

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS.....	i
LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
INTRODUCTION.....	1
OBJECTIVES.....	3
LITERATURE REVIEW.....	4
Morphology and biology of freshwater mussels.....	4
Life cycle.....	7
Fertilization.....	8
Larval development.....	9
Factors affecting larval growth.....	11
Culture of glochidia in artificial media.....	13
MATERIALS AND METHODS.....	14
Glochidia culture in artificial media.....	14
Preparation of glochidia samples for light microscopic observations	16
RESULTS.....	17
Morphological development of glochidia to juvenile	17
Mature glochidia (day 0 glochidia)	17
Development of digestive tract	19
Development of adductor muscle.....	19
Development of gill.....	20
Development of foot.....	20
Development of mantle	21

TABLE OF CONTENTS (CONTINUED)

DISCUSSION	63
Shape and size of mature glochidia.....	63
Attachmant organs.....	64
Organogenesis.....	65
Mantle development.....	68
Adductor muscle development.....	69
Nervous ganglia and sensory hair cells.....	70
CONCLUSIONS.....	71
LITERATURE CITED	72
APPENDIX.....	81

LIST OF TABLES

Table		Page
1	Morphological development of the glochidium, <i>H. bialatus</i> cultured in artificial media.....	62
Appendix Table		
1	Comparison of glochidial dimensions of several unionids.....	84
2	Composition of artificial medium for <i>in vitro</i> culture of glochidia <i>Hyriopsis bialatus</i>	86
3	Antibiotics and antimycotic chemicals for culture <i>in vitro</i> culture of glochidia <i>Hyriopsis bialatus</i>	86

LIST OF FIGURES

Figure		Page
1	Mature glochidia at day 0.....	23
2	Cross-section of the mature glochidia at day 0 (H&E).....	23
3	Supporting band (Masson's trichrome)	23
4	Supporting band (PAS)	23
5	Cross-section of Mucopolysaccharide band (Masson's trichrome).....	25
6	Sensory hair cell.....	25
7	Sensory hair cell on larval adductor muscle.....	25
8	Larval thread and thread gland (PAS).....	27
9	Larval thread and thread gland (Masson's trichrome).....	27
10	Internal larval thread (PAS).....	29
11	Internal larval thread (Masson's trichrome).....	29
12	Internal larval thread and larval thread (Masson's trichrome).....	29
13	Saggital-section of the mature glochidia at day 0	29
14	Vetral plate (H&E).....	31
15	Oral plate and thread gland.....	31
16	Oral plate and ventral plate (Masson's trichrome).....	31
17	Oral plate and ventral plate (PAS).....	31
18	Cross-section of day 2 glochidia	33
19	Degenerating muscle cells.....	33
20	Saggital-section of day 2 glochidia 1.....	33
21	Degenerating muscle cells and inner larval mantle	33
22	Developing ventral plate 1.....	35
23	Developing ventral plate 2.....	35
24	Lateral pits 1.....	37
25	Lateral pits 2.....	37
26	Lateral pits 3.....	37
27	Gill buds.....	39
28	Saggital-section of day 2 glochidia 2.....	39
29	Foot lobe.....	41
30	Frontal section of day 4 glochidia.....	41

LIST OF FIGURES (CONTINUED)

Figure		Page
31	A pair of foot lobes (H&E).....	41
32	A pair of foot lobes (Masson's trichrome).....	41
33	Gill buds of day 4 glochidia 1.....	43
34	Gill buds of day 4 glochidia 2.....	43
35	Gill buds of day 4 glochidia 3.....	43
36	Saggital-section of day 4 glochidia 1.....	45
37	Saggital-section of day 4 glochidia 2.....	45
38	Saggital-section of day 6 glochidia	47
39	Larval mantle of day 6 glochidia.....	47
40	Cross-section of day 6 glochidia	47
41	Digestive tract with numerous cilia.....	49
42	Foot and gill bars of day 6 glochidia.....	49
43	Saggital-section of day 8 glochidia.....	51
44	Anterior juvenile adductor.....	51
45	Cross-section through the middle foot of day 8 glochidia 1	51
46	Single foot lobe	51
47	Cross-section through the middle foot of day 8 glochidia 2	53
48	Foot and gill bars of day 8 glochidia 1.....	53
49	Foot and gill bars of day 8 glochidia 2.....	53
50	Style sac.....	53
51	Digestive gland.....	55
52	Stomach.....	55
53	Foot and gill bars of day 10 glochidia.....	55
54	Cross-section of day 10 glochidia.....	55
55	Cross-section through the middle foot of day 10 glochidia 1.....	57
56	Cross-section through the middle foot of day 10 glochidia 2.....	57
57	Definitive mantle.....	59
58	Cross-section through the proximal foot of day 10 glochidia	59
59	Cross-section through the distal foot of day 10 glochidia 1.....	59
60	Cross-section through the distal foot of day 10 glochidia 2.....	59

LIST OF FIGURES (CONTINUED)

Figure		Page
61	Cross-section through the distal foot of day 10 glochidia 3.....	61
62	Complete gill bars.....	61
63	Posterior juvenile adductor of day 10 glochidia.....	61
Appendix Figure		
1	Outer shell appearance of <i>Hyriopsis (Hyriopsis) bialatus</i>	82
2	Inner shell appearance of <i>Hyriopsis (Hyriopsis) bialatus</i>	82
3	Anatomy of <i>Hyriopsis (Hyriopsis) bialatus</i>	82
4	The life cycle of Freshwater pearl mussels.....	83
5	The diagram illustrating an anatomic structure of mussels.....	83