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Disease assessment and pathogenicity of *Phomopsis* spp. in fruits of eggplants (*Solanum melongena*) in Miagao, Iloilo, Philippines

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Abstract. *Nacionales AMB, Paguntalan DP. 2026. Disease assessment and pathogenicity of* Phomopsis *spp. in fruits of eggplants (*Solanum melongena*) in Miagao, Iloilo, Philippines. Nusantara Bioscience 18 (1): n180102. https://doi.org/10.13057/nusbiosci/n180102.* Fruit rot is an economically important disease affecting eggplant (*Solanum melongena*) production worldwide. This study assessed the incidence, severity, and economic impact of fruit rot in Barangay Oyungan, Miagao, Iloilo, Philippines and characterized its causal pathogen. Across three harvests, disease incidence averaged 35.05%, with 14.75% specifically attributed to fruit rot. The Percent Disease Index (PDI) was consistently high (mean 54.79%). Economic losses were substantial, with rejected fruit peaking at 51.55% of the harvest on 17 March 2024. Morpho-cultural characterization of fungal isolates revealed nine colonies, of which AES2R3 and AES3R3 exhibited typical *Phomopsis* spp. characteristics. AES2R3 produced both alpha- and beta-conidia, whereas AES3R3 produced only alpha-conidia. Pathogenicity tests confirmed that both isolates were pathogenic, producing characteristic sunken, gray-to-brown lesions and dark pycnidia by 22 days post-inoculation. These findings establish that *Phomopsis* spp. is a major cause of eggplant fruit rot in the locality and demonstrate its significant impact on yield and quality. Results highlight the importance of implementing integrated disease management strategies, varietal screening, and seasonal monitoring to reduce losses and support farmer profitability. This is the first study to report the occurrence of *Phomopsis* species causing fruit rot in Miagao, Iloilo.

Keywords: Disease assessment, eggplant, fruit rot, pathogenicity test, *Phomopsis* spp.

INTRODUCTION

Eggplant (*Solanum melongena*), known locally as *talong* or *tarong* in the Philippines, is one of the most economically important vegetable crops in the world. It is an extensively cultivated agricultural crop in the Philippines, ranking as the leading vegetable crop by volume, according to the Statista Research Department (2024). Eggplant production from April to June 2023 was recorded at 102.98 thousand metric tons, a -3.6 percent decline from the 106.87 thousand metric tons produced in the same quarter of 2022 (PSA 2022, 2023a, b). Miagao, a first-class municipality in the province of Iloilo, located in the Western Visayas region of the Philippines, is one of the top producers of eggplant with one of its barangays recognized as the “Eggplant Capital of Panay”. The town has an eggplant plantation area of 28.25 hectares, and a total production of 131.25 mt in 2015 (Municipality of Miagao n.d.). Recently, in the first quarter of 2023, the Ilocos Region's production of eggplant fell. It reflected a 0.66 percent decrease relative to the 32,870.77 metric tons of production reported in the first quarter of 2022 (PSA 2023). The recent declines in the total harvest of eggplants could be attributed to several factors in preharvest and postharvest losses. The eggplants' low quality profile in preharvest could be due to immaturity, overmaturity, scarring, curling, scaling, and insect damage. Postharvest losses may be due to mechanical damage (dents, bruises, punctures, and cuts) and pathological defects, like soft rot, wilting, and signs of disease. In the study of Flores et al. (2018), the results of profiling indicated that most of the defects at farmer level were due to preharvest factors specifically caused by pests and diseases.

Eggplants are commonly affected by various fungal infections, particularly in Southeast Asia, including the Philippines. Miagao, a first-class municipality in the province of Iloilo, in the Western Visayas region of the Philippines, is one of the top eggplant producers, with one of its barangays recognized as the "Eggplant Capital of Panay." The town has an eggplant plantation area of 28.25 hectares, and a total production of 131.25 mt in 2015 (Municipality of Miagao n.d.), but recent declines have also been observed among plantation owners. The recent decline in the total eggplant harvest can be attributed to several factors, including preharvest and postharvest losses. Postharvest losses may be due to mechanical damage (dents, bruises, punctures, and cuts) and to pathological defects such as soft rot, wilting, and disease symptoms. The indications of various diseases and disorders that adversely affect eggplants can be detected in the crop's roots, leaves, stems, or fruits. Fruit rot is the most widespread of all eggplant-related fungal diseases caused by a variety of pathogens like *Fusarium* spp., *Colletotrichum* spp., *Phytophthora* spp., *Alternaria* spp., and *Phomopsis* spp., which are most common in hot and wet weather (Maithani and Sharma 2021). In India and Pakistan, the two causal agents responsible for the disease are *Diaporthe vexans* and *Alternaria* spp. (Raja et al. 2006; Iftikhar et al. 2021;

