Biological Forum – An International Journal **15(5a): 450-455(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Wood-rotting Fungi of Valmiki National Park, Bihar (India)

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(Received: 04 April 2023; Revised: 26 April 2023; Accepted: 03 May 2023; Published: 15 May 2023)
(Published by Research Trend)

ABSTRACT: Survey of surroundings enhances human capabilities to make future strategies for survival and development of society. Forests and its biotic components like flora, fauna and funga has been documented since the evolution of human beings due to dependency on it. Food, medicine and morphological features of funga have attracted human beings in the past and continue to attract even today. Fungi dependent on woods are excellent target for exploring potential resources for the benefit of humans. Here arise the quarries to find out diversity, relationship, pros and cons between plants and fungi. Unfortunately, these quarries are being restricted day by day in the state like Bihar, India due to human interference in the nature. In and around of Valmiki National Park there is high anthropogenic pressure which lead to document the wood-rotting fungi from the surrounding areas for posterity before any kind of genetic erosion will take place. The present communication deals with the enumeration of 136 species of wood rotting fungi representing 02 major phyla under 38 families belonging to 81 genera of Valmiki National Park, Bihar.

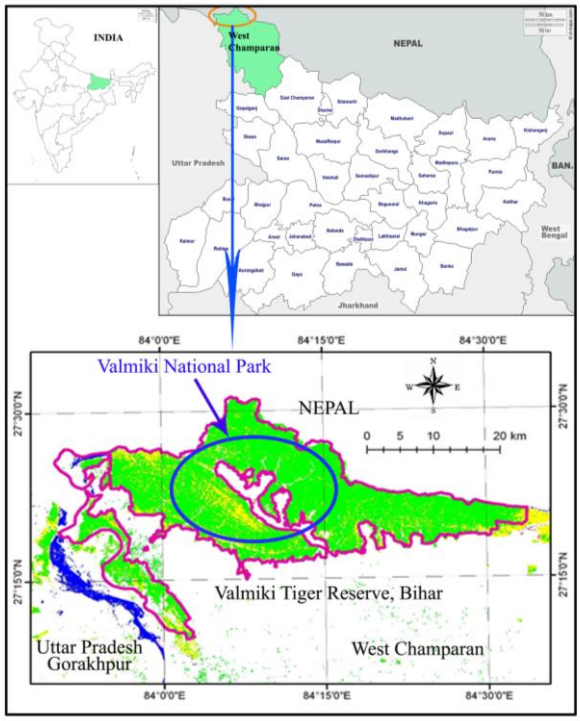
Keywords: Enumeration, Fungi, Taxonomy, Valmiki National Park.

INTRODUCTION

Fungi are beautiful creation of nature closely associated with social life of humans, animals and plants either by welfare or by destructive activities. Recent phylogenetic knowledge of fungi indicates close relationship with animals rather than plants and deserves to be placed under a separate Kingdom 'Fungi'. At present, the Kingdom Fungi is summarized with 07 phyla, 10 subphyla, 36 classes, 12 subclasses and 140 orders (Hibbett *et al*., 2007). Among 07 diverse phyla wood rotting macrofungi are those, in which, fruiting bodies can be observed by naked eyes, growing on trees and shrubs causing their decay for energy requirement and propagation. For layman morphologically they are known by 'mushrooms forms', 'bracketed polypore', 'jelly fungi', 'carbon & cushion fungi', 'stereoid fungi' and less explored crusty 'corticoid fungi'. Taxonomically, they are artificial group based on similar habit and habitat and do not fit under a particular rank.

Valmiki National Park geographically lies in between 83°–50′ & 84°–10′ E longitude and between 27°–10′ & 27°–03′N latitude in the north-western most of West Champaran district of Bihar state in India covering an area of 335.65 sq. Km. (Map) with cliffs, ridges, gorges, hills, streams and valleys; dense forests, open woodlands, grasslands, swamps and riverine fringe. Entire area is a combination of bhabar and terai tracts in which *Shorea robusta*, *Terminalia tomentosa*, *T. belerica*, *Adina cordifolia*, *Miliusa velutina*, *Trewia nudiflora*, *Mallotus philippensis*, *Lagerstroemia parviflora*, *Salmalia malabarica* and *Acacia catechu* (Singh, 2007) are dominant trees and serve as hosts of wood rotting fungi. This protected area is not only famous for conservation of tigers but also for the well protected fauna and flora. Diversity and distribution of wood rotting fungi in this park area is of immense ecological and economic significance because they are directly involved in cycling of minerals by decaying the wood. Besides, causing serious disease to the living trees and rot of the fallen wood, they form staple food for many small organisms playing key roles in the food chain.

