Asterina macrosolenae sp. nov. (Asterinales,Asterinaceae) from northern Western Ghats, India

MAHENDRA R. BHISE[1*], CHANDRAHAS R. PATIL[2], CHANDRAKANT B. SALUNKHE[3] AND SIDANAND V. KAMBHAR[4]

J. Mycopathol. Res. 61(1) : *125-127, 2023;*
ISSN 0971-3719

Department of Botany,
University of Calcutta,
Kolkata 700 019, India

J. Mycopathol. Res. **61(1)** : 125-127, 2023; ISSN : 0971-3719 (Print), 2583-6315 (Online) doi.10.57023/JMycR.61.1.2023.125

Asterina macrosolenae sp. nov. (Asterinales,Asterinaceae) from northern Western Ghats, India

MAHENDRA R. BHISE[1*], CHANDRAHAS R. PATIL[2], CHANDRAKANT B. SALUNKHE[3] AND SIDANAND V. KAMBHAR[4]

[1]Department. of Botany, Late Ku. Durga K. Banmeru Science College, Lonar, Dist. Buldana -443302 Maharashtra.
[2]Department of Botany, Dattajirao Kadam Art's, Science and Commerce College, Ichalkaranji, Dist. Kolhapur-416115 Maharashtra
[3]Krishna Mahavidhyalaya, Shivnagar, Rethare (BK.) Dist. Satara -415108, Maharashtra
[4]Government of Karnataka, Department of Collegiate Education, Department of Botany, Government First Grade College, Raibag Belagavi - 591 317, Karnataka

Received : 17.12.2022 Accepted :29.01.2023 Published : 27.03.2023

A new black mildew fungal species *Asterina macrosolenae* sp. nov., infecting the leaves of *Macrosolen capitellatus* (Wight & Arn.) Danser (Loranthaceae Juss.) from Mahabaleshwar, Maharashtra, India, is being reported here. A taxonomic description, microphotographs, illustrations and comparative account of closely associate species also been provided.

Key words: *Asterina*, foliicolous, fungi, Loranthaceae

INTRODUCTION

India is represented with rich diversity of black mildew fungi and about 1159 taxa of black mildew fungi have been reported in India. The group Asterinaceous fungi comprises about 300 taxa in the world (Hosagoudar, 2003, 2010, 2012). These fungi are characterised by forming black, ectoparasitic, superficial colonies appear on host leaf surface and it has host specific in nature. The superficial colonies produce septate branched hyphae with appressoria; ascopores are developed inside the thyriothecia (Hosagoudar, 2012). The species of *Macrosolen capitellatus* (Wight & Arn.) Danser (Loranthaceae Juss.) is highly infected by this fungus.

About 9 species of Asterina have been described on the different members of family Loranthaceae Juss. in the world (Hosagoudar and Abraham, 2000; Hosagoudar, 2012; Farr and Rossman, 2014).

*Correspondence : mahendrabhise17@gmail.com

During the exploration of foliicolous fungi in Mahabaleshwar and its adjoining forest areas which is located in Satara District of Maharashtra State, India. The infected host twigs were collected separately in sterilized polythene bags, tagged with field number, brought in the laboratory and pressed neatly to dry in between blotting papers. The well dried specimens were enclosed in butter paper and preserved in standard size mycological herbarium packets. The host plants were identified firstly by referring the regional flora (Deshpande *et al.* 1995). The dried leaf material was processed to observe fungal specimen. The micro–morphological structures of fungi on leaves were mounted in lactophenol, stained with cotton blue and observed under compound light microscope. To observe mycelial branching, position and size of hyphae, appressoria, thyriothecia, asci and ascospores a drop of peeling solution (Xylene–Thermocol solution) was applied on selected areas of the colonies, and after drying the film was mounted directly again in the same peeling solution. Biometric data were based on at least 20 measurements of structures; illustrations were

prepared with Camera Lucida and photographed under Leica DM2000 fluorescence microscope equipped with digital camera. After critical examination, the present fungal specimen identified as a new species of *Asterina* by using standard references (Hansford, 1946; Hosagoudar and Abraham, 2000; Hosagoudar *et. al.* 2001; Song and Shen, 2004; Hosagoudar, 2009, 2012; Farr and Rossman, 2014). The identified new species was deposited in Herbarium Cryptogamae Indiae Orientalis (HCIO), IARI, New Delhi (India) for their accession. The digital data also submitted to MycoBank and got accession number. The detail taxonomic description, colour photographs, illustrations, comparative account and discussion of new species is provided in the paper.

Asterina macrosolenae M.R. Bhise, C.R. Patil, C.B. Salunkhe and S.V. Kambhar sp. nov. (Fig. 1)
MycoBank No: MB 811796
Etymology: The specific epithets based on the genus of host plant *Macrosolen*.

