

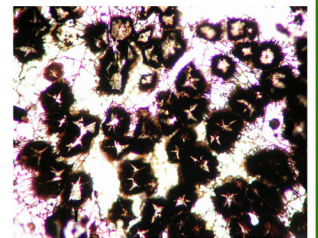
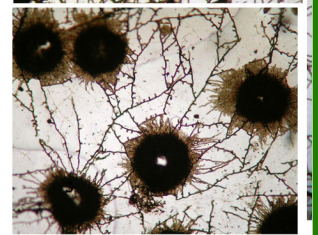
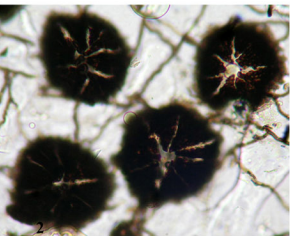
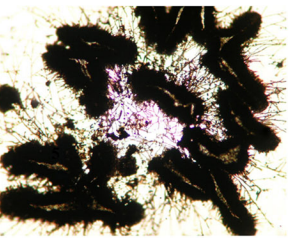
DIVERSITY AND DISTRIBUTION OF BLACK MILDEW CAUSING FUNGI IN SHENDURUNY WILDLIFE SANCTUARY, KERALA

Final Report of the Major Research Project
[F.No. 41-406/2012 (SR) dated, 16th July, 2012]

Submitted to

UNIVERSITY GRANTS COMMISSION

Bahadurshah Zafar Marg
New Delhi – 110 002



By

DR. JACOB THOMAS

Principal Investigator & Assistant Professor
P.G. & RESEARCH DEPT. OF BOTANY



MAR THOMA COLLEGE

(Re Accredited with A Grade by NAAC)

THIRUVALLA - 689103, KERALA, INDIA

DECEMBER-2015

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Estd. 1952



MAR THOMA COLLEGE, TIRUVALLA

(Accredited with **A-Grade** by the National Assessment and Accreditation Council - NAAC)

(Affiliated to Mahatma Gandhi University)

TIRUVALLA - 689 103, KERALA, INDIA

E-mail : mtcofficevla@gmail.com

PRINCIPAL

Telephone : 0469 - 2630342

Fax : 0469 - 2605843

CERTIFICATE

This is to certify that a copy of the final report of the work done in connection with the UGC Major Project entitled '*Diversity and Distribution of Black Mildew causing fungi in Shenduruny Wildlife Sanctuary, Kerala*' (F.No. 41-406/2012 (SR) dated, 16th July, 2012) by Dr. Jacob Thomas (Principal Investigator), Asst. Professor in Botany of this Institution has been kept in the library and executive summary of the work done is posted in the website of this college (www.marthomacollege.org).

PRINCIPAL
Dr. JACOB K.
Principal
Mar Thoma College
Thiruvalla





**PROFORMA FOR SUBMISSION OF INFORMATION AT THE TIME OF SENDING THE
FINAL REPORT OF THE WORK DONE ON THE PROJECT**

1.	Title of the Project	<i>Diversity and Distribution of Black Mildew causing fungi in Shenduruny Wildlife Sanctuary, Kerala</i>
2.	NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR	Dr. Jacob Thomas
3.	NAME AND ADDRESS OF THE INSTITUTION	P.G. & Research Department of Botany, Mar Thoma College, Kuttapuzha P.O., Thiruvalla, Pathanamthitta (Dist.) Kerala - PIN: 689103
4.	UGC APPROVAL LETTER NO. AND DATE	F.No. 41-406/2012 (SR) dated, 16th July, 2012
5.	DATE OF IMPLEMENTATION	25.08.2012
6.	TENURE OF THE PROJECT	24.02.2016 (Three and half years)
7.	TOTAL GRANT ALLOCATED	Rs. 10,48,800
8.	TOTAL GRANT RECEIVED	1st Instalment : Rs. 6,44,800 2nd Instalment : Rs. 2,88,640 Income generated from bank interest Rs. 17,723 Income generated by tender cost Rs. 1,251 Security Deposit of Microscope Rs. 7,014 Grand Total Rs.9,59,428
9.	FINAL EXPENDITURE	Rs. 10,92,041 (Rupees Ten lakh ninety-two thousand and forty one only)
10.	TITLE OF THE PROJECT	<i>Diversity and Distribution of Black Mildew causing fungi in Shenduruny Wildlife Sanctuary, Kerala</i>
11.	Objectives of the Project	i. Collection, identification and documentation of Black Mildew Causing Fungi in Shenduruny Wildlife Sanctuary in Kerala State. ii. To study the host range and the pathogenic effect on the host plants iii. To study the geographical distributional pattern of these fungi iv. Categorization of the infected plants based on their economic importance.
12.	WHETHER OBJECTIVES WERE ACHIEVED (GIVE DETAILS)	Yes i. More than 1200 specimens were Collected, resulted in identification of 945 taxa and documentation 134 species of Black Mildew Fungi in Shenduruny Wildlife Sanctuary in Kerala State were conducted. ii. To study the host range and the pathogenic effect on the host plants were completed. iii. Geographical distributional pattern of these fungi studied iv. infected host plants were categorized based on their economic importance

13. ACHIEVEMENTS FROM THE PROJECT

- Seasonal field collection trips were conducted to Shenduruny Wildlife Sanctuary, Kollam Dist., Kerala; made more than 1200 foliicolous fungal collections. Of these, 945 collections have been identified, resulted in recording **134 black mildew fungal taxa**. Of these **4 new species** and 7 new records to study area is discovered.
- A **digital compound microscope** with image analyzer software and inbuilt camera is procured from the project fund.
- **Fungal Herbarium** established at the host institution and accredited with an acronym (**MTCHT**) from the New York Botanic Garden, USA (Details attached). Now MTCHT is the 8th recognized Herbarium in the Kerala State.
- Junior Research Fellow appointed in the project is registered for Ph.D. in Botany at Mahatma Gandhi University, Kottayam under the guidance of Dr. Neeta N. Nair, Asst. Professor of Botany, Mar Thoma College, Thiruvalla 689103, Kerala. Further, the work will be continued for the Ph.D. course.
- The research outputs are being published in the form of publications in national and international journals, and seminars and conferences. The publication list are attached as separate sheets. Few articles are also published in Malayalam Dailies. (Copies are attached).

14. SUMMARY OF THE FINDINGS (IN 500 WORDS):

The minute nature of microfungi makes their direct observation in the field difficult. The success of this approach varies according to collector experience but even an expert who may be able to achieve targeted collection for some groups, often has little idea of what actually has been collected until the materials examined microscopically. Most of Black mildew fungi are host specific because they must circumvent tolerate and overcome the specific resistance factors of the particular host. The resistance factors may be physical barrier, fungitoxic chemicals produced by the host either before or after the response to the infection and environmental influence. The general answer for restricting the speciation to the host family level was, the pathogens were adapted to a species, genus or family may be that the plants within that taxon have similar types of defence chemicals. The species concept of Asterinaceous fungi were based on the respective host plants and also on the morphological aspects of the fungus.

A total number **134** taxa of black mildew fungi could collected and identified from the Shendhuruny Wildlife Sanctuary *viz.* include Meliolaceae (86), Asterinaceae (32), Lembosiaceae (8), Armatellaceae and Englerulaceae (3) and Meliolinaceae and Parodiellaceae (1). Of the 134 taxa, the genus *Meliola* represents 72 species, *Asterina* – 26, *Asteridiella* – 6,

Irenopsis – 6, *Armatella* – 3, *Asterolibertia*, *Echidnodella*, *Lembosia*, *Prillieuxina*, *Questieriella* 2 each and, *Asterostomella*, *Asterostomula*, *Cirsosia*, *Dysrhynchis*, *Echidnodes*, *Ectendomeliola*, *Ishwaramyces*, *Meliolina*, *Sarcinella* and *Symphaster* with single species. Out of the 134 species, 88 are endemic to Southern Western Ghats of Kerala State and Western Ghats of India, mainly Peninsular regions.

Four new fungal taxa were identified as new species viz., *Asterina athirampuzhaensis*, *Meliola emgiuensis*, *M. justiciae* and *M. marthomaensis*. The present study area forms the type locality for 16 species. Likewise, some black mildew occurs in the present area, are common to Eastern and Western Ghats of Peninsular India, which are endemic to Peninsular India. Many of the Asterinaceous fungi and Meliolaceous fungi were also reported from the different parts of the world, are now known from the study area. Hence it reveals that, the black mildew fungal flora has an affinity with South Africa and other Asian countries. This may be due the similarity in climatic and environmental conditions prevailing in the study area and different parts of the world.

The Indian climate, in general, is suitable for the growth of these fungi. The present study covering the all regions of Shendhuruny Wildlife sanctuary of Kollam district of Kerala state shows that these regions are a good abode for the Black Mildews represented by 20 genera and 134 species distributed in 7 families. This reveals that the tropical forests in Kerala are the treasure for these fungi.

The ideal temperature for fungal spore germination is 25-35°C. The climatic factors, temperature, rainfall, humidity, host range of the study area is more suitable for the survival, development and spore germination. The temperature and rainfall play an important role in the distribution of black mildew fungi. The number of species collected from the different climatic time revealed that, black mildew fungal collection negatively correlated with the rainfall and temperature. During the highest rainfall time, the collection of these species were comparatively very low than the remaining time. From the month of January to March, the species collection was moderate and it was slightly decreasing after April- August. The number of collection was slightly increased in the month of September to October. The number of collections was more in the month of November and December than the remaining months. The highest temperature affect the distribution of Black Mildew fungi.

No inventory of microbial species of the world exist and it is estimated that < 5% of the earth species are known. The situation deepens further due to the declining number of microbial systematics.

