

**TWENTY-FIVE NEW CONIDIAL FUNGI
FROM THE WESTERN GHATS
AND THE ANDAMAN ISLANDS (INDIA)**

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ABSTRACT — Twenty-five new taxa of conidial fungi are described and illustrated from forest litter in the Western Ghats in southern India, and from the Andaman Islands. They include the new anamorph-genera *Vanakripa* and *Xenoheteroconium*, and new species of *Anavirga*, *Arthrinium*, *Bahusutrabeeja*, *Beltrania*, *Cheiropolyschema*, *Craspedodidymum*, *Cryptophiale*, *Dictyochaeta*, *Dischloridium*, *Fusichalara*, *Hyphopolynema*, *Kostermansinda*, *Phialosporostilbe*, *Phragmotrichum*, *Piricaudiopsis*, *Selenodriella*, *Spadicoides*, *Sporidesmiopsis*, *Sporoschisma* and *Uberispora*. In addition, new combinations are made in *Craspedodidymum*, *Dictyochaeta*, and *Sporidesmiopsis*.

KEY WORDS: anamorphs, conidial fungi, hyphomycetes, taxonomy, new taxa, biodiversity, India, litter decomposition.

INTRODUCTION

During surveys of tropical microfungi from the forests of the Western Ghat hills in southwestern India, and from the Andaman Islands, numerous conidial fungi (dikaryomycotan anamorphs) were collected on plant litter. Among them were a substantial number of undescribed taxa.

This paper describes and illustrates 25 of these new taxa, as part of an ongoing documentation of previously unrecorded biodiversity in tropical microfungi (see Castañeda & Kendrick, 1990a,b, 1991).

The Western Ghats and their forests.

The Western Ghats are an extensive range of hills in south-western India, running nearly parallel to the coastline between 8°— 22.5°N and 72.5°— 76.5°E, extending south from the Tapti river for about 1600 km through five States to Cape Comorin (Fig. 1). The steep western escarpment of the Ghats rises 15-80 km from the west coast, and the hills slope gently away to the east, the average elevation being 1220 m. The Western Ghats receive southwest monsoon rain from June to September. Annual rainfall on the western slopes ranges from 300 to 550 cm. Mean annual temperature is 28°C to 31°C, the temperature seldom falling below 15°C. Mean annual relative humidity is above 80%. Under these warm and humid conditions, luxuriant wet evergreen forests flourish on the windward, western side of the escarpments (Pascal, 1989). The mycota of this area is still largely unknown, but the senior author is collecting extensively and intensively, and we will explore the fungal facet of its biodiversity in a series of publications.

The rainforests of the Andaman-Nicobar Islands.

The Andaman and Nicobar Islands are a string of about 350 islands (over 500 if one counts all the tiny outcrops) in the Bay of Bengal that form an archipelago 700 km long and 60 km wide, lying between 6° and 14°N, and 92° and 94° E, with a combined coastline of about 2000 km (Fig. 1). The interiors of these islands still support dense rainforests, while mangrove swamps fringe the coast. The islands have a hot, humid climate with temperatures ranging from 23°-36°C, relative humidity of 80-90% and rainfall of 300-400 cm per year. The remoteness of the islands from the mainland and their relative inaccessibility helped to preserve the rainforests and mangroves. Although the flora of the Andaman and Nicobar Islands is said to be partly endemic and partly composed of elements from Burma and Malayasia, no authoritative reports have yet been published on the fungi of these islands. In this series of papers, we hope to partially remedy this deficiency.

Studies of microfungi in Asia

Many new taxa of hyphomycetes have already been described from south and south-east Asia by Kuthubutheen and Nawawi (1991a,b,c,d,e, 1992), Matsushima (1971, 1975, 1980, 1981, 1983, 1989), Nawawi and Kuthubutheen (1988, 1989a,b, 1990, 1992), Pirozynski and Patil (1970)

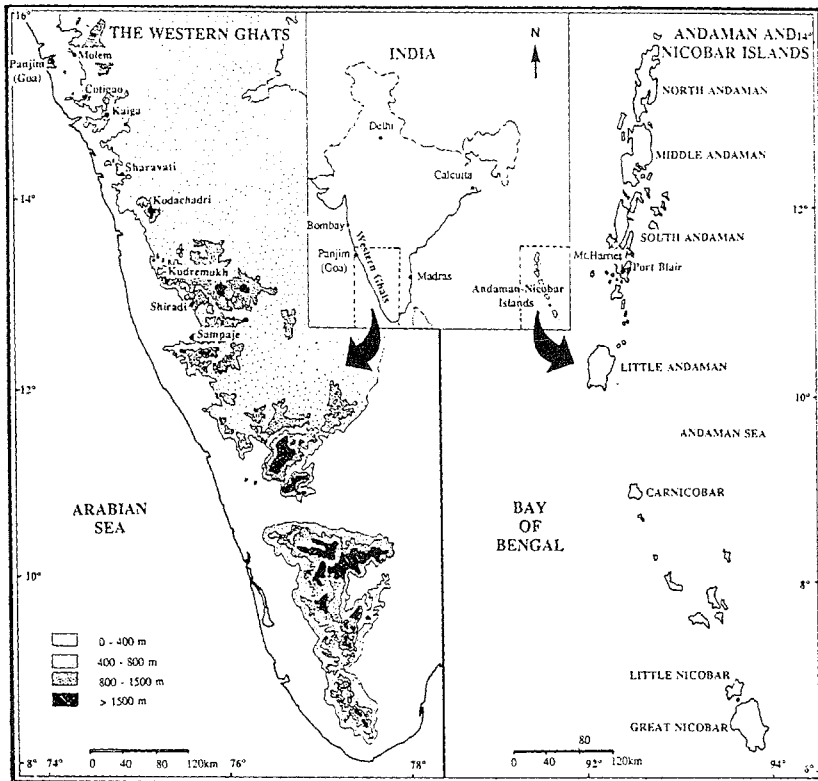


Fig. 1. Map of the Western Ghats of south-west India, and the Andaman Islands.

Rao and de Hoog (1986), Subramanian and Bhat (1977, 1987), Tzean and Chen (1989a,b,c, 1990, 1991) and Tzean et al. (1990). However, according to present estimates (Hawksworth, 1991) we have so far described less than 5% of the world's mycota. The fungi of tropical regions are especially poorly known. The present study was undertaken to add to our knowledge of Asian microfungi

MATERIALS AND METHODS

Throughout this study, lactic acid and lactophenol mounting media were used in making semi-permanent slide preparations. Measurements were made in lactic acid mounts. Drawings were executed with the aid of a camera lucida.

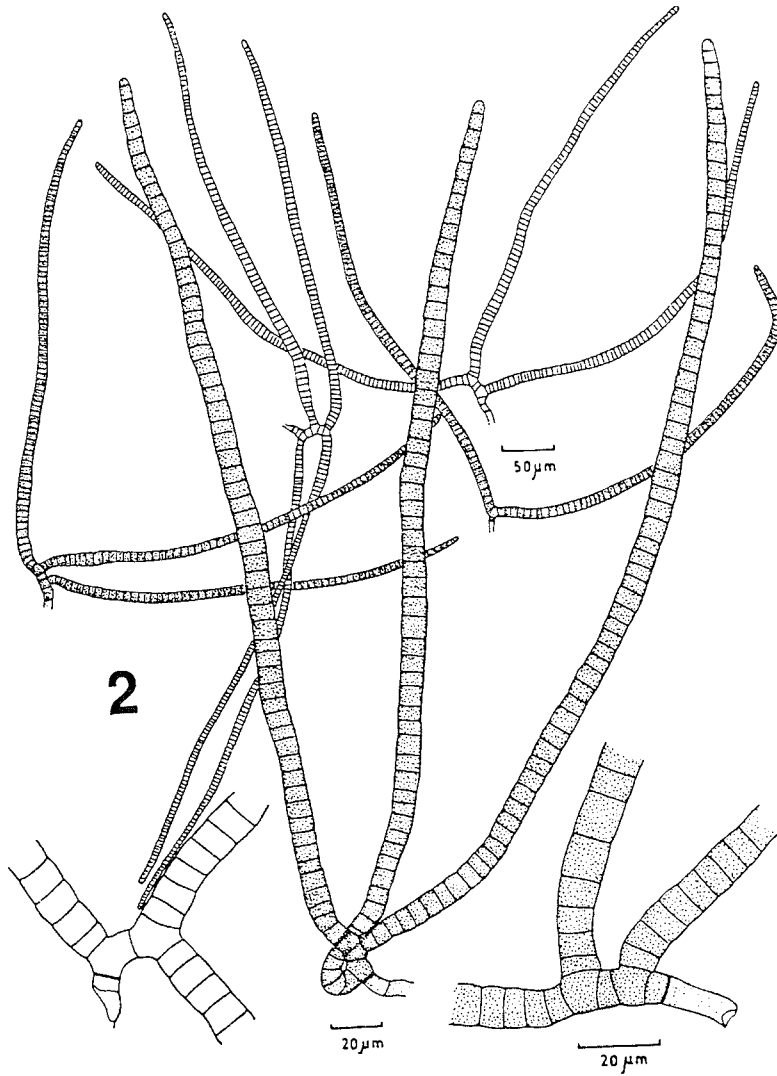


Fig. 2. *Anavirga vermiformis* anam.-sp. nov.
staurospores with worm-like arms.

TAXONOMY

Anavirga vermiformis Bhat & Kendrick **anam.-sp. nov.** (Fig. 2)
(Etym. Latin: *vermis* = a worm + *forma* = shape)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae, velutinae. Mycelium partim superficiale, partim in substrato immersum, ex hyphis laevibus, pallide brunneis, ramosis, septatis, 3.5-4.5 μm lat. compositum. Conidiophora inconspicua, mononemata, 1-2-septata, valde pallide brunnea, laevia, usque ad 10 μm long. et usque ad 5 μm lat. Cellulae conidiogenae integratae, terminales, determinatae. Conidia sicca, laevia, ramosa, brachiis 2-4 (vulgo 3), longissimis, divergentibus, ex cellulis successivis axis principalis perpendiculariter exorientibus; unumquidque brachium vermiforme et flexuosum, 300-400 μm long., 7-9.5 μm lat., 60-120-euseptatum, ad aliquot septa leniter constrictum, brunneum vel aureo-brunneum, laeve, ad apicem rotundatum leniter angustatum.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, velvety. Mycelium partly superficial, partly immersed in the substrate, composed of smooth, pale brown, branched, septate hyphae 3.5-4.5 μm wide. Conidiophores inconspicuous, mononematous, 1-2-septate, very pale brown, smooth, up to 10 μm long, up to 5 μm wide. Conidiogenous cells integrated, terminal, determinate. Conidia dry, smooth, branched, with 2-4 (mostly 3) very long divergent arms arising at right angles from successive cells of the main axis; each arm vermiform and flexuous, 300-400 μm long, 7-9.5 μm wide, 60-120-euseptate, slightly constricted at some septa, brown to golden brown, smooth, slightly narrower at the rounded apex.

HOLOTYPE: on dead twigs, Kodachadri Hills, Karnataka State, India, 12 Sept. 1991, D.J. Bhat, DAOM 214620.

Teleomorph: unknown.

Although the generic limits of those conidial fungi with branched, hyphoid conidia are not yet well defined, our fungus can best be accommodated in *Anavirga* Sutton (Sutton, 1975). The conidia of *A. vermiformis* are clearly different from those of the two known species [*A. laxa* Sutton (1975) and *A. dendromorpha* Descals & Sutton (1976)]. The conidia in *A. laxa* are triradiate (Y-shaped) or occasionally tetraradiate, 4-16-septate and 90-185 X 11-14 μm ; in *A. dendromorpha*, the conidia may branch at any point along their axis (not exclusively near the base, as in *A. vermiformis*); they may also assume a densely arborescent form

and give rise to an unnamed *Phialocephala* synanamorph. In our opinion, the *Phialocephala* synanamorph of *A. dendromorpha* is the more characteristic and differentiated of the two anamorphs, and not only fully deserves a binomial, but should probably be given preference as the diagnostic anamorph.

***Arthriniium mytilomorphum* Bhat & Kendrick anam.-sp. nov.** (Fig. 3)
(Etym. Greek: *mytilos* = mussel + *morphe* = shape)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae punctiformes, pulvinatae, atrobrunneae, hypophyllae. Conidiophora basauxica, mononematica, erecta, flexuosa, cylindrica, incolorata, apice rotundato, usque ad 80 μm alt., 4.5-5 μm lat., septis conspicuis, spissis, atro-brunneis praedita, e cellulis matricialibus obpyriformibus vel ampulliformibus basibus brunneis apicibus incoloratis, 5.5-6.5 μm lat. oriunda. Cellulae conidiogenae integratae, terminales vel intercalares, mono- vel polyblasticae, minute denticulatae, 9-10 X 4.5-5 μm . Conidia solitaria, sicca, fusiformia vel navicularia, leniter curva et asymmetrica, non-septata (amerospora), laevia, ad medium latissima, sed versus extremitates anguste rotundatas attenuata, 20-30 X 6-8.5 μm ; pars proximalis per tres longitudinis quadrantes atro-brunnea, pars distalis per unum longitudinis quadrantem pallide brunnea et leniter per frontem aspera, inter quas est zona angusta paene incolorata; locus affixus in parte conidii media convexa fuscata perspicue visibilis.

Conidial fungi, hyphomycetes. Colonies punctiform, pulvinate, dark brown, hypophyllous. Conidiophores basauxic, mononematous, erect, flexuous, cylindrical, colourless, rounded at the apex, up to 80 μm tall, 4.5-5 μm wide, with conspicuous thick, dark brown septa; arising from obpyriform to ampulliform conidiophore mother cells that are brown at the base and colourless at the apex, 5.5-6.5 μm wide. Conidiogenous cells integrated, terminal or intercalary, mono- to poly-blastic, minutely denticulate, 9-10 X 4.5-5 μm . Conidia solitary, dry, fusiform to navicular, slightly curved and asymmetrical, non-septate (amerosporous), smooth-walled, broadest in the middle, tapering toward the narrowly rounded ends, 20-30 X 6-8.5 μm , proximal three-quarters dark brown, distal quarter pale brown and slightly roughened on the face, with a narrow, almost colourless zone between the lighter and darker parts; point of attachment clearly visible at the mid point of the convex dark region of the conidium. HOLOTYPE: on dead blades of *Andropogon* sp (Poaceae), Kodachadri Hills, Dakshina Kannada District, Karnataka State India, 12 Dec. 1991, D.J. Bhat, DAOM 214595.

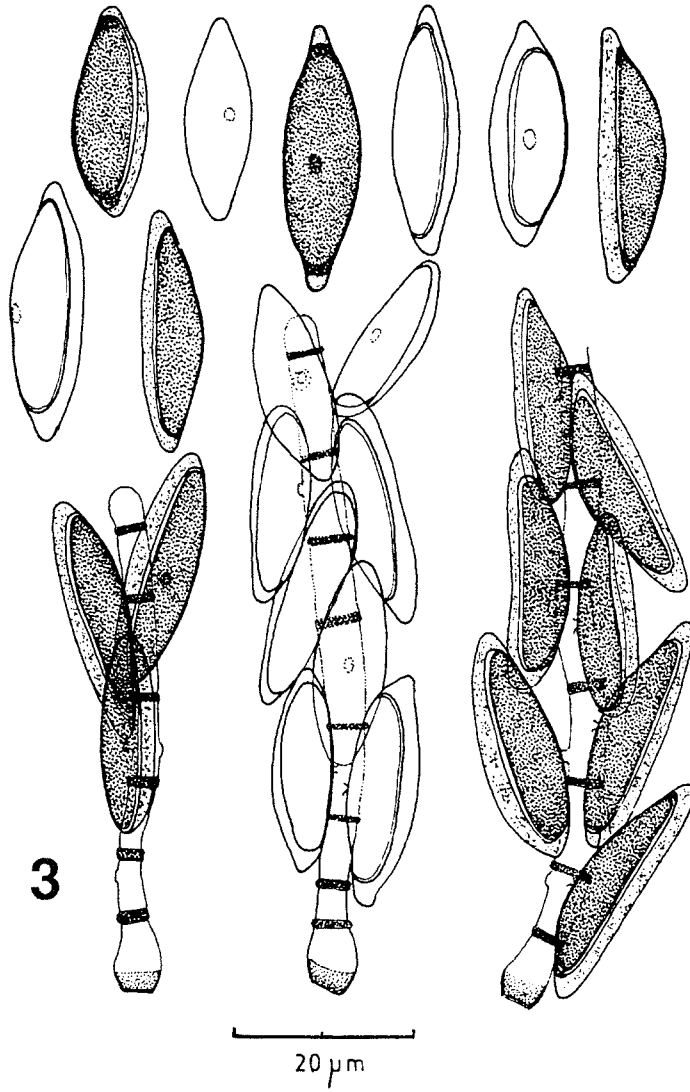


Fig. 3. *Arthriniu mytilomorphu* anam.-sp. nov.
three basauxic conidiophores and clam-shaped conidia.

Teleomorph: unknown.

Because of the distinctive morphology of its conidia, our new species need be compared with only two of the previously described species of *Arthrimum*. The conidia in *A. ushuvaiense* Spegazzini (Ellis, 1971) are only 17-25 X 6-9 μm and are uniformly darkly pigmented, except for a narrow, distal (or peripheral) colourless rim or germ slit. In *A. caricicola* Kunze ex Ficinus & Schubert (Ellis, 1971), the conidia are larger, 30-53 X 7.5-13 μm , and although their pattern of pigmentation is superficially similar to that in *A. mytilomorphum*, the narrow colourless zone is distal, while in *A. mytilomorphum* the corresponding colourless zone is median. The strange, elongate sterile cells (they may be aborted conidia) that arise from the conidiophore axis alongside the conidia of *A. caricicola* and *A. ushuvaiense* are absent from *A. mytilomorphum*.

***Bahusutrabeeja globosa* Bhat & Kendrick anam.-sp. nov. (Fig. 4)**

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae, velutinae. Conidiophora mononematica, erecta, recta vel flexuosa, non-ramosa, usque ad 350 μm alt., 7.5-9.5 μm lat., percurrenter renascentia, 5-12-septata, ad basim inflatam atrobrunnea, apicem versus pallescentia. Cellulae conidiogenae terminales, integratae, monophialidicae, basim versus leniter inflatae, 25-32 X 8-9.5 μm , apertura phialidis 5.5 μm lat., cum collarulo brevissimo, inconspicuo, parum expanso. Conidia blastico-phialidica, globosa ad apicem phialidis in massa mucosa hyalina aggregata, crassitunicata, non-septata, incolorata cum cytoplasmate granuloso, 18-22 μm diam., setulis 9-12, gracilibus, radiantibus, 6.5-12.5 μm long., per superficiem aequabiliter dispositis praedita.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, velvety. Conidiophores mononematous, erect, straight or flexuous, unbranched, up to 350 μm long, 7.5-9.5 μm wide, regenerating percurrently, 5-12-septate, dark brown at the swollen base, slightly paler toward the apex. Conidiogenous cells terminal, integrated, monophialidic, slightly swollen toward the base, 25-32 X 8-9.5 μm , phialide opening 5.5 μm wide, with a very short, inconspicuous, slightly flaring collarette. Conidia blastic-phialidic, globose, accumulating in a slimy colourless mass at the apex of the phialide, thick-walled, non-septate, colourless with granular cytoplasm, 18-22 μm diam., with 9-12 slender, radiating setulae, 6.5-12.5 μm long, distributed evenly over the surface of the conidia.

HOLOTYPE: on decaying twigs, Kudremukh, Karnataka State, India, 2

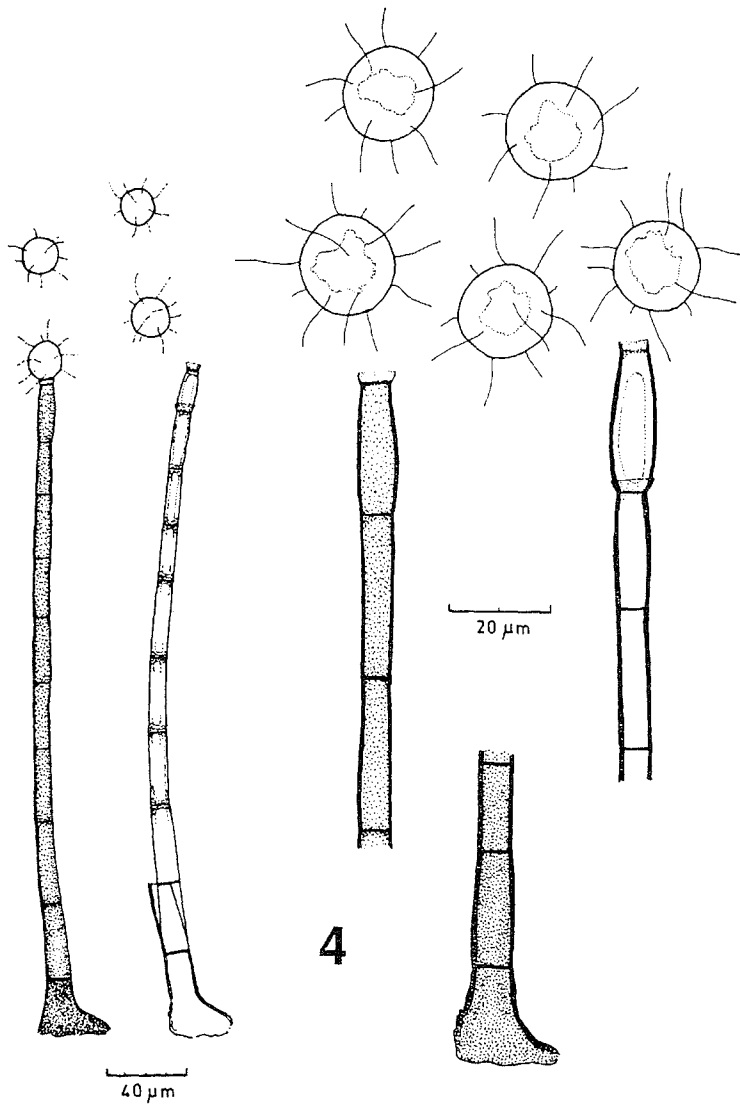


Fig. 4. *Bahusutrabeeja globosa* anam.-sp. nov.:
conidiophores and globose, multi-setulate conidia.

