

***Psathyrella lyckebodensis*, a first record for Austria**

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Abstract: A record of *Psathyrella lyckebodensis* in Austria is presented, its characteristics are described and it is illustrated with a photograph and line drawings. It belongs to section *Cystopsathyra* based on the characteristic structure of the veil. It differs from other species of this section mainly by its ecology and microscopic characteristics, i.e. lageniform, (sub)capitate cheilocystidia and spores without a germ pore.

Zusammenfassung: Ein Fund von *Psathyrella lyckebodensis* in Österreich wird vorgestellt, die Merkmale werden beschrieben und mit einem Foto und Zeichnungen illustriert. Aufgrund des typischen Velumaufbaus gehört die Art in die Sektion *Cystopsathyra*. Sie unterscheidet sich von weiteren Arten dieser Sektion hauptsächlich durch ihre Ökologie und mikroskopischen Merkmale, nämlich lageniforme, schwach bis deutlich kopfige Cheilozystiden und Sporen ohne Keimporus.

During a field trip to the Hörfeld mire – a 137 ha fen complex and nature reserve located in the districts Murau (Styria) and Sankt Veit an der Glan (Carinthia) – three mature fruit bodies of a small, light-coloured *Psathyrella* were collected and subsequently identified as *Psathyrella lyckebodensis* ÖRSTADIUS & E. LARSS., which was only recently newly described by ÖRSTADIUS & al. (2015). This is the first record of *P. lyckebodensis* in Austria. It is another rare species found in the Hörfeld mire, among numerous others, e.g. *Hypocreopsis lichenoides* (TODE) SEAVER, *Hemipholiota heteroclita* (FR.) BON and *Lactarius aspideus* (FR.) FR.

The Austrian collection of *P. lyckebodensis* is described macro- und microscopically and the differences to the other taxa of sect. *Cystopsathyra* (SINGER) KITS VAN WAV., to which this species belongs, are discussed.

Material and methods

The description of the microscopic characters is based on the dried specimen. Cystidia, veil and other structures were studied in ammonia solution (NH₄OH 10 %) stained with Congo Red. Spores were measured in water. The colour of the spores was examined in water, ammonia solution (10 %) and potassium hydroxide (KOH 5 %). The spore measurements were taken from 20 mature spores found on the apex of the stipe. The collection was photographed *in situ* and the photograph was used as the basis for the macroscopic description.

The specimen is deposited in GJO (Universalmuseum Joanneum in Graz).



Fig. 1. *Psathyrella lyckebodensis* (GJO 90035). – Phot. M. and G. FRIEBES

Psathyrella lyckebodensis ÖRSTADIUS & E. LARSS. 2015, Mycol. Progress 14 (25): 23 (Figs. 1–2)

Description:

Pileus: 6–7 mm wide, flat convex, nearly whitish to very pale (grey) brownish, with granular veil remnants, veil on a very young fruit body slightly fibrillose.

Lamellae: distant, broadly adnate, mixed with lamellulae in mostly two lengths, light brown, lamellar edge white.

Stipe: 15–30 × 0.5–1 mm, subcylindrical, slightly bent, white, fibrillose, especially towards base.

Spores: in front view ellipsoid to minimally ovoid, in side view occasionally with conspicuous suprahilar depression, 8.1–9.4 × 4.4–5 μm, average = 8.7 × 4.9 μm,

$Q = 1.70\text{--}2.00$, $Q_{av.} = 1.78$, germ pore not visible. In water and ammonia solution (10 %) reddish brown, in potassium hydroxide (5 %) slightly darker, not opaque.

