

THE EFFECT OF SOME NUTRIENTS AND
WATER QUALITY PARAMETERS ON THE *IN VITRO*
MULTIPLICATION, LONGEVITY AND SURVIVAL OF
VIBRIO PARAHAEMOLYTICUS ISOLATED FROM
CAGE CULTURED FISH

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SERDANG, SELANGOR DARUL EHSAN

1994

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VIBRIO PARAHAEMOLYTICUS ISOLATED FROM
CAGE CULTURED FISH

BY

CHONG SEN MUN @ ESTHER

*A research project report submitted in
partial fulfilment of the requirement for the
degree of Bachelor of Fisheries Science.*

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1994

1100023801

0200003113

To my beloved mother

for all her love and sacrifice

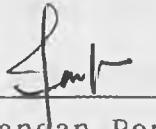
UNIVERSITI PERTANIAN MALAYSIA
FAKULTI PERIKANAN DAN SAINS SAMUDERA
PSF 499 - PROJEK DAN SEMINAR

BORANG PENGESAHAN DAN KELULUSAN LAPORAN
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Dengan ini disahkan bahawa saya telah menyemak laporan akhir projek ini dan

- (i) semua pembetulan yang disarankan oleh pemeriksa-pemeriksa telah dibuat, dan
- (ii) laporan ini telah mengikut format yang diberikan dalam Panduan PSF 499 - Projek dan Seminar, 1991, Fakulti Perikanan dan Sains Samudera, Universiti Pertanian Malaysia.


(Tandatangan Penyelia)

18 April 94
(Tarikh)

ACKNOWLEDGEMENTS

I am greatly indebted to my supervisors, Dr. Rohana Subasinghe and Prof. Madya Dr. Fatimah Md. Yusoff for their invaluable advice, guidance, support, comfort, patience, generosity and time. Without their useful suggestion, comments and constant encouragement, this project would not be possible. I would like to express my gratefulness to them for they have been truly supportive and extremely helpful in so many ways.

My appreciation also reaches out to Prof. Dr. Mohd. Shariff for generously permitting me to use the UPS service and Dr. Mohd. Salleh Kamarudin for his guidance in sigmaplot. I would also like to thank Dr. Alicia E. Toranzo for kindly providing literatures which have been a useful review of this thesis. My gratitude also goes to Ms Chan Soo Mun and Premala Arulampalam for their kind assistance, understanding and concern throughout the time in the micro lab. Thanks are also due to Pn. Nor Zaidah Mawi and En. Rosdi Abd. Ghani for their technical assistance.

My family have been so supportive and understanding during my study life here. I am thankful for their constant source of inspiration. Last but not least, my gratitude is extend to my course-mates and friends, especially Mr. Teo Kok Seng for his valuable assistance and companionship, Wesly Voon for the use of his computer and Ooi Soo Tuck for the computer services during the period of my project.

ABSTRACT

Laboratory microcosms were employed to evaluate the effect of some selected water quality parameters and inorganic nutrients on the population of *Vibrio parahaemolyticus*.

Of the five salinities examined (0, 5, 10, 20 and 30 ppt), *V. parahaemolyticus* showed maximum growth at salinity of 30 ppt. However, a decline in plate counts was associated with decreasing salinity. In contrast, over the range of temperature tested, an apparent inverse relationship between the temperature and the multiplication of *V. parahaemolyticus* was observed. Temperature of 20°C induced the multiplication, whereas 35°C proved to be lethal to this strain. With alkalinity lower than 50 mg/l CaCO₃ and at 150 mg/l CaCO₃ or above, the population of *V. parahaemolyticus* declined. *V. parahaemolyticus* stored on TSA slant supplemented with 3% NaCl at 5°C showed the best potential of retrieval.

Natural seawater enriched with PO₄³⁻ showed a similar *V. parahaemolyticus* growth patterns at all the concentrations tested. Nitrate however, caused a marked increase in culturable cells of *V. parahaemolyticus* with a concentration of 70 µg NO₃⁻/l but showed a decrease growth with higher NO₃⁻ levels. Based on the result of this study, it is concluded that the population of *V. parahaemolyticus* in estuarine microbial community has a close relationship with the environmental factors.

ABSTRAK

Mikrokosma telah digunakan untuk mengenalpastikan kesan beberapa parameter kualiti air dan nutrien bukan organik tertentu ke atas populasi *V. parahaemolyticus*.

Daripada lima saliniti iaitu 0, 5, 10, 20, dan 30 ppt yang dikaji, *V. parahaemolyticus* menunjukkan pertumbuhan yang maksimum pada 30 ppt. Bagaimanapun, bilangan populasi dalam plat berkurangan apabila saliniti menurun. Sebaliknya, kesan suhu menunjukkan satu perhubungan yang songsang dengan multiplikasi *V. parahaemolyticus*. Suhu air pada 20°C menggalakkan multiplikasi, manakala suhu 35°C dibuktikan menyebabkan maut kepada *V. parahaemolyticus*. Pada tahap alkaliniti kurang daripada 50 mg/l CaCO₃ ataupun tinggi daripada 150 mg/l CaCO₃, jumlah populasi maksimum *V. parahaemolyticus* menurun. *V. parahaemolyticus* yang disimpan pada agar condong tryptone soya agar (TSA) yang ditambahkan dengan 3% NaCl dan dieramkan pada suhu 5°C menunjukkan potensi yang paling baik untuk dikultur semula.

Air laut semulajadi yang diperkayakan dengan fosfat (PO₄³⁻) menunjukkan corak pertumbuhan *V. parahaemolyticus* yang sama untuk semua kepekatan yang dikaji. Manakala pertambahan nitrat (NO₃⁻) sebanyak 70 µg NO₃⁻/l ke dalam mikrokosma menunjukkan kesan ke atas peningkatan pertumbuhan *V. parahaemolyticus* yang jelas

tetapi respon sebaliknya diperhatikan dengan kepekatan NO_3^- yang lebih tinggi. Berdasarkan kepada keputusan kajian ini, populasi *V. parahaemolyticus* dalam komuniti mikrob di muara mempunyai perhubungan yang tinggi dengan faktor persekitaran.