III. STUDIES IN MELIOLACEAE

•

Taxonomical Criteria : a)

The collection of "Black Mildews" fungi is not difficult due to their conspicuous nature of black colonies (ectoparasitic) mostly on the leaves. But their taxonomy is rather difficult at a species level. Therefore, many taxonomists, who studied these fungi from different regions of the world have used sound morphologic based characteristic features which help to identify the genus and to proceed further for identification of the species or varieties. Therefore, the following criterions are generally à like ??? The first used.

- Colony characters 1)
- 2) Mycelium and Hyphopodia
 - a) Capitate hyphopodia
 - b) Mucronate hyphopodia
- 3) Setae
 - a) Mycelial setae
 - b) Perithecial setae
- 4) Perithecial appendages
- Perithecia 5)
- 6) Asci
- 7) Ascospores
- 8) Host specificity
- 9) Beeli's formula.

1) Colony characters :

The occurrence of the colonies on the lamina of the host are much importance in distinguishing the epiphyllous, leaves hypophyllous, amphigenous habits. In some form they may be on petiole or on stems and may be single or confluent. Some species have always very dense, sharply limited colonies while others have thin, loose, wooly in nature, pulvinate, circular colonies tending to spread over the entire leaf. The colour of the colonies are variable i.e. black, olivaceous-brown, while size and shape of the colonies are always not specific i.e. loose, pulvniate, or crustose - especially in Amazonia and Asteridiella chocolate colour colonies sparse colonies always developed or in Appendiculella and Irenopsis. Colonies are mostly on lower side but on upper side are not uncommon. The colony characters may vary due to the part affected, or environmental characters. infection and colonies mostly observed on fully mature leaves (old leaves).

2) Mycelium and Hyphopodia :

It is developed from the germinating ascospores, and superficial except in a new recent genus <u>Endomeliola</u> (1995), in which mycelium is inside the host tissue. While remaining all taxa it is external. It grows and forms a colony. The mycelium produced lateral hyphopodia, setae, perithecia etc. Haustoria produced from the head cell of the capitate hyphopodia which

penetrate in the epidermal cells. Mycelium is pale brown to dark brown, thick-walled and septate. They may be loosely branched at rather long intervals and form a thin reticulate colony or more closely branched so that some species may even form a continuous plate. The branching may be more or less alternate, opposite is often characteristic of certain species.

a) Capitate hyphopodia :

112

Capitate hyphopodia are most important in distinguishing the species and varieties. It was first introduced by Gaillard (1891) as 'hyphopodias capitees' while Arnaud (1918) called them as 'sigmopodia'. These are short, specialised, lateral branches of the mycelium and are closely adpressed to the host surface. Capitate hyphopodia are mostly 2-celled but in a few species more than two cells are also present (i.e. stalk cell and head cell). The stalk cell is cylindrical to cuneate, mostly single celled except Meliola collicosa Nair & Kaul in which it is elongated, tortuous and one to several septate. The head cell varies in its shape as oval, cylindrical, globose, lobate, or stellate. Its function is of two fold as mechanically holding the host surface and to produce haustorium from head cell to absorb the food from the host epidermis.

The morphology, measurement, arrangement are the diagnostic character of an individual taxon. These are generally arranged into three different types as alternate to unilateral,

32

ŋ

opposite only and opposite to alternate.

b) Mucronate hyphopodia :

Mucronate hyphopodia are remarkable for their uniformity throughout the group. It consists of a single predominently sessile. ampulliform, obpyriform, obclavate subcylindrical to conoid cell with a short to long, tapering or cylindrical neck in Meliola neissliana Wint. the Mh. is stalked. but only Comparatively they are fewer in number. Sevens (1925) referred to mucronate hyphopodia as 'ampulliform hyphopodia' while Doidge (1917) called them as 'abortive mycelial branches'.

Hansford (1961) recognised that young mucronate hyphopodia have closed neck but at later stage the neck appears But in 1975, Goos & Gessner remarked that mucronate open. hyphopodia appear to be attenuated hyphal branches which are without function, but Hughes (1978, 1981) stated that mucronate (which) phialoconidia, hyphopodia are phialides producing functioning as spermatia. Only in the species of Armatella Theiss & Syd. and Diporotheca Gordon & Shaw mucronate hyphopodia are absent. They may be mixed or separate and their arrangement is similar to capitate hyphopodia. They generally do not keep contact with host surface as capitate hyphopodia and thus, their function is not definitely known.

3) Setae :

Setae play an important role in the taxonomy of the

family Meliolaceae at generic level as key character. Based on the presence or absence of the setae the genera of the family Meliolaceae have been separated (Hansford, 1961; Yarwood, 1973). setae are of two types : a) Mycelial setae;

- b) Perithecial setae:
 - i) Setae associated at the base of ascomatous Meliola.
 - ii) Setae produced from perithecial cells Irenopsis

a) Mycelial setae :

The presence of mycelial setae is considered as the important feature of this group. These are having two types as (1) Entirely confined to Mycelium and 2) associated with ascocarp.

Mycelial setae arise as an outgrowth, from the mycelial cells and bend immediately upward to become almost perpendicular to the host surface. The septa may be visible while in most of the species, the septa appeared completely obscure due to their thick and opaque nature. These are straight, uncinate to coiled, simple to dichotomously branched and tips are acute, obtuse, dentate to furcate. Mycelial setae may be numerous and uniformly scattered all over the colonies or grouped around peritheccia. They show great variations. Only in Meliola the mycelial setae are present. The mycelial setae function as an armour to protect (insects. the entire colony from feeding by animals mites.

mollusca, etc.). Both mycelial and perithecial setae may be morphologically similar or dissimilar as well as vary in their dimensions.

There are a few species of the genus <u>Asteridiella</u> in which mycelium produced repent, hyaline or brown, cylindrical, clavate, septate or non-septate, thick-walled outgrowths similar to setae but called appendages.

b) Perithecial setae :

Perithecial setae arise from the outer wall cells of the perithecia, mostly straight to undulating but never like appendages. These setae are septate, straight to bent at tips. These are mostly parallel to host surface or bent upward around the perithecium. Presence of perithecial setae is characteristic feature of the genus Irenopsis Stevens. The function of perithecial setae is unknown but similar to mycelial setae. Generally mycelial and perithecial setae are alike in morphology. In the species of Meliola the mycelial setae are crowded or group around the perithecium originally from the basal mycelial subiculum on which perithecium is produced and loosely designated as perithecial setae but not true perithecial setae as they are present in the species of the genus Irenopsis Stevens.

4) Perithecial Appendages :

Presence of perithecial appendages is the character of

the genus <u>Appendiculella</u> v.Hoehnel. These are called as larviform appendages while mycelial setae and perithecial setae are absent in this genus. These larviform appendages spread all over the surface of the perithecium or <u>restricted</u> to the lower part but quite distinct and easily recognised from it by their peculiar shape, size and colour. Their number, distribution, shape, size and morphology vary species to species. These are very stout, short, thick-walled, straight or curve hyaline, yellow, yellowishbrown or pinkish with acute apex mostly nonseptate but sometime septate basally and tapering towards the apex, smooth or striated and originated from the perithecial cells and of unknown function or may help to disperse either by wind or crowling insects over the colonies.

5) <u>Perithecia</u> :

We^{rth}

Perithecia developed as a result of sexual reproduction and are generally produced on mycelial mat of the colony except in the genus <u>Amazonia</u>. Mostly globose, smooth, black or applanate without ostioles (except in a few species of <u>Meliola</u>, true ostiole is present). Their frequency vary species to species may be spread over or crowded or in groups, Mostly glaborous but with appendages or setae or with conoid outgrowth (<u>Asteridiella</u>) produced from surface cells. The wall very thick, britle and raptured to tease the ascospores.

36

6) <u>Asci</u> :

All ascomyceteous fungi are primarily characterised by their perfect state spores i.e. Ascospores which are produced in asci in the ascocaprs (except the Hemiascomycetes). Luterell (1951, 1955) considered it, the most fundamental character and into used to classify the ascomycetous fungi / like unitunicate and bitunicate asci. Recently, Eriksson et al. (1983) in their revision of the Ascomycetous fungi (they) divided all the ascomycetes into of groups based on the nature the asci proto-cunicate, bi-tunicate. Accordingly they considered that the oni-tunicate, asci of the meliolaceous fungi are protopseudotunicate or bitunicate and kept them into Loculoascomycetes suggested to be and originated from Asterinales. But traditionally they are considered unitunicate similar to plectomyceteous fungi where in also asci and included into Pyrenomycetes evanescent at maturity are (Eriksson, et al., 1987).

Asci are mostly 2-8 spored or only two spored except in <u>Armatella</u> in which asci are 4-8 spored while in <u>Diporotheca</u>, asci are 8-spored.

7) Ascospores :

Morphology of Ascospores (size, shape, septation, pigmentation, germination etc.) plays important role in systematics of the taxa of the family Meliolaceae. Ascospore size varies (free period but are quite larger in size. Beeli (1920) has used this features in his formula. The ascospores in known taxa

of Meliolaceae are transversely septate except in the genus Armatella, but they also become one-septate at the time of their Mgermination. Shapes of the ascospores are different in different taxa of the different genera. But the nature of shape, size, individual cells of ascospores are found quite septation and similar in the taxa of the genera viz. Meliola, Asteridiella, Irenopsis, Amazonia, Appendiculella while their shape and septation and individual cells vary in Armatella, Diporotheca, Ophioirenina others. Otherwise in all taxa they are generally 2,3,4 and septate. Shape of ascospores is similar in all taxa except again Armatella and Diporotheca. Each cell is similar except terminal and which are hemispherical. While remaining cuboid or rectangular, thick-walled, brown, constricted or not except in Diporotheca where terminal cells are smaller while middle cells larger with terminal germ pore and covered by hyaline and thin membrane, 1 the name of the genus indicates (Diporotheca). These spores germinate in nature by hyphopodite germ tube either monopolar, bipolar or multipolar. These are biologically dry spores and easily dispersed by various agents.

8) Host specificity :

Meliolaceous fungi are being considered as obligate parasites of vascular plants and mostly flowering plants. Attempts to culture them totally failed. Thus, we do not know their exact nutritional requirement or the conditions they require during culture. Thus, they are obligate parasites like Rusts, Powdery

mildew, Downy mildews, Taphrinales, Brachybasidiales, Septobasidiales and Exobasidiales (Ainsworth <u>et al.</u>, 1963, 1971).

Therefore, in addition to morphology, host specificity has been always used as one of the important criterian otherwise it is very difficult to identify these taxa. But at what level the host specificity should be recognized.

i) at the species level of the host

ii) at the generic level of the host

or

s. Al

iii) at the family level of the host

As Hansford (1961) commented and supported by Goos and Anderson (1972) that new taxon should not be raised unless the host family and its parasitic taxon are known and compared. But opinions differ person to person to use the host specificity at the species, genus or family level. Most of the taxa known of this family are the parasites of the Dicotyledonous plants while comparatively a limited number of species are recorded on Monocotyledons, Gymnosperms and Pteridophytes. That is most of them (about 90% taxa) are the parasites of flowering plants and that too Dicotyledonous one (Table 1).

Generally, most of the workers have used host specificity at species level of the host alongwith the morphological features. But it requires cross inoculation studies to confirm it. The host

Table 🗲 I

Y.

Number of Host Plant Orders, Families, Genera and Species per 'Black Mildew' Genus in India. ٠

:	var.	53	2	•	2	ı	I	ł	ı
	_			·					
	Tota spp.	204	18	16	13	60	03	10	10
	Species	252	19	16	16	60	05	01	10
	Genus	192	21	16	14	07	04	10	10
	Family	79	14	14	13	02	03	10	10
	Order	46	12	12	11	02	03	01	10
	Black Mildew Genus	Meliola	Asteridiella	Amazonia	Irenopsis	Armatella	Appendiculella	Diporotheca	Ophioirenina
		1 .	2.		4.	ъ.	6.	7.	. 8

~

specificity is quite interesting in the species of the genus Armatella, which are strictly confined to the hosts of the family Lauraceae. Lauraceous members are parasitized by other taxa in addition to Armatellla but species of Armatella are not known to parasitize other than Lauraceous host except a one species reported by Patil, C.R.(1990) on the member of the family Celastraceae i.e. Gymnosporia but author studied its type material and did not observe or trace the occurrence of Armatella. Why all the taxa of Armatella are strictly confined to the Lauraceous host is not known.

8) Beeli's formula :

Thus five genera the family Meliolaceae of namely v. Armatella Appendiculella Hoehnel. Theiss. H.Sydow., 8 Asteridiella McAlpine, Irenopsis Stev. and Meliola Fr. emend Bornet, have been dealt with in this work. All the genera are arranged alphabetically and also the species of each genus are arranged alphabetically. Keys are provided to genera, species and varieties based on morphology, measurements and hosts. The with resolution at and a deal of a d following abbreviations have been used in the key :

- Ch Capitate hyphopodia
- Col Colonies
- head cell hc
- Mh Mucronate hyphopodia
- Mycelial setae Ms
- Ps Perithecial setae

Stalk cells. Stc

40

=14

Proceeding the species Beeli's (1920) numerical formula is given at the left hand corner consisting of eight digits. It is modified after Hansford (1961) for the genus Armatella (P.Henn) Theiss. & H.Sydow for aseptate to one septate ascospores. Belli $\stackrel{\scriptstyle \prime}{>}$ spaciation and identification of different formula is used for their comparative morphological sketches collections based on of different structures of individual collection which shows the similarities and dissimilarities and their affinities to each other and morphological variation of an individual taxon.

I. Morphology :

- (1) Normal septation of ascospores :
 - 1. ... aseptate to 1-septate
 - 2. ... 3-septate
 - 3. ... 4-septate
- (2) Perithecia :

1

- 1. ... without setae or appendages
- 2. ... bearing larviform appendages
- 3. ... bearing unicinate or coiled setae
- 4. ... bearing straight setae.
- (3) Mycelile, setae :

0. ... absent

1. ... straight and simple

12890

A

- 2. ... Simple, unicinate or coiled
- 3. ... dentate or shortly furcate (less than 30 µm long).

