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Brown spot infection in rice variety Sahabhagi Dhan

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ABSTRACT

New drought-tolerant line IR74371-70-1-1 released as "Sahabhagi Dhan" in India was infected with brown spots during dry season 2010. Symptoms on 15 days old seedlings included stunted and yellow growth, with brown spots on leaves. The associated microflora was isolated and identified by molecular techniques. Taxonomy report by BLAST of NCBI indicated that the pathogen isolated during this investigation, belonged to Ascomycota, Dothideomycetes, Pleosporaceae. It had 99% similarity with Bipolaris oryzae, and 97% similarity with Cochliobolus sativus. Appropriate control / management practices for cultivation of this new drought tolerant rice variety must be adapted to avoid crop losses due to this devastating disease.

Key words: *Ascomycota, Dothideomycetes, Pleosporaceae Bipolaris oryzae, Cochliobolus sativus*

Drought stress severely limits rice productivity in the rainfed ecosystem in which farmers often experience total crop failure because of a lack of water at any critical plant growth stage. New drought-tolerant line IR74371-70-1-1 could withstand a drought spell of up to 12 days. It is released as "Sahabhagi Dhan" in India (Reyes 2009).

The seedlings of this variety were severely infected with brown spots during *Rabi* 2010. Symptoms on 15 days old seedlings included stunted and yellow growth, with brown spots on leaves.

The associated microflora from brown spots was isolated. Its DNA was isolated (Dhua *et al* 2008),Internal Transcribed Spacer (ITS) region of Ribosomal DNA was amplified and sequenced (White *et al.,* 1990) to identify this pathogen. ITS primers (Operon) ITS-1(TCCGTAGGTGAACCTGCGG), ITS-4 (TCCTCCGCTTATTGATATGC) were used for PCR amplification: Sequencing was outsourced to Chromous Biotech. Pvt. Ltd., Kolkata.

Taxonomy report by Basic Local Alignment Search Tool (BLAST) of NCBI indicated that the pathogen isolated during this investigation belonged to Ascomycota, Dothideomycetes, Pleosporaceae. It had 99% similarity with *Bipolaris oryzae*, and 97% similarity with *Cochliobolus sativus* (Table 1). *Cochliobolus miyabeanus* is teleomorph of *Bipolaris oryzae*. Hence, it was confirmed that the *Bipolaris oryzae* was the causal agent of the seedling infection on this rice variety.

Sahbhagi Dhan is observed to be highly susceptible to brown spot, hence it is essential to monitor

Table1. Database sequences searched by Mega BLAST and showing pair-wise similarities with fungal isolates associated with rice cultivars

Database sequences with max. score showing similarity		Max. Identity	Max.score	Query coverage	E-value	Reference
Accession	Description					
DQ300207	*Bipolaris oryzae*	99%	987	99%	0	Dela Paz,M.A.G., *et al.* (2006)
DQ300206	*Bipolaris oryzae*	99%	987	99%	0	Dela Paz,M.A.G., *et al.* (2006).
AF158104	*Cochliobolus sativus*	97%	913	97%	0	Berbee, M.L., Pirseyedi,M. and Hubbard, S. (1999).

the virulence of *Bipolaris oryzae* isolates collected from various locations and appropriate control / management practices for cultivation of this new rice variety must be adapted to avoid crop losses due to this devastating disease.

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