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RESEARCH PAPER

Survey on powdery mildew of coriander in northern parts of Karnataka

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Abstract: A roving survey was carried out during *rabi* 2024 in four major coriander growing districts of Northern Karnataka namely Belagavi, Bagalkot, Dharwad and Vijayapura to assess the prevalence and severity of powdery mildew caused by *Erysiphe polygoni* DC. The survey covered 36 villages across 12 talukas and observations were recorded on crop stage, soil type, irrigation method and Percent Disease Index (PDI). Belagavi recorded the highest mean PDI (38.43%) with maximum severity of (53.59%) at Badigwad (Gokak taluk), followed by Bagalkot with an average of (32.98%) and a peak of (44.26%) at Gulgal Jambagi (Mudhol taluk). Dharwad showed moderate incidence with a mean PDI of (20.17%) whereas Vijayapura recorded the lowest incidence averaging (16.78%). Wilt and blight were also observed in some villages particularly in heavy soils with poor drainage. Higher severity in Belagavi and Bagalkot was linked to late sowing which exposed crops to warm and dry conditions favorable for the pathogen. The presence of alternate hosts such as fenugreek, green gram and black gram along with dense canopy and poor aeration further aggravated disease spread. The findings emphasize the role of sowing time, crop history and microclimate in shaping powdery mildew epidemics in coriander.

Key words: Coriander, *Erysiphe polygoni*, Powdery mildew, Severity, Survey

Introduction

India is renowned as the spice land as it is the largest producer, consumer and exporter of spices. Spices are low-volume, high-value export-oriented crops. Coriander (*Coriandrum sativum* L.), popularly known as "Dhaniya," is an important spice crop. It is an annual herb of the family Apiaceae grown in tropical and subtropical regions. Both leaves and seeds are used in cooking. Coriander has health-promoting properties such as antioxidant, anti-diabetic, anti-mutagenic and antimicrobial activity along with analgesic and hormonal balancing effects. Its leaves are rich in vitamins, while the seeds contain polyphenols and essential oils, making it a valuable source of nutrition (Bhat *et al*., 2014).

Coriander is a tropical crop grown in the *rabi* season where severe frost does not occur during flowering and seed setting, with cool and dry weather favouring seed production. In India, sowing period varies in Karnataka, it is from May to July for *kharif* and October to January for *rabi* (Farooqi *et al*., 2005). The crop is mainly grown in Rajasthan, Madhya Pradesh, Gujarat, Karnataka, Andhra Pradesh, Tamil Nadu, Uttar Pradesh and Uttarakhand, with Rajasthan leading in area and production. India produces nearly 80 per cent of the world's coriander and exports to Malaysia, Singapore, Sri Lanka, USA and Gulf countries (Malhotra and Vashistha, 2008). Presently, coriander is grown in 563.1 thousand hectares with production of 764 thousand metric tonnes and productivity of 1.36 metric tonnes per hectare. In Karnataka, area, production, productivity is 0.57 thousand hectares, 0.35 thousand metric tonnes and 0.60 metric tonnes per hectare respectively (Anon., 2024).

The crop is affected by fungal diseases such as stem gall (*Protomyces macrosporus*), wilt (*Fusarium oxysporum*f.sp. *coriandrii*), blight (*Alternaria* spp.), stem rot (*Rhizoctonia* spp.) and powdery mildew (*Erysiphe polygoni* DC). Among these, powdery mildew is the most destructive, causing whitish patches on leaves, stems, umbel and inflorescences, leading to poor growth, shriveled seeds and reduced yield (Kalra *et al*., 2000). It occurs almost every season under cool, dry conditions, making it a serious production constraint. Hence, roving survey was conducted in major coriander growing areas to determine disease severity, locate hotspots and guide effective management.

Material and methods

A roving survey was conducted during *rabi* 2024 to know the occurrence of powdery mildew disease of coriander in the farmer's fields of Vijayapur, Bagalkot, Dharwad and Belgaum districts. The coriander fields on the survey route were visited and the observations on powdery mildew disease index, stage of the crop, type of soil, irrigation method and other details recorded were noted down and the per cent disease index was recorded by following the 0-9 Scale as detailed under as given by (Mayee and Datar 1986).

