# IMPROVING SURVIVAL RATE IN PACIFIC WHITE SHRIMP (*Litopenaeus vannamei*) REARED IN LOW SALINITY WATER BY SUPPLEMENTATION OF $Mg^{2+}$ AND $K^{+}$

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MALAYSIA

2013

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Improving survival rate in pacific white shrimp (Litopenaeus vannamei) reared in low salinity water by supplementation of Mg2+ and k+ / Mohamad Aslah Mohamad.



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**By**

**Mohamad Aslah bin Mohamad**


**Research Report submitted in partial fulfillment of**
**the requirements for the degree of**
**Bachelor of Science (Marine Biology)**


**Department of Marine Science**
**Faculty of Maritime Studies and Marine Science**
**UNIVERSITI MALAYSIA TERENGGANU**

**2013**

This project report should be cited as:

Mohamad, M.A. 2013. Improving Survival Rate in Pacific White Shrimp (*Litopenaeus vannamei*) Reared in Low Salinity Water by Supplementation of $Mg^{2+}$ and $K^{+}$. Undergraduate Thesis, Bachelor of Science (Marine Biology), Faculty of Maritime Study and Marine Science, Universiti Malaysia Terengganu, Terengganu, 47p.

**DEPARTMENT OF MARINE SCIENCE**
**FACULTY OF MARITIME STUDIES AND MARINE SCIENCE**
**UNIVERSITI MALAYSIA TERENGGANU**

## DECLARATION AND VERIFICATION REPORT

## FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Improving survival rate in Pacific White shrimp (Litopenaeus vannamei) reared in low salinity water by supplementation of $Mg^{2+}$ and $K^{+}$

by Mohamad Aslah bin Mohamad, Matric No. UK22452 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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## ACKNOWLEDGEMENT

*In the name of Allah, the Most Gracious.*

Thanks to Allah SWT, I had finished my thesis. He tested me very hard along the way to complete this thesis. I lost my father, my shrimps died due to physical factors before starting the experiment (I had repeated samples preparation with four batches of shrimps from four different locations of commercial hatcheries), two IC and one osmometer failed to be used due to technical problems (I'm not the one who make it damage, seriously) and many more.

At this moment, I would like to thanks to any person who help me to complete my proposal especially to my supervisor, **Dr. Safiah binti Jasmani** who really coached and guided me from starting till the end, my parents **Nooridah binti Che Mat** who give moral support and always pray for me, my late father **Mohamad bin Said** who gives me a motorbike to ease my experiment at the hatchery, my best friends who always support me, **Hidir bin Ariffin** and **Mohd Farhan bin Tahir**, **Puan Zuhrah** the INOS officer, **Mr. Yaakob** the hatchery officer, **Mr. Wan Mohd Redhuan** and **Ms. Jannatul Fareha** (research assistants) and many others. Millions of thanks for you guys.

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## ABSTRACT

This study was conducted at Universiti Malaysia Terengganu, Malaysia. Samples of Pacific White Shrimp, *Litopenaeus vannamei* were obtained from commercial hatcheries of Agrobest Shrimp Farm in Nenasi, Pahang. Samples were cultured for fourteen days in order to investigate the survival rate of *L. vannamei* in different treatment of low salinity water (0.5 ppt) supplemented with 5 ppm $K^+$, 40 ppm $K^+$, 20 ppm $Mg^{2+}$, 160 ppm $Mg^{2+}$ and mixed cations of 5 ppm $K^+$ with 15 ppm $Mg^{2+}$ and 40 ppm $K^+$ and 120 ppm $Mg^{2+}$. 160 ppm $Mg^{2+}$ showed the highest survival rate which is 80% and the lowest survival rate (23.3%) is the control tanks where the low salinity water of 0.5 ppt was not supplemented with any cations. Mixture of 5 ppm $K^+$ with 15 ppm $Mg^{2+}$ showed high survival rate and efficient for shrimp survival and growth.

Meningkatkan Kadar Survival Udang Putih, *L. vannamei* Yang Dibela Dalam Air Berkemasinan Rendah Dengan Penambahan $Mg^{2+}$ Dan $K^{+}$

## ABSTRAK

Kajian ini mengenai survival udang putih, *Litopenaeus vannamei* di dalam air berkemasinan yang sangat rendah iaitu pada kemasinan 0.5 ppt. kajian ini dilakukan di Universiti Malaysia Terengganu, Malaysia. Sampel udang putih diambil dari Pusat Kultur Udang Agrobest di Nenasi, Pahang. Sampel dibela selama 14 hari untuk menguji tahap survival udang di dalam air berkemasinan rendah tersebut. Sample udang tersebut dibahagikan kepada tujuh tangki kajian dan setiap tangki diisi dengan kadar konsentrasi $K^{+}$ dan $Mg^{2+}$ yang berlainan. Konsentrasi kation tersebut merangkumi 5 ppm $K^{+}$ , 40 ppm $K^{+}$, 20 ppm $Mg^{2+}$, 160 ppm $Mg^{2+}$ dan kation campuran 5 ppm $K^{+}$ bersama dengan 15 ppm $Mg^{2+}$ dan 40 ppm $K^{+}$ bersama dengan 120 ppm $Mg^{2+}$. Tangki yang berisi sample dalam air berkemasinan rendah yang ditambah dengan 160 ppm $Mg^{2+}$ menunjukkan kadar survival yang sangat tinggi (80%) manakala tangki kawalan yang tidak diisi dengan kation $K^{+}$ dan $Mg^{2+}$ menunjukkan kadar survival yang terendah iaitu 23.3%. Campuran kation 5 ppm $K^{+}$ dengan 15 ppm $Mg^{2+}$ menunjukkan kadar pertumbuhan yang tinggi dan efisien bagi meningkatkan kadar pertumbuhan dan survival udang putih.