
Contents

C O N T E N T S

Chapter No.	Title	Page No.
	Acknowledgements	I
	List of Figures and Tables	III, IV
	Abbreviations	V
	Introduction	VIII
I	Review of Literature	
	A) Historical account	1
	B) Chemicals properties	2
	C) Biosynthesis of Proline	4
	D) Site of proline biosynthesis in plant cell	12
	E) Regulation of Proline biosynthesis	13
	F) Fate of proline	15
	G) Proline accumulation	18
	a) Water deficit stress conditions	18
	b) Waterlogging stress conditions	24
	c) Salinity stress conditions	24
	d) Mineral deficiency conditions	29
	e) High and low temperature stress conditions	30
	f) Chemical stress conditions	34
	g) Pathogenesis - attack of pathogens and pests.	35
	h) Pollution stress conditions.	37
	H) Functions of proline	39
	a) Osmoregulation	39
	b) Enzyme stabilization	40

...

Chapter No.	Title	Page No
	c) Cellular metabolism	41
	d) Conservation of energy, carbon and Nitrogen	42
	e) Sink for soluble nitrogen	43
	f) Growth	44
	g) Plant architecture	44
	h) Reproduction	44
	i) Water relations	45
	j) Cold tolerance	46
	k) Air pollution tolerance	46
II	Material and Methods	
	A) Material	48
	B) Methods	49
	1) Determination of leaf moisture percentage	49
	2) Free proline estimation	49
	3) Total sugar estimation	51
	4) Estimation of mineral elements (Ca ⁺⁺ and K ⁺)	53
	5) Total nitrogen estimation	54
	6) Stomatal studies	55
	7) Study of Influence of artificial irrigation	55
III	Results and Discussion	
	A) Total nitrogen and free proline contents	57
	B) Monthly variations in free proline	62
	C) Relationship between environmental factors and free proline accumulation in the leaves of three plant species.	67

...

Chapter No.	Title	Page No.
	D) Relationship between the leaf moisture status and free proline, in three species.	74
	E) Relationship between leaf K^+ and Ca^{++} status and free proline.	80
	F) Relationship between leaf carbohydrate status and free proline levels.	90
	G) Relationship between transpiration rate and free proline levels.	98
	H) Relationship between free proline accumulation and nitrate reductase activity.	106
IV	Summary and Conclusions	114
	Bibliography	124
	Statement I	139
	Statement II	140
