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New records of microfungi from Sanjay Gandhi National Park (SGNP), Maharashtra, India,

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ABSTRACT

The paper deals with an account of 3 species of microfungi which are reported as new records to India viz., *Angustimassarina populi* Thambug. & K.D. Hyde 2015; *Natantiella ligneola* (Berk. & Broome) Reblova 2009; *Rhytidhysterion thailadicum* Thambug. & K.D. Hyde 2016.

Key words: Microfungi, New Records, Sanjay Gandhi National Park (SGNP), Maharashtra, India.

INTRODUCTION

Sanjay Gandhi National Park (SGNP) is one of the national parks of Maharashtra which is nestled within the Mumbai Metropolitan Region. The National Park lies between longitude 72°53' to 72°58' E and latitude 19°8' to 19°21' N (Khawarey 2000) and covers 103.09 km² of area spanning over three districts viz., Mumbai Suburbs (towards the south and west), Thane (towards the east) and Palghar (towards the north). The Sanjay Gandhi National Park (SGNP) is one of the few national parks in the world entirely lying within the limits of a bustling metropolis. While working on microfungi biota of SGNP, it was observed that 03 species of microfungi have not earlier been described from India and thus constitute new records for India. Hence, in present paper those 03 species are duly described along with their nomenclature, taxonomic position and distribution.

MATERIALS AND METHODS

The three forest ranges (Tulsi, Krishangiri and Yeoor range) and 10% adjoining areas of the National Park were thoroughly surveyed in different seasons viz., monsoon, post monsoon, winter and summer, to study the diversity of microfungi. Litter samples include dried, decaying plant specimens (wood, logs), infected samples of fallen leaves, twigs and other litter. Global Positioning System (GPS) coordinates of collection locations were also recorded. QGIS 3.14 'Pi' version

was used for plotting GPS data to prepare a survey map showing collection sites visited during the field tours, also plotted on Google Map, given along with range map of SGNP (source: forest authorities), are shown in Fig. 1. The slides showing vegetative, asexual and sexual structures of fungi were observed under Olympus compound microscope model CX-41 and microphotographs were captured with the attached DP22 and DP27 cameras. Fungi belonging to Ascomycetes were identified by Dennis (1978), Pande (2008), Hanlin (1998). Bitunicate ascomycetes were studied with the help of Sivanesan (1983). The isolates were assigned to respective genera and species using aforementioned approaches based on morphology. The recent taxonomic position of fungal taxa was verified from the online databases such as Index fungorum (<http://www.indexfungorum.org>) and Mycobank (<http://www.mycobank.org>).

1. *Angustimassarina populi* Thambugala & K.D. Hyde, Fungal Diversity 74: 254. (2015) **Fig. 2 (A-F)**

Position in classification:

Fungi, Ascomycota, Pezizomycotina,
Dothideomycetes, Pleosporomycetidae, Pleosporales, Amorosiaceae

Ascomata 120–160 µm high 95–132 µm diam. solitary or gregarious, immersed to semi-immersed becoming erumpent, coriaceous, dark brown to black, globose to subglobose, uniloculate,

ostiolate. Ostiole central, cylindrical, and composed of pseudoparenchymatous cells, broad, well-developed, with a pore-like opening or through the cracks of host surface. Peridium composed of several layers of dark brown to lightly pigmented cells of *textura angularis*. Hamathecium comprising septate, branched or unbranched, cellular, pseudoparaphyses, embedded in a gelatinous matrix. Asci, 75–100 × 10–12 µm, 8-spored, bitunicate, fissitunicate, cylindrical to cylindrical-clavate, short pedicellate, rounded at the apex, with an ocular chamber. Ascospores 13–22 × 3–7 uni to tri-seriate, hyaline, becoming ocher brown at

maturity, fusiform to cylindrical, mostly straight, widest at the centre and tapering toward the ends, 1–3-septate, smooth-walled, filled with a different sized guttule per cell and surrounded by a mucilaginous sheath.

Material examined: On Dead stem, Sarjamori, North of Vasai Creek, Yeoor Range [North], SGNP, Palghar Dist., Maharashtra, India, date 20/12/2017, RD, 209262 BSI (WC), Accession no. BSI-F712.

Geographical Distribution: Earlier reported from Italy and China (Wijayawardene et al. 2022).

