# Two remarkable brown-spored agarics from Spain: *Simocybe parvispora* sp. nov. and *Crepidotus ibericus* comb. nov.

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*Simocybe parvispora* is proposed as a new species. This small-spored fungus having orange-brown basidiomes was found growing on wood debris close to a *Sphagnum* bog in a *Pinus sylvestris* forest in Central Spain. *Simocybe iberica*, previously described from the Iberian Peninsula, is also studied. After reexamination of the holotype and additional collections from Madrid province, it is concluded that, on account of the distinctive macro- and microscopic characters, it should be transferred to the genus *Crepidotus*. Descriptions, discussions and illustrations of macro- and microscopic features are provided for both taxa.

Keywords: Agaricales, Crepidotaceae, taxonomy, wood-inhabiting fungi.

Until the description of *Simocybe iberica* G. Moreno & Esteve-Rav. (1990), which is here transferred to *Crepidotus* (Fr.) Staude, most records of *Simocybe* P. Karst. known from the Iberian Peninsula were referred to *Simocybe haustellaris* (Fr.) Watling [= *S. rubi* (Berk.) Singer], a rarely encountered species that occurs in different kinds of vegetation throughout Europe. Also, under the name *S. haustellaris*, some records of *Crepidotus eucalyptinus* Maire & Malençon have passed unnoticed (Bandala *et al.* 2008). Other species rarely recorded in the Iberian Peninsula are *Simocybe centunculus* (Fr.) P. Karst. and *S. sumptuosa* (P.D. Orton) Singer. After the monographic study of European taxa by Senn-Irlet (1995a), the only contribution referred to new taxa of *Simocybe* in the Mediterranean area is that of Contú (1993), in which three new species were described under the generic name of *Ramicola* Velen.

The family *Crepidotaceae* (S. Imai) Singer has been conceived as a taxon including both *Crepidotus* and *Simocybe*, as well as other genera with brown-spored members (Moser 1983; Singer 1986). Most

recent phylogenetic hypotheses based on molecular data have revealed, however, that the two genera mentioned before are the core members that define this family (Moncalvo *et al*. 2002, Aime *et al*. 2005). The combination of the following set of characteristics support the separation of *Simocybe* from *Crepidotus:* (a) pileipellis with incrusted hyphae or containing brown pigment, (b) bearing cystidiform terminal elements commonly arranged in a hymeniform-like layer (consequently the pileus surface may appear minutely granulose or moderately velvety under magnification), (c) stipitipellis with caulocystidia, then the stipe surface often pruinose, and (d), basidiomes rather consistently with olivaceous tinges (Aime *et al*. 2005, Moser and Jülich 1986, Senn-Irlet 1995a, Singer 1986, Watling and Gregory 1989). Though taxonomic descriptive data on *Crepidotus* and *Simocybe* have been published in various contributions, the specific distinction of several taxa in both genera is often problematic due to the apparent overlapping of the established discriminative characters, e.g. pileipellis structure, size and shape of basidiospores and cheilocystidia, trama tissues. In our opinion, several species of *Simocybe* (even the better known ones), still require to be comparatively detailed with regard to their distinctive morphocharacters in order to achieve a better delimitation, and to add taxonomic stability to both the genus and the family. Re-examination of type material and other collections of *Simocybe iberica* revealed that the macro- and microscopic characters are consistent with the generic concept of *Crepidotus*, and, therefore, we propose its transfer to this latter genus. *Simocybe parvispora* is proposed as a new species superficially similar to *S. centunculus* (Fr.: Fr.) Karst.

## Materials and Methods

Macroscopic description is based on the study of fresh specimens or data recorded from herbarium specimens. Colors of the basidiomes were compared and coded (alphanumeric codes in brackets) according to the colour charts of Kornerup and Wanscher (1967) (e.g. 4A3-4) and Munsell (1994) (e.g. 7Y 7/6). Microscopic analysis was carried out on hand sections of revived tissues mounted in 3% KOH and Congo red 1% in water; measurements and colors of the structures were observed in the former. Line drawings were made with the aid of a drawing tube. Part of the suggestions by Heinemann and Rameloo (1985) were followed for estimating the spore dimensions; $\overline{x}$ corresponds to the range of means of length and width and $Q$ to the range of the mean values of length/width ratio, in both cases of $n$ collections and based on at least 50 spores measured per collection. For SEM study of the basidiospores, small sections of dry lamellae were re-hydrated in $NH_4OH$, fixed in glutaraldehyde, critically point

dried, and subsequently coated with gold-palladium. Herbarium acronyms are according to Holmgren *et al.* (1990).

## Taxonomy

***Simocybe parvispora*** Bandala, Esteve-Rav. & Montoya **sp. nov.** – Figs. 1–2, 5a–e & 7a.

**MycoBank no.: 512152**

*Etymology:* (Latin) refers to the relatively small basidiospores.

*Pileus* 3–10 mm diam., aurantiobrunneus vel ochraceobrunneus, conicus demum subcampanulatus vel convexo-umbonatus, subglaber ad leviter minute pruinoso-fibrillosus, leviter lubricosus, hygrophanous, striatus. *Lamellae* subadnatae vel sinuatae, confertae vel subdistantes, pallidae dein pallide fuscae, saepe olivaceous. *Stipes* 10–20 x 1–1.5 mm, pileo concolor, ad apicem saepe pallide, cylindricus, pruinosus, base subbulbosa, interdum mycelium pallide aurantiacus observatis. *Contextus* pallidus, odore et sapore non distinctus. *Basidiosporae* 5–6 (–6.5) x 2.5–3.5 (–4) µm ($\overline{x}$ = 5.4–5.8 x 2.8–3.1 µm), Q = 1.87–1.99, ellipsoideae vel subamygdaliformeae, reniformeae, pallide fuscae vel pallide ochraceobrunneae, laevis, poro germinativo nullo. *Basidia* 20–28 (–30) x 5–6 µm, clavata, tetrasporigera interdum mono- vel bisporigera. *Pleurocystidia* nulla. *Cheilocystidia* 25–67 (–75) x 4.5–7.5 µm, numerosis, saepe rara, subcylindrata, subcylindrato-clavata vel sublageniformia, tenui-tunicata. *Pileipellis* ex hyphis cylindraceis vel ventricosis cutem formantibus, luteobrunneis, incrustatis, cellulis terminalibus interdum tenui gelatinosis. *Fibulae* praesentes.