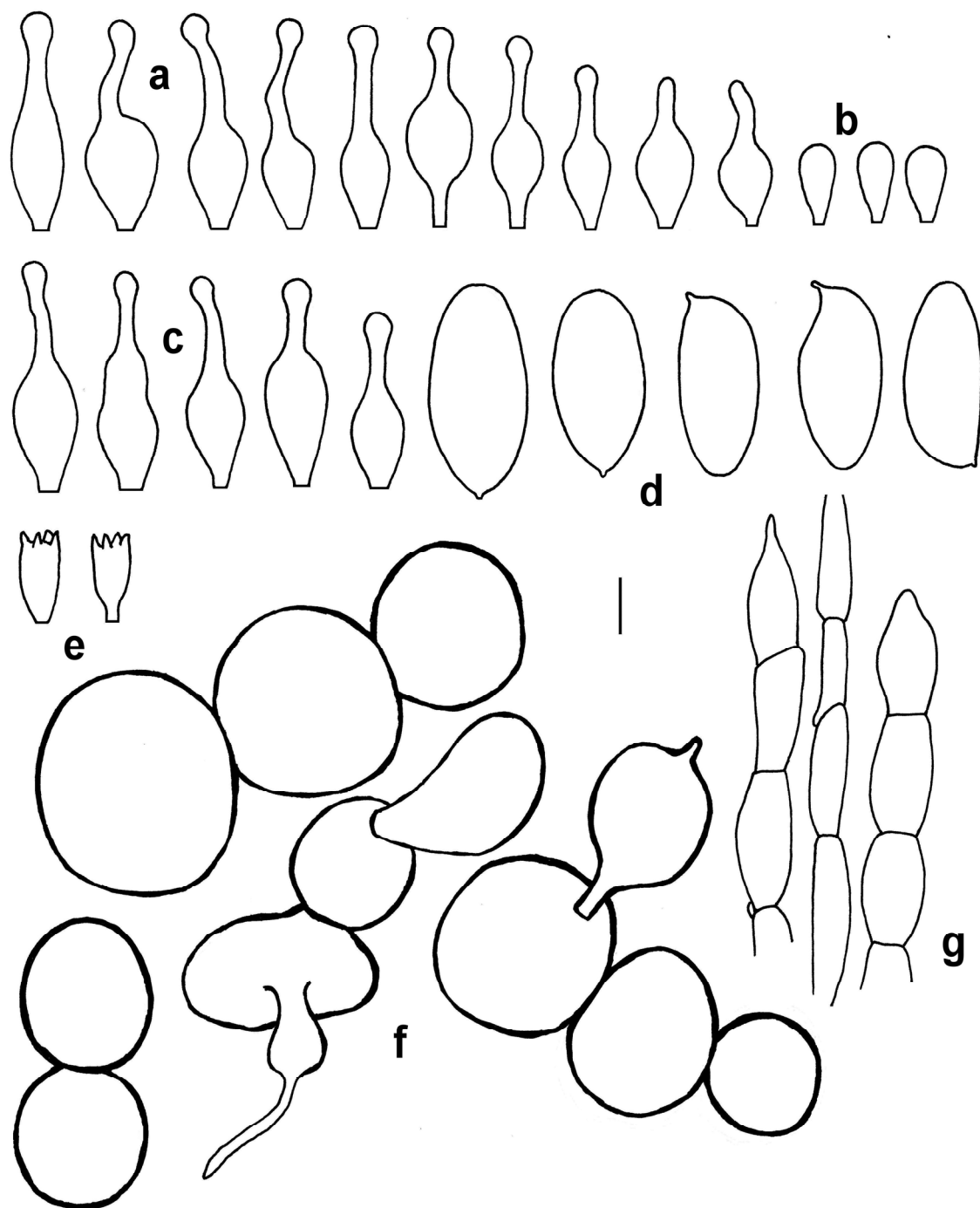


Fig. 2. *Psathyrella lyckebodensis* (GJO 90035); a cheilocystidia, b clavate marginal cells, c pleurocystidia, d spores, e basidia, f (sub)globose veil elements, g (sub)cylindrical veil elements. Bar: 5 μm (spores), 10 μm (others). – Drawing by A. MELZER

Basidia: $13.7\text{--}16.4 \times 8\text{--}9.6 \mu\text{m}$, clavate, sphaeropedunculate, 4-spored.

Cheilocystidia: $22\text{--}41 \times 9.6\text{--}13.7 \mu\text{m}$, very scattered, only sometimes crowded, lageniform, neck occasionally bent or tortuous, mostly subcapitate to capitate, thin-walled and colourless; in addition, inconspicuous clavate marginal cells present.

Pleurocystidia: 30–43.7 × 9.6–12.3 µm, very rare, similar to cheilocystidia.

Veil: predominantly consisting of short chains of (sub)globose cells, 15–45 µm wide; also chains of (sub)cylindrical cells present, these up to 30 × 16.5 µm, walls slightly thickened, with brownish pigment, not encrusted.

Clamp connections: present.

Collection examined: Austria, Styria, district Murau, Hörfeld mire, Emmi-Antes-Steg, 14° 30' 31" E, 47° 01' 07" N, 930 m s. m., on moist soil near *Salix*, 29. September 2018, leg. M. FRIEBES et al., det. A. MELZER, GJO 90035.

Discussion

The relevant characters of the present collection are in excellent accordance with the original description, only the cheilocystidia and pleurocystidia are somewhat shorter and the spores slightly slenderer, namely 8.1–9.4 × 4.4–5 µm, $Q_{av.} = 1.78$ in the Austrian collection versus 8–9.2 × 4–4.6 µm, $Q_{av.} = 2.0$ in the type material (ÖRSTADIUS & al. 2015). Another minor difference is the ecology – moist soil near *Salix* (Austrian collection) versus sandy soil in a dry pasture (type collection). However, this is likely the second collection of *P. lyckebodensis* worldwide, therefore little is known about the ecology of this species.

