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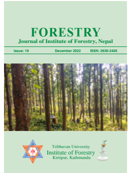

Pathogenic Fungi Associated with Economically Important Tree Species in a Planted Forest in Ghorahi, Dang, Nepal

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KEYWORDS

Diseased sample
Pathogen
Stratified random sampling
Forest disease

ABSTRACT

The structure and composition of healthy ecosystems, as well as the production and protection equations, are all influenced by forest diseases. This study was conducted in a planted forest in Ghorahi, Dang, Nepal, to document pathogenic fungi associated with economically important tree species, viz. *Tectona grandis, Dalbergia sissoo, Eucalyptus camaldulensis, and Bombax ceiba*. By using a stratified random sampling technique, a total of 10 quadrats, with a sample size of 20x20m, were located. Each plot was then divided into quadrats of 10x10m. The diseased samples were collected and brought to the laboratory. A total of 10 fungal pathogens were identified. Of them, eight pathogens were identified to species level and two to generic level. These 10 pathogens are *Erysiphe tectonae* (powdery mildew), *Oliveatectonae* (leaf rust), *Alternaria alternata* (leaf blight), *Colletotrichum gloeosporioides* (leaf blight), *Cylindrocladium reteaudii* (leaf blight), *Fusarium sp.* (dieback), *Alternaria alternata* (leaf blight), *Fusarium solani* (gummosis), *Fusarium sp.* (canker), and *Maravalia achroa* (leaf rust).

Introduction

In Nepal, there are many economically important trees that have been cultivated in planted forests. Some economically important forest trees species such as *Tectona grandis, Dalbergia sissoo,* and *Bombax ceiba* are deciduous while others such as *Eucalyptus camaldulensis* are evergreen. These trees can be found growing throughout Nepal's forests. Higher-quality wood from these species can be used for a variety of projects. Tectona grandis has excellent wood properties, making it one of the most economically valuable timber species in Southeast Asia (Farid et al., 2005). Furniture, cabinets, plywood, and musical instruments can be made from *Dalbergia sissoo*. *Sissoo* bark is used in medicine for its anthelmintic properties, while itsleaves are used as an expectorant and the wood as an antipyretic (Shah et al., 2010). *Sissoo* leaf extracts are also prescribed for gonorrhea, syphilis, dysentery, sore throats, and heart issues in Nepal and India (Al-Quran, 2008).

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Eucalyptus camaldulensis is grown for its wood, fuel, and paper pulp, and it also has a variety of medicinal uses. It is a source of essential oil used in cosmetics and medications. Its oil has both pesticide and insecticide properties (Bashir and Tahira, 2012). Similarly, *Bombax ceiba* is used for firewood, timber, and fodder. Around 60% of people in Nepal directly depend on forest resources. Approximately 44.74% of the country's forestland has diverse economic potential (Kanel, 2007; Basnyant et al., 2020). According to FAO (2010), Nepal has 4,300 hectares (ha) of planted forests. Plantation forests are an important land use in Nepal, and they provide a number of economic and social benefits for the country. Plantation forests are a major source of wood and other forest products, and they contribute to the livelihoods of a large number of people in Nepal. In 2008/09, timber products contributed more than 90% of the forestry sector's total revenue (Banjade, 2012). Approximately NPR 57.5 million was collected in royalty by the government from the sale of timber products through initiatives like the Sagarnath Forestry Project and Ratuwamai Forest Project (MOFE, 2015).

Data on the extent and seriousness of various forest disturbances, such as grazing, forest fires, and tree cutting, were gathered as part of the National Forest Resource Assessment (2010–14). Information on pathogens and forest pests, however, were not recorded. In the national context, there is a glaring gap in our understanding of the full range of problems and the status of forest pathogens and pests. According to general observations, pathogens and insect infestations are a serious issue in Nepal, especially in plantation and forest nurseries (Pokhrel, 2017).

Plantations play a vital role in alleviating rural poverty, ensuring food security, and providing decent living conditions (FAO, 2010). Nevertheless, the prevalence of diseases in plantations has grown over time, posing a threat to the long-term viability of commercial tree plantations. Various plant parts, including leaves, bark, seed, and roots, are used to extract fungi. Fungi isolated from *sissoo* are *Botryodiplodia sp.* (roots), *Cladosporium sp.* (seeds, pods), *Colletotrichum sissoo* (leaves), *Aspergillus sp.* (seeds, pods), *Ganoderma sp.* (heartwood), *Fusarium solani* (roots, heartwood), *Slternaria sp.* (seeds, pods), *Phoma sp.* (leaves), *Maravalia achroa* (leaves), *Phyllachora dalbergiae* (leaves), *Phyllactinia dalbergiae* (leaves), *Uredo sissoo* (leaves), *Polyporus sp.* (wood rot) (Manandhar and Shrestha, 2000). *Cylindrocladium sp*. (dieback), *Leptocybeinvasa* (leafgall), and *Cryphonectria sp.* (canker), all of which were isolated from *Eucalyptus sp.* (Malla and Pokharel, 2018). Because of their surface area and nutrient supply, however, leaves offer a very favourable environment for the growth and development of fungal pathogens. These leaf-inhabiting fungi are also known as foliicolous fungi (Ajay and Mall, 2013). The most common fungal pathogens are *Alternaria alternata*, *Fusarium sp.*, *Colletotrichum sp*, and *Cylindrocladium sp*. Both plantations and natural forests are being severely damaged as a result of these plant pathogens posing major biological hindrances to forest health, productivity, and conservation (Hawksworth et al., 1996).

The interest in biological carbon sequestration in natural ecosystems, like forests, has been greatly sparked by global environmental change, caused by an increase in greenhouse gases like carbon dioxide in the atmosphere (Bu et al., 2019). However, diseases and pest infestations in forests are causing great economic and ecological losses (Government of Canada, 2020).

This study aims to identify to most common diseases of planted forests in Ghorahi, Dang. The pathogen collected in this study could be used in population and phylogenetic studies to determine their origin and spread, thus providing information for the improved management of diseases. Thus, the results of this study can be helpful in designing effective control measures to reduce economic losses due to fungal pathogen.

