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POLYCOCCUM KAERNEFELTII
SP. NOVA (DOTHIDEALES),
A NEW LICHENICOLOUS FUNGUS
ON *TELOSCHISTES*
***CHRYSOPHTHALMUS* (L.) TH. FR.**

Key words: lichenicolous fungi, Polycoccum, Pyrenidium,
Teloschistes, Australia

Introduction

During special study of the representatives of the Teloschistaceae in 1995—2007 [15—17, 20, 22—32, 35—37] several taxa of lichenicolous fungi were selected as critical for the further investigations. Some of them represent rare species of lichenicolous fungi and their distribution was published in parts [21, 23, 33, 34, 38]. However, some of them found to be still waiting for being described.

The genus *Polycoccum* Sauter ex Körb. includes lichenicolous fungi with dark perithecioid ascomata, a pseudoparenchymatous exciple composed of dark, angular polyhedral cells, fissitunicate asci with brown one-septate rarely many-septate ascospores, and persisting branched and anastomosed interascal filaments. Species of this genus usually form commensalistic symbioses with their host lichens, and often produce characteristic gall-like structures on the host thallus. Most appear to be confined to a single host lichen or to a group of related species.

Hawksworth & Diederich [13] accepted 23 species in their synopsis of the genus. After that 17 additional species referred to this genus were described [2–10, 12, 14, 18, 19, 41, 42, 44] or combined [43]. However, there are still undescribed taxa of this genus. For one of them, namely *Polycoccum kaernefeltii* full description and comparison with close taxa are provided.

Materials and methods

The morphology of the studied lichen-forming and lichenicolous fungi was examined using an Olympus stereo microscope with digital camera and DS Camera Control Unit DS-L1. Anatomical characters, ascospores and spermatia were examined using a Carl Zeiss microscope with digital camera Olympus DP-11.

Standard methods for identification of lichen-forming and lichenicolous fungi were applied.

Results

Polycoccum kaernefeltii S.Y. Kondr. *sp. nova*

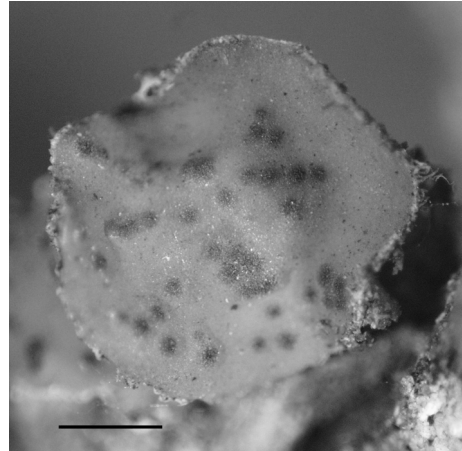
Ascomata lichenicola, immersa, dispersa, subglobosa, ostiolata, atra, (200—)250—350(—450) μm diam. Paries brunneus, cellis pseudoparenchymatis 7—10(—13) \times 2—5(—7) μm . Pseudoparaphyses ramosae et anastomosantes, 1.2—2.0 μm crassae. Asci elongato-cylindrici, 8-spori, (85—)110—115 \times 8—11(—12) μm . Ascosporae ovoideae, (0—)1—2(—3) septatae, brunneae, (16—)17—22(—25) \times (7—)9—10(—11) μm .

Typus: Australia, Victoria, 20 km SW of on the road to Patchewollah, on *Acacia* and other shrubs along the road, c. 100 m alt., 35°10.52'S 142°12.32'E, on *Teloschistes chrysophthalmus* growing with *Caloplaca cerina*, 15.01.1999, I. Kärnefelt 992401 (*LD* — holotype).

Lichenicolous fungus forming blackish ascomata completely immersed in hymenium of *Teloschistes chrysophthalmus* apothecia with only the ostiole visible (as rounded blackish points, more seldom visible only as pimples around ostiole to 50 μm diam.), and probably causing bleaching and dying host apothecia. Ascomata perithecioid, subglobose to obpyriform, (200—)250—350(—450) μm diam., and a. 200 μm high (in section), dark brown to black, ostiolate. Wall pseudoparenchymatous, to 15(—20) μm thick, cells 7—10(—13) \times 2—5(—7) μm . Hamathecium of well developed, permanent, branched and anastomosing filaments to 1.2—2.0 μm diam. Asci arising from the base of the ascomatal cavity, cylindrical, long, (85—)110—115 \times 8—11(—12) μm , 8-spored, with ascospores monostichously arranged. Ascospores (0—)1—2(—3)-septate in the same ascus, ellipsoid to almost spherical or sole-like, with visible oil guttules, often collapsed in asci with longitudinal wrinkles, and therefore seem to be mural; upper cell (or two of three or four) larger and slightly broader, apices generally rounded, somewhat constricted at the septum, brownish, (16—)17—22(—25) \times (7—)9—10(—11) μm .