July 1989, D.J. Bhat, DAOM 214596.

Teleomorph: unknown.

In the type species of the genus *Bahusutrabeeja* Subramanian & Bhat, *B. dwaya* Subramanian & Bhat (1977), the first-formed conidia are pear-shaped, while subsequent conidia are globose and smaller. In *B. globosa*, conidia are globose and larger than those of *B. dwaya*. The globose conidia of *B. dwaya* are 12.5-14(-16) μm in diam., while in *B. globosa* they are 18-22 μm diam. This means that conidia of *B. globosa* have almost three times the volume of those of *B. dwaya*. The conidial setulae of *B. dwaya* are 4.5-5 μm long, whereas in *B. globosa* they are 6.5-12.5 μm long. The only other species of *Bahusutrabeeja*, *B. angularis* Rao & de Hoog (1986) has much smaller, angular conidia, appearing 4- or 5-sided, 7-8 μm in diam., with a setula arising from each corner, and with a narrow truncate base.

Beltrania circinata Bhat & Kendrick **anam.-sp. nov.** (Fig. 5)
(Etym. Latin: *circinatus* = made circular)

Ad fungos conidiales, hyphomycetes, pertinet. Coloniae effusae, leniter prominentes, olivaceae vel atrobrunneae, velutinae, hypophyllae. Conidiophora mononematica, 2-6 aggregata, erecta, recta vel flexuosa, crassitunicata, 50-110 μm alt., cellula basali inflata et lobata, 9.5-11.5 μm lat., stipite 4.5-6 μm lat. supra basim, gradualiter dilatato ad 8.5 μm apicem versus, 3-5-septata, non-ramosa; pars inferior laevis et brunnea, pars superior verrucosa et atrobrunnea. Setae numerosae, non-ramosae, erectae, in parte superiore flexuosae, sinuatae, valde curvatae vel circinatae, crassitunicatae, 130-290 μm alt., 4-7-septatae, cellula basali lobata et usque ad 10.5 μm lat., axe 4-6 μm lat. supra basim, attenuato ad 2.5-3 μm lat. apicem versus, infra laeviae et brunneae, supra verrucosae et atrobrunneae. Cellulae conidiogenae terminales, discretae, usque ad 10, verticillatim vel fasciculate ad apicem conidiophori, polyblasticae, globosae vel subglobosae, plerumque non-septatae, interdum 1-septatae, 7-8.5 μm diam., crassitunicatae, laeves, brunneae vel atrobrunneae, 1-4-denticulatae, constrictae ad basim. Conidia sicca, biconica, laevia, non-septata, crassitunicata, brunnea vel atrobrunnea, cum zona aequatoria paene incolorata vel pallide brunnea, margine irregulari, 1.5-2 μm lat., valde contracta et minute rostrata ad apicem, rotundata ad basim, 16-22.5 X 10-12 μm .

Conidial fungi, hyphomycetes. Colonies effuse, slightly raised, olivaceous to dark brown, velvety, hypophyllous. Conidiophores mononematous,

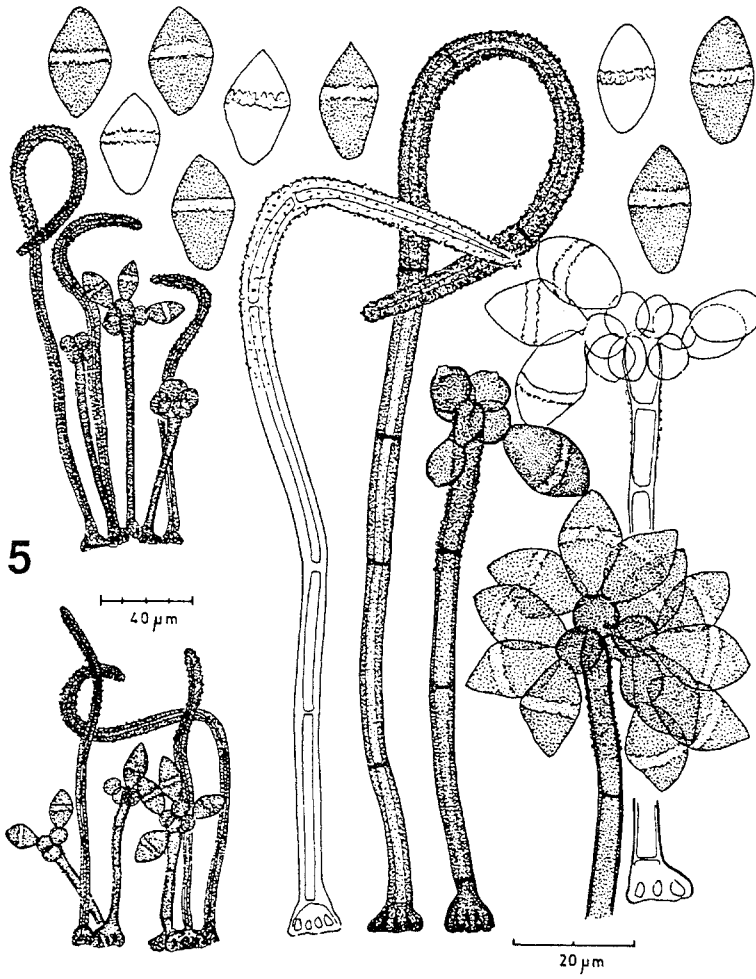


Fig. 5. *Beltrania circinata* anam.-sp. nov.:
circinate setae, conidiophores and biconic conidia.

arising in groups of 2-6, erect, straight or flexuous, thick-walled, 50-110 μm long, inflated and lobed basal cell 9.5-11.5 μm wide, stipe 4.5-6 μm wide above base, widening gradually to 8.5 μm near the apex, 3-5-septate, unbranched; lower part of conidiophores smooth and medium brown, upper part verrucose and dark brown. Setae numerous, unbranched, erect, upper part flexuous, sinuate, strongly curved or circinate, thick-walled, 130-290 μm long, 4-7-septate, basal cell lobed and up to 10.5 μm wide, axis 4-6 μm wide above the base, tapering to 2.5-3 μm wide at the apex, lower half smooth and medium brown, upper half verrucose and dark brown. Conidiogenous cells terminal, discrete, up to 10, developing in whorls or clusters at the conidiophore apex, polyblastic, globose to subglobose, usually non-septate, occasionally 1-septate, 7-8.5 μm diam., thick-walled, smooth, medium to dark brown, 1-4-denticulate, deeply constricted at the base. Conidia solitary, dry, biconic, smooth, non-septate, thick-walled, medium to dark brown, with an almost colourless to pale brown, irregularly edged equatorial band, 1.5-2 μm wide; sharply tapering and minutely beaked at the tip, rounded at the base, 16-22.5 X 10-12 μm .

HOLOTYPE: on decaying leaves of *Terminalia* sp. (Combretaceae), western escarpment of the Kodachadri hills, Dakshina Kannada District, Karnataka State, India, 30 Dec. 1989, D.J. Bhat, DAOM 214597.

Of all known species of *Beltrania* Penzig (Ellis, 1976; Matsushima, 1975; Pirozynski, 1963; Pirozynski and Patil, 1970), verrucose setae are found only in *B. africana* Hughes and *B. mangifera* Manjal and Kapoor. In *B. africana*, the sparsely verrucose setae are straight, and the conidia are very large, 35-45 X 17-20 μm . In *B. mangifera*, setae are of two kinds, both arising from the same radially lobed basal cell: a single central straight, smooth, dark brown, pointed seta surrounded by 2-5 flexuous, pale brown, narrower and slightly taller setae with the upper half distinctly verrucose. In *B. circinata*, all setae are verrucose and apically circinate. *B. onirica* Onofri *et al.* (1981) has smooth, straight setae, and its conidia lack a clearly defined equatorial band.

In a revision of *Beltrania* and related genera, Pirozynski (1963) described the conidiogenous cells as integrated, polyblastic and often associated with almost colourless to pale brown, thin-walled, oval to subglobose, separating cells that usually become detached with the conidia. Subsequent workers have seen these separating cells attached to conidia in all known species of *Beltrania*. It seems possible that the discrete non-caducous conidiogenous cells of *B. circinata* may be derived from the so-called 'separating cells.' Although this character makes *B. circinata*

distinct from the rest of the genus, we do not consider it an adequate reason for disposing this species elsewhere, since its other features are typical of *Beltrania*.

***Cheiropolyschema ghaticum* Bhat & Kendrick *anam.-sp. nov.* (Fig. 6)
(Etym. Hindi: *ghat* = escarpment)**

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae vel nigrae. Conidiophora mononematica, erecta vel prostrata, flexuosa, pallide brunnea vel brunnea, usque ad 30 μm alt., saepe ramos breves fertiles ferentia; rami arete septati, ad septa constricti, torulosi, cellula unaquaeque globosa vel subglobosa, laevis, 3.5-5 μm diam. Cellulae conidiogenae integratae, terminales, monoblasticae, globosae, brunneae usque atrobrunneae, post secessionem conidiorum cupulatae, 4.5-5.5 μm diam. Conidia solitaria, sicca, olivacea vel atrobrunnea, aspectu muriformia (dictyoseptata) sed re vera cheirosporosa, complanata, 12-23 X 10.5-14 μm , semper ex seriebus tribus cellularum contiguas, seriebus externis ad apicem saepe incurvatis; series unaquaeque vulgo ex 3-4 cellulis aequalibus, sed alterum latus interdum brevius quam alterum; cellulae plerumque rectangulares, 4-5 μm diam., cellulae apicales plerumque utrinque rotundatae; cellulae omnino 10-13; cellulae conidiogenae interdum cum socio conidio secedentes.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown to black. Conidiophores mononematous, erect to prostrate, flexuous, pale to medium brown, up to 30 μm long, often bearing short fertile branches, closely septate, deeply constricted at the septa, torulose, each cell globose to subglobose, smooth, 3.5-5 μm diam. Conidiogenous cells integrated, terminal, monoblastic, globose, medium to dark brown, becoming cupulate after conidium secession, 4.5-5.5 μm diam. Conidia solitary, dry, olive-brown to dark brown, appearing dictyoseptate but actually cheirosporous (hand-like), flattened in one plane, 12-23 X 10.5-14 μm , always with 3 contiguous rows of cells, outer rows often apically incurved; each row usually with 3-4 cells of equal length, but the row on one side occasionally shorter than that on the other; cells mostly rectangular, 4-5 μm diam., apical cells often with rounded ends; total number of cells per conidium 10-13; conidiogenous cell sometimes seceding with conidium and remaining attached at its base.

HOLOTYPE: on decaying leaves, Edakumeri, Dakshina Kannada District, Karnataka State, India, 29 Sept. 1989, D.J. Bhat, DAOM 214602.

Teleomorph: unknown.

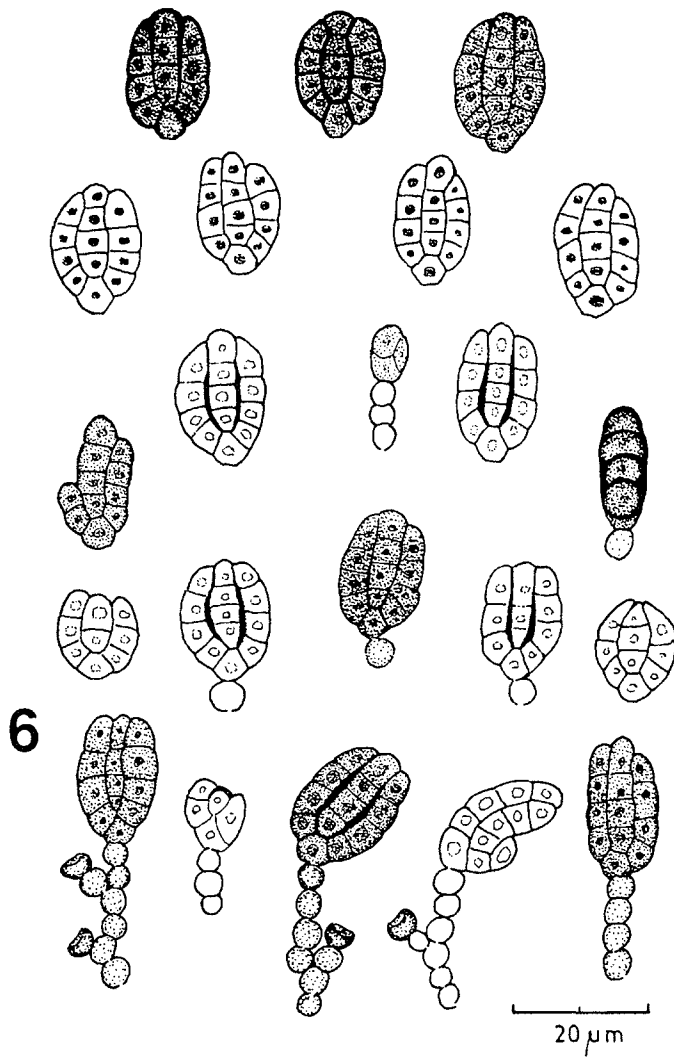


Fig. 6. *Cheiropolyschema ghaticum* anam.-sp. nov.: torulose conidiophores, and cheirosporous conidia.

Cheirosporous conidia are known in a number of genera, including *Cheironiliophora* Tzean & Chen (1990), *Cheiropolyschema* Matsushima (1971), *Dictyosporium* Corda (Bhat and Sutton, 1985b; Ellis, 1971, 1976; Matsushima, 1975) and *Pseudodictyosporium* Matsushima (1975). Conidiogenesis and morphology of conidiogenous cells were important in the delimitation of these genera. Only in *Cheiropolyschema* are the conidia developed on catenulate, spherical conidiogenous cells. *Cheiropolyschema ghaticum* resembles the type species, *C. formosana*, but its conidiogenous cells often become cupulate after conidium secession, a feature also seen in genera such as *Torula* Persoon ex Fries and *Dwayabeeja* Subramanian (Ellis, 1971). Further, the conidiogenous cells often secede with the conidia, as they do in *Dictyosporium gauntii* Bhat & Sutton (1985b).

Craspedodidymum fimbriatum Bhat & Kendrick **anam.-sp. nov.** (Fig. 7)
(Etym. Latin: *fimbriatus* = fringed)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae gregariae, effusae, atrobrunneae, velutinae. Conidiophora mononematica, 4-20 aggregata, erecta, recta, crassitunicata, atrobrunnea, non-ramosa, 150-240 μm alt., 6-7.5 μm lat., 5-8-septata, e stromatibus parvibus ca. 50 μm lat. exorientia. Cellulae conidiogenae terminales, integratae, monophialidicae, clavatae vel cylindrico-clavatae, ad apicem leniter inflatae et rotundatae, brunneae vel atrobrunneae, 25-32 μm long., 5.5-7.5 μm lat. ad basim, 11-13.5 μm lat. supra, apicem versus angustatae, collarulo inconspicuo, expanso, 7.5 μm lat., praeditae. Conidia blastico-phialidica, globosa, non-septata, crassitunicata, brunnea, 18-24 μm diam., cum appendicibus numerosis fibrillosis, curvatis, chlamydem 2-3 μm cr. formantibus; ad apicem conidiophori in massis mucosis incoloratis aggregata, vel post secessionem nonnunquam lateribus cellularum conidiogenerum adhaerentia.

Conidial fungi, hyphomycetes. Colonies gregarious, effuse, dark brown, velvety. Conidiophores mononematous, fasciculate in groups of 4-20, erect, straight, thick-walled, dark brown, unbranched, 150-240 μm tall, 6-7.5 μm wide, 5-8-septate, septa 20-28 μm apart, developing from small stromata about 50 μm wide. Conidiogenous cells terminal, integrated, monophialidic, clavate to cylindric-clavate, slightly inflated and rounded at the apex, medium to dark brown, 25-32 μm long, 5.5-7.5 μm wide at the base, 11-13.5 μm wide above, narrowing toward the apex, which bears an inconspicuous, flared collarette 7.5 μm wide. Conidia blastic-phialidic, globose, non-septate, thick-walled, medium brown, 18-24 μm diam., with

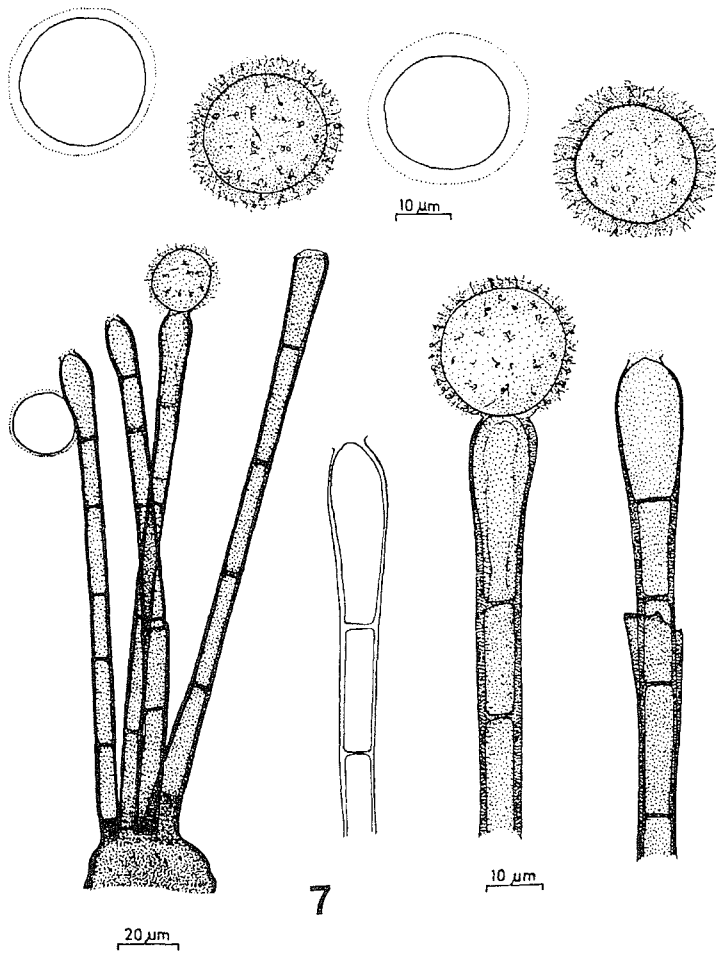


Fig. 7. *Crapedodidymum fimbriatum* anam.-sp. nov.:
stroma, conidiophores and fimbriate conidia.

numerous acellular, fibrillose, curved appendages forming a pile or coat 2-3 μm thick on the surface; accumulating in colourless slimy masses at the apex of the conidiophore, or sometimes adhering to the sides of conidiogenous cells after secession.

HOLOTYPE: on decaying twigs, Shiradi Ghat, Karnataka State, India, 18 Dec. 1988, D.J. Bhat, Herb. DAOM 214598.

Teleomorph: unknown.

Craspedodidymum hyalosporum Bhat & Kendrick *anam.-sp. nov.*

(Etym. Greek: *hyaleos* = glassy, transparent) (Fig. 8)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, pilosae, atrobrunneae vel nigrae. Conidiophora mononematica, ex stromatibus atrobrunneis, 25-45 μm lat., oriunda; erecta, recta vel leniter flexuosa, laevia, crassitunicata, atrobrunnea, non-ramosa, saepe percurrenter renascentia, 180-290 μm alt., ad basim 9-11.5 μm lat., apicem versus attenuata ad 5-7.5 μm lat., 8-12-septata. Cellulae conidiogenae terminales, integratae, monophialidicae, clavatae vel cylindrico-clavatae, 25-38 μm long., 5-6.5 μm lat. ad basim, 8-10 μm lat. in parte superiore, pallide brunneae vel brunneae, collarulo prominenti, tenuitunicati, cupulato et expanso, usque ad 6.5 μm profundo, usque ad 8 μm lat., basi constricto, 4-5 μm lat., praeditae. Conidia blastico-phialidica, brevicylindrica vel late ellipsoidea, utrinque rotundata, laevia, incolorata, 1-septata, interdum leniter constricta ad septum, 8-12.5 X 4-6 μm , ad apicem conidiophori in massis mucosis incoloratis aggregata.