Scale	Description
0	No symptoms
1	Small white specks on the leaf covering 1% or less leaf area.
3	Small powdery patches covering 1-10% of leaf area
5	Powdery mildew lesion enlarges covering 11-25% of leaf area
7	Powdery patches irregular in size covering 26-50% of leaf area
9	White powdery growth covering more than 50% leaf area

The per cent disease intensity will be worked out by using the formula given by

wheeler (1969).

$$\text{Per cent disease index} = \frac{\text{Sum of all numerical rating}}{\text{No. of leaves examined x maximum disease rating}} \times 100$$

Results and discussion

Survey on powdery mildew of coriander in northern parts of Karnataka

A roving survey was conducted during *rabi* 2024 across four major coriander growing districts of Northern Karnataka namely Belagavi, Bagalkot, Dharwad and Vijayapura in order to assess the severity of powdery mildew caused by *Erysiphe polygoni*DC. Observations recorded during the survey included crop growth stage, soil type, other disease observed, irrigation type, variety and Percent Disease Index (PDI). A total of 36 villages under 12 talukas were surveyed, revealing clear differences in disease severity across districts (Table 1 and 2).

In Belagavi district, the survey covered Mudalagi, Gokak and Hukkeri taluks. Powdery mildew was widespread, ranging from moderate to high severity. The highest PDI of (53.59%) was seen in Badigwad village of Gokak taluk followed by (49.53%) Sanganakeri of Mudalagi taluk. Arabhavi and Lolasur recorded (36.42%) and (36.87%), while Gudas (31.63%) and Raxi (34.53%) had comparatively lower severity. The average PDI for the district was (38.43%). Wilt was also observed in Arabhavi and Pamaladinni likely influenced by irrigation on heavy soils.

Bagalkot district showed considerable disease pressure, with an average PDI of (32.98%). Gulgal Jambagi (Mudhol taluk) recorded (44.26%), followed by Hunnur (Jamkhandi taluk) at (40.24%). Villages such as Savalagi (35.12%), Kankanawadi (31.26%) and Chichakhandi (32.12%) exhibited moderate disease levels. Rabkavi Banhatti taluk villages -Yalatti (30.12%), Kulhalli (26.68%) and Madhurakhandi (28.12%) also reported moderate infection. Wilt was observed in Chichakhandi and Hunnur, while blight appeared in GulgalJambagi.

In Dharwad, survey was carried in Dharwad, Navalgund and Kalaghatagi taluks and the infection was found moderate.

Table 1. Survey of powdery mildew of coriander in northern parts of Karnataka during *rabi* 2024-25

District	Taluka	Village	Crop growth Stage	Soil type	Irrigated/ Rainfed	Variety/ Hybrid	Percent disease index (PDI)	Other disease observed
Belagavi	Mudalagi	Arabhavi	Vegetative	Black	Irrigated	Local variety	36.42	wilt
		Sanganakeri	Seed formation	Black	Irrigated	Local variety	49.53	-
		Kallolli	Flowering	Black	Irrigated	Local variety	33.73	-
	Gokak	Lolasur	Flowering	Red	Rainfed	Local variety	36.87	-
		Badigwad	Flowering	Red	Irrigated	Local variety	53.59	-
		Pamaladinni	Vegetative	Black	Irrigated	Local variety	37.27	wilt
	Hukkeri	Gudas	Flowering	Black	Rainfed	Local variety	31.63	
		Raxi	Vegetative	Black	Irrigated	Local variety	34.53	
		Shiragaon	Vegetative	Red	Irrigated	Local variety	32.29	
Dharwad	Dharwad	Garag	Flowering	Black	Irrigated	Local variety	17.56	-
		Mummigatti	Vegetative	Red	Irrigated	Local variety	19.21	Wilt
		Narendra	Vegetative	Black	Irrigated	Local variety	22.66	-
	Navalagund	Navalli	Flowering	Sandy	Irrigated	Local variety	25.09	Wilt
		Shirur	Vegetative	Black	Irrigated	Local variety	24.21	-
		Shirkol	Flowering	Black	Irrigated	Local variety	22.65	-
	kalaghatagi	Bammigatti	Seed formation	Black	Irrigated	Local variety	15.54	-
		Kamadhenu	Vegetative	Black	Irrigated	Local variety	19.28	-
		Tavaregere	Flowering	Black	Irrigated	Local variety	15.39	-
Vijayapura	Babaleshwar	Shegunashi	vegetative	Black	Irrigated	Local variety	36.25	Blight,Wilt
		Sangapur	Flowering	Black	Irrigated	Local variety	23.21	-
		Halagani	vegetative	Black	Irrigated	Local variety	14.43	-
	Sindagi	Golageri	vegetative	Red	Irrigated	Local variety	12.25	Blight,Wilt
		Khanapur	Flowering	Red	Irrigated	Local variety	11.33	-
		Kumasagi	Flowering	Black	Irrigated	Local variety	15.69	-
	Basavanbagewadi	Nagur	Flowering	Red	Irrigated	Local variety	11.76	-
		Managuli	Flowering	Black	Irrigated	Local variety	12.43	-
		Telgi	Vegetative	Black	Irrigated	Local variety	13.67	-
Bagalkot	Jamkhandi	Hunnur	Vegetative	Black	Irrigated	Local variety	40.24	Wilt
		Savalagi	Vegetative	Red	Irrigated	Local variety	35.12	-
		kankanawadi	Flowering	Black	Irrigated	Local variety	31.26	-
	Mudhol	GulgalJambagi	Seed formation	Black	Irrigated	Local variety	44.26	Blight
		Chichakhandi	Flowering	Black	Irrigated	Local variety	32.12	Wilt
		Metgud	Flowering	Black	Irrigated	Local variety	28.89	Wilt
	Rabkavi Banhatti	Kulhalli	Flowering	Black	Irrigated	Local variety	26.68	-
		Yalatti	Vegetative	Black	Irrigated	Local variety	30.12	-
		Madhurakhandi	Flowering	Black	Irrigated	Local variety	28.12	

