Is *Psilocistella quercina* (Velen.) Svrček a good taxon?

Luis QUIJADA
Seppo HUHTINEN
Michel HAIRAUD
Esperanza BELTRÁN-TEJERA

Ascomycete.org, 6 (5) : 143-146.
Décembre 2014
Mise en ligne le 18/12/2014

Summary: Since *Psilocistella quercina* was described in 1977, it is considered a doubtful taxon, and therefore not currently accepted. A bibliographic revision, together with recent studies on collections from France and the Canary Islands (Spain) are used to provide evidence about its relevance. A provisional key to the genus is also given.
Keywords: Ascomycota, *Helotiales*, *Hyaloscyphaceae*, *Hyaloscypha*, *Psilocistella*, taxonomy.

Résumé : depuis la description de *Psilocistella quercina* en 1977, ce dernier est considéré comme un taxon douteux, et par conséquence non accepté actuellement. Une révision bibliographique, associée à l'étude de récoltes récentes de France et des îles Canaries (Espagne), sont utilisées pour fournir des preuves de sa pertinence. Une clé provisoire du genre est également proposée.
Mots-clés : Ascomycota, *Helotiales*, *Hyaloscyphaceae*, *Hyaloscypha*, *Psilocistella*, taxinomie.

Introduction

The genus *Psilocistella* was described in 1977 by Svrček, based on hair and paraphysis differences compared to other genera in *Hyaloscyphaceae* Nannf. *Psilocistella* is morphologically close to *Cistella* Quél., but hairs lack a swollen apex with a surface covering of needle-like spines or warts; it is also close to *Psilachnum* Höhn., but lacking lanceolate paraphyses. The type species is *Psilocistella obsoleta* (Velen.) Svrček, combined from *Hyaloscypha priapi* var. *obsoleta* Velen. (PRM 150906). The following new combinations appeared in the same publication: *Psilocistella lignatilis* (Velen.) Svrček based on *Hyaloscypha lignatilis* Velen., and *Psilocistella quercina* (Velen.) Svrček based on *Hyaloscypha quercina* Velen. Besides, Svrček mentioned that the species described by Dennis (1953) under that name is a different taxon. Nowadays the genus has 12 recognized species, 11 restricted to the Northern Hemisphere (Canada, Czech Republic, Denmark, Germany, Greenland, Netherlands, Spain, Spitsbergen, Switzerland, Ukraine), and only one, *Psilocistella deschampsiae* Gamundí & Spinedi, to the Southern Hemisphere (Antarctic Peninsula) (Ascofrance, 2014; Gamundí & Spinedi, 1988; Huhtinen, 1987a, 1993; Gbif, 2014; Kirk *et al.*, 2008). Unnamed members of the genus have been studied also from Finland, Sweden, United Kingdom and California (USA) by the second author (Huhtinen ined.).

As Svrček combined *Hyaloscypha quercina* Velen. into *Psilocistella* in 1977, he noted the following differences to *Psilocistella obsoleta*: (1) *P. quercina* has longer and wider hairs than *P. obsoleta* (30–85 × 2.5–4 µm vs. 25–40 × 2–2.5 µm), *P. quercina* has asci and ascospores larger than *P. obsoleta* (asci 25–40 × 5 µm and ascospores 5–8 µm vs. asci 20–22 × 3.5–5 µm and ascospores 2.5–4 µm). Svrček also noticed some differences in amyloidity between *Psilocistella quercina* and *Hyaloscypha priapi* var. *vernalis* Velen. (PRM 151115), which was later combined and raised at species level as *Psilocistella vernalis* (Velen.) Svrček (Svrček, 1985). In the same work (*op. cit.*), he suggested that *Hyaloscypha hyalina* (Pers. : Fr.) Boud., *sensu* Boudier (1905-1910 : 308 + pl. 525) could be conspecific with *Psilocistella quercina* (Velen.) Svrček.