Holotypus. – SPAIN, Guadalajara, road Aldeanueva de Atienza to Condemios de Arriba, Río Pelagallinas, 4 Sep 1999, F. Esteve-Raventós & M. Trasviña s.n. (AH 25260).

Pileus 3–10 mm diam., at first conical soon becoming more or less campanulate to convex-umbonate or convex-papillate, orange-brown to yellowish-brown, darker at the center, orangish-brown to orange-ochraceous towards the margin, dry, hygrophanous, slightly lubricous when wet, apparently glabrous but minutely pruinose-fibrillose (under magnification), translucently striate up to half the radius when wet, margin initially slightly incurved, becoming straight, even to somewhat eroded, thin and slightly projected beyond lamellae. – Lamellae pale cream in young stages, becoming pale ochraceous, pale brownish or pale grayish-brown, usually with olivaceous or citrine-olivaceous tinges, adnexed to slightly sinuate, subdistant (L = 35–45; l = 1–3), more or less ventricose (up to 2.5 mm wide), edges weakly fimbriate, somewhat irregular. – Stipe 10–20 x 1–1.5 mm, more or less concolorous with pileus, paler with age, pale orange or yellow-brown towards the apex, cylindrical, at times curved, usually more or less enlarged towards the base to subbulbous, central, slender, hollow, surface finely pruinose to tomentose, showing a moderately compact, pale orange or pale rusty mycelial patch at the attachment to substratum. – Context up to

1.5 mm thick (at pileus center), whitish to pale yellowish; odor and taste not distinctive.

Basidiospores 5–6 (–6.5) x 2.5–3.5 (–4) µm ($\overline{x}$ = 5.4–5.8 x 2.8–3.1 µm) Q = 1.87–1.99, ellipsoid to more or less narrowly amygdaliform, adaxially variably depressed then more or less narrowly reniform or some even weakly curved, often constricted in the middle portion when seen in dorso-ventral view, apically rounded, smooth and lacking germ pore (even under SEM), thick-walled (< 0.5 µm wide), pale yellow to pale brownish. – Basidia 20–28 (–30) x 5–6 µm, tetrasporic, often bi- or monosporic, clavate, thin-walled, hyaline, clamped. – Pleurocystidia absent. – Cheilocystidia 25–67 (–75) x 4.5–7.5 µm, subcylindric, subcylindric-clavate or slightly broadened towards the base and then somewhat narrowly utriform or narrowly lageniform, often sinuous, apex rounded, 4.5–8 (–9) µm wide, rarely tapered, hyaline, thin- or slightly thick-walled (< 0.5 µm thick), smooth, clamped, not gelatinized, numerous or scarce (at times one or more lamellae tips in tangential section can be devoid of cheilocystidia). – Pileipellis a pigmented layer (orange-brown, yellowish-orange to yellowish-brown) of compactly arranged, subventricose, repent, thin- to thick-walled (< 1 µm), clamped hyphae (7–20 µm diam.) with parietal, yellow or yellowish-brown incrusted pigment; the tissue exhibiting a cellular aspect and the more terminal cells bearing distinctly cylindric, 2–5 (–7) µm diam., short or long, undifferentiated terminal elements which are paler, thin-walled, smooth or occasionally punctuate, moderately loosely arranged but repent, at times obscurely gelatinized, scattered on pileus surface or at times in some points more or less erect and then recalling a trichodermoid arrangement; in young basidiomes the dark pigmented hyphae are more periclinally arranged, thus the stratum looks like a trichodermoid structure; towards pileus margin with numerous, smooth, undifferentiated, more or less clavate or narrowly utriform terminal elements with yellow plasmatic content. – Pileus trama composed of compactly arranged, not gelatinized, colorless or yellowish, thin-walled, subcylindric, simple or bifurcate hyphae 4–9 µm diam., with intraparietal, yellow, incrusted pigment. – Hymenophoral trama regular to subirregular, composed of subventricose, hyaline to pale yellowish, not gelatinized hyphae 4–13 (–20) µm diam., with intraparietal, yellow, incrusted pigment. – Stipitipellis with caulocystidia 18–40 x (3–) 5–6.5 µm, subcylindric to subcylindric-clavate, often somewhat narrowly utriform or narrowly lageniform, apex rounded, 3–5 (–6) µm wide, at times tapered, numerous, in clusters, more or less forming a continuous layer near the stipe apex, hyaline, with or without yellow incrusting pigment (then pale yellowish in mass), thin- or slightly thick-walled (< 0.5 µm thick), clamped, not gelatinized; arising from pigmented

hyphae resembling those from the pileipellis. – Clamp connections present.

Habitat. – On dead branches or fallen woody debris of *Pinus sylvestris*, in soil close to a *Sphagnum* bog in *Pinus sylvestris* forest, in acid soil.

Distribution. – Spain.

Material examined. – SPAIN, Guadalajara, road from Aldeanueva de Atienza to Condemios de Arriba, river Pelagallinas, 30TVL 9060, 1380 m alt., on decaying branches of *Pinus sylvestris*, 4 September 1999, F. Esteve-Raventós & M. Trasviña s.n. (AH 25260, **holotype**); 4 October 1991, M. Heykoop & G. Moreno s.n. (AH 14284 as S. *centunculus* f. *filopes*); 23 September 2000, F. Esteve-Raventós & M. Trasviña s.n. (AH 26817); 2 October 1999, Villarreal and coll. s.n. (AH 25282).

Other material examined. – *Simocybe centunculus* (Fr.) P. Karst.: SPAIN, Balearic Islands, Cabrera, Plá de Ses Sitjes, among dead needles of *Pinus halepensis*, 23 November 1994, J.L. Siquier C-112b (AH 26902). *Simocybe sumptuosa* (P.D. Orton) Singer: SPAIN, Extremadura, Cañamero, El Batán, Sierra del Pimpollar, on dead wood of *Populus*, 14 October 1993, G. Moreno & V. González s.n. (AH 16936).