41

- 4. ... branched, branches usually more than
 - 30 µm long.
- (4) Capitate hyphopodia :
 - 1. ... alternate or unilateral
 - 2. ... opposite only
 - 3. ... opposite and alternate

II. Measurements :

				.5
(5)	Max	imum	ascospore length :	NU N
	1.	•••	below 20 µm	100
	2.	•••	21 to 30 µm	5
	3.	•••	31 to 40 µm	
	4.	•••	41 to 50 µm	
	5.	•••	51 to 60 µm	
	6.	•••	more than 60 µm	
(6)	Max	imum	spore width :	
	1.	•••	upto 10 µm	
	0		11 to 20 thm	

- 2. ... 11 to 20 µm
- 3. ... 21 to 30 µm
- 4. ... more than 30 μ m
- (7) Maximum diameter of the perithecia :
 - 0. ... perithecia immature
 - 1. ... upto 100 µm
 - 2. ... 101 to 200 µm
 - 3. ... 201 to 300 µm
 - 4. ... more than 300 µm

4~

- (8) Maximum length of the Mycelial setae :
 - 0. ... absent
 1. ... upto 300 μm
 2. ... 300 to 500 μm
 3. ... 500 to 1000 μm
 4. ... more than 1000 μm

Beeli's formula consists of eight digits. The first four digists represent the morphological characters like ascospores septation, and the nature of the perithecia with setae or and the nature of the mycelial setae and the appendagess. arrangement of the capitate hyphopodia respectively. The second half represents the measurements such as length and breadth of the ascospores, diameter of the perithecia and length of the mycelial setae respectively. The species having both simple and dentate mycelial setae is denoted by 1/3. Genuetichy have the the species - and deta have

b) Taxonomy of The Family - Meliolaceae :

The meliolaceous fungi are ectoparasites and commonly known as "black mildews" or "dark mildews". These are mostly parasitic on higher plants, especially as parasites on leaves. Before proposing the family Meliolaceae, the genus Meliola and its allied genera were grouped either under the order Perisporiales Though. Erysiphales. differences of opinion or there were regarding the acceptance of the Meliolales, order there is

43

- t

unanimous opinion on accepting the family Meliolaceae as most stable family.

Fries (1823) coined the term 'perisporiae' to include the fungi producing small non-ostiolate fruiting bodies seated on superficial mycelia. This concept increased the complications and diversity of opinions and resulted in bringing the unrelated forms into one group. Winter (1887) made the first attempt to bring out all the fungi having superficial mycelia with a fruiting borne on them into a family "Perisporiazeen" and classified all of them under two sub-families "Erysipheae and Perisporiae". Lindau (1897) revised Winter's concept and added a family "Microthyriaceae" by seggregating the sub-family 'Perisporiae'. Theissen (1913a,b) studied all other forms and excluded the family 'Microthyriaceae' from Perisporiales and transferred some of the genera to a new order 'Hemisphaeriales'. Simultaneously, Saccardo (1913) divided the family Perisporiaceae into five tribes. Theissen & H.Sydow (1917) once again revised this order and included four families viz. 'Erysiphaceae, Perisporiaceae, Englerulaceae, and Capnodiaceae'. Gwynne-Vaughan (1922) substituted another order 'Erysiphales' based on the well known genus 'Erysiphe'.

Arnaud (1918) considered all such superficial fungi under the name 'Asterinees'. But the name 'Asterinees' was rather confusing because of the genus <u>Asterina</u> Lev. Hence, he coined the name 'Meliolinees' for the forms having superficial hypho-

podiate mycelia and the globose superficial fruit bodies. Spegazzini (1918) distinguished these fungi into parasitic and saprophytic species. For parasitic species he introduced the term 'Meliolaea' and reserved the name 'Perisporea' for saprophytic forms.

Muller and Von Arx (1973) have studied and key out the unitunicate Pyrenomycetes and also classified in the order sphaeriales. while Meliolales, Coronophorales and Erysiphales small groups with usually, cleistocarpous having relatively ascomata. The order Erysiphales, commonly synonymous with the Perisporales, comprise those funngi with asci arranged as a palisade within a non-ostiolate, dark coloured perithecia borne superficially on the host surface with mycelium. All forms are parasitic on the elaves of higher plants, nourished by haustoria and obligate parasites. Order Erysiphales include one to at least (Bessey, 1961). Yarwood (1973) six families used common subdivision of the order into two families Erysiphaceae and Perisporaceae. The Perisporaceae is commonly synonymous with the Meliolaceae. The Perisporaceae are primarily tropical while Erysiphaceae extends from tropics to temperate regions. The Perisporaceous members hold their host usually by capitate hyphopodia while Erysiphaceous members hold to leaf surface by appresoria. The taxonomy of Perisporiaceae is more confusing and unstable than that of Erysiphaceae.

Thus, many taxonomists who have placed the black mildews in the Meliolaceae and assigned the family to either (1) Meliolales (Ainsworth 1971; Muller and V.Arx, 1973; Alexopoulous and Mims, (1979) or (2) Myriangiales (Hansford, 1946) or (3) Erysiphales (Bessey, 1950). However, the most significant contributions to the biology of these fungi were monumented in studies of Hansford (1961, 1963).

Martin (1941) proposed the family "Meliolaceae" to accommodate Meliola Fr. and its related genera in the order Meliolales aand validated by Hansford (1946). The Meliolaceae was classified under the series "Pyrenomycetes" by various workers like Gaillard (1892), Ward (1883), Booth (1966) and under the series 'Plectomycetes' by Dennis (1968). Recently Meliolaceae has been accommodated in the order 'Dothidiales' (Eriksson, 1981, 1982; Hawksworth et al.., 1983).

Miller (1949) has stated that the concept of Meliola and its related genera can not be satisfactorily fixed in the system until more species are investigated. Gauman (1952) classified the genus Meliola and its related genera under Meliolaceae of the order Pseudosphaeriales. Roger (1953)placed the family 'Meliolaceae' along with nine other families under the order Hypocreales and included the genera Actinodothis, Amazonia, Irene, Irenina, Irenopsis, Meliola Meliolina and under Meliolaceae. (1961). Hansford genera in his monograph, considered the

Amazonia, Appendiculella, Asteridiella, Irenopsis and Meliola under 'Meliolineae'. Yarwood (1973) the group divided the order Erysiphales into two families, 'Erysiphaceae and Perisporiaceae' and brought the genera Actinodothis, Amazonia, Appendoliculella, Asteridiella, Irenopsis and Meliola along with several other genera under the familly 'Perisporiaceae'. Ainsworth (1971) recognised the order 'Meliolales' and the family 'Meliolaceae' but stated that the family 'Meliolaceae' include 50 genera. with representative genera like Amazonia, Appendiculella, Asteridiella, Irenopsis and Meliola. Muller and von Arx (1973) recognised the familv 'Meliolaceae' and the order 'Meliolales' under Pyrenomycetes. However, they have considered only seven genera under the family 'Meliolaceae' viz. Amazonia, Appendiculella, Armatella, Asteridiella, Diporotheca, Irenopsis and Meliola. Hughes and Pirozynski (1995) have added one more new genus Endomeliola family Meliolaceae. Barr (1976) recognised in the the order 'Meliolales' and a single family 'Meliolaceae' under the subclass 'Parenchemycetidae' under the class 'Euascomycetes'. Alexopoulous & Mims (1979) recognised the order 'Meliolales' and brought it under Phyllactinia type of centrum. Under this type, they have considered two orders Erysiphales and Meliolales.

Hawksworth recognised al. (1983) family et the 'Meliolaceae' under the bitunicate of the order Dothidiales. Eriksson, V.O. (1982b) has stated that "... some families

characterised by Cleistothecia with ± reduced hamathecium and pseudoprototunicate asci have obviously evolved from typical bitunicate ascomycetes. 'Meliolaceae'... One of them is but probably be referred to Asterinales...". Further he (/1982a, 1983) in placing this family under the order 'Dothidiales'. Sarbhoy (1983) recognised the 'Meliolales' under unitunicate orer Pyrenomycetes.

Hawksworth and Eriksson in Eriksson & Howksworth (1986) have amended the description of the other Meliolaes proposed by Gaumann (1964), treating it under Microthyriales. Lutrell (1989) concluded that the Meliolales belong to the Pyrenomycetes and should not be placed with the Loculoascomycetes. Gregory,S. and Taylor, John (1995) in their preliminary analysis found that Meliolales and Erysiphales are not close relatives on the basis of molecular sequence data from the nuclear ribosomal small subunit (18S) gene.

From the taxonomic point of view, the group 'Meliolineae' has considerably attracted the attention of the mycological taxonomists.

48

C) Results and Discussion :

Family - Meliolaceae Martin ex Hansford, CMI Paper, 15: 23, 1946.

This family of black mildew fungi was established by Martin in 1946. These are foliicolous ectoparasites; mycelium superficial except in Endomeliola brown, septate, branched, hyphopodiate and thick, penetrating hypha arising from the head of capitate hyphopodia forming haustoria within cells the epidermal cells of the host; mucronarte hyphopodia often present; mycelial setae present or absent; ascomata superficial mostly globose, dark with parenchymatous wall of one or more layers, usually without ostiole; setae and appendages often present on ascomatal wall; asci borne in hymenium, 2 to 8-spored and evanescent; ascospores. 0, 1, 2, 3 or 4-septate and brown at maturity. Number of genera in the family vary from 7 to 45 (Muller and V. Arx. 1973; Eriksson et al., 1987 and Goos and Anderson, 1972) Eriksson et al., (1987) accepted 25 valid genera and others are treated as synonyms. Very recently one more genus has been added by Hughes, S.J. and Pirozynski, K.A. (1995) viz. Endomeliola collected from New Zealand.

Type genus : Meliola Fr. emend Bornet

Key to the genera of the Family - Meliolaceae studied :

1.	Ascospores 0	-l septate	•••	Armatella
1'	Ascospores 3	-4 septate	•••	2

2	Mycelial setae present	• • •	<u>Meliola</u>
21	Mycelial setae absent	• • •	3
3.	Setae present only on ascomata	•••	Irenopsis
3'	Setae not present on ascomata	•••	4
4	Appendages present on ascomata	•••	Appendiculella
4'	Appendages not found on ascomat	a •••	5
5	Ascomata below a shield of radi	ating	
	mycelium	•••	Amazonia
5	Ascomata lacking a shield	•••	Asteridiella

,

.

1

٠,



Amazonia Theissen Ann. Mycol. 11 : 499, 1913.

- = Actinodothis Sydow & Sydow, Philipp.J.Sci., 9: 174, 1914;
- Meliolaster Doidge, Trans. Roy. Soc. South Africa, 8 : 123, 1920 (non Meliolaster Hoehnel, 1918).

This genus was established by Theissen in 1913 and characterised by mycelium superficial, brown, septate, branched, hyphopodiate; ascomata globose, shield like, non-ostiolate; asci 2-4 spored and evanescent; ascospores 3 or 4 septate and brown. This genus is known by its 79 species and from India 10 species have been reported (Bilgrami <u>et al.</u>, 1979, 81 & Patil, C.R. 1990).

Type species : A. psychotriae (P.Henn.) Theissen

3101.4230

A. peregrina H. and P.Syd., Ann.Mycol. 15 : 238, 1917.

· *.

Habit : On living leaves of <u>Maesa indica</u> (Roxb.) DC. (F. Myrsinaceae), Amboli (M.S.), 28-12-1988, C.R.Patil, HCIO No.

dr.

Remarks : Sydow H. and P. (1917) have reported this species on <u>Maesa indica</u> (Roxb.) DC. from Philippines. This species is characterised by colonies which are amphigenous and crustose; capitate hyphopodia densely arranged. Hosagoudar (1989) has also reported and described the same species on same host from Idukki (Kerala). The present collection has been recorded on the same host and found to be identical morphologically in all respects and thus referred to it. It makes a new record to the fungi of the Maharashtra State.

G: APPENDICULELLA

Appendiculella Hoehnel, Sitzb. K. Akad. Wiss. Wein. Math. naturw KI: 128 : 556, 1919.

= <u>Irene</u> Theiss. and Sydow <u>sensu</u> Stevens, <u>Ann. Mycol.</u>, <u>25</u>:, 420, 1927 (non <u>Irene</u> Theissen and Sydow, 1917).

This genus was established by Hoehnel in 1919 and characterised as : mycelium superficial brown, septate, branched, hyphopodiate and without setae; perithecia superficial, globose and bearing larviform appendages; asci 2-4 spored and evanescent; ascospores 3-4 septate and brown. This genus is known by 10 species and 2 varieties. Three species have been reported from India (Bilgrami <u>et al.</u>, 1979, 1981 & Patil D.B. 1991).

Type species : A. calostroma (Desm.) Hoehnel

2201.6230

A. gloriosa (Doidge) Hansford, Sydowia, 10: 40, 1957.

- Basio.= <u>Meliola</u> gloriosa Doidge, <u>Trans. Roy. Soc. South Africa</u>, 8: 139, 1920.
 - Irene gloriosa Doidge, South Africa Journ. Nat. Hist. 2: 40, 1920. (Text Fig.I - Figs. 1 to 4; Text Pl.I - Figs.1-4)

Infection foliicolous and colonies hypophyllous, thin. black, circular, distinct and a few. Hyphae substraight, septate, brown coloured, branched alternately and cells mostly 12-16 X 7 µm. Hyphae bearing hyphopodia of two types: capitate and mucronate. Capitate hyphopodia alternate, antrose to angulose, 2-celled and 23-27 µm long; stalk cell cuneate and 7-12 µm long; head cell sublobate to angulose, often bent, 14-18 X 17-22 μ m. Mucronate hyphopodia a few, mixed with capitate hyphopodia, one-celled. brown, ampulliform and 20-22 X 7-9 p.m. Perithecia scattered, globose, a few on the mycelium, brown and 300 µm in diameter. Perithecial appendages larviform, numerous, ascending 60-75 X 25-30 µm, tapering towards the apex, simple, non-striated, smooth and pinkish-brown. Ascospores 3-septate, brown, thickwalled, slightly constricted at the septa, 46-55 X 15-18 Pm, obtuse, ellipsoide, slightly curved, all cells of equal size and terminal cells hemispherical - germination not observed.

