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Source of resistance to anthracnose (*Colletotrichum capsici)* disease in *Capsicum* species*

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Anthracnose or dieback or ripe fruit rot in chillies (*Capsicum annuum* L.) is a common disease caused by *Colletotrichum capsici* (Sydow) Butler & Bisby, the hyphae of which proliferate within the host tissue and form lesions on the fruits (Muthumary and Jayachandhra 1994). It is one of the major production constraints in tropical and subtropical areas. The pathogen causes yield reduction up to 66-84 % in Punjab (Thind and Jhooty 1985). Many authors reported that only red ripe stages of chilli fruits to be vulnerable for attack by the pathogen rather than green fruits (Chowdhury 1957). Chemical control of anthracnose is hazardous to health and uneconomical; hence development and use of resistant varieties is the most pragmatic way to keep disease under check. Resistant genotypes have been identified through screening, in different parts of the world (AVRDC 1992, Henz *et al.* 1993, Ruth Beulah Rani 2002, Yoon 2003). The present study reports level of resistance against anthracnose in 26 accessions and 30 hybrids of chilli and 1 accession of cherry capsicum.

A field screening against anthracnose disease was carried out during 2004–2005 season with 27 accessions and 30 hybrids and were evaluated under field conditions in a randomized block design with 2 replications.

For assessing intensity of anthracnose disease incidence, 0-9 score chart (0, no infection; 1, < 1% of area affected; 3, 1-10% of area affected; 5, 11-25% of area affected; 7, 26-50% of area affected and 9, more than 50% of area affected) was used as suggested by McKinney (1923). Per cent disease index (PDI) was calculated as per the formula of Wheeler (1969). Based on PDI, genotypes were grouped into 5 classes such as, no infection as immune; 1-5% PDI as resistant; 6-25% PDI as moderately resistant; 26-50% PDI as susceptible and 51-100% PDI as highly susceptible (Bansal and Grover 1969).

Per cent disease index of accessions for anthracnose disease ranged from 0 to 48.41 % and average disease index was 20.36 %. Grouping of the accessions for disease incidence showed that 3.7 % accessions were immune, 7.4 % were resistant, 48.1 % were moderately resistant and remaining 40.8 % were susceptible (Table 1). The results corroborate with earlier studies conducted on resistance aspect of this disease that showed very little resistance indicating the presence of diverse population with in the anthracnose fungus (Mandeep Kaur *et al.* 2005). However immune source is available in cherry capsicum (Yoon 2003). In the present study also Accession 16 'PBC 81' of cherry capsicum showed immunity to anthracnose.

Table 1 Reaction of chilli accessions against anthracnose disease

Disease rating	PDI (%)	Accession numbers (with available variety name / culture number / donors number)
Immune	No infection	Acc.16 'PBC –81'
Resistant	1 – 5	Acc.17 'CC 4', Acc.5 'S 1'
Moderately resistant	6 – 25	Acc.2 'ICBD 2', Acc.4 'ICBD 4', Acc.6 'Tomato chilli', Acc.8 'ICBD 17', Acc.9 'ICBD 18', Acc.10 'ICBD 19', Acc.11 'Arka Lohit', Acc.12 'Arka Abir', Acc.13 'Co 4', Acc.15 '1888', Acc.21 'MDU R', Acc.22 'MDU Y' and Acc.26 'Kt Pl 18'
Susceptible	26 – 50	Acc.1 'ICBD 1', Acc.3 'ICBD 3', Acc.7 'ICBD 15', Acc.14 'K 2', Acc.18 'Kt Pl 19', Acc.19 'Simla Paprika', Acc.20 'ICBD 14', Acc.23 'Bydage Kaddi), Acc.24 'Bydage Dabbi', Acc.25 'Tomato chilli1' and Acc.27 'Kt Pl 19-1'
Highly susceptible	51 – 100	

PDI, Percent Disease Index

* Short note

Based on a part of Ph D thesis submitted to the TNAU, Coimbatore during 2005

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High population of resistant to moderately resistant accessions as observed in this study showed that anthracnose disease is probably under the control of a few genes and resistance appears to be dominant as disease incidence trait skewed towards resistance and none of the genotype had disease incidence of more than 50 %. Accessions found to be immune and resistant can be used in the breeding programme to combine this trait with other horticulture traits.

Field screening of hybrids under natural epiphytotics revealed that out of 30, none of them were found to be immune to anthracnose disease. Anthracnose per cent disease index of hybrids ranged from 4.57 to 51.41 % and average disease index was 16.09 %. Grouping of the hybrids for disease incidence showed that 13.4, 60.0, 23.3 and 3.3 % as resistant, moderately resistant, susceptible and highly susceptible respectively. The 4 resistant hybrids were 'Arka Lohit' × 'S 1', 'MDUY' × 'S 1', 'Arka Abir' × 'S 1' and 'Co 4' × 'S 1' and the resistant parent 'S 1' was common male parent in all the 4 resistant hybrids. Almost similar pattern of resistance in chillies against ripe fruit rot pathogen has also been reported by Jeyalakshmi and Seetharaman (1998) and Ruth Beulha Rani (2002).

SUMMARY

A field screening under natural epiphytotics was conducted during September 2004 to March 2005 to identify the resistance sources to anthracnose or ripe fruit rot pathogen of 26 accessions and 30 hybrids of Chilli (*Capsicum annuum* L.) and one accession of cherry capsicum (*Capsicum frutescens* L. var *baccatum* (L.) Irish). Cherry capsicum accession 'PBC 81' was immune to anthracnose. Accession 'CC 4' and 'S1' were resistant. Among the 30 hybrids 'Arka Lohit' × 'S 1', 'MDUY' × 'S 1', 'Arka Abir' × 'S 1' and 'Co 4' × 'S 1' were resistant to anthracnose fungus which has common resistant parent 'S 1'.

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Announcements

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