Conidial fungi, hyphomycetes. Colonies effuse, hairy, dark brown to black. Conidiophores mononematous, arising from dark brown stromata 25-45 μm wide, erect, straight or slightly flexuous, smooth, thick-walled, dark brown, unbranched, often percurrently regenerating at cut ends, 180-290 μm tall, 9-11.5 μm wide at the base, tapering to 5-7.5 μm wide above, 8-12-septate, septa 15-25 μm apart. Conidiogenous cells terminal, integrated, monophialidic, clavate to cylindrical-clavate, 25-38 μm long, 5-6.5 μm wide at the base, 8-10 μm wide in the upper half, pale to medium brown, with a prominent, thin-walled, cup-shaped and flared collarette, up to 6.5 μm deep, up to 8 μm wide at the flared open end, distinctly constricted at the base, which is 4-5 μm wide. Conidia blastico-phialidic, short-cylindrical to broadly ellipsoidal, rounded at both ends, smooth, colourless, 1-septate, sometimes slightly constricted at the septum, 8-12.5 X 4-6 μm , accumulating in colourless slimy masses at the conidiophore apex.

HOLOTYPE: on decaying twigs, Edakumeri, Dakshina Kannada District,

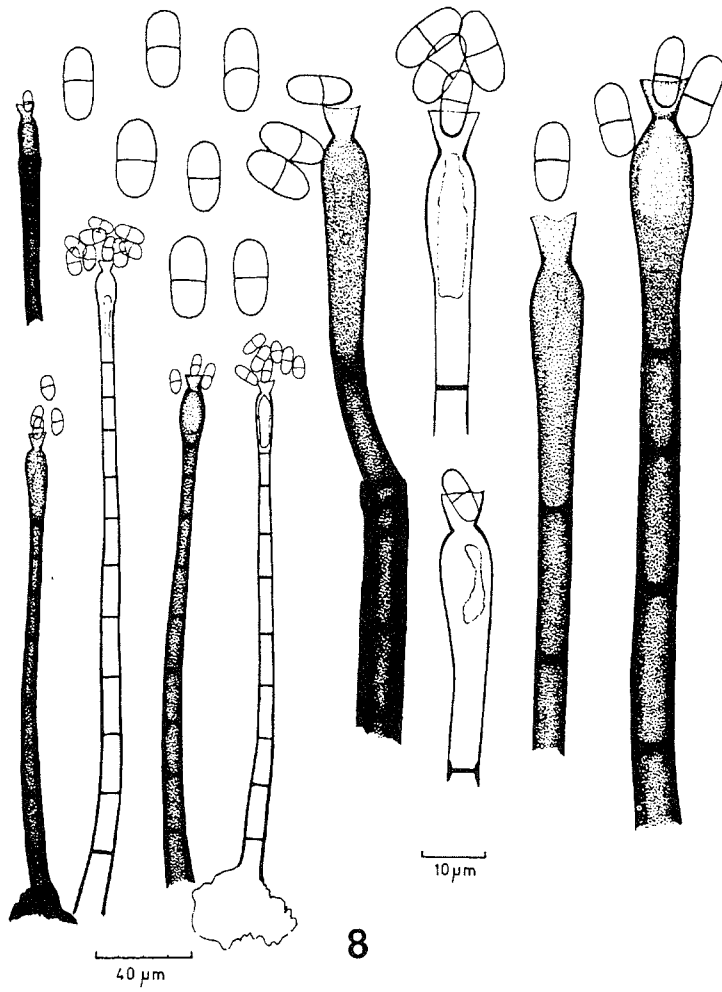


Fig. 8. *Craspedodidymum hyalosporum* anam.-sp. nov.:
conidiophores, apical phialides with collarettes,
and didymosporous conidia.

Karnataka State, India, 5 Oct. 1989, D.J. Bhat, DAOM 214599.
Teleomorph: unknown.

The genus *Craspedodidymum* Holubová-Jechová (1972) is typified by *C. elatum* Holubová-Jechová, which has branched conidiophores terminating in apically inflated phialides with large funnel-shaped collarettes, producing brown, non-septate conidia in slimy heads. Three further species have been described in this genus: *C. abigianense* Lunghini & Onofri (1980), *C. proliferans* Rao & de Hoog (1986), and *C. pulneyensis* Subramanian & Bhat (1987). *Craspedodidymum abigianense* produces lateral as well as terminal collarettes (the conidiogenous cells therefore being polyphialides), and the conidiophores are unbranched. The conidiophores of *C. proliferans* are unbranched, but percurrently proliferating. In *C. fimbriatum*, the collarette is inconspicuous and the slimy, globose, nonseptate conidia have a densely fibrillose surface. In *C. hyalosporum* the conidia are colourless and 1-septate.

We have determined that *C. pulneyensis* Subramanian & Bhat is almost identical with *C. proliferans*, so it may now be regarded as a facultative synonym of *C. proliferans*.

Craspedodidymum proliferans Rao & de Hoog,
Stud. Mycol. 26:64-65 (1986).
= *Craspedodidymum pulneyensis* Subramanian & Bhat,
Kavaka 15:52-54 (1987).

Kirk (1985) described *Dischloridium keniense* P.M. Kirk with unbranched, percurrently proliferating conidiophores terminating in distinct cup-shaped phialidic collarettes and ellipsoidal to obovoid, 1-septate, darkly pigmented conidia. At the time he recognized the similarity of his new taxon to *Craspedodidymum*, but thought it generically distinct from *C. elatum*. The subsequent apparently reasonable expansions of the generic concept of *Craspedodidymum* now make it appropriate to transfer *D. keniense* to this genus.

Craspedodidymum keniense (P.M. Kirk) Bhat & Kendrick
comb. nov.
≡ *Dischloridium keniense* P.M. Kirk, Mycotaxon 23:320-322
(1985).

***Cryptophiale apicalis* Bhat & Kendrick *anam.-sp. nov.* (Fig. 9)**

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, hirsutae, inconspicuae. Mycelium immersum, sparsum, ex hyphis ramosis, septatis, brunneis, ca. 4 μm lat., compositum. Conidiophora mononematica, proprie characteristica; axis principalis setiformis, rectus sed versus apicem modice curvatus, atro-brunneus, laevis, crassitunicatus, usque ad 300 μm long., basi usque ad 40 μm lat., in medio 10-15 μm lat., ad apicem acutus; usque ad 16-septatis, septis infra zonam fertilem 30-38 μm distantibus, in zona fertili 8-14 μm distantibus, apice ultra zonam fertilem 12-25 μm protrudenti. Zona fertilis argute propria, subapicalis et unilateralis, secus curvamen interiorem conidiophorum exoriens, 40-75 μm long., ex tribus monatibus composita: (1) 5-8 axis principalis rami, breves, laterales, axis principalis ad intervalla plus minusve regularia circum peripheriam orientes; hi rami basi leniter constricti, brunnei vel atro-brunnei, modice incurvi, subulati, laeves, 1-2-septati, 30-45 μm long., prope basim 4-7 μm lat.; (2) cellulae steriles plus minusve cylindricae, pallide brunneae, 18-24 X 3-4.5 μm ; (3) cellulae conidiogenae monophialidicae, discretiae, cylindricae, cum apertura angusta fertili, vallum arcte contiguum formantes, sed plerumque cellulis sterilibus absconditae. Conidia falcata, non-septata, laevia, incolorata, 9-14 X 1.5-2 μm , in massis mucosis incoloratis aggregata.

Conidial fungi, hyphomycetes. Colonies effuse, hairy, inconspicuous. Mycelium immersed, sparse, composed of branched, septate, brown hyphae, about 4 μm wide. Conidiophores mononematous, differentiated; main axis setiform, erect but gently curved near the apex, dark brown, smooth, thick-walled, up to 300 μm long, up to 40 μm wide at the base, 10-15 μm wide in the middle, tapering to a pointed tip; up to 16-septate, septa 30-38 μm apart below the discrete fertile zone, 8-14 μm apart in the fertile zone, apex protruding 12-25 μm beyond the fertile zone. Fertile zone sharply delimited, subapical and unilateral, arising along the inner curve of the conidiophore, 40-75 μm long, composed of three elements: (1) a series of 5-8 short, lateral branches of the main axis arising at more or less regular intervals around the periphery; these branches slightly constricted at the base, brown to dark brown, gently incurved, subulate, smooth, 1-2-septate, 30-45 μm long, 4-7 μm wide near the base; (2) more or less cylindrical, pale brown, sterile cells 18-24 X 3-4.5 μm ; (3) conidiogenous cells that are monophialidic, discrete, cylindrical, with a narrow fertile aperture, and in a tightly packed palisade, but generally obscured by the sterile cells. Conidia falcate (curved and pointed at both ends), non-septate (amerosporous), smooth-walled, colourless, 9-14 X 1.5-

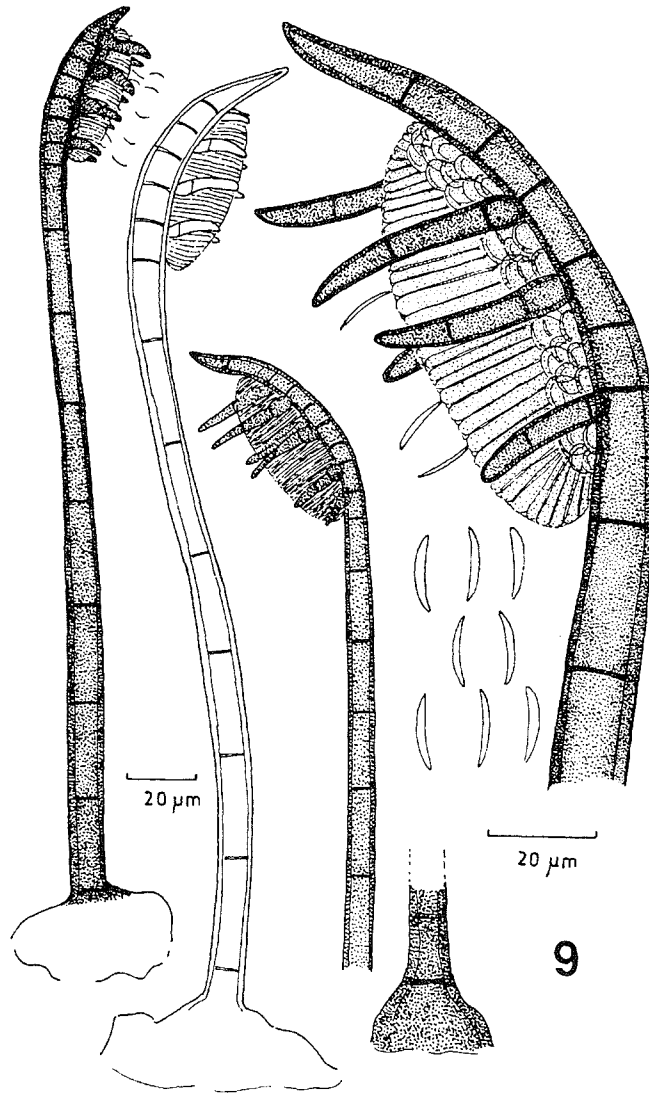


Fig. 9. *Cryptophiale apicalis* anam.-sp. nov.: setose conidiophores with sub-apical, unilateral fertile zone, and falcate, amerosporous conidia.

2 µm, accumulating in colourless mucus.

HOLOTYPE: on dead leaves of *Vateria indica* L. (Dipterocarpaceae), Shiradi Ghat, Dakshina Kannada District, Karnataka State, India, D.J. Bhat, 16 Aug. 1989. DAOM 214248.

Teleomorph: unknown.

***Cryptophiale verrucosa* Bhat & Kendrick anam.-sp. nov.** (Fig. 10)

(Etym. Latin: *verrucosus* = warty)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, hirsutae, inconspicuae. Mycelium immersum, ex hyphis ramosis, septatis, brunneis, ca. 4.5 µm lat., compositum. Conidiophora mononematica, proprie characteristica; axis principalis setiformis, rectus sed versus apicem modice curvatus, atro-brunneus, laevis, crassitunicatus, usque ad 260 µm long., basi 20-32 µm lat., in medio 10-12 µm lat., ad apicem acutus; usque ad 16-septata, septis infra et supra zonam fertilem 25-32 µm distantibus, in zona fertili 8-15 µm distantibus, apice ultra zonam fertilem 50-90 µm protrudenti. Zona fertilis argute propria, medialis et unilaterialis, secus curvamen interiorem conidiophorum exoriens, 50-80 µm long., ex tribus monatibus composita: (1) 4-8 axis principalis rami, breves, laterales, axis principalis ad intervalla plus minusve regularia circum peripheriam orientes; hi rami basi leniter constricti, pallide brunnei vel brunnei, modice incurvi, subulati, conspicue verrucosi, 2-3-septati, 45-90 µm long., 5-9 µm lat. prope basim; (2) cellulae steriles plus minusve cylindricae, pallide brunneae, 18-25 X 2.5-4.5 µm; (3) cellulae conidiogae monophialidicae, discretae, cylindricae, cum apertura angusta, vallum arcte contiguum formantes, sed plerumque cellulis sterilibus absconditae. Conidia falcata, non-septata, laevia, incolorata, 9-12 X 1.5-2 µm, in massis mucosis incoloratis nata.

Conidial fungi, hyphomycetes. Colonies effuse, hairy, inconspicuous. Mycelium immersed, composed of branched, septate, brown hyphae about 4.5 µm wide. Conidiophores mononematous, highly differentiated, main axis erect but slightly to distinctly curved in the middle, brown to dark brown, smooth, thick-walled, up to 260 µm long, 20-32 µm wide at the bulbous base, 10-12 µm wide in the middle, tapering to a pointed tip; up to 16-septate, with septa 25-32 µm apart in the apical and basal sterile regions, 8-15 µm apart in the median fertile zone, apex protruding 50-90 µm above the fertile zone. Fertile zone sharply delimited, median and unilateral, arising along the inner curve of the conidiophore, 50-80 µm long, composed of three elements: (1) a series of 4-8 short lateral branches of the main axis arising at more or less regular intervals around

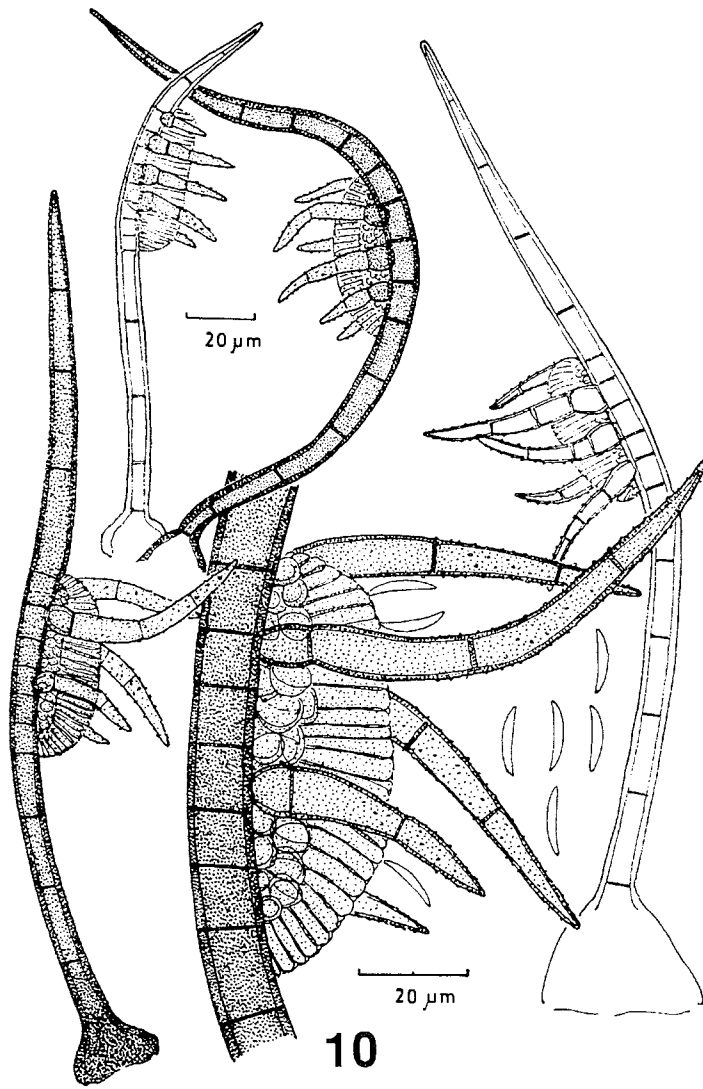


Fig. 10. *Cryptophiale verrucosa* anam.-sp. nov.:
setose conidiophores, median, unilateral fertile zone,
verrucose branches, and falcate conidia.

the periphery, these branches pale brown to brown, slightly constricted at the base, slightly to distinctly curved, subulate, distinctly warty, 2-3-septate, 45-90 μm long, 5-9 μm wide near the base; (2) a palisade of sterile, flat, cylindrical, pale brown cells, 18-25 X 2.5-4 μm ; (3) conidiogenous cells that are monophialidic, discrete, cylindrical, with a narrow fertile aperture, in a tightly packed palisade, but generally obscured by the sterile tissue. Conidia falcate, non-septate, smooth-walled, colourless, 9-12 X 1.5-2 μm , accumulating in colourless slimy masses.

HOLOTYPE: on dead leaves of *Vateria indica* L. (Dipterocarpaceae), Sampaje Ghat, Kodagu District, Karnataka State, India, D.J. Bhat, 23 Nov. 1989, DAOM 214249.

Teleomorph: unknown.

Pirozynski (1968) introduced the generic name *Cryptophiale* for two distinctive fungi, which were described as *C. kakombensis* Pirozynski (the type species) on dead leaves of *Baphia* sp. from Tanzania, and *C. udagawae* Pirozynski & Ichinoe on dead leaves of *Quercus* sp. from Japan. The genus was characterized as having tall, dark, setose, apically branched conidiophores with a discrete lateral fertile zone consisting of a patch of pigmented sterile tissue bearing a tightly packed palisade layer of pigmented phialides, each giving rise to a succession of colourless, lunate or falcate, slimy conidia. Kirk & Sutton (1985), in a reassessment of the anamorph genus *Chaetopsina* Rambelli and closely related taxa, limited *Cryptophiale* to anamorphic fungi with sessile conidiogenous cells borne unilaterally and in a submedian position on setiform, apically unbranched or branched conidiophores, and obscured by a palisade of shield-shaped sterile cells. If this generic concept is accepted, nine described species fit the genus: *C. kakombensis* Pirozynski and *C. udagawae* Pirozynski & Ichinoe (Pirozynski, 1968), *C. guadalcanalensis* Matsushima (1971), *C. iriomoteana* Matsushima (1975), *C. manifesta* Sutton & Hodges (1976), *C. minor* Farr (1980), *C. aristata* Kuthubutheen & Sutton (1985), *C. cucullata* Kuthubutheen (1987) and *C. enormis* Sutton, Nawawi & Kuthubutheen (1989). Using characters derived from the morphology of the conidiophores, fertile zones and conidia, Sutton *et al.* (1989) published a dichotomous key to the known species of *Cryptophiale*.

Although *C. apicalis* and *C. verrucosa* have similar conidia and conidiogenous cells, the fertile zone in *C. apicalis* is subapical, while that in *C. verrucosa* is median on the conidiophore. The lateral branches of *C. apicalis* are smooth-walled, 30-45 μm long and dark brown, whereas

in *C. verrucosa* they are distinctly verrucose, 45-90 μm long and mid-brown. Several collections have been made of both of our new species: these specimens confirm the stable nature of the interspecific differences.

Both new species can be readily distinguished from the other nine species of *Cryptophiale*. Our species have conidiophores that branch subterminally, and exclusively on one side. In six of the other nine species the conidiophore axes are unbranched; in the remaining three (*C. udagawae*, *C. guadalcanalensis* and *C. cucullata*) the conidiophores branch apically and dichotomously.

Chaetopsina ramifera Matsushima (1971) and *C. splendida* Sutton & Hodges (1976) resemble *Cryptophiale verrucosa* and *C. apicalis* in having 5-7 branches of the conidiophore axis arising in association with the fertile zone. However, in the *Chaetopsina* species the branches are not spaced around the periphery of the zone, but are grouped above that zone. In the *Chaetopsina* species the fertile zone is not palisade-like, and it lacks the shield-like sterile cells so evident in species of *Cryptophiale*.

Rambelli and Onofri (1987) emended the generic diagnosis of *Xenokylindria* Di Cosmo *et al.* (1983) to accommodate mononematous hyphomycetous anamorphs with percurrently proliferating conidiogenous cells. They proceeded to describe *X. ciliata* Onofri & Rambelli, which had non-septate, bisetulate conidia that they believed arose from percurrently proliferating conidiogenous cells. Unfortunately, although their line-drawings showed annellations at the narrow tip of the conidiogenous cells, their photomicrographs did not provide any confirmation of this. In principle, percurrent proliferations should result in increase in length of the conidiogenous cells, but the illustrations given by Onofri and Rambelli do not show this. It is also usual for setulate conidia to be produced from phialides. We have collected a fungus from the Western Ghats which is clearly identical with the one they found in the Ivory Coast. We have examined the fungus for any sign of percurrent proliferation and the resultant annellations, but failed to find any: the collarettes are all of the same length, and show no sign of annular scars. It would therefore appear that this fungus would be best disposed in *Dictyochaeta* Spegazzini, and we make the requisite combination.

