

BIOGEOGRAPHICAL DISTRIBUTION OF MELIOLACEAE MEMBERS IN INDIA

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ABSTRACT

This paper gives an account of 533 taxa belonging to the meliolaceous genera: Amazonia (27), Appendiculella (8), Armatella (12), Asteridiella (60), Irenopsis (27), Meliola (397) and Prataprajella (2) known from India. Biogeographically, India has been classified into ten regions. Of these, the Trans Himalayan, Desert, Semi Arid and Coastal vegetations are apparently devoid of meliolaceous taxa. The Western Ghats is presently represented by 488 taxa (Amazonia 24, Appendiculella 5, Armatella 12, Asteridiella 54, Irenopsis 26, Meliola 365 and Prataprajella 2), and the Himalayan region 12 taxa (Amazonia 1, Appendiculella 1, Asteridiella 1 and Meliola 9). Deccan region 16 taxa (Amazonia 1, Appendiculella 1, Asteridiella 1 and Meliola 13), Gangetic plain with 39 taxa (Amazonia 1, Appendiculella 4, Armatella 1, Asteridiella 5, Irenopsis 1 and Meliola 27), northeastern India with 7 taxa (Amazonia 1, Meliola 6) and all the Islands represent three species (of the genus Meliola). Bio-geographically, most of the fungi are restricted in their distribution to a particular region, but there are a few which are common to Eastern and Western Ghats, Western Ghats and Himalayan region, Eastern Ghats and Himalayan regions and Western Ghats and the Islands.

KEYWORDS

Biogeography, distribution, India, meliolaceae

India occupies a strategic position in Asia, comprising all types of physiographical regions such as snow clad regions in the Himalaya, highest rainfall areas in Assam and Karnataka, deserts in Rajasthan, hilly tracts in the Eastern and Western Ghats and coastlines along the eastern and western sides of peninsular India. It has mainly three seasons in a year, viz., rainy season (June to September and October to November), winter season (October to February) and summer season (March to June).

The forest cover is 19.27% of the total geographic area. Of this, 11% has dense forest, while, the remaining are open forest. The total number of species of Phanerogams in India is estimated to be 45,000, of which 17,000 have been described. Of these, 40-45% is endemic to the region and are largely concentrated in the western Himalaya, eastern Himalaya and peninsular India (Sharma *et al.*, 1993).

The author has been engaged in the study of foliicolous fungi in India, an attempt is made here to record the distribution of the known meliolaceous fungal members in India. This will help to focus on the regions which have not been adequately studied and where future work should be focused.

Meliolaceae

Meliola and its related genera are known as meliolaceous fungi, or black or dark mildews. The members of the family Meliolaceae are unique in being mostly ectophytic, having brown and

apressoriate mycelium, with phialides and setae, and having globose perithecia with 2-8 ascospore unitunicate and early evanescent asci with 1-4 septate ascospores. These fungi flourish well in tropics and have an extended distribution from subtemperate to temperate regions of the world. Little attention has paid to this group, since these fungi do not cause any appreciable pathogenicity on staple food producing crops. Economically, like other biotrophs, these fungi increase the temperature in the areas covered by the black colonies, initiate more respiration, reduce the efficiency of the chlorophyll and reduce total sugars (Hosagoudar *et al.*, 1997). Hence, Wellman (1972) stated that "nowhere are these black mildews being made a subject of major pathological study, although agriculturists who observe their crops well, know that at times these fungi are very damaging in their effects".

Taxonomy

Meliolaceous fungi classified under the family Meliolaceae of the order Meliolales and are represented by eight genera worldwide. Of which, *Endomeliola* and *Pauhia* are not represented in India. The recent work of Mibey & Cannon (1999) reveals that the genus *Cryptomeliola* lacks appressoria and hence, it has not been included here.

Generic Description

The Genus *Amazonia*

Amazonia Theiss., Ann. Mycol. 11: 499, 1913.
Actinodothis Sydow & Sydow, Philippine J. Sci. 9: 174, 1914.
Meliolaster Doidge, Trans. Royal Soc. South Africa 8: 123, 1920 (non *Meliolaster* Hohnel)

Amazoniella Bat. & Maia, Broteria 29: 73, 1960.
Mycelium superficial, brown, septate, branched, appressoriate. Perithecia borne under radiating mycelium, wall radial, shield like, non-ostiolate to ostiolate, hemispherical, inner wall pale, thin; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.

Type: *A. psychoptriae* (P. Henn.) Theiss.

The genus *Appendiculella*

Appendiculella Hohn. in Sitz. K. Akad. Wiss. Wien, Math.-naturw. Kl. 128: 556, 1919.
Irene Stev., Ann. Mycol. 25: 420, 1927 (non *Irene* Theiss. & Sydow, 1917).

Mycelium superficial, brown, septate, branched, appressoriate. Perithecia globose, discrete, \pm ostiolate, larviform and striated appendages present; asci 2-4 spored; ascospores brown 3-4 septate.

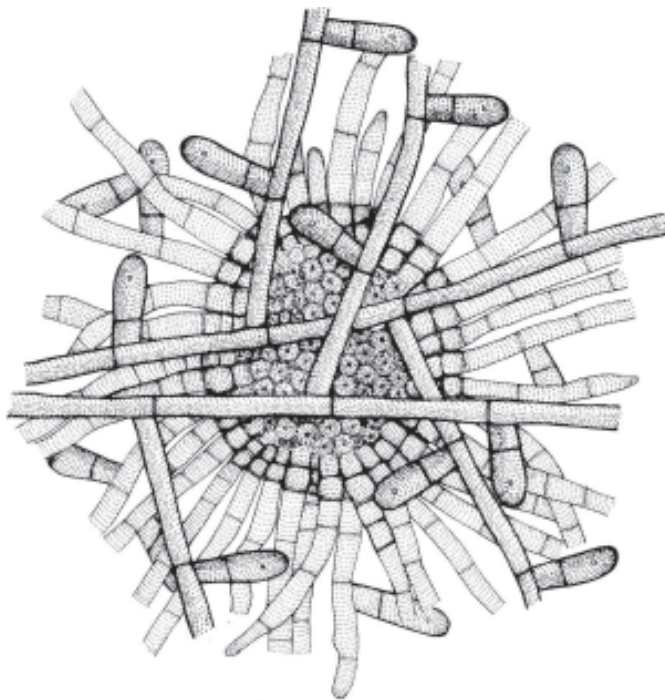
Type: *A. calostroma* (Desm.) Hohn.

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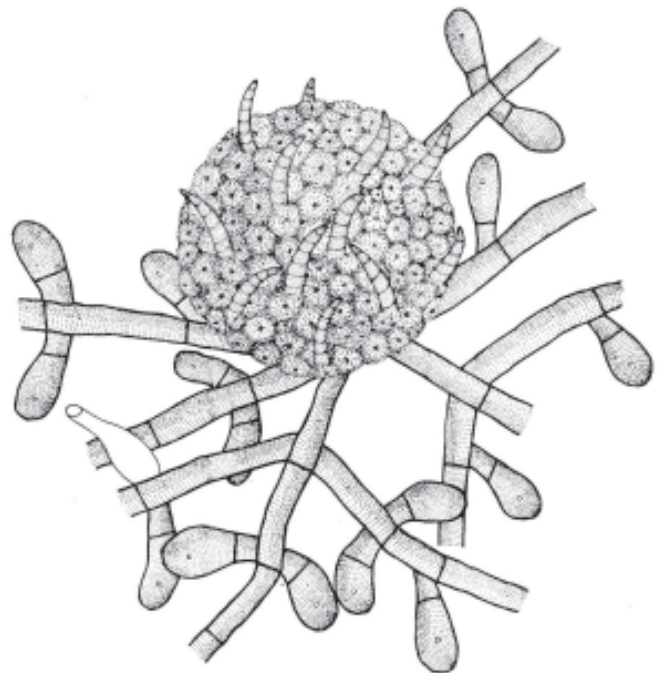
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Key to the Meliolaceae genera

- 1. Mycelium endophytic *Endomeliola*
- 1A. Mycelium ectophytic 2
- 2. Ascospores 0-1 septate *Armatella*
- 2A. Ascospores 3-4 septate 3
- 3. Perithecia stromatic *Pauhia*
- 3A. Perithecia discrete 4
- 4. Perithecia flattened-globose, hidden under the radiating hyphae *Amazonia*
- 4A. Perithecia globose, not hidden in the mycelial mat 5
- 5. Mycelium with setae *Meliola*
- 5A. Mycelium without setae 6
- 6. Perithecia with appendages, and with straight and repent setae 7
- 6A. Perithecia devoid of appendages and setae *Asteridiella*
- 7. Perithecia only with straight and strong setae *Irenopsis*
- 7A. Perithecia with larviform appendages and repent setae 8
- 8. Perithecia only with larviform appendages *Appendiculella*
- 8A. Perithecia with both larviform appendages and repent setae *Prataprajella*



The genus Amazonia



The genus Appendiculella

The genus Armatella

Armatella Theiss. & Sydow, Ann. Mycol. 13: 235, 1915; Arx, Fungus (Wageningen) 28: 1, 1958; Verona & Benedek, Mycopath. Mycol. Appl. 18: pl. 6. 115, 1962; Muller & Arx, Die Guttungen der Didymosporen pyrenomyceten, 1961, p. 622; Katumoto, Bull. Fac. Agric. Yamaguti Univ. 13: 291, 1962; Hosag., J. Econ. Tax. Bot. 15: 195, 1991.
Artallendea Bat. & Maia, Atas Inst. Micol. Univ. Recife 1: 221, 1960.

