Table S1. Occurrence of ultraviolet stabilizers in aquatic environments.

Composition	Sample location	Sample type	Concentrations	Key points/effects	Reference
BUVSs					
1BUVS UV-360	3beaches(Gran Canaria island)	Seawater	41.12-544.9 ng/L	UV-360 was higher than other BUVSs.	(Garcia-Guerra et al. 2016)
Σ5BUVSs (UV-P,UV-329,UV-350,UV-234,UV-328)	4 WWTPs and 4rivers (Shandongprovince, China)	Influent Effluent Water	0.66-37.1 ng/L 0.46-15.9 ng/L ND-8.1ng/L	The different BUVSs concentrations and profiles among the different WWTP samples may indicate different usage of the UV stabilizers among the sampling regions.	(Liu et al. 2014)
Σ6BUVSs (UV-9,UV-P,UV-326,UV-327,UV-328,UV-329)	Kaveri, Vellar, and Thamiraparani (Tamil Nadu, India)	Water	1.7-31.3 ng/L	UV-9 were found predominant in the study matrices during wet and dry season.	(Vimalkumar et al. 2018)
Σ4BTRs (1H-BTR,Me-1HBTR,5,6-DIMeBTR,5-Cl-BTR)	5 STPs Indian	Influent Effluent	0.6-503 ng/L 3-42 ng/L	BTH levels were among thehighest ever reported in the literature, and the overall abundance of the target chemicals in wastewater was in thefollowing order: BTHs>> BTRs > BzPs > BPs	(Karthikraj and Kannan 2017)
Σ5BUVSs (UV-P,UV-320,UV-326,UV-327,UV-328)	WWTP Lisbon(Portugal)	Influent Effluent	24-85 ng/L ND-31 ng/L	Although Tinuvins appeared to be conveniently removed from the water phase in sewage treatment	(Carpinteiro et al.

	WWTP Spain	Influent Effluent	ND-65 ng/L ND	plants, further studies are required to address their potential concentration in sludge.	2012)
Σ5BUVSs (UV-P,UV-326,UV-327,UV-328,UV-329)	coastal region and offshore region of South China Sea	Seawater coastal region offshore region	 0.1-26.1 ng/L ND-14.6 ng/L	Both coastal seawater and corals generally showed higher OUVA levels than offshore.	(Pei et al. 2023)
Σ4BUVSs (1H-benzotriazole,1-hydroxy-benzotriazole,tolyltriazole, and xylyltriazole ,)	WWTP Athens (Greece)	Influent Effluent	106-15841 ng/L 19-5737 ng/L	Occurrence of BTRs and BTHs was proved in the particulate matter of wastewater.	(Asimakopoulos et al. 2013)
Σ3UV filters (BZT,MeBZT,DMBZT)	Adrià del Besòs (NE of Spain)	Surfacewater Groundwater	61.1-1340 ng/L 59.7-1980 ng/L	Triazoles (BZT and MeBZT) seemed to be the most persistent PCPs in the aquifer.	(Serra-Roig et al. 2016)
Σ9BUVSs (UV-P,UV-531,UV-329,UV-320,UV-234,UV-326,UV-328,UV-327,UV-928)	South Korea	Seawater	0.172-1.75 ng/L	UV-326 can both bioaccumulate and biomagnify.	(Wang, Lee, and Oh 2022)
Σ9BUVSs (UV-320，UV-350，UV-326，UV-329，UV-328，UV-327，UV-234，UV-9，UV-P)	Lake St. Louis (LSL), ÎlesdeBoucherville (IB),Îlet Vert (IV) (St. Lawrence River,	LSL:Water IB:Water IV:Water	ND-13 ng/L ND-92 ng/L ND-12 ng/L	SPM showed greater sorption capacities of most target contaminants compared to those of the sediment.	(Dalpe Castilloux et al. 2022)