Psathyrella lyckebodensis belongs to sect. *Cystopsathyra*, which is morphologically well-defined by the veil structure. Macroscopically the veil appears grainy, microscopically it consists mainly of subglobose to globose elements.

The species of sect. *Cystopsathyra* have small to medium-sized fruit bodies and grow on soil, dung or remnants of other basidiomycetes. The spores are medium-sized, pale to dark, the germ pore is usually visible and central, the basidia are 4-spored. Pleurocystidia and cheilocystidia are similar, lageniform to utriform. Pileocystidia occur rarely. Clamp connections are present.

The small number of species in sect. *Cystopsathyra* makes their determination relatively easy and unambiguous.

Pileocystidia are only present in *P. tenuicula* (P. KARST.) ÖRSTADIUS & HUHTINEN (= *P. berlinensis* EW. GERHARDT) and the potentially synonymous species *P. granulosa* ARNOLDS (ARNOLDS 2003) and *P. coprinoides* A. DELANNOY, CHIAFFI, CORTECOUISSE & EYSSARTIER (DELANNOY & al. 2002). They all grow on dung or at least in very nutrient-rich places.

The species without pileocystidia are also well characterised. *Psathyrella globosivelata* GRÖGER (= *P. friburgensis* GRÖGER, ined.) grows on sclerotia-like, deformed basidiomata and has mostly utriform, very rarely capitate cystidia (GRÖGER 1984, 1986; GELDERBLUM 1992; DE HAAN 1993; ENDERLE 1998; CARBÓ & PÉREZ-DE-GREGORIO 2006; LUDWIG 2007; ÖRSTADIUS & KNUDSEN 2008).

Another species of this section with rather unusual ecology is *Psathyrella kellermanii* (PECK) SINGER; the type collection grew in a greenhouse. *Psathyrella kellermanii* sensu orig. is unlikely to be confused with *P. lyckebodensis*, because the spores of the

former should have a small but distinct germ pore (SINGER 1959). Moreover, the pileus is up to 30 mm wide (PECK 1906), the veil is sparse, and the lamellae are much more numerous and narrower. The collection described by DE HAAN (1993) as *Psathyrella* cf. *kellermanii* differs from the descriptions by PECK (1906) and SINGER (1959) in the smaller habitus and the spores with a very large germ pore as well as caespitose growth on rotten fungal remains.

Psathyrella sphaerocystis P. D. ORTON (ORTON 1964) is a fimicolous species (horse and cow dung). The type specimen was also examined by KITS VAN WAVEREN (1985) and DELANNOY et al. (2002). Further records of this species are reported by SMITH (1972), ENDERLE (1998), ARNOLDS (2003), LARSSON & ÖRSTADIUS (2008) and ÖRSTADIUS & KNUDSEN (2008). The frontal spore shape is mostly described as broadly ellipsoid, ovoid to even approximately heart-shaped and also partly illustrated as such (ORTON 1964, SMITH 1972, KITS VAN WAVEREN 1985, ENDERLE 1998, ARNOLDS 2003). The lateral shape is referred to as subphaseoliform at most, the germ pore is always described as very distinct.

Psathyrella albofloccosa ARENAL, M. VILLARREAL & ESTEVE-RAV. is not yet known from actual dung, although the Spanish type specimen and two further collections were found on a fertilized lawn (ARENAL & al. 2003). In Norway, the species was discovered on remains of *Deschampsia* P. BEAUV. (ÖRSTADIUS & KNUDSEN 2008). However, the Spanish and Norwegian collections differ quite considerably in the shape of the spores and the size of the germ pores. While ARENAL & al. (2003) mention ellipsoid, slender ellipsoid to subcylindrical spores with a germ pore up to 2 µm wide, the spores according to ÖRSTADIUS & KNUDSEN (2008) are ovoid and the germ pore is indistinct or even completely lacking.

Psathyrella utriformicystis S. J. SEOK & Y. S. KIM, so far only known from Korea, has a very similar habitus to *P. lyckebodensis* according to the description and the coloured illustration in SEOK & al. (2010: fig. 1 E), only the veil seems to be slightly more abundant. The ecology – growing on soil or remnants of cotton plants – and the spore dimensions are also rather alike; however, the spores have a conspicuous germ pore in *P. utriformicystis*. The cystidia are utriform but also subcapitate as in *P. lyckebodensis*. The structure of the veil is again very similar in both species, with the presence of chains consisting of both globose and subcylindrical cells as described and drawn by SEOK & al. (2010: fig. 4). However, taken as a whole, the differences to *P. lyckebodensis* seem too significant to suggest a conspecificity.

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