Distribution: Australia, so far it is known from several scattered localities (Victoria and South Australia).

Fig. 1. *Polycoccum kaernefeltii*, holotype. General habitus of host lichen apothecia with immersed ascomata of lichenicolous fungus. Bar = 5 mm



Etymology: Species is named after Prof. Ingvar Kärnefelt (Lund, Sweden), who has made important contribution to our recent knowledge on the Teloschistaceae (as well as Parmeliaceae), provided type collection and allowed me to work with his large collection from Southern Hemisphere.

Notes: According to size of ascospores and ascomata *Polycoccum kaernefeltii* is the closest to *Polycoccum tryptethelioides*

(Th. Fr.) R. Sant. known from diverse *Stereocaulon* species from Europe and Greenland. But it differs from the latter species in having mainly 2-septate (seldom even 3-septate) ascospores in the same ascus, not so large distinction in size and shape of the spore cells, as well as by different ecology and distribution. *Polycoccum bryonothae* (Arnold) Vežda, recorded from *Caloplaca cerina* var. *chloroleuca* (as *C. stillicidiorum*) and *Pertusaria bryontha* from Europe, has rarely 2-septate ascospores, but they are much smaller ($10-11-13(-15) \times (4-4.5-6 \mu\text{m})$). (Data on *P. tryptethelioides* and *P. bryonothae* are provided after Hawksworth & Diederich [13]).

Due to 3-septate ascospores even though they are rather rare in material of *Polycoccum kaernefeltii*, we have checked if there is no appropriate name described within the genus *Pyrenidium*. In spite of *Pyrenidium actinellum* Nyl. is rather large complex taxon, there is a number of taxa described (or combined) for this genus [1, 11, 12, 39–41]. Furthermore, the latter genus is currently under taxonomic revision and results will be published in the nearest future (Roux & Navarro-Rosines, pers. comm.). However, from typical *Pyrenidium actinellum* as well as from the other representatives of this genus, *Polycoccum kaernefeltii* differs by consistent 8-spored asci, with ascospores monostichously arranged, mainly 1–2 septate only with additional few 0- or 3-septate. Moreover, all cells of ascospores are concolorous (evenly brownish), while *P. actinellum* usually has much darker central cells of ascospores.

Other specimens examined: AUSTRALIA, South Australia, 54 km W of Lameroo, 1 km E of Peake on highway 12, on *Callitris*, c. 80 m alt., 35°21.81'S 140°17.57'E, on *Teloschistes chrysophthalmus*, 16.01.1999, E.I. Kärnefelt 992901 (LD), 4 km E of Chinamans Well, Yorke Peninsula, 5 m alt., Mallee scrub, on *Melaleuca* sp. 01.09.1977 J.A. Elix 3783 (CBG 9507502). VICTORIA: Vic. Volcanic Plain, Portland, Bat's Ridges [Flora Reserve], 38°20'S 141°30'E, Vic. Grid Ref. E12: E21, 05.09.1981 A.C. Beauglehole 2035 (MEL 1020588); Vic. Volcanic Plain, 5 miles north of Rockbank, Mount Misery (Mt Kororoit), 37°39'S 144°40'E, Vi. Grid Ref. N41, on dead twigs of *Muehlenbeckia cunninghamii* (lignum) in extensive swamp beside Diggers Rock road, at eastern foot of mount, 28.05.1967 J.H. Willis s.n. (MEL 22394).