***Dictyochaeta ciliata* (Onofri & Rambelli) Bhat & Kendrick comb. nov.**
(Fig. 11)

= *Xenokylindria ciliata* Onofri & Rambelli, Trans. Brit. mycol.
Soc. 88: 397. 1987.

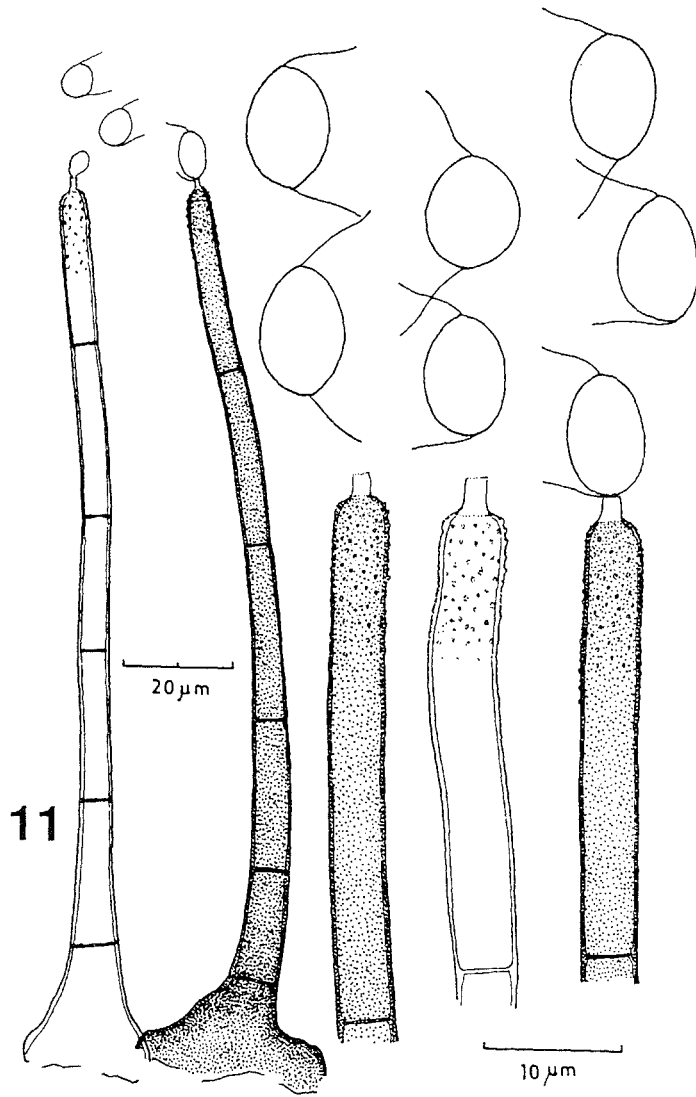


Fig. 11. *Dictyochaeta ciliata* comb. nov.:
conidiophores and bisetulate, amerosporous conidia.

Conidial fungi, hyphomycetes. Colonies effuse, pale brown to brown, hairy. Mycelium mostly immersed, partly superficial, composed of branched, septate, pale brown to brown hyphae 2.5-4 μm wide. Setae absent. Conidiophores differentiated, erect, straight or slightly curved, smooth, thick-walled, up to 6-septate, unbranched, dark brown to black at the base, brown at the apex, up to 160 μm tall, 15-20 μm wide at the base, 5-8.5 μm wide above. Conidiogenous cells blastic-phialidic, terminal, integrated, determinate, upper half distinctly verrucose, smooth below, with a narrow, cylindrical, colourless collarette, 2-3 μm deep, 1-2 μm wide. Conidia slimy, ellipsoidal, smooth, colourless, non-septate, 6.5-10.5 X 6-8 μm , with a single setula, 5-8 μm long, at each end; lower setula arising at right angles to the conidium axis. Conidia accumulating in colourless slimy droplets.

Specimen examined: on dead leaves of *Cinnamomum* sp. (Lauraceae), Kudremukh, Karnataka State, India, D.J.Bhat, 2 July 1989, DAOM 214600.

Teleomorph: unknown.

***Dictyochaeta tropicalis* Bhat & Kendrick *anam.-sp. nov.* (Fig. 12)**

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, pilosae, griseo-brunneae, velutinae. Conidiophora mononematica, erecta, recta vel flexuosa, non-ramosa, laevia, 5-6-septata, infra atrobrunnea, superne pallide brunnea, 90-130 μm alt., basim versus exigue vel conspicue inflatam ad 17 μm lat., ad apicem 4.5-6 μm lat. Cellulae conidiogenae terminales, integratae, monophialidicae, cylindricae, supra leniter latiores, 15-25 μm long, 6-7.5 μm lat., cum collarulo apicali 2-2.5 μm alt. et 3 μm lat., conidia iterum atque iterum in loco eodem producentes. Conidia blastica-phialidica, non-septata, ellipsoidea vel guttuliformia, versus apicem attenuata, basi truncata vel obtusa, 7.5-9.5 X 3-5 μm , incolorata, laevia, utrinque una setula praedita; setula apicalis arrecta, 2.5-3 μm long., velut extensio apicis conidii attenuati oriunda; setula basalis curvata, usque ad 3.5 μm long., excentrica; ad apicem cellularum conidiogenarum in massis mucosis incoloratis aggregata.

Conidial fungi, hyphomycetes. Colonies effuse, hairy, greyish brown, velvety. Conidiophores mononematous, erect, straight or flexuous, unbranched, smooth, 5-6-septate, dark brown below and pale brown above, 90-130 μm tall, up to 17 μm wide at the slightly to conspicuously swollen base, 4.5-6 μm wide above. Conidiogenous cells terminal, single, integrated, monophialidic, cylindrical, slightly wider above, 15.5-25 X 6-7.5 μm , with a flared apical collarette 3 μm wide and 2-2.5 μm deep,

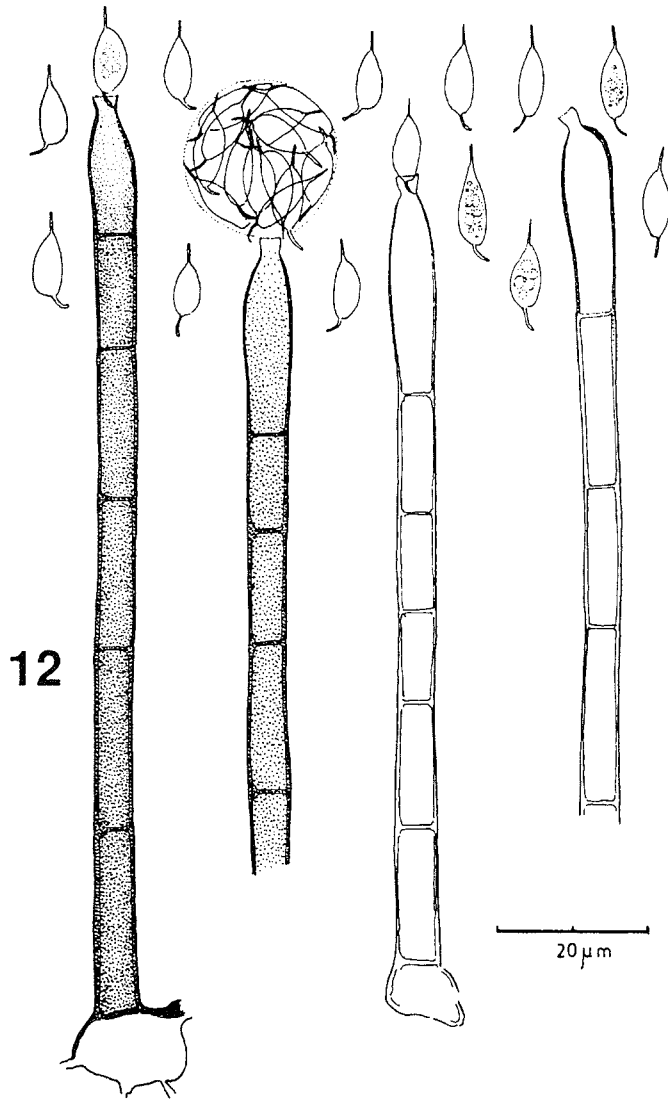


Fig. 12. *Dictyochaeta tropicalis* anam.-sp. nov.:
conidiophores, apical phialides,
and bisetulate, atherosporous conidia.

producing a basipetal succession of conidia without any extension growth of the conidiogenous cell. Conidia blastic-phialidic, non-septate, ellipsoid to drop-shaped, tapering to a pointed apex, truncate to obtuse at the base, 7.5-9.5 X 3-5 μm , colourless, smooth, with a setula at each end: apical setula straight, 2.5-3 μm long and arising as an extension of the tapering conidium apex; basal setula curved, up to 3.5 μm long and arising from one side of the broadly truncate base, accumulating in a slimy droplet at the apex of the phialide.

HOLOTYPE: on dead leaves, Mt. Harriet, South Andaman Island, India, 4 May 1990, D.J. Bhat, DAOM 214601.

Teleomorph: unknown.

Dictyochaeta tropicalis is unique in its ellipsoidal to drop-shaped, colourless, bisetulate conidia produced on monophialidic conidiophores bearing distinct collarettes. The apical setula is always straight, the basal setula curved. Kuthubutheen and Nawawi (1991b) have recently provided a key to 69 species so far described in *Dictyochaeta* Spegazzini and *Codinaea* Maire (Hughes and Kendrick, 1968; Gamundi *et al.*, 1977). Following Arambarri and Cabello (1989), Kuthubutheen and Nawawi regarded 59 species as appropriately disposed in *Dictyochaeta*. Arambarri and Cabello (1989) had maintained the remaining 10 species in *Codinaea* because these had branched conidiophores with distinct conidiogenous cells. The species these authors kept in *Codinaea* are indeed distinct from those placed in *Dictyochaeta*, but neither Arambarri and Cabello nor Kuthubutheen and Nawawi included among them the type species of *Codinaea*, *C. aristata*. It is illegitimate to exclude the type species from a genus while maintaining the original generic name for other species, and if the ten species are to be maintained as a distinct anamorph-genus, a new generic name must be provided for them.

In most species of *Dictyochaeta* the setulate conidia are falcate or lunate, and pointed at both ends. The conidiogenous cells are usually polyphialides (sympodially proliferating phialides with two to several conidiogenous apertures which function successively). *Dictyochaeta tropicalis* belongs in the second group delineated by Kuthubutheen and Nawawi, having non-septate, setulate conidia. It differs from other species in that group in several ways: (1) no polyphialides have been seen, (2) setae are absent, (3) the conidia are not falcate, (4) the conidia are smaller than those of otherwise similar species [*D. apiculata* Matsushima, *D. parva* Holubová-Jechová, *D. tilikfrei* Bhat & Sutton, and *D. vulgaris* (Hughes & Kendrick) Cabello & Arambarri (Arambarri and Cabello, 1989)].

***Dischloridium regenerans* Bhat & Kendrick anam.-sp. nov.** (Fig. 13)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae, pilosae, velutinae. Conidiophora mononematica, erecta, recta vel flexuosa, usque ad 300 μm alt., 8-10 μm lat., 4-7-septata, septis 20-30 μm distantibus, non-ramosa, in dimidio inferiore vulgo verrucosa, crassitunicata, cylindrica, atrobrunnea, versus apicem pallescentiora, semel vel bis percurrenter extensa. Cellulae conidiogenae solitariae, integratae, terminales, monophialidicae, 70-100 X 8-10 μm , cylindricae, brunneae, apicis pariete periclinali leniter incrassato sine collarulo conspicuo. Conidia amerospora (non-septata), cylindrica vel ellipsoidea, apice obtusa, basi anguste truncata, crassitunicata, laevia, incolorata, 25-38 X 12-16 μm , ad apicem phialidis in massis mucosis incoloratis aggregata.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, hairy, velvety. Conidiophores mononematous, differentiated, erect, straight or flexuous, up to 300 μm tall, 8-10 μm wide; 4-7-septate, septa 20-30 μm apart, unbranched, mostly verrucose in the lower half, thick-walled, cylindrical, dark brown, paler toward the apex, with 1-2 percurrent proliferations, up to 300 μm long, 8-10 μm wide. Conidiogenous cells integrated, terminal, monophialidic, 70-100 X 8-10 μm , cylindrical, medium brown, apical periclinal wall slightly thickened, but with no conspicuous collarete, 70-100 μm long, 8-10 μm wide. Conidia blastiphialidic, cylindrical to ellipsoidal, obtuse at the apex, narrower and truncate at the base, non-septate, thick-walled, smooth, colourless, 25-38 X 12-16 μm , accumulating in colourless to whitish slimy masses.

HOLOTYPE: on dead twigs of a strangler fig (*Ficus* sp., Moraceae), Mt. Harriet, South Andaman Island, 4 May 1990, D.J. Bhat, DAOM 214603. Teleomorph: unknown.

The generic name *Dischloridium* was introduced by Sutton (1977) for *Chloridium laeense* Matsushima (1971), originally described on leaves from Papua-New Guinea. Holubová-Jechová (1990) listed 7 species of *Dischloridium*, of which 4 have non-septate conidia. Of these, only *D. laeense* (Matsushima) Sutton (1977) and *D. roseum* (Petch) Seifert & Gams (1985) are close to *D. regenerans* in conidium shape and dimensions. The conidia of *D. regenerans* are almost as large as those of *D. roseum*, but shaped like the much smaller conidia of *D. laeense*. In addition, the lower half of the percurrently regenerating conidiophores of *D. regenerans* is often verrucose.

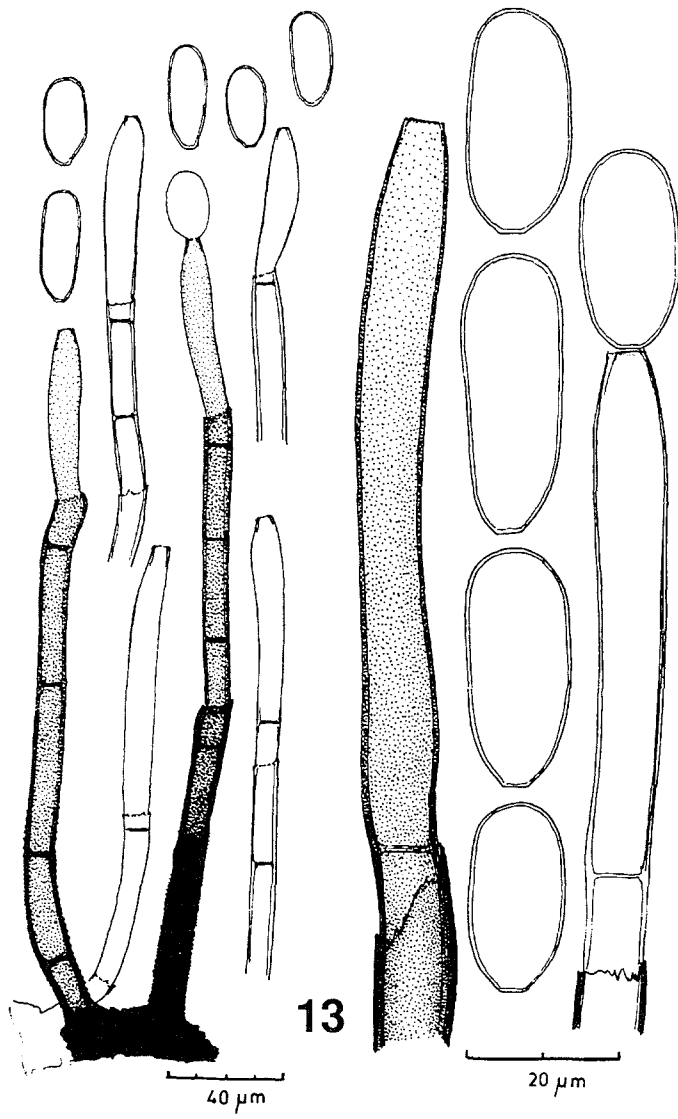


Fig. 13. *Dischloridium regenerans* anam.-sp. nov.:
conidiophores and amerosporous conidia.

Fusichalara goanensis Bhat & Kendrick **anam.-sp. nov.** (Fig. 14)
(Etym. = pertaining to Goa State in India)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, brunneae, lanatae. Mycelium plerumque immersum, ex hyphis ramosis, septatis, 3.5-5 μm lat. compositum. Conidiophora mononematica, 2-4 in fasciculis enata, non-ramosa, arrecta, recta, brunnea vel aureo-brunnea, apicaliter pallescentiora, laevia, cylindrica vel subcylindrica, 3-4-septata, 80-110 μm long., 6-8.5 μm lat. Cellulae conidiogenae monophialidicae, cylindricae vel subcylindricae, 60-72 μm long., ventre parum inflato, 25-38 X 6.5-8.2 μm , et collarulo profundo 18-24 X 6.5-8 μm praeditae. Conidia mucosa, plus minusve cylindrica, apice rotundata, basi truncata, incolorata, laevia; conidorum sunt 2 formae: conidia priora 3-septata, 17-22 X 5-6 μm ; conidia cetera 1-septata, 12-15 X 4.5-5.5 μm , saepe in pseudo-catenis facile secedentibus nata.

Conidial fungi, hyphomycetes. Colonies effuse, brown, hairy. Mycelium mostly immersed, composed of branched, septate, hyphae 3.5-5 μm wide. Conidiophores macronematous, mononematous, arising in fascicles of 4-5, simple, erect, straight, brown to golden brown, apically paler, smooth, cylindrical to subcylindrical, 3-4-septate, 80-110 μm long, 6-8.5 μm wide. Conidiogenous cells monophialidic, cylindrical to subcylindrical, 60-72 μm long, with slightly inflated venter, 25-38 X 6.5-8.2 μm and a deep cylindrical collarette 18-24 X 6.5-8 μm , minutely flared only at the rim. Conidia slimy, nearly cylindrical, rounded at the apex, truncate at the base, colourless, smooth, of two kinds; first-formed conidia 3-septate, 17-22 X 5-6 μm ; subsequent conidia 1-septate, 12-15 X 4.5-5.5 μm , often in readily seceding false chains.

HOLOTYPE: on decaying twigs, Cotigao Wildlife Sanctuary, Goa State, India, 14 July 1991, D.J. Bhat, DAOM 214604.

Teleomorph: unknown.

The genus *Fusichalara* was established by Hughes and Nag Raj (1973) for three *Chalara*-like anamorphic fungi: *F. dimorphospora* Hughes & Nag Raj (the type species), *F. dingleyae* Hughes & Nag Raj, and *F. novae-zelandiae* Hughes & Nag Raj. These differed from *Chalara* in the presence of a pronounced wall-thickening inside the phialide at the base of the collarette, and in producing two morphologically different kinds of conidia. Gams and Holubová-Jechová (1976) added another species, *F. minuta* Hol.-Jech., and a fifth, *F. clavatispora* P.M.Kirk apud Kirk and Spooner, was added in 1984. Our new species invites comparison only with *F. dingleyae* and *F. clavatispora*. *Fusichalara dingleyae* can be

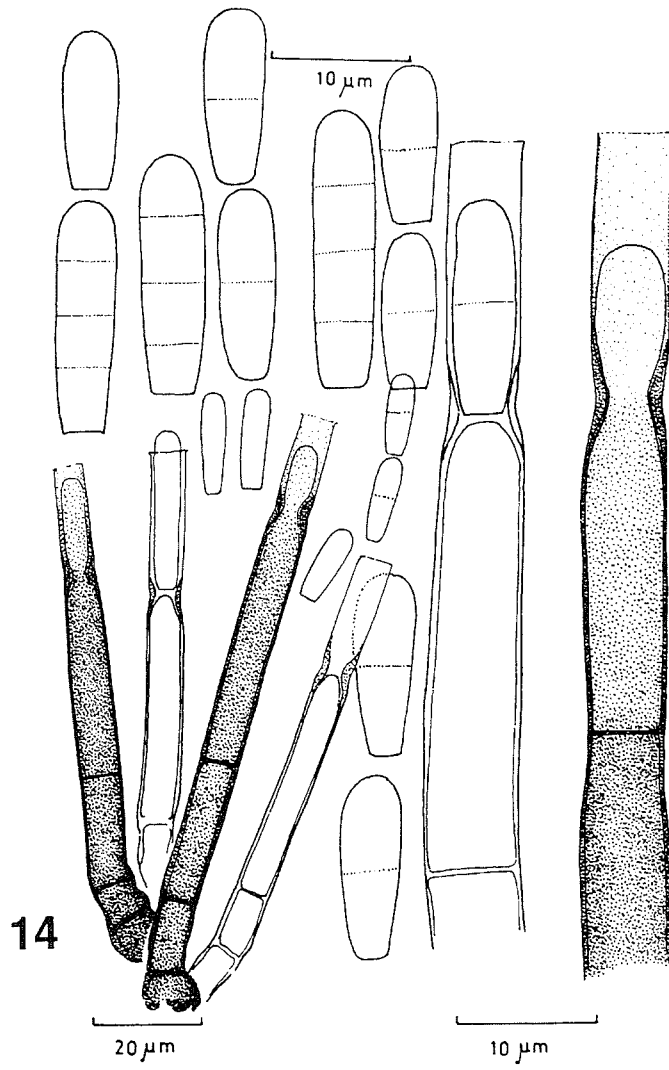


Fig. 14. *Fusichalara goanensis* anam.-sp. nov.:
conidiophores with integrated apical phialides
and phragmosporous conidia.

differentiated from *F. goanensis* as follows: (1) its conidiophores are distinctly verrucose; (2) its primary conidia are much longer (up to 84 μm long and up to 7-septate); (3) its secondary conidia are fusiform. *F. clavatispora* can be distinguished from *F. goanensis* as follows: (1) the venter of its phialide is rather swollen and ellipsoidal; (2) there is no clear distinction between the first-formed and subsequent conidia, all are 1-3-septate and 12-16 X 3.5-4 μm ; in *F. goanensis*, first-formed conidia are 3-septate and 17-22 X 5-6 μm ; subsequent conidia are 1-septate, and 12-15 X 4.5-6.5 μm .

