Table 2
Highest toxin levels reported for marine gastropods.

Species	Toxins	Toxin concentration	Analysed tissue	Local	Reference
Suspension-feeder					
Calyptraeidae					
Crepidula fornicata	PSP	580 μg STX eq. kg^{-1}	*nr*	Gulf of Maine, USA	(in Shumway, 1995)
Herbivorous					
Haliotidae					
Haliotis tuberculata	PSP	>540000 μg STX eq. kg^{-1}	Edible part	Chile	(in McLeod et al., 2010)
Haliotis midae	PSP	[a]16000 μg STX eq. kg^{-1}	*nr*	Chile	(in McLeod et al., 2010)
Haliotis laevigata	PSP	16 μg STX eq. kg^{-1}	Foot	Australia	(Dowsett et al., 2011)
Haliotis rubra	PSP	6400 μg STX eq. kg^{-1}	Edible part	Tasmanian, Australia	(Harwood et al., 2014)
Littorinidae					
Littorina littorea	PSP	720 μg STX eq. kg^{-1}	Edible part	Massachusetts, USA	(in Shumway, 1995)
Littorina littorea	PSP	300 μg STX eq. kg^{-1}	Digestive Gland	Chile	(Neves, Figueiredo, Valentin, da Silva Scardua, & Hégaret, 2015)
Tegulidae					
Tectus fenestratus	PSP	187 μg STX eq. kg^{-1}	Whole body	Australia	(Negri & Llewellyn, 1998)
Tectus niloticus maximus	PSP	[a]900 μg STX eq. kg^{-1}	Whole body	Ishigaki Island, Japan	(in Deeds et al., 2008)
Tectus pyramis	PSP	[a]3420 μg STX eq. kg^{-1}	Whole body	Ishigaki Island, Japan	(in Deeds et al., 2008)
Turbinidae					
Turbo argyrostoma	PSP	[a]3600 μg STX eq. kg^{-1}	Whole body	Ishigaki Island, Japan	(in Deeds et al., 2008)
Turbo marmorata	PSP	[a]756 μg STX eq. kg^{-1}	Whole body	Ishigaki Island, Japan	(in Deeds et al., 2008)
Strombidae					
Lambis lambis	PSP	[a]315 μg STX eq. kg^{-1}	*nr*	Sabah, Malaysia	(in Shumway, 1995)
Carnivorous					
Volutidae					
Adelomelon brasiliana	PSP	[a]5040 μg STX eq. kg^{-1}	Whole body	Mar del Plata, Argentina	(Carreto et al., 1996)
Ranellidae					
Argobuccinum ranelliforme	PSP	19870 μg STX eq. kg^{-1}	Whole body	Chile	(Zamorano et al., 2013)
	DSP	65 μg OA eq kg^{-1}	Foot	Chile	(García et al., 2015)
Charonia lampas	PSP	[a]3150 μg STX eq. kg^{-1}	Digestive Gland	Galicia, Spain	(in Deeds et al., 2008)
Buccinidae					
Buccinum undatum	PSP	6080 μg STX eq. kg^{-1}	Whole body	Quebec, Canada	(in Shumway, 1995)
	PSP	16000 μg STX eq. kg^{-1}	Digestive Gland	Quebec, Canada	(in Shumway, 1995)
Neptunea decemcostata	PSP	40000 μg STX eq. kg^{-1}	*nr*	Gulf of Maine, USA	(in Deeds et al., 2008)
Neptunea spp.	PSP	2500 μg STX eq. kg^{-1}	Edible part	Alaska, USA	(in Shumway, 1995)
Searlesia dira	PSP	[a]500 μg STX eq. kg^{-1}	Whole body	Washington, USA	(Wekell, Lorenzana, Hogan, & Barnett, 1996)
Melongenidae					
Busycon spp	PSP	5000 μg STX eq. kg^{-1}	*nr*	Quebec, Canada	(in Shumway, 1995)
Muricidae					
Concholepas concholepas	PSP	5000 μg STX eq. kg^{-1}	Foot	Chile	(Lembeye, 1992)
	DSP	400 μg OA eq kg^{-1}	Foot	Chile	(García et al., 2015)
Naticidae					
Euspira heros	PSP	29220 μg STX eq. kg^{-1}	*nr*	Gulf of Maine, USA	(in Shumway, 1995)
Nassariidae					
Nassarius fossatus	ASP	674 mg DA kg^{-1}	Whole body	California, USA	(Kvitek et al., 2008)
Nassarius siguijorensis	*PSP*	666 μg STX eq. kg^{-1}	*nr*	China	(in Choi et al., 2006)
Nassarius sufflatus	*PSP*	[a]>2700 μg STX eq. kg^{-1}	Whole body	China	(Hwang, Noguchi, & Hwang, 2007)
Nassarius sp.	PSP	[a]193343 μg STX eq. kg^{-1}	*nr*	Zhoushan Islands, China	(Choi et al., 2006)
Haliplanellidae					
Natica lineata	PSP	[a]>2700 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Naticidae					
Natica vitellus	PSP	[a]2520 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Polinices heros	PSP	14500 μg STX eq. kg^{-1}	Whole body	Massachusetts, USA	(in Shumway, 1995)
Polinices lewissi	PSP	[a]6000 μg STX eq. kg^{-1}	*nr*	Canada	(in Deeds et al., 2008)
	PSP	[a]3130 μg STX eq. kg^{-1}	Viscera	Washington, USA	(Wekell et al., 1996)
Nassariidae					
Niotha clathrata	PSP	[a]>25700 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Muricidae					
Nucella lamellosa	PSP	[a]720 μg STX eq. kg^{-1}	Whole body	Washington, USA	(Wekell et al., 1996)
Rapana venosa	PSP	[a]2052 μg STX eq. kg^{-1}	Viscera	Hiroshima, Japan	(Ito, Asakawa, Beppu, Takayama, & Miyazawa, 2004)
Nucella lapillus	PSP	340 μg STX eq. kg^{-1}	*nr*	Maine, USA	(in Shumway, 1995)
Nucella lima	PSP	1800 μg STX eq. kg^{-1}	Edible part	Washington, USA	(in Shumway, 1995)
Plicopurpura columellaris	PSP	12600000 μg STX eq. kg^{-1}	Edible part	El Salvador	(Barraza, 2009)
Olividae					
Oliva hirasei	PSP	[a]1620 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Oliva miniacea	PSP	[a]1620 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Oliva mustelina	PSP	[a]2250 μg STX eq. kg^{-1}	Whole body	China	(Hwang et al., 2007)
Oliva vidua fulminans	PSP	[a]4545 μg STX eq. kg^{-1}	Whole body	Sabah, Malaysia	(in Shumway, 1995)
Olivellidae					
Olivella biplicata	ASP	3 mg DA kg^{-1}	Whole body	California, USA	(Kvitek et al., 2008)
Volutidae					
Zidona angulata	PSP	[a]4500 μg STX eq. kg^{-1}	Foot	Mar del Plata, Argentina	(Carreto et al., 1996)
	PSP	[a]37800 μg STX eq. kg^{-1}	Viscera	Mar del Plata, Argentina	(Carreto et al., 1996)

