Supplementary Materials

The Influence of Design and Operational Factors on the Removal of Personal Care Products by Constructed Wetlands

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Supplementary materials 1: The treatment performance of four types of CWs (FWSCW, HFCW, VFCW, and HCW) for the removal of personal care products.

Table S1. The performance of FWSCW for personal care products removal.

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Full/ Tertiary	*	Galaxolide	3.5/0.1	17/8.1	0.01/NA	0.2	30/36/2	NA/*Phragmites australis, Typha latifolia*	8.4/NA	2.9/0.4	0.02/85	Matamoros et al. [1]/Spain
	*	Tonalide	3.5/0.1	17/8.1	0.01/NA	0.2	30/36/2	As above	8.4/NA	0.9/0.1	0.01/88	
Full/ Tertiary	*	Galaxolide	3.5/0.1	7.8/7.3	0.01/NA	0.2	30/36/2	NA/*Phragmites australis, Typha latifolia*	8.9/NA	2.9/0.3	0.03/88	Matamoros et al. [1]/Spain
	*	Tonalide	3.5/0.1	7.8/7.3	0.01/NA	0.2	30/36/2	As above	8.9/NA	0.9/0.1	0.01/90	
Full/ Tertiary	*	Galaxolide	3.5/0.1	NA/NA	0.01/NA	0.7	30/36/2	NA/*Phragmites australis, Typha latifolia*	NA/NA	2.9/0.4	0.02/87	Llorens et al. [2]/Spain
	*	Tonalide	3.5/0.1	NA/NA	0.01/NA	0.7	30/36/2	As above	NA/NA	0.9/0.1	0.01/89	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	18/6.9	0.05/CF	5.0	2.1/17/3	Soilless system/*Typha angustifolia*	0.6 (0.5/0.7)/ +26(+36/ -62)	4.0/0.7	0.2/82	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	18/6.9	0.05/CF	5.0	2.1/17/3	As above	As above	1.2/0.3	0.05/78	
	D	Tonalide	0.5/18	18/6.9	0.05/CF	5.0	2.1/17/3	As above	As above	0.4/0.1	0.01/75	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	17/7.1	0.05/CF	5.0	3.3/17/3	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.5 (0.6/0.3)/ +26/(+63/-101)	4.0/0.8	0.2/80	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	17/7.1	0.05/CF	5.0	3.3/17/3	As above	As above	1.2/0.5	0.03/58	
	D	Tonalide	0.5/18	17/7.1	0.05/CF	5.0	3.3/17/3	As above	As above	0.4/0.2	0.01/50	
Lab/	D	Methyl	0.5/18	19/6.6	0.05/CF	5.0	2.9/17/3	Soilless	0.7	4.0/0.2	0.2/96	Hijosa-Valsero

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Secondary		dihydro-jasmonate						system/ *Phragmites australis*	(0.8/0.5)/+ 26/(+48/ -25)			et al. [3]/Spain
	D	Galaxolide	0.5/18	19/6.6	0.05/CF	5.0	2.9/17/3	As above	As above	1.2/0.3	0.05/78	
	D	Tonalide	0.5/18	19/6.6	0.05/CF	5.0	2.9/17/3	As above	As above	0.4/0.1	0.01/75	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	6.9/6.7	0.05/CF	25	2.1/11/3	Soilless system/*Typha angustifolia*	0.6 (0.7/0.4)/ -6/(+22/ -25)	12/6.0	0.3/50	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	6.9/6.7	0.05/CF	25	2.1/11/3	As above	As above	0.9/0.5	0.02/40	
	D	Tonalide	0.5/6.0	6.9/6.7	0.05/CF	25	2.1/11/3	As above	As above	0.4/0.3	0.005/25	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	5.6/6.8	0.05/CF	25	3.3/11/3	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.6 (0.6/0.6)/ -6/(-10/-3)	12/6.0	0.3/50	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	5.6/6.8	0.05/CF	25	3.3/11/3	As above	As above	0.9/0.7	0.01/22	
	D	Tonalide	0.5/6.0	5.6/6.8	0.05/CF	25	3.3/11/3	As above	As above	0.4/0.3	0.004/20	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	6.4/7.0	0.05/CF	25	2.9/11/3	Soilless system/ *Phragmites australis*	0.6 (0.6/0.5)/ -6/(-10/ -50)	12/7.2	0.2/40	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	6.4/7.0	0.05/CF	25	2.9/11/3	As above	As above	0.9/0.8	0.003/7.0	
	D	Tonalide	0.5/6.0	6.4/7.0	0.05/CF	25	2.9/11/3	As above	As above	0.4/0.38	0.001/4.0	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	18/6.9	0.05/CF	6.0	0.5/36/9	Soilless system/*Typha angustifolia*	0.9 (1.0/0.8)/ +2.7/(+65/ +14)	5.8/0.7	0.3/88	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	18/6.9	0.05/CF	6.0	0.5/36/9	As above	As above	2.1/0.3	0.09/87	
	D	Tonalide	0.5/18	18/6.9	0.05/CF	6.0	0.5/36/9	As above	As above	0.4/0.1	0.02/76	
Lab/ Secondary	D	Methyl dihydro-	0.5/8.4	6.9/6.7	0.05/CF	17	0.5/30/6	Soilless system/*Typha*	0.4/-41/ (-47/-25)	6.6/3.2	0.2/51	Reyes-Contreras et al.

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
		jasmonate						*angustifolia*				[4]/Spain
	D	Galaxolide	0.5/8.4	6.9/6.7	0.05/CF	17	0.5/30/6	As above	As above	1.5/0.8	0.03/44	
	D	Tonalide	0.5/8.4	6.9/6.7	0.05/CF	17	0.5/30/6	As above	As above	0.3/0.2	0.01/38	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	17/7.1	0.05/CF	6.0	0.4/36/9	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	1.0 (1.5/0.6)/ +2.7/(+93/ -65)	5.8/0.8	0.3/87	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	17/7.1	0.05/CF	6.0	0.4/36/9	As above	As above	2.1/0.6	0.08/73	
	D	Tonalide	0.5/18	17/7.1	0.05/CF	6.0	0.4/36/9	As above	As above	0.4/0.1	0.01/68	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	5.6/6.8	0.05/CF	17	0.4/30/6	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.6 (0.6/0.6)/ -41/(-22/ -81)	6.6/3.3	0.2/50	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/8.4	5.6/6.8	0.05/CF	17	0.4/30/6	As above	As above	1.5/0.9	0.03/40	
	D	Tonalide	0.5/8.4	5.6/6.8	0.05/CF	17	0.4/30/6	As above	As above	0.3/0.2	0.01/40	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	19/6.6	0.05/CF	6.0	1.1/36/9	Soilless system/ *Phragmites australis*	0.9 (1.2/0.7)/ +2.7/(+54/ -14)	5.8/0.3	0.3/94	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	19/6.6	0.05/CF	6.0	1.1/36/9	As above	As above	2.1/0.4	0.08/81	
	D	Tonalide	0.5/18	19/6.6	0.05/CF	6.0	1.1/36/9	As above	As above	0.4/0.1	0.02/73	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	6.4/7.0	0.05/CF	17	1.1/30/6	Soilless system/ *Phragmites australis*	0.5/-41/ (-54/-50)	6.6/3.4	0.2/49	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/8.4	6.4/7.0	0.05/CF	17	1.1/30/6	As above	As above	1.5/1.1	0.02/24	
	D	Tonalide	0.5/8.4	6.4/7.0	0.05/CF	17	1.1/30/6	As above	As above	0.3/0.2	0.004/26	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/20	18/7.0	0.05/CF	6.0	1.6/36/3	Soilless system/ *Typha*	0.2/(-100/ -126)	7.3/1.5	0.3/79	Hijosa-Valsero et al. [5]/Spain

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								angustifolia				
	D	Galaxolide	0.5/20	18/7.0	0.05/CF	6.0	1.6/36/3	As above	As above	3.8/0.4	0.2/89	
	D	Tonalide	0.5/20	18/7.0	0.05/CF	6.0	1.6/36/3	As above	As above	0.3/0.1	0.01/76	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/20	19/6.8	0.05/CF	6.0	1.2/36/3	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.2/(-100/ -201)	7.3/1.5	0.3/79	Hijosa-Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	19/6.8	0.05/CF	6.0	1.2/36/3	As above	As above	3.8/1.3	0.1/66	
	D	Tonalide	0.5/20	19/6.8	0.05/CF	6.0	1.2/36/3	As above	As above	0.3/0.1	0.01/68	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/20	20/6.8	0.05/CF	6.0	1.6/36/3	Soilless system/ *Phragmites australis*	0.2/(-100/ -107)	7.3/0.7	0.3/90	Hijosa-Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	20/6.8	0.05/CF	6.0	1.6/36/3	As above	As above	3.8/0.8	0.1/80	
	D	Tonalide	0.5/20	20/6.8	0.05/CF	6.0	1.6/36/3	As above	As above	0.3/0.04	0.01/84	
Lab/ Primary	S	Triclosan	0.5/7.0	NA/NA	0.3/NA	17	5/NA/ NA	25 cm Sand (0-3)/*Cattail*	NA/NA	60/1.0	17/98	Liu et al. [6] /China
Lab/ Primary	S	Triclosan	0.5/7.0	NA/NA	0.3/NA	17	5/NA/ NA	As above/ *Hornwort*	NA/NA	60/1.3	17/98	Liu et al. [6] /China
Lab/ Primary	S	Triclosan	0.5/7.0	NA/NA	0.3/NA	17	5/NA/ NA	As above/ *Lemna minor*	NA/NA	60/0.8	17/99	Liu et al. [6] /China
Lab/ Primary	S	N,N-diethyl-meta-toluamide	0.7/27	NA/7.4	0.02/CF	5.0	7/NA/4	NA/*Spirodela polyrhiza*	6.0/NA/ -63	25/25	0.0/0.0	Li et al. [7]/UK
	S	Triclosan	0.7/27	NA/7.4	0.02/CF	5.0	7/NA/4	As above	As above	25/1.5	0.4/94	
Pilot/ Secondary	D	Methylparaben	1.0/1.3	NA/NA	0.1/CF	73	21/NA/ NA	NA/*Landoltia punctata*	NA/NA	157/15	17/91	Anjos et al. [8]/Brazil
	D	Propylparaben	1.0/1.3	NA/NA	0.1/CF	73	21/NA/ NA	As above	NA/NA	149/57	11/61	
Pilot/ Secondary	D	Methylparaben	1.0/1.3	NA/NA	0.1/CF	73	21/NA/ NA	NA/*Lemna minor*	NA/NA	157/18	17/89	Anjos et al. [8]/Brazil

