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Survey and Identification of Fungal Plant Diseases on Major Crops in Lunglei District of Mizoram

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ABSTRACT

A survey work on fungal diseases of major crops in Lunglei district, Mizoram was undertaken in farmers' field during *kharif* season of 2021, using visual assessment method, in which pictorial representation of the host plant with known and graded amount of disease are compared with disease leaves to allow estimation of disease incidence, by measuring intensity of the pathogen with the help of disease grading scales. The disease samples collected from the farmers' field were brought in the laboratory where identification of pathogen was done based on their morphological characters under the microscope. The Disease Incidence (DI) was recorded from the three blocks of Lunglei district viz. Lunglei block, Lungsen block and W. Bunghmun block. The Disease Incidence (DI) of brown spot of rice (37.22%), Narrow brown spot of rice (19.43%), Southern corn leaf blight (37.77%), Cercospora leaf spot of chilli (40.54%), Ginger leaf spot (32.21%), Banana black sigatoka (48.32%), and Sugarcane eye spot (33.32%) were highest in W. Bunghmun block. While, incidence of Anthracnose of chilli (19.43%) and Black spot of citrus (26.66%) were highest in Lunglei block. Percent Disease Index (PDI) was also recorded from the same blocks of Lunglei district. The Percent Disease Index of Brown spot of rice (14.07), Narrow brown spot of rice (7.34), Southern corn leaf blight (22.55), Cercospora leaf spot of chilli (16.54), Ginger leaf spot (11.55), Black sigatoka (21.10), Black spot of citrus (10.67) and Sugarcane eye spot (16.04) were highest in W. Bunghmun block. However, PDI of Anthracnose of chilli (4.37) was recorded highest in Lunglei block.

Keywords Disease incidence, Fungal diseases, Scales, Visual assessment method.

INTRODUCTION

The present survey was carried out in *kharif* cropping season, 2021 in order to study the incidence of fungal plant diseases in major crops of Lunglei district, Mizoram, India which is loacated in North Eastern region of India. Lunglei district covers 4,572 sq km in total. The districts of Mamit and Aizawl are to

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the north of the district, Bangladesh is to the west, Lawngtlai district is to the south, Siaha district is to the southeast, Myanmar is to the east, and Serchhip district is to the northeast. Rugged, north-south oriented hill ranges with heights ranging from 500 feet (150 meters) to 900 feet make up the immediate area (275 meters) (Lallianthanga *et al.* 2014). The majority of the population of Mizoram works in agriculture, which employs over 60% of the state's total workforce. The present region of study is the second largest district in Mizoram and due to vast area under crops cultivation, the district had been chosen as the site of survey. Rice and maize are the staple crop, cash crops like sugarcane, ginger and cotton, horticultural crops like mustard, French bean, squash, tomato, chilli, brinjal, okra, plantation crops like areca nut, banana, orange, tree bean (*Parkia* sp.), mango are largely grown in Lunglei district (Lalthlamuanpuii *et al.* 2024). Survey and detection of plant diseases in the selected district will assist in giving farmers a "voice" as few studies have been done addressing the incidence of fungal plant diseases and the issues that farmers faces on a daily basis.

MATERIALS AND METHODS

Lunglei district, Mizoram, India was chosen for the survey sites due to lack of recorded literature regarding incidence of plant diseases in this area. This survey was taken up to create awareness among people and to join a link between farmers and the Department of Agriculture. Lunglei district is divided into three Rural Development Block called 'RD Block'. The three blocks under RD block are Lunglei block, Lungsen block and Bunghmun block. From each block, two villages were selected for the survey. Based on the availability of the crops, three fields/farmers from each village were selected for the field survey. The cultivation areas of each individual farmer range widely from one acre to three acres due to the district's rough terrain. These locations were chosen to represent a variety of meteorological conditions and cultivar types of crops.

Symptoms were recorded on the field and compared to the disease symptoms recorded in literatures. A photo documentation and herbarium was also maintained for further inspection. Infected crop leaves from different crops were collected from farmers' field of each village.

To identify the relationship between crop host and pathogen in the crop field of Lunglei district, Mizoram.

Three farmers field were selected from each villages and 30 plants were randomly chosen from each farmer field. A survey of the villages of Zobawk and Chawngte was conducted in the month of October, Phairuangkai and Marpara during November, and Changpui and Haulawng during December 2021.

Identification of symptoms was done on the field, by comparing with recorded photos and literatures. Suspected plant parts were collected for further confirmation in the laboratory.

