Hyphodontia* s.l. with encrusted cystidial elements

Gorjón SP^{1*}

¹Centro de Investigación y Extensión Forestal Andino Patagónico. Área de Protección, 9200, Esquel, Argentina

Gorjón SP 2012 – Some species of *Hyphodontia* s.l. with encrusted cystidial elements. *Mycosphere* 3(4), 464–474, Doi 10.5943 /mycosphere/3/4/10

Some species in *Hyphodontia* or related genera with encrusted cystidia are discussed. The type specimens of the following species have been studied: *Grandinia erikssonii*, *Hyphodontia heterocystidiata*, *H. wrightii*, *Hypochnicium odontioioidescens*, *H. rickii*, *Palifer seychellensis*, and *Peniophora verecunda*. All all them except *P. seychellensis*, belong to *Hyphodontia* s.l. Based on morphological characters of the generic type, *Palifer* could be considered a synonym of *Xylodon*.

Key words – Corticioid fungi – *Hypochnicium* – *Lagarobasidium* – *Palifer* – *Xylodon*

Article Information

Received 10 July 2012

Accepted 23 July 2012

Published online 21 August 2012

*Corresponding author: Sergio Pérez Gorjón – e-mail – spgorjon@gmail.com

Introduction

Hyphodontia J. Erikss. contains several species with a variable micro- and macromorphology, but as a rule easily to distinguish by the usually odontoid to hydroid hymenophore, hyphae generally with distinct to somewhat thickened walls with small semicircular clamps, and cylindrical to suburniform basidia. A great variation is found in the presence of cystidial elements, from slightly differentiated hyphal ends, to thick-walled tubular elements, lagenocystidia, encrusted cystidia, leptocystidia, septocystidia, usually not conspicuous gloeocystidia, and so on. The genus thus defined seems quite artificial and several molecular studies show that *Hyphodontia* is polyphyletic (Binder et al. 2005, Larsson et al. 2006). However the limits and relationships between most of the species in *Hyphodontia* s.l. are still unclear. *Hyphodontia* s.str., as defined by the generic type *Gonatobotrys pallidula* Bres. [= *H. pallidula* (Bres.) J. Erikss.], includes species with both, septocystidia and lagenocystidia (even the abundance and presence of cystidial elements may vary from few to absent among the species) (Parmasto 1968, Hjortstam 1983).

Phylogenetically, *H. pallidula*, *H. alutaria* (Burt) J. Erikss., and *H. arguta* (Fr.) J. Erikss., are supported in an isolated clade differentiated from most of the species in *Hyphodontia* s.l. (Larsson et al. 2006). *Hyphodontia sphaerospora* (N. Maek.) Hjortstam & Ryvarden (≡ *Grandinia arguta* var. *sphaerospora* N. Maek.), and *H. subdetritica* S.S. Rattan (= *H. propinqua* Hjortstam) seem to be morphologically related to *H. pallidula* in *Hyphodontia* s.str. Also phylogenetically isolated is a group of *Hyphodontia* with thick-walled tubular cystidia of tramal origin, reclassified recently in the genus *Kneiffiella* P. Karst., with *Hydnum barba-jovis* Bull. as the type species. Many of the remaining species cluster in a quite well supported clade where *Odontia quercina* Pers., the generic type of *Xylodon* (Pers.) Gray, is present. There it is found a mixture of species with variable cystidial elements, but often not more than distinct hyphal ends, conical to more commonly capitate, rarely septate, smooth to variably encrusted. The previous subdivision of *Hyphodontia* s.l. in small morphologically related entities was recently proposed by

Hjortstam & Ryvar den (2002, 2009) and subsequently followed by Bernicchia & Gorjón (2010). To date, the more complete study on the phylogeny of the *Hymenochaetales* (Larsson et al. 2006) separates a well differentiated *Kneiffiella* clade, *Hyphodontia* clade (with species of *Hyphodontia* s.str. intermingling with genera as *Spahaerobasidium* Oberw. and *Tubulicrinis* Donk), and a *Coltricia* clade where most of the remaining species in *Hyphodontia* s.l. are present together with a subclade formed by species of *Coltricia* Gray and *Coltriciella* Murrill. *Schizopora* Velen., a genus separated from *Hyphodontia* mainly by the more or less poroid hymenophore, is also included in the clade with the type species of *Xylodon*. At least in two species of *Schizopora* (vid. *S. cystidiata* A. David & Rajchenb., a rare species reported from two localities in Africa and China (David & Rajchenberg 1992, Dai 2012) and *S. flavipora* (Berk. & M.A. Curtis ex Cooke) Ryvar den, a common species in the Northern Hemisphere), encrusted cystidial elements or hyphal ends are also present. Also, *Echinoporia* Ryvar den, with an hymenophore with angular to irpicoid pores and characterized by arthroconidia produced in bristles on the abhymenial surface, present species with lagenocystidia (vid. *E. aculeifera* (Berk. & M.A. Curtis) Ryvar den and *E. hydno phora* (Berk. & Broome) Ryvar den).

