

**Name: Manoj Emanuel Hembrom**

**Designation: Botanist, Central National Herbarium, Howrah.**

**Date of Joining: 28<sup>th</sup> November 2005, as Botanical Assistant at AZRC, Jodhpur Till 30<sup>th</sup> January 2006; 1<sup>st</sup> February 2007-10<sup>th</sup> May 2012, Bot.**

**Assistant at NRC, Dehradun; 12<sup>th</sup> May 2012-till date at CNH**

**Total tenure in BSI:11 years & two months**

**PhD Title: Taxonomic study on the Corticoid fungi of Rajmahal hills, Jharkhand**

**Field of work/ specialization: Macrofungi (Poroid, Corticoid, Hydroid, Clavaroid, Theleporoid , Gasteroid, and certain group of Ascomycota)**

#### **Annual Action Plan**

- 1) Macrofungi of Siwalik Himalaya (submitted)
- 2) Wood rotting fungi of Rajmahal hills, Jharkhand (2013-2017)
- 3) Macrofungi of AJCBIBG, Howrah (2015-2017)



#### **Others :**

**IBRAD Project on Sunderban**

**NGT EIA Project on Rabindra Sarobar, Kolkata**



## Research Contribution

1. Martin, K.P., Zhang, C.L., **Hembrom, M.E.**, Slater, A. & Joseph, M.V. (2008). Adventitious root induction in *Ophiorrhiza prostrata* a tool for the production of camptothecin (an anticancer drug) and rapid propagation. *Plant Biotechnology Reports* **2**: 163–169.
2. **Hembrom, M.E.**, Martin, K.P., Kumar, S.P. & Joseph, M.V. (2006). Rapid in vitro production of true –to-type plants of *Pogostemon heyneanus* through dedifferentiated auxiliary buds. *In vitro Cellular and Developmental Biology Plant* DOI 10:1079.
3. Sehgal D., Sharma J.R. & **Hembrom, M.E.** ( 2008) . A rare polypore from Western Himalaya, Uttarakhand. *Indian Journal of Forestry* **31**(4): 659–660.
4. Das, K., **Hembrom, M.E.**, Parihar, A., (2013). Two Interesting species of stinkhorns from India. *NeBIO* **4**(4): 1–6.
5. **Hembrom, M.E.**, Parihar, A. and Das, K., (2013) . A new species of *Poronia* from India. *Current Research in Environment & Applied Mycology*. **3**(2): 182–185.
6. Parihar, A. & **Hembrom, M.E.** & Das, K. (2013). New Distributional Records of *Ganoderma colossus* (Ganodermataceae) From Jharkhand and Rajasthan. *Indian Journal of Plant Sciences* **2**(4):49–53.
7. Das, K., Parihar, A., **Hembrom, M.E.** (2015) . A New species of *Bondarzewia* from India. *Turkish Journal of Botany* **39**: 128–133.
8. **Hembrom, M.E.**, Parihar, A., Martin, M.P., Watling, R. and Das, K., (2014). First report of *Astraeus odoratus* from India . *Kavaka* **42**: 16–19.



8. **M.E. Hembrom**, Arvind Parihar and Kanad Das. (2014). *Gyrodontium sacchari* (Spreng.) Hjortstam – a new record of wood-inhabiting hydroid fungus from India. *Journal on New Biological Reports* **3**(2):71–74.
9. Kanad Das, **M.E. Hembrom**, Arvind Parihar, Deepa Mishra and J.R. Sharma. (2014). *Strobilomyces polypyraxis* – rediscovery of a wild mushroom from Sikkim, India. *Indian journal of Plant Sciences* **3**(2): 13–18.
10. Arvind Parihar, **M.E. Hembrom** and Kanad Das. (2014). *Borofutus dhakanus* (Boletaceae)-An Addition to Indian Mycobiota. *Nelumbo* **56**: 342–345.
11. Das, K., **Hembrom, M.E.**, Parihar, A. & Zhao, R.L. (2015). A new species of *Cyathus* (Agaricaceae) from India. *Turk. J. Bot.* **40**: 97–103.
12. Das, K., **Hembrom, M.E.**, Dutta, A.K., Parihar, A., Paloi, S. & Acharya, K. (2016). *Ramaria subalpina* (Gomphaceae): a new edible fungus from India. *Phytotaxa* **246** (2): 137–144.
13. **Hembrom, M.E., Parihar, A.**, Das, K. (2016). Three interesting wood rotting macro-fungi from Jharkhand, India. *Journal of Threatened Taxa* **8**(2): 8518–8525.
14. Acharya, K., Das, K., Paloi, S., Dutta, A.K., **Hembrom, M.E.**, Khatua, S. and Parihar, A. (2017). Exploring a novel edible mushroom *Ramaria subalpina*: Chemical characterization and Antioxidant activity. *Pharmacogn J.* **9**(1): 30–34.
15. **Hembrom, M.E.**, Das, K., Nilsson, R.H., **Parihar, A.**, Baghela, A., Mehta, N., Singh, S.K. and Hallenberg, N. (2016). Morphology and phylogeny reveal a novel hydroid taxon from India: *mycorrhapoides stalpersii* gen. and sp. nov. *Nordic Journal of Botany.* **000: 001–010, 2016**, doi: 10.1111/njb.01256, ISSN 1756-1051.
- 16) **Hembrom, M.E.**, Das, K., Adhikari, S., Parihar, A. and Buyck, B. (2016). First report of *Pterygellus* from Rajmahal hills of Jharkhand (India) and its relation to *Craterellus* (Hydnaceae, Cantharellales). (Communicated to Phytotaxa).
- 17) Das, K., **Hembrom, M.E.**, Parihar, A., Adhikari, S. & Nuytinck, J. (2017). Fungal Biodiversity profile. (Communicated to Cryptogamic mycologie)

## Articles in Rajbhasha Hindi

1. **Hembrom, M.E.** & Kumar, B. (2008). *Arabidopsis thaliana*-Padap Jagat ka Drosophila. *Vanaspati Vaani* **18** :121–122.
2. **Hembrom, M.E.** (2010). Siwalik Himalaya ke Brihad Kavakaon ka Singhawalokan. *Vanaspati Vaani* **20** :133–136.
3. Parihar, A. & **Hembrom, M.E.** (2013). Ek Anokhi Prakirya, Spalt. *Vanaspati Vaani* **22**: 117–120 .
4. **Hembrom, M.E.** & Parihar, A. (2013). Prof. Kartar Singh Thind – Ek Kavaka Vigyanii. *Vanaspati Vaani* **22**: 143–144.