Identification of pathogen was done by isolating diseased plant parts in the laboratory which were collected from the farmer's field. The collected samples were further sent to plant pathologist, KVK, Lawngtlai for confirmation. The sizes of spores were measured using micrometer under the microscope.

To determine the amount of the pathogen's damage to the crop under consideration

During the survey, disease severity scale was recorded in every field monitored. For estimation of infected leaf area, the whole leaf area was regarded as 100% and the rating of different disease in leaf was done by visual assessment method. To determine the percentage of diseased leaf area, scales given by IRRI (2002) was used in case of rice diseases viz. Narrow brown spot and brown spot diseases, scales given by Hooda *et al.* (2017) was used for Southern corn leaf blight diseases of maize, scales given by Stover and Dickson (1970) was used for sigatoka diseases of banana, scales given my Montri *et al.* (2009) was used for diseases of chilli viz. anthracnose and leaf spot diseases. In the case of sugarcane eye spot and citrus black spot, scales given by Sharma *et al.* (2015) was used for disease grading.

In each village, a random sample of 30 plants were taken from each farmer`s field and the incidence

of diseases can be calculated by the given formula:

$$\text{Disease incidence (\%)} = \frac{\text{No. of infected plants}}{\text{Total no. of plants assesed}} \times 100$$

Disease severity was determined by the formula:

$$\text{Disease severity (area) \%} = \frac{\text{Area of plant tissue affected by disease}}{\text{Total area}} \times 100$$

The severity of the disease was converted into a Percent Disease Index (PDI) (Wheeler 1969). The disease incidence was determined by recording the degree of disease in a given area using the aforementioned measures. The following formula was used to determine the percent disease index:

$$\text{PDI} = \frac{\text{Sum of individual ratings}}{\text{Total no. of plant observed}} \times \frac{100}{\text{Maximum category value used}}$$

RESULTS AND DISCUSSION

Association of crop host and pathogen

Nine fungal diseases of major crops under study were indentified based on the symptomatological observation at field conditions and the characteristics of the isolated pathogens under the microscope. Identification of the pathogen was made from the plant parts showing symptoms of the disease. Conidia of the pathogen were examined under a binocular dissecting microscope and their identification was confirmed by its morphological characteristics.

Brown spot of rice: In all of the villages studied, the typical indications of brown spot disease of rice were minute dots in the leaf. On the leaves, spots are circular brown in color with grey or whitish center, oval or sometimes almost cylindrical in shape. The spot sometimes coalesce at later stage and cause drying of the leaves. Under the microscope, conidia were found to be curved, navicular, cylindrical in shape, hillum was minute black or light, often projecting, somewhat papillate, and pale to mid golden brown, smooth, 5-12 distoseptate, 46.5-12512-26 m (Plate 1).

The symptoms observed for brown spot of rice were comparable to those observed by Singh *et al.* (2013), Bag *et al.* (2021), and Gupta *et al.* (2013). Previous researchers' descriptions of brown spots on rice under a microscope (Kumari *et al*. 2015 and Valarmathi and Ladhalakshmi 2018) complement the current study's findings, and so the brown spot fungi was identified as *Bipolaris oryzae.*

Narrow brown spot of rice: In all of the villages studied, the signs of narrow brown spot disease of rice were short, linear brown lesions approximately 2 mm to 10 mm long and around 1 mm wide. Lesions on resistant types are narrower, shorter, and deeper brown, whereas lesions on susceptible variety are larger, lighter brown, with grey necrotic centers. Conidia were 20-60 × 6-7 m in size, hyaline or subhyaline, cylindrical, and 3-10 septate (Plate 2).

The symptoms of rice narrow brown spot identified in this survey were comparable to those observed by Shah *et al.* (2016), and Soura *et al.* (2018). Previous work (Hussain and Abid 2011, Uppala and Zhou 2018S and Addison *et al.* 2021) described a thin brown spot of rice under a microscope, which corrob-

Plate 1(a): Symptom

Plate 1(b): Microscopic view of *Bipolaris oryzae* (40x)

Plate 1(c): Herbarium

Plate 1. Brown spot of rice.

Plate 2(a): Symptom

Plate 2(b): Survey field

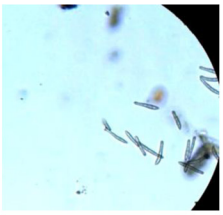

Plate 2(c): Microscopic view of *Cercospora janseana* (40x)

Plate 2(d): Herbarium

Plate 2. Narrow brown spot of rice.