Palifer Stalpers & P.K. Buchanan was described to accommodate *Peniophora ver ecunda* G. Cunn., a species from New Zealand with resupinate smooth hymenophore and microscopically characterized above all by the presence of smooth, thin-walled tubular cystidia, encrusted cystidial elements, and capitate hyphal ends (Stalpers & Buchanan 1991). Hjortstam & Ryvar den (2007) included in *Palifer* the next species originally described from Argentina: *Hyphodontia gamundiae* Gresl. & Rajchenb., *H. hjortstamii* Gresl. & Rajchenb., and *H. wrightii* Hjortstam & Ryvar den, however differing from *P. ver ecunda* in the odontoid hymenophore and the absence of the thin-walled tubular cystidia. Later, Hjortstam & Ryvar den (2009) indicated the possibly that *P. ver ecunda* was a species fairly isolated and the three other combined taxa needed further studies. Dämmrich &

Rödel (2010) described *Palifer seychelensis* Dämmrich & Rödel from Seychelles, however, a deviating species from the concept of *Palifer*.

The following list comprises some species of *Hyphodontia* s.l. with encrusted cystidial elements, most of them previously classified in *Palifer*, as well the study of a number of type specimens of species of doubtful position. *Palifer* was emphasized by the presence of encrusted cystidia, not narrowed in a needle apical part as typical lagenocystidia. As a rule, this kind of cystidia is easily recognized in some South American species combined in *Palifer* and they are useful for a quick identification. Anyhow, when increasing the number of specimens studied limits between not typical encrusted cystidia and lagenocystidia become less obvious.

Methods

For light microscopic studies, samples were mounted in 3% potassium hydroxide (KOH), Melzer's reagent (IKI), sulfobenzaldehyde, and 0.1% cotton blue in 60% lactic acid to determine cyanophily. Line drawings were made with a camera lucida attachment. Herbarium acronyms follows Thiers (2012). Some isotypes were deposited in the Centro de Investigación y Extensión Forestal Andino Patagónico (CIEFAP, Esquel, Argentina).

Taxonomy

Species included in Hyphodontia s.l.

Hyphodontia erikssonii (M. Galán & J.E. Wright) Hjortstam & Ryvar den, in Hjortstam et al., Syn. Fung. 20: 63, 2005.

≡ *Grandinia erikssonii* M. Galán & J.E. Wright, Darwiniana 32: 251, 1993.

The species has encrusted cystidial elements of the same kind of *H. gamundiae* and *H. hjortstamii*. In the original publication basidiospores of *H. erikssonii* are described as broadly ellipsoid, $4-5 \times 3-3.5 \mu\text{m}$ (Galán et al. 1993), but comparing the holotype with authentic specimens of *H. hjortstamii* basidiospore size and shape is almost identical. Regarding strictly morphology both species can be considered conspecific, and *H. hjortstamii* probably should be treated as a

latter synonym of *H. erikssonii*. *H. erikssonii* is only known from tropical and subtropical areas in Argentina (type locality) and Venezuela where it has also been cited by Hjortstam et al. (2005). *H. hjortstamii* is, contrary, a common species in the Patagonian Andes forests. It would be desirable to perform mating tests of South American specimens of *H. erikssonii* and *H. hjortstamii* to evaluate the conspecificity also from a biological perspective.

Material examined – Argentina, Prov. Bonariae, Videla Dorna, ad *Salix babylonica*, May 1972, Deschamps et al., BAFC 31920 (holotypus).

Hyphodontia gamundiae Gresl. & Rajchenb., Mycologia 92: 1159, 2000.

≡ *Palifer gamundiae* (Gresl. & Rajchenb.) Hjortstam & Ryvarde, Syn. Fung. 22: 9, 2007.

Hyphodontia gamundiae is a species distributed in the Argentinean and Chilean Patagonia (Greslebin & Rajchenberg 2003, Gorjón & Hallenberg 2012) and Colombia (Hjortstam & Ryvarde 2007). It is typical member of *Hyphodontia* s.l., with characteristic encrusted cystidia and narrowly ellipsoid basidiospores.

Material examined – Argentina, Chubut, National Park Los Alerces, 520 m, on dead wood of *Nothofagus dombeyi*, 6 May 2011, coll. S.P. Gorjón 3325 (in CIEFAP). Argentina, Neuquén, National Park Nahuel Huapi, Victoria Island, 820 m, on dead wood of *Nothofagus dombeyi*, 10 Dec 2009, coll. S.P. Gorjón 2570 (in CIEFAP).

Hyphodontia heterocystidiata H.X. Xiong, Y.C. Dai & Sheng H. Wu, Mycol. Progress 8: 166, 2009.

The holotype of *Hyphodontia heterocystidiata* is composed by a whitish resupinate corticioid with minutely odontoid hymenophore covering a side of two small angiosperm branches. The species was originally described bearing two kind of cystidia: capitate cystidia, and clavate to cylindrical leptocystidia (Xiong et al. 2009). Hyphae in the apex of the aculei are encrusted with round aggregate crystals. This kind of hyphal encrustation is similar to those present in the hyphae of *Hyphodontia breviseta* (P.

Karst.) J. Erikss. or *H. nespori* (Bres.) J. Erikss. & Hjortstam. Capitate cystidia are easily visible and abundant, mostly covered by a round cap of resinous matter. The long tubular and sinuous leptocystidia, can be interpreted as gloeocystidia, some of them are more or less constricted, and are comparable to those present in the *H. breviseta* group. Considering the previous features, *H. heterocystidiata* should be interpreted as a species belonging to the *Hyphodontia breviseta* complex in *Hyphodontia* s.l.

Material examined – Taiwan, Nantou, Huisun Forestry, alt. 750 m, on angiosperm branch, leg. S.H. Wu, 3 Jan 1999, TNM F0010235 (holotypus).