***Hyphopolynema stilboideum* Bhat & Kendrick *anam.-sp. nov.* (Fig. 15)**
(Etym. Latin: *stilbius* = shining)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae, pilosae, velutinae, hypophyllae. Conidiomata synnemata, conspicua, erecta, atrobrunnea, 550-1250 μm alt., usque ad 110 μm lat. ad basim, usque ad 25 μm lat. in medio et supra, in caput fertile usque ad 45 μm lat. terminantia, ex conidiophoris adhaerentibus, parallelis, septatis, ramosis, brunneis, 3.5-4.5 μm lat., composita. Cellulae conidiogenae terminales, integratae, monophialidicae, cylindricae vel subcylindricae, parum latiores in medio quam utrinque, incoloratae usque subhyalinae, 30-40 X 3-4.5 μm , apertura phialidica 2.5 μm lat., collarulo inconspicuo, pariete periclinali incrassato praeditae. Conidia blastico-phialidica, fusiformia vel ellipsoidea, basi rotundata, apice leniter attenuata, 1-septata, ad septum leniter constricta, incolorata, laevia, 13-19 X 5-7 μm ; una setula apicalis 8-10 μm long., et quattuor setulae similes, 8-15 μm long., aequidistantes circa basim; conidia in massis mucosis incoloratis aggregata.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, hairy, velvety, hypophyllous. Conidiomata synnematal, determinate, conspicuous, erect, dark brown, 550-1250 μm tall, up to 110 μm wide at the base, up to 25 μm wide in the middle and above, terminating in a fertile head up to 45 μm wide, composed of tightly adherent, parallel, septate, branched, brown conidiophores, 3.5-4.5 μm wide. Conidiogenous cells terminal, clustered, integrated or discrete, monophialidic, cylindrical to subcylindrical, slightly wider in the middle than at either end, colourless to almost colourless, 30-40 X 3-4.5 μm , phialide aperture 2.5 μm wide, with an inconspicuous collarette, and some periclinal thickening. Conidia blastic-phialidic, fusiform to ellipsoid, base rounded, apex slightly tapered, 1-septate, very slightly constricted at the septum, colourless, smooth, 13-19 μm long, 5-7 μm wide, with 1 apical setula 8-

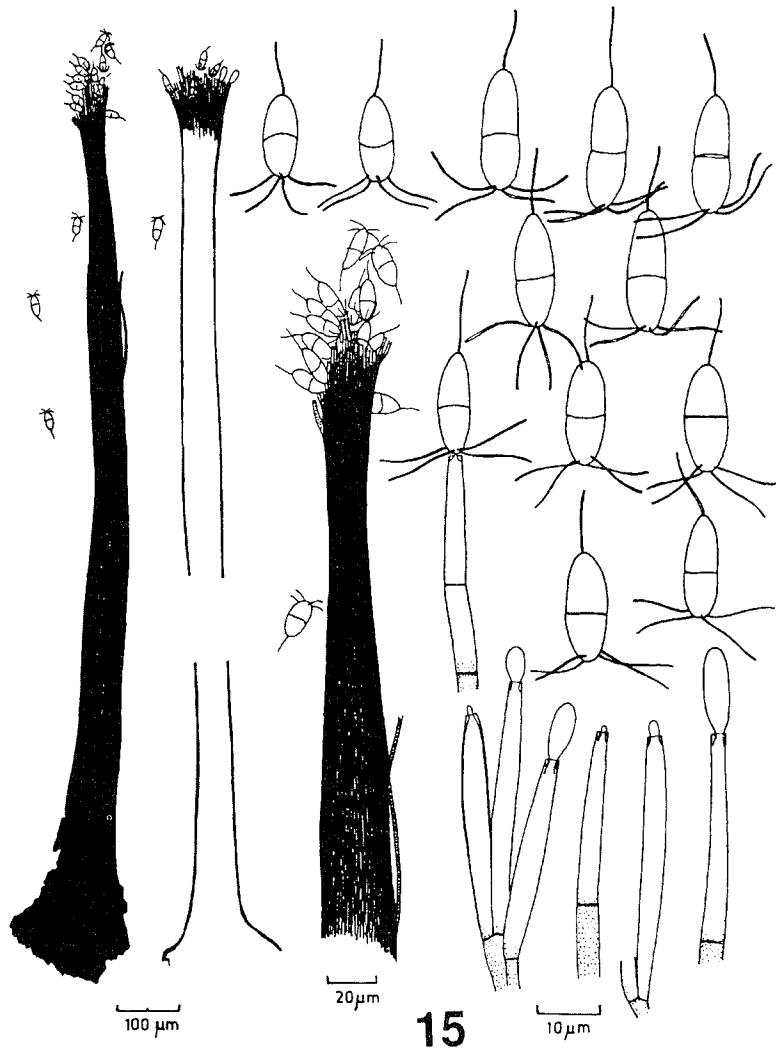


Fig. 15. *Hyphopolynema stilboideum* anam.-sp. nov.:
synnematal conidiomata, phialidic conidiogenous cells,
and setulate, didymosporous conidia.

10 μm long, and with 4 similar setulae, 8-15 μm long, arising evenly spaced around the base; conidia accumulating in reflective, colourless slimy masses.

HOLOTYPE: on dead leaves of *Syzygium* sp. (Myrtaceae), Kodachadri Hills, Dakshina Kannada District, Karnataka State, India, 30 Dec. 1991, D.J. Bhat, DAOM 214605.

Teleomorph: unknown.

Several genera of synnematosus hyphomycetes with setulate phialoconidia have been described (Ellis, 1971, 1976; Carmichael *et al.*, 1980; Mercado and Portales, 1985). The presence of setae in the synnemata, the shape of the conidia, and the number and position of the setulae have been given considerable importance in drawing generic distinctions. In *Thozetella nivea* Kuntze, the type species of *Thozetella*, the synnema has small, setoid structures called microawns, the colourless conidia are falcate and non-septate, and they have 1 setula at each end. In *Phialosporostilbe turbinata* Mercado & Portales, the type species of *Phialosporostilbe*, the colourless conidia are turbinate, and have 3 apical setulae and often 1 basal setula (see Fig. 17, of the similar *P. setosa*). In *Menisporopsis theobromae* Hughes, the type species of *Menisporopsis*, the synnema has a single large seta, the colourless conidia are falcate and non-septate, and they have 1 setula at each end. However, in *Menisporopsis pleioisetosa* Rao & de Hoog (1986), although the large seta characteristic of the genus is present, the colourless, non-septate conidia are obturbinate and have 1 apical and 2-4 basal setulae. This poses a taxonomic problem. In almost every character other than the large seta and the non-septate conidia, *M. pleioisetosa* resembles what we have named *Hyphopolynema stilboideum*. The other species of *Hyphopolynema* Nag Raj (Nag Raj, 1977; Sutton and Alcorn, 1984), are sporodochial, but in each case the characters of the conidiogenous cells and conidia are similar, each conidium bearing 1 apical and 2-4 basal setulae. It may become expedient to erect a new genus for *H. stilboideum* and *M. pleioisetosa* at some point, if other as yet undiscovered species form a group with them, and the difference between synnemata and sporodochia is perceived as a natural taxonomic hiatus.

***Kostermansinda andamanensis* Bhat & Kendrick anam.-sp. nov.**

(Etym. = pertaining to the Andaman Islands) (Fig. 16)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae atrobrunneae, velutinae. Conidiomata synnemata, erecta, atrobrunnea usque ad 420 μm alt., 40-70 μm lat. ad basim, 15-30 μm lat. in medio e supra, apice in capitulum fertile expanso et 90 μm lat., ex conidiophori

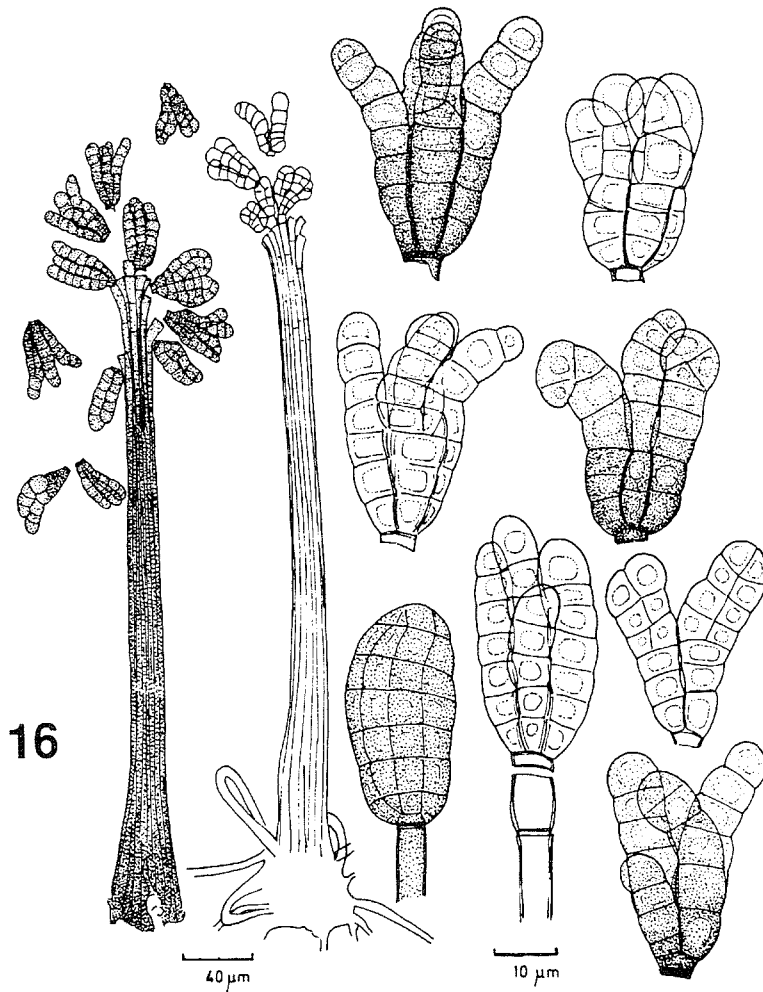


Fig. 16. *Kostermansinda andamanensis* anam.-sp. nov.:
synnematal conidiomata and cheirosporous conidia.

Kostermansinda andamanensis differs unequivocally from the other species of *Kostermansinda* Rifai (1968) in that the upper part of each mature conidium is composed of diverging columns of cells: *K. magna* (Boedijn) Rifai and *K. minor* Cabello & Arambarri (Arambarri *et al.*, 1987) both produce ovoid to broadly ellipsoidal, dictyoseptate conidia

atrobrunneis, parallelis, septatis, laevibus, crassitunicatis, non-ramosis, atrobrunneis, 5-6.5 μm lat., composita. Cellulae conidiogenae integratae, terminales, monoblasticae, percurrenter renascentes, apice truncato et 8 μm lat. post secessionem conidiorum. Conidia solitaria, sicca, cheirosporosa, infra atrobrunnea, supra brunnea, laevia et crassitunicata, truncata ad basim, ex 2-4 columnis cellularum composita; quamquam multorum conidiorum juvenilium pars exterior relative laevis est et columnae cellularum connatae, tamen conidia matura inter cellulas sulcos non profundos praebent et partes apicales columnarum liberatae divergunt; cheirosporae 32-42 μm long., 5.5-8 μm lat. ad basim, 13-20 μm lat. in medio, et usque ad 36 μm lat. trans apices divergentes columnarum; columna unaquaque ex (3-)6-7 cellulis euseptatis composita, 5-6.5 X 6.5-8 μm , ad septa leniter constricta. Conidia saepe per disruptionem rhexolyticam cellularum sustinentium liberantur.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, velvety. Conidiomata synnematal, determinate, erect, dark brown, up to 420 μm long, 40-70 μm wide at the base, 15-30 μm wide in the middle and above, broadening at the apex into a fertile head 90 μm wide, composed of compactly and parallel, septate, smooth, thick-walled, unbranched, dark brown conidiophores 5-6.5 μm wide. Conidiogenous cells integrated, terminal, monoblastic, percurrently regenerating, truncate and up to 8 μm wide at the apex after conidium secession. Conidia solitary, dry, cheirosporous, dark brown below, medium brown above, smooth and thick-walled, truncate at the base, consisting of 2-4 columns of cells; although in many developing conidia the exterior is relatively smooth, and the cell columns still united up to their apices, mature conidia develop shallow furrows between the cells, and the apical parts of the columns become free and divergent; cheirosporae are 32-42 μm long, 5.5-8 μm wide at the base, 13-20 μm wide in the middle and up to 36 μm wide across the divergent apices of the columns; each column is composed of (3-)6-7 euseptate cells, each cell 5-6.5 μm long and 6.5-8 μm wide, slightly constricted at the septa. The spores are often released by rhexolytic fracture of the supporting cell.

HOLOTYPE: on dead leaves of *Calamus* sp. (Arecaceae), Mt. Harriet, South Andaman Island, 5 May 1990, D.J. Bhat, Herb. DAOM 214606. Teleomorph: unknown.

with a smooth outline. The similar genus *Kostermansindiopsis* Castañeda (1986) also has rounded dictyospores, and produces curved, tapering, needle-like accessory hyphae on the conidiogenous cells.

Phialosporostilbe setosa* Bhat & Kendrick *anam.-sp. nov. (Fig. 17)
(Etym. Latin: *seta* = a bristle)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, pilosae, albae usque griseo-brunneae. Conidiomata synnemata, erecta, recta vel flexuosa, 140-440 μm alt., 13-30 μm lat., ex 5-20 conidiophoris parallelis, contiguis, crassitunicatis, septatis, brunneis, apice fertili divergentibus composita; synnemata semper setam unam (raro plus quam unam) sterilem, atrobrunneam, laevem, crassitunicatam, obtusam, 160-450 μm alt., 5.5-8.5 μm lat., septis 15-20 μm distantibus; aequa vel longiora quam conidiophora et eis circumcincta. Cellulae conidiogenae terminales, integratae, monophialidicae, usque tripliciter percurrenter extensae, ex axe synnematis divergentes, pallide brunneae vel brunneae, cylindricae usque cylindrico-clavatae, 22-45 μm long., infra 5-7 μm lat., apice 3-4.5 μm lat., collarulum apicale inconspicuum ferentes. Conidia blastico-phialidica, in massis mucosis incoloratis aggregata; conidorum sunt 2 formae: (1) conidia e cellulis conidiogenis superioribus oriunda, angularia, cuneiformia vel tetraclavata, 3 angulis protuberantibus et basi plusminusve truncata vel anguste rotundata praedita, non-septata, laevia, crassitunicata, incolorata; setula filosa, 5-7.5 μm long., in angulo unoquoque, praedita; (2) conidia e cellulis conidiogenis inferioribus oriunda, guttuliformia, basi anguste acuta praedita, non-septata, incolorata, laevia, 2-3.5 μm diam.

Conidial fungi, hyphomycetes. Colonies effuse, hairy, white to greyish brown. Conidiomata synnematal, erect, straight or flexuous, 140-440 μm tall, 13-30 μm wide, composed of 5-20 parallel, thick-walled, septate, brown conidiophores diverging at their fertile apices; synnemata indeterminate, always incorporating 1 (or rarely more than 1) sterile, dark brown, smooth, thick-walled, blunt seta 160-450 μm long, 5.5-8.5 μm wide, septa 15-20 μm apart; as long as or slightly longer than the conidiophores and surrounded by them. Conidiogenous cells terminal, integrated, monophialidic, extending percurrently up to 3 times, diverging from the main axis of the synnema, pale to medium brown, cylindrical to cylindric-clavate, 22-45 μm long, 5-7 μm wide below, 3-4.5 μm wide at the tip, with an inconspicuous apical collarette. Conidia blastic-phialidic, aggregating in colourless slimy masses and of two kinds: (1) conidia arising from the upper conidiogenous cells are angular, cuneiform, tetrahedral or tetraclavate, with 3 protuberant corners and a slightly

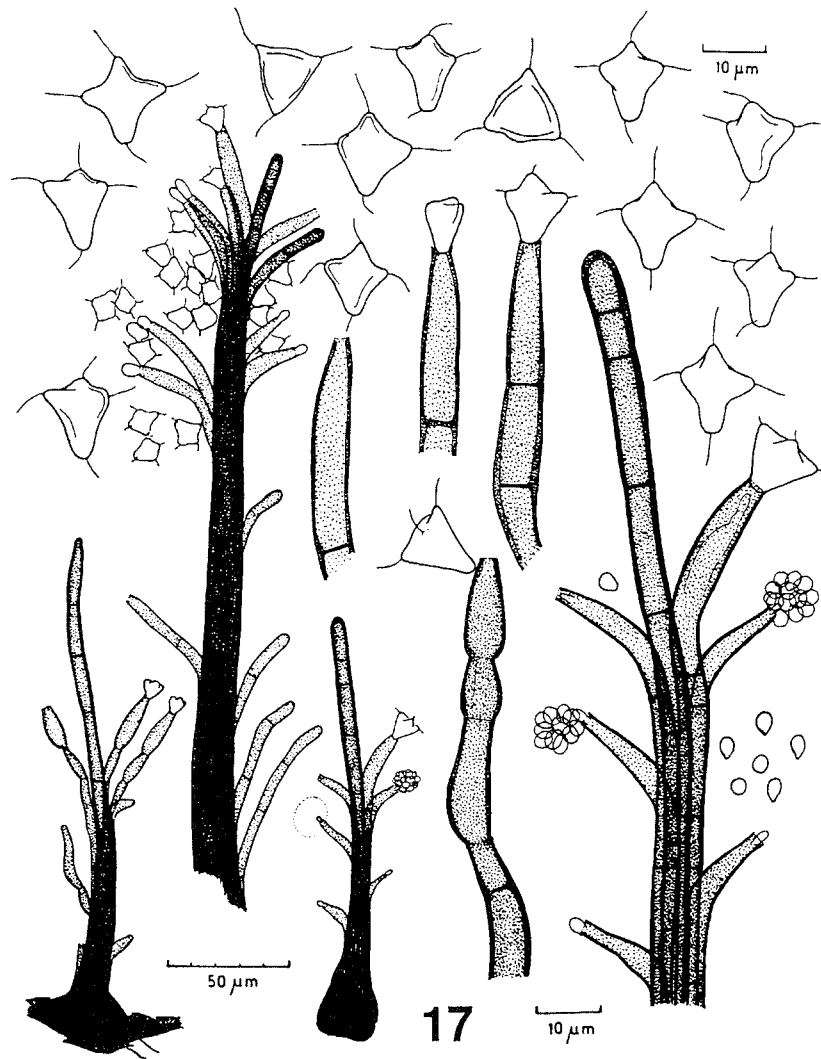


Fig. 17. *Phialosporostilbe setosa* anam.-sp. nov.:
synnematal conidiomata, phialidic conidiogenous cells,
tetradiate, setulate conidia and microconidia.

truncate to rounded narrow base, non-septate, smooth, thick-walled, colourless, with dense cytoplasm, and on each corner having a thin setula, 5-7.5 μm long; (2) conidia arising from conidiogenous cells in the lower half of the synnema are drop-shaped, with a narrowly pointed base, non-septate, colourless, smooth, 2-3.5 μm diam.

HOLOTYPE: on decaying leaves of *Ochlandra* sp. (an endemic member of the Poaceae), Kudremukh, Shimogga District, Karnataka State, India, 30 Dec. 1989, D.J. Bhat, DAOM 214607. Teleomorph: unknown.