Plate 3(a): Symptom

Plate 3(b): Survey field

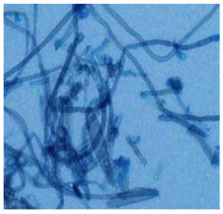

Plate 3(c): Microscopic view of *Bipolaris maydis* (40x)

Plate 3(d): Herbarium

Plate 3. Southern corn leaf blight.

orated the current study's findings, and so the brown spot fungi was identified as *Cercospora janseana.*

Southern corn leaf blight: The symptoms of southern maize leaf blight in all of the communities studied were diamond-shaped lesions at the beginning of the disease infection, which eventually turned into elongated lesions. The final lesion is rectangular, 2-6 mm broad, and 3-22 mm long. Conidia were fusoid dark-colored conidia with lengths and widths ranging from 29.1-75.4 m and 10-15.5 m, respectively. Septa vary in size from 4 to 10 (Plate 3).

The colors ranged from black to light black, light green to light green, and grey to light grey. The symptoms of southern maize leaf blight described by Bruns (2017) and Hooda *et al.* (2017) were found to be consistent with the symptoms seen in the current study. The pathogen descriptions given by Yadav *et al.* (2013), Pal *et al.* (2015) and Bhavani and Gohilo (2016) correlate with the results and findings of the current investigation, and thus *Bipolaris maydis* was the pathogen of Southern maize leaf blight/Maydis leaf blight.

Cercospora leaf spot of chilli: The symptoms of leaf spot of chilli in all the villages under study showed necrotic, circular lesion with greyish white center. The spots enlarged up to a mean diameter of 9.8 mm, coalesced frequently and led to defoliation with or

Plate 4(a): Symptom

Plate 4(b): Survey field

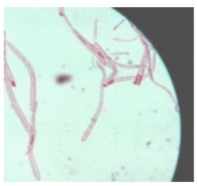

Plate 4(c): Microscopic view of *Cercospora capsici* (40x)

Plate 4(d): Herbarium

Plate 4. Cercospora leaf spot of chilli.


Plate 5(a): Symptom

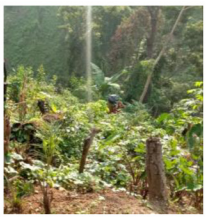
Plate 5(b): Survey field


Plate 5(c): Microscopic view of *Colletotrichum capsici* (40x)


Plate 5(d): Herbarium

Plate 5. Anthracnose of chilli.

without yellowing. Conidia were aricular, continuous, 3 to 13 septate, hyaline and borne solitary on conidiophores. The conidia measured 40-135 × 5-6 µm (Plate 4).

Several authors documented the symptoms of Cercospora leaf spot of chilli, and the symptoms recorded in the survey were consistent with those described by Katoch *et al.* (2014), and Islam *et al.* (2015). The description of Cercospora leaf spot of chilli under microscope by previous worker (Suresh 2013) coincides with the current findings, and the causal organism of Cercospora leaf spot of chilli was identified as *Cercospora capsici.*

Anthracnose of chilli: The symptoms of anthracnose of chilli in all the villages under studied showed small circular spots on the leaves. Defoliation of the infected plant occurs as the spots consolidate to create big elliptical blotches on fruits and leaves, ranging in color from black to dirty grey. Conidia were hyaline, continuous slightly curved, pointed at both the ends and measuring 25.5-30.5 × 54-7 µm (Plate 5).

Various authors report the symptoms of anthracnose of chilli and the symptoms recorded in the survey was in agreement with the symptoms described by Kim *et al.* (2004), Kumar and Bhaskaran (2007). Previous descriptions of chilli anthracnose (Saxena *et al.* 2016, Ghosh *et al.* 2016 and Prajapati *et al.* 2020). The variation in spore size was noticed by Hanumanthappa *et al.* (2018) which support the current findings, and the causal organism of chilli anthracnose was identified as *Colletotrichum capsici.*

Ginger leaf spot: The symptoms of ginger leaf spot in all the surveyed villages showed circular spots on the leaves with white centers, dark brown margins and yellowish surrounding halos. The circular spots measures about 1×0.5 mm and oval or elongated spots measures about 9-10×3-4 mm in diameter. Conidia are cylindrical with tapering ends and the size of conidia ranged from 12.2-18.3 × 6.9-11 µm (Plate 6).