Hyphodontia hjortstamii Gresl. & Rajchenb., Mycologia 92: 1160, 2000.

≡ *Palifer hjortstamii* (Gresl. & Rajchenb.) Hjortstam & Ryvarde, Syn. Fung. 22: 9, 2007.

Hyphodontia hjortstamii, so far known from the Patagonian Andes, is a species related to *H. gamundiae*, differing in the broader ellipsoid basidiospores and slightly thickened in the former. It is a species very closely related or identical to *H. erikssonii* (see comments under this species). See Greslebin & Rajchenberg (2000) for descriptions and illustrations.

Material examined – Argentina, Chubut, National Park Los Alerces, 520 m, on dead wood of *Nothofagus dombeyi*, 26 Apr 2010, coll. S.P. Gorjón 2644 (in CIEFAP). Chile, X Region, Entre Lagos, Aguas Calientes, Trail Los Rápidos, 500 m, 22 Feb 2010, Valdivian rainforest, on deciduous wood, leg. L. & N. Hallenberg & S.P. Gorjón, coll. S.P. Gorjón 2640 (in CIEFAP).

Hyphodontia rickii (Hjortstam & Ryvarde) Gresl. & Rajchenb., Mycologia 92: 1161, 2000.

≡ *Hypochnicium rickii* Hjortstam & Ryvarde, Mycotaxon 15: 271, 1982.

≡ *Lagarobasidium rickii* (Hjortstam & Ryvarde) Hjortstam & Ryvarde, Syn. Fung. 26: 46, 2009.

Hypochnicium rickii, a name based on *Odontia polycystidifera* J. Rick, 1959 nom. inval., is a species distributed in Southern Brazil and according to the original description differentiate by the granular to odontoid

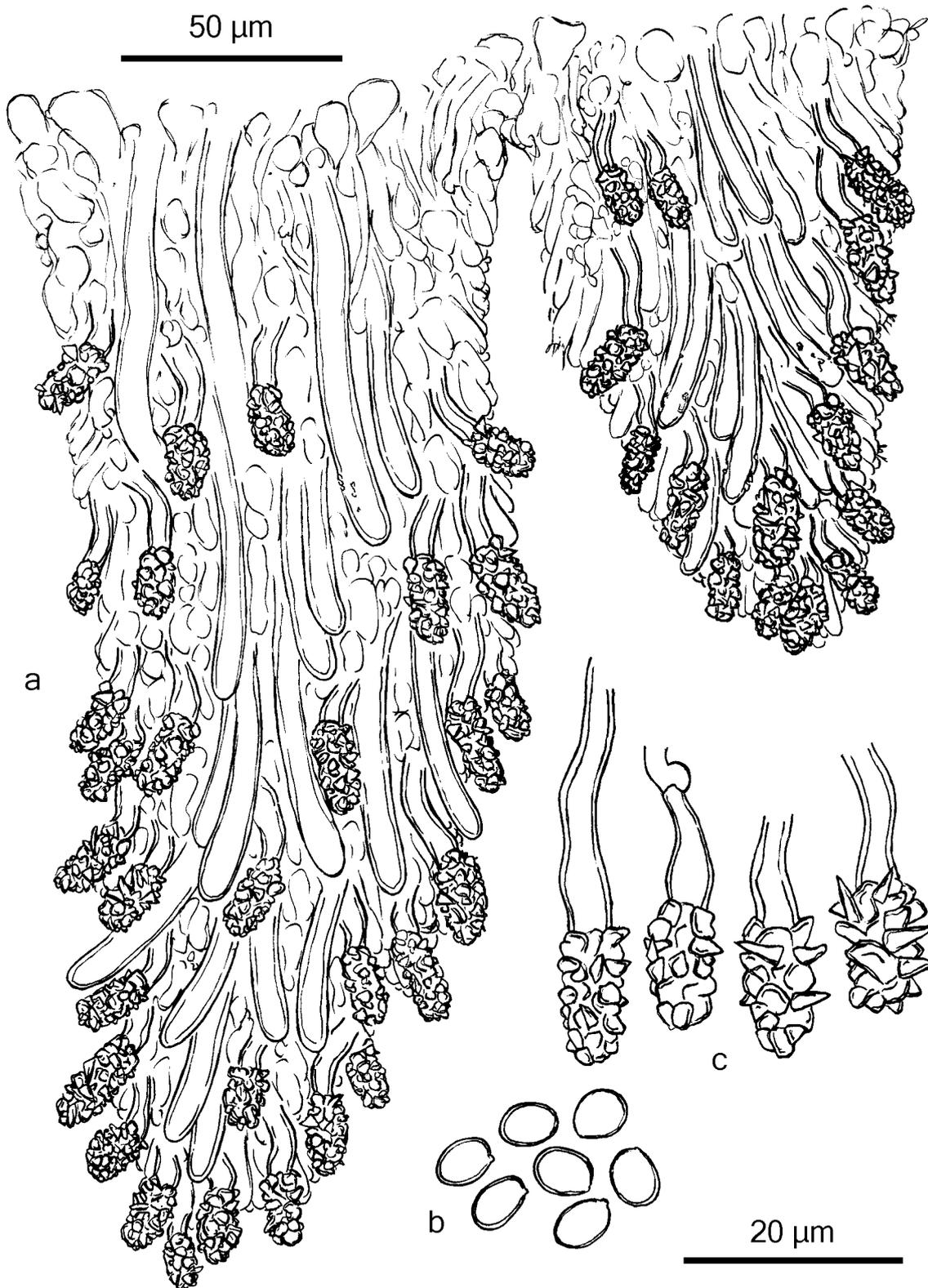


Fig. 1 – *Hyphodontia rickii* (holotype). Microscopical elements. **a** aculei section. **b** basidiospores. **c** encrusted cystidia.