## Discussion

*Simocybe parvispora* is a slender, orange-brown fungus that differs microscopically from close relatives by possessing small, pale brownish basidiospores and a cutis with elongated terminal elements. Its ecological requirements seem also to be characteristic: it grew in a pine forest, close to a bog community with *Sphagnum* and diverse *Cyperaceae*, inhabiting wood debris. In the field *Simocybe parvispora* may remind a small lignicolous *Galerina* or even a *Tubaria*, the former, however, embraces rusty brown-spored (then dextrinoid) members while the latter includes representatives with distinctively subdecurrent or adnate lamellae and having pileipellis and basidiospores with different characteristics (Moser 1983, Singer 1986). It can be distinguished from the core of European *Simocybe* species, such as *S. centunculus* [including var. *filopes* (Romagn.) Senn-Irlet], *S. haustellaris* (Fr.: Fr.) Watling [= *S. rubi* (Berk.) Singer] and *S. sumptuosa* (Orton) Singer, because these fungi form basidiomes typically with olivaceous colors, more pigmented and broader, distinctly ovoid-reniform basidiospores, and a pileipellis with a different structure, *i.e.* a layer with well differentiated terminal elements as pileocystidia forming a more "trichodermoid" structure (Romagnesi 1962, Senn-Irlet 1995a, Breitenbach & Kränzlin 2000). On account of the "mycenoid-galerinoid" aspect of basidiomes, *S. parvispora* could recall especially *S. centunculus* or *S. sumptuosa* (the "crepidotoid" habit of *S. haustellaris* separates it macroscopically from this group). In fact, one of the examined collections (AH 14284) was previously determined as a form of *S. centunculus* [as *Ramicola centuncula* f. *filopes* (Romag.) Bon, Heykoop

*et al.* (1994)]. Two collections representing *S. centunculus* and *S. sumptuosa* were studied for comparison and their respective microscopically distinctive features are shown in Figs. 3–4. The herbarium sample of *S. sumptuosa*, which presents a macroscopic aspect similar to an *Agrocybe* species, is distinguished microscopically by the basidiospores 7–8 x 4–5 µm ($\overline{x}$ = 7.5 x 4.6 µm), $Q$ = 1.63, cheilocystidia 37–92 (–98) x 5–11 (–12) x (apically) 4.5–11 (–12) µm, pileocystidia (32–) 35–72 x (5–) 6–13 x (apically) 4–7 µm, and caulocystidia 30–80 (–85) x 4.5–12 x (apically) 4–10 (–11) µm (Fig. 3). The *S. centunculus* specimen presented a somewhat collybioid habit and microscopically differed by the basidiospores 8–9 (–9.5) x 4.5–5.5 µm ($\overline{x}$ = 8.5 x 5.0 µm), $Q$ = 1.69, cheilocystidia 28–48 x 4.5–7 x (apically) 4.5–6.5 (–7) µm, and pileocystidia 18–41 (–47) x 4–6.5 (–8) x (apically) 4–6 (–8) µm (caulocystidia not completely revived with KOH) (Fig. 4). [For further anatomical details and differences among these taxa *cf.* Romagnesi (1962) and Senn-Irlet (1995a)] *Simocybe coniferarum* Singer (1989), a species known also from conifer forests (*Picea*), is reminiscent of *S. centunculus*, and, according to its description, differs from *S. parvispora* by a distinctly olivaceous pileus, bigger basidiospores (6.5–7.5 x 4.2–4.5 µm), and a pileipellis bearing differentiated pileocystidia.

***Crepidotus ibericus*** (G. Moreno & Esteve-Rav.) Bandala, Esteve-Rav. & Montoya, **comb. nov.** – Figs. 5f–i, 6 & 7b.

**MycoBank no.: MB512154**

Basionym. – *Simocybe iberica* G. Moreno & Esteve-Rav., Riv. Micol. (Boll. Gruppo Micol. Bresadola) 33: 290. 1990.

Synonym. – *Ramicola iberica* (G. Moreno & Esteve-Rav.) Bon, Doc. Mycol. 21 (83): 38. 1991.

*Phaeomyces ibericus* (G. Moreno & Esteve-Rav.) Horak, Röhrlinge und Blätterpilze in Europe, p. 509. 2005.

Pileus 5–20 mm diam., hemispherical to convex when young, soon becoming plano-convex to applanate, finally centrally depressed (then with an aspect more or less "clitocyboid" or "omphalinoid"), surface dull, dry, not hygrophanous, uniformly cream-yellow to cream-ochraceous, grey-yellow or pale brownish-yellow, occasionally whitish-cream, matted to finely adpressed-fibrillose, then glabrescent with age, not striate even in wet condition, margin initially involuted becoming incurved to deflexed, even at times somewhat undulate-lobate. – Lamellae whitish to pale cream-yellow when young, becoming yellow-brown, brownish or darker, with olivaceous tinges, adnate or slightly sinuate to subdecurrent (and then subtriangular), subdistant (L = 15–20; l = 1–2), more or less ventricose to straight, edges finely fimbriate, whitish. – Stipe 5–20

x 1–3 mm, concolorous with pileus or paler, cylindrical to somewhat attenuate towards the base, central, occasionally subeccentric, slender, hollow, surface finely fibrillose to glabrescent, often showing a cottony-white, mycelial patch at the base. – Context thin, concolorous; odor and taste not distinctive.

