

**THE EFFECTS OF THE VENOM OF  
*AIPYSURUS LAEVIS* ON ITS PREY SPECIES**

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## DECLARATION

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*I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree.*

*I certify that to the best of my knowledge any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.*



*J*

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# Contents

Acknowledgements	iii
Abstract	xvii
<b>1 Introduction</b>	<b>1</b>
1.1 Snake Venom . . . . .	1
1.1.1 General Information . . . . .	1
1.1.2 Hydrophiid venom . . . . .	6
1.1.3 Neurotoxic components . . . . .	6
1.1.4 Myotoxic components . . . . .	8
1.2 Skeletal Muscle . . . . .	12
1.2.1 General information . . . . .	12
1.2.2 Muscle organization . . . . .	13
1.2.3 Muscle ultrastructure . . . . .	14
1.2.4 Muscle contraction . . . . .	15
1.3 Fish Ventilation Mechanism . . . . .	16
<b>2 General Materials and Methods</b>	<b>20</b>
2.1 Venom Collecting and Processing . . . . .	20
2.2 Venom Injection Procedures . . . . .	21
2.3 Prey Species and Collecting Procedures . . . . .	21
2.4 Stock Tank Holding Facilities . . . . .	23
2.5 Experimental Tank Holding Facilities . . . . .	23
2.6 Whitespot Prevention . . . . .	24

2.7	Electron Microscopy . . . . .	25
<b>3</b>	<b>Initial Studies With Goldfish</b>	<b>37</b>
3.1	Introduction . . . . .	37
3.2	Materials and Methods . . . . .	38
3.3	Results . . . . .	38
3.4	Discussion . . . . .	40
<b>4</b>	<b>Comparative Studies With Marine Prey Species</b>	<b>46</b>
4.1	Introduction . . . . .	46
4.2	Materials and Methods . . . . .	47
4.3	Results . . . . .	48
4.4	Discussion . . . . .	50
<b>5</b>	<b>Ventilation Studies</b>	<b>60</b>
5.1	Introduction . . . . .	60
5.2	Materials and Methods . . . . .	60
5.3	Results . . . . .	62
5.3.1	Mean ventilation rates: total number of fish . . . . .	62
5.3.2	Mean ventilation rates: surviving fish only . . . . .	63
5.3.3	Statistical analysis . . . . .	64
5.3.4	<i>Dascyllus aruanus</i> . . . . .	65
5.3.5	<i>Istiblennius meleagris</i> . . . . .	66
5.3.6	<i>Chromis nitida</i> . . . . .	67
5.4	Discussion . . . . .	69
<b>6</b>	<b>Behavioural Studies</b>	<b>81</b>
6.1	Introduction . . . . .	81
6.2	Materials and Methods . . . . .	81
6.3	Results . . . . .	83
6.3.1	Ethogram . . . . .	83
6.3.1.1	Stage one . . . . .	83
6.3.1.2	Stage two . . . . .	83

6.3.1.3	Stage three . . . . .	84
6.3.1.4	Stage four . . . . .	84
6.3.1.5	Stage five . . . . .	84
6.3.1.6	Stage six . . . . .	85
6.3.2	Behavioural stage profiles . . . . .	85
6.3.3	Percent of fish found in each stage . . . . .	86
6.3.4	Analysis of time to reach each stage and stage duration . . . . .	87
6.3.4.1	Time to reach each stage . . . . .	87
6.3.4.2	Stage duration . . . . .	89
6.3.5	Ventilation rates at different stages . . . . .	89
6.4	Discussion . . . . .	91
<b>7</b>	<b>Ultrastructural Study</b>	<b>104</b>
7.1	Introduction . . . . .	104
7.2	Materials and Methods . . . . .	105
7.3	Results . . . . .	106
7.4	Discussion . . . . .	109
<b>8</b>	<b>Venom Fractions</b>	<b>118</b>
8.1	Introduction . . . . .	118
8.2	Materials and Methods . . . . .	118
8.3	Results . . . . .	120
8.3.1	Chromatography . . . . .	120
8.3.2	Ventilatory study with fractions . . . . .	121
8.3.3	Behavioural study with fractions . . . . .	123
8.3.3.1	Fraction 1 (Behavioural Study) . . . . .	124
8.3.3.2	Fraction 2 (Behavioural Study) . . . . .	124
8.3.3.3	Fraction 3 (Behavioural Study) . . . . .	125
8.3.3.4	Fraction 4 (Behavioural Study) . . . . .	125
8.3.3.5	Fraction 5 (Behavioural Study) . . . . .	126
8.3.3.6	Fraction 6 (Behavioural Study) . . . . .	127
8.3.3.7	Fraction 7 (Behavioural Study) . . . . .	128