This important protected area is not yet surveyed in terms of wood-rotting macrofungi; so, survey, collection, characterization, identification, documentation of wood rotting fungi of Valmiki National Park is very significant. Both Fauna and flora are well explored (Singh, 2007) while fungi being an important element (symbiotic/saprophytic/pathogenic to forest plants) are seldom known from the Valmiki National Park though, highly diversified, ecologically and economically important. Taxonomic studies are of immense importance in terms of forest pathology, trees and timber industries, food and health products, and basic life-science studies. Present taxonomic study is dealing with exploration of diversity and taxonomic study of economically important group of macrofungi responsible for rotting of cultivated and natural tree resource of the National Park.



Map: Map showing location of Valmiki National Park

MATERIAL AND METHODS

Survey and collections: Field trips were undertaken to 3 different forests blocks of Valmiki National Park namely Naurangia, Triveni, Chiutaha, Ganauli, Harnatand, Raghia and Kosil and 300 specimens were collected randomly from different localities during the months of July-October of 2019–2020.

Characterization: Macromorphological characterization were undertaken for all the specimens including field photographs made from fresh fruiting bodies followed by drying of the specimens along with reference collection number. Microscopic characterizations were undertaken with the help of compound light microscope and micromorphological characters were noted.

Identification: As the Valmiki National Park is having similar vegetation pattern with dominancy of *Shorea robusta* as major floristic element and this will be worthy to compare the records of fungi made from Chota Nagpur Plateau (Parihar *et al*., 2019a & 2019b; Parihar 2020) and Rajmahal hills of Jharkhand (Hembrom *et al*., 2015; 2017; Hembrom, 2018; Wang *et al*., 2018; Rossi *et al*., 2020; Buyck *et al*., 2022) followed by Lateritic zones of West Bengal (Pradhan *et al*., 2012; Hembrom *et al*., 2014; Das *et al*., 2020; Thapa *et al*., 2020). De (1996); Pande (2008); Sharma (2012); Das *et al*., 2019 were found suitable manual to identify the member of wood decayers.

Results: This investigation shows 134 species of wood rotting fungi representing 02 major phyla namely Ascomycota and Basidiomycota holding 38 families with 81 genera within the boundaries of Valmiki National Park, Bihar (Plate 1 and 2) and 02 species representing 02 genera have not been assigned any family till date due to lack of taxonomic opinion. This preliminary study will be beneficial for the researchers, students, amateurs, foresters, policy makers, environmentalists in order to undertake conservation and management programmes. Apart from this a few fungal allies (04 species within 03 genera) were also recorded.

PHYLLUM: Ascomycota Caval.-Sm.
Hypoxylaceae DC.
Annulohypoxylon stygium (Lév.) Y.M. Ju, J.D. Rogers & H.M. Hsieh
Biscogniauxia capnodes (Berk.) Y.M. Ju & J.D. Rogers
Daldinia concentrica (Bolton) Ces. & De Not.
Hypoxylon anthochroum Berk. & Broome
Hypoxylon haematostroma Mont.
Hypoxylon rubiginosum (Pers.) Fr.
Xylariaceae Tul. & C. Tul.
Kretzschmaria deusta (Hoffm.) P.M.D. Martin
Xylaria multiplex (Kunze) Fr.
X. polymorpha (Pers.) Grev.
Xylaria sp.1
PHYLLUM: Basidiomycota R.T. Moore
Auriculariaceae Fr.
Auricularia auricula-judae (Bull.) Quél.
Auricularia brasiliana Y.C. Dai & F. Wu
A. delicata (Mont. ex Fr.) Henn.
A. nigricans (Sw.) Birkebak, Looney & Sánchez-García
Exidia recisa (Ditmar) Fr.
Heterochaete delicata Bres.
Dacrymycetaceae J. Schröt.
Dacryopinax spathularia (Schwein.) G.W. Martin
Tremellaceae Fr.
Tremella fuciformis Berk.,
Agaricaceae Chevall
Leucocoprinus cepistipes (Sowerby) Pat.
L. fragilissimus (Berk. & M.A. Curtis) Pat.
L. birnbaumii (Corda) Singer
Bondarzewiaceae Kotl. & Pouzar
Amylosporus campbellii (Berk.) Ryvarden

