

Taxonomic revision of the genus *Cheilymenia* – 10.  
*Cheilymenia apiculispora* spec. nov.,  
a new species of the section *Coprobia*

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*Cheilymenia apiculispora* J. Moravec spec. nov., a new species of the genus *Cheilymenia* Boud., section *Coprobia* (Boud.) J. Moravec, is described according to a collection from the Russian Far East, and compared to related taxa.

**Key words:** *Cheilymenia apiculispora* spec. nov., section *Coprobia*, Pezizales, Pyrenomataceae.

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*Cheilymenia apiculispora* J. Moravec spec. nov., nový druh rodu *Cheilymenia* Boud. sekce *Coprobia* (Boud.) J. Moravec, je popsán podle nálezu z ruského Dálného Východu a porovnán s příbuznými druhy.

The present paper follows the previously published contributions within the framework of the author's taxonomic revision of the genus *Cheilymenia* Boud. Ahead of a monograph of the genus, which is currently being prepared, a new species of the section *Coprobia* is described here.

MATERIAL AND METHODS

The ascospores were stained with "cotton blue" [Geigy s. 123 or 0.5 % methyl blue (R. A. L.) in lactic acid] called here "C<sup>4</sup>B" which stains directly without heating the slides and does not destroy the separable perispore. For other examinations see Moravec (2003).

Acronyms of the herbaria:

- BPI – U. S. National Fungus Collections, Beltsville, Maryland, U. S. A.;  
BRNM – Botanical Department of the Moravian Museum, Brno, Czech Republic;  
CUP – Department of Plant Pathology, Cornell University, Ithaca, New York, U.S.A.;  
PAN – Herbarium, Botany Department, Panjab University, Chandigarh, Punjab, India;  
TAA – Institute of Zoology and Botany, Tartu, Estonia;

UPS – Institute of Systematic Botany, University of Uppsala, Sweden;  
J. Mor. – private herbarium (Discomycetes), Jiří Moravec, Adamov, Czech Republic.

## RESULTS AND DISCUSSION

Only two sections of the genus *Cheilymenia*, the section *Coprobina* (Boud.) J. Moravec and the section *Striatissporae* J. Moravec accommodate species characterised by ascospores possessing rib-like striation on the separable perispore. The cyanophilic striation is observable when the ascospores are stained with C<sup>4</sup>B in lactic acid without heating the slides (seen without any staining in several species only) and is perfectly distinguishable in SEM photomicrographs. The latter section was subdivided to two series, the series *Striatissporae* and series *Tenuistriatae* (Moravec 1990).

In species of the section *Coprobina*, the apothecia are "hairless", possessing only sparse or extremely rare, hyaline, thin-walled, hyphoid lateral hairs (occasionally with slightly thickened walls), while those of the section *Striatissporae* may possess both hyphoid or true subacuminate to acuminate marginal and lateral hairs. The shape of apothecial hairs did not prove to be decisive for recognising separate genera within *Cheilymenia* (see also the discussion in Moravec 1990) as there are intermediate shapes of hairs in species of the genus and this is especially illustrative in these two sections. Even in the type species of the section *Striatissporae*, *C. theleboides* (Alb. et Schwein.: Fr.) Boud., which normally possesses apothecia with sparsely distributed but well developed true (subacute to acute) hairs, these hairs may be extremely sparse, and in a number of collections the apothecia entirely lack such true hairs and possess only sparse hyaline hyphoid hairs (I consider such collections to represent merely a "hairless" form of *C. theleboides*). Species of the series *Tenuistriatae* possess robust marginal hairs in combination with well differentiated excipulum.

The excipular structure and the shape of paraphyses are more important for a delimitation of these two sections. Species of the section *Coprobina*, with the type species *Cheilymenia granulata* (Bull.: Fr.) J. Moravec, possess a simpler excipular structure and thick paraphyses. These two characters distinguish them from species of the section *Striatissporae* which possess thinner (filiform) paraphyses and more frequent hyphae in the medulla, often forming a *textura subintricata* in species of the series *Striatissporae*, or *textura intricata* in species of the series *Tenuistriatae* (compare fig. 2-2a to fig. 3a-3b in Moravec 1990). Nevertheless, the excipulum in the section *Coprobina* is not unequivocally simple ("undifferentiated" as commonly interpreted) as the cells in the medullary layer are much smaller and hyphal elements, though less frequent, also occur, especially in the area under the hypothecium (see also fig. 38 in Le Gal 1954 and fig. 1 in Moravec 1990).