Habit : On the living leaves of <u>Celastrus paniculata</u> Willd. (F.-Celastraceae), Amboli (M.S.), 22-2-1989, C.R.Patil, HICO No. 41,811 and WIF No. 730.

Remarks : Doidge (1920) has reported originally this species as <u>Meliola gloriosa</u> Doidge from South Africa on <u>Celastrus cordatus</u> Linnaeus. Hansford (1957) restudied Doidge's collection and found it to be a species of the genus <u>Appendiculella</u> and thus, proposed a new combination as <u>A. gloriosa</u> (Doidge) Hansford. The present collection resembles in respects, of morphology and dimensions of mycelium, hyphopodia and perithecia except the ascospores which are slightly larger and also recorded on the same host genus and thus, referred to it. <u>Celastrus paniculata</u> Willd. is an additional host. This species has been recorded for the first time in India and thus, a new addition to the fungi of the India.



Armatella Theissen & Sydow, Ann.Mycol., 13: 235, 1915.

= <u>Artallendea</u> Bat. & Maia, <u>Atas Inst. Micol., Univ. Recite.,</u> <u>1</u>: 222, 1960.

This genus was established by Theissen and Sydow in 1915 and characterised as mycelium superficial, brown, septate, branched, hyphopodiate and without setae; ascomata superficial, globose, dark, without appendages, or setae; asci 4-8 spored and evanescent; ascospores initially non-septate and hyaline, becoming brown and one-septate at maturity; on germination the upper cell enlarges to form a capitate hyphopodium, the other empties and collapses. This is comparatively a very small genus with nine species and one variety and also host limited. All taxa parasitized only on the members of the family Lauraceae. Eight species are known in India (Hosagoudar, 1991, Patil C.R., 1990).

Type species - A. litseae (P.Henn.) Thess. and Sydow

1101.4320

<u>A. balakrishnanii</u> Hosagoudar, <u>J.Ecom.Tax. Bot.</u> <u>15</u> (1): 196, 1991. Habit : On the living leaves of <u>Cinnamomum</u> <u>zeylanicum</u> L. (F.-Lauraceae), Kamengundi (K.S.), 28-1-1991, Shri M.S.Patil, HCIO No. and WIF No.

The genus Armatella is known by its 9 species and Remarks : a variety. In India it is known by 8 species (Hosagoudar 1991). All the taxa parasitised (to) the members of the host family Lauraceae. Hosagoudar (1991) has provided a key to Indian species. Out of these 8 species, 4 species have been recorded only on the host genus Cinnamomum. The present species in respect of measurement of the ascospore as per the key goes to balakrishnanii Hosagoudar but its ascospores Armatella are ellipsoidal and measure 43.3-49.5 X 18.5-21.5 µm i.e. more than 40 μ m long. The shape of ascospores of the present collection is fusiform and thus match well to Armatella indica Hosagoudar but ascospores are longer (46.5-52.5 X 18.5-21.5 µm). But the measurement of the present collection of ascospores is 34-40 X These ascospores at maturity mostly found one 15.5-18.6 jim. septate centrally to produce approximately two equal halves, but some time more than one septum has been also observed in number of the ascospores at maturity. The typical mode of germination of ascospores in a type species, a large cell which forms a capitate hyphopodiate nature of germ tube while a small cell (hc) becomes empty. The size of these ascospores as to compare

with type species <u>Armatella litseae</u> (P.Henn.) found to be larger. The most unusual feature in morphology of ascospores of present collection is their fusiform shape, centrally one septate or more than one septate and mode of germination by a basal cell is by a simple monopolar germ tube, mostly one some times two. Therefore, such a behaviour is not found in any taxa of the genus <u>Armatella</u> so far known. Therefore, the present collection shaired a character of <u>A. balakrishnanii</u> Hosagoudar in its measurements and by its shape to <u>A. indica</u> Hosagoudar but septation and germination features are quite distinct of its own. It require to raise either a new variety or a new species but tentatively it has been assigned to <u>A. balakrishnanii</u> Hosagoudar. So <u>Cinnamomum zeylanicum</u> L. is an additional host record.



1

<u>A. gymnosporae</u> Patil, C.R. <u>Studies of some Indian Fungi</u>Ph.D. Thesis, Shivaji Univ., Kolhapur (M.S.), pp.700, 1990 (approved by S.U., Kolhapur).

Habit : On living leaves of <u>Gymnosporia</u> <u>rothiana</u> Laws. (F.-Celastraceae), Kamengundi (K.S.), 27-2-1984, C.R.Patil, HCIO. No. 40024.

Remarks : Patil, C.R. (1990) has described a new species of <u>Armatella</u> viz. <u>Armatella gymnosporia</u> sp. nov and recorded it on the leaves of <u>Gymnosporia</u> rothiana Laws., a member of the family Celastraceae. The taxa of the genus Armatella are known to parasitize only on the members of the family Lauraceae. Therefore, to clear the doubt, its type material (HCIO No. 40024) deposited at New Delhi has been critically studied and found that there was not a single colony on the leaves but the leaves were parasitized by the members of family Asterinaceae viz. <u>Asteromella</u>, a conidial state of the genus <u>Asterina</u>. Thus, this species is quite doubtful and not accepted as a member of the genus Armatella.

•



Asteridiella McAlpine, Proc. Lin. Soc. New South Wales, 22:38, 1897.

- = <u>Irene</u> Theissen & Sydow, <u>Ann.Mycol.</u>, <u>15</u> : 194, 917;
- = <u>Irenina</u> Stevens, <u>Ann. Mycol.</u>, <u>25</u> : 411, 1927.

This genus was established by McAlpine in 1897 and characterised by mycelium which is superficial, brown, septate, branched, hyphopodiate and without setae; perithecia borne on the mycelia, globose, black, non-ostiolate, without perithecial setae but surface cells which are protruding and conoid with or without striations; asci 2-4 spored and evanescent; ascospores brown and 3-4 septate. This genus is known by its 541 species and 52 varieties. Eighteen species and ten varieties are known in India Bilgrami et al., 1979, 1981, Patil, C.R. 1990).

Type species - A. solani McAlpine

Key to the taxa of Asteridiella studied :

I.	Colonies amphigenous	2
Ι.	Colonies strictly hypophyllous	A. tremae
2.	Mucronate hyphopodia mixed;	
	alternate and opposite	3
2.	Mucronate hyphopodia separate; opposite	
	and unilateral	A. wendlandiae
3.	Perithecia 180 μ m in diameter	A. atricha
3.	Perithecia 345 μ m in diameter	A. ohiana
		var. major

3101.4320

A. atricha (Speg.) Hansford, Sydowia, 10: 46, 1957.

Basio. = <u>Meliola laxa</u> Gaill. var. <u>atricha</u> Speg., <u>Annual.Mus. Nac.</u> <u>Buenos Aries</u>, <u>32</u> : 355, 1924.

Irenina atricha (Speg.) Stev., Ann.Mycol., 25 : 469, 1927. (Text Fig.-I Figs.5-9, Text P.I figs. 5-8)

Infection foliicolous: colonies amphigenous, thick, black, many in number, small, scattered, circular and measured 2 mm in diameter. Hyphae substraight, septate, brown coloured, branched oppositely and cells mostly 19-24 X 7-8 μ m. Hyphae hyphopodiate and of two types : capitate and mucronate. Capitate hyphopodia 2-celled, alternate and unilateral, slightly curved, 18-20 µm long; stalk cell cuneate and 4-8 µm long; head cell ovate, cylindrical and 12-15 X ll-13 µm. Mucronate hyphopodia opposite or alternate, one-celled, ampulliform and 20mixed, 24 X 7-9 µm. Perithecia scattered, varrucose, globose to flattened, on the mycelium, black, opaque and 180 um in diameter. Perithecial cells conoid and 20 µm high. Ascospores oblong to ellipsoid, 4-septate, constricted at the septa, 39-45 X 19-24 µm all cells of equal size, thick-walled, dark brown, smooth and terminal cells hemispherical. Germination of ascospoores not observed.

Habit : On the living leaves of <u>Eugenia</u> sp. (F.- Myrtaceae), Amboli (M.S.), 22-2-1989, C.R.Patil, HICO No. 41815 and WIF No.734.

chether crawined by the condition?

Remarks : Spegazzini (1924) has reported originally this species as a variety of <u>Meliola laxa</u> Gaill. var. <u>atricha</u> Speg. from Argentina on a species of <u>Eugenia</u>. Hansford (1957) restudied this variety and found to belong to the genus <u>Asteridiella</u> and thus a new combination has been proposed viz. <u>A. atricha</u> (Speg.) Hansford. The present collection has been also recorded on the same host genus and thus, compared with it. Almost in every respect the present collection resembles with this species both morphologically as well as in measurements of the colonies, perithecia, ascospores etc. and therefore, referred to it. It is a new addition to the mycoflora of the India.

3101.4340

<u>A. ohiana</u> (Stev.) Hansford var. <u>major</u> Kar and Maity, <u>Sydowia</u>, <u>24</u>: 63, 1970.

= <u>Amazonia ohianus</u> Stev., <u>Bull. Bishop. Mus Honolulu</u>, <u>19:</u> 50, 1925.

Habit : On the living leaves of <u>Eugenia</u> sp. (F. - Myrtaceae), Anmode (K.S.), 31-1-1995, Miss Anjali M.Patil, HCIO No. 41816 and WIF. No.735.

Remarks : This variety has been already reported and described by Kar & Maity (1970) on <u>Syzigium claviflora</u> Roxb. of the family-Myrtaceae based on the colonies which are amphigenous and thick; hyphae are straight to substraight and capitate hyphopodia alternate. The present collection as compared with this variety, matched well in respects of morphology as well as dimensions (ascospores, perithecia, hyphopodia etc.) and thus, referred to <u>A. ohiana</u> (Stev.) Hansford var. <u>major</u> Kar and Maity except the host genus. It has been recorded on <u>Eugenia</u> species. So it is a new record to the fungi of the Karnataka State as well as <u>Eugenia</u> sp. is an additional host record.

3101.3220

<u>A. tremae</u> (Speg.) Hansford, <u>Sydowia</u>, <u>10</u>: 50, 1957. Basio.= <u>Meliola tremae</u> Speg. <u>Mycet. Argent VI., Ann.Mus.Nac.</u> <u>Buenos Aires</u>, <u>23</u> : 45, 1912.

Irenina tremae (Speg.) Stevens. <u>Ann.Mycol. 25</u>: 412,1927. (Text Fig.II, Figs.1-5, Text PL.II - Figs. 1-4)

Infection foliicolous; colonies hypophyllous, thick, black, small, many, scattered, circular upto 5 mm in diameter. Hyphae straight, brown coloured, septate, branched oppositely at acute angles and cells 16-20 X 7-8 μ m. Hyphae bearing hyphopodia which are of two types : capitate and mucronate. Capitate hyphopodia alternate, antrose, 2-celled, 14-20 μ m long; stalk cell cylindrical to cuneate 5-7 μ m long; head cell globose, entire and 9-13 X 11-13 μ m. Mucronate hyphopodia a few, mixed, opposite to unilateral and ampulliform, 1-celled, brown 16-18 X 7-8 μ m. Perithecia disperse, black, verrucose, globose and 200 μ m in diameter. Perithecial cells conoid and non-striated. Ascospores oblong, 4-septate, straight, constricted at the septa, 35-40 X
11-18 um and central cell slightly larger, brown, smooth and thickwalled.

Habit : On the living leaves of Trema orientalis Bl. (F.-Ulmaceae), Dandeli (K.S.), 8-1-1993, Miss Anjali M.Patil, HCIO No. 41814 and WIF. No.733.

Spegazzini (1912) has reported originally this species Remarks : Meliola tremae Speg. from Argentina on Trema micranthae as Linnaeus. Hansford (1957) restudied Spegazzini's collection and found it to be a species of the genus Asteridiella and thus, proposed a new combination as A.tremae (Speg.) Hansford. The present collection resembles in respects of morphology as well as dimensions of mycelium, hyphopodia, perithecia and ascospores except the colonies which are hypophyllous, and capitate hyphopodia which are alternate and ascospores slightly smaller. It has been also recorded on the same host genus and thus, referred to it. Trema orientalis Bl. is an additional host. This species has been recorded for the first time in India.

3101.4220

A.wendlandiae sp. nov.

(Text Fig.-II - Figs. 6-10 Fext PL-II - Figs.5-9)

Infection foliicola; plagulae amphigenae, dense, nigricans, illus. numerosus, inspersus, orbicula ad 2-3 mm in diam.; confluents. Hyphae rectae vel lentiter undulating, brunneus coloratio, septatus, oppositae acuteque vel laxe ramosae, densae vel reticulatae, cellulis 17-23 X 7-8 μ m. Hyphae igenus hyphopodia ad bitypus capitata et mucronata. Hyphopodia capitata alternata, antrosa, recta vel curvula, 17-27 μ m longa; cellula basali cylindracea (vel cuneata, 4-6 μ m longa; celluli apicali ovata, globosa; integra 12-18 X 9-15 μ m. Hyphopodia mucronata opposita vel unilateralia, ampullacea in hyphis distincta evoluta 17-35 X 7-8 μ m. Perithecia despersa, verrucosus, globosis in hyphae, nigricanse ad 200 μ m diam; cellulis perietis conoideis; sporae ellipsoideae, 4-septate, constrictae et 42-48 X 9-20 μ m.

Colin France ?

Holotypus : Typus lectus in foliis vivis <u>Wendlandia</u> <u>notoniana</u> Wall. (F.- Rubiaceae), Amboli (M.S.), 22-2-1989, C.R.Patil et positus in HCIO No. 41812 et WIF No. 731.

