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# Saprobic Fungi in Sal Forests of Santhal Pargana, Jharkhand: A Field Ecological Note

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## ABSTRACT

Decomposer fungi are routinely cited as important for nutrient cycling in tropical forests, yet for many landscapes this importance rests on inference rather than direct, site-level documentation. The tribal upland forests of Santhal Pargana, Jharkhand, are one such gap. This note reports field observations of saprobic fungal activity recorded across the Sal-dominated (*Shorea robusta*) forests of the Poreyahat region of Godda district and the Thengimo Hills of Dumka district, gathered between December 2025 and January 2026. At Pindra Van, three decaying Sal logs at varying stages of decay supported a combined total of approximately twelve fan-shaped sporocarps arranged in three discrete clusters; their laterally attached, sessile, fan-like fruiting bodies and tomentose upper surface were consistent in the field with the splitgill fungus *Schizophyllum commune* Fr., a cosmopolitan white-rot basidiomycete known for unusual desiccation tolerance among wood-decay fungi. A separate, unidentified macrofungal sporocarp was tracked across repeat visits over eight days in a leaf-litter microhabitat at Thengimo Hills, persisting through a short dry spell that would ordinarily be expected to limit fruiting-body survival. Ant traffic was repeatedly observed moving across and around the decaying substrate at Pindra Van, consistent with the kind of fungus-invertebrate association reported from other wood-decay systems. Taken together, these observations are presented not as a definitive species inventory but as a baseline record establishing that active lignicolous and litter-associated fungal decomposition is occurring in a landscape where it has previously gone undocumented.

**Key Words -** Saprobic fungi, Sal Forest, *Schizophyllum commune*, wood decay, decomposition ecology, Jharkhand, dry deciduous forest

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## INTRODUCTION

Fungi occupy a peculiar position in forest ecosystems: they are rarely the organisms a casual observer notices, yet they govern much of what determines whether a forest floor accumulates litter indefinitely or releases it back into circulation as available nutrients. Saprobic fungi achieve this through extracellular enzymatic digestion of structural plant polymers cellulose, hemicellulose, and lignin a metabolic capability that very few other organisms possess in comparable efficiency.

In tropical and subtropical dry deciduous systems, this fungal activity is concentrated around two pulses: the heavy post-monsoon leaf fall and the gradual accumulation of woody debris from natural treefall and branch shedding. Sal-dominated forests, structured around *Shorea robusta* Gaertn., are among the most extensive forest formations in the Chota Nagpur and Santhal Pargana plateaus, and the decomposer guilds operating within them directly influence how quickly nutrients locked in Sal litter and deadwood become available to regenerating saplings and understorey vegetation.

Despite this functional importance, fungal ecology in Santhal Pargana has received almost no dedicated field attention. Ecological work in this part of Jharkhand has tended to prioritise charismatic or economically relevant taxa trees, mammals, and ethnobotanically useful plants leaving the decomposer community essentially undescribed at the landscape level. This is not unique to Jharkhand; decomposer fungi are persistently undersampled across the wider eastern Indian plateau region relative to their ecological footprint.

The present note addresses this gap in a deliberately modest way. Rather than attempting a taxonomic survey, it documents what was directly observed during ongoing conservation-linked fieldwork: where lignicolous fungal colonization was found, what it looked like, how persistent it was, and what it was associated with. The intention is to establish a citable baseline rather than a comprehensive account, on the understanding that even incomplete field records have value in landscapes with no prior documentation.

**Study Area**

Observations were made within Sal-dominated forest landscapes near the Poreyahat region of Godda district, Jharkhand (24.5986° N, 87.3240° E), focusing on the Pindra Van forest tract, together with associated upland forest patches in Dumka district. Both sites lie within the Santhal Pargana plateau, a landscape of low lateritic hills and shallow black soils that forms the eastern margin of the Chota Nagpur plateau system.

The forest type is classified as tropical dry deciduous, with *Shorea robusta* (Sal, locally Sakua) as the dominant canopy species. Annual rainfall in the region falls within the range of approximately 1400–1600 mm, concentrated almost entirely in the southwest monsoon months. Mean elevation across the study landscape is close to 150 m above mean sea level. Ambient temperatures recorded during the field visits ranged between 26 and 27.5 °C, typical of the post-monsoon to early winter transition during which most observations were made.

Soils are shallow and lateritic, with exposed gravelly patches interspersed among areas of darker, organic-rich black soil beneath a denser canopy. Leaf litter accumulates unevenly across the landscape, thickest beneath closed-canopy stands and comparatively sparse on the more exposed lateritic exposures. This patchiness in litter depth and soil moisture retention is itself ecologically relevant, since it determines where microclimatic conditions remain favourable for fungal fruiting body persistence even as the broader landscape dries out through the winter months.