	Quebec, Canada)			The accumulation of UVAs and IAs in fish depends on their feeding behavior.	
Σ5BUVSs (UV-328,UV-329,UV-326,UV-234,UV-327)	9WWTPs (Canada）	Influent Effluent	ND-34.4 ng/L ND-2.61 ng/L	Wastewater effluent is a vector of SDPAs and BZT-UVs to the aquatic environment. The results also highlight the high concentrations of SDPAs and BZT-UVs associated with the solid stream in WWTPs, which could affect the beneficial use of biosolids (e.g., compost or land applications).	(Lu, Smyth, et al. 2017)
Σ6BUVSs (UV-329,UV-328,UV-234,UV-326,UV-327,UV-350)	southern Ontario (Canada)	Upstream：Water Downstrea：Water	＜0.05-84.3 ng/L ＜0.05-1.5 ng/L	SDPAs and BZT-UVs were frequently detected , suggesting a ubiquitous presence and bioaccumulation of these emerging contaminants. Crayfish could be used as an indicator species for these compounds.	(Lu et al. 2016)
Σ6BUVSs (UV-9，UV326，UV-328，UV-P，UV-327，UV-329)	11WWTPs Tamil Nadu, India.	Influent Effluent	65-567 ng/L 7.2-2732 ng/L	The wider usage of target ECs impregnated products in India and their elevated levels confirm their ubiquitous occurrence in wastewater.	(Vimalkumar et al. 2022)

				A personal care chemical (UV-328) may cause health implications in organisms of the effluent receiving systems.	
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPs (Norway)	Effluent (ng/L)	＜10 ng/L	It is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Øxnevad, et al. 2015)
Σ6BUVSs (UV-P,UV-326,UV-327,UV-328,UV-329,UV-360)	5WWTPs Gran Canaria (Canary Islands, Spain)	Influent Effluent Seawater	13.12-1933 ng/L 28.8-570.9 ng/L 67.01-2419 ng/L	The studied compounds exhibited different trends of occurrence in aqueous and solid samples due to their different coefficients of hydrophobicity.	(Montesdeoca-Esponda et al. 2019)
BTri	WWTPs、Lakes Canton of Zurich, Switzerland, Swiss midland region.	Influent Effluent Surface water Groundwater	10-24 ug/L 4-12 ug/L 11-917 ng/L 16-77 ng/L	Concentration ratios between compounds indicated some elimination of BTri and DiOH-CBZ during subsurface passage or in groundwater, while CBZ and PMD appeared to be more stable and thus are promising wastewater markers for groundwater.	(Kahle et al. 2009)

Σ3BUVSs (MeBZT,BZT,UV-P)	Tunisia	Seawater	15.2-50.9 ng/L	MePB and MeBZT showed the highest sediment-water partition coefficients, tending to accumulate in sediments.	(Fenni et al. 2022)
Σ7BUVSs (UV-P,UV-329,UV-326,UV-328,UV-327,UV-571,UV-360)	3WWTPs Gran Canaria Island (Spain)	Seawater Wastewater	19.9-92.2 ng/L 19.8-83.3 ng/L		(Montesdeoca-Esponda et al. 2013)
Σ4BUVSs (BTri,5-TTri,5-ClBTri,XTri)	upstream and downstream of Xiangjiang River,China	Water	ND-21.7 ng/L	The monitoring of selected parabens, benzotriazoles, and antimicrobials in the Xiangjiang River showed that these compounds were more detected whereas benzophenones were less detected.The major three contaminants were MeP, PrP, and BTri.	(Lu et al. 2018)
Σ2BUVSs (UV-328,UV360)	3WWTPs Gran Canaria Island (Spain)	Sewage	17.3-99.2 ng/ml	The application of the proposed method has allowed detecting two compounds, UV 360 and UV 328 in the three analysed sewage samples, revealing higher concentrations of both compounds in the WWTP that only conducted	(Montesdeoca-Esponda et al. 2015)