Maithani and Sharma 2021; Rohini et al. 2023). Only a few studies in the Philippines have conducted identification and pathogenicity studies on eggplant fungal pathogens. *Phomopsis* blight is one of the most devastating diseases of eggplant, with significant economic and scientific impacts (Udayanga et al. 2011). The pathogen is widely distributed in all eggplant-growing regions worldwide. It continues to lower the productivity, value, and profitability of not only eggplant production (Rohini et al. 2023), but also of many crops (Udayanga et al. 2011; Li et al. 2017), causing inconvenience to eggplant producers during preharvest and postharvest periods.

Species identification based on morphological traits is the first step in assessing the presence and distribution of fungal diseases in a given area. It often serves as a prerequisite for more advanced taxonomic or phylogenetic analyses. In regions like Miagao and the broader Visayas, where baseline information on *Phomopsis* species and eggplant fungal diseases is lacking, a focused morpho-cultural and pathogenicity assessment provides essential foundational data. While molecular tools can later enhance taxonomic resolution, establishing these preliminary characteristics is a necessary starting point for guiding subsequent molecular, ecological, and disease-management studies. Given the absence of existing reports on *Phomopsis* blight in the region, this initial approach is vital for understanding local species diversity and their potential impacts. The occurrence of *Phomopsis* spp. in eggplant crops in Miagao is crucial for expanding knowledge of the condition and, ultimately, for creating integrated disease management strategies.

The objectives of this study were to: (i) conduct a disease assessment of severity and incidence from field harvests, (ii) isolate the fungal pathogen from symptomatic samples, (iii) morphologically characterize the isolates through cultural and microscopic characteristics, and iv) perform pathogenicity tests in healthy eggplants to prove Koch's postulates.

MATERIALS AND METHODS

Study area

Miagao is situated in the southwest region of Iloilo on the Island of Panay, Philippines (Figure 1). It is 58 kilometers from San Jose, Antique's capital city, and 40 kilometers southwest of Iloilo City. The study site was in Barangay Oyungan, Miagao, which is located at approximately 10°39′10.628867″ N, 122°14′18.2364″ E. Barangay Oyungan was chosen for this study since it has the biggest eggplant plantation area in Miagao. It is one of the three barangays, together with Barangay Bagumbayan and Barangay Naclub, that grow eggplant from October to February.

Disease assessment

A 1-5 grading scale (Valida et al. 2018) was used to evaluate the severity of *Phomopsis* fruit rot disease in symptomatic eggplants from a single plantation. The table presents a five-grade disease severity scale for eggplant fruit rot, ranging from no visible symptoms (Grade 1) to severe, extensive rotting affecting more than 51% of the fruit (Grade 5). Each grade includes a brief description of the percentage of rot and a corresponding reference image illustrating the typical appearance of the fruit at that severity level (Table 1).

