RESULTS AND DISCUSSION

CLASS - PYRENOMYCETES

Cystotheca Berkeley and Curtis

Proc.Am.Acad.Arts Sci. 4 : 130, 1858.

The genus Cystotheca was established by Berkeley and Curtis in 1858 and C.wrightii Berk. and Curt. as a type species. It belongs to the family Erysiphaceae of the order Erysiphales (Class - Pyrenomycetes). It is characterised by ascocarps without or with poorly defined appendages, with single ascus, peculiar dark aerial hyphae, inner peridinal cells with hyaline wall which can be easily separatable from outer one. It is not clearly defined as a member of the family Erysiphaceae. The genus Cystotheca is often included under the genus Sphaerotheca. Yarwood (1978) rejected this genus as a member of the family Erysiphaceae, but Homma (1937) treated it as an independent genus because of some of its morphological features and its peculiar host range. The genus was treated as representative of the new family Cystothecaceae by P.Hennings (1901) because of sac-like inner peridium involving single ascus. Katumoto (1973) included the genus in the family Erysiphaceae in respects of its parasitism and morphology of conidial stage and raised a new sub-family Cystothecoideae. This genus has been now considered as a valid genus by Hirrata (1966), Eriksson and Hawksworth (1987) and Braun (1988). This genus has been reported from Simla, (U.P.) in India.

It is known by only three species and reported on thirty-seven host belonging to five genera of two families viz.

Fagaceae and Ulmaceae of the order Fagales and Urticales from Japan, Formosa, Korea, China, India, U.S.A., Mexico, Taiwan and Java. It is a new generic record to the fungi of Tamil Nadu.

Cystotheca indica sp.nov.

= Arachnomyces nitidus Masse and Salmon, Geobios new Reports 4 : 66-69, 1985.
Fig.No.1-3 and 35-38;

Mycelio denso, persistente, arachnoideo, brunneo-flaveolo caespitulis 2-6 µm crassa; demum confluentibus, strato lanoso efformatis quandoque totam paginam inferiorem occupantibus, peritheciis brummei et nigra opaci globosa e floccis, 45-90 µm diam. tunica bitunicate, exotunica intus e cellulis et nigra, endotunica hyalinis; appendiculis a mycelio distinctis, numeresus, 100-500 x 4-8 (-13) µm bruneo, arachnoid simplicibus et ramosus; ascis unicus ovatis et subglobosis crasse tunicatis non-pedicillatis 30-50 x 25-35 µm diam., 4-8 sporii; ascosporae subglobosae et ellipsoidis, hyalinis unicellulis, 7-13 x 10-20 µm; conidial status non visa.

Typus lectus in Foliis Calophyllum apetalum Willd. {Fam.-Clusiaceae (=Guttiferae)}, Coimbatore (T.N.), 19.3.84, V.B.Hosagoudar, HCIO-36387, (a typus).

Infection hypophyllus and forming large spreading chocolate-brown colonies; primary mycelium hyaline, septate, free, external and 2-6 µm wide, later on turning to yellowish or yellowish-brown; special aerial hyphae which are long, hyaline or usually so, straight, septate, or scarsly septate with ± undulate; ascocarps scattered to gregarious, spherical, dark, opaque, 45-90 µm in diam. with numerous appendages; wall of the ascocarps composed of two separate layers : the outer peridial layer is very dark, non-transperent and individual cells obtuse : inner layer which swells and comes out along with ascus in water mountings and composed of annular cells, 8-16 µm thick, hyaline and forming a sac which covers the ascus; appendages numerous, well developed, long, flexible or undulate, thick-walled, bulbous at the base, brown and terminally hyaline, simple, rarely terminally branched, thinly septate, 1-5 times long as the ascocarp diameter or 100-500 µm long and 4-8 (-13) µm thick; ascus single per ascocarp, ovoid or sub-globose, 30-50 x 25-35 µm, 4-8 spored, swells in water and measurei 80 x 60 µm, ascus wall unitunicate, thick and glittering; ascospores sub-globose, ellipsoid, crowded, hyaline, thin-walled, one-celled, 7-13 x 10-20 µm; conidial state not observed.

Holotype : On the living leaves of Calophyllum apetalum Willd. { Fam.-Clussiaceae (= Guttiferae)}, Coimbatore (T.N.), 19.3.84, V.B.Hosagoudar, HCIO-36387, (a type).

Remark : The genus Cystotheca Berk. and Curtis is very small and only known by its three species (Katumoto, 1973). The present collection as to compare with the known species found to be quite distinct in respects of morphology and dimensions of the mycelium, ascocarps, appendages, asci and ascospores as well as its occurence on a quite unrelated member of the family Clussiaceae (= Guttiferae) and thus, new species has been proposed to accomodate the present collection as Cystotheca indica sp.nova. The present collection was also sent to Braun,U. (1990), an authority in powdery mildews and studied by him the material and suggested it to be as a new taxa.

The same collection was erroneously identified as Arachnomyces nitidus Masse and Salman by Pawar and Patil (1985). The material has been restudied and also confirmed by Braun (1990) as new species of the genus Cystotheca. Present material has been compared with the known species of the genus Cystotheca in the Table No.3.

The comparison of the present collection (Table No.3) showed that it agrees in respect of dimensions of the ascocarps and ascospores with a type species but differs in respects of nature and length of the appendages which are numerous and very long; asci are smaller and 4-8 spored and no conidial state has been observed. As to compare with remaining two species the dimensions of the ascocarps, asci and ascospores are quite larger than the present collection, appendages are quite well developed, numerous and quite longer. The

Table No.3

Comparison of present collection with the known species of genus Cystotheca Berkeley and Curtis.

Species	Ascocarp	Appendages	Ascus	Asco-spores	Conidial state	Host plants	Distribution
1. Cystotheca wrightii (Berk. and Curt.) Hohn. (Type)	60-75 µm diam.	Appendages scanty, 7-9 x 120-180 µm	Globose to elliptic, 60-75 x 45-60 µm; 8 spored	11-13 x 14-18 µm	Present	Cyclobalanopsis, Pasania and Quercus spp.	Japan, Taiwan, Korea, China and India.
2. Cystotheca lanestris (Harkn.) Sacc.	90-110 µm diam.	Appendages scanty and indistinct	Globose to elliptic, 75-120 µm in diam.; 8-spored.	21-26 x 13-16 µm	Present	Quercus spp.	Japan, U.S.A. and Mexico.
3. Cystotheca tijbodensis (Gaum.) Katumoto	90-130 µm diam.	Without appendages	Globose to elliptic, 80-100 x 70-80 µm; 8-spored.	19-25 x 19-21 µm	Absent	Castanea spp.	Java
4. Present collection C.indica sp.nov.	45-90 µm diam.	100-500 µm long; numerous and well developed.	Globose to elliptic, 30-50 x 25-35 µm and 4-8 spored.	7-13 x 10-20 µm	Conidia not observed.	Calophyllum apetalum Willd.	Coimbatore (T.N.), India

material has been collected on a quite new host belonging to the unrelated family, on which other species have been recorded. Therefore, a new species has been proposed to accomodate this collection as Cystotheca indica sp.nova. Out of these four species, two are known from India. These two species showed quite distinct geographical distribution. One from Simla i.e. North India while the present is from Coimbatore - South India.

Uncinula Leveille

Ann.Sci.Nat.Bot. III, 15 : 151, 1851.

The genus Uncinula was established by Leveille in 1851 with U.bivonae Lev. as a type species. It belongs to the family Erysiphaceae of the order Erysiphales (Class - Pyrenomycetes). The genus characterised by superficial mycelium; perithecia with many asci; appendages of perithecia coiled at tips and asci pear-shaped. In India 15 species have been reported (Bilgrami et al., 1979). In Maharashtra State, only one species have been reported (Bhide et al., 1987). The conidial states (anamorphs) belonged to the form genus Acrosporium (= Oidium). Tai (1946) key out the Chinese species of this genus.

Uncinula religiosa Ramkr., T.S. and Sundaram

Indian Phytopath. 7 : 140-151, 1954.
Fig.No.4-7 and 39-42;
Hab. : On the living leaves of Ficus religiosa L.

(Fam. - Urticaceae), Satara (M.S.), 22.5.1990, S.H.Mahamulkar, W.I.F.No.701.

Remark : There are two species of Uncinula Lev. viz. U.religiosa and U.aspera Doidge on F.religiosa and other species of Ficus from Kenya, Africa, India, and South-America (Hirrata, 1966). Ramkrishnan and Sundaram (1954) have recorded this species on the leaves of F.religiosa L. from Gleburn State, Nilgiri (T.N.). Present collection agrees well in respects of morphology and dimensions of perithecia, appendages, asci and ascospores and also collected on the same host and therefore, referred to it. Conidial state is not observed. It makes new record to the fungi of the Maharashtra State.

Appendiculella Hoehnel,Sitzb.K.

Akad.Wiss.Wien.Math.Naturw.Kl. 128 : 556, 1919.

The genus Appendicul ella was established by Hoehnel Sitzb.K. in 1919 and A.calostroma (Desm.) Hoehnel as a type species. The genus belongs to the family Meliolaceae of the order Meliolales (Class - Pyrenomycetes) von Arx and Muller, 1973; Eriksson and Hawksworth, 1987. The genus is characterised by mycelium which is superficial, brown, septate, branched, hyphodiate and without setae; ascomata superficial, globose, perithecioid, with larviform appendages; asci 2-4 spored, evanescent; ascospores 3-4 septate and brown. The genus is known by 5 species (Bilgrami et al., 1979) in India. It is new record of the species to fungi of Karnataka State and additional host record.

Appendiculella calostroma (Desm.) Hohn.

Sitzb.K.Akad.Wissen.Wien.Math.Naturw.Kl. 128 : 556, 1919.

Hab. : On the living leaves of Rubus moluccanus L. (Rosaceae), Kimmengundi (K.State), 27.1.91, M.S.Patil, W.I.F. No.702.

Remark : Hoehnel (1919) has reported this species on the leaves of Rubus sp. from Europe. Bose (1962) has recorded this species as Irenopsis crataegi Bose on Cratagus crenulata Roxb. from Chaubattia (W.B.). Kapoor (1967) has also collected it

on Rubus ellipticus Sm. and R.calycinus Don. from Kalimpong and Manebhanjan, Darjeeling (W.B.) respectively and found that it is Appendicul ella calostroma (Desm.) Hohnel. Present material has been collected on R.moluccanus L. and found to be identical to this species and thus, referred to it. It makes a new record to the Karnatak State and R.moluccanus L. is an additional host record.

Asteridiella Mc Alpine

Proc.Linn.Soc.N.S.Wales 22 : 38, 1897.

The genus Asteridiella was established by Mc Alpine in 1897 with A.solani McAlp. as a type species. It was formerly classified in the family Perisporiaceae of the order Erysiphales. The family Perisporiaceae is commonly considered as synonym of the family Meliolaceae (Yarwood, 1973). Muller and von Arx (1973) classified it under the family Meliolaceae of the order Meliolales, which is well defined order in the Pyrenomycetes. The genus is characterised by glabrus, spherical or nearly so ascomata and without mycelial setae. The dark mildews, sometimes incorrectly called the sooty moulds, are characterised by superficial mat of thin-walled, regularly branched hyphae with one or two types of hyphopodia. The asci possess a thin, typically evanescent membrane, 2-4 rarely 8-spored at maturity. The genus is tropical and sub-tropical in its distribution. Each species shows a narrow specialization with respect to particular host species or genus. The genus Asteridiella is monographed by Hansford (1962, 1965) along with other members of the family. It is very large genus next to Meliola Fries. Thrimulachar (1948) has recorded for the first time this genus in South India. It is known by 13 species and 1 variety from India (Bilgrami et al., 1979 and 81; Housagoudar, 1987). Three species

have been reported from the Maharashtra State (Bhide et al., 1987).

Asteridiella theae sp.nov.

Fig.No.8-11 and 46-48;

Plagulae epiphyllae, hyphae bruneo rectae vel undulatae, alternus ramose laxe reticulatae, cellulis 30-34 x 6 µm; hyphopodia capitata alternata vel unilateralia, cellula capitata 12.5 x 15.5-18.5, cellula basali 6 x 9-15.5 µm, hyphopodia mucronata natus in homo mycelium alternata vel, opposite ampullacea, 15.5-27.5 x 9.0 µm, apex aliquando strepto curvo; perithecia disseminatus, melano, 220 µm; perithecial cellulis mammilatae 25-37.5 µm longis sporae fere quadra cellula, curvo, inconstrictae, si penta-cellula, striatus profunde constrictae 12.5-18.5 x 34-46.5 µm.

Typus lectus in foliis Thea sinensis L. (Fam.- Theaceae), Kodaikanal (T.N.), 12.11.89, R.S. Sawant; W.I.F. No.703.

Colonies foliicolous and epiphyllous; mycelium superficial, dark brown, hyphae straight to slightly undulate, branching alternate at wide angles, loosely reticulate, cells 30-34 x 6 µm; hyphopodia of two types :- Capitate and Mucronate; capitate hyphopodia alternate, head cell 12.5 x 15.5-18.5, basal cell 6 x 9-15.5 µm; mucronate hyphopodia

alternate or opposite, ampulliform, 15.5-27.5 x 9.0 µm, tip occasionally twisted and bent variously; Perithecia scattered, black, opaque, upto 220 µm in diam.; perithecial cells mammilate, 25-37.5 µm long; ascospores mostly 4-celled, curved and not constricted, if 5-celled then straight and deeply constricted, 12.5-18.5 x 34-46.5 µm and brown.

Holotype : Collected on living leaves of Thea sinensis L. (Fam.-Theaceae), Kodaikanal (T.N.), 12.11.89, R.S.Sawant, W.I.F.No.703.

Remark : The comparison of the present collection with type species (Table No.4) showed that the present collection agrees in most of the respects except the habit which is epiphyllous, dimensions of the mycelial cells and capitate hyphopodia which are quite larger and perithecial surface conoid cells are striated. Moreover, there is not record of the genus Asteridiella McAlpine on any member of the family Theaceae (Hansford, 1961) and therefore, a new species has been proposed to accomodate the present collection as Asteridiella theae sp.nova.

Table No.4. Comparison of the present collection with a type species.

	Asteridiella solani Mc Alpine (Type species)	Present collection : A.theae sp.nov.
Colony ...	Amphigenous	Epiphyllous
Hyphae ...	Cells 12.25 x 8-11 µm	30-34 x 6 µm
Hyphopodia :- Capitate	Alternate, antrose; Stalk cell 3-7 µm long; head cell 12-19 x 11-17 µm	Alternate; Stalk cell 6 x 9-15.5 µm; head cell globose, 12.5 x 15.5-18.5 µm
Mucronate :	Few, mixed and ampulliform	Opposite, ampulliform and 15-27.5 x 9.0 µm
Perithecia	250 µm in diameter	220 µm in diameter
Perithecia surface	Conoid outgrowths, 30-40 µm in diam. at base, not striated.	25-37.5 µm diam. at the base and striated.
Ascospores	4-septate, constricted at the septa, 37-44 x 14-17 µm.	4-celled, curved and not constricted; if 5-celled, straight and constricted, 12.5-18.5 x 34-46.5 µm.
Host	Solanum viride	Thea sinensis L.
Distribution	New South-Wales, Australia.	Kodaikanal (T.N.), India.

Meliola Fries

Syst.Orb.Veg. 111, 1825.

The genus Meliola was established by Fries in 1825 with M.nidulans (Schw.) Cooke as a type species. The genus belongs to the family Meliolaceae of the order Meliolales of the class Pyrenomycetes, (von Arx and Muller, 1973; Eriksson and Hawksworth, 1987). The order is characterised by ascomata which are astomatous or with rudimentary ostiole, spherical, developing upon external mycelium; mycelium dark with hyphopodia; asci mainly 2-spored; ascospores dark, typically 3-4 septate. The genus is characterised by spherical ascomata; mycelium superficial, brown, septate, setose with hyphopodia; ascospores brown and 4-5 septate. The genus Meliola Fries is commonly called black mildews. It is known by more than 1200 species. In India 86 species have been reported (Bilgrami et al., 1979 and 81) and 49 species have been reported in Maharashtra State (Bhide et al., 1987). The genus has been extensively studied by many workers and monographed by Hansford (1961 and 1965).

Meliola anodendrae Sawada and Yamamoto

Spec.Publ.Coll.Agric.Nat.Taiwan Univ., 8 : 28, 1959.

Fig.No.49-51;

Colonies Poliicolous and amphigenous, 2-5 mm diam;

mycelium setose and hyphopodiate, hyphal cells 6.2-15.5 x 18.6 µm; mycelial setae dark; opaque, scattered, straight, simple, obtuse, 10.8-12.4 x 263.5-180 µm; hyphopodia of two types : capitate and mucronate; capitate hyphopodia 2-celled, alternate, subantrose, straight, 20-30 µm long, stalk cell crunate 6.2-6.2x12.4 µm, head cell oblong to clavulate, entire, 9-12.4 x 15.5-18.6 µm; mucronate hyphopodia very rare; perithecial setae simple, straight, obtuse, 9-10 x 186-217 µm; perithecia scattered, globose, verrucose, 90-200 µm in diam.; asci evanescent but 2-spored; ascospores oblong, obtuse, brown, 4-septate, constricted at septa, 12-17.5 x 37.0-46 µm.