				primary and secondary treatment.	
Σ5BUVSs (UV-P,Allyl-bzt,UV-326,UV-328,UV-327)	Laboratory	Wastewater	ND-57 ng/L	This fact confirms the contribution of sewage water to the introduction of UV stabilizers in the aquatic environment, where they are likely fixed to suspended particles and sediments.	(Carpinteiro et al. 2010)
Σ5BUVSs (UV-P,UV-329,UV-234,UV-326,,UV-328,)	WWTP (Jinan city, Shandong Province in China,)	Water	4.92-50.3 ng/L	UV-P, UV-326, UV-328 and UV-329 were considered as major BZT contaminants. Waste sludge could be a potential source of BZT-UVs reaching the environment.	(Song et al. 2014)
Σ7BUVSs (UVP,UV329,UV326,UV328,UV327, UV571 ,UV360)	7WWTPs,6beaches Gran Canaria Island (Spain).	Seawater Wastewater	2.8-5.2 ng/L 4-13 ng/L		(Montesdeoca-Esponda, Sosa-Ferrera, and Juan Santana-Rodriguez 2012)

Σ9BUVSs (UV-P,UV-PS,UV-320,UV-350,UV-326,UV-329,UV-328,UV-327,UV-234)	WWTP Songhua River in Harbin Section, Northeastern China.	Wastewater	0-38.89 ng/L	The A/O treatment process provided better removal of BTs UV filters than the BAF treatment process. Seasonal changes have no significant influence on residual concentrations and removal efficiency. The comparison with concentration and composition between upstream and downstream surface water indicated the influence of effluent discharge on the receiving water system.	(Zhao et al. 2017)
Σ11BUVSs (BTR,5-Cl-BTR,UV-P,UV-PS,UV-320,UV-350,UV-326,UV-329,UV-328,UV-327,UV-234)	Yangtze River (China)	Seawater	ND-10.73 ng/L	The main species were UV-P, UV-PS, UV-329, and UV-328.	(Zhao et al. 2023)
Σ4BUVSs (UV-320,UV-326,UV-329,UV-327)	Chaohu Lake.	Water	0.81-3.04 ng/L	High concentrations of BP were universally detected in the investigated water samples. A source assessment suggested the discharge from industries using UVAs as stabilizers to be an important source of their occurrence in aquatic environments, in addition to the	(Tang et al. 2018)

				direct source of domestic sewage resulting from the wide use of UVAs in cosmetics.	
5BUVSs (UV-P,UV-326,UV-327,UV-328,UV-329)	Pearl River basin (West River and North River) in Guangdong and Guangxi Province, south China	Surface water	0.65-59.8 ng/L	Significant seasonal differences of organic UV filters and BTs were found in surface water, but not in sediments.	(Hu et al. 2021)
6BUVSs (UV-P,UV-320,UV-326,UV-329,UV-328,UV-327)	3Rivers (India)	Water	ND-6.79 ng/L	UV-329 and UV-327 were the dominant BUVs in sediment and water. BUVs posed low risk to planktons in water bodies. Plastic debris and wastewater discharge were major sources of BUVs.	(Khare et al. 2023)
Σ2BUVSs (BZT,MeBZT)	20WWTPs Catalonia (Spain)	BZT:Influent Effluent MeBZT:Influent Effluent	76.5-4380 ng/L 26.7-1513.8 ng/L 778.7-47142.9 ng/L 587.1-10541.2 ng/L	BZT and MeBZT were found in all the studied samples showing the widespread occurrence of these two contaminants. MeBZT may represent a hazard for different aquatic organisms.	(Molins-Delgado, Silvia Diaz-Cruz, and Barcelo 2015)

