

Incidence of *Alternaria* Species on Different Cereals, Pulses and Oil Seeds

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Abstract

Present paper deals with the study of diversity of *Alternaria* species on different cereals, pulses and oilseeds. Total nine species of *Alternaria* viz *A. alternata*, *A. crassa*, *A. cibborii*, *A. chrysanthemi*, *A. dianthicola*, *A. longipes*, *A. porri*, *A. tenuissima* and *A. triticina* were isolated from cereals like wheat, bajra, maize, barley and jowar. Eight species of *Alternaria* viz *A. alternata*, *A. dianthicola*, *A. longipes*, *A. longissima*, *A. raphani*, *A. porri*, *A. sesame* and *A. tenuissima* were reported on the pulses viz green gram, black gram, pea, red gram, cowpea and moth bean. Thirteen species of *Alternaria* like *A. alternata*, *A. brassicicola*, *A. brassicae*, *A. carthami*, *A. helianthi*, *A. longipes*, *A. longissima*, *A. macrospora*, *A. ricini*, *A. raphani*, *A. sesame*, *A. sesamicola* and *A. tenuissima* were occurred on six oil seeds like cotton, ground nut, sunflower, safflower, mustard and sesame.

1. Introduction

Crop plants suffer from number of diseases caused by species of fungi, bacteria, viruses and nematodes. Most of the diseases are transmitted through seeds which are the main carrier of the disease causing organisms. Among these diseases fungal pathogen play major role in yield loss, biodeterioration and chemical value of the seeds. The literature cited on seed pathology clearly reveal that the seed-borne fungi have found to be composed of great diversity which mainly include species of *Alternaria*, *Aspergillus*, *Curvularia*, *Drehsclera*, *Helminthosporium*, *Fusarium*, *Penicillium*, *Rhizopus*, *Rhizogtonia*, *Trichoderma*, *Verticillium* etc. However, the importance of seed-borne species of *Alternaria* is studied meager. In order to know the seed-borne nature of *Alternaria* and its role in seed biodeterioration, present investigation was carried out. Species of *Alternaria* cause range of diseases with great economic importance on large variety of commercially cultivated tropical crop plants which include cereals, legumes, oil seeds and large number of post harvest crops. *Alternaria* species causing early blight disease to the plants are known to cause wild spread damage in tropical crops. It shows diversity with respect to cultural morphological, physiological, pathological and molecular level. The isolation from different geographical regions has been found to be differing with varying virulence and sporulation, therefore emphases has been made on the genus *Alternaria* in the present investigation.

2. Materials and Methods

Collection of seed samples

For the collection of seed samples the method described by Neergaard (1973) has been adopted.

Accordingly random samples of different varieties of seeds were collected from fields, store houses, market places and seed companies. A composite samples of each variety was prepared by mixing the individual samples together, preserved in cloth bags in laboratory conditions at room temperature during the studies.

Isolation of seed mycoflora

The seed mycoflora was isolated by using standard Agar plate methods (APM) as recommended by International Seed Testing Association (ISTA 1966); De Tempe (1970) and Neergaard (1973).

Identification of seed-borne fungi

The fungi occurring on each and every seed in the plates were identified preliminary on the basis of sporulation characters like sexual or asexual spores with the help of stereoscopic binocular microscope. The identification and further confirmation of seed-borne fungi was made by preparing slides of the fungal growth and observing them under compound microscope. The identification was made with the help of standard literature

3. Results and Discussion

It is clear from the table 1 that nine species of *Alternaria* viz *A. alternata*, *A. crassa*, *A. cibborii*, *A. chrysanthemi*, *A. dianthicola*, *A. longipes*, *A. porri*, *A. tenuissima* and *A. triticina* were occurred on different cereals. It is interesting to note that all the species were occurred on wheat seeds, however only *Alternaria alternata* occurred on all other cereals.

Similarly *A. alternata*, *A. dianthicola*, *A. longipes*, *A. tenuissima* and *A. triticina* also occurred more than 50 % on other cereals. Eight species of *Alternaria* viz *A. alternata*, *A. dianthicola*, *A. longipes*, *A. longissima*, *A. raphani*, *A. porri*, *A. sesame* and *A. tenuissima* were reported on the pulses. *Alternaria alternata* occurred on all the pulses whereas *A. dianthicola* occurred on green gram. *A. raphani* occurred on gram *A. sesame* occurred on pea only, whereas *A. longipes* and *A. longissima* occurred more than 30 % on the seeds (Table 2).