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
	D	Propylparaben	1.0/1.3	NA/NA	0.1/CF	73	21/NA/ NA	As above	NA/NA	149/16	16/89	
Aerated FWSCW												
Lab/ Primary	S	N,N-diethyl-meta-toluamide	0.7/27	NA/8.0	0.02/CF	5.0	7/NA/4	NA/*Spirodela polyrhiza*	NA/NA/ +14	25/17	0.0/4.2	Li et al. [7]/UK
	S	Triclosan	0.7/27	NA/8.0	0.02/CF	5.0	7/NA/4	As above	As above	25/0.3	0.4/99	

Note: Free water surface flow constructed wetland (FWSCW); Wastewater type (WT); Domestic (D); Synthetic (S); Personal care products (PCPs); Temperature (T); Hydraulic loading rate (HLR); Operational mode (OM); Intermittently fed (IF); Continuously fed (CF); Organic loading rate (OLR); Chemical oxygen demand (COD); Hydraulic retention time (HRT); System age (SA); Experiment duration (ED); Dissolved oxygen (DO); Oxidation-reduction potential (ORP); Not available (NA).

Domestic (55%) and Industrial discharge (45%) (*); The Population equivalent (PE) is calculated based on the common relation 1 PE = 60 g biochemical oxygen demand (BOD) d^{-1}. BOD values were approximated using the ratio COD/BOD = 2 in the studies where BOD was not reported [6-8], and COD values were approximated using the ratio COD = 2BOD in the studies where COD was not reported [5].

Table S2. The performance of HFCW for personal care products removal.

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	18/6.5	0.05/CF	5.0	2.5/17/3	45 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.5/+26/ (+26/+22)	4.0/0.1	0.2/98	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	18/6.5	0.05/CF	5.0	2.5/17/3	As above	As above	1.2/0.5	0.04/62	
	D	Tonalide	0.5/18	18/6.5	0.05/CF	5.0	2.5/17/3	As above	As above	0.4/0.2	0.01/62	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	19/7.4	0.05/CF	5.0	2.6/17/3	45 cm Siliceous gravel (4.0) /Unplanted	0.3/+26/ (-6/-91)	4.0/0.6	0.2/85	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	19/7.4	0.05/CF	5.0	2.6/17/3	As above	As above	1.2/0.8	0.02/30	
	D	Tonalide	0.5/18	19/7.4	0.05/CF	5.0	2.6/17/3	As above	As above	0.4/0.3	0.007/37	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	5.6/6.9	0.05/CF	25	2.5/11/3	45 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.5/-6/ (+39/+24)	12/3.0	0.4/75	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	5.6/6.9	0.05/CF	25	2.5/11/3	As above	As above	0.9/0.8	0.004/10	
	D	Tonalide	0.5/6.0	5.6/6.9	0.05/CF	25	2.5/11/3	As above	As above	0.4/0.3	0.004/20	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	5.4/7.4	0.05/CF	25	2.6/11/3	45 cm Siliceous gravel (4.0) /Unplanted	0.6/-6/ (+46/+11)	12/6.0	0.3/50	Hijosa-Valsero et al. [3]/Spain
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	18/6.5	0.05/CF	6.0	2.2/36/9	45 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.6 (0.6/0.5)/ +2.7/(+47/ -3.3)	5.8/0.7	0.3/89	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	18/6.5	0.05/CF	6.0	2.2/36/9	As above	As above	2.1/0.6	0.07/70	
	D	Tonalide	0.5/18	18/6.5	0.05/CF	6.0	2.2/36/9	As above	As above	0.4/0.1	0.01/68	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	5.6/6.9	0.05/CF	17	2.2/30/6	45 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.6 (0.8/0.5)/ -41/(+14/ -55)	6.6/4.7	0.1/29	Reyes-Contreras et al. [4]/Spain

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
	D	Galaxolide	0.5/8.4	5.6/6.9	0.05/CF	17	2.2/30/6	As above	As above	1.5/1.3	0.01/12	
	D	Tonalide	0.5/8.4	5.6/6.9	0.05/CF	17	2.2/30/6	As above	As above	0.3/0.4	NR	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/18	17/7.4	0.05/CF	6.0	0.7/36/9	45 cm Siliceous gravel (4.0)/ Unplanted	0.5 (0.5/0.4)/ +2.7/(-5.7 /-83)	5.8/1.4	0.2/76	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	17/7.4	0.05/CF	6.0	0.7/36/9	As above	As above	2.1/1.7	0.02/19	
	D	Tonalide	0.5/18	17/7.4	0.05/CF	6.0	0.7/36/9	As above	As above	0.4/0.36	0.004/16	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	5.4/7.4	0.05/CF	17	0.7/30/6	45 cm Siliceous gravel (4.0)/ Unplanted	0.7	6.6/6.0	0.03/8.5	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/8.4	5.4/7.4	0.05/CF	17	0.7/30/6	As above	(0.8/0.5)/	1.5/1.7	NR	
	D	Tonalide	0.5/8.4	5.4/7.4	0.05/CF	17	0.7/30/6	As above	-41/(+8/	0.3/0.5	NR	
Pilot/ Secondary	D	Galaxolide	0.5/8.4	NA/7.6	0.03/IF	14	5.5/NA/6	Gravel (8-32)/ *Phragmites australis*	0.3/-91/+8	2.1/1.8	0.01/14	Carranza-Diaz et al. [9]/ Germany
	D	Tonalide	0.5/8.4	NA/7.6	0.03/IF	14	5.5/NA/6	As above	As above	0.9/0.7	0.01/20	
	D	Triclosan	0.5/8.4	NA/7.6	0.03/IF	14	5.5/NA/6	As above	As above	1.0/0.9	0.003/8.0	
Pilot/ Secondary	D	Galaxolide	0.5/8.4	NA/7.7	0.03/IF	14	5.5/NA/6	As above/ Unplanted	0.8/-91/ -84	2.1/2.0	0.004/5.0	Carranza-Diaz et al. [9]/ Germany
	D	Tonalide	0.5/8.4	NA/7.7	0.03/IF	14	5.5/NA/6	As above	As above	0.9/0.8	0.003/9.0	
	D	Triclosan	0.5/8.4	NA/7.7	0.03/IF	14	5.5/NA/6	As above	As above	1.0/0.95	0.001/2.0	
Lab/ Primary	S	Triclosan	0.5/6.7	NA/NA	0.3/IF	18	5/5/1	25 cm (0-3)/ *Typha angustifolia*	NA/NA	60/5.1	16/91	Zhao et al. [10]/China
Lab/ Primary	S	Triclosan	0.5/6.7	NA/NA	0.3/IF	18	5/5/1	25 cm (0-3)/ *Salvinia natans*	NA/NA	60/8.0	15/87	Zhao et al. [10]/China
Lab/ Primary	S	Triclosan	0.5/6.7	NA/NA	0.3/IF	18	5/5/1	25 cm (0-3)/ *Hydrilla. verticillata*	NA/NA	60/11	14/81	Zhao et al. [10]/China
Full/	D	Triclosan	0.8/5.0	NA/NA	0.03	13	6.5/120/6	80 cm Gravel	NA/NA	0.1/0.01	0.003/91	Chen et al.

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Secondary								(4-8)/ *Phragmites australis*				[11]/Czech Republic
Full/ Secondary	D	Triclosan	0.8/9.4	NA/NA	0.02	3.4	13/36/6	80 cm Gravel (4-8)/*Phalaris arundinacea*	NA/NA	0.1/0.01	0.003/91	Chen et al. [11]/Czech Republic
Full/ Secondary	D	Triclosan	0.8/6.6	NA/NA	0.04	7.3	5.4/144/6	80 cm Gravel (4-16)/ *Phragmites australis*	NA/NA	0.1/0.01	0.003/91	Chen et al. [11]/Czech Republic
Pilot/ Secondary	D	Galaxolide	0.47/2.0	25/7.4	0.1/CF	61	NA/NA/ 7	3.9 cm Gravel (5), 1.9 cm Tezontle (5) 3.8 cm Tezontle (5)/ *Typha latiffolia, Phragmites australis, Cyperus papyrus*	1.4/NA/ -325	4.1/0.9	0.3/79	Herrera-Cárdenas et al. [12]/ México
	D	Tonalide	0.47/2.0	25/7.4	0.1/CF	61	NA/NA/ 7	As above	As above	0.5/0.1	0.05/86	
	D	Methyl dihydro-jasmonate	0.47/2.0	25/7.4	0.1/CF	61	NA/NA/ 7	As above	As above	11/3.4	0.8/70	
Lab/ Secondary	D	Methyl dihydro-jasmonate	0.5/20	20/6.5	0.05/CF	6.0	3/36/3	45 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.2/ (-100/ -102)	7.3/1.1	0.3/85	Hijosa-Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	20/6.5	0.05/CF	6.0	3/36/3	As above	As above	3.8/1.1	0.1/72	
	D	Tonalide	0.5/20	20/6.5	0.05/CF	6.0	3/36/3	As above	As above	0.3/0.1	0.01/72	
Lab/	D	Methyl	0.5/20	19/7.2	0.05/CF	6.0	1.7/36/3	45 cm Siliceous	0.2/	7.3/1.2	0.3/83	Hijosa-

