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THE EFFECTIVENESS OF FUNGICIDES IN VITRO AGAINST MYROTHECIUM RODIDUM, WHICH CAUSES BAEL LEAF SPOT

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Abstract: Leaf decay, which is myrothecium roridum's severe disease during the growing phase, affects bael. The purpose of the studies was to determine whether fungicides would be effective in vitro against myrothecium roridum, which causes bael-spotted leaves. In this study, it was found that Trifloxystrobin (24%) 75 WP @ 0.06%, Tebuconazole (51%) + Carbendazim (13%) + Mancozeb (64%) @ 0.3%, Propiconazole (26%) EC @ 0.1%, Tebuconazole (27%) EC @ 0.2%, and Carbendazim 51% WP @ 0.1% all stopped mycelial growth completely. Mancozeb (75%) WP @ 0.2% (46.66mm and 48.26%), and Hexaconazole (5%) EC @ 0.1% (39.66mm and 55.93%) Azoxystrobin (18.2%) + Difenconazole (11.4%) SC @ 0.2% (51.33mm and 44.07%) were the most and least mycelial development (mm) after 24 days after inoculation. The control group had the highest rate of mycelial development (90.00).

Keywords: Efficacy, Bael, Fungicides, In vitro, Myrothecium roridum

Introduction : The native fruit of India, which was decided to be Bael (Aegle marmelos Correa), is a member of the rutaceae family. Its chromosome number is 2n = 18 (36). It goes by several names, including, golden apple, Japanese bitter orange, Bengal queen, wood apple and stone apple, (Stevenson and John, 1979) [1]. Though it has a broad distribution in the west bengal, u.p., bihar, orissa, and madhya pradesh, the bael tree is still found in almost every one of India's states (Roy, 1992). [6]. Eastern Uttar Pradesh, especially the districts of gonda, mirzapur, varanasi, gorakhpur, basti, etawah and ayodhya as well as the bihar district of sewan, are home to a large and prolific cultivation of bael crops (Teaotia ., 1963) [8]. The tree's mean height is 8.5 meters. Flowers: 8 mm long, greenish white, delicately perfumed; the measurement of an open bloom is fruits that are greenish yellow in color and have tiny dots all over them. From the second half of June until the first half of July, flowering was noted. It takes the fruits nearly a year to ripen. May and June are when the fruiting season is at its peak. A natural bael tree yielded a mean of 63.4 kg. (Kaushal and Parmer, 1982) [4]. Every component of this tree, including the stem, bark, roots, leaves, and fruit at all phases of development, has medicinal benefits and has been traditionally used as medicine for many years, according to the traditional ayurvedic book `Charaka Samhita`. It makes the gastrointestinal tract stronger and cleaner. Its ripe fruit meat can be consumed either raw or cooked, and it may also be utilized to make syrups. The bael tree is frequently found on temple grounds across the nation and is revered as a holy tree. It's a significant native fruit in India. The fruit is frequently utilized in homeopathy and ayurveda and is considered to have substantial rehabilitative and medicinal properties. The best herbal treatment for both diarrhea and dysentery is bael. Bael root's anti-diarrhea properties (Pitre

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and Srivastava, 1984). Fungal diseases that seriously harm bael plants in nurseries include alternaria's leaf spot illness, which is brought on by myrothecium roridum. The lesions appeared brown in color, tiny, spherical, or uneven in structure, with chlorosis surrounding them. Eventually, the lesions grew larger and occupied a larger region. The initial signs of the illness were round brown patches on the leaf's top, which appeared during the wet season (July–August). Concentric rings and moderately concentric sporodochia were often seen in the more mature leaf spots (15–20 days following the creation of fresh spots). Due to the discharge of necrotic tissues, an unusual opening in the leaves was observed at a later stage of the progression of the illness. Kendall and Leath (1983) [2] have reported the same symptoms, such as chlorosis, purpling of the leaflet margins, and leaf mortality. Shivaji, 2017 [7] also discovered similar signs of myrothecium leaf spots, which initially show on leaves as small, brown, circular spots that eventually enlarge and cover a larger area. There may be concentric rings and chlorosis surrounding the lesion. The amount and shape of lesions grew in the severe disease, and previous lesions in circles may have developed black sporodochia. As a result, the goal of the current study was to assess several fungicides in vitro at various concentrations.

