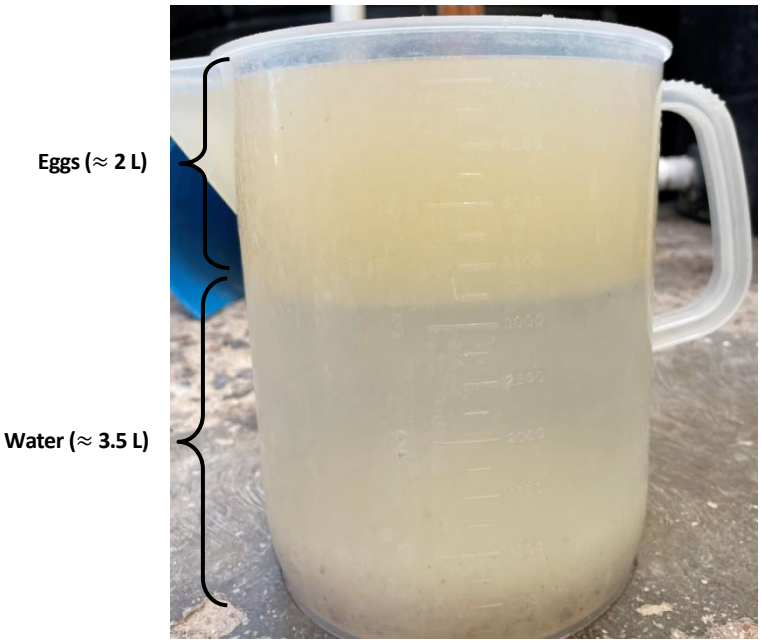


Figure S1. Spawning volume obtained from *S. rivoliana* broodstock reared by Kampachi Farms.

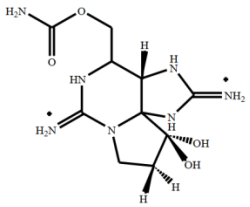
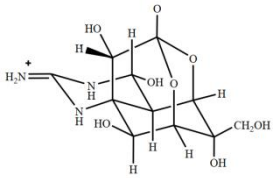
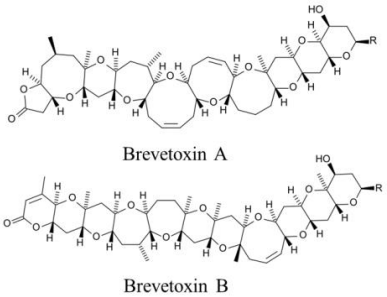
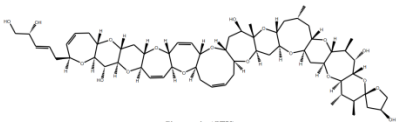
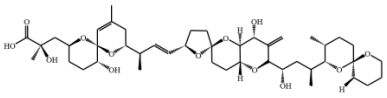
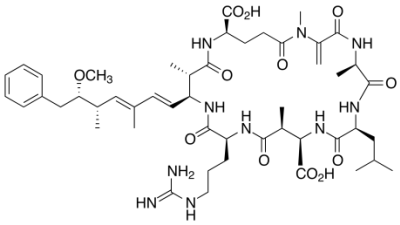
Table S1. Summary of the research on the effects of exposure to various concentrations of paralytic shellfish toxins (PSTs), including saxitoxin (STX) and gonyautoxin (GTX), in different fish species.

Fish species	Life stage; Tissue	Toxin	Concentration	Exposure route and period	Effects	Reference
Capelin (*Mallotus villosus*); Atlantic herring *(Clupea harengus harengus)*	Capelin larvae aged 1, 2, 3, 5, 8, and 11 days; Herring larvae aged 1, 3, and 6 days; Herring post-larvae aged 10 and 15 days	PSTs (unspecified)	*A. tamarense* (2.5, 5, 10, and 15 x 10^5 cells L^{-1}); zooplankton that had eaten *A. tamarens*e and extracted cellular content of *A. tamarense*	Oral ingestion and waterborne subacute exposure to dissolved PSTs	High mortality in fish larvae and early post-larvae either by direct or vectorial intoxication; Symptoms of paralysis; Insensitivity to dissolved toxin	[43]
Zebrafish *(Danio rerio)*	Embryos from 8 hpf to hatching; Larvae at 2, 4, and 6 dph	STX	229 and 481 μg STX eq L^{-1}	Dissolved STX subacute exposure (7 days)	Mortality; Growth retardation; Reduction in sensorimotor function as early as 48 hpf; Paralysis of larvae at 4 dpf; Severe edema of the eye, pericardium, and yolk sac in larvae 6 dpf	[23]
Pacific herring *(Clupea harengus pallasi)*	Larvae at 0, 4, and 11 dph	STX	50, 400, 800, and 1,600 μg STX eq. L^{-1}	Dissolved STX acute exposure (24 h)	Inhibition of sensorimotor function; Progressive age-specific increase in STX-induced paralysis; No STX-induced morphological abnormalities	[44]