Σ2BUVSs (BZT,MeBZT)	6WWTPs、2Rivers. Llobregat River basin and the Besòs River basin. (Spain).	Influent Effluent River water	1495.2-9481.6ng/L 1084.1-16933.1ng/L 23.7-8529.8ng/L	BZT and MeBZT concentrations measured in some effluent streams do pose a risk for D. galeata and V. fischeri.	(Molins-Delgado et al. 2017)
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPS (Norway)	Effluent	5ng/L	it is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Oxnevad, et al. 2015)
6BUVSs (BT,5-TTri,CBT,XTri,UV-326,UV-329)	WWTP (South Australia)	Ground water Effluent	97.5-280ng/L 77.2-2206ng/L	The highest concentration of BT reached up to 2.2 ug/L in effluent samples, indicating its persistence of BT in the environment.	(Liu et al. 2011)
Σ3BUVSs (UV-329,UV-234,UV-327)	Bohai Sea (China), Qinglong Lake (Tangshan, China), and the North China University of Science and Technology (Tangshan, China)	Seawater Lake water Wastewater	2.9-43.7ng/ml 3.4-19.3ng/ml ND		(Zhang et al. 2023)

Sediment					
Σ6BUVSs (UV-9,UV-P,UV-326,UV-327,UV-328,UV-329)	Kaveri, Vellar, and Thamiraparani (Tamil Nadu, India)	Sediment	0.2-7.3ng/g dw	UV-9 were found predominant in the study matrices during wet and dry season.	(Vimalkumar et al. 2018)
Σ4BUVSs (UV-320,UV-326,-UV-327,UV-328)	Ariake Sea, Japan	Sediment	0.3-320ng/g dw	UV-327 was the most frequently detected compound in organisms analyzed.	(Nakata, Murata, and Filatreau 2009)
Σ3BUVSs (BZT,TBHPBT,MeBZT)	Palmital River, Atuba River, Belem River, Iguaçu River (Upper Iguaçu watershed, Curitiba (Brazil))	Sediment Palmital River Atuba River Belem River Iguaçu River	 6.7-630ng/g dw 5.7-322.2ng/g dw 9.3-313.8ng/g dw 4.6-160.8ng/g dw	Both hydrophobic and polar compounds are accumulated in the sediments. Urban wastewater is the main source of the contamination observed in the sediments.	(Mizukawa et al. 2017)
Σ9BUVSs (UV-P,UV-234,UV-320,UV-326,UV-327,UV-328,UV-329,UV-350,UV-360)	GermanBight, Skagerrak and Kattegat,German Baltic Sea (European North and Baltic Seas)	Sediment GermanBight: Skagerrak and Kattegat: German Baltic Sea	 ND-0.13ng/g dw ND-0.1ng/g dw ND-0.63ng/g dw	Bisoctrizole (UV-360) was the predominant benzotriazole UV stabilizer.	(Apel, Joerss, and Ebinghaus 2018)

Σ9BUVSs (UV-P,UV-531,UV-329,UV-320,UV-234,UV-326,UV-328,UV-327,UV-928)	South Korea	Sediment	ND-0.422ng/g dw	UV-326 can both bioaccumulate and biomagnify.	(Wang, Lee, and Oh 2022)
Σ9BUVSs (UV-320，UV-350，UV-326，UV-329，UV-328，UV-327，UV-234，UV-9，UV-P)	Lake St. Louis (LSL), ÎlesdeBoucherville (IB),Îlet Vert (IV) (St. Lawrence River, Quebec, Canada)	LSL:Sediment IB:Sediment IV:Sediment	ND-20ng/g dw ND-16ng/g dw ND-43ng/g dw	SPM showed greater sorption capacities of most target contaminants compared to those of the sediment. The accumulation of UVAs and IAs in fish depends on their feeding behavior.	(Dalpe Castilloux et al. 2022)
Σ2BUVSs (BZT,MeBZT)	6WWTPs、2Rivers. Llobregat River basin and the Besòs River basin. (Spain).	Sediment	ND-230.9ng/g dw	BZT and MeBZT concentrations measured in some effluent streams do pose a risk for D. galeata and V. fischeri.	(Molins-Delgado et al. 2017)
Σ6BUVSs (UV-329,UV-328,UV-234,UV-326,UV-327,UV-350)	southern Ontario (Canada)	Upstream：Sediment Downstrea：Sediment	＜0.01-0.7ng/g dw ＜0.08-3ng/g dw	SDPAs and BZT-UVs were frequently detected , suggesting a ubiquitous presence and bioaccumulation of these emerging contaminants. Crayfish could be used as an	(Lu et al. 2016)