Huhtinen (1990), in his monograph of *Hyaloscypha*, exposed the problem about the heterogeneous type specimen of *Hyaloscypha quercina*, which includes three different species: *Hyaloscypha quercina*, *H. aureliella* (Nyl.) Huhtinen and *H. quercicola* (Velen.) Huhtinen. To clarify the typification, Huhtinen checked out again the same material, which was sent to him by Svrček. Finally, Huhtinen concluded that the combination of *Hyaloscypha quercina* in *Psilocistella* was correct, and he also explained that the possible confusion about

Table 1. – Morphological characters and measurements taken from the literature, the ranges given are those between different collections
(Amyl. = amyloid reaction, C.I. = Canary Islands, F = France, Orig. = data from original description of *Psilocistella quercina*

Taxa	Description in	Hairs (µm)	Spore number	Crozier / Amyl.	Asci (µm)	Ascospores (µm)
P. alchemillae	Raitviir 2003	25–50 × 3–3.5	8	– / –	60–80 × 9–13.5	9.5–12 × 4–4.5
P. conincola	Svrček 1979	20–45 × 2–4	8	? / –	35–47 × 5.5–6.5	5–8 × 2.5–3
P. deschampsiae	Gamundí & Spinedi 1988	18–45 × 2.3–3.6	8	+ / +	25–36 × 3.6–4.5	5.5–9.1 × 1–1.8
P. fonticola	Svrček 1983	23–35 × 2–4	4 (rare 8)	? / +	30–35 × 4–6	7–12 × 1.5–2
P. jasmini	Raitviir & Galán *in* Raitviir 2004	15–30 × 3.5–6	8 (4–6)	+ / –	55–65 × 5–7	8–12 × 3–4
P. lignatilis	Svrček 1977	20–25 × 2–3.5	8	? / +	25–30 × 4.5–5	4–6 × 1.3–1.8
P. macrospora	Raitviir 2003	25–33 × 3.5–5	8	– / +	80–125 × 10–13	10–15 × 5–6.5
P. nympharum	Svrček 1985	10–25 × 3.5–6	8	? / +	45–60 × 10	12–15 × 2.5–3.5
P. obsoleta	Svrček 1977	25–40 × 2–2.5	8	? / +	20–22 × 3.5–5	2.4–4 × 2.5–4
P. parca	Svrček 1992	40 × 2–2.5	8	? / +	35–40 × 4–5.5	5.5–8 × 1.5–2
H. quercina (Orig.)	Velenovský 1934	25–70 × 2–3	8	? / +	25–40 × 5	5–8 × ?
†P. quercina (C.I.)	this paper	†25–68.5 × 2–3	8	+ / +	†28–48 × 4–6	†4–7 × 1.6–2.2
**P. quercina (C.I.)*	this paper	*25–72.5 × 2–4	8	+ / +	*41–62 × 5.7–7	*5.5–9.8 × 2–3.2
**P. quercina (F)*	this paper	up to *70 × 6	8	+ / +	*55–60 × 6–7.5	*8–10 × 2.5–3
H. quercina	Dennis 1953	50 × 2	8	? / –	25–45 × 5–6	6–9 × 1–1.5
H. hyalina	Boudier 1907	?	8	? / ?	*55–60 × 8–10	*6–10 × 2–3
P. vernalis	Svrček 1985	35–40 × 2.5–3.5	8	? / +	60–70 × 7.5–9	7–9 × 2.5–3

amyloid reactions mentioned by Svrček (1977, 1985) could have been due to a mixed specimen collection. In order to avoid problems with the heterogeneous sample mentioned above, Huhtinen used original material of *Uncina quercicola* Velen. to effect the combination *Hyaloscypha quercicola* (Velen.) Huhtinen.

In the present work, our purpose is to clarify the taxonomical confusion about *Psilocistella quercina*, to give an accurate description of this species, to verify its relevance and to provide a worldwide key for the genus.

Material and methods

The samples have been collected in Tenerife (Canary Islands, Spain) and France between 2012 and 2014. Descriptions are given following Huhtinen (1990), and vital study and abbreviations according to Baral (1992). Macroscopic and microscopic methods are the same as in *Quijada et al.* (2012). Localities were georeferenced (with a Geonaute Keymaze device) and ecological data were taken for each locality (altitude, plant communities and substrates). Distributions of the treated species were explored using the bibliography contained in this article, as from The Global Biodiversity Information Facility (Gbif, http://www.gbif.org/). Specimens are deposited in the personal herbarium of the third author (M.H.) and in the TFC Herbarium, section mycology (University of La Laguna). Colour coding refers to Iscc-Nbs (1976).

Abbreviations: CR= Aqueous Congo Red, OCI= oil content index ranging from 0–90% according to Baral & Marson (2005), KOH= potassium hydroxide, LUG= Lugol's solution, MLZ= Melzer´s reagent, * = living state, † = dead state.