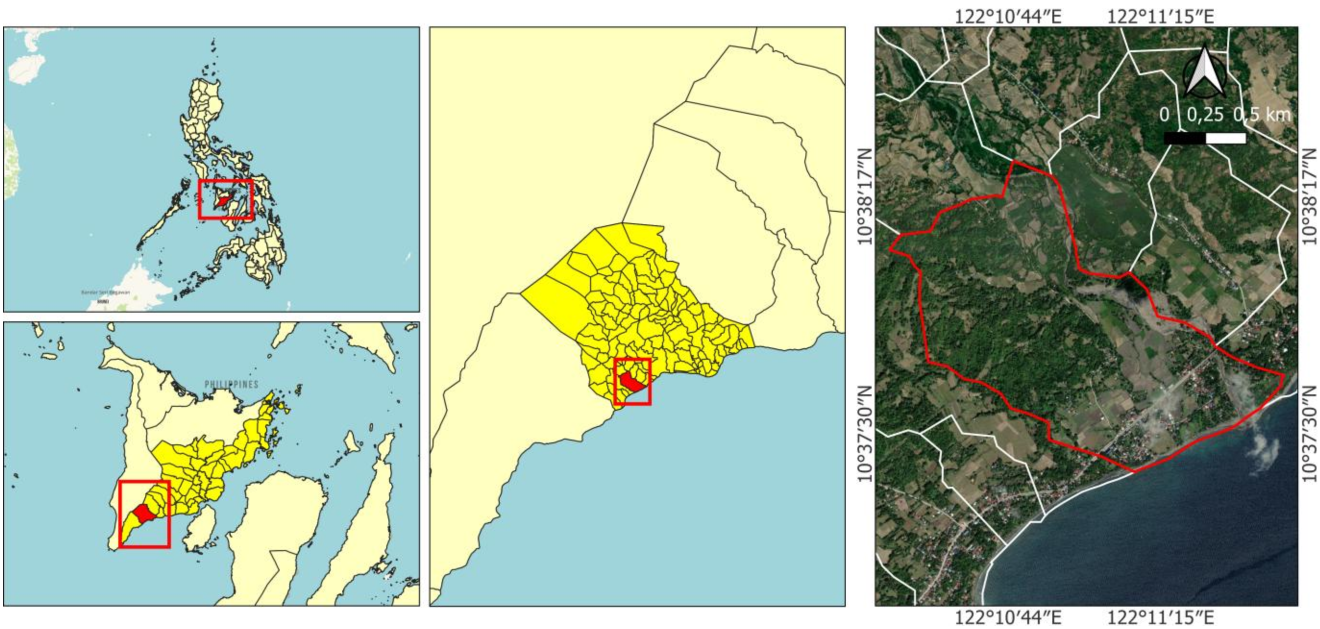

Figure 1. Location of Barangay Oyungan, Miagao, Iloilo, Philippines

Table 1. Disease severity scale

Grade	Description	Images
1	No symptom of rotting	
2	1-10% rotting	
3	11-30% rotting	
4	31-50% rotting	
5	>51% severe and extensive rotting	

The proportion of eggplants in each severity grade was recorded, with Grade 1 (Table 1) representing those with no visible signs of rot. The overall disease severity percentage was calculated for all sampled eggplants. Disease incidence and fruit rot incidence were calculated using the formula:

Disease incidence (%) = (Number of diseased fruits / Total number of observed fruits) × 100

Fruit rot incidence (%) = (Number of symptomatic eggplants with lesions in one harvest / Total number of diseased eggplants in one harvest) × 100

The Percent Disease Index (PDI) was computed using Mackinney's formula. Unlike overall disease severity, PDI calculations excluded Grade 1 eggplants and focused only on those with fruit-rot symptoms (Grades 2-5).

Percent Disease Index (PDI) = [Sum of all individual disease ratings / (Total number of plants observed × Maximum disease grade)] × 100

Variations in sample size, field conditions, and disease pressure at the time of each sampling were considered in the analysis. The independent nature of each sampling event was accounted for in data interpretation.

Sample collection and fungal isolation

Samples with characteristic lesions (Figure 2.A) were collected from February to March 2024. Sample collection and fungal isolation were performed according to the modified method described by Cai et al. (2009). The infected fruit samples were collected from the field and kept in labeled, resealable bags. A flame-sterilized scalpel was used to cut thin tissue slices (1-2 cm) of the infected fruits. Samples were disinfected with 10% (v/v) sodium hypochlorite for one minute, then washed and rinsed three times for 30 seconds with sterile distilled water, dried with sterile tissue paper, and transferred to 100-mm plates of potato dextrose agar (PDA) medium. The Petri plates were then incubated at room temperature (28-30°C) for two weeks. Fungal isolates were aseptically transferred to PDA, purified, and further characterized. A portion of mycelia was scraped from a sporulating culture using a sterile needle and placed in the center of another 50-mm PDA plate for purification. The plates were incubated at 28°C for 7 days.

