

# *Dennisiopsis*, a new genus of Discomycetes\*

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*Summary.* Two new coprophilous discomycetes, one with 8-spored asci and the other with multispored asci, are described from India. A new genus, *Dennisiopsis*, is proposed to accommodate the two species in both of which the ascocarp is a simple fascicle of asci and paraphyses without an ectal excipulum. The taxonomy of the fungi is discussed.

Two interesting discomycetes from India form the subject of this paper and we are delighted to be able to present it in a volume commemorating the contributions to mycology of one so distinguished as Dr. R. W. G. Dennis. Both species are being assigned here to a new genus, *Dennisiopsis*, so named to honour Dr. Dennis as a humble tribute to the remarkable and distinctive role he has played in the development of mycological taxonomy in its classical purity.

## ***Dennisiopsis* Subramanian & Chandrashekara, gen. nov.**

Discomyces apothecia gerens. Apothecia superficialia, sparsa, sessilia, laete flava vel cremea, e fasciculo vel e fasciculis pluribus ascorum et paraphysium in medulla basili constata; medulla sine excipulo ectali. Asci operculati 8- vel multisporei, non-amyloidei. Ascosporeae hyalinae vel pallide flavae, unicellulares, tenuiter tunicatae, globosae vel ellipsoideae, laeves, in massam interdum agglutinantes, unaquaque 'bulla de Baryea' prominenter ornata. Paraphyses filiformes, septatae, simplices vel ramosae.

Type species: *Dennisiopsis octospora*.

## ***Dennisiopsis octospora* Subramanian & Chandrashekara, sp. nov.**

Apothecia superficialia, sparsa, sessilia, laete flava vel maturitate rufescentia, 167-434  $\mu\text{m}$  diam., 161-279  $\mu\text{m}$  alta, e 1-9 fasciculis ascorum et paraphysium in medulla basali constata. Medulla textura globulosa composita sine excipulo ectali. Asci operculati, cylindrico-clavati, breviter stipitati, 71-95  $\times$  20-27  $\mu\text{m}$ , octospori, non-amyloidei. Ascosporeae irregulariter biseriatae, unicellulares, hyalinae vel pallide flavae, laeves, globosae vel ellipsoideae, 11.7-19.5(-15.9)  $\times$  9.1-13(-10.5)  $\mu\text{m}$ , unaquaque 'bulla de Barreya' prominenter ornata. Paraphyses longae, filiformes, septatae, simplices vel ad basim dichotome divisae, ubique, apicae excepto (3.2  $\mu\text{m}$ ), aequaliter incrassatae (2-2.6  $\mu\text{m}$ ). Fasciculos laxos, circa ascos efformantes. Typus: *Chandrashekara* 2335 (holotypus, MUBL).

*Apothecia* scattered, usually solitary, very rarely in groups of two or three, superficial, sessile, bright lemon yellow when young, becoming reddish-brown with age, 167.4-434  $\mu\text{m}$  in diameter and 161-279  $\mu\text{m}$  in height; simple in structure, consisting merely of clusters of asci and paraphyses on a basal tissue ('medulla') and totally lacking an ectal excipulum, each

\* Memoir No. 201 from the Centre for Advanced Study in Botany, University of Madras.

apothecium with 1–9 such fascicles of asci and paraphyses (Fig. 1A); basal tissue made up of 'textura globulosa'. Number of asci in each fascicle not determined due to the fact that they are very densely covered by the paraphyses. *Asci* operculate, cylindric-clavate,  $70.9\text{--}94.8 \times 20.1\text{--}27.3 \mu\text{m}$ , each with a short stipe, a somewhat rounded apex and a large terminal operculum, typically 8-spored, sometimes with only 4, 5 or 7 spores (Fig. 1B–F); ascus wall not turning blue in Melzer's reagent. *Ascospores* irregularly biseriata, 1-celled, hyaline to pale yellow, spherical to ellipsoidal,  $11.7\text{--}19.5(-15.9) \times 9.1\text{--}13(-10.5) \mu\text{m}$ , thin-walled, smooth, each with a prominent de Bary bubble when mounted in lactophenol (Fig. 1H). *Paraphyses* forming loose fascicles, long, filiform, simple or dichotomously branched in the basal part, septate, of uniform width ( $2\text{--}2.6 \mu\text{m}$ ) throughout, except at the tip which is slightly wider (Fig. 1G).