Taxonomy

Psilocistella quercina (Velen.) Svrček, *Česká Mykol.*, 31(4): 197 (1977) – Fig. 1,2

≡ *Hyaloscypha quercina* Velen., *Monogr. Discom. Bohem.*: 275, pl. XIV, fig. 30 (1934)

Apothecia 0.2–0.6(1.1) mm in diam., up to 0.2 mm high, sparse to subgregarious, not erumpent, sessile, yellow white (92. y White) when young, in mature disc white (263. White) to greyish red brown (46. gy. r Br), receptacle concolorous to dark greyish red brown (47. d. gy. r Br), margin and receptacle hairy, usually dentate with groups of cohering hairs. **Hairs** cylindrical, apex rounded (never tapered), 1–3(4) septate, straight to rarely slightly undulating; surface smooth, without changes in CR and KOH, in MLZ with amyloid areas or not; at upper flanks *(31)45.7–60(72.5) µm long, at margin *(25.3)31.7–45.7(53.3) µm long, *(2)2.4–3.4(4) µm broad at base; apex *(2.3)3–3.5(4) µm, †25–68.5 × 2–3 µm. **Asci** *(41)48.8–54.2(61.6) × 5.7–6.7 (7) µm, †(28)35.8–41.2(48.4) × 4–5(6) µm; arising from croziers; cylindrical-clavate, 8-spored, biseriate, *pars sporifera* *18–25 µm, pore amyloid in MLZ and LUG with or without KOH pretreatment. **Ascospores** *(5.5)6.5–7.6(9.8) × 2–3.2 µm, †4–7 × 1.6–2.2 µm; ellipsoid to cylindrical-subcylindrical (rarely slightly clavate), straight to slightly inequilateral, aseptate, hyaline, thin-walled, with 2–4(6) large guttules, OCI (20)30–45(60)%. **Paraphyses** uninflated cylindrical to slightly clavate, 2–3(4)-septate; terminal cell *(10.4)15.5–21.6(28.6) × 2–3 µm, cell below *(10)12.6–16.6(21) × 1.8–2.4 µm; simple to bifurcate near base, thin-walled, without guttules. **Ectal excipulum** from base to margin of *textura angularis* to *prismatica*, *21.4–86 µm thick at base and middle flanks; *9–21(40) µm thick at margin and upper flank; hyaline, not gelatinized, without crystals, but near base with strong deep red brown (41. deep r Br) to dark brown (59. d. Br) amorphous resinous matter, without change in MLZ and LUG. **Ectal cells** *(7.5)12.4–16.4(21.8) × (5.1)7.2–8.6(10.8) µm at middle flank, wall thickness *0.3–0.7(1) µm; *(6)9.2–11(13) × 3–4(5) µm at margin.

Specimens studied: France. Treglamus, 48°33'42"N, 3°16'52"W, 186 m asl, under the bark of a dead trunk of *Quercus* sp., 23 Feb. 2014, *leg*. M. Hairaud (M.H. 160214). Spain. Canary Islands, Tenerife, Los Silos, Lomo Alto, 28°20'04"N, 16°49'22"W, 749 m asl, dry evergreen laurel forest, on detached branch of *Laurus novocanariensis*, 4 May 2012, *leg*. L. Quijada, I. Peréz-Vargas & J. Díaz-Armas (TFC Mic. 23484). La Laguna, Hija Cambada, 28°31'44"N, 16°17'10"W, 845 m asl, humid evergreen laurel forest, on detached branch of *Ocotea foetens*, 18 Apr. 2013, *leg*. L. & C. Quijada (TFC Mic. 24122).