				indicator species for these compounds.	
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPs (Norway)	Sediment	＜65ng/g dw	It is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Øxnevad, et al. 2015)
Σ9BUVSs (UV-326,UV-320,UV-329, UV-350, UV-328,UV-327,UV-928, UV-234，UV-360)	5Rivers (German)	Sediment	0.23-21ng/g dw	Five of the nine examined BUVSs were also detected in bream liver and confirmed their high bioaccumulation potential. This supports the so far only predicted high persistence of BUVSs in aquatic systems. High persistence of BUVSs in aquatic systems.	(Wick et al. 2016)
Σ6BUVSs (UV-P,UV-326,UV-327,UV-328,UV-329,UV-360)	5WWTPs Gran Canaria (Canary Islands, Spain)	Sediments	4.42-2162ng/kg dw	The studied compounds exhibited different trends of occurrence in aqueous and solid samples due to their different coefficients of hydrophobicity.	(Montesdeoca-Esponda et al.

					2019)
Σ7BUVSs (UV234;UV320;UV326;UV327;UV328;UV329)	Bohai and Yellow Seas(China)	Sediment	Bohai：0.022-0.17ng/g dw Yellow Sea:0.01-0.83ng/g dw	UV-329 and UV-326 may have an identical input pathway and similar environmental behavior.	(Apel, Tang, and Ebinghaus 2018)
MeBZT	Tunisia	Sediment	8.7-24.9ng/g dw	MePB and MeBZT showed the highest sediment-water partition coefficients, tending to accumulate in sediments.	(Fenni et al. 2022)
Σ4BUVSs (UV-329,UV-326,UV-327,UV-320)	5Rivers Tianjin, China	Sediment	1.09-1.35mg/g dw	Source assessment further suggested that the industrial activities seemly contributed more to the sedimentOUVAs than the use of cosmetics and PCPs in the area.	(Li, Xing, et al. 2022)
Σ11BUVSs (BTR,5-Cl-BTR,UV-P,UV-PS,UV-320,UV-350,UV-326,UV-329,UV-328,UV-327,UV-234)	Yangtze River (China)	Sediment	ND-11.31ng/g	The main species were UV-P, UV-PS, UV-329, and UV-328.	(Zhao et al. 2023)
Σ4BUVSs (UV-320,UV-326,UV-329,UV-327)	Chaohu Lake.	Sediment	＜0.15-0.64ng/g	High concentrations of BP were universally detected in the investigated water samples. A source assessment suggested the	(Tang et al. 2018)

				discharge from industries using UVAs as stabilizers to be an important source of their occurrence in aquatic environments, in addition to the direct source of domestic sewage resulting from the wide use of UVAs in cosmetics.	
Σ5BUVSs (UV-P,UV-326,UV-327,UV-328,UV-329)	Pearl River basin (West River and North River) in Guangdong and Guangxi Province, south China	Sediment	3.82-18.8ng/g	Significant seasonal differences of organic UV filters and BTs were found in surface water, but not in sediments.	(Hu et al. 2021)
Σ6BUVSs (UV-P,UV-320,UV-326,UV-329,UV-328,UV-327)	3Rivers (India)	Sediment	ND-16.1ng/g	UV-329 and UV-327 were the dominant BUVs in sediment and water. BUVs posed low risk to planktons in water bodies. Plastic debris and wastewater discharge were major sources of BUVs.	(Khare et al. 2023)
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPS (Norway)	Sediment	4.8-12.5ng/g dw	it is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the	(Langford, Reid, Fjeld,