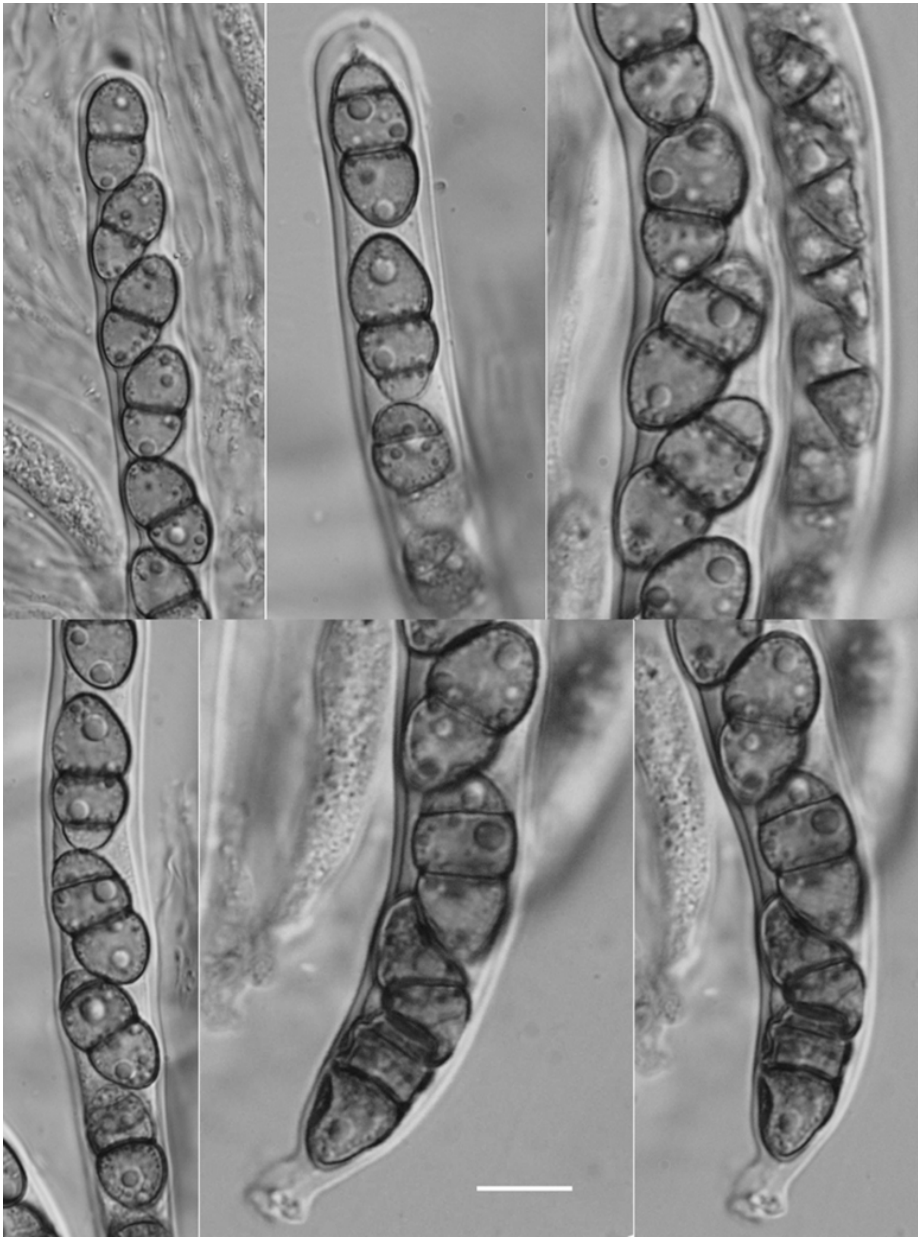


Fig. 2. *Polycoccum kaernefeltii*, holotype. Mature asci with 1–2-septate ascospores. Bar = 10 μ m

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POLYCOCCUM KAERNEFELTII SP. NOVA (DOTHIDEALES) —
НОВИЙ ЛІХЕНОФІЛЬНИЙ ГРИБ НА *TELOSCHISTES*
CHRYSOPHTHALMUS (L.) TH. FR.

Наведено опис нового виду ліхенофільного гриба *Polycoccum kaernefeltii* S. Kondr. sp. nova з Австралії (Вікторія та Південна Австралія). *P. kaernefeltii* має деякі ознаки представників двох родів — *Polycoccum* та *Pyrenidium*. Від їх представників він відрізняється дво-триклітинними спорами, які часто трапляються в одній сумці з одно- та чотириклітинними спорами, розташованими в один ряд, а також за деякими іншими ознаками плодових тіл та спор.

Ключові слова: ліхенофільні гриби, *Polycoccum*, *Pyrenidium*, *Teloschistes*, Австралія.

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CHRYSOPHTHALMUS (L.) TH. FR.

Приведено описание нового вида лихенофильного гриба *Polycoccum kaernefeltii* S. Kondr. sp. nova из Австралии (Виктория и Южная Австралия), который характеризуется признаками, свойственными представителям двух родов — *Polycoccum* и *Pyrenidium*. От их представителей он отличается двух-трехклеточными спорами, часто встречающимися в одной сумке с одно- и четырехклеточными спорами, расположенными в один ряд, а также некоторыми другими признаками плодовых тел и спор.

Ключевые слова: лихенофильные грибы, *Polycoccum*, *Pyrenidium*, *Teloschistes*, Австралия.