hymenophore, thick-walled and cyanophilous basidiospores, and two kind of cystidia: 1) numerous, thick-walled, and strongly encrusted and 2) few, thin-walled, distinctly capitate (Hjortstam & Ryvarde 1982). However, the examination of the holotype reveals that capitate cystidia are not conspicuous and absent from many parts of the basidiome, and they are more comparable with capitate poorly differentiate hyphal ends. The encrusted tubular thick-walled cystidia are similar to those of *H. erikssonii*, *H. gamundiae* and *H. hjortstamii*. In the core of the aculei, thick-walled, not or slightly encrusted cystidial elements, are present, and they are of the same kind of the encrusted cystidia. They may represent a variation of this, because their encrustation is variable and often dissolves in all reacting mounting media (Fig. 1). As previously indicated by Greslebin & Rajchenberg (2000), *H. rickii*, is somewhat similar to *Hyphodontia magnifica* Gresl. & Rajchenb. [= *Lagarobasidium magnificum* (Gresl. & Rajchenb.) Hjortstam & Ryvarde] by the cyanophilous and thick-walled basidiospores, but differing in the two kind of cystidia of the latter (the first, tubular and thick-walled, and the second, conspicuous and largely capitate, both types not encrusted). Greslebin & Rajchenberg (2000) also mentioned for *H. rickii* that “the encrustation (of the tubular cystidia) is similar to those present in *H. gamundiae*”. Therefore, *H. rickii* belongs to the group of *Hyphodontia* s.l. with encrusted cystidial elements, not being a member of *Lagarobasidium* Jülich nor *Hypochnicium* J. Erikss.

Material examined – Brazil, S. Salvador, 5 Apr 1944, Rick 208 47, (in CIEFAP) (isotypus).

Hyphodontia septocystidiata H.X. Xiong, Y.C. Dai & Sheng H. Wu, *Mycologia* 102: 918, 2010.

It has been not possible to examine the holotype of *H. septocystidiata* but according to the original description and illustration, encrusted cystidia seem similar to those present in *H. gamundiae*, *H. hjortstamii*, *H. erikssonii*, and *H. rickii*. Xiong et al. (2010) indicated *H. erikssonii* and *H. rickii* as the closest relatives,

but with no indication of type or specimens examinations.

Hyphodontia verecunda (G. Cunn.) Hjortstam & Ryvarde, *Mycotaxon* 64: 237, 1997.

≡ *Peniophora verecunda* G. Cunn., *Trans. Roy. Soc. New Zealand* 83: 262, 1955.

≡ *Palifer verecundus* (G. Cunn.) Stalpers & P.K. Buchanan, *New Zealand J. Bot.* 29: 339, 1991.

Peniophora verecunda, the generic type of *Palifer*, is a species of uncertain position. It has three kind of cystidia: lagenocystidia, cylindrical cystidia, and capitate cystidia (Fig. 2). Lagenocystidia are similar to those of *H. wrightii* and *H. alutaria*, and they are variably shaped and not necessary narrowed in a needle apical part. The type specimen differs from *H. wrightii* in the smooth hymenophore, a feature shared with *H. alutaria*. There is another specimen from Colombia (Hjortstam & Ryvarde 1997) where the hymenial surface is described as smooth or slightly graninoid when well developed. Hjortstam & Ryvarde (1997) note in the comments that the type specimen is “rather young and thin, not showing the hymenial verrucae”. In fact, examination of the holotype reveals a very thin specimen with no trace of hymenial aculei. *Peniophora verecunda* differs from species in *Hyphodontia* s.str. by the large thin-walled non-septate cylindrical cystidia, somewhat reminiscent of those present in *Hyphodontia alutacea* (Fr.) J. Erikss. From the holotype examination, cylindrical cystidia appears curved and partially collapsed, seemingly a kind of gloeocystidia but they do not show a particular coloration in KOH, Melzer's reagent, or sulfobenzaldehyde diverse from other elements (but it may be due to the age of the specimen collected in 1953). Cylindrical to tubular cystidia or more or less constricted gloeocystidia are also found in many species of *Hyphodontia* s.l. (vid. *H. borealis* Kotir. & Saaren., *H. breviseta* group, *H. curvispora* J. Erikss. & Hjortstam, *Hyphodontia latitans* (Bourdot & Galzin) Ginns & M.N.L. Lefebvre, *Hyphodontia tenuicystidia* Hjortstam & Ryvarde) as well capitate cystidia or hyphal ends. Hyphae in *P. verecunda* are deviating from typical *Hyphodontia*-like hyphae with

