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Incidence of Deuteromycetean Fungal Diseases on Various Parts of Some Vegetable and Legume Crops from Aurangabad District of Maharashtra State, India

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ABSTRACT

An extensive survey has been carried out in Aurangabad District of Maharashtra during 2018-2020 to study incidence of fungal diseases caused by Deuteromycetean fungi on some vegetable and legume crops. In present investigation total 19 crops has been selected to study Deuteromycetean fungal diseases on various parts like leaves, stem, fruits, pods and flowers of some common and economically important vegetable and legume crops from Aurangabad district of Maharashtra. Among 19 selected crops, 14 belong to vegetable crops and 05 belong to legume crops. The diseased parts from the selected crops has been collected for the laboratory analysis and the results obtained shows that the leaves, stem and fruits of 05 vegetable crops and flowers of 02 vegetable crops found infected with Deuteromycetean fungi while leaves, stem and pods of legume crops found infected with Deuteromycetean fungi. The species of genus *Colletotrichum*, *Cercospora*, *Alternaria*, *Fusarium* and *Septoria* infected the leaves, stem, fruits, pods and flowers of selected vegetable and legume crops resulting in heavy yield losses.

Key words: Deuteromycetean fungi, Vegetable, Legume, *Colletotrichum*, *Fusarium*

Plants are infected by different kinds of microbial pathogens including fungi, bacteria, virus, nematodes etc. These microbial pathogens are responsible for causing various parasitic diseases in plants especially in crop plants. Among these microbial pathogens, fungi constitute the largest number of plant pathogens and are responsible for causing serious plant diseases [1-2]. The fungal diversity of Maharashtra has been recorded by the mycologists of Agharkar Research Institute, Pune and mycologists of Pune University. [3-6] also contributed to the fungal diversity of Maharashtra.

Variety of crops like vegetable, legume, cereal, oilseed, cash crops etc. has been produced in Aurangabad district and these crops are considered as an important economical source. The different parts of this variety of crops including leaves, stem, fruits, pods and flowers are infected by various fungal diseases especially by Deuteromycetes fungi that decrease the quality, quantity and productivity of crops especially vegetable and legume crops in Aurangabad district resulting in high yield losses.

MATERIALS AND METHODS

Collection of samples

An extensive survey was carried out during 2018-2020 in order to study the various fungal diseases associated with vegetable and legume crops from Aurangabad district of Maharashtra. To observe the incidence of Deuteromycetean fungal diseases, repeated visits were made around 09 tehsils of Aurangabad district and the diseased parts like leaves, stem, fruits, pods and flowers of vegetable and legume crops showing clear symptoms were collected in pre-sterilized air tight polythene bags labeled with location site, local name of crop plants and brought to the laboratory for further investigations.

Isolation and identification of fungal pathogens

The infected parts of vegetable and legume crops like leaves, stem, fruits, pods and flowers were washed with sterile water and the diseased tissues were cut into small pieces and were transferred to Mercuric chloride containing Petri dishes with the help of flame sterilized forceps for surface sterilization. The surface sterilized pieces were incubated on potato dextrose agar medium containing Petri dishes aseptically. The plates were incubated at room temperature around 24 to 26°C for 4 to 6 days during which fungal growth was observed on PDA containing Petri plates. The fungi were sub-cultured and by using single spore suspension technique, the pure culture was made.

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The isolated fungal pathogens were identified on the basis of accessible literature including manuals and monographs by [7-9] and different research papers published in the standard research journals.

RESULTS AND DISCUSSION

Some common and economically important 14 vegetable crops including *Capsicum annum* L., *Solanum lycopersicum* L., *Solanum tuberosum*, *Solanum melongena* L., *Zingiber officinale*, *Cucumis colocynthis* L., *Allium cepa* L., *Allium sativum* L., *Spinacia oleracea* L., *Brassica oleracea*, *Abelmoschus esculentus*, *Luffa aegyptiaca*, *Momordica charantia*, *Trigonella foenum-graecum* L. and 05 legume crops including *Cajanus cajan* L., *Cicer arietinum* L., *Vigna radiata*, *Vigna mungo* and *Vigna unguiculata* were selected for the present study and the results obtained are summarized in (Table 1-2).