Collected on the leaves of Anodendron paniculatum DC. (Fam.-Apocynaceae), Patgaon (Dist.-Kolhapur), 26.1.1989 S.R.Yadav, W.I.F. No.704.

Remark : This species has been reported by Sawada and Yamamoto (1959) from Formosa on the leaves of Anodendron affine. The present collection resembles in respects of morphology and dimensions of colonies, mycelium, mycilial and perithecial setae, hyphopodia and ascospores except perithecia which are slightly larger and also recorded on the species of the same host genus and therefore, referred to it. It makes a new record to the fungi of India.

Meliola setariae Hansf. and Deight. var. indica var.nov.

Fig.No.12-13 and 52-54.

Plague amphigenus, hyphae sub-rectae, ramose laxe oppositus vel irregularis, cellulis 16.5-25 x 6.5 µm, hyphopodiate et setosus; hyphopodia capitata alternata, cellula basali cylindrica, cellula capitata piriformis, subglobosis, 12.5 x 15.5-6.2 x 9-10 µm; hyphopodia mucronata distinctus, alternata vel oppositis ampullacea, 9-9.5 x 15.5-18.5 µm, mycelialis seta numerosus disseminatus, rectae, 8.5-9.5 x 155-186 µm; perithecelis seta rectae, simplex, 8-9.5 x 170-250 µm; perithecis disseminatus, globosis, 140-155 µm diam., sporae 4-septata, subconstrictae, oblongis 12.4-15.5 x 40-46.5 µm.

Typus lectus in foliis Setaria sp. (Fam.-Poaceae), Kodaikanal (T.N.), 12.11.89, R.S.Sawant, W.I.F.No.704.

Colonies foliicolous and amphigenous; hyphae sub-straight, branching opposite or irregular at wide angles, cells 16.5-25 x 6.5 µm, hyphopodiate and setose; Hyphopodia of two types : Capitate and Mucronate; capitate hyphopodia alternate, stalk cell cylindric to cruhate, head cell piriform, angulose or subglobose, 12.5 x 15.5 - 6.2 x 9-10 µm; macronate hyphopodia separate, alternate or opposite, ampulliform, 9-9.5 x 15.5-18.5 µm; mycelial setae numerous, scattered, straight,

8.5-9.5 x 155-186 µm, apex simple and acute; perithecial setae, simple, straight, acute apex, 8-9.5 x 170-250 µm; perithecia scattered, verrucose, globose, 140-155 µm in diam.; spores 4-septate, slightly constricted, oblong, 12.4-15.5 x 40-46.5 µm.

Holotype : Collected on living leaves of Setaria sp. (Fam.-Poaceae), Kodaikanal (T.N.), 12.11.89, R.S.Sawant, W.I.F. No.704.

Remark : Hansford and Deighton (1948) have reported M.setariae Hansf. and Deighton from Gold coast on Setaria. The present collection has been also recorded on Setaria and thus compared with it. The comparison (Table No.5) showed that the present collection agrees in most of the respects except the dimensions of the setae (both mycelial and perithecial) which are quite smaller and ascospores which are larger and therefore, a new variety has been proposed to accomodate the present collection as Meliola setariae Hansf. and Deight. var. indica var.nova. But it is observed that (Table No.5) the dimensions of the mycelial setae vary from host to host and not a constant character. Therefore, for time being a new variety has been raised but further observations is necessary.

Table No.5. Comparison of present collection with Meliola setariae Hansf. and Deighton.

		Meliola setariae Hansf. and Deighton	Present collection : M.setariae var. indica var.nov.
Colony ...		Amphigenous, 3 mm in diameter	Amphigenous, 2-3 mm in diameter
Hyphae		Cells 20-30 x 6-7 µm	16.5-24.8 x 6.2 µm
Hyphopodia :	Capitate -	antrose; stalk cells 15-12 µm long and head cells 12-16 x 8-13 µm.	12.5 x 15.5 - 6.2 x 9-10 µm
	Mucronate-	ampulliform	ampulliform, 9-9.5 x 15.5-18.5 µm
Setae :	Mycelial -	900 x 8-9 µm in (S.chevalieri) 350 µm long in (S.sulcata)	8.5-9.5 x 155-186 µm.
Perithecial		simple.	8-9.5 x 170.5-248 µm
Perithecia		130 µm in diameter	140-155 µm in diameter
Ascospores		32-37 x 10-12 µm	12.4-15.5 x 40-46.5 µm
Hosts		Setaria chevalieri Setaria sulcata	Setaria sp.
Distribution		Sierra Leone, Brazil.	Kodaikanal (T.N.), India.

Meliola stenospora Wint. var. major Hansf., Sydowia.Beih. 11 : 75, 1962.

= M.piperae Thite and Miss S.D.Patil, Geophytology 13(1) : 124-125, 1983.

On living leaves of Piper nigrum L. (Fam.-Piperaceae), Amboli (Dist.-Ratnagiri, M.S.), Nov.1979, Miss S.D.Patil, HCIO-33672 (a type).

Remarks : Thite and Miss S.D.Patil (1983) have described a new species viz. M.piperae sp.nov. collected on Piper nigrum L. from Amboli on the basis of the dimensions of mycelial cells and size of ascospores (120-155 x 35-75 µm). The size of ascospores given by the authors found to be surprisingly larger and such range is rarely found in the species of the genus Meliola Fries, so far described (Beeli, 1920). Therefore, the type material of this species (HCIO-33672) was restudied and found that the ascospores are not found of such given range but quite normal and identical with a variety viz. Meliola stenospora Wint. var. major Hansf. and therefore, M.piperae sp.nov. considered as invalid species and assigned to M.stenospora Wint. var. major Hansford, which has been already reported from the Maharashtra State (Pawar and Patil, 1986) on the same host and very common in western Ghats of Sahyadri.

Ophioirenina Sawada and Yamamoto

Catal.Taiwan Fungi Part XI Spec.Publ.No.8 : 35, 1959.

The genus Ophioirenina was established by Sawada and Yamamoto in 1959 with O.theae Sawada and Yamamoto as a type species. It belongs to the family Meliolaceae of the order Meliolales, Pyrenomycetes (Eriksson and Hawksworth, 1987). The genus is characterised by superficial mycelium with capitate hyphopodia; perithecia globose to pear shaped; asci fusiform, 8-spored; ascospores clavate and 3-septate. The genus is known by its type species. It is a new generic record to the fungi of India.

Ophioirenina theae Sawada and Yamamoto

Catal.Taiwan Fungi Part XI Spec.Publ.No. 8 : 35, 1959.
Fig.No.14-15 and 43-45;

Colonies foliicolous and epiphyllous; mycelium branched, septate, 5-7.5 µm wide, hyphopodiate and non-setose; Hyphopodia only of one type i.e. capitate hyphopodia alternate, below the septum, 2-celled, upper cell 15-17.5 µm width, lower cell 10-11 µm wide; perithecia black, globose to pear-shaped, non-ostiolate non-setose, smooth, 150-250 µm diameter; asci fusiform, shortly stalked, unitunicate, evanescent, 8-spored, 62.5-71.5 x 12.5 µm; ascospores hyaline, bi or multiseriate or overlaping and

crowded, constricted at the middle septum, 4-celled, head cells larger and clavate, lower cells tapering, 25-30.5 x 7.5 µm.

Collected on the living leaves of Thea sinensis L. (Fam.-Theaceae), Kodaikanal (T.N.), 12.1.89, R.S.Sawant, W.I.F.No.705.

Remark : Sawada and Yamamoto (1959) have recorded this species on the leaves of Camellia sinensis Kuntze from Taiwan. Present collection agrees well in respects of morphology and dimensions of mycelium, hyphopodia asci and ascospores except the perithecia which are slightly larger and also collected on the same host, therefore, referred to it. It makes a new generic record to the fungi of India.

Nitschkia Otth and Fuckel ex Karsten

Symb.Mycol. 165, 1869.

The genus Nitschkia was established by Otth and Fuckel in 1869 and N.fuckelii Nke. as a type species. It belongs to the family Coronophoraceae of the order Coronophorales, class Pyrenomycetes (Ainsworth, et al., 1973). But now the genus is included in the family Nitschkiaceae of the order Sordariales - Pyrenomycetes (Eriksson and Hawksworth, 1987). Subramanian, C.V. (1986) has studied and revised the order Coronophorales and divided it into two families viz. Coronophoraceae and Bertiaceae. The order Coronophorales is characterised by dark carbonaceous, non-ostiolate ascomata which reptures due to mucilaginous mass of gelatenous 'Quell-korper' cells; Periderm cells with Munk pores; asci numerous, cylindrical, polysporous and unitunicate; ascospores allantoid, many, non or 1-septate. The genus is characterised by ascomata which are solitary and free or aggregated, often seated on compact stroma and cupulate. Eriksson and Hawksworth (1987) have merged sixteen genera in this genus as synonyms e.g. the genus Fracchiea Sacc.; Bacilliospora Petrak Calyculosphaeria Fitzp. etc. In India one species have been reported from Punjab (Mundkar and Ahmad, 1946) but many species of Fraechiea, Calyculosphaeria have been reported from India required reinvestigation and correct idemtity.

Nitschkia broomeina (Berk.) Nannfeldt, Sevenk.Bot.Tidskav. 69(1) : 60, 1975.

= Fracchiaea heterogena Sacc., Myc.Ven.Soec. 115, 1863. Fig.No.16-20;

Perithecia single or in groups, carbonaceous black, superficial on subuculum, non-ostiolate, 300-560 x 250-600 µm, setose or spinose; spines 5 to 15 per perithecium, 100-200 µm long; asci many cylindrical, unitunicate, polysporous, characteristic oblique arrangement of spores, thin-walled, 75-130 x 15-20 µm; ascospores allantoid, 1-septate, thin-walled, smooth, non-guttulate, apex rounded, hyaline, 4-6 x 0.5-0.7 µm.

Collected on dead fallen pods of Xylia sp. (Fam.-Mimosaceae), Kernala Fort (Dist.-Raigad), 24.9.89, D.B.Patil, W.I.F.No.706.

Remark : This species has been reported by Nannfeldt (1975) from Europe and characterised by its carbonaceous black, non-ostiolate perithecia with spines. Peridium cells with Munk pores; asci cylindrical, polysporous with characteristic arrangement of spores; ascospores allantoid, 1-septate, The present collection matched in respects of morphology and dimensions of perithecia, asci and ascospores except the setae (= spines) which are longer and therefore, referred to it. It makes a new record to the fungi of India.

Eutypa Tulasne

Selecta Fungorum Carpologia 2 : 52, 1863.

The genus Eutypa was established by Tulasne in 1863 with E.lata (Pers.) Tulasne as a type species. This genus was included by Butler and Bisby (1931) in the family Valsaceae. Dennis (1968, 84) included this genus in the family Diatrypaceae on the basis of common feature of members of the family having light brown, hyaline, sausage-shaped ascospores. The genus belongs to the family Diatrypaceae of the order Diatrypales, class Pyrenomycetes (Eriksson and Hawksworth, 1987). The genus is characterised by ascomata which are solitary or in small groups with ostioles not collectively erumpent and stromata formed by fungus element and host tissue, not well delimited, reduced or sometimes absent. Sometimes the beaks of perithecia ornamented with radial furrows; asci well developed with amyloid apical ring. All species are saprophytic growing on dead stems of woody plants. About 140 species have been reported from world. Patil (1979) has reported this genus from the Maharashtra State. The genus is known by 10 species from India (Bilgrami et al., 1979); seven species have been reported from Maharashtra State. Patil (1979), Gambir (1979), Kar and Maity (1979) have reported some new species.

Eutypa aurindinacea Saccardo

Fungi ven.Ser. 4 : 15, 1873.

Stromata oblong and sublinear; Perithecia minute, subglobose, ostiolate, slightly projecting, 300-500 µm in diam.; asci clavate, conspicuous, long, stipitate, 8-spored, unitunicate with short slender stalk, 50 x 6 µm; ascospores one-celled, smooth, thin-walled, curved, hyaline, guttullate, 12 x 2.5 - 3 µm.

Collected on dead culms of Themeda triandra Forssk. (Fam.-Poaceae), Panhala (Dist.-Kolhapur), 28.3.86, M.S.Patil; W.I.F.No.707.

Remark : This species was first reported by Saccardo in 1873 on Arundinis and Donaxis. It is characterised by its stromata which are oblong and sub-linear; perithecia minute, ostiolate and sub-globose; asci clavate, 8-spored; ascospores one-celled and smooth. Present species collected on Themeda triandra Forssk. agrees well in respects of morphology and dimensions of stromata, perithecia and asci but ascospores are slightly longer and therefore, referred to it. It is a new record to the fungi of India.

Phyllachora Nitschke ex Fuckel

Symboleae Mycologica, 216, 1869.

The genus Phyllachora was established by Nitschke in 1869 with P.graminis (Pers.ex Fries) Nitschke as a type species. It belongs to the family Polystigmataceae of the order Sphaeriales of the class Pyrenomycetes (Ainsworth et al., 1973) but the genus now included in the family Phyllachoraceae of the order Phyllachorales of the same class (Eriksson and Hawksworth, 1987). The genus is characterised by ascomata which are immersed in a dark stroma covered by stromatic clypeus, erumpent or superficial, not staining blue with iodine; peridinal wall often dark membranaceous; asci unitunicate; ascospores hyaline and non-septate. Phyllachora is an obligate parasite commonly called "tar-spot". The genus is known by about 1100 species including homonyms (Parbery, 1973). In India 107 species have been reported including homonyms and synonyms (Kamat et al., 1978; Bilgrami et al., 1979 and 81). The genus is known by about 45 species in the Maharashtra State (Bhide et al., 1987). Conidial states suggested to belong to the Coelomycetous form genera viz. Hendersonia, Stagonospora, Coniothyrium and Urohendersonia because of their close association with the species of Phyllachora but not proved by the cultural studies except P.quadraspora Tehon (Parbery and Langdon, 1963 b).

Kamat et al., (1978) and Parbery (1967) monographed the genus from India and graminicolous species of the world respectively and provided also the keys. Many species of Phyllachora also produce the spermatogonia and used as one of the characters in classification of the species.

Phyllachora arthraxonis P.Hennings

Hedwigia, 43 : 142, 1904.

On the living leaves of Arthraxon innermis Hook.f. and A.lanceolatus Hochst. (Fam.-Poaceae), Satara and Kolhapur, 26.1.86 and 15.1.86 respectively; M.S.Patil, W.I.F.Nos.708, 709.

Remark : P.Hennings (1904) has collected this species on the leaves of Arthraxon hispidus (Thunb.) Makino and reported it from Japan. It is characterised by perithecia which measured 192-220 x 138-193 µm, ascal breadth less than 10 µm, ascospores 10-15 µm long and most of the spores are ellipsoid and some are ovoid. This species has been only recorded on the different species of the genus Arthraxon from Japan, Taiwan, and India. Kamat, Sheshidri and Pande (1978) have recorded this species on Arthraxon meeboldii Stapf. from Pune (M.S.). Present collection collected on two different species of the host genus Arthraxon found to be identical in respects of the morphology and dimensions of stroma, perithecia,

asci and ascospores with P.arthraxonis P.Henn. and thus, referred to it. Arthraxon innermis Hook.f. and A.lanceolatus Hochst. are the new additional hosts. No spermogonia and conidial state have been observed.

Phyllachora bonariensis Speggazini

F.Argent. 1 : 185, 1880.

Fig.No.55-57.

Infection spots foliicolous, amphigenous, scattered, minute, circular, 0.2-1 mm in diameter; perithecia minute immersed, globose in group or separate, single, 150-290 x 250-390 µm; asci clavate or cylindrical unitunicate, shortly pedicillate, octosporous, 60-65 x 10-15 µm; ascospores mono or distichous, ovoid to ellipsoid, one-celled, 10-15 x 5-7.5 µm, hyaline; conidial state not observed.

On the living leaves of Brachiaria reptans (L.) Gerad. and C.E.Hubb. (Fam.-Poaceae), S.U.C., Kolhapur, 18.12.86, M.S.Patil; W.I.F.No.710.

Remark : Speggazini (1880) has recorded this species on Lasiacis divaricata (L.) Hitch. from Argentina and characterised by asci which measured 9-16 x 45-84 µm, ascospores monostichous or distichous and ellipsoid to oval or ovoid and recorded on the species of Alloteropsis, Brachiaria, Cyrtococcum, Digitaria, Melinis, Oplismenus, Panicum, Setaria

and Urochloa, from different parts of world. Present collection found to be identical in respects of morphology and dimensions of stroma, perithecia and asci except the ascospores which are smaller in size and thus, referred to P.bonariensis Speggazini. Doidge (1942) has also listed two species of Brachiaria on which he recorded P.sanguinolenta Doidge from Kongo. But Parbery (1967) merged this species into P.bonariensis Speg. on the basis of morphological similarities and priority. It makes new record to the fungi of India.