Structurally, the forest combines mature Sal stands with regenerating saplings, a sparse-to-moderate shrub understorey, and a forest floor littered with fallen branches and partially decomposed logs at various stages along the decay continuum. This heterogeneity in deadwood condition from freshly fallen branches to logs reduced almost to soil-incorporated humus provides a range of substrate conditions for different decomposer guilds, of which the present observations capture only a narrow slice.

**MATERIALS & METHODS**

Field data were gathered through repeated exploratory surveys within Sal-dominated forest tracts of Godda and Dumka districts, beginning in December 2025 and continuing as part of ongoing landscape-level ecological monitoring conducted by the author in the same forest region. Surveys were opportunistic rather than transect-based, reflecting the exploratory, baseline-establishing intent of this note rather than a quantitative assessment of diversity. At each site, the following were specifically recorded:

1. Presence, number, and clustering pattern of fungal sporocarps on dead woody substrates
2. Macrofungal emergence from leaf-litter microhabitats
3. Substrate decay condition, scored qualitatively against the Maser and Trappe (1984) decay-class scheme commonly used in coarse woody debris studies
4. Persistence of individual sporocarps across repeat visits, where access permitted
5. Co-occurring invertebrate activity on or adjacent to colonized substrates

At Pindra Van, three decaying *Shorea robusta* logs bearing visible fungal growth were examined in detail, yielding a combined count of approximately twelve sporocarps distributed across three spatially discrete clusters. At Thengimo Hills, a single sporocarp emerging from a leaf-litter microhabitat was located and revisited across repeat field trips spanning eight days, allowing a basic assessment of its persistence under fluctuating moisture conditions.

Photographic documentation was carried out using a Canon EOS R10 with supplementary mobile photography (iPhone 16 Pro Max) for habitat-scale and contextual images. For each fungal observation, photographs captured the dorsal and, where the specimen permitted handling without damage, ventral fruiting body surface, substrate type, decay condition, and the surrounding microhabitat.

Field identification relied on macroscopic morphological features sporocarp shape, attachment, surface texture, coloration, and clustering behaviour interpreted against published descriptions of common lignicolous basidiomycetes. No specimens were subjected to laboratory microscopy, spore-print analysis, or molecular sequencing; consequently, all species-level assignments in this note are explicitly probable identifications based on field morphology alone, not confirmed determinations.

No destructive sampling or permanent specimen removal was undertaken. One sporocarp was briefly detached from its substrate for close-range photographic documentation and was not retained.

## RESULTS & DISCUSSION

### Forest Habitat Characteristics

Both study sites were dominated by mature and regenerating *Shorea robusta* stands with a moderately open canopy and substantial dry-litter accumulation across the forest floor. Exposed lateritic patches alternated with pockets of shallow black soil, particularly along slope breaks and beneath denser canopy cover.

Coarse woody debris was present in varying quantities at both sites, ranging from recently fallen, bark-intact branches to logs reduced to a friable, soil-incorporated state. This range in decay condition is consistent with continuous, rather than seasonally synchronized, deadwood input unsurprising given that Sal forests shed branches and occasional whole trees through a combination of wind events, senescence, and seasonal water stress rather than through a single discrete disturbance event.

Despite the generally dry character of the landscape during the observation period, shaded microzones beneath leaf litter and within partially buried logs retained perceptibly higher moisture than the surrounding exposed soil. These microzones appear to function as the principal refugia sustaining fungal activity through the drier months, a pattern broadly consistent with how moisture-limited tropical dry forests are known to concentrate decomposer activity into discrete microhabitats rather than distributing it evenly across the forest floor.

### Lignicolous Fungal Colonization on Woody Substrates

At Pindra Van, three decaying Sal logs at intermediate-to-advanced decay stages (approximately corresponding to decay classes III–IV of the Maser and Trappe scheme) carried a combined total of around twelve sporocarps, grouped into three discrete clusters rather than distributed singly. Each fruiting body was sessile, laterally attached, and fan- to shell-shaped, with a finely tomentose,

**Table 1. Summary of fungal field observations from Sal-dominated forest ecosystems of Santhal Pargana, Jharkhand.**

| Site | Period | Substrates examined | Sporocarps recorded | Decay class | Probable identity |
|---|---|---|---|---|---|
| Pindra Van, Godda district | Dec 2025–ongoing | 3 decaying Sal logs | ~12 fan-shaped sporocarps in 3 discrete clusters | Class III–IV (Maser & Trappe) | Morphologically consistent with *Schizophyllum commune* |
| Thengimo Hills, Dumka district | Jan 2026 (repeat visits over 8 days) | Leaf-litter microhabitat, single locus | 1 sporocarp persisted across repeat visits | Not applicable | Unidentified macro fungus |

greyish-white upper surface and gilled undersurface radiating from the point of attachment, a combination of features that, in the field, is most consistent with *Schizophyllum commune* Fr., a species whose fan-shaped, split-gilled fruiting body is one of the more field-recognisable forms among lignicolous basidiomycetes.