The symptoms of ginger leaf spot observed by Meenu and Tennyson Jebasingh (2019) and Rai *et al.* (2017) were similar with the symptoms recorded in the survey. Previous descriptions of ginger leaf spot (Kumar 2013, Sampritha *et al*. 2023) coincide with the current study's conclusions and findings, and the causal organism of ginger leaf spot was identified as *Phyllosticta zingiberi.*


Plate 6(a): Symptom


Plate 6(b): Survey field

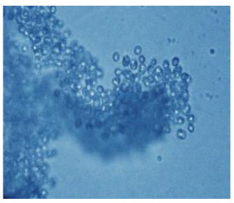
Plate 6(c): Microscopic view of *Phyllosticta zingiberi* (40x)


Plate 6(d): Herbarium

Plate 6. Ginger leaf spot.

Plate 7(a): Symptom

Plate 7(b): Survey field

Plate 7(c): Microscopic view of *Pseudocercospora fijiensis* (40x)

Plate 7(d): Herbarium

Plate 7. Black sigatoka leaf spot of banana.

Black sigatoka: The symptoms of black sigatoka of banana reported in the survey village showed that small, light yellow spots or streaks on one-month-old leaves are the first signs of black sigatoka (*Mycosphaerella fijiensis*). The veins run parallel to the symptoms. The patches grow to reach a few centimeters in diameter and turn brown with light grey centers after a few days. The tissue around the lesions becomes yellow and dies as the spots grow larger. When lesions coalesce, the entire leaf turns brown and eventually dies. Conidia observed under microscope are primarily cylindric, obclavate on rare occasions, 1 to 5 septate, uniform thickness along length, and lacking a prominent basal hilum, usually measured 10-80 µm × 2-6 µm (Plate 7).

The symptoms of black sigatoka of banana, earlier studied by George *et al.* (2021), Esguera *et al.* (2024) is similar with the symptoms oberserved in the survey. Microscopic observations conducted by earlier researchers such as Crous and Mourichon (2002) and Sepúlveda *et al.* (2009) reinforce the current findings, and the causative organism of black sigatoka of banana disease was identified as *Pseudocercospora fijiensis.*

Black spot of citrus: The symptoms of citrus black spot reported in the survey village showed that the disease appeared on the leaves as spot lesions (15 mm in diameter with raised cracks and diffuse edges. In some instances, the centers of lesions developed into hard patches. Small (up to 7 mm long), brilliant red, uneven, indented, and frequently with numerous pycnidia, the early virulent spot lesions were also indented. Conidia observed under the microscope was hyaline, aseptate, cylindrical to dumbbell-shaped with guttules at each end, 10-12 µm × 6-7.5 µm (Plate 8).

The symptoms of citrus black spot reported by different authors (Tran *et al.* 2017, Agostini *et al.* 2006) is similar with the symptoms observed in the survey. Previous descriptions of citrus black spot (Baldassari *et al.* 2009, Hu *et al.* 2014) coincide with the current study's conclusions and findings, and the causal organism of citrus black spot was identified as *Phyllosticta citricarpa.*

Sugarcane eye spot: The symptoms of sugarcane eye spot reported in the survey village showed water-soaked area which appears on leaves, grows longer, and eventually transforms into a "eye" shaped patch with a reddish brown center surrounding by straw yellow tissues. Conidia were cylindrical to oblong, slightly curved to one side, tapering bluntly

Plate 8(a): Symptom

Plate 8(b): Survey field

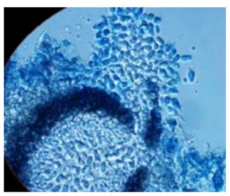

Plate 8(c): Microscopic view of *Phyllosticta citricarpa* (40x)

Plate 8(d): Herbarium

Plate 8. Black spot of citrus.

Plate 9(a): Symptom

Plate 9(b): Survey field

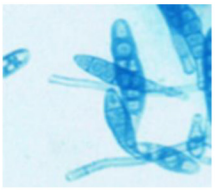

Plate 9(c): Microscopic view of *Bipolars sacchari* (40x)

Plate 9(d): Herbarium

Plate 9. Sugarcane eye spot.

pointed ends with thin peripheral walls measuring 37-98.9 µm × 9.3-13.1µm, having 5-10 septation (Plate 9).

The symptoms of sugarcane eye spot earlier recorded by Jackson *et al.* 2013; Rott *et al.* 2017 was found in agreement with the symptoms observed in the survey. Description of Sugarcane eye spot by earlier workers (Tiwari *et al.* 2010, Rott *et al.* 2017) were in accordance with the findings of the present study and the causal organism of sugarcane eye spot disease was identified as *Bipolars sacchari.*

Assessment of the extent of crop damage caused by the disease

During the course of the survey, incidence and disease severity of fungal diseases were recorded in the three blocks of Lunglei district. Fungal disease incidence (Table 1) and severity (Table 2) of each village were discussed below

.