It is noted from the table 3 that thirteen species of *Alternaria* like *A. alternata*, *A. brassicicola*, *A. brassicae*, *A. carthami*, *A. belianthi*, *A. longipes*, *A. longissima*, *A. macrospora*, *A. ricini*, *A. raphani*, *A. sesame*, *A. sesamicola* and *A. tenuissima* were occurred on six oil seed crops. *Alternaria alternata* occurs on all the oil seeds. Cotton seed shows *A. alternata* and

A. macrospora in dominance. Sunflower seeds showed *Alternaria alternata*, *A. carthami*, *A. belianthi* in dominance similarly safflower seed showed *A. alternata* and *A. carthami* in maximum number. Mustard seed showed *A. alternata*, *A. brassicicola*, *A. brassicae*, *A. carthami* and sesame seed shows *A. alternata*, *A. sesame* and *A. sesamicola* are in maximum count whereas on the other side *A. brassicae* occurs only on mustard seed. *A. macrospora* occurred only on cotton seed, *A. raphani* occurs only on groundnut seed and *A. sesamicola* occurs only on sesame seed. Mukewar and Sen (1979) observed an incidence of *Alternaria alternata* and *A. zinniae*. Raut (1985) reported *Alternaria belianthi* from sunflower seeds and its transmission from seed to plant. Similarly Ataga and Aksyeshic (1986) showed *Alternaria tenuis* is in maximum count on sunflower seeds.

Table 1 Percent incidence of *Alternaria* species on cereals

Species of <i>Alternaria</i>	Wheat	Bajra	Maize	Barley	Jowar
<i>A. alternata</i>	++++	+++	+++	+++	+++
<i>A. crassa</i>	++	--	--	--	--
<i>A. cibborii</i>	++	--	--	--	+
<i>A. chrysanthemi</i>	++	--	--	--	--
<i>A. dianthicola</i>	+++	++	--	+	++
<i>A. longipes</i>	+	++++	--	+	--
<i>A. porri</i>	++	--	--	+	--
<i>A. tenuissima</i>	+++	--	++	+	--
<i>A. triticina</i>	++++	+	+	--	++

-- Absent, + upto 10 %, ++ upto 20 %, +++ upto 30 %, ++++ upto 50 %

Table 2 Percent incidence of *Alternaria* species on pulses

Species of <i>Alternaria</i>	Green gram	Black gram	Pea	Red gram	Cowpea	Moth bean
<i>A. alternata</i>	+++	+++	+++	++	+++	++
<i>A. dianthicola</i>	++	--	--	--	--	--
<i>A. longipes</i>	+	+++	--	+	++	+
<i>A. longissima</i>	++	+	+++	+	--	+
<i>A. raphani</i>	--	--	--	--	--	++
<i>A. porri</i>	++	+	--	--	--	--
<i>A. sesame</i>	--	--	+	--	--	--
<i>A. tenuissima</i>	+	++	--	--	+	--

-- Absent, + upto 10 %, ++ upto 20 %, +++ upto 30 %, ++++ upto 50 %

Table 3 Percent incidence of *Alternaria* species on oil seeds

Species of <i>Alternaria</i>	Different oil seeds					
	Cotton	Ground nut	Sunflower	Safflower	Mustard	Sesame
<i>A. alternata</i>	+++	+++	++++	+++	+++	+++
<i>A. brassicicola</i>	--	++	+	+	++++	++
<i>A. brassicae</i>	--	--	--	--	+++	--
<i>A. carthami</i>	--	+	+++	++++	+++	--
<i>A. helianthi</i>	--	+	+++	--	--	--
<i>A. longipes</i>	++	--	++	--	++	+
<i>A. longissima</i>	+	+	+	++	+	++
<i>A. macrospore</i>	++++	--	--	--	--	--
<i>A. ricini</i>	--	--	++	++	--	--
<i>A. raphani</i>	--	++	--	--	--	--
<i>A. sesame</i>	--	--	--	--	--	++++
<i>A. sesamicola</i>	--	--	--	--	--	+++
<i>A. tenujissima</i>	+	--	+	--	++	+

-- Absent, + upto 10 %, ++ upto 20 %, +++ upto 30 %, ++++ upto 50 %

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