Cultural and morphological characterization of isolates

The cultural characteristics of different isolates were noted, including mycelial form, size, margin, elevation, and the texture and color of both the obverse and reverse sides of purified plates. A thin layer of aerial mycelia from the representative fungal cultures was cut with a mounting needle and placed over a drop of the lactophenol-cotton blue stain. The slide was mounted and inspected under the light microscope with 10x and 40x objective lenses. The characterization was based on morphological criteria, including conidial structure, shape, and type. Pure cultures were then identified based on their morphological, cultural, and microscopic characteristics, as described by Kanematsu et al. (1999), including conidial size and shape. A Novex stereomicroscope AP-4 was used to observe the cultural properties of 7-day-old cultures. The Nikon Eclipse E100 and the AmScope Digital Compound Microscope were used to observe the isolates' morphological characteristics, and ImageFocus Plus V2 Software was used to document and measure the alpha- and beta-conidia.

Pathogenicity test

The pathogenicity test was conducted on detached eggplant fruits to evaluate the virulence of the fungal isolates. Pure cultures of each fungal isolate were first established on Potato Dextrose Agar (PDA). From these cultures, mycelial plugs approximately 5 mm in diameter were aseptically excised and used as inoculum. The inoculation was performed using the pin-pricking method described by Phoulivong et al. (2012), in which small wounds were made on the fruit surface to facilitate infection. Two eggplant fruits were used as biological replicates for each fungal isolate, yielding a total of four fruits across the two isolates. Each fruit was inoculated at three sites, bringing the total to 12. This setup ensured consistency and reproducibility in evaluating the pathogenic effects of the fungal isolates on the host tissue. All isolates exhibited symptoms comparable to those observed in the field. Symptom development was recorded at 4, 11, 18, and 22 days post-inoculation (dpi) using the grading scale of Valida et al. (2018). At 18 dpi, fungal re-isolation was performed from the infected inoculated sites to confirm Koch's postulates.

Data analysis

Mean and standard deviation were used to assess disease incidence, severity, and Percent Disease Index across sampling periods. The Kruskal–Wallis H test was employed to evaluate whether disease severity grades differed significantly across the three independent harvests included in the study. In this analysis, the dependent variable was the ordinal disease severity grade assigned to each sample, while the harvest batches served as the independent grouping factor. For the pathogenicity assay, the Friedman test was utilized to assess changes in disease progression across repeated observations taken at 4, 11, 18, and 22 days post-inoculation (dpi). Because the same set of inoculated fruits was monitored over time, this non-parametric repeated-measures test was appropriate. Here, the dependent variable was the disease severity score measured at each time point, and time (dpi) served as the within-subjects factor.

RESULTS AND DISCUSSION

Disease incidence

The results of disease incidence at different harvesting dates are presented in Table 2. The disease incidence of the total harvest was 21.82%, of which 12.5% was due to fruit rot. On 25 February 2024, the total was 5,190 pieces, comprising 3,540 good eggplants and 1,650 rejects. Of the 1,650 rejects, 70 eggplants showed signs of rot. The disease incidence of the total harvest was 31.79%, with 4.24% being attributed to fruit rot. On 17 March 2024, the total harvest was 3,880 pieces, comprising 1,880 good eggplants and 2,000 rejects. Of the 2,000 rejects, 550 eggplants showed signs of rot. The disease incidence of the total harvest was 51.55%, of which 27.5% was due to fruit rot. The highest disease incidence was observed on the last harvesting date, while the lowest was observed on the first. The harvest days had an average disease incidence of 35.05%, with 14.75% of the total rejects being attributed to fruit rot. The incidence of fruit rot among the total number of rejected eggplants was considerably high, as nearly half of them were attributed to rotting. This percentage may be expected at least for every harvest.

Overall, the observed incidence reflects moderate to high disease pressure, while the fruit-rot component falls within the lower-to-mid range reported in field studies. Eggplant fruit rot has been reported at rates ranging from ~15% to over 60% depending on the pathogen, season, cultivar, and location (Mahadevakumar et al. 2017; PriyaReddy et al. 2018; Keinath 2021). Thus, the 35.05% overall incidence represents a meaningful production constraint under local conditions. In comparison, the 14.75% fruit-rot fraction indicates that fruit rot is an important, though not dominant, component of total disease loss.