Mercado and Portales (1985) erected *Phialosporostilbe* for *P. turbinata* Mercado & Portales, a synnematos, phialidic hyphomycete with colourless, turbinate, angular conidia each bearing 3 apical setulae and sometimes 1 basal setula. In south India we have collected both *P. turbinata* and a possibly congeneric fungus, the mononematous *Nawawia filiformis* Marvanova (1980), which has angular, turbinate conidia with 3-4 apical setulae. It seems to us that a serious reassessment of these genera, and possibly also the mononematous, apically bisetulate *Chalarodes* McKenzie (1991) is warranted, but until this has been done, we prefer to dispose our fungus in *Phialosporostilbe*. The angular conidia of *P. setosa* resemble those of the type species. The major differences between the two species lie in the regular presence of one or more large, central setae in the synnema of *P. setosa* and especially in its development of a small-spored, phialidic *Chloridium*-like synanamorph on the lower part of the synnema.

Phragmotrichum andamanense Bhat, Kendrick & Nag Raj
 anam.-sp. nov. (Figs. 18, 19)
 (Etym.: = pertaining to the Andaman Islands)

Ad fungos conidiales, Coelomycetes, pertinens. Caulicola. Conidiomata eustromatica, dissita, erumpentia, aspectu frontali doliiformia, initio clausa, post dehiscencia et quasi cupulata, atrobrunnea vel nigra, 120-160 X 100-135 μm ; pariete membranaceo, ex textura porrecta composito, cellulis crassitunicatis, pallide brunneis, ex stratis cellularum 1-2 compositis; tela basali ex textura angulari composita, cellulis tenuitunicatis, incoloratis vel pallide brunneis. Hyphae conidiogenae e tela basali oriundae, plus minusve nodulosae, profuse ramosae, meristematae, irregulatum septatae, plusminusve incoloratae vel pallide brunneae, tenuitunicatae, laeves. Conidia thallica, terminalia vel intercalaria, clavata vel fusiformia, apice et basi obtusa, laevia, dictyoseptata, septis transversalibus 10-15 et septis longitudinalibus 6-9, parte superiore lata et paene nigra, singula cellula apicali et cellulis in parte inferiore

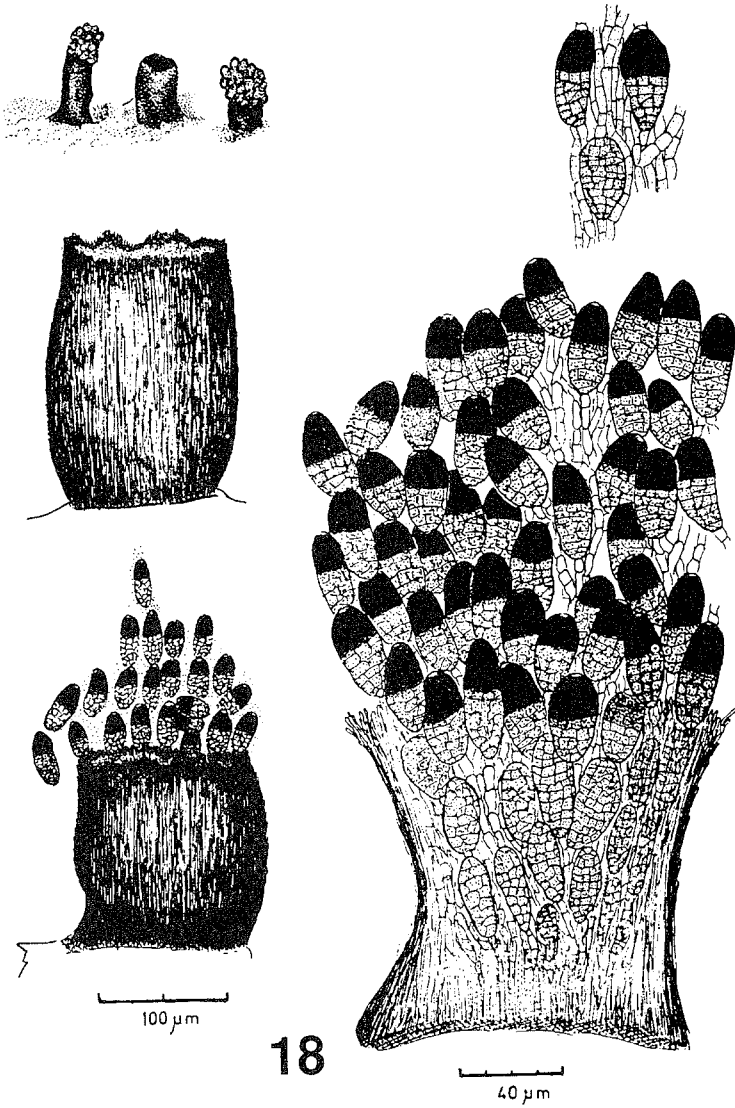


Fig. 18. *Phragmotrichum andamanense* anam.-sp. nov.:
cupulate, stromatic conidiomata and bicoloured,
thallic, dictyosporous conidia.

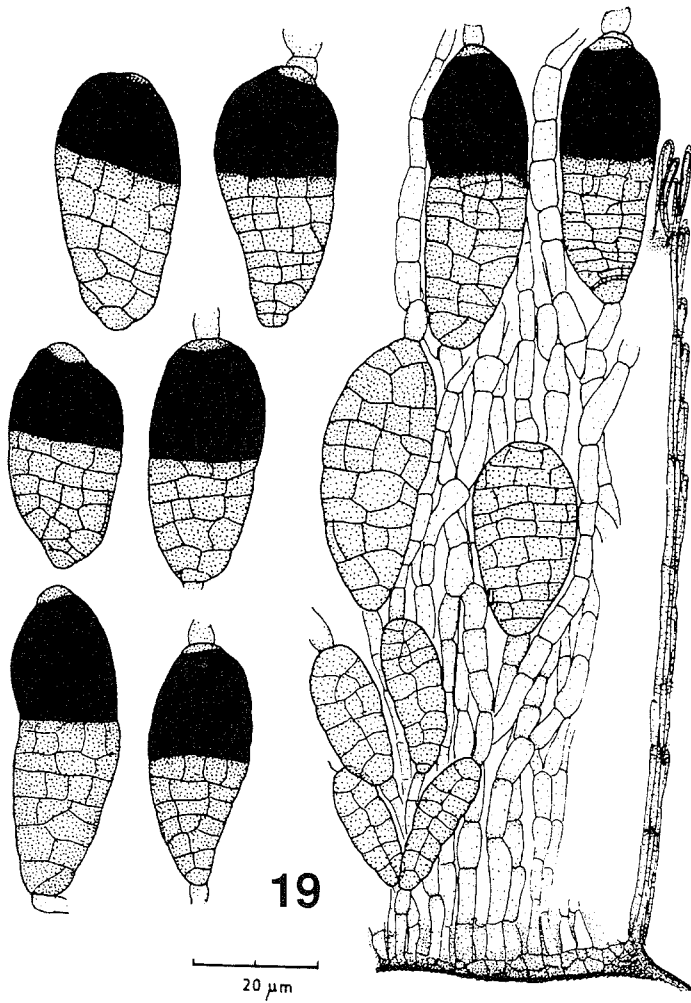


Fig. 19. *Phragmotrichum andamanense* anam.-sp. nov.:
bicoloured, thallic, dictyosporous conidia.

pallidioribus, praedita; 35-50 X 16-20 μm .

Conidial fungi, Coelomycetes. Caulicolous. Conidiomata eustromatic, separate, erumpent, in surface view doliiform, initially closed but eventually opening and appearing cupulate, dark brown to black, 120-160 X 100-135 μm ; wall membranous, of textura porrecta, cells thick-walled, pale brown, in 1-2 cell layers; basal tissue of textura angularis, cells thin-walled, colourless to pale brown. Conidiogenous hyphae arising from the basal tissue, more or less nodulose, profusely branched, meristematic, irregularly septate, almost colourless to medium brown, thin-walled, smooth. Conidia thallic, terminal or intercalary, clavate to fusiform with obtuse ends, smooth-walled, dictyoseptate with 10-15 transverse septa and 6-9 longitudinal septa, broad and almost black in the upper half, a single apical cell and the cells in the lower half paler; 35-50 X 16-20 μm .

HOLOTYPE: on dead twigs of *Strobilanthes* sp. (Acanthaceae), Mt. Harriet, South Andaman Island, 5 May 1990, D.J. Bhat, DAOM 214609. Teleomorph: unknown.

Sutton (1980) accepted four species in the genus *Phragmotrichum* Kunze: *P. chailletii* Kunze (the type species), *P. pini* (Cooke) Sutton & Sandhu, *P. platanoidis* Otth, and *P. rivoclarinum* (Peyronel) Sutton & Pirozynski. *Phragmotrichum andamanense* differs from all four in the following characters: (1) the eustromatic conidioma is doliiform to cupulate; (2) the conidiogenous cells are irregularly septate, meristematic and develop from nodulose basal tissue cells; (3) the conidia are clavate to fusiform, broad and almost black in the upper half, a single apical cell and the cells in the lower half paler; (4) the conidia measure 35-50 X 16-20 μm .

***Piricaudiopsis appendiculata* Bhat & Kendrick anam.-sp. nov. (Fig. 20)**
(Etym. Latin: *appendiculatus* = with appendages)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, olivaceae vel atrobrunneae, pilosae. Mycelium in substrato immersum. Conidiophora mononematica, discreta, erecta, recta vel flexuosa, non-ramosa, laevia, crassitunicata, usque ad 620 μm alt., 18-35 μm lat. ad basim, 13-18 μm lat. in medio, 7-11.5 μm lat. ad apicem, 4-8-septata. Cellulae conidiogenae integratae, terminales, interdum laterales, post secessionem conidorum truncatae. Conidia solitaria, sicca, flabelliformia, interdum bi- vel tri-lobata, lenticularia, dictyoseptata, ex columnis cellularum radiantia, atrobrunnea, 50-80 μm alt., 60-90 μm lat., 15-22 μm cr. in medio appendicibus 2-4 longis, divergentibus, angustis, 75-120 μm long., laevibus, praedita; pars inferior 3-5-septata, 4-6 μm lat., brunnea;

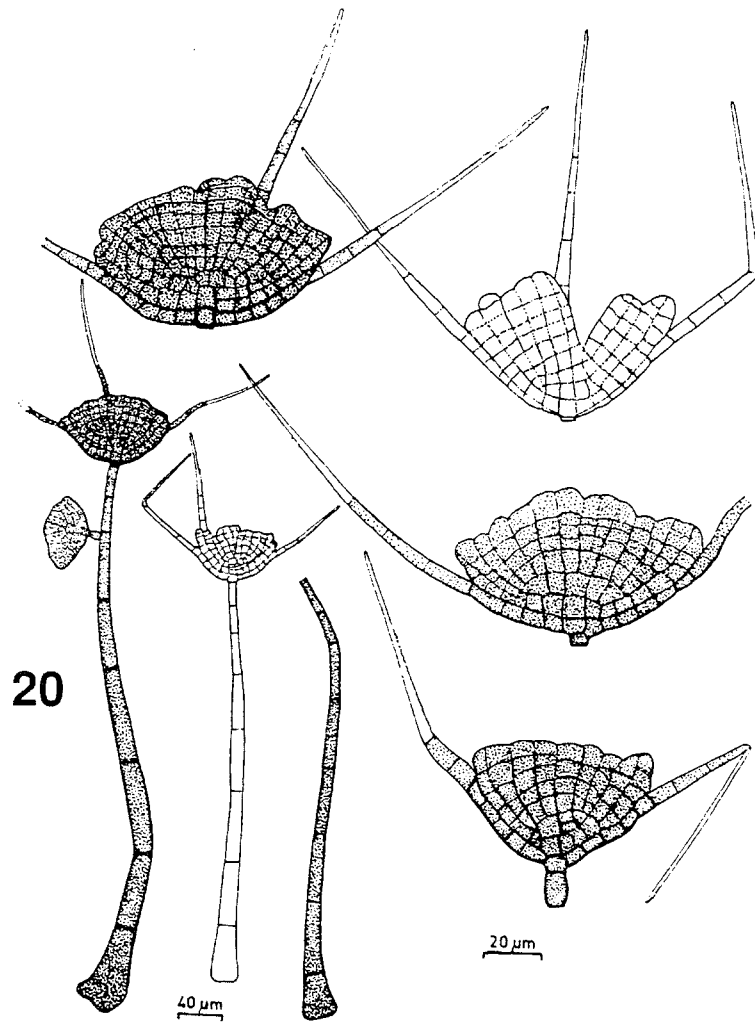


Fig. 20. *Piricaudiopsis appendiculata* anam.-sp. nov.:
conidiophores and fan-shaped, appendaged,
dictyosporous conidia.

pars superior incolorata, angustata ad 1.5-2 μm lat., ex columnis externis cellularum conidiorum, et in ambobus angulis et in utrisque lateribus, exoriunda.

Conidial fungi, hyphomycetes. Colonies effuse, olivaceous to dark brown, hairy. Mycelium immersed in the substrate. Conidiophores mononematous, differentiated, erect, straight or flexuous, unbranched, smooth, thick-walled, up to 620 μm long, 18-35 μm wide at the base, 13-18 μm wide in the middle, 7-11.5 μm wide at the apex, 4-8-septate. Conidiogenous cells integrated, terminal, sometimes lateral, truncate after conidium secession. Conidia solitary, dry, fan-shaped, sometimes two- or three-lobed, lenticular in edge view, dictyoseptate, with rows of cells radiating from a protuberant basal cell 6-7.5 μm wide, dark brown, 50-80 μm high, 60-90 μm wide, 15-22 μm thick in the middle; with 2-4 long, divergent, tapering, appendages 75-120 μm long, smooth, lower half 3-5-septate, 4-6 μm wide, brown, and apically colourless tapering to 1.5-2 μm wide; appendages arising from outermost rows of cells on the main body of the conidium, on both corners and on either side.

HOLOTYPE: on dead twigs, Kudremukh, Karnataka State, India, 7 July 1989, D.J. Bhat, DAOM 214610.

Teleomorph: unknown.

Piricaudiopsis appendiculata differs from *P. elegans* Portales & Mercado, the type species of *Piricaudiopsis* Portales & Mercado (1987), in the long hyphal appendages on the conidia: those in *P. elegans* are very short. *Ceratosporella fertilis* Castañeda (1985) could also possibly be disposed in *Piricaudiopsis*, but the rows of cells constituting its conidia are separate, and the occasional apical appendage is filiform.

Selenodriella indica Bhat & Kendrick **anam.-sp. nov.** (Fig. 21)
(Etym. = pertaining to India)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, brunneae, hypophyllae. Mycelium plerumque immersum, ex hyphis septatis, ramosis, paene incoloratis, 2-4 μm lat., compositum. Conidiophora macronemata, mononematica, erecta, recta vel flexuosa, atrobrunnea, crassitunicata, 110-220 X 5-8 μm , 8-14-septata, percurrenter renascentia; basis similis rhizomati, contorta, vermiformis, ad 15 μm lat., arcte septata, atrobrunnea, valde crassitunicata, laevis. Cellulae conidiogenae blastico-sympodiales, discretae, verticillatim vel aggregate ad apicem conidiophori oriundae, lageniformes, denticulatae, 8-10 μm long., usque ad 5 μm lat. ad basim, 2-2.5 μm lat. ad apicem fertilelem,

tenuitunicatae, basi pallide brunneae, supra hyalinae, vel e conidiophoris, vel e ramis 0-1-septatis vel e cellula terminali, oriundae. Conidia blastico-sympodialia, falcata, laevia, hyalina, non-septata, utrinque acuta, 7-10 X 0.5-1 μm .

Conidial fungi, hyphomycetes. Colonies effuse, brown, hyphophyllous. Mycelium mostly immersed, composed of septate, branched, almost colourless hyphae 2-4 μm wide. Conidiophores differentiated, mononematous, erect, straight or flexuous, dark brown, thick-walled, 110-220 X 5-8 μm , 8-14-septate, regenerating percurrently; base rhizome-like, contorted, vermiform, up to 15 μm wide, closely septate, dark brown, very thick-walled, smooth. Conidiogenous cells blastic-sympodial, discrete, developing in whorls or clusters at the tip, lageniform, with minute denticles, 8-10 μm long, up to 5 μm wide at the base, 2-2.5 μm wide at the fertile apex, thin-walled, pale brown at the base, colourless at the upper half, arising directly on conidiophores, from 0-1-septate branches or from the terminal cell. Conidia blastic-sympodial, falcate, smooth, colourless, non-septate, pointed at both ends, 7-10 X 0.5-1 μm .

HOLOTYPE: on dead leaves, Mt. Harriet, South Andaman Island, India, 5 May 1990, D.J. Bhat, DAOM 214611.

Teleomorph: unknown.

Selenodriella Castañeda & Kendrick (1990b) essentially combines the characters of *Selenosporella* Arnaud: MacGarvie (1968) and *Idriella* Nelson & Wilhelm (1956) in its conidiophore, conidiogenous cells and conidium morphology. Three species have so far been assigned to this genus: *S. fertilis* (Pirozynski & Hodges) Castañeda & Kendrick (the type species), *S. intermedia* Castañeda & Kendrick, and *S. perramosa* Castañeda & Kendrick. *Selenodriella indica* is unique in that: (1) the conidiogenous cells arise only on the apical region of the conidiophore, while in the other species they are distributed along the axis; (2) the conidiophore bases are thickened and coiled or contorted, assuming a rhizome-like appearance, while in the other species they are lobed.

Spadicoides goanensis Bhat & Kendrick **anam.-sp. nov.** (Fig. 22)
(Etym. = pertaining to Goa State, India)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae gregariae, effusae, olivaceae vel brunneae, hypophyllae. Conidiophora mononematica, discreta, 6-18 aggregata, erecta, recta vel in medio curvata, crassitunicata, non-ramosa, 160-200 μm alt., ad basim 4-8-lobata et inflata usque ad 15 μm lat., 6-8.5 μm lat. supra, 3-5-septata, infra

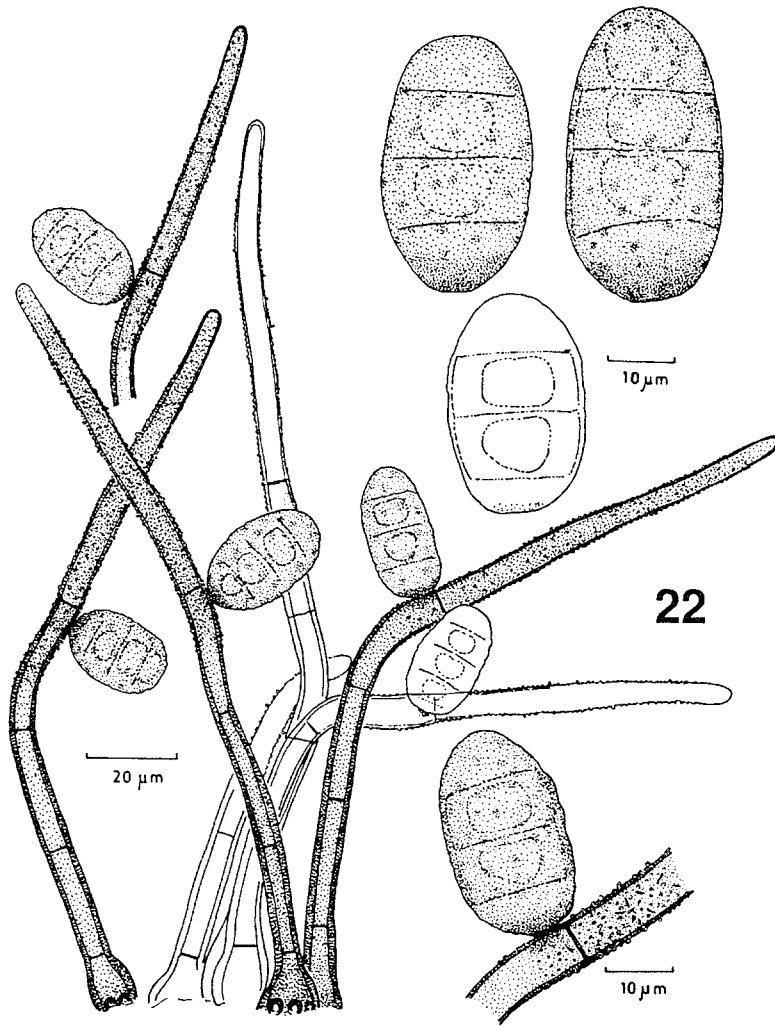


Fig. 22. *Spadicoides goanensis* anam.-sp. nov.:
setose conidiophores and tretic, phragmosporous conidia.

laevia, supra verrucosa, olivacea vel atrobrunnea; versus apicem pallescentia, laevia, rotundata. Cellulae conidiogenae intercalares, integratae, monotreticae, poro uno, indistincto, minuto, simplici, infra septum superius praeditae; 25-32 X 6-8.5 μm , supra verrucosae, infra laeves. Conidia solitaria, sicca, cylindrico-ovoidea vel oblonga, 3-pseudoseptata, cellulis duabus centralibus crassitunicatis, lumine reducto, verruculosa, brunnea vel atrobrunnea, basi atrantia, 23-40 X 14-22 μm .