The present report is based on reconnaissance collection tours to the study area and less than half of the collections made from the preceding tour have been identified. Very interesting fungal collection are there to be identified, which may be new to study area and science. The study reveals that Shendhuruny Wildlife Sanctuary is a potential area for the foliicolous fungi.

15. CONTRIBUTION TO THE SOCIETY (GIVE DETAILS)

Leaves and other green parts of plants are the most important food manufacturing mini sugar industries of the plants. Leaves indicate the health of the plants. Any malformation or ill health of the leaves directly affect the growth of the plant and its produce, which is directly proportional to the economy of the country. Hence, an account of the friends and foes of the plants are to be brought to light by surveying them systematically. Black mildew fungi are the leaf dweller or leaf infecting parasitic microfungi. This study helps to know:

1. Diversity richness which is the indication of the prosperity of the region.
2. Study of the individual taxon of the Region/Nation leads to understanding of the biodiversity of the region.
3. To reach the prosperity, identification of an individual entity is important. This is achieved based on the efforts put in the past, present work and in future plan.
4. The evaluation of the natural resources has got prime importance in the development of the nation.
5. Host-parasite-environment relation.
6. Epidemic, endemic and cosmopolitan diseases.
7. Diseases on economically important plants, endemic plants and their effects.
8. Helps in the quarantine process.

16.	WHETHER ANY PH.D. ENROLLED/PRODUCED OUT OF THE PROJECT	The Junior Research Fellow appointed in the project is registered for Ph.D. in Botany at Mahatma Gandhi University, Kottayam under the guidance of Dr. Neeta N. Nair, Asst. Professor of Botany, Mar Thoma College, Thiruvalla 689103, Kerala. Further, the work will be continued for the Ph.D. course.
17.	NO. OF PUBLICATIONS OUT OF THE PROJECT (PLEASE ATTACH)	Papers published: (Reprints attached) 1.Jacob-Thomas, 2013. Career Opportunities in Biological Fields in New World. <i>Wizmag Sciene Plus</i> , 1(1): pp. 385-386. 2.Jacob-Thomas, Teena Elizabeth Alex and Riya J. Thomas, 2013. <i>Meliola marthomaensis</i> sp. nov. an addition to Meliolaceae from Western Ghat Region in Kerala State, India. <i>Universal Journal of Plant Science</i> . 3.Jacob Thomas, Frangipani Disease (<i>Coleosporium plumeriae</i>) on <i>Plumeria</i> from Kerala State, India: In 3 rd International Science Congress, Karunya University, Coimbatore, 8-9 December, 2013. 4.Jacob Thomas, 2014. Multiple shoot and microtuber production from <i>Glorios superb</i> L. an endangered plant of Asia and Africa, in 26 th Kerala Science Congress, KSCSTE, Govt. of Kerala, 28.01.2014 – 31.01.2014, KVASU, Pookode, Wayanad, Kerala.

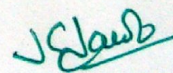
5. Jacob Thomas, 2014. A serious rust (*Coleosporium plumeriae*) disease on Frangipani (Temple tree) from Kerala State, India, in 26th Kerala Science Congress, KSCSTE, Govt. of Kerala, 28.01.2014 – 31.01.2014. KVASU, Pookode, Wayanad, Kerala.
6. Jacob Thomas, 2014. A Serious Rust Disease Affecting Frangipani (*Plumeria rubra*) in Kerala State, India, *Journal of Plant and Pest Science* 1(1):17-2.
7. Jacob Thomas, 2014. Biochemical changes in the *Lawsonia inermis* L. infected with *Asterina lawsoniae* Henn. & Nyn., *Current Research in Environmental & Applied Mycology* 4 (2): 217–220, ISSN 2229-2225 Doi 10.5943/cream/4/2/9
8. Jacob Thomas, 2015 Fungal Flora in Tropical Forests i. *Abstract of National Seminar on New Trends in Plant Diversity Studies* In: *Abstract of National Seminar on New Trends in Plant Diversity Studies*. Department of Botany, Catholicate College, Pathanamthitta 31st July . Pp. 4-6
9. Teena Elizabeth Alex & Jacob Thomas, 2015. Black Mildew Causing Fungi in Thiruvalla Taluk of Pathanamthitta District, Kerala State. In: *Abstract of National Seminar on New Trends in Plant Diversity Studies*. Department of Botany, Catholicate College, Pathanamthitta 31st July P-17
10. Jacob Thomas and Nisha Mathew, 2016. *A review on the status of bark inhabitant Ascomycetes fungi* in: National Seminar on Biodiversity of Microbes and Climate Change Mitigation Department of Botany, Catholicate College, Pathanamthitta 03rd to 05th February 2016
11. Jacob Thomas and Susan Kuriakose, 2016. *A preliminary survey of foliicolous fungi in Vandanam sacred grove in Alappuzha district, Kerala* in: National Seminar on Biodiversity of Microbes and Climate Change Mitigation Department of Botany, Catholicate College, Pathanamthitta 03rd to 05th February 2016



PRINCIPAL INVESTIGATOR

(SIGNATURES WITH SEAL)

Dr. JACOB THOMAS
Asst. Professor & Principal Investigator
U.G.C. Major Project
Dept. of Botany
Mar Thoma College, Thiruvalla-689103



Dr. JACOB K.
Principal
Mar Thoma College
Thiruvalla

REGISTRAR/PRINCIPAL

(SIGNATURES WITH SEAL)



EVALUATION / ASSESSMENT CERTIFICATE

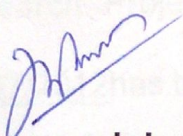
It is certified that the project report entitled "Diversity and Distribution of Black Mildew Causing fungi in Shenduruny Wildlife Sanctuary, Kerala" by Dr. Jacob Thomas, Asst. Professor, Deptt. of Botany of Mar Thoma College, Thiruvalla has been assessed and evaluated by the subject expert panel of Research Project Evaluation committee consisting the following members for final submission of project report to the University Grants Commission, New Delhi under the scheme of Major Research Projects.


Comments:

The project is completed as per the guidelines of UGC, New Delhi.

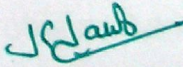
The project work was completed as per the objectives and the methodology mentioned in the research proposal.

Details of Expert Committee:

- 
1. **Dr. Thomas John**
Assoc. Professor & Research Guide in Botany
St. Thomas College, Kozhencherry, Kerala

- 
2. **Dr. Thomas V. P.**
Asst. Professor in Botany
Catholicate College
Pathanamthitta, Kerala



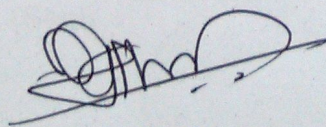

Dr. JACOB K.
Principal
Mar Thoma College
Thiruvalla

(REGISTRAR/ PRINCIPAL)

**UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH ZAFAR MARG
NEW DELHI – 110 002**

Utilization certificate

1. Certified that the grant of Rs. 9,33,440.00 (Rupees Nine lakh thirty three thousand four hundred and forty only) and bank interest earned Rs. 17723 (Rupees Seventeen thousand seven hundred and twenty three), Tender cost for Microscope Rs. 1251 (Rupees One thousand two hundred and fifty one only) and Security deposit for Microscope Rs. 7014 (Rupees seven thousand and fourteen only) [Total - 9,33,440 + 17723 + 1251 + 7014 = **9,59,428.00** (Rupees Nine lakh fifty nine thousand four hundred and twenty eight only)] received from the University Grants Commission under the scheme of support for Major Research Project entitled vide UGC letter F. No. 41-406/2012 (SR) dated 16/07/2012 has been fully utilized for the purpose for which it was sanctioned and in accordance with the terms and conditions laid down by the University Grants Commission.
2. It is certified that the appointment(s) have been made in accordance with the terms and conditions laid down by the Commission.
3. It as a result of check or audit objective, some irregularly is noticed, later date, action will be taken to refund, adjust or regularize the objected amounts.
4. Payment @ revised rates shall be made with arrears on the availability of additional funds.

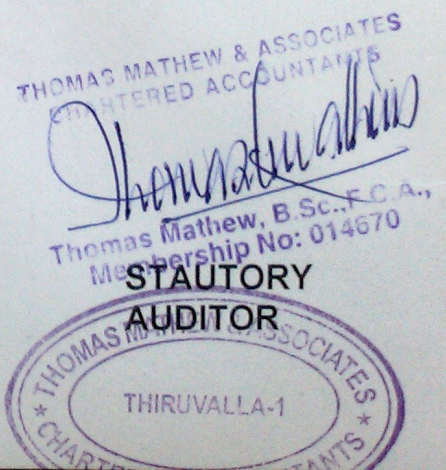


Dr. JACOB THOMAS
Asst. Professor & Principal Investigator
SIGNATURE OF THE
PRINCIPAL INVESTIGATOR
Mar Thoma College, Thiruvalla-689103



J. Jacob
Dr. JACOB K.
Principal
Mar Thoma College
Thiruvalla

**REGISTRAR/
PRINCIPAL**



Thomas Mathew
Thomas Mathew, B.Sc., F.C.A.,
Membership No: 014670
**STATUTORY
AUDITOR**

UNIVERSITY GRANTS COMMISSION

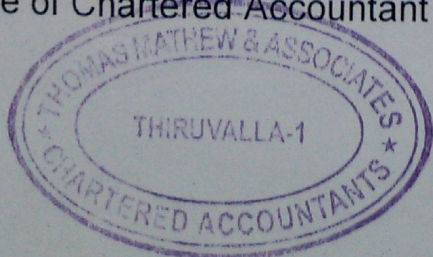
Statement of Grant approved and actual expenditure against the Grant