Phyllachora fallax Saccardo

Hedwigia, 15 : 117, 1876.

Collected on the living leaves of Chionachnes koenigii (Spreng.) Thw. (Fam.-Poaceae), Kolhapur, 10.4.85 and Koyana-nagar, 9.8.87, M.S.Patil and S.R.Yadav respectively, W.I.F. No.711.

Remark : Saccardo (1876) has reported this species on Chrysopogon gryllus (L.) Trin. from Germany and characterised by asci which are more than 75 µm long and 10 µm wide and always associated with spermatogonia. This species has been recorded on the Chrysopogon montanus Trin. (Kamat, et al., 1978) and C.fulvus (Spreng.) Chiov. (Purohit, 1972) from Khandala (M.S.) and Taknore (Punjab) respectively.

Sydow,P. (1904) has reported P.chionachnes Syd. on C.koenigii (Spreng.) from Punjab. But this species has reduced to synonomy with Phyllachora fallax by Petrak (1941). Present collection collected on Chionachnes koenigii (Spzeng.) Thw. is identical in respects of morphology and dimensions of the asci, ascospores and also constantly associated with the spermogonia and therefore, referred to it. This species has been recorded for the first time on this host from Maharashtra State.

Phyllachora graminis (Pers. ex Fries) Nke.

Symb.Myc., 216, 1869.

On the living leaves of Eragrostiella nardoides (Trin.) Bor (Fam.-Poaceae), S.U.Campus, Kolhapur, 18.10.85, M.S.Patil, W.I.F.No.712.

Remark : This is a very common species and recorded on large number of the graminicolous hosts from different parts of the world. (Parbery, 1967; Kamat et al., 1978) and characterised by perithecia which measured 87-159 x 72-145 µm, ascus breadth less than 10 µm and most of the ascospores are oval or ovoid (both shapes always present). The present collection collected on Eragrostiella nardoides (Trin.) Bor matched well with this species in all respects. Mathur and Mathur (1971) have reported P.eragrostidis Chardom on this

host from Punjab but this species has been considered identical to P.eragrostidis Sawada and later being also considered synonym to P.eleusines P.Henn. (Parbery, 1967). Our material does not match to this species even though collected on Eragrostiella nardoides (Trin.) Bor. This is an additional host record from the Maharashtra State.

Phyllachora ischaemi Sydow, H.and P.

Ann.Mycol., 13 : 40, 1915.

On the living leaves of Dichanthium annulatum (Forssk.) Stapf, D.glabrum (Roxb.) Jain and Deshpande, Ischaemum rugosum Salib., Sehima nervosum (Rottl.) Stapf and S.sulcatum (Hack.) A. Camus (Fam.-Poaceae), S.U.C., Kolhapur, Satara, Gokul-Shirgaon, Panhala (Dist.-Kolhapur Satara), 29.9.87, 26.1.86, 25.1.85, 28.8.86 and 10.11.86 respectively, M.S.Patil, W.I.F.Nos. 713, 714, 715, 716, 717.

Remark : Sydow, H. and P. (1915) have recorded this species on Sehima nervosum (Rottl.) Stapf from Burma and characterised by the asci which are less than 100 µm long, ascospores dumbel-shaped and commonly 12-16 µm long and some times equatorially constricted. This species has been recorded on Andropogon assimilis Steud., A.triticeus Br., Heteropogon contortus (L.) P.Beauv., Capillipedium huegelii (Hack.) A.Camus, Cymbopogon flexosus (Nees) Wats.,

Ischaemum zeylanicolum Bor from Maharashtra (Uppal, 1935; Kamat et al., 1978) and Uttar Pradesh (Chona, 1958). The present collection collected on the different hosts agreed well in respects of the morphology and dimensions of the stroma, perithecia, asci and ascospores except some spores which are sigmoid, especially collected on Dichanthium annulatum (Forssk.) Stapf; D.annulatum (Forssk.) Stapf, D.glabrum (Roxb.) Jain and Deshpande, Sehima sulcatum (Hack.) A.Camus and Ischaemum rugosum Salib. are the new additional hosts.

Phyllachora paspalicola P.Hennings

Hedwigia, 48 : 106, 1908.

On the living leaves, leaf sheaths and culms of Ophiuros exaltatus O.Kuntze (Fam.-Poaceae), Mahuli (Dist.-Satara), 26.1.86, M.S.Patil, W.I.F.No. 718.

Remark : P.Hennings (1908) has recorded this species on Paspalum species from Para (Brazil) and characterised by the asci which measured 60-80 µm long and most of the ascospores subglobose to broadly ellipsoid and 8-9 µm wide and recorded on the different species of Digitaria, Isachne, Ophiuros, Panicum, Paspalum, Trichachne and Triniochloa from different parts of world (Parbery, 1967). Mathur and Mathur (1971) have recorded this species on Isachne albeus Trin.

from Gangapur (U.P.). Hosagoudar (1985) has recorded this species on Digitaria longiflora (Retz.) Pers. from Kerala. The present collection found to be quite identical in respects of the morphology and dimensions of the stroma, perithecia, asci and ascospores except the ascospores which are some times equitorially constricted and thus, referred to it. It makes a new record to the fungi of the Maharashtra State. Sydow, H.and P. (1917) have recorded this species as P.ophiuri Syd. on this host from Papua - New Guinea, but Parbery (1967) has merged it as synonym into P.paspalicola P.Hennings.

Phyllachora sacchari P.Hennings

Hedwigia, 41 : 143, 1902.

On the living leaves of Saccharum officianum L. (Fam.-Poaceae), Arjunnagar (Dist.-Kolhapur), 31.3.66, S.D. Patil, W.I.F.No.719.

Remark : There are two species of the genus Phyllachora viz. P.sacchari-spontanei Syd. and P.sacchari P. Henn. recorded on the different species of the genus Saccharum from the different parts of world (Parbery, 1967; Kamat et al., 1978). The present collection found to be matched in respects of morphology and dimensions of stroma, perithecia, asci and

ascospores with P.sacchari P.Henn. and thus, referred to it. This species differs from P.sacchari-spontanei Syd. in respects of bigger spores, larger stromata, 1-2 perithecia per spot, no spermogonia and no red pigment produced in the leaf spots. This species has been reported from Assam, Tamil Nadu, Kerala and Bihar (Kamat et al., 1978). It makes a new record to the fungi of the Maharashtra State.

Heleococcum Jorgenson

Bot.Tidsskrift, 37 : 417, 1922.

The genus Heleococcum was established by Jorgenson in 1922 with H.aurantiacum Jorgenson as a type species. It belongs to the family Hypocreaceae of the order Sphaeriales, class Pyrenomycetes (Ainsworth et al., 1973). But Rogerson (1970) has included this genus in the family Hypocreaceae of the order Hypocreales. The genus is characterised by ascomata which are not immersed in the stromata, developing singly and superficially or immersed in the host tissue, occasionally botryose on a basal stromata and astomatous; asci spherical; ascospores 2-celled, ellipsoid, occasionally sprouting within the ascus; humicolous or lignicolous. The genus is very rare and known by only two species viz. H.aurantiacum Jorgenson and H.japanese Tubaki. No conidial state has been observed. It is a new generic record to the fungi of India.

Heleococcum indicum sp.nov.

Fig.No.21-22;

Ascocarpus superficialis, distinetus vel aggregatus, sessilis e globosus, hemisphaericus vel ellipsoideus phaeo-brunneus ad melano inostiolatus glaber, carbonaceous externus dissepimentum hyalinus, pseudoparenchymatibus, 260-350 x

210-330 µm; asciis gregaricus, sessilis vel subsessilis, globosus ad ellipsoideus, aparaphysatus, octosporiis, 9-12 x 7-10 µm; ascosporiis congentus, didymus medias septatus, brunneus, tenuitunicatus, glaber 6-10 x 6-7 µm; conidicus status non-visa.

In mortus legumen de Poinciana regia Boer. (Fam.-Caesalpinaceae), Kernala-Fort (Dist.-Raigad), 20.8.1989, D.B.Patil, a typus, W.I.F.No.727.

Ascocarps superficial, seperate or in groups, spherical, hemispherical or ellipsoid, dark brown to almost black, non-ostiolate, smooth and carbonaceus; outer wall black; inner wall hyaline, pseudoparenchymatous, 260-350 x 210-330 µm; asci clustered, sessile or shortly stalked, thick-walled when young, spherical to ellipsoid unitunicate, evanescent when matured, non-paraphysate, 8-spored, 9-12 x 7-10 µm; ascospores crowded, conglomerate, 2-celled, medially septate, ellipsoid, brown, thin-walled, smooth, without germ pores, 6-10 x 6-7 µm; conidial state not observed.

Holotype : Collected on the dead fallen pods of Poinciana regia Bojer. (Fam.-Caesalpinaceae), Kernala-Fort (Dist.-Raigad), 20.8.1989, D.B.Patil, a type. W.I.F.No.727.

Remark : The genus Heleococcum is very rare and known

by only its two species. The comparison of the present collection with a type species (Table No.6) shows that it resembles in morphology and dimensions of the ascocarps with a type species but quite distinct in size of asci and ascospores which are very small. Therefore, a new species has been proposed here to accomodate the present collection as H.indicum sp.nova.

Table No.6.

Table showing comparison of the present collection with type species.

Species	Ascocarps	Asci	Ascospores	Substratum	Distribution
Heleococcum aurantiacum Jorgensen (a type species)	Upto 1/3 mm across (300 -350 µm in diam.)	45 x 35 µm and 8-spored	25-30 x 10-15 µm	Humus compost	England
H.indicum sp.nov.	260-350 x 210-330 µm	9-12 x 7-10 µm and 8-spored	6-10 x 6-7 µm	On dead fallen pods of Poinciana regia Bojer.	Kernala-Fort (Raigad), M.S., India.

Hypomyces Tulasne

Ann.Sci.Nat.Bot. IX, 13 : 11, 1860.

The genus Hypomyces was established by Tulasne in 1860 with H.aurantius (Pers.and Fr.) Tulasne as a type species. It belongs to the family Hypomycetaceae of the order Sphaeriales of the class Pyrenomycetes (Ainsworth et al., 1973). But now the family Hypomycetaceae has been synonymized and merged with Hypocreaceae (Rogerson, C.T., 1970; Eriksson and Hawksworth, 1987) and thus, belongs to the family Hypocreaceae of the order Hypocreales. The genus is characterised by medium sized ascomata with short cylindrical or papillate ostioles; asci cylindrical; ascospores 2-celled and strictly fungicolous. About 5 species and two varieties have been reported and key out with their perfect and imperfect states (Rogerson and Samuels, 1985). In India 3 species have been reported (Bilgrami et al., 1979) but these species appeared to be doubtful and require revision. The conidial states (anomorphs) belonged to various form genera of the Hyphomycetes viz. - Papulaspora, Sibirina, Stephanoma, Verticillium, Cladobotryum, Gliocladium and Sepenodium. Rogerson and Samuels (1985) key out the species based on the substrate and also suggested the conidial state relationship of various species of the genus Hypomyces. It is a new generic record to the fungi of the Maharashtra State.

Hypomyces papulasporae Rogerson and Samuels var. americanus Rogerson and Samuels

Mycologia 77(5) : 763-783, 1985.

Fig.No.23-26 and 58-63;

Subiculum white and cottony; perithecia gregarious or in groups, partly immersed in hyphal mat, hyaline or pinkish, papillate with distinct ostiole; 140-160 µm x 170-290 µm; asci many, cylindrical, non-paraphysate, unitunicate, subsessile, 8-spored, apex with minute ring, thin-walled, 45-65 x 2.5-3.2 µm; ascospores obliquely uniseriate, 1-septate, fusiform to naviculate with apical end some what more pointed than basal end, smooth, medially uniseptate, 9.5-12.5 x 2.5-3 µm; conidial states; : Papulaspora candida Saccardo. Conidiophores crowded, simple, straight, hyaline; chlamydospores pedicillate with terminal vesicle bearing 3-12 tubercles, light-brown, 10-30 µm in diameter; Verticillium psalotae Treschow; Conidiophores simple, hyaline bearing conidigenous branches in whorls; conidia one-celled, hyaline, single, terminal, 8-12 x 3-5 µm.

Collected as hyperparasite on the ascocarps of Trichoglossum hirsutum (Pers.ex Fr.) Boud. (Fam.-Geoglossaceae), Radhanagari, 28.8.88, M.S.Patil, T.hirsutum var. irregulare Mains, Radhanagari (Dist .-Kolhapur), 28.8.88 and Gaganbawada (Dist .-

Kolhapur), 5.9.88, T.hirsutum var.longisporum (Tai) Mains, Shelap (Dist.-Kolhapur); T.octopartitum Mains, Panhala (Dist.-Kolhapur); T.octopartitum var. irregulare var.nov., Panhala (Dist.-Kolhapur), 7.9.84 and T.walteri (Berk.) Durand, Gawase (Dist.-Kolhapur), 3.8.86, M.S.Patil and R.S.Sawant, W.I.F.Nos. 19, 21 a, 21 b, 22, 23, 24 c, 29.

Remark : Rogers and Samuels (1985) have recorded this variety on the ascocarps of Trichoglossum with Papulaspora candida Sacc. as a conidial state. Present collection collected on different species and varieties of the genus Trichoglossum found to be quite identical in respects of morphology and dimensions of perithecia, asci and conidial states except the ascospores which are slightly smaller and thus, referred to it. The perfect state has been recorded only on the ascocarps of Trichoglossum hirsutum var. irregulare Mains, while on remaining substrates only anomorph has been recorded very abundently. It makes a new record to the fungi of India and a new generic record to the fungi of the Maharashtra State.

Hypocrella Saccardo

Michelia 1 : 322, 1878.

The genus Hypocrella was established by Saccardo in 1878 with H.discoidea (Berk. and Br.) Saccardo as a type species. It belongs to the family Clavicipitaceae of the order Sphaeriales, class Pyrenomycetes (Ainsworth et al., 1973). But now the genus has been included in the same family but of the order Clavicipitales (Eriksson and Hawksworth, 1987). The genus is stromatic and entomogenous; stromata fleshy or horney, often completely smoothering the host; ascomata immersed; asci cylindrical; ascospores septate and separating into part spores within the ascus. The genus is known by 7 species from India (Bilgrami et al., 1979 and 81). The species of the genus regularly producing the anomorphs which belongs to the form genus Aschersonia (Class - Coelomycetes). It is a new generic record to the fungi of the Maharashtra State.

Hypocrella tubulata Petch

Ann.R.Bot.Gard.Peradeninya 7 : 241, 1921.

Fig.No.27-29 and 64-68;

Stromata growing and covering the body of the insects; spherical, hemispherical or tuberculate with flat base and punctate tops due to perithecial openings, brightly coloured,

1000-2500 x 500-900 µm; perithecia minute, immersed, ostiolate, subglobose or subpyriform, 200-575 x 800-500 µm; asci long, cylindrical, unitunicate, with apical apparatus and bulbous swellings, subsessile, 8-spored, 170-182 x 5.7-7.6 µm; ascospores long, parallel, multiseptate, hyaline, smooth, thin-walled, separating into part spores within the ascus, each segment measured 1.0-3 x 5-11 µm; conidial state belonged to the form genus Aschersonia : Pycnidia immersed in a fleshy stromata, cylindrical to globose, ostiolate, 75-87.5 x 100-110 µm; conidia fusoid, 7.5 x 1.0 µm.

Collected on the dead fallen leaves of Eugenia jambulana L. (Fam.-Myrataceae), Kernala fort (Dist.-Raigad, M.S.), 15.6.88, D.B.Patil; W.I.F.No.720.

Remark : Present species was first reported by Petch in 1921 on Eugenia revoluta Horton from Ceylon. The present collection agrees well in respect of morphology and dimensions of stromata, perithecia, asci, ascospores and its conidial state and also recorded on the same host and thus, referred to it. It makes a new generic record to the fungi of the Maharashtra State and a new record to the fungi of India.

C L A S S - L O C U L O A S C O M Y C E T E S

Hypnotheca Tommerup

Trans.Br.Mycol.Soc. 55 : 463-475, 1970.

The genus Hypnotheca was established by Tommerup in 1970 with H.graminis Tommerup as a type species. It belongs to the family Dothioraceae of the order Dothideales, class Loculoascomycetes (Ainsworth et al., 1973). The genus Hypnotheca has been included in the genera of incertain position by von Arx and Muller (1975) and Eriksson and Hawksworth (1987). The genus is characterised by pseudothecia which are sub-epidermal to erumpt, crateriform, made up of rows of vertically arranged cells; entire upper surface of stroma is thrown off to expose disk-shaped layer of aparaphysate asci; ascospores non-septate and hyaline. The genus is known only by its type species. The conidial state belonged to the form genus of Hyphomycetes - Monochaetiella.

Hypnotheca graminis Tommerup

Trans.Br.Mycol.Soc. 55 : 463-475, 1970.