				present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	Oxnevad, et al. 2015)
Sludge					
Σ4BTRs (1H-BTR,Me-1HBTR,5,6-DIMe BTR,5-Cl-BTR)	5 STPs Indian	Sludge	0.8-58.4ng/g dw	BTH levels were among thehighest ever reported in the literature, and the overall abundance of the target chemicals in wastewater was in thefollowing order: BTHs>> BTRs > BzPs > BPs	(Karthikraj and Kannan 2017)
Σ9BUVSs (UV-P,UV-PS,UV-329,UV-350,UV-320,UV-234,UV-326,UV-328,UV-327)	WWTPs (33 cities,China)	Sludge	ND-24700ng/g dw	The most dominant analogue was UV-234and accounted on average for 27.2% of total BZTs. Significant correlations were found among the BZT concentrations and also with a WWTP characteristic (daily treatment volume). The commercial BZT chemicals and their plausible transformation products might be persistent in the environment.	(Ruan et al. 2012)

Σ4BUVSs (1H-benzotriazole,1-hydroxy-benzotriazole,tolyltriazole, and xylyltriazole ,)	WWTP Athens (Greece)	Sludge	25-116ng/g	Occurrence of BTRs and BTHs was proved in the particulate matter of wastewater.	(Asimakopoulos et al. 2013)
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPs (Norway)	Sludge	1172-3303ng/g dw	It is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Øxnevad, et al. 2015)
Biota					
Σ6BUVSs (UV-9,UV-P,UV-326,UV-327,UV-328,UV-329)	Kaveri, Vellar, and Thamiraparani (Tamil Nadu, India)	Fish	0.3-79.4ng/g ww	UV-9 were found predominant in the study matrices during wet and dry season.	(Vimalkumar et al. 2018)
Σ4BUVSs (UV-320,UV-326,-UV-327,UV-328)	Ariake Sea, Japan	Marine Organisms	＜0.05-55ng/g ww	UV-327 was the most frequently detected compound in organisms analyzed.	(Nakata, Murata, and Filatreau 2009)

Σ7BUVSs (UV-P,UV-234,UV-320,UV-326,UV-327 ,UV-328 ,UV-329)	BohaiSea (China)	mollusks	ND-110ng/g dw	UV-326, UV-327, UV-Pwere thepredominant analogues, andUV-328 wasthemost frequently detected BZT-UV.	(Li, Su, et al. 2022)
Σ3BUVSs (UV-320,UV-327,UV-328)	Ariake Sea regions, western Japan	Finless porpoises	<0.05-64ng/g ww	BUVSs appear to be persistent and bioaccumulative in the aquatic food chain.	(Nakata et al. 2010)
Σ9BUVSs (UV-P,UV-531,UV-329,UV-320,UV-234,UV-326,UV-328,UV-327,UV-928)	South Korea	Fish Benthic invertebrate	30.9-281ng/g Lw 35.3-228ng/g Lw	UV-326 can both bioaccumulate and biomagnify.	(Wang, Lee, and Oh 2022)
Σ5BUVSs (UV-328,UV-329,UV-326,UV-234,UV-327)	9WWTPs (Canada）	Biosolids	ND-239ng/g dw	Wastewater effluent is a vector of SDPAs and BZT-UVs to the aquatic environment. The results also highlight the high concentrations of SDPAs and BZT-UVs associated with the solid stream in WWTPs, which could affect the beneficial use of biosolids (e.g., compost or land applications).	(Lu, Smyth, et al. 2017)