S.No.	Particulars of Expenditure	Amount Released 1 st Installment	Amount Released 2 nd Installment	Total Expenditure Incurred Rs.
1	Books & Journals	20,000	0	19,999
2	Equipment	1,50,000	0	1,57,086
3	Contingency released	45,000	36,000	1,00,962
4	Field Work/Travel	50,000	40,000	1,24,376
5	Chemicals & Glassware	45,000	36,000	90,685
6	Overhead	70,800	0	70,933
7	Salaries to Project Fellow@ 14, 000/- p.m. for initial two years and Rs. 16, 000/- p.m. from third year onwards.	2,64,000	1,76,640	5,28,000
	Total	6,44,800	2,88,640	6,04,955
	Bank interest	13,610	4113	
	Tender cost	1,251	-	
	Security deposit for Microscope	-	7014	
	Sub Total	6,59,661	2,99,767	10,92,041

Dr. JACOB THOMAS
Asst. Professor & Principal Investigator
U.G.C. Major Project
Dept. of Botany
Mar Thoma College, Tiruvalla-689103
Signature of Principal Investigator

THOMAS MATHEW & ASSOCIATES
CHARTERED ACCOUNTANTS

Thomas Mathew
Thomas Mathew, B.Sc., F.C.A.,
Membership No: 014670
Signature of Chartered Accountant
(Seal)



J. Jacob
Dr. JACOB K.
Principal
Mar Thoma College

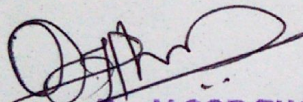
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(Parent Institution)
(Seal)

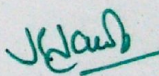


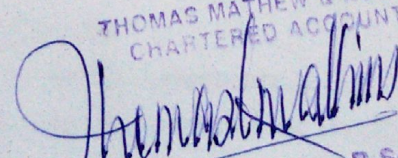
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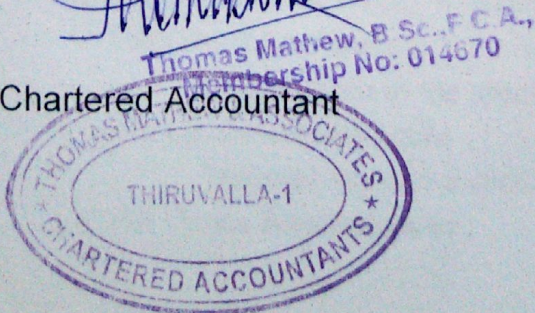
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5	Chemicals & Glassware	81,000	90,685
6	Overhead	70,800	70,933
7	Salaries to Project Fellow@ 14,000/- p.m. for initial two years and Rs. 16,000/- p.m. from third year onwards.	4,40,640	5,28,000
	Total	9,33,440	6,04,955
	Bank interest	17,723	
	Tender cost	1,251	
	Security deposit for Microscope	7,014	
	Sub Total	9,59,428	10,92,041


Dr. JACOB THOMAS
Asst. Professor & Principal Investigator
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Dept. of Botany
Mar Thoma College, Thiruvalla-689103
Signature of Principal Investigator


Dr. JACOB K.
Principal
Mar Thoma College
Thiruvalla
Signature of registrar/principal
(Parent Institution)


THOMAS MATHEW & ASSOCIATES
CHARTERED ACCOUNTANTS
Thomas Mathew, B.Sc., F.C.A.,
Membership No: 014670
Signature of Chartered Accountant
(Seal)



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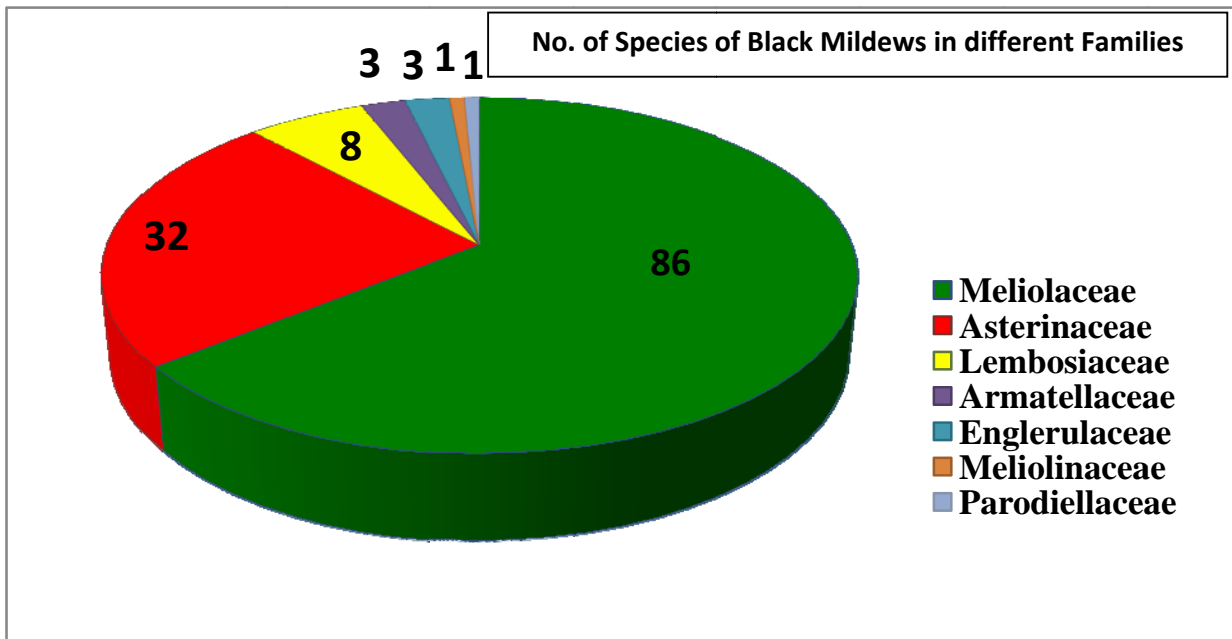


Fig. 131 - Distribution of Black Mildew Fungal Families in the Study Area

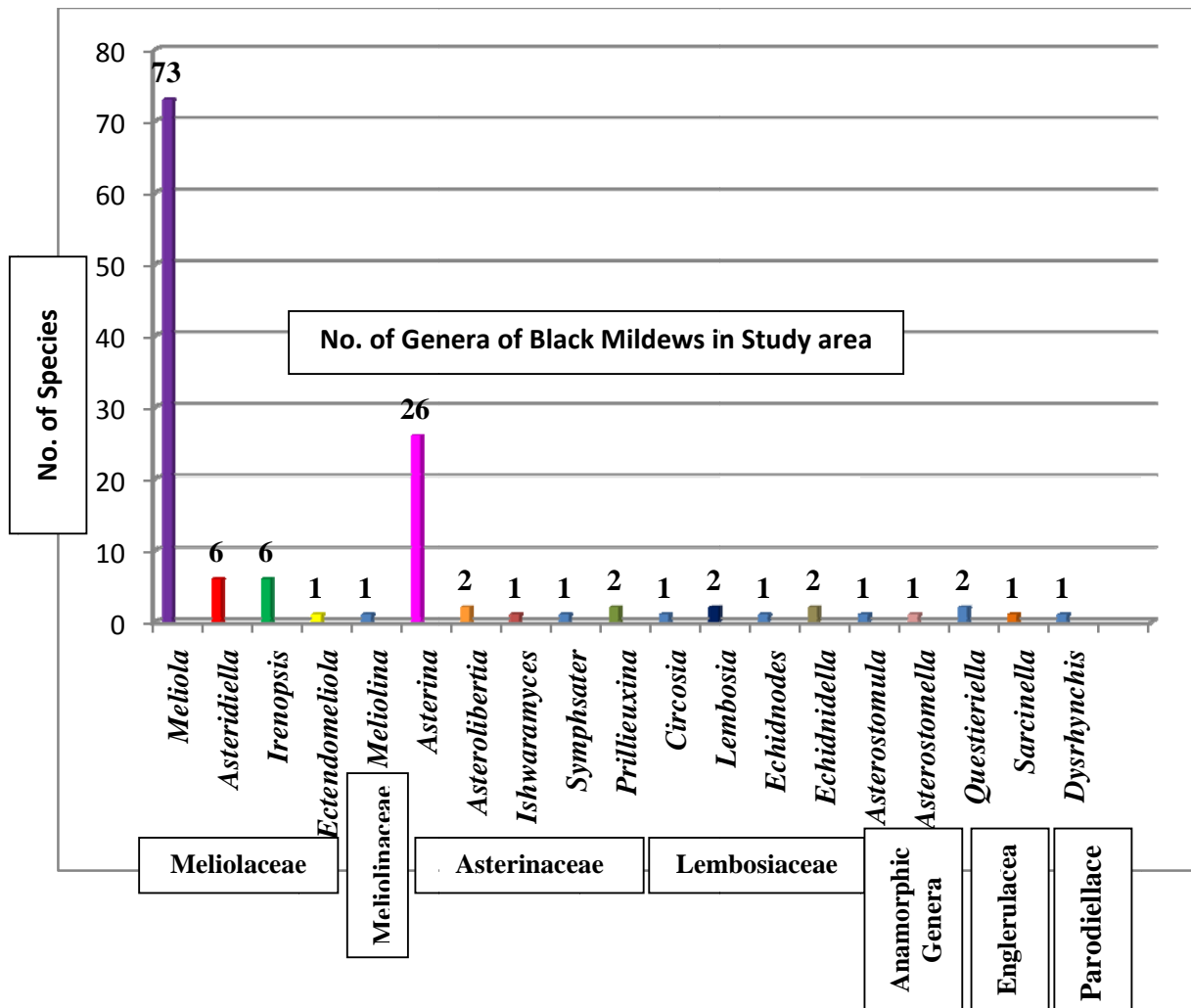


Table -1: Black mildew fungi identified from the Shendhuruny Wildlife Sanctuary

Table – 2: Endemic Black Mildew Fungi in Study Area to the Western Ghats Region

Table – 3: Black Mildew Fungi reported from the Study Area and other parts of the globe

Table - 4: Black mildew fungi on Medicinal & Aromatic plants

Table - 5: Black mildew fungi on Fungi on Fruit yielding plants.