Conidial fungi, hyphomycetes. Colonies gregarious, effuse, olivaceous to brown, hypophyllous. Conidiophores mononematous, differentiated, arising in groups of 6-18, erect, straight or curved in the middle, thick-walled, unbranched, 160-200 μm long, 4-8-lobed and inflated at the base up to 15 μm wide, 6-8.5 μm wide above, 3-5-septate, lower part smooth, upper part verrucose, olivaceous to dark brown, paler, smooth and rounded at the tip. Conidiogenous cells intercalary, integrated, monotretic, with a single, indistinct, minute, simple pore just below the upper septum, 25-32 X 6-8.5 μm , upper half verrucose, lower half smooth. Conidia solitary, dry, cylindric-ovoid to oblong, 3-pseudoseptate, central 2 cells thick-walled with reduced lumen, verruculose, medium to moderately dark brown, darker at the base, 23-40 X 14-22 μm .

HOLOTYPE: on decaying leaves, Morphirla, Goa, India, 28 July 1991, D.J. Bhat, DAOM 214612.

Teleomorph: unknown.

In a reassessment of the genera *Spadicoides* Hughes (1958) and *Diplococcium* Grove (1885), Sinclair, Eiker and Bhat (1985), rejected the branching of conidiophores as a diagnostic generic character and separated the two genera only on their respectively solitary or catenate conidia. The generic descriptions were emended accordingly. Kuthubutheen and Nawawi (1991a) reviewed the taxonomy of *Spadicoides* and provided a key to the 16 accepted species. Among these, only *S. curvularioides* Sutton & Hodges, with its large (22-33 x 6-7.5 μm), verruculose, 3-septate conidia, and *S. xylogena* (A.L. Smith) Hughes, also with large (16-34 x 7-10.5 μm), smooth, 3-septate conidia, resemble *S. goanensis*. However, *S. goanensis* differs from these and all other species of *Spadicoides* in: (1) its partly verrucose conidiophores, (2) the presence of only one, monotretic conidiogenous cell on each conidiophore, (3) the production of only a single conidium by the conidiogenous cell.

Sporidesmiopsis goanensis Bhat & Kendrick **anam.-sp. nov.** (Fig. 23)
(Etym. = pertaining to Goa State, India)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, atrobrunneae, pilosae. Mycelium plerumque immersum. Conidiophora mononematica, discreta, erecta, recta vel flexuosa, atrobrunnea usque nigra, laevia, crassitunicata, usque ad 220 μm alt., basi inflata 20-25 μm lat., apice usque ad 10 μm lat., usque ad 10-septata, in dimidio superiore infra septa ramosa; rami percurrenter semel aut bis extensi, crassitunicati, 1-2-septati, laeves, atrobrunnei, 20-30 X 5-10 μm . Cellulae conidiogenae integratae, apicales in axe principali et ramis, anguste doliiformes, post secessionem conidiorum apice truncatae, 7.5-10 X 5.5 μm . Conidia solitaria, sicca, obclavata vel fusiformia, saepe leniter curvata, basi truncata, apice rotundata, pallide brunnea, laevia, 20-30 μm long., infra medium 5-7 μm lat., basi et apice 2-3 μm lat., 3-4-septata.

Conidial fungi, hyphomycetes. Colonies effuse, dark brown, hairy. Mycelium mostly immersed. Conidiophores mononematous, differentiated, erect, straight or flexuous, dark brown to black, smooth, thick-walled, up to 220 μm tall, 20-25 μm wide at the swollen base, up to 10 μm wide at the tip, up to 10-septate, branched below septa in the upper half; branches extending percurrently 1-2 times, thick-walled, 1-2-septate, smooth, dark brown, 20-30 X 5-10 μm . Conidiogenous cells integrated, apical on main stipe and branches, narrowly doliiform, truncate at the apex after conidium secession, 7.5-10 X 5.5 μm . Conidia solitary, dry, obclavate to fusiform, often slightly curved, base truncate, apex rounded, pale brown, smooth, 20-30 μm long, 5-7 μm wide just below the middle, 2-3 μm wide at base and apex, 3-4-septate.

HOLOTYPE: on dead twigs, Kodachadri Hills, Karnataka, India, D.J.Bhat, 12 Aug. 1991, DAOM 214613.

Teleomorph: unknown.

Subramanian and Bhat (1987) introduced two new monotypic genera, *Sporidesmina* Subram. & Bhat (type species: *S. malabarica* Subram. & Bhat) and *Sporidesmiopsis* Subram. & Bhat (type species: *S. malabarica* Subram. & Bhat), conidiogenesis in both being similar to that in most species classified in *Sporidesmium* Link ex Fries. The three genera are distinguishable as follows: the conidiophores in *Sporidesmium* are mononematous and unbranched, and the conidiogenous cells are integrated; in *Sporidesmina* the conidiophores are synnematos and carbonaceous and the conidia are partly euseptate and partly distoseptate. (It could be argued that *Sporidesmina* is separated from *Sporidesmium*

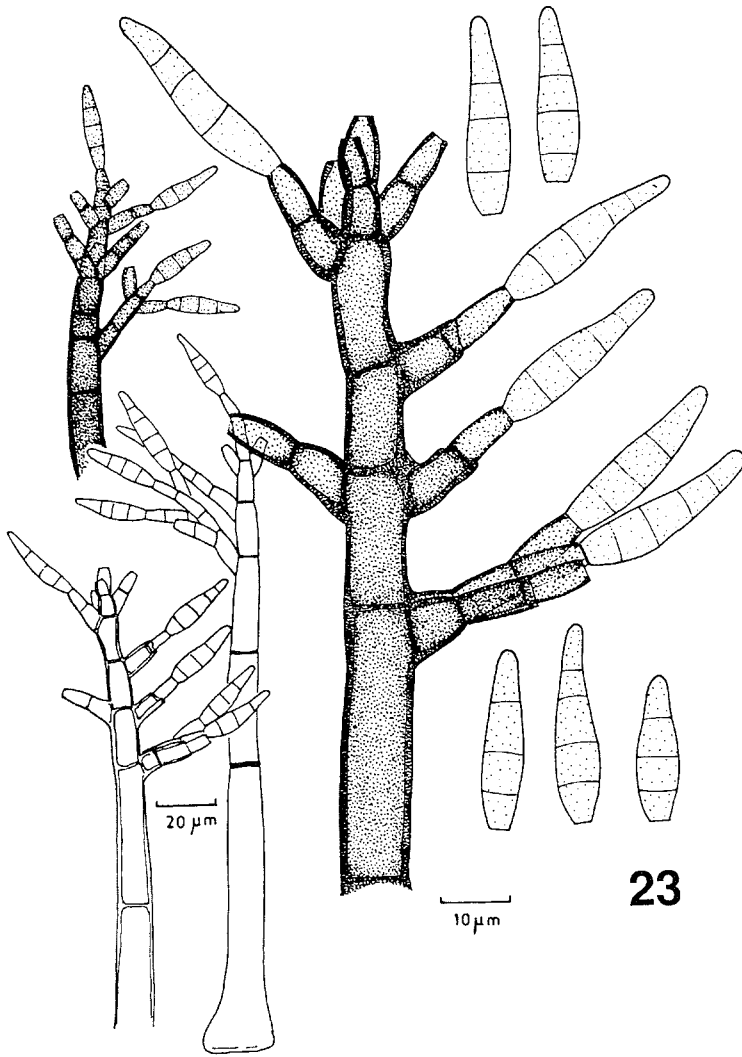


Fig. 23. *Sporidesmiopsis goanensis* anam.-sp. nov.: apically branched conidiophores, terminal, monoblastic conidiogenous cells, and phragmosporous conidia.

only by the aggregation of its conidiophores into synnemata, but *Sporidesmium* is such a large and obviously heterogeneous genus that the spinning off of segregate genera is bound to continue.) In *Sporidesmiopsis*, the conidiophores are mononematous with apical branches, and conidiogenous cells arise on both stipe and branches. In the *Sporidesmium-Sporidesmina-Sporidesmiopsis* complex, our fungus, with its apically branched, mononematous conidiophores, fits into *Sporidesmiopsis*. However, it differs from the type species in shape, septation, pigmentation and dimensions of conidia.

Crane and Dumont (1978) described a new species of hyphomycete from Venezuela as *Brachysporiella dennisii*. This fungus was also reported from Cuba by Mercado (1984), and is clearly identical with the type species of *Sporidesmiopsis*, *S. malabarica* Subramanian & Bhat (1987). This provides an older epithet for *S. malabarica*. We accordingly make the required new combination:

Sporidesmiopsis dennisii (Crane & Dumont) Bhat, Kendrick & Nag Raj **comb. nov.**

= *Brachysporiella dennisii* Crane & Dumont,

Can. J. Bot. 56:2613. 1978.

= *Sporidesmiopsis malabarica* Subramanian & Bhat,

Kavaka 15: 71-74. 1987.

Sporoschisma uniseptatum Bhat & Kendrick **anam.-sp. nov.** (Fig. 24)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, nigrae, velutinae. Conidiophora mononematica, discreta, erecta, recta vel flexuosa, 140-205 µm alt., 10-12.5 µm lat., 1-2-septata, non-ramosa, crassitunicata, atrobrunnea, ex stromatibus atrobrunneis, usque ad 65 µm diam., oriunda. Hyphae steriles capitatae ex stromatibus oriundae, erectae, flexuosae, brunneae, laeves, usque ad 175 µm alt., 8-10 µm lat., ad apicem expansum usque ad 12.5 µm lat., 3-6-septata, 2-3 percurrenter renascentes. Cellulae conidiogenae phialidicae, usque ad 160 µm long., terminales, integratae, crassitunicatae, atrobrunneae, ex ventre leniter inflato ad 22 µm lat., et collarulo tubuliformi, 70-80 X 12-16.5 µm, compositae. Conidia blastico-phialidica, cylindrica, utrinque truncata, 1-septata, raro 2-septata, crassitunicata, verruculosa, pallide brunnea, 27-32 X 11-12.5 µm, saepe 10-15 conidiorum pseudocatenam mucosam formantia.

Conidial fungi, hyphomycetes. Colonies effuse, black, velvety.

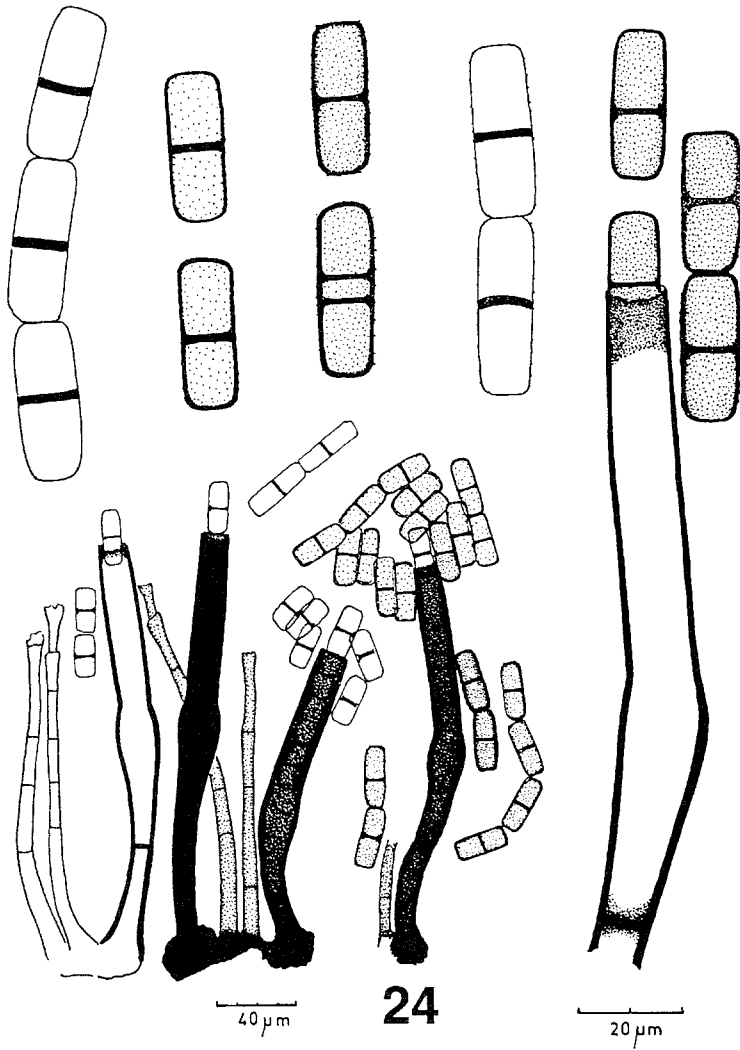


Fig. 24. *Sporoschisma uniseptatum* anam.-sp. nov.:
conidiophores with large apical phialides, deep, tubular collarettes,
and cylindrical, didymosporous conidia.

Conidiophores mononematous, differentiated, erect, straight or flexuous, 140-205 μm tall, 10-12.5 μm wide, 1-2-septate, unbranched, thick-walled, dark brown, arising from dark brown stromata up to 65 μm across. Sterile capitata hyphae arising from the same stromata, erect, flexuous, medium brown, smooth, up to 175 μm tall, 8-10 μm wide, up to 12.5 μm wide at flared apex, 3-6-septate, regenerating percurrently 2-3 times. Conidiogenous cells phialides, up to 160 μm long, terminal, integrated, thick-walled, dark brown, consisting of a slightly swollen venter up to 22 μm wide and a tubular collarete 70-80 X 12-16.5 μm . Conidia blastiphialidic, cylindrical, truncate at both ends, 1-septate, very rarely 2-septate, thick-walled, verruculose, pale brown, 27-32 X 11-12.5 μm , often in slimy false chains of 10-15 conidia.

HOLOTYPE: on decaying twigs, Morphirla, Goa, India, 28 July 1991, D.J. Bhat, DAOM 214614.

Teleomorph: unknown.

The conidia of *S. uniseptatum* may be compared with those of *S. juvenile* Boudier (Ellis, 1971), which are also verruculose, but while those of *S. juvenile* are regularly 3-septate, those of *S. uniseptatum* are just as regularly 1-septate. This feature distinguishes *S. uniseptatum* from all other species of *Sporoschisma* Berkeley & Broome (Hughes, 1966).

Uberispora tropicalis Bhat & Kendrick *anam.-sp. nov.* (Fig. 25)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, griseo-brunneae, velutinae. Conidiophora mononematica, erecta, recta vel flexuosa, pallide brunnea, 3-7-septata, septis 8-23 μm distantibus, raro ramosa, usque ad 4-plo percurrenter renascentia, 40-150 μm alt. et sursum gradatim attenuata, ad basim leniter inflatam ad 8-11 μm lat., in medio 4-5.5 μm lat., 2.5-3.5 μm lat. ad apicem. Cellulae conidiogenae integratae, terminales, monoblasticae, cylindricae, paene incoloratae, 10-30 μm long. Conidia solitaria, sicca, dictyoseptata, septis conspicuis 4-5, raro 6, crassis et atris; 20-23 μm diam., ex cellulis 3 formarum composita: (1) cellula centralis solitaria, crassitunicata, atrobrunnea, laevis, angularis, 12-18 μm diam.; (2) cellulae laterales 3-4, paene incoloratae, conicae, apicibus obtusis, basibus truncatis, 5-10 X 4.5-7 μm ; (3) cellula basalis conico-truncata, 5-8 X 3-6 μm ; schizolytice secedens, saepe partem superiorem apicalis cellulae conidiogenae quasi fimbriam basalem ferens. Interdum conidia secessa ad latera conidiophori per vestigium parietis adhaerent.

Conidial fungi, hyphomycetes. Colonies effuse, greyish-brown, velvety. Conidiophores mononematous, erect, straight or flexuous, pale brown, 3-

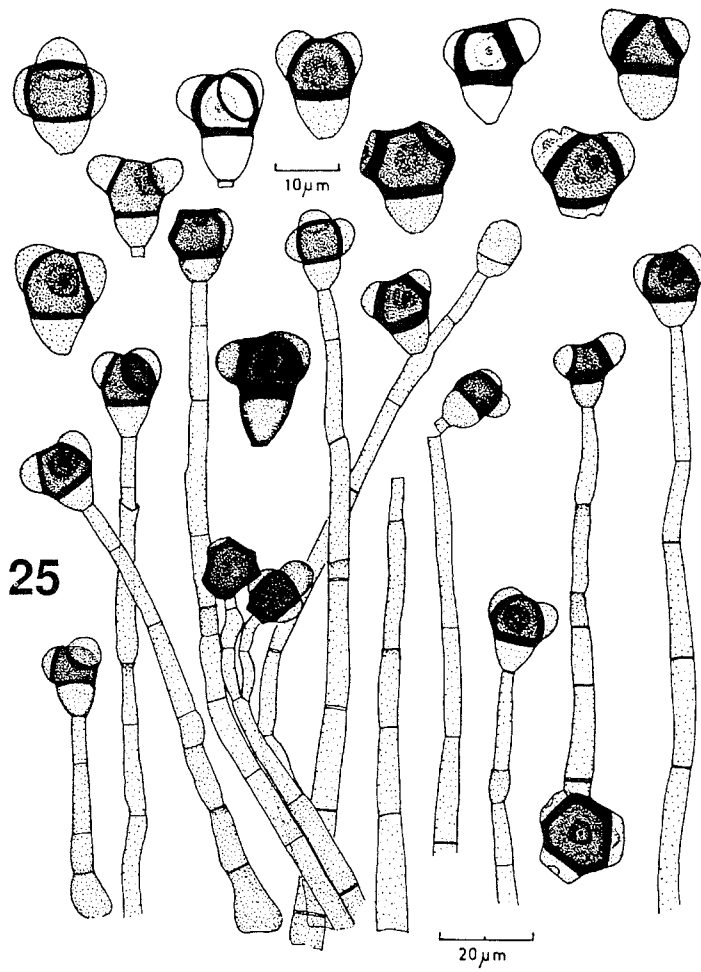


Fig. 25. *Uberispora tropicalis* anam.-sp. nov.: conidiophores and solitary, apical, lobed conidia.

7-septate, septa 8-23 μm apart, rarely branched, percurrently regenerating 3-4 times, 40-150 μm long, and gradually tapering upward, 8-11 μm wide at the slightly inflated base, 4-5.5 μm wide in the middle, 2.5-3.5 μm wide at the tip. Conidiogenous cells integrated, terminal, monoblastic, cylindrical, almost colourless, 10-30 μm long. Conidia solitary, dry, septate, 20-22.5 μm diam., with a central thick-walled, dark brown, smooth, angular cell, 12-18 μm diam., and 3 lateral, almost colourless, conical cells with obtuse apices and truncate base 5-10 X 4.5-7 μm , with a conico-truncate basal cell 5-8 X 3-6 μm , often carrying the upper portion of the conidiogenous cell as a basal frill, seceding schizolytically. Seceded conidia sometimes remain attached to the side of the conidiophore by a wall remnant.

HOLOTYPE: on dead twigs, Donigalu, Hassan District, Karnataka State, India, 28 Oct. 1989, D.J. Bhat, DAOM 214615.

Teleomorph: unknown.

The genus *Uberispora* Pirozynski & Hodges (1973), until now represented only by the type species, *U. simplex* (Ichinoe) Pirozynski & Hodges, is characterized by complex, dictyoseptate conidia with a central, thick-walled, dark brown, angular cell surrounded by several conical cells with narrow apices. *Uberispora tropicalis* differs from *U. simplex* in several qualitative characters: (1) almost all conidia of *U. tropicalis* lack an apical cell; (2) the peripheral cells on the conidium of *U. simplex* narrow to a pointed apex, while in *U. tropicalis* they have obtuse apices; (3) in *U. tropicalis* the peripheral cells of older conidia often collapse.

Uberispora tropicalis may also be compared with *Uvarispora* Goos & Pirozynski (1975), and with *Sopagraha* Subramanian & Sudha (1979). However, *Uvarispora lignicola* Goos & Pirozynski, the type species of *Uvarispora*, produces sporodochial conidiomata, with slimy, colourless conidia. Conidia of *Sopagraha sibika* Subramanian & Sudha also have central and peripheral cells, but always have more than one central cell, the central cells bear up to 12 apiculate peripheral cells, and these in turn bear smaller satellite cells.

Many years ago, the junior author described a new species of *Hormodendrum* (Kendrick, 1961) (subsequently transferred to *Cladosporium* by Ellis, 1976) which differed from many other species of *Cladosporium* mainly in the presence of a darkly pigmented, chlamydosporous synanamorph. Although no name was provided for this synanamorph, the chlamydo-spores resembled those of *Uberispora* in having a central cell with two rounded lateral cells, a rounded apical cell,

and a conico-truncate basal cell. These propagules were usually sessile, but their cruciate appearance was reminiscent of *Uberispora*. When the genera of hyphomycetes are rationalized, this similarity will have to be taken into account.