Materials and Methods

Study area

The study was conducted in Brahakshetra planted forest, Ghorahi, Dang (Figure 1). It lies in the Lumbini province in the mid-western part of Nepaland is located 413 km southwest of Nepal's capital-city, Kathmandu. This place is known for its landscape and slightly mild climate. The altitude of the area ranges from 710 to 1,240masl. The planted forest occupies 5.86 ha. It is surrounded by the Siwalik hillsin the south and the Mahabharat range in the north. The famous Brahakune Temple is located inside the forest. The area has distinct dry (October–May) and wet (June–September) seasons.

Sample collection

As for the study of economic value, four planted trees were selected, viz. *Tectona grandis*,

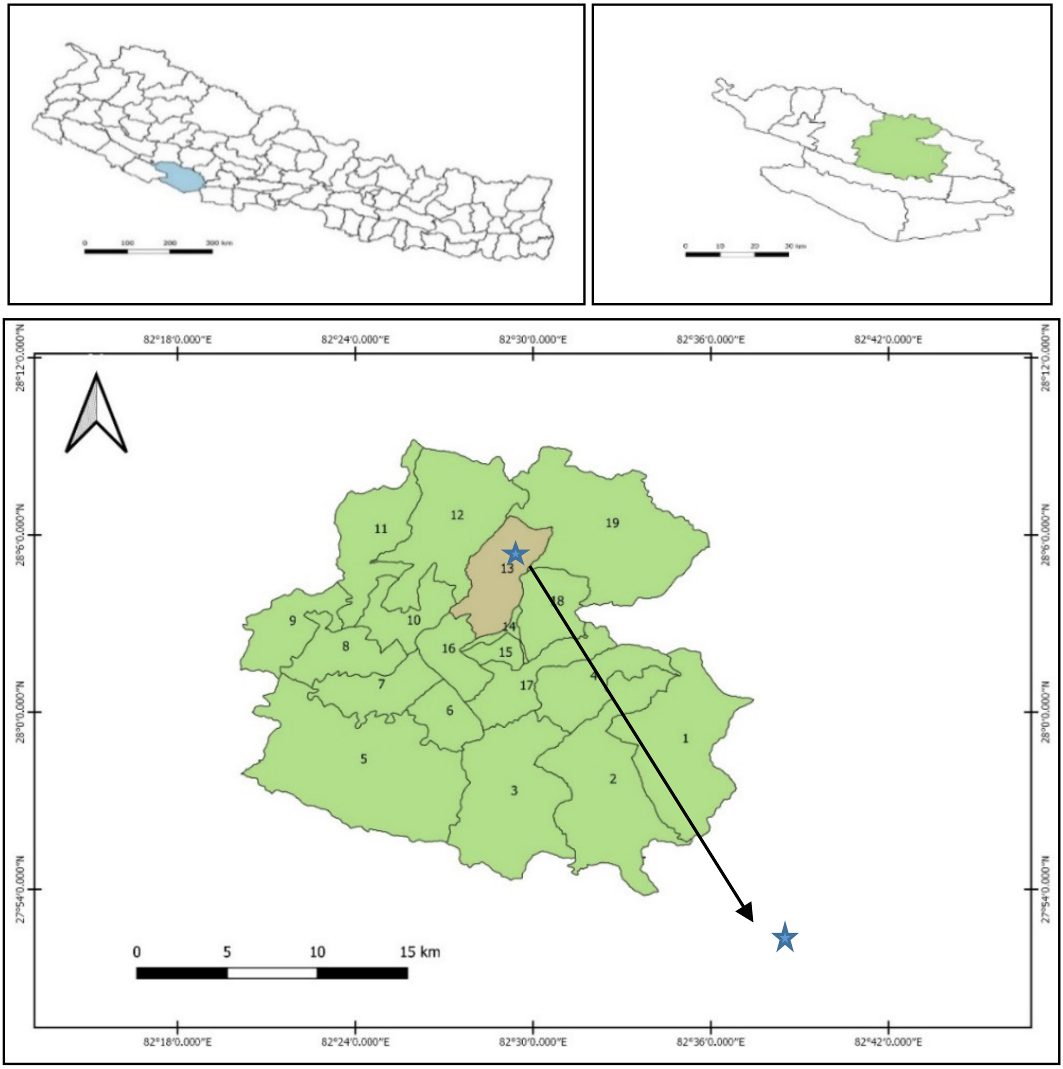

Figure 1: Map showing Brahakshetra Planted Forest, Dang

Dalbergia sissoo, *Eucalyptus camaldulensis*, and *Bombax ceiba*. By using the stratified random sampling method, 10 quadrats, with a sample size of 20m×20m, were placed in twoline transects (Elliott, 1971). Each plot was further divided into 10m×10m quadrats. Diseased samples were collected and photographed. While collecting samples, special attention was paid to collecting plant pathogen and diseased portion of bark stem and roots. Symptoms of the diseases and infected hostswere recorded, and all the samples were properly wrapped in a plastic bag and kept in an ice box for long-term preservation. Then, the diseased samples were taken for laboratory analyses.

Laboratory analysis

Sterile distilled water was used to wash infected plant parts for removing dust and adherent soil particles. Small pieces of the infected parts were surface sterilized with 70% ethanol and washed with sterile distilled water. Then, the infected plant parts were placed on Petri plates containing potato dextrose agar, which allows particular pathogens to grow. The media was supplemented with streptomycin sulfate as an antibiotic to inhibit bacterial growth. The Petri plates were incubated at 25±2^{0}c for 3–7 days to allow fungal growth. Then, a single pore or a small piece of mycelium was inoculated on the agar medium in Petri dishes to create the pure culture. The inoculated agar plates were covered with parafilm tape and then placed in an incubator for 3–7 days, after which the agar plates showed fungal growth in pure form. The plant infected with rust and powdery mildew was directly isolated from the leaf surface.

Slides were prepared using the staining agent, lactophenol cotton blue, to examine fungi under a microscope. Fungi were classified based on their morphological characteristics, such as colony morphology, conidial pattern, and the size and shape of the conidia (Barnett, 1960). All the laboratory analyses were done in the pathology laboratory of the Central Department of Botany, Tribhuvan University, Kathmandu, Nepal.

Results

A total of 10 pathogens were identified from the infected samples collected from the study forest. Out of 10 pathogens, only 8 pathogens were identified to the species level while 2 were identified to the generic level (Table 1).

