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Choanephora Blight in Chilli: A Silent Threat to Spice Farmers

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Chilli (*Capsicum annuum* L.) is one of the most important spice crops in India, contributing significantly to farmer income and export earnings. In recent years, Choanephora blight caused by *Choanephora cucurbitarum* has emerged as a serious disease, particularly under warm and humid conditions. The disease affects tender plant parts such as shoots, flowers, and fruits, leading to soft rot, premature fruit drop, and severe yield losses. This article reviews the symptoms, epidemiology, factors influencing disease development, and integrated management practices, along with recent research findings.

Introduction

Chilli (*Capsicum annuum* L.) is widely cultivated across India and plays a crucial role in culinary, economic, and industrial sectors. However, its production is increasingly constrained by fungal diseases, among which Choanephora blight has gained importance in recent years. The disease is particularly prevalent in tropical and subtropical regions during the rainy season, where high humidity and temperature favor rapid disease development. Severe outbreaks can result in substantial yield losses, posing a threat to farmers' livelihoods.

Etiology and Pathogen Characteristics

Choanephora blight is caused by *Choanephora cucurbitarum*, a fungus belonging to the order **Mucorales** (formerly classified under Zygomycetes). The pathogen is characterized by rapid growth and prolific sporulation under favorable conditions.

Microscopic Characteristics

- **Colony**: Fast-growing, white and cottony initially, turning pale yellow upon sporulation
- **Sporangiophores**: Erect, non-septate, unbranched or dichotomously branched
- **Sporangia**: Globose to subglobose, terminal, measuring 44.8–165.2 µm in diameter
- **Sporangiola**: Brown, oval to ellipsoidal, measuring 10.1–18.4 × 6.1–12.7 µm
- **Sporangiospores**: Ovoid with longitudinal striations and hyaline appendages

A key diagnostic feature is the presence of **longitudinally striated spores**.

Fig.1. Microscopic view of *Choanephora cucurbitarum*

Fig. 2. Symptoms of Choanephora blight on leaves, flower and fruits

Symptoms

- Water-soaked lesions on tender shoots, leaves, and flower buds
- Rapid wilting and collapse of young branches

- Soft, slimy rot of infected tissues
- Mushy, discoloured fruits with premature dropping
- Characteristic hairy fungal growth under humid conditions

Epidemiology and Disease Development

The pathogen thrives under high humidity (>80%) and temperatures of 25–30°C. Continuous moisture due to rainfall, dew, or irrigation facilitates spore germination and infection. The disease spreads rapidly through rain splash, wind, and irrigation water. Dense crop canopy and poor air circulation further enhance disease development.

Factors Favoring Disease Spread

- High humidity and prolonged rainfall
- Warm temperature (25–30°C)
- Dense planting and poor air circulation
- Overhead irrigation practices
- Waterlogging and poor drainage
- Excess nitrogen fertilization
- Continuous cropping without rotation
- Presence of infected plant debris
- Wide host range (okra, beans, cucurbits, cotton)

Economic Importance

Choanephora blight can cause 30–50% yield loss, particularly when infection occurs during flowering and fruiting stages. In severe cases, complete crop failure may occur. The disease also reduces fruit quality, leading to lower market value and significant economic losses, especially for small and marginal farmers.

Management Practices

1. Cultural Practices

- Removal and destruction of infected plant parts
- Maintenance of field sanitation
- Adequate plant spacing for better aeration
- Avoidance of overhead irrigation
- Proper drainage to prevent waterlogging

2. Chemical Control

- Seed treatment with Mancozeb @ 2.5–3.0 g/kg seed or Captan @ 2.5 g/kg seed
- Foliar sprays (at early stage of infection):

✓ Mancozeb 75% WP @ 2–2.5 g/L
✓ Propineb 70 WP @ 2.5 g/L
✓ Tebuconazole 25 WG @ 1.0–1.2 g/L
✓ Propiconazole 25 EC @ 1.5–2.0 ml/L

3. Biological Control

- Seed treatment with *Trichoderma viride* @ 4 g/kg seed

4. Crop Rotation

- Avoid continuous cultivation of solanaceous crops
- Follow rotation with non-host crops such as cereals

Recent Research Findings

Recent studies indicate that Choanephora blight is an emerging and increasingly important disease affecting chilli and other crops. In Eastern India, particularly Odisha, it has been reported across multiple hosts, highlighting its wide host range and significant economic impact (Arun *et al*., 2024). Globally, outbreaks in pepper crops in the USA have emphasized the growing importance of the disease, along with challenges such as limited effectiveness of fungicides and the possibility of resistance development (Yu *et al*., 2025). In India, the first documented occurrence of Choanephora twig blight in chilli in Odisha showed notable incidence during the Kharif season, confirming its emerging status (Ganesan *et al*., 2021).

Similarly, field surveys in Telangana have reported the disease affecting various plant parts, with characteristic symptoms and successful pathogen identification through morphological studies (Chandrakala and Vidyasagar, 2018).

Conclusion

Choanephora blight has emerged as a significant threat to chilli cultivation due to its rapid spread, high yield losses, and favorable environmental conditions. Integrated disease management involving cultural, chemical, and biological approaches is essential for effective control. Increased awareness, timely intervention, and further research are necessary to mitigate its impact on chilli production.

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