Mycelium superficial, brown, septate, branched, appressariate. Perithecia globose, ± ostiolate, thick walled, verrucose. Mycelial

setae, perithecial setae and perithecial appendages lacking. Asci usually 4-8 spored; ascospores typically brown, one septate (immature spores remain hyaline and aseptate).

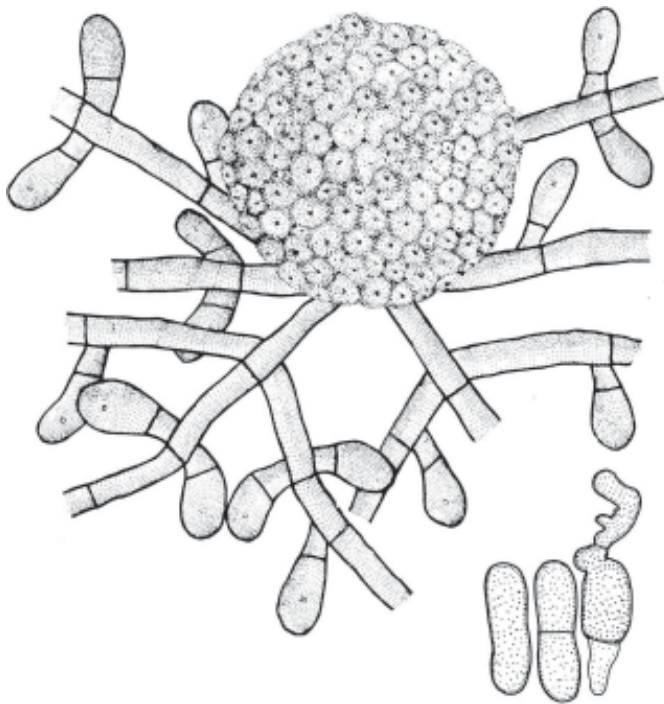
Type: *A. litseae* (P. Henn.) Theiss. & Sydow

The genus Asteridiella

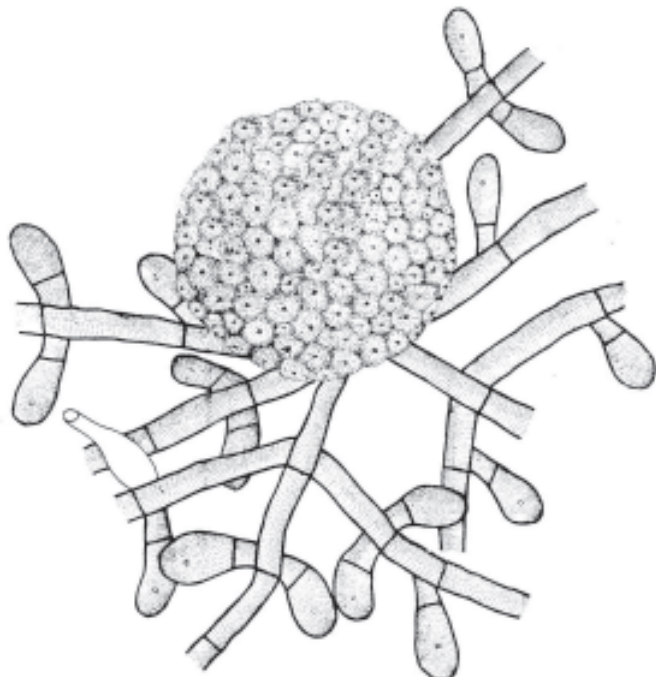
Asteridiella McAlpine, Proc. Linn. Soc. New South Wales, p. 38, 1897.

Irene Theiss. & Sydow, Ann. Mycol. 15: 194, 1917 (non *Irene* Stev., 1927).

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



The genus Armatella



The genus Asteridiella

Mycelium superficial, brown, septate, branched, appressoriate, mycelial setae absent. Perithecia globose, discrete, \pm ostiolate, without setae and appendages, conoid cells projecting and are non-striated; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.

Type: *A. solani* McAlpine

The genus Endomeliola

Endomeliola Hughes & Pirozynski, New Zealand J. Bot. 32: 53, 1994.

Mycelium produced from the ascospores, enters the mesophyll and palisade tissues through stomata. Hyphae intercellular, produce 1-3 celled appressoria. Hyphae emerge through stomata and form stomata on the epidermis. Phialides produced on the superficial stomata or on the wall of ascogonia. Ascogonia ectophytic, subglobose; asci 4-spored; ascospores brown, 4-septate.

Type: *E. dingleyae* Hughes & Piroz.

The Genus Irenopsis

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

Mycelium superficial, brown, septate, branched, appressoriate, mycelial setae absent. Perithecia globose, discrete, \pm ostiolate, with prominent, dark-brown setae, larviform appendages absent; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.

Type: *I. tortuosa* (Wint.) Stev.

The Genus Meliola

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

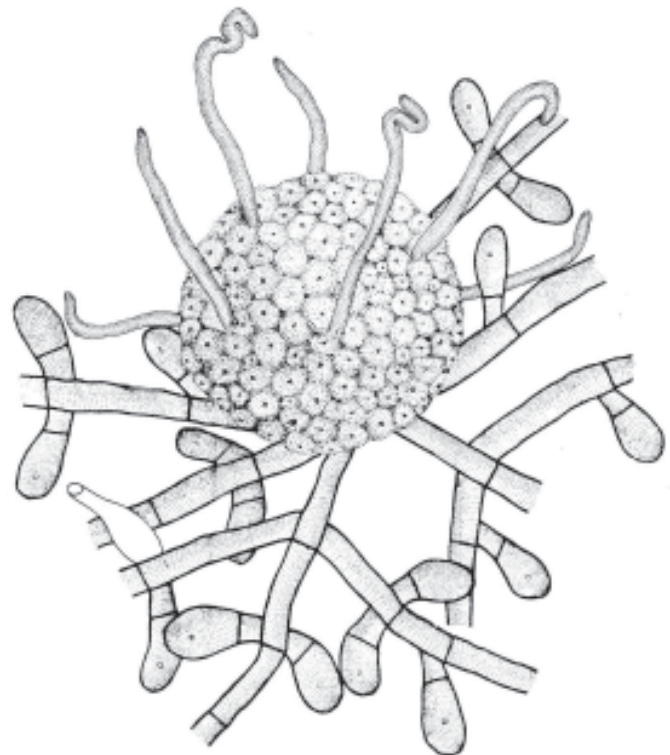
Meliola Fries, Syst. Orb. Veg. P., 111, 1825.

Amphitrichum Fries, Syst. Mycol. 2: 513, 1829 (p.p.)

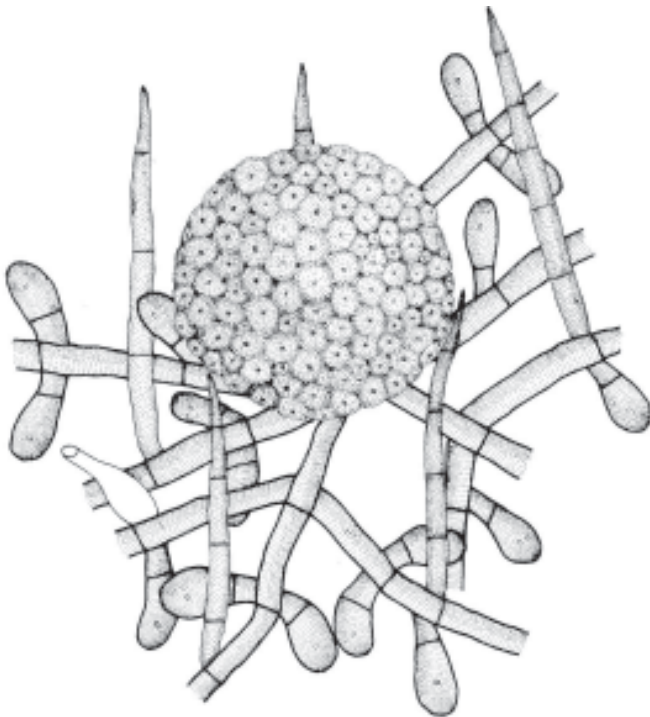
Myxothecium Kuntze ex Fries, Syst. Mycol. 3: 232, 1829.

Couturea Cast. In Fries, Summ. Veg. Sand. P., 407, 1846.

Asteridium Sacc., Syll. Fung. 1: 49, 1882.



The genus Irenopsis



The genus *Meliola*

Mycelium superficial, brown, septate, branched, appressoriolate, mycelial setae present. Perithecia globose, discrete, \pm ostiolate; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.
Type: *M. psidii* Fries

Meliola psidii Fries is conserved over the earlier synonym *M. trichostroma* (Kuntze) Toro (Crane & Jones, 2001).

The genus *Pauhia*

Pauhia Stevens, Bernice P. Bishop Mus. Bull. 19: 1-189, 1925.

Mycelium superficial, brown, septate, branched, appressoriolate, setae absent. Perithecia globose, stromatic, loculate, \pm ostiolate; asci evanescent; ascospores brown, 3-septate.
Type: *P. sideroxyli* Stev.

The genus *Prataprajella*

Prataprajella Hosag., Nova Hedwigia 55: 224, 1992.

Mycelium superficial, brown, septate, branched, appressoriolate, setae absent. Perithecia globose, discrete, \pm ostiolate, repent setae and larviform striated appendages present; asci 2-4 spored, evanescent; ascospores brown, 3-4 septate.
Type: *P. turpiniicola* (Hosag.) Hosag.