Plate 1: a. Cellulariella acuta (Berk.) Zmitr. & Malysheva; **b. Earliella scabrosa** (Pers.) Gilb. & Ryvarden; **c. Fulvifomes durissimus** (Lloyd) Bondartseva & S. Herrera; **d. Hymenochaete conchata** L.W. Zhou; **e. Lentinus sajor-caju** (Fr.) Fr.; **f. Phellinus allardii** (Bres.) S. Ahmad; **g. Rigidoporus lineatus** (Pers.) Ryvarden; **h. Tremella fuciformis** Berk.

Callistosporiaceae Vizzini, Consiglio, M. Marchetti & P. Alvarado
Macrocybe gigantea (Massee) Pegler & Lodge
M. pachymeres (Berk. & Broome) Pegler & Lodge
Cerrenaceae Miettinen, Justo & Hibbett
Pseudolagarobasidium subvinosum (Berk. & Broome) Sheng H. Wu
Clavariadelphaceae Corner
Beenakia fuliginosa (Maas Geest.) Parmasto & Ryvarden
Coniophoraceae Ulbr.
Gyrodontium sacchari (Spreng.) Hjortstam
Crepidotaceae (S. Imai) Singer
Crepidotus variabilis (Pers.) P. Kumm.
Ganodermataceae Donk
Ganoderma australe (Fr.) Pat.
G. chalceum (Cooke) Steyaert
G. mediosinense J.D. Zhao
Tomophagus colossus (Fr.) Murrill
Gelatoporiaceae Miettinen, Justo & Hibbett
Obba rivulosa (Berk. & M.A. Curtis) Miettinen & Rajchenb
Gloeophyllaceae Jülich
Gloeophyllum sp.1
Hymenochaetaceae Donk
Coltriciella sp.1
Coltricia sp. 1
Fomitiporia sp. 1
Fulvifomes durissimus (Lloyd) Bondartseva & S. Herrera
F. glaucescens (Petch) Y.C. Dai
Fuscoporia rhabarbarina (Berk.) Groposo, Log.-Leite & Góes-Neto
F. senex (Nees & Mont.) Ghob.-Nejh.
Hymenochaete boddingii Hembrom, A. Parihar, K. Das & A. Ghosh
H. conchata L.W. Zhou
H. sharmae Hembrom, K. Das & A. Parihar
Inonotus pachyphloeus (Pat.) T. Wagner & M. Fisch.
I. rickii (Pat.) D.A. Reid
I. shoreae (Wakef.) Ryvarden
Phellinus allardii (Bres.) Ahmad
P. badius (Cooke) G. Cunn.
P. gilva (Schwein.) Pat.
P. mori Y.C. Dai & B.K. Cui
Phylloporia ribis (Schumach.) Ryvarden
Phylloporia sp. 1
Hymenogastraceae Vittad.
Gymnopileus pampeanus (Speg.) Singer
G. purpureosquamulosus Høil.
Hyphodontiaceae R.T. Moore
Hyphodontia barba-jovis (Bull.) J. Erikss
Incrustoporiaceae Jülich
Skeletocutis albomarginata (Zipp. ex Lév.) Rui Du & Y.C. Dai
Marasmiaceae Roze ex Kühner
Trogia infundibuliformis Berk. & Broome
Meripilaceae Jülich
Rigidoporus microporus (Sw.) Overeem
R. vinctus (Berk.) Ryvarden
Rigidoporus sp. 1
Meruliaceae Rea
Flavodon flavus (Klotzsch) Ryvarden
Pappia fissilis (Berk. & M.A. Curtis) Zmitr.
Phlebia boddingii Hembrom, A. Ghosh, A. Parihar & A.V. Kisku