Disease severity

Disease severity in eggplant plants was found to vary across three harvest intervals (2 February 2024, 9 February 2024, and 23 March 2024). The harvesting dates were presented along with the number of eggplants, aligned with their respective severity grades (Table 3). Eggplants showing 1-10% of rotting were 6.74%, followed by eggplants showing 11-30% of rotting, which were 4.87%. Eggplants showing 31-50% and > 51% of rot were 1.70% and 0.71%, respectively. Results show that most eggplants harvested with fruit-rot symptoms had a grade of 2, indicating that only 1-10% of the fruit was affected by rot. This indicates that although a substantial portion of plants experience rot, the majority have low-severity lesions, consistent with a moderately high Percent Disease Index across harvests. Many eggplants with grades of 4 and 5, showing more than 31% severe and extensive rot, were not recorded because they were no longer harvested and left in the field to rot. This practice was adopted because classifying eggplants by quality during selection was inconvenient.

Percent Disease Index

The Percent Disease Index and Mean ± SDs of the Percent Disease Index values for three harvest dates are shown in Table 4. The highest Percent Disease Index recorded was 54.89%, while the lowest was 54.63%. There was no significant difference among the Percent Disease Indexes, as the average Percent Disease Index of fruit rot in the field was 54.79 ± 0.14. The highest disease incidence in eggplant harvests occurred on 17 March 2024, with a total of 79.05% (51.55% rejected + 27.5% with fruit rot). This does not represent the PDI but corresponds to the combined proportion of rejected fruits and those with fruit rots. The lowest was on 18 February 18 2024, at 34.32% (21.82% rejected + 12.5% with fruit rot), with the lowest fruit rot incidence recorded on 25 February 2024, at 4.24%. PDI measures the intensity of disease based on severity grades across fruits and is conceptually distinct from rejection rates.

The highest Percent Disease Index in eggplant harvests was recorded on 1 February 2024 (Sampling 1) at 54.89%, while the lowest was on 25 February 2024 (Sampling 2) at 54.63%, with an overall mean Percent Disease Index of 54.79 ± 0.14% across the three sampling periods, including 17 March 2024 (Sampling 3) at 54.84%. This trend suggests disease intensity increased over time with more favorable conditions for pathogen development.

Table 2. Disease incidence (%) of harvested eggplants from three independent sampling events in Barangay Oyungan, Miagao, Iloilo, Philippines

	Sampling 1		Sampling 2		Sampling 3		
Eggplant harvest	**Total (pieces)**	**Disease incidence (%)**	**Total (pieces)**	**Disease incidence (%)**	**Total (pieces)**	**Disease incidence (%)**	**Disease incidence % (Mean ± SD)**
Healthy	4300		3540		1880		
Rejected	1200	21.82	1650	31.79	2000	51.55	35.05 ± 15.13
With fruit rot	150	12.5	70	4.24	550	27.5	14.75 ± 11.79
Total	5500		5190		3880		49.80 ± 20.69%

Table 3. Disease severity grades of harvested eggplants from three independent sampling events in Barangay Oyungan, Miagao, Iloilo, Philippines

Grade	Sampling 1	Sampling 2	Sampling 3	Sum severity grade	Disease severity (%)	Disease severity (Mean ± SD)	p-value
1	530	490	550	1570	85.98	523.33 ± 30.55	0.007
2	89	22	12	123	6.74	41 ± 41.87	
3	61	12	16	89	4.87	29.67 ± 27.21	
4	26	3	2	31	1.70	10.33 ± 13.58	
5	8	4	1	13	0.71	4.33 ± 3.51	

Table 4. Percent Disease Index (PDI) of fruit rot in harvested eggplants from three independent sampling in Barangay Oyungan, Miagao, Iloilo, Philippines

Harvesting period	Percent Disease Index (%)
Sampling 1	54.89
Sampling 2	54.63
Sampling 3	54.84
Total % index	54.79 ± 0.14