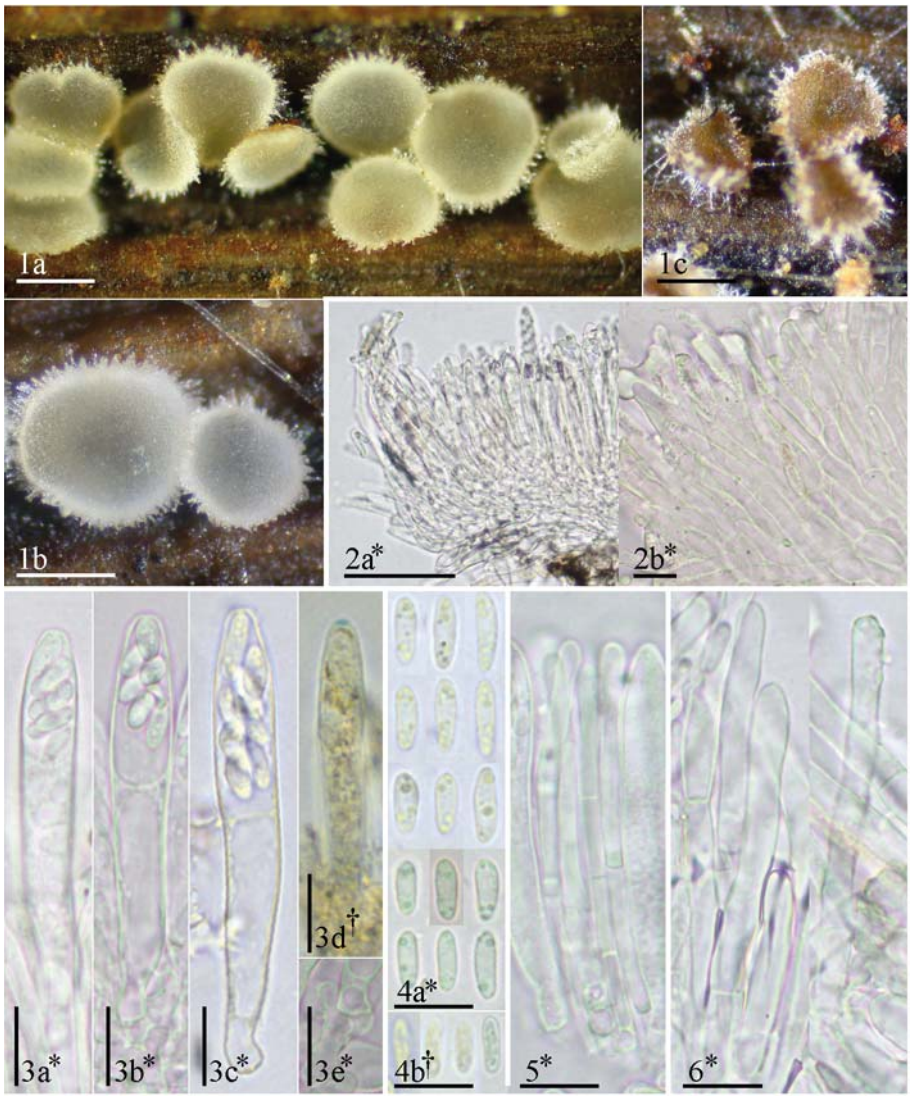


Fig. 1. – Morphological features of *Psilocistella quercina* from a French collection (M.H. 160214).
1. Fresh apothecia. 2. Excipular tissues in section. 3. Asci. 4. Ascospores. 5. Paraphyses. 6. Hairs. Scale bars: 1a-c = 500 µm; 2a = 50 µm; 2b, 3a-e, 4a-b, 5, 6 = 10 µm. Mounted in: H_2O= 2a-b, 3a-c, 3e, 4a-b, 5, 6; MLZ= 3d.

Distribution and ecology known hitherto: only reported previously from Czech Republic on wood or bark of *Fagus* sp. and *Quercus* sp., spring to summer (Velenovský, 1934).

Remarks: the description is based only on our recently collected French and Canarian material. All the morphological and biometrical characteristics of our samples fit well with the description of *Hyaloscypha quercina* (Velenovský, 1934). For the comparison with the information in the literature we only take into account our measures in the dead state (†). The most similar species is *Psilocistella vernalis* with wider ascospores (2.5–3 µm vs. 1.6–2.2 µm) and bigger asci (60–70 × 7.5–9 µm vs. 25–48 × 4–6 µm). We have not considered the differences in the amyloid reaction remarked by Svrček between *P. quercina* and *P. vernalis*. Svrček (1977, 1985) used inconsistent terms when describing the hairs and excipulum of *P. vernalis*: in 1977 they were stated to be amyloid and in 1985 pseudoamyloid (= dextrinoid). There are also noticeable biometrical differences between the two species. Our findings of amyloid areas in otherwise inamyloid hairs (Fig. 2, 4c, 4e) is a feature seen also in e.g. *Hyaloscypha aureliella* and *Arachnopeziza variepilosa* (Galan & Raitv.) Huhtinen (Huhtinen, 1987b, 1990).

