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Cercospora leaf spot of mungbean: A comprehensive field survey across Jalgaon and Dhule districts

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Abstract
A roving field survey was conducted during the Kharif 2025 season to evaluate the distribution and intensity of *Cercospora* leaf spot, incited by *Cercospora* canescens, across major mungbean-growing tracts in the Jalgaon and Dhule districts of Maharashtra. The assessment encompassed six representative villages from each district. Within each sampling site, ten plants were randomly selected to record disease severity based on a standard 0–9 rating scale. These observations were used to compute the Per cent Disease Index (PDI) for each location, with the precise geographical coordinates of each site documented via GPS.
The disease manifested a ubiquitous distribution, occurring across all surveyed villages in both districts. In Jalgaon district, PDI values varied from 34.62% to 43.01%. The highest disease intensity was registered in Salbardi (43.01%), followed sequentially by Kothali (39.04%), Hated Bru. (37.81%), Pal (36.57%), Kurhe Panache (35.65%), and Jalgaon (34.62%), culminating in a district mean of 37.78%. Conversely, disease intensity in Dhule district ranged from 24.35% to 36.20%. The maximum PDI was documented in Deobhane (36.20%), followed by Dhanur (35.68%), Kapadane (28.38%), Thalner (27.66%), Varshi (27.57%), and Dabhashi (24.35%). The mean PDI for Dhule was determined to be 29.97%, while the pooled overall mean across both districts stood at 33.88%. Consequently, the survey confirmed the widespread prevalence of *Cercospora* leaf spot in the appraised mungbean ecosystems, establishing a relatively higher average disease pressure in Jalgaon compared to Dhule.

Keywords: Mungbean, *Cercospora canescens*, GPS, Disease intensity, PDI

Introduction

Mungbean (*Vigna radiata* (L.) Wilczek) is an important pulse crop grown extensively in India as well as in tropical and subtropical regions. Besides its nutritional value, the crop contributes to soil fertility through biological nitrogen fixation. Nevertheless, mungbean production is constrained by several biotic stresses, including *Cercospora* leaf spot, a significant foliar disease caused by *Cercospora canescens*. The disease develops particularly well under warm and humid
conditions. Early symptoms are commonly expressed as small, circular or irregular reddish-brown to grey lesions on leaves. With continued disease development, individual lesions enlarge and merge, which can lead to premature leaf fall, reduction in photosynthetic leaf area, inadequate pod development and yield loss.
Earlier investigations have documented the occurrence of this disease in different mungbean-producing areas. Munjal *et al.* (1960) recorded *Cercospora* leaf spot from Delhi, India, and noted that warm and humid weather favoured severe disease development. Bashir (2005) [1] recorded 22 to 55 per cent disease incidence in mungbean-growing regions of Pakistan. Kaur *et al.* (2011) [2] observed the disease extensively in Punjab, where incidence varied from 30 to 65 per cent. Kumar *et al.* (2021) [3] reported disease intensity ranging from 29.38 to 51.20 per cent across important mungbean-growing districts of Rajasthan. In Maharashtra, mungbean is an important Kharif pulse in the Khandesh region, which includes Jalgaon and Dhule districts. However, information on the present distribution and severity of *Cercospora* leaf spot across individual mungbean-growing locations of this region was limited. Accordingly, the present investigation was carried out to determine the occurrence and intensity of *Cercospora* leaf spot in major mungbean-growing areas of Jalgaon and Dhule districts of Maharashtra.

Materials and Methods

The survey was conducted during Kharif 2025 in major mungbean-producing areas of Jalgaon and Dhule districts of Maharashtra. A roving survey approach was followed, covering selected villages known for mungbean cultivation.
Two to three talukas were selected in each district, and representative mungbean-growing villages were included within these talukas. Fields were selected randomly along the survey route. Ten plants were randomly

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tagged in every selected field for disease assessment. Leaves from the lower, middle and upper portions of each tagged plant were examined for disease symptoms. Disease severity was scored according to a 0–9 rating scale based on the proportion of leaf area affected. Ratings of 0, 1, 3, 5, 7 and 9 represented successive levels of disease severity. The recorded scores were used to determine the Per cent Disease Index (PDI) using the following expression:

$$\text{Per cent disease index (\%)} = \frac{\text{Sum of all disease ratings} \times 100}{\text{Number of leave / Plant observed} \times \text{Maximum Disease Rating}}$$

Geographical coordinates of the surveyed sites were obtained using a Global Positioning System (GPS), and latitude and longitude were recorded for each sampling location.