## ABSTRACTS

1. **Hembrom, M.E.**, Arvind Parihar & Kanad Das. (2014) Preliminary studies on Wood-rotting and Gasteroid Macrofungi of Rajmahal hills. Proceedings of the National seminar on cryptogamic Botancy, Kalyani University. 2014: 27.
2. Parihar, A., **Hembrom, M.E.** & Kanad Das. (2014) Macro fungal diversity in Kodarma wild life sanctuary. Proceedings of the National seminar on cryptogamic Botancy, Kalyani University. 2014: 23.
3. **Hembrom, M.E.**, Parihar, A. & Das, K. 2016. Wood rotting fungi of Rajmahal hills, Jharkhand. Proceedings of the National Conference on “Challenges and Opportunities in Mycological Research 2016: 98–99
4. **Hembrom, M.E.**, Parihar, A. & Das, K. Hymenophoral diversity among wood-rotting macrofungi of Jharkhand. Proceedings of the International Conference on The green planet: past, present and future 2016: 55.
5. Parihar, A., **Hembrom, M.E.**, & Das, K. A detailed account of woodrotting macrofungi from Koderma wildlife sanctuary. Proceedings of the International Conference on The green planet: past, present and future 2016: 98–99.

**Seminar/Conference/Workshop/Training/Exhibition (only in numbers)**

**(a) National: Attended: FOUR ; Delivered (oral/poster): TWO**

**(b) International: Attended: TWO. ; Delivered (oral/poster): ONE**

**Significant contributions (only in numbers)**

**(a) Novelties: New genus (1)**

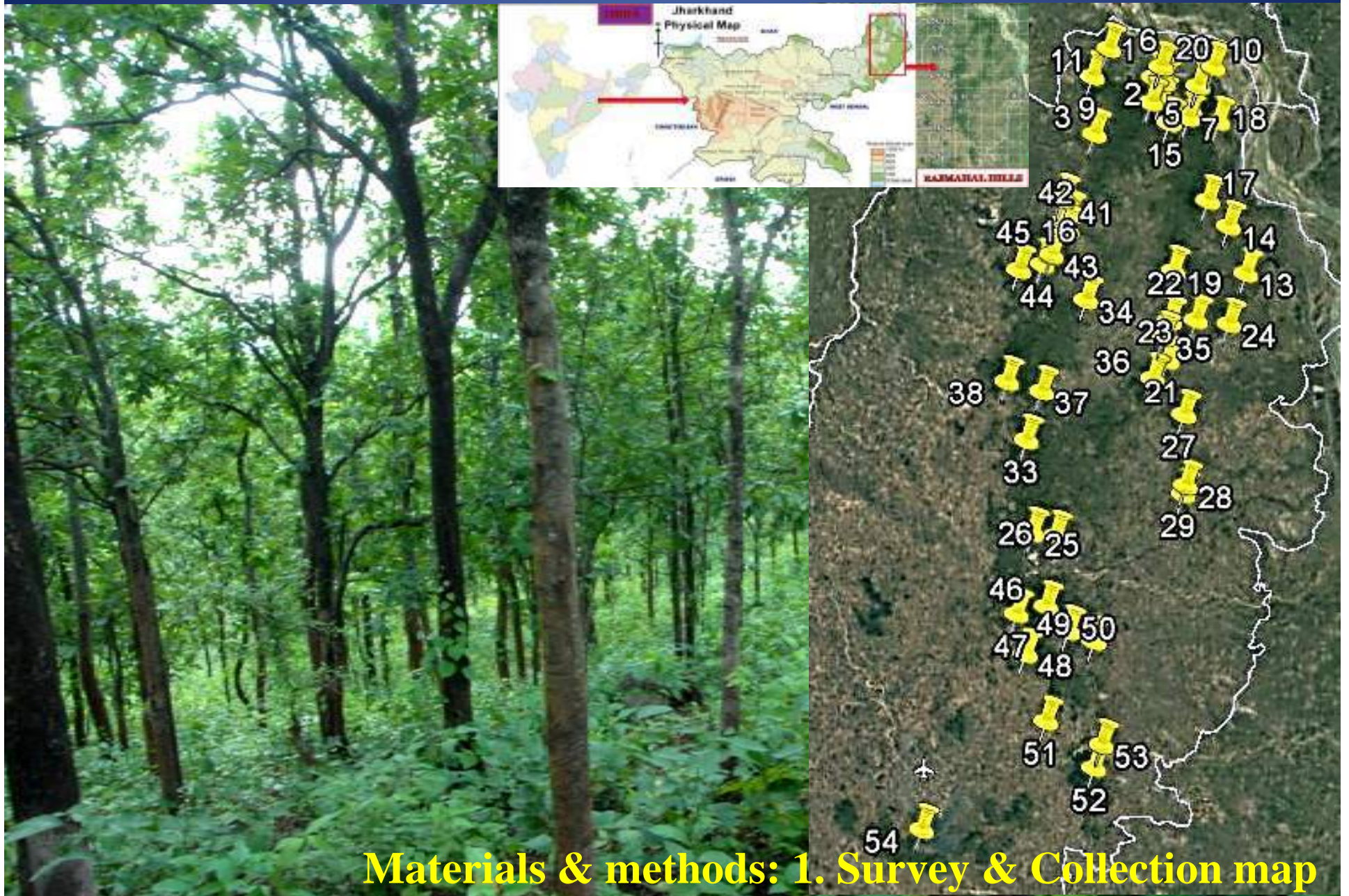
**(b) New species (5+2=7)**

**(b) Rediscoveries (at least after 50 years): One**

**(c) New Reports: (2+3=5)**



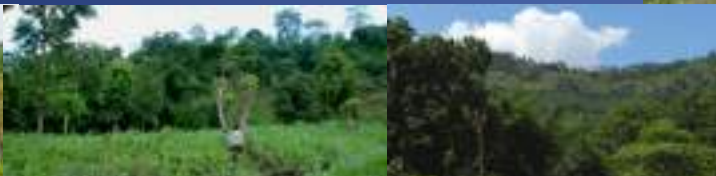
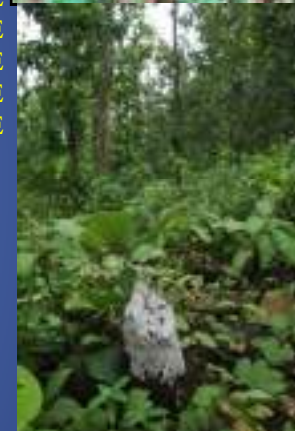
# Wood rotting fungi of Rajmahal hills, Jharkhand