The following lignicolous species also resemble *Psilocistella quercina*: *P. jasmini* Raitv. & R. Galán has larger ascospores (8–12 × 3–4 µm), *P. fonticola* Svrček has bigger and narrower ascospores (7–12 × 1.5–2 µm), *P. deschampsiae* Gamundí & Spinedi has fusoid narrower ascospores (1–1.8 µm wide), *P. obsoleta* (Velen.) Svrček and *P. lignatilis* (Velen.) Svrček have smaller ascospores (2.5–4 × 1–1.5 µm; 4–6 × 1.3–1.8 µm), and *P. conincola* (Velen.) Svrček has inamyloid asci (Gamundí & Spinedi, 1988; Huhtinen, 1987a, 1993; Raitviir, 2003, 2004; Svrček, 1977, 1979, 1983, 1985).

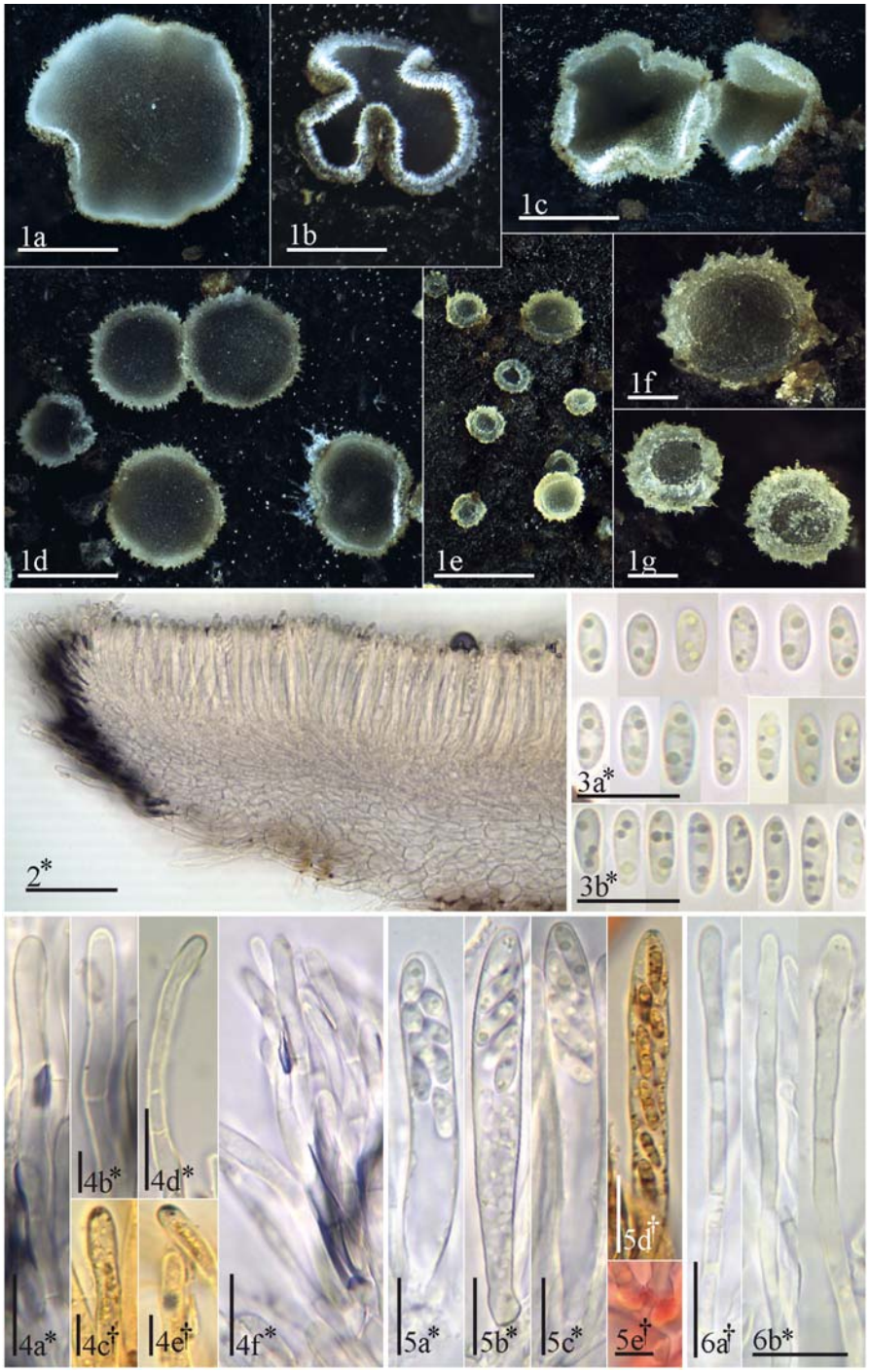


Fig. 2. – Morphological features of *Psilocistella quercina* from the Canary Islands. 1. Fresh apothecia. 2. Excipular tissues in section. 3. Ascospores. 4. Hairs. 5. Asci. 6. Paraphyses. Scale bars: 1a-e = 500 µm; 1f-g = 100 µm; 2 = 50 µm; 4a, 4d-e, 5a-d, 6a-b = 10 µm=; 4b-c, 5e = 5 µm. Mounted in: CR = 5e; H_2O = 2, 3a-b, 4a-b, 4d, 4f, 5a-c, 6a-b; MLZ = 4c, 4e, 5d. Photos: TFC Mic. 24122 = 1a-d, 2, 3b, 4a-b, 5b-e, 6b; TFC Mic. 23484 = 1e-g, 3a, 4e, 4c-f, 5a, 6a.

Conclusions

Though the type of this taxon has an unfortunate history due to a mixed collection, which has led to contradictory interpretations, we do believe that *Psilocistella quercina* can safely be interpreted as the taxon presented in this paper for the following reasons: (1) the reexaminations and clarifications of the lectotype of *Hyaloscypha quercina* made, at first by Svrček and later by Huhtinen; (2) the original drawings of Velenovský (1934, Pl. XIV, fig. 30); and (3) the biometry combined with the ecology (Velenovský, 1934: 275), all of which fit with our observations. At present Index Fungorum has *Hyaloscypha quercina* and *Psilocistella quercina* (Velen.) Svrček, synonymized in *Hyaloscypha quercicola* (Velen.) Huhtinen, while in MycoBank (Robert *et al*., 2005) *Psilocistella quercina* is synonymized in *Hyaloscypha quercina*.

Hitherto, *Psilocistela quercina* had only been reported from Czech Republic, our findings considerably extend the ecological and geographical range, verifying the typical ecology of the species with the French collection (on *Quercus* wood), and widening its distribution to the south, in the Canary Islands (Northwest Africa), and on new substrates (*Laurus novocanariensis* and *Ocotea foetens*).