Phlebia sp. 1
Hyphoderma sp.1
Omphalotaceae Bresinsky
Omphalotus olivascens H.E. Bigelow, O.K. Mill. & Thiers
Panaceae Miettinen, Justo & Hibbett
Panus sp. 1
Panus sp.2
Peniophoraceae Lotsy
Asterostroma muscicola (Berk. & M.A. Curtis) Massee
Duportella tristicula (Berk. & Broome) Reinking
Scytinostroma duriusculum (Berk. & Broome) Donk
S. portentosum (Berk. & M.A. Curtis) Donk
Phanerochaetaceae Jülich
Phanerochaete affinis (Burt) Parmasto
P. laevis (Fr.) J. Erikss. & Ryvarden
P. sordida (P. Karst.) J. Erikss. & Ryvarden
P. velutina (DC.) P. Karst.
Phanerochaete sp.1
Phlebiopsis crassa (Lév.) Floudas & Hibbett
P. flavidoalba (Cooke) Hjortstam
P. friesii (Lév.) Spirin & Miettinen
Porostereum spadiceum (Pers.) Hjortstam & Ryvarden
Rhizochaete rhizomorphosulphurea (B.K. Bakshi & Suj. Singh) Nakasone
Physalacriaceae Corner
Oudemansiella sp.1
Pleurotaceae Kühner
Pleurotus djamor (Rumph. ex Fr.) Boedijn
P. cystidiosus O.K. Mill
P. ostreatus (Jacq.) P. Kumm.
Pluteaceae Kotl. & Pouzar
Pluteus cervinus (Schaeff.) P. Kumm.
Volvariella diplasia (Berk. & Broome) Singer
Podoscyphaceae D.A. Reid
Podoscypha petalodes (Berk.) Boidin
P. venustula (Speg.) D.A. Reid
Polyporaceae Fr. ex Corda
C. telfairii (Klotzsch) Ryvarden
Coriolopsis sp.1
Cellulariella acuta (Berk.) Zmitr. & Malysheva
Earliella scabrosa (Pers.) Gilb. & Ryvarden
Favolus grammocephalus (Berk.) Imazeki
Favolus roseus Lloyd
Funalia floccosa (Jungh.) Zmitr. & Malysheva
F. leonina (Klotzsch) Pat.
Grammothele fuligo (Berk. & Broome) Ryvarden
G. lineata Berk. & M.A. Curtis
Hexagonia apiaria (Pers.) Fr.
Hexagonia tenuis (Fr.) Fr.
Lentinus arcularius (Batsch) Zmitr.
L. sajor-caju (Fr.) Fr.
Lentinus sp1.
Leiotrametes menziesii (Berk.) Welti & Courtec.
L. lactinea (Berk.) Welti & Courtec.
Microporus vernicipes (Berk.) Kuntze
M. xanthopus (Fr.) Kuntze
Microsporus sp.1
Navisporus floccosus (Bres.) Ryvarden
Nigrofomes melanoporus (Mont.) Murrill
Pycnoporus sanguineus (L.) Murill
Trametes apiaria (Pers.) Zmitr., Wasser & Ezhov
T. cingulata Berk
T. elegans (Spreng.) Fr.
T. ellipsospora Ryvarden
T. variegata (Berk.) Zmitr., Wasser & Ezhov
T. vespacea (Pers.) Zmitr., Wasser & Ezhov
Truncospora ochroleuca (Berk.) Pilát
T. tephropora (Mont.) Zmitr.
Psathyrellaceae Vilgalys, Moncalvo & Redhead
Psathyrella sp.1
Pleurocybella sp.
Schizophyllaceae Quél.
Schizophyllum commune Fr.
Schizoporaceae Jülich
Leucophellinus hobsonii (Berk. ex Cooke) Ryvarden
Schizopora paradoxa (Schrad.) Donk
Xylodon flaviporus (Berk. & M.A. Curtis ex Cooke) Riebesehl & Langer
Serpulaceae Jarosch & Bresinsky
Serpula similis (Berk. & Broome) Ginns
Steccherinaceae Parmasto
Junghuhnia rhizomorpha H.S. Yuan & Y.C. Dai
Stereopsidaceae Sjökvist, E. Larss., B.E. Pfeil & K.H. Larss.
Stereopsis dimiticum (Rehill & B.K. Bakshi) Sharma
Vuilleminiaceae Höhn.
Vuilleminia tropica Hembrom, A. Ghosh, A. Parihar & K. Das
Incertae sedis
Cyathus striatus Willd.
Trichaptum byssogenum (Jungh.) Ryvarden
Fungal allies
Arcyria cinerea (Bull.) Pers.
Arcyria denudata (L.) Wettst.
Ceratiomyxa fruticulosa T. Macbr.
Stemonitis fusca Willd.