Infection foliicolous; colonies amphigenous, thick, black, small, many, scattered, circular upto 2-3 mm in diameter and confluents. Hyphae straight to undulating, brown coloured, septate, branched oppositely at wide angles, loosely to closely reticulate and cells 17-23 X 7-8 µm. Hyphae bearing hyphopodia of two types : Capitate and mucronate. Capitate hyphopodia alternate, antrose, 2-celled, 17-27 µm long; stalk cell cuneate and 4-6 µm long; head cell ovate, globose and 12-18 X 9-15 µm. Mucronate hyphopodia opposite to unilateral, brown, 1-celled, ampulliform, we borne on separate mycelial branches, 17-35 X 7-8 µm. Perithecia superficial, desperse, verrucose, globose, black and 200 µm in

diameter; perithecial cells conoid and non-striated. Ascospores ellipsoides, 4-septate, constricted at the septa, 42-48 X 9-20 μ m all cells of equal length, brown, smooth, thick-walled and terminal cells hemispherical. Germination of ascospores not observed.

Holotype : On the living leaves of <u>Wendlandia</u> <u>notoniana</u> Wall. (F.- Rubiaceae). Amboli (M.S.), 22-2-1989, C.R.Patil, HCIO No. ~41812 and WIF. No. 731.

AS CY Remarks : So far the review of the literature is concerned, it not and? is found that there is no any record of the genus Asteridiella To record on any species of the host genus Wendlandia. Therefore, the present collection has been compared with the description of the type species (Table 3). The above comparison reveals that the present collection differs from type species in number of respects as the hyphal cells of present collection are narrower, mucronate hyphopodia which are present on separate branches and are unilateral to opposite; perithecia are found slightly smaller while ascospores are slightly larger. And therefore. taking into consideration /of these features a new species has been proposed wendlandiae viz. Α. sp. nov. to accommodate the present collection.

Etymology : Wendlandiae (Latin, <u>Wendlandia</u>) referred to the name of the host genus <u>Wendlandia</u> after which the species has been named.

			al to cuneate e, 14-19 X	orm 17-35 X ranches.		septa <u>30</u> -45 X	ibiaceae)	and the second sec	
Present collection	Amphigenous	17-23 X 7-8 μm.	Alternate; stalk cell cylindric 4 to 7 μm long; hc - globos 9-13 μm.	Unilateral, opposite, ampullifc 7-8 μm; borne on separate b	200 µ m in diameter	4-septate, constricted at the 12-20 μ m.	<u>Wendlandia</u> notoniana Wall. (Ru	Amboli (M.S., India) د در دوکر ۲۰۰۵ میلی د در دوکر ۲۰۰۵ میلی	رسی ۱۰ ۱۹ ۱۹ ۱۹ ۱۹
<u>Asteridiella solani</u> McAlpine (Type)	Amphigenous	12-25 X 8-11 µm.	Alternate, antrorse, stalk cell- 3-7 µm long; hc - 12-19 X 11-17 µm.	few, mixed and ampulliform	250 µm in diameter	4-septate, constricted at the septa, $37-44 \times 14-17 \mu m$.	Solanum viridae (Solanaceae)	New South Wales (Australia)	
Characters	Colany	Hypha cells	Capitate hyphopodia	Mucronate hyphopodia	Perithecia	Ascospores	Host	Distribution	
No.	, 	2			e	4	ŝ	9	

•

G. IRENOPSIS

Irenopsis Stev. Ann. Mycol., 25 : 411, 1927.

This genus was established by Stevensen in 1927 and characterised : mycelium superficial, brown, septate, branched, hyphopodiate and without mycelial setae; perithecia borne on the mycelia, globose, non-ostiolate, with true perithecial setae; asci 2-4 spored and evanescent; ascospores brown and 3-4 septate. This genus is known by its 85 species and 6 varieties. Eleven species and two varieties are known in India (Bilgrami <u>et al.</u>, 1979, 1981; Patil,C.R.1990).

Type species : I. tortuosa (Winter) Stevensen

Key to the taxa studied :

1.	Colonies	epiphyllou	s; perithecia	• • •	I. leeae	var.indica
	upto 150	µm in dia	meter			

des not entry land, neutherds man

1.	condities not epiphymous; permiecia	more		
	than 150 µm in diameter	•••		2
2.	Colonies hypophyllous; perithecia 30	0 µm	in diameter	<u>I. rubi</u>
2.	Colonies amphigenous; perithecia mor	e or		
	less than 300 μ m in diameter	• • •		3
3.	Perithecia 200 µm in diam.; ascospor	res		
	30-50 X 15-20 µm.	•••		I.ligustri

Perithecia 330 μm in diam.; ascospores
30-35 X 11-14 μm.
I. nephali

. 67

I. leeae Hansf. var. indica Hosagoudar, Mycotaxon 36 (1):243-244, 1989.

Habit : On the living leaflets of <u>Leea indica</u> (Brum. f.) Merr. (F.- Leeaceae), Vasota (Dist.- Satara, M.S.), 4-10-1993, G.B.Dixit, HCIO No.41817 and WIF. No.736.

Remarks : Two varieties of the species <u>I. leeae</u> Hansf. are known, viz. <u>I. leeae</u> Hansf. var. <u>javensis</u> Hansf. and <u>I. leeae</u> Hansf. var. <u>indica</u> Hosagoudar recorded on the species of the host genus <u>Leea</u>. Present collection as <u>(to)</u> compare with these varieties, matches well in respects of morphology and dimensions of the capitate hyphopodia which are alternate and mycelium substraight to undulate and thus referred to <u>I. leeae</u> Hansf. var. <u>indica</u> Hosagoudar, which has been reported from Kerala on <u>Leea indica</u> (Brum.f.) Merr. This collection has been also recorded on the same host. Thus, it is a new record to the fungi of the Maharashtra State.

3401.3220

I. ligustri sp. nov.

(Text Fig.III - Figs.1-4; Text PL.III - Figs.1-6)

Infection foliicola; plagulae amphigenae, dense, nigricanse, illus, numersus, inspersus, orbiculatim, ad 2-3 mm in diameter. Hyphae rectae, brunneus colaratio, septatis, oppositae acuteque, cellulis 23-30 X 8-9 μ m. Hyphae igenus hyphopodia ad bitypus: capitata et mucronata. Hyphopodia capitata alternata, antrorsa, 21-27 μ m longa; cellula basali cuneate 6-8 μ m longa; cellula apicali ovata, globosa, integra 14-18 X 7-11 μ m. Hyphopodia mucronata illus capitatis commixta, ampullaceae, opposita, unilateralia vel alternata 21-24 X 7-9 μ m. Perithecia despersa, verrucose, globosis in hyphae, nigricanse ad 200 μ m diam., setae peritheciales rectae vel flexuos, simplices, brunneae ad apices acutae ad 160 X 7-9 μ m sporae ellipsoideae, 4-septate, constrictae et 30-50 X 15-20, μ m raris 3-celluli sporae.

Holotypus : Typus lectus in foliis vivis <u>Ligustrum</u> <u>neilgherrense</u> Clerk. (F.- Oleaceae), Amboli (M.S.), 22-2-1989, C.R.Patil et positus in HICO. No.41819 et. WIF. No. 738.

Infection foliicolous; colonies amphigenous, thick black, small, many, scattered, circular and upto 2-3 mm in diameter. Hyphae straight, brown coloured, septate, branched oppositely at acute angles; cells 23-30 X 8-9 μ m. Hyphae hyphopodiate are of two types : capitate and mucronate. Capitate hyphopodia alternate, antrose, 2-celled and 21-27 μ m long; stalk cell cuneate and 6-8 μ m long; head cell ovate, globose and 14-18 X 7-11 μ m. Mucronate hyphopodia mixed with capitate hyphopodia, opposite, unilateral to alternate, one-celled, ampulliform and 21-24 X 7-9 μ m. Perithecia desperse, verrucose, globose on hyphae black upto 200 μ m in diameter. Perithecial setae straight or slightly

curved, brown coloured, acute at the apex, septate and 160 μ m long. Ascospores ellipsoid, 4-septate, constricted at the septa, 30-50 X 15-20 μ m, all cells are equal in length, brown coloured, smooth, thick-walled, 3-celled ascospores are also seen occasionally.

Holotype : On living leaves of <u>Ligustrum neilgherrense</u> Clerk (F.-Oleaceae), Amboli (M.S.), 22-2-1989, C.R.Patil, HCIO No. 41819 and WIF No.738.

The same species has been collected on the same host from Kankumbi (K.S.), 24-1-1994 by the candidate.

Remarks : So far the review of the literature is concerned, it is found that there is no any record of the genus <u>Irenopsis</u> Stev. on any species of the host genus <u>Ligustrum</u> as well as the other members of the family Oleaceae. Therefore, the present collection has been compared with the description of the type species (Table-4). The comparison of the above table clearly shows that the present collection differs from type species in respects of the infection which is amphigenous, perithecia are larger while ascospores are smaller, 3-celled ascospores also occasionally seen. And therefore, a new species has been proposed viz. <u>I. ligustri</u> sp.nov. to accommodate the present collection.

Etymology : <u>Ligustri</u> (Latin, <u>Ligustrum</u>) referred to the name of the host genus <u>Ligustrum</u>, after which the species has been named.

mparison	Present collection	Amphigenous	Straight, brown coloured, branched oppositely at	acute angless; cells - 23-30 X 8-9 μ m. Alternate, 21-27 μ m long; stalk cell cuneate and 6-8 μ m long; head cell globose - 14-18 X 7-11 μ m.	Unilateral, alternate, 21-24 X 7-9 μ m ampulliform.	250-270 μ m in diameter and globose.	160 µm long, straight to slighly curved, acute at the apex and thick.	4-septate, constricted at the septa, $30-50 \text{ X} - 30-51 \text{ X}$ 12-17 µm; rarely 3-celled ascospores are seen.	Ligustrum neilgherrense L. (Oleaceae)	Amboli (M.S., India)& Kankumbi (K.S., India).	Le So X 12 12
Table 4 - Table of Co	Irenopsis tortuosa Winter (Type)		ŕ	ł	I	Globose, 160-190 µm in	diameter.	4-septate, constricted at the septa,49-54 X 18-20 $\mu\mathrm{m}$	Piper cujusdam (Piperaceae)	Brazil	t statute 3.
	Characters	Colony	Hyphae	Capitate hyphopodia	Mucronate hyphopodia	Perithecia	Perithecial setae	Ascospores	Host	Distribution	
	No.		2			e	4	വ	9	٢	

-

I. nephali sp.nov.

(Text Fig.III - Figs.5-9; Text PL. IV - Figs. 1-5)

Infectio foliicola; plagulae amphigenae, dense, nigricanse, numerosus, inspersus, orbiculatim ad 3-4 mm in diam., confluents. Hyphae rectae vel undulating, brunneus coloratio, septatus, oppositae acuteque, cellulis 20-30 X 6-8 µm. Hyphae igneus hyphobitypus capitata et mucronata. Hyphopodia capitata ad podia alternata, 18-23 µm longa; cellula basali cuneata, 6-8 µm longa; cellula apicali globosa, integra, ll-15 X 8-10 µm. Hyphopodia mucronata opposita vel unilateralia, ampullaceae in hyphis distinct evoluta 18 X 8 μ m. Perithecia despersa, verrucosa, globosis in hyphae, nigricanse ad 330 µm diam., setae peritheciales rectae, simplices, brunneae ad apices acutae ad 180 X ll μ m; sporae obovoidae, 4-septate, constrictae et 30-35 X 11-14 µm.

Holotypus : Typus lectus in foliis vivis <u>Nephalium longon</u> Lour. (F.- Sapindaceae), Kamengundi (K.S.), 28-1-1991, M.S.Patil, et positus HCIO No. 41820 et WIF No. 739.

Infection foliicolous; colonies amphigenous, thick, black, many, scattered, circular upto 3-4 mm in diameter and confluents. Hyphae straight to undulating, brown coloured, septate, branched oppositely at acute angles and cells 20-30 X 6-8 μ m. Hyphae hyphopodiate which are of two types : capitate and mucronate. Capitate hyphopodia alternate, antrose, 2-celled and 18-25 μ m long; stalk cell cuneate 6-8 μ m long; head cell globose ll-15 X 8-10 μ m. Mucronate hyphopodia one-celled,opposite to unilateral, borne on separate mycelial branches, ampulliform, 18 X 8 μ m. Perithecia desperse, globose, black, verrucose and 330 μ m in diameter. Perithecial setae straight, simple, brown coloured, acute at the apex and measured 180 X 11 μ m. Spores obovide, 4-septate, constricted at the septa, 30-35 X 11-14 μ m, all cells are of equal length, dark brown, thick-walled and smooth.

Holotype : On the living leaves of <u>Nephalium longan</u> Lour. (F.-Sapindaceae), Kamengundi (K.S.), 28-1-1991, Shri M.S.Patil, HCIO No.41820 and WIF No.739.

The same species has been also collected on the same host from Kankumbi (K.S.), 24-1-1994 by the candidate.

Remarks : One species has been reported on the member of the family .Sapindaceae viz. <u>I. araneosa</u> (Syd.) Stevensen (1927). The present collection has been compared with this species as well as the type species (Table 5). The present collection differs from them in respect of the infection which is amphigenous, thick colonies, capitate hyphopodia longer while mucronate hyphopodia borne on separate mycelial branches and opposite, alternate to unilateral. Perithecia are larger. Ascospores similar to <u>I. araneosa</u> (Syd.) Steven. but smaller than the type species. And thus, a new species has been proposed viz. <u>I. nephali</u> sp. nov. to accommodate the present collection.