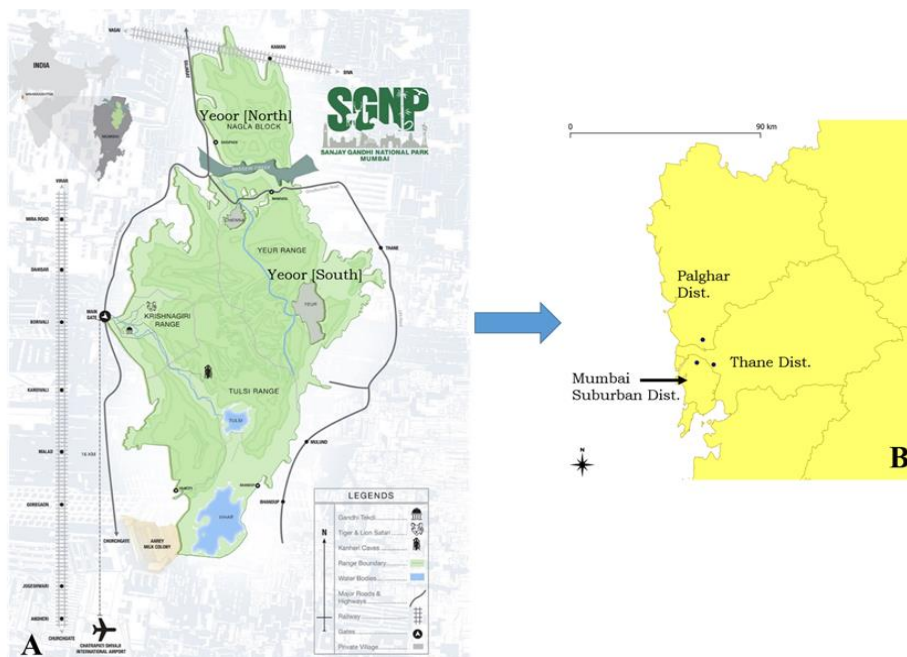


Figure 1. Map of SGNP showing collection locations: A Map of SGNP ranges provided by forest authorities. B. Survey map prepared by plotting GPS of collection locations using QGIS 3.14 'Pi' version

2. *Natantiella ligneola* (Berk. & Broome) Réblová
Mycological Research 113 (9): 996 (2009)

Fig. 2 (G-I)

Synonymy: *Ceratostomella ampullasca* (Cooke)
Sacc., *Sylloge Fungorum* 1: 409 (1882)

Position in classification:

Fungi, *Ascomycota*, *Pezizomycotina*,
Sordariomycetes, *Incertae sedis*, *Incertae sedis*,
Incertae sedis.

Sexual morph: Perithecia nonstromatic, immersed in the substratum, solitary to gregarious, dark brown to black, venter globose to subglobose, 300–400 µm high, 350–500 µm diam, glabrous, with cylindrical neck that may become slightly swollen apically, straight to slightly flexuous, rounded at the top, 400–1200 µm long, 90–120 µm wide. Ostium periphysate. Asci unitunicate, clavate in sporiferous part, ascus apex rounded-truncate with a distinct, shallow, refractive apical annulus, (35–)40–52 µm long in pars sporifera, (8–)9–13 µm wide (broadest

part), stipe 15–45 µm long. Ascospores oblong to ellipsoidal, rounded at the ends, (9–)10–12.5(–14) × 3.5–4 µm hyaline, smooth, aseptate.

Asexual morph: reported

Material examined: Leaf litter, Magar Dam, Krishnagiri Range, SGNP, Mumbai, Maharashtra, India, date 22/01/2017, RD, LL.4, BSI (WC), Accession no. BSI-F768.

Geographical Distribution: Earlier reported from Belgium, Czech Republic, Denmark, Great Britain, Germany and New Zealand (Réblová & Štěpánek 2009).

3. *Rhytidhysterion thailandicum* Thambug. & K.D. Hyde, *Cryptogamie Mycologie* 37 (1): 110 (2016)

Fig. 2 (J-O)

Position in classification:

Fungi, *Ascomycota*, *Pezizomycotina*,
Dothideomycetes, *Incertae sedis*, *Patellariales*,
Patellariaceae.