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Secondary		dihydro-jasmonate						gravel (4.0)/ Unplanted	(-100/ -155)			Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	19/7.2	0.05/CF	6.0	1.7/36/3	As above	As above	3.8/2.2	0.08/42	
	D	Tonalide	0.5/20	19/7.2	0.05/CF	6.0	1.7/36/3	As above	As above	0.3/0.2	0.004/36	
Full/ Tertiary	*	Galaxolide	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	Gravel (8-25) Granitic gravel (6-25)/ *Phragmites australis*	0.4/NA	1.4/0.8	0.001/42	Matamoros et al. [13]/Spain
	*	Oxybenzone	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	1.1/0.3	0.002/74	
	*	Methylparaben	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.7/0.6	0.0003/16	
	*	Triclosan	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.7/0.2	0.001/67	
	*	Tributyl phosphate	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.5/0.2	0.001/61	
	*	Tonalide	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.5/0.3	0.001/41	
	*	Tris (2-chloroethyl) phosphate	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.5/0.4	0.0004/28	
	*	Methyl dihydro-jasmonate	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.3/0.1	0.0004/56	
	*	Triphenyl phosphate	0.7/8.6	18/NA	0.003/IF	14	NA/120/1	As above	0.4/NA	0.1/0.01	0.0002/82	
Full/ Tertiary	*	Galaxolide	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	1.4/0.6	0.002/59	Matamoros et al. [13]/Spain
	*	Oxybenzone	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	1.1/0.2	0.002/85	
	*	Methylparaben	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.7/0.3	0.001/60	
	*	Triclosan	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.7/0.2	0.001/73	
	*	Tributyl phosphate	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.5/0.3	0.0004/34	
	*	Tonalide	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.5/0.2	0.001/51	
	*	Tris (2-	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.5/0.4	0.0002/19	

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
		chloroethyl) phosphate										
	*	Methyl dihydro-jasmonate	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.3/0.1	0.0004/60	
	*	Triphenyl phosphate	0.7/3.2	23/NA	0.003/IF	38	NA/120/1	As above	0.5/NA	0.1/0.02	0.0002/75	
Pilot/ Secondary	D	Acesulfame	0.5/5.5	21/NA	0.03/CF	22	5.5/60/12	Gravel (8-16)/ *Phragmites australis*	3.0/-277/ -228	19/19	0.0/0.0	Kahl et al. [14]/Germany
Full/ Tertiary	L	N,N-diethyl-meta-toluamide	NA/NA	NA/NA	0.01/NA	1.0	23/NA/12	NA/ *Phragmites australis*	NA/NA	1.5/0.03	0.02/98	Yi et al. [15]/ Singapore
Full/ Primary	D	Triclosan	NA/5.3	NA/NA	NA/NA	NA	NA/264/ 12	Crushed rock (4-8)/ *Phragmites australis*	NA/NA	0.6/0.1	NA/86	Vymazal et al. [16]/Czech Republic
	D	Triclocarban	NA/5.3	NA/NA	NA/NA	NA	As above	As above	NA/NA	0.1/0.01	NA/86	
Full/ Primary	D	Triclosan	NA/11	NA/NA	NA/NA	NA	NA/252/ 12	Gravel (4-8)/ *Phragmites australis*	NA/NA	0.2/0.1	NA/53	Vymazal et al. [16]/Czech Republic
	D	Triclocarban	NA/11	NA/NA	NA/NA	NA	As above	As above	NA/NA	0.03/0.01	NA/67	
Full/ Primary	D	Triclosan	NA/5.5	NA/NA	NA/NA	NA	NA/192/ 12	Gravel (4-8)/ *Phragmites australis, Phragmites arundinacea*	NA/NA	0.2/0.1	NA/47	Vymazal et al. [16]/Czech Republic
	D	Triclocarban	NA/5.5	NA/NA	NA/NA	NA	As above	As above	NA/NA	0.3/0.01	NA/96	
Full/ Primary	D	Triclosan	NA/4.6	NA/NA	NA/NA	NA	NA/120/ 12	Gravel (8-16)/ *Phragmites australis, Phragmites*	NA/NA	0.5/0.1	NA/73	Vymazal et al. [16]/Czech Republic

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								arundinacea				
	D	Triclocarban	NA/4.6	NA/NA	NA/NA	NA	As above	As above	NA/NA	0.05/0.01	NA/74	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Phragmites australis*	NA/NA	4.8/2.8	0.5/42	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.1	0.4/59	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Phragmites australis*	NA/NA	4.8/1.5	0.8/70	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.4	0.6/86	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Phragmites australis*	NA/NA	4.8/0.8	1.0/84	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.2	0.6/93	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm River gravel (10)/ *Phragmites australis*	NA/NA	4.8/2.2	0.6/54	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.8	0.5/71	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm River gravel (10)/ *Phragmites australis*	NA/NA	4.8/1.3	0.9/73	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.3	0.6/88	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm River gravel (10)/ *Phragmites australis*	NA/NA	4.8/0.7	1.0/86	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.2	0.6/92	

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Typha latifolia*	NA/NA	4.8/0.9	1.0/81	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.6	0.3/41	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Typha latifolia*	NA/NA	4.8/0.4	1.1/93	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.4	0.3/49	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Typha latifolia*	NA/NA	4.8/0.2	1.2/96	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.4	0.6/84	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm River gravel (10)/ *Typha latifolia*	NA/NA	4.8/1.2	0.9/76	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.8	0.2/34	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm River gravel (10)/ *Typha latifolia*	NA/NA	4.8/0.3	1.1/95	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.4	0.3/47	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm River gravel (10)/ *Typha latifolia*	NA/NA	4.8/0.2	1.2/96	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.3	0.6/87	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Cyperus papyrus*	NA/NA	4.8/2.1	0.7/56	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.2	0.4/54	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Cyperus*	NA/NA	4.8/0.7	1.0/85	Salcedo et al. [17]/Mexico

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								papyrus				
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.7	0.5/73	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm Volcanic gravel (4.0)/ *Cyperus papyrus*	NA/NA	4.8/0.3	1.1/93	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.5	0.6/83	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm River gravel (10)/ *Cyperus papyrus*	NA/NA	4.8/2.6	0.6/47	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.7	0.3/38	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm River gravel (10)/ *Cyperus papyrus*	NA/NA	4.8/0.6	1.1/87	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.9	0.5/68	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm River gravel (10)/ *Cyperus papyrus*	NA/NA	4.8/0.3	1.1/93	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/0.3	0.6/90	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm Volcanic gravel (4.0)/ Unplanted	NA/NA	4.8/2.5	0.6/49	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.8	0.2/33	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm Volcanic gravel (4.0)/ Unplanted	NA/NA	4.8/0.9	1.0/81	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.8	0.2/32	
Lab/ Primary	S	Methyl dihydro-	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm Volcanic gravel (4.0)/	NA/NA	4.8/0.7	1.0/86	Salcedo et al. [17]/Mexico

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
		jasmonate						Unplanted				
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.3	0.3/52	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	1.0/NA/ NA	33 cm River gravel (10)/ Unplanted	NA/NA	4.8/2.7	0.5/45	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/2.1	0.1/22	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	3.0/NA/ NA	33 cm River gravel (10)/ Unplanted	NA/NA	4.8/1.0	1.0/79	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.7	0.2/35	
Lab/ Primary	S	Methyl dihydro-jasmonate	0.33/2.3	NA/NA	0.25/IF	51	5.0/NA/ NA	33 cm River gravel (10)/ Unplanted	NA/NA	4.8/0.6	1.1/88	Salcedo et al. [17]/Mexico
	S	Galaxolide	0.33/2.3	NA/NA	0.25/IF	51	As above	As above	NA/NA	2.7/1.3	0.3/50	
Full/ Tertiary	D	Oxybenzone	NA/NA	16/8.6	3.4/NA	NA	14/NA/2	Steel slag/ *Phragmites australis*	6.0/NA	0.05/0.06	NR	Petrie et al. [18]/UK
	D	Sulisobenzone	NA/NA	16/8.6	3.4/NA	NA	14/NA/2	As above	6.0/NA	4.2/3.8	1.2/8.7	
	D	Methylparaben	NA/NA	16/8.6	3.4/NA	NA	14/NA/2	As above	6.0/NA	0.024/ 0.023	0.004/5.0	
	D	Propylparaben	NA/NA	16/8.6	3.4/NA	NA	14/NA/2	As above	6.0/NA	0.006/ 0.008	NR	
	D	Triclosan	NA/NA	16/8.6	3.4/NA	NA	14/NA/2	As above	6.0/NA	0.1/0.1	NR	
Full/ Tertiary	D	Oxybenzone	NA/NA	16/8.0	3.4/NA	NA	14/NA/2	Gravel/ *Phragmites australis*	5.5/NA	0.05/0.03	0.05/32	Petrie et al. [18]/UK
	D	Sulisobenzone	NA/NA	16/8.0	3.4/NA	NA	14/NA/2	As above	5.5/NA	4.2/3.9	1.0/7.3	
	D	Methylparaben	NA/NA	16/8.0	3.4/NA	NA	14/NA/2	As above	5.5/NA	0.024/0.02	0.01/16	
	D	Propylparaben	NA/NA	16/8.0	3.4/NA	NA	14/NA/2	As above	5.5/NA	0.006/ 0.006	0.0/1.6	
	D	Triclosan	NA/NA	16/8.0	3.4/NA	NA	14/NA/2	As above	5.5/NA	0.13/0.1	0.08/19	
Full/	D	Oxybenzone	NA/NA	16/8.2	3.4/NA	NA	14/NA/12	Gravel/	6.0/NA	0.05/0.07	NR	Petrie et al.