As the intermediate shapes and variable frequency of hairs as well as transitional patterns of structures in the medullary layer within these two sections exist, the species accommodated in them are obviously members of only one genus, *Cheilymenia* as emended in Moravec (1990).

The new species described below belongs to the section *Coprobia*.

*Cheilymenia apiculispora* J. Moravec spec. nov.

(Figs. 1-4)

**Diagnosis.** Apothecia 1-4 mm diam., gregaria, sessilia, primum molliter patellaria, orbicularia dein discoidea et explanata, molliter et tenuiter carnosae, tota laete flavo-ochracea usque ochracea; pars exterior apothecii minute granulato-furfuracea; parte basali rarissime cum pilis sparsis, hyphoideis hyalinis, septatis. Excipulum externum e textura globulosa, usque globuloso-angulare, cum cellulis (15-)25-75(-90)  $\mu\text{m}$  in diam. Excipulum internum (medulla) e textura globuloso-angulare, cum cellulis parvis (8-25  $\mu\text{m}$  in diam.), subglobosis, sed etiam cum hyphis irregularibus, sparsis, aliquando vesiculare-inflatis constat; hypothecium e cellulis et hyphis irregularibus, minoribus (4-8  $\mu\text{m}$  in diam.), cyanophilis constat. Asci 100-140  $\times$  7.5-12.5  $\mu\text{m}$ , cylindracei, octospori. Ascospores (11.0-)12.5-16.5(-18.2)  $\times$  (6.0-)6.3-7.9 (-9.0)  $\mu\text{m}$ , plerumque 14.3  $\times$  7.1  $\mu\text{m}$  (ornamento excluso), eguttulatae, ellipsoideae seu elongato-ellipsoideae, perisporio separabile, crasse et sparse longitudinale striato cum costis (0.3-)0.6-0.9(-1.3)  $\mu\text{m}$  crassis, cyanophilis, simplicibus vel anastomosantibus, cum apiculis (0.3-)0.5-2.1(-2.6)  $\mu\text{m}$  longis ad polis donatae. Paraphyses crasse filiformes, (3-)4-5(-6)  $\mu\text{m}$  crassae, apice sensim clavato-incrassatae (6-9(-12)  $\mu\text{m}$ ).

**Holotypus.** In excremento vaccino, Russia: Far East, Primorsk Region, in jugo montium Pidan, mons Hualaza, 1. VIII. 1970, leg. B. Kullman et Ain Raitviir. Holotypus in herbario TAA (No 61438) et isotypi in BRNM 686284 et in herbario privato J. Mor. asservantur.

Apothecia (Fig. 1) 1-4 mm in diam., sparsely gregarious, sessile, first shallowly saucer-shaped, orbicular, then expanded to flattened, thin-fleshy and soft, pale yellow-ochraceous to ochraceous, external surface finely scurfy, hairless.

Apothecial structure (Fig. 4). Hymenium 110-150  $\mu\text{m}$  thick. Hypothecium indistinctly differentiated from medullary layer, about 30-45  $\mu\text{m}$  thick, composed of small (4-8 mm in diam.) irregular cyanophilic cells. Medullary excipulum about 60-120  $\mu\text{m}$  thick, composed of irregular globose to subangular cells, 8-25  $\mu\text{m}$  in diam., forming a textura globulosa to angularis, but occasionally mixed with 7-12  $\mu\text{m}$  thick hyphae with cyanophilic septa which are often vesicular-inflated (up to the diameter of the globose cells), in some areas inconsistently forming an indefinite texture, especially under hypothecium. Ectal excipulum about 80-180  $\mu\text{m}$

thick, slightly differentiated from medulla, composed of much larger globose or globose-ellipsoid cells (15-)25-75(-90)  $\mu\text{m}$  in diam, forming textura globulosa.

