# RELATIONSHIP BETWEEN CLUTCH SIZE AND HATCHING SUCCESS OF THE GREEN TURTLE, *Chelonia mydas* IN REDANG ISLAND



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# RELATIONSHIP BETWEEN CLUTCH SIZE AND HATCHING SUCCESS OF THE GREEN TURTLE, *Chelonia mydas* IN REDANG ISLAND

**By**

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## ABSTRACT

The hatching success and clutch size for relocated and natural nests of the green turtle, *Chelonia mydas*, were examined in Redang Island. Relocated nests with specific clutch size were used to examine the hatching success of green turtle eggs with respect to different clutch sizes. Eggs were split into five different clutch sizes that is, 5, 25, 50, 75, and 100 eggs per clutch. Every nest throughout the nesting season (April to September 2002) was marked and left to incubate till emergence. The nests were then excavated and analyzed. There was no significant correlation between clutch size and hatching success for the relocated nests based on correlation analysis. Therefore hatching success is not influenced by clutch size. In the comparison with randomly selected natural nests, the relocated nests had higher mean hatching success than the natural nests. ANOVA Two Factor, with replicate analysis showed that no significant difference was found between the relocated and natural nests, the different clutch sizes and no interaction between the clutch size and the natural or relocated nests. A total of 423 *in situ* nests were analyzed. The average hatching success for the whole season was 78.7 % whereas the average clutch size was 94.26 ± 8.98 eggs. About 77.62 % of all deposited eggs produced healthy hatchlings. The number of nests increased as the season progressed and peaked during 13$^{th}$ week (June 24$^{th}$ – 30$^{th}$) at 31 nests but started to decrease rapidly after the 21$^{st}$ week (August 19$^{th}$ – 25$^{th}$) till the end of the season. The mean hatch rate per week remains almost constant between 70 to 100 % throughout the season but was low during the 20$^{th}$, 21$^{st}$, 22$^{nd}$ (August 12$^{th}$ – September 1$^{st}$) and 25$^{th}$ weeks (September 16$^{th}$ – 22$^{nd}$). The mean clutch size per nest also remains almost constant throughout the season but with a

slight decline after the 21st (August 19th – 25th) week. The major cause of hatch failure from the 20 experimental *in situ* nests was predation by crabs and red ants.

# ABSTRAK

Kadar penetasan dan saiz kelompok telur untuk sarang yang dipindahkan dan sarang semulajadi penyu agar *Chelonia mydas* telah dikaji di Pulau Redang. Sarang yang dipindahkan dan mempunyai saiz kelompok telur yang tertentu telah digunakan sebagai kaedah untuk mengkaji kadar penetasan telur penyu agar berhubung dengan saiz kelompok telur yang berbeza. Telur telah dipisahkan kepada lima kelompok dengan saiz kelompok yang berbeza iaitu 5, 25, 50, 75 dan 100 biji telur dalam setiap kelompok. Setiap sarang sepanjang musim persarangan (April hingga September, 2002) telah ditandakan dan dibiarkan untuk pengeraman hingga anak penyu keluar dari sarang. Sarang-sarang tersebut kemudian digali dan dianalisis. Hasil analisis korelasi menunjukkan tidak ada korelasi di antara saiz kelompok dengan kadar penetasan. Oleh itu, kadar penetasan tidak dipengaruhi oleh saiz kelompok. Dalam perbandingan antara sarang yang dipilih secara rawak, min penetasan sarang yang dipindahkan adalah lebih tinggi berbanding dengan sarang semulajadi. Analisis ANOVA dua hala dengan replikasi menunjukkan tidak ada perbezaan signifikasi antara kadar penetasan pada sarang yang dipilih secara rawak dengan sarang semulajadi, saiz kelompok telur yang berbeza dan tidak ada interaksi di antara sarang yang telah dipindahkan sand sarang semulajadi dengan saiz kelompok. Sejumlah 423 sarang telah dikaji. Min kadar penetasan untuk keseluruhan musim adalah 78.7 % manakala min saiz kelompok adalah 94.26 ± 8.98 telur. Lebih kurang 77.62 % daripada semua telur telah menghasilkan anak penyu yang sihat. Bilangan sarang meningkat dengan musim dan adalah paling tinggi pada minggu ke-13 (24hb – 30hb Jun)dengan 31 sarang tetapi mula menurun selepas minggu ke-21(19hb – 25hb Ogos) hingga ke penghujung musim. Min kadar penetasan setiap minggu adalah hampir

tetap di antara 70 hingga 100 % untuk keseluruhan musim tetapi adalah rendah semasa minggu ke-20, ke-21, ke-22 (12hb Ogos –1hb September)dan ke-25 (16hb – 22hb September). Min saiz kelompok telur untuk setiap sarang juga adalah hampir tetap untuk keseluruhan musim tetapi mula menurun selepas minggu ke-21 (19hb – 25hb Ogos). Kegagalan telur menetas untuk 20 sarang eksperimen adalah disebabakan oleh pemangsa ketam dan semut.