



## Two new species of asterinaceous fungi from Mahabaleshwar, Maharashtra, India

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### Abstract

The black mildews from Mahabaleshwar are under exploration, among which two species of Asterinaceous fungi occurring on *Syzygium* spp. (Myrtaceae) are found to be new. These species, viz. *Asterina myrtacearum* sp. nov. and *Lembosia mahabaleshwarensis* sp. nov. are reported in this paper. The detail morphological description, colour photographs, line drawings and discussions are provided here for each species.

**Key words:** *Asterina*, black mildews, fungi, *Lembosia*, taxonomy

### Introduction

Mahabaleshwar is one of the famous hill stations in the Western Ghats of India, situated in Satara district of Maharashtra state. It spreads over about 150 square kilometer, bounded by valleys on all sides and blessed with abundant life forms and habitats, clad in subtropical evergreen and semi-evergreen forests. The variation in altitude, high rainfall, humidity and edaphic factors favor the rich vegetation of vascular plants and thereby it provides favorable conditions for growth of black mildew fungi. Flowering plants are flourishing at Mahabaleshwar and its surrounding area, which is dominated by one of the angiosperms families, namely Myrtaceae and represented by the species of *Syzygium* Gaert. (1788:166), such as *S. caryophyllatum* (L. 1753:472) Alst. (1931:116); *S. cumini* L. (1753:471); *S. heyneanum* (Duthie 1878:500) Gamble (1919:482) var. *heyneanum*; *S. phillyreoides* Sant. (1948:276) and *S. rubicundum* Wight & Arn. (1834:330). These species are distributed from lower altitude river lines to high altitude hill tops in Mahabaleshwar and its surrounding area (Deshpande *et al.* 1995). All species of *Syzygium* are found to be infected with black mildew fungi, except *S. phillyreoides* in this area.

Black colony forming fungi are known as ‘Black or dark mildews’, and are obligate, foliicolous, superficial, host specific, belonging to different taxonomic groups of meliolaceous fungi, schiffnerulaceous fungi, asterinaceous fungi and some hyphomycetous fungi (Hosagoudar 2012). Till date, rich diversity of asterinaceous fungi is reported on host species of family Myrtaceae from tropical and sub-tropical regions of the world. However, about 29 species of *Asterina* Lev. (1845:57) and 12 species of *Lembosia* Lev. (1845:58) have been reported on host species of *Syzygium* and *Eugenia* L. (1753:470) from the different parts of the world (Hosagoudar and Abraham 2000, Song and Hosagoudar 2003, Hosagoudar 2012, Far and Rossman 2014).

During the exploration of foliicolous fungi from Mahabaleshwar and its surrounding area, two undescribed species of black mildew fungi belonging to asterinaceous fungi, are recorded on *Syzygium* spp.; of which, *Asterina myrtacearum* Bhise & Patil sp. nov. from *S. caryophyllatum* and *Lembosia mahabaleshwarensis* Bhise & Patil sp. nov. from *S. rubicundum* are reported here as new species.

**TABLE 2.** Comparative account of *Lembosia hosagoudarii*, *L. syzygii* and *L. mahabaleshwariensis* sp. nov.

Sr. No.	Morpho-taxonomic characters	<i>Lembosia hosagoudarii</i>	<i>Lembosia syzygii</i>	<i>Lembosia mahabaleshwariensis</i> sp. nov.
1.	Host Plant	<i>Syzygium arnottiana</i> , <i>S. cumini</i> and <i>S. taminadensis</i>	<i>S. suborbiculare</i>	<i>Syzygium rubicundum</i>
2.	Colonies	Amphigenous, mostly epiphyllous, up to 3 mm diam.	Epiphyllous, up to 1cm	Amphigenous, mostly epiphyllous, up to 4 mm diam.
3.	Hyphae	Straight to substraight, cells 31–38 × 3–5 µm	Substraight to flexuous, 4–6 µm thick	Substraight to flexuous, cells 20–39 × 5–7 µm
4.	Appressoria	Alternate, uniformly scattered, sparse, 9–18 µm long	Alternate, uniformly scattered, 14–16 µm long	Opposite, rarely alternate, distantly formed in closed groups, 16–21 µm long
5.	Thyriothecia	640–930 × 214–286 µm	Mostly linear, rarely Y-shaped, up to 1 mm long	Orbicular to Y-shaped, 314–838 × 240–329 µm
6.	Asci	Cylindrical to clavate, 71–84 × 37–47 µm	Broadly ellipsoidal, 50–72 × 42–53 µm	Obovate to oval, 60–73 × 43–59 µm
7.	Ascospores	Conglobate, constricted, smooth walled, 21–28 × 9–12.5 µm	Ellipsoidal, constricted, distinctly verruculose, 32–35 × 13–15 µm	Oblong, slightly constricted, smooth walled, 38–43 × 16–18 µm