**Materials & methods: 1. Survey & Collection map**

# Materials & methods 1. Survey & Collection of samples from Rajmahal hills, Jharkhand

Survey & Collection site	Altitude	Lat. & Long.	Survey & Collection site	Altitude	Lat. & Long.
1. Sahibganj area	156m	25°24'56.4"N87°64'00.7"E	37. Simlong Amar Bhatta	270m	24°45'42.0"N87°23'36.3"E
2. Chaldhi	208m	25°12'54.0"N87°36'23.3"E	38. Sundarpahari Mate	111m	24°47'11.4"N87°22'37.3"E
3. Bijliya	237m	25°11'15.0"N87°36'32.2"E	39. Bathani -1	111m	24°45'05.5"N87°34'59.8"E
4. Mandro fossil park	137m	25°07'31.2"N87°31'20.2"E	40. Amarpur Puriabandar	394m	25°01'15.8"N87°30'02.8"E
5. Dhogada	318m	25°58'18.4"N87°40'24.1"E	41. Amarpur Karmatanr	193m	24°58'57.1"N87°29'30.6"E
6. Buru Betaona	178m	25°12'44.9"N87°36'34.3"E	42. Amarpur Puriabadar	369m	25°00'07.1"N87°27'49.2"E
7. Pir-Baba	152m	25°10'40.1"N87°40'29.4"E	43. Barakamu	307m	24°55'33.1"N87°26'21.8"E
8. Kairasol	113m	25°09'37.6"N87°40'37.4"E	44. Tatbhitta	307m	24°55'38.7"N87°24'07.1"E
9. Mirzachowki	96m	25°24'10.1"N87°59'00.2"E	45. Bhagwanpur Sunderdam	111m	24°45'05.5"N87°34'59.8"E
10. Morchathan	89m	25°03'28.8"N87°30'01.8"E	46. Kathikund-block,	208m	25°12'54.0"N87°36'23.3"E
11. Karamtola	205m	25°14'18.9"N87°31'27.1"E	47. Kathikund	237m	25°11'15.0"N87°36'32.2"E
12. Sakrigali	168m	24°21'51.7"N87°25'30.6"E	48. Kathikund	137m	25°07'31.2"N87°31'20.2"E
13. Bakudih	63m	24°51'21.2"N87°41'22.3"E	49. Gopikandar	318m	25°58'18.4"N87°40'24.1"E
14. Tinpahar area	96m	24°57'53.4"N87°43'01.1"E	50. Gopikandar	178m	25°12'44.9"N87°36'34.3"E
15. Birbal-Kandor, Kodma	183m	25°10'16.8"N87°39'09.4"E	51. Duarpahari area	152m	25°10'40.1"N87°40'29.4"E
16. Mangra, Lalmatia	108m	25°01'24.2"N87°28'06.4"E	52. Sikaripara-block	113m	25°09'37.6"N87°40'37.4"E
17. Joshkuti, Dalabari	135m	25°02'38.7"N87°39'11.8"E	53. Sikaripara-block	96m	25°24'10.1"N87°59'00.2"E
18. Karanpurato, Taljhari	49m	25°05'04.2"N87°44'09.7"E	54. Masanjor	89m	25°03'28.8"N87°30'01.8"E
19. Phulbhanga, Shivgadi	215m	25°24'51.1"N87°63'41.8"E			
20. Pangro	288m	25°12'41.6"N87°42'29.1"E			
21. Pandanbhitta,	183m	24°48'32.0"N87°38'19.0"E			
22. Chandragoda	182m	24°51'15.8"N87°38'21.3"E			
23. Rangapahar	155m	24°51'24.8"N87°41'13.3"E			
24. Mongladih Sitapahar	112m	24°52'09.7"N87°43'56.3"E			
25. Salaipahari	174m	24°32'11.4"N87°24'10.8"E			
26. Alubera Sundrijola	276m	24°33'46.1"N87°24'17.4"E			
27. Bara Khambipahar, Hiranpur	137m	24°43'03.4"N87°40'06.3"E			
28. Talpahari	76m	24°37'02.2"N87°40'24.3"E			
29. Dhangarha	88m	24°37'07.5"N87°40'42.0"E			
30. Dumurbir	89m	24°39'38.2"N87°34'50.9"E			
31. Amtola Paharia Singarsi	363m	24°38'10.7"N87°28'25.9"E			
32. Dangapara	241m	24°36'55.4"N87°28'35.5"E			
33. Langidih Gora	337m	24°40'02.5"N87°24'36.3"E			
34. Bathani	93m	24°45'45.3"N87°42'04.1"E			
35. Bathani -1	111m	24°45'05.5"N87°34'59.8"E			
36. Bathani -2	305m	24°44'44.3"N87°35'27.8"E			



# Survey, collection, characterization and preservation of Wood rotting fungi belonging to Rajmahal hills, Jharkhand



Handwritten notes detailing the characteristics of a wood rotting fungus. The text includes botanical descriptions such as 'Do to pale bank of bamboo', 'Annual, solitary - caespitose, solitary, sterile, branched with some sub. branched', and 'Flesh of white color gradually 75% from base finally 100% brownish, effluent, heavily and heavily branched, irregularly shaped due to presence of scattered papillae and granules giving base a fine 5-10 mm thick plane internally brown granules'. There are also small diagrams of a circular cross-section and a wedge-shaped piece of wood.