Wetland type/Scale /type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Tertiary								*Phragmites australis*				[18]/UK
	D	Sulisobenzone	NA/NA	16/8.2	3.4/NA	NA	14/NA/12	As above	6.0/NA	4.2/3.7	1.5/11	
	D	Methylparaben	NA/NA	16/8.2	3.4/NA	NA	14/NA/12	As above	6.0/NA	0.024/0.02	0.01/17	
	D	Propylparaben	NA/NA	16/8.2	3.4/NA	NA	14/NA/12	As above	6.0/NA	0.006/ 0.009	NR	
	D	Triclosan	NA/NA	16/8.2	3.4/NA	NA	14/NA/12	As above	6.0/NA	0.13/0.1	0.09/21	
Pilot/ Secondary	D	Acesulfame	0.5/5.3	12/7.2	0.03/CF	23	5.5/60/12	Gravel (8-16)/ *Phragmites australis*	3.0/-270/ -220	19/18	0.03/5.0	Nivala et al. [19]/Germany
Full/ Tertiary	L	Triclosan	NA/NA	NA/NA	NA/NA	NA/ NA	NA/NA/ 1.0	NA/*Typha angustifolia*; *Chrysopogon zizanioide*; *Cyperus papyrus*	NA/NA	0.003/ 0.001	NA/57	Wang et al. [20]/ Singapore
Full/ Tertiary	L	Triclosan	NA/NA	NA/NA	NA/NA	NA/ NA	NA/NA/ 1.0	As above	NA/NA	0.003/ 0.002	NA/29	Wang et al. [20]/ Singapore
Aerated HFCW												
Pilot/ Secondary	D	Acesulfame	1.0/1.4	21/NA	0.1/CF	87	5.5/60/12	Gravel (8-16)/ *Phragmites australis*	10/-277/ +208	19/4.0	2.1/79	Kahl et al. [14]/Germany
Pilot/ Secondary	D	Acesulfame	1.0/1.3	12/6.9	0.1/CF	90	5.5/60/12	Gravel (8-16)/ *Phragmites australis*	10/-270/ +183	19/7.2	1.6/62	Nivala et al. [19]/Germany

Note: Horizontal flow constructed wetland (HFCW); Wastewater type (WT); Domestic (D); Synthetic (S); Landfill leachate (L); Personal care products (PCPs); Temperature (T); Hydraulic loading rate (HLR); Operational mode (OM); Intermittently fed (IF); Continuously fed (CF); Organic loading rate (OLR); Chemical oxygen demand (COD); Hydraulic retention time (HRT); System age (SA); Experiment duration (ED); Dissolved oxygen (DO); Oxidation-reduction potential (ORP); Not available (NA); Not removed (NR).

Domestic (55%) and Industrial discharge (45%) (*); The Population equivalent (PE) is calculated based on the common relation 1 PE = 60 g biochemical oxygen demand (BOD) d^{-1}. BOD values were approximated using the ratio COD/BOD = 2 in the studies where BOD was not reported [10,13], and COD values were approximated using the ratio COD = 2BOD in the studies where COD was not reported [5,12,14,17,19].

Table S3. The performance of VFCW for personal care products removal.

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Pilot/ Secondary	D	Methyl dihydro-jasmonate	1.0/3.5	NA/8.1	0.07/IF	35	0.25/60/2	80 cm Gravel (0.5–4) 20 cm Gravel (8-16)/ *Phragmites australis*	9.0/NA	23/0.2	1.6/99	Matamoros et al. [21]/ Denmark
	D	Hydrocinnamic acid	1.0/3.5	NA/8.1	0.07/IF	35	0.25/60/2	As above	9.0/NA	15/0.2	1.1/99	
	D	Oxybenzone	1.0/3.5	NA/8.1	0.07/IF	35	0.25/60/2	As above	9.0/NA	15/0.4	1.0/97	
	D	Galaxolide	1.0/3.5	NA/8.1	0.07/IF	35	0.25/60/2	As above	9.0/NA	5.6/0.6	0.4/90	
	D	Tonalide	1.0/3.5	NA/8.1	0.07/IF	35	0.25/60/2	As above	9.0/NA	1.0/0.2	0.1/82	
Pilot/ Secondary	D	Tonalide	0.85/NA	19/6.6	0.095/ IF	NA	NA/12/2	Sand (1-3)/ *Phragmites australis*	5.5/-263/ +169	0.2/0.04	0.01/78	Ávila et al. [22]/Germany
	D	Oxybenzone	0.85/NA	19/6.6	0.095/ IF	NA	NA/12/2	As above	As above	2.6/0.1	0.2/96	
	D	Triclosan	0.85/NA	19/6.6	0.095/ IF	NA	NA/12/2	As above	As above	0.4/0.1	0.04/89	
Pilot/ Secondary	D	Tonalide	0.85/NA	19/7.2	0.095/ IF	NA	NA/12/2	Gravel (4-8)/ *Phragmites australis*	3.4/-263/ +98	0.2/0.1	0.01/61	Ávila et al. [22]/Germany
	D	Oxybenzone	0.85/NA	19/7.2	0.095/ IF	NA	NA/12/2	As above	As above	2.6/0.3	0.2/89	
	D	Triclosan	0.85/NA	19/7.2	0.095/ IF	NA	NA/12/2	As above	As above	0.4/0.1	0.03/73	
Pilot/ Secondary	D	Acesulfame	0.85/2.1	21/NA	0.09/ CF	58	NA/60/12	Gravel (4-8)/ *Phragmites australis*	4.0/-277/ +111	19/19.4	NR	Kahl et al. [14]/Germany
Pilot/ Primary	D	Triclosan	0.69/NA	NA/ NA	0.03/IF	1.0	7.0/NA/ 3.0	15 cm Gravel (20-30)	NA/NA	0.8/0.1	0.02/84	Francini et al. [23]/Italy

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								45 cm of expanded Agrileca clay (8-20) 5 cm Gravel (20-30)/ *Phragmites australis*				
Pilot/ Primary	D	Triclosan	0.69/NA	NA/ NA	0.03/IF	1.0	7.0/NA/ 3.0	15 cm Gravel (20-30)	NA/NA	0.8/0.1	0.02/83	Francini et al. [23]/Italy
								45 cm of expanded Agrileca clay (8-20) 5 cm Gravel (20-30)/*Salix matsudana*				
Pilot/ Secondary	D	N,N-diethyl-meta-toluamide	0.8/1.6	21/6.9	0.1/IF	40	NA/76/4	10 cm Sand (1-2) 70 cm Gravel (3-8)/ *Phragmites australis*	0.5/+33/ -16	2.4/1.7	0.1/28	Sgroi et al. [24]/Spain
	D	Sucralose	0.8/1.6	21/6.9	0.1/IF	40	NA/76/4	As above	As above	13.1/12.5	0.1/4.4	
Lab/Primary	S	Triclosan	0.6/NA	NA/ NA	0.08/ CF	4.0	3.0/5.0/ 3.0	20 cm Washed river sand (0-3.0) 20 cm Birnessite-coated sand (1.0-3.0) 10 cm Gravel	2.4/NA	80/7.2	5.8/91	Xie et al. [25]/China

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								(10-30)/ *Phragmites australis*				
Lab/Primary	S	Triclosan	0.6/NA	NA/ NA	0.08/ CF	4.0	3.0/5.0/ 3.0	40 cm Washed river sand (0-3.0) 10 cm Gravel (10-30)/ *Phragmites australis*	2.4/NA	80/13	5.4/84	Xie et al. [25]/China
Pilot/ Secondary	D	Acesulfame	0.85/2.0	13/6.6	0.09/ CF	61	NA/60/12	Gravel (4-8)/ *Phragmites australis*	5.0/-270/ +108	19/20	NR	Nivala et al. [19]/Germany
Lab/ Primary	S	Triclosan	0.64/11	20/8.0	0.02/ NA	11	7.0/1.0/16	30 cm Gravel (10-15) 80% Limestone /*Phalaris arundinacea*	8.5/NA	500/0.2	11/100	Button et al. [26]/Canada
Lab/ Primary	S	Triclosan	0.64/11	20/8.0	0.02/ NA	11	7.0/1.0/16	30 cm Gravel (10-15) 80% Limestone /Unplanted	8.5/NA	500/0.2	11/100	Button et al. [26]/Canada
Aerated VFCW												
Pilot/ Secondary	D	Tonalide	0.85/NA	19/6.1	0.095/ IF	NA	NA/12/2	Gravel (8-16)/ *Phragmites australis*	5.2/-263/ +172	0.2/0.03	0.01/83	Ávila et al. [22]/Germany
	D	Oxybenzone	0.85/NA	19/6.1	0.095/ IF	NA	NA/12/2	As above	As above	2.6/0.2	0.2/91	
	D	Triclosan	0.85/NA	19/6.1	0.095/	NA	NA/12/2	As above	As above	0.4/0.1	0.04/86	

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
Pilot/ Secondary	D	Acesulfame	0.85/2.1	21/NA	IF 0.09/ CF	58	NA/60/12	Gravel (8-16)/ *Phragmites australis*	8.0/-277 /+86	19/9.0	0.9/53	Kahl et al. [14]/Germany
Pilot/ Secondary	D	Acesulfame	0.85/2.0	12/7.0	0.09/ CF	61	NA/60/12	Gravel (8-16)/ *Phragmites australis*	8.0/-270 /+88	19/8.7	1.0/54	Nivala et al. [19]/Germany

Note: Vertical flow constructed wetland (VFCW); Wastewater type (WT); Domestic (D); Olive mill (O); Personal care products (PCPs); Temperature (T); Hydraulic loading rate (HLR); Operational mode (OM); Intermittently fed (IF); Continuously fed (CF); Organic loading rate (OLR); Chemical oxygen demand (COD); Hydraulic retention time (HRT); System age (SA); Experiment duration (ED); Dissolved oxygen (DO); Oxidation-reduction potential (ORP); Not available (NA); Not removed (NR).

The Population equivalent (PE) is calculated based on the common relation 1 PE = 60 g biochemical oxygen demand (BOD) d^{-1}. BOD values were approximated using the ratio COD/BOD = 2 in the studies where BOD was not reported [23,25,26], and COD values were approximated using the ratio COD = 2BOD in the studies where COD was not reported [14,19,21].

Table S4. The performance of HCW for personal care products removal.

