

Distribution of pharmaceuticals in marine surface sediments and macroalgae (ulvophyceae) around Mombasa peri-urban Creeks and Gazi Bay, Kenya

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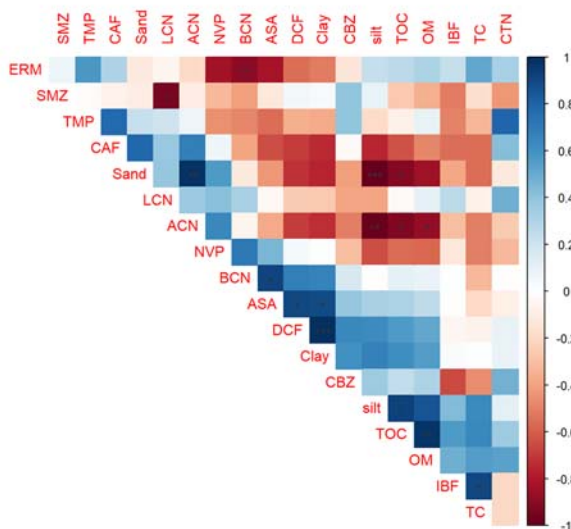
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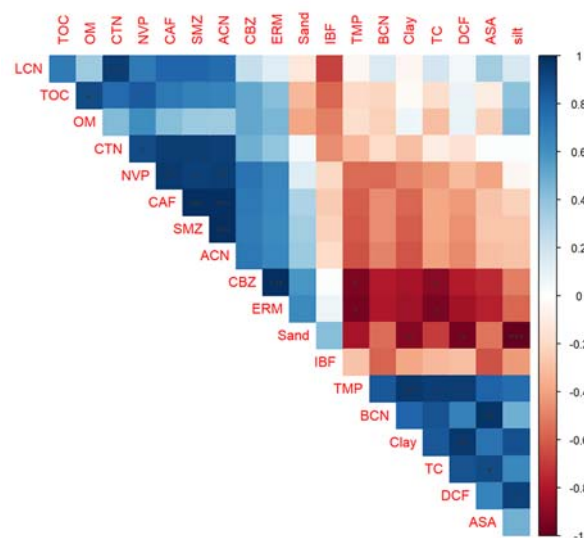
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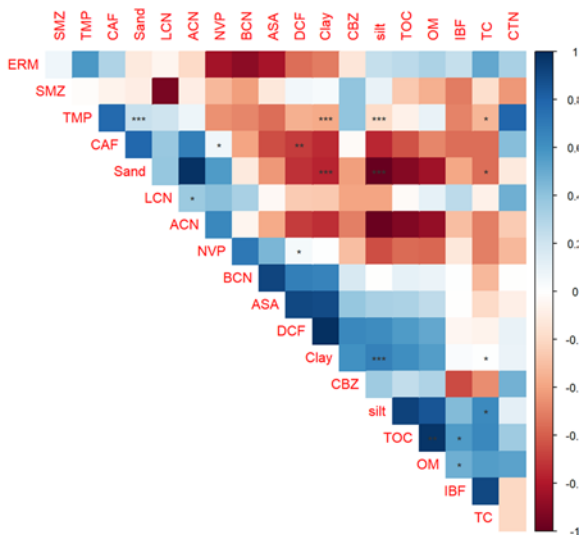
Tudor (Dry season)



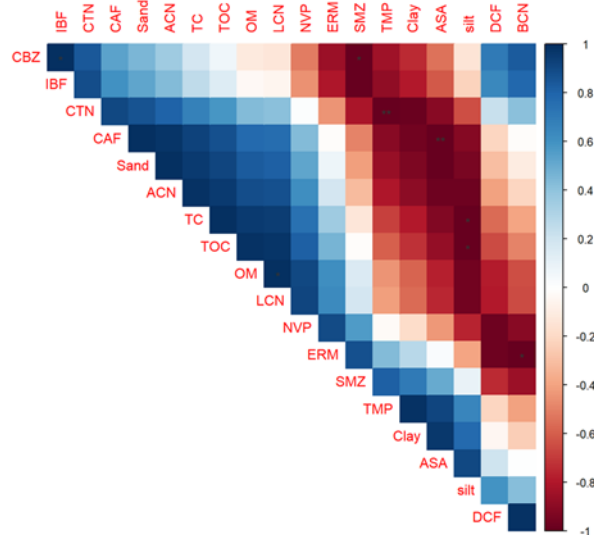
Tudor (Wet season)



Makupa creek (Dry season)



Makupa creek (Wet season)