The highest disease incidence (DI) of brown spot of rice (37.22%) was observed in Bunghmun block. The DI of narrow brown spot (19.43%), southern corn leaf blight (37.77%), leaf spot of chilli (40.54%), ginger leaf spot (32.21%), banana black sigatoka (48.32%) and sugarcane eye spot (33.32%) were also recorded to be highest in Bunghmun block (Table 1). Whereas, the DI of anthracnose (19.43%) and black spot of citrus (26.66%) were recorded to be highest in Lunglei block (Table 1).

Percent Disease Incidence (PDI) was calculated

Table 1. Incidence of diseases in different villages and blocks under Lunglei district in the year 2021.

Block	Village	Field	Rice					
			DI (%)	Mean incidence of brown spot of rice		DI (%)	Mean incidence of narrow brown spot of rice	
				Village	Block		Village	Block
W. Bunghmun		F1	43.33			16.66		
	Changpui	F2	40.00	43.33		23.33	19.99	
		F2	46.66			20.00		
		F1	30.00		37.22	13.33		19.43
	Marpara	F2	33.33	31.11		23.33	18.88	
		F3	30.00			20.00		
Lungsen		F1	26.66			16.66		
block	Chawngte	F2	33.33	29.99		13.33	13.33	
		F3	30.00			10.00		
		F1	26.66		31.1	20.00		16.66
	Phairuangkai	F2	33.33	32.21		26.66	19.99	
		F3	36.66			13.33		
Lunglei block		F1	33.33			10.00		
	Lunglei	F2	36.66	36.66		20.00	15.55	
		F3	40.00			16.66		16.66
		F1	30.00		33.32	13.33	17.77	
	Haulawng	F2	26.66	29.99		16.66		
		F3	33.33			23.33		

Table 1. Continued.

Block	Village	Field	Maize DI (%)	Mean incidence of southern corn leaf blight		Chilli DI (%)	Mean incidence of Cercospora leaf spot of chilli	
				Village	Block		Village	Block
W. Bunghmun		F1	43.33			43.33		
	Changpui	F2	33.33	37.77		40.00	38.88	
		F2	36.66			33.33		
		F1	33.33		37.77	46.66		40.54
	Marpara	F2	40.00	37.77		36.66	42.21	
		F3	40.00			43.33		
Lungsen		F1	30.00			30.00		
block	Chawngte	F2	23.33	25.55		36.66	35.55	
		F3	23.33			40.00		
		F1	26.66		23.88	43.33		39.49
	Phairuangkai	F2	23.33	22.21		40.00	43.33	
		F3	16.66			46.66		
Lunglei		F1	20.00			33.33		
block	Lunglei	F2	16.66	18.88		36.66	37.77	
		F3	20.00			43.33		
		F1	23.33		18.16	46.66		39.43
	Haulawng	F2	13.33	17.44		36.66	41.10	
		F3	16.66			40.00		

Table 1. Continued.

Block	Village	Field	Chilli DI (%)	Mean incidence of anthracnose of chilli		Ginger DI (%)	Mean incidence of of ginger leaf spot		Banana DI (%)	Mean incidence of banana black sigatoka	
				Village	Block		Village	Block		Village	Block
W. Bunghmun		F1	16.66			33.33			50.00		
	Changpui	F2	20.00	16.66		40.00	38.87		46.66	48.88	
		F2	13.33			43.33			50.00		
		F1	23.33		17.21	26.66		32.21	43.33		48.32
	Marpara	F2	13.33	17.77		26.66	25.55		50.00	47.77	
		F3	16.66			23.33			50.00		
Lungsen		F1	20.00			30.00			40.00		
block	Chawngte	F2	13.33	14.44		26.66	29.99		53.33	47.77	
		F3	10.00			33.33			50.00		
		F1	20.00		17.21	26.66		29.43	43.33		44.99
	Phairuangkai	F2	13.33	19.99		30.00	28.88		46.66	42.21	
		F3	26.66			30.00			36.66		
Lunglei block		F1	16.66			23.33			43.33		
	Lunglei	F2	23.33	19.99		26.66	25.55		46.66	46.66	
		F3	20.00			26.66			50.00		
		F1	16.66		19.43	30.00		26.10	53.33		45.55
	Haulawng	F2	16.66	18.88		26.00	17.44		36.66	44.44	
		F3	23.33			23.33			43.33		

Table 1. Continued.

