

## C O N T E N T S

Chapter		Page
ACKNOWLEDGEMENTS		
Abbreviations and Symbols used in statistical analysis	... ...	i
List of Illustrations	... ...	ii
List of Tables	... ...	vi
List of Graphs	... ...	xi
<u>SECTION I</u>		
1. Introduction	... ...	1
1.1. What is autecology?	... ...	1
1.2. Importance of autecological studies	... ...	1
1.3. Previous work done in the field of autecology		2
1.4. What are weeds?	... ...	4
1.5. Importance of autecological studies of weeds		5
1.6. Choice of species for autecological studies		6
1.7. Sites of study	... ...	7
2. Materials and Methods	... ...	9
2.1. Climatic data	... ...	9
2.2. Microclimatic data	... ...	9
2.3. Soil analysis	... ...	9
2.4. Anatomical studies	... ...	10
2.5. Stomatal index	... ...	10
2.6. Chromosome numbers	... ...	11
2.7. Seed and seed germination	... ...	12
2.8. Culture experiments	... ...	14
2.9. Statistical analysis	... ...	14

Chapter				Page
3.	Ecology of the study sites	...	...	15
3.1.	Location of the study sites..	...	...	15
3.2.	Climate of Baroda	...	...	15
3.3.	Microclimatic data	...	...	21
3.4.	Soil properties	...	...	21
3.5.	Plant Associates	...	...	27

### SECTION - II

#### Ecology of *Abutilon ramosum* Guill. & Perr.

4.	Taxonomy, Distribution and Morphology	...	...	36
4.1.	Systematic position	...	...	36
4.2.	Distribution	...	...	36
4.3.	Habit and habitat	...	...	36
4.4.	Morphology	...	...	38
4.5.	Economic importance	...	...	40
4.6.	Phenology	...	...	40
4.7.	Anatomy	...	...	41
4.8.	Stomatal index	...	...	44
4.9.	Chromosome numbers	...	...	45
5.	Seed and Seed Germination	...	...	46
5.1.	Size, weight and moisture content	...	...	46
5.2.	Imbibition rate	...	...	47
5.3.	Seed output	...	...	48
5.4.	Dispersal of seeds	...	...	50
5.5.	Germination studies	...	...	51
5.5.1.	Dormancy of seeds ...	...	...	52
5.5.2.	Effect of mechanical scarification	...	...	53
5.5.3.	Effect of chemical scarification	...	...	56
5.5.4.	Effect of pretreatment with organic solvents ...	...	...	62
5.5.5.	Effect of high temperature treatment...	...	...	64
5.5.6.	Effect of dry and wet heating..	...	...	67
5.5.7.	Effect of burial ...	...	...	69

Chapter		Page
5.5.8.	Effect of type of soil ...	71
5.5.9.	Effect of depth of sowing ...	72
5.5.10.	Effect of soil moisture content ...	76
5.5.11.	Effect of temperature ...	78
5.5.12.	Effect of light ...	79
5.5.13.	Effect of colour (wavelength) of light.	81
5.5.14.	Effect of inorganic salts ...	85
5.5.15.	Effect of nitrates on germination in darkness ...	94
5.5.16.	Effect of thiourea...	97
5.5.17.	Effect of GA <sub>3</sub> ...	100
5.5.18.	Effect of kinetin ...	103
5.5.19.	Effect of 2,4-D ...	105
5.6.	Reproductive capacity ...	108
5.7.	Seedling morphology ...	109
6.	Growth Performance in Culture Experiments..	111
6.1.	Climatic factors ...	112
	Light intensity and growth performance	113
6.2.	Edaphic factors ...	119
6.2.1.	Soil moisture regime and growth performance...	120
6.2.2.	Organic matter content in soil and growth performance...	128
6.3.	Biotic factors ...	133
6.3.1.	Intraspecific competition and growth performance ..	135
6.3.2.	Interspecific competition and growth performance ..	140

### SECTION - III

Ecology of Euphorbia geniculata Orteg.