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (μg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
HCW												
Full (FWS+FWS) /Secondary	D	Triclosan	0.13/NA	29/6.9	0.5/NA	NA	0.25/48/ 1.0	NA/*Acoru, Typha* spp.	NA/(543/ 116)	NA/NA	NA/70	Park et al. [27]/Korea
	D	Tris (2-chloroethyl) phosphate	0.13/NA	29/6.9	0.5/NA	NA	As above	As above	As above	NA/NA	NA/10	
Pilot (H+H+H)/ Secondary	D	Tonalide	NA/13	21/7.1	0.04/NA	9.3	3.5/26/0.8	30 cm Gravel (5)/*Phragmites australis*	5.4/(-97/ +126)	1.8/0.04	0.1/98	Ávila et al. [28]/Spain
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/18	16/7.3	0.05/CF	5.0	5.1/17/3	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.4 (0.5/0.3)/ +26/(+9/ -55)	4.0/0.7	0.2/82	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	16/7.3	0.05/CF	5.0	5.1/17/3	As above	As above	1.2/0.3	0.04/75	
	D	Tonalide	0.5/18	16/7.3	0.05/CF	5.0	5.1/17/3	As above	As above	0.4/0.1	0.01/70	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/18	17/7.9	0.05/CF	5.0	6.1/17/3	25 cm Siliceous gravel (4.0)/ Unplanted	1.4 (2.4/0.3)/ +26/(+25/ -118)	4.0/0.8	0.2/80	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/18	17/7.9	0.05/CF	5.0	6.1/17/3	As above	As above	1.2/0.3	0.04/75	
	D	Tonalide	0.5/18	17/7.9	0.05/CF	5.0	6.1/17/3	As above	As above	0.4/0.1	0.01/75	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/6.0	5.2/7.0	0.05/CF	25	5.1/11/3	25 cm Siliceous gravel (4.0)/ *Typha angustifolia*	0.6 (0.7/0.4)/ -6/(+15/ -16)	12/3.0	0.4/75	Hijosa-Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	5.2/7.0	0.05/CF	25	5.1/11/3	As above	As above	0.9/0.3	0.03/65	
	D	Tonalide	0.5/6.0	5.2/7.0	0.05/CF	25	5.1/11/3	As above	As above	0.4/0.2	0.01/60	
Lab (FWS+H)	D	Methyl	0.5/6.0	5.1/7.6	0.05/CF	25	6.1/11/3	25 cm	2.4	12/4.2	0.4/65	Hijosa-

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
/Secondary		dihydro-jasmonate						Siliceous gravel (4.0)/ Unplanted	(3.5/1.2)/ -6/(+40/ +3)			Valsero et al. [3]/Spain
	D	Galaxolide	0.5/6.0	5.1/7.6	0.05/CF	25	6.1/11/3	As above	As above	0.9/0.5	0.02/42	
	D	Tonalide	0.5/6.0	5.1/7.6	0.05/CF	25	6.1/11/3	As above	As above	0.4/0.2	0.01/52	
Full (FP+FWS+H)/ Secondary	D	Methyl dihydro-jasmonate	1.6 FP/ 0.3 FWS/ 0.5 H/5.8	NA/ NA	0.02/CF	4.0	75.9+1.2+ 5.7/NA/2	[30 cm Gravel (6-8)]FWS/ *Typha latifolia* [55 cm Gravel (6-8)]H/*Salix atrocinerea*	(9.0 FP/ 2.0 FWS/ 1.0 H)/NA	12/1.2	0.2/90	Hijosa-Valsero et al. [29]/Spain
Full (FP+FWS+H)/ Secondary	D	Methyl dihydro-jasmonate	1.8 FP/ NA FWS/ NA H/1.2	NA/ NA	0.24/NA	33	4.2+3.5+ 3.2/NA/2	[NA]FWS/ *Typha latifolia* [NA]H/*Salix atrocinerea*	(3.0 FP/ 3.0 FWS/ 6.0 H)/NA	6.6/0.3	1.5/95	Hijosa-Valsero et al. [29]/Spain
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /12	12/NA	0.04/IF	9.3	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites australis*	3.5/(+124/ -68)	1.1/1.9	NR	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	12/NA	0.04/IF	9.3	3.5/24/0.2	As above	As above	0.3/0.6	NR	
	D	Methyl dihydro-jasmonate	As above	12/NA	0.04/IF	9.3	3.5/24/0.2	As above	As above	16/5.7	0.4/64	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /12	22/NA	0.04/IF	6.8	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.4/(+124/ +116)	1.3/0.2	0.04/85	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	22/NA	0.04/IF	6.8	3.5/24/0.2	As above	As above	0.5/0.1	0.01/77	
	D	Methyl dihydro-	As above	22/NA	0.04/IF	6.8	3.5/24/0.2	As above	As above	21/0.4	0.7/98	

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
		jasmonate										
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /12	11/NA	0.04/CF	9.3	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites australis*	3.5/(+124/ -106)	1.1/2.7	NR	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	11/NA	0.04/CF	9.3	3.5/24/0.2	As above	As above	0.3/0.9	NR	
	D	Methyl dihydro-jasmonate	As above	11/NA	0.04/CF	9.3	3.5/24/0.2	As above	As above	16/10	0.2/35	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /12	21/NA	0.04/CF	6.8	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.8/(+124/ +92)	1.3/0.2	0.04/85	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	21/NA	0.04/CF	6.8	3.5/24/0.2	As above	As above	0.5/0.1	0.01/74	
	D	Methyl dihydro-jasmonate	As above	21/NA	0.04/CF	6.8	3.5/24/0.2	As above	As above	21/0.4	0.7/98	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /8.1	5.7/NA	0.04/CF	18.6	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites australis*	0.4/(-6.0/ -36)	0.9/1.1	NR	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	5.7/NA	0.04/CF	18.6	3.5/24/0.2	As above	As above	0.4/0.4	NR	
	D	Methyl dihydro-jasmonate	As above	5.7/NA	0.04/CF	18.6	3.5/24/0.2	As above	As above	12/7.1	0.2/38	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /24	17/NA	0.04/CF	3.8	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ *Phragmites*	0.3/(-6.0/ -102)	1.2/0.9	0.01/29	Hijosa-Valsero et al. [30]/Spain

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								australis				
	D	Tonalide	As above	17/NA	0.04/CF	3.8	3.5/24/0.2	As above	As above	0.4/0.2	0.005/38	
	D	Methyl dihydro-jasmonate	As above	17/NA	0.04/CF	3.8	3.5/24/0.2	As above	As above	4.0/0.1	0.1/96	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /8.1	4.5/NA	0.04/CF	18.6	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ Unplanted	0.6/(-6.0/ -47)	0.9/1.3	NR	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	4.5/ NA	0.04/CF	18.6	3.5/24/0.2	As above	As above	0.4/0.4	NR	
	D	Methyl dihydro-jasmonate	As above	4.5/ NA	0.04/CF	18.6	3.5/24/0.2	As above	As above	12/7.8	0.1/32	
Pilot (H+H+H)/ Secondary	D	Galaxolide	0.45-0.8 /24	17/NA	0.04/CF	3.8	3.5/24/0.2	30 cm Siliceous gravel (4.0)/ Unplanted	0.2/(-6.0/ -64)	1.2/1.1	0.003/6.6	Hijosa-Valsero et al. [30]/Spain
	D	Tonalide	As above	17/NA	0.04/CF	3.8	3.5/24/0.2	As above	As above	0.4/0.3	0.001/8.1	
	D	Methyl dihydro-jasmonate	As above	17/NA	0.04/CF	3.8	3.5/24/0.2	As above	As above	4.0/0.6	0.1/86	
Full (P+P+FWS)/ Tertiary	D	Cashmeran	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	NA/ *Phragmites australis, Typha latifolia*	3.3/NA	0.2/0.03	0.02/80	Matamoros and Salvadó [31]/Spain
	D	Celestolide	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.03/0.01	0.002/54	
	D	Galaxolide	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.8/0.04	0.1/95	
	D	Tonalide	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.3/0.04	0.04/88	
	D	Methyl dihydro-jasmonate	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.5/0.2	0.05/64	

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
	D	Triclosan	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.05/0.01	0.01/86	
	D	Oxybenzone	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.1/0.03	0.01/77	
	D	Tris (2-chloroethyl) phosphate	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.22/0.16	0.01/27	
	D	Tributyl phosphate	0.5/0.4	16/NA	0.2/NA	NA	8.5/132/4	As above	3.3/NA	0.06/0.02	0.01/60	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/18	16/7.4	0.05/CF	6.0	1/36/9	[25 cm Siliceous gravel (4.0)] H/*Typha angustifolia*	1.0 (1.4/0.6)/ +2.7/(+60/ -15)	5.8/0.6	0.3/89	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	16/7.4	0.05/CF	6.0	1/36/9	As above	As above	2.1/0.5	0.08/76	
	D	Tonalide	0.5/18	16/7.4	0.05/CF	6.0	1/36/9	As above	As above	0.4/0.1	0.01/67	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	5.2/7.0	0.05/CF	17	1/30/6	[25 cm Siliceous gravel (4.0)] H/*Typha angustifolia*	0.8 (1.1/0.5)/ -41/(+15/ -74)	6.6/1.8	0.2/72	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/8.4	5.2/7.0	0.05/CF	17	1/30/6	As above	As above	1.5/0.5	0.05/68	
	D	Tonalide	0.5/8.4	5.2/7.0	0.05/CF	17	1/30/6	As above	As above	0.3/0.1	0.01/66	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/18	18/7.9	0.05/CF	6.0	0.6/36/9	[25 cm Siliceous gravel (4.0)] H/Unplanted	2.6 (4.6/0.5)/ +2.7/(+91/ -79)	5.8/1.0	0.2/82	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/18	18/7.9	0.05/CF	6.0	0.6/36/9	As above	As above	2.1/0.7	0.07/69	
	D	Tonalide	0.5/18	18/7.9	0.05/CF	6.0	0.6/36/9	As above	As above	0.4/0.2	0.01/62	
Lab (FWS+H) /Secondary	D	Methyl dihydro-jasmonate	0.5/8.4	5.1/7.7	0.05/CF	17	0.6/30/6	[25 cm Siliceous gravel (4.0)] H/Unplanted	1.7 (2.6/0.9)/ -41/(+36/-40)	6.6/1.9	0.2/71	Reyes-Contreras et al. [4]/Spain
	D	Galaxolide	0.5/8.4	5.1/7.7	0.05/CF	17	0.6/30/6	As above	As above	1.5/0.7	0.04/52	