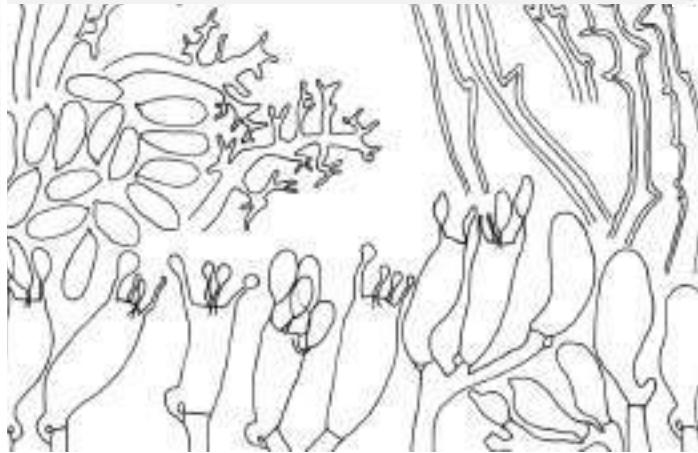
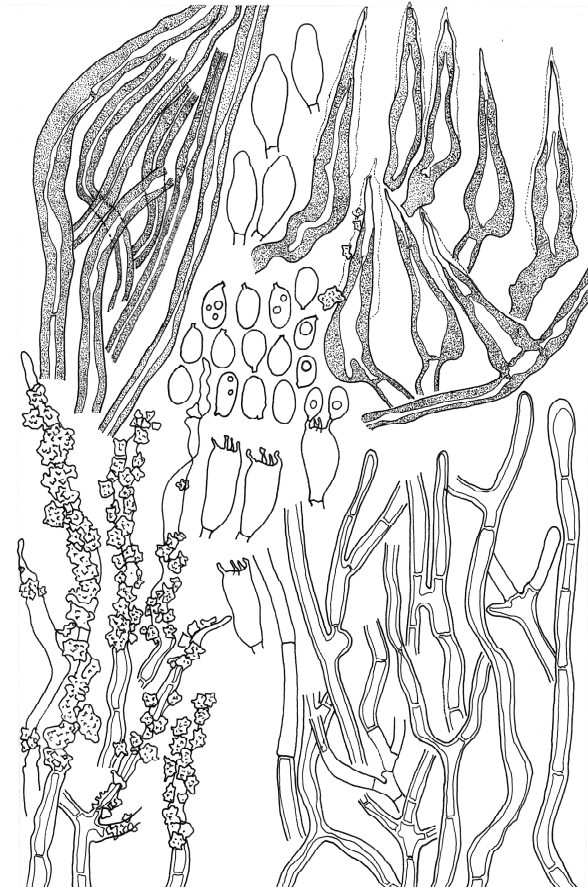
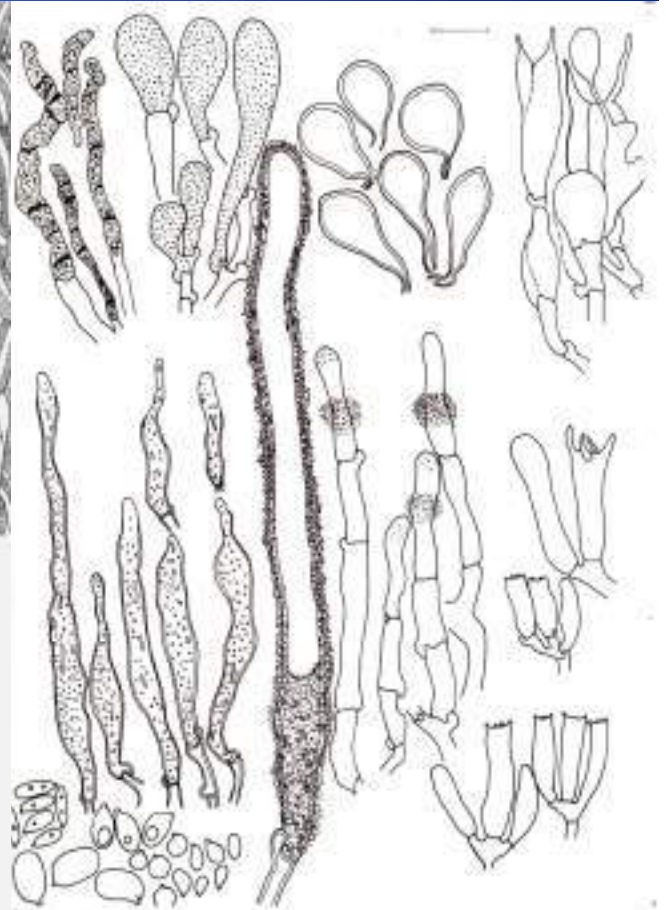
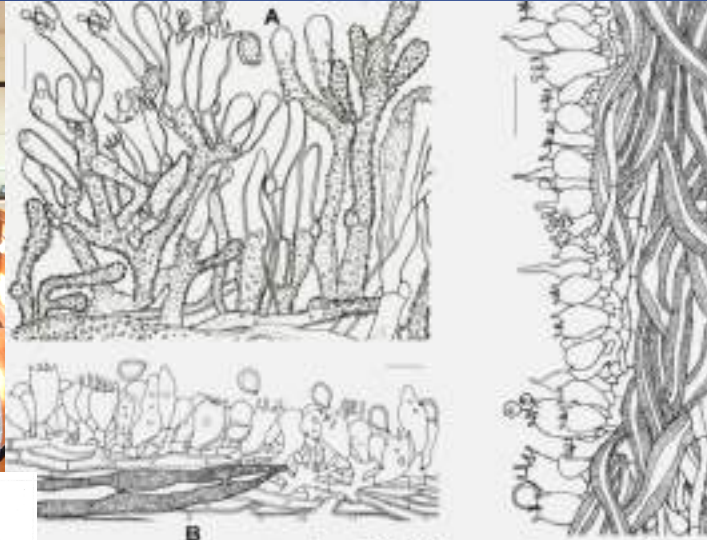


Printed form from the Botanical Survey of India, Central National Herbarium, Howrah. The form contains handwritten data for specimen 66211, including the name 'Rajmahal hills', the genus 'Pestalotia', and the species 'Pestalotia'. It also includes a list of numbers (66212, 66211, 66211, 66211, 66211, 66211) and a date '2014-04-04'.