Acknowledgements

It is a pleasure to dedicate this paper to Hans-Otto Baral, in recognition his enormous contribution to the knowledge of Ascomycota, particularly in the *Helotiales* and *Orbiliales* field, and his continuous most valuable and friendly help. Ernest Emmett is thanked for checking the English language. This study was partly funded by the Canarian Government (PhD-Grant BOC n°086/29 April – FSE 85% financed).

Tentative key for the species of *Psilocistella* based on literature

1a. Mean length of ascospores up to 5.5 µm (length varies between 2.4–6 µm) 2
1b. Mean length of ascospores 5.5 µm or more (length varies between 5–15 µm) 3
2a. Ascospores up to 4 µm long ..... ***Psilocistella obsoleta***
2b. Ascospores longer than 4 µm ..... ***Psilocistella lignatilis***
3a. Ascus pore inamyloid 4
3b. Ascus pore amyloid 6
4a. Ascospores up to 8 µm long ..... ***Psilocistella conincola***
4b. Ascospores longer than 8 µm 5
5a. Ascospores narrower than 4 µm, asci narrower than 8 µm ..... ***Psilocistella jasmini***
5a. Ascospores wider than 4 µm, asci wider than 8 µm ..... ***Psilocistella alchemillae***
6a. Mean width of ascospores < 2.5 µm, and mean length of asci < 45 µm 7
6b. Mean width of ascospores >2.5 µm, mean length of asci >45 µm 10
7a. Foliicolous 8
7b. On stems or wood 9
8a. Mean length of asci < 36 µm, in Southern hemisphere ..... ***Psilocistella deschampsiae***
8a. Mean length of asci >36 µm, in Northern hemisphere ..... ***Psilocistella parca***
9a. Asci always 8-spored, on wood ..... ***Psilocistella quercina***
9b. Asci usually 4-spored (rarely 8-spored), on stems ..... ***Psilocistella fonticola***
10a. Ascospores narrower than 4 µm 11
10b. Ascospores broader than 4 µm ..... ***Psilocistella macrospora***
11a. Ascospores up to 9 µm long ..... ***Psilocistella vernalis***
11b. Ascospores larger than 9 µm ..... ***Psilocistella nympharum***

References

Ascofrance — www.ascofrance.fr/main/search?searchString=Psilocistella (accessed 9 Sep. 2014).