Colonies amphigenous, dark black, thin to subdense, circular to scattered, up to 4 mm in diameter, confluent. Hyphae undulate to crooked, branching opposite to alternate at acute to wide angles, closely reticulate; cells 16–36 × 5–7 μm. Appressoria alternate to unilateral, closely formed, unicellular, oblong, ovate to clavate, shallowly lobate, straight to curved, entire, 11–14 × 8–9 μm. Thyriothecia closely scattered, orbicular, up to 227 ìm in diameter, stellately dehisced at the center, margin fimbriate. Asci numerous, globose to ovate, 8-spored, 41–71 × 40–57 μm. Ascospores oblong, conglobate, uniseptate, constricted at the septum, olivaceous brown, 34–38 × 18–19 μm, smooth walled. Anamorph present. Pycnothyria numerous, same as thyriothecia, smaller, up to 175 μm in diameter. Pycnothyriospores unicellular, globose, ovate to pyriform, dark brown, 16–27 × 14–18 μm.

Specimen examined

On leaves of *Macrosolen capitellatus* (Wight & Arn.) Danser (Loranthaceae), Gonoshi, 17°552 22.32 2 N, 73°362 00.22 2 E, elev. 696 m, 04.02.2014, Bhise M.R., HCIO 51777; Birmani-Bhairijogeshwari, 17°542 08.22 2 N, 73°362 45.82 2 E, elev. 704 m, 10.12.2013, Bhise M.R., HCIO 51778; Dhudhgaon, 17°502 55.72 2 N, 73°372 36.02 2 E, elev. 772 m, 14.02.2014, Bhise M.R., MHB 0587.

Distribution: India (Maharashtra).

Notes: around 10 species of *Asterina* have been described on the members of family Loranthaceae in the world (Hosagoudar and Abraham, 2000; Hosagoudar, 2012; Farr and Rossman, 2014, Bhise *et al*., 2021). The present species is compared with earlier described species of *Asterina viz*. *A. deightonii* Sydow, and *A. loranthigena* Hosag., which was described on different members of Loranthaceae. After comparison, it is divulged that, the present collection differs from allied species with respect to distinctly oblong, ovate to clavate appressoria; larger thyriothecia, asci and

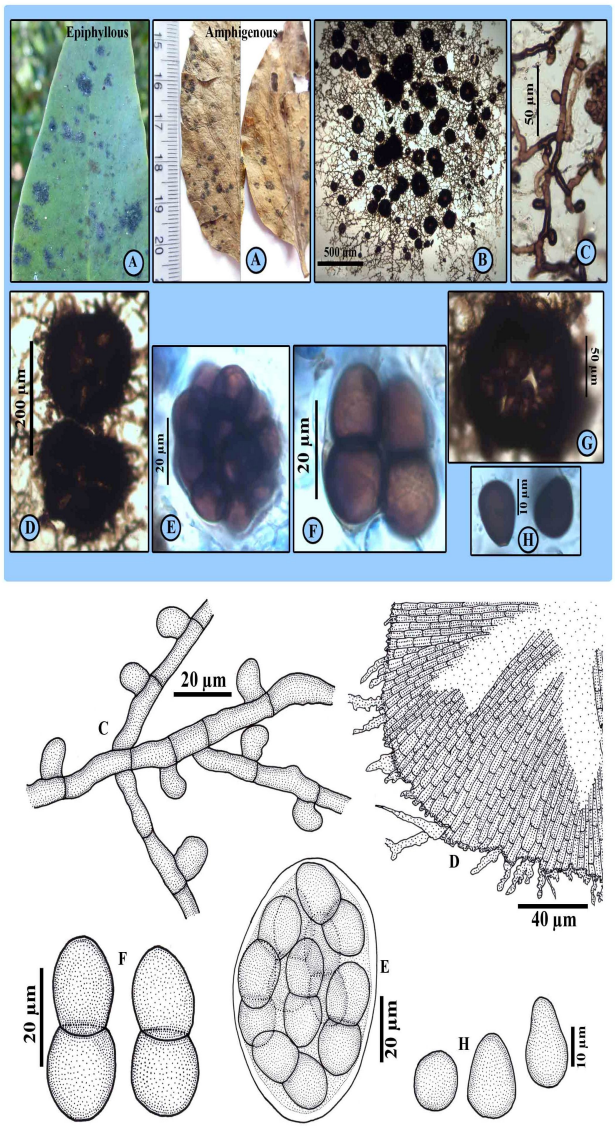

Fig. 1: A–H. *Asterina macrosolenae* (**A)** Infected Leaf (**B)** Mycelial colony with thyriothecia (**C)** Appressoriate mycelium **(D)** Thyriothecium (**E)** Ascus (**F**) Ascospores (**G**) Pycnothyria (H) pycnothyriospores

Table 1 : Comparative account of *Asterina macrosolenae* sp. nov., *A. deightonii* Sydow, and *A. loranthigena* Hosag.