Subsequent collections from the Western Ghats of Peninsular India revealed that the repent setae are borne from the perithecia.

Biogeographic regions of India

The biogeographic regions of India as recognized by Rogers and Panwar (1988) is followed here. The distributional records are based on the Meliolales of India (Hosagoudar, 1996) and



The genus *Prataprajella*

subsequent records of meliolaceous fungi from various works known until April 2002 (Hosagoudar, 1996; Hosagoudar & Abraham, 1996a,b, 1997, 1998a,b,c,d,e,f; Goos & Hosagoudar, 1998; Hosagoudar *et al.*, 1998a,b,c,d, 1999, 2000, 2001a,b,c,d,e, 2002; Patil & Mahamulkar, 1999).

Descriptions of the biogeographic regions

1. The Trans Himalaya comprises the Ladakh district of Jammu and Kashmir and Lahul Spiti districts of Himachal Pradesh. This area with extremes of heat, cold and dryness is at an altitudinal range between 2900-5000m and comprises 750 species of flowering plants.

2. The Himalayan Region comprises of Kashmir to the Sutlej in Himachal Pradesh, Sutlej to Gandak to West Bengal and Sikkim and Arunachal Pradesh. The region has 8000 species of flowering plants.

3. The Indian Desert includes the Thar and Kutch regions of Rajasthan and part of Kutch region of Gujarat in the southwest. It has high atmospheric temperature, low and erratic rainfall, high wind velocity, low relative humidity, high evaporation, non-existence of perennial water source and scanty vegetation. This region supports 2000 species of vascular plants.

4. The semi-arid lies between Deccan in the south and east and desert in the west, comprising the Punjab plains, Delhi, Haryana, parts of Jammu and Kashmir, Himachal Pradesh, western side of Uttar Pradesh, eastern Rajasthan, eastern Gujarat, and northern Madhya Pradesh. This region has Savannah woodland, dry deciduous and tropical thorn forest

Distribution of representative political boundaries with biogeographic regions*

S.No.	Biogeographic regions	Political boundaries	Area (in sq. km)
1	Trans Himalaya	Jammu and Kashmir, Himachal Pradesh	184823
2	Himalaya	Uttaranchal, Jammu and Kashmir, Himachal Pradesh, Arunachal Pradesh, Sikkim	210662
3	Desert	Rajasthan, Gujarat	215757
4	Semi arid	Punjab, Rajasthan, Gujarat, Haryana, Delhi, Madhya Pradesh, Uttar Pradesh	545850
5	Western Ghats	Maharashtra, Karnataka, Goa, Kerala, Tamil Nadu	132606
6	Deccan Peninsula	Maharashtra, Madhya Pradesh, Uttar Pradesh, West Bengal, Andhra Pradesh, Orissa, Tamil Nadu, Bihar	1380380
7	Gangetic Plain	Uttar Pradesh, West Bengal Bihar	354782
8	Coast	Konkan region of Karnataka, Kerala, Goa, North Maharashtra, Orissa, Gujarat, Tamil Nadu, Andhra Pradesh	82813
9	Northeast	Assam, Nagaland, Manipur, Mizorum, Tripura	171341
10	Island	Andaman and Nicobar group of Islands, Lakshadweep	8249

* based on Dhar (2002)

zone. The number of flowering plants in this region are 2500.

5. The Western Ghats hill ranges which run along the west coast of peninsular India, stretch to a length of 1600km from Tapti river in Gujarat to Kanyakumari in Tamil Nadu, traversing through the states of Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu. These hills are at an average altitude of 1200m. The southern Western Ghats are, in particular, rich in Phanerogams and is the centre of mega biodiversity with 4000 flowering plants.

6. The Deccan Peninsula is the largest and most extensive, but relatively homogenous region including the Vindhya and Satpura hill ranges, Chota Nagpur plateau, Eastern Ghats, Tamil Nadu plains and Karnataka plateau with moist deciduous, deciduous and thorn or scrub jungles and 3000 species of flowering plants.

7. The Gangetic plains region stretches from eastern Rajasthan through Uttar Pradesh to Bihar and West Bengal. Most of the area is under cultivation and has 2000 flowering plants.

8. The Coasts called the eastern and western coast line of India is from Gujarat to Kanyakumari in the west and from Sunderbans to Kanyakumari in the east, stretching about 5400km, harbouring mangrove forests with 500 flowering plants.

9. The Northeast Region includes the entire seven sister states of northeastern India and is a biogeographic gateway for plant migration. This region is richest in biological diversity. Khasi and Jaintia hills are the richest botanical habitats.

10. The Islands include both Lakshadweep islands (27 small islands), and Andaman and Nicobar Islands (348 islands). The latter harbour 2500 flowering plant species and renowned for endemic and endangered species.

DISCUSSION

Meliolaceous fungi are obligate biotrophs and are host specific as is evidenced in several species such as *Amazonia actinodaphnes* Hosag., *Asteridiella clerodendricola* Hosag., *Meliola ailanthis* Sharma *et al.* emend. Hosag., *M. kydiae-calycinae* Hansf. & Thirum. (Hosagoudar, 1996). Some species infect hosts of the same genus (e.g. *Irenopsis bengutensis* Stev.

& Rold. ex. Hansf. on *Ficus* spp., *Meliola diospyri* Sydow on *Diospyros* spp., *M. gemellipoda* Doidge on *Jasminum* spp., *M. holigarnae* Stev. on *Holigarna* spp., *M. nothopegiae* Hansf. on *Nothopegia* spp.). Some species grow on different genera of the same family. *Meliola acanthacearum* Hansf. var. *occidentalis* Hansf. is found on *Dicliptera foetida*, *Blepharis asperima* and *Rungia sisparensis*. *M. clavulata* Wint. on *Ipomea* sp. and *Argyria populifolia*, *M. drypeticola* Hosag. on *Drypetes macrophylla* and *Epiprinus mallotiformis*, *Meliola groteana* Sydow on *Embelia viridifolia* and *Maesa indica*, *M. ixorae* Yates on *Ixora polyantha* and *Canthum wightii*, *M. opiliae* Sydow var. *singalensis* Hansf. on *Cansjera rheedei* and *Lepionurus sylvestris* etc. This host range may provide some indication on the genetical and biochemical similarities among hosts.

Most of the fungi are restricted in their distribution to various biogeographical regions. However, *Asteridiella malloti* (Hansf. & Thirum.) Hansf., *Meliola bauhiniicola* Yamam, *M. chandleri* Hansf., *M. heudelotii* Gaill., *M. maredumilliana* Hosag. & Mohanan, *M. mayapeae* Stev. and, *M. opiliae* Sydow are known from the Western Ghats and Eastern Ghats (Deccan Plateau) in peninsular India; *Meliola butleri* Sydow, *M. malacotricha* Speg., *M. mitragynae* Sydow and *M. tabernaemontanicola* Hansf. & Thirum. are known from Western Ghats and Gangetic plain, *Meliola simillima* Ellis & Everh. var. *major* Hansf. and *M. tawaoensis* Hansf. are common to Eastern Ghats and Gangetic plain; *Meliola mangiferae* Earle is common to Western Ghats and Andaman Islands, *M. butleri* Sydow is common to Himalaya, Western Ghats, Gangetic plain and the Islands. This indicates that although endemism is prevalent among these taxa, there are, however, some with wide geographical distribution.

These fungi are predominantly occurring on forest plants but are not uncommon on plantation crops like Mango, Cinnamomum, Cashew, and Wattles (Hosagoudar & Balakrishnan, 1995; Hosagoudar & Abraham, 2000). Although most of these taxa are biotrophs, the effects of *Asteridiella clerodendricola* Hosag., *Meliola hunteriae* Hosag. and *M. pongamiae* Hosag. & Abraham on the host plants is noteworthy. In others, the black colonies absorb more light and increase the temperature by about 1.5°C more than the other leaf surface area (Schiedeknecht, 1970). This exerts

pressure on the host plant to cool. Biochemically, the infected plants showed decrease in the carbohydrates and soluble sugars (Hosagoudar *et al.*, 1997). These fungi are very common in forest areas and sacred groves but they are not noticed in thickly populated areas. Hence these further studies may reveal that these fungi may act as pollution indicators.

India hosts 17672 described flowering plants belong to *ca.* 300 (247-315) families, which represents 7% of the world flora (Dhar, 2002). Of these, 548 plants belonging to 102 families are infected with meliolaceous fungi, which forms 3% of the total flowering plant families of India; 534 meliolaceous taxa are known on 548 host plants. Five-hundred-and-eight meliolaceous fungi infect dicotyledons: Lauraceae with 39, Rubiaceae 36, Euphorbiaceae 28, Fabaceae 25, Rutaceae 24, Apocynaceae 19, and other families represent less; 19 are on monocots: Agavaceae 1, Araceae 1, Arecaceae 2, Cyperaceae 2, Pandanaceae 2 and Poaceae 11; two species on Gymnosperms: Gnetaceae 1 and Taxaceae 1; and one on Pteridophytes: Angiopteridaceae. However, the total number of meliolaceous taxa (534) is almost equal to the number of host plants (548) and make the host-parasite ratio 1:1.

The present distribution record reveals that the Western Ghats are rich in meliolaceous fungi numbering 487 taxa of the 530 (92%). Climatologically, Western Ghats enjoy 2350-7450mm rain fall, with means 24°C temperature, 60-90% humidity and altitude ranging from 100m to 2698m (Nair & Daniel, 1986). Majority of the area is constituted by tropical rain forest making it suitable for meliolaceous fungi. Of the known species, *Meliola* ranks first in having 398 species, then *Amazonia* and *Irenopsis* each with 27 species, *Armatella* with 11, *Appendiculella* six and *Prataprajella* with two species. Of all these genera, the genus *Meliola* is versatile and has got wide host range and occurs in all the altitudes and ecological conditions.

