

TABLE OF CONTENT

	Page no.
ABSTRACT	i
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	vii
LIST OF MAPS	vii
LIST OF PLATES	viii
ABBREVIATIONS	ix
1. INTRODUCTION	1
2. REVIEW OF LITERATURE	
2.1. General Introduction	6
2.2. Botany of orchids	7
2.2.1. Structure of the orchid plant	7
2.2.2. Stem and leaves	7
2.2.3. Roots and other underground parts	8
2.2.4. Flowers and fruits	8
2.3. Seed culture	8
2.4. Green pod culture of orchids	9
2.5. Seed sown culture	10
2.6. Tissue Culture of orchids	10
2.6.1. Explant sources for tissue culture	11
A. Meristem	
B. Nodal region from stems	
C. Leaves and leaf tips	
D. Inflorescences and buds from inflorescences	
E. Rhizome and roots	
2.6.2. Excision and Inoculation	12
2.6.3. Initiation and multiplication of protocorms	12

2.7 Differentiation of protocorms into plants	12
2.8. Growing seedlings	13
2.9. Acclimatization of seedlings	14
2.9.1. Washing the seedlings	14
2.9.2. Community pot (compot) media	14
2.10. Placing seedlings in compots	14
2.11. Biogeography of Sri Lankan orchids	15
2.12. Ecology of orchids	18
2.13. Conservation	18
3. MATERIALS AND METOHD	
3.1. Collection of Mother Stock	20
3.2. Preparation of culture media	21
3.3. Embryo culture	
3.3.1. Surface sterilization of pods	22
3.3.2. (A) Morphological indicators of maturity	22
(B) Effect of pod age on germination	22
(C) Effect of media on germination	23
3.4. Experiments on <i>in- vitro</i> vegetative propagation	24
3.4.1. Surface sterilization of explants	24
3.4.2 Culture of single nodal segments of <i>Dendrobium</i>	24
3.4.3 Rhizome tip Culture of <i>Ipsea speciosa</i>	25
3.4.4 Plant proliferation studies of <i>Ipsea speciosa</i>	25
3.4.5. Leaf segment culture of <i>Rhynchosstylis retusa</i>	26
3.5. Acclimatization of plantlets	26
3.6. Data analysis	26
4. RESULTS	
4.1. Embryo culture	
4.1.1. <i>Ipsea speciosa</i>	27
4.1.1 (A) Morphological Indicators of maturity	28
4.1.1 (B) Effect of pod age on germination	28
4.1.1 (C) Effect of media on germination	30

4.1.2. <i>Rhynchostylis retusa</i>	32
4.1.2 (A) Morphological indicators of maturity	32
4.1.2 (B) Effect of pod age on germination	33
4.1.2.(C) Effect of media on germination	34
4.1.3. <i>Dendrobium maccarthiae</i>	35
4.1.3 (A) Morphological indicators for maturity	35
4.1.3 (B) Effect of media on germination	35
4.1.4. <i>Vanda spathulata</i>	37
4.1.4 (A) Morphological indicators of maturity	37
4.1.4 (B) Effect of media for germination	37
4.2 Experiments on <i>in-vitro</i> vegetative propagation	38
4.2.1 Culture of Nodal Segments of <i>Dendrobium maccarthiae</i>	38
4.2.2 Rhizome tip Culture of <i>Ipsea speciosa</i>	39
4.2.3 Leaf Segment Culture of <i>Rhynchostylis retusa</i>	40
4.3 Ecology of the selected Orchids	41
5. DISCUSSION	
5.1 Mass propagation	45
5.1.1 Embryo culture	45
5.1.2 Experiments on <i>in-vitro</i> vegetative propagation	46
5.2 Ecology-Habitat and Distribution	47
5.3 Conservation	48
6. CONCLUTIONS	50
7. REFERENCES	51

Annexes

LIST OF TABLES

	Page no.
Table 2.1: Classification of orchids	16
Table 3.1: Flowering calendar of selected orchids species	22
Table 3.2: Media tested for <i>in-vitro</i> germination.	23
Table 3.3: Explants used for in-vitro vegetative propagation	24
Table 4.1: Pod length and girth of <i>Ipsea</i>	28
Table 4.2: Pod age and time taken for germination	29
Table 4.3: Pod length and girth of <i>Rhynchosstylis retusa</i>	32
Table 4. 4: Pod age and time taken for germination	33
Table 4.5: Associated plats of selected Orchids	42

LIST OF FIGURES

Figure 1. Developmental stages of the pods of <i>Ipsea</i>	28
Figure 2. Germination percentages of <i>Ipsea speciosa</i>	30
Figure 3. Developmental stages of the pods of <i>Rhynchosstylis</i>	33
Figure 4. Germination percentages of <i>Rhynchosstylis retusa</i>	34
Figure 5. Germination percentages of <i>Dendrobium maccarthiae</i>	35
Figure 6. Germination percentages of <i>Vanda spathulata</i>	37

LIST OF MAPS

Map I. Ecological diversity of the selected Orchids	4
Map II. Geographical locations where mother plants were collected	21

LIST OF PLATES

	Page no.
Plate 1. Selected Orchids species for the study	3
Plate 2. Monopodial and sympodial growth habits of orchids	7
Plate 3. Developmental stages of pods of <i>Ipsea speciosa</i>	27
Plate 4. (a=seeds of mature pod –8-week-old; b= seeds of immature pod-6-week-old; c= immature seeds on culture media; d=blackening of immature seeds)	29
Plate 5. Germinating <i>Ipsea</i> seeds on different media	31
Plate 6. Developmental stages of the pods of <i>Rhynchostylis retusa</i>	32
Plate 7. Germinating seeds of <i>Rhynchostylis retusa</i>	34
Plate 8. Developing pods and seeds of <i>D. macarthiae</i>	35
Plate 9. Seedlings of <i>D. macarthiae</i> on different culture media	36
Plate 10. A pod and seeds of <i>V.spathulata</i>	37
Plate 11. Seedlings of <i>V.spathulata</i>	38
Plate 12. (a = a nodal segment, b = growing buds of <i>Dendrobium</i>)	38
Plate 13. Contaminating microbes (a = <i>Fusarium</i> , b = <i>Aspergillus</i>)	39
Plate 14. (a = A growing rhizome tip, b= Proliferated plantlets of <i>Ipsea</i>)	40
Plate 15. <i>Ipsea speciosa</i> –growing in mountain rock crevices with companion grasses.	41
Plate 16. <i>Rhynchostylis retusa</i> growing on a <i>Terminalia chebula</i> under reduced light condition.	41
Plate 17. <i>Vanda spatulata</i> in its natural habitat at Kalpitiya	43
Plate 18. <i>Dendrobium</i> species growing with its companion plants	43
(Magnification of all plates 1x 1)	