## Materials & methods 2b. microscopic characterization

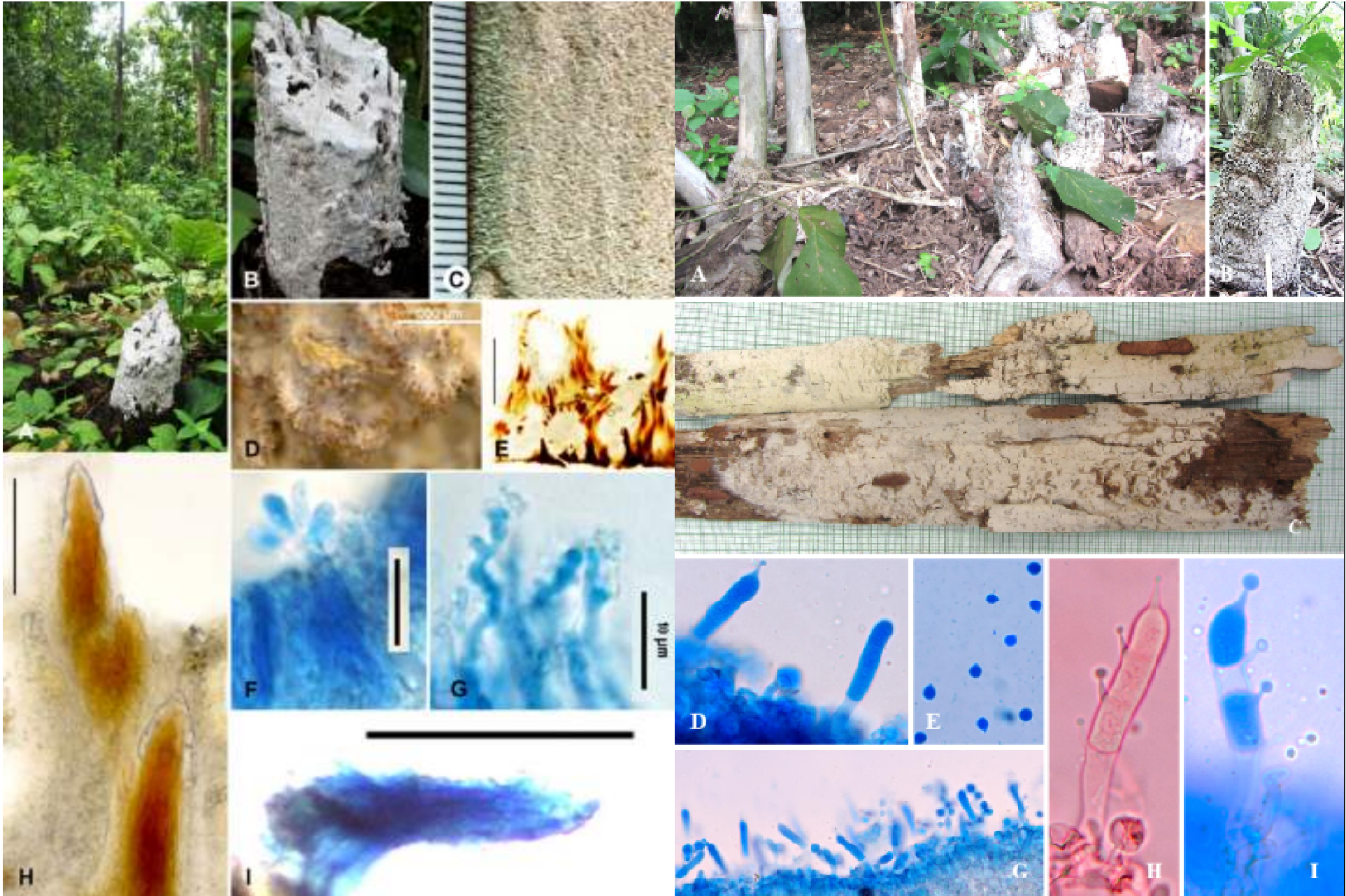




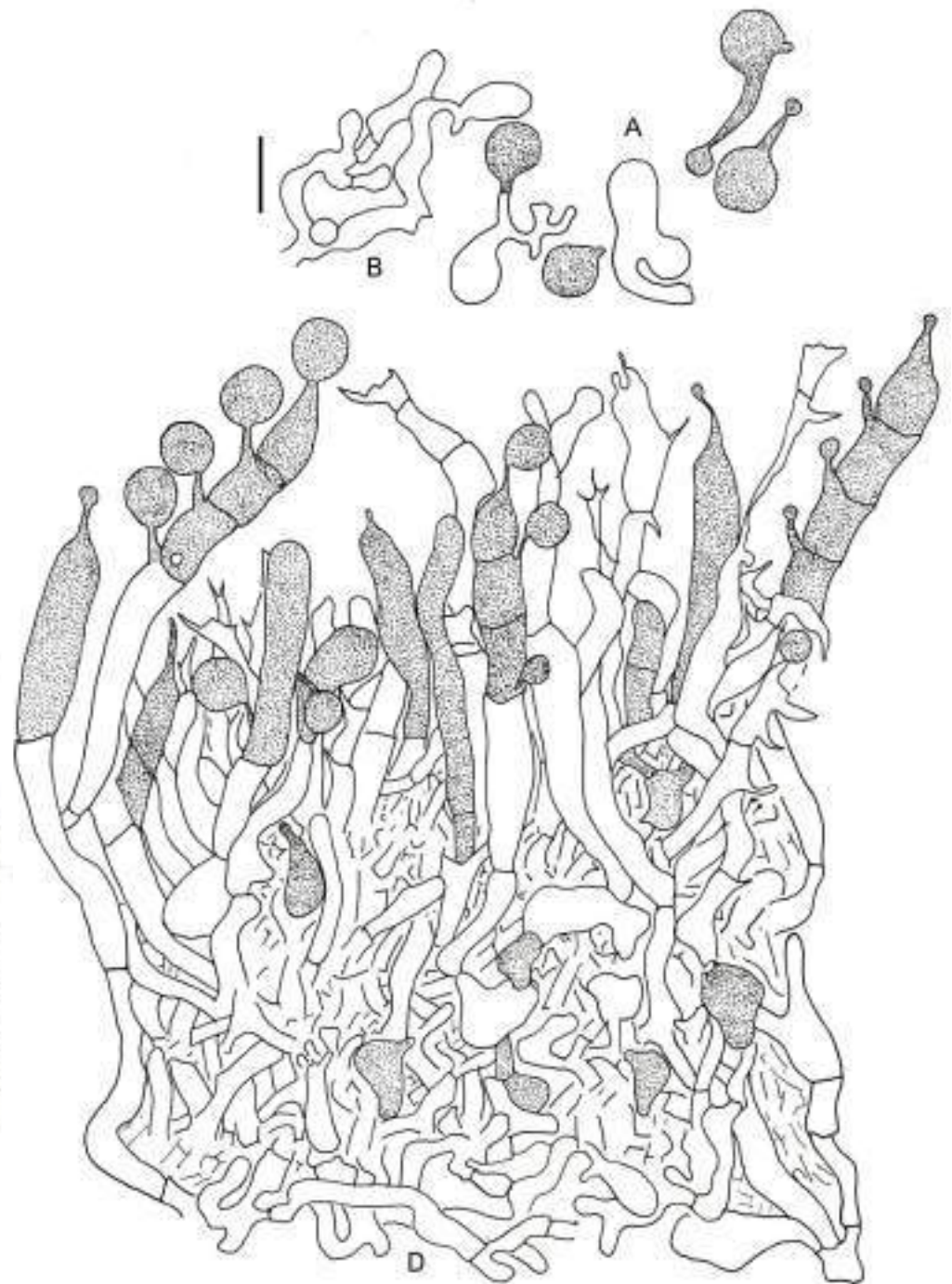
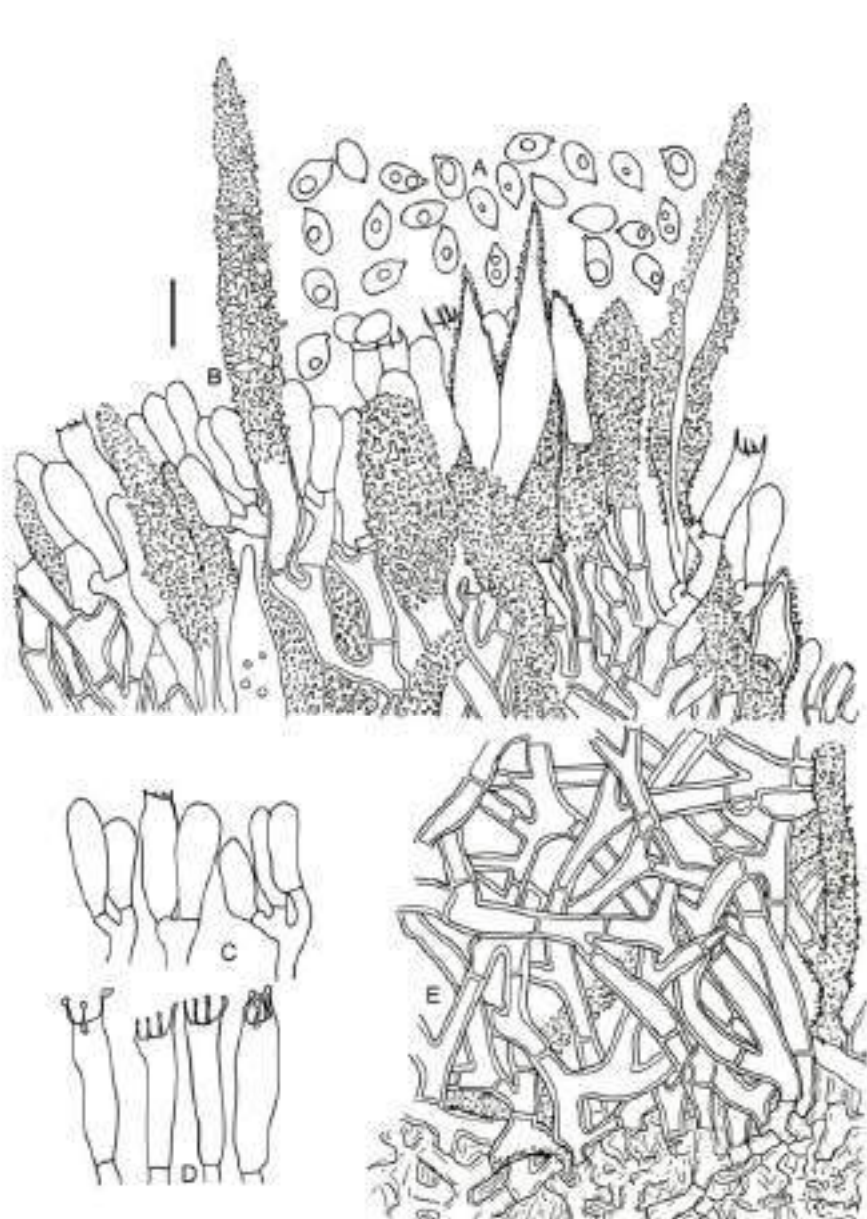
**DD, BSD,  
PUN,  
MUBL,  
CALI, CAL**