Basidiospores (7.5–) 8–11 (–11.5) x (5–) 5.5–6.5 µm ($\overline{x}$ = 9.4–10 x 5.5–6.1 µm) Q = 1.63–1.72, ellipsoid, more or less oblong-ellipsoid in dorso-ventral view, often with a weak suprahilar depression, then somewhat amygdaliform, occasionally rather reniform due to a weak adaxial depression, apically rounded and lacking germ pore, smooth (even under SEM), thick-walled (< 0.5 µm wide), honey yellow to ochraceous. – Basidia (25–) 30–39 x 8–10 µm, tetrasporic, occasionally bisporic, clavate, thin-walled, hyaline, clamped. – Pleurocystidia absent. – Cheilocystidia (22–) 35–90 x 3.5–7 (–7.5) x (apex) 2–5.5 µm, numerous, subcylindric or somewhat broadened downwards and then elongate and more or less narrowly lageniform, sinuous, constricted, somewhat tortuous, apex rounded, often bifurcate, projecting above the hymenium level, hyaline, thin-walled, often bearing a colorless, incrusted material as scattered granulations, not gelatinized, clamped. – Pileipellis a not gelatinized layer of interwoven or entangled, more or less filamentous hyphae 2–5 µm wide, simple, bifurcate or with short, lateral outgrowths, forming a moderately compact cutis with a variable number of undifferentiated, simple or bifurcate, sinuous, repent or often erect terminal elements (when more projected recalling a transition between a cutis to a loose trichoderm); hyphae hyaline to pale yellowish (then the entire layer appearing variably yellowish to pale yellowish-brown), clamped, thin-walled, smooth or often some segments with incrusted, colorless material. – Pileus trama composed of compactly arranged, not gelatinized, colorless or yellowish, thin-walled, cylindric, simple or bifurcate hyphae 4–8 µm diam. – Hymenophoral trama regular, composed of cylindric, hyaline to pale yellowish, not gelatinized hyphae 3–8 µm diam. – Stipitipellis with cystidiform terminal elements 37–80 x 4–5.5 x (apex) 3–4 µm, more or less similar in shape to the cheilocystidia, in small groups along the stipe surface. – Clamp connections present in all tissues.

Habitat. – On dead branches or woody debris of *Salsola vermiculata* and *Kochia prostrata* (*Chenopodiaceae*), also found once under *Artemisa* sp. (*Compositae*), in xerophitic vegetation (*Juniperus thurifera-Quercus ilex* mixed forest), in basic soil.

Distribution. – Spain.

Material examined. – SPAIN, Guadalajara, Tamajón, Ermita de los Enebrales, 30TVL 7540, 1050 m alt., among vegetal debris under *Artemisa* sp., in a mixed forest of *Juniperus thurifera-Quercus ilex*, 7 Dec 2004, G. Moreno, F. Esteve-

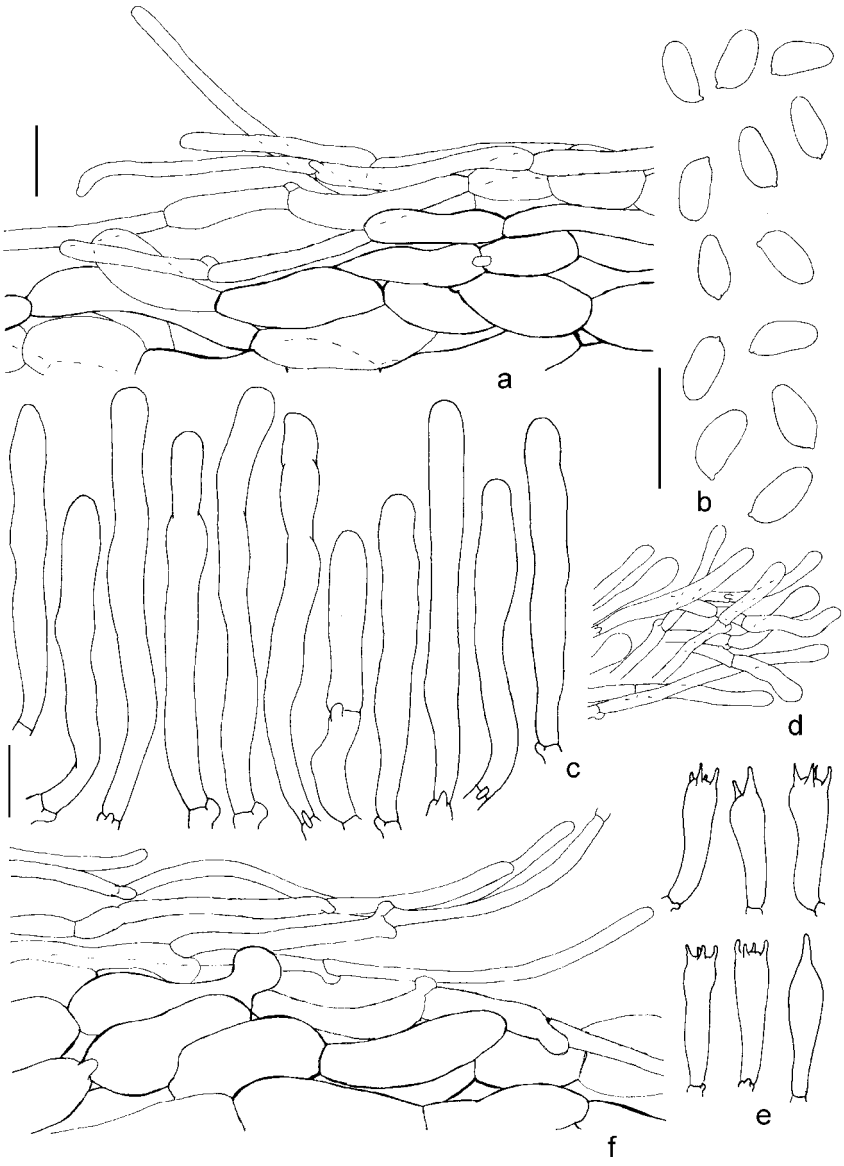


**Fig. 1.** *Simocybe parvispora* (from holotype, AH 25260). **a.** Pileipellis (near middle portion of pileus). **b.** Basidiospores. **c.** Cheilocystidia. **d.** Terminal elements of pileipellis at pileus margin. **e.** Basidia. **f.** Pileipellis (as in a, but from a different basidiome). Bar = 10 μm, except a,d & f = 15 μm.

