

**CULTURE AND UPSCALING OF SOME MARINE  
HARPACTICOID IN LABORATORY CONDITION**

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LABORATORY CONDITION**

**By**

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JABATAN SAINS MARIN  
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: Culture and Upscaling of Some Marine Harpacticoid in Laboratory Condition oleh Sellinna Binti Mohd Zaki Tan, No.Matrik UK12045 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	ii
<b>LIST OF TABLES</b>	iii
<b>LIST OF FIGURES</b>	iv
<b>LIST OF ABBREVIATIONS</b>	vi
<b>LIST OF APPENDICES</b>	vii
<b>ABSTRACT</b>	viii
<b>ABSTRAK</b>	ix
<b>CHAPTER 1: INTRODUCTION</b>	1
1.1 Introduction	1
1.2 Importance of Study	4
1.3 Objectives of study	5
<b>CHAPTER 2: LITERATURE REVIEW</b>	6
2.1 Culture of harpacticoid copepods	6
2.2 Diet of harpacticoid copepods	8
2.3 Culture conditions of harpacticoid copepods	11
2.3.1 Temperature	11
2.3.2 Salinity	13
2.3.3 Light intensity	15

2.4	Reproduction and development	16
2.5	Upscaling of live food for aquaculture	17
<b>CHAPTER 3: METHODOLOGY</b>		22
3.1	Sampling site	22
3.2	Sample collection	23
3.3	Isolation	23
3.4	Laboratory culture	23
3.4.1	Culture medium preparation	24
3.4.2	Environmental condition	24
3.4.3	Laboratory processing and daily routine	25
3.5	Upscaling by monoculture technique	26
3.6	Upscaling by multiculture technique	27
3.7	Data analysis	28
3.7.1	Instantaneous growth rate	28
3.7.2	Doubling time	28
3.8	Statistical analysis	29
<b>CHAPTER 4: RESULTS</b>		30
4.1	Culture of marine harpacticoid species in laboratory condition	30
4.1.1	Culture condition	30
4.2	Upscaling by monoculture technique	32



4.2.1	Monoculture technique of <i>Robertgurneya</i> sp.	32
4.2.2	Monoculture technique of <i>Pararobertsonia</i> sp.	33
4.2.3	Monoculture technique of <i>Arenosetella kaiseri</i>	34
4.2.4	Comparison between species from monoculture technique	36
4.3	Upscaling by multiculture technique	37
4.4	Comparison between monoculture and multiculture technique	39
4.5	Population dynamic	40
4.5.1	Comparison of instantaneous growth rate ( $K$ ) between Monoculture and multiculture technique	40
4.5.2	Comparison of doubling time ( $Dt$ ) between monoculture and multiculture technique	41
<b>CHAPTER 5: DISCUSSION</b>		42
5.1	Culture and upscaling of marine harpacticoid in laboratory condition	42
5.2	Upscaling by monoculture technique	43
5.3	Upscaling by multiculture technique	46
5.4	Instantaneous growth rate ( $K$ ) and doubling time for monoculture and multiculture technique	48
<b>CHAPTER 6: CONCLUSION</b>		51
<b>REFERENCES</b>		53

**APPENDICES**

**61**

**CURICULUM VITAE**

**72**

## LIST OF TABLES

Table		Page
4.1	Salinity (ppt) for <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp. and <i>Arenosetella kaiseri</i> by monoculture technique and mixed species by multiculture technique	31

## LIST OF FIGURES

Figure		Page
3.1	Location of Merchang Estuary, Terengganu (5°02.260' N, 103° 17.821' E)	22
3.2	Method for monoculture technique	26
3.3	Method for multiculture technique	27
4.1	Population density of <i>Robertgurneya</i> sp. with respect to the life cycle stages (nauplii,copepodite,adult,gravid) by monoculture technique	33
4.2	Population density of <i>Pararobertsonia</i> sp. with respect to life cycle stages (nauplii,copepodite,adult,gravid) by monoculture technique	34
4.3	Population density of <i>Arenosetella kaiseri</i> for the first 15 days with respect to the life cycle stages (nauplii,copepodite, adult,gravid) by monoculture technique	35
4.4	Population density of <i>Arenosetella kaiseri</i> for day 16 until 45 by monoculture technique	36
4.5	Comparison on population density of <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp., and <i>Arenosetella kaiseri</i> by monoculture technique	37
4.6	Population density of <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp., and <i>Arenosetella kaiseri</i> by multiculture technique	38
4.7	Comparison between monoculture ( <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp., and <i>Arenosetella kaiseri</i> ) and multiculture (mixed species) technique per mililiter of culture medium and 45 days treatment	39
4.8	Instantaneous growth rate ( <i>K</i> ) for <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp. and <i>Arenosetella kaiseri</i> from monoculture technique and mixed species from multiculture technique	40

4.9	Doubling time (Dt) for <i>Robertgurneya</i> sp., <i>Pararobertsonia</i> sp., and <i>Arenosetella kaiseri</i> from monoculture and mixed species from multiculture technique	41
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## LIST OF ABBREVIATIONS