7.	Taxonomy, Distribution and Morphology	143
----	---------------------------------------	-----

Chapter			Page
7.1.	Systematic position	...	143
7.2.	Distribution	...	143
7.3.	Habit and habitat	...	143
7.4.	Morphology	...	145
7.5.	Economic importance	...	146
7.6.	Phenology	...	147
7.7.	Anatomy	...	148
7.8.	Stomatal index	...	150
7.9.	Chromosome numbers	...	152
8.	Seed and Seed Germination	...	153
8.1.	Size, weight and moisture content	...	153
8.2.	Imbibition rate	...	154
8.3.	Seed output	...	155
8.4.	Dispersal of seeds	...	156
8.5.	Germination studies	...	160
8.5.1.	Effect of type of soil	...	160
8.5.2.	Effect of depth of sowing	...	161
8.5.3.	Effect of soil moisture content	...	165
8.5.4.	Effect of temperature	...	167
8.5.5.	Effect of light	...	169
8.5.6.	Effect of colour (wavelength) of light.	...	171
8.5.7.	Effect of inorganic salts	...	172
8.5.8.	Effect of nitrates on germination in darkness	...	180
8.5.9.	Effect of thiourea...	...	183
8.5.10.	Effect of GA <sub>3</sub>	...	186
8.5.11.	Effect of kinetin	...	188
8.5.12.	Effect of 2,4-D	...	190
8.6.	Reproductive capacity	...	192
8.7.	Seedling morphology	...	193
9.	Growth Performance in Culture Experiments..	...	194

Chapter			Page
9.1.	Light intensity and growth performance	...	194
9.2.	Soil moisture regime and growth performance	...	199
9.3.	Organic matter content in soil and growth performance	...     ...     ...	204
9.4.	Intraspecific competition and growth performance	...     ...     ...	209
9.5.	Interspecific competition and growth performance	...     ...     ...	213

#### SECTION - IV

##### Ecology of Rivinia humilis Linn.

10.	Taxonomy, Distribution and Morphology	...     ...     ...	217
10.1.	Systematic position	...     ...     ...	217
10.2.	Distribution	...     ...     ...	217
10.3.	Habit and habitat	...     ...     ...	217
10.4.	Morphology	...     ...     ...	219
10.5.	Economic importance	...     ...     ...	221
10.6.	Phenology	...     ...     ...	221
10.7.	Anatomy	...     ...     ...	221
10.8.	Stomatal index	...     ...     ...	224
10.9.	Chromosome numbers	...     ...     ...	225
11.	Seed and Seed Germination	...     ...     ...	226
11.1.	Size, weight and moisture content	...     ...     ...	226
11.2.	Imbibition rate	...     ...     ...	227
11.3.	Seed output	...     ...     ...	228
11.4.	Dispersal of seeds	...     ...     ...	229
11.5.	Germination studies	...     ...     ...	230
11.5.1.	Effect of type of soil	...     ...     ...	230
11.5.2.	Effect of depth of sowing	...     ...     ...	233
11.5.3.	Effect of soil moisture content	...     ...     ...	235
11.5.4.	Effect of temperature	...     ...     ...	236
11.5.5.	Effect of light	...     ...     ...	238

Chapter		Page
11.5.6.	Effect of colour (wavelength) of light ... ... ...	242
11.5.7.	Effect of inorganic salts...	245
11.5.8.	Effect of nitrates on germination in darkness ... ... ...	251
11.5.9.	Effect of thiourea ... ... ...	254
11.5.10.	Effect of GA <sub>3</sub> ... ... ...	257
11.5.11.	Effect of kinetin... ... ...	259
11.5.12.	Effect of 2,4-D ... ... ...	261
11.6.	Reproductive capacity ... ... ...	263
11.7.	Seedling morphology ... ... ...	264
12.	Growth Performance in Culture Experiments ...	275
12.1.	Light intensity and growth performance ...	275
12.2.	Soil moisture regime and growth performance...	280
12.3.	Organic matter content in soil and growth performance ... ... ...	285
12.4.	Intraspecific competition and growth performance ... ... ...	289
12.5.	Interspecific competition and growth performance ... ... ...	294
<u>SECTION - V</u>		
13.	Important Findings and General Discussion. ...	311
	Bibliography ... ... ...	347

\*\*\*\*\*