Three pathogens were isolated from *Tectona grandis* and *Bombax ceiba* each and two from *Dalbergia sissoo* and *Eucalyptus camaldulensis* is each. The majority of the pathogens (7) were isolated from the leaves, followed by 2 from stems and 1 from root (*Fusarium sp.* caused dieback). *Erysiphe tectonae* and *Olivea tectonae* were found to be host-specific, whereas *Colletotrichum gloeosporioides*, *Alternaria alternata*, *Maravalia achroa*, and *Fusarium solani* were found to be non-host specific, infecting multiple tree species. This study also

Table 1: Fungal pathogens found in Brahakshetra planted forest, Ghorahi, Dang.Name of the host plant, disease caused by the pathogen, their class and plant parts infected by the pathogen are shown.

Host plant	Disease	Fungal pathogen	Class (fungi)	Plant parts affected
Tectona grandis	Powdery mildew	*Erysiphe tectonae*	Leotiomycetes	Leaves
	Leaf rust	*Oliveatectonae*	Pucciniomycetes	Leaves
	Leaf blight	*Alternaria alternata*	Dothideomycetes	Leaves
Darbergia sissoo	Leaf blight	*Colletotrichum gloeosporioides*	Sordariomycetes	Leaves
	Leaf rust	*Maravalia achroa*	Pucciniomycetes	Leaves
Eucalyptus camaldulensis	Leaf blight	*Cylindrocladium reteaudii*	Sordariomycetes	Leaves
	Gummosis	*Fusarium solani*	Sordariomycetes	Stem
	Dieback	*Fusarium sp.*	Sordariomycetes	Twigs, branches, shoot
Bombax ceiba	Canker	*Fusarium sp.*	Sordariomycetes	Stem
	Leaf blight	*Alternaria alternata*	Dothideomycetes	Leaves

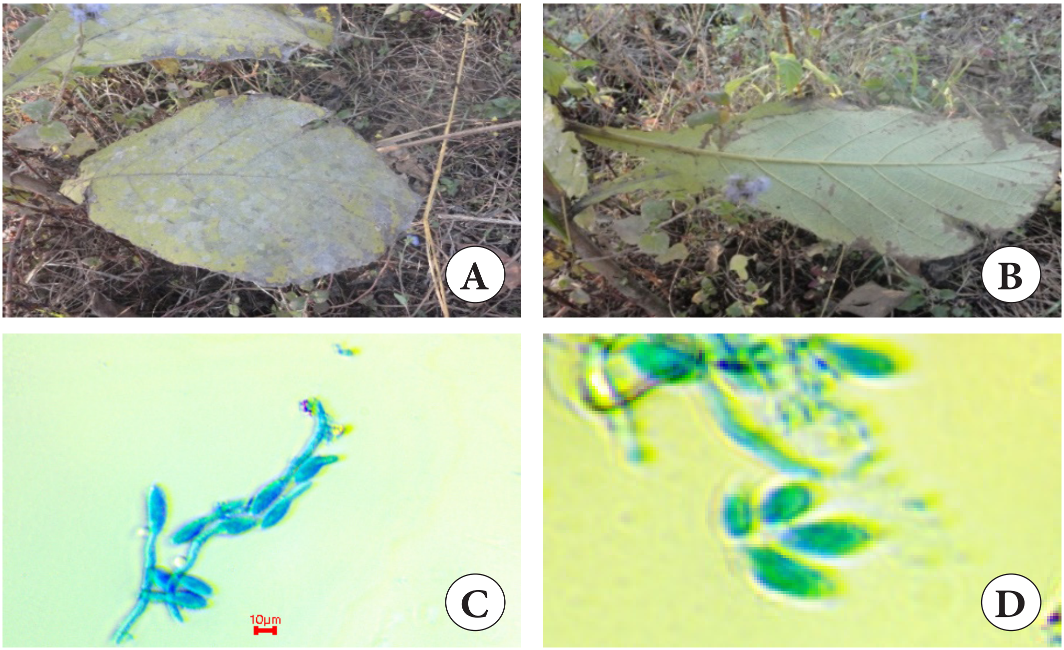

Figure 2: A: Infected leaf, B: Abaxial surface of infected leaf, C: D Conidiophore and Conidia,Bars: 10µm

found that the same leaves were infected by two pathogens, causing leaf rust and leaf blight on the same leaves. Detailed descriptions of the diseases caused by the pathogens identified in this study are presented below.

1. Powdery mildew

Causal agent: *Erysiphe tectonae*
Host: *Tectona grandis* L.f.
Symptoms: Small patches of white-coloured powdery masses on the upper surface of leaves. In later stage, white powdery patches turned brown to black and leaves turned yellow due to necrosis.

Identifying characters: Long and erect conidiophores arising from the upper surface of the mother cells. Conidia ellipsoid ovoid to sub-cylindrical (Figure 2).

2. Leaf rust

Causal agent: *Olivea tectonae*
Host: *Tectona grandis* L.f.
Symptoms: Small necrotic areas ranging in colour from yellowish brown to grey couldbe seen on the lower surface of the leaves of the diseased plants. Later, the lesion grew bigger and combined with another to form a larger necrotic lesion. The numerous sub-epidermal areas of erumpent uredinia on the abaxial leaf surface that the necrotic areas matched up with. The plant's inflorescences also showed signs of lesions. Plants that were severely infected had lost most of their leaves.

Identifying character: *Olivea tectonae* is host-specific and known to cause leaf rust in teak. It is yellowish to orange in colour, ovoid to ellipsoidal. *Uredinia* were powdery, orange, sub-epidermal at first and later erumpent (Fig. 3).

3) Leaf rust

Causal agent: *Maravalia achroa*
Host: *Dalbergia sissoo* Roxb.
Symptoms: The affected leaves are frequently malformed, and the infected plant exhibits noticeable growth retardation and appears weak and stunted. The affected leaves appear yellowishon the lower surface of the leaves.