Table 2. District and taluka mean recorded while conducting survey on powdery mildew of coriander in different districts of North Karnataka during 2024-25

Districts	Taluk	Per cent disease Index	
		Taluk mean	District mean
Belagavi	Mudalagi	39.89	38.43
	Gokak	42.58	
	Hukkeri	32.82	
Dharwad	Dharwad	19.81	20.17
	Navalagund	23.98	
	Kalaghatagi	16.74	
Vijayapura	Babaleshwar	24.63	16.78
	Sindagi	13.09	
	Basavanbagewadi	12.62	
Bagalkot	Jamkhandi	35.54	32.98
	Mudhol	35.09	
	Rabkavi Banhatti	28.31	

PDI ranged from (15.39%) Tavaregere to (25.09%) Navalli. Narendra (22.66%), Mummigatti (19.21%), Garag (17.56%), Kamadhenu (19.28%), and Shirkol (22.65%) showed mild infection. The district average PDI was (20.17%). Wilt was recorded in Navalli and Mummigatti, indicating the role of soil moisture and crop stage in disease development.

Vijayapura exhibited the lowest disease intensity, with a mean PDI of (16.78%). Shegunashi (Babaleshwar taluk) recorded (36.25%), while other villages such as Khanapur (11.33%), Kumasagi (15.69%), Nagur (11.76%), and Telgi (13.67%) showed minimal infection. Wilt and blight were observed in Golageri and Shegunashi, respectively, but overall disease pressure remained low.

The survey indicated that Belagavi (38.43%) and Bagalkot (32.98%) faced the highest disease pressure, while Dharwad (20.17%) and Vijayapura (16.78%) were comparatively less affected. Late sowing in Belagavi and Bagalkot exposed crops to warm and dry weather, providing ideal conditions for fungal development. Previous cultivation of fenugreek, green gram, and black gram in these fields may have left residual inoculum, contributing to rapid disease spread.

Dense crop canopies restricted air circulation and created humid zones around foliage, which favoured rapid spread of powdery mildew. Frequent irrigation prolonged leaf wetness, further enhancing sporulation. Similar observations were reported by Ashtaputre *et al.* (2007) and Sheethal *et al.* (2021) in chilli.

In contrast, early sowing and wider spacing in Dharwad and Vijayapura reduced disease severity by improving air movement and lowering humidity. The survey also confirmed that powdery mildew was most severe during the flowering stage when the canopy was dense, which agrees with the findings of Arjunan *et al.* (1976) and Sivaprakasam *et al.* (1981).

The survey revealed that powdery mildew incidence in coriander was governed by a combination of interrelated factors such as sowing time, preceding crops, canopy density, irrigation practices, crop stage and prevailing microclimatic conditions. Among the surveyed districts, Belagavi (38.43%) and Bagalkot (32.98%) recorded higher disease intensity which could be attributed to late sowing, dense crop canopies and the presence of residual inoculum from earlier crops that served as primary sources of infection. These conditions collectively created a favourable environment for disease establishment and rapid spread.

On the other hand, Dharwad (20.17%) and Vijayapura (16.78%) showed relatively lower levels of disease severity. This was largely due to early sowing and maintenance of wider crop spacing which facilitated better airflow and reduced canopy humidity, thereby restricting disease development. The overall findings underline the importance of adopting proper crop management practices such as timely sowing, optimal plant density and effective crop rotation as key strategies to minimize the severity of powdery mildew in coriander.

Conclusion

Powdery mildew severity in coriander was highest in Belagavi and Bagalkot and lowest in Dharwad and Vijayapura. The disease was influenced by sowing time, previous crops, canopy density and irrigation. Timely sowing, proper spacing and crop rotation are key to managing the disease effectively.

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