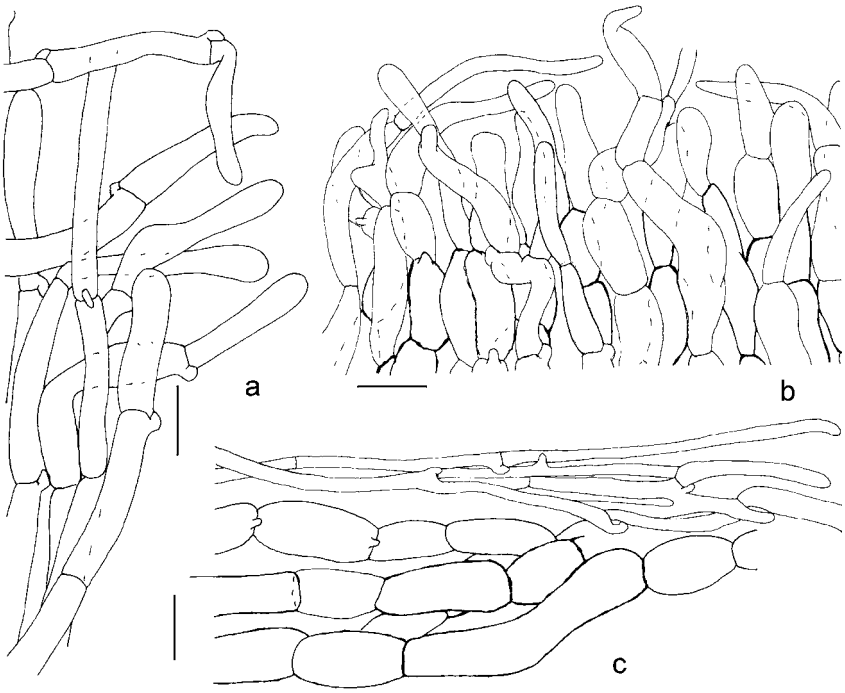


**Fig. 2.** *Simocybe parvispora* (from holotype, AH 25260). **a.** Caulocystidia. **b.** Pileipellis (near central portion of pileus in a young basidiome). **c.** Pileipellis (near middle portion of pileus in a developed basidiome). Bar = 15 µm, except a = 10 µm.

Raventós, F. Prieto & M.A. González s.n. (AH 34424). Madrid, Alcalá de Henares, on woody debris of *Salsola vermiculata*, 30 Nov 1989, G. Moreno, C. Illana, A. Altés & J.L. Manjón s.n. (AH 11818, **holotype**; AH 12661, AH 12662); on woody debris of *Kochia prostrata*, Nov 6, 1990, G. Moreno & F. Esteve-Raventós s.n. (AH 12663); 1 Mar 1991, G. Moreno s.n. (AH 13568). Aranjuez, on decaying branches of *Chenopodiaceae*, 25 Jan 2002, G. Moreno & F. Prieto s.n. (AH 19694) (all at AH under *Simocybe iberica*).

## Discussion

This taxon has been controversial to us according to its taxonomic placement, owing to the "non-simocyboid" pileipellis and overall colors of the basidiomes. Even by having an evident, elongate stipe, the specimens supporting *Simocybe iberica* possess a combination of macro- and microscopical characters that fit within the generic concept of *Crepidotus* (Hesler & Smith 1965, Senn-Irlet 1995b, Aime *et al*. 2005). A pileus variably fibrillose, tomentose-fibrillose or matted, whitish to sordid yellow or darker (ochraceous to yellowish-brown), dry, and lamellae yellowish, ochraceous or yel-

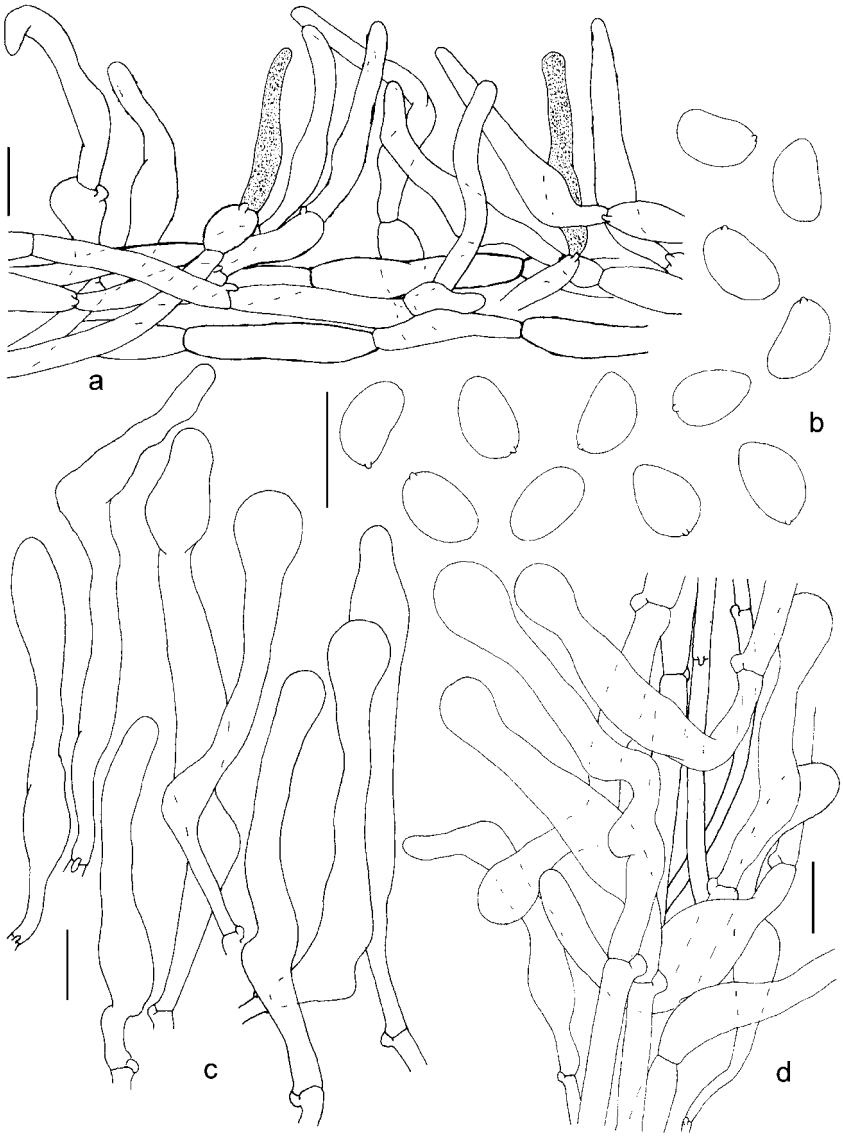


**Fig. 3.** *Simocybe sumptuosa* (AH 16939). **a.** Pileipellis. **b.** Basidiospores. **c.** Cheilocystidia. **d.** Caulocystidia. Bar = 10 μm, except a = 15 μm.

