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First report of *Alternaria* pod blight of okra in Egypt

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Okra plants (*Hibiscus esculentus* L) were exhibited wet rotten of young fruiting pods during May and June 2010, in Kafr El –Abiada village, El Mahalla El Kobera District, Gharbeia Governorate, Egypt. The high losses of fresh pods was observed due to soften wet rot of young pods during their developing. Diseased pods fail to develop during. Isolation trails from tissue of diseased pods on potato dextrose agar (PDA) revealed that several fungal isolates. The fungal isolates were purified using single spore technique .Cultures are white aerial mycelia developed to olive which identified as *Alternaria alternata* (Fr.) Keissler on the basis of cultural and morphological characteristics. Pathogenicity tests were performed by inoculation young pods by mycelial mat of fungal isolates from 7- 10 days old cultures grown on (PDA). Pods free inoculation was served as a control. All pods were inocubated in chamber at 28°C for 48 h. Water-soaked lesions of inoculation pods were developed to wet rot then coverd by mycelia growth. Koch's postulates were completed by reisolation fungal isolates from diseased pods. According to the available literature, this is the first record of wet rot on okra in Egypt.

Key words: Okra, *Hibiscus esculentus*, *Alternaria alternate*

Introduction

Okra (*Abelmoschus esculentus* L.) is an annual vegetable crop grown in the tropical and sub-tropical regions. Tender green fruits of okra used as vegetable are fairly rich in vitamins and minerals. It's an important vegetable crop of Egypt grown commonly in summer season. Several important pathogens have been reported *Alternaria alternata* recorded a new post- harvest disease of okra pods in Japan (Tohyama *et al*., 1995 and Yoshitaka (2001) . In Egypt, *Alternaria* leaf spot of okra was observed on okra plants under field conditions under natural infection (Atia and Tohamy, 2004). *Rhizoctonia solani* recorded as a novel postharvest rot in okra pods in Brazil (Henz, *et al*., 2007), Recently *Cercospora* leaf spot of okra recorded in Egypt (Farrag Eman, 2011).

The present investigation was aimed to isolation and identification of pod blight causal pathogen of okra growing areas of Kafr El-Abiada village, Gharbeia, Governorate, Egypt

Materials and methods

Isolation and identification of causal agents

Samples of rotted young pods of okra were collected from field at Kafr El-Abiada village, Gharbeia, Governorate, Egypt. Diseased young pods were cut into bits and surface sterilized using 1% sodium hypochlorite one min. then washing with sterilized distilled water several times then cultured on potato dextrose agar medium (PDA) and incubated as mentioned above. The plates were incubated at 25ºC for 7days. Colony margins were transferred onto (PDA) which as a part of the culture purification process by single spore isolation technique and fungal isolates were identified according to (Ellis, 1971).

Pathogenicity test

Healthy young pods Cv. Balady wounded with entomological pins, followed by deposition of a plug of mycelial culture on the injured site. A plug of sterile PDA was used as a control. Pods were kept in plastic bags (95 % RH) for seven days in growth chambers at 25 C. Pods typical greenish color turning brown and tissues fully covered with mycelia. Internally diseased tissues were light brown to black. Percentage of diseasesd pods was recorded and disease severity development was recorded 5 days as follows:- 0= healthy, no soften lesion, 1= 25% soften of pod area, 2= 50% soften of pod area, 3= 75 % soften of pod area and 4= 100% soften of pod area. The data was statistically analyzed by procedures of Sukhatme and Amble (1985).

Results

Isolation, identification and pathological potential of fungal isolates

External syndrome of okra blight due to *A. alternata* invation at early are chlorosis then yellowish in colour and stunt. Affected pods were failure to developing as shown in Fig (1). Internal syndromes was observed through longitudinal and cross section of diseased pods as shown in Figs (2 &3) different degree of necrotic tissues of diseased pods invaded by *A. alternata* clearly observed compare the healthy (control). Several isolates of *A. alternata* fungi was isolated from diseased tissue of okra pods. Thesenisolates was identified according morphological chracters. All isolates were able to causing wet rot of wounded okra pods compare the control (wounded pods free fungal infestation). Fungal isolates varied of their pathological potential on okra pods.

Table 1. Pathogenicity test of fungal isolates on okra pods

Fungal name	Diseased pods %	D. severity
Alternaria alternata 1	60.0 d	1.6 c
Alternaria alternata 2	93.0 a	2.4 b
Alternaria alternata 3	73.3 c	2.4 b
Alternaria alternata 4	86.6 b	3.0 a
Check	00.0 e	0.0 d

Values with the different letters in the same column are significantly (P≤0.05) according to Duncan's multiple range test.

Fig. 1. *Alternaria* blight of okra pods under field diseased okra pod (right) compare healthy pods (left)

Fig. 2. Inner syndrome of okra pods of, longitudinal section showing different black discoloration of tissues invaded by *A. alternata* compared with control (left)

Fig. 3. Inner symptoms of diseased okra pod of cross section showing different degree of necrotic tissues of diseased pods invaded by *A. alternata* compared with control (left)

Dissicusion

Our observation are clearly indicated that *Alternaria alternata* (Fr.) Keissler causing wet rot disease of okra young pods in Egypt. As far as the writer are aware, this is first record of *A. alternata* as a new pathogens causing rot disease of okra pods in Egypt, expect (Atia and Tohamy, 2004) reported that *A. alternata* attacking leaves of okra plant under field natural infestation causing leaf spot disease recorded as a first report in Egypt. *A. alternata* is common pathogen of okra it is recorded a new post- harvest disease of okra pods in Japan Tohyama *et al*. (1995 a,b) and Yoshitaka (2001). According to the available literature, this is the first record of wet rot on okra in Egypt.

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