The data obtained from (Table 1) clearly shows that 14 vegetable crops has been selected for the study and it is found that leaves, stem and fruits of 05 selected vegetable crops including *Capsicum annum* L., *Luffa aegyptiaca*, *Solanum melongena* L., *Solanum lycopersicum* and *Momordica charantia* found infected by Deuteromycetes fungi *Colletotrichum capsici*, *Colletotrichum orbiculare*, *Fusarium oxysporum*, *Alternaria solani* and *Colletotrichum orbiculare* respectively while only leaves and stem of remaining 05 vegetable crops *Solanum tuberosum* L., *Zingiber officinale*, *Cucumis colocynthis* L., *Abelmoschus esculentus*, *Trigonella foenum-graecum* L. found infected with deuteromycetes fungi *Alternaria solani*, *Septoria lycopersici* and *Fusarium oxysporum* and only leaves of 04 vegetable crops *Allium cepa* L., *Allium sativum* L., *Spinacia oleracea* L., and *Brassica oleracea* found infected with *Alternaria porri*, *Fusarium oxysporum*, *Colletotrichum spinaciae* and *Alternaria brassicae* [10-12]

Table 1 Data showing infection caused by Deuteromycetean fungi on different parts of vegetable crops

Name of the plant	Name of the pathogen	Parts of the crop plant				
		Leaves	Stem	Fruits	Pods	Flowers
<i>Capsicum annum</i> L. (Chili)	<i>Colletotrichum capsici</i>	+	+	+	--	+
	<i>Cercospora capsici</i>	+	+	--	--	--
	<i>Alternaria solani</i>	+	+	+	--	--
	<i>Fusarium solani</i>	+	+	--	--	--
<i>Solanum lycopersicum</i> L. (Tomato)	<i>Fusarium oxysporum</i>	+	+	--	--	--
	<i>Colletotrichum phomoides</i>	--	--	+	--	--
	<i>Septoria lycopersici</i>	+	+	--	--	+
	<i>Alternaria solani</i>	+	+	+	--	--
<i>Solanum tuberosum</i> L. (Potato)	<i>Alternaria solani</i>	+	+	--	--	--
	<i>Septoria lycopersici</i>	+	+	--	--	--
<i>Solanum melongena</i> L. (Brinjal).	<i>Fusarium oxysporum</i>	+	+	+	--	--
	<i>Cercospora melongenae</i>	+	--	+	--	--
	<i>Alternaria melongenae</i> ,	+	+	+	--	--
<i>Zingiber officinale</i> (Ginger)	<i>Fusarium oxysporum</i>	+	+	--	--	--
<i>Cucumis colocynthis</i> L. (Cucumber)	<i>Alternaria cucumerina</i>	+	--	--	--	--
	<i>Cercospora citrullina</i>	+	--	+	--	--
	<i>Fusarium oxysporum</i>	+	+	--	--	--
<i>Allium cepa</i> L. (Onion)	<i>Alternaria porri</i>	+	--	--	--	--
	<i>Fusarium oxysporum</i>	+	--	--	--	--
<i>Allium sativum</i> L. (Garlic)	<i>Alternaria porri</i>	+	--	--	--	--
	<i>Fusarium oxysporum</i>	+	--	--	--	--
<i>Spinacia oleracea</i> L. (Spinach)	<i>Fusarium oxysporum</i>	+	--	--	--	--
	<i>Colletotrichum spinaciae</i>	+	--	--	--	--
	<i>Cladosporium variabile</i>	+	--	--	--	--
<i>Brassica oleracea</i> (Cabbage)	<i>Alternaria brassicae</i>	+	--	--	--	--
<i>Abelmoschus esculentus</i> (Okra)	<i>Fusarium oxysporum</i>	+	+	--	--	--
	<i>Cercospora malayensis</i>	+	--	--	--	--
<i>Luffa aegyptiaca</i> (Green sponge gourd)	<i>Alternaria cucumerina</i>	+	--	--	--	--
	<i>Colletotrichum orbiculare</i>	+	+	+	--	--
	<i>Cercospora citrullina</i>	+	--	--	--	--
<i>Momordica charantia</i> (Bitter gourd)	<i>Alternaria cucumerina</i>	+	--	--	--	--
	<i>Colletotrichum orbiculare</i>	+	+	+	--	--
	<i>Cercospora citrullina</i>	+	--	--	--	--
<i>Trigonella foenum-graecum</i> L. (Fenugreek)	<i>Fusarium oxysporum</i>	+	+	--	--	--

+ = Infection

-- = No infection

Table 2 Data showing infection caused by Deuteromycetean fungi on different parts of legume crops