Table - 6: Black mildew fungi on Fungi on Timber yielding Plants

Table 7. Distribution of Black mildew fungi on Fungi on Ornamental plants

Table -1: Black mildew fungi identified from the Shendhuruny Wildlife Sanctuary

ARMATELAACEAE			
	Fungus	Host	Host family
1.	<i>Armatella balakrishnanii</i> Hosag.	<i>Cinnamomum malabatrums</i>	Lauraceae
2.	<i>A. cinnamomicola</i> Hansf.	<i>Cinnamomum malabatrums</i>	
3.	<i>A. cryptocaryae</i> Hosag.	<i>Litsea coriacea</i> <i>L. deccanensis</i> <i>Actinodaphne sp;</i> <i>Lauraceae member</i>	
MELIOLACEAE			
4.	<i>Asteridiella phaulopsidis</i> Hosag	<i>Phaulopsis imbricata</i>	Acanthaceae
5.	<i>Meliola justiciae</i> Jacob Thomas <i>et al.</i>	<i>Justicia gendarussa</i>	
6.	<i>Meliola abrahamii</i> Hosag. <i>et al</i>	<i>Semecarpus anacardium</i>	Anacardiaceae
7.	<i>Meliola anacardii</i> Zimm	<i>Anacardium occidentale</i>	
8.	<i>Meliola ardigoosii</i>	<i>Buchanania lanzan</i>	
9.	<i>Meliola geniculata</i> Sydow & Butler	<i>Lannea coromandelica</i>	
10.	<i>Meliola holigarnae</i> Stev.	<i>Holigarna ornottiana</i>	
11.	<i>Meliola mangiferae</i> Earle	<i>Mangifera indica</i>	Annonaceae
12.	<i>Meliola artabotrydicola</i> Hosag. & Abraham	<i>Artabotrys zeylanicus</i>	
13.	<i>Meliola ichnocarpi-volubili</i> Hansf.	<i>Ichnocarpus frutescense</i>	Apocynaceae
14.	<i>Meliola pepparaensis</i> Hosag. & Abraham	<i>Tabernaemontana divaricata</i>	
15.	<i>Meliola vallaridis</i> Hosag., Jacob, Sabeena & Archana	<i>Vallaris solanacea</i>	
16.	<i>Meliola hemidesmicola</i> Hosag.	<i>Hemidesmus indicus</i>	Asclepiadaceae
17.	<i>Meliola caesalpiniae</i> Hansf. & Deight. var. <i>indica</i> Hosag. & H. Biju.	<i>Caesalpinia sappan</i>	Caesalpinaceae
18.	<i>Meliola kulathupuzhaensis</i> Hosag. & J. P. Jacob	<i>Bauhinia sp.</i>	
19.	<i>Meliola tamarindi</i> Sydow & Sydow	<i>Tamarindus indica</i>	
20.	<i>Meliola garciniae</i> Yates	<i>Garcinia gummigutta</i>	Clusiaceae
21.	<i>Asteridiella combreti</i> (Stev.) Hansf. var. <i>leonensis</i> Hansf.	<i>Terminalia paniculata</i> <i>Calycopterisflorubunda</i> <i>Terminalia sp.</i>	Combretaceae
22.	<i>Meliola erycibes-paniculatae</i> Hosag.	<i>Erycibe paniculata</i>	Convolvulaceae
23.	<i>Meliola malacotricha</i> Speg.	<i>Hewittia scadens</i>	
24.	<i>Meliola malacotricha</i> Speg. var. <i>major</i> Beeli	<i>Merremia umbellate</i> <i>Argyria hookeri</i>	
25.	<i>Meliola tibigirica</i> Hosag. & Abraham	<i>Cyperus sp.</i>	Cyperaceae
26.	<i>Asteridiella crotonicola</i> Hosag. & Abraham	<i>Croton malabaricus</i> <i>C.zeylanicus</i>	

27.	<i>Asteridiella wyanadensis</i> Hosag., C.K. Biju & Abraham	<i>Mallotus</i> sp.	Euphorbiaceae
28.	<i>Meliola crotonis-malabarici</i> Hosag.	<i>Croton malabaricus</i>	
29.	<i>Meliola bicornis</i> Wint.	<i>Desmodium cephalotes</i> <i>D. polycarpum</i> <i>D. triquetrum</i> <i>D. latifolium</i> <i>D. pulchellum</i> <i>Uraria rufescens</i>	
30.	<i>Meliola buteae</i> Hafiz, Azmatulla & Kafi	<i>Butea parviflora</i> <i>B. monosperma</i>	
31.	<i>Meliola desmodii-pulchelli</i> Hosag.	<i>Desmodium pulchellum</i>	
32.	<i>Meliola desmodii-velutini</i> Hosag. & Manoj.	<i>D. velutinum</i>	
33.	<i>Meliola emgiuensis</i> sp. nov. Jacob Thomas, Aswathy C. Babu and Sujeesh	Papilionaceae member	
34.	<i>Meliola flemingiicola</i> Hosag., Jose & H. Biju	<i>Flemingia semialata</i>	Fabaceae
35.	<i>Meliola gliricidiicola</i> Hosag. & Agarwal	<i>Gliricidia sepium</i>	
36.	<i>Meliola phaseoli</i> Thite ex Hosag.	<i>Phaseolus</i> sp.	
37.	<i>Meliola pongamiae</i> Hosag. & Abraham	<i>Pongamia pinnata</i>	
38.	<i>Meliola pseudarthriae</i> Hosag. & Manoj	<i>Pseudarthria viscida</i>	
39.	<i>Meliola pterocarpi</i> Yates	<i>Pterocarpus marsupium</i>	
40.	<i>Meliola spatholobii</i> Hosag.	<i>Spatholobus roxburghii</i>	
41.	<i>Meliola urariae</i> Hosag.	<i>Uraria rufescens</i>	
42.	<i>Meliola arippaensis</i> Hosag. & Sabeena	<i>Flacourtia</i> sp.	Flacourtiaceae
43.	<i>Meliola gneti</i> Hansf.	<i>Gnetum ula</i> Brogn	Gnetaceae
44.	<i>Meliola hyptidis</i> Sydow	<i>Hyptis suaveilense</i>	Lamiaceae
45.	<i>Meliola beilschmiediae</i> Yamam. var. <i>cinnamomicola</i> Hosag.	<i>Cinnamomum malabatum</i>	Lauraceae
46.	<i>Meliola linderiae</i> Yamam.	<i>Actinodaphne hookeri</i>	
47.	<i>Meliola machili</i> Yamam.	<i>Litsea stocksii</i>	
48.	<i>Meliola careyae</i> (Stev.) Hosag. var. <i>indica</i> Hosag	<i>Careya arborea</i>	Lecythidaceae
49.	<i>Irenopsis loranthicola</i> Hosag. & Riju	<i>Loranthus</i>	
50.	<i>Meliola dendrothoicola</i> Hosag. & Abraham	<i>Loranthus</i> sp.	Loranthaceae
51.	<i>Meliola loranthacearum</i>	<i>Loranthus</i> sp.	
52.	<i>Meliola prataprajii</i> Hosag. & Abraham	<i>Loranthus</i> sp.	
53.	<i>Asteridiella michelieae</i> Jana, Gosh, & Das	<i>Michelia champaka</i>	Magnoliaceae
54.	<i>Asteridiella micheliifolia</i> Hosag. & Archana	<i>Michelia champaka</i>	
55.	<i>Irenopsis molleriana</i> (Wint.) Stev.	<i>Urena lobata</i> <i>Hibiscus teliaceus</i> <i>Hibiscus furcatus</i>	Malvaceae