**Prof. A. B. De,  
KFRI-Peechi, IARI-  
PUSA**



**Photo plates showing habitat and characteristic morphological features for easy identification**



Characteristic microscopic illustrations

**Grammothele lineata** Berk. & M.A. Curtis, J Linn Soc, Bot 10(no. 46): 327 (1868) [1869]; Figs. 1 & 2

Basidiomata annual, resupinate and widely effused, closely adnate, inseparable, leathery when fresh, turning hard and brittle on drying, without odour or taste when fresh; 50–150 × 15–90 mm or more, up to 1 mm thick, initially appearing as small patch later growing in all direction fusing laterally and forming large basidiomata covering sometimes entire host; margin distinct to indistinct, fertile, pale orange when fresh (6A3) to greyish orange (6B3) when fresh but soon turning to greyish (5A3) to chalky white; pore surface irregularly poroid, partially cracked when dried, chalky white when fresh but gradually turning into bluish grey (21B2–21B3) when dry; Pores 1–5 per mm, angular to irregular in shape, walls often forming irregular plates or teeth-like structure, gradually towards margin fuse to form more or less poroid pattern; dissepiments thin, entire to partially lacerate. Subiculum thin to almost absent, white, white to pink when fresh turning dark and resinous in old specimens. Tubes 0.5–1 mm long, shallow, violet grey (18D2–18C3).

Hyphal system trimitic; generative hyphae clamped, thin-walled, branched; skeletal hyphae moderately to distinctly thick-walled, hyaline to brown. Subiculum generative hyphae 1.5–3 µm wide, interwoven, hyaline; skeletal hyphae 1.5–2 µm wide, thick-walled to solid, agglutinate to form conical shape in subhymenium and hymenium, hyaline to pale brown, dextrinoid. Tramal generative hyphae 1.5–3 µm wide, thin to distinctly thick-walled, interwoven, hyaline; skeletal hyphae 1.5–2.5 µm wide, thick-walled, collected in bundles to form brown coloured hyphal pegs hyaline to brown, cyanophilic, dextrinoid; hyphal pegs 100–300 µm long, conical, few incrusted apically, brown in Melzer's reagent. Dendrohyphidia 15–37 µm long, common, apically infrequently branched, apparently arising at the end of branched generative hyphae along with hyphal pegs, projecting 13–27 µm into the hymenium, hyaline, Basidia 12–17 × 4–6 µm, clavate to cylindrical, clamped at base, 4-sterigmate; sterigmata 3–6 µm long. Basidioles 14–16 × 4–6 µm similar to basidia; fusoid cystidioles 12–14 × 3–4 µm; basidiospores 5–(5.5)–6.6 × 2.4–(2.77)–3 µm, Q= 1.66–(1.97)–2.28, oblong ellipsoid, thin-walled, hyaline, non amyloid.

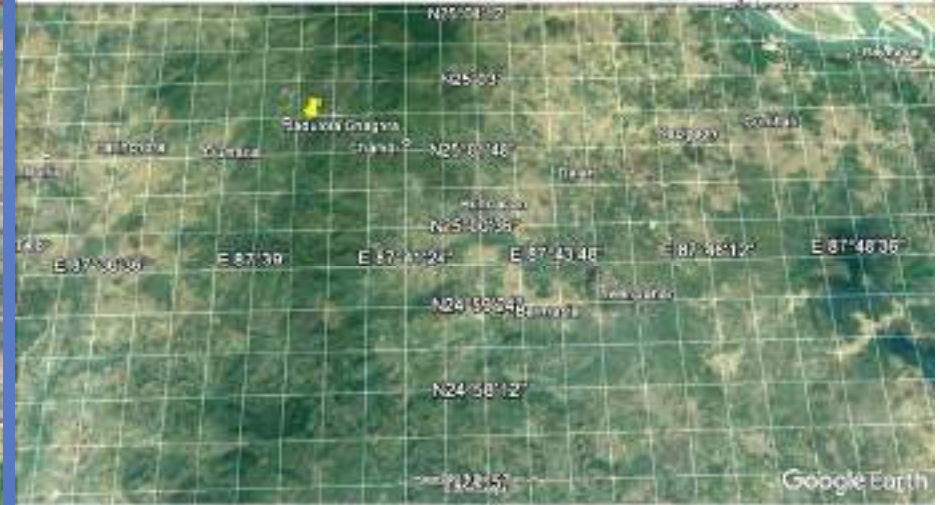
**Habitat and ecology:** Common. Growing on dead cut stump and log of timber yielding and religious angiospermic woods for Santhal & Paharia tribes.

**Distribution:** ASIA; Indonesia<sup>[3 & 20]</sup>, China<sup>[6]</sup>. AFRICA; Ethiopia, Kenya, Tanzania & Malawi<sup>[15]</sup>. S. AMERICA; Brazil<sup>[7]</sup>.

**Specimens examined:** INDIA; Jharkhand, Rajmahal hills, Dumka district, Kathikund block, Mahuadangal forest area, on the fallen cut trunk of *Shorea robusta*, 265 m, 24°22'□37.1'□N 87°24'□16.4'□E, 19<sup>th</sup> October 2015, *M.E. Hembrom*, CAL-69914; *ibid.*, Gariapani to Dumurtola and surrounding forest area, on the dead trunk of *Butea monosperma*, 133 m, 24°24'□27.0'□N 87°29'□47.1'□E, 20<sup>th</sup> October 2015, *M.E. Hembrom*, CAL-69929; *ibid.*, Sahibganj district, Taljhari block, on the cut stump of *Shorea robusta* 133 m, 25°10'□24.8'□N 87°40'□26.8'□E, 31<sup>st</sup> August 2013, *M.E. Hembrom*, CAL-66154.