Results and Discussion

The roving survey undertaken during Kharif 2025 confirmed the presence of *Cercospora* leaf
spot in every surveyed village of Jalgaon and Dhule districts. Considerable variation in disease intensity was recorded among individual locations.

Survey of Cercospora leaf spot in Jalgaon district

Within Jalgaon district, Salbardi registered the greatest disease intensity, with a PDI of 43.01 per cent. The subsequent values were recorded at Kothali (39.04%), Hated Bru. (37.81%), Pal (36.57%), Kurhe Panache (35.65%) and Jalgaon (34.62%). The resulting mean disease intensity for Jalgaon was 37.78 per cent PDI. The comparatively greater disease intensity in this district could be related to environmental conditions favourable for disease development, such as warm and humid weather, intermittent rainfall and extended periods of leaf wetness. Repeated cultivation of mungbean, use of susceptible varieties and survival of the pathogen in infected crop residues may also favour disease establishment and progression.

Survey of Cercospora leaf spot in Dhule district

Cercospora leaf spot was recorded in all six surveyed villages of Dhule district. The PDI values varied from 24.35 to
36.20 per cent. Deobhane showed the highest disease intensity (36.20% PDI), followed by Dhanur (35.68%), Kapadane (28.38%), Thalner (27.66%), Varshi (27.57%) and Dabhashi (24.35%). The district mean was 29.97 per cent PDI. The lower mean disease intensity observed in Dhule compared with Jalgaon may be associated with differences in prevailing environmental conditions and crop management practices.

Comparative disease intensity between Jalgaon and Dhule districts

Across the complete survey area, *Cercospora* leaf spot was consistently detected in all sampled villages. Disease intensity extended from 24.35 to 43.01 per cent PDI. Salbardi of Jalgaon showed the maximum value (43.01% PDI), whereas Dabhashi of Dhule recorded the minimum (24.35% PDI). The district average was 37.78 per cent PDI for Jalgaon compared with 29.97 per cent PDI for Dhule. The overall mean disease intensity was 33.88 per cent PDI, demonstrating a moderate to high level of disease occurrence in the surveyed mungbean-growing areas.

Comparison with earlier research

The results obtained in the present survey corresponded with earlier reports describing the widespread occurrence and location-wise variation of *Cercospora* leaf spot in mungbean. Munjal *et al.* (1960) documented the disease in Delhi and associated severe development with warm and humid conditions. Bashir (2005) [1] recorded disease incidence between 22 and 55
per cent in mungbean-producing regions of Pakistan. Kaur *et al.* (2011) [2] reported widespread disease occurrence in Punjab, with incidence ranging from 30 to 65 per cent. Bhat *et al.* (2020) [4] identified *Cercospora* leaf spot as an important foliar disease of greengram in Kashmir and observed differences in disease intensity among locations. Kumar *et al.* (2021) [3] recorded 29.38 to 51.20 per cent disease intensity in major mungbean-growing districts of Rajasthan. Yadav *et al.* (2024) [5] also documented substantial variation in *Cercospora* leaf spot incidence among mungbean-growing districts of Eastern Uttar Pradesh. The range observed in the present investigation was therefore comparable with the variation reported from other mungbean-producing regions. Overall, the survey established that *Cercospora* leaf spot was broadly distributed in the Khandesh region and that its intensity differed appreciably between sampling sites.