Fig.No.30-31 and 74;

Infection foliicolous; infection spots, 3-5 mm x 2-3 mm, dark purple or reddish-purple; pseudothecia subepidermal to erumpten, crateriform, made up of rows of vertically arranged cells, 90-108 µm in height, entire upper surface of the stromata is thrown out to expose disk shaped layer of aparaphysate

immature asci, which were found to be filled with lipid globules - a characteristic feature of dormant phase; conidial state not observed.

Collected on the living leaves of Coix lachryma jobi L., Cymbopogon flexuosus (Nees) Wats. and Thelepogon elegans Roth. (Fam.-Poaceae), Shivaji University Campus, Kolhapur, Gokul Shirgaon and Jotiba Hills (Dist.-Kolhapur, M.S.), 8.10.78, 8.12.85, 25.12.85 respectively, M.S.Patil, W.I.F.Nos.721, 722, 723.

Remark : The morphology and dimensions of pseudothecia and asci of present collections exactly matched with a type species. Immatured asci were also found to be filled with lipid globules - characteristic feature of its dormant phase and thus referred to it. This is reported from Queensland (Australia) on the living leaves of Heteropogon contortus (L.) P.Beauv. This species has been considered and experimently proved as a perfect state of Monochaetiella themede Kandaswamy and Sundaram recorded on H.contortus (L.) P.Beauv. and Themeda australis. No conidial state was observed in present collections. Tommerup (1970) raised a new genus Hypnotheca belonging to the family Dothioraceae of the order Dothideales on the basis of its sessile, cylindrical, bituni-cate asci formed fasciculately on a plane stroma; asci are

aparaphysate in a continuous layer in a locule exposed by repture of the overlying stroma with Monochaetiella themedae Kandaswamy and Sundaram as a conidial state. Lutrell (1973) accepted the genus but further commented that it is closely related in its internal structure of ascocarp and its parasitic habit to Moeszopeltis Petrak, a member of the family Lepto-peltidaceae of the order Hemisphaeriales. But von Arx and Muller (1975) considered the genus Hypnotheca Tommerup as a genus of uncertain affinity. And also further commented that it may probably an immature Discomycetes. Apparently, the morphology of fungus appears as a member of the Discomycetes - especially a member of Phacidales, on account of its habit - foliicolous, arrangement, colour and shape of the ascocarps and its basal feebly developed stroma. Its perfect state shows a considerable period of dormancy which might have created an impression of v.Arx and Muller (1975) who studied the material that might be in its dormant phase and thus, called it as an immatured Discomycetes. One of the unknown feature observed while studying the present materials in laboratory that, when fresh collection or section mounted in lactophenol a purple blue pigment has been observed. This may probably the pigment synthesized either by pathogen or by host or as an interaction of both because the infection spots (non-necrotic) appeared mostly on upper side of the leaves

which are dark bluish or purplish-black. This pigment might be dissolved in lactic acid. It is a new generic record to the fungi of India and recorded also as new additional hosts.

Asterina Leveille

Ann.Sci.Nat.Ser. 3 : 59, 1845.

The genus Asterina was established by Leveille in 1845 with A.azarae Leveille as a type species. It belongs to the family Asterinaceae of the order Hemisphaeriales of the class Loculoascomycetes (Ainsworth et al., 1973). Now the family Asterinaceae belongs to the order Dothideales, Loculoascomycetes (von Arx and E.Muller, 1975; Eriksson and Hawksworth, 1987). The order Dothideales is characterised by ascocarps which are dimidiate-scutate, perithecioid, apothecioid or pulvinate with acropetal or centrifugal development, superficial, erumpt or innate; asci aparaphysate in fascicles of small perithecioid locules or broad discoid layers. The genus is characterised by pseudothecia single, orbicular, opening by broad pore or by irregularly stellate fissures, crumbling or disintegrating into slime; mycelium entirely superficial and hyphopodiate; hyphopodia lateral; ascospores 1-septate, becoming brown; conidia lacking or in hemispherical pycnidia. The genus is known by more than 200 species (v.Arx and Muller, 1975). In India 38 species have been reported (Bilgrami et al., 1979 and 81) and 20 species have been reported from the Maharashtra State (Bhide et al., 1986). The conidial state belonged to the form genus Asterostomella. Japanese and Formosan species of the

genus Asterina Lev. were key out by Katumoto (1975) and Yamamoto (1957) respectively.

Asterina camelliae Syd. and Butler

Ann.Mycol. 9 : 389, 1911.

Collected on the leaves of Thea sinensis L. (Fam.-Theaceae), Kodaikanal (T.N.), 12.1.1990, R.S.Sawant, W.I.F. No.724.

Remark : The present species has long been known as Asterina cincta Berk. collected on Thea sinensis L. from Khasis of Eastern India, was carefully examined by Theissen (1913) and stated that the specimen was incomplete and parasitized by Acanthostoma wattii (Syd.) Theissen, almost all portion of its mycelia. Then the name of A.cincta Berk. was erased by him and replaced by the name A.camelliae Syd. and Butler, which was also fouhd on the Thea sinensis L. in Sibsagar districts of Eastern India. It is characterised by colonies which are epiphyllous; hyphae irregularly reticulate; hyphopodia unilateral; ascomata gregarious and superficial and dehisce at the apex; asci 8-spored; ascospores 1-septate, rounded at both the ends. The present collection agrees well in above respects except the ascospores which are slightly smaller in size and also collected on the same host and therefore, referred to it. Conidial

state not observed. It makes new record to the fungi of the Tamil Nadu State.

Asterina daphniphylii Yamamoto

Sci.Rep.Hyogo.Univ.Agric., Ser.Agric.Biol., 2 : 34, 1956. Fig.Nos.69-73;

Colonies epiphyllous or gregarious, circular, blackish, 3-6 mm diameter; hyphae irregularly reticulate, somewhat undulate, oppositely or alternately ramose, brown hyphopodiate, very compact, 3-5 µm in width; hyphopodia one-celled, unilateral, smooth, continuous, rounded at the apex, 6 x 8.5 µm; ascomata gregarious, orbicular, brown, stellately dehisced, 150-240 µm diam.; asci subglobose, ovate to abovate, sessile, bitunicate, 8-spored, 50 x 20.5 µm; ascospores ovate, oblong, 1-septate, constricted at the septum, rounded at both the ends, brown, smooth and 18-21.5 x 8.5-9.6 µm; conidial state not observed.

Collected on the leaves of Daphniphyllum neilgherrense (Wt.) Rosenth. (Fam.-Daphniphyllaceae), Kodaikanal (T.N.), 12.1.1989, R.S.Sawant; W.I.F.No.725.

Remark : The present species was first described by Yamamoto (1956) and collected on Daphniphyllum tejsmanni Zoll. from Japan. Another species viz. A.kamiziyama Fukui was reported by Fukui (1940) on D.macropodium. A.daphniphylli Yamamoto is characterised by epiphyllous and gregarious colonies; hyphae undulate and reticulate, very compact;

hyphopodia unilateral, smooth and straight; ascomata gregarious; asci ovate and 8-spored; ascospores smooth and 1-septate. The present collection agrees well in respects of morphology and dimensions of the ascomata, hyphae, hyphopodia and ascospores with A.daphniphylli except asci which are slightly smaller in size and also collected on the same host genus and therefore, referred to it. It makes a new record to the fungi of India.

Eudarluca Spegazzini

Rev.Mus.La.Plata 15 : 22, 1908.

The genus Eudarluca was established by Spegazzini in 1908 with E.australis Speg. as a type species. It belongs to the family Venturiaceae of the order Pleosporales, class Loculoascomycetes (Ainsworth et al., 1973). But the family Venturiaceae is now included in the order Dothideales by Eriksson and Hawksworth (1987). The genus is characterised by pseudothecia basally or wholly immersed in a globose to orbicular-pulvinate stroma; ascospores septate at or slightly below the middle, sometimes becoming phramosporous; hyper-parasites in and around pustules of Uredinales. In India two species have been reported (Bilgrami et al., 1971 and 81) and one species from the Maharashtra State (Bhide et al., 1987).

Eudarluca caricis (Fr.) O.Eriksson var. indica (Ramkrishnan) O.Eriksson comb.nov., Arkiv.Bot.Ser.2, 6 : 390-392, 1967.

Bas. = E.indica Ramkrishnan, Proc.Ind.Acad.Sci.Sect.B, 34, 158, 1951.

= E.caricis (Fr.) O.Eriksson, Indian Phytopath. 32(4) : 576-77, 1979.

In or on the urediniospore pustules of Puccinia duthiae Ell. and Tracy on the leaves of Dichanthium annulatum (Forssk.) Stapf. (Fam.-Poaceae), Shivaji University Campus, Kolhapur (M.S.), 19.9.78, M.S.Patil, HCIO-32784.

Remark : Eriksson (1966 a) reviewed the taxonomy, nomenclature and distribution of uredinicolous Pyrenomycetes - Eudarluca caricis which commonly associates with graminicolous species of Puccinia. It is a perfect state of Darluca filum (Biv.) Cast., an hyperparasite of many graminicolous rusts. Two species are known of this genus viz. E.caricis (Fr.) O.Eriksson and E.indica Ramkrishnan. The former species known from Europe and South America while later known to occur from Africa, America, Asia, Australia and Europe. The Indian species reported by Ramkrishnan from South India is being considered as a variety of E.caricis (Fr.) O.Eriksson and proposed a new combination viz. Eudarluca caricis (Fr.) O.Eriksson var. indica (Ramkrishnan) O.Eriksson comb.nova on the basis of nature of the stroma, septation and pigmentation of the ascospores. On the basis of these characters, the species reported by Patil (1979) is considered here as a variety viz. E.caricis (Fr.) O.Eriksson var. indica on the basis of the well developed stroma, ascospores strictly 1-septate, hyaline and its geographical distribution.

Wentiomyces Koorders

Verh.K.ned.Akad.Wet.Ze.Reeks, 13(4) : 168, 1907.

The genus Wentiomyces was established by Kooders in 1907 with W.javanicus Koorders as a type species. It belongs to the family Dimeriaceae of the sub-order Pseudosphaeriineae of the order Dothideales, - Loculoascomycetes (von Arx and E.Muller, 1975; Eriksson and Hawksworth, 1987). The genus is characterised by pseudothecia which are nested in the mycelium or on the strips of stromatic columns, globose or slightly dipressed, small to middle sized with hyphal hairs or appendages or setae; seldom completely glabrous; wall of the several layers of cells; epiphytes; ascospores 2-celled and remaining hyaline. The genus is known by about 50 species (v.Arx and Muller, 1975), enumerated by Hansford (1946) as Dimeriella. Three species have been reported from India (Bilgrami et al., 1979 and 81) and also from Maharashtra State (Kamat et al., 1976; Bhide et al., 1986).

Wentiomyces javanicus Koorders

Verh.K.ned.Akad.Wet.Ze.Reeks, 13(4) : 168, 1907.

Fig.Nos.75-77;

Collected on the dead fallen leaves of Ficus elastica Roxb. (Fam.-Urticaceae), Panhala (Dist.-Kolhapur), 10.8.88, M.S.Patil, W.I.F.No.726.

Remark : This species was reported by Koorders on the leaves of Ficus elastica Roxb. from Java. Bose and Muller (1964) have reported this species on the leaves of Quercus leucotrichophora A.Camus from Uttar Pradesh (India). Present collection resembles in the morphology and dimensions of pseudothecia, asci and ascospores and collected also on the same host and therefore, referred to it. It makes a new record to the fungi of the Maharashtra State.

Tubeufia Penzig and Saccardo

Malpighia, 11 : 517, 1897.

The genus Tubeufia was established by Penzig and Saccardo in 1897 with T.javanica Penzig and Saccardo as a type species. It belongs to the family Pleosporaceae of the order Pleosporales of the sub-order Pseudosphaeriineae of the class Loculoascomycetes, (von Arx and E.Muller, 1975). But now this genus is included in the family Tubeufiaceae of the order Dothideales - Loculoascomycetes (Barr, 1980; Eriksson and Hawksworth, 1987). The genus is characterised by Pseudothecia which are separate, light or pink coloured, ochraceous to yellow and becoming brown, apex bluntly papillate, surface glabrous or pulverulent with protruding cells or short setose or bearing hyphal appendages; asci from base of locule, bitunicate, octosporous; ascospores acicular to filamentous and hyaline; on plants stems or as hyper-parasites on other fungi. The genus is known by about 10 species (Booth, 1959; Webster, 1951; Pirozynski, 1972). Only one species has been reported from India (Bilgrami et al., 1979 -81) and one species has been reported from Maharashtra state (Kamat, et al., 1976; Bhide et al., 1986). The conidial state belonged to the form genera viz. Helicosporium or Helicoma, Monodictys, Pendulispora.

Tubeufia indica sp.nov.

Fig.No.32-34;

Pseudotheciis gregaris, inatis in substratum contextu pseudothecis laxe prosenchymato palido 215-360 x 170-380 µm; hyphis radicularibus, filiformibus, radiantibus septatis; ostiolo protrudo superfici cinctus coronato tuberculatis et globularibus in sicco oblongis 45-80 x 20-50 µm ascis cylindraceis tereeti-clavatis breve stipitatis apice rotundis parcissme pseudoparaphysatis octosporiis, bitunicatae, 80-90 x 10-15 µm; sporidiis cylindraceis recta vel curvatae basi multiseptatis, non-constrictis olivecae-brunnae 50-55 x 3.5-6.5 µm; conidiis nula.

Hab. : Typus lectus in apotheciis Hymenoscyphus on dicot leaf Shelap (Dist .-Kolhapur), 23.9.75, M.S.Patil, a type, W.I.F.No.728.

Ascomata completely immersed in the hymenium, crowded, protruding only by their ostioles to the flat surface of the apothecium, spherical or ovoid, yellowish-brown, peridium multilayered, soft, pseudoparenchymatous 215-360 x 170-380 µm; ostiole is lined like a corona with many thick walled, vertically elongated, brown, baloon like simple, non-septate sessile floats 45-80 x 20-50 µm; asci many bitunicate, cylindric, 8-spored, pseudoparaphysate, sub-sessile, 80-90 x 10-15 µm; ascospores parallel, elongated clavate, multiseptate

(9-11 septa), curved, non-constricted at the septa, smooth yellowish brown 50-55 x 3.5-6.5 µm, pseudoparaphyses many and septate; conidial state not observed.

Holotype : In the living apothecium of Hymenoscyphus on dicot leaf Shelap (Dist.-Kolhapur), 23.9.75, M.S.Patil, a type, W.I.F.No.728.

Remark : The genus Tubeufia Penzig and Sacc. is characterised by the phragmosporous to scolicosporous brown to yellowish brown or hyaline ascospores and occured as a hypersaprobic on decaying woody or herbaceous substrates often over old ascomata or mycelium of other ascomycetes in tropical and temperate regions (Lutrell, 1973; Bar, 1980). The genus has been studied in detail by Bar (1980) and divided into 4 sections viz. Tubeufia, Thaxteriella, Nectrioidea and Acanthostigmina. von Arx (1975) considered 10 valid species of this genus but Barr (1980) has accepted only 7 species. The genus have been reported by Tilak and Kale (1969-70) in India. Some species of this genus produce conidial state belonging to the form genera viz. Monodictys, Helicosporium, Helicoma, Helicomyces, Drepanospora. Barr (1980) has described the species of this genus and their synonyms.

The present collection has been collected as a hyperparasite in the living apothecia of genus Hymenoscyphus mostly,

Table No.7.

