

CONTENTS

CHAPTER	TITLE	PAGE
I	INTRODUCTION	1-4
II	REVIEW OF LITERATURE	5-28
	2.1 Magnitude of heterosis	5
	2.2 Combining ability and gene action	15
III	MATERIALS AND METHODS	29-37
	3.1 Experimental materials	29
	3.2 Crossing programme	29
	3.3 Experimental details	31
	3.4 Characters studied	31
	3.5 Statistical procedures	32
IV	EXPERIMENTAL RESULTS	39-68
	4.1 Analysis of variance for experimental design	39
	4.2 Mean performance of parents and hybrids	39
	4.3 Estimation of heterobeltiosis and standard heterosis	43
	4.4 Analysis of variance for combining ability	53
	4.5 Combining ability effects	54
	4.5.1 General combining ability effects	54
	4.5.2 Specific combining ability effects	61
V	DISCUSSION	69-98
	5.1 Analysis of variance	69
	5.2 Manifestation of heterosis	70
	5.3 Gene action	76
	5.4 General and specific combining ability effects	82
	5.4.1 General combining ability effects	83
	5.4.2 Specific combining ability effects	89
VI	SUMMARY AND CONCLUSIONS	99-104
	BIBLIOGRAPHY	i-x
	APPENDICES	i-v
	Appendix-I	i
	Appendix-II	ii-v

LIST OF TABLES

TABLE	TITLE	PAGE
3.1	Pedigree, source and salient features of parental lines used in study	30
3.2	Analysis of variance for experimental design	33
3.3	Analysis of variance for combining ability	35
4.1	Analysis of variance for experiment design for different characters in sesame	40
4.2	Per cent heterobeltiosis (H_1) and standard heterosis (H_2) for days to 50 per cent flowering, days to maturity, plant height, height to first capsule and number of branches per plant in sesame	45-46
4.3	Per cent heterobeltiosis (H_1) and standard heterosis (H_2) for number of internodes per plant, length of capsule, width of capsule, number of capsules per plant and number of capsules per leaf axil in sesame	49-50
4.4	Per cent heterobeltiosis (H_1) and standard heterosis (H_2) for number of seeds per capsule, 1000-seed weight, seed yield per plant and oil content in sesame	51-52
4.5	Analysis of variance for combining ability and variance components for different characters in sesame	55
4.6	General combining ability effects for days to 50 per cent flowering, days to maturity, plant height, height to first capsule and number of branches per plant in sesame	57
4.7	General combining ability effects for number of internodes per plant, length of capsule, width of capsule, number of capsules per plant and number of capsules per leaf axil in sesame	59
4.8	General combining ability effects for number of seeds per capsule, 1000-seed weight, oil content and seed yield per plant in sesame	61
4.9	Specific combining ability effects for days to 50 per cent flowering, days to maturity, plant height, height to first capsule, number of branches per plant, number of internodes per plant and length of capsule in sesame	63-64
4.10	Specific combining ability effects for width of capsule, number of capsules per plant, number of capsules per leaf axil, number of seeds per capsule, 1000-seed weight, seed yield per plant and oil content in sesame	66-67

TABLE	TITLE	PAGE
5.1	Range of heterobeltiosis (H_1) and standard heterosis (H_2) as well as number of crosses with specific heterotic effects for various traits in sesame	75
5.2	Comparative study of ten most standard heterotic (H_2) crosses for seed yield per plant along with heterobeltiosis (H_1), <i>per se</i> performance and their standard heterotic effects for component characters in sesame	77
5.3	Summary of general combining ability effects of the parents for fourteen characters in sesame	85-86
5.4	Information on best three parents on the basis of <i>per se</i> and gca effects as well as three best crosses on the basis of <i>per se</i> , heterobeltiosis, standard heterosis and sca effects for various characters in sesame	94-96

LIST OF APPENDICES

TABLE	TITLE	PAGE
I	Mean weekly meteorological data recorded during the crop season in the year 2016 at meteorological observatory, College of Agriculture, Junagadh Agricultural University, Junagadh	i
II	Mean performance of parents and crosses for fourteen characters in sesame	ii-v