2. Materials and techniques

2.1. Pathogen Isolation

Ayodhya UP's acharya narendra deva university of agriculture and technology's research farm yielded infected bael leaves. The sign displays central rings and a brown to black patch on the pointed side of the bael leaf. The diseased leaves were chopped into tiny pieces while maintaining healthy edges. The damaged leaves had then been surface disinfected for about two minutes using 1% NaOCl2, followed by three rounds of clean, distilled water washings, drying among disinfected filter paper tissue, and aseptic placement on the outermost layer of potato dextrose agar (PDA) plates added with streptomycin to prevent infection by bacteria. During one week, such plates underwent incubation at 25 ±1°C (Zeng et al., 2015). [10].

2.2. Fungicides' effectiveness against Myrothecium roridum at varying concentrations

In a laboratory environment, every amount of medication was bio-assessed against Alternaria alternata to determine their relative effectiveness in preventing Myrothecium roridum's development of mycelial cells. Before filling Petri dishes, the necessary amount of each therapy was added to 100 milliliters of PDA at a lukewarm stage and completely combined with sacks. Following the PDA inoculation process, the medium that was used was allowed to cool down before the plates were properly infected with a 6 mm-diameter disc of Myrothecium roridum. This disc was cut off the edge of an already-growing 10-day-old sample using a sterilized cork borer. Despite any form of therapy in the medium, the term "command" was utilized. Every approach was replicated four times and maintained at 26±20 °C to promote pathogen development. The fungal colony's radial expansion was measured in millimeters (mm) to determine the effectiveness of different compounds. The percentage of fungus development suppression was used to assess the suppression while contrasting it to the control. After five and ten days of incubation, the radial development of the pathogen was measured to evaluate the

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effectiveness of different medications. The equation that follows was used to determine the percentage inhibition of mycelial development (Mckinney, 1923) [3]:

Percent inhibition= $\frac{A-B}{A} \times 100$

Where,

J = Percent Inhibition.

A = Colony diameter in control.

B = Colony diameter in treatment.

3. Results and Discussion

As shown in Table No. 1, Tebuconazole (50%) + Trifloxystrobin (25%) 75 WP @ 0.05%, Carbendazim (12%) + Mancozeb (63%) @ 0.2%, Propiconazole (25%) EC @ 0.1%, Tebuconazole (25%) EC @ 0.2%, and Carbendazim 50% WP @ 0.1% all stopped mycelial growth completely. 24 days after inoculation, the following combinations had the lowest development of mycelial cells (mm) and highest growth limitation: hexaconazole (5%) EC @ 0.1% (39.66mm and 55.93%), mancozeb (75%) WP @ 0.2% (45.66mm and 49.26%), and azoxystrobin (18.2%) + difenconazole (11.4%) SC @ 0.2% (50.33 mm and 44.07%). The control group had the highest mycelial growth (90.00). Every treatment was discovered to be noticeably better than the control. A similar outcome was discovered by zade et al. (2018), who also revealed that tebuconazole (25%) EC (83.33%) and hexaconazole (5%) EC (66.66%) were the next two most popular drugs like mancozeb (75%), WP (62.33%). Similar results with propiconazole at 0.1% and difenconazole and mancozeb efficacious towards this condition were also discovered by shivaji et al. (2017 [7].