Comparison of present collection with different species of Tubeufia Penzig. & Saccardo

Species	Ascomata	Protruding cells or appendages	Asci	Paraphysis	Ascospores	Conidial State	Host, substratum and Distribution
1. T.javanica Penz.& Sacc. (Type species)	165-300 x 245-330 µm, brown, soft peridium, pseudo-parenchymatous	45-115 x 2-4 µm	140-195 x 10-13 µm Cylindric	Pseudopara-physes cellular	100-200 x 3-7 µm, yellow curved, -35 septate, thick tip	Monodictys	On woody monocots bamboo, Palm, over substrata of other ascomycetes. U.S.A., Florida, Panama, Colombia, Java.
T.cylindrotheca (Seaver) von Hohnel, Sitzungber	165-275 x 275-385 yellow, dark base, Peridium glabrous, Pigment patches	Projecting cells or short setae	85-140 x 9-15 µm Cylindric	narrow, cellular	40-55 x 3-5 µm clavate, 7-13 septate	Helicospo-rium roseum Coils 30-45 µm	On woody monocots or substrata of other ascomycetes. U.S.A. Bermuda, Colombia, Trinad.
T.cerea (Berk. and Curt.) von Hohnel Sitzungber	120-160 µm, yellow Pigments as crystalline granules on wall.	Protruding cells or hyphal appendages 22-33 µm long	50-74 x 7-12 µm Clavate	narrow cellular	30-52 x 2.5-3.5 µm curved 7-10 septate.	Helicospo-rium vegetum Coiled 2-3 times.	On mature stromata of other ascomycetes America, Austrelia, Europe, Belgium.
T.pezizula (Berk. & Curt.) Barr comb nov.	300-450 µm Peridium smooth	Protruding cells with encruting pigment	100-145 x 20-32 µm clavate	narrow cellular	35-60 x 8-12 µm 7-9 septate	Helicoma Helicospo-rium Helicomyces	Dead woody branches of Dicot. America, Bermuda, Jamaica, Grenada.
T.helicoma (Phill. & Plowr.) Pirozynski	180-385 x 208-550 µm, glabrous	Protruding cells apex rounded	120-200 x 15-25 µm	narrow cellular	60-100 x 4-6 µm upto 25 septate	Helico-sporium	On dead branches, monocot culmn, USA, Guinia, Europe, England.
T.clitonii (Peck.) Barr comb.nov.	90-180 µm, grouped on subicul um	Stiff, pointed setae 30-90 µm	50-90 x 13-20 µm	narrow cellular	32-45 x 3.5-5.5 µm curved	Not known certainly	Rotting deciduous leaves or old ascoma USA, Europe, America, Asia, Java
T.scopula (Cooke and Peck.) Barr comb.nov.	165-280, peridium soft	Dark non-septate setae 37-90 µm	67-100 x 11-15 µm oblong	narrow cellular	56-80 x 2.5-3.5, fusoid, curved	Helicospo-rium Helicomyces	Decorticated conifer wood rarely on deci-duous leaves. USA, Europe, Austrelia.
Present collection T.indica sp.nov.	215-360 x 170-380 µm, yellow to brown, grouped, soft peridium prosenchymataous innate	Tuberculate floator baloon like appenda-ges arranged at mouth like corona 45-80 x 20-50 µm.	80-90 x 10-15 µm cylindric	narrow cellular	50-55 x 3.5-6.5 µm multiseptate Generally 9-11 septa	Not observed	On living apothecium of Hymenoscyphus on dicot leaf Shelap (Dist .-Kolhapur)

foliicolous thus it is strictly parasitic in habit. As to compare the present collection (Table No.7) in respect of habit and host (substratum) morphology of pseudothecia ostiolar floats appendages, asci and ascospores with known species it does not match to a type species and other reported fungicolous species except asci of present collection in respects of dimensions agrees with T.elintonii (Peck.)Barr and ascospores matches with T.cylindrotheca (Seaver) von Hohnel, Stizungsber, T.cerea (Berk. and Curt.) von Hohnel, Sitzungsber T.pezizula (Berk. and Curt.) Barr. Therefore, our collection appears to be quite distinct in respects of habit, in which pseudothecia entirely innate in the hymenium of living apothecia and ostiolar appendages which are tuberculated or baloon like and no conidial state observed in this collection. Therefore, on the basis of average morphological and dimensional characters as well as the substratum i.e. host is quite distinct and therefore, new species viz. Tubeufia indica sp.nova has been proposed here to accomodate the present collection.

Explanation of Figures 30-34.

Fig.Nos.30-31 : *Hypnotheca graminis* Tommerup

30. : Habit;

31. : T.S. of leaf showing pseudothecia, x 150.

Fig.Nos.32-34 : *Tubeufia indica* sp.nov.

32. : Habit;

33,34. : Perithecial baloon like appendages, x 810.

Explanation of Figures 27-29.

Fig.Nos.27-29 : *Hypocrella tubulata* Petch

27. : Habit;

28. : Habit of conidial state *Aschersonia*

29. : Stromata showing perithecia x 3.

Explanation of Figures 21-26.

Fig.Nos.21-22 : Heleococcum indicum sp.nov.

21. : Perithecia, x 150;

22. : Ascospores, x 250.

Fig.Nos.23-26 : Hypomyces papulasporae Rogerson and Samuels var. americanus Rogerson and Samuels.

23. : Habit on ascocarps of Trichoglossum hirsutum var. irregularae Mains. Loc. Radhanagari;

24. : Habit on ascocarps of Trichoglossum hirsutum var. longisporum Loc. Shelap;

25. : Dehiscing perithecium with asci and a conidial state Papulaspora candida Saccardo, x 665;

26. : Conidial state Papulaspora candida Saccardo, x 600.

Explanation of Figures 16-20

Fig.Nos.16-20 : Nitschkia broomeina (Berk.) Nannfeldt

16. : Habit;

17. : Perithecium with asci, x 90;

18. : T.S. of Xylia Fruit pericarp showing perithecia, x 25;

19. : Asci x 350;

20. : Ascospores, x 800.

Explanation of Figures 12-15

Fig.Nos.12-13 : *Meliola setariae* Hansf. and Deight. var. *indica* var.nov.

12. : Perithecium, x 160;

13. : Ascospores, x 550.

Fig.Nos.14-15 : *Ophioirenina theae* Sawada and Yamamoto

14. : Habit;

15. : Ascospores, x 830.

Explanation of Figures 8-11

Fig.Nos.8-11 : *Asteridiella theae* sp.nov.

8. : Habit;

9. : Hyphae with hyphopodia, x 125;

10. : Perithecium, x 150;

11. : Ascospores, x 1330.

Explanation of Figures 1-7

Fig.Nos. 1-3 : Cystotheca indica sp.nov.

1 : Habit;

2.: Perithecium with appendages and ascus, x 310;

3 : Dehiscing perithecium with ascus, x 375.

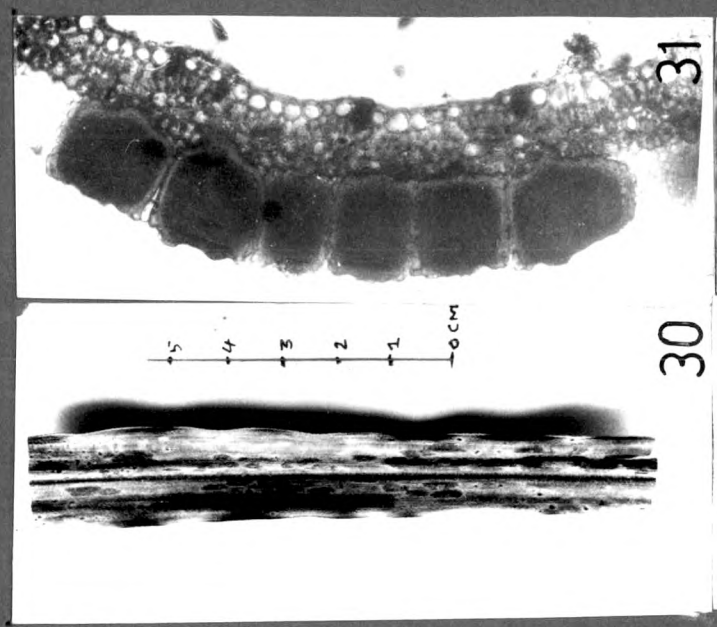
Fig.Nos. 4-7 : Uncinula religiosa Ramkrishnan and Sundaram

4 : Habit;

5 : Perithecium with appendages, x 150;

6 : Perithecia, x 100;

7 : Dehiscing perithecium with asci, x 400.



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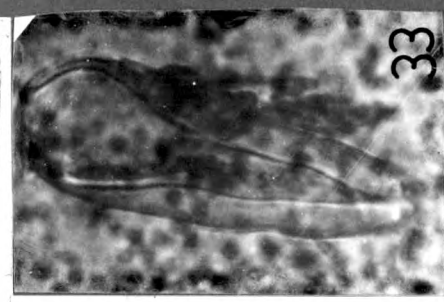

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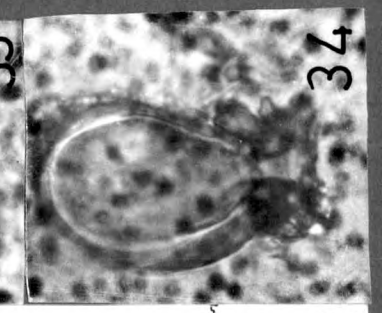

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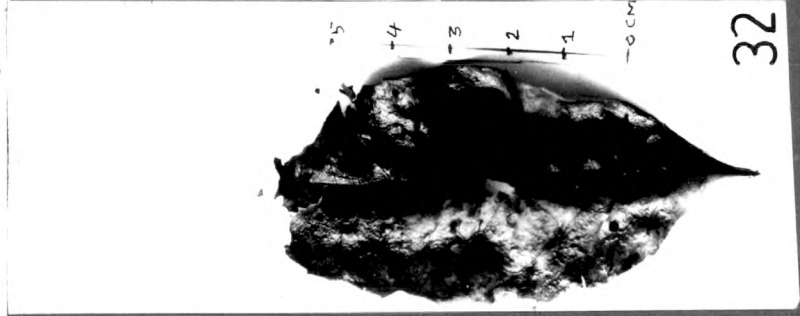

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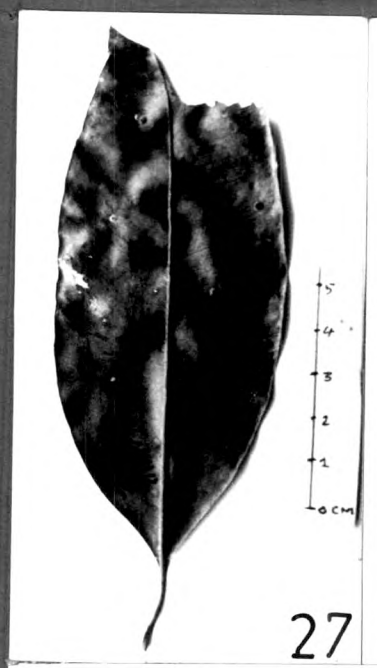

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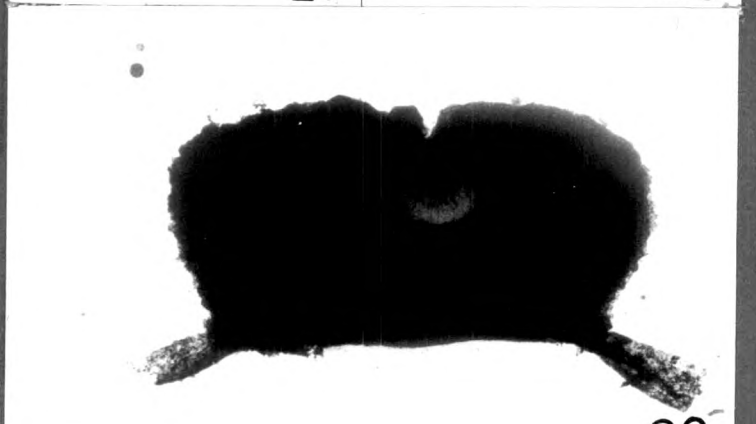

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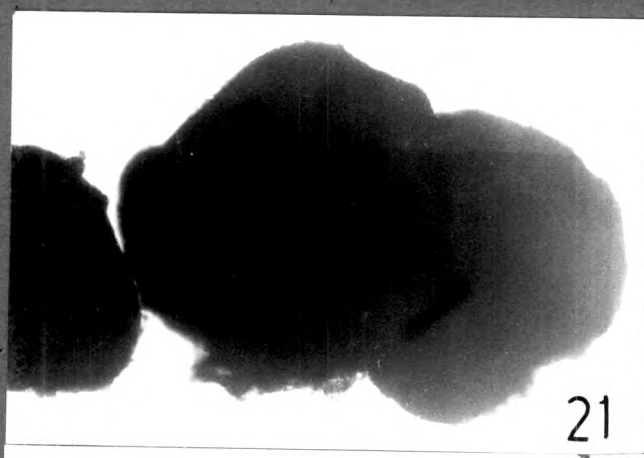

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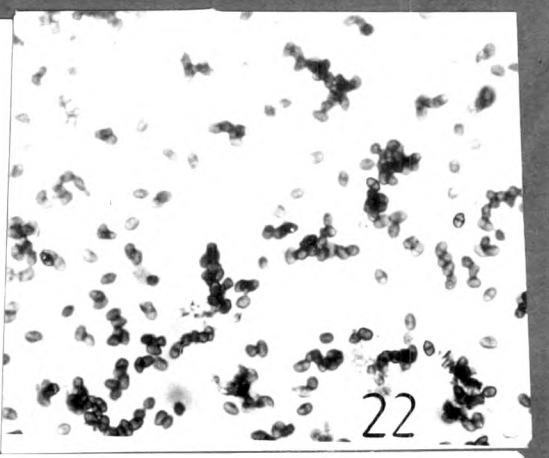

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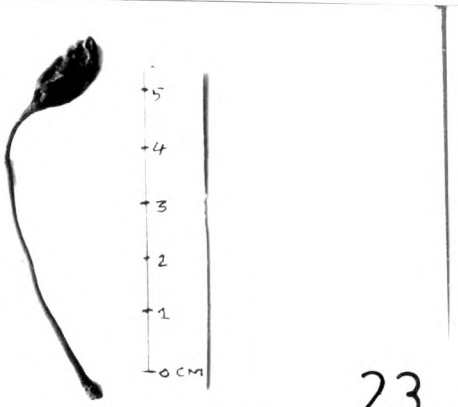

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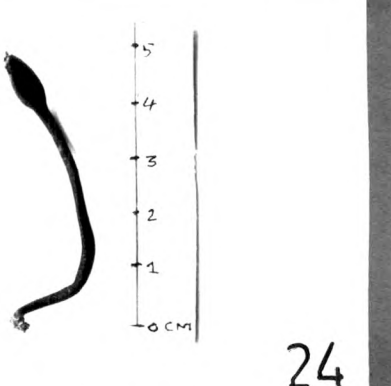

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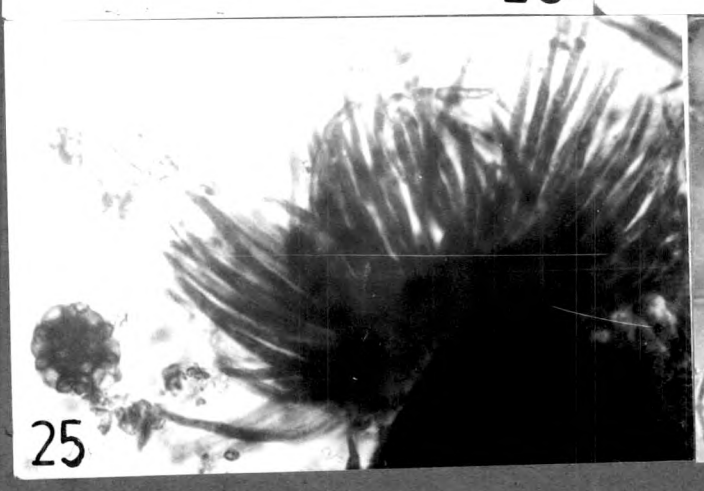

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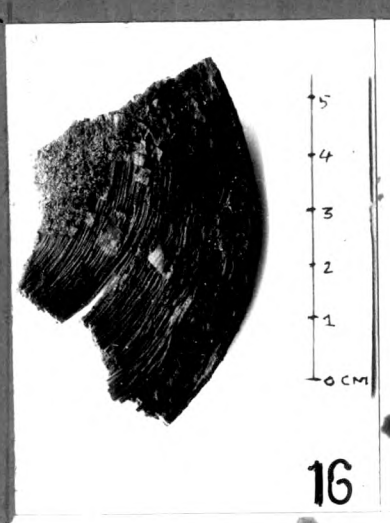

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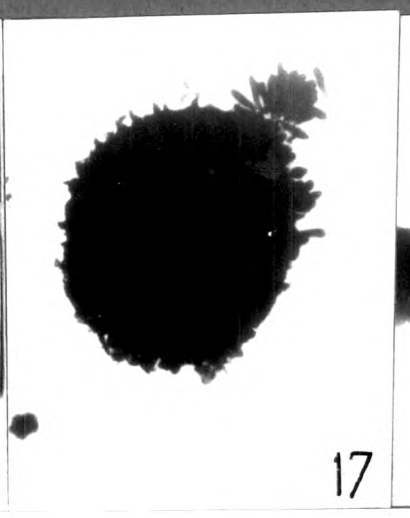

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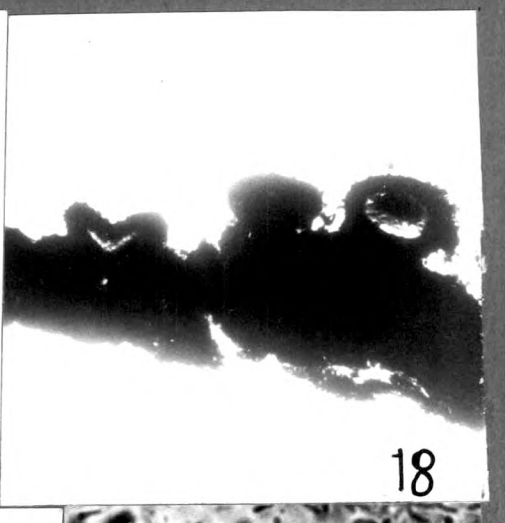

