TABLE 24.2 Approximate times of toxin retention for various species of bivalve molluscs (time for toxin levels to fall below either quarantine or detection levels). Algal species are as given in original publications [1].

Species	Toxin source	Retention time	Reference
Ameghinomya antiqua	probably *Dinophysis acuta*	>6 months	Lembeye *et al*. (1993)
Anadara maculosa	*Pyrodinium bahamense*	6 weeks	Worth *et al*. (1975)
Argopecten irradians	*Prorocentrum lima*	>11 <60 days (viscera)	Bauder *et al*. (2001)
Arctica islandica	*Protogonyaulax tamarensis*	2 months *in vivo*	Shumway, unpublished
Aulacomya ater	probably *Dinophysis acuta*	6 months	Lembeye *et al*. (1993)
Choromytilus meridionalis	*Gonyaulax catenella*	3 months	Popkiss *et al*. (1979)
Clinocardium nuttalli	*Gonyaulax acatenella*	9 weeks	Quayle (1965)
Crassostrea cucullata	not specified, probably *Pyrodinium bahamense*	2 months	Karunasagar *et al*. (1984)
Crassostrea echinata	*Pyrodinium bahamense*	3 weeks in closed system; longer periods *in vivo*	Maclean (1975)
		4 months	Worth *et al*. (1975)
Crassostrea gigas	*Gonyaulax acatenella*	1–9 weeks	Quayle (1965; 1969); Sharpe (1981)
		1 month	Sribhibhadh (1963)
Crassostrea iridescens	*Gymnodinium catenatum*	>1 month	Mee *et al*. (1986)
Crassostrea virginica	*Gymnodinium breve*	2–6 weeks	Morton & Burklew (1969)
Meretrix casta	not specified, probably *Pyrodinium bahamense*	1 month	Karunasagar *et al*. (1984)
Mercenaria mercenaria	*Alexandrium tamarense*	2.1–3.6 weeks	Bricelj *et al*. (1991)
Modiolus auriculatus	*Pyrodinium bahamense*	6 weeks	Worth *et al*. (1975)
Modiolus modiolus	*Gonyaulax tamarensis*	up to 60 days [2]	Gilfillan *et al*. (1976)
Mya arenaria	*Gonyaulax acatenella*	5 weeks	Quayle (1965)
	Gonyaulax tamarensis	4–6 weeks	Prakash *et al*. (1971); Bicknell & Collins (1973)
		up to 45 days [2]	Gilfillan *et al*. (1976)
Mytilus californianus	*Gonyaulax catenella*	<1 month	Sommer & Meyer (1937) Sharpe (1981)
Mytilus edulis	*Protogonyaulax tamarensis*	10 days–7 weeks	Oshima *et al*. (1982);
		up to 50 days	Gilfillan *et al*. (1976) Prakash *et al*. (1971)
	Gonyaulax acatenella	11 weeks	Quayle (1965)
		4 weeks	Sharpe (1981)
	Gonyaulax excavata	2–3 weeks	Gaard & Poulsen (1988)

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TABLE 24.2 *(Suite)*

Species	Toxin source	Retention time	Reference
	Dinophysis spp.	1 week	Haamer *et al*. (1989)
	Dinophysis spp.	8 weeks	Marcaillou-le Baut *et al*. (1990)
	Dinophysis spp.	8>42 days [2]	Marcaillou-le Baut *et al*. (1993)
	Dinophysis spp.	>10 months	Sechet *et al*. (1990)
	Dinophysis spp. (?) *Prorocentrum* spp. (?)	10 days	Quilliam *et al*. (1993)
	probably *Dinophysis acuta*	6 months	Lembeye *et al*. (1993)
Ostrea edulis	*Alexandrium tamarense*	>6 weeks	Shumway *et al*. (1990)
Patinopecten yessoensis	*Protogonyaulax tamarensis*	6 weeks–5 months	Oshima *et al*. (1982); Iioka *et al*. (1964)
*Perna canaliculus**	*Nitzschia pungens* f. *multiseries*	2 days	Mackenzie *et al*. (1993)
Placopecten magellanicus	*Protogonyaulax tamarensis*	6 month in closed system; can be toxic year round *in vivo*	Bourne (1965); Shumway *et al*. (1988)
	P. Pungens f. multiseries	>2 weeks (viscera)	Van Apeldoorn *et al*. (1999)
Protothaca staminea	*Protogonyaulax acatenella*	5 weeks	Quayle (1965)
Saxidomus giganteus	*Protogonyaulax acatenella*	2 years +	Quayle (1965); Anonymous (1974)
Saxidomus solidissima	*Gonyaulax catenella*	3 months–2.5 years	Quayle (1969)
Siliqua patula	*Pseudonitzschia* spp. (?)	>2 years	Wekell *et al*. (1993); Drum *et al*. (1993); Horner *et al*. (1993)
Spisula solidissima	*Alexandrium tamarense*	3 months-3+ years	Shumway *et al*. (1994; unpublished)
Spondylus sp.	*Pyrodinium bahamense*	still highly toxic after months	Worth *et al*. (1975)
Tresus capax	*Gonyaulax acatenella*	11 weeks	Quayle (1965)
Venerupis japonica	*Gonyaulax acatenella*	5 weeks	Quayle (1965)

1. Note : *Gonyaulax* and *Protogonyaulax* = *Alexandrium; Nitzschia* = *Pseudo-nitzschia*.
2. Dependent on initial level of toxicity.

* Laboratory study only; toxic organisms not identified in natural habitat.

toxins by the enzymes (during or after digestion) of the accumulator, very likely inducing significant changes in its toxicity. Simultaneously, OA, DTX1 and DTX2 can be converted to the corresponding acyl-derivatives (DTX3) (Fernández *et al*., 1998; Moroño *et al*., in press). ASP toxins have been less studied with regard to this aspect. Notwithstanding this, a number of DA isomers that bind to the kainate receptor less strongly (see Wright and Quilliam, 1995) have been described; consequently, the situation may be the same as that reported for PSP and DSP toxins.