This apothecial fungus appeared on cowdung samples collected at Uppinangadi, Karnataka State, India, 10 Jan. 1975, and incubated in moist chambers. The mature fruit bodies appeared on the substrate after 12 days of incubation. Type: *Chandrashekara* 2335 (MUBL).

The development of the apothecium was studied by picking up young fruit bodies in different stages of development from the substrate and examining them. The development appears to conform to the eugymnohymenial type where an excipulum is completely absent (van Brummelen, 1967). The paraphyses grow out from the basal tissue well in advance of the asci and can be seen in groups or fascicles from the early stages, i.e., even before the asci are initiated (Fig. 1J).

***Dennisiopsis multispora* Subramanian & Chandrashekara, sp. nov.**

Apothecia sparsa, solitaria, superficialia, sessilia, iuventate creama maturitate albida,  $217\text{--}279 \mu\text{m}$  diam.,  $155\text{--}198 \mu\text{m}$  alta, ef asciculo ascorum et paraphysium in medulla basali constata, medulla textura angulari omnio sine excipulis ectali composita. *Asci* latae clavati breviter stipitati, vel apicem rotundati, operculati  $89\text{--}146 \times 29\text{--}46 \mu\text{m}$ , multispori (?128 spora in quoque asco), non-amyloidei. *Ascopora*e unicellulares, hyalinae vel pallide flavae, ellipsoideae, tenuiter tunicatae, laeves, unaquaque 'bulla de Baryea' prominenter ornatae,  $6.5\text{--}10.4(-8) \times 4.6\text{--}5.9(-5.2) \mu\text{m}$ , spora omnes in asco agglutinantes et massam immutato liberata, efformantes. *Paraphyses* longae, filiformes, simplices vel ramosae, septatae, ubique aequaliter incrassatae. Typus: *Chandrashekara* 2336 (holotypus, MUBL).

*Apothecia* scattered, solitary, superficial, sessile, cream-coloured when young, dull white after discharging the spores,  $217\text{--}279 \mu\text{m}$  in diameter,  $155\text{--}198 \mu\text{m}$  in height, very simple in structure, consisting of a hymenium of asci and paraphyses developing from a basal tissue ('medulla') of 'textura angularis', ectal excipulum completely absent. *Asci* 1–7 per ascocarp in a single cluster interspersed with paraphyses (Fig. 2A), broadly clavate, with a short stipe, rounded at the apex, with distinct large and thin terminal operculum (spore liberation observed), non-amyloid  $89\text{--}145.8 \times 29\text{--}45.9 \mu\text{m}$ , typically multispored (Fig. 2B–E),  $122\text{--}125(-?128)$  per ascus. *Ascospores* 1-celled, hyaline to very pale yellow, ellipsoidal, thin-walled, smooth, each with a prominent de Bary bubble in lactophenol mounts,  $6.5\text{--}10.4(-8) \times$