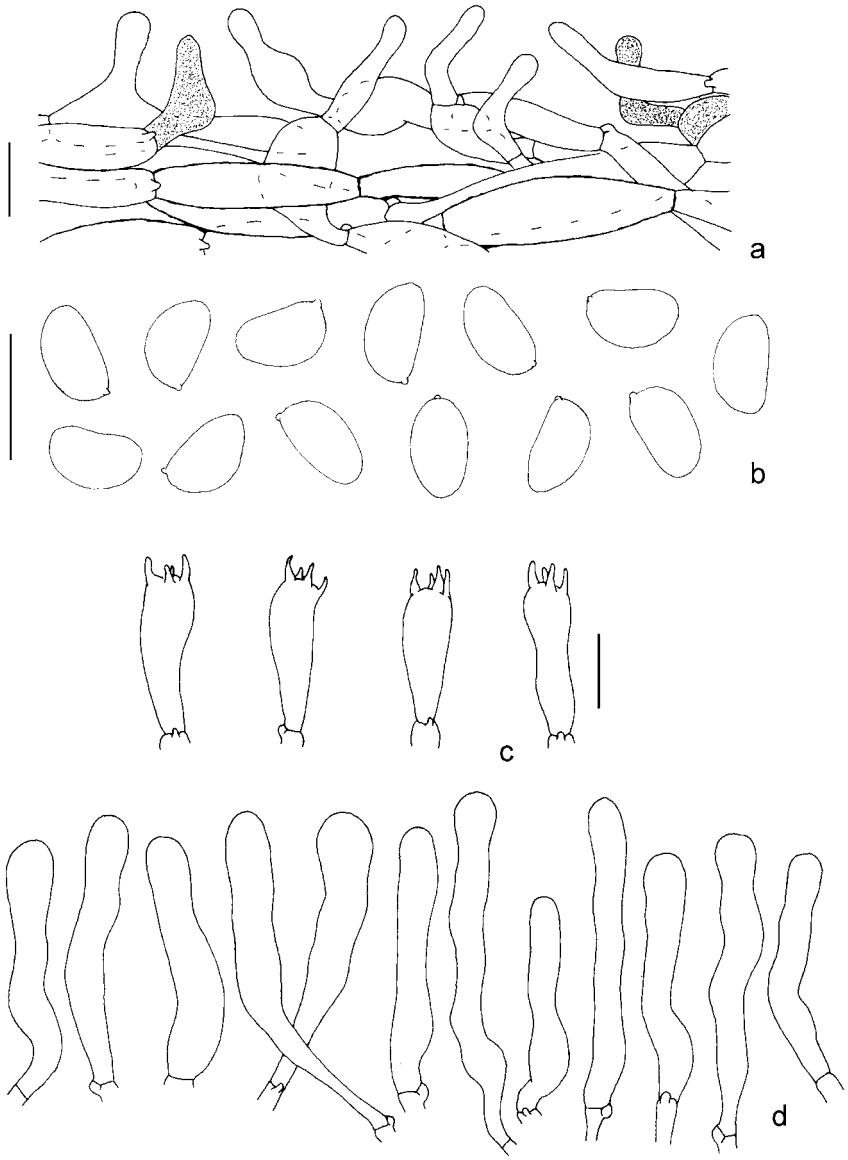


**Fig. 4.** *Simocybe centunculus* (AH 26902). **a.** Pileipellis. **b.** Basidiospores. **c.** Basidia. **d.** Cheilocystidia. Bar = 10 µm, except a = 15 µm.

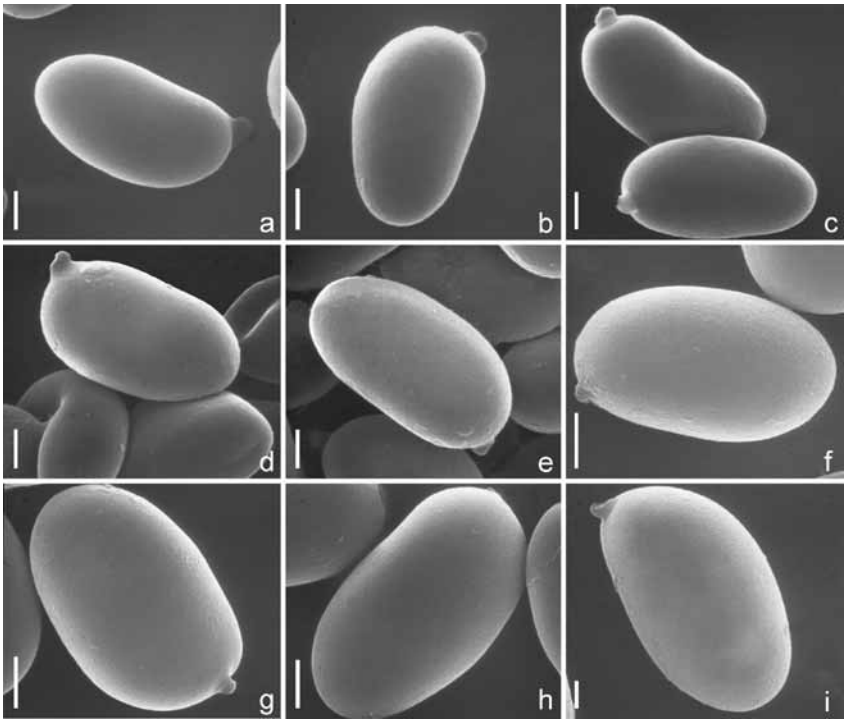


**Fig. 5.** Scanning electron micrographs of *Simocybe* and *Crepidotus* basidiospores. **a–e.** *Simocybe parvispora* (a–c. from holotype, AH 25260; d–e. AH 25282). **f–i.** *Crepidotus ibericus* (f–h. from holotype of *Simocybe iberica*, AH 11818; i. AH 12663). Bar = 1 μm, except f–h = 2 μm.