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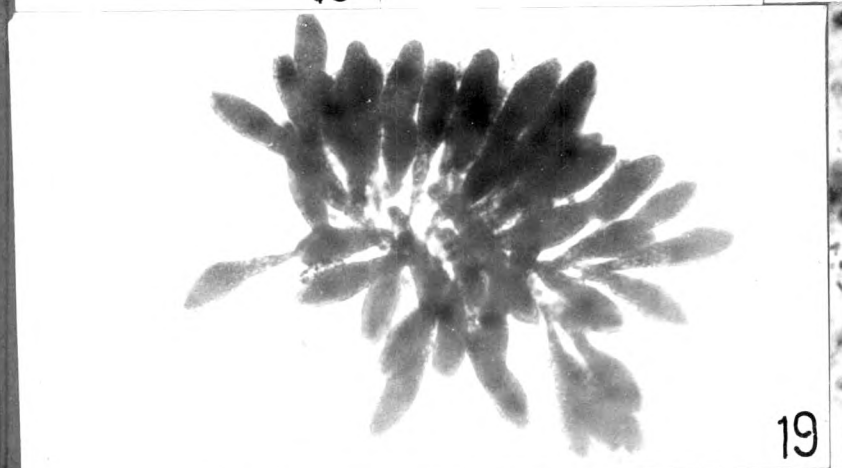

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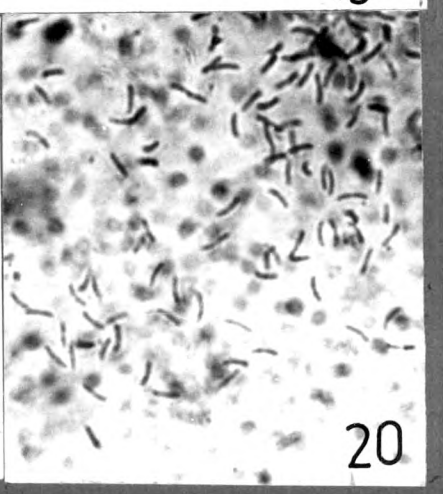

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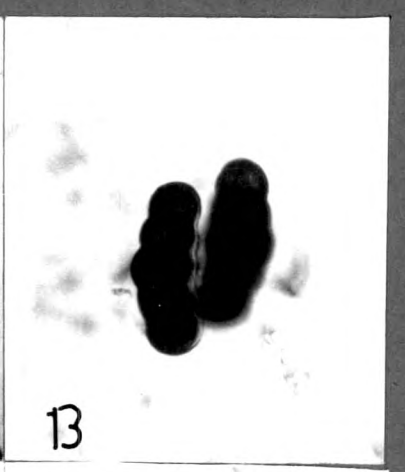

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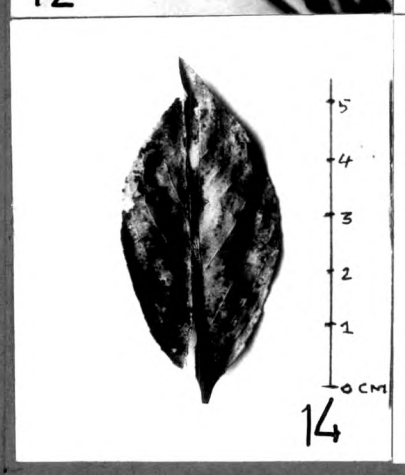

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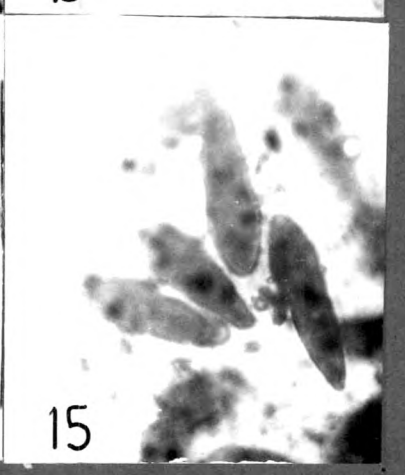

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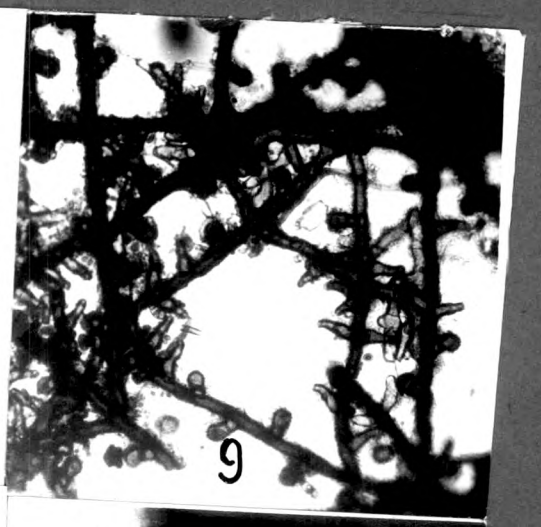

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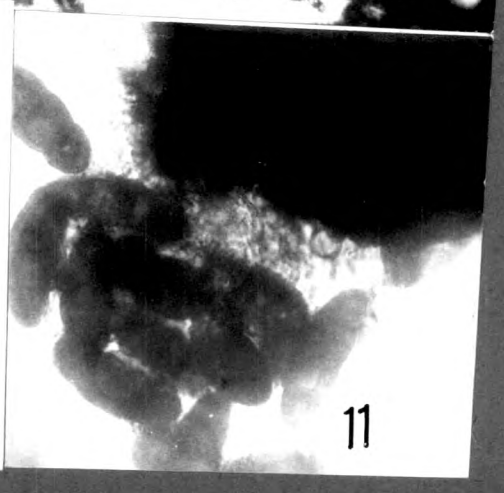

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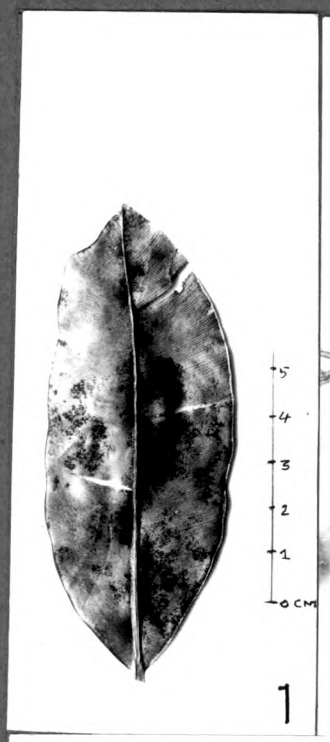

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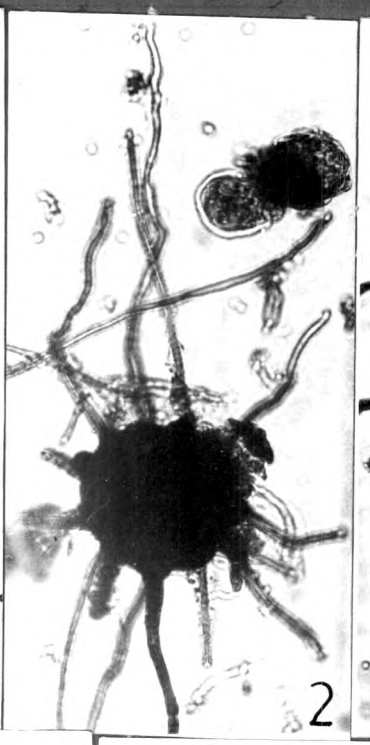

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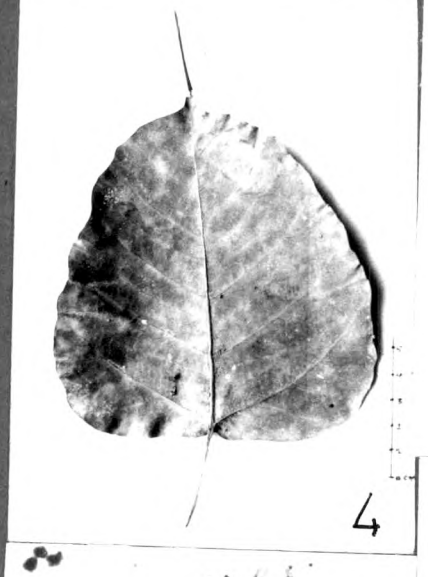

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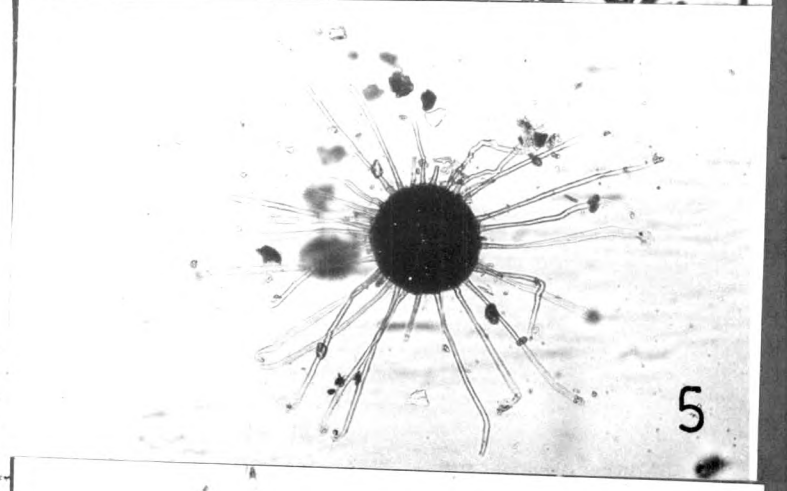

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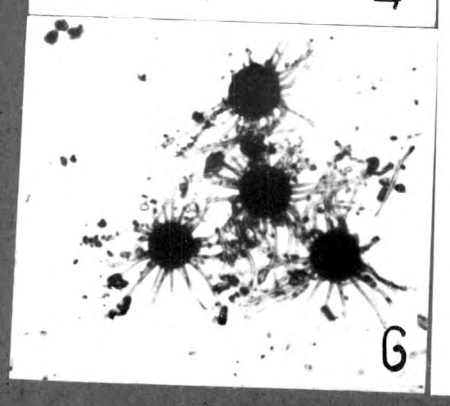

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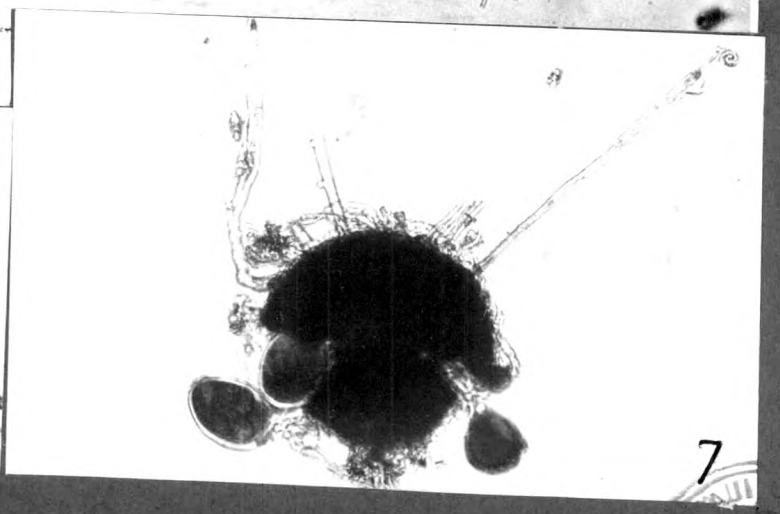


7

Explanation of Figures 35-42.

Fig.Nos.35-38 : *Cystotheca indica* sp.nov.

35. : Perithecium with appendages;

36. : Appendages;

37. : Asci with ascospores;

38. : Ascospores.

Fig.Nos.39-42 : *Uncinula religiosa* Ramkrishnan and Sundaram.

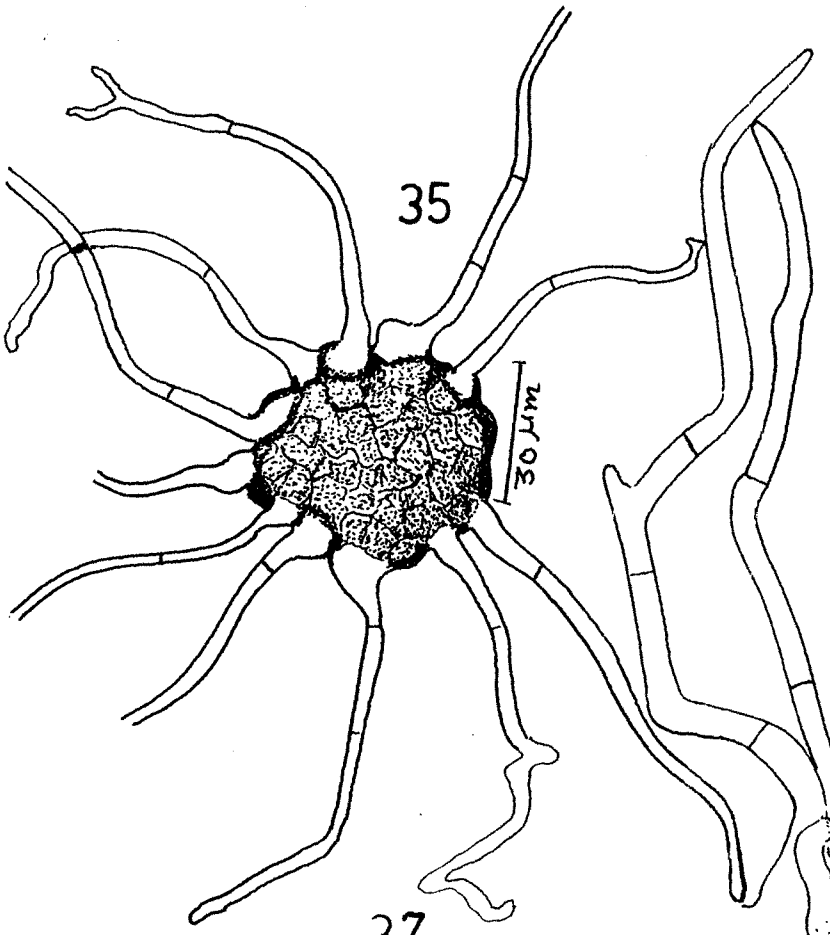
39. : Perithecium with appendages;

40. : Single appendage;

41. : Asci with ascospores;

42. : Ascospores.

35



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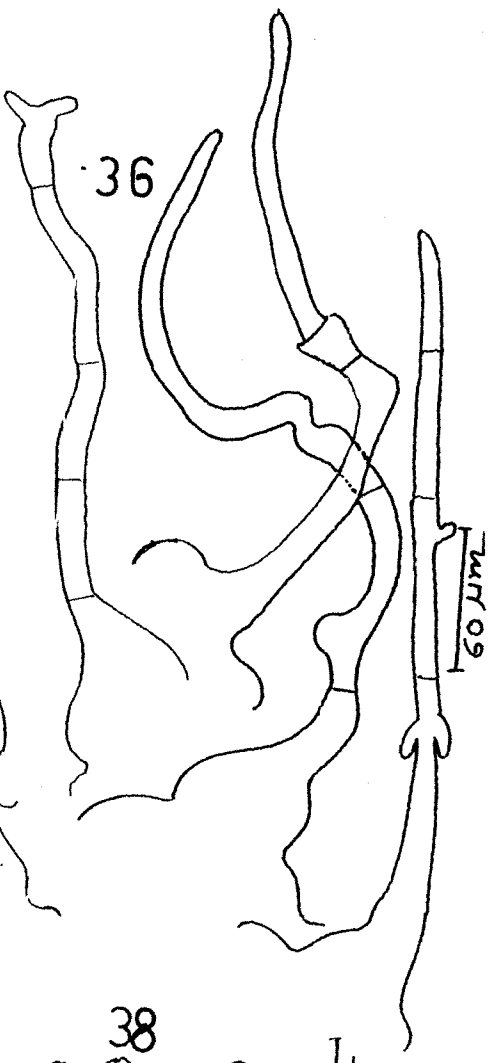

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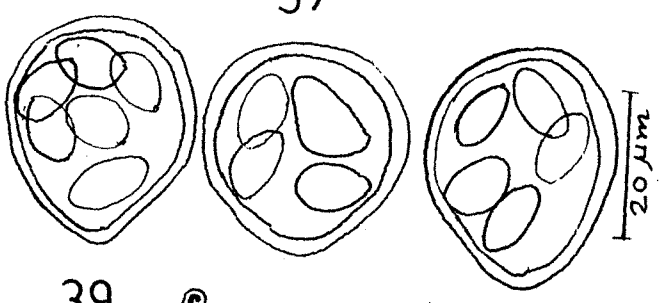

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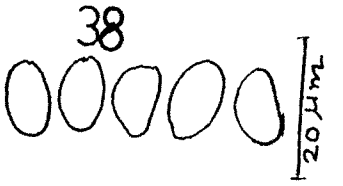

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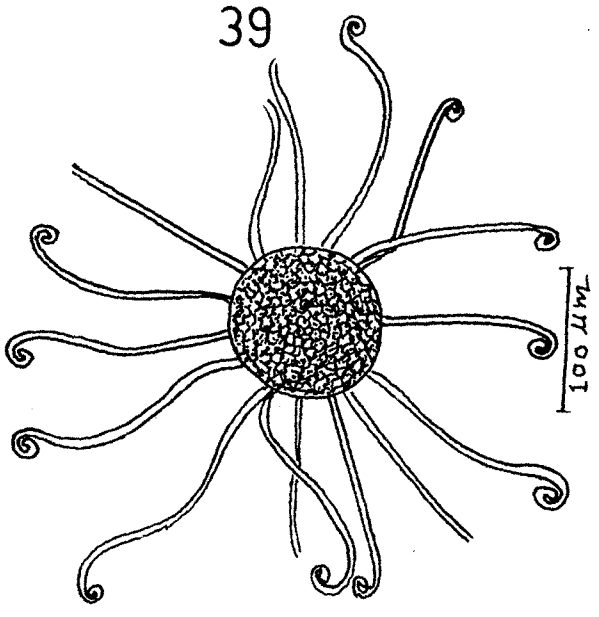

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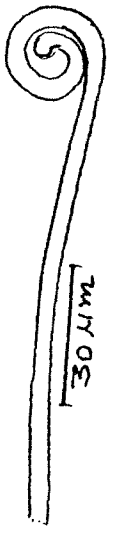

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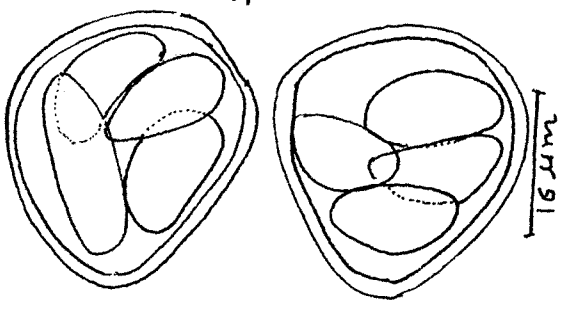

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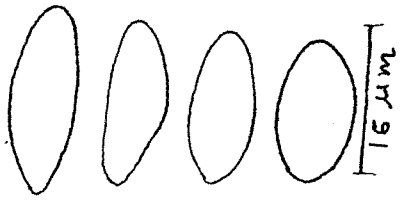


Explanation of Figures 43-48

Fig.Nos.43-45 : *Ophioirenina theae* Sawada & Yamamoto.