Morpho-taxonomic characters	*Asterina macrosolenae*	*A. deightonii*	*A. loranthigena*
Host Plant	*Macrosolen capitellatus*	*Loranthus* sp., *Helixanthera* sp., *Dendropthoe falcata*	*Dendrophthoe* sp.
Colonies	Amphigenous, up to 4 mm in diam.	Amphigenous, up to 2 mm in diam.	Amphigenous, up to 2 mm in diam.
Hyphae	Undulate to crooked, cells 16–36 × 5–7 µm	Substraight to flexuous, cells 17–21 × 4–5 µm	Flexuous to crooked, cells 22–26 × 4–7 µm
Appressoria	Alternate to unilateral, unicellular, oblong, ovate to clavate, 11–14 × 8–9 µm	Alternate, 1% opposite, unicellular, globose to ovate, 6–10 × 5–7 µm	Alternate to unilateral, often some hyphae devoid of appressoria, unicellular, oblong to clavate, curved to uncinate,12–21 × 6–8 µm
Thyriothecia	Up to 227 µm in diam.	Up to 145 µm in diam.	Up to 200 µm in diam.
Asci	Globose to ovate, 41–71 × 40–57 µm in diam.	Numerous, globose, up to 40 µm in diam.	Few, globose, up to 35 µm in diam.
Ascospores	34–38 × 18 µm, wall smooth	21–23 × 11–13 µm, wall glabrous to minutely echinulate	27–30 × 14–16 µm, wall strongly echinulate
Anamorph	Present	Present	Present

ascospores, and smooth walled ascospores than A. *deightonii* and *A. loranthigena*; presence of anamorph and on different host plant. Therefore, based on the host specificity and above distinguishing characters, the present species is treated as new species (Table 1).

ACKNOWLEDGEMENTS

The authors are thankful to authorities of Maharashtra State Biodiversity Board, Nagpur (M.S.) for granting permission for collection of plant material from study area. Thanks are also due to Prof. S. R. Yadav, Ex-Head, Dept. of Botany, Shivaji University, Kolhapur for providing the micro photography facility; Principal, D. K. A. S. C. College, Ichalkaranji & Krishna Mahavidhyalaya, Shivnagar, Rethare (BK.), Dist. Satara, for providing the laboratory facilities.

REFERENCES

Bhise, M.R., Patil, C.R., Salunkhe, C.B., Kambhar, S.V. 2021. New species of *Asterina* and *Balladyna* (black mildew fungi) from Mahabaleshwar, Maharashtra, India. *Phytotaxa* **511**: 283–288. https://doi.org/ 10.11646/PHYTOTAXA.511.3.7

Deshpande, S., Sharma, B.D., Nayar M.P. 1995. Flora of Mahabaleshwar and Adjoining's, Maharashtra. Calcutta: Botanical Survey of India. Vol. I & II, pp. 776-795.

Farr, D.F., Rossman, A.Y. 2014. Fungal Databases, Systematic Mycology and Microbiology Laboratory, ARS, USDA. http://nt.ars-grin.gov/fungaldatabases/, accessed 13 June 2014.

Hansford, C.G. 1946, The foliicolous Ascomycetes, their parasites and associated fungi. *Mycological Papers.* **15**: 1"240.

Hosagoudar, V.B. 2003. Asterinaceae of India. *Zoos´ Print Journal.* **18**: 1280"1285.

Hosagoudar, V.B. 2010. Anamorphs of Asterinales. *J. Theoret. Exper. Biol.* **6**: 199"211.

Hosagoudar, V.B., Abraham, T.K. 2000. A list of *Asterina* Lev. species based on the literature. *J. Econ. Taxon. Bot.* **24**: 557"587.

Hosagoudar, V.B., Abraham, T.K. Biju, C.K. 2001. Re-evaluation of the family Asterinaceae. *J. Mycopathol. Res.* **39**: 61–63.

Hosagoudar, V.B. 2009. Studies on Foliicolous Fungi – XXVI – a new species and three new records. *J. Threatened Taxa* **1**: 375–377.

Hosagoudar, V.B. 2012.Asterinales of India. *Mycosphere* **2**: 617–852.

Song, B., Li, T.H. Shen, Y.H. 2004. New species of *Asterina* from Guangdong, China. *Mycotaxon*. **90**: 29"34.