8.3.3.8	Fraction recombination (Behavioural Study) . . . . .	129
8.3.4	Ultrastructural study with fractions . . . . .	130
8.3.4.1	Fraction 1 (Ultrastructural Study) . . . . .	130
8.3.4.2	Fraction 2 (Ultrastructural Study) . . . . .	131
8.3.4.3	Fraction 3 (Ultrastructural Study) . . . . .	131
8.3.4.4	Fraction 4 (Ultrastructural Study) . . . . .	131
8.3.4.5	Fraction 5 (Ultrastructural Study) . . . . .	132
8.3.4.6	Fraction 6 (Ultrastructural Study) . . . . .	132
8.3.4.7	Fraction 7 (Ultrastructural Study) . . . . .	133
8.4	Discussion . . . . .	133
<b>9</b>	<b>Conclusion</b>	<b>152</b>
9.1	Myotoxic components . . . . .	152
9.1.1	Open and extended mouths . . . . .	153
9.1.2	Incomplete mouth closure . . . . .	153
9.1.3	Bottom rubbing . . . . .	153
9.1.4	Ultrastructural change . . . . .	154
9.2	Fish resistance to venom . . . . .	154
9.3	Evolutionary model of predator-prey interaction . . . . .	155
9.4	Final remarks . . . . .	156
	<b>References</b>	<b>157</b>
	<b>Appendices</b>	<b>174</b>
A	LD values for marine fish species . . . . .	174
B	Profiles of variability (whole venom) . . . . .	176
C	Probability values (whole venom) . . . . .	183
D	Profiles of probability (whole venom) . . . . .	187
E	Standard error of the means (whole venom) . . . . .	194
F	Behavioural descriptions . . . . .	198
G	Behavioural stage times . . . . .	202
H	Three-dimensional chromatograph from venom fractionation . . . . .	205

I	Probability values (venom fractions) . . . . .	206
J	Profiles of probability (venom fractions) . . . . .	211



# List of Tables

2.1	Venom dosages and injection volumes for <i>Aipysurus laevis</i> venom. . . . .	30
2.2	Information on marine prey species used during the study. . . . .	34
4.1	Probit analysis results . . . . .	55
4.2	Probit line comparisons . . . . .	57
4.3	LD50 values . . . . .	58
4.4	Mean time to death with different venom doses . . . . .	59
5.1	Means and standard deviations for total number of fish, ventilation data. . . . .	74
5.2	Means, standard deviations and n values for total number of living fish, ventilation data. . . . .	78
5.3	Probability comparisons from LSD computations . . . . .	80
6.1	Ethogram of behavioural changes resulting form envenomation . . . . .	97
6.2	Mean values, standard deviations and n values for analysis of time to each stage. . . . .	101
6.3	Means, standard deviations and n values for analysis of time in each stage. . . . .	102
8.1	Dose levels for venom fractions . . . . .	140
8.2	Means and standard deviations for the venom fraction study. . . . .	142
8.3	Probability comparisons from LSD computations for the venom fraction study. . . . .	143
8.4	Behavioural signs for the venom fraction study. . . . .	144

