

EFFECTS OF DETERGENTS ON *Macrobrachium*
rosenbergii (de Man) EGG HATCHABILITY

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1999

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EFFECTS OF DETERGENTS ON *Macrobrachium rosenbergii* (de Man) EGG
HATCHABILITY

BY
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This project is submitted in partial fulfillment of the requirements for the degree of
Bachelor of Fisheries Science

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ACKNOWLEDGEMENTS

I would like to extend my gratitude and appreciation to my supervisors, Prof. Dr. Law Ah Theem and Dr. Abol Munafi Ambok Bolong for their valuable comments, guidance, patience and time throughout a year. Truly without their help and supervision this project would not have been possible.

I would also like to thank to Poh Nyo, Pak Hussien and Cikgu Ka for providing the natural berried female prawns for this project. I am also grateful to Puan Kartini Mohammed for her help in taking the photographs.

My deepest gratitude goes out to my family for providing me the support I needed for my studies. Also a very special thank you to my beloved Miss Lee Chow Chin for her love, care, moral support, advice and help especially during my time of sadness and depression.

Finally, I would like to thank to my housemates, coursemates, seniors and juniors for their helping hand in this final year project.

ABSTRACT

Three commercial detergents namely Glo, Attack and Dynamo have been used to study the effects of detergents on the *Macrobrachium rosenbergii* egg hatchability at pH 7 by using the flow through bioassay method. The EC₅₀ of Glo, Attack and Dynamo on *M. rosenbergii* egg hatchability were 47.42 mg/L, 16.94 mg/L and 109.14 mg/L respectively. The most toxic detergent was Attack which was two times more toxic than Glo and six times more toxic than Dynamo. Anionic surfactants, which was the primary toxic component in detergent, had been measured using the Methylene blue active substances method (MBAS method). The percentage of anionic surfactant in Glo and Attack were 26.94 % and 42.03% respectively. However, the surfactants in Dynamo was not an anionic surfactant and therefore could not be analyzed using this method. The EC₅₀ of anionic surfactants in Glo and Attack on the *M. rosenbergii* egg hatchability were 12.76 mg/L and 6.95 mg/L respectively. The recommended safety level of anionic surfactant in Glo and Attack for *M. rosenbergii* eggs for natural environment and hatchery management were below 1.28 mg/L and 0.695 mg/L respectively. Abnormalities of newly hatched larvae were observed in eggs treated with detergent solution. The most common deformities was the ventral flexure along the axis of the body. The average time of hatching were not significantly different between control and low concentrations of detergent test solutions but a delay of hatching time was significantly different at high concentrations of detergent test solutions.

ABSTRAK

Tiga jenama pencuci sintetik iaitu Glo, Attack dan Dynamo telah digunakan untuk mengaji kesan pencuci ke atas kadar penetasan telur Udang Galah, *Macrobrachium rosenbergii* pada pH 7 dengan menggunakan kaedah bioesei aliran berterusan. Nilai EC_{50} untuk Glo, Attack dan Dynamo ke atas kadar penetasan telur *M. rosenbergii* adalah 47.42 mg/L, 16.94 mg/L dan 109.14 mg/L. Antara ketiga-tiga pencuci ini, Attack merupakan pencuci yang paling toksik ke atas telur *M. rosenbergii*. Nilai ketoksikan adalah lebih daripada dua kali ganda untuk Glo dan lebih daripada enam kali ganda lebih toksik untuk Dynamo. Anionic surfactant yang merupakan bahan yang paling toksik dalam pencuci sintetik telah diukur dengan menggunakan kaedah Methylene blue active substances (MBAS). Kandungan anionic surfactant dalam Glo dan Attack adalah sebanyak 26.94% dan 42.03%. Oleh kerana surfactant dalam Dynamo bukan anionic surfactant, maka kandungannya tidak dapat diukur dengan kaedah MBAS. Nilai EC_{50} untuk anionic surfactant yang terkandung dalam Glo dan Attack adalah 12.76 mg/L dan 6.95 mg/L. Paras keselamatan yang disyorkan untuk anionic surfactant yang terkandung dalam Glo dan Attack ke atas telur *M. rosenbergii* pada keadaan alam semulajadi dan juga pengurusan hatceri adalah 1.28 mg/L dan 0.695 mg/L. Larva udang yang menetas dalam larutan pencuci sintetik sebahagiannya adalah cacat. Kecacatan yang paling utama adalah bengkok secara bawah pada badan larva. Purata masa penetasan adalah tidak berbeza antara telur kawalan dan telur yang terdedah pada kepekatan pencuci yang rendah. Kelewatan masa penetasan adalah berbeza secara bererti antara telur kawalan dan telur yang terdedah pada kepekatan pencuci yang tinggi.