

Supplementary Material (SM)

Risk Assessment of Total Mercury (T-Hg) in Commercial Seafood Marketed in Bangkok, Thailand**Irwan Ramadhan Ritonga¹, Sujaree Bureekul^{1,2,*}, Penjai Sompongchaiyakul^{1,2}**¹ Department of Marine Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand² Center of Excellence on Hazardous Substance Management, Chulalongkorn University Research Building, Bangkok, Thailand

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SM 1 T-Hg levels in $\mu\text{g g}^{-1}$ in the fish organs, EDI in $\mu\text{g kg}^{-1}$ body weight d^{-1} , and MSDC in g d^{-1} of seafood from Bangkok supermarkets

Scientific name	Common name	n*	n	Mean of T-Hg (µg g ⁻¹ wet weight)			EDI	MSDC
				Flesh	Gill	Viscera	Flesh	Flesh
Fish								
<i>Alepes djedaba</i>	Shrimp scad		3	0.13±0.02	0.05±0.00	0.09±0.01	0.06	102
<i>Lactarius lactarius</i>	False trevally		1	0.47	0.08	0.16	0.22	29.5
<i>Lates calcarifer</i>	Barramundi		1	0.11	0.02	0.01	0.05	120
<i>Rastrelliger kanagurta</i>	Indian mackerel		3	0.05±0.00	0.01±0.00	0.02±0.00	0.03	261
<i>Salmo</i> spp.	Salmon		2	0.02-0.04	–	–	0.01	474
<i>Scomber japonicus</i>	Chub mackerel		3	0.42±0.03	0.12±0.05	0.28±0.13	0.20	32.8
<i>Scomberomorus cavalla</i>	King mackerel		1	0.26	–	–	0.12	53.4
<i>Scomberomorus commerson</i>	Narrow-barred Spanish mackerel		2	0.79-0.80	–	–	0.38	17.4
<i>Sphyraena putnamae</i>	Sawtooth barracuda		2	0.28-0.29	0.09-0.13	0.13-0.14	0.14	48.2
<i>Thunnus albacares</i>	Yellowfin tuna		1	0.89	–	–	0.42	15.5
<i>Thunnus tonggol</i>	Longtail tuna		1	0.11	0.03	0.04	0.05	124
<i>Eleutheronema tetradactylum</i>	Fourfinger threadfin		1	0.71	0.09	0.13	0.34	19.4
<i>Parastromateus niger</i>	Black pomfret		3	0.08±0.02	0.04±0.01	0.04±0.02	0.04	183
<i>Seriola quinqueradiata</i>	Japanese amberjack		3	0.09±0.00	0.01±0.01	0.03±0.01	0.04	159
<i>Epinephelus bleekeri</i>	Dusky tail Grouper		2	0.19-0.29	0.04-0.09	0.14-0.21	0.11	57.3
<i>Epinephelus sexfasciatus</i>	Sixbar grouper		5	0.34±0.13	0.10±0.05	0.21±0.20	0.16	40.5
<i>Larimichthys polyactis</i>	Small yellow croaker		1	0.17	0.04	0.06	0.08	82.2
<i>Nemipterus nematophorus</i>	Double whip threadfin bream		6	0.32±0.18	0.09±0.10	0.25±0.18	0.15	42.7

SM 1 T-Hg levels in $\mu\text{g g}^{-1}$ in the fish organs, EDI in $\mu\text{g kg}^{-1}$ body weight d^{-1} , and MSDC in g d^{-1} of seafood from Bangkok supermarkets (*continued*)

Scientific name	Common name	n*	n	Mean of T-Hg (µg g ⁻¹ wet weight)			EDI	MSDC
				Flesh	Gill	Viscera	Flesh	Flesh
Fish (continued)								
<i>Seriola nigrofasciata</i>	Black Banded trevally		2	0.15-0.15	0.05-0.05	0.09-0.10	0.07	91.1
<i>Cynoglossus arel</i>	Largescale tonguesole		2	0.14-0.14	0.03-0.04	0.04-0.33	0.07	98.3
<i>Mallotus villosus</i> *	Capelin	11	1	0.07	0.02	0.04	0.03	198
<i>Sillago sihama</i> *	Silver Sillago	4	1	0.62	0.13	0.19	0.30	22.2
Minimum - maximum				0.02-0.89	0.01-0.13	0.01-0.28	0.01-0.42	15.5-4.74
Mean ± SD				0.29±0.25	0.06±0.04	0.12±0.08	0.14±0.12	103±1.06
Cephalopods								
<i>Architeuthis</i> sp.	Giant squid		2	0.05-0.08	—	—	0.03	202
<i>Loligo duvauceli</i> *	Indian squid	3	1	0.10	—	—	0.05	139
<i>Loliolus</i> sp.*	Kobi squid	10	1	0.03	—	—	0.01	470
<i>Photololigo chinensis</i> *	Splendid squid	3	1	0.11	—	—	0.05	129
Minimum - maximum				0.03-0.11	—	—	0.01-0.15	129-470
Mean ± SD				0.08±0.04	—	—	0.04±0.02	235±160
Shellfish								
<i>Penaeus merguensis</i> *	White prawn	36	1	0.12	—	—	0.06	118
<i>Penaeus monodon</i> *	Tiger shrimp	3	1	0.05	—	—	0.03	255
<i>Meretrix meretrix</i> *	Asiatic hard clam	28	1	0.06	—	—	0.03	236
<i>Paphia textile</i> *	Textile venus	30	1	0.05	—	—	0.02	276
<i>Saccostrea</i> sp.*	Oyster	33	1	0.04	—	—	0.02	374
<i>Solen</i> sp.*	Razor clam	25	1	0.13	—	—	0.06	103
Minimum - maximum				0.04-0.13	—	—	0.02-0.06	103-374
Mean ± SD				0.07±0.04	—	—	0.04±0.02	227±102
EC (2006) ^a				0.50/1.00	0.50/1.00	0.50/1.00		
JECFA (2007) ^b				0.23				

Remark: EDI and MSDC calculated by assuming methylmercury was presented approximately 93% of T-Hg based on Windom and Cranmer [13] and Anual et al. [16].