# List of Figures

1.1	Schematic representation of normal vertebrate skeletal muscle . . . .	19
2.1	Map of collecting and experimental sites . . . . .	27
2.2	<i>Aipysurus laevis</i> . . . . .	28
2.3	Collecting <i>Aipysurus laevis</i> . . . . .	28
2.4	The fang of <i>Aipysurus laevis</i> . . . . .	29
2.5	Milking <i>Aipysurus laevis</i> . . . . .	29
2.6	<i>Chromis nitida</i> . . . . .	31
2.7	<i>Chromis atripectoralis</i> . . . . .	31
2.8	<i>Dascyllus aruanus</i> . . . . .	32
2.9	<i>Istiblennius meleagris</i> . . . . .	32
2.10	<i>Istiblennius edentulus</i> . . . . .	33
2.11	Intramuscular injection site . . . . .	33
2.12	Stock holding tanks . . . . .	35
2.13	Experimental holding tanks . . . . .	35
2.14	Head region of <i>Dascyllus aruanus</i> . . . . .	36
3.1	<i>Carassius auratus</i> ventilation rates. . . . .	44
3.2	Goldfish <i>Carassius auratus</i> control micrograph. . . . .	45
3.3	Goldfish <i>Carassius auratus</i> saline-injected micrograph. . . . .	45
3.4	Goldfish <i>Carassius auratus</i> envenomated micrograph. . . . .	45
4.1	All species' probit curve . . . . .	53
4.2	Fiducial limits . . . . .	54
4.3	Comparisons of mean time to death with different venom doses . . . .	56

5.1	<i>Chromis nitida</i> mean ventilation, 2800 minutes, n = total fish number	71
5.2	<i>Chromis nitida</i> mean ventilation, 400 minutes, n = total fish number	71
5.3	<i>Dascyllus aruanus</i> mean ventilation, 2880 minutes, n = total fish number	72
5.4	<i>Dascyllus aruanus</i> mean ventilation, 450 minutes, n = total fish number	72
5.5	<i>Istiblennius meleagris</i> mean ventilation, 2880 minutes, n = total fish number . . . . .	73
5.6	<i>Istiblennius meleagris</i> mean ventilation, 450 minutes, n = total fish number . . . . .	73
5.7	<i>Chromis nitida</i> mean ventilation, 2880 minutes, n = total number of living fish . . . . .	75
5.8	<i>Chromis nitida</i> mean ventilation, 400 minutes, n = total number of living fish . . . . .	75
5.9	<i>Dascyllus aruanus</i> mean ventilation, 2880 minutes, n = total number of living fish . . . . .	76
5.10	<i>Dascyllus aruanus</i> mean ventilation, 450 minutes, n = total number of living fish . . . . .	76
5.11	<i>Istiblennius meleagris</i> mean ventilation, 2880 minutes, n = total number of living fish . . . . .	77
5.12	<i>Istiblennius meleagris</i> mean ventilation, 450 minutes, n = total number of living fish . . . . .	77
5.13	Ventilation divisions . . . . .	79
6.1	Behavioural profiles of <i>Chromis nitida</i> for 3 venom doses. . . . .	98
6.2	Behavioural profiles of <i>Dascyllus aruanus</i> for 3 venom doses. . . . .	98
6.3	Behavioural profiles of <i>Istiblennius meleagris</i> for 3 venom doses. . . . .	98
6.4	Percent of behavioural stage entry for <i>Chromis nitida</i> . . . . .	99
6.5	Percent of behavioural stage entry for <i>Dascyllus aruanus</i> . . . . .	99
6.6	Percent of behavioural stage entry for <i>Istiblennius meleagris</i> . . . . .	99
6.7	Behavioural line profiles through to stage two. . . . .	100
6.8	Behavioural line profiles through to stage three. . . . .	100
6.9	Behavioural line profiles through to stage six. . . . .	100