lowish-brown, with white, fimbriate edges are features found in *Crepidotus,* e.g. in some members related to the group of *C. versutus* (Peck) Sacc., *C. applanatus* (Pers.) P. Kumm. or *C. autochthonus* J.E. Lange. It has been demonstrated that the presence of an evidently elongate stipe is not an excluding character, being the case in *C. nyssicola* Bigelow (1980) and *C. thermophilus* (Singer) Aime, Baroni & Miller (2002). In fact, a number of members of *Crepidotus* possess a stipe more or less developed, being more evident during primordial or very young stages (Senn-Irlet 1995b, Bandala and Montoya pers. obs.) and, with age, becoming commonly a cylindric knob more or less differentiated, often collapsed against the pileus margin at the point of substratum attachment (Hesler & Smith 1965, Nordstein 1995, Senn-Irlet 1995b, Bandala and Montoya pers. obs.). For example, a consistent, rudimentary, tiny stipe can be found in *C. autochthonus, C. eucalyptinus* or *C. hirsutellus* Horak (Malençon & Bertault 1975, Horak 1977, Senn-Irlet 1995b, Bandala *et al.* 2008).

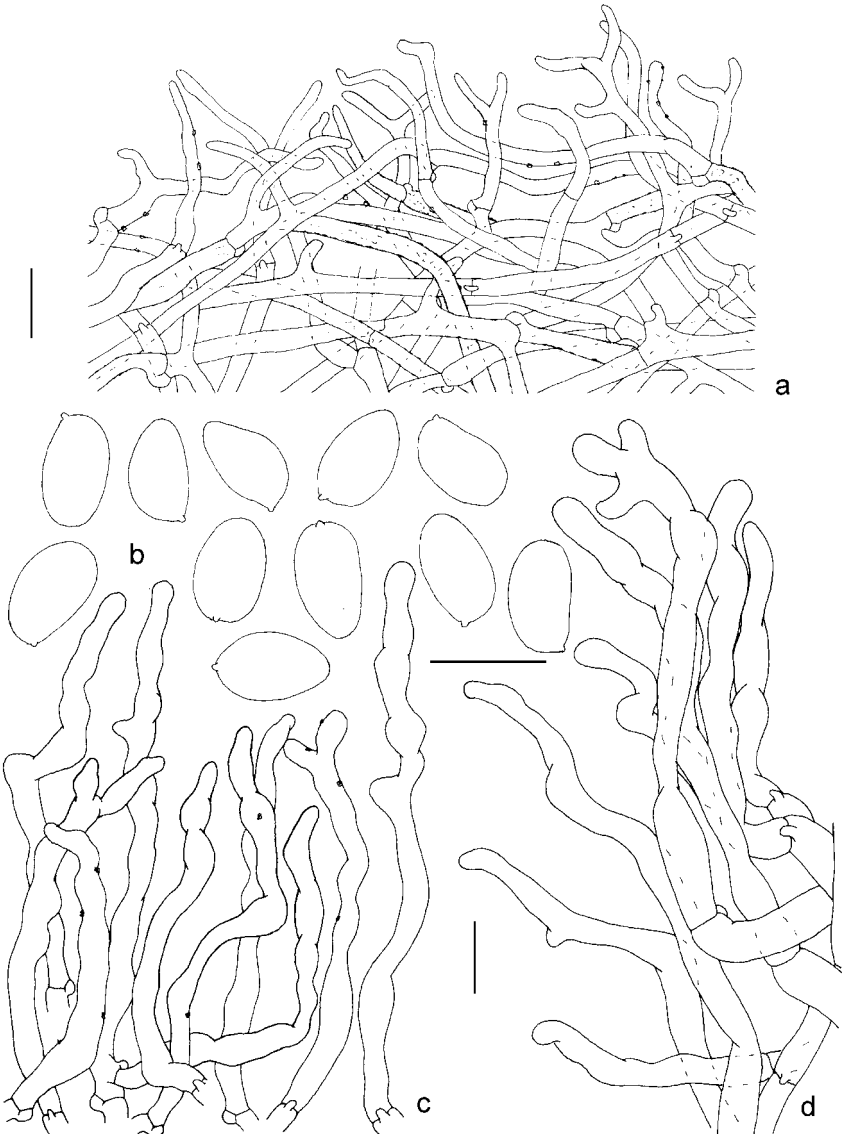


**Fig. 6.** *Crepidotus ibericus* (from holotype of *Simocybe iberica*, AH 11818). **a.** Pileipellis. **b.** Basidiospores. **c.** Cheilocystidia. **d.** Terminal elements of stipitipellis. Bar = 10 μm, except a = 15 μm.


**Fig. 7.** Basidiomes. **a.** *Simocybe parvispora* (holotype, AH 25260). **b.** *Crepidotus ibericus* (AH 34424). Bar = 10 mm.

