

Cistella spicicola (*Hyaloscyphaceae*, *Leotiales*), a new species on *Lycopodium*

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Abstract: A new species of *Cistella*, found on the sporophores of *Diphasiastrum complanatum*, is described from Finland. The species is characterized by dark excipulum and hair vesture composed of acyanophilous spines and warts. The circumscription of the genera *Hyphodiscus* and *Cistella* is discussed. Cultural characters of the new taxon are given.

Zusammenfassung: Eine neue *Cistella*-Art, die auf den Sporenträgern von *Diphasiastrum complanatum* gefunden worden ist, wird aus Finnland beschrieben. Die Art ist charakterisiert durch ein dunkles Excipulum und Haare mit acyanophilen Stacheln und Warzen. Die Abgrenzung der Gattungen *Hyphodiscus* und *Cistella* wird diskutiert. Angaben über das Kulturverhalten des neuen Taxons werden gemacht.

HOLM & HOLM (1981) studied ascomycetes on Nordic lycopods. They dealt with 25 taxa, part of which were new to science. Hyaloscyphaceous taxa were relatively few in number, only four species were discovered on this substrate. Of the different lycopods, *Diphasiastrum complanatum* (L.) J. HOLUB was mentioned as particularly mycophilous. HOLM & HOLM (1981) also noted that sporophylls were, in some species, the most attractive substrate. They also postulated that the mycoflora of lycopods is mostly composed of species which are confined to this substrate.

The present specimen was found as a stray collection, not after systematic research of the substrate. We sent part of the material to Dr L. HOLM (Uppsala). He had not seen such a species on *Lycopodium* before. Although we have only a single collection site, we feel safe to describe a new species because of the relatively conspicuous character combination of the present material.

Material and methods

The following abbreviations are used: *MLZ* Melzer's reagent, *CB* cotton blue in lactic acid, *CR* ammoniacal Congo red. All characters were studied from squash mounts. Cultural characters were studied from single- and multispore strains, originating from ascospores shot on agar. Radial growth was

measured at two week intervals after the culture had reached a diameter of 2 cm. This initial growth phase took two months.

***Cistella spicicola* HUHTINEN & SÖDERHOLM, spec. nova.** - Fig. 1.

Apothecia discoidea vel cupulata, sessilia, usque ad 200 μm lata, minuter pilosa; specimina exsiccata atra, margine albo. Excipulum externum textura prismatica, cellulis prismaticis, tenuiter tunicatis vel aliquantum crassotunicatis, in solutione Melzeri non coloratis. Pili usque ad 56 μm longi, 2,8-3,8 μm lati, cylindrati vel minuter clavati, aseptati, in solutione Melzeri non colorati, in apice spinulosi vel tuberculati. Asci late cylindrati, octospori, 15-28 x 3,8-5,0 μm , in apice conici, amyloidei, in basi uncinati. Sporae subfusiformae, in specimina exsiccata 3,8-6,0 x 1,0-1,5 μm , non septatae, hyalinae. Paraphyses cylindricae, 1,0-1,5 μm latae, cellulis terminalibus 7-16 μm longis.

Holotype: Finland: Etelä-Häme, Kangasala, Vehoniemenkylä, Väärälukko, grid 27° E 6812:349, on dead sporophylls of *Diphasiastrum complanatum*, 04. 07. 1995, SÖDERHOLM 2329 (TUR 115359, isotype in UPS).

Apothecia discoid to shallowly cupulate when fresh, centrally attached, up to 200 μm in diam., flanks brown to dark brown (CAILLEUX 1981: R77), disc close to beige (M91), margin serrate, pure white; blackish below, 1/3 of the upper flanks lighter to hyaline when dry; typically densely gregarious.

Ectal excipulum of thin-walled textura prismatica to modified textura prismatica with clearly gelatinized walls and thinner septa, *MLZ* -.

Hairs numerous, cylindrical to somewhat clavate, 22-56 x 2.8-3.8(-5.0) μm , thin-walled when fresh in water, rarely somewhat firm-walled in dried material, aseptate, prominently apically spiny-tuberculate, hyaline, lacking inside pigments and outside resins in fresh and dried condition; lower flanks covered by clavate, hair-like hyphal ends, 4-8 μm wide; hair vesture dense and prominent on marginal hairs, more sparse or lacking from hairs on lower flanks, persistent in 10 % KOH, *CB*-, *CR*-, *MLZ*-, the general appearance varying from clearly tuberculate (in water) to clearly spiny (in *MLZ*).