**Notes:** In the field, *Grammothele lineata* (Polyporaceae) is very distinct from other species within the genus due to partially developed medium sized irregular to incised dentate pores (2–4 per mm), whereas, conical shaped embedded hyphal pages consisting of strongly dextrinoid skeletal hyphae and dendrohyphidia are very distinct. Moreover, relatively smaller basidiospores (4.5–6 × 2–2.5 µm as given by Ryvarde<sup>[14]</sup> & 4.5–6 × 1.5–2.5 µm as in Ryvarde & Johansen<sup>[15]</sup>) clearly distinguishes it from closely allied *G. fuligo* (Berk. & Broome) Ryvarde which is so far reported as host specific to monocots in India (Sharma<sup>[17&18]</sup>) and abroad (Ryvarde<sup>[14]</sup>). All the macro- and micromorphological features are conformity with that of African materials as described and illustrated in details by Ryvarde<sup>[14]</sup> and Ryvarde & Johansen<sup>[15]</sup> except apically incrusted hyphal pegs which are observed in Indian specimens although not yet reported in African counterparts.

# Wood rotting fungi species distributional map in the Rajmahal hills, Jharkhand



***Asterostroma muscicola* (Berk. & M.A. Curtis) Massee**

***Helicoglossa globosa* Chee J. Chen & Oberw.**

# Host range and specificity

## ATHELIACEAE

1. *Athelia decipiens*: *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*

## CONIOPHORACEAE

2. *Coniophora* sp.: *Accacia* sp.

3. *Gyrodontium sacchari*: Bamboos, *Phoenix sylvestris*,

## CYSTOSTEREACEAE

4. *Cystostereum murrayi*: *Shorea robusta*, *Madhuca*

5. *Parvobasidium* sp. : Unidentified wood

## HERICIACEAE

6. *Laxitextum bicolor* : *Anacardium* sp.

## HYDNODONTACEAE

7. *Trechispora mollusca*: *Vitex negundo*, *Bombax cieba*

## HYMENOCHAETACEAE

8. *Hymenochaete conchata*: *Shorea robusta*

9. *Hymenochaete rheicolor*: *Diospyros malabarica*

10. *Hymenochaete rubiginosa* : *Shorea robusta*

11. *Hymenochaete villosa*: *Madhuca longifolia*

12. *Hymenochaete* sp.1: Bamboos

13. *Hymenochaete* sp. 2: Bamboos

14. *Hymenochaete* sp. 3: *Cassia* sp.

## LACHNOCLADIACEAE

15. *Asterostroma muscicola* : *Madhuca longifolia*, *Artocarpus lakoocha*, *Shorea robusta*

16. *Scytinostroma duriusculum* : Bamboos, *Madhuca longifolia*, *Artocarpus lakoocha*

17. *Scytinostroma portentosum* : *Mangifera indica*,

18. *Dichostereum effuscatum* : *Dalbergia sissoo*

## MERULIACEAE

19. *Flavodon flavus*: *Artocarpus lakoocha*, *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*,

20. *Hypochnicium* sp. : *Ficus benghalensis*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*

21. *Mycoacia* sp. : *Shorea robusta*

22. *Metulodontia nivea* : *Mallotus philippensis*, *Mangifera indica*, *Phyllanthus embelica*

23. *Phlebia* sp. : Bamboos

24. *Radulodon subvinosus*: Mimosaceae shrubs

25. *Steccherinum* sp.1: *Artocarpus lakoocha*,

26. *Steccherinum* sp.2: *Mangifera indica*,

27. *Scopuloides* sp. : *Acacia* sp.

## PENIOPHORACEAE

28. *Duportella tristicula*: *Acacia* sp., *Tamarindus* sp., *Diospyros melanoxylon*

29. *Duportella* sp. : *Phyllanthus embelica*

30. *Peniophora cinerea* : *Madhuca longifolia*

31. *Peniophora indica* : *Mangifera indica*

32. *Peniophora lycii* : *Bauhinia* spp., *Bombax cieba*,

## PHANEROCHAETACEAE

33. *Byssomerulius corium*: *Accacia nilotica*

34. *Hjortstamia percomis*: *Aegle marmelos*,

35. *Hjortstamia friesii* : *Artocarpus lakoocha*, *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*

36. *Phanerochaete affinis*: *Artocarpus lakoocha*,

37. *Phanerochaete sordida* : *Artocarpus lakoocha*, *Mangifera indica*,

38. *Phanerochaete* sp. : *Butea monosperma*, *Madhuca longifolia*,

39. *Phlebiopsis flavidoalba*: *Butea monosperma*, *Madhuca longifolia*,

40. *Phlebiopsis crassa* : *Butea monosperma*,

41. *Phlebiopsis ravenelii* : *Butea monosperma*,

42. *Porostereum spadiceum* : *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*

## PHLEOGENACEAE

43. *Helicogloea globosa*: Bamboos, *Syzygium cumini*

## POLYPORACEAE

44. *Epithele* sp. : *Bauhinia* sp.

45. *Grammothele fuligo* : Bamboos, *Phoenix sylvestris*

46. *Grammothele lineata*: *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*

47. *Lopharia papyrina* : *Butea monosperma*, *Madhuca longifolia*, *Mangifera indica*, *Shorea robusta*

## SCHIZOPORACEAE

48. *Hyphodontia* sp. : Bamboos

49. *Kneiffiella flavipora* : , *Terminalia alata*, *T. arjuna*

50. *Schizopora paradoxa* : Bamboos

51. *Xylodon sambuci* : *Alangium* sp.

## SERPULACEAE

52. *Serpula similis* : Bamboos

## XENASMATAACEAE

53. *Xenasma pulverulentum* : unknown wood

## AGARICOMYCETES

54. *Odonticium depauperatum*: Bamboos, unknown wood

## HYMENOCHAETALES

55. *Physodontia lundellii* : Unidentified wood

## POLYPORALES

56. *Obba rivulosa* : , *Terminalia alata*, *T. arjuna*,



## Key to the families

- 1a. Basidiocarps generally gelatinous when fresh .....2
- 1b. Basidiocarps not gelatinous leathery when fresh ..... 4
- 2a. Basidiospores ornamented, basidia neither septate nor forked ..... Xenasmataceae
- 2b. Basidiospores smooth, basidia septate or forked ..... 3
- 3a. Basidia septate ..... Phleogenaceae
- 3b. Basidia forked ..... Auriculariaceae
- 4a. Basidiospores colored ..... 5
- 4b. Basidiospores hyaline..... 6
- 5a. Basidiospores olive brown ..... Coniophoraceae
- 5b. Basidiospores yellowish ..... Serpulaceae
- 6a. Basidiomata showing xanthochoric reaction ..... 7
- 6b. Basidiomata without xanthochoric reaction .....8
- 7a. Basidiospores amyloid ..... Lachnocladiaceae
- 7b. Basidiospores non amyloid ..... Hymenochaetaceae
- Continued.....