Hairs absent on the margin and flanks. Hyaline superficial hyphoid hairs (Fig. 4) extremely rarely occur near receptacular base; they are hyaline, 25-70  $\times$  7-12  $\mu\text{m}$ , aseptate or sparsely septate, thin-walled.

Asci (Fig. 2.) 100-140  $\times$  7.5-12.5  $\mu\text{m}$ , cylindrical with blunt apex, eight-spored. Ascospores (Fig. 3 and SEM Fig. 5) eguttulate, with thick homogenous content (more distinct than in *C. granulata*), ellipsoid or ovoid or elongate ellipsoid, (11.0-)12.5-16.5(-18.2)  $\times$  (6.0-)6.3-7.9(-9.0)  $\mu\text{m}$ , mostly 14.3  $\times$  7.1  $\mu\text{m}$  (ornamentation and apiculi excluded); perispore possessing conspicuously coarse and strongly cyanophilic longitudinal ribs (when stained with C<sup>4</sup>B in lactic acid without heating); the ribs are continuous or usually obliquely anastomosing, (0.3-)0.6-0.9(-1.3)  $\mu\text{m}$  thick and 0.3-0.6(-1.0)  $\mu\text{m}$  high, forming conspicuous, blunt or mostly subacute and elongate, (0.3-)0.5-2.1(-2.6)  $\mu\text{m}$  high apiculi on ascospore poles. Paraphyses (Fig. 2) thickly filiform to cylindrical, (3-)4-5(-6)  $\mu\text{m}$  thick, apices moderately or more distinctly enlarged to 6-9(-12)  $\mu\text{m}$ , with subhyaline (in rehydrated apothecia) content.

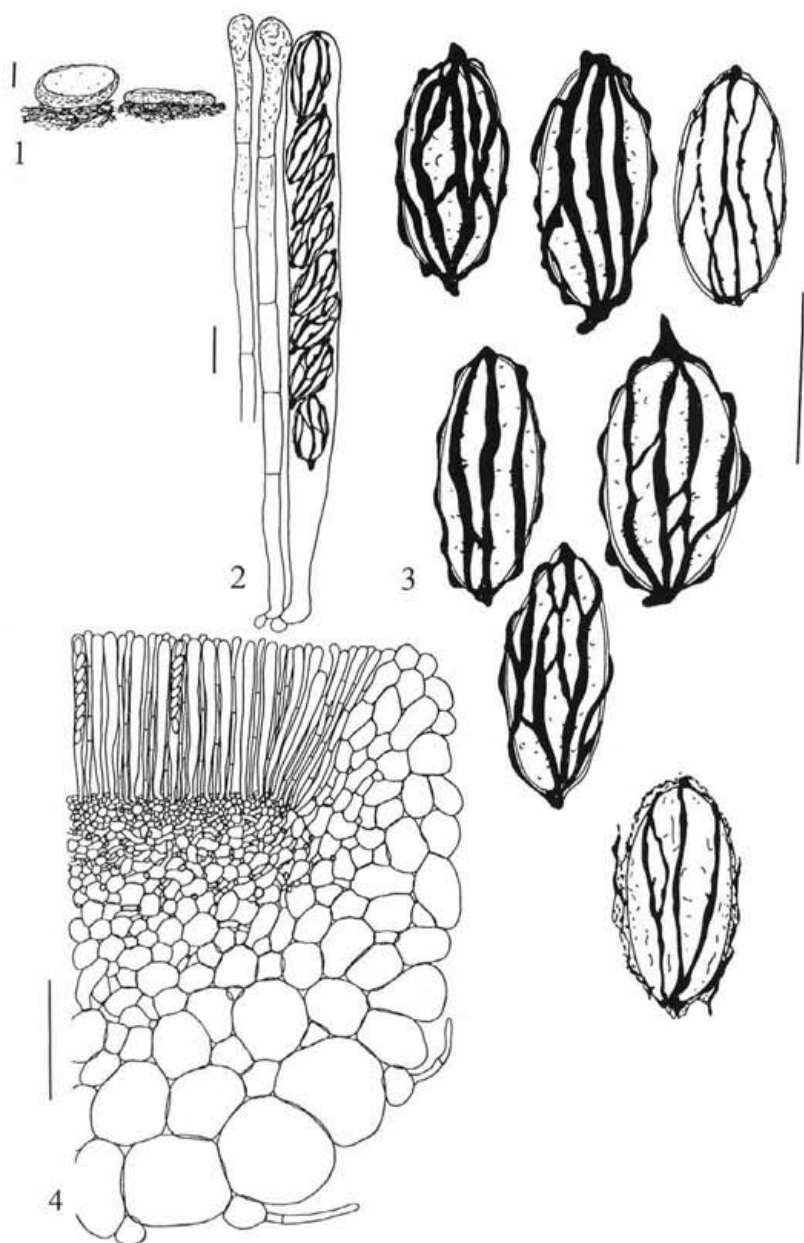
Habitat and distribution. On cow dung. Known only from the type locality in the Far East.