Microscopic features distinctive of *Simocybe iberica*, such as smooth basidiospores in combination with a pileipellis consisting of filamentous, entangled hyphae, lacking both incrusted pigmentation and pileocystidia-like elements, indicate a very close relationship with *Crepidotus*. Taxa like *C. eucalyptinus, C. lepton* (Berk.) Sacc. and *C. pezizula* (Berk. & Broome) Sacc., although "crepidotoid" in form, exhibit a similar (if not identical) set of microscopic char-

acters, *i.e.* smooth, ellipsoid basidiospores, clamped hyphae, lack of gelatinized tissues, pileipellis as an entangled, not pigmented tissue with undifferentiated terminal cells, and the hyphae of this layer as well as the elongate and sinuous cheilocystidia, both showing scattered, colorless, incrusted material (Pegler 1986, Bandala *et al.* 2008, after type study). The stipitipellis (terminal elements) has rarely been studied in *Crepidoti* with rudimentary stipes; apparently it was not studied in *C. nyssicola* (Hesler & Smith 1965, Bigelow 1980) but recorded for *C. thermophilus* by Aime *et al.* (2002). The presence of cystidiform hyphae on the stipitipellis in the collections of *Simocybe iberica* does not necessarily indicate that such specimens have a relationship with members of *Simocybe*, indeed, such cystidiform hyphae, together with elements of the pileipellis, are not taxonomically comparable with those formed by true members of *Simocybe* (e.g. Figs. 1–4, *cf.* Senn-Irlet 1995a). We consider that macro- and microscopically, the holotype and the additional collections of *S. iberica* examined by us possess a set of distinctive morphocharacters identical and consistent with those found in *Crepidotus* rather than in *Simocybe*; even under *Phaeomyces* Horak (2005) this stipitate fungus seems to be more naturally allied within *Crepidotus* according to the generic concept of Aime *et al.* (2005), and related with the group of species in the *Crepidotellae* Hesler & A.H. Sm. s. Senn-Irlet. Thus, based on all the aforementioned information, we propose the transfer of *Simocybe iberica* to *Crepidotus*.

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## References

Aime M.C., Baroni T.J., Miller O.K. (2002). *Crepidotus thermophilus* comb. nov., a reassessment of *Melanomphalia thermophila*, a rarely collected tropical agaric. *Mycologia* **94**: 1059–1065.

Aime M.C., Vilgalys R., Miller O.K. (2005). The Crepidotaceae (Basidiomycota, Agaricales): phylogeny and taxonomy of the genera and revision of the family based on molecular evidence. *American Journal of Botany* **92**: 74–82.

Bandala V.M., Montoya L., Esteve-Raventós F. (2008). *Crepidotus eucalyptinus* (= *Naucoria decolorata*) and *Simocybe haustellaris* two uncommon species found in Central Spain. *Mycotaxon* **104**: 369–384.

Bigelow H.E. (1980). *Crepidotus nyssicola*. *Mycologia* **72**: 1227–1231.

Breitenbach J., Kränzlin F. (2000). *Fungi of Switzerland*. Vol 5. Verlag Mykologia, Luzern, Switzerland.

Contú M. (1993). Contributo ad una check list dei funghi della Sardegna I. Tre nuove specie di *Ramicola* (*Crepidotaceae*). *Micologia Italiana* **3**: 64–67.
Heinemann P., Rammeloo J. (1985). De la mésure des spores et de son expression. *Agarica* **6**: 366–380.
Hesler L.R., Smith A.H. (1965). *North American Species of Crepidotus*. Hafner Publ., New York.
Heykoop M., Esteve-Raventos F., Moreno G. (1994). Algunos Agaricales interesantes de la Provincia de Guadalajara (España Peninsular), II. *Cryptogamie Mycologie* **15**: 39–56.
Holmgren P.K., Holmgren N.H., Barnett L.C. (1990). *Index Herbariorum*. Part I. The Herbaria of the world. 8th edn. New York.
Horak E. (1977). *Crepidotus episphaeria* and related species from the Southern Hemisphere. *Berich der Schweizerischen Botanischen Gesellschaft* **87**: 227–235.
Horak E. (2005). *Röhrlinge und Blätterpilze in Europa*. Spektrum Akademischer Verlag, Elsevier, Munich.
Kornerup A., Wanscher J.H. (1967). *Methuen Handbook of Colour*. 2nd edn. Methuen, London.
Malençon G., Bertault R. (1975). *Champignons supérieurs du Maroc II*. Institute Cientifique Cherifien, Faculté des Sciences de Rabat.
Moncalvo J.M., Vilgalys R., Redhead S.A., Johnson J.E., James T.Y., Aime M.C., Hofstetter V., Verduin S.J.W., Larsson E., Baroni T.J., Thorn R.G., Jacobson S., Clémençon H., Miller O.K. (2002). One hundred and seventeen clades of euagarics. *Molecular Phylogenetics & Evolution* **23**: 357–400.
Moreno G., Esteve-Raventós F. (1990). *Gymnopilus microsporus* (Sing.) Sing. y *Simocybe iberica* sp. nov. en España peninsular. *Rivista di Micolgia* (Boll. Gruppo Micol. G. Bresadola) **33**: 287–292.
Moser M. (1983). *Key to agarics and boleti (Polyporales, Boletales, Agaricales, Russulales)*. Roger Phillips, London.
Moser M., Jülich W. (1986). *Farbatlas der Basidiomyceten III*. G. Fischer, Stuttgart.
Munsell *Soil Colour Charts*, 1994. Macbeth, New Windsor.
Nordstein S. (1990). *The genus Crepidotus (Basidiomycotina, Agaricales) in Norway*. Synopsis Fungorum 2. Fungiflora, Oslo.
Pegler D.N. (1986). *Agaric flora of Sri Lanka*. Kew Bull. Add. Ser. XII, HMSO, London.
Romagnesi H. (1962). Les *Naucoria* du groupe *centunculus* (*Ramicola Velen.*). *Bulletin Trimestriel de la Societé Mycologique du France* **78**: 337–358.
Senn-Irlet B. (1995a). Die Gattung *Simocybe* Karsten in Europa. *Mycologia Helvetica* **7**: 27–61.
Senn-Irlet B. (1995b). The genus *Crepidotus* (Fr.) Staude in Europe. *Persoonia* **16**: 1–80.
Singer R. (1986). *The Agaricales in modern taxonomy*. 4ed, Koeltz Sc. Books, Koeningstein.
Singer R. (1989). New taxa and new combinations of Agaricales (diagnosis fungorum novorum agaricalium, IV). *Fieldiana* **21**: 1–133.
Watling R., Gregory N.M. (1989). *Crepidotaceae, Pleurotaceae and other pleurotoid agarics*. British Fungus Flora **6**: 1–157.

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