



**Fig. 2.** Mean toxin concentrations ( $\mu\text{g g}^{-1}$ ) of C3+4 and C1+2 (A), GTX5 and GTX6 (B), dcSTX, dcNEO and dcGTX2+3 (C), and GTX2+3, NEO and STX (D) quantified in digestive glands of *Cerastoderma edule* cockle collected under post-bloom natural conditions (days 0, 8, 12, 14, 19, 21 and 25) at Aveiro lagoon, Portugal; mean values ( $n = 3$ ;  $\pm\text{SD}$ ).

**Table 1**

Best fitting curves for PST concentrations to exponential decay equations ( $y = a \exp^{-bx}$ ) in digestive gland (C1+2, C3+4, GTX5, GTX6, dcGTX2+3, dcSTX, dcNEO, GTX2+3, STX and NEO) and gills (C1+2, C3+4 and dcGTX2+3) of *Cerastoderma edule* cockle under post-bloom natural conditions; calculated parameters (standard error); correlation coefficients ( $r$ ) and levels of significance ( $p$ ).

Toxin	<i>a</i>	<i>b</i>	<i>r</i> *
<b>Digestive gland</b>			
C1+2	70.0 (3.1)	0.115 (0.0093)	0.977
C3+4	85.6 (3.3)	0.144 (0.011)	0.983
GTX5	14.8 (1.2)	0.0724 (0.0094)	0.922
GTX6	15.6 (0.83)	0.103 (0.0099)	0.968
dcGTX2+3	7.45 (0.28)	0.124 (0.086)	0.984
dcSTX	1.73 (0.084)	0.107 (0.0092)	0.971
dcNEO	2.83 (0.13)	0.131 (0.011)	0.978
GTX2+3	1.18 (0.038)	0.178 (0.012)	0.986
STX	0.397 (0.016)	0.241 (0.029)	0.979
NEO	0.582 (0.023)	0.0900 (0.0050)	0.979
<b>Gills</b>			
C1+2	4.37 (0.178)	0.0840 (0.0054)	0.974
C3+4	6.10 (0.343)	0.0750 (0.0070)	0.947
dcGTX2+3	0.307 (0.017)	0.0610 (0.0056)	0.936

\* $p < 0.05$ .

in line with the decline of *G. catenatum* cells from  $6 \times 10^3$  cells  $\text{L}^{-1}$  in day 0 to 20 cells  $\text{L}^{-1}$  in day 19. A detailed description of phytoplankton data obtained from the IPMA monitoring program is given

in Botelho et al. (2014). The decrease rate of toxins in digestive gland differed among the compounds (Table 1). From day 0 to day 8, the values of STX and GTX2+3 decreased 6–8 times, while concentrations of C1+2, C3+4, dcGTX2+3, dcNEO, dcSTX and NEO diminished only 2–3 times. The concentrations of GTX5 and GTX6 declined gradually until day 19, although a slight irregularity was found in day 8.

Fig. 3 presents the variation of the mean toxin concentrations ( $\pm$ one standard variation) in gills of cockles. In day 0, mean concentrations of C3+4 and C1+2 (6.0 and 4.2  $\mu\text{g g}^{-1}$ , respectively) (Fig. 3A) exceeded 2–3 times the values of GTX6 and GTX5 (1.9 and 1.6  $\mu\text{g g}^{-1}$ , respectively) (Fig. 3B). The toxins dcGTX2+3 and dcSTX presented mean concentrations of 0.31 and 0.12  $\mu\text{g g}^{-1}$ , respectively (Fig. 3A and B), and values of dcNEO, GTX1+4, NEO and STX were below the detection limit throughout the observation period. Concentrations of C1+2, C3+4 and dcGTX2+3 in gills decreased progressively with time according to equations given in Table 1: from day 0 to day 12 values all toxins decreased 2–3 times almost linearly, then C3+4 presented an irregularity in day 14 and decreased afterwards; dcGTX2+3 remained relatively constant; and C1+2 showed a slight decrease until day 25. On the contrary, GTX5, GTX6 and dcSTX concentrations showed irregular variations: GTX6 and dcSTX increased ( $p < 0.05$ ) from day 0 to day 8 and day 12, and then decreased to day 14 ( $p < 0.05$ ); GTX6 showed an additional increase ( $p < 0.05$ ) from day 14 to day 19; GTX5