



**ECOLOGICAL AND BIOLOGICAL STUDIES ON THE COCKLE  
*Cerastoderma glaucum* (BIVALVIA, CARDIIDAE)  
FROM DIFFERENT HABITATS IN EGYPTIAN WATERS**

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## Summary

The present study aimed to investigate some ecological and biological aspects of the edible cockle *Cerastoderma glaucum* (family: Cardiidae) in two areas; Lake Qarun and Lake Timsah. Cockle samples were collected monthly from Lake Qarun during February 2008- May 2009 and collected seasonally from Lake Timsah [Spring, Summer, Autumn 2008 and Winter 2009]. The following aspects were mainly employed:-

- (1) Population structure and growth.
- (2) Length-weight relationships and changes in body weights.
- (3) Reproduction.

### The results are summarized as follow:

- (1) Length frequency distributions for Lake Qarun populations indicated that newly settled juveniles ( $\leq 4$  mm shell length) were recorded in February and May 2008, March and May 2009. For these months, the percentages of these juveniles were 16.7, 11.5, 3.5 and 8.9% of the total population, respectively. Length frequency histograms were polymodal in Lake Timsah population indicating a continuous admission of new cohorts.
- (2) Largest cockles ever found were 27.9 and 32 mm shell length for Lake Qarun and Lake Timsah, respectively.
- (3) Monthly growth rate of the different cohorts of *C. glaucum* at Lake Qarun ranged from 1.3 to 2.5 mm / month ( $\bar{X} = 1.6$  mm/ month). Very little or no growth was observed during summer.
- (4) Linear regressions fitted between shell length and other shell dimensions (shell height and shell breadth) were highly correlated ( $p < 0.0001$ ). For both Lakes, the growth rate in height and breadth is higher than that of length.
- (5) Total wet weight, digestive gland weight and gonad weight increased isometrically with shell length throughout the study period.

Spawning may explain negative allometric pattern for wet flesh weight–shell length relationships during February–March ۲۰۰۸, December ۲۰۰۸ and April–May ۲۰۰۹ for Lake Qarun population.

- (۶) *C. glaucum* is dioecious. It is possible to sex individuals from the colour of their gonads that is orange in males and light brown in females.
- (۷) Reproduction occurred throughout the year in a poorly defined pattern with some annual variation in the timing and intensity of spawning (i.e. the lack of reproductive periodicity). The individuals of *C. glaucum* spawned in four episodes (multiple spawnings) through the year. Mass spawning of lake Qarun population occurred during April–May, July, November ۲۰۰۸ and February–March ۲۰۰۹. spawning activities were not closely synchronized and some individuals may be in spawning condition at nearly all times of the year.
- (۸) The end of the spawning periods was usually marked by gamete artesia (degeneration and phagocytosis). The state of sexual quiescence (inaction stage) was not recorded in Lake Qarun population.
- (۹) The depletion of ripe ova in female gonads during spring and winter was rapidly compensated by the onset of oogenesis. This indicates that spawning was followed by rapid development of the gonad.
- (۱۰) Sex ratio of Lake Qarun population differed significantly from the expected ۱:۱ ratio indicating that males outnumbered females. For Lake Timsah population, the departure from equal proportions of females and males was not significant.
- (۱۱) The length at the onset of sexual maturity (SM<sub>50</sub>) varied seasonally. The values ranged from ۶ mm (in winter) to ۱۰.۱ mm ( in summer) shell length in Lake Qarun population. Lower temperature in winter is important for an early recruitment into the breeding population.

SM<sub>0</sub> was relatively larger in Lake Timsah population. The lowest value (9 mm shell length) was recorded in summer 2008 and the highest value (11.5 mm shell length) was recorded in winter 2009. Thus the higher temperature in summer is important for an early recruitment into the breeding population.