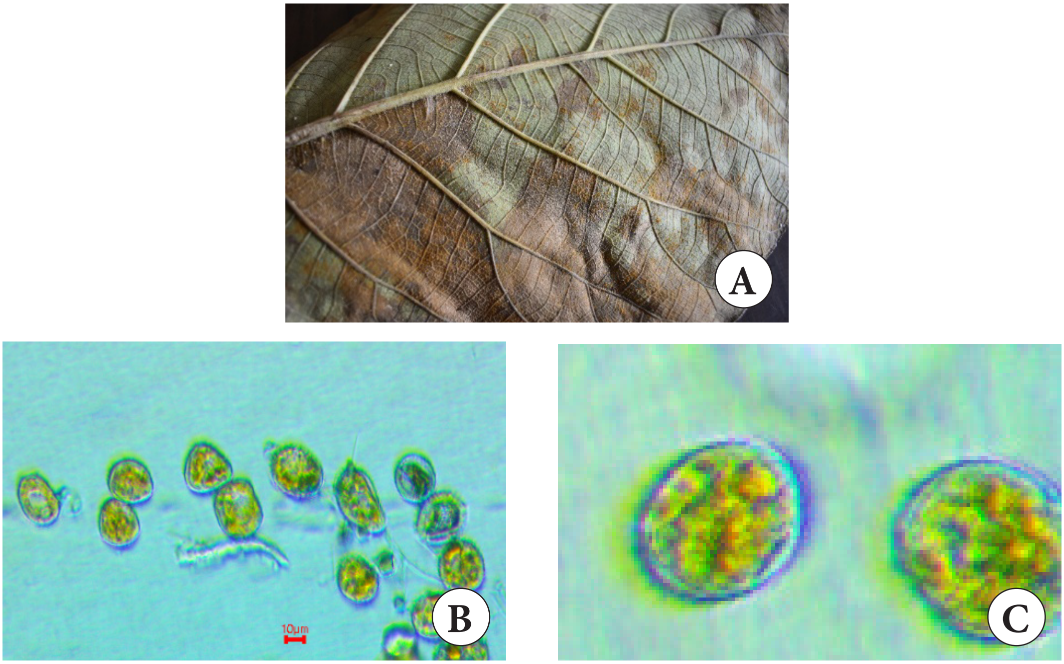

Figure 3:A: abaxial surface of leaf showing rust, B: C Urediniospores of Olivea tectonae, Bars:10µm

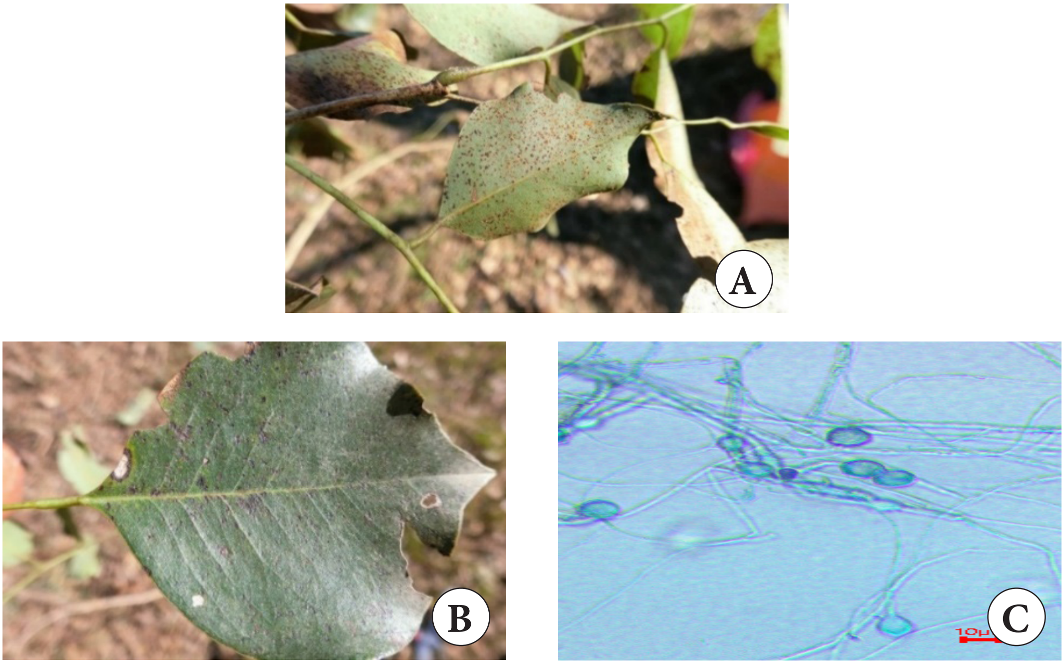

Figure 4: A: lower infected leaves, B: upper infected leaf surface, C: urediospore of Maravalia achroa, Bar: 10µm

Identifying characters: *Urediniospores* have equatorial germ pores and are asymmetrically obovoid to ellipsoid in shape. At their apex, teliospore walls are thick, enclosing the apical germ pore (Figure 4).

4) Leaf blight

Causal agent: *Alternaria alternata*
Host: *Tectona grandis* L.f.
Symptoms: The infected plants had water-soaked grayish brown patches spread across the lamina, covering most or all of it. Because infected tissues are shed during intense rains, blighted leaves frequently have holes in the infected area. The diseased leaves eventually shrivel and fall off. Defoliation is likely to be severe.

Identifying characters: *Alternaria alternata* is an opportunistic pathogen that has been recorded as causing leaf spots, rots, and blights on various host species of plants. Colony on Potato Dextrose Agar (PDA) has whitish grey to black concentric rings. Brown, septate hyphae are characteristic of *Alternaria* species. Conidiophore are also septate and brown in colour, occasionally appearing zigzag. They produce large, simple, or branched conidia (23–34–7–10mm), with both transverse and longitudinal septa. These conidia may be seen singly or in acropetal clusters. The end of the conidium closest to the conidiophore is rounded, but it tapers towards the apex (Figure 5).

5) Leaf blight

Causal agent: *Colletotrichum gloeosporioides*
Host: *Dalbergia sissoo* Roxb.
Symptoms: As the hyphae advance, the disease's initial appearance on leaves is as water-soaked grayish-brown blotches that grow in size until the entire leaf is covered.

Identifying characters: *Colletotrichum gloeosporioides* is one of the most common colletotrichum fungal plant pathogens. It causes bitterroot, leaf blight, necrosis, and lesion. The conidia of this species appear ovoid to oblong, slightly curved in shape, 10–15µm in length, and 5–7µm in width. The masses of conidia appear pink or salmon in colour. The colony on PDA is whitish to grey and grows fast and covers the entire plate (Figure 6).