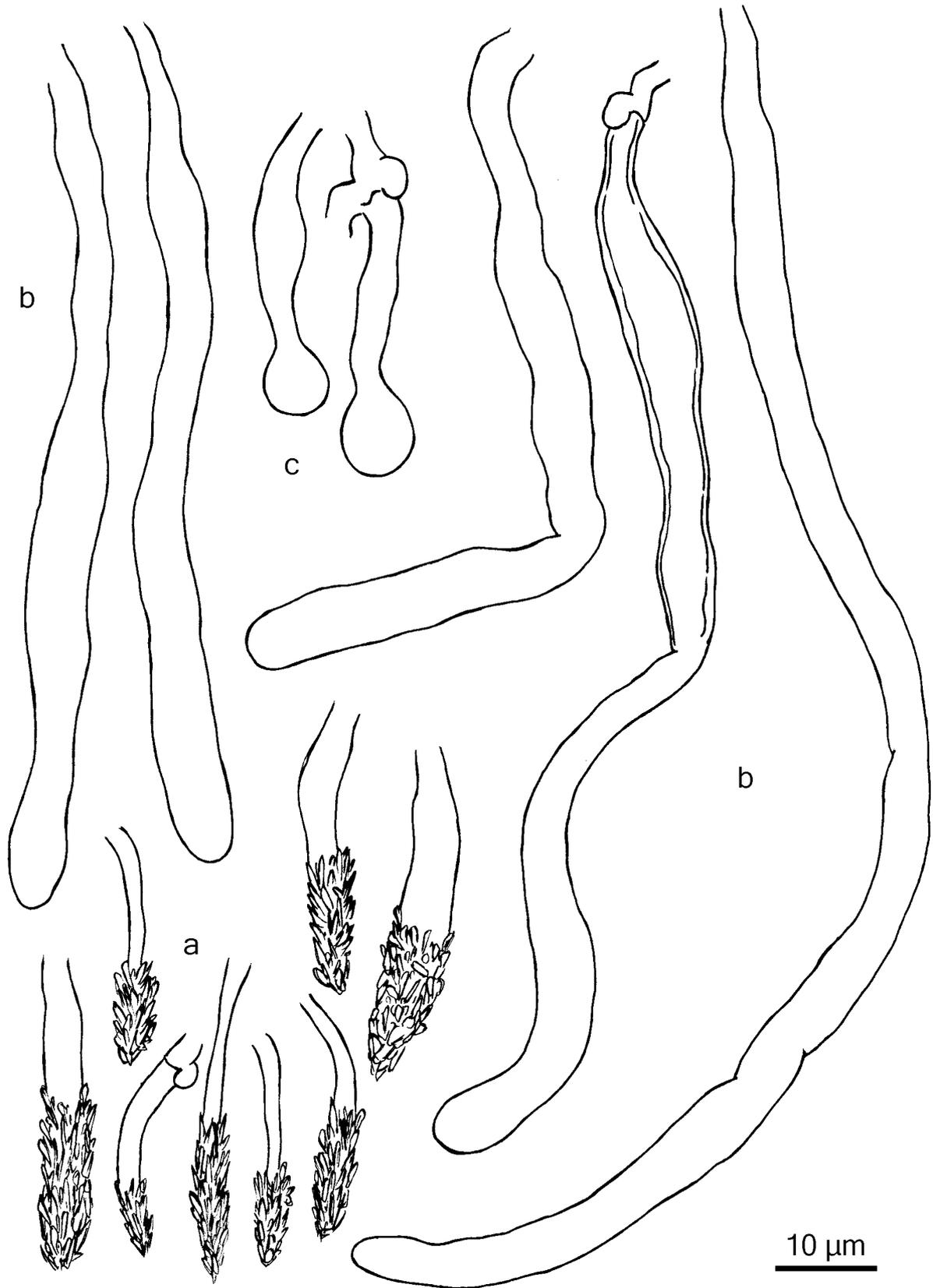


Fig 2 – *Hyphodontia verecunda* (holotype). **a** lagenocystidia. **b** cylindrical cystidia. **c** capitate cystidia.

small semicircular clamps, and some slightly ampullate sections and septa are found. From a molecular perspective, there are some doubts about the phylogenetic position of *P.verecunda* as only one specimen has been included in molecular analysis (Larsson et al.2006). According to the information provided in GenBank, this is a specimen from USA, not from the type locality. This specimen of *P.verecunda* takes an isolated position among the *Coltricia* clade in a subclade with the type species of *Xylodon* (Larsson et al. 2006). As stated above, at least based on morphological data, *P. verecunda* shares many features with species in *Hyphodontia* s.l. (*Xylodon*) and there is no reason to keep the species in a separated genus.

Material examined – New Zealand, Auckland, Hauhangaroa Range, Taupo, 2.000 ft, on decayed decorticated wood of *Dacrydium cupressinum*, March 1953, J.M. Dingley, PDD 12513 (holotypus).

Hyphodontia wrightii Hjortstam & Ryvarden, Mycotaxon 25: 560, 1986.

≡*Palifer wrightii* (Hjortstam & Ryvarden) Hjortstam & Ryvarden, Syn. Fung. 22: 10, 2007.

The species is characterized by the granular hymenophore, subcylindrical basidiospores, and presence of lagenocystidia. Lagenocystidia in *H. wrightii* are cylindrical to subulate, not narrower in a needle apical part, the same kind of lagenocystidia are found in some species of *Hyphodontia* s.str. They are similar to those of *Hyphodontia alutaria*, even in the latter species septocystidia are distinctly present, but different to the encrusted cystidia of *H. gamundiae* and *H. hjortstamii*. *H. wrightii* lacks septocystidia, but contrary to the descriptions by Hjortstam & Ryvarden (1986) and Langer (1994), capitate cystidia with a resinous apical globule are easily seen in the holotype. All hymenial elements in the holotype (hyphae, basidia, lagenocystidia, and basidiospores), are strongly cyanophilous. There is a good microscopical illustration in Langer (1994: 235). *H. wrightii* is thus excluded from the concept of *Palifer* and, even lacking septate cystidia, it seems better classified in *Hyphodontia* s.str. by the presence of typical lagenocystidia.