No.	Characters	Irenopsis tortuosa (Winter) Steven. (Type Species)	Irenopsis araneosa (Syd.) Stevens	Present collection
	Colany	ſ	Epiphyllous	Amphigenous, small, thick, 1-2 mm in diameter
5	My celium	ł	Straight,brown coloured, septate	Straight, brown coloured, branched oppositely at acute angles, cells 23-30 X 8-9 μ m.
	Capitate hyphopodia	ŀ	Alternate 9-11 μ m long, hc-globose to subglobose	Alternate 18-23 μ m;stalk cell 6-8 μ m long; and cuneate. he-globose 11-15 X 8-10 μ m.
	Mucronate hyphopodia	1	Alternate to opposite, subampulliform ,18-2 µm long	Alternate, uniláteral, borne on separate mycelial branches ampulliform 18-20 X 7-8 µm.
e	Perithecia	Globose, 160-190 µm in diameter	Globose,110-150 μ m in diameter.	Globose few, desperse 350 µm in diameter.
4	Perithecial setae	ł	100 μ m, long 6 acute at the apex.	Black, septate, acute at the apex and $200 \times 7-9 \mu m$.
വ	Ascospores	4-septate, 49-54 X 18 μm constricted at the septa.	Oblonge, 4-septate, constricted at the septa 35-38 X 11-15 µm.	Oblong, 4-septate, constricted at the septa 30-35 X 11-14 µm.
9	Host	<u>Piper cujusdam</u> (Piperaceae)	<u>Euphoria longana</u> Lamk. (Sapindaceae)	Nephalium longana Lour (Sapindaceae)
2	Distribution	Brazil	Philippines	Kamengundi (K.S.) India Kankumbi (K.S., India).
		Ligherences Ligherences	Let the apprece is	guidinent but there is

Etymology : <u>Nephali</u> (Latin, <u>Nephalium</u>) referred to the name of the host genus <u>Nephalium</u>, after which the species has been named.

3401.4220

I. rubi sp.nov.

(Text Fig.IV - figs. 1-4).

Infectio foliicola; plagulae hypophyllae, dense. inspersus, orbiculatim ad 4-5 mm nigricanse, illus, numerosus, undulating, brunneus diameter. Hyphae rectae vel coloratio, septatus, oppositae acuteque, cellulis 20-37 X 7-8 µm. Hyphae igenus hyphopodia ad bitypus capitata et mucronata. Hyphopodia capitata alternata, antrorsa 14-28 µm longa; cellula basali cylindracea vel cuneata 14-13 μ m longa; cellula/apicali/globosa, ovata/ integra / 9-17 X 10-13 μ m. Hyphopodia mucronata illis, capitatis commixta, ampullaceae, opposita 20-28 X 7-9 µm. Perithecia despersa, verrucose, globosis, nigricanse ad 300 µm in diam., setae peritheciales rectae, simplices, nigricanse ad apices acute 150 X 7-9 µm, sporae ellipsoideae, 4-septate constrictae et 45-55 X 18-20 um.

Holotypus : Typus lectus in foliis vivis <u>Rubus moluccanse</u> L. (F..-Rosaceae), Kodaikanal (T.N.), 29-11-1987, R.S.Sawant et positus in HCIO No. 41818 et WIF. No.737.

Infection foliicolous; colonies hypophyllous,thick,black, small, many in number, scattered, circular, upto 4-5 mm in diameter. Hyphae bearing hyphopodia are of two types: capitate

and mucronata. Capitate hyphopodia alternate, antrorse, 2-celled, 14-18 μ m long; stalk cell cuneate and 4-13 μ m long; head cell globose to ovate and 9-17 X 10-13 μ m. Mucronate hyphopodia mixed with ch., one-celled, ampulliform, opposite and 20-28 X 7-9 μ m. Perithecia desperse, vertucose, globose, black 300 μ m in diameter and setose. Perithecial setae straight, simple, black, acute at the apex and 160 X 7-9 μ m. Ascospores ellipsoide 4-septate, constricted at the septa, 33-35 X 18-20 μ m, smooth, thick-walled.

Holotype : On the living leaflets of <u>Rubus moluccans</u> L. (F.-Rosaceae), Kodaikanal (T.N.), 29-11-1987, R.S.Sawant, HCIO No. 41818 and WIF No.737.

Remarks : So far the review of the literature is concerned it is found that there is no any record of the genus <u>Irenopsis</u> Stev. on any species of the host genus <u>Rubus</u> as well as on other members of the family Rosaceae. Therefore, the present collection has been compared with the type species (Table 6). The table of comparison showed that the present collection differs in number of respects: the arrangement of mucronate hyphopodia as well as perithecia which are larger. The ascospores of present collection are also longer than ascospores of type species. Therefore, a new species has been proposed viz. <u>I. rubi</u> sp.nov. to accommodate the present collection.

Etymology : <u>Rubi</u> (Latin, <u>Rubus</u>) referred to the name of the host genus <u>Rubus</u> after which the present species has been named.

1.	Characters	Irenopsis tortuosa (Witer)	Stevens Present collection
		(I y pe)	
	Colony	ı	Amphigenous, 2-3 mm in diameter.
	Hyphae	1	Mycelium branched oppositely cells - 20-37 X
			7-8 µm.
	Capitate	ı	Alternate, 14-28 µm long; stalk cell cuneate and
	hyphopodia		4-13 μm long; head cell globose to ovate -
			9-17 X 10-13 µm.
	Mucronate		Opposite, ampulliform 20-28 X 7-9 µm.
	hyphopodia		
	Perithecia	160-190 µm in diameter	300 µm in diameter and globose
		and globose	
	Perithecial	ı	160 µm long; acute at the apex, thick, black.
	setae		
	Ascospores	4-septate, constricted at	4-septate, constricted at the septa $\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \int_{-\infty}$
		the septa, 49-54 X 18 μ m.	<u>33-55 Х 18-20 рт. К. in Collandor </u>
	Host	Piper cujusdam (Piperaceae)	Rubus moluccanse L. (Rosaceae)
	Distribution	Brazil	لامdaikanal (T.N India) (درمارد م /

٠,

•

G. MELIOLA Fr. emend. Bornet

Meliola Fries emended Bornet, Ann.Sci.Nat.III, 16: 267, 1851.

- = Meliola Fries, Syst. Orb. Veg., P.111, 1825.
- = Amphitrichum Nees ex Spreng, Pl. Crypt.Trop, P.46, 1820;
- = Sphaeria Fries, Syst.Myc., 2 : 513, 1923;
- = Myxothecium Kunze, Syst.Mycol., 3 : 232, 1829;
- = Couturea Cast., Summa. Veg. Sand., P.407, 1846;
- = Asteridium Sacc., Syll. Fung. 1 : 49, 1882.

This genus was established by Fries in 1851 and characterised as : Mycelium superficial, brown, setpate, branched. hyphopodiate and setose, Perithecia borne on the mycelium, globose, non-ostiolate, black, without perithecial appendages or setae. Asci 2-4 spored and evanescent, ascospores 3-4 septate and brown. It is the type genus of the family and largest among known genera of the family and constitute about 90 % taxa i.e. about 1800 species (Yarwood, 1971) and many varieties. In India 300 species and 53 varieties (Hosagoudar, 1995) of this genus have been described. It was reported in India in 1884 from Belgaum (K.S.) by Cooke.

Lectotype : M.trichostroma (Kunze) Toro

Key to the species/varieties :

Ι	Infection mostly foliicolous	•••	2
I'	Infection only caulicolous	• • •	<u>M.</u> vitis
I"	Infection mostly phyllodiicolous	• • •	M. aethiops

	In ,	Infection only on petioles	•••	M. petrakii
	2.	Ms are quite short, scutate/knob		
、		or crooked	<u>M.</u>	limorphochaeta
\sim	(2.)	Ms. are quite normal	• • •	3
	3	Ms. generally simple	• • •	4
	3.	Ms. fork and dichotomously branch	ed at the apex	5 [°]
	4.	Ms. upto 1000 µm long	•••	6
	4'	Ms. upto 500 µm or more long	•••	7
	4"	Ms. less than 500 µm long	•••	8
	5	Col. on stem; myc. very thick, b	ranched	
		irregularly; myc. cells 25-40 µm	long (I') .	<u>M.</u> <u>vitis</u>
	5.	Col. on leaves; myc. not thick, b	oranched	
		oppositely; Myc. cells - 18-22 µm	long	M. tenella
ىر		ch) ,	var. <u>atalantiae</u>
Ser.	6	Mh. on separate branches; Ch. al	ternate	9
the	6	Mh. mixed; ch. are opposite and	Ms	
3.0	-	1100 µm long	•••	M. longiseta
10 30	7.	Ascospores upto 34-40 µm long	•••	10
	7	Ascospores above 40 μ m long	•••	M.atalantiae
	8	Infection on phyllode or petiole	•••	
L	8	Infection foliicolous	•••	12 😤
	9	Head cells of Ch. are lobate	•••• <u>N</u>	<u>1. ixorae</u> var.
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			macrospora
	`~ 9	Head cells of 2^{Ch} . globose or subg	lobose <u>M.</u>	stenospora var
	à	si the for		major
	y v	The second		
Ş				
	v			

10	Ch. opposite	• • •	<u>M. capensis</u> var.
			Malayensis
10	Ch. alternate	• • •	13 ो
11	Infection on phyllode (I")	•••	M. aethiops
11	Infection on petioles (I"')	• • •	<u>M.</u> petrakii
12	Perithecia less than 100 m in diam	1	M. ervatamiae
12	Perithecia more than 100 m in dia	m	14
13	Myc. cells 7-9 X 24-33 m	•••	<u>M. celtidis</u> var.
			indica var. nov.
13	Myc. cells 6-8 X 9-15 m	•••	<u>M.carissae</u> var.
			indica
14	Infection hypophyllous	• • •	<u>M. malabarensis</u>
14'	Infection epiphyllous	• • •	M. atylosiae
14"	Infection amphigenous	• • •	15
15	Mh. on separate branches (Opposite		*
	and alternate)	•••	M. bengalorensis
15	Mh. mixed (opposite and alternate)	•••	16
16	Ascospores 14-18 X 34-42 m.	•••	M. tylophorae
16	Ascospores 17-20 X 48-53 m	М.	puerariae sp.nov.



. 4

M. aeithops Sacc., Bol. Orto Bot. Napoli 6 : 41, 1921.

Habit : On the phyllode of <u>Acacia auriculiformis</u> A. Cunn. and <u>A. longifolia</u> A.Cunn. (F.- Mimosaceae), Trivendrum, (Kerala) and Kankumbi (K.S.), 29-2-1992 and 24-1-1994, Shri Varkad, V.S. and Miss Shinde, T.V. respectively and deposited in HCIO Nos. 41825 and 41824 WIF. Nos. 744 and 743 respectively.

Saccardo (1921) has reported Meliola aeithops Sacc. Remarks : on phyllode of Acacia auriculiformis A.Cunn. from Itali. Lim,G. (1975) has also reported the same species on the same host from Singapore. There are five varieties of this species reported on the different members of the family Ceaslpiniaceae from Sierra Leone (South Africa) and India by Hansford and Deighton (1962) and Rao (1967). Present collection recorded on phyllodes of Acacia auriculiformis A.Cunn. and Acacia longifolia A. Cunn. are found to be identical and thus, referred to it. Rao (1967), who reported a new variety viz. Meliola aeithops Sacc. var. cassiae Rao, on leaflets of Cassia fistula L. from Pakhal forest (Andhra Pradesh). This variety by its morphological description found to be quite identical to Meliola aeithops Sacc. in all respects and thus there is no need to raise a new variety. This species makes a new record to the Karnataka and the Kerala States and Acacia longifolia A. Cunn. is an additional host.

M. atalantiae Hosagoudar, Mycotaxon, 37 : 220, 1990.

Habit : On living leaves of <u>Atlantia wightii</u> Tanaka (F.- Rutaceae), Amboli (M.S.), 6-3-1981 Shri C.R.Patil, HCIO. No. and WIF.No.

Remarks : Hosagoudar (1990) has reported this species on Atalantia wightii Tanaka from Painavu (Kerala). It is characterised by the straight hyphae forming hypophyllous colonies; capitate hyphopodia alternate to opposite, head cell conoid and entire; and mycelial setae dentate. mucronate hyphopodia mixed The present collection has been recorded on the same host and found to be morphological identical in all above respects and thus, referred to it. It makes a new record to the fungi of the Maharashtra State.

3113.3221.

X

M. atylosiae Hosagoudar, Mycotaxon, 37 : 220-221, 1990.

Habit : On living leaflets of <u>Atylosia lineata</u> Wight and Arn. (F.-Fabaceae), Kankumbi (K.S.), 24-1-1994, Miss Shinde, T.V., HCIO. No.41830 and WIF. No.749.

Remarks : This species has been already described and reported by Hosagoudar (1990) on <u>Atylosia lineata</u> Wight. & Arn. from Idukki (Kerala). This species is characterised by undulating hyphae which forms dense, epiphyllous colonies; capitate hypho-

podia with head cell globose and mucronate hyphopodia mixed; mycelial setae terminally dentate. The present collection has been recorded on the same host and found to be identical in all respects and thus, referred to it. It makes a new record to the fungi of the Karnataka State.

3113.3221.

<u>M. bengalorensis</u> Hansford & Thirumalachar, <u>Farlowiia</u>, <u>3</u>: 290,1948.
Habit : On living leaves of <u>Ficus bengalensis</u> Linn. (F.- Moraceae),
Trivendrum (Kerala), 29-2-1992, Shri Varkad, V.S., HCIO.No. and WIF No.

Hansford & Thirumalachar (1948) have described and Remarks : reported the species of Meliola viz. M. bengalorensis Hansf. & Thirum., M. ficicola Hansf. & Thirum. and M. ovatipoda Hansf. & Thirum. on the species of the host genus viz. Ficus. Present collection as to compare with these species, matched well in respect of crooked to substraight hyphae forming sub-dense amphigenous colonies; capitate hyphopodia are alternate and opposite while mucronate hyphopodia are on separate mycelial branches and thus, referred to M. bengalorensis Hansford & Thirumalachar which has been reported from Bengalore (K.S.) on Ficus species. The present collection has been also recorded on the same host genus. Thus, it is new record to the fungi of the Kerala State.

3112.3223.

2 (S () 2)

<u>M.</u> <u>capensis</u> (K.& C.) Theiss. var. <u>malayensis</u> Hansford, <u>Sydowia</u>, <u>10</u>: 67, 1957.