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## References

- Alston, A.H.G. (1931) *A Handbook to the Flora of Ceylon*. Dulau & Co., London, 350 pp.
- Deighton, F.C. (1978) Asterinaceous fungi on *Syzygium* from Sierra Leone. *Transactions of the British Mycological Society* 71: 518–519.  
[http://dx.doi.org/10.1016/s0007-1536\(78\)80088-6](http://dx.doi.org/10.1016/s0007-1536(78)80088-6)
- Deshpande, S., Sharma, B.D. & Nayar, M.P. (1995) *Flora of Mahabaleshwar and Adjoining's, Maharashtra*. vols. I & II, Botanical Survey of India, Calcutta, 776 pp.
- Farr, D.F. & Rossman, A.Y. (2014) *Fungal Databases*, Systematic Mycology and Microbiology Laboratory, ARS, USDA. Available from <http://nt.ars-grin.gov/fungal-databases/> (accessed 25 July 2014).
- Gaertner, J. (1788) *De Fructibus et Seminibus Plantarum Stvtgardiae I*. Academiae Carolinae, Stvtgardiae, 577 pp.  
<http://dx.doi.org/10.5962/bhl.title.59684>
- Gamble, J.S. (1919) *Flora of the Presidency of Madras, vol. I*. West, Newman and Adlard, 936 pp.
- Hansford, C.G. (1944) Contributions towards the fungus flora of Uganda–VI. New records. *Proceedings of the Linnean Society of London* 156: 102–124.  
<http://dx.doi.org/10.1111/j.1095-8312.1944.tb00381.x>
- Hansford, C.G. (1956) Tropical fungi–VI. New species and revisions. *Sydowia* 10 (1–6): 41–100.
- Hooker, J.D. (1878) *Flora of British India, vol. II*. London, 981 pp.
- Hosagoudar, V.B. & Abraham, T.K. (2000) A list of *Asterina* Lev. species based on the literature. *Journal of Economic & Taxonomic Botany* 24: 557–587.
- Hosagoudar, V.B. (2012) Asterinales of India. *Mycosphere* 2(5): 617–852.  
<http://dx.doi.org/10.5943/mycosphere/3/5/9>

- Kar, A.K. & Maity, M.K. (1970) New *Asterina* species from West Bengal. *Transactions of the British Mycological Society* 54: 435–444.  
[http://dx.doi.org/10.1016/s0007-1536\(70\)80158-9](http://dx.doi.org/10.1016/s0007-1536(70)80158-9)
- Leveille, J.H. (1845) Champignons exotiques. *Annales des Sciences Naturelles, Botanique* 3: 38–71.
- Linnaeus, C. (1753) *Species Plantarum I*. Holmiae (Stockholm): Impensis Laurentis Salvii, 1200 pp.
- Nair, L.N. & Kaul, V.P. (1987) A new species of *Asterina*. *Current Science* 56(20): 1071–1072.
- Patil, C.R., Bhise, M.R. & Patil, S.C. (2014) Three new asterinaceous fungi from western ghats, India. *Current Research in Environmental & Applied Mycology* 4(1): 80–86.  
<http://dx.doi.org/10.5943/cream/4/1/6>
- Santapau, H. (1948) New Plant Names from India. *Kew Bulletin* 3(2): 276  
<http://dx.doi.org/10.2307/4119773>
- Sivanesan, A. & Shivas, R.G. (2002) New species of *Lembosia* and *Lembosina* from Australia. *Fungal Diversity* 11: 159–168.
- Song, B. & Hosagoudar, V.B. (2003) A list of *Lembosia* species based on the literature. *Guizhou Science* 21: 93–101.
- Wight, R. & Arnott, G.A.W. (1834) *Prodromus Florae Peninsulae Indiae Orientalis*, vol. I. London, Parbury, Allen & Co., 480 pp.  
<http://dx.doi.org/10.5962/bhl.title.252>