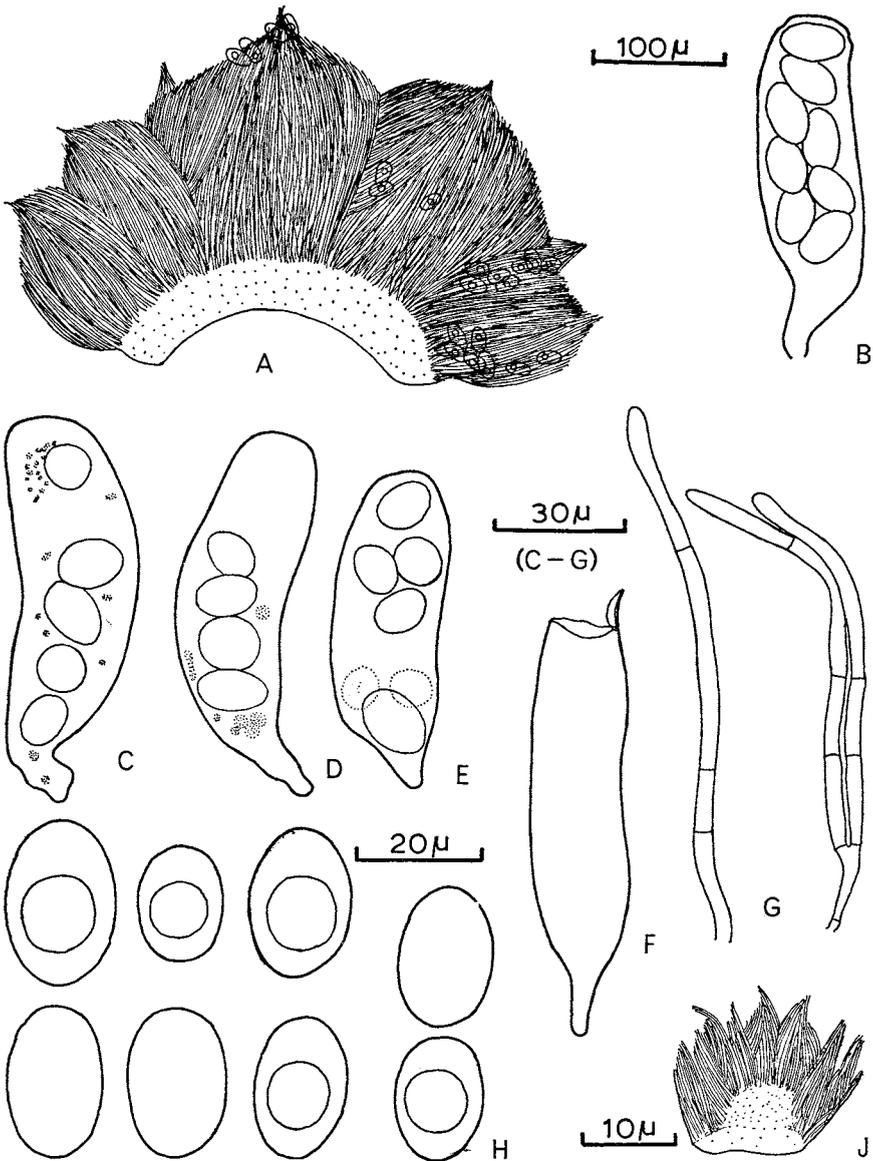


FIG. 1. *Dennisiopsis octospora*. **A**, general aspect of the apothecium; **B-E**, asci with spores; **F**, ascus after liberation of spores; **G**, paraphyses; **H**, ascospores; **J**, apothecium (young stage).

4.6-5.9(-5.2)  $\mu\text{m}$  (Fig. 2G). *Paraphyses* long, filiform, simple or once branched, septate, of uniform width.

This fungus grew on goat dung collected at Maduravoyal, near Madras, Tamil Nadu, India, 11 July 1975, and incubated in moist chambers. The mature fruit bodies appeared on the substrate after 10 days of incubation. Type: Chandrashekara 2336 (MUBL).