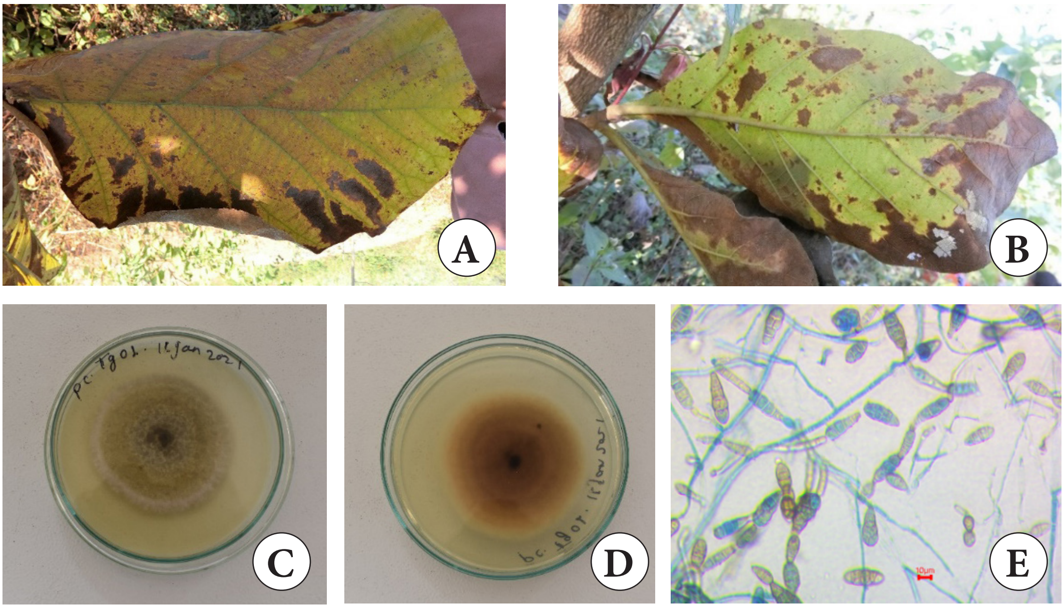

Figure 5: A: Adaxial side of infected leaf, B: abaxial side of infected leaf, C: Culture of infected part on PDA media, D: reverse view of culture plate, E: conidial chain of Alternaria alternata, F: Conidia, Bar: 10µm

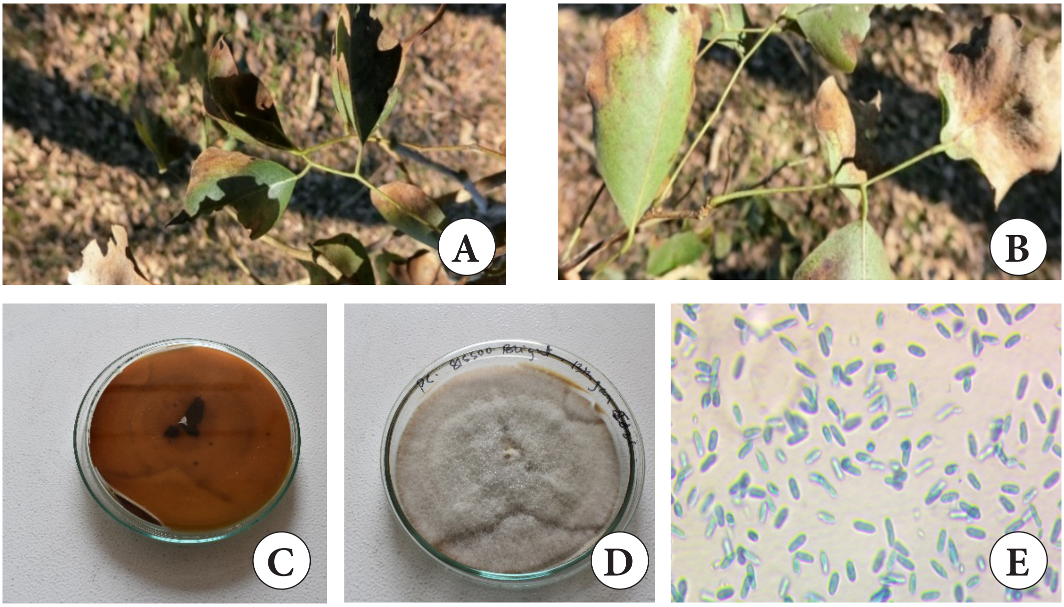

Figure 6: A-B infected adaxial and abaxial leaves surface, C-D culture plate of disease part, E-Conidia of Colletotrichum gloeosporioidesBar-10μm

6) Leaf blight

Causal agent: *Cylindrocladiumreteaudii*
Host: *Eucalyptus camaldulensis* Dehnh.
Symptoms: Greyish water-soaked spots on young leaves are the first signs of the disease. These spots then combine to form sizable necrotic areas. Necrotic lesions cover the entire area of the leaf and fruit profusely on young shoot tips that are killed when the favourable conditions of high humidity and frequent rainfall occur, leading to the symptoms of leaf and shoot blight.

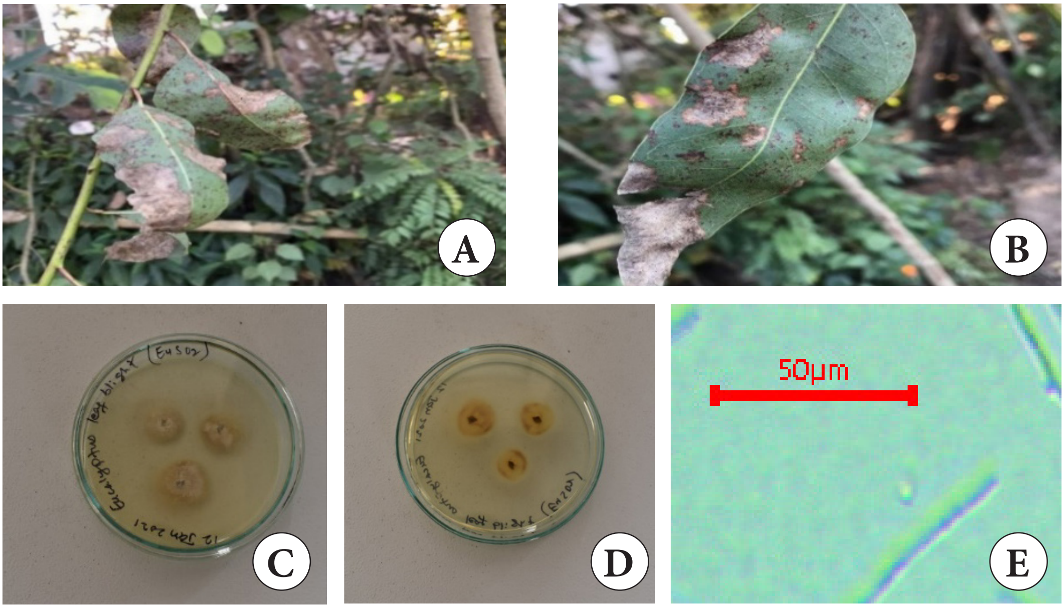

Figure 7: A-B infected leaves, C-D culture plate, D-conidia of Cylindrocladium reteaudi, Bar-50 μm