Killifish *(Fundulus heteroclitus)*	Adults; brain	STX	75 and 150 ppb	Dissolved STX acute exposure (60 min)	Decrease in c-Fos protein expression; Behavioral alterations	[45]
Wolf fish *(Hoplias malabaricus)*	Adults; brain	97% STX and 3% NeoSTX and GTX	0.08 μg STX eq. 100 g^{-1} tissue	Intraperitoneal inoculation; Subacute exposure (20 days)	Oxidative stress; Damage of DNA, proteins, and lipids	[46]
White seabream *(Diplodus sargus)*	Juveniles; Liver	N-sulfocarba-moyl and decarbamoyl toxins	1.60 μg STX eq. kg^{-1} body weight	Intracoelomic injection; Subacute exposure (2–6 days)	GST activity induction (phase II biotransformation); Chromosome breaks or loss; Segregational anomalies	[47]
Wolf fish (*Hoplias malabaricus*)	Adults; Liver and blood	97% STX and 3% NeoSTX and GTX	0.08 μg STX eq. 100 g^{-1} tissue	Intraperitoneal inoculation; Subacute exposure (20 days)	Oxidative stress; No significant effect on the hepatosomatic index; Increase in hemoglobin concentration	[48]
Marine medaka (*Oryzias melastigma*)	Embryos	STX	840 and 1260 μg. L^{-1}	Dissolved STX subacute exposure (15 dph)	Abnormal growth; High neuron development; Decrease in VTG and vtg1 protein expression; Reduction in the yolk sac size; Up-regulation in glycolytic and lipid metabolic proteins; Increase in stress proteins	[49]
Longfin yellowtail *(Seriola rivoliana)*	Larvae at 0 and 3 dph	GTX2-3; dcGTX2-3; C1-2	0.1 μg STX eq. mL^{-1}	Dissolved PSTs acute exposure (24 h)	High mortality; Increase in lipase activity and gene expression	[36]
Zebrafish *(Danio rerio)*	Embryos	STX	0.05 and 0.1 μM	Dissolved STX subacute exposure (from 3 to 96 hpf)	Mortality; Oxidative stress; Apoptosis; DNA damage	[42]

Zebrafish *(Danio rerio)*	Adults (males and females)	STX	0.1 and 1 μg L^{-1}	Dissolved STX chronic exposure (90 days)	Decrease in body weight and length: Oxidative stress; Immunosuppression; No significant effect on reproductive parameters	[50]
Longfin yellowtail (*Seriola rivoliana*)	Embryos at 8 and 26 hpf; Larvae at 44, 50, and 62 hpf	STX	100 μg L^{-1}	Dissolved STX subacute exposure (from 8 to 62 hpf)	High mortality; Stage-specific sensitivity to the toxin; Genetic regulation of NaV channels; HSP induction; Increase in adipogenesis and lipid metabolism; Regulation of MAP kinases and phosphatases activities	This study

Table S2. Marine toxins, chemical structure and main mode of action in the intoxicated organism. Adapted from Vasconcelos et al. [22] and Guillotin & Delcourt [18].

Toxin	Example of producing organism	Chemical type and structure	Target / mode of action
Saxitoxins	**Dinoflagellates** *Alexandrium* spp *Pyrodinium bahamense* *Gymnodinium catenatum*	Alkaloid 	Na^+ channels, site 1 of the α subunit / blockage Ca2+ channels / blockage K+ channels / blockage
Tetrodotoxin	**Bacteria** *Vibrio* sp. *Serratia marcescens*	Alkaloid 	Na^+ channels, site 1 of the α subunit / blockage
Brevetoxins	**Dinoflagellates** *Karenia brevis*	Polyethers  Brevetoxin A Brevetoxin B	Na^+ channels, site 5 of the α subunit / permanent activation
Ciguatoxin	**Dinoflagellates** *Gambierdiscus* and *Fukuyoa*	Polycylic ethers 	Na^+ channels, site 5 of the α subunit / permanent activation K+ channels / blockage
Okadaic acid	**Dinoflagellates** *Dynophysis* and *Prorocentrum*	Polyethers 	Protein phosphatases / inhibition
Microcystin-	**Cyanobacteria** *Microcystis aeruginosa*	Polyethers 	Protein phosphatases / inhibition