Block	Village	Field	Citrus DI (%)	Mean incidence of black spot of citrus		Sugarcane DI (%)	Mean incidence of sugarcane eye spot	
				Village	Block		Village	Block
W. Bunghmun	Changpui	F1	26.66			40.00		
		F2	23.33	24.44		30.00	34.44	
		F3	23.33			33.33		
		F1	20.00		23.88	36.66		

Table 1. Continued.

Block	Village	Field	Citrus DI (%)	Citrus Mean incidence of black spot of citrus Village	Citrus Mean incidence of black spot of citrus Block	Sugarcane DI (%)	Sugarcane Mean incidence of sugarcane eye spot Village	Sugarcane Mean incidence of sugarcane eye spot Block
	Marpara	F2	26.66	23.33		26.66	32.21	
		F3	23.33			33.33		
		F1	16.66			30.00		
Lungsen	Chawngte	F2	23.33	19.99		26.66	25.55	
block		F3	20.00			20.00		
		F1	26.66		20.54	20.00		22.77
	Phairuangkai	F2	20.00	21.10		26.66	19.99	
		F3	16.66			13.33		
		F1	23.33			36.66		
Lunglei	Lunglei	F2	20.00	23.33		26.66	27.77	
block		F3	26.66			20.00		
		F1	30.00		26.66	40.00		32.21
	Haulawng	F2	33.33	29.99		36.66	36.66	
		F3	26.66			33.33		

*DI– Disease incidence.

from three blocks of Lunglei district. The highest PDI of all the diseases i.e., brown spot of rice (14.07), narrow brown spot of rice (7.34), southern corn leaf blight (22.55), leaf spot of chilli (16.54), ginger leaf spot (11.55), black sigatoka (21.10), black spot of citrus (10.67) sugarcane eye spot (16.04) were recorded to be highest in Bunghmun block (Table 2) except anthracnose of chilli. PDI for anthracnose of chilli (4.37) was recorded to be highest in Lunglei block (Table 2).

In the current study, the highest disease incidence was identified in Bunghmun block for all diseases except anthracnose of chilli, which was highest in Lunglei block (Table 2). This maybe attributed due to a number of factors like environmental conditions, use of infected seeds from previous crop season, since W. Bunghmun block is not well connected with the main district headquarter by road, awareness regarding the fungal diseases are very limited, the farmers` from W. Bunghmun block usually keep crops debris in the field for enriching the soil nutrients, these may be the main reason for the high incidence of the disease in the area compared to other blocks.

In anthracnose of chilli, disease development is favored by temperature which ranged between 27-20 ˚C and relative humidity of 80 % (Rahman *et al.* 2018). The high incidence of anthracnose of chilli in Lunglei block is mainly due to the high rainfall and high humidity during the fruiting stage of chilli (Murmu *et al.* 2021). Most of the farmers in Lunglei

Table 2. Percent Disease Index (PDI) of the diseases in different blocks of Lunglei district during 2021.

Block	Village	Mean PDI								
		Brown spot of rice	Narrow brown spot of rice	Southern corn leaf blight	Cercospora leaf spot of chilli	Anthracnose of chilli	Ginger leaf spot	Banana black sigatoka	Black spot of citrus	Sugarcane eye spot
W. Bunghmun Block	Changpui Marpara	14.07	7.34	22.55	16.54	3.39	11.55	21.10	10.67	16.04
Lungsen block	Chawngte Phairuangkai	11.23	5.98	15.10	15.92	3.64	10.05	20.15	9.35	10.42
Lunglei block	Lunglei Haulawng	13.02	6.16	10.33	15.24	4.37	9.49	20.63	10.30	15.55

block follow intercropping of chilli with turmeric to increase their field productivity. Since, turmeric can serves as secondary host for *Colletotrichum* sp. This may also be the reason for the high incidence of the disease in the area.

CONCLUSION

According to data of disease incidence and percent disease index recorded in the survey, it was observed that most of the disease incidence and PDI are highest in Bunghmun block except anthracnose of chilli in Lunglei block. Bunghmun block is situated on the remote part of Lunglei district, the road connection to the main block headquarter is not well developed. Due to the in accessible nature of the block from the district Agriculture Department, there is lack of knowledge regarding diseases of crops and good agricultural practices, this may have been the reason for the high incidence of disease in the area.

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