6.10	Ventilation rate and behavioural profile comparison for <i>Dascyllus aruanus</i> low dose envenomation. . . . .	103
6.11	Ventilation rate and behavioural profile comparison for <i>Dascyllus aruanus</i> medium dose envenomation. . . . .	103
6.12	Ventilation rate and behavioural profile comparison for <i>Dascyllus aruanus</i> high dose envenomation. . . . .	103
7.1	Osmolarity study with 32 parts / thousand sea water buffer. . . . .	112
7.2	Osmolarity study with 24 parts / thousand sea water buffer. . . . .	112
7.3	Osmolarity study with 10 parts / thousand sea water buffer. . . . .	112
7.4	Electron micrograph of control sternohyoideus muscle (low mag.). . .	113
7.5	Electron micrograph of control sternohyoideus muscle (high mag.). . .	113
7.6	Electron micrograph of saline-injected control sternohyoideus muscle (low mag.). . . . .	113
7.7	Electron micrograph of saline-injected control sternohyoideus muscle (high mag.). . . . .	113
7.8	Electron micrograph of envenomated sternohyoideus muscle (low mag.).	113
7.9	Electron micrograph of envenomated sternohyoideus muscle (high mag.).	113
7.10	Electron micrograph of envenomated sternohyoideus muscle, 72 hour sample (low mag.). . . . .	114
7.11	Electron micrograph of envenomated sternohyoideus muscle, 72 hour sample (high mag.). . . . .	114
7.12	Electron micrograph of envenomated sternohyoideus muscle, 96 hour sample (low mag.). . . . .	114
7.13	Electron micrograph of envenomated sternohyoideus muscle, 96 hour sample (high mag.). . . . .	114
7.14	Electron micrograph of envenomated sternohyoideus muscle, 120 hour sample (low mag.). . . . .	114
7.15	Electron micrograph of envenomated sternohyoideus muscle, 120 hour sample (high mag.). . . . .	114

7.16	Electron micrograph of envenomated sternohyoideus muscle showing vacuolation and degeneration of muscle. . . . .	115
7.17	Electron micrograph of envenomated sternohyoideus muscle showing interfibrillar space increase. . . . .	115
7.18	Electron micrograph of envenomated sternohyoideus muscle showing affected mitochondria. . . . .	115
7.19	Electron micrograph of envenomated sternohyoideus muscle showing Z line streaming. . . . .	115
7.20	Electron micrograph of control sternohyoideus muscle, transverse section, showing normal muscle morphology. . . . .	115
7.21	Electron micrograph of envenomated sternohyoideus muscle, transverse section, showing swelling of the sarcoplasmic reticulum and mitochondria.	115
7.22	Image enhanced electron micrograph of control sternohyoideus muscle showing normal muscle morphology, used for image analysis (transverse section). . . . .	116
7.23	Binary image from image enhanced electron micrograph of control sternohyoideus muscle used for image analysis (transverse section). . . . .	116
7.24	Image enhanced electron micrograph of envenomated sternohyoideus muscle showing sarcoplasmic reticulum swelling, used for image analysis (transverse section). . . . .	117
7.25	Binary image from image enhanced electron micrograph of envenomated sternohyoideus muscle used for image analysis (transverse section). . . . .	117
8.1	Chromatograph for seven venom fractions of <i>Aipysurus laevis</i> venom.	139
8.2	Mean ventilation rates for venom fractions, recombination of fractions and control groups (2880 minutes). . . . .	141
8.3	Mean ventilation rates for venom fractions, recombinations of fractions and control groups (150 minutes). . . . .	141
8.4	Venom fraction 1 electron micrograph showing a low magnification of muscle. . . . .	145

8.5	Venom fraction 1 electron micrograph showing a medium magnification of muscle. . . . .	145
8.6	Venom fraction 1 electron micrograph showing a high magnification of muscle. . . . .	145
8.7	Venom fraction 1 electron micrograph showing a low magnification of muscle nucleus. . . . .	145
8.8	Venom fraction 1 electron micrograph showing a high magnification of muscle nucleus. . . . .	145
8.9	Venom fraction 1 electron micrograph showing muscle mitochondria. . . . .	145
8.10	Venom fraction 2 electron micrograph showing a low magnification of muscle. . . . .	146
8.11	Venom fraction 2 electron micrograph showing a medium magnification of muscle. . . . .	146
8.12	Venom fraction 2 electron micrograph showing a high magnification of muscle. . . . .	146
8.13	Venom fraction 2 electron micrograph showing a low magnification of muscle nucleus. . . . .	146
8.14	Venom fraction 2 electron micrograph showing a high magnification of muscle nucleus. . . . .	146
8.15	Venom fraction 2 electron micrograph showing muscle mitochondria. . . . .	146
8.16	Venom fraction 3 electron micrograph showing a low magnification of muscle. . . . .	147
8.17	Venom fraction 3 electron micrograph showing a medium magnification of muscle. . . . .	147
8.18	Venom fraction 3 electron micrograph showing a high magnification of muscle . . . . .	147
8.19	Venom fraction 3 electron micrograph showing a low magnification of muscle nucleus. . . . .	147
8.20	Venom fraction 3 electron micrograph showing a high magnification of muscle nucleus. . . . .	147
8.21	Venom fraction 3 electron micrograph showing muscle mitochondria . . . . .	147