Habit : On living leaves of <u>Nephalium longan</u> Lour. (F.-

Remarks : This variety has been reported by Hansford (1957) on <u>Nephalium longan</u> Lour. from Malaya. Hosagoudar (1990) has reported the same variety from Idukki (Kerala) on the same host. The present collection also matched well in case of straight hyphae, capitate hyphopodia (alternate to opposite), head cell (globose and entire) as well as the dimensions and also recorded on the same host and thus, referred to it. It makes a new record to the fungi of the Maharashtra State.

3111.4222

M. carissae Doidge, var. indica Hansford, Sydowia, 10: 67, 1957. Habit : On living leaves of Carissa carandus L. (F.-Apocynaceae), Amboli (Dist.- Kolhapur) and Vasota (Dist.-Satara), 22-8-1988 and 4-10-1993, C.R.Patil and G.B.Dixit respectively 4 and deposited in HCIO. Nos. and WIF. Nos. 4 ١ and respectively. Remarks : Two varieties are known of Meliola carissae Doidge viz., M. carissae Doidge var. indica Hansf., and M. carissae

Doidge var.Spinari Hosagoudar on the species of the host genus

<u>Carissa</u>. Present collection as to compare with these two varieties, it matched well in respects of morphology and dimensions of capitate hyphopodia which are lobate and mycelium which is substraight to crooked and thus, referred to <u>M. carissae</u> Doidge var. <u>indica</u> Hansford which has been reported from Kerala. So it is a new record to the fungi of the Maharashtra State.

3111.3122

M. celtidiae Yates var. indica var nov.

 χ^{0} (Text Fig.IV - Figs. 5-8, Text Pl.V - Figs. 1-5) χ^{0} (Different M. celtidiae Yates var. celtidiae plagulis densis, peramphus, hyphopodiis mucronata illus, setae myceliales illus in tandem, sporae illus.

Infection foliicolous; colonies amphigenous dense, thick, large, upto 5 mm in diameter. Hyphae straight, brown coloured, septate, hyphopodiate, branched oppositely and cells 24-33 X 7-9 μ m, Hyphopodia are of two types : capitate and mucronate, capitate hyphopodia 2-celled, alternate, 20-24 μ m ong; stalk cell cuneate 7-9 μ m long; head cells globose, ovate 13-17 X 9-13 μ m Mucronate hyphopodia opposite mixed with ch, ampulliform, 17-20 X 6-8 μ m. Mycelial setae long, straight, simple, acute at the apex, dark, opaque, and 300-400, μ m. Perithecia globose, black and 175-200 μ m in diameter. Perithecial setae simple, black, acute at the apex, black, straight and 250 μ m in length, Ascospores

			in / - 1 ante ni milihai 12011	
No.	Characters	<u>M. celtidiae</u> Yates var. <u>Celtidiae</u>	Present Collection	Present collection
	Colonies	1-2 mm in diameter	4-5 mm in diam., amphigenous, and dense.	4-6 mm in diam., amphigenous, dense.
2.	Mycelium	Straight, branched oppositely	Straight, branched oppositely. cells 24-33 & 7-9 µm.	Straight, branched oppositely. 18-25 X 7-9 m m.
	с.н.	Alternate, 12–20 X 10–25 tum	Alternate, 20-24 µm long,stc- 7-0 µm long, he nuste	Alternate 19-23 µm long; stc- 6-8 µm long hc. ovate
			13-17 X 9-13 µm.	13-15 X 12-14 µm.
	м.н.	Mixed with ch, ampu-	Opposite, mixed with ch; ampu-	Opposite, unilateral, ampulliform
		lliform and 20-30	lliform and 17-20 X 6-8 µm	19-22 Х 7-9 µm.
		µ m long.		
З.	Mycetial	800-1200 µm long.	400-500 µm long, acute at	400-600 μ m long, acute at the
	setae	acute at the apex	the apex, black.	apex, black.
4.	Perithecia	175-225 µm in diam.	175-200 μ m in diameter	180-200 μ m in diameter.
5.	Ascospores	4-septate, constricted	4-septate, constricted at the	4-septate, constricted at the
		at the septa 50-55 µm	septa, 34-38 X 9-12 µm.	septa, 35-40 X ll-14 µm.
		long		
6.	Host	Celtis luzonesis L	Celtis cinnamomea Lindl	<u>Celtis philippinsis</u> Blanco
		(Ulmaceae)	(Ulmaceae)	(Ulmaceae)
7.	Distribution	Philippines	Dandeli (K.S., India)	Dandeli (K.S.,India)

٦

Table of comparison Table 7 -

4-septate, constricted at the septa, 34-38 X 9-12 μ m, all cells are of equal in length, smooth, dark brown, thick-walled and terminal cells hemispherical. Ascospore germination not observed. Holotype : On living leaves of Celtis cinnamomea Lindl. (F.-Ulmaceae), Dandeli (K.S.), 8-1-1993, Miss Anjali M. Patil, HCIO. A-182. 9 No.41822 and WIF. No. 741.

The same species has been also collected on the Celtis Philippinsis Blanco. from the same locality.

Remarks : Yates (1917) has recorded M.celtidiae Yates var. c eltidae on Celtis luronensis L. from Philippines. Present collections have been also recorded on two species of the same host genus viz. Celtis. Both collections differed from this variety (Table -7) in respect of the dimensions of the ascospores which are quite smaller moreover the colonies are quire dense. Therefore, a new variety has been proposed viz. M. celtidiae Yates var. indica var. nov. to accommodate the collection collected, on C. cinnamomea L. The second collection collected on C. philippinsis Blanco is an additional one on other host species viz. C. philippinsis Blanco.

3113.3222

M. dimorphochaeta sp.nov.

(Text Fig.V - Figs. 1-4) Infectiony foliicola; plagulae amphigenae, valde pergrandis, N^U

singer 40

dispergens, et totus folium amietus, densae, si distinets ad 5-10 mm diam. Hyphae rectae brunneus colarato, septatus, oppositae acuteque vel laxa ramosa, dense vel reticulatae, cellulis 14-18 X 5-8 µm. Hyphae igneus hyphopodia ad bitypus: capitata et mucronata. Hyphopodia capitata opposita vel alternata, antrorsa µm longa; cellula basali cuneata 2-5 µm longa; cellula 17-20 apicali, ovata, globosa, cellula basali cuneata 2-5 4 m longa, curvula 14-17 X 9-11 µm. Hyphopodia mucronata opposita vel unilateralia, illis, capitatis, ampullaceae 20-24 X 6-9 µm. Setae myceliales dimorphiis, scutatus, septatus, cylindracea, curuatus et rectae, partis terminalis hamatus, nigricunse, opeues dense, 30-35 X 8-10 ¥m. Perithecia despersa, globosa, nigricanse, verrucose ad 200 µm diam. Setae peritheciales ad 400 µm longa, rectae, simplices, brunneae ad apices acute; sporae oblonge, 4septatae, constrictae, 35-45 X 14-16 µm.

Holotypus : Typus lectus in foliis vivis <u>Tylophora</u> <u>tenuis</u> Bl. (F.- Asclepiadaceae), Kankumbi (K.S.), 24-1-1994, Miss Anjali & M.Patil, et positus HCIO. No. 41823 et WIF. No. 742.

Infection foliicolous; colonies amphigenous, very large, spreading and coalsed to cover whole leaf lamina and dense. Hyphae straight, brown coloured, septate, branched oppositely at acute angles and loosely to closely reticulate; cells 14-18 X 5-8 µm. Hyphae hyphopodiate and hyphopodia are of two types: capitate and mucronate. Capitate hyphopodia 2-celled, opposite

to alternate, antrorse and 17-20 µm long; stalk cells cuneate and 2-5 µm long; head cells ovate to globose, curved and 14-17 X 9-11 µm. Mucronate hyphopodia one celled, opposite to unilateral, mixed with ch., ampulliform and 20-24 X 6-9 µm. Mycelial setae are also of two types: (i) exceptionally short, thick, scutate, cylindrical, 1-2 septate and apically crooked, brownish-black and measured 30-35 X 8-10 μ m and (ii) other simple, acute at the apex, thick black, opaque, upto 400 µm long. Perithecia 200 desperse. globose. black. verrucose, in diameter. μm Perithecial setae normal, black, septate, acute at the apex straight simple and measured 500 μ m long. Ascospores oblong, 4-septate. smooth. all cells equal length, of thick-walled. constricted at the septa and $35-45 \times 14-16 \mu$ m. Germination not observed.

Holotype : On living leaves of <u>Tylophora tenuis</u> Bl. (F.- Asclepiadaceae), Kankumbi (K.S.), 24-1-1994, Miss Anjali M.Patil, HCIO No.41823 and WIF No. 742.

Remarks : Six species and one variety of the genus <u>Meliola</u> have been recorded on the different hosts of the family Asclepiadaceae (India). Two species and one variety have been reported on the host genus <u>Tylophora</u> viz. <u>M. perpusilla</u> Syd., <u>M. tylophorae</u> Hosagoudar and <u>M. telosmae</u> var. <u>tylophorae</u> Hansford. The present collection has been compared with these taxa (Table 8). The present collection differs from them in respects of infection which

85

Table 8 - Table of Comparison

٠

N0.	Characters	<u>M.perpusilla</u> Syd.	<u>M. telosmae</u> Rehm var. <u>tylophorae</u> Hansf.	M. <u>tylophorae</u> Hosagoudar	Present collection
-	Colany	Epiphyllous, 4 mm in diameter.	Epiphyllous, 4 mm in diameter.	Amphigenous,hypo- phyllous 5 mm in diameter.	Amphigenous,thick,whole leaf is covered 9-10 mm in diameter.
2.	Mycelium	Straight,long, radiate 8-10 µm.	Substraight to slightly undulating, opposite at acute angles cells $20-30 \times 5-7 \mu m$.	Straight to slightly undulating opposite at acute to wide angles cells 12-30 X 6-8 µm.	Straight,opposite at acute angles, reticulate cells 14-18 X 5-8 µ m.
	с.н.	Cylindrical,straight, errect 16-24 X 8-10 µm.stcminute	Alternate, more or less antrose, usually straight 12-19 µm long stc.3-7 µm hc - ovate 9-13 X 7-10 µm.	Alternate, antrorse, straight to curved, 16-20 m long. st.cell - 4-8 µ m hc - globose, ovate 10-14 X 8-10 µ m. 9	Opposite to alternate antrorse 17-20 µm long stc-cuneate 2-5 µm long hc-ovate, globose, curved 14-17 X 9-11 µm.
	м.н.	Small non-vivis 14 X 7 µm.	Mixed with ch, opposite to alternate, ampulliform 13-16 X 7-8 Mm.	Mixed with Ch.opposite to alternate, ampulli- form 12-24 X 6-10 µm	Mixed with ch, opposite 20-24 X 6-9 µm.
• ന	Mycelial setae	Simple errect,acute at apex 200-300 X 8-10 µtm.	Numerous scattered to grouped around perithecia,straight simple, obtuse 640 µm long	Scattered,grouped around perithecia, simple, obtuse at tip upto 460 µm long.	Two types: (1) short, bent, hook like at apex thick upto 29-35 X 8-10 µm. (2) simple,long 400 µm. acute at the tip.
.	Perithecia	Glohose 125-150 µm in diameter.	Scattered, verrucose 140 µm in diameter	Grouped,verrucose 250- µm in diameter.	Disperse, globose 200 m in diameter.
5.	Perithecial setae	ł	I	I	500 µm in length (simple)
6.	Ascospores	Obovoidal,4-septate constricted, 34-42 X 14-18 µm.	Oblong, 4-septate constricted 26-32 X 11-12 µm.	Obovoidal, 4-septate constricted 34-42 X 14-18 µm.	Oblong 4-septate, constricted 35-45 X 14-16 µ m.
7.	Host	Tylophora sp.	Tylophora tenuis Bl	Tylophora <u>capparidifolia</u> Wight & Arn	Tylophora tenuis Bl.
8.	Distribution	Philippines	Maharashtra, India	Kerala, India	Karnataka, India.

1

•

is amphigenous, thick, dark, large and coalesing colonies, ch. alternate to opposite and in size similar to <u>M. tylophorae</u> but smaller than other species; Mh. are opposite and similar to <u>M.</u> <u>tylophorae</u> in dimensions but larger than other species. Mycelial setae are of two types which is not seen in any species of the genus <u>Meliola</u> i.e. (1) simple, (2) Scuted and crooked. Ascospores dimensions matched to <u>M. perpusilla</u> Syd. exactly and also with <u>M. tylophorae</u> Hosagoudar. Therefore, a new species has been proposed viz. <u>M. dimorphocheata</u> sp. nov. to accommodate the present collection.

Etymology : <u>Dimorphochaeta</u> (Gr.and L.- Dis. two; Morphe shape; Gr. chaeta - spine - seta) referring to morphologically two types of setae (i.e. Mycelial).

3111.3211

M. ervatamiae Hosagoudar, Sydowia, 40: 115, 1987.

Habit : On living leaves of <u>Ervatamia heyneana</u> T. Cooke. (= <u>Tabernaemontana heyneana</u> Wall.) (F.- Apocynaceae), Amboli (M.S.) and Dandeli (K.S.), 6-3-1981 and 8-1-1993, C.R.Patil and and Miss Anjali M.Patil respectively, deposited in HCIO. Nos. 41835 and 41836, WIF. Nos. 754 and 755 respectively.

Remarks : Hosagoudar (1987) has reported this species on <u>Ervatamiae</u> <u>heyeana</u> T. Cooke from Valparai (T.N.). It is characterised by undulating hyphae with capitate hyphopodia in

which head cells are angular; smaller mycelial setae, perithecia and ascospores. The present collection has been recorded on the same host and found to be morphologically identical in all above respects and thus, $\int geterred$ to it. It makes a new record to the fungi of the Maharashtra and the Karnataka State.