***Vanakripa* Bhat, Kendrick & Nag Raj anam.-gen. nov.**
(Etym. Sanskrit: *Vanakripa* = gift of the forest)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, nigrae, velutinae. Mycelium partim superficiale et partim in substrato immersum, ex hyphis septatis, ramosis, incoloratis vel pallide brunneis, plusminusve crassitunicatis, compositum. Conidiomata sporodochialia ex stromatibus pseudoparenchymaticis oriunda. Conidiophora mononematica, conspicua, erecta, flexuosa, incolorata, septata, ramosa, laevia, saepe septis crassis, refractilibus, praedita. Cellulae conidiogenae holoblasticae, obpyriformes, clavatae, incoloratae, curvatae, versus septa basalia angustatae, post secessionem conidiorum truncatae. Conidia clavata vel obpyriformia, ad apicem rotundata, ad basim truncata, atrobrunnea vel nigra, laevia, crassitunicata, 0-1-septata.

Conidial fungi, hyphomycetes. Colonies effuse, black, velvety. Mycelium partly immersed, partly superficial, composed of septate, much branched, colourless to pale brown, moderately thick-walled hyphae. Conidiomata sporodochial, arising from pseudoparenchymatous stromata. Conidiophores differentiated, erect, flexuous, colourless, septate, branched, smooth, often with thick, refractile septa. Conidiogenous cells holoblastic, obpyriform, clavate, colourless, often curved, narrowed toward the base, truncate after conidial secession. Conidia clavate to obpyriform, rounded at the tip, truncate at the base, darkly pigmented, smooth, thick-walled, 0-1-septate.

Type species: *V. gigaspora*.

Few fungi resemble *Vanakripa*. Although *Bactrodesmium* Cooke (Ellis, 1971) is also sporodochial, and accommodates some taxa with large, rounded, darkly pigmented conidia, those conidia are phragmoseptate, and their subtending structures look like rather undifferentiated hyphae. The conidia of *Vanakripa* are 0-1-septate, and their subtending structures are highly diagnostic. The cells of the conidiogenous hyphae are characteristically swollen and thin-walled, though the septa tend to be narrow and thickened. In *V. gigaspora*, the cells of the conidiogenous hyphae tend to be swollen toward the apex, at times looking like raquette hyphae of some keratinophilic members of the Onygenales (Currah, 1985).

***Vanakripa gigaspora* Bhat, Kendrick & Nag Raj anam.-sp. nov. (Fig. 26)**

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, nigrae, velutinae, corticolae. Mycelium partim immersum, partim superficiale, ex hyphis septatis, ramosis, incoloratis usque pallide brunneis, leniter crassitunicatis, laevibus, 2.5-4 μm lat., compositum. Conidiophora discreta, erecta, flexuosa, incolorata, usque ad 110 μm alt., 4-5 μm lat., septata, ramosa, laevia; septa angusta, crassa, saepe cum zona incrassata refractiva consociata, spisse et paene parallele in sporodochiis usque ad 120 μm diam., usque ad 400 μm alt., disposita, ex stromate pseudoparenchymatico usque ad 300 μm diam., enascentia. Cellulae conidiogenae obpyriformes, incoloratae, curvatae, 12.5-40 μm long., supra 5-10 μm lat., ad basim 2-3 μm lat., laeves, apice post secessionem conidiorum truncatae. Conidia clavata vel obpyriformia, apice rotundata, basi truncata, fuscantia, 32-43 X 18-22 μm , laevia, crassitunicata, septo submediali praedita; cellula apicalis grandis, 30-38 μm long., cellula basalis parva 3-5 μm long.

Conidial fungi, hyphomycetes. Colonies effuse, black, velvety, corticolous. Mycelium immersed and superficial, composed of septate, much branched, colourless to pale brown, smooth hyphae 2.5-4 μm wide. Conidiophores differentiated, erect, flexuous, colourless, up to 110 μm long, 4-5 μm wide, septate, branched, smooth; septa narrow, thick, often associated with a narrow, circular, refractile zone and giving an appearance of raquette hyphae; arranged compactly and almost parallel in sporodochia up to 120 μm diam., up to 400 μm tall, arising from a pseudoparenchymatous stroma up to 300 μm wide. Conidiogenous cells holoblastic, obpyriform, colourless, curved, 12.5-40 μm long, 5-10 μm wide above, 2-3 μm wide at the base, smooth, truncate at the tip after conidium secession. Conidia clavate to obpyriform, rounded at the tip, truncate at the base, darkly pigmented, 32-43 X 18-22 μm , smooth, thick-walled, apiosporous, with a submedian septum delimiting a large apical cell 30-38 μm long, and a small basal cell 3-5 μm long.

HOLOTYPE: on dead twigs, Molem Wildlife Sanctuary, Goa, India, 30 June 1991, D.J. Bhat, DAOM 214616.

Teleomorph: unknown.

***Vanakripa parva* Bhat, Kendrick & Nag Raj anam.-sp. nov. (Fig. 27)**
(Etym. Latin: *parvus* = small)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, nigrae, velutinae, corticolae. Mycelium partim immersum, partim superficiale,

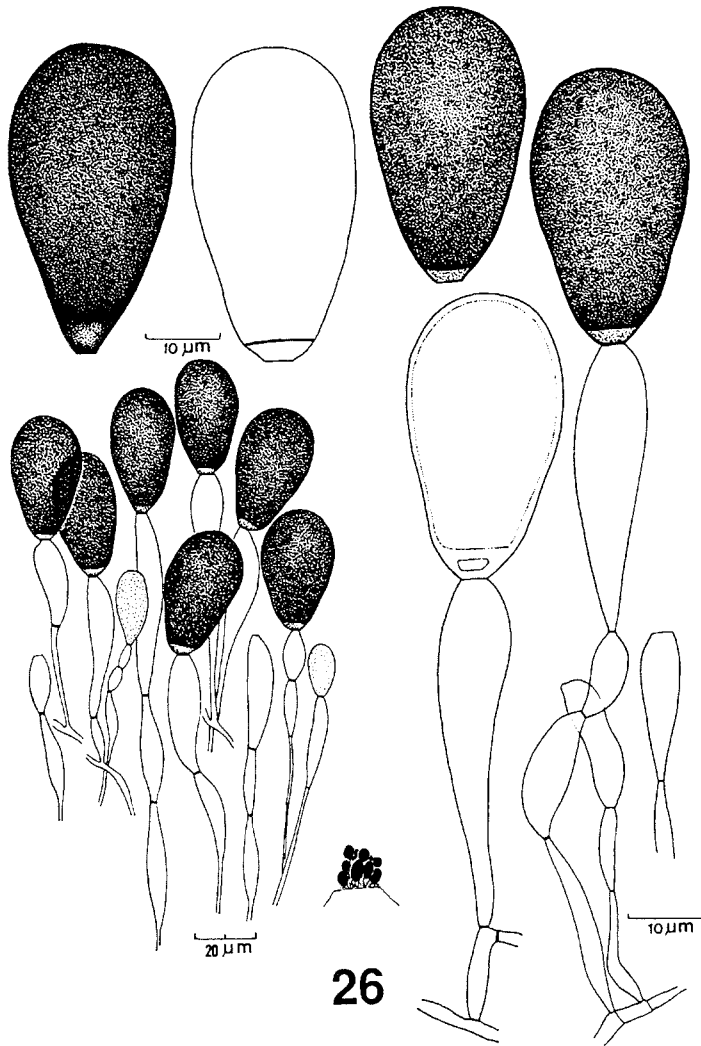


Fig. 26. *Vanakripa gigaspora* anam.-sp. nov.: sporodochial conidioma (habit sketch), inflated conidiogenous cells, and dark, obpyriform, didymosporous conidia.

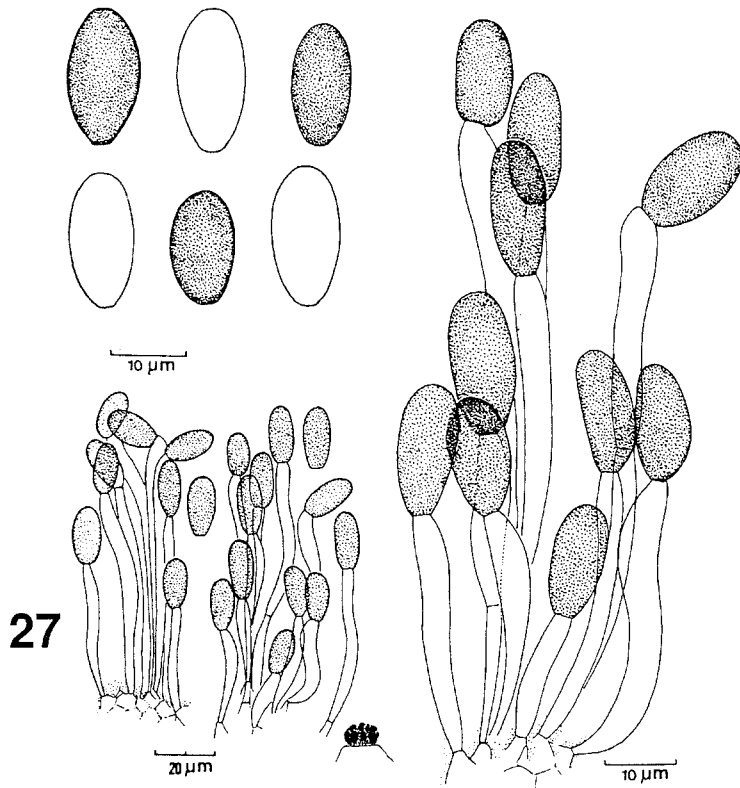


Fig. 27. *Vanakripa parva* anam.-sp. nov.: sporodochial conidioma (habit sketch), conidiogenous cells, and dark, amerosporous conidia.

ex hyphis septatis, ramosis, incoloratis, tenuitunicatis, laevibus, 2.5-4.5 μm lat. Conidiophora discreta, erecta, flexuosa, incolorata, 30-75 X 4-5 μm , septata, ramosa, laevia, spisse et paene parallela et in denso sporodochio 200-400 X 170-200 μm disposita; ex stromati pseudoparenchymatico enascentia. Cellulae conidiogenae vermiformes, curvatae, incoloratae, 18-40 X 3-5.5 μm , utrinque angustatae ad 2-3 μm lat., apice post secessionem conidiorum truncatae. Conidia ovata vel fusiformia, rotundata ad apicem, truncata ad basim, 7.5-10.5 X 4-6 μm , fuscantia, laevia, crassitunicata, non-septata.

Conidial fungi, hyphomycetes. Colonies effuse, black, velvety, corticolous. Mycelium partly immersed, partly superficial, composed of septate, branched, colourless, thin-walled, smooth hyphae 2.5-4.5 μm wide. Conidiophores differentiated, erect, flexuous, colourless, 30-75 X 4-5 μm , septate, branched, smooth, arranged compactly and almost parallel in sporodochia (200-400 X 170-200 μm) arising from a pseudoparenchymatous stroma. Conidiogenous cells holoblastic, vermiform, curved, colourless, 18-40 X 3-5.5 μm , narrower (2-3 μm wide) at the base and apex, truncate at the tip after conidium secession. Conidia ovoid to fusiform, rounded at the tip, truncate at the base, 7.5-10.5 X 4-6 μm , dark-coloured, smooth, thick-walled, non-septate.

HOLOTYPE: on dead twigs, Cotigao Wildlife Sanctuary, Goa State, India, 28 July 1991, D.J. Bhat, DAOM 214617.

Teleomorph: unknown.

Vanakripa parva differs from the type species of the genus *Vanakripa*, *V. gigaspora* Bhat, Kendrick & Nag Raj, by the absence of refractile septa in the conidiogenous hyphae, and in the smaller, non-septate conidia.

Xenoheteroconium Bhat, Kendrick & Nag Raj anam.-gen. nov.

(Etym. Greek: *xeno* = foreign, different + *Heteroconium*).

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, brunneae, velutinae, hypophyllae. Conidiophora mononematica, discreta, non-ramosa, septata, erecta, basi inflata et lobata, parte inferiore pallide brunnea, parte superiore fertili, atro-brunnea, saepe postea secedenti et velut propagulo. Cellulae conidiogenae apicales et intercalares, in conidiophoris et in conidiis integratae, monoblasticae, brunneae. Conidia phragmospora, euseptata, cylindrico-fusiformia, brunnea, sicca, laevia, saepe lateraliter e locis angustatis et protrudentibus, admodum subter septis et in conidiophoris et in conidiis aliis dispositis, interdum apicaliter in conidiophoris et conidiis exorientia.

Conidial fungi, hyphomycetes. Colonies effuse, brown, velvety, hypophyllous. Conidiophores mononematous, discrete, unbranched, septate, upright, erect, with expanded and lobed base, lower part mid brown, upper fertile part darker brown and often seceding later, presumably acting as a propagule. Conidiogenous cells apical and intercalary in the conidiophore and in conidia, integrated, monoblastic, brown. Conidia phragmosporous, euseptate, cylindric-fusiform, brown, dry, smooth-walled, usually arising laterally from narrow protruding loci just below septa both on the conidiophore and on other conidia, or

sometimes apically on conidiophores and conidia.

Type species: *Xenoheteroconium bicolor*.

Genera such as *Heteroconium* Petrak (1949), *Lylea* Morgan-Jones (1975), and *Septonema* Corda (1837), may be compared to *Xenoheteroconium*. *Heteroconium* produces conidia like those of *Xenoheteroconium*, but only in unbranched, acropetal chains (Ellis, 1971, 1976; Morgan-Jones, 1976). Mycelium in *Heteroconium* is also superficial on living leaves and sometimes associated with other fungi such as *Meliola* spp. and *Asterina* spp. (Morgan-Jones, 1976). Development in *Septonema* is similar to that in *Xenoheteroconium*, though conidia are more symmetrical and often in long, acropetal chains, and new conidia arising from extant conidia develop only from the apical cells of those conidia. The pattern of conidium formation in *Lylea* is more like that in *Xenoheteroconium*, but *Lylea* has short, inconspicuous conidiophores, symmetrical, cylindrical conidia with rounded ends, and the conidia are distoseptate, with extremely thick walls (Morgan-Jones, 1975). Of the four genera under discussion, only *Xenoheteroconium* has a parti-coloured conidiophore, with the darker apical portion seceding and acting as a propagule.

Xenoheteroconium bicolor Bhat, Kendrick & Nag Raj **anam.-sp. nov.**
(Fig. 28)

Ad fungos conidiales, hyphomycetes, pertinens. Coloniae effusae, brunneae, velutinae, hypophyllae. Conidiophora mononematica, erecta, recta vel flexuosa, cylindrica, laevia, non-ramosa, infra pallide brunnea, supra brunnea (quod crassitudo parietis diversa hos duos colores efficit), 70-145 μm alt., 4-5.6 μm lat. in medio et superne, basi 5-7-lobata inflata usque ad 10-15 μm lat., 5-17-septata, septis 8-15 μm distantibus, ex extremis fractis percurrenter prolificantia. Cellulae conidiogenae terminales et intercalares in axe conidiophorum et in conidiis integratae, brunneae, monoblasticae; si terminales, versus apicem fertilem angustatae, si intercalares cylindricae vel utrinque leniter constrictae, protuberatione brevi, fertili, admodum subter septo distali exorienti praeditae; 8-14 X 3.5-4 μm . Conidia phragmospora, brunnea, laevia, sicca, duarum formarum: (1) conidia primaria breviora e cellulis stipitis et e conidiis aliis oriunda, 20-42 X 3.5-5 μm , fusiformia vel obclavata, recta, prope basim rotundatam vel truncatam latissima, sursum gradatim angustata ad apicem anguste rotundatum vel acutum, 2-4-euseptata, plerumque 3-septata, ad septa leniter constricta, modice crassitunicata, facile secedentia; (2) conidia secunda longiora, quae partes fuscantes et fertiles sunt conidiophorum, 53-77 X 4.5-5.5 μm , recta vel leniter curvata,

cylindrica vel cylindrico-fusiformia, ad basim truncata, versus apicem attenuata, 4-7-euseptata, ad septa leniter constricta, modice crassitunicata, serotine secedentia.

Conidial fungi, hyphomycetes. Colonies effuse, brown, velvety, hypophyllous. Conidiophores mononematous, erect, straight or flexuous, cylindrical, smooth-walled, unbranched, lower part pale brown, upper part brown, with a sharp line of demarcation between the two levels of pigment (the two colour zones a direct result of different wall thickness), 70-145 μm tall, 4-5.6 μm wide in the middle and above, broadening to 10-15 μm wide at the 5-7-lobed base; 5-17-septate, septa 8-15 μm apart; regenerating percurrently from broken ends. Conidiogenous cells terminal and intercalary in the upper part of the conidiophore axis and in primary conidia, integrated, monoblastic, brown; if terminal, tapered toward the fertile apex, if intercalary, cylindrical or slightly constricted at each end, cylindrical or slightly constricted at each end, with a small fertile protuberance just below the distal septum; 8-14 X 3.5-4 μm . Conidia phragmosporous, brown, smooth, dry, of two types: (1) shorter primary conidia arising from cells of the stipe and from other primary conidia, 20-42 X 3.5-5 μm , fusiform to obclavate, straight, widest near the rounded or truncate base, tapering gradually toward the narrowly rounded or pointed apex, 2-4-euseptate, usually 3-septate, slightly constricted at the septa, moderately thick-walled, seceding readily; (2) longer secondary conidia (the more darkly pigmented, fertile upper portions of conidiophores), 53-77 X 4.5-5.5 μm , straight to slightly curved, cylindrical to cylindric-fusiform, truncate at the base, tapering toward the tip, 4-7-euseptate, often slightly constricted at the septa, moderately thick-walled, seceding late.

HOLOTYPE: on decaying leaves, Agumbe, Karnataka State, India, 12 Nov. 1989, D.J. Bhat, DAOM 214618. Additional material examined: on decaying leaves, Agumbe, Karnataka State, India, 12 Sept. 1989, D.J. Bhat, DAOM 214621.

Teleomorph: unknown.

Xenoheteroconium bicolor produces two kinds of propagule which, although functionally identical, are clearly distinguishable by their modes of development and dehiscence, and by their sizes. It is interesting, and perhaps significant, that the more numerous 'conventional' primary conidia mostly arise singly from small, solitary swellings on the side of, and just below the distal septum of, the cells of the upper part of the conidiophore or of other conidia, and have a narrow base; some are borne apically, but in both cases, they are clearly blastic. The atypical

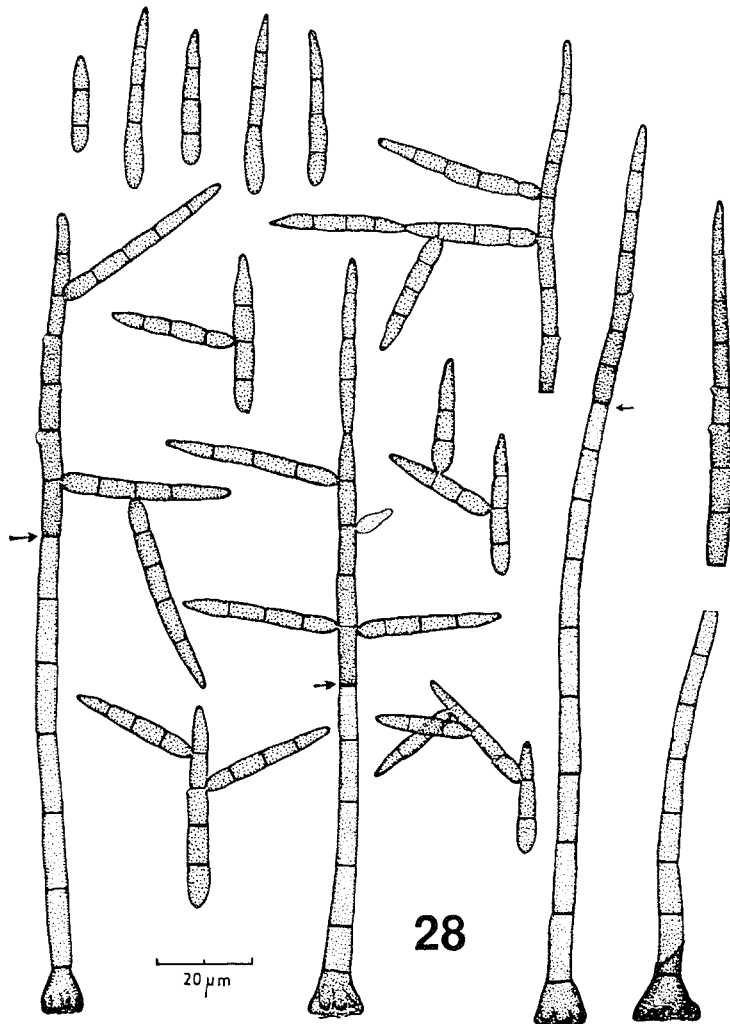


Fig. 28. *Xenoheteroconium bicolor* anam.-sp. nov.: conidiophores, primary conidia in branched chains, and secondary conidia (bases indicated by arrows).

secondary propagules represent a conversion of, and a secondary function for, the upper portion of the conidiophore. These propagules are far fewer in number than the others, as well as longer and with more septa, but the most striking difference lies at their base, which has what Kendrick *et al.* (1971) called a "full-width connection" to the lower part of the conidiophore. This and their earlier role as the fertile part of the conidiophore indicates that these conidia are thallic, and establishes a clear, as well as conceptually interesting, developmental dichotomy between the two kinds of spores produced by *Xenoheteroconium*.

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