Identifying characters: The colony of *cylindrocladium reteaudii* is whitish-yellow in colour. The main axis of the conidiophore extends beyond the sporogenous zone to form long sterile appendages known as a stipe extension, which is characteristic of the genus. The width of the stipe extension decreases just below the hyaline, ellipsoidal-shaped, swollen apical vesicle. In the upper cell, conidia are produced, and they are straight, cylindrical, or slightly swollen (Figure 7).

7) Leaf blight

Causal agent: *Alternaria alternata*
Host: *Bombax ceiba* L.
Symptoms: Initially, the leaves have a small irregular brown spot surrounded by a yellow halo. Leaf occasionally forms a ring pattern that resembles a target. Severely damaged leaves turn brown, curl upward, wither, and die.

Identifying characters: Colony on PDA having whitish grey to black in colour with a concentric ring. *Alternaria spp* has septate and brown hyphae. The septate and brown conidiophore is also present. They produce large, simple, or branched conidia with transverse and longitudinal septa (Figure 8). They are ovoid to obclavate, darkly pigmented, and roughened and can be seen singly or in acropetal chains. These conidia can also produce germ tubes.

8) Gummosis

Causal agent: *Fusarium solani*
Host: *Eucalyptus camaldulensis* Dehnh.
Symptoms: The infected stem exhibits sap leakage from a tree wound, including winter damage, disease damage, or damage from a gardening tool. Sap oozing from tiny cracks in the infected bark, giving the tree a bleeding appearance, is one of the early signs of gummosis. The infected area eventually causes the bark to crack as it dries and remains firm. A lesion gradually girdles the tree's trunk as it extends around it.

Identifying characters: On PDA, a fungus isolated from the stem of diseased eucalyptus plants formed a white to the light pink colour colony. Conidia of *Fusarium solani* varied in size. They produced a lot of unicellular, elliptical, curved, or gradually pointed edges (Figure 9).

9) Dieback

Causal organism: *Fusarium sp.*
Host: *Eucalyptus camaldulensis* Dehnh.

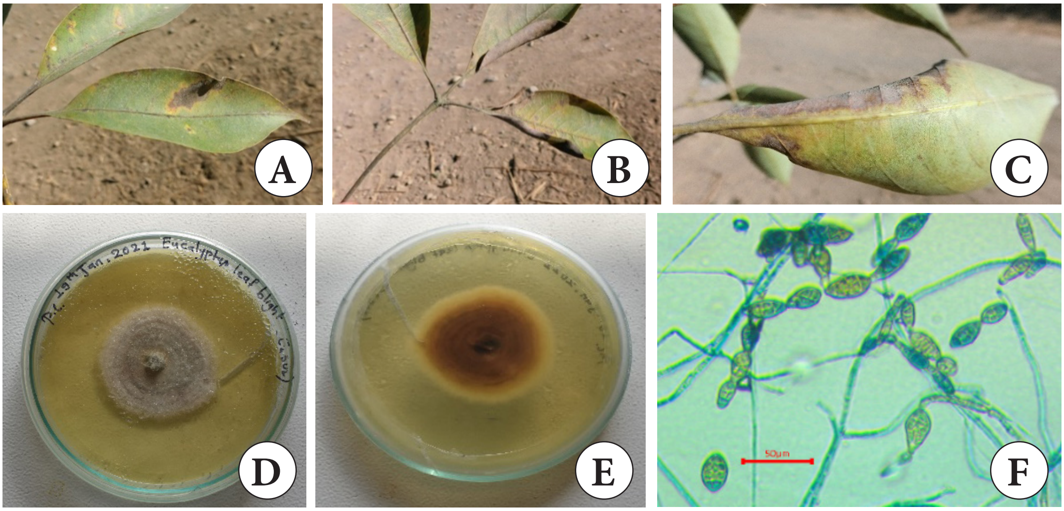

Figure 8: A-C adaxial and abaxial side of infected leaves, D-E culture plate of diseased part of plant on PDA, F- conidial chain of Alternaria alternata, Bar- 50μm

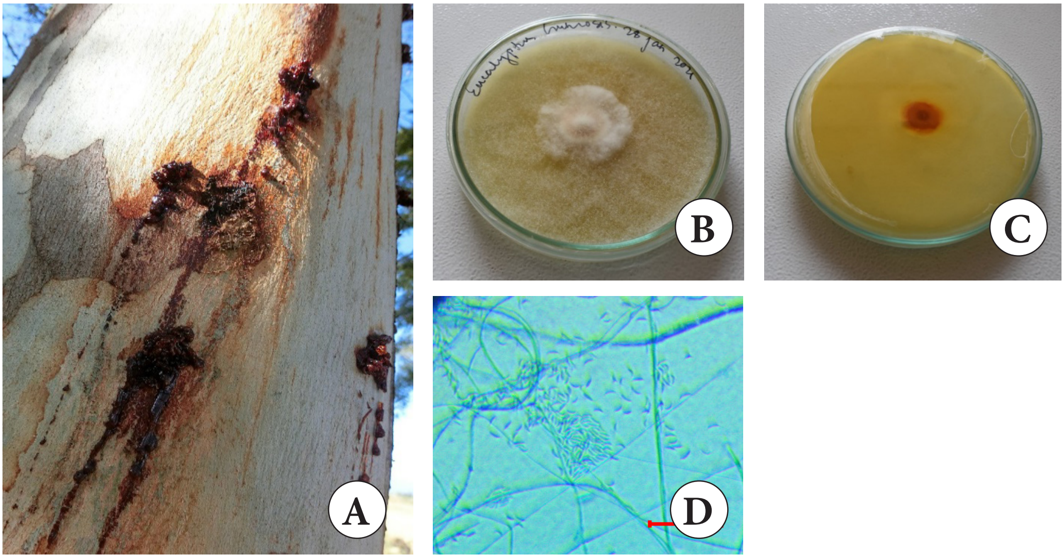

Figure 9: A-infected stem, B-C culture plates, D-conidia of Fusarium solani, Bar-50µm

Symptoms: Dieback symptoms can include seemingly healthy twigs and branches next to dead or dying twigs and branches. Its symptoms are frequently subtle, slow to develop, and uniform throughout the crown. It typically starts at the top of the plant and moves downward but may start on the lower branches. Dieback generally manifests as pale green or yellow leaves, small leaves, delayed growth, reduced twig and stem growth, early leaf drop, and premature fall coloration.