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
	D	Tonalide	0.5/8.4	5.1/7.7	0.05/CF	17	0.6/30/6	As above	As above	0.3/0.1	0.01/61	
Pilot (H+H+H)/ Secondary	D	Tonalide	0.45-0.5/ 10	14/6.9	0.04/CF	12	3.5/34/0.9	30 cm Gravel (7.3)/ *Phragmites australis*	NA/ (-196/-96)	3.4/0.4	0.1/88	Ávila et al. [32]/Spain
	D	Oxybenzone	0.45-0.5/ 10	14/6.9	0.04/CF	12	3.5/34/0.9	As above	As above	8.3/1.1	0.3/87	
Pilot (H+H+H)/ Secondary	D	Tonalide	0.45-0.5/ 12	14/6.9	0.04/IF	10	3.5/34/0.9	As above	NA/(-87/ -11)	3.4/0.3	0.1/91	Ávila et al. [32]/Spain
	D	Oxybenzone	0.45-0.5/ 12	14/6.9	0.04/IF	10	3.5/34/0.9	As above	As above	8.2/0.4	0.3/95	
Full (H+H+FWS)/ Tertiary	D	N,N-diethyl-3-methyl benzoylamide	NA/NA	NA/ NA	0.8/CF	NA	1.6/NA/2	NA/[*Cyperus alternifolius, Thalia dealbata*] H, [*Thalia dealbata, Canna lily, Iris pseudacorus, Herba Saururi Chinensis, Oenanthe javanica*] H, [*Nymphaea alba, Herba Saururi Chinensis, Pontederia cordata, Iris tectorum, Thalia*	NA/NA	0.05/0.07	NR	Zhu and Chen [33]/ China

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								dealbata, Hydrocotyle verticillata, Phragmites australis] FWS				
	D	Triclocarban	NA/NA	NA/ NA	0.8/CF	NA	1.6/NA/2	As above	NA/NA	0.008/ 0.01	NR	
Pilot (V+V+H+FWS)/ Secondary	D	Tonalide	NA/2.7	14/7.8	0.06/IF	37	4/12/1.4	[10 cm Sand (1-2) Gravel (3-8)]V [30 cm Gravel (4-12) Inlet & outlet, Stones (30-50)]H [10 cm Gravel (4-12)]FWS/ *Phragmites australis*	(3.6 V/ 0.6 H/ 5.9 FWS)/ (-88/ +171)	NA/NA	NA/95	Ávila et al. [34]/Spain
	D	Oxybenzone	NA/2.7	14/7.8	0.06/IF	37	4/12/1.4	As above	As above	NA/NA	NA/96	
	D	Triclosan	NA/2.7	14/7.8	0.06/IF	37	4/12/1.4	As above	As above	NA/NA	NA/96	
Pilot (V+V+H+FWS)/ Secondary	D	Tonalide	NA/0.9	16/8.0	0.13/IF	110	2/12/1.4	As above	(3.2 V/ 0.4 H/ 5.2 FWS)/ (-139/ +158)	NA/NA	NA/85	Ávila et al. [34]/Spain
	D	Oxybenzone	NA/0.9	16/8.0	0.13/IF	110	2/12/1.4	As above	As above	NA/NA	NA/92	
	D	Triclosan	NA/0.9	16/8.0	0.13/IF	110	2/12/1.4	As above	As above	NA/NA	NA/92	
Pilot (V+V+H+FWS)/ Secondary	D	Tonalide	NA/0.6	18/7.6	0.18/IF	159	1.5/12/1.4	As above	(2.7 V/ 0.3 H/ 3.7 FWS)/ (-168/	NA/NA	NA/85	Ávila et al. [34]/Spain

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
									+156)			
	D	Oxybenzone	NA/0.6	18/7.6	0.18/IF	159	1.5/12/1.4	As above	As above	NA/NA	NA/95	
	D	Triclosan	NA/0.6	18/7.6	0.18/IF	159	1.5/12/1.4	As above	As above	NA/NA	NA/85	
Full (V+H+FWS)/ Secondary	D	Tonalide	0.8 V/ 0.4 H/ 0.3 FWS/11	20/7.8	0.04/IF	11	7.4/54/ NA	[5 cm Sand (1-2) 60 cm Siliceous gravel (4-12) 15 cm Siliceous gravel (25-40)]V /*Phragmites australis* [40 cm Siliceous gravel (4-12) Inlet & outlet, Stones (40-80)]H/ *Phragmites australis* [20 cm Siliceous gravel)]FWS/ *Typha* spp., *Scirpus* spp., *Iris pseudacorus, Carex flacca, Cyperus rutundus* and	(2.0 V/ 4.2 H/ 2.7 FWS)/ (+2/+129)	0.3/0.02	0.01/94	Ávila et al. [35]/Spain

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								Juncus spp.				
	D	Triclosan	As above /11	20/7.8	0.04/IF	11	7.4/54/ NA	As above	As above	0.1/0.03	0.004/77	
Full (H+H)/ Secondary	D	Methyl dihydro-jasmonate	0.5/3.6	21/NA	0.1/IF	33	5/120/1	NA/ *Phragmites australis*	0.9/NA	NA/NA	NA/93	Matamoros et al. [36]/ Spain
	D	Galaxolide	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/75	
	D	Oxybenzone	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/78	
	D	Tonalide	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/73	
	D	Methylparaben	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/56	
	D	Tributyl phosphate	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/37	
	D	Triclosan	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/35	
	D	Cashmeran	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/39	
	D	Triphenyl phosphate	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/67	
	D	Tris (2-chloroethyl) phosphate	0.5/3.6	21/NA	0.1/IF	33	5/120/1	As above	0.9/NA	NA/NA	NA/24	
Full (H+H)/ Secondary	D	Methyl dihydro-jasmonate	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/79	Matamoros et al. [36]/ Spain
	D	Galaxolide	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/79	
	D	Oxybenzone	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/87	
	D	Tonalide	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/83	
	D	Methylparaben	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/33	
	D	Tributyl phosphate	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/32	
	D	Triclosan	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/45	
	D	Cashmeran	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/50	

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
	D	Triphenyl phosphate	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/38	
	D	Tris (2-chloroethyl) phosphate	0.5/4.8	10/NA	0.1/IF	24	5/120/1	As above	1.2/NA	NA/NA	NA/7.0	
Lab $^{(FWS+H)}$ /Secondary	D	Methyl dihydro-jasmonate	0.5/20	19/6.7	0.05/CF	6.0	1.6/36/3	[25 cm Siliceous gravel (4.0)]^{H}/ *Typha angustifolia*	(0.2 ^{FWS}/ 0.2 ^{H})/ (-100/ -134)	7.3/0.9	0.3/87	Hijosa-Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	19/6.7	0.05/CF	6.0	1.6/36/3	As above	As above	3.8/1.2	0.1/68	
	D	Tonalide	0.5/20	19/6.7	0.05/CF	6.0	1.6/36/3	As above	As above	0.3/0.1	0.01/64	
Lab $^{(FWS+H)}$ /Secondary	D	Methyl dihydro-jasmonate	0.5/20	18/7.4	0.05/CF	6.0	2.3/36/3	[25 cm Siliceous gravel (4.0)]^{H}/ Unplanted	(0.3 ^{FWS}/ 0.1 ^{H})/ (-100/ -132)	7.3/1.0	0.3/86	Hijosa-Valsero et al. [5]/Spain
	D	Galaxolide	0.5/20	18/7.4	0.05/CF	6.0	2.3/36/3	As above	As above	3.8/1.4	0.1/64	
	D	Tonalide	0.5/20	18/7.4	0.05/CF	6.0	2.3/36/3	As above	As above	0.3/0.1	0.01/64	
Full $^{(V+H)}$/ Tertiary**	D	Triclosan	0.7 ^{V}/ 0.8 ^{H}/17	25.8/ 6.7	0.5/IF	7.2	1/9/2	[Gravel (10-30) Gravel (30-50)]$^{V+H}$/ [*Canna glauca, Thalia dealbata, Canna indica, Typha angustifolia*] ^{V} [*Cyperus alternifolius, Arundo donax, Acorus*	3.1/NA	0.2/0.03	0.1/84	Dai et al. [37]/China

Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								tatarinowii, Desmodium styracifolium]^{H}				
Full $^{(V+H)}$/ Tertiary**	D	Triclosan	0.7 ^{V}/ 0.8 ^{H}/8.4	25.8/ 6.7	1.0/IF	14	0.5/9/2	As above	3.1/NA	0.2/0.03	0.2/84	Dai et al. [37]/China
Full $^{(V+H)}$/ Tertiary**	D	Triclosan	0.7 ^{V}/ 0.8 ^{H}/5.6	25.8/ 6.7	1.5/IF	21	0.3/9/2	As above	3.1/NA	0.2/0.03	0.2/84	Dai et al. [37]/China
Full $^{(V+H)}$/ Tertiary**	D	Triclosan	0.7 ^{V}/ 0.8 ^{H}/4.2	25.8/ 6.7	2.0/IF	29	0.25/9/2	As above	3.1/NA	0.2/0.03	0.3/84	Dai et al. [37]/China
Pilot $^{(V+V)}$/ Secondary	D	Acesulfame	(0.85 ^{VG} /0.85 ^{VS}) /4.1	21/NA	0.05/IF	29	NA/60/12	Gravel (4-8)^{VG} Sand (1-3)^{VS}/ *Phragmites australis*	10/(-277/ +216)	19/10	0.4/47	Kahl et al. [14]/ Germany
Full $^{(V+V+H+FWS)}$/ Secondary	H	Triclosan	NA/NA	NA/7.6	0.02/NA	2.1	10/12/12	[60 cm Fluviatile sand] ^{V} [25 cm Fluviatile sand] ^{H}/*Phragmites australis, Typha latifolia L., Scirpus sylvaticus L.*	NA/NA	0.2/0.1	0.002/50	Vystavna et al. [38]/ Ukraine
Full $^{(V+V+H+FWS)}$/ Secondary	H	Triclosan	NA/NA	NA/7.7	0.03/ NA	4.4	13/48/12	As above	NA/NA	0.3/0.01	0.008/97	Vystavna et al. [38]/ Ukraine
Pilot $^{(V+H+FWS)}$/ Secondary	D	N,N-diethyl-meta-toluamide	0.8 ^{V}/ 0.3 ^{H}/ 0.5 ^{FWS}/ 1.6	20/7.4	0.1/IF	40	NA/76/4	[10 cm Sand (1-2) 70 cm Gravel (3-8)]^{V}	(2.1 ^{V}/ 2.2 ^{H}/ 0.8 ^{FWS})/ (+33/+69)	2.4/0.5	0.3/80	Sgroi et al. [24]/Spain