Asci cylindrical-clavate, 15-28 x 3.8-5.0 μm in *CB* (\bar{x} = 21.4 \pm 2.9 x 4.3 \pm 0.4 μm , n = 20), eight-spored, apically conical, arising from croziers, ascus pore *MLZ*+.

Spores subfusoid, 3.8-6.0 y 1.0-1.5 μm in *CB* (\bar{x} = 4.6 \pm 0.5 x 1.2 \pm 0.1 μm , n = 20), *Q* = 3.2-4.7 (\bar{x} = 3.8 \pm 0.4); 5.0-9.0 x 1.7-2.0 μm when fresh in water (\bar{x} = 6.5 \pm 1.2 x 1.9 \pm 0.1 μm , n = 20), *Q* = 2.5-4.7 (\bar{x} = 3.4 \pm 0.6), hyaline, aseptate, aguttulate in fresh and dried condition.

Paraphyses cylindrical, not exceeding the asci, 1.0-1.5 μm wide in dried condition, 1.2-2.0 μm wide when fresh in water, lacking pigments, simple or once/twice branched, terminal cell 7-16 μm long.

Cultural characters (multispore strain, 2% Malt extract agar with 1 g peptone, 20 g saccharose): Radial growth 8.5 mm/month. Mats initially clearly raised from the agar, up to 1.5 mm high, dark brown to brown (CAILLEUX T71, P70), thinner marginal areas cinnamon (N69), at first with a very narrow, 0.5 mm wide, faintly brown (M75) rim, later expanding to 2-6 mm, margin even and distinct, surrounding agar not stain-