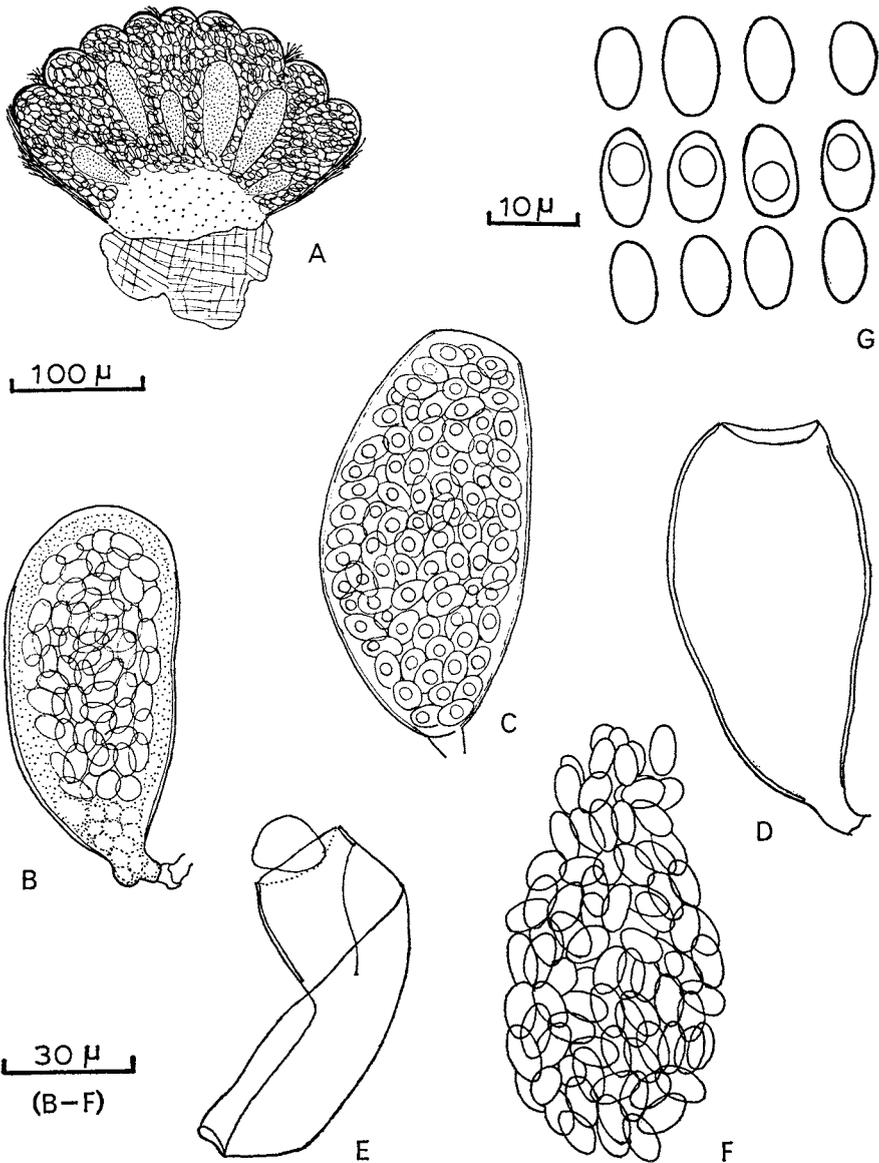


FIG. 2. *Dennisiopsis multispora*. **A**, apothecium, showing asci & paraphyses; **B** & **C**, ascus with ascospores (young & intermediate stage); **D** & **E**, ascus after liberation of spores; **F**, ejected mass of ascospores; **G**, ascospores.

When the ascus is young and not yet ready for discharge the ascospores lie well dispersed throughout the ascus (Fig. 2B). As the ascus matures and is ready to discharge the spores, they unite into one distinct group and the whole moves towards the upper portion of the ascus and then is thrown off in an adhering mass. When such ejected groups of ascospores were examined in water mounts, no common mucilaginous sheath holding all the spores together, as in the case of species of *Saccobolus*, was seen (Fig. 2F). This

agglutination of spores was seen only in water mounts and not in lactophenol or Melzer's reagent mounts.