56.	<i>Irenopsis thespesiae</i> Hansf.,	<i>Thespesia lampas</i>	
57.	<i>Ectendmeliola walsurae</i> Hosag. & Agarwal	<i>Walsura trifolia</i>	Meliaceae
58.	<i>Meliola cycleae</i> Hosag.	<i>Cyclea peltata</i>	Menispermaceae
59.	<i>Meliola melanoxylois</i> Hosag. & Pillai	<i>Acacia mangium</i> <i>Acacia auriculiformis</i> <i>Acacia melanoxylois</i>	Mimosaceae
60.	<i>Meliola strebli</i> Hosag. & Archana,	<i>Streblus taxoides</i> <i>S. asper</i>	Moraceae
61.	<i>Meliola jasmini</i> Hansf. & Stev.	<i>Jasminum pubescence</i> <i>Jasminum sambac</i> <i>Jasminum rottlerianum</i>	Oleaceae
62.	<i>Meliola ligustri</i> Hosag.	<i>Ligustrum walkeri</i>	
63.	<i>Meliola malabarensis</i> Hansf.	<i>Olea dioica</i>	
64.	<i>Meliola oleacearum</i> Hosag.	<i>Olea dioica</i>	
65.	<i>Meliola panici</i> Earle	<i>Oplismenus compositus</i> <i>Panicum</i> sp. <i>Cymbopogon</i> sp.	Poaceae
66.	<i>Meliola zizyphi</i> Hansf. & Thirum.	<i>Ziziphus oenoplea</i> <i>Ziziphus</i> sp.	Rhamnaceae
67.	<i>Irenopsis murrayae</i> Hosag. & Rajkumar,	<i>Murraya koenigii</i>	Rutaceae
68.	<i>Meliola anceps</i> Sydow & Sydow	<i>Mussaenda philippica</i>	Rubiaceae
69.	<i>Meliola cadambae</i> Hosag. & C.K. Biju	<i>Neolamarkia cadamba</i>	
70.	<i>Meliola cadigensis</i> Yates var. <i>glycosmidis</i> (Kapoor) Hosag.	<i>Glycosmis mauritiana</i>	
71.	<i>Meliola marthomaensis</i> sp. nov. Jacob Thomaset al.	<i>Hymenodictyon obovatum</i>	
72.	<i>Meliola randiicola</i> Hansf.	<i>Ixora coccinea</i>	
73.	<i>Meliola citricola</i> Sydow & Sydow	<i>Citrus grandis</i>	Rutaceae
74.	<i>Meliola allophyli – concanici</i> Hosag.	<i>Allophylus serrulatus</i>	Sapindaceae
75.	<i>Meliola allophylogena</i> Hosag.	<i>Allophylus serrulatus</i>	
76.	<i>Meliola allophyli-serrulati</i> Hosag. & Abraham,	<i>Allophylus cobbe</i>	
77.	<i>Meliola capensis</i> (Kalch. & Cooke) Theiss. var. <i>malayensis</i> Hansf.	<i>Nephelium longan</i>	
78.	<i>Meliola capensis</i> (Kalch. & Cooke) Theiss. var. <i>schleicherae</i> Hosag. & Pillai	<i>Schleichera oleosa</i>	
79.	<i>Meliola harpullyicola</i> Hosag. & Sabeena	<i>Harpullia arborea</i>	
80.	<i>Meliola ailanthi</i> Sharma, Mohanan & Florence	<i>Ailanthus exelsa</i>	Simaroubiaceae
81.	<i>Meliola smilacacearum</i> Hosag.	<i>Smilax</i> sp.	Smilacaceae
82.	<i>Irenopsis helicteridis</i> Hosag.	<i>Helicteres isora</i>	Sterculiaceae
83.	<i>Meliola gamsii</i> Hosag. & Shiburaj	<i>Strychnos nux-vomica</i>	Strychnaceae
84.	<i>Irenopsis triumfettae</i>	<i>Triumfetta</i> sp.	Tiliaceae
85.	<i>Asteridiella callista</i> (Rehm) Hansf.	<i>Stachytarpheta</i>	

		<i>jamaicensis</i>	
86.	<i>Meliola altissimae</i> Hosag.	<i>Vitex altissima</i>	Verbenaceae
87.	<i>Meliola clerodendricola</i> Henn.	<i>Clerodendrum viscosum</i>	
88.	<i>Meliola clerodendricola</i> Henn. var. <i>micromera</i> (Sydow & Sydow) Hansf.	<i>Gmelina arborea</i> <i>G. asiatica</i>	
89.	<i>Meliola cookeana</i> Speg.	<i>Clerodendron inerme</i>	
MELIOLINACEAE			
90.	<i>Meliolina pulcherrima</i> (Sydow & Sydow) Sydow & Sydow	<i>Syzygium cumini</i>	Myrtaceae
ASTERINACEAE			
91.	<i>Asterina tertia</i> Racib.	<i>Adhatoda zeylanica</i> <i>Dipteracanthus patulus</i>	Acanthaceae
92.	<i>Asterina athirampuzhaensis</i> Jacob <i>et al.</i>	<i>Justicia gendarussa</i>	
93.	<i>Asterina lanneae</i> Hosag. & Manoj.	<i>Lannea coromandelica</i>	Anacardiaceae
94.	<i>Asterolibertia mangiferae</i> Hansf. & Thirum.	<i>Mangifera indica</i>	
95.	<i>Prillieuxina polyalthiae</i> Hosag. & Abraham	<i>Polyalthia longifolia</i>	Annonaceae
96.	<i>Asterina wrightiae</i> Sydow in Sydow & Petrak	<i>Wrightia tinctoria</i>	Apocynaceae
97.	<i>Asterina thotteae</i> Hosag. & Hanlin	<i>Thottea ponmudiana</i> <i>T. siliquosa</i>	Aristolochiaceae
98.	<i>Asterina cassiifolia</i> Hosag. & Fathima	<i>Cassia occidentalis</i>	Caesalpiniaceae
99.	<i>Asterina combreti</i> Sydow	<i>Terminalia cuneata</i> T. <i>paniculata</i> , <i>Calycopteris floribunda</i>	Combretaceae
100.	<i>Asterina escharoides</i> Sydow	<i>Quisqualis indica</i>	
101.	<i>Asterina elaeocarpi</i> Sydow var. <i>ovalis</i> Kar & Ghosh	<i>Elaeocarpus tuberculatus</i>	Elaeocarpaceae
102.	<i>Asterina aporusae</i> Hansf.	<i>Aporusa lindleyana</i>	Euphorbiaceae
103.	<i>Asterina mallotica</i> Hosag.	<i>Mallotus philippensis</i>	
104.	<i>Asterina derridicola</i> Hosag. <i>et al.</i>	<i>Derris</i> sp.	Fabaceae
105.	<i>Asterina granulosa</i> (Hansf.) Hosag.	<i>Scolopia crenata</i>	Flacourtiaceae
106.	<i>Asterolibertia hydnocarpi</i> Hosag. & Abraham	<i>Hydnocarpus macrocarpus</i>	
107.	<i>Ishwaramyces flacourtae</i> Hosag., Kamar. & Sabu	<i>Flacourtia montana</i>	
108.	<i>Asterina deightonii</i> Sydow	<i>Dendrophthoe</i> sp.	Loranthaceae
109.	<i>Asterina loranthigena</i> Hosag., Agarwal, H. Biju & Archana	<i>Dendrophthoe</i> sp.	
110.	<i>Asterina lawsoniae</i> Henn. & Nyn.	<i>Lawsonia inermis</i>	Lythraceae
111.	<i>Asterina diplocarpa</i> Cooke	<i>Sida glutinosa</i>	Malvaceae
112.	<i>Asterina hibisci</i> (Doidge) Hosag.	<i>Hibiscus rosa-sinensis</i>	
113.	<i>Asterina cipadessae</i> Yates	<i>Cipadessa baccifera</i>	Meliaceae
114.	<i>Asterina knemae-attenuatae</i>	<i>Knema attenuata</i>	Myristicaceae

	Hosag., Abraham & T.S. Nayar		
115.	<i>Asterina claviflori</i>	<i>Syzygium mundagam</i>	Myrtaceae
116.	<i>Asterina erysiphoides</i> Kalch. & Cooke	<i>Jasminum cordifolium</i> <i>J. auriculatum</i> <i>J. sambac</i> <i>J. angustifolium</i>	Oleaceae
117.	<i>Prillieuxina ixorigena</i> Hosag. & Chandra.	<i>Psychotria sp.</i>	Rubiaceae
118.	<i>Asterina congesta</i> Cooke	<i>Santalum album</i>	Santalaceae
119.	<i>Symphaster mimusopsidis</i> Hosag. & Sabeena	<i>Mimusops elengi</i>	Sapotaceae
120.	<i>Asterina helicteridis</i> Ouyang & Hu	<i>Helicteres isora</i>	Sterculiaceae
121.	<i>Asterina leptalea</i> Sydow in Sydow & Petrak	<i>Helicteres isora</i>	
122.	<i>Asterina triumfeticola</i> Yamam.	<i>Triumfetta sp.</i> <i>Triumfetta rhomboidea</i>	Tiliaceae
ENGLERULACEAE			
123.	<i>Sarcinella tamarindi</i> Hosag. & Riju,	<i>Tamarindus indica</i>	Caesalpiniaceae
124.	<i>Questieriella terminaliae</i> Hosag. & Agarwal	<i>Terminalia catappa</i>	Combretaceae
125.	<i>Questieriella strychni</i> Hosag.	<i>Strychnos nux-vomica</i>	Strychnaceae
LEMBOSIACEAE			
126.	<i>Echidnodella polyalthiae</i> Hosag.	<i>Polyalthia longifolia</i>	Annonaceae
127.	<i>Lembosia malabarensis</i> (Sydow & Sydow) Hosag. & Goos	<i>Pothosscandens</i>	Araceae
128.	<i>Cirsosia globulifera</i> (Pat.) Arn.	<i>Calamus</i> sp.	Arecaceae
129.	<i>Asterostomella dilleniacearum</i> Hosag.	<i>Dillenia pentagyna</i>	Dilleniaceae
130.	<i>Asterostomula loranthis</i> Theiss.	<i>Loranthus sp.</i>	Loranthaceae
131.	<i>Echidnodella memecyli</i> Hosag. & Abraham	<i>Memecylon edule</i>	Melastomataceae
132.	<i>Lembosia linocierae</i> Hosag.	<i>Linociera sp.</i>	Oleaceae
133.	<i>Echidnodes pandanicola</i> Hosag. & Hanlin,	<i>Pandanus sp.</i>	Pandanaceae
PARODIELLACEAE			
134.	<i>Dysrhyndis uncinata</i> (Sydow) Arx	<i>Ochlandra travancorica</i>	Poaceae

