

Contents

Chapter	Page
1. Introduction	1-5
2. Review of literature	6-22
2.1. The genus <i>Capsicum</i>	6
2.2. Botany	7
2.3. Innovative utility	8
2.4. Pungency (capsaicinoids)	12
2.5. Colour (carotenoids)	15
2.6. Flavours	18
2.7. Spice production and quality	19
2.8. Male sterility in <i>Capsicum</i>	20
3. Materials and methods	23-34
3.1. Plant materials	23
3.1.1. Collection of fruit samples	23
3.1.2. Crosses developed	25
3.1.3. Collection of fruit samples	26
3.2. Methodology	28
3.2.1. Field experiments	28
3.2.2. Biochemical analysis	30
4. Results	35-58
4.1. Screening of germplasm (one season data)	35
4.2. Screening of germplasm (two season data)	37
4.3. Colour in fresh and stored powder	40
4.4. Capsaicin and oleoresin analysis	41
4.5. Capsaicin in fresh and stored powder	42
4.6. Estimation of capsaicin using two methods	42
4.7. Ascorbic acid in green and red ripe fruits	43
4.8. Germplasm screening for selected parameters	43
4.9. Biochemical analyses of RILs	46
4.10. Evaluation of parents and crosses	47
4.11. Heterosis	52
4.12. Fertility restoration in F_1 s	57
5. Discussion	59-74
5.1. Capsaicin contents	59
5.2. Oleoresin contents	64
5.3. Ascorbic acid contents	66
5.4. Dry matter	68
5.5. Evaluation of parents and crosses	68
5.6. Heterosis	70
5.6.1. Paprika qualities	70
5.6.2. Morphological characters	71
5.7. Fertility restoration in F_1 s	72
6. Summary and conclusions	75-78
7. References	i-ix

List of tables

Table No.	Title
Table 1.1.	Commercial cultivation of pepper in India: fruits of various market types
Table 2.1.	Distinguishable morphology of five cultivated species of <i>Capsicum</i>
Table 2.2.	Versatile and innovative uses of pepper
Table 2.3.	Name of some popular genotypes with their pungency level
Table 3.1.	Chilli and sweet pepper genotypes utilized for the estimation of biochemical parameters
Table 3.2.	List of parental lines used to develop crosses during 2002-2003
Table 3.3.	List of parental lines used to develop crosses during 2003-2004
Table 3.4.	List of RILs were utilized for biochemical analysis
Table 4.1.	Qualitative analysis of red ripe fruits of 56 chilli genotypes
Table 4.2.	Biochemical analyses of selected genotypes during two seasons
Table 4.3.	Colour estimates in fresh and stored samples
Table 4.4.	Genotypes analyzed during 2004-2005
Table 4.5.	Capsaicin percent in fresh and stored powder
Table 4.6.	Comparison of capsaicin contents estimated by spectrophotometer and HPLC
Table 4.7.	Ascorbic acid contents in green and red ripe fruits
Table 4.8.	Screening of genotypes for selected biochemical parameters
Table 4.9.	Variability in capsaicin and oleoresin contents in RILs
Table 4.10.	Capsaicin and oleoresin contents of selected parental lines and their crosses
Table 4.11.	Salient morphological characters of parents and crosses
Table 4.12.	Heterosis for biochemical parameters
Table 4.13.	Heterosis for selected morphological attributes
Table 4.14.	Fertility restoration reaction of cms based crosses (2002-2003)
Table 4.15.	Fertility restoration reaction of cms derived F ₁ s (2004-05)
Table 5.1.	Comparison of capsaicin contents of BS-35 with previously known world's most pungent genotypes
Table 5.2.	Restoration ability of common male parents to two independently isolated male sterile cytoplasm