CULTURE AND UPSCALING OF SOME MARINE HARPACTICOID IN LABORATORY CONDITION

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CULTURE AND UPSCALING OF SOME MARINE HARPACTICOID IN LABORATORY CONDITION

By

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PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

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 memperolehi Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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

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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 ± 1°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 ± 1.00 individual per ml of culture medium, while the lowest population density belongs to *Robertgurneya* sp. with only 0.2 ± 0.06 individual found per ml of culture medium. For multiculture technique, the cultured and upscaled value was 10.70 ± 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±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 ± 1°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 ± 1.00 individu per ml medium pengkulturan, manakala kepadatan paling rendah dipunyai oleh *Robertgurneya* sp. dengan hanya 0.20 ± 0.06 individu dijumpai per ml medium pengkulturan. Bagi pengkulturan secara multikultur, nilai pengkulturan dan penggandaan adalah sebanyak 10.70 ± 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 ± 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.