#### TAXONOMY

The two species described here are considered to be congeneric, despite the fact that in one the ascus has eight spores and in the other they are numerous (?128). A distinctive feature of both is the total absence of an ectal excipulum, the apothecium being a simple naked fascicle of asci and paraphyses. In this, a comparison with the genus *Ascodesmis* v. Tiegh. seems relevant. Our species cannot be placed in that genus as the ascospores in *Ascodesmis* are ornamented and not smooth, nor do the spores become dark-coloured at maturity as in *Ascodesmis*, and, in addition, the ascospores in our species have de Bary bubbles—characters considered to be of taxonomic importance.

The two species are operculate discomycetes and clearly belong to the order Pezizales. The fleshy apothecia, the thin-walled cylindrical-clavate to broadly clavate asci with a terminal operculum, and the radially symmetrical ascospores which are typical of both are features of the sub-order Pezizineae (Korf, 1972 & 1973).

The sub-order Pezizineae includes five families, viz., *Ascobolaceae*, *Pezizaceae*, *Pyronemataceae*, *Morchellaceae* and *Helvellaceae* (Korf, 1972). The presence of small, fleshy and light-coloured apothecia containing non-amyloid asci and hyaline thin-walled ascospores with de Bary bubbles suggests that our two species are members of the family *Pyronemataceae*. This family includes five sub-families: *Ascodesmidoideae*, *Pyronematoideae*, *Ascophanoideae*, *Otideoideae* and *Scutellinioideae* (Korf, 1972).

The sub-family *Ascodesmidoideae* includes forms with pigmented spores which are at maturity brown and often variously sculptured. It also includes hyaline-spored forms, but then the apothecia have 'definite violet to purple pigments'. Though hyaline-spored, our two species therefore cannot be included here. The sub-family *Pyronematoideae* is characterized by forms with 'apothecia on an obvious subiculum', with smooth to strongly marked ascospores which are eguttulate and often with carotenoid pigments. They are common on burnt or steam-sterilized substrata. Our two species cannot be included in this sub-family either, due to the absence of a subiculum and features of the ascospores.

The sub-family *Ascophanoideae* includes forms with small discoid to globose apothecia lacking carotenoid pigments and having eguttulate ascospores, but frequently with 'de Bary bubbles' in certain mountants. In our view this sub-family can accommodate our species. The tribe *Theleboleae* includes forms with globose, discoid or turbinata apothecia containing non-amyloid asci and always with smooth and hyaline ascospores with prominent de Bary bubbles. Moreover, the members of this tribe are predominantly coprophilous. The tribe *Theleboleae* includes forms which are distinctly operculate as well as forms which lack a distinct operculum (inoperculate, in this sense) and spore liberation in such inoperculate forms is by the irregular tearing of the ascus apex (one exception is *Ascozonus* (Renny) Hansen which has a vertical slit in the ascus apex through which spores are released). Only *Coprotus* Korf and *Lasiobolus* Sacc. possess distinctly operculate asci, as do our two species which are thus related to these two genera.

Our two species can be clearly distinguished from *Lasiobolus*, which

includes forms with characteristic pilose apothecia with well developed and differentiated excipulum; the genus includes species with 8-spored or multispored asci. The genus *Coprotus* also includes species with 8-spored and multispored asci and in all the known species an ectal excipulum is recognizable, forming a margin to the apothecium, though it may not be well differentiated. Our two species totally lack an ectal excipulum and the apothecium merely consists of a naked fascicle of asci and paraphyses on a basal tissue and so can be easily distinguished from *Coprotus*.

#### ACKNOWLEDGEMENTS

We are grateful to Dr. J. van Brummelen of the Rijksherbarium, Leiden, Netherlands, for kindly examining material of *Dennisiopsis octospora* and giving his valuable opinion. We are thankful to Mr. R. D. Meikle for the Latin diagnoses of the new taxa. One of us (KVC) thanks the Indian University Grants Commission for a Research Fellowship.

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