nr: not reported.
[a] Mouse Units were converted into STX equivalents, considering 1MU = 0.18 μg STX.

Table 3
Highest toxin levels reported for crustaceans.

Species	Toxins	Toxin concentration	Analysed tissue	Local	Reference
Suspension-feeder					
Balanidae					
Balanus Balanoides	PSP	>500 μg STXeq kg^{-1}	*nr*	Canada	(in Shumway, 1995)
Balanus cariosus	PSP	510 μg STXeq kg^{-1}	*nr*	Canada	(in Shumway, 1995)
Balanus spp.	PSP	840 μg STXeq kg^{-1}	Whole body	Washington, USA	(Jonas-Davies & Liston, 1985)
Lepadidae					
Lepas sp.	PSP	>500 μg STXeq kg^{-1}	*nr*	Maine, USA	(in Shumway, 1995)
Pollicipes					
Pollicipes polymerus	ASP	10 mg DA kg^{-1}		California, USA	(CDHS, 2002)
Herbivorousr					
Epialtidae					
Pugettia producta	PSP	17100 μg STXeq kg^{-1}	Viscera	Washington, USA	(in Deeds et al., 2008)
Majidae					
Schizophrys aspera	PSP	414 μg STXeq kg^{-1}	Whole body	Ishigaki Island,Japan	(in Deeds et al., 2008)
Varunidae					
Hemigrapsus nudus	PSP	440 μg STXeq kg^{-1}	Whole body	Washington, USA	(in Deeds et al., 2008)
Hemigrapsus oregonensis	PSP	310 μg STXeq kg^{-1}	Whole body	Washington, USA	(in Deeds et al., 2008)
Xanthidae					
Actaeodes tomentosus	PSP	23400 μg STXeq kg^{-1}	*nr*	Ishigaki Island,Japan	(in Deeds et al., 2008)
Atergatis floridus	PSP	62270 μg STXeq kg^{-1}	Whole body	Australia	(Negri & Llewellyn, 1998)
Zosimus aeneus	PSP	1630 μg STXeq kg^{-1}	Whole body	Timor	(Llewellyn et al., 2002)
Omnivorousr					
Eriphiidae					
Eriphia scabricula	PSP	32400 μg STXeq kg^{-1}	Whole body	Ishigaki Island, Japan	(in Deeds et al., 2008)
Eriphia sebana	PSP	[a]1620 μg STXeq kg^{-1}	Whole body	Australia	(Llewellyn & Endean, 1989)
Grapsidae					
Metopograpsus frontalis	PSP	100 μg STXeq kg^{-1}	Whole body	Australia	(in Deeds et al., 2008)
Portunidae					
Carcinus maenas	DSP	503 μg OAeq kg^{-1}	Digestive Gland	Denmark	(Jørgensen, Cold, & Fischer, 2008)
Carnivorousr					
Cambaridae					
Procambarus clarkii	PSP	41 μg STX eq.kg^{-1}	Digestive Gland	Sanriku, Japan	(in Deeds et al., 2008)
Cancridae					
Cancer productus	PSP	2850 μg STXeq.kg^{-1}	Viscera	Washington, USA	(in Jester, Baugh, & Lefebvre, 2009)
Cancer antennarius	PSP	493 μg STXeq.kg^{-1}	Viscera	California, USA	(Jester et al., 2009)
Cancer borealis	PSP	560 μg STXeq.kg^{-1}	*nr*	Maine, USA	(in Shumway, 1995)
Cancer irroratus	PSP	2420 μg STXeq.kg^{-1}	Digestive Gland	New Hampshire, USA	(in Shumway, 1995)
Cancer magister	PSP	720 μg STXeq.kg^{-1}	Viscera	Washington, USA	(in Shumway, 1995)
Cancer antennarius	ASP	105 mg DA kg^{-1}	Edible part	Washington, USA	(in Shumway, 1995)