Σ6BUVSs (BT,5-TTri,CBT,XTri,UV-326,UV-329)	WWTP (South Australia)	Biosolid	＜2.9-21.4ng/g	The highest concentration of BT reached up to 2.2 ug/L in effluent samples, indicating its persistence of BT in the environment.	(Liu et al. 2011)
Σ6BUVSs (UV-329,UV-328,UV-234,UV-326,UV-327,UV-350)	southern Ontario (Canada)	Upstream： Biota:Crayfish Chub Shiner Downstrea： Biota:Crayfish Chub Shiner	 ＜0.2-1076ng/g Lw ＜0.07-6.86ng/g Lw ＜0.07-2ng/g Lw ＜0.2-1306ng/g Lw ＜0.004-8.1ng/g Lw ＜0.07-3.86ng/g Lw	SDPAs and BZT-UVs were frequently detected , suggesting a ubiquitous presence and bioaccumulation of these emerging contaminants. Crayfish could be used as an indicator species for these compounds.	(Lu et al. 2016)
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPs (Norway)	Biota:Cod (liver) Prawn(whole) Crab (whole) Burbot (fillet) Whitefish(fillet) Perch (fillet)	＜10-＜50ng/g ＜10–51.8ng/g ＜25ng/g ＜50ng/g ＜50ng/g ＜25ng/g	It is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford , Reid, Fjeld, Øxnevad, et al. 2015)
Σ4BUVSs (UV-320,UV-326.UV-327,UV-328)	Cambodia China Hong Kong India Indonesia	Mussels	＜0.05-120 ＜0.05-96 ＜0.05-200 ＜0.05 ＜0.05-120	Significant correlations were found between the concentrations of HHCB and AHTN, and also between the concentrations of UV-327 and UV-328, which suggest	(Nakata et al. 2012)

	Japan Korea Malaysia Philippines USA Vietnam		33-450 ＜0.05-220 ＜0.05-42 ＜0.05-170 ＜0.05-130 ＜0.05	similar sources and compositions of these compounds in commercial and industrial products.	
Σ4BUVSs (UV-326,UV-328,UV-329,UV-360)	Gran Canaria Island (Spain)	fish samples： Boops boops, Sphyraena viridensis， Sphoeroides Marmoratus，	 Muscle：5.2-34.9ng/g dw Viscera：2.3-45.6ng/g dw Muscle：6.9ng/g dw Viscera ： 2.16-34.5ng/g dw Muscle：4.16-16.8ng/g dw Viscera ： 1.34-10.7ng/g dw	These results demonstrate the widespread dissemination of BUVSs in the marine ecosystem.	(Montesdeoca-Esponda et al. 2020)
Σ8BUVSs (UV-P,UV-9,UV-234,UV-320 ,UV-326 ,UV-327,UV-328 ,UV-329)	Manila Bay, the Philippines.	Fishes	0.02-211ng/g Lw	Among BUVSs, UV-P showed significant positive relationship between concentration and fish length and fish weight . Possibile sink of UV-P is bottom sediment in the bay, and ultimately	(Kim, Isobe, et al. 2011)

				accumulate through benthic food web rather than pelagic food web.	
Σ8BUVSs (UV-P,UV-9,UV-234,UV-320,UV-326,UV-327,UV-328,UV-329)	Manila Bay, the Philippines	Fish	<0.0002-179ng/g LW	The ubiquitous contamination by these emerging pollutants in Manila Bay.	(Kim, Ramaswamy, et al. 2011)
Σ4BUVSs (UV-320,UV-326,UV-329,UV-327)	Lake Chaohu,China.	Fish	＜0.17-6.23ng/g dw	High liver accumulation capacity of UVAs was observed in fish.	(Tang et al. 2019)
Σ4BUVSs (BT,5-TT,CBT,XT)	Dongjing River,China	Fish muscle liver	＜0.21-3.88ng/g ww ND-33.7ng/g ww	Most of the target compounds showed high detection frequencies, indicating bioaccumulation of these chemicals by wild fish. The concentrations for most analytes in liver tissue were higher than those in muscle tissue.	(Yao et al. 2016)
Σ2BUVSs (UV-234,UV-328)	Ontario, Canada	Fish	0.219-4.9ng/g ww	The concentrationof target compounds generally decreased in the following order: liver > carcass homogenate ≥ bile > plasma. This indicates that liver is a major tissue for accumulation of these contaminants in fish.	(Lu, De Silva, et al. 2017)