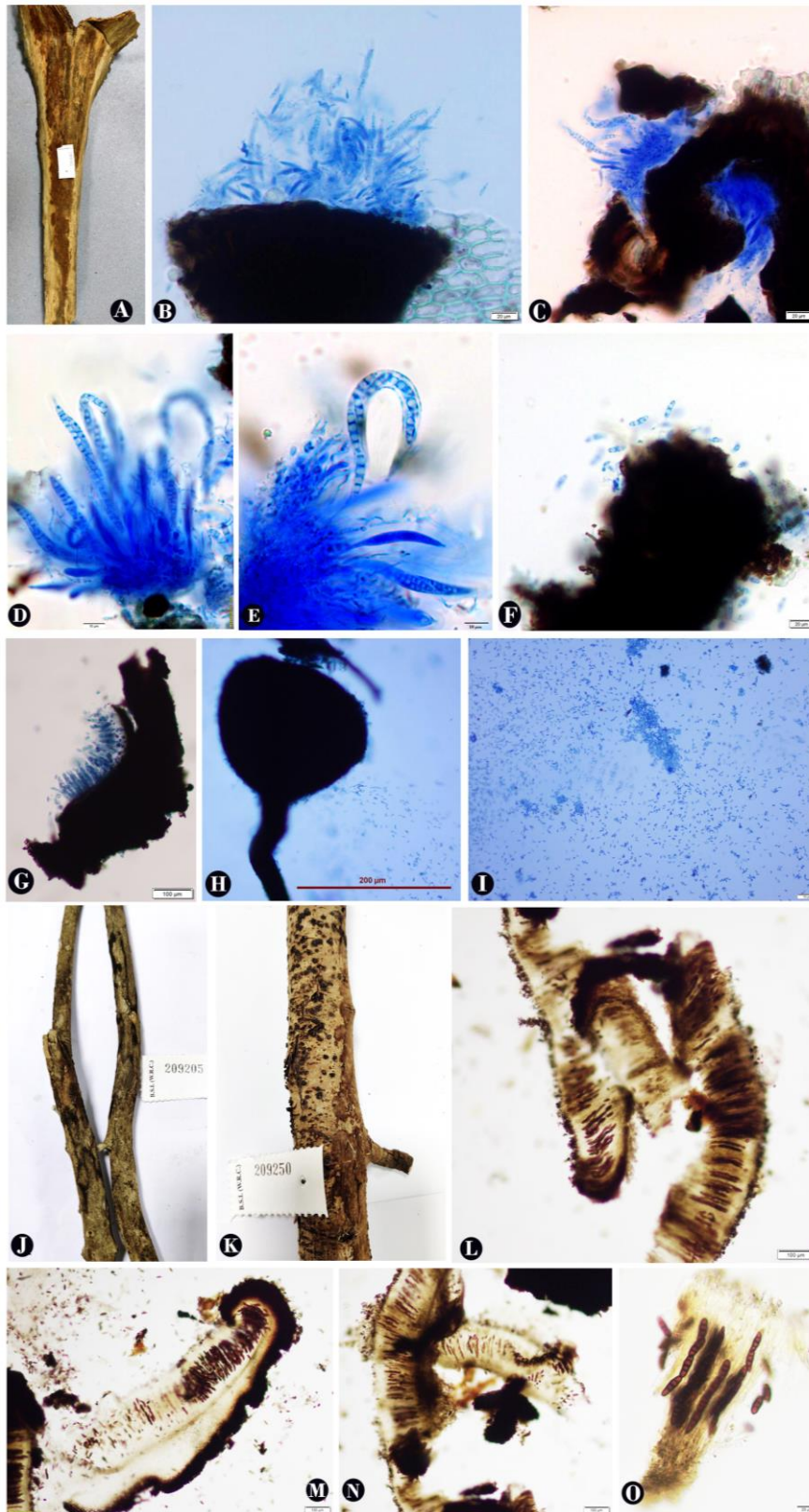


Figure 2. New records of fungi from Sanjay Gandhi National Park: A-F. *Angustimassarina populi*: A. Dead stem; B-C. Ruptured Ascumata with Asci and ascospores; D-E Asci with ascospores; F. Ascospores. G-I. *Natantiella ligneola*: G. Asci and ascospores; H. Pycnidia, I. Pycnidiospores. J-O. *Rhytidhysteron thailandicum*: J-K. Stem litter; L-N Sections of Ascumata; O. Arrangements of ascospores in Asci. Scale bars: B, C, F, O = 20 µm; D, E, I = 10 µm; G, L-N = 100 µm; H = 200 µm.

Sexual morph: Hysterothecia 900–1800 µm long × 300–500 high × 500–1100 µm diameter, arising singly or in small groups. Receptacle cupulate, black, flat or slightly concave, yellowish brown when fresh, with slightly dentate margin. Excipulum 40–70 µm wide, ectal excipulum narrow layered, deep, thick-walled, with black cells of textura globulosa to textura angularis; medullary excipulum composed of narrow, long, thin-walled, hyaline to brown cells of textura angularis. Hamathecium comprising 2–5 µm wide, numerous, paraphyses, exceeding asci in length, apices form a layer on the hymenium to develop the epithecium. Asci 122–150 × 13–16 µm, 8–42 spored, long cylindrical, short pedicellate, rounded at the apex. Ascospores 20–32 × 7.5–10.5 µm, uniseriate, dark brown, ellipsoid with conical ends, regularly 3-septate, smooth-walled, guttulate.

Asexual morph: coelomycetous.

Material examined:

- i. On Dead stems, Panchpakhadi, Yeoor Range [South], SGNP, Thane, Maharashtra, India, date 20/10/2018, RD, 209205 BSI (WC), BSI (WC), Accession no. BSI-F684.
- ii. On wood, Sarjamori Yeoor Range SGNP, Palghar Dist, Maharashtra, India, date 20/12/2017, RD, 209250 BSI (WC), Accession no. BSI-F732.

Geographical Distribution: Earlier reported from Thailand (Thambugala et al. 2016) and China (De Silva et al. 2020).

Discussion: Based on the reviews published (Bilgrami et al 1979 1981, 1991; Jamaluddin 2004; Maheswari et al 2012; Manoharachary et al 2022), it reveals that all 03 species are a new addition to the mycoflora of India.

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