* Composite sample; n* means number of samples that blend together before analysis.

^a. Standard guidelines of mercury at 0.50 $\mu\text{g g}^{-1}$ for commonly fish and 1.00 $\mu\text{g g}^{-1}$ for predatory fish according to European Commission Regulation [10].

^b. Reference dose for EDI from the PTDI according to the Joint FAO/WHO Expert Committee on Food Additives [20]. .

SM 2 Kruskal-Wallis testing**a) Total mercury (T-Hg) levels in different tissues of fish**

Ranks				Test Statistics	
	Fish tissues	N	Mean rank	T-Hg	
T-Hg	Flesh	47	99.9	Chi-Square	41.3
	Gill	47	46.2	df	2
	Viscera	47	66.9	Asymp. Sig.	0.000
	Total	141		a. Kruskal Wallis Test	
				b. Grouping Variable: Fish tissues	

b) Total mercury (T-Hg) levels in fish (only muscle), cephalopods and shellfish

Ranks				Test Statistics^{a,b}	
	Seafood flesh	N	Mean rank	T-Hg	
T-Hg	Fish	47	34.9	Chi-Square	13.8
	Cephalopods	5	15.2	df	2
	Shellfish	8	14.2	Asymp. Sig.	0.001
	Total	60		a. Kruskal Wallis Test	
				b. Grouping Variable: Seafood flesh	

SM 3 Mann Whitney test of total mercury (T-Hg) levels in cephalopods and shellfish**Ranks**

	Group	N	Mean rank	Sum of ranks
Values	Cephalopod	4	5.50	22.0
	Shellfish	6	5.50	33.0
	Total	10		

Test statistics^b

	Values
Mann-Whitney U	12.0
Wilcoxon W	33.0
Z	0.00
Asymp. Sig. (2-tailed)	1.00
Exact Sig. [2*(1-tailed Sig.)]	1.00 ^a

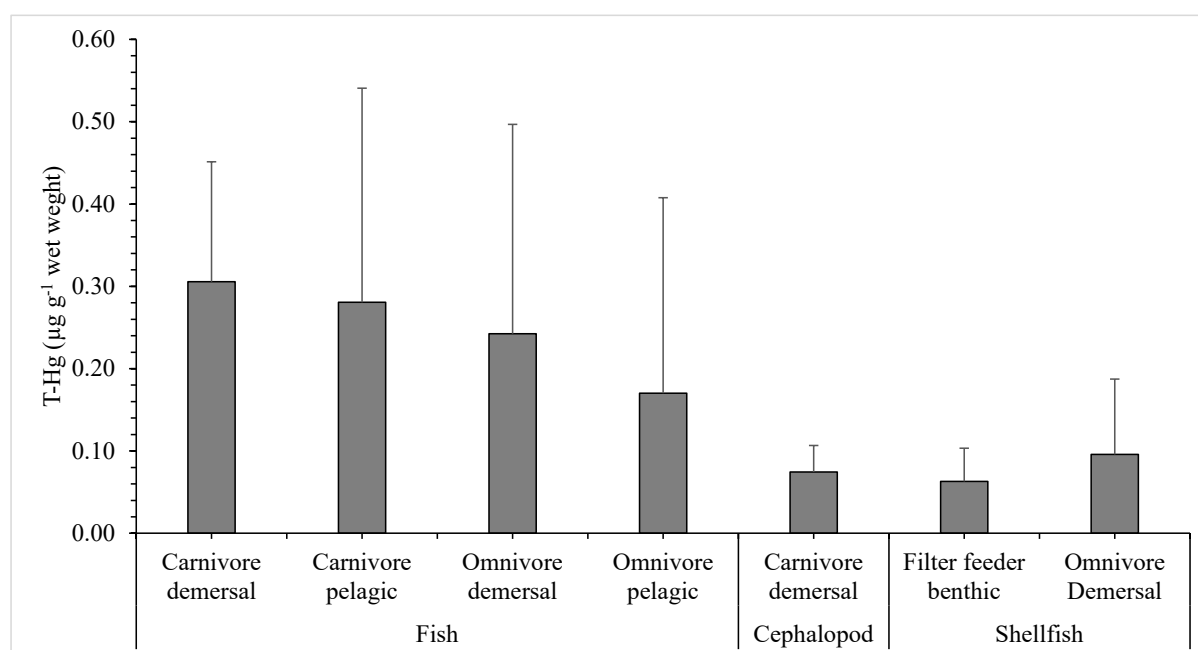
a. Not corrected for ties.

b. Grouping Variables: Group

SM 4 Kruskal-Wallis test for the T-Hg accumulation in different food habit and habitat of seafoods collected from Bangkok supermarkets.

Kruskal-Wallis test

Ranks				Test Statistics ^{a,b}	
	Food habit and habitat	N	Mean rank		T-Hg
T-Hg	Carnivore demersal	47	86.9	Chi-Square	15.5
	Carnivore pelagic	55	72.0	df	4
	Filter feeder benthic	5	50.9	Asymp. Sig.	0.004
	Omnivore demersal	15	68.0	a. Kruskal Wallis Test	
	Omnivore pelagic	21	46.5	b. Grouping Variable: Seafood flesh	
	Total	143			



SM 5 T-Hg (in $\mu\text{g g}^{-1}$ wet weight) of seafood collected from Bangkok supermarkets displayed within groups of different food habit and habitat.