3111.4224

M. ixorae Yates var. macrospora Hosagoudar, Mycotaxon, 37:235,1990.

Habit : On living leaves of Ixora sp.(F.-Rubiaceae), Amboli (M.S.), 6-3-1981, C.R.Patil, HCIO, No. and WIF. No. Remarks : There are three species and one variety of the genus Meliola recorded on the species of the host genus Ixora. These are, viz. M. twaitesiana Hansf., M. tawaoensis Hansf., M. ixorae Yates and M. ixorae Yates var. macrospora Hosagoudar. The present collection as to compare with these taxa, it matched well in respects of morphology and dimensions of capitate hyphopodia mycelial which longer are alternate and setae, having hypophyllous colonies and thus, referred to M. ixorae Yates var. macrospora Hosagoudar which has been reported from Idukki (Kerala) on Ixora species. Present collection has been also recorded on the same host genus. Thus, it is a new record to the fungi of the Maharashtra State.

<u>M.</u> longiseta v. Hohnel, <u>Fragm.Z.Mycol.</u> III, <u>Sitzb. K.Ak.d.</u> Wissench.Wien Bd, <u>cxvi</u> (Abt) <u>I</u>: 100, 1907

(Text Fig.V - Figs. 5-8; Text P. V - Figs. 6-10)

Infection foliicolous; colonies amphigenous, thick, black, velvety, scattered, large, many in number, circular to irregular and 5 mm in diameter. Hyphae straight, septate, brown coloured, branched oposite to alternately at acute angles, cells 17-20 X μ m. Hyphae bearing hyphopodia which are of two types: 4-6 capitate and mucronate. Capitate hyphopodia 2-celled, opposite and 17-28 μ m long; stalk cell cuneate and 4-6 μ m long; head cell ovate, cylindrical, slightly curved at the tip, 12-18 X 8-12 µm Mucronate hyphopodia opposite, mixed with ch, one-celled, ampulliform, 18-20 µm long. Mycelial setae thick-walled, straight, acute at the apex, long, septate, black and measured upto 1100 µm long. Perithecia globose, many, black, crowded on the mycelium, 180 µm in diameter. Perithecial setae similar to the mycelial um long. Ascospores setae but shorter in length i.e. 500 4-septate, constricted at the septa, oblong, brown, thick-walled, smooth and 40-50 X 13-15 µm. Central cell slightly larger.

Habit : On the living leaves of <u>Psychotria</u> sp. (F.-Rubiaceae), Vishalghar (Dist.-Kolhapur, M.S.), 25-11-1994, M.S.Patil, HCIO No. 41828 and WIF. No.747. Remarks : So far seven species and one variety of Meliola have been recorded on the species of the host genus Psychotria viz. M. africana Hansf., M. bayamonesis Tehon., M. imperspicua Deighton; M. mayaguesiana var. dominicana cif., M. longiseta, v. Hohnel, M. maquilingiana Syd., M. psychotria Earle, Μ. rechingeri Hansf. The present collection as to compare with these taxa, it matched well in respects of morphology and dimensions of capitate hyphopodia (which are opposite) head cells (globose to ovate), longer mycelial setae and dimensions of ascospores and thus, referred to M. longiseta v. Hohnel which has been reported from Samoa Island on Psychotria species. Present collection has been also recorded on the same host genus. Thus, it is a new record to the fungi of the India.

3111.3222

M. <u>malabarensis</u> Hansf. <u>Proc.Linn.Soc.London</u>; <u>157</u>: 182, 1946. Habit : On living leaves of <u>Olea</u> <u>dioica</u> Roxb. (F.- Oleaceae), Vasota (Dist.- Satara, M.S.), <u>4-10-1993</u>, Shri G.B.Dixit, HCIO No. 41832 and WIF No. 751.

Remarks : This species has been reported and described by Hansford (1946) on <u>Olea</u> sp. from Karnataka State. This species is characterised by colonies which are hypophyllous and thin hyphae straight; head cell globose to cylindrical and mucronate hyphopodia mixed with capitate hyphopodia. Thite and Kulkarni (1973) have also reported and described the same species on Ligustrum neilgherrense Clerke from Radhanagari (M.S.) Hosagoudar (1990) also reported this species from Painave (Kerala) on <u>Olea</u> <u>dioica</u> Roxbourg. The present collection has been also recorded on the same host and found to be identical in all above respects and thus, referred to it. It is recorded for the first time this species on <u>Olea dioica</u> Roxb. from the Maharashtra State.

3111.4231

M. petrakii Stev. & Rold, Philipp Journ. Sci., 56 : 65, 1935.

= M. petiolaris Petrak, Ann.Mycol., 29: 185, 1931 (non Doidge)

Habit : On petioles of <u>Melia composita</u> Wild. (F.- Meliaceae), Dandeli (K.S.), 8-1-1993, Miss Anjali M.Patil, HCIO. No. 41827 and WIF. No.746.

Remark : Petrak (1931) has described and reported a species of <u>Meliola</u> viz. <u>Meliola petiolaris</u> Petrak on <u>Dysoxylum cumingianum</u> DC. from Philippines, the pre-occupied name. Hence, Stevens and Rolden (1935) proposed a new name viz. <u>Meliola petrakii</u> Stev. & Rold for it. This species has been recorded by Hosagoudar in 1986 on the leaves of <u>Dysoxylum malabaricum</u> Bedd. from Chandenthode forest, Wynaad, Kerala. Present collection has been collected on petioles and rarely on leaflets of <u>Melia composita</u> Willd; and found to be identical in all respects and thus, referred to it. It makes a new record to the fungi of the Karnataka State and <u>Melia composita</u> Willd. is an additional host record.

 \rightarrow

M. puerariae sp. nov.

(Text Fig.VI - Figs.1-4, Text PL. VI- figs. 1-5)

Infectio foliicolae; plagulae amphigenae; dense, nigricanse, numerosus. inspersus, orbiculatine ad 3-4 mm diam. Hyphae rectae, brunneus coloratio, septatus, alternata, acuteque vel laxe ramosa, cellulis 12-20 X 7-8 µm. Hyphae igneus hyphopodia ad bitypus: capitata et mucronata, Hyphopodia capitata alternata vel unilateralia, antrorsa 22-25 µm longa; cellula basali cuneata, 6µm longa; cellula apicali globosa 13-18 X 8-10 µm. Hyphopodia 🖋 9 mucronata opposita, illis capitatis ampullacea 22-28 X 7-9 μm. Setae myceliales numerosae, inspersus, simplices, rectae. nigricanse, ad apices acute 450 µm longa. Perithecia denspersa, globosa, verrucosa ad 175-200 µm diameter. Setae peritheciales, apices acute ad **µ**m 300 longa, sporae oblongae, simplices. 4-septatis, constricta ad 48-53 X 17-20 µm.

Infection foliicolous; colonies amphigenous, dense, black, many, scattered, circular upto 3-4 mm in diameter. Hyphae straight, brown, septate, branched alternately at acute angles, loosely to closely reticulate, cells 12-20 X 7-8 μ m. Hyphae hyphopodiate and are of two types : capitate and mucronate; capitate

hyphopodia alternate to unilateral, 2-celled, antrorse, 22-25 μ m long; stalk cells cuneate and 6-9 μ m long; head cells globose, noin entire and 13-18 X 8-10 μ m. Mucronate hyphopodia opposite, one-figure celled, mixed, ampulliform and 22-28 X 7-9 μ m. Mycelial setae many, scattered, simple, straight, black, acute at the apex and 450 μ m long. Perithecia desperse, globose, black, vertucose and measured 175 μ m in diameter. Perithecial setae simple, a few, of 000 μ m long Ascospores oblong, 4-septate, constricted at the septa, 48-53 X 17-20 μ m, brown, smooth, thick-walled, all cells are of equal in length and terminal cells hemispherical.

Holotype : On the living leaflets of <u>Pueraria</u> <u>tuberosa</u> DC.(F.-Fabaceae), Kankumbi (K.S.), 24-1-1994, Miss T.V.Shinde, HCIO. No.41840 and WIF. No 759.

Remarks : Seven species and two varieties of the genus <u>Meliola</u> have been recorded on the different hosts of the family Fabaceae from India. The present collection has been compared with these taxa (Table 9) and it differs from them in respects of the infection which is amphigenous, mycelial cells are long and matched to <u>M. atylosiae</u> Hosagoudar, ch. are also longer and are alternate to unilateral, Mh. are few and also longer. Ascospores of present collection are quite larger than all species recorded on the family Fabaceae (India). There is no record of the genus <u>Meliola</u> on any species of the host genus <u>Pueraria</u>, hence, a new •

.

-	<u>K. trylosic(</u> Roagoudar Epiphyllous, dense upto 2 mm in diam. Undulating, opposite to alternate at acute	A Sydow. A Sydow. A Sydow. A un is dian. A un is dian. A un tet to opposite adulating. loosely	N. batamensis Hansky, rar. keralensis Rosagoudar Bepipkyilous, amphigenous thim to subleivety upto jam in diam. Tortuous, opposite to irregular at acute to	M.bicorais Tiat. Epiphyllous, thin upto 3 mm in diam. Substraight to undu- lating, opposite at	M.butredeleji Armatulla Kab. Armatulla Kab. Piphyllous, subdense to relvety upto 4 mm in dian relvety upto 4 mm in dian substraight to crooked, Substraight to crooked,
	angles Loosely reti- culate, cells upto 12-22x4-8 µm. Opposite to alternate, straight antrose 12-16 24m long, stc-cylindri- cal to cuneate 4-6 44m hc-globese 8-10 22x 10-12 µm.	reticulate cells 24-30 r 6-8 µm. Scattered, altermate, spreading to antrose 18-26 µm stC-cuneate to cylindrical 3-10 µm hc-orate, globose, cylindrical 14-20 r 6-14 µm.	wice angles, loosely to ciosely reticulate cells, 18-3016-8 µm. Alternate to mnilate- ral spreading, antrose 14-20 µm tong st.c- cylindrical to cueate -8 m long. hc-globose to subglobose angulose to slowly lobste to slowly lobste to slowly lobste	acut angles loosely reticulate, cells 21-25 x 7-9 µm. Opposite to alter- nate antrose. 15-18.6 µm long, st.c-cylindri cal cuncate 2-3 µm hc. globose, entire 12-14.5 x 12-14 µm.	rice angles, loosely to closely reticulate cells 22-38 x 6-8 µm. Alternate, antrose- straight 14-20 µµ long st.c-cylindrical cuncate 4-8 µm. hc-globose to subglobose 10-16 x 10-12 µm.
· ···· ···· ··· · · · · · · · · · · ·	Wired with ch. alternate to opposite ampullifrom 16-20 r 6-10 µm.	Mired with ch. alternate, ampulli- from, 16-20 r 9 ei0 µm.	Mired with Ch. alter- nate, opposite, ampulli- from 10-22 T 4-8 µm.	Mired with ch. opposite alternate, 13-25 z 9-12.5 µm.	Wired with Ch. alter- nate to opposite, ampu- ifrom 18-22r6-8 µm.
i	Free, siaple, denta- te at aper, upto 2 µm long.	Numeroms, grouped around perithecia, simple, acute upto 12-20-44 long,	Scattered, straight. simple, acute at the tip 288 µm long.	Scattered, straight, simple acute to obtuse at tip 233 pm long.	Grouped around perithe- cia, straight, simple, acute obtuse at tip 346 µm.
·····	Scattered, grouped, recrucose upto [40 µm.	Scattered upto 140 xm	Scattered, Verrucose, upto 100 xm.	Scattered verrucose, 23) gm.	Scattered to grouped rerrucose 180 µm.
	Abloag, to obvoidei 4 aeftete, constricted 30-40 z 10-14 µm.	<pre>4 septate, obovoidal, constricted 36-44 x 14-16 µm.</pre>	Obionge, 4 septate, 37-50 z 12-18 µm.	Obovoidal, 4-septate constricted, 33-40 r 12-15 µm.) Oblong, 4 septate, constricted 40-48 r 16-20 µm.
	<u>Atriusia lineata</u> Fright e Are.	Nilletia rubizinosa Vight & Arn.	Desnodium Ayrans DC.	Desnodium triguetrum DC.	Butea nogosperns Lan.
	Kera is	Kerala	Keraia	Kerala and Kernetaka	Keharashtra Keharashtra
Table - 9 : Table of Comparison (contd..)

.•

	a. stituties Bosegondar		<u>H. machane</u> Rant. 7ar <u>hirautae</u> Bosagosdar	H. notstarensis	Present collection sp. nov.
405	phigenous, mostly iphyllous, subdense to 2 mm in diam.	Epiphyllous, this spto 3 m is diss.	Epiptyllous, this upto 3 an is dias.	Epiphyllous, this spto 7 an is disn.	Amphigoneous, thia, thick, 3-4 am in diam.
	ubstraight to sligh- ly undulating, oppo- ite at acute angles, oosely reticulate ells 24-38x6-8 µm.	Sabstraight to sligh- lty undulating, opposite at wide angles, loosely reticulate cells 39-3535-7 µm.	Undulating, opposite to irregular at acute angles, loosely to closely reticulate cells, 16-34x6-8 µm.	Unduisting, opposite a toute angles, loosely reticulate, 5-6.5 µm.	Straight, alternate at acute angle, loosely reticulate cells. 12-20 r 1-8 µm.
	ternate, unilateral, reight to curved, 12- pm, st-c-cylindrical caneate 4-8 µm, hc- cobose, estire to rved 8-12 µm.	Altermate, straight 15-23 µm, st-c-cylim- 15-21 µm, st-c-cylim- drical to cureate dri um. fac-cylindri- cal, clavate, sub- cal, clavate, sub- globose, 12-16 r	Alternate, opposite, antrose apreading 14-20 µm long st-c-cyllindrical cuncate 4-8 µm. hc- flobose entire 10-12 µm	Alternate to opposite antrose, straight to curred, 13-15.5 µm. stc-cylindrical curr- ate 3-6 µm, hc-cunate globose, angular 9-13 x 9-10 µm.	Alternate to unilateral antrose to curred upto 22-25 µm, st.c-6-9 µm, cuneate hc - 13-18 x 8-10 µm globose, curred.
X 5 L 6 2	red with ch.& borne i separate mycelial anch alternate to posite ampulliform -24 I 8-10 µm.	Wired with ch. oppo- site alternate ampu- -lliform 13-19 x 7-9 µm.	Wired with ch. oppo- site to alternate, ampullibium 16-20 r 8-10 µm.	Mired with ch. opposite alternate, ampuliform 19-25 x 9-10 µm.	Mired with ch. ampulliform 22-23 x 7-9 µm.
2 2 2 2	attered to grouped ound perithecia, mple, straight 0 µm.	Scattered, straight to carved, simple, obtuse, upto 500 µm. long.	Grouped around peri- thecias, straight to curved, simple 324 µm long.	Scattered, to grouped around perithecia, simple, straight acule 500 µm long.	Fes, scattered, pointed at apex 450 µm long.
2 di	attered, versucose, to 18 µm.	Scattered to closely grouped.Verycouse, 100 µm.	Scattered, Verrucose, 176 µm.	Scattered to grouped, verrucose upto 172 µ∎.	Scattered upto 175 µm Verrucose
4P S	ilong. 4 septate, instricted 36-42 r i-14 µm.	cylindrical, slightly constricted 35-42 x 11-15 µm.	ellipsoidal, 4 septate constricted, 30-56 r 12-14 µm.	Cylindrical, 4 septate constricted, 38-42.5 x 13-16 µm.	Constricted, 4 septate, oblong, 43-55 m z 17-20 µm.
리	itoris ternatea L	Errthrina indica b.	<u>Nucean bifouta</u> Tight & Arr	Mucena indricata DC.	Pueraria tuberosa DC.
ä	rala.	Helarashtra Helarashtra	Kerala and Maharashtra	Vest Seagal	Karateka

-~

,

species has been proposed viz. <u>M. puerariae</u> sp. nov. to accommodate the present collection.