Type material examined. Russia: Far East, Primorsk Region, Pidan mountain range, Mt. Hualaza, on cow dung, 1. VIII. 1970, leg. B. Kullman and Ain Raitviir. Holotype in TAA 61438, isotypes in BRNM 686284 and in herb. J. Mor.

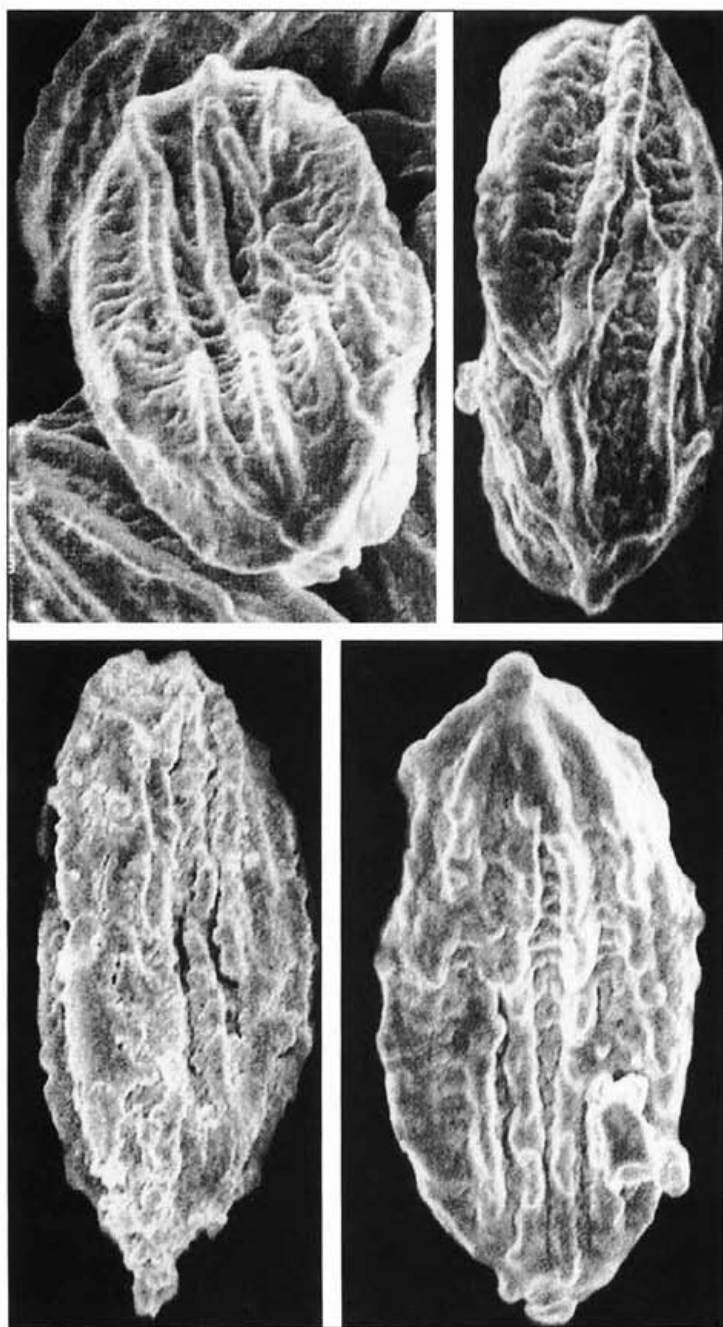
Etymology. Derived from the Latin "apiculus" and "spora", referring to the distinct apiculi on the ascospore poles in this new species.