>	-	more than
<	-	less than
%	-	percent
μg	-	microgram
μm	-	micrometer
°C	-	degree Celsius
cm	-	centimeters
h	-	hour
L	-	Liter
ml	-	milliliters
mm	-	millimeters
ppt	-	part per thousand
sp	-	species



## LIST OF APPENDICES

<b>Appendix</b>		<b>Page</b>
1	Culture medium and material	61
2	Image of marine harpacticoid that have been culture and upscaled in laboratory condition	62
3	Population density of harpacticoid species with respect to life cycle stages for monoculture technique	65
4	Population density (ind/10ml) of mixed species by multiculture technique	70

## ABSTRACT

This study was conducted to culture and upscale three different species of marine harpacticoid copepods which were the *Robertgurneya* sp., *Pararobertsonia* sp. and *Arenosetella kaiseri* in a laboratory condition using two methods, monoculture (one species at time) and multiculture (mix of species in one culture vessel) technique. All three species of harpacticoid copepods were obtained from the wild at Merchang estuary and cultured in a laboratory condition with temperature  $25 \pm 1^\circ\text{C}$  and salinity ranging between 24-26 ppt for 45 days. Harpacticoid copepods cultures were fed baker's yeast (0.1mg/ml) daily. For monoculture technique, *Arenosetella kaiseri* showed the highest population density with  $8.00 \pm 1.00$  individual per ml of culture medium, while the lowest population density belongs to *Robertgurneya* sp. with only  $0.2 \pm 0.06$  individual found per ml of culture medium. For multiculture technique, the cultured and upscaled value was  $10.70 \pm 0.58$  individual found per ml of culture medium. Statistical analysis using one way ANOVA of all treatments showed that the upscaled value of population density resulted in significant difference between species ( $P < 0.05$ ). In order to compare the successful method in culturing and upscaling of marine harpacticoid, instantaneous growth rate ( $K$ ) and doubling time ( $Dt$ ) were calculated. In terms of instantaneous growth rate ( $K$ ), *Arenosetella kaiseri* showed the highest value with  $0.1 \pm 0.003$  and *Robertgurneya* sp. showed the lowest rate with 0.02. For doubling time ( $Dt$ ), the lowest day needed to doubling the population density belongs to *Arenosetella kaiseri* with 10 days compared to *Robertgurneya* sp. which needs 50 days. Thus, The suitable species and technique to culture and upscale marine harpacticoid species in laboratory condition belongs to *Arenosetella kaiseri* by monoculture technique.

# KULTUR DAN PENGGANDAAN BEBERAPA HARPAKTICOID MARIN DALAM KEADAAN MAKMAL

## ABSTRAK

Kajian ini dijalankan untuk mengkultur dan menggandakan tiga spesies kopepod harpaktikoid marin iaitu *Robertgurneya* sp., *Pararobertsonia* sp., and *Arenosetella kaiseri* dalam keadaan makmal menggunakan dua kaedah, teknik monokultur (satu species dalam satu masa) dan teknik multikultur (species yang berlainan dikultur bersama di dalam satu bekas pengkulturan). Kesemua tiga spesies copepod harpaktikoid diperolehi dari habitat asal di Merchang dan dikultur di dalam makmal dengan suhu  $25 \pm 1^\circ\text{C}$  dan julat salinity antara 24-26 ppt selama 45 hari. Kultur copepod harpakticoid diberi makan yis (0.1mg/ml) setiap hari. Untuk pengkulturan secara monokultur, *Arenosetella kaiseri* menunjukkan kepadatan populasi yang paling tinggi dengan  $8.00 \pm 1.00$  individu per ml medium pengkulturan, manakala kepadatan paling rendah dipunyai oleh *Robertgurneya* sp. dengan hanya  $0.20 \pm 0.06$  individu dijumpai per ml medium pengkulturan. Bagi pengkulturan secara multikultur, nilai pengkulturan dan penggandaan adalah sebanyak  $10.70 \pm 5.77$  individu ditemui per ml medium pengkulturan. Analisis statistik menggunakan ANOVA sehala kepada semua rawatan menunjukkan nilai penggandaan terhadap kepadatan populasi adalah mempunyai perbezaan yang ketara antara spesies ( $P < 0.05$ ). Untuk membandingkan kejayaan kaedah untuk mengkultur dan menggandakan harpaktikoid marin, Pertumbuhan kadar segera ( $K$ ) dan gandaan dua masa ( $Dt$ ) dikira. Dalam istilah pertumbuhan kadar segera, *Arenosetella kaiseri* menunjukkan nilai tertinggi dengan  $0.1 \pm 0.003$  dan *Robertgurneya* sp. menunjukkan kadar terendah dengan 0.02. Untuk gandaan dua masa ( $Dt$ ), hari terendah

diperlukan untuk mengganda duakan kepadatan populasi dipunyai oleh *Arenosetella kaiseri* dengan 10 hari berbanding *Robertgurneya* sp. yang memerlukan 50 hari. Spesies dan teknik yang paling sesuai untuk mengkultur dan menggandakan harpaktikoid marin dalam keadaan makmal ialah *Arenosetella kaiseri* yang dikultur menggunakan kaedah monokultur.