43. : Hypha with hyphopodia;

44. : Asci with ascospores;

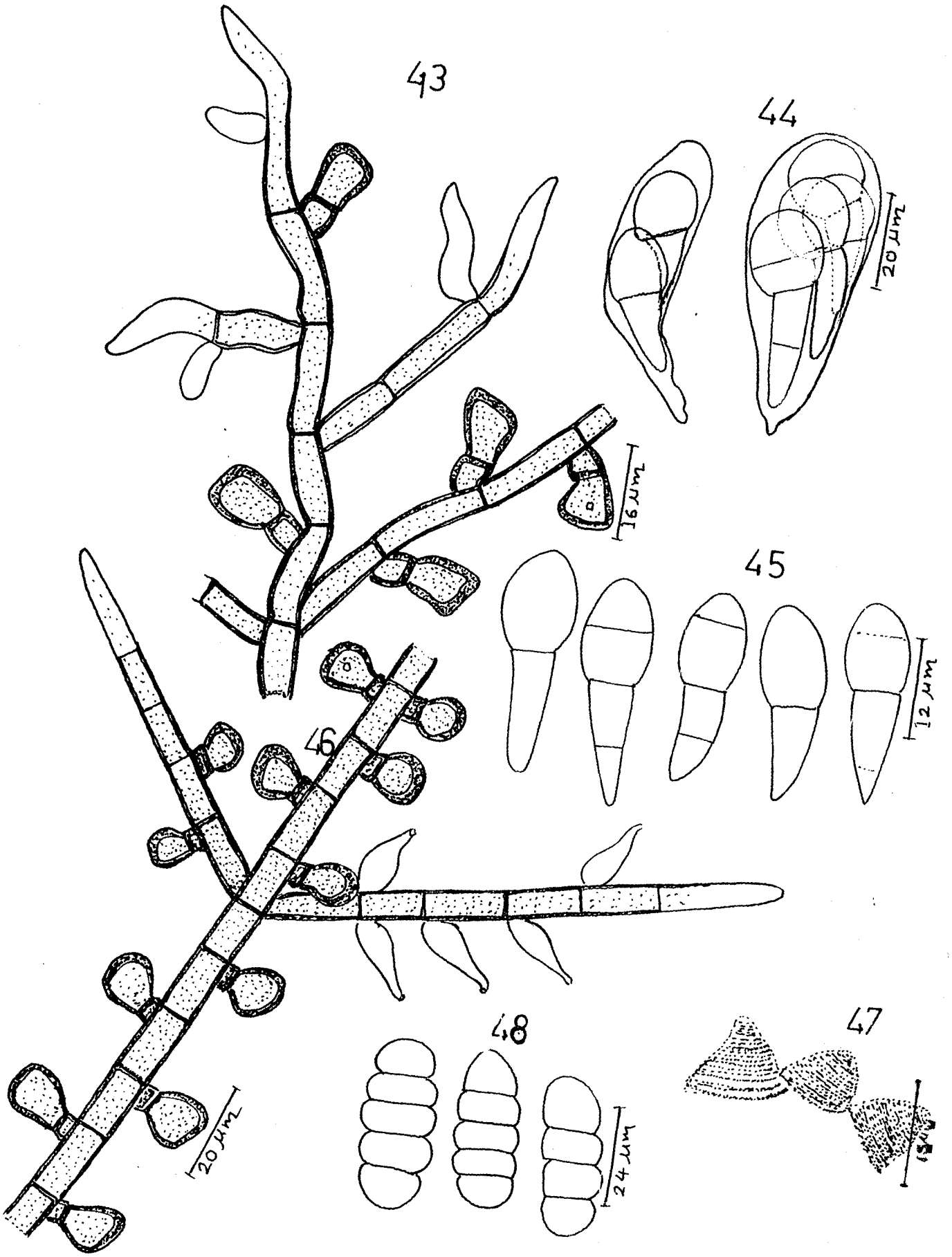
45. : Ascospores.

Fig.Nos.46-48 : *Asteridiella theae* sp.nov.

46. : Hypha with hyphopodia;

47. : Perithecial cells;

48. : Ascospores.


43
44
45
46
47
48
16 µm
20 µm
12 µm
20 µm
24 µm

Explanation of Figures 49-54.

Fig.Nos.49-51 : Meliola anodendrae Sawada & Yamamoto.

49. : Hypha with hyphopodia;

50. : Setae;

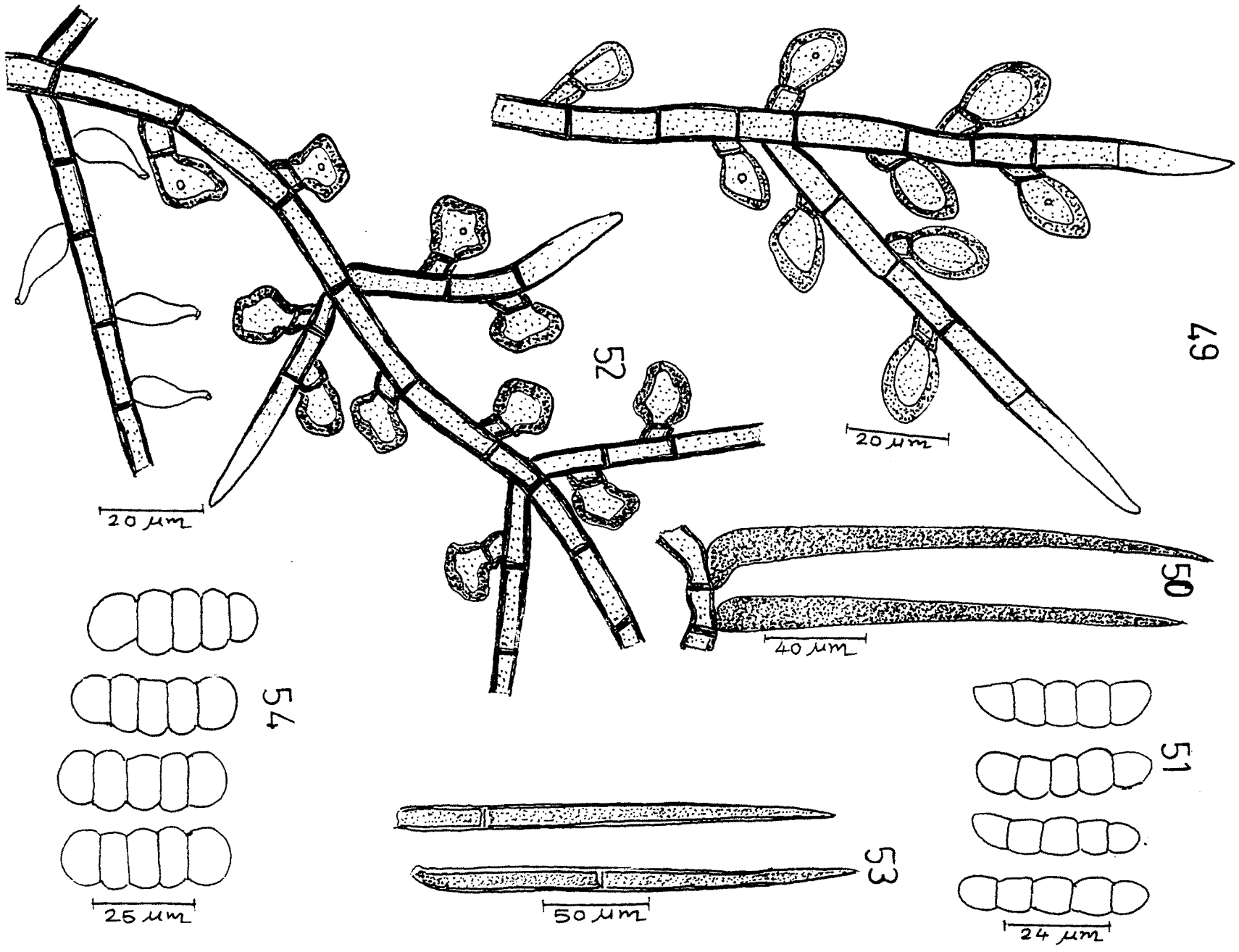
51. : Ascospores.

Fig.Nos.52-54 : Meliola setariae Hansf. and Deight. var. indica var.nov.

52. : Hypha with hyphopodia;

53. : Setae;

54. : Ascospores.


20 µm
52
20 µm
49
40 µm
50
25 µm
54
50 µm
53
24 µm
51

Explanation of Figures 55-57.

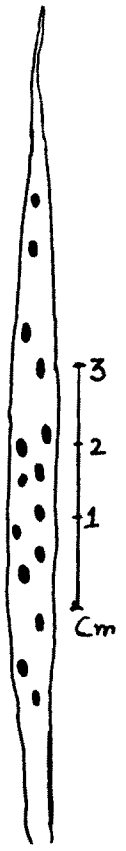
Fig.Nos.55-57 : Phyllachora bonariensis Speggazini

55 a. : Habit;

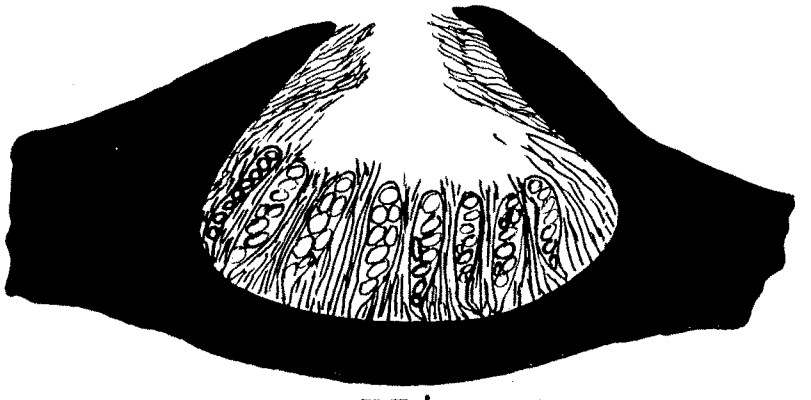
55 b. : T.S. of leaf showing perithecium, asci and paraphysis;

56. : Asci showing ascospores;

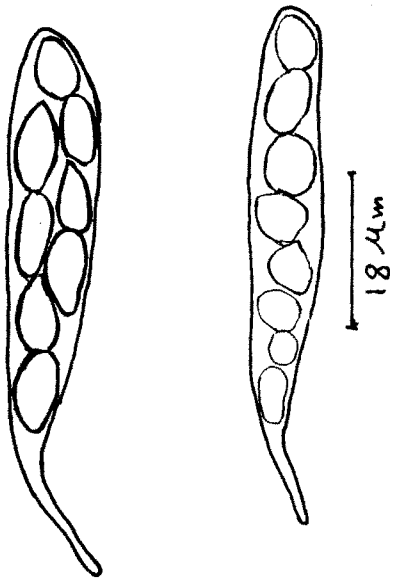
57. : Ascospores.



55a



55b



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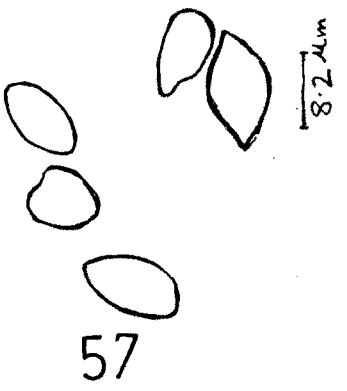


57

Explanation of Figures 58-63.

Fig.Nos.58-63 : Hypomyces papulasporae Rogerson and Samuels var. americanus, Rogerson and Samuels.

58. : Perithecium on the hymenium;

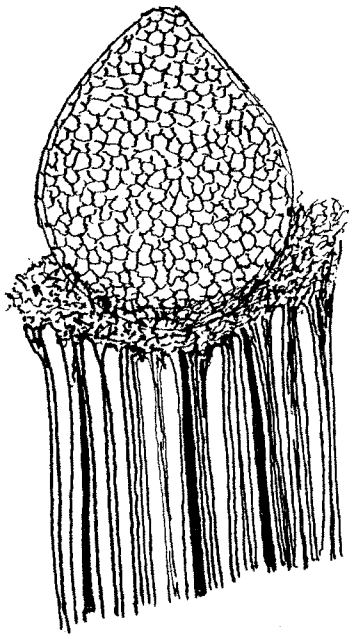
59. : Asci with ascospores;

60. : Ascospores;

61,62. : Verticillium psaliotae Treschow a conidial state showing conidiophores and conidia;

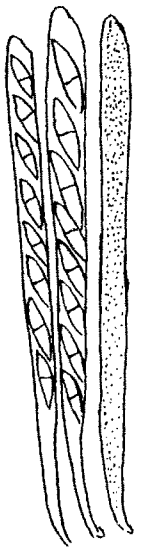
63. : Papulaspora candida Saccardo chlamydospores.