Remarks. *Cheilymenia apiculispora* spec. nov., although macroscopically resembling *C. granulata*, is a very conspicuous and easily distinguishable species, especially for its constantly apiculate and coarsely longitudinally costate ascospore perispore. The ornamentation of the perispore consists of extremely thick and strongly cyanophilic ribs forming an irregularly uneven ascospore outline. The perispore loosens but rarely separates entirely from the epispore, as the rigid ribs stiffen the wall.

No species of *Cheilymenia* possesses such thick rib-like ascospore ornamentation as that in the new species. It is even much coarser than that in *Cheilymenia crassistriata* (J. Moravec) J. Moravec (compare illustrations in Moravec 1987, 1990). Another taxon commonly occurring in Asia, *Cheilymenia striata* (K. S. Thind, E. K. Cash et Pr. Singh) J. Moravec, described from India by Thind, Cash and Singh (1977) as *Ascophanus striatus* [= *Coprobria striata* (K. S. Thind, E. K. Cash et Pr. Singh) Waraitch], distinctly differs in having smaller ascospores with much finer and denser ascospore striation - the striation is the same as that in *C. granulata* (or even finer), so the name does not reflect any difference between these two taxa. After examination of the isotype (BPI ex PAN) of *Ascophanus striatus* and of the



Figs 1-4. *Cheilymenia apiculispora*: 1. - apothecia on cow dung (scale bar = 1 mm); 2. - paraphyses and ascus (scale bar = 10  $\mu$ m); 3. - seven mature ascospores, oil immersion, C<sup>4</sup>B, note one ascospore (underneath) with loosening perispore (scale bar = 10  $\mu$ m); 4. - median section through apothecial margin, with rare hyphoid hairs (scale bar = 100  $\mu$ m). Isotype J. Mor. (ex holotype TAA 61438).



**Fig. 5.** *Cheilymenia apiculispora*. SEM photomicrographs of ascospores (scale bar = 3  $\mu$ m). Isotype J. Mor. (ex holotype TAA 61438).

other material from India treated by Thind and Kaushal (1978) [but also from Kyrgyzstan (TAA), Nepal (BPI) and China (J. Mor.)], I consider *Cheilymenia striata* merely an infraspecific taxon of *C. granulata*. It should be noted that the collection (UPS, CUP) reported from Macaronesia by Korf and Zhuang (1991) as *C. striata* is another, very different species, possessing true apothecial hairs and is close to *C. lemuriensis* Heim ex Le Gal (section *Striatisporeae*) - the hairs were overlooked by the cited authors.

The elongate apiculi on the ascospore poles in *C. apiculispora* are unique in *Cheilymenia*. Within the genus, only *C. polaripustulata* possesses apiculate ascospores but the apiculi are blunt as they are formed by rounded pustules and the ascospore striation is much finer and denser (Moravec 1998). Moreover, *C. polaripustulata*, which belongs to the section *Striatisporeae* series *Tenuistriatae*, differs in having apothecia with robust marginal hairs.

I have placed *C. apiculispora* into the section *Coprobia* especially for its shape of the hairless apothecia (with extremely sparse hyphoid hairs occurring only near the apothecial bases), and less differentiated medullary layer, which, however, comprises somewhat more frequent hyphal elements (but hyphae mostly of an indefinite shape and arrangement). Moreover, the thickly filiform paraphyses (though comparatively slender and less enlarged than those in *C. granulata*) better correspond with those in the species of the section *Coprobia*.

Regarding the other species of these two sections, I have treated them in detail (including their infraspecific taxa), and the results will be published in the upcoming monograph of the genus *Cheilymenia*.

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