Plate 2: a. A panoramic view inside Valmiki National Park showing patches of **Truncospora tephropora** (Mont.) Zmitr.; **b. Truncospora tephropora** (Mont.) Zmitr.

DISCUSSION

All together 134 species were gathered from branches, stem or roots of trees and shrubs responsible for decaying of wood either by parasitic or saprophytic mode. Phylum Basidiomycota encompasses Polyporaceae (15 genera with 31 species), Hymenochaetaceae (08 genera with 19 species) and Phanerochaetaceae (04 genera with 10 species) families, were found to be most dominant. Auriculariaceae represents 03 genera followed by Ganodermataceae and Pluteaceae families representing 02 genera each and rest other families represents one genus each. Similarly, Phylum Ascomycota holds Hypoxylaceae (04 genera with 06 species) and Xylariaceae (02 genera with 04 species). Genera like, *Trametes* (06 species) *Phanerochaete* (05 species) *Auricularia* (04 species) and *Phellinus* (04 species) are most speciousus. Second order of diversity was represented by genera like *Ganoderma*, *Hymenochaete*, *Hypoxylon*, *Inonotus*, *Lentinus*, *Leucocoprinus*, *Microporus*, *Phlebiopsis*, *Pleurotus*, *Rigidoporus*, *Coriolopsis*, *Leucocoprinus*, *Phlebiopsis* and *Xylaria* with 3 species each. Remaining genera either represents 02 or 01 species each. Majority of them are appearing during rainy season when moisture is abundant. Though, few draught resistant perennial species remains throughout the years. *Ganoderma australe*, *Cellulariella acuta*, *Earliella scabrosa*, *Flavodon flavus*, *Hymenochaete conchata*, *Microporus xanthopus*, *Schizophyllum commune*, *Scytinostroma duriusculum* and *Truncospora tephropora* were found commonly on various living and dead trees. Decayers like species of *Auricularia* sp., *Dacryopinax spathularia* and *Tremella fuciformis* are moist dependent and their existence were observed followed by rain in the area.

Many wood-rotting macro-fungi does not have specific host choice while *Hymenochaete sharmae*, *Serpula similis*, *Stereopsis dimiticum* grows only on bamboos and *Grammothele fuligo* prefers monocot wood like bamboos and palms. *Phellinus badius* prefers to grow on trees of family Leguminoseae. Similarly, *Fulvifomes durissimus*, *Hymenochaete boddingii*, *Hymenochaete conchata*, *Incrustoporia albomarginata*, *Rhodofomitopsis* sp., *Panus* sp. 2 prefers to flourish on *Shorea robusta* only. Species like *Tomophagus colossus* and *Inonotus rickii* (Anamorphic and Telomorphic forms both) are usually attacking trees planted near road side and along the pathways and thus making these trees prone to high winds which may cause causalities.

So far host specificity is concerned *Phellinus badius* is host specific and confined to the leguminous trees and *Grammothele fuligo* has opted monocotyledonous woods in the entire study areas. Similarly, *Hymenochaete sharmae* and *Serpula similis* were found to attack on the bamboos whereas *Stereopsis dimiticum* is closely associated with decaying roots of it. Species like *Coltriciella* sp.1, *Fulvifomes durissimus*, *Hymenochaete conchata*, *H. boddingii*, *I. shoreae*, *Incrustoporia albomarginata*, *Panus* sp.1, *Rhodofomitopsis* sp.1 and *Tomentella* sp.1 and *Xylaria* sp. 1 are strictly recorded from *Shorea robusta*. Thin branches of *Murraya paniculata* bushes were found infected with *Phylloporia ribis* whereas thin branches are infected with *Phylloporia* sp. 1. Species like *Cyathus striatus*, *Fomitiporia* sp.1 and *Thelphora* sp.1 were collected only once from the area.