Baral H.-O. 1992. — Vital *versus* herbarium taxonomy: morphological differences between living and dead cells of Ascomycetes, and their taxonomic implications. *Mycotaxon*, 44: 333-390.

Baral H.-O. & Marson G. 2005. — *In vivo veritas*. Over 10,000 Images of Fungi and Plants (microscopical drawings, water color plates, photo macro- & microphotographs), with material on vital taxonomy and xerotolerance. Privately distributed DVD, 3rd edition.

Boudier E. [1907]1905-1910. — *Icones mycologicae* ou Iconographie des champignons de France. Paris, Paul Klincksieck. 4 vols.

Dennis R.W.G. 1953. — *Hyaloscypha quercina* Vel. in England. *Kew Bulletin*, 8: 295-296.

Gamundí I. & Spinedi H. 1988. — Ascomycotina from Antartica. New species and interesting collection from Danco Coast, Antartic Peninsula. *Mycotaxon*, 33: 467-482.

Huhtinen S. 1987a. — New Svalbard fungi. *In*: Laursen G.A., Ammirati J.F. & Redhead S.A. (eds.): *Arctic and Alpine Mycology* 2. New York, Plenum Press: 123-151.

Huhtinen S. 1987b. — Taxonomic studies in the genera *Protounguicularia*, *Arachnopeziza* and *Dematioscypha*. *Mycotaxon*, 30: 9-28.

Huhtinen S. 1990 [1989]. — A monograph of *Hyaloscypha* and allied genera. *Karstenia*, 29 (2): 45-252.

Huhtinen S. 1993. — New or less known hyaloscyphaceous fungi from the Canadian timberline. *Bibliotheca Mycologica*, 150: 93-103.

Index Fungorum. — www.indexfungorum.org (accessed 9 Oct. 2014)

Kirk P.M., Cannon P.F., Minter D.W. & Stalpers J.A. 2008. — *Ainsworth and Bisby's Dictionary of the Fungi*. 10th ed. United Kindom, CAB international, 771 pp.

Quijada L., Baral H.O. & Beltrán-Tejera E. 2012. — New species of *Orbilia* (*Orbiliales*) from arid ecosystems of the Canary Islands (Spain). *Nova Hedwigia*, 96: 237-248.

Raitviir A. 2003. — New or forgotten Helotiales from Greenland 1. *Dermateaceae* and *Hyaloscyphaceae*. *Mycotaxon*, 87: 359-378.

Raitviir A. 2004. — *Revised synopsis of the Hyaloscyphaceae*. Scripta Mycologica 20. Tartu, 133 pp.

Robert V., Stegehuis G. & Stalpers J. 2005. — The MycoBank engine and related databases. http://www.mycobank.org (accessed 9 Sep. 2014)

Svrček M. 1977. — New or less known Discomycetes. VI. *Česka Mykologie*, 31: 193-200.

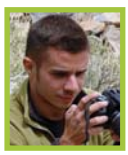
Svrček M. 1979. — New or less known Discomycets. X. *Česka Mykologie*, 33: 193-206.

Svrček M. 1983. — New or less known Discomycetes. XII. *Česka Mykologie*, 37: 65-71.

Svrček M. 1985. — Notes on the genus *Hyaloscypha* (*Helotiales*). *Česka Mykologie*, 39: 205-219.

The Global Biodiversity information Facility: GBIF Backbone Taxonomy, 2014-09-09. Accessed via http://www.gbif.org/species/2585982 (accessed 9 Sep. 2014).

Velenovský J. 1934. — *Monographia Discomycetum Bohemiae* (Vol. 1, 2). Prague, 436 pp.



Luis Quijada
Dpto. Botánica, Ecología & Fisiología, Universidad de La Laguna
38201Tenerife
Canary Islands, Spain
lquijull@gmail.com

Esperanza Beltrán-Tejera
Dpto. Botánica, Ecología & Fisiología, Universidad de La Laguna
38201Tenerife
Canary Islands, Spain

Seppo Huhtinen
Herbarium, University of Turku
20014 Turku
Finland
sephuh@utu.fi

Michel Hairaud
2 impasse des Marronniers
79360 Poivendre-de-Marigny
France
michel.hairaud@wanadoo.fr