Isolation and identification of isolates

Nine fungal colonies formed during isolation, two of which, isolate AES2R3 and isolate AES3R3, exhibited typical characteristics of *Phomopsis* spp. The colonies of fungal isolate AES2R3 on PDA were circular with an entire margin and raised elevation. Initially, the surface was cottony white or grey, but it turned dark olive green or dark gray after 10 days, with scattered white aerial hyphae atop stroma-bearing pycnidial locules. The reverse side transitioned from yellow or cream to black with a rugose texture. Similarly, isolate AES3R3 formed circular colonies with a complete margin, a slightly raised elevation, and a rugose texture. The surface, initially floccose grey, became grayish-brown after 10 days, featuring abundant white aerial hyphae over the pycnidial stroma. The reverse changed from bright yellow or orange to black with a rugose texture. The conidia of isolates AES2R3 and AES3R3 exhibit distinct characteristics (Figures 2. B-C). Alpha-conidia of AES2R3 were fusiform (spindle-shaped), straight, and biguttulate, with a hyaline (transparent) appearance; those of AES3R3 are filiform (thread-like), either straight or hooked, and eguttulate but also hyaline. Beta-conidia, observed only in AES2R3, are fusiform, straight, biguttulate, and hyaline (Figure 2.D). The alpha-conidia have an average size of 2.40 × 0.74 µm, with lengths ranging from 1.55 to 4.16 µm and widths from 0.54 to 0.93 µm. The beta-conidia have an average size of 8.38 × 0.78 µm, with lengths ranging from 3.40 to 14.48 µm and widths from 0.52 to 1.02 µm. Alpha- and beta-conidia are characteristics of *Phomopsis* spp.

Pathogenicity test

Eleven days post-inoculation, the wound sites of healthy eggplant samples inoculated with isolates AES2R3 and AES3R3 started to form a white mycelium. Symptoms, such as a slight change in color in the area around the wound, appeared 18 days post-inoculation. Eggplant replicates 2 of the isolates, AES3R3, developed brown, sunken rotting lesions around the inoculated site. Twenty-two days post-inoculation, eggplant replicate 1 of isolate AES2R3 and the two eggplant replicates of isolate AES3R3 showed severe and extensive rotting with white mycelia covering almost half of the fruit (Figure 3). In contrast, control plants showed no symptoms. Pycnidia were also present on the surface of the fruit; they were visible as black bumps or fruiting bodies on the eggplant. Re-isolation and fungal identification of the isolates from the newly inoculated eggplant fruits revealed morphocultural characteristics similar to those of the original pure cultures of isolates AES2R3 and AES3R3. The symptoms on the inoculated plants were also similar to those of the natural plants, confirming Koch's postulates.

The pathogenicity test confirmed that fungal isolates AES2R3 and AES3R3 were pathogenic to eggplant fruits in detached fruit assays. Characteristic symptoms of sunken gray to brown oval depression lesions in the inoculated fruits were observed. Moreover, dark pycnidia, black fruiting bodies produced by *Phomopsis* spp., were also erumpent at 22 days post-inoculation. Statistical analysis of disease severity over time demonstrated a significant increase in symptom severity throughout the 22-day observation period. The Friedman test revealed a significant effect of time on disease development for both isolates, with isolate AES2R3 (p-value = 0.003) and isolate AES3R3 (p-value < 0.001). These results indicate that disease severity changed significantly across the different post-inoculation time points for both isolates. In other words, symptom intensity increased as time progressed following inoculation.

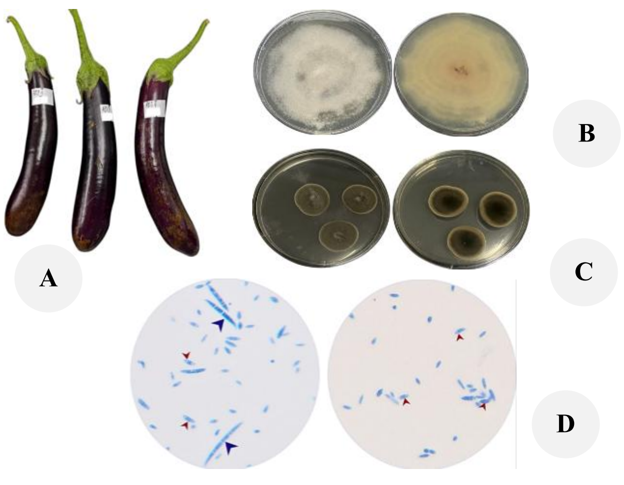

Figure 2. A. Diseased eggplant fruit samples with characteristic lesions, B and C. Obverse (left) and reverse (right) view of AES2R3 and AES3R3 pure cultures, D. Isolates AES2R3 (left) and AES3R3 (right) showing the alpha-conidia (red arrowhead); beta-conidia (blue arrowhead)