Table – 2: Endemic Black Mildew Fungi in Study Area to the Western Ghats Region

1.	<i>Armatella balakrishnanii</i> Hosag.	<i>Cinnamomum malabattrum</i>	Lauraceae
2.	<i>Armatella cinnamomicola</i> Hansf.	<i>Cinnamomum malabattrum</i>	Lauraceae
3.	<i>Armatella cryptocaryae</i> Hosag.	<i>Litsea coriacea</i> <i>L. deccanensis</i> <i>Actinodaphne sp</i> <i>Lauraceae member</i>	Lauraceae
4.	<i>Asteridiella crotonicola</i> Hosag. & Abraham	<i>Croton malabaricus</i> <i>C.zeylanicus</i>	Euphorbiaceae
5.	<i>Asteridiella micheliae</i> Jana, Gosh, & Das	<i>Michelia champaka</i>	Magnoliaceae
6.	<i>Asteridiella micheliifolia</i> Hosag. & Archana	<i>Michelia champaka</i>	Magnoliaceae
7.	<i>Asteridiella phaulopsidis</i> Hosag	<i>Phaulopsis imbricata</i>	Acanthaceae
8.	<i>Asteridiella wyanadensis</i> Hosag., C.K. Biju & Abraham	<i>Mallotus sp.</i>	Euphorbiaceae
9.	<i>Asterina aporusae</i> Hansf.	<i>Aporusa lindleyana</i>	Euphorbiaceae
10.	<i>Asterina atherampuzhaensis</i> Jacob Thomas, Sujeesh K.G. & Aswathy C. Babu	<i>Justicia gendarussa</i>	Acanthaceae
11.	<i>Asterina cassiifolia</i> Hosag. & Fathima	<i>Cassia occidentalis</i>	Caesalpiniaceae
12.	<i>Asterina derridicola</i> Hosag. <i>et al.</i>	<i>Derris sp.</i>	Fabaceae
13.	<i>Asterina elaeocarpi</i> Sydow var. <i>ovalis</i> Kar & Ghosh	<i>Elaeocarpus tuberculatus</i>	Elaeocarpaceae
14.	<i>Asterina knemae-attenuatae</i> Hosag., Abraham & T.S. Nayar	<i>Knema attenuata</i>	Myristicaceae
15.	<i>Asterina lanneae</i> Hosag. & Manoj.	<i>Lannea coromandelica</i>	Anacardiaceae
16.	<i>Asterina loranthisgena</i> Hosag., Agarwal, H. Biju & Archana	<i>Dendrophthoe sp.</i>	Loranthaceae
17.	<i>Asterina malloticola</i> Hosag.	<i>Mallotus philippensis</i>	Euphorbiaceae
18.	<i>Asterina thotteae</i> Hosag. & Hanlin	<i>Thottea ponmudiana</i> <i>T. siliquosa</i>	Aristolichiaeae
19.	<i>Asterolibertia hydnocarpi</i> Hosag. & Abraham	<i>Hydnocarpus macrocarpus</i>	Flacourtiaceae
20.	<i>Asterostomella dilleniacearum</i> Hosag.	<i>Dillenia pentagyna</i>	Dilleniaceae
21.	<i>Echidnodella memecyli</i> Hosag. & Abraham	<i>Memecylon edule</i>	Melastomataceae
22.	<i>Echidnodella polyalthiae</i> Hosag.	<i>Polyalthia longifolia</i>	Annonaceae
23.	<i>Echidnodes pandanicola</i> Hosag. & Hanlin	<i>Pandanus sp.</i>	Pandanaceae
24.	<i>Ectendomeliola walsurae</i> Hosag. & Agarwal	<i>Walsura trifolia</i>	Meliaceae
25.	<i>Irenopsis helicteridis</i> Hosag.	<i>Helicteres isora</i>	Sterculiaceae
26.	<i>Irenopsis loranthiscola</i> Hosag. & Riju	<i>Loranthus</i>	Loranthaceae
27.	<i>Irenopsis murrayae</i> Hosag. &	<i>Murraya koenigii</i>	Rutaceae

	Rajkumar,		
28.	<i>Ishwaramyces flacourtiaae</i> Hosag., Kamar. & Sabu	<i>Flacourtia montana</i>	Flacourtiaceae
29.	<i>Lembosia linocierae</i> Hosag.	<i>Linociera</i> sp.	Oleaceae
30.	<i>Lembosia malabarensis</i> (Sydow & Sydow) Hosag. & Goos	<i>Pothosscandens</i>	Araceae
31.	<i>Meliola justiciae</i> Jacob <i>et al.</i>	<i>Justicia genderusa</i>	Acanthaceae
32.	<i>Meliola strebli</i> Hosag., H. Biju & Manoj	<i>Strebles asper</i>	Moraceae
33.	<i>Meliola abrahamii</i> Hosag. <i>et al</i>	<i>Semecarpus anacardium</i>	Anacardiaceae
34.	<i>Meliola allophyli – concanici</i> Hosag.	<i>Allophylus serrulatus</i>	Sapindaceae
35.	<i>Meliola allophyligena</i> Hosag.	<i>Allophylus serrulatus</i>	Sapindaceae
36.	<i>Meliola allophyli-serrulati</i> Hosag. & Abraham	<i>Allophylus cobbe</i>	Sapindaceae
37.	<i>Meliola altissimae</i> Hosag.	<i>Vitex altissima</i>	Verbenaceae
38.	<i>Meliola ardigoosii</i> Hosag. & Abraham	<i>Buchanania lanzan</i>	Anacardiaceae
39.	<i>Meliola arippaensis</i> Hosag. & Sabeena	<i>Flacourtia</i> sp.	Flacourtiaceae
40.	<i>Meliola artabotrydicola</i> Hosag. & Abraham	<i>Artabotrys zeylanicus</i>	Annonaceae
41.	<i>Meliola beilschmiediae</i> Yamam. var. <i>cinnamomicola</i> Hosag.	<i>Cinnamomum malabattrum</i>	Lauraceae
42.	<i>Meliola cadambae</i> Hosag. & C.K. Biju	<i>Neolamarkia cadamba</i>	Rubiaceae
43.	<i>Meliola cadigensis</i> Yates var. <i>glycosmidis</i> (Kapoor) Hosag.	<i>Glycosmis mauritiana</i>	Rutaceae
44.	<i>Meliola caesalpiniae</i> Hansf. & Deight. var. <i>indica</i> Hosag. & H. Biju.	<i>Caesalpinia sappan</i>	Caesalpinaceae
45.	<i>Meliola capensis</i> (Kalch. & Cooke) Theiss. var. <i>schleicherae</i> Hosag. & Pillai	<i>Schleichera oleosa</i>	Sapindaceae
46.	<i>Meliola careyae</i> (Stev.) Hosag. var. <i>indica</i> Hosag	<i>Careya arborea</i>	Lecythidaceae
47.	<i>Meliola crotonis-malabarici</i> Hosag.	<i>Croton malabaricus</i>	Euphorbiaceae
48.	<i>Meliola cycleae</i> Hosag.	<i>Cyclea peltata</i>	Menispermaceae
49.	<i>Meliola dendrothoicola</i> Hosag. & Abraham	<i>Loranthus</i> sp.	Loranthaceae
50.	<i>Meliola desmodii-pulchelli</i> Hosag.	<i>Desmodium pulchellum</i>	Fabaceae
51.	<i>Meliola desmodii-velutini</i> Hosag. & Manoj.	<i>Desmodium velutinum</i>	Fabaceae
52.	<i>Meliola emgiuensis</i> Jacob Thomas, Aswathy C. Babu and Sujeesh	Papilionaceae member	Fabaceae
53.	<i>Meliola erycibes-paniculatae</i> Hosag.	<i>Erycibe paniculata</i>	Convolvulaceae
54.	<i>Meliola flemingiicola</i> Hosag., Jose & H. Biju	<i>Flemingia semialata</i>	Fabaceae
55.	<i>Meliola gamsii</i> Hosag. & Shiburaj	<i>Strychnos nux-vomica</i>	Strychnaceae