Etymology : <u>Puerariae</u> (Latin - <u>Pueraria</u>) referred to the name of the host genus <u>Pueraria</u>, after which the species has been named. 3112.4212 <u>M. santalacearum</u> Budathoki <u>et al., Indian Phytopath.</u>, <u>47</u>(4): 379-380, 1994.

Habit: On the leaves of <u>Osyris</u> <u>arborea</u> Wall. ex DC. (F.-Santalaceae), Thankot, Kathmandu Valley, Nepal, Sept., 1987, IMI-304156.

Remarks : Very recently Miss Usha Budathoki <u>et al.</u> (1994) have reported a species of <u>Meliola</u> on the leaves of <u>Osyris arboria</u> Wall. ex DC. a member of the family Santalaceae from Nepal, as a new species. As the authors claim that there is no report of or record of <u>Meliola</u> sp. on this host, and <u>unfortunate</u> statement. There is a record of species of <u>Meliola</u> reported by Hansford in 1946 on the same host from Uganda and also Thite and Patil have also reported this species from Maharashtra State and is so common and widely distributed from different parts of India. From description of this species from Nepal, it appeared that authors did not see the references perectly. However, the description of present species shows some morphological variations

ŋ

especially in dimension of mycelial cells and capitate hyphopodia Se which are smaller and opposite. Larger mycelial setae and smaller perithecia. It appears that these dimensional variations may be due to climatic variations at higher elevation from where this material has been collected in Nepal, mostly due to low temperature and therefore, a new taxa raised by the authors is difficult to justify. Such variations do occur if large collections, have been studied. Therefore, at present this species (is considered as <u>Meliola osyricola</u> Hansford which makes a new record to the inther wind the second we fungi of the Nepal.

3111.3223

M. stenospora Wint. var. major Hansf., Sydowia: 16 : 103, 1963. = <u>M. piperae</u> Thite and Miss S.D. Patil, <u>Geophytology</u>, 13(1):124, 1983.

Habit : On living leaves of Piper hookeri Miq. (F.-Piperaceae), Anmode (M.S.) 23-1-1995, Shri M.S.Patil, HCIO. No. 41837 and WIF. No. 756.

Remarks : Thite and Miss S.D. Patil (1983) have published a new species of Meliola viz. M. piperae Thite and Miss Patil on the leaves of Piper nigrum L. from Amboli (M.S.) based on the larger mycelial cells, alternate capitate hyphopodia, rare mucronate hyphopodia and surprizingly larger ascospores 120-155 X 35-75 µm. The type material (HCIO No.- 33672) was studied by author and found that this material did not show above distinctive feature on which a new taxa (has been proposed. (Thus) this her alter wins

)L

material matched well in all respects with already known variety viz. <u>M. stenospora</u> Wint. var <u>major</u> Hansford. Thus, it has been made as synonym.

The present Anmode collection was also studied by the author and compared with this variety and matched it well in respects of morphology and dimensions except the host. It has been recorded on <u>Piper hookeri</u> Miq. of the same family. So it is an additional host record.

3141.4221

M. tenella Pat. var. atalantiae (Pat.) Hansf., Proc. Linn. Soc. London, 158 : 35, 1946.

Habit : On living leaves of <u>Atalantia monophylla</u> L. (F.-Rutaceae), Amboli (M.S.) 6-3-1981, C.R.Patil, HCIO. No. 41831 and WIF. No.750.

Remarks : This variety was recorded on <u>Atalantia</u> spp. from Tonkin, Ceylon, Formosa and Philippines by Hansford. This variety is characterized by colonies which are epiphyllous and dense; hyphae straight; head cells cylindrical and entire and mycelial setae dichotomously branched. Bilgrami <u>et al.</u> (1979 & 1981) reported the same variety from India. Hosagoudar (1988) has also reported the same variety on <u>Atalantia monophylla</u> L. from Athikadu (T.N.) The present collection has been recorded on the same host and found to be identical morphologically in all above respects and thus, $\int_{-\infty}^{\infty}$ referred to it. It makes a new record to the fungi of the Maharashtra State.

3113.4232

M. tylophorae Hosagoudar, Mycotaxon, 37 : 250, 1990.

Habit : On living leaves of <u>Tylophora</u> <u>capparidifolia</u> Wight. &
Arn. (F.- Asclepiadaceae), Vasota (Dist. - Satara, M.S.), 4-10-1993,
G.B.Dixit, HCIO. No. 41829 and WIF. No. 748.

Remarks : This species has been already described and reported by Hosagoudar (1990) on <u>Tylophora capparidifolia</u> Wight. & Arn. from Calvary Mount (Kerala). It is characterised by the straight hyphae, having opposite to alternate capitate hyphopdia, longer setae, larger perithecia and ascospores as to compare the existing species on this host genus <u>Tylophora</u>. The present collection has been recorded on the same host and thus, referred to it. It makes a new record to the fungi of the Maharashtra State.

3143.3221

M. vitis Hansf., Proc.Linn.Soc.London., 158: 26, 1946.

(Text Fig.VI - Figs. 5-8).

Infection caulicolous; colonies thick, black, circular, distinct upto 3 mm in diameter. Hyphae substraight, crooked, septate, brown coloured, branched irregularly at wide angles, cells

96

mostly 25-40 X 6-8 µm. Hyphae bearing hyphopodia which are of two types : capitate and mucronate. Capitate hyphopodia alternate to opposite straight to bent, spreading, 2-celled, brown, measured 20-30 µm long; stalk cells 4-8 µm long, cuneate; head cells cylindric and entire or bent, 15-25 X 9-16 µm. Mh. mixed with ch; opposite to alternate, 1-celled, brown, ampulliform 22-25 X 7-9 µm. Mycelial setae numerous, scattered, straight thick, terminally 2-3 dichotomously 5^{cv^2} 200 X 8-11 black, µm, branched. Branches spreading, reflexed measured, 1 ry to 50 µm 2n ry 30 µm. Perithecia scattered, verrucose, 160 µm in diam., black. Perithecial setae black, thick-walled upto 250 um long. Ascospores oblong, obtuse, 4-septate, constricted at the septa, brown coloured, thick-walled, smooth 35-45 X 12-16 µm.

0

Habit : On living stems and branches of <u>Vitis</u> sp. (F.- Vitaceae), Radhanagari (M.S.), 22-8-1990, Shri V.D.Chavan (field collector), HCIO. No.41826 and WIF. No. 745.

Remarks : This species has been reported by Hansford (1946) from Ceylon on <u>Vitis rheedii</u> Wight. & Arn. The present collection has been also recorded on the same host genus and thus, compared with it. Almost in every respect the present collection resembles with his species, both morphologically as well as in measurements of the structures and therefore, referred to it. It makes a new record to the fungi of India. (This species was only listed in Fungal Flora of Radhanagari by Dr.M.S.Patil and Dr.A.N.Thite published in <u>J.Shiv.Uni. Sc.; Vol.20</u>, 19**\$9**).

97

sec.ex

EXPLANATION OF TEXT FIGURE - I

Appendiculella gloriosa Doidge

Fig.	1	Mycelium	with	capitate	hyphopodia
Fig.	2	Mycelium	with	mucronat	e hyphopodia
Fig.	3	Perithecia	al app	oendages	

Fig. 4 As; cospores

Asteridiella atricha (Speg.) Hansford

- Fig.5 Mycelium with capitate hyphopodia
- Fig.6 Mycelium with capitate hyphopodia
- Fig.7 Mycelium with mucronate hyphopodia
- Fig.8 Perithecial cells
- Fig.9 Ascospores

TEXT FIGURE-I



EXPLANATION OF TEXT FIGURE-II

Asteridiella tremae (Speg.) Hansford.

Fig.l	Mycelium	with	capitate	hyphopod ia
-------	----------	------	----------	-------------

- Fig.2 Mycelium with mucronate hyphopodia
- Fig.3 Mycelium with mucronate hyphopodia
- Fig.4 Perithecial cells
- Fig.5 Ascospore

Asteridiella wendlandiae sp.nov.

- Fig.6 Mycelium with capitate hyphopodia
- Fig.7 Mycelium with mucronate hyphopodia
- Fig.8 Mycelium with mucronate hyphopodia
- Fig.9 Perithecial cells
- Fig.10 Ascospores



EXPLANATION OF TEXT FIGURE-III

Irenopsis ligustri sp. nov.

Fig.l	Mycelium with capitate hyphopodia
Fig.2	Mycelium with mucronate hyphopodia
Fig.3	Perithecial setae
Fig.4	Ascospores

Irenopsis nephali sp. nov.

Fig.5	Mycelium with capitate hyphopodia
Fig.6	Mycelium with mucronate hyphopodia
Fig.7	Mycelium with mucronate hyphopodia
Fig.8	Perithecial setae
Fig.9	Ascospores





EXPLANATION OF TEXT FIGURE-IV

Irenopsis rubi sp. nov.

- Fig.1 Mycelium with capitate hyphopodia
- Fig.2 Mycelium with mucronate hyphopodia
- Fig.3 Perithecial setae
- Fig.4 Ascospores

Meliola celtidiae Yates var. indica var. nov.

- Fig.5 Mycelium with capitate hyphopodia
- Fig.6 Mycelium with mucronate hyphopodia
- Fig.7 Mycelial setae
- Fig.8 Ascospores





EXPLANATION OF TEXT FIGURE - V

۰,



Meliola dimorphochaeta sp. nov.

Fig.1	Mycelium with capitate hyphopodia
Fig.2	Mycelium with mucronate hyphopodia
Fig.3	Mycelial setae
Fig.4	Ascospores

Meliola longiseta v. Hohnel

Fig.5	Mycelium with capitate hyphopodia
Fig.6	Mycelium with mucronate hyphopodia
Fig.7	Mycelial setae
Fig.8	Ascospores



EXPLANATION OF TEXT FIGURE - VI

Meliola puerariae sp. nov.

- Fig.1 Mycelium with capitate hyphopodia
- Fig.2 Mycelium with mucronate hyphopodia
- Fig.3 Mycelial setae
- Fig.4 Spores

Meliola vitis Hansford

- Fig.5 Mycelium with capitate hyphopodia
- Fig.6 Mycelium with mucronate hyphopodia
 - Fig.7 Mycelial setae
 - Fig.8 Ascospores

TEXT FIGURE-VI







EXPLANATION OF TEXT PLATE - I

Appendiculella gloriosa Doidge

Fig.1	Mycelium		
Fig.2	Capitate hyphopodia	480	х
Fig.3	Mucronate hyphopodia	50 0	х
Fig.4	Ascospore	500	х

Asteridiella atricha (Speg.) Hansford

Fig.5	Mycelium		
Fig.6	Capitate hyphopodia	420	X
Fig.7	Mucronate hyphopodia	810	X
Fig.8	Ascospores	500	х



Asteridiella wendlandia sp.nov.

Fig.5	Habit			
F ig. 6	Mycelium			
Fig.7	Capitate hyphopodia	360	x	\mathbf{i}
Fig.8	Mucronate hyphopodia	300	X	
Fig.9	Ascospores	400	Х	/

EXPLANATION OF TEXT PLATE - III

Irenopsis ligustri sp.nov.

Fig.l	Habit		
Fig.2	Mycelium		
Fig.3	Capitate hyphopodia	420	X
Fig.4	Mucronate hyphopodia	485	x
Fig.5	Perithecia	70	X
Fig.6	Ascospores	375	x

EXPLANATION OF TEXT PLATE - IV

Irenopsis nephali sp. nov.

Fig.l	Habit		
Fig.2	Mycelium		
Fig.3	Capitate hyphopodia	487	х
Fig.4	Mucronate hyphopodia	444	x
Fig.5	Ascospores	460	х

EXPLANATION OF TEXT PLATE - V

Meliola celtidiae Yates var. indica var. nov.

- Fig.l Habit
- Fig.2MyceliumFig.3Capitate hyphopodia500 XFig.4Mucronate hyphopodia485 XFig.5Ascospore X γ500 X

Meliola longiseta V. Hohnel

Fig.6	Habit		
Fig.7	Mycelium		
Fig.8	Capitate hyphopodia	533	X
Fig.9	Mucronate hyphopodia	450	X
Fig.10	Ascospore $\chi - \gamma$	385	X

EXPLANATION OF TEXT PLATE - VI

<u>Meliola</u> <u>pueraria</u> sp.nov.

5

.

•

Fig.1	Habit		
Fig.2	Mycelium		
Fig.3	Capitate hyphopodia	not .	297 X
Fig.4	Mucronate hyphopodia	illa	360 X
Fig.5	Ascospore	C	375 X