8.22	Venom fraction 4 electron micrograph showing a low magnification of muscle. . . . .	148
8.23	Venom fraction 4 electron micrograph showing a medium magnification of muscle. . . . .	148
8.24	Venom fraction 4 electron micrograph showing a high magnification of muscle. . . . .	148
8.25	Venom fraction 4 electron micrograph showing a low magnification of muscle nucleus. . . . .	148
8.26	Venom fraction 4 electron micrograph showing a high magnification of muscle nucleus. . . . .	148
8.27	Venom fraction 4 electron micrograph showing muscle mitochondria. .	148
8.28	Venom fraction 5 electron micrograph showing a low magnification of muscle. . . . .	149
8.29	Venom fraction 5 electron micrograph showing a medium magnification of muscle. . . . .	149
8.30	Venom fraction 5 electron micrograph showing a high magnification of muscle. . . . .	149
8.31	Venom fraction 5 electron micrograph showing a low magnification of muscle nucleus. . . . .	149
8.32	Venom fraction 5 electron micrograph showing a high magnification of muscle nucleus. . . . .	149
8.33	Venom fraction 5 electron micrograph showing muscle mitochondria. .	149
8.34	Venom fraction 6 electron micrograph showing a low magnification of muscle. . . . .	150
8.35	Venom fraction 6 electron micrograph showing a medium magnification of muscle. . . . .	150
8.36	Venom fraction 6 electron micrograph showing a high magnification of muscle. . . . .	150
8.37	Venom fraction 6 electron micrograph showing a low magnification of muscle nucleus. . . . .	150

8.38	Venom fraction 6 electron micrograph showing a high magnification of muscle nucleus. . . . .	150
8.39	Venom fraction 6 electron micrograph showing muscle mitochondria. .	151
8.40	Venom fraction 7 electron micrograph showing a low magnification of muscle. . . . .	151
8.41	Venom fraction 7 electron micrograph showing a medium magnification of muscle. . . . .	151
8.42	Venom fraction 7 electron micrograph showing a high magnification of muscle. . . . .	151
8.43	Venom fraction 7 electron micrograph showing a low magnification of muscle nucleus. . . . .	151
8.44	Venom fraction 7 electron micrograph showing a high magnification of muscle nucleus. . . . .	151
8.45	Venom fraction 7 electron micrograph showing muscle mitochondria. .	151



# Abstract

The aim of this investigation was to examine the effects of *Aipysurus laevis* venom on its prey species. This was accomplished through LD50 studies with whole venom, and ventilation, behavioural and ultrastructural studies with both whole venom and venom fractions.

LD50 studies demonstrated differences in resistance to *A. laevis* venom among the species *Chromis nitida*, *Chromis atripectoralis*, *Dascyllus aruanus*, *Istiblennius meleagris* and *Istiblennius edentulus*.

Further investigations with whole venom showed *A. laevis* venom to significantly affect the ventilatory process, with ventilation and other behavioural signs proving to be similar in all fish tested (*C. nitida*, *D. aruanus* and *I. meleagris*). An ethogram showing the hierarchy of behavioural changes, as the result of envenomation, was constructed.

Ultrastructural examinations using muscle from *D. aruanus* revealed the occurrence of muscle necrosis resulting from envenomation. This suggests the presence of myotoxic components that affect the muscle of lower vertebrates, i.e. marine fish.

Venom fractions had different effects from whole venom. These differences are thought to be due to (1) the overshadowing of some components by more potent toxins, (2) cumulative effects producing stronger responses and (3) inhibition of the effects of some components by other constituents of the whole venom.

Ultrastructural examinations showed evidence of muscle necrosis caused by many of the fractions, but fraction 4 proved to possess the most potent myotoxic component(s). Fraction 6 had the greatest effect on ventilation and appeared to be the most potent neurotoxic fraction.