56.	<i>Meliola gliricidiicola</i> Hosag. & Agarwal	<i>Gliricidia sepium</i>	Fabaceae
57.	<i>Meliola harpullicola</i> Hosag. & Sabeena	<i>Harpullia arborea</i>	Sapindaceae
58.	<i>Meliola hemidesmicola</i> Hosag.		
59.	<i>Meliola hemidesmicola</i> Hosag.	<i>Hemidesmus indicus</i>	Asclepiadaceae
60.	<i>Meliola justiciae</i> Jacob Thomas, <i>et al.</i>	<i>Justicia gendarussa</i>	Acanthaceae
61.	<i>Meliola kulathupuzhaensis</i> Hosag. & J. P. Jacob	<i>Bauhinia</i> sp.	Cesalpiniaceae
62.	<i>Meliola ligustri</i> Hosag.	<i>Ligustrum walkeri</i>	Oleaceae
63.	<i>Meliola linderiae</i> Yamam. var. <i>microspora</i> Hosag. & Abraham	<i>Actinodaphne hookeri</i>	Lauraceae
64.	<i>Meliola loranthacearum</i>	<i>Loranthus</i> sp.	Loranthaceae
65.	<i>Meliola malabarensis</i> Hansf.	<i>Olea dioica</i>	Oleaceae
66.	<i>Meliola marthomaensis</i> Jacob Thomas <i>et al.</i>	<i>Hymenodictyon obovatum</i>	Rubiaceae
67.	<i>Meliola melanoxylois</i> Hosag. & Pillai	<i>Acacia mangium</i> <i>Acacia auriculiformis</i> <i>Acacia melanoxylois</i>	Mimosaceae
68.	<i>Meliola oleacearum</i> Hosag.	<i>Olea dioica</i>	Oleaceae
69.	<i>Meliola pepparaensis</i> Hosag. & Abraham	<i>Tabernaemontana divaricata</i>	Apocynaceae
70.	<i>Meliola phaseoli</i> Thite ex Hosag.	<i>Phaseolus</i> sp.	Fabaceae
71.	<i>Meliola pongamiae</i> Hosag. & Abraham	<i>Pongamia pinnata</i>	Fabaceae
72.	<i>Meliola prataprajii</i> Hosag. & Abraham	<i>Loranthus</i> sp.	Loranthaceae
73.	<i>Meliola pseudarthriae</i> Hosag. & Manoj	<i>Pseudarthria viscida</i>	Fabaceae
74.	<i>Meliola smilacacearum</i> Hosag.	<i>Smilax</i> sp.	Smilacaceae
75.	<i>Meliola spatholobii</i> Hosag.	<i>Spatholobus roxburghii</i>	Fabaceae
76.	<i>Meliola strebli</i> Hosag. & Archana,	<i>Streblus taxoides</i> <i>S. asper</i>	Moraceae
77.	<i>Meliola tibigirica</i> Hosag. & Abraham	<i>Cyperus</i> sp.	Cyperaceae
78.	<i>Meliola urariae</i> Hosag.	<i>Uraria rufescens</i>	Fabaceae
79.	<i>Meliola vallaridis</i> Hosag., Jacob, Sabeena & Archana	<i>Vallisneria spiralis</i>	Apocynaceae
80.	<i>Meliola zizyphi</i> Hansf. & Thirum.	<i>Ziziphus oenoplea</i> <i>Ziziphus</i> sp.	Rhamnaceae
81.	<i>Prillieuxina ixorigena</i> Hosag. & Chandra.	<i>Psychotria</i> sp.	Rubiaceae
82.	<i>Prillieuxina polyalthiae</i> Hosag. & Abraham	<i>Polyalthia longifolia</i>	Annonaceae
83.	<i>Questieriella strychni</i> Hosag.	<i>Strychnos nux-vomica</i>	Strychnaceae
84.	<i>Questieriella terminaliae</i> Hosag. & Agarwal	<i>Terminalia catappa</i>	Combretaceae
85.	<i>Sarcinella tamarindi</i> Hosag. & Riju,	<i>Tamarindus indica</i>	Caesalpiniaceae
86.	<i>Symphaster mimusopsidis</i> Hosag. & Sabeena	<i>Mimusops elengi</i>	Sapotaceae

Table – 3: Black Mildew Fungi reported from the Study Area and other parts of the globe

Sl. No.	Fungus	Geographical Distribution
1.	<i>Asteridiella callista</i>	Amboina, Guyana, Ecuador, Grenada, Java, Philippines, Puerto Rico, Trinidad
2.	<i>A. combreti</i> var. <i>leonensis</i>	Congo, Ghana, Java, New Guinea, Philippines, Sierra Leone, Uganda
3.	<i>Asterina deightonii</i>	Sierra Leone
4.	<i>A. escharoides</i>	Philippines
5.	<i>A. triumfeticola</i>	Taiwan
6.	<i>Asterina wrightiae</i>	Philippines
7.	<i>Cirsosia globulifera</i>	Philippines
8.	<i>Dysrhyinchis uncinata</i>	Philippines
9.	<i>Echidnodella memecyli</i>	Puerto Rico
10.	<i>Irenopsis molleriana</i>	Congo, Costa Rica, Ghana, Jamaica, Java, Panama, Paraguay, Puerto Rico, San Domingo, San Thome, Sierra Leone
11.	<i>Meliola anacardii</i>	British Guiana, Costa Rica, Java, Malaysia, Philippines, San Domingo
12.	<i>M. bicornis</i>	Amboina, Brazil, Cameroon, China, Congo, Costa Rica, Ecuador, Ghana, Honduras, Jamaica, Java, Panama, Philippines, Puerto Rico, San Domingo, Sierra Leone, Suriname, Trinidad, Uganda, Venezuela
13.	<i>M. buteae</i>	China, Pakistan
14.	<i>M. capensis</i> var. <i>malayensis</i>	China, Malaysia, Philippines
15.	<i>M. citricola</i>	China, Indonesia, Java, New Guinea, Philippines, Singapore, Sri Lanka, Sumatra.
16.	<i>M. clerodendricola</i>	Amboina, Cameroon, Celebes, Congo, Cuba, Ghana, Japan, Penang, Philippines, San Domingo, Sierra Leone, China, Tropical Africa, Uganda
17.	<i>M. clerodendricola</i> var. <i>micromera</i>	Java, Philippines
18.	<i>M. geniculata</i>	Ghana, Java, Sierra Leone, Uganda
19.	<i>M. gneti</i>	Java, Philippines
20.	<i>M. ichnocarpium-volubili</i>	Philippines
21.	<i>M. jasmini</i>	Ghana, Malaysia, Sierra Leone, Uganda
22.	<i>M. machili</i>	Java, Taiwan
23.	<i>M. malacotricha</i>	Brazil, Congo Beige, Costa Rica, Ghana, Guyana, Honduras, Malaysia, Panama, Paraguay, Philippines, Puerto Rico, San Domingo, Sierra Leone, Sri Lanka, Taiwan, Uganda
24.	<i>M. malacotricha</i> var. <i>major</i>	Congo
25.	<i>M. mangiferae</i>	Amboina, Brazil, Costa Rica, Guyana, Jamaica, Java, Malaysia, Panama, Philippines, Puerto Rico, Trinidad, Venezuela
26.	<i>M. panici</i>	Congo, Costa Rica, Ecuador, Grenada, Indonesia, Jamaica, Java, Malaysia, Panama, Philippines, Puerto Rico, San Domingo, Sierra Leone, Singapore, Surinam, Uganda, Venezuela
27.	<i>M. pterocarpi</i>	Indonesia, Philippines, Sumatra

Table - 4: Black mildew fungi on Medicinal & Aromatic plants

	Host	Fungus
1.	<i>Adhatoda zeylanica</i>	<i>Asterina tertia</i>
2.	<i>Allophylus cobbe</i>	<i>Meliola allophyli – serrulati</i>
3.	<i>Allophylus serrulatus</i>	<i>Meliola allophyli – concanici</i> <i>Meliola allophylogena</i>
4.	<i>Artabotrys zeylanicus</i>	<i>Meliola artabotrydicola</i>
5.	<i>Bauhinia</i> sp.	<i>Meliola kulathupuzhaensis</i>
6.	<i>Butea parviflora</i> <i>B. monosperma</i>	<i>Meliola buteae</i>
7.	<i>Caesalpinia sappan</i>	<i>Meliola caesalpiniae</i> var. <i>indica</i>
8.	<i>Calamus</i> sp.	<i>Cirsosia globulifera</i>
9.	<i>Cassia occidentalis</i>	<i>Asterina cassiifolia</i>
10.	<i>Cinnamomum malabattrum</i>	<i>Meliola beilschmiediae</i> var. <i>cinnamomicola</i>
11.	<i>Clerodendron inerme</i>	<i>Meliola cookeana</i>
12.	<i>Clerodendrum viscosum</i>	<i>Meliola clerodendricola</i>
13.	<i>Cyclea peltata</i>	<i>Meliola cycleae</i>
14.	<i>Cymbopogon</i> sp.	<i>Meliola panici</i>
15.	<i>Desmodium pulchellum</i>	<i>Meliola desmodii-pulchelli.</i>
16.	<i>Elaeocarpus tuberculatus</i>	<i>Asterina elaeocarpi</i> var. <i>ovalis</i>
17.	<i>Garcinia gummigutta</i>	<i>Meliola garciniae</i>
18.	<i>Glycosmis mauritiana</i>	<i>Meliola cadigensis</i> var. <i>glycosmidis</i>
19.	<i>Gmelina arborea</i> <i>G. asiatica</i>	<i>Meliola clerodendricola</i> var. <i>micromera</i>
20.	<i>Helicteres isora</i>	<i>Irenopsis helicteridis</i> <i>Asterina helicteridis</i> <i>Asterina leptalea</i>
21.	<i>Hemidesmus indicus</i>	<i>Meliola hemidesmicola</i>
22.	<i>Hibiscus rosa-sinensis</i>	<i>Asterina hibisci</i>
23.	<i>Holigarna ornottiana</i>	<i>Meliola holigarnae</i>
24.	<i>Ichnocarpus frutescense</i>	<i>Meliola ichnocarpi-volubili</i>
25.	<i>Ixora coccinea</i>	<i>Meliola randiicola</i>
26.	<i>Justicia gendarussa</i>	<i>Meliola justiciae</i> <i>Asterina athirampuzhaensis</i>
27.	<i>Knema attenuata</i>	<i>Asterina knemae-attenuatae</i>
28.	<i>Lawsonia inermis</i>	<i>Asterina lawsoniae</i>
29.	<i>Linociera</i> sp.	<i>Lembosia linocierae</i>
30.	<i>Mangifera indica</i>	<i>Asterolibertia mangiferae</i> <i>Meliola mangiferae</i>
31.	<i>Memecylon edule</i>	<i>Echidnodella memecyli</i>
32.	<i>Michelia champaka</i>	<i>Asteridiella micheliae</i> <i>Asteridiella micheliifolia</i>
33.	<i>Mimusops elengi</i>	<i>Symphaster mimusopsidis</i>
34.	<i>Murraya koenigii</i>	<i>Irenopsis murrayae</i>

