ISSN: 2226-7522(Print) and 2305-3372 (Online)
Science, Technology and Arts Research Journal
Sci. Technol. Arts Res. J., April-June 2014, 3(2): 01-03
Journal Homepage: http://www.starjournal.org/

New Perspective

First Report of *Fusarium proliferatum* Causing Rot of Onion Bulbs (*Allium cepa* L.) in India

Ravi Sankar N[1,2*], Nagalakshmi Devamma M[3] and Bagyanarayana G[4]

[1]Microbiology Laboratory, Global Institute of Biotechnology, Hyderabad-500 029, Andhra Pradesh, India

[2]Department of Plant Sciences, College of Agriculture and Natural Resource, Wollega University, Shambu Campus, Post Box No: 38, Ethiopia

[3]Applied Plant Pathology Laboratory, Department of Botany, Sri Venkateswara University, Tirupati-517 502, Andhra Pradesh, India

[4]Mycology and Plant Pathology Laboratory, Department of Botany, Osmania University, Hyderabad-500 007, Andhra Pradesh, India

Abstract

A rot disease was observed on onion bulbs in major growing areas of Kadapa and Kurnool districts of Andhra Pradesh, India during 2010 to 2012. Based on pathogenicity, morphology and ribosomal DNA spacer sequences, the pathogen was identified as *Fusarium proliferatum* (Matsushima) Nirenberg. The fungus was isolated from onion bulbs presenting purple and reddish lesions, obtaining *F. proliferatum* consistently. The fungus produced effuse white colonies, branched hyphae, short conidiophores, slightly curved macroconidia, and single celled microconidia measuring 5.6-10.5 X 2.0-3.5 µm in diameter. Morphological identification of the fungus was confirmed using ribosomal DNA sequence data. Kotch's postulates were confirmed by performing pathogenicity test on healthy onion bulbs. This is the first report of *F. proliferatum* causing rot disease on onion bulbs in India; although it had already been reported for onion in the USA and Serbia.

Article Information

Article History:
Received : 14-03-2014
Revised : 10-06-2014
Accepted : 11-06-2014

Keywords:
Onion bulbs
Rot disease
Fusarium proliferatum
Pathogenicity
rDNA - ITS

***Corresponding Author:**
Ravi Sankar N
E-mail: ravisankarreddyn@gmail.com

INTRODUCTION

The onion (*Allium cepa* L.), is a monocot bulbous biannual or perennial herbaceous plant of the Liliaceae, native to southwestern Asia and is the most widely cultivated species of the genus *Allium*. This genus also contains several other species variously referred to as onions and cultivated for food, such as the Japanese bunching onion (*A. fistulosum*), the Egyptian onion (*A. xproliferum*), and the Canada onion (*A. canadense*). Present species, *A. cepa* is one of the most familiar species of the group, is cultivated and used around the world. It is also known as the bulb onion or common onion, is used as a vegetable. It is widely used in the cuisine, often used as thickening agent for curries and gravies, but can also be eaten raw in salads, being rich vitamin C, B_6 and folic acid (James, 1994). It contains chemical compounds such as phenolics and flavonoids that have potential anti-inflamatory, anti-cholesterol, anti-cancer, antioxidant and antibacterial properties (Yang *et* al., 2004). Most onion cultivars are about 89% water, 4% sugar, 1% protein, 2% fibre and 0.1% fat. (Slimestad *et al*., 2007) It is estimated that around the world, over 9,000,000 acres (3,642,000 ha) of onions are grown annually. About 170 countries cultivate onions for domestic use and about 8% of the global production is traded internationally (Chengappa *et al*., 2012).

India is the second largest producer of onion in the world next to China. Onion is considered one of the most profitable crops in India, with a planted surface area of 1.04 million hectares and a domestic production in 2011-12 of 15.75 million tones (Chengappa *et al*., 2012). 50% of onion production is concentrated in the states of Maharashtra, Karnataka, Madhya Pradesh, Gujarat, Rajasthan, Andhra Pradesh, Uttar Prdesh, Bihar, Orissa, and Tamil Nadu both in rabi (winter) and kharif (rainy) seasons (Chengappa *et al*., 2012). In these regions, fungal diseases are the main cause of huge economic losses, including damping-off, purple blotch, block mould, white rot, basal rot, and onion smut.

In Andhra Pradesh, onion bulbs are grown for large domestic and regional export markets. In October of 2010, diseased onion bulbs were received from producers and exporters in Kadapa district, Andhra Pradesh, India. From 2010 to 2012, similar symptoms were observed at harvest on onion bulbs in Kadapa and Kurnool districts, Andhra