This identification is offered cautiously. *Schizophyllum commune* is notable among wood-decay fungi for an unusually broad ecological tolerance: it is one of the few basidiomycetes capable of surviving repeated desiccation and rehydration cycles, with its gills curling inward (the trait from which the genus name derives) to limit water loss during dry periods before reopening once moisture returns. This physiological tolerance plausibly explains why clustered fruiting persisted on these logs through a period when the surrounding leaf litter had visibly dried out, though confirming the identification would require spore-print examination or sequencing of the ITS region, neither of which was undertaken here.

The largest single sporocarp recorded showed clearly developed lamellar tissue and substantial radial growth, suggesting an extended period of uninterrupted development rather than a single recent flush, consistent with the idea that this fungus was established on the substrate well before the observation period began rather than representing a transient post-rain fruiting event.

Decaying Sal wood of this kind represents a substrate dominated by structural lignocellulose: roughly comparable proportions of cellulose, hemicellulose, and lignin bound into a recalcitrant matrix that few organisms outside the fungal kingdom can degrade efficiently. White-rot fungi, the functional group to which *Schizophyllum* belongs, are distinguished from brown-rot fungi precisely by their capacity to degrade lignin itself rather than leaving it behind as a residual brown, cubically-fractured mass; this is achieved through extracellular ligninolytic enzymes, laccases and peroxidases, that oxidise lignin's phenolic structure (Kirk and Farrell, 1987; Schwarze *et al.*, 2000). The practical consequence for forest nutrient cycling is that white-rot activity releases a more complete suite of carbon and associated nutrients back into circulation than brown-rot decay alone would, with corresponding implications for soil carbon turnover at the stand level (Boddy and Watkinson, 1995).

Wood decay of this kind is rarely a static process. As decay progresses through successive stages, the fungal community occupying a given log typically changes in composition, with early colonisers giving way to later-stage decomposers as substrate chemistry shifts, a successional pattern well documented in temperate systems but considerably less studied for Indian dry deciduous forests. The clustering of sporocarps observed here, on logs already at an intermediate-to-advanced decay stage rather than on freshly fallen wood, is consistent with this fungus occupying a mid-to-late position in that successional sequence rather than being a true primary coloniser.

**Macrofungal Emergence from Leaf-Litter Microhabitats**

At Thengimo Hills, a single macrofungal sporocarp was located emerging from a leaf-litter microhabitat beneath mixed Sal-dominated vegetation, in a setting of shaded understorey, moist decomposing organic matter, and partially compacted litter. This individual was revisited across repeat field trips over an eight-day window.

The sporocarp persisted across this period, including through a short interval of drier conditions during which surface litter elsewhere in the same patch visibly dried and curled. Its survival through this interval suggests that the specific microhabitat at the point of emergence, likely buffered by the insulating effect of overlying litter and the moisture-retentive capacity of partially decomposed organic matter beneath it, remained more hydrically stable than the surrounding litter surface generally.

This pattern reinforces a broader point about litter-layer decomposer ecology in seasonally dry systems: bulk measures of forest 'dryness' during the post-monsoon transition can obscure considerable fine-scale moisture heterogeneity, and it is this heterogeneity, rather than average conditions, that most directly determines where fungal fruiting can be sustained (Lodge, 1997; Dix and Webster, 1995).

No conclusive field identification could be reached for this specimen; its general morphology did not correspond closely enough to readily recognisable field taxa to justify even a provisional genus-level assignment, and it is reported here as an unidentified macrofungus pending future examination.

**Multi-Trophic Ecological Interaction**

Ant activity was observed repeatedly on and around the colonized Sal logs at Pindra Van, with individuals moving across the fungal-bearing surfaces and the adjacent bark on multiple visits. While no direct feeding interaction between the ants and the fungal tissue was observed, the consistency of this association across visits is suggestive of a more than incidental relationship.