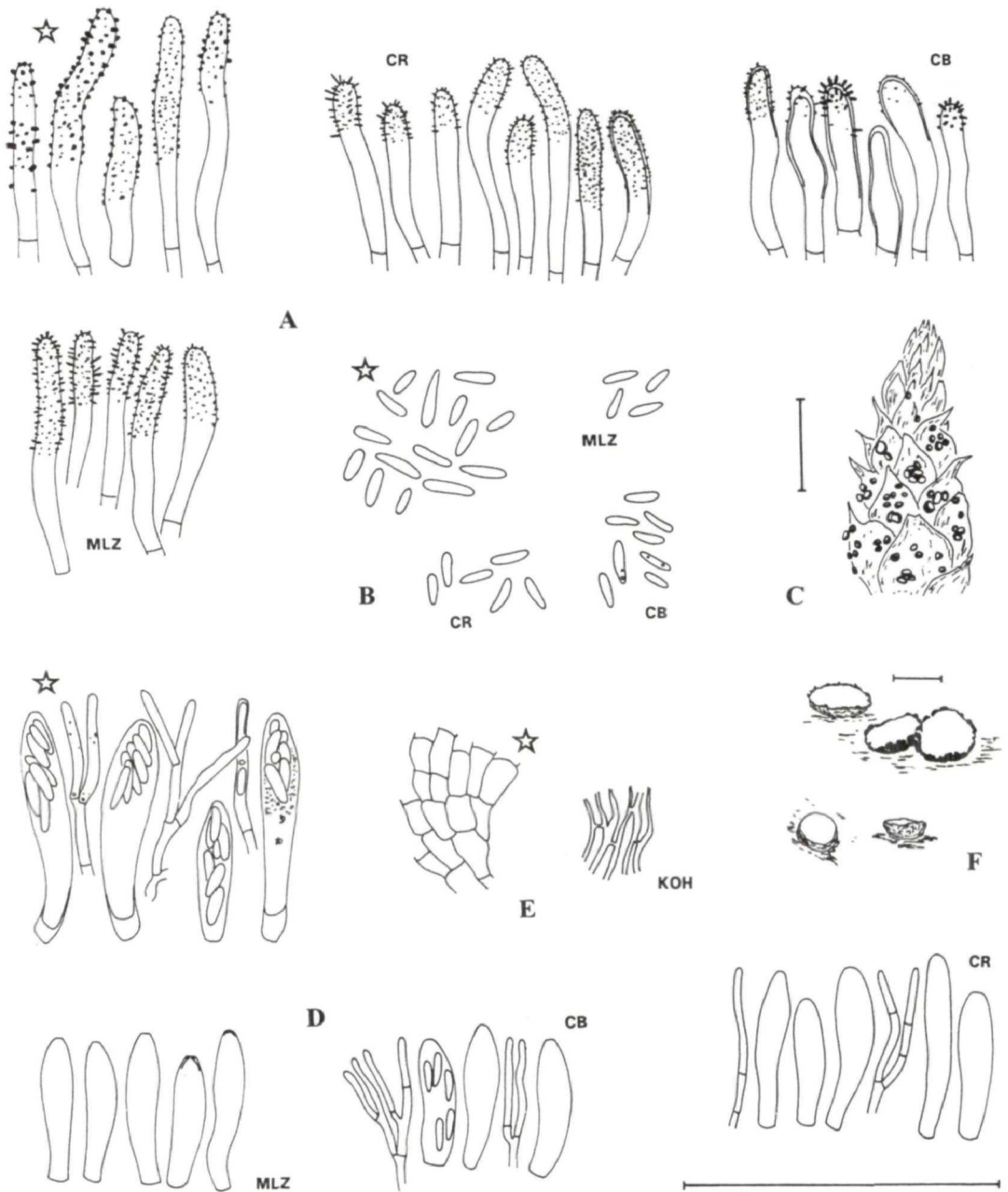


Fig. 1. *Cistella spicicola*, from holotype, dried material; those marked with star from topotype, illustrated in living state in water. A Marginal hairs, B spores, C habit, D asci and paraphyses, E ectal excipulum from medial flanks, F fresh apothecia. - Bar: 50 μ m, for habit 1 mm, for apothecia 200 μ m.

ed. Aerial mycelium initially sparse, later totally absent, grey to whitish. Hyphal strands absent. Yeast-like growth absent. Anamorph and teleomorph absent in multispore trials.

Other specimen studied: Finland: Etelä-Häme, Kangasala, Vehoniemenkylä, exactly same site as holotype, on dead sporophylls of *Diphasiastrum complanatum*, 13. 07. 1996 SÖDERHOLM 2516 (Topotype, TUR 116388; multispore strain in CBS).

Discussion

The variability seen in hair vestiture is mostly mountant-based. When observed fresh in water, the hairs bear relatively short and broad spines and tubercles. In *CB* the general appearance differs mainly in the spines being longer. In *MLZ* and *CR* the width of individual spines is not easily observable, resulting in a more dense and delicately spinulose appearance.

The generic placement of this new species is not univocally clear. At first sight it looks like a *Cistella* QUÉL. The cylindrical marginal hairs with long, spine-like crystals are a look-alike to those characterizing many species of *Cistella*. But as summarized by HUHTINEN (1990), there are two major types of hair vestiture in *Cistella*. The sole remaining, possibly original collection of the type species of the genus, *Cistella dentata* (PERS.: FR.) QUÉL., in *PC* shows needle-like, cyanophilous crystals on the hairs. Quite many species of the genus show similar hair vestiture. For such taxa MATHEIS (1977) established the subgenus *Verrucotricha*. Similar spines are also characteristic in the genus *Polaroscyphus* HUHTINEN (HUHTINEN 1987). The other subgenus of *Cistella* ss. MATHEIS sense embraces taxa with acyanophilous warts. There is, however, a third element of hair vestiture in these *Cistella* look-alikes, namely that consisting of acyanophilous spines, as in the present taxon. Bearing in mind the variability illustrated for the present taxon, the true differences remain to be seen.

ZHUANG (1988) treated the genus *Hyphodiscus* KIRSCHST. She combined the most characteristic features of the genus as follows: yellowish pigment in hymenium and excipulum, rod-like granules on the clavate hairs, hair wall almost colourless to pigmented, ectal excipulum of gelatinized textura intricata, paraphyses filiform, association with other fungi common.

This concept was widened by BARAL (1993), who combined *Cistella hymenio-phila* (P. KARST.) KORF and the type species of the genus *Incrupilella* SRVČEK, *I. flexipila* SRVČEK, into the genus. The pertinent features were given as: excipulum often brown-pigmented, gelatinized, coloured (green, yellow, red) exudates present and hair vestiture consisting of tuberculate warts. This emendation resulted in a relatively heterogeneous genus as variability was reportedly seen in the presence versus absence of exudates, colour of exudates, amount of gelatinization in the excipulum, and the hair vestiture. The last character was given by BARAL (1993) as tuberculate warts for species of *Hyphodiscus*, which is not the case in *Hyphodiscus* ss. ZHUANG (1988; "rod-like granules").

The present collection does not fall into the core of "typical" *Cistella* characterized by cyanophilous spines covering the cylindrical or clavate hairs and by the hyaline excipulum. It shows some affinity to the character combination of *Hyphodiscus* given by ZHUANG (1988). Her drawing of the excipular structure is, however, deviating from present material. BARAL (1993) characterized the excipulum of the same species

as "textura prismatica - oblita". In all, the affinity to *Hyphodiscus* is partial. A close association with other fungi is also lacking. Hence, this new species is placed in *Cistella*.

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