Material examined – Argentina, Prov. Misiones, Iguazu Nat. Park., Cataratas de Iguazu. 1-5 March 1982, L. Ryvarden 19636, (in CIEFAP) (isotypus).

Hypochnicium odontoidescens Boidin & Gilles, Bull. Soc. Mycol. Fr. 116: 168, 2000.

The species was examined because according to the original description and notes it seemed a member of *Hyphodontia* s.l. (in the original description it was compared to *H. rickii*, the latter also referred to *Hypochnicium* by Boidin & Gilles 2000). The holotype shows intermediate microfeatures of *Lagarobasidium* and *Xylodon* by the monomitic hyphal system, skeletocystidia, stellate disperse encrustation, and thick-walled, cyanophilous basidiospores. Cystidial elements in *H. odontoidescens* are very variable in size and shape, but usually they are tubular to sinuous with thickened walls, and with an irregular subcapitate to capitate apical part, however in the type they often appears collapsed. It reminds in some aspects *Hyphodontia magnifica* Gresl. & Rajchenb., from Patagonia (Greslebin & Rajchenberg 2000), the latter differing in the conspicuous thick-walled cystidia and large capitate cystidia. As commented before for *H. heterocystidiata*, *H. odontoidescens* may belong to the *Hyphodontia breviseta* complex (*Xylodon*) but I refuse to do a formal combination because the type specimen is scanty and in poor condition. According to molecular studies by Larsson et al. (2006) and Larsson (2007a, 2007b), *Lagarobasidium detriticum* (Bourdot & Galzin) Jülich, the generic type of *Lagarobasidium*, cluster close to generic type of *Xylodon*, and *Lagarobasidium* could be considered a latter synonym of *Xylodon*. There is some controversial about the previous statement, and Dueñas et al. (2009) considered *Lagarobasidium* a genus different from *Hyphodontia* and *Hypochnicium*. However, the reference specimens of *Lagarobasidium* they used in the analysis, cluster in Blast search the first with species of *Hyphoderma* Wallr. and the second get no clear result (noted by Karl-Henrik Larsson, comm. pers.).

Material examined – Réunion, Bellevue - 85; 11635, sur *Cryptomeria japonica*, Bébou - 85, LY 11527 (holotype).

Key to the species of *Hyphodontia s.l.* with encrusted cystidia or with lagenocystidia

1. Thin-walled tubular cystidia present..... *H. verecunda*
 1. Thin-walled tubular cystidia absent 2
2. Basidiome effuse-reflexed to pileate, hymenophore irpicoid to poroid..... 3
 2. Basidiome resupinate, hymenophore smooth, odontoid to hydroid..... 5
3. Arthroconidia produced in bristles on the abhymenial surface..... 4
 3. Arthroconidia absent *Schizopora cystidiata* (cf. also *S. flavipora*)
4. Arthroconidia longer than 10 μm *Echinoporia aculeifera*
 4. Arthroconidia up to 10 μm long..... *Echinoporia hydnohora*
5. Typical lagenocystidia present (with a cylindrical base and narrowed in a needle apical part)..... 6
 5. Typical lagenocystidia absent but with encrusted hyphae-like cystidia 10
6. Hymenophore smooth to slightly grandinoid..... 7
 6. Hymenophore odontoid to hydroid 8
7. Basidiospores 6–7.5 \times 4–4.5 μm *H. subdetritica* (= *H. propinqua*)
 7. Basidiospores 4.5–6 \times 3.5–4 μm *H. alutaria*
 (check *H. pallidula* with smaller basidiospores and where lagenocystidia are absent or very few)
8. Basidiospores subcylindrical, 4.5–5.5 \times 2.5–3 μm *H. wrightii*
 8. Basidiospores wider than 3 μm 9
9. Basidiospores broadly ellipsoid, thin-walled, 4.5–6 \times 3.5–4 μm *H. arguta*
 9. Basidiospores globose, thick-walled, 3.2–4.5 \times 3.5–4.5 μm *H. sphaerospora*
10. Basidiospores thick-walled, with septocystidia or thick-walled cystidia 11
 10. Basidiospores thin-walled, neither septocystidia nor thick-walled cystidia 12
11. Septocystidia present, thick-walled cystidia absent..... *H. septocystidiata*
 11. Septocystidia absent, thick-walled cystidia present *H. rickii*
12. Basidiospores subcylindrical, 6–6.5 \times 3–3.5 μm *H. gamundiae*
 12. Basidiospores ellipsoid 4–6 \times 3.5–4.5 μm *H. erikssonii* (includ. *H. hjortstamii*)

Species excluded from *Hyphodontia s.l.*

Palifer seychellensis Dämmrich & Rödel, Z. Mykol. 76: 211, 2010.

This species is characterized above all by the characteristic subicular cystidial elements, a striking thick-walled hyphal projections with a double small umbrella-like cap. In the holotype, leptocystidia are not usually easily to distinguish and they can be interpreted as smooth cystidiols or slightly differentiate leptocystidia, but never

comparable with the long cylindrical cystidia of *Peniophora verecunda*. (Fig. 3). A detailed description and illustrations are also found in Dämmrich & Rödel (2010). A new generic arrangement is needed for *P. seychellensis* and it will be studied in detail in a separate paper (Karl-Henrik Larsson, comm. pers.).