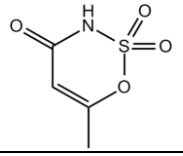
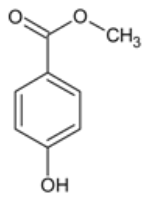
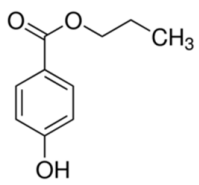
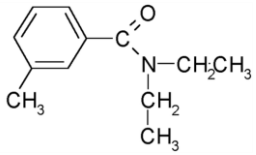
Wetland type/Scale/ type of treatment	WT	PCPs	Depth (m)/ Area (m^2 PE^{-1})	T (°C) /pH	HLR (m^3 m^{-2} d^{-1})/ OM	OLR (g COD m^{-2} d^{-1})	HRT (days) /SA/ED (months)	Filter media (mm)/Plants	Effluent DO (mg L^{-1})/ ORP (Inf/Eff) (mV)	Influent/ Effluent conc. (µg L^{-1})	Removal rate (mg m^{-2} d^{-1}) /Removal (%)	Author/ Country
								[30 cm Gravel (4-12) Inlet and outlet: Stone (30-50)]^{H}/ *Phragmites australis*				
	D	Sucralose	As above /1.6	20/7.4	0.1/IF	40	NA/76/4	As above	As above	13.1/13.3	NR	
Full $^{(FWS+V+FWS+FWS+SL)}$/ Primary	*	N,N-diethyl-3-methyl-benzamide	NA/6.5	NA/8.0	0.22/CF	26	1.5/NA/ 12	NA/ *Myriophyllum verticillatum* L., *Pontederia cordata*	NA/NA	0.5/0.01	0.1/97	Chen et al. [39]/China
	*	Triclosan	NA/6.5	NA/ 8.0	0.22/CF	26	1.5/NA/ 12	As above		0.2/0.04	0.03/81	
	*	Carbendazim	NA/6.5	NA/ 8.0	0.22/CF	26	1.5/NA/ 12	As above		0.1/0.003	0.02/98	
	*	Methylparaben	NA/6.5	NA/ 8.0	0.22/CF	26	1.5/NA/ 12	As above		0.06/0.01	0.01/77	
Pilot $^{(V+V)}$/ Secondary	D	Acesulfame	(0.85 ^{VG} /0.85 ^{VS}) /4.0	12/6.9	0.05/IF	30	NA/60/12	Gravel (4-8)^{VG} Sand (1-3)^{VS}/ *Phragmites australis*	9.0/(-270/ +207)	19/8.7	0.5/54	Nivala et al. [19]/ Germany

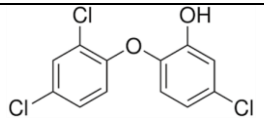
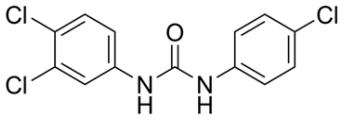
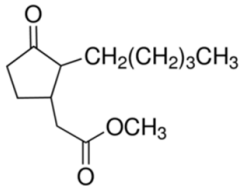
Note: Free water surface flow constructed wetland (FWSCW); Horizontal flow constructed wetland (HFCW); Vertical flow constructed wetland (VFCW); Hybrid constructed wetland (HCW); Wastewater type (WT); Domestic (D); Healthcare facility/hospital (H); Personal care products (PCPs); Temperature (T); Hydraulic loading rate (HLR); Operational mode (OM); Intermittently fed (IF); Continuously fed (CF); Organic loading rate (OLR); Chemical oxygen demand (COD); Hydraulic retention time (HRT); System age (SA); Experiment duration (ED); Dissolved oxygen (DO); Oxidation-reduction potential (ORP); Not available (NA); Not removed (NR).

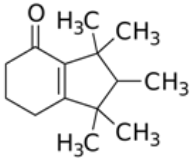
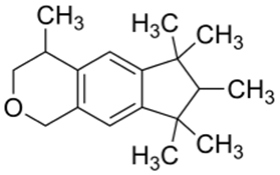
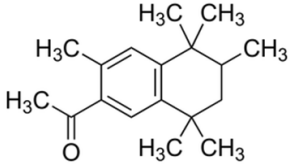
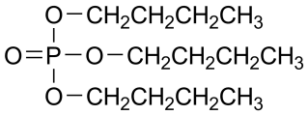
Domestic (70%) and livestock sewage (30%) (*); Two FWSCWs are connected in series ($^{FWS+FWS}$); Two HFCWs are connected in parallel with one HFCW in series ($^{H+H+H}$); FWSCWs on top of HF filter ($^{FWS+H}$); Two HFCWs and one FWSCW are connected in series ($^{H+H+FWS}$); Two polishing ponds and one FWSCW are connected in parallel ($^{P+P+FWS}$); Facultative pond, FWSCW and HFCW are connected in series ($^{FP+FWS+H}$); Two VFCWs are connected in parallel, and HFCW and FWSCW are connected in series ($^{V+V+H+FWS}$); VFCW, HFCW and FWSCW are connected in series ($^{V+H+FWS}$); Two HFCWs are connected in parallel ($^{H+H}$); VFCW and HFCW are in a stack design ($^{V+H}$)**; Three FWSCWs, one VFCW and one stabilization lagoon are connected in series ($^{FWS+V+FWS+FWS+SL}$); Two VFCWs are connected in parallel ($^{V+V}$). The Population equivalent (PE) is calculated based on the common relation 1 PE = 60 g biochemical oxygen demand (BOD) d^{-1}. BOD values were approximated using the ratio COD/BOD = 2 in the studies where BOD was not reported [36,37], and COD values were approximated using the ratio COD = 2BOD in the studies where COD was not reported [5,14,19,29].

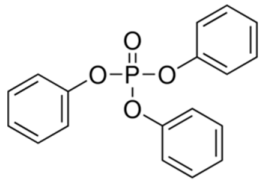
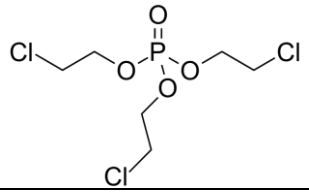
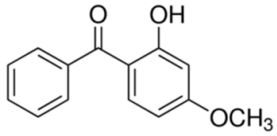
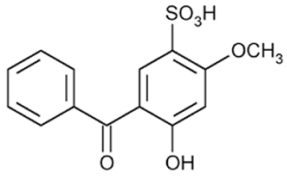
Supplementary materials 2: Physicochemical properties of selected personal care products.

Table S5. Physicochemical properties of 15 selected personal care products.

Class/ PCPs/ Molecular weight (g mol^{-1})	Molecular formula	Molecular structure	Water Solubility at 25 °C (mg L^{-1})	Log Kow	Log Koc	Log Dow	Henry's Law Constant (atm m^3 mol^{-1})	pKa/ charge at pH 7	Reference
Artificial sweeteners									
Acesulfame/ 163.15	$C_4H_5NO_4S$		2.7×10^5	-1.33	0.347	-1.49	9.63×10^{-9}	2.0/ negative	(1); (2); (3); Zou et al [40]; Magnuson et al. [41]
Preservatives									
Methylparaben/ 152.15	$C_8H_8O_3$		5.98×10^3	2.00	2.11	1.63	3.61×10^{-9}	8.3/ neutral	(2); (3); Petrie et al. [18]
Propylparaben/ 180.21	$C_{10}H_{12}O_3$		529.3	2.98	2.71	2.51	6.37×10^{-9}	8.2/ neutral	(2); (3); Petrie et al. [18]
Insect repellents									
N,N-diethyl-meta-toluamide/ 191.3	$C_{12}H_{17}NO$		912	2.18	1.76	2.50	2.10×10^{-8}	0.7/ neutral	(2); Conkle et al. [42]; Anumol et al. [43]; Li et al. [7]; Yi et al. [15]; Sgroi et al. [24]
Antiseptics									

Class/ PCPs/ Molecular weight (g mol^{-1})	Molecular formula	Molecular structure	Water Solubility at 25 °C (mg L^{-1})	Log Kow	Log Koc	Log Dow	Henry's Law Constant (atm m^3 mol^{-1})	pKa/ charge at pH 7	Reference
Triclosan/ 289.55	$C_{12}H_7Cl_3O_2$		10	5.34	4.26	4.76	2.13×10^{-8}	7.9/ neutral; negative	(2); Park et al. [27]; Verlicchi et al. [44,45]; Zhang et al. [46]; Zhu and Chen [33]; Carranza-Diaz et al. [9]; Dai et al. [37]; Li et al. [7]; Vystavna et al. [38]; Petrie et al. [18]; Wang et al. [20]
Triclocarban/ 315.6	$C_{13}H_9Cl_3N_2O$		0.11	4.90	3.73	4.90	4.50×10^{-11}	12.8/ neutral	(2); Zhu and Chen [33]; Anumol et al. [43]; Verlicchi et al. [45]; Chen et al. [11]
Fragrances									
Methyl dihydro-jasmonate/ 226.31	$C_{13}H_{22}O_3$		91.7	2.98	2.18	NA	5.02×10^{-7}	-6.9/ neutral	(2); (4) Hijosa-Valsero et al. [3,5,30]; Reyes-Contreras et al. [4]; Zhang et al. [46]; Verlicchi et al. [45]