Others					
Σ9BUVSs (UV-P,UV-PS,UV-9,UV-320,UV-326,UV-327,UV-328,UV-329,UV-350)	Tokyo (Japan)	Plastic products Beveragebottlecaps food packages shopping bags	 0.04-160ng/g 0.1-27.7ng/g 0.13-209ng/g	UV-P,UV-PS,UV-090,UV-329 showed ER α and/ or ERagonistic activities. UV-320,UV-350 acted as both ER α / β antagonists, and UV-328/-329 acted as ER β antagonists.UV-P,UV-9 showed AR antagonistic activity. plastic additives, BUVSs, are present in our daily environment and several of them have endocrine-disrupting effects via ERs and AR.	(Sakuragi et al. 2021)
Σ5BUVSs (UV-234,UV-328,UV-P,1-H-benzotriazole,5-Methyl-benzotriazole)	Philippines, Indonesia, Switzerland, India, Georgia, China, Cambodia, Egypt, Bangladesh, Portugal, Turkey,	Clothing	1.44-3120ng/g	Clothing textiles can be a possible route for human exposure to harmful chemicals by skin contact, as well as being a potential source of environmental pollutants via laundering and release to household wastewater.	(Avagyan et al. 2015)

	Bulgaria, Latvia, Lithuania				
Σ9BUVSs (UV-320，UV-350，UV-326，UV-329，UV-328，UV-327，UV-234，UV-9，UV-P)	Lake St. Louis (LSL), ÎlesdeBoucherville (IB),Îlet Vert (IV) (St. Lawrence River, Quebec, Canada)	LSL:SPM IB:SPM IV:SPM	ND-499ng/g dw ND-611ng/g dw ND-235ng/g dw	SPM showed greater sorption capacities of most target contaminants compared to those of the sediment. The accumulation of UVAs and IAs in fish depends on their feeding behavior.	(Dalpe Castilloux et al. 2022)
Σ2BUVSs (BZT,MeBZT)	6WWTPs、2Rivers. Llobregat River basin and the Besòs River basin. (Spain).	Suspended solid	416.8-21832.1ng/g dw	BZT and MeBZT concentrations measured in some effluent streams do pose a risk for D. galeata and V. fischeri.	(Molins-Delgado et al. 2017)
Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPs (Norway)	Landfill leachate	＜5-19ng/L	It is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Øxnevad, et al. 2015)

Σ4BUVSs (UV-324,UV-327,UV-328,UV-329)	3WWTPS (Norway)	Landfill leachate	＜5-19ng/L	it is possible that under certain low flow conditions selected organic UV filters may pose a risk to surface waters but under the present conditions the risk is low, but some UV filters will potentially accumulate through the trophic food chain.	(Langford, Reid, Fjeld, Oxnevad, et al. 2015)
Σ4BUVSs (UV-320,UV-326,UV-327,UV-328)	South Korea	Marine debris	0.3-81700ng/g	The detection frequency and concentration levels of additive chemicals (except for Irganox 1076 and UV 320) in new plastics were relatively high in new plastics compared to marine debris, implying their potential leaching or degradation during use or after disposal.	(Rani et al. 2017)
Σ10BUVSs (UV-P,UV-PS,UV-329,UV-9,UV-320,UV-350,UV-326,UV-327,UV-328,UV-234)	Otsuchi town, Iwate Prefecture, Japan	propylene face masks	1.4-848ng/g	The face mask found in the feces of a green sea turtle.	(Fukuoka et al. 2022)

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