Table 1. Disease intensity of *Cercospora* leaf spot of mungbean during Kharif 2025

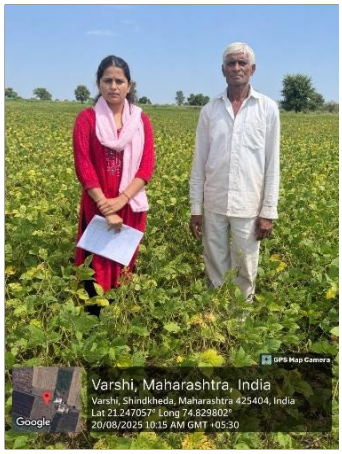
Sr.	Village	Tahsil	District	Latitude	Longitude	PDI (%)
1	Kothali	Muktainaga r	Jalgaon	21.0543° N	76.0447° E	39.04
2	Salbardi	Muktainaga r	Jalgaon	21.0273° N	76.0404° E	43.01
3	Pal	Raver	Jalgaon	21.3698° N	75.9137° E	36.57
4	Jalgaon	Jalgaon	Jalgaon	20.9935° N	75.5706° E	34.62
5	Hated Bru.	Chopda	Jalgaon	21.2475° N	75.1949° E	37.81
6	Jalgaon			20.9569° N	75.7909° E	35.65
	Jalgaon Mean					37.78
7	Varshi	Shindkheda	Dhule	21.2471° N	74.8299° E	27.57
8	Dabhashi	Shindkheda	Dhule	21.2537° N	74.8381° E	24.35
9	Kapadane	Dhule	Dhule	21.0289° N	74.8298° E	28.38
10	Dhanur	Dhule	Dhule	21.0491° N	74.8382° E	35.68
11	Deobhane	Dhule	Dhule	21.0177° N	74.7767° E	36.20
12	Dhule			21.2684° N	74.9578° E	27.66
	Dhule Mean					29.97
	Overall Mean					33.88

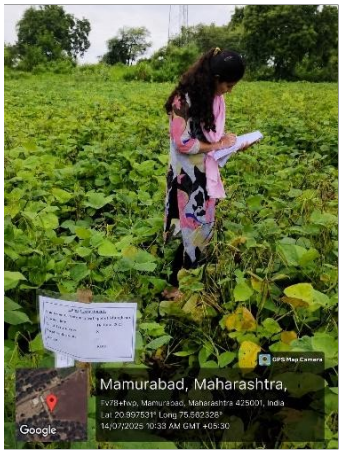
Conclusion

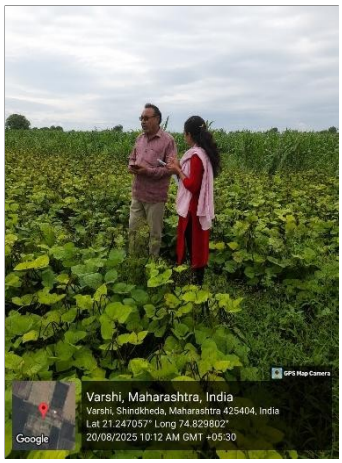
The Kharif 2025 roving survey established that *Cercospora* leaf spot caused by *Cercospora canescens* was widely distributed throughout the surveyed mungbean-growing areas of Jalgaon and Dhule districts of Maharashtra. Disease occurrence was recorded in every surveyed village, although the level of intensity differed among locations. Jalgaon recorded a higher mean PDI of

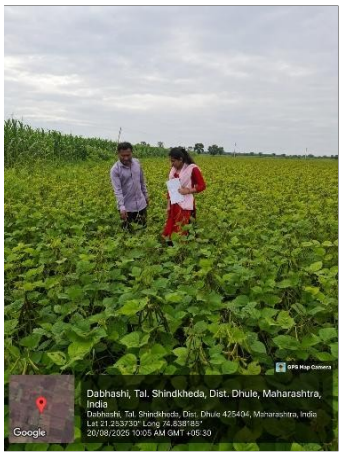
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37.78 per cent, while Dhule had a mean PDI of 29.97 per cent; the overall mean was 33.88 per cent. Salbardi showed the maximum disease intensity (43.01% PDI), whereas Dabhashi had the minimum (24.35% PDI). These observations demonstrate that *Cercospora* leaf spot represents an important disease limitation to mungbean cultivation in the Khandesh region. The observed variation among locations highlights the need for regular disease surveillance and appropriate integrated disease management measures to support sustainable mungbean production.













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