Class/ PCPs/ Molecular weight (g mol^{-1})	Molecular formula	Molecular structure	Water Solubility at 25 °C (mg L^{-1})	Log Kow	Log Koc	Log Dow	Henry's Law Constant (atm m^3 mol^{-1})	pKa/ charge at pH 7	Reference
Cashmeran/ 206.33	$C_{14}H_{22}O$		5.94	4.49	2.99	NA	1.42×10^{-4}	-5.1/ neutral	(2); (3); (5); Hijosa-Valsero et al. [3]; Verlicchi et al. [45]
Galaxolide/ 258.4	$C_{18}H_{26}O$		1.75	6.26	4.29	NA	1.32×10^{-4}	8.24/ neutral	(2); (3); Hijosa-Valsero et al. [3,5,30]; Reyes-Contreras et al. [4]; Zhang et al. [46]; Verlicchi et al. [45]
Tonalide/ 258.41	$C_{18}H_{26}O$		1.25	6.35	4.27	5.80	4.22×10^{-5}	16/ neutral	(2); (3); Ávila et al. [28]; Hijosa-Valsero et al. [3,5,30]; Reyes-Contreras et al. [4]; Zhang et al. [46]; Verlicchi et al. [45]
Flame retardants									
Tributyl phosphate/ 266.32	$C_{12}H_{27}O_4P$		280	4.00	3.24	NA	3.19×10^{-6}	19/ neutral	(2); (3); Bergman et al. [47]

Class/ PCPs/ Molecular weight (g mol^{-1})	Molecular formula	Molecular structure	Water Solubility at 25 °C (mg L^{-1})	Log Kow	Log Koc	Log Dow	Henry's Law Constant (atm m^3 mol^{-1})	pKa/ charge at pH 7	Reference
Triphenyl phosphate/ 326.29	$C_{18}H_{15}O_4P$		1.9	4.70	3.24	NA	3.98×10^{-8}	16.4/ neutral	(2); (3); Brooke et al. [48]
Tris (2-chloroethyl) phosphate/ 285.48	$C_6H_{12}Cl_3O_4P$		7.82×10^{3}	1.63	2.48	NA	2.55×10^{-8}	16.1/ neutral	(3); (6); (7); Xu et al. [49]
Sunscreen agents									
Oxybenzone/ 228.25	$C_{14}H_{12}O_3$		68.6	3.52	2.63	3.06	1.50×10^{-8}	7.92/ neutral	(2); (3); (7); Zhang et al. [46]; Verlicchi et al. [45]; Petrie et al. [18]
Sulisobenzone/ 308.31	$C_{14}H_{12}O_6S$		2.03×10^{4}	0.37	1.55	-0.53	7.06×10^{-15}	1.99/ negative	(2); (3); (8); Petrie et al. [18]

Note: https://www.drugfuture.com/chemdata/ (1); https://www.ncbi.nlm.nih.gov/pccompound (2); QSAR Toolbox 4.3.1 (3); http://www.hmdb.ca/metabolites/HMDB0031740 (4); http://contaminantdb.ca/contaminants/CHEM008153 (5); https://www.sigmaaldrich.com/nederland.html (6); http://www.t3db.ca/toxins/T3D4950 (7); https://www.drugbank.ca/drugs/DB11185 (8); Molecular structures are taken from website: https://images.google.com/

Supplementary materials 3: The removal efficiency of 15 widely studied PCPs in four types of CWs.

Table S6. The removal efficiency (mean % and standard deviation) of 15 widely studied PCPs in four types of CWs.

Class/PCPs	FWSCW (n)	HFCW (n)	VFCW (n)	HCW (n)
Artificial sweeteners				
Acesulfame	NA	2.5±3.5 (2)	-3.5±2.1 (2)	51±5 (2)
Preservatives				
Methylparaben	90±1 (2)	23±21 (5)	NA	55±22 (3)
Propylparaben	75±20 (2)	- 21±21 (3)	NA	NA
Insect repellents				
N,N-diethyl-meta-toluamide	0.0 (1)	98 (1)	28 (1)	80 (1)
Antiseptics				
Triclosan	97±2 (4)	59±31 (18)	88±9 (8)	77±19 (15)
Triclocarban	NA	81±13 (4)	NA	- 14 (1)
Fragrances				
Methyl dihydrojasmonate	71±20 (15)	73±21 (37)	99 (1)	76±19 (23)
Cashmeran	NA	NA	NA	56±21 (3)
Glaxolide	63±26 (18)	53±26 (37)	90 (1)	65±22 (17)
Tonalide	59±27 (18)	43±25 (12)	74±11 (3)	72±20 (24)
Flame retardants				
Tributyl phosphate	NA	48±19 (2)	NA	43±15 (3)
Triphenyl phosphate	NA	79±5 (2)	NA	53±21 (2)
Tris (2-chloroethyl) phosphate	NA	24±6 (2)	NA	17±10 (4)
Sunscreen agents				
Oxybenzone	NA	64±28 (3)	94±4 (3)	88±8 (8)
Sulisobenzone	NA	9.0±1.9 (3)	NA	NA

Note: Constructed wetlands (CWs); Free water surface CW (FWSCW); Horizontal flow CW (HFCW); Vertical flow CW (VFCW); Hybrid CW (HCW); Number of data points (n); Not available (NA).

Supplementary materials 4: Influence of design and operational factors, and physicochemical parameters of CWs on the removal of PCPs.

Table S7. Pearson correlation statistics among the studied factors and six selected PCPs.

Personal care products	Depth	Area	HLR	OLR	HRT	Temperature	pH	Effluent DO
Galaxolide	0.197	-0.043	0.100	-0.001	**0.267**	**0.485**	0.019	**0.361**
Methyl dihydrojasmonate	-0.011	**0.247**	0.120	-0.064	0.141	**0.714**	-0.011	0.111
Tonalide	**0.332**	-0.153	0.254	0.129	**0.283**	**0.417**	0.138	**0.506**
Triclosan	0.182	0.061	**-0.386**	0.039	-0.274	0.271	-0.245	**0.443**
Methylparaben	0.736	**-0.754**	**-0.690**	**0.836**	0.160	0.561	-0.600	-0.704
Oxybenzone	**0.733**	-0.054	**-0.889**	0.369	**-0.934**	-0.047	-0.311	0.145

Note: Bold values indicate a significant correlation between the parameters at 95% confidence level.

Supplementary materials 5: The estimated statistics (mean and standard deviation), results of z-Test for comparison of means of the removal efficiency of PCPs in planted and unplanted CWs, and in different seasons.

Table S8. Statistics (mean and standard deviation) of PCPs in planted and unplanted CWs and in different seasons.

Class/PCPs	No. of observations based on removal (%)	Influent conc. ($\mu g\ L^{-1}$) Mean ± Stdev	Effluent conc. ($\mu g\ L^{-1}$) Mean ± Stdev	Removal rate ($mg\ m^{-2}\ d^{-1}$) Mean ± Stdev	Removal efficiency (%) Mean ± Stdev	Influent conc. ($\mu g\ L^{-1}$) Mean ± Stdev	Effluent conc. ($\mu g\ L^{-1}$) Mean ± Stdev	Removal rate ($mg\ m^{-2}\ d^{-1}$) Mean ± Stdev	Removal efficiency (%) Mean ± Stdev
	Planted/ Unplanted	**Planted CWs**				**Unplanted CWs**			
Fragrances									
Methyl dihydrojasmonate	34/18	7.3±4.7	1.7±2.2	0.6±0.4	77±20	6.5±2.8	2.3±2.2	0.4±0.4	68±23
Galaxolide	32/16	2.2±0.8	0.9±0.6	0.3±0.2	63±24	2.1±0.9	1.4±0.6	0.1±0.1	39±21
Tonalide	13/10	0.4±0.1	0.3±0.2	0.009± 0.002	58±19	0.4±0.2	0.3±0.2	0.007± 0.004	42±25
Antiseptics									
Triclosan	2/2	251±353	0.6±0.5	5.5±7.8	54±65	251±353	0.6±0.5	5.5±7.8	51±69
	Summer/ Winter	**Summer**				**Winter**			
Fragrances									
Methyl dihydrojasmonate	19/19	6.6±5.3	0.6±0.3	0.3±0.2	88±7	10±3	5.0±2.2	0.2±0.1	52±19
Galaxolide	20/14	1.6±0.5	0.6±0.4	0.05±0.03	65±24	1.3±0.5	1.0±0.6	0.02±0.01	42±26
Tonalide	20/13	0.4±0.1	0.2±0.1	0.01±0.004	62±21	0.4±0.1	0.3±0.2	0.007± 0.003	45±26
Cashmeran	1/1	NA	NA	NA	39	NA	NA	NA	50
Antiseptics									

Class/PCPs	No. of observations based on removal (%)	Influent conc. (μg L^{-1}) Mean ± Stdev	Effluent conc. (μg L^{-1}) Mean ± Stdev	Removal rate (mg m^{-2} d^{-1}) Mean ± Stdev	Removal efficiency (%) Mean ± Stdev	Influent conc. (μg L^{-1}) Mean ± Stdev	Effluent conc. (μg L^{-1}) Mean ± Stdev	Removal rate (mg m^{-2} d^{-1}) Mean ± Stdev	Removal efficiency (%) Mean ± Stdev
Triclosan	1/1	NA	NA	NA	35	NA	NA	NA	45
Preservatives									
Methylparaben	1/1	NA	NA	NA	56	NA	NA	NA	33
Flame retardants									
Tributyl phosphate	1/1	NA	NA	NA	37	NA	NA	NA	32
Triphenyl phosphate	1/1	NA	NA	NA	67	NA	NA	NA	38
Tris (2-chloroethyl) phosphate	1/1	NA	NA	NA	24	NA	NA	NA	7.0
Sunscreen agents									
Oxybenzone	1/1	NA	NA	NA	78	NA	NA	NA	87

Note: For planted and unplanted CWs data is taken from: Hijosa-Valsero et al. [3,5,30]; Reyes-Contreras et al. [4]; Carranza-Diaz et al. [9]; Salcedo et al. [17]; Button et al. [26]; For seasonal differences data is taken from: Matamoros et al. [1,36]; Hijosa-Valsero et al. [3,30]; Reyes-Contreras et al. [4].

Table S9. The results (*p*-values) of z-Test for comparison of means for the removal of PCPs in planted and unplanted CWs, and in different seasons.

z-Test results		
Parameter	**Planted Vs Unplanted CWs**	**Summer Vs Winter**
Methyl dihydrojasmonate	0.18	**0.01**
Galaxolide	**0.0003**	**0.01**
Tonalide	0.08	0.06

Note: Bold values indicate significant difference at $\alpha = 0.05$ ($p < 0.05$) for z-test results.

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