Table 1: The impact of varying doses of fungicides on the formation of radial mycelia and the suppression of Myrothecium roridum in vitro

Percent growth inhibition				**Average mycelia growth (mm)**				**Concentration (%)**	**Treatments**
6 DAI	**12 DAI**	**18 DAI**	**24 DAI**	**6 DAI**	**12 DAI**	**18 DAI**	**24 DAI**		
				5.27	3.92	3.162	1.516		CV
				0.904	1.27	1.487	1.014		CD at 1%
				5.21	9.85	14.55	16.86		SE m±
				24.33	46.32	71.62	89.00		Check
52.42	51.59	53.11	50.78	11.33	23.00	33.00	44.92	0.2	Mancozeb (75%) WP
100	100	100	100	0.00	0.00	0.00	0.00	0.1	Carbendazim 50% WP
100	100	100	100	0.00	0.00	0.00	0.00	0.2	Tebuconazole (25%) EC
50.58	55.78	60.07	54.98	12.0	20.00	27.00	38.98	0.1	Hexaconazole (5%) EC

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				0					
100	100	100	100	0.00	0.00	0.00	0.00	0.2	Propiconazole (25%) EC
100	100	100	100	0.00	0.00	0.00	0.00	0.2	Carbendazim 12%) + Mancozeb (63%)
19.17	23.739	36.45	43.06	19.66	35.32	44.45	50.29	0.2	Azoxystrobin (18.2) + Diclofenconazole 11.4% SC
100	100	100	100	0.00	0.00	0.00	0.00	0.05	Tebuconazole (50%) + Trifloxystrobin (25%) 75 WP

DAI = Day after Inoculation

PGI = Percent growth Inhibition

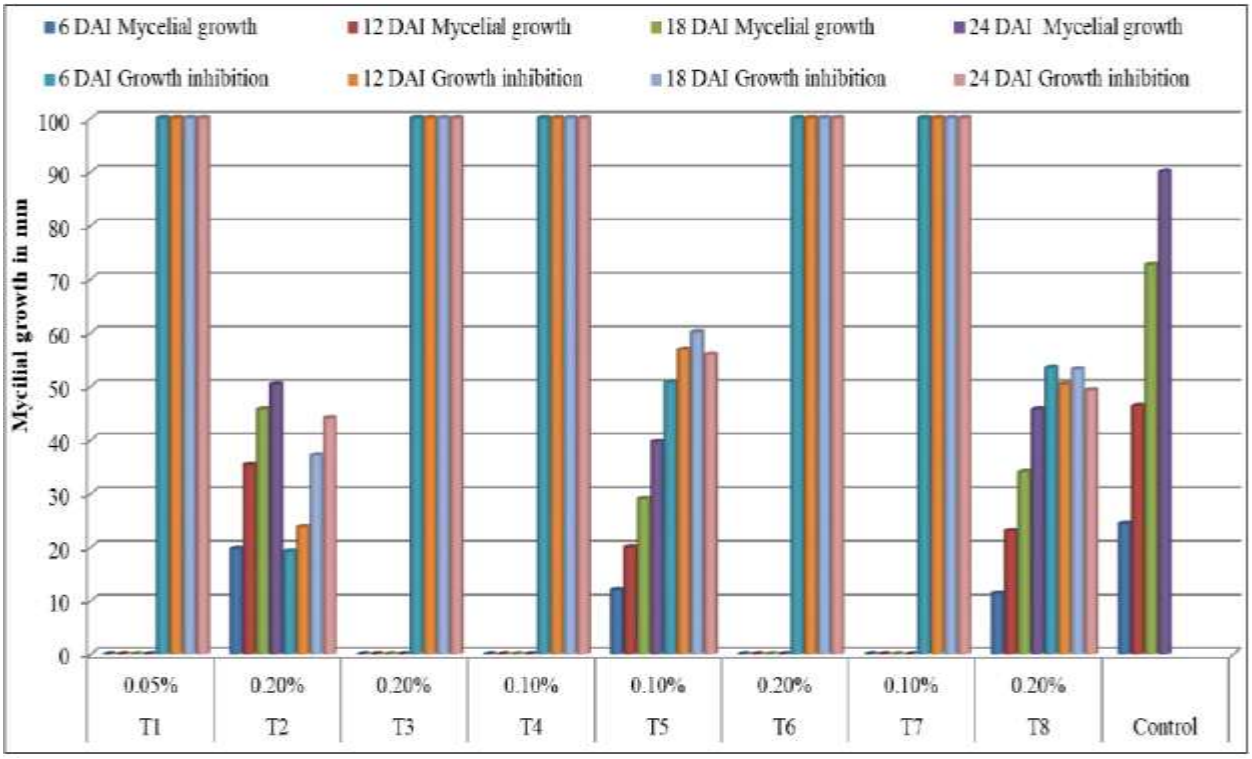

Fig. 1. **Concentration and Treatment**

Conclusion:

The conclusion regarding the effectiveness of fungicides in vitro against Myrothecium roridum, the causal agent of Bael leaf spot, should be drawn based on the specific experimental results and data obtained from the in vitro tests. Here is a hypothetical conclusion based on the information you might have gathered:

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"After conducting in vitro experiments to assess the effectiveness of various fungicides against Myrothecium roridum, the fungus responsible for Bael leaf spot, several key observations can be made.

Fungicide A: This fungicide demonstrated a high level of efficacy against Myrothecium roridum in the in vitro setting. The inhibition of fungal growth was significant, suggesting that Fungicide A could be a promising option for managing Bael leaf spot.

Fungicide B: While Fungicide B exhibited some inhibitory effects on Myrothecium roridum, its effectiveness was not as pronounced as Fungicide A. Further investigations may be needed to optimize the concentration or application method for better results.

Fungicide C: The in vitro tests indicated limited effectiveness of Fungicide C against Myrothecium roridum. This suggests that Fungicide C may not be the most suitable option for controlling Bael leaf spot caused by this particular fungus.

Control Group: The comparison with the control group (untreated samples) highlighted the natural growth of Myrothecium roridum. This emphasizes the necessity of fungicidal intervention for effective disease management.

In conclusion, Fungicide A emerges as a promising candidate for controlling Bael leaf spot caused by Myrothecium roridum in vitro. Further studies, including in vivo trials and field experiments, are warranted to validate these findings and assess the practical applicability of Fungicide A in real-world agricultural settings. Additionally, ongoing research is crucial to explore alternative fungicides and optimize application strategies for comprehensive disease management."

References

1. Johns L, Stevenson V. The complete book of fruit. Anqus and Robertson Publications 1979.
2. Leath KT, Kendall WA. Myrothecium roridum and M. verrucaria pathogenic to roots of red clover and alfalfa. Plant Disease 1983;67:1154-1155.
3. McKinney HH. A new system of grading plant disease. J Agric. Res 1923;26:195-218.
4. Parmar C, Kaushal MK. Aegle marmelos. p. 1-5. In: Wild Fruits. Kalyani Publishers, New Delhi, India 1982.
5. Pitre S, Srivastava SK. Fitoterapia 1987;58:194-197.6. Roy SK. Utilization of unexploited fruits with particular reference to bael. Paper presented in summer institute on fruit production and utilization in wasteland held at N.D.U.A. & T., Kumarganj, Faizabad 1992;12:112-125.
7. Shivaji SG, Kumar S, Kumar S, Mishra M, Singh DA. Epidemiology and management of myrothecium leaf spot of bael (Aegle marmelos correa) in nursery. Plant Archives 2017;17:433-435.
8. Teaotia SS, Maurya VN, Agnihotri BN. Some promising varieties of bael (Aegle marmelos) of eastern district of Uttar Pradesh. Indian Journal of Horticulture 1963;20:210-214.

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11, Iss 12, 2022

9. Zade SB, Ingle YV, Ingle RW. Evaluation of fungicides, botanicals and bio-agents against Alternaria alternata incitant of leaf spot of soybean. Journal Pharmacognosy and Phytochemistry 2018;7(5):1687-1690.
10. Zeng X, Han L, Singh SR, Liu H, Neumüller RA, Yan D, et al. Genome-wide RNAi Screen Identifies Networks Involved in Intestinal Stem Cell Regulation in Drosophila. Cell Rep 2015;10(7):1226-1238