35.	<i>Ochlandra travancorica</i>	<i>Dysrhynchis uncinata</i>
36.	<i>Pandanus</i> sp.	<i>Echidnodes pandanicola</i>
37.	<i>Polyalthia longifolia</i>	<i>Echidnodella polyalthiae</i> <i>Prillieuxina polyalthiae</i>
38.	<i>Pongamia pinnata</i>	<i>Meliola pongamiae</i>
39.	<i>Psychotria</i> sp.	<i>Prillieuxina ixorigena</i>
40.	<i>Pterocarpus marsupium</i>	<i>Meliola pterocarpi</i>
41.	<i>Santalum album</i>	<i>Asterinacongesta</i>
42.	<i>Sida glutinosa</i>	<i>Asterina diplocarpa</i>
43.	<i>Smilax</i> sp.	<i>Meliola smilacacearum</i>
44.	<i>Strychnos nux-vomica</i>	<i>Meliola gamsii</i> <i>Questieriella strychni.</i>
45.	<i>Syzygium cumini</i>	<i>Meliolina pulcherrima</i>
46.	<i>Syzygium mundagam</i>	<i>Asterina claviflori</i>
47.	<i>Tabernaemontana divaricata</i>	<i>Meliola pepparaensis</i>
48.	<i>Tamarindus indica</i>	<i>Meliola tamarindi</i> <i>Sarcinella tamarindi</i>
49.	<i>Terminalia catappa</i>	<i>Questieriella terminaliae</i>
50.	<i>Thottea ponmudiana</i> <i>T. siliquosa</i>	<i>Asterina thotteae</i>
51.	<i>Vitex altissima</i>	<i>Meliola altissimae</i>
52.	<i>Walsura trifolia</i>	<i>Ectendomeliola walsurae</i>
53.	<i>Wrightia tinctoria</i>	<i>Asterina wrightiae</i>
54.	<i>Ziziphus oenoplea</i>	<i>Meliola zizyphi</i>

Table - 5: Black mildew fungi on Fungi on Fruit yielding plants.

	Host	Fungus
1.	<i>Anacardium occidentale</i>	<i>Meliola anacardii</i>
2.	<i>Aporusa lindleyana</i>	<i>Asterina aporusae</i>
3.	<i>Citrus grandis</i>	<i>Meliola citricola</i>
4.	<i>Elaeocarpus tuberculatus</i>	<i>Asterina elaeocarpi</i> var. <i>ovalis</i>
5.	<i>Flacourtia montana</i>	<i>Ishwaramyces flacourtiae</i>
6.	<i>Flacourtia</i> sp.	<i>Meliola arippaensis</i>
7.	<i>Garcinia gummigutta</i>	<i>Meliola garciniae</i>
8.	<i>Gliricidia sepium</i>	<i>Meliola gliricidiicola</i>
9.	<i>Mangifera indica</i>	<i>Meliola mangiferae</i>
10.	<i>Mangifera indica</i>	<i>Asterolibertia mangiferae</i>
11.	<i>Syzygium cumini</i>	<i>Meliolina pulcherrima</i>
12.	<i>Syzygium mundagam</i>	<i>Asterina claviflori</i>
13.	<i>Tamarindus indica</i>	<i>Meliola tamarindi</i>
14.	<i>Tamarindus indica</i>	<i>Sarcinella tamarindi</i>
15.	<i>Terminalia catappa</i>	<i>Questieriella terminaliae</i>

Table - 6: Black mildew fungi on Fungi on Timber yielding Plants

	Host	Fungus
16.	<i>Acacia mangium</i> <i>Acacia auriculiformis</i> <i>Acacia melanoxylon</i>	<i>Meliola melanoxylonis</i>
17.	<i>Actinodaphne hookeri</i>	<i>Meliola linderiae</i>
18.	<i>Ailanthus exelsa</i>	<i>Meliola ailanthi</i>
19.	<i>Anacardium occidentale</i>	<i>Meliola anacardii</i>
20.	<i>Aporusa lindleyana</i>	<i>Asterina aporusae</i>
21.	<i>Buchanania lanzan</i>	<i>Meliola ardigosii</i>
22.	<i>Caesalpinia sappan</i>	<i>Meliola caesalpiniae</i> var. <i>indica</i>
23.	<i>Calamus</i> sp.	<i>Cirsosia globulifera</i>
24.	<i>Careya arborea</i>	<i>Meliola careyae</i> var. <i>indica</i>
25.	<i>Cinnamomum malabatum</i>	<i>Armatella balakrishnanii</i>
26.	<i>Cinnamomum malabatum</i>	<i>A. cinnamomicola</i>
27.	<i>Cinnamomum malabatum</i>	<i>Meliola beilschmiediae</i> var. <i>cinnamomicola</i>
28.	<i>Cipadessa baccifera</i>	<i>Asterina cipadessae</i>
29.	<i>Elaeocarpus tuberculatus</i>	<i>Asterina elaeocarpi</i> var. <i>ovalis</i>
30.	<i>Erycibe paniculata</i>	<i>Meliola erycibes-paniculatae</i>
31.	<i>Flacourtia montana</i>	<i>Ishwaramyces flacourtae</i>
32.	<i>Flacourtia</i> sp.	<i>Meliola arippaensis</i>
33.	<i>Garcinia gummigutta</i>	<i>Meliola garciniae</i>
34.	<i>Gliricidia sepium</i>	<i>Meliola gliricidiicola</i>
35.	<i>Gmelina arborea</i>	<i>Meliola clerodendricola</i> var. <i>micromera</i>
36.	<i>Harpullia arborea</i>	<i>Meliola harpullicola</i>
37.	<i>Hydnocarpus macrocarpus</i>	<i>Asterolibertia hydnocarpi</i>
38.	<i>Hymenodictyon obovatum</i>	<i>Meliola marthomaensis</i>
39.	<i>Knema attenuata</i>	<i>Asterina knemae-attenuatae</i>
40.	<i>Lannea coromandelica</i>	<i>Meliola geniculata</i>
41.	<i>Lannea coromandelica</i>	<i>Asterina lanneae</i>
42.	<i>Ligustrum walkeri</i>	<i>Meliola ligustri</i>
43.	<i>Litsea stocksii</i>	<i>Meliola machili</i>
44.	<i>Mangifera indica</i>	<i>Meliola mangiferae</i>
45.	<i>Mangifera indica</i>	<i>Asterolibertia mangiferae</i>
46.	<i>Michelia champaka</i>	<i>Asteridiella micheliae</i>
47.	<i>Michelia champaka</i>	<i>Asteridiella micheliifolia</i>
48.	<i>Mimusops elengi</i>	<i>Symphaster mimusopsidis</i>
49.	<i>Ochlandra travancorica</i>	<i>Dysrhychnis uncinata</i>
50.	<i>Olea dioica</i>	<i>Meliola malabarensis</i>
51.	<i>Olea dioica</i>	<i>Meliola oleacearum</i>
52.	<i>Polyalthia longifolia</i>	<i>Prillieuxina polyalthiae</i>
53.	<i>Polyalthia longifolia</i>	<i>Echidnodella polyalthiae</i>
54.	<i>Pongamia pinnata</i>	<i>Meliola pongamiae</i>
55.	<i>Pterocarpus marsupium</i>	<i>Meliola pterocarpi</i>

56.	<i>Santalum album</i>	<i>Asterinacongesta</i>
57.	<i>Schleichera oleosa</i>	<i>Meliola capensis</i> var. <i>schleicherae</i>
58.	<i>Semecarpus anacardium</i>	<i>Meliola abrahamii</i>
59.	<i>Strychnos nux-vomica</i>	<i>Meliola gamsii</i>
60.	<i>Strychnos nux-vomica</i>	<i>Questieriella strychni</i>
61.	<i>Syzygium cumini</i>	<i>Meliolina pulcherrima</i>
62.	<i>Syzygium mundagam</i>	<i>Asterina claviflori</i>
63.	<i>Tamarindus indica</i>	<i>Meliola tamarindi</i>
64.	<i>Tamarindus indica</i>	<i>Sarcinella tamarindi</i>
65.	<i>Terminalia catappa</i>	<i>Questieriella terminaliae</i>
66.	<i>Terminalia cuneata</i> <i>T. paniculata</i> , <i>Calycopteris floribunda</i>	<i>Asterina combreti</i> Sydow
67.	<i>Terminalia paniculata</i>	<i>Asteridiella combreti</i> var. <i>leonensis</i>
68.	<i>Thespesia lampas</i>	<i>Irenopsis thespesiae</i>

Table 7. Distribution of Black mildew fungi on Fungi on Ornamental plants.

	Host	Fungus
1.	<i>Bauhinia</i> sp.	<i>Meliola kulathupuzhaensis</i>
2.	<i>Helicteres isora</i>	<i>Asterina helicteridis</i> <i>Asterina leptalea</i> <i>Irenopsis helicteridis</i>
3.	<i>Hibiscus rosa-sinensis</i>	<i>Asterina hibisci</i>
4.	<i>Ixora coccinea</i>	<i>Meliola randiicola</i>
5.	<i>Jasminum cordifolium</i> <i>J. auriculatum</i> <i>J. sambac</i> <i>J. angustifolium</i>	<i>Asterina erysiphoides</i>
6.	<i>Jasminum pubescence</i> <i>Jasminum sambac</i> <i>Jasminum rottlerianum</i>	<i>Meliola jasmini</i>
7.	<i>Michelia champaka</i>	<i>Asteridiella micheliae</i> <i>Asteridiella micheliifolia</i>
8.	<i>Mimusops elengi</i>	<i>Symphaster mimusopsidis</i>
9.	<i>Mussaenda philippica</i>	<i>Meliola anceps</i>
10.	<i>Polyalthia longifolia</i>	<i>Echidnodella polyalthiae</i> <i>Prillieuxina polyalthiae</i>
11.	<i>Quisqualis indica</i>	<i>Asterina escharoides</i>

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