Hansford (1961) included 1814 species in his Monograph. Hosagoudar *et al.* (1997) provided an account of 371 taxa and around 200 taxa have been added until now. Indian meliolaceous fungal flora (530 taxa) forms 22% of the world meliolaceous fungal flora (2400).

As there is a host range, there is evidence that a single host harbours more than one species, *viz.*, *Actinodaphne hookeri* is the host for *Amazonia actinodaphnes* Hosag., *Meliola linderiae* Yamam.; *Aphanamixis polystachya* is the host of *Irenopsis indica* (Anahosur) Hosag., *Meliola aphanamixidis* Hosag. and *M. nairii* Hosag.; *Cansjerar rheedii* is the host for *Meliola cansjerar* Hansf. & Thirum., *Meliola cansjerar* Hansf. & Thirum. var. *indica* Hosag. *et al.*, *M. cansjericola* Hosag., *M. opiliae* Sydow var. *singalensis* Hansf., etc.

Since there is no thorough survey work on any regions of India, it is difficult to predict the total number of meliolaceous fungi occurring in India. However, during the year 1996-97, the author conducted four field tours to the Peppara and Neyyar wildlife sanctuaries, each collection site was visited only once, and recorded 98 meliolaceous taxa. Even though the collections

are made by the trained eyes, the number can be attributed to 40% of its total meliolaceous fungi occurring in the region. Hence, we can expect the occurrence of these fungi up to 248 taxa in Peppara and Neyyar. Since meliolaceous fungi are biotrophs, their number and occurrence depends on the number of flowering plants. The area represents 1084 flowering plants (Mohanani *et al.*, 1997). This forms 22.6% of the angiosperm plants numbers. Based on this data, we can expect 900 meliolaceous taxa in the Western Ghats for 4000 flowering plants. Calculating the total numbers of flowering plants in different regions of India, and excluding the Trans Himalayan, Desert, Semiarid and Coasts that are devoid of meliolaceous fungi the number of meliolaceous fungi in India can be expected to be around 4000.

A thorough knowledge on the floristic account of meliolaceous fungi in the Western Ghats, northeastern region and Gangetic plain is awaited. Though Nayar *et al.* (1998) have trapped the ascospores in air, much is awaited regarding their biology. Ultrastructural studies are to be carried out. Spore germination to spore formation studies will reveal many secrets about these fungi. Molecular taxonomy may help in segregating the complex species like *Meliola bicornis* Wint. In short, the uniqueness of the meliolaceous fungi attracts the attention of every mycologist.

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Distributional pattern of meliolaceous fungi and their corresponding regions

Taxa	1	2	3	4	5	6	7	8	9	10	11	Taxa	1	2	3	4	5	6	7	8	9	10	11	
1. <i>Amazonia abaremae</i> Hosag. & Antony					+						E													
2. <i>Amazonia abutili</i> Hosag.						+					E	68. <i>Asteridiella eucleae</i> Hansf.					+							E
3. <i>Amazonia acronychiae</i> Hosag.					+						E	var. <i>microspora</i> Hosag. & Raghu												
4. <i>Amazonia actinodaphnes</i> Hosag.					+						E	69. <i>Asteridiella formosensis</i> (Yamam.) Hansf.					+							
5. <i>Amazonia antistrophecola</i> Hosag. & Abraham					+						E	70. <i>Asteridiella gaultheriae</i> Hosag. et al.					+							E
6. <i>Amazonia balakrishnanii</i> Hosag.									+		E	71. <i>Asteridiella glycosmidis</i> Hosag. et al.					+							E
7. <i>Amazonia cinnamomi</i> Hosag.					+						E	72. <i>Asteridiella greviae</i> Patil ex Hosag.					+							E
8. <i>Amazonia flacourtiae</i> Hosag. et al.					+						E	73. <i>Asteridiella heritiericola</i> (Thite & Patil) Hosag.					+							E
9. <i>Amazonia gomphandrae</i> Hosag.					+						E	74. <i>Asteridiella julostylidis</i> Hosag. & Abraham					+							E
10. <i>Amazonia goniothalami</i> Hosag. et al.					+						E	75. <i>Asteridiella kapoorii</i> Hosag. & Raghu					+							E
11. <i>Amazonia goosii</i> Hosag. & Abraham					+						E	76. <i>Asteridiella knemae</i> Hansf. var.					+							E
12. <i>Amazonia goosii</i> Hosag. & Abraham var. <i>microspora</i> Hosag. et al.					+						E	<i>macrospora</i> Hosag. & Abraham					+							E
13. <i>Amazonia gordonicola</i> Hosag. et al.					+						E	77. <i>Asteridiella kombeensis</i> Hosag.					+							E
14. <i>Amazonia gouaniae</i> Hosag. & Braun					+						E	78. <i>Asteridiella lophopetali</i> Hosag. & Raghu					+							E
15. <i>Amazonia henryi</i> Hosag.						+					E	79. <i>Asteridiella macarangicola</i> Hosag.					+							E
16. <i>Amazonia kakachiana</i> Hosag.					+						E	80. <i>Asteridiella malloti</i> (Hansf. & Thirum.) Hansf.					+	+						E
17. <i>Amazonia kariii</i> Hosag. & Balakr.							+				E	81. <i>Asteridiella mallotica</i> (Yamam.) Hansf.					+							E
18. <i>Amazonia karnatakensis</i> Hosag. & Manian					+						E	82. <i>Asteridiella mastixiae</i> Hosag. & Raghu					+							E
19. <i>Amazonia leae</i> Hansf. & Thirum.					+						E	83. <i>Asteridiella meliosmae</i> Kar & Maity							+					E
20. <i>Amazonia mayteni</i> Hosag. et al.					+						E	84. <i>Asteridiella millettiae</i> Hosag. et al.					+							E
21. <i>Amazonia melicopecola</i> Hosag. & Abraham					+						E	85. <i>Asteridiella myristicacearum</i> Hosag.					+							E
22. <i>Amazonia patilii</i> Hosag.					+						E	86. <i>Asteridiella ohiana</i> (Stev.)							+					E
23. <i>Amazonia peregrina</i> Sydow					+						E	Hansf. var. <i>major</i> Kar & Maity												E
24. <i>Amazonia psychotriae</i> (Henn.) Theiss.					+						E	87. <i>Asteridiella pentapterygii</i> Kar & Maity							+					E
25. <i>Amazonia psychotriae</i> (Henn.) Theiss. var. <i>macrospora</i> Hosag. et al.					+						E	88. <i>Asteridiella phaulopsidis</i> Hosag.					+							E
26. <i>Amazonia syzygii</i> Hosag.					+						E	89. <i>Asteridiella pitya</i> (Sacc.) Hansf.							+					E
27. <i>Amazonia vaccinii</i> Hosag. et al.					+						E	90. <i>Asteridiella pothodis</i> (Hansf. & Thirum.) Hansf.					+							E
28. <i>Appendiculella calophylli</i> (Stev.) Toro var. <i>apetali</i> Hosag. et al.					+						E	91. <i>Asteridiella pygei</i> Hansf. var.				+								E
29. <i>Appendiculella calostroma</i> (Desm.) Hohnel		+				+	+	+			E	<i>microspora</i> Hosag.												E
30. <i>Appendiculella gaultheriae</i> Hosag. et al.								+			E	92. <i>Asteridiella quercina</i> Hansf.							+					E
31. <i>Appendiculella gloriosa</i> (Doidge) Hansf.								+			E	93. <i>Asteridiella resinosa</i> Hosag.						+						E
32. <i>Appendiculella hoveniae</i> Kar & Maity								+			E	94. <i>Asteridiella sapotacearum</i> Hansf.						+						E
33. <i>Appendiculella shettyi</i> Hosag. et al.					+						E	95. <i>Asteridiella schlegeliae</i> (Stev.) Hansf.						+						E
34. <i>Appendiculella vacciniacearum</i> Hosag. et al.					+						E	var. <i>stereospermi</i> Hosag. & Raghu												E
35. <i>Appendiculella vivekananthanii</i> Hosag. et al.					+						E	96. <i>Asteridiella schumannianthi</i> Hosag. et al.					+							E
36. <i>Armatella actinodaphnes</i> Hosag. et al.					+						E	97. <i>Asteridiella scolopiae</i> Hosag.					+							E
37. <i>Armatella apolloniadis</i> Hosag. et al.					+						E	98. <i>Asteridiella tarlacensis</i> Petrak					+							E
38. <i>Armatella balakrishnanii</i> Hosag					+						E	99. <i>Asteridiella theae</i> Patil & Mahamulkar					+							E
39. <i>Armatella caulicola</i> Hosag. et al.					+						E	100. <i>Asteridiella tremae</i> (Speg.) Hansf.					+							E
40. <i>Armatella cinnamomi</i> Hansf. & Thirum.					+						E	101. <i>Asteridiella triloba</i> (Wint.) Hansf.					+							E
41. <i>Armatella cinnamomicola</i> Hansf.					+						E	102. <i>Asteridiella triloba</i> (Wint.) Hansf.					+							E
42. <i>Armatella cryptocaryae</i> Hosag.					+						E	var. <i>momordicae</i> Hosag. et al.												E
43. <i>Armatella indica</i> Hosag.					+						E	103. <i>Asteridiella vacciniicola</i> Hansf.					+							E
44. <i>Armatella katumotoi</i> Hosag.					+						E	104. <i>Asteridiella vivekananthanii</i> Hosag.					+							E
45. <i>Armatella litseae</i> (Henn.) Theiss. & Sydow var. <i>boninensis</i> Katumoto & Harada					+						E	105. <i>Asteridiella websteri</i> Hosag.					+							E
46. <i>Armatella litseae</i> (P. Henn.) Theiss. & Sydow					+		+				E	106. <i>Asteridiella wyanadensis</i> Hosag. et al.					+							E
47. <i>Armatella phoebeicola</i> Hosag.					+						E	107. <i>Irenopsis benguetensis</i> Stev. & Rold. ex Hansf.					+							E
48. <i>Asteridiella acronychiae-pedunculatae</i> Hosag.					+						E	108. <i>Irenopsis chukrasiae</i> Hosag.					+							E
49. <i>Asteridiella americana</i> Hansf.					+						E	109. <i>Irenopsis coimbatorica</i> Hosag. et al.					+							E
50. <i>Asteridiella anamalaiana</i> Hosag.					+						E	110. <i>Irenopsis crotonis</i> (Stev. & Tehon) Stev.					+							E
51. <i>Asteridiella antidesmaticola</i> Hosag. & Abraham					+						E	111. <i>Irenopsis eriolaenae</i> Hosag.					+							E
52. <i>Asteridiella atricha</i> (Speg.) Hansf.					+						E	112. <i>Irenopsis goniothalami</i> Hosag. & Abraham					+							E
53. <i>Asteridiella callista</i> (Rehm) Hansf.					+						E	113. <i>Irenopsis gordoniae</i> Hosag. et al.					+							E
54. <i>Asteridiella casearicola</i> Hosag.					+						E	114. <i>Irenopsis helicteridis</i> Hosag.					+							E
55. <i>Asteridiella clerodendricola</i> Hosag.					+						E	115. <i>Irenopsis indica</i> (Anahosur) Hosag.					+							E
56. <i>Asteridiella combreti</i> (Stev.) Hansf. var. <i>leonensis</i> Hansf.					+						E	116. <i>Irenopsis leae</i> Hansf. var. <i>indica</i> Hosag.					+							E
57. <i>Asteridiella confragosa</i> (Sydow) Hansf.					+						E	117. <i>Irenopsis leae</i> Hansf. var. <i>javensis</i> Hansf.					+							E
58. <i>Asteridiella crotonicola</i> Hosag. & Abraham					+						E	118. <i>Irenopsis ligustri</i> Patil & Mahamulkar					+							E
59. <i>Asteridiella crotonis</i> Hosag.					+						E	119. <i>Irenopsis molleriana</i> (Wint.) Stev.					+							E
60. <i>Asteridiella cyclopoda</i> (Stev.) Hansf.					+						E	120. <i>Irenopsis mudumalaiensis</i> Hosag.					+							E
61. <i>Asteridiella cyclopoda</i> (Stev.) Hansf. var. <i>vernoniae</i> Hosag et al.					+						E	121. <i>Irenopsis murrayae</i> Hosag. & Rajkumar					+							E
62. <i>Asteridiella cyrtandrae</i> (Stev.) Hansf. var. <i>didymocarpi</i> Hosag.					+						E	122. <i>Irenopsis mysorensis</i> Hansf. & Thirum.					+							E
63. <i>Asteridiella dilleniae</i> Hosag. & Kamarudeen					+						E	123. <i>Irenopsis nepheli</i> Patil & Mahamulkar					+							E
64. <i>Asteridiella ehretiae</i> Hosag. & Raghu					+						E	124. <i>Irenopsis paulensis</i> Hansf.					+							E
65. <i>Asteridiella elaeocarpi-tuberculati</i> Hosag.					+						E	125. <i>Irenopsis rubi</i> Patil & Mahamulkar					+							E
66. <i>Asteridiella entebbeensis</i> (Hansf. & Stev.) Hansf.					+						E	126. <i>Irenopsis sidae</i> (Rehm) Hughes					+							E
67. <i>Asteridiella entebbeensis</i> (Hansf. & Stev.)					+						E	127. <i>Irenopsis tenuissima</i> (Stev.) Stev. var. <i>major</</i>												

Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11	Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11
132.	<i>Irenopsis vaccinii</i> Hosag. et al.					+						E		Theiss. var. <i>allophylicola</i> Hansf. & Deight.											
133.	<i>Irenopsis xanthophylli</i> Hosag.					+						E	200.	<i>M. capensis</i> (Kalch. & Cooke)					+						E
134.	<i>Meliola abrahamii</i> Hosag. et al.					+						E		Theiss. var. <i>emerginati</i> Hosag. et al.											
135.	<i>M. acanthacearum</i> Hansf. var. <i>occidentalis</i> Hansf.					+							201.	<i>M. capensis</i> (Kalch. & Cooke)					+		+				
136.	<i>M. actephilae</i> Hosag. et al.					+						E		Theiss. var. <i>malayensis</i> Hansf.											
137.	<i>M. actinodaphnecola</i> Hosag. & Abraham					+						E	202.	<i>M. capensis</i> (Kalch. & Cooke)					+						E
138.	<i>M. adenanthericola</i> Hosag. et al.					+						E		Theiss. var. <i>schleicherae</i> Hosag. & Pillai											
139.	<i>M. aequatoriensis</i> Petrak					+							203.	<i>M. cappadicola</i> Hosag.					+						E
140.	<i>M. aethiops</i> Sacc. var. <i>cassiae</i> Rao						+					E	204.	<i>M. careyae</i> (Stev.) Hosag.					+						E
141.	<i>M. aethiops</i> Sacc. var. <i>keralica</i> Hosag.					+						E	205.	<i>M. careyae</i> (Stev.) Hosag. var. <i>indica</i> Hosag					+						E
142.	<i>M. aethiops</i> Sacc. var. <i>longiseta</i> Deight.								+				206.	<i>M. carissae</i> Doidge var. <i>indica</i> Hansf.					+						
143.	<i>M. aethiops</i> Sacc. var. <i>moullavae</i> Hosag. & Raghu					+						E	207.	<i>M. carissae</i> Doidge var. <i>spinari</i> Hosag.								+			E
144.	<i>M. affinis</i> Sydow var. <i>indica</i> Hosag.					+						E	208.	<i>M. caryotae</i> Srinivasulu					+						E
145.	<i>M. africana</i> Hansf.					+							209.	<i>M. celastracearum</i> Hosag. & Dayal					+						E
146.	<i>M. aglaicola</i> Hansf.					+							210.	<i>M. celtidicola</i> Yates var. <i>indica</i> Patil & Mahamulkar					+						E
147.	<i>M. agumbensis</i> (Subhedar & Rao) Hosag.					+						E	211.	<i>M. ceropegiae</i> Hosag. & Ramachandran					+						E
148.	<i>M. ailanthi</i> Sharma et al. emend. Hosag.					+						E	212.	<i>M. chandleri</i> Hansf.					+						
149.	<i>M. allophyl-concanici</i> Hosag.					+						E	213.	<i>M. chandolensis</i> Patil ex Hosag.					+						E
150.	<i>M. allophyligena</i> Hosag.					+						E	214.	<i>M. chandrasekharanii</i> Hosag.					+						E
151.	<i>M. allophyl-serulati</i> Hosag. & Abraham					+						E	215.	<i>M. chennaiana</i> Hosag. & Goos						+					E
152.	<i>M. alstoniae</i> Koord.					+							216.	<i>M. chilocarp</i> Hosag. & Abraham					+						E
153.	<i>M. altissimae</i> Hosag.					+						E	217.	<i>M. cholakadensis</i> Hosag. et al.					+						E
154.	<i>M. anacardii</i> Zim.					+							218.	<i>M. chukrasiae</i> Hosag.					+						E
155.	<i>M. anceps</i> Sydow					+							219.	<i>M. cinnamomi</i> Hosag. & Abraham					+						E
156.	<i>M. ancistrocladi</i> Hosag.					+						E	220.	<i>M. cissampelicola</i> Hansf. & Thirum.					+						E
157.	<i>M. angiopteridis</i> Hansf. var. <i>indica</i> Hosag.					+						E	221.	<i>M. citricola</i> Sydow					+			+			
158.	<i>M. anisophylleae</i> Hansf. & Deight. var. <i>caralliae</i> Hosag. et al.					+						E	222.	<i>M. cookeana</i> Speg. var. <i>viticis</i> (Hansf.) Hansf.					+						
159.	<i>M. anodendri</i> Sawada & Yamam.					+							223.	<i>M. clausenae</i> Hosag.					+						E
160.	<i>M. aphanamixicis</i> Hosag.					+						E	224.	<i>M. clavulata</i> Wint.					+						
161.	<i>M. ardigoosii</i> Hosag. & Abraham					+						E	225.	<i>M. clerodendricola</i> Henn.					+						
162.	<i>M. artabotryicola</i> Hosag. & Abraham					+						E	226.	<i>M. clerodendricola</i> Henn. var. <i>micromera</i> (Sydow) Hansf.					+						
163.	<i>M. artocarp</i> Yates					+							227.	<i>M. clitoriae</i> Hosag.					+						E
164.	<i>M. artocarp</i> Yates var. <i>indica</i> Hosag. et al.					+						E	228.	<i>M. commixta</i> Sydow					+						
165.	<i>M. arundinis</i> Pat.									+			229.	<i>M. connari</i> Yates					+						
166.	<i>M. attayarica</i> Hosag & Abraham					+						E	230.	<i>M. connari</i> Yates var. <i>indica</i> Hosag.					+						E
167.	<i>M. atylosiae</i> Hosag.					+						E	231.	<i>M. cookeana</i> Speg.					+						
168.	<i>M. banasurani</i> Hosag. et al.					+						E	232.	<i>M. cookeana</i> Speg. var. <i>viticis</i> (Hansf.) Hansf.					+						
169.	<i>M. bangalorensis</i> Hansf. & Thirum.					+						E	233.	<i>M. coreopsisidis</i> Thite & Kulkarni					+						E
170.	<i>M. banosensis</i> Sydow					+							234.	<i>M. crescentiae</i> Stev.					+						
171.	<i>M. banosensis</i> Sydow var. <i>puerariae</i> Hosag.					+						E	235.	<i>M. crotonis-malabarici</i> Hosag.					+						E
172.	<i>M. bataanensis</i> Sydow					+							236.	<i>M. cryptocaricicola</i> Hosag. & Raghu					+						E
173.	<i>M. bataanensis</i> Sydow var. <i>indica</i> Hosag. & Abraham					+							237.	<i>M. cycleae</i> Hosag.					+						E
174.	<i>M. banosensis</i> Sydow var. <i>puerariicola</i> Hosag.					+						E	238.	<i>M. cymbopogonis</i> Kapoor					+						E
175.	<i>M. bantamensis</i> Hansf. var. <i>keralensis</i> Hosag.					+						E	239.	<i>M. daviesii</i> Hansf.				+							
176.	<i>M. barberiae</i> Srinivasulu					+						E	240.	<i>M. dendrothoicola</i> Hosag. & Abraham					+						E
177.	<i>M. bauhiniicola</i> Yamam.					+			+				241.	<i>M. densa</i> Cooke					+						
178.	<i>M. beilschmiedia</i> Yamam. var. <i>cinnamomicola</i> Hosag.					+						E	242.	<i>M. desmodii-pulchelli</i> Hosag. et al.					+						E
179.	<i>M. beilshmiidicola</i> Hosag.					+						E	243.	<i>M. dichapetalii</i> Hansf. & Thirum.					+						E
180.	<i>M. bhesae</i> Hosag.					+						E	244.	<i>M. dichotoma</i> Berk. & Curt. var. <i>kusanoi</i> (Henn.) Hansf.					+						
181.	<i>M. bicornis</i> Wint.					+							245.	<i>M. dimocarp</i> Hosag. & Abraham					+						E
182.	<i>M. bosei</i> Hosag.								+				246.	<i>M. dimidiatae</i> Hosag.					+						E
183.	<i>M. brassaiopsidis</i> Hosag.					+						E	247.	<i>M. dimorphochaeta</i> Patil & Mahamulkar					+						E
184.	<i>M. buchananicola</i> Hosag.					+						E	248.	<i>M. diospyri</i> Sydow					+						E
185.	<i>M. buteae</i> Hafiz et al.					+							249.	<i>M. diospyri</i> Sydow var. <i>yatesiana</i> (Trott.) Hansf. & Deight.					+						
186.	<i>M. buteri</i> Sydow				+			+			+		250.	<i>M. dorsteniae</i> Hosag. & Abraham					+						E
187.	<i>M. cadambae</i> Hosag. & C.K. Biju					+						E	251.	<i>M. dracaenae-terriflorae</i> Hosag.					+						E
188.	<i>M. cadigensis</i> Yates var. <i>glycosmidis</i> (Kapoor) Hosag.					+			+				252.	<i>M. drepanochaeta</i> Sydow var. <i>insignis</i> Hosag.					+						E
189.	<i>M. cadigensis</i> Yates var. <i>toddaliae</i> Hosag. et al.					+						E	253.	<i>M. drypticola</i> Hosag.					+						E
190.	<i>M. caesalpiniae</i> Hansf. & Deight. var. <i>indica</i> Hosag. & H. Biju					+						E	254.	<i>M. dysoxyl-malabarici</i> Hosag. & Kamarudeen					+						E
191.	<i>M. canarii</i> Sydow					+							255.	<i>M. ehreticicola</i> Hosag.					+						E
192.	<i>M. cannonii</i> Hosag. & D.K. Agarwal					+						E	256.	<i>M. elaeagni</i> Hansf. & Thirum.					+						E
193.	<i>M. cansjeriae</i> Hansf. & Thirum.					+						E	257.	<i>M. ellertoniae</i> Hosag. & Abraham					+						E
194.	<i>M. cansjeriae</i> Hansf. & Thirum. var. <i>indica</i> Hosag. et al.					+						E	258.	<i>M. entadicola</i> Deight.					+						
195.	<i>M. cansjericola</i> Hosag.					+						E	259.	<i>M. ervatamiae</i> Hosag.					+						E
196.	<i>M. canthii</i> Hansf.					+		+					260.	<i>M. erycibes-paniculatae</i> Hosag.					+						E
197.	<i>M. canthii-angustifolii</i> Hosag.																								

Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11	Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11
267.	<i>M. eugeniicola</i> Stev.					+						E	336.	<i>M. kydiae-calycinae</i> Hansf. & Thirum.					+					E	
268.	<i>M. euonymicola</i> Hosag.					+						E	337.	<i>M. laxa</i> Gaill. var. <i>indica</i> Hosag. et al.					+					E	
269.	<i>M. exaci</i> Hosag.					+						E	338.	<i>Meliola lepiantheddis</i> Hosag. & Kamarudeen					+					E	
270.	<i>M. farenheitiae</i> Hosag. & Abraham					+						E	339.	<i>M. leycesteriae</i> Kar & Maity							+			E	
271.	<i>M. ficicola</i> Hansf. & Thirum.					+						E	340.	<i>M. ligustri</i> Hosag.					+					E	
272.	<i>M. filicii</i> Hosag.					+						E	341.	<i>M. ligustricola</i> Hosag. et al.					+					E	
273.	<i>M. filicicola</i> Hosag. et al.					+						E	342.	<i>M. linderiae</i> Yamam.					+					E	
274.	<i>M. floridensis</i> Hansf.					+						E	343.	<i>M. linderiae</i> Yamam. var. <i>microspora</i> Hosag. & Abraham					+					E	
275.	<i>M. floridensis</i> Hansf. var. <i>pudukadensis</i> Hosag.					+						E	344.	<i>M. linocierae-malabaricae</i> Hosag.					+					E	
276.	<i>M. frutescentis</i> Hosag. et al.					+						E	345.	<i>M. litseae</i> Sydow var. <i>floribundae</i> Hosag.					+					E	
277.	<i>M. furcata</i> Lev.					+						E	346.	<i>M. litseae</i> Sydow var. <i>insignis</i> Hosag.					+					E	
278.	<i>M. gamblei</i> Hosag.					+						E	347.	<i>M. litseae</i> Sydow var. <i>keralensis</i> Hosag.					+					E	
279.	<i>M. gamsii</i> Hosag. & Shiburaj					+						E	348.	<i>M. litseae</i> Sydow var. <i>microspora</i> Hosag.					+					E	
280.	<i>M. garciniae</i> Yates					+						E	349.	<i>M. litseae</i> Sydow var. <i>rotundipoda</i> Hansf.					+					E	
281.	<i>M. gardneriae</i> Hansf. & Thirum.					+						E	350.	<i>M. lobeliae</i> Stev.					+					E	
282.	<i>M. gardneriae</i> Hansf. & Thirum. var. <i>indica</i> Hosag. et al.					+						E	351.	<i>M. longiseta</i> Hohn.					+					E	
283.	<i>M. gemellipoda</i> Doidge					+						E	352.	<i>M. loranthacearum</i> Hosag. & Abraham					+					E	
284.	<i>M. geniculata</i> Sydow & Butler					+						E	353.	<i>M. luvungae</i> Hosag.					+					E	
285.	<i>M. gersoppaensis</i> Hosag. et al.					+						E	354.	<i>M. machilli</i> Yamam.					+					E	
286.	<i>M. glandulifera</i> Hosag. et al.					+						E	355.	<i>M. mackenzieae</i> Hosag. et al.					+					E	
287.	<i>M. gliricicola</i> Hosag. & D.K. Agarwal					+						E	356.	<i>M. macropoda</i> Sydow					+					E	
288.	<i>M. glochidii</i> Stev. & Rold. ex Hansf. var. <i>velutini</i> Hosag.					+						E	357.	<i>M. maduraiensis</i> Hosag. et al.					+					E	
289.	<i>M. glochidicola</i> Yamam.					+						E	358.	<i>M. mahabaleshwariensis</i> Srinivasulu					+					E	
290.	<i>M. glutiae</i> Hosag. & Abraham					+						E	359.	<i>M. malabarensis</i> Hansf.					+					E	
291.	<i>M. gneti</i> Hansf.					+						E	360.	<i>M. malacotricha</i> Speg.					+		+			E	
292.	<i>M. goosii</i> Hosag.					+						E	361.	<i>M. malacotricha</i> Speg. var. <i>major</i> Beeli					+					E	
293.	<i>M. gooseana</i> Hosag. & Abraham					+						E	362.	<i>M. mallotica</i> Hosag.					+					E	
294.	<i>M. gomphandrae</i> Hosag. & Abraham					+						E	363.	<i>M. mammeicola</i> Hansf.					+					E	
295.	<i>M. gordoniae</i> Hosag.					+						E	364.	<i>M. mangiferae</i> Earle					+			+		E	
296.	<i>M. grewiae</i> Hansf. var. <i>longispora</i> Hosag. & Raju					+						E	365.	<i>M. mannavanensis</i> Hosag. et al.					+					E	
297.	<i>M. groteana</i> Sydow					+						E	366.	<i>M. manni</i> Hosag.					+				+	E	
298.	<i>M. hemidesmi</i> Kamal & Gupta								+			E	367.	<i>M. maredumilliana</i> Hosag. & Mohanan					+	+				E	
299.	<i>M. hemidesmica</i> Hosag.					+						E	368.	<i>M. mayapeae</i> Stev.					+	+				E	
300.	<i>M. henryi</i> Hosag.					+						E	369.	<i>M. mayapiicola</i> Stev. var. <i>indica</i> Hosag.					+					E	
301.	<i>M. henryi</i> Hosag. var. <i>oldenlandiae</i> et al.					+						E	370.	<i>M. megalocarpa</i> Sydow var. <i>microspora</i> Hosag.					+					E	
302.	<i>M. heudelotii</i> Gaill.					+	+					E	371.	<i>M. melanochaeta</i> Sydow							+			E	
303.	<i>M. heyneae</i> Hansf. & Thirum.					+						E	372.	<i>M. melanoxylois</i> Hosag. & Pillai					+					E	
304.	<i>M. himalayensis</i> Kapoor		+									E	373.	<i>M. memecyli</i> Sydow					+					E	
305.	<i>M. holarrhenae</i> Hansf. & Thirum.					+						E	374.	<i>M. memecyli</i> Sydow var. <i>microspora</i> Hosag. et al.					+					E	
306.	<i>M. holigamae</i> Stev.					+						E	375.	<i>M. memecylica</i> Hansf. var. <i>indica</i> Hosag.					+					E	
307.	<i>M. hunteriae</i> Hosag.					+						E	376.	<i>M. memecylica</i> Hansf. var. <i>longiseta</i> Hosag. et al.					+					E	
308.	<i>M. hydei</i> Hosag et al.					+						E	377.	<i>M. millettiae-chrysophyllae</i> Deight. var. <i>indica</i> Hosag. et al.					+					E	
309.	<i>M. hydnocarpi</i> Hansf. var. <i>indica</i> Hosag. & Kamarudeen					+						E	378.	<i>M. millettiae-racemosae</i> Hosag. & Mohanan							+			E	
310.	<i>M. hystricis</i> Kar & Maity								+			E	379.	<i>M. mitragynae</i> Sydow					+		+			E	
311.	<i>M. ichnocarpi</i> Hansf. & Thirum.					+						E	380.	<i>M. mitrephorae</i> Hosag. & Rajendran					+					E	
312.	<i>M. ilicis-malabaricae</i> Hosag. & Raghu					+						E	381.	<i>M. motatanensis</i> Hansf.							+			E	
313.	<i>M. indica</i> Sydow									+		E	382.	<i>M. mucunae</i> Hansf. var. <i>hirsutae</i> Hosag.					+					E	
314.	<i>M. integrifolia</i> Patil ex Hosag.					+						E	383.	<i>M. mucunae-acuminatae</i> Hansf. var. <i>indica</i> Hosag. et al.					+					E	
315.	<i>M. integripoda</i> Hosag. et al.					+						E	384.	<i>M. myristicae</i> Hosag. & Raghu					+					E	
316.	<i>M. invisiae</i> Hosag. & H. Biju					+						E	385.	<i>M. nairii</i> Hosag.					+					E	
317.	<i>M. ixorae</i> Yates					+						E	386.	<i>M. neanotidis</i> Hosag. et al.					+					E	
318.	<i>M. ixorae</i> Yates var. <i>macrospora</i> Hosag.					+						E	387.	<i>M. neolitseae</i> Yamam.					+					E	
319.	<i>M. ixorae</i> Yates var. <i>psychotriae</i> Hosag. & Abraham					+						E	388.	<i>M. nephelii</i> Sacc. var. <i>singalensis</i> Hansf.					+					E	
320.	<i>M. ixorae-coccineae</i> Hosag. & Pillai					+						E	389.	<i>M. nilgiriathi</i> Hosag.					+					E	
321.	<i>M. jasmini</i> Hansf. & Stev.					+						E	390.	<i>M. nothopegiae</i> Hansf.					+					E	
322.	<i>M. jasmini</i> Hansf. & Stev. var. <i>microspora</i> Hosag. et al.					+						E	391.	<i>M. odoratisimae</i> (Kapoor) Hosag.								+		E	
323.	<i>M. jasminicola</i> Henn. var. <i>indica</i> Kapoor					+		+				E	392.	<i>M. olacicola</i> Hosag.					+					E	
324.	<i>M. jatrophae</i> Stev.					+						E	393.	<i>M. oldenlandiae</i> Hansf. & Stev.					+					E	
325.	<i>M. jayachandranii</i> Hosag.					+						E	394.	<i>M. oldenlandiae</i> Hansf. & Stev. var. <i>indica</i> Hosag. et al.					+					E	
326.	<i>M. kakachiana</i> Hosag.					+						E	395.	<i>M. oleacearum</i> Hosag.					+					E	
327.	<i>M. kanniyakumariana</i> Hosag.					+						E	396.	<i>M. oligomera</i> Sydow					+					E	
328.	<i>M. Kapoorii</i> Hosag. & Raghu					+						E	397.	<i>M. opilliae</i> Sydow							+	+		E	
329.	<i>M. karnatakensis</i> Hosag. et al.					+						E	398.	<i>M. opilliae</i> Sydow var. <i>singalensis</i> Hansf.			+		+	+				E	
330.	<i>M. kaveriappai</i> Hosag. et al.					+						E	399.	<i>M. ostodis</i> Kapoor			+							E	
331.	<i>M. khasiensis</i> Hansf.									+		E	400.	<i>M. osyridicola</i> Hansf.					+					E	
332.	<i>M. kingiodendri</i> Hosag. et al.					+						E	401.	<i>M. osyridicola</i> Hansf. var. <i>indica</i> Hosag.					+					E	
333.	<i>M. knoxicola</i> Hosag. et al.					+						E	402.	<i>M. otonephelii</i> Hosag.					+					E	
334.	<i>M. kulathupuzhaensis</i> Hosag. & S.J.P. Jacob					+						E	403.	<i>M. otophorae</i> Yates var. <i>indica</i> Hosag. & Ravikumar					+					E	
335.	<i>M. kweichowensis</i> Hansf. var. <i>uncinata</i> Kar & Maity								+			E	404.	<i>M. ovatifoda</i> Hansf. & Thirum.					+					E	

Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11	Nos	Name of the taxa	1	2	3	4	5	6	7	8	9	10	11		
405.	<i>M. palmicola</i> Wint. var. <i>africana</i> Hansf..					+	+	+		+			474.	<i>M. stemonuri</i> Hosag.											E		
406.	<i>M. pandanacearum</i> Hosag. & Abraham											E	475.	<i>M. stenospora</i> Wint.													
407.	<i>M. panici</i> Earle					+							476.	<i>M. stenospora</i> Wint. var. <i>major</i> Hansf.													
408.	<i>M. panici</i> Earle var. <i>laciacidis</i> (Toro) Hansf.								+				477.	<i>M. stephaniae</i> Hansf.													
409.	<i>M. panici</i> Earle var. <i>macropodia</i> Hosag. & Abraham					+						E	478.	<i>M. strobilanthalicola</i> Hosag. et al.												E	
410.	<i>M. panici</i> Earle var. <i>vetivericola</i> Gawande et al.											E	479.	<i>M. strychnacearum</i> Hosag. & Abraham												E	
411.	<i>M. paramignyae</i> Hosag.					+						E	480.	<i>M. surattensis</i> Hosag. et al.												E	
412.	<i>M. parvula</i> Sydow					+							481.	<i>M. suttonii</i> Hosag. et al.												E	
413.	<i>M. patileana</i> Hosag.					+						E	482.	<i>M. swietenicola</i> Hosag. et al.												E	
414.	<i>M. payakii</i> Hosag.			+									483.	<i>M. symingtoniae</i> Kapoor				+				+				E	
415.	<i>M. pepparaensis</i> Hosag. & Abraham											E	484.	<i>M. symphorematicola</i> Hosag. et al.												E	
416.	<i>M. pequensis</i> Hosag. et al.					+							485.	<i>M. symplocicola</i> Yamam.													
417.	<i>M. peringamalaensis</i> Hosag. & Kamarudeen					+						E	486.	<i>M. syzygii-benthamianii</i> Hosag. & Abraham												E	
418.	<i>M. petchii</i> Hansf.					+							487.	<i>M. tabernae montanica</i> Hansf. & Thirum.									+				
419.	<i>M. petrakii</i> Stev. & Rold.					+							488.	<i>M. tabernaemontanae</i> Speg.													
420.	<i>M. phaseoli</i> Thite ex Hosag.					+						E	489.	<i>M. tamarindi</i> Sydow													
421.	<i>M. phyllostachydis</i> Yamam.					+						E	490.	<i>M. tawaoensis</i> Hansf.									+				
422.	<i>M. phyllostachydis</i> Yamam. var. <i>microspora</i> Hosag. et al.					+						E	491.	<i>M. tectleae</i> Hansf. var. <i>toddaliae-asiaticae</i> Hansf.													
423.	<i>M. plectroniae</i> Hansf.											E	492.	<i>M. telosmae</i> Rehm. var. <i>bogoriensis</i> Hansf.									+				
424.	<i>M. pogostemonis</i> Hansf.					+							493.	<i>M. telosmae</i> Rehm. var. <i>indica</i> Hosag. et al.												E	
425.	<i>M. polygoni</i> Srinivasulu					+						E	494.	<i>M. telosmae</i> Rehm. var. <i>radhanagariensis</i> Hosag.													E
426.	<i>M. polygonicola</i> Hosag.					+							495.	<i>M. tenella</i> Pat.													
427.	<i>M. polytricha</i> Kalch. & Cooke					+							496.	<i>M. tenella</i> Pat. var. <i>atalantiae</i> (Pat.) Hansf.													
428.	<i>M. pongamiae</i> Hosag. & Abraham					+							497.	<i>M. tenella</i> Pat. var. <i>atalanticola</i> Hosag.										+			E
429.	<i>M. prataprajii</i> Hosag. & Abraham					+							498.	<i>M. teramni</i> Sydow var. <i>milletiae</i> Hosag.											+		E
430.	<i>M. premnicola</i> Hosag.					+							499.	<i>M. teramicola</i> Hosag. et al.										+			E
431.	<i>M. psychotriae</i> Earle					+							500.	<i>M. tetradeniae</i> (Berk.) Theiss. & Sydow													
432.	<i>M. psychotriae-nudiflorae</i> Hosag.					+							501.	<i>M. themedae</i> Stev. & Rold. ex Hansf. var. <i>indica</i> Hosag.													E
433.	<i>M. pterocarpus</i> Yates					+							502.	<i>M. themediacola</i> Hosag. et al.													E
434.	<i>M. pterospermi</i> Stev. var. <i>microspora</i> Hosag. & Raghu					+							503.	<i>M. thitei</i> Hosag.													E
435.	<i>M. pudukadensis</i> Hosag.											E	504.	<i>M. thirumalacharii</i> Hosag. & Rajendran													E
436.	<i>M. pulchella</i> Speg. var. <i>syzygii</i> Hosag.					+						E	505.	<i>M. thiruvananthapurica</i> Hosag. & Abraham													E
437.	<i>M. pushpangadani</i> Hosag. & Abraham					+						E	506.	<i>M. thiteana</i> Hosag.													E
438.	<i>M. quadrispina</i> Racib.					+							507.	<i>M. tibigirica</i> Hosag. & Abraham													E
439.	<i>M. radhanagariensis</i> Hosag.					+							508.	<i>M. toddaliae</i> Doidge													
440.	<i>M. rajamalaensis</i> Hosag. et al.					+							509.	<i>M. toddallicola</i> Hansf. var. <i>indica</i> Hansf. & Thirum.													E
441.	<i>M. ramacharii</i> Hosag.					+							510.	<i>M. toonae</i> Hosag. & T. Sabu													E
442.	<i>M. ramosii</i> Sydow					+							511.	<i>M. toreniae</i> Hosag.													E
443.	<i>M. randiicola</i> Hansf.					+							512.	<i>M. toricelliae</i> Kar & Maity													E
444.	<i>M. ranganaathii</i> Hansf.					+							513.	<i>M. toxocarpus</i> Hosag. & Antony													E
445.	<i>M. rapanae</i> Sydow var. <i>microspora</i> Hosag. & Ganesan					+							514.	<i>M. transvaalensis</i> Doidge											+		
446.	<i>M. ravii</i> Hosag. et al.					+							515.	<i>M. travancoricae</i> Hosag.													E
447.	<i>M. reevesiae</i> Maity									+			516.	<i>M. trewiae</i> Hosag.													E
448.	<i>M. reinwardtiodendri</i> Hosag.					+							517.	<i>M. trichostroma</i> (Kunze) Toro													
449.	<i>M. rickiana</i> Hansf. var. <i>zanthoxyli</i> Hosag.					+							518.	<i>M. twaitesiana</i> Hansf.													
450.	<i>M. roureae</i> Sydow var. <i>major</i> Hansf. & Deight.					+							519.	<i>M. tylophorae</i> Hosag.													
451.	<i>M. rubi</i> Stev. & Rold. ex Hansf. var. <i>garhwalensis</i> (Srivastava & Topal) Hosag. & Balakr.									+			520.	<i>M. unonae</i> Hosag. & Abraham													E
452.	<i>M. rubiella</i> Hansf.					+							521.	<i>M. unoncola</i> Hosag. & Abraham													E
453.	<i>M. rubiella</i> Hansf. var. <i>indica</i> Hosag.					+							522.	<i>M. vepriidis</i> Hosag. et al.													E
454.	<i>M. sacchari</i> Sydow					+							523.	<i>M. vitis</i> Hansf.													E
455.	<i>M. salaciae</i> Hansf.					+							524.	<i>M. vittalii</i> Hosag. et al.													E
456.	<i>M. salleana</i> Hansf. var. <i>smilacis</i> Hosag.					+							525.	<i>M. vivekananthanii</i> Hosag. et al.													E
457.	<i>M. samaderae</i> Hosag. et al.					+							526.	<i>M. weberae</i> Kapoor													E
458.	<i>M. sarcostigmaticola</i> Hosag. & Abraham					+							527.	<i>M. wendlandiae</i> Hosag.													E
459.	<i>M. sarcostigmatis</i> Hosag.					+							528.	<i>M. woodfordiae</i> Srinivasulu													E
460.	<i>M. scleropyri</i> Hosag.					+							529.	<i>M. zanthoxyli</i> Hansf.													
461.	<i>M. scolopiae</i> Doidge var. <i>indica</i> Hosag.					+							530.	<i>M. zanthoxyli-ovalifolii</i> Hosag.													E
462.	<i>M. semecarpus-anacardii</i> Hosag. et al.					+							531.	<i>M. zizyphi</i> Hansf. & Thirum.													E
463.	<i>M. semecarpicola</i> Hansf.					+							532.	<i>Prataprajella turpinicola</i> (Hosag.) Hosag.													E
464.	<i>M. sempeiensis</i> Yamam. var. <i>nicobarica</i> Lakshmanan et al.											+	533.	<i>Prataprajella rubi</i> Hosag. et al.													E
465.	<i>M. serjaniae</i> Stev. var. <i>major</i> Hansf.					+							1 - Trans Himalaya; 2 - Himalayan region; 3 - Indian desert; 4 - Semi arid; 5 - Western Ghats; 6 - Deccan peninsula; 7 - Gangetic plains; 8 - Coasts; 9 - Northeastern region; 10 - Islands; 11 - Endemicity; E - Endemic to India														
466.	<i>M. setariae</i> Hansf. & Deight. var. <i>indica</i> Patil & Mahamulkar					+																				E	
467.	<i>M. shettyi</i> Hosag. et al.					+																				E	
468.	<i>M. shivarajui</i> Hosag. & Kamarudeen																										