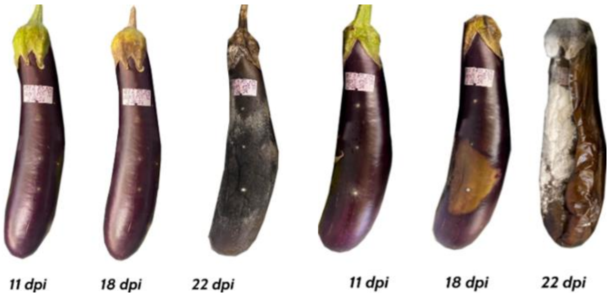

Figure 3. Pathogenicity of isolates: A. AES2R3, B. AES3R3 in healthy eggplant fruits after 11, 18, and 22 days post-inoculation

Discussion

The occurrence of fruit rot in Barangay Oyungan, Miagao, Iloilo has resulted in significant production and yield losses in eggplant cultivation. The reported disease incidence of 35.05% among the total harvest, with 14.75% specifically attributed to fruit rot, highlights the substantial impact of this disease on eggplant productivity. These findings align with broader research on fruit diseases in eggplant and other crops. Nasehi et al. (2012) documented disease incidences averaging around 30% in severely infected eggplant fields, underscoring a comparable scale of loss. For instance, in a study in Tamil Nadu, India, 22.07% to 27.05% across different cropping seasons for phytoplasma-associated eggplant disease (Karthikeyan et al. 2024). Meanwhile, a study in Korea documented much lower fruit rot incidence in eggplant, approximately 2.6% (Kwon and Jee 2005). In parts of Central Luzon, Philippines, the incidence of insect pests associated with eggplant reached up to 38.3%, demonstrating variability in pest and disease pressures depending on local conditions (Srinivasan 2014). The disease reduces yield by reducing the quantity and quality of marketable fruit, as seen in other fruit crops, where moderate to severe fruit rot leads to significant losses (Montecalvo et al. 2023).

In terms of disease severity, across three harvests, most fruits had mild rot, with 6.74% affected at 1-10% and 4.87% at 11-30%. More severe cases were rare (1.70% at 31-50% and 0.71% above 51%). This pattern reflects farmers' preference for harvesting mildly affected fruits (grade 2), while severely damaged ones (grades 4-5) were often left due to handling difficulties. Similar patterns of fungal disease severity have been observed in eggplants and related Solanaceous crops affected by pathogens such as *D. vexans*, and those causing soft rot and anthracnose (Manda et al. 2020; Keinath 2021; Saha et al. 2021). Relatedly, Mahadevakumar et al. (2017) observed fruit rot symptoms 45-55 days post-inoculation, suggesting that symptom progression in fruits may take longer under different growing conditions.

The presence of a high number of rejected fruit on the peak incidence date indicates that disease severity directly influences fruit marketability, with extensive rot leading to the discarding of infected fruit to maintain quality standards. This observation aligns with findings from studies where a high Percent Disease Index (PDI) correlates with greater economic losses due to both yield reduction and diminished fruit quality (Nahar et al. 2019; Di Miceli et al. 2024).