Material examined – Seychelles, Mahé, South West from Jardin du Roi, ca. 150–250 m, an liegendem, stark zersetztem Laubholzast, leg. T. Rödel, 4 Mar 2009, SEY073 in GLM, F092834 (holotypus).

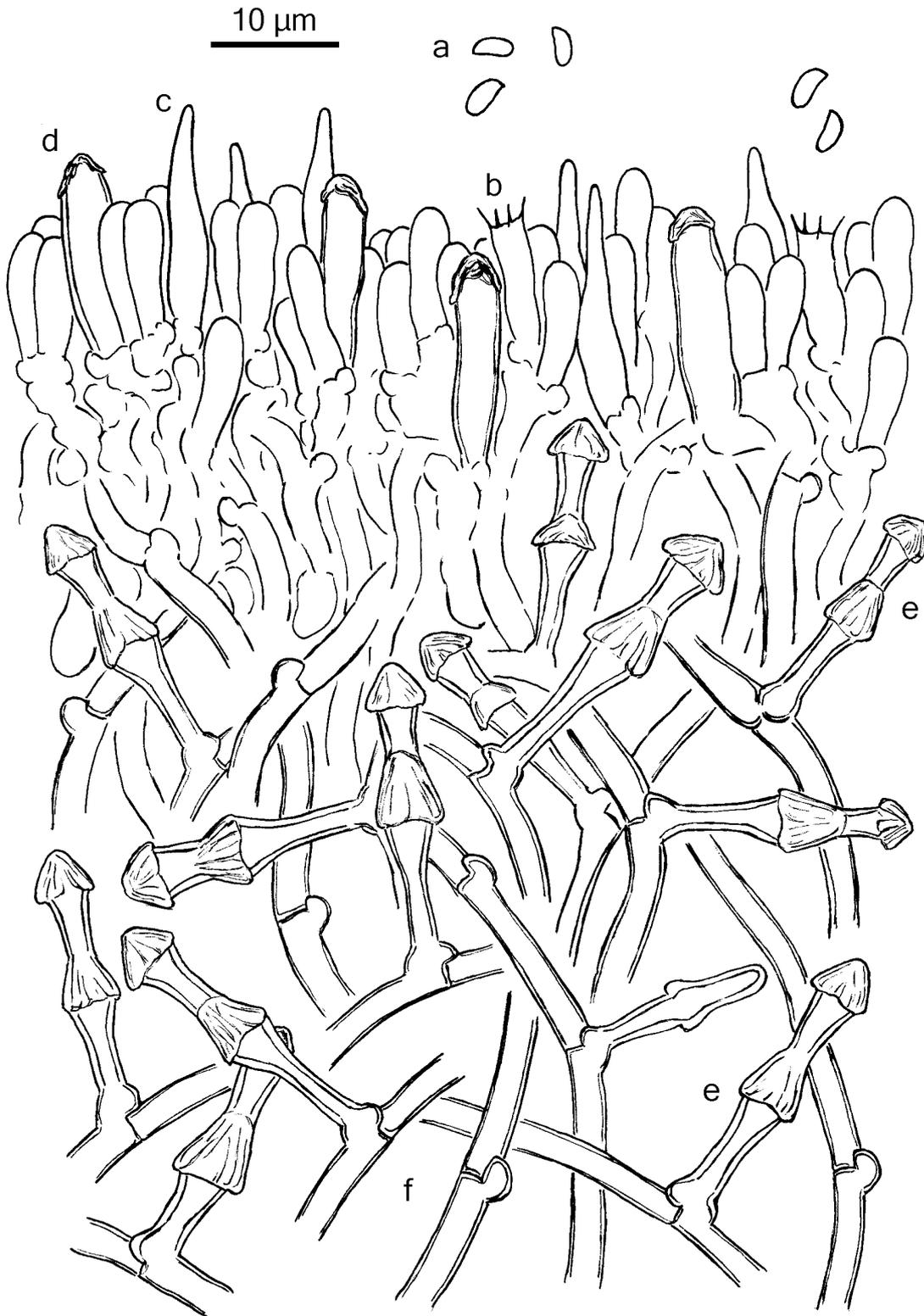


Fig. 3 – *Palifer seychellensis* (holotype). Microscopical elements. **a** basidiospores. **b** basidia. **c** leptocystidia or cystidiols. **d** encrusted hymenial cystidia. **e** subicular cystidia with a double umbrella-like cap encrustation. **f** subicular hyphae.

Discussion

As stated before, *Hyphodontia* can be considered a small genus restricted to species with septate cystidia and lagenocystidia or prudently we can wait for a more complete understanding of the whole group classifying most of the species under *Hyphodontia* s.l. I am conscious that most of the species discussed before can be properly classified in *Xylodon* based strictly in morphology, however, I prefer to be conservative and not to introduce new taxonomic changes and combinations until the whole group is molecularly resolved. It is clear that a more detailed study is necessary, including species from both hemispheres, and combining morphological and molecular analysis, to have a more comprehensible vision of *Hyphodontia* s.l.

Acknowledgements

Curators of BAFC, GLM, LY, PDD, SALA, and TNM are thanked for loans of specimens, and especially Fco. Javier Hernández García and Mario Rajchenberg for technical support. Frank Dämmrich and Karl-Henrik Larsson are thanked for comments and cooperation.

