**Zeitschrift:** Mycologia Helvetica

**Herausgeber:** Swiss Mycological Society

**Band:** 6 (1994)

Heft: 2

**Artikel:** Calvatia subcretacea, a synonym of C. arctica

Autor: Lange, Morten

**DOI:** https://doi.org/10.5169/seals-1036340

# Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

## **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

# Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

**Download PDF: 28.11.2025** 

ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch

# Calvatia subcretacea, a synonym of C. arctica.

# Morten Lange<sup>1</sup>

Dept. of Mycology, Botanical Institute, University of Copenhagen, Denmark

Summary. Calvatia arctica is characterized by an exoperidium composed of pyramidal warts, and a greyish-violaceous gleba. The spores are remaining smooth and the capillitium is described as fragmented at the septa. C. subcretatcea shares these characters but the capillitium is almost devoid of septa, with a jagged fragmentation. An examination of the type material of the two species shows that the type of fragmentation is a very instable character varying over a broad scale in a series of 20 specimens from various arctic and subarctic regions. C. subcretatcea is thus reduced to a synonym of C. arctica. The species belongs to subgenus Hippoperdon (Mont.) M. Lange.

KEY WORDS: Calvatia arctica-subarctica, synonymy, jagged fragmentation.

## Introduction

Calvatia subcretacea was described by S.M. Zeller (1947). A slightly emended decription was provided by A.H. Smith (Zeller & Smith 1964). The species was indicated as common in 2000–3000 m alt. in western USA. It is one of the few Calvatia species with the exoperidium made up of smaller or larger pyramidal warts. Macrospcopically it is further distinguished by the color of the gleba, described (Zeller, loc. cit.) as passing in ripening from Olive-Buff through Drab to Burnt Amber in the standard of Ridgeway (1912). The noteworthy microscopical features are the spores which long remain almost smooth, and the capillitium which is devoid of septations, fragmented by jagged tears.

Calvatia arctica was described by Ferdinandsen & Winge (1910) on material from NE-Greenland. It was redescribed by M. Lange (1948), where a close relationship to *C. subcretacea* was indicated. Zeller & Smith (1964) include the two species in the same stirps noting the similarity in exoperdial structure. Calvatia arctica was described again by M. Lange (1980), now based on several specimens from E-Greenland, Svalbard and Iceland. Noting i. a. the violaceous cast of the gleba, the species was referred to as series of species showing this

<sup>&</sup>lt;sup>1</sup> Present address: Rønnebærvej 66, DK-2840 Holte, Denmark.

character. Finally, in M. Lange (1992) it was included in subgenus *Hippoperdon* (Mont.) M. Lange, described with *Calvatia cyathiformis* (Bosc.) Morgan as type species.

When comparing the described characterisitics of *Calvatia arctica* and of *C. subcretacea*, it is evident that the two taxa show the same macroscopical features: pyramidal structure of exoperidium, violaceous colors of ripening gleba. The spores, long remaining almost smooth, also characterise both species.

The lack of septa and the corresponding jagged fragmentation of the capillitium stand out as the only clearly expressed difference. These features have recently been described by Kreisel (1989) as the main characters of his new genus *Handkea*, to which the author also referred *Calvatia subcretacea*.

A few small *Calvatia* specimens from Islandic collections in Akureyri (AMNH) were in my revision of *Calvatia* (M. Lange, 1990) put aside, temporarily labelled as *C. subcretacea* Zeller. One of these specimens had the capillitium characters described for this species. After editing a note on the classification of *Calvatia* (M. Lange 1993) I found it necessary to undertake a renewed study of this material. The study also included the type specimen of *C. subcretacea*, and the type specimen of *C. arctica*, together with a number of specimens referred to this taxon in M. Lange (1990), a total of 20 collections.

In the type of *Calvatia subcretacea* the gleba has the characteristic violaceous cast (6D4–6E7, Kornerup & Wanscher, 1978). The spores appear almost smooth in thelight microscope, almost globose to slightly drop-shaped,  $3.8–4.5\times4.5–5$  µm.

The capillitium is pale yellowish-vinaceous, mostly 4–6  $\mu$ m broad with V-and T-branchings frequent, and segments tapering to 1.5  $\mu$ m, often screw-like; almost devoid of septa, broken up in longer and shorter fragments by jagged fragmentations, walls rather thin, often ruptured, with some large corrosion pores, and also with minute pores puncturing the inner walls.