Number of meliolaceous fungi on their host families in India

1. Acanthaceae 6	52. Lythraceae 1
2. Agavaceae 1	53. Malvaceae 7
3. Anacardiaceae 13	54. Marantaceae 1
4. Ancistrocladaceae 1	55. Melastomataceae 7
5. Angiopteridaceae 1	56. Meliaceae 13
6. Annonaceae 6	57. Menispermaceae 3
7. Apocynaceae 19	58. Mimosaceae 8
8. Aquifoliaceae 2	59. Moraceae 8
9. Araceae 1	60. Myristicaceae 3
10. Araliaceae 3	61. Myrsinaceae 6
11. Arecaceae 2	62. Myrtaceae 16
12. Asclepiadaceae 7	63. Olacaceae 2
13. Asteraceae 3	64. Oleaceae 15
14. Bignoniaceae 2	65. Opiliaceae 5
15. Boraginaceae 2	66. Pandanaceae 2
16. Burseraceae 1	67. Periplocaceae 2
17. Caesalpiniaceae 8	68. Pinaceae 1
18. Capparaceae 1	69. Piperaceae 4
19. Caprifoliaceae 3	70. Pittosporaceae 1
20. Celastraceae 8	71. Poaceae 13
21. Clusiaceae 3	72. Polygonaceae 2
22. Combretaceae 2	73. Rhamnaceae 4
23. Convolvulaceae 5	74. Rhizophoraceae 1
24. Cornaceae 1	75. Rosaceae 8
25. Cucurbitaceae 3	76. Rubiaceae 36
26. Cyperaceae 1	77. Rutaceae 24
27. Dichapetalaceae 1	78. Sabiaceae 1
28. Dilleniaceae 1	79. Santalaceae 3
29. Ebenaceae 5	80. Sapindaceae 16
30. Elaeagnaceae 1	81. Sapotaceae 2
31. Elaeocarpaceae 1	82. Scrophulariaceae 1
32. Ericaceae 4	83. Simaroubaceae 2
33. Erythropalaceae 1	84. Smilacaceae 3
34. Erythroxylaceae 1	85. Solanaceae 1
35. Euphorbiaceae 28	86. Staphyleaceae 2
36. Fabaceae 25	87. Sterculiaceae 7
37. Fagaceae 6	88. Stilaginaceae 2
38. Flacourtiaceae 5	89. Strychnaceae 3
39. Gentianaceae 1	90. Styrcaceae 1
40. Gesneriaceae 1	91. Symphoremataceae 1
41. Gnetaceae 1	92. Symplocaceae 3
42. Hammamalidaceae 1	93. Taxaceae 1
43. Hippocrateaceae 2	94. Theaceae 6
44. Icacinaceae 7	95. Thymeleaceae 1
45. Lamiaceae 1	96. Tiliaceae 6
46. Lauraceae 39	97. Toricelliaceae 1
47. Lecythidaceae 5	98. Ulmaceae 3
48. Leeaceae 4	99. Vacciniaceae 5
49. Lobeliaceae 1	100. Verbenaceae 11
50. Loganiaceae 4	101. Vitaceae 2
51. Loranthaceae 3	102. Xanthophyllaceae 1

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