References

- Bernicchia A, Gorjón SP. 2010 – *Corticiaceae* s.l. Fungi Europaei 12. Ed. Candusso. Italy.
- Binder M, Hibbett DS, Larsson KH, Larsson E, Langer E, Langer G. 2005 – The phylogenetic distribution of resupinate forms across the major clades of mushroom-forming fungi (*Homobasidiomycetes*). Systematics and Biodiversity 3, 1–45.
- Boidin J, Gilles G. 2000 – Basidiomycètes Aphyllophorales de l'île de la Réunion XX – Le genre *Hypochnicium* Eriksson. Bulletin de la Société Mycologique de France 116, 159–172.
- Dai YC. 2012 – Polypore diversity in China with an annotated checklist of Chinese polypores. Mycoscience 53, 49–80.
- Dämmrich F, Rödel T. 2010 – *Palifer seychellensis* – eine neue Art aus den Tropen. Zeitschrift für Mykologie 76, 211–216.
- David A, Rajchenberg M. 1992 – West African polypores: new species and combinations. Mycotaxon 45, 131–148.
- Dueñas M, Tellería MT, Melo I, Martín MP. 2009 – *Lagarobasidium calongei* (*Aphyllophorales*, *Basidiomycota*), a new species of corticioid fungi from Azores Islands. Anales del Jardín Botánico de Madrid 66, 41–46.
- Galán M, López SE, Wright JE. 1993 – Corticiaceas 'Hifodermoideas' (*Basidiomycetes*, *Aphyllophorales*) de la provincia de Buenos Aires, Argentine. Darwiniana 32, 237–256.
- Gorjón SP, Hallenberg N. 2012 – Some new species and a first checklist of corticioid fungi (*Basidiomycota*) from Chile. Mycological Progress (on line first).
- Greslebin AG, Rajchenberg M. 2000 – The genus *Hyphodontia* in the Patagonian Andes forests of Argentina. Mycologia 92, 1155–1165.
- Greslebin AG, Rajchenberg M. 2003 – Diversity of *Corticiaceae* sens. lat. in Patagonia, Southern Argentina. New Zealand Journal of Botany 41, 437–446.
- Hjortstam K. 1983 – Studies in the genus *Hyphodontia* (*Basidiomycetes*) I. *Hyphodontia* John Erikss. sectio *Hyphodontia*. Mycotaxon 17, 550–554.
- Hjortstam K, Ryvarden L. 1982 – Studies in tropical *Corticiaceae* (*Basidiomycetes*) IV. Type studies of taxa described by J. Rick. Mycotaxon 15, 261–276.
- Hjortstam K, Ryvarden L. 1986 – Some new and noteworthy fungi (*Aphyllophorales*, *Basidiomycetes*) from Iguazu, Argentina. Mycotaxon 25, 539–567.
- Hjortstam K, Ryvarden L. 1997 – Corticioid species (*Basidiomycotina*, *Aphyllophorales*) from Colombia collected by Leif Ryvarden. Mycotaxon 64, 229–241.
- Hjortstam K, Ryvarden L. 2002 – Studies in tropical corticioid fungi (*Basidiomycotina*, *Aphyllophorales*) *Alutaceodontia*, *Botryodontia* *Hyphodontia* s.str. and *Kneiffiella*. Synopsis Fungorum 15, 7–17.
- Hjortstam K, Ryvarden L. 2007 – The genus *Palifer*. Synopsis Fungorum 22, 7–10.
- Hjortstam K, Ryvarden L. 2009 – A checklist of names in *Hyphodontia* sensu stricto -

- sensu lato and *Schizopora* with new combinations in *Lagarobasidium*, *Lyomyces*, *Kneiffiella*, *Schizopora*, and *Xylodon*. *Synopsis Fungorum* 26, 33–55.
- Hjortstam K, Ryvarden L, Iturriaga T. 2005 – Studies in corticioid fungi from Venezuela II. (*Basidiomycotina*, *Aphylophorales*). *Synopsis Fungorum* 20, 42–78.
- Langer E. 1994 – Die Gattung *Hyphodontia* John Eriksson. *Bibliotheca Mycologica* 154, 1–298.
- Larsson KH. 2007a – Molecular phylogeny of *Hyphoderma* and the reinstatement of *Peniophorella*. *Mycological Research* 111, 186–195.
- Larsson KH. 2007b – Re-thinking the classification of corticioid fungi. *Mycological Research* 111, 1040–1063.
- Larsson KH, Parmasto E, Fischer M, Langer E, Nakasone K, Redhead S. 2006 – *Hymenochaetales*: a molecular phylogeny of the hymenochaetoid clade. *Mycologia* 98, 926–936.
- Parmasto E. 1968 – *Conspectus Systematis Corticiacearum*. Institutum Zoologicum et Botanicum Academiae Scientiarum RPSS Estonicae, Tartu. 261 pp.
- Stalpers JA, Buchanan PK. 1991 – Type studies of the species of *Pellicularia* and *Peniophora* described by G.H. Cunningham. *New Zealand Journal of Botany* 29, 331–340.
- Thiers B. 2012 – Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/ih/>
- Xiong HX, Dai YC, Wu SH. 2009 – Three new species of *Hyphodontia* from Taiwan. *Mycological Progress* 8, 165–169.
- Xiong HX, Dai YC, Wu SH. 2010 – Two new species of *Hyphodontia* from China. *Mycologia* 102, 918–922.