Name of the plant	Name of the pathogen	Parts of the crop plant				
		Leaves	Stem	Fruits	Pods	Flowers
<i>Cajanus cajan</i> L. (Pigeon pea)	<i>Fusarium oxysporum</i>	+	+	--	--	--
	<i>Alternaria alternata</i>	+	--	--	--	--
	<i>Colletotrichum truncatum</i>	+	+	--	+	--
	<i>Cercospora cajani</i>	+	--	--	--	--
<i>Cicer arietinum</i> L. (Chickpea)	<i>Fusarium oxysporum</i>	+	+	--	--	--
	<i>Alternaria alternata</i>	+	+	--	+	+
	<i>Colletotrichum dematium</i>	+	+	--	+	--
<i>Vigna radiata</i> (Green gram)	<i>Colletotrichum lindemuthianum</i>	+	+	--	+	--
	<i>Cercospora canesens</i>	+	--	--	+	--
<i>Vigna mungo</i> (Black gram)	<i>Colletotrichum lindemuthianum</i>	+	+	--	+	--
	<i>Cercospora canesens</i>	+	--	--	+	--
<i>Vigna unguiculata</i> (Cowpea)	<i>Colletotrichum destructivum</i>	+	--	--	--	--
	<i>Fusarium oxysporum</i>	+	--	--	--	--
	<i>Alternaria cucumerina</i>	+	--	--	--	--
	<i>Fusarium oxysporum</i>	+	--	--	--	--
	<i>Cercospora citrullina</i>	+	--	--	--	--

+ = Infection

-- = No infection

The data obtained from (Table 2) shows that, among 05 selected legume crops, the leaves, stem, pods and flowers of *Cajanus cajan* L., *Cicer arietinum* L., *Vigna radiata*, *Vigna mungo* and *Vigna unguiculata* found infected with the species of genus *Fusarium*, *Alternaria*, *Colletotrichum* and *Cercospora* [13-15].

CONCLUSION

The present investigation shows that the various parts like leaves, stem, fruits, pods and flowers of selected

vegetable and legume crops are infected by Deuteromycetean fungal diseases which decrease quality, quantity and productivity of vegetable and legume crops in Aurangabad district resulting in heavy yield losses.

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LITERATURE CITED

1. Das SN, Sarma TC. 2012. Some micro-fungi and their association on the incidence of diseases of brinjal (*Solanum melongena* L.) in Western Assam. *The Bioscan* 1: 303-306.
2. Altinok HH. 2005. First report of *Fusarium* wilt of eggplant caused by *Fusarium oxysporum* f. sp. *Melongenae* in Turkey. *Plant Pathology* 54: 577.
3. Gogoi R, Sarmah DK, Puzari KC. 2004. Aerial blight of gram and green gram caused by *Sclerotium rolfsii* Sacc. *Journal of Mycology and Plant Pathology* 34(1): 156-157.
4. Cannon PF, Damm U, Johnson PR, Weir BS. 2012. *Colletotrichum*-current status and future directions. *Stud. Mycol.* 73: 181-213.
5. Akhtar J, Singh MK. 2007. Studies on the variability in *Colletotrichum capsici* causing chilli anthracnose. *Indian Phytopathology* 60(1): 63-67.
6. Dongre MA, Borse KN. 2015. Common fungal leaf spot diseases of *Allium cepa* L. and *Allium sativum* L. crop from Maharashtra State, India. *International Research Journal of Biological Sciences* 4(11): 34-37.
7. Ekka S, Dubey SC. 2003. *Colletotrichum* blight a new disease of bitter melon. *Indian Phytopathology* 56: 503-504.
8. Abhinandan D, Randhawa HS, Sharma RC. 2004. Incidence of *Alternaria* leaf blight in tomato and efficacy of commercial fungicides for its control. *Annual Biology* 20(2): 211-218.
9. Deora A, Ramdhawa HS, Sharma RC. 2004. Incidence of *Alternaria* leaf blight on tomato and efficacy of commercial fungicides for its control. *Annuals of Biology* 20(2): 211-218.
10. Bhale UN. 2011. Survey of market storage diseases of some important fruits of Osmannabad District (MS.) India, *Science Research Reporter* 1(2): 88-91.
11. Chopada GB, Singh P, Chandulala K. 2015. Cultural and morphological variability among *Fusarium oxysporum* f.sp. *lycopersici* causing wilt of tomato in south Gujarat region. *Archives of Phytopathology and Plant Protection* 48(2): 104-110.
12. Kantwa SL, Tatarwal JP, Shekhawat S. 2014. *In vitro* effect of fungicides and phyto-extracts against *Alternaria alternata* causing leaf blight of groundnut. *IOSR Jr. Agric. and Vet. Science* 7(6): 28-31.
13. Ghangaokar NM, Ayodhya DK. 2013. Study of seed borne fungi of different legumes. *Trends in Life Sciences* 2(1): 32-35.
14. Chehri Kh. 2015. First report of post-harvest fruit rots of tomato caused by *Fusarium oxysporum* in Iran. *Archives of Phytopathology and Plant Protection* 48(6): 537-544.
15. Reddy ES, Kashinath BS. 2017. A survey of some common crop diseases from Kinwat Taluka of Nanded District (Maharashtra State), India. *International Journal for Innovative Research in Multidisciplinary Field* 3(5): 94-97.