58



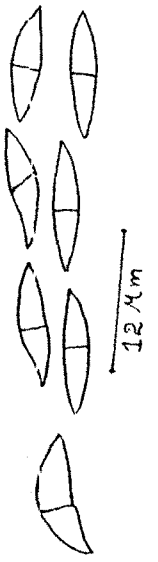
115 µm

59



15 µm

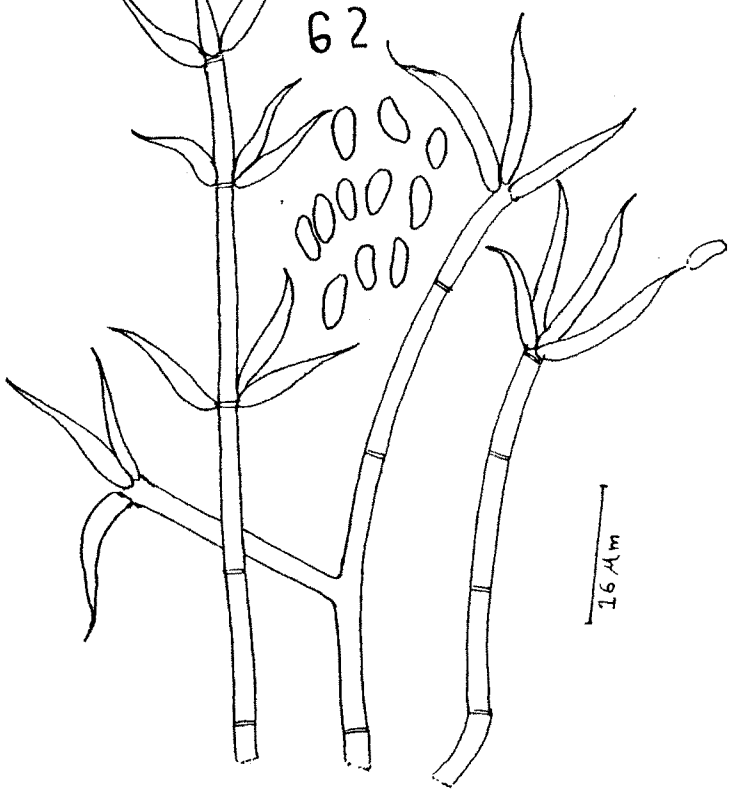
60



12 µm

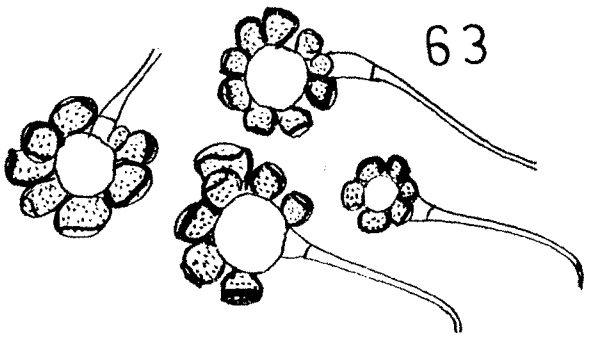
61

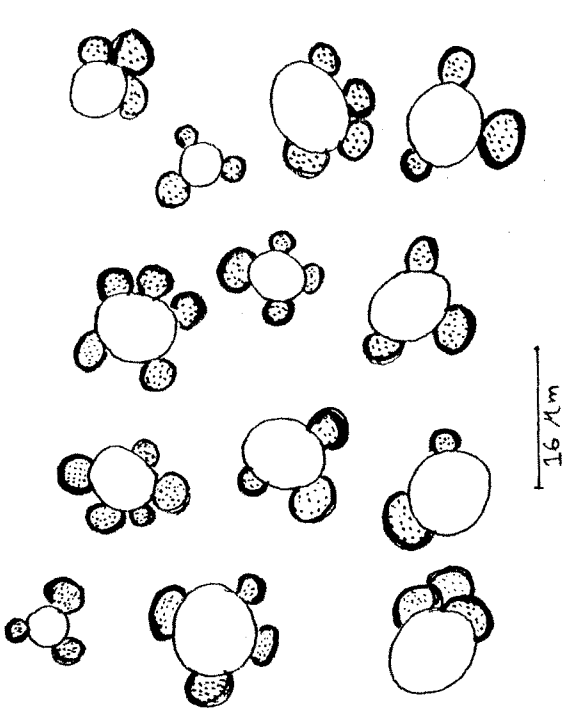
62



16 µm

63





16 µm

Explanation of Figures 64-68.

Fig.Nos.64-68 : Hypocrella tubulata Petch.

64. : Stromata with perithecia;

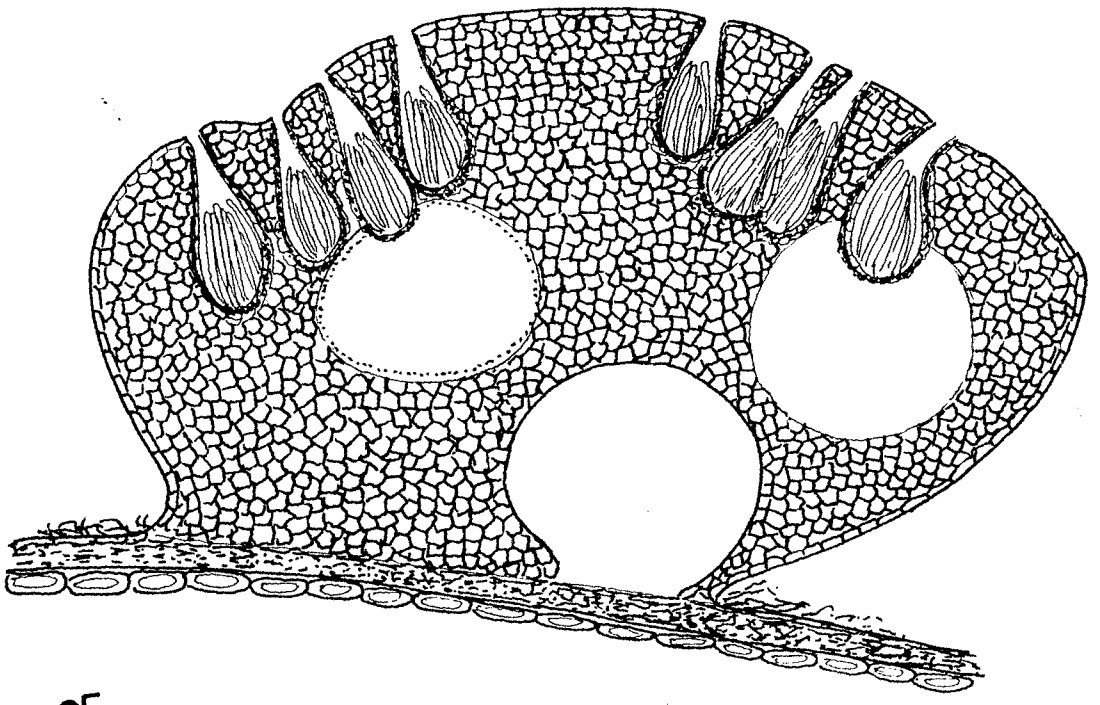
65. : Asci with ascospores;

66. : Ascospores;

67. : Aschersonia - a conidial state showing immersed pycnidia in the stromata;

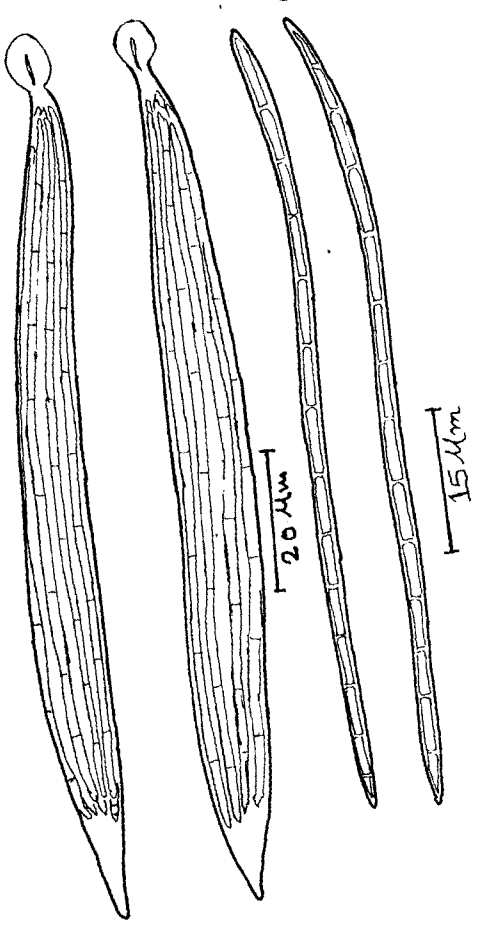
68. : Conidia of Aschersonia.

64



65

66



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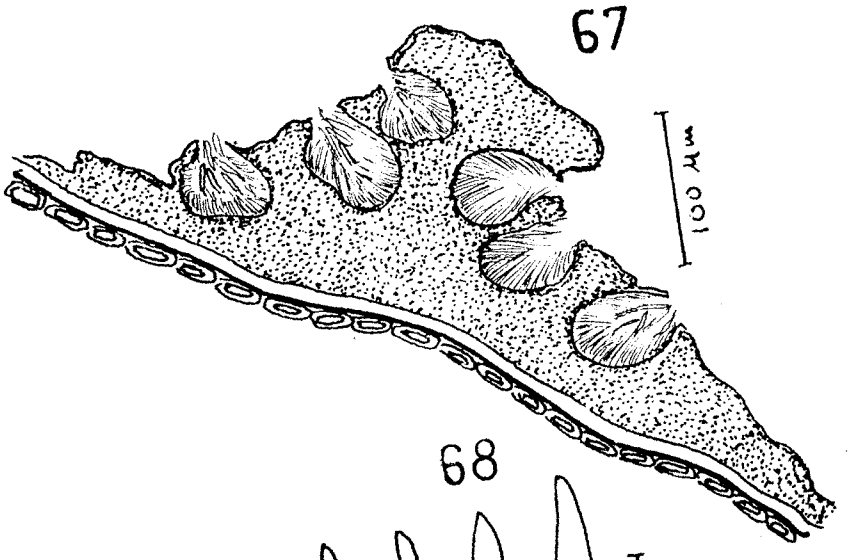

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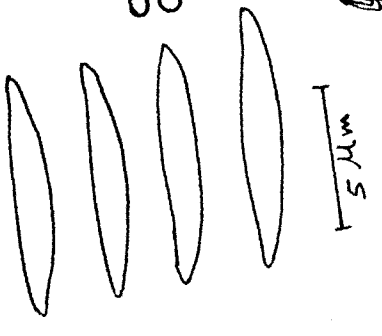


Explanation of Figs. 69-74.

Fig.Nos.69-73 : Asterina daphniphylli Yamamoto

69. : Epiphyllous colony;

70. : Hyphae with hyphopodia;

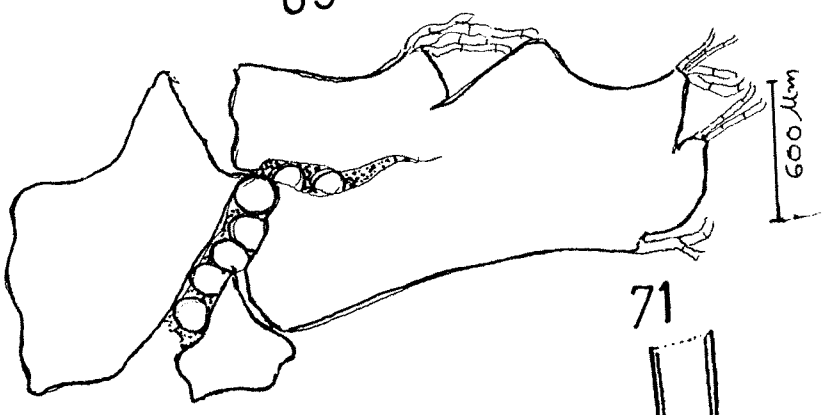
71. : Single hyphopodium;

72. : Single ascus showing ascospores;

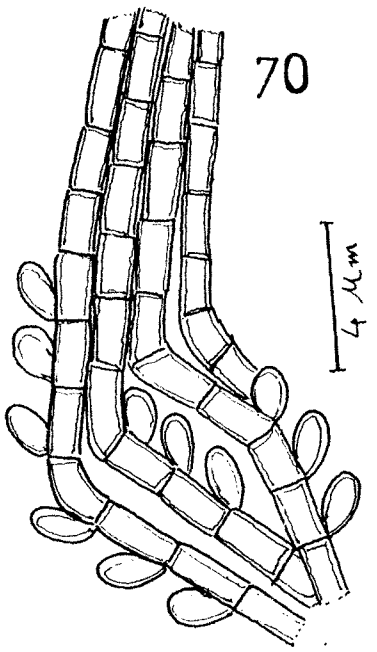
73. : Ascospores.

Fig.Number 74 : Hypnotheca graminis Tommerup
v.s. of Stromata with leaf.

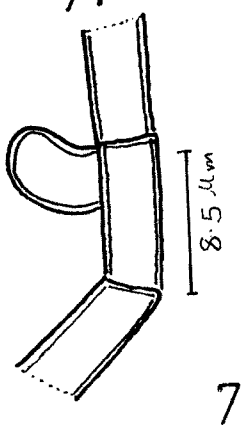
69



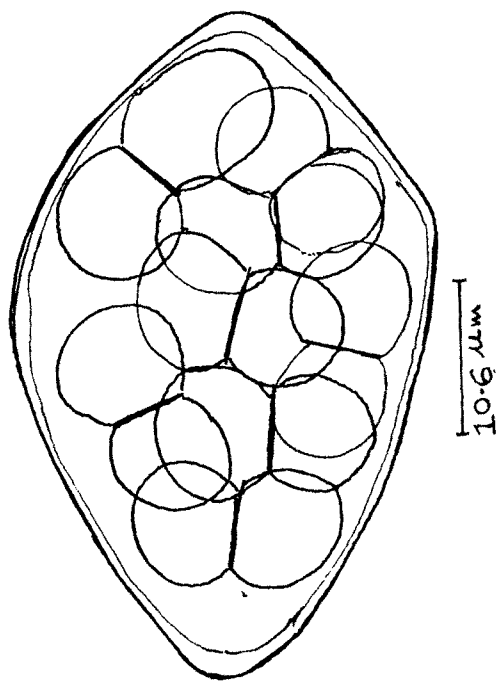
70



71



72



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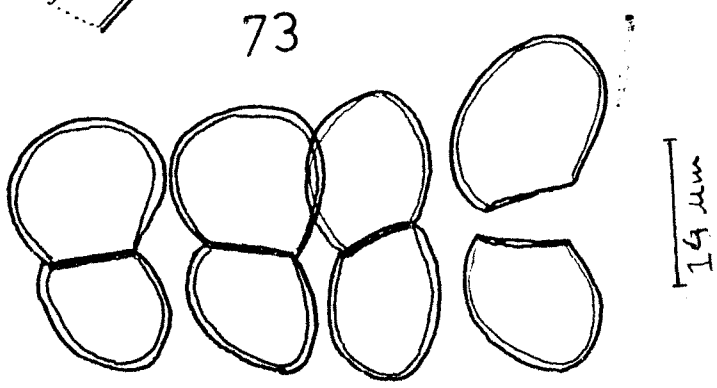

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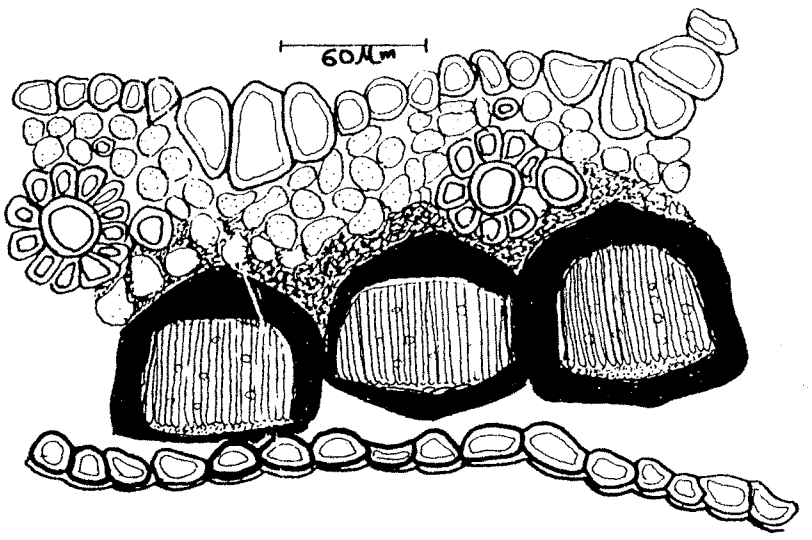


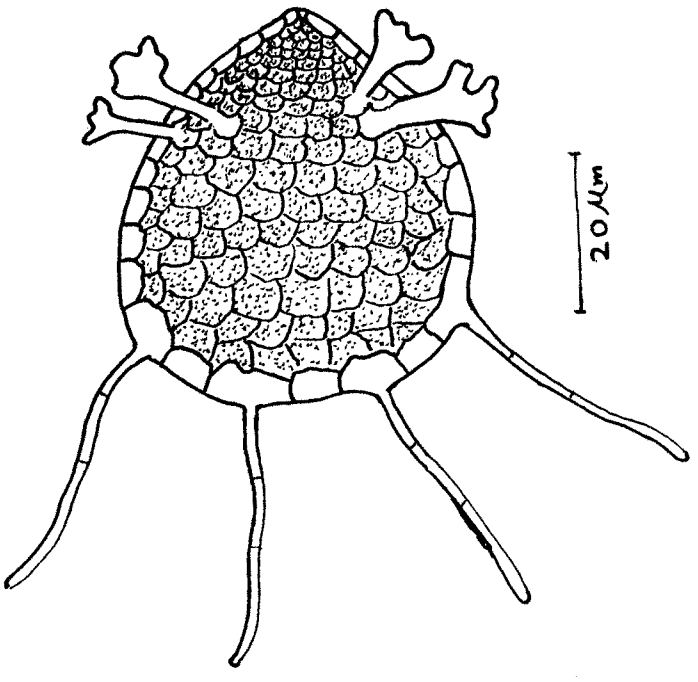
Explanation of Figures 75-77

Fig.Nos.75-77 : *Wentiomyces javanicus* Koorders

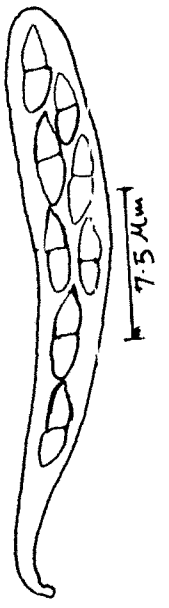
75. : Perithecium with appendages;

76. : Single ascus;

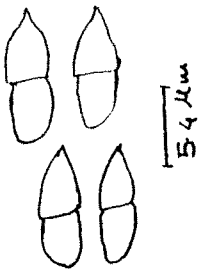
77. : Ascospores.



75



76



77