Identifying characters: Cultures have white mycelia but may develop pink to violet pigments. The typical *Fusarium* conidia are fusiform, multicell by transverse septa, and have an apical cell that is pointed to whip-like and a basal cell that has the distinctive shape of a foot. These range from globose, oval, and reniform to fusiform and are primarily single-celled, occasionally three- to five-celled (Fig. 10).

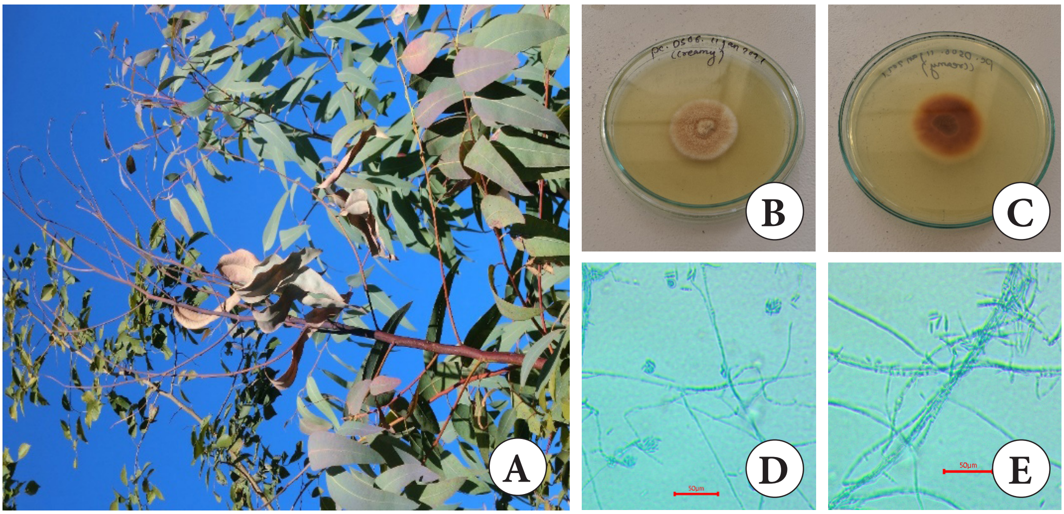

Figure 10: A- infected plant, B-C culture plates, D-E conidia of Fusarium sp, Bars-50µm

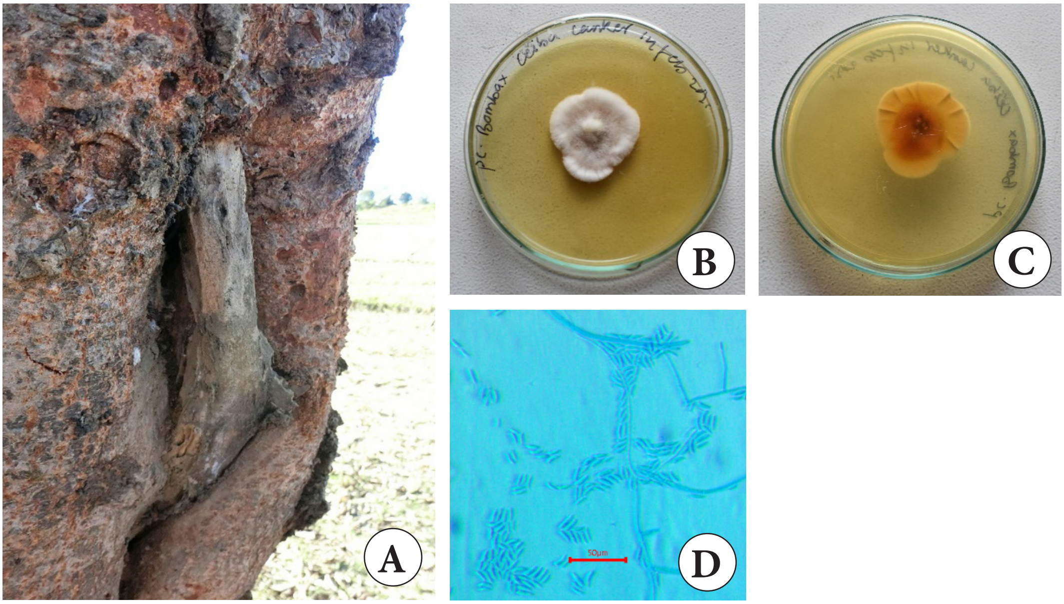

Figure 11: A-infected stem, B-C culture plates, D-conidia of Fusarium sp.

10) Stem canker

Causal agents: *Fusarium sp.*

Host: *Bombax ceiba L.*

Symptoms: Cankers can range greatly in size and shape but are typically oval to elongated. On the bark of trunks and branches, they typically present as localized, sunken, slightly discoloured, brown to reddish lesions, or as harmed patches on smaller twigs. The diseased and healthy tissue of the bark frequently separate from one another and occasionally may even ooze sap or moisture. The inner bark darkens and occasionally emits an unpleasant odour.

