



First report of anthracnose disease on groundnut caused by *Colletotrichum dematium* from Allahabad (Uttar Pradesh) in India

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Abstract : Groundnut is most important oil seed crop which contributes about 40 per cent of total oil seed production in India. According to its nutritional value and oil production it is very valuable economical crop but several diseases like tikka, rust, peanut bud necrosis, collar rot, and anthracnose are constraints the yield and productivity. This being a new disease unreported from Allahabad, the basic symptoms and nature of the pathogen. Anthracnose of groundnut caused by *Colletotrichum dematium* was first reported by Subramanyum *et al.* (1992). In the present study the symptoms appear as wedge-shaped lesions which also developed on the leaflet margins leading to marginal blight. In severe condition fruiting body acervuli visible through hand lens the disease may also extent to stipules and stems. A new marginal leaf-spot was developed on groundnut caused by *Colletotrichum dematium* in Allahabad region which is also known Anthracnose disease of groundnut.

Key Words : Groundnut, Anthracnose, Leaf spot, *Colletotrichum dematium*

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INTRODUCTION

Groundnut is believed to be native of Brazil and belongs to family Fabaceae. It is grown widely between latitudes 40°N and 40°S in the semi-arid tropics and is cultivated on a variety of soils pH ranging between 6.0-6.5 are more preferable. On the world scene, groundnut is grown in several parts of India, China, Asia, Africa Australia, America, Indonesia, Brazil, and Argentina. Groundnut is an annual oil seed crop of *Kharif* season but also grown in the *Rabi* season where winter is not sever. World groundnut production stood at 34.43 Million tonnes in 2009-10 and India with 6.25 million tonnes which is the second largest producer after China with 14.30 million tonnes followed by the United States of America with 2.34 million tonnes. In India 75 per cent of the production are concentrated in the four states of Gujarat, Andhra Pradesh, Tamil Nadu and Karnataka (Anonymous 2009-10). In 2010-11

all over India, more than 22 states where groundnut is grown in *Kharif/Rabi* or in both seasons. Where the area was 4.93 million hectares, production 5.64 million tones and the highest yield was 1144 kg/hectare (Anonymous 2010-11).

Fungal leaf spot diseases caused by a large number of fungi such as *Alternaria*, *Cercospora*, *Colletotrichum*, *Gloeosporium*, *Helminthosporium*, *Sphaceloma*, *Phyllosticta*, *Septoria*, and many more, which damage the plant stems, branches, leaf foliage, plant reduces the yield and in severe conditions plant dry up. The term 'Anthracnose' literally means 'like coal' and first used by Fabre and Dunal to describe a disease of grapes in which blackening of tissues was characteristic feature black lesions, usually sunken caused by certain imperfect fungi that produce conidia in acervuli those are hyaline, one-celled, that is *Colletotrichum*.

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MATERIALS AND METHODS

During routine surveys of Central Research Farm SHIATS, and adjacent of Allahabad district in the *Kharif* season 2011 which is situated at 25.27° North latitude 80.50° East longitude and at an altitude of 98 meter above sea level. The climatic condition is typically semi arid and sub tropical and the maximum temperature reaches up to 47°C in summer and drops down to 1.5°C in winter. A new leaf spot disease on groundnut was observed 25-30 DAS which was differ to leaf spot of Tikka and with other diseases of groundnut, the temperature was 25-30°C and Relative humidity was 65- 75 per cent at that time. The leaf spot was similar to anthracnose disease of groundnut by Subrahmanyum *et al.*, 1992 who was first reported from Andhra Pradesh.

RESULTS AND DISCUSSION

The infected plants symptoms first appear on lower leaves between 8-12 node stages, approximately 4-10 days before flowering, they are wedged-shaped lesions developed on the leaflet margins leading to marginal blight then enlarge rapidly become irregular on leaves, stem and move up to the canopy in severe condition. Plant starts leaf foliage, lesions on stems can girdle the plant branches resulting in wilting and plants die (Fig.1). The microscopic details of the test

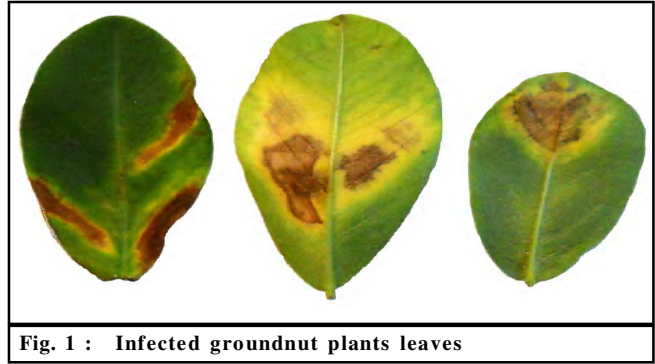


Fig. 1 : Infected groundnut plants leaves

fungus were in conformity with the findings of Ahmed and Reddy (1993) regarding *Colletotrichum dematium*.

Mycelium is hyaline, and produces circular, blunted, dark brown to black acervuli with setae. These acervuli are scattered on the infected pods or aggregated or in groups which is pale to smoke-gray masses. Numerous thick, black, erect setae are interspersed within the acervuli. Conidia were fusoid and bluntly tapered at both ends.