Fungal decay physically alters its substrate in ways that are ecologically relevant well beyond the fungus itself: enzymatic breakdown of lignocellulose softens wood texture, increases porosity, and creates galleries and surface irregularities that can facilitate movement and nesting access for wood-associated invertebrates. Saproxylic insect communities, species dependent at some life stage on dead or decaying wood, are known from other tropical systems to track fungal decay progression closely, often colonizing logs preferentially once fungal softening has progressed past an initial threshold.

The ant activity recorded here is consistent with this general pattern of decomposer-mediated habitat facilitation, though the observational design of this study cannot distinguish whether the ants were using the fungal fruiting bodies themselves, the softened wood beneath them, or simply transiting the area for unrelated reasons. This ambiguity is itself worth noting as a specific, answerable question for future, more targeted field observation at this site.

**Ecological Significance in Sal-Dominated Forests**

Sal-dominated forests of the Santhal Pargana plateau are not static structures; they are systems in which the rate of nutrient return from litter and deadwood to available soil nutrients is governed substantially by decomposer activity that operates largely out of view. Saprobic fungal communities in such systems are conventionally understood to contribute to several interlinked processes:

- breakdown of structural lignocellulose in woody litter,
- redistribution of nitrogen and other limiting nutrients immobilised in dead plant tissue,
- maintenance of soil organic matter and associated soil fertility,
- net carbon turnover at the stand and landscape scale,
- and the physical stabilisation and microhabitat structuring of the forest floor itself.

The fungal activity documented here, a multi-log, multi-cluster colonization event consistent with *Schizophyllum commune*, and a persistent litter-associated sporocarp surviving short-term desiccation, is a small but concrete demonstration that these processes are actively occurring in this specific landscape, rather than simply being assumed to occur by analogy with better-studied forest types elsewhere.

This has some bearing on how the landscape might be expected to respond to ongoing environmental change. Jharkhand's rainfall patterns have shown increasing inter-annual variability in recent years, and habitat fragmentation continues incrementally across much of the Santhal Pargana plateau through agricultural expansion and infrastructure development. Decomposer fungi capable of tolerating moisture fluctuation, of which Schizophyllum commune is a well-documented example, may prove disproportionately important to maintaining decomposition function as average conditions become less predictable, even as the specific fungal community composition shifts in response to those same pressures.

More immediately, these observations point to a straightforward research gap rather than a settled conclusion: systematic, repeated fungal surveys across multiple Sal forest patches in this region, ideally paired with basic substrate and microclimate measurements, would be needed to move from this kind of baseline record toward any defensible statement about diversity, distribution, or seasonal dynamics of decomposer fungi in Santhal Pargana.


**Fig. 1. Satellite map showing the study area boundary within the Pindra region, Poreyahat administrative area, Godda district, Jharkhand, India. The red boundary delineates the approximate extent of the Pindra Van forest landscape surveyed during the present study. Location pin indicates the approximate centre of the study area (24.5986° N, 87.3240° E). Source: Google Maps satellite imagery.**

**Fig. 2. General physiognomy of the Sal-dominated tropical dry deciduous forest ecosystem near Poreyahat region, Godda district, Jharkhand.**

**Fig. 3. White-rot fungal colonization morphologically consistent with Schizophyllum commune on decomposing woody substrate within the Pindra Van forest ecosystem.**

**Fig. 4. Clustered splitgill fungal growth associated with decomposing woody substrate under shaded forest-floor conditions.**

**Fig. 5. Author collecting a fungal specimen of probable *Schizophyllum commune* during a field ecological survey within the Pindra Van forest landscape, Godda district, Jharkhand**

**Fig. 6. Macrofungal sporocarp emerging from moist leaf-litter microhabitat within forest patches of Thengimo Hills, Dumka district, Jharkhand.**

## CONCLUSION

This note documents field-based evidence of active saprobic fungal activity within Sal-dominated tropical dry deciduous forests of Santhal Pargana, Jharkhand, drawn from observations at Pindra Van and Thengimo Hills between December 2025 and January 2026.

A multi-cluster lignicolous colonization event on decaying Sal logs, comprising approximately twelve sporocarps morphologically consistent with *Schizophyllum commune*, together with a litter-associated sporocarp that persisted across an eight-day observation window spanning a short dry spell, together indicate that wood- and litter-decomposition processes are active and, in at least one case, notably resilient to short-term moisture stress within this landscape.

These findings are presented as a baseline rather than a survey, and the probable species identifications offered here should be treated as provisional pending laboratory confirmation. Even so, the record establishes that fungal decomposer activity in the tribal upland forests of Santhal Pargana is real, observable, and worth further dedicated study, particularly given how little prior documentation exists for this specific functional group in this specific landscape.

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