Cancer borealis	ASP	485 mg DA kg^{-1}	Viscera	Washington, USA	(in Shumway, 1995)
Cancer pagurus	ASP	>30 mg DA kg^{-1}	*nr*	Washington, USA	(Altwein, Foster, Doose, & Newton, 1995)
Cancer magister	DSP	1500 μg OAeq.kg^{-1}	*Digestive Gland*	Arendal, Norway	(Castberg et al., 2004)
Cheiragonidae					
Telmessus acutidens	PSP	[a]15354 μg STXeq kg^{-1}	Digestive Gland	Fukushima, Japan	(Oikawa, Fujita, Saito, Satomi, & Yano, 2007)
Limulidae					
Carcinoscorpius rotundicauda	PSP	[a]3787 μg STXeq kg^{-1}	Soft tissue	Vietnam	(Dao, Takata, Sato, Fukuyo, & Kodama, 2009)
Nephropidae					
Homarus americanus	PSP	9610 μg STXeq kg^{-1}	Digestive Gland	Gaspé Bay, Canada	(Sephton, Haya, Martin, LeGresley, & Page, 2007)
	PSP	690 μg STXeq kg^{-1}	Muscle	Gaspé Bay, Quebec	(Deeds et al., 2008)
	ASP	12 mg DA kg^{-1}	Digestive Gland	Pacific Coast, USA	(Shumway, 1995)
Menippidae					
Menippe adina	ASP	>30 mg DA kg^{-1}	*nr*	Washington, USA	(Altwein et al., 1995)
Palinuridae					
Palinurus elephas	ASP	24 mg DA kg^{-1}	*nr*	Washington, USA	(Altwein et al., 1995)
Panulirus longipes	PSP	380 μg STXeq kg^{-1}	Whole body	Sabah, Malaysia	(in Deeds et al., 2008)
Panulirus versicolour	PSP	400 μg STXeq kg^{-1}	Whole body	Sabah, Malaysia	(in Mcleod, Stewart, & Kiermeier, 2012)
Panulirus longipes	ASP	5.7 mg DA kg^{-1}	Edible part	Aveiro, Portugal	(Vale & Sampayo, 2002)
Portunidae					
Charybdis japonica	PSP	6786 μg STXeq kg^{-1}	Digestive Gland	Hiroshima, Japan	(Oikawa, Matsuyama, Satomi, & Yano, 2008)
Ovalipes catharus	PSP	2215 μg STXeq kg^{-1}	Viscera	California, USA	(Jester et al., 2009)
Polybius henslowii	ASP	323 mg DA kg^{-1}	Whole body	Portugal	(Costa et al., 2003)
Portunus pelagicus	PSP	315 μg STXeq kg^{-1}	Whole body	Sabah, Malaysia	(in Shumway, 1995)
Xanthidae					
Atergatopsis germaini	PSP	[a]236 μg STXeq kg^{-1}	Appendages	Twain	(Tsai, Hwang, Chai, & Jeng, 1996)
Lophozozymus pictor	PSP	3402 μg STXeq kg^{-1}	Whole body	Australia	(in Deeds et al., 2008)

nr: not reported.
[a] Mouse Units were converted into STX equivalents, considering 1MU = 0.18 μg STX.

residual comparing to fish and other seafood. There is a lack of data on levels of production or capture of echinoderms and tunicates in FAO fishery and aquaculture statistics. However, as a response to global trade, in particular to meet the Asian appetite for seafood organisms, such as sea urchins and sea cucumbers, EU business operators have been showing interest in the exploitation of these marine live resources. The landings of marine gastropods and crustaceans, which are prominent marine resources indispensable