The Genera *Colletotrichum* have numerous species of a fungus which occurs in all types of climatic condition and widely infected all over the world. The infection of *Colletotrichum* spp. have a wide range of hosts crops fruits,

Table 1 : List of the intection caused by *Colletotrichum* spp.

<i>Colletotrichum</i> spp.	Infected host
<i>C. acutatum</i>	Almond (forster <i>et al.</i> , 1999), Rose (Sattar <i>et al.</i> , 2003), Strawberry (Polizzi. G. <i>et al.</i> , 2011)
<i>C. capsici</i>	betelvine (Gupta <i>et al.</i> , 1988), Chilli (Malraja <i>et al.</i> ,1988), (Korpraditskul <i>et al.</i> , 1999), (Jameel akhtar 2007) , Tomato, Okra, Brinjal, Urd bean, Mung bean, Cow pea, Turmeric (Narasimhudu <i>et al.</i> , 2002), Rose, Bitter gourd (Dubey S. C. <i>et al.</i> , 2004)
<i>C. curcumae</i>	Turmeric (Palarpawar <i>et al.</i> , 1992)
<i>C. caudatum</i>	C4 Grasses (Crouch <i>et al.</i> , 2005)
<i>C. coccodes</i>	Potato (Zastita Bilja 1993), Chilli (Sharma <i>et al.</i> , 2011)
<i>C. dematium</i>	Groundnut (Subrahmanyum <i>et al.</i> , 1992), Countrybean (Rahman <i>et al.</i> , 1994), Mulberry (Yoshida <i>et al.</i> , 2000), Chickpea (Washti <i>et al.</i> , 2000), Cabbage (Park <i>et al.</i> , 2001), Pongamia pinnata (Vinay <i>et al.</i> , 2008), Reineckea (Takeuchi <i>et al.</i> , 2008), Turmeric (Kothikar <i>et al.</i> , 2009), Chilli (Padghan <i>et al.</i> , 2009), (Kumar <i>et al.</i> , 2004), Cacalia delphiniifolia (Takeuchi <i>et al.</i> , 2010), Catharanthus (Stefaniak <i>et al.</i> , 2011), Humans (Stefaniak <i>et al.</i> , 2011), Japanese Radish, Strawberries, German statice (Stefaniak- Machowicz 2011), Reineckea plant,
<i>C. falcatum</i>	Sugarcane (Saharan <i>et al.</i> , 1994) (Crouch <i>et al.</i> , 2005),
<i>C. graminicola</i>	Maize, Wheat (Crouch <i>et al.</i> , 2009), Grasses
<i>C. gloeosporioides</i>	Papaya (Bag T. K. 2004), Apple (Carvalho <i>et al.</i> , 2000), Mango (Mills <i>et al.</i> , 1992), Papaya, Coffee (Brooks <i>et al.</i> , 1931), Pomegranate (Patel <i>et al.</i> ,2009), (Shit <i>et al.</i> , 2006), Saraca asoca (ojha <i>et al.</i> , 2008)
<i>C. gossypii</i>	Cotton (Alves <i>et al.</i> , 2009)
<i>C. higginsianum</i>	Cowpea, Tobacco, Alfalfa, Cruciferous (Higgins <i>et al.</i> , 1971) plants
<i>C. jacksonii</i>	Grass
<i>C. kahawae</i>	Coffee berry (Sutton <i>et al.</i> , 1992)
<i>C. lindemuthianum</i>	Urd bean (Kalha <i>et al.</i> , 2006), Common bean (Padder <i>et al.</i> , 2010)
<i>C. sublineolum</i>	Sorghum (Crouch <i>et al.</i> , 2005)
<i>C. truncatum</i>	Mungbean (Singh <i>et al.</i> , 2001), (Rathaiah <i>et al.</i> , 2004)

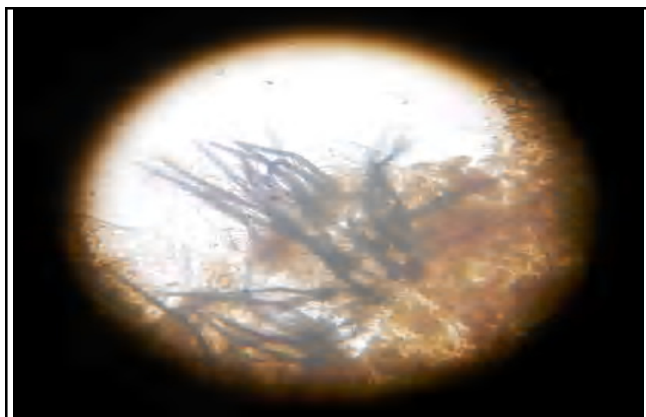


Fig. 2 : Acervuli on groundnut infected leaves



Fig. 3 : Symptoms of disease in field condition

vegetables, oilseeds, cereals, trees grasses and many more crops. It is also reported on animals and as well as in humans also.

It has been revealed from the scanning of literature that it is the first report on the association of *Colletotrichum dematium* with groundnut causing leaf spot disease in Allahabad of Uttar Pradesh State. This was firstly identifying by Ankur Jha, Shashi Tiwari Sunil Zacharia from Department of Plant Protection Sam Higginbottom Institute of Agriculture, Technology and Sciences (Deemed-to-be-University), Naini, Allahabad.

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