Valmiki National Park is having both natural and planted tree species are either naturalized or cultivated were found infested with wood-rotting fungi. Majority of wood-rotting on host wood/trees were found white rot (80%) followed by brown rot (15%) while rest (5%) were with incomplete information where rot could not be determined. These plants are important economic and ecological resources for human society and supporting host for various groups of fungi including wood-rotting macro-fungi which are being studied in the present programme. Species like *Hymenochaete conchata*, *Fulvifomes durissimus*, *Phellinus allardii*, *P. badius*, *Inonotus pachypholeus*, *Leucophellinus hobsonii*, *Fomitiporia* sp.1 and *Truncospora tephropora*, *Rhodofomitopsis* sp.1 are showing perennial growth habit while rest others are annual in nature. Second rank of dominancy is occupied by Mushroom forming wood-rotting fungi in which fertile surface remains gilled. Beautiful mushroom forming short lived, delicate individuals are represented by 08 families 10 genera and 17 species need special attention to collect and preserve for study. Macro-morphologically crust/corticoid groups appear simple and look alike but microscopically they are highly diversified are ranked within 05 families, 08 genera and 10 species in the present study.

Based on occurrence, it may be concluded that wood decaying fungi under phylum Ascomycota are less prominent to attack trees and timbers of Valmiki National Park as they are represented by 02 families (Hypoxylariaceae and Xylariaceae) fallen under genera like (*Annulohypoxylon*, *Biscogniauxia*, *Daldinia*, *Hypoxylon*, *Kretzschmaria* and *Xylaria*) with 10 species. Present work is only of preliminary nature and it gives the partial enumeration of wood-rotting fungi. Further survey, collection, characterization, identification and documentation and researches will definitely reveal many species.

02 Orphan genera *Cyathus* and *Trichaptum* representing one species each with uncertain families (Incertae sedis) were also reported. They need attention to be resolved at the family level under the light of phylogenetic approach.

CONCLUSIONS

136 species belonging to true fungi and while 04 fungi allies were also found to cause decay of wood. True fungi are falling under two major Phyla which represent 37 families and 75 genera. These fungi are either growing on living tree as parasite or growing on dead and decaying wood as saprophyte.

Acknowledgements. Authors are thankful to the Director Botanical Survey of India, Kolkata and Scientist 'E' & HoO, AJCBIBG & CNH, BSI, Howrah for their support and research facilities. MEH is thankful to the PCCF, Bihar and National Park Authorities of VNP and other related forest official for allowing survey and study the wood-rotting fungi.

Conflict of Interest. None.

REFERENCES

Buyck, B., Eyssartier, G., Corrales A., Hembrom, M. E., Das, K., Dima B., Ghosh, A., Noordeloos, M.E., Vila, J., Bellanger, J. M., Krisai-Greilhuber, I., Bizio, E., Adamcikova, K., Hampe, F., Pipenbring, M., Manz, C., Vera M., Parihar, A., Rossi, W., Leonardi, M., Adamcik, S. & Cabon, M. (2022). Fungal Biodiversity Profile 111-120. *Cryptogamie Mycologie*, *43*(2), 23–60.

Das, K., Parihar, A. & Hembrom, M. E. (2019). *Macrofungi of Acharya Jagadish Chandra Bose Indian Botanic Garden*: *A Pictorial Guide*. ENVIS Resource Partner on Biodiversity, Botanical Survey of India, MoEF&CC, Govt. of India, 185pp.

Das, D., Tarafder, E., Bera, M., Roy, A. & Acharya, K. (2020). Contribution to the macromycetes of West Bengal, India: 51–56. *Journal of Threatened Taxa 12*(9), 16110–16122.