A consistently high PDI reflects sustained disease pressure in the field. PDI quantifies the intensity of disease symptoms across a population by accounting for both incidence and severity, and higher values indicate a greater proportion of plant tissue affected by the pathogen over time. High PDI values typically correlate with reduced physiological performance of the crop and greater potential for yield loss, as severe or widespread infection disrupts fruit development. Notably, PDI is distinct from economic impact metrics such as rejection rates. While PDI captures biological disease pressure, rejection rates (e.g., the combined percentage of rejected fruits and those with visible rot) directly measure loss of marketable yield. These losses translate immediately into reduced income for growers, regardless of symptom severity. Studies in eggplant production systems demonstrate that reducing disease severity through improved management increases the proportion of marketable fruits and farm profitability (Nahar et al. 2019; Aumentado and Balendres 2022). Thus, high PDI signals strong and persistent disease pressure, whereas rejection rates quantify its economic consequence; both metrics are necessary for a comprehensive assessment of disease impact. Balendres (2025) reported that severe *Diaporthe* blight in eggplant fields resulted in significant yield losses and a marked reduction in marketable fruit, with the market value of infected fruit potentially decreasing by over 50%. In an earlier study by Aumentado and Balendres (2022) in eggplant, major diseases such as *Phomopsis/Diaporthe* fruit rot and related disorders are recognized constraints to production, with severe outbreaks capable of reducing yield by more than 50% when unmanaged. Relatedly, improved disease management demonstrates that reductions in fruit rot incidence lead to increased marketable yields, underscoring how high disease severity directly translates into economic impact. Therefore, the high rejection rate observed in Barangay Oyungan is consistent with the established relationship between fungal disease severity and marketability, in which more extensive rot significantly reduces the proportion of quality fruits suitable for sale, resulting in economic losses for farmers. Effective control measures that reduce disease severity can thus have positive outcomes not only on yield but also on market acceptance and farm profitability.

Recommendations for future research, to better understand *Phomopsis* rot and improve disease management strategies in Miagao, Iloilo, future researchers should consider the recommendations proposed in this study. Comparative studies should be conducted to assess the field prevalence of different eggplant varieties, such as comparing the Calixto F1 hybrid with the Oyungan open-pollinated variety. In addition, focusing on fruit rot symptoms and fungal isolates found in the Oyungan variety is strongly recommended. It is also important to evaluate the impact of seasonal variations, especially the wet season, on disease incidence and severity. This evaluation should consider how rain-induced conidia transmission and moist soil conditions contribute to yield loss. Comparisons of disease incidence and severity across the eggplant plantations of different barangays in Miagao, specifically Barangays Oyungan, Naclub, and Bagumbayan, could highlight spatial variations and differences, facilitating more targeted intervention strategies. Lastly, the Miagao Local Government Unit, especially with the help of the Office of the Municipal Agriculturist, should take an active role in monitoring eggplant plantations throughout the growing season. Special attention should be given to barangays with high eggplant production levels and significant disease incidence and severity to ensure timely interventions and support for farmers.

In conclusion, the present study highlights the significant impact of fruit rot on eggplant production in Barangay Oyungan, Miagao, Iloilo, where disease incidence averaged 35.05% of the total harvest, with 14.75% directly attributed to fruit rot. The consistently high Percent Disease Index (PDI) across the three harvests, peaking at 79.05% during the final assessment, demonstrates sustained disease pressure in the field and reflects widespread symptom development among fruits. Coupled with the high rejection rates observed during peak incidence, these findings indicate that disease severity directly translates into economic loss, as fruits with advanced rot are no longer marketable.

Morpho-cultural characterization and pathogenicity assays confirmed that the fungal isolates AES2R3 and AES3R3 are pathogenic to eggplant fruits and exhibit diagnostic features consistent with *Phomopsis* spp. The presence of alpha- and beta-conidia, characteristic mycelial growth, and the reproduction of typical sunken lesions with pycnidia formation fulfill Koch's postulates and establish these isolates as causal agents of fruit rot under local conditions. The confirmation of pathogenicity, together with the persistently high PDI, underscores that fruit rot in Miagao is not incidental but represents an active and damaging disease system capable of sustaining yield losses across cropping cycles.

Collectively, these results point to an urgent need to implement Integrated Disease Management (IDM) strategies in eggplant production systems in Miagao. Effective IDM should include the use of resistant or tolerant cultivars, improved field sanitation, timely removal of infected fruits, and seasonally informed cultural practices to reduce inoculum pressure. This study constitutes the first documented confirmation of *Phomopsis*-associated fruit rot in eggplant in Barangay Oyungan, Miagao, Iloilo, providing a critical baseline for future surveillance and management efforts. Strengthening disease-monitoring programs and enabling timely, science-based interventions through the Miagao LGU and Municipal Agriculture Office will be essential to reducing production losses and improving farmers' profitability in the region.

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