The type specimen of *Calvatia arctica* was found to have capillitium with frequent septations, fragmented at most septa. About 10% of the fragmentations were, however, of the jagged type. Many segments show single or double subseptal branching but also several V- and T-branching are noted. Large corrosion pores are frquent, indicating fragile capillitium walls. Except for the septations being freqent, the capillitium pattern is very similar to what is observed in *C. subcretacea*. The spores are almost globose,  $5-5.8 \times 4.8-5.5 \mu m$ , warty-spiny, the warts  $0.4 \mu m$  high.

Four other specimens from NE-Greenland show great variation in the fragmentation of the capillitium. The specimnens are indicated by their collection numbers (see material examined).

AL 1906 has 75% ragged fragmentations, CK 1900 and WF 90,5 have 40–50% ragged fragmentation, while this type of fragmentations is found to be less

than 5% in HK & al. 72. The Svalbard specimen ML 89-05 has 10% ragged fragmentation.

Of the Islandic specimens, HH 9292 has 100% ragged fragmentations, HH 9291 has 60% fragmentations of this type, while a number of ragged fragmentation varies from almost 0 to 20–30%.

There is considerably variation in the shape and configuration of the spores varying from almost globose to slightly drop-shaped and from almost smooth to distinctly warty-spinulose. This variation does in part reflect differences in ripeness but not entirely. Thus the type specimen of *Calvatia subcretacea* and HH 9292 – both with 100% ragged fragmentations are on the same level of ripening but the spores are respectively almost smooth or distinctly spiny.

Except for these two types of differences the entire material is very homogeneous. Thus all specimens in the relevant ripening stages show he coherent gleba mass, becoming powdery only at a very late stage. Also the exoperidium is very typical, the warts peeling off singly or in small groups. On this basis it is evident that *Calvatia subcretacea* must be considered as a synonym of *C. arctica*.

# Discussion

The jagged fragmentation of a capillitium devoid of septa seems to be a stable character of *Calvatia utriformis* (Bull.: Pers.) Jaap and of *C. excipuliformis* [(Scop.) Schaeff.: Pers.] Perdeck. They form the core of the genus *Handkea* Kreisel (1989). The present example shows that this character is instable in *C. arctica*. Ragged fragmentation is similarly an instable character in *C. horrida* M. Lange and in *C. bellii* (Peck) M. Lange (Lange 1990). The character has further been used to distinguish *C. fumosa* Zeller, and its var. *idahoensis* Smith. A have proposed to reject the genus *Handkea* (M. Lange, 1993), due to this instability of the main and only generic character.

Material examined: USA: Oregon, Mt. Hood 1938, type (NY) of *Calvatia subcretacea* Zeller. – NE-GREENLAND: Liverpool Land, Hurry Fjord, type (C) of *C. arctica*. Ferd. & Winge; CK 1900, AL 1906, HK & al. 72, BF 90, loc. 5. – (All. in C). – SVALBARD: ML 89-05 (C). – ICELAND: HH 47, 206, 5154, 7175, 7178, 8689, 9285, 9291, 9292, 9294, 9297, 9301 (All in AMNH).

## References

Kornerup, A. & J. H. Wanscher. 1978. Methuen Handboof Color. 3rd ed., Methuen, London, 252 pp.

Kreisel, H. 1989. Studies in the *Calvatia*.-complex (Basidiomycetes). Nova Hedwigia 48, 281–296.

# This contribution is dedicated to Prof. Dr. M. Moser (Innsbruck, Austria), on occasion of his 70th birthday.

Lange, M. 1948. Macromycetes 1. The Gasteromycetes of Greenland. Medd. Grønl. 147 (4), 1–32.

Lange, M. 1990. Arctic Gasteromycetes. 2: *Calvatia* in Greenland, Svalbard and Iceland. Nord. J. Bot. 9, 523–546.

Lange, M. 1993. Classifications in the *Calvatia*-group. Blyttia 51, 141–144. Ridgeway, R. 1912. Color Standard and Color Nomenclature. Washington. Zeller, S. M. (947. More notes on Gasteromycetes. Mycologia 39, 282–312.

Zeller, S. M. & A. H. Smith. 1964. The genus *Calvatia* in North America. Lloydia 27, 148–186.