## Key to the genera of Meruliaceae

- 1a Generative hyphae clamped.....2
- 1b Generative hyphae simple septate ..... 3
- 2a Hymenophore with interwoven ridge striate and forming pits, reticulate ..... *Merulius*
- 2b Hymenophore toothed .....*Phlebia*
- 3a Hyphal system monomitic.....*Metulodontia*
- 3b Hyphal system dimitic.....4
- ...
- 4a Basidiocarps pinkish; not changing to dark red or reddish brown in KOH .....*Steccherinum*
- 4b Basidiocarps yellow; changing to dark red or reddish brown in KOH ..... *Flavodon*

## Key to the genera of Phanerochaetaceae

- 1a Hymenophore meruloid..... *Byssomerulius*
- 1b Hymenophore smooth, tuberculate to hydroid.....2
- 2a Encrusted cystidia present ..... 3
- 2b Encrusted cystidia absent .....4
- 3a Context dense, subiculum thin, cystidia strongly encrusted..... *Phlebiopsis*
- 3b Not as above.....*Phanerochaete*
- 4a Basidiomata pinkish brown, abhymenial surface absent..... *Hjortstamia*
- 4b. Basidiomata olivaceous brown, abhymenial surface villose ..... *Porostereum*

# Administrative Contribution

**As DDO : Acting DDO, CNH, Howrah**

**As BSI representative : Prepared replies and assisted officers during Inspection\Oral Evidence\Discussion programme for Committee of Parliament on official language in June 2008.**

**Participated as representative member of BSI in State wild life Board meeting chaired by Shree Raghubar Das Chief Minister Jharkhand in December 2016.**

**Technical : Day to day work of Junior Hindi translator at NRC, Dehradun w.e.f. April 2007- April 2012.**

**Preparation of regular reports of RAJBHASHA Hindi Section.**

**Organized regular Quarterly, half yearly and yearly meetings.**

**Organized Hindi PAKHWARA , Workshops and various activities related to RAJBHASHA.**

**Counting and maintenance of herbarium sheets in hall-5.**

**Others: 1) Court cases of NRC, Dehradun**

**2) Organized various sports and cultural activities of NRC as Secretary and Treasurer of Phyton Club, NRC Dehradun.**

**3) Acted as member disposal of CNH old stores materials.**

**4) Archival documents were sorted at Lal Kuthi, AJCBIBG, Howrah.**

**5) GPS & Camera distribution and maintenance of corresponding files & registers at CNH, Howrah w.e.f. April 2014.**

## EXHIBITION

**1) Uttarakhand Herbal Expo -2007 held at Dehradun 16-19 March, 2007**

**2) SUTRA-2014.**

**3) Science Express Barrackpore**



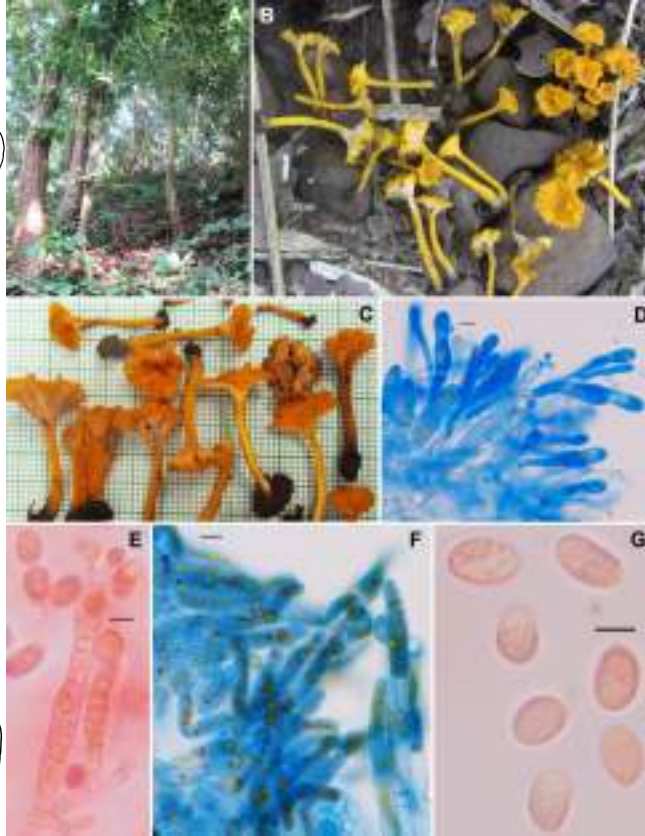
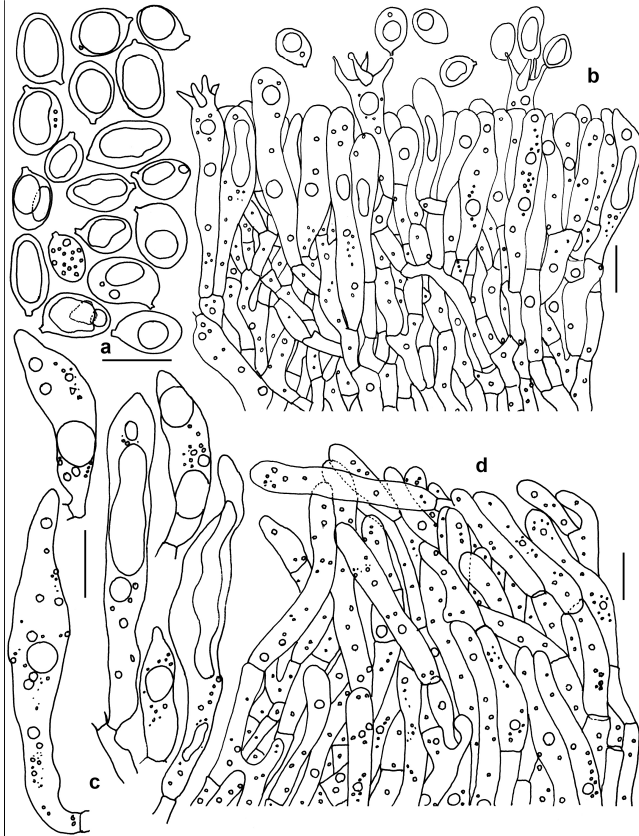


## Future plan



**Taxonomic study on the wood, litters and soil inhabiting Macrofungi in AJCBIBG, Howrah, West Bengal: Characterization of taxa and distribution patterns revealed by fruitbody surveys and molecular screening.**





**THANK YOU**