De, A. B. (1996). *Polyporaceae of India*. International Book Distributors, Dehradun, 309 pp.

Hembrom, M. E., Parihar, A. & Das, K. (2014). *Gyrodontium sacchari* (Spreng.) Hjortstam — a new record of wood inhabiting hydnoid fungus from India. *Journal on New Biological Reports*, *3*(2), 71–74.

Hembrom, M. E. (2018) Taxonomic studies on Corticoid fungi of Rajmahal hills, Jharkhand, Unpublished Ph.D. thesis, Nadia West Bengal: University of Kalyani.

Hembrom, M. E., Parihar, A. & Das, K. (2015). Three interesting wood rotting macrofungi from Jharkhand (India). *Journal of Threatened Taxa*, *8*(2), 8518–8525.

Hembrom, M. E., Das, K., Parihar, A. & Sengupta, C. (2017). *Hymenochaete conchata* (Hymenochaetaceae), A new record for Indian mycobiota. *Indian Journal of Plant Sciences*, *6*(3), 1–9.

Hibbett, D. S., Binder, M., Bischoff. J. F., Blackwell. M. & Cannon. P. F. (2007). A higher-level phylogenetic classification of the Fungi. *Mycological Research*, *111*, 509–547.

Parihar, A., Das, K., Prasanna, P.V., Rao, Y. V., Padal, S. B. & Hembrom, M.E. (2019a). Inventory of woody and fleshy poroid macrofungi from Koderma wildlife sanctuary, Jharkhand. *Tropical Plant Research*, *6*(3), 452–461.

Parihar, A., Rao, Y. V., Padal, S.B., Das, K. & Hembrom, M. E. (2019b). Taxonomy and diversity of the Genus *Phellinus* Quél. s.s. (Basidiomycota, Hymenochaetaceae) in Koderma wildlife sanctuary, Jharkhand, India. *Tropical Plant Research*, *6*(3), 472–485.

Pande, A. (2008). *Ascomycetes of Peninsular India*. Scientific Publishers, Jodhpur, 584 pp.

Parihar, A. (2020). Taxonomic study on woody and fleshy poroid fungi of Koderma Wild life sanctuary, Jharkhand. Unpublished Ph.D. thesis, Vishakhapattanam: Andhra University.

Pradhan, P., Dutta, A.K., Roy, A., Basu, S. K. & Acharya, K. (2012). Inventory and spatial ecology of macrofungi in the *Shorea robusta* forest ecosystem of lateritic region of West Bengal. *Biodiversity*, *13*(2), 88–99.

Rossi, W., Das, K., Hembrom, M. E., Santamaria, S., Parihar, A., Ghosh, A., Henkel, T.W., Hofstetter, V., Randrianjohany, E., Vizzini, A., Wang, X.H. & Buyck, B. (2020). Fungal Biodiversity Profile 91-100. *Cryptogamie Mycologie*, *41*(4), 69–107.

Sharma, J.R. (2012). *Aphyllophorales of Himalaya*: *Ausriscalpiaceae–Tremellodendropsis*. Botanical Survey of India, Calcutta, 617 pp.

Singh, R. K. (2007). Floristic wealth of Valmiki National Park, Bihar-An Overview. Indian *Journal of Forestry 30*(2), 159–166.

Thapa, A., Saha, R., Tamang J., Das, D., Roy, A. & Acharya, K. (2020). Contribution to the macromycetes of West Bengal, India: 40-50. *J. Botan. Soc. Bengal*, *74*(2), 105–118.

Wang, X.A., Das, K., Joel Horman, J., Vladimir Antonin, V., Baghela, A., Chakraborty, D., Hembrom, M.E., Nakasone, K., Ortiz-Santana, B., Vizzini, A., Valérie Hofstetter, V. & Buyck, B. (2018). Fungal Biodiversity Profiles 51–60. *Cryptogamie Mycologie*, *39*(2), 211–257.

How to cite this article: Manoj Emanuel Hembrom, Arvind Parihar and S.P. Panda (2023). Wood-rotting Fungi of Valmiki National Park, Bihar (India). *Biological Forum – An International Journal*, *15*(5a): 450-455.