Table 2: Fungal species with their colony colour and spore size, and corresponding disease and disease percentage

Fungal Pathogen	Disease	Colony color	Diameter of colony	Spore size	% of Disease
Erysiphae tectconae	Powdery mildew	Directly isolated*	Directly isolated*	30-37×16-20 µm (100× magnified)	20%
Olivea tectcinae	Leaf rust	Directly isolated*	Directly isolated*	2-9×2-9 µm (40× Magnified)	20%
Alternaria alternata	Leaf blight	Whitish grey to black	6±0.5 cm	18 –35×6.35-12.22 µm	60%
Colletotrichum gloeosporioides	Leaf blight	Grey	5.5±0.18 cm	10-15×5-7µm	80%
Maravalia achroa	Leaf rust	Directly isolated*	Directly isolated*	15-30×10-15µm	40%
Cylindrocladium reteaudii	Leaf blight	Yellowish white	5±0.5 cm	27-84×4-7.5µm	40%
Fusarium solani	Gummosis	White to light pink	6±7 cm	5-13×3.6×5.5µm	10%
fusarium sp.	Dieback	Light pink	3.86±0.5 cm	6-15×3-4µm	10%
fusarium sp.	Canker	white	3.9±0.6 cm	7.5-14.5×4-6.33µm	10%
Alternaria alternata	Leaf light	Whitish grey to black	6.2±0.4 cm	18-35 × 6.35-12.2 µm	30%

(*) Directly isolated from diseased leaf surface not cultured

Identifying characters: Conidia of *Fusarium sp.* varied in size. They form a large number of unicellular, elliptical, and gradually pointed edges (Figure 11). These range from globose, oval, and reniform, to fusiform and are primarily single-celled, occasionally three- to five-celled.

Discussion

The infected samples collected from tree species *(Tectona grandis, Eucayptus camaldulensis, Dalbergia sissoo,* and *Bombax ceiba*) contained a total of 10 pathogens. Among them, leaf blight, caused by *Colletotrichum gloeosporioides*, was found to be most prevalent, followed by *Alternaria* leaf blight of *Tectona grandis*, leaf rust of *Dalbergia sissoo*, and so on.

This study confirmed that there are many diseases that reduce the productivity of plantations. These trees often constitute the only cash income of farmers (Malla, 2000). These diseases result in cracked and distorted stems that reduce their potential value as construction timber, which is the most profitable option. We found that the majority of the fungal pathogens are non-host specific and can cause more than one disease in more than one tree species. This study revealed that *Fusarium solani* causes gummosis in *Eucalyptus camaldulensis*, which was not reported till now. However, it has been reported to cause Gummosis in rubber tree (Huang et al., 2016). In this study, two previously unreported Fusarium species were discovered as a causative organisms of stem canker in Bombax, ceiba and dieback in *Eucalyptus camaldulensis*. Depending on the host and the environment, *Fusarium spp.* can cause a variety of diseases, such as vascular wilts, head and seed blights, stem rots, root and crown rots, and canker diseases. Some species are also capable of simultaneously causing multiple or overlapping disease syndromes (Leslie and Summerell, 2013).

Alternaria alternata, which has been reported to cause brown spot in teak plants in China (Ai et al., 2015), is responsible for causing leaf blight in *Bombax ceiba* and *Tectona grandis* in Dang. This shows that the same pathogen can cause different diseases in different species in different environments. This study confirmed that the leaf blight of *Dalbergia sissoo* is caused by *Colletotrichum gloeosporioides*, which is in line with Chaudhury et al. (2020).

Table 1 also shows that different causal organisms may be responsible for causing one disease, but the plant would be different such as *Alternaria alternata* caused leaf blight in both *Tectona grandis* and *Bombax ceiba*. In line with Perez et al. (2010), *Olivea tectonae* was isolated as a causal agent of leaf rust in *Tectona grandis*, confirming its host specificity. Our results support the findings of Meeboon and Takamatsu (2017) that *Erysiphe tectonae* is responsible for causing powdery mildew on *Tectona grandis*. Similarly, in line with Shamsi et al. (2012), *Maravalia achroa* was identified as a causal agent of rust disease of *Dalbergia sissoo*. In contrast to Booth et al. (2000), which reported *Cylindrocladium quinqueseptatum* Boedijn and Reitsmo(syn. *Cylindrocladium reteaudii* (Buga) Boesew) as a pathogen of Eucalyptus sp.This studyalso identified the same species as a causal agent of leaf blight in *Eucalyptus camaldulensis*. This is the most serious and causal organism of eucalypts, causes *Cylindrocladium* leaf blight (CLB) in nurseries and plantations and has been responsible for epidemic infestation in several countries, including India, Australia, Vietnam, Laos, and Thailand (Old et al., 2003).

Plant diseases caused by plant pathogenic fungi are among the most important factors that reduce yield losses (Bashir and Tahira, 2012). So, the management of forest disease is very important for the maintenance of economic as well as ecosystem values. The management practices of forest diseases can vary depending on the specific disease and the forest ecosystem it is affecting. Some common strategies for managing fungal disease or infection in these tree species are: preventing the spread of the disease such as quarantining infected trees or areas; treating infected trees by using chemical treatments or natural remedies to kill the pathogen or reduce its impact on the tree; removing infected trees to prevent the disease from spreading further; planting resistant or tolerant species; improving forest management practices such as thinning, overcrowded stands, improving drainage; and providing adequate nutrients to help trees better withstand diseases. These implications are quite similar to Edmonds (2013). His study shows there are various strategies for managing forest diseases such as eradication (eliminating diseased part before it becomes widespread), avoidance (avoiding conditions or environments that are conducive to the disease), integrated disease management (compilation into best management practices), resistance (genetic resistance, breeding for resistance, and genetic engineering), and protection (chemical, biological, fertilization, prescribed fire, and root trenching).

Conclusions

This study reveals that many pathogenic fungi are responsible for causing diseases in economically important tree species such as *Eucalyptus camaldulensis, Bombax ceiba, Tectona grandis, and Dalbergia sissoo. Eucalyptus camaldulensis* was infected by *Cylindrocladium reteaudii* (leaf blight) and *Fusarium spp.* (gummosis and dieback). Likewise, *Bombax ceiba* was found to be infected by *Alternaria alternata* (leaf blight) and *fusarium sp.* (canker). *Erysiphe tectonae* (powdery mildew), *Olivea tectonae* (leaf rust), and *Alternaria alternata* (leaf blight) were isolated from *Tectona grandis*. In addition, *Dalbergia sissoo* was affected by *Colletotrichum gloeosporioides* (leaf blight) and *Maravalia achroa* (leaf rust). Among these diseases, leaf blight of *sissoo* caused by *Colletotrichum gloeosporioides* was found more severe. The most lucrative option, construction timber, is affected by these diseases, which cause cracked and distorted stems that lower their potential value. So, effective measures can be implemented to reduce these diseases or infections. Moreover, the pathogen identified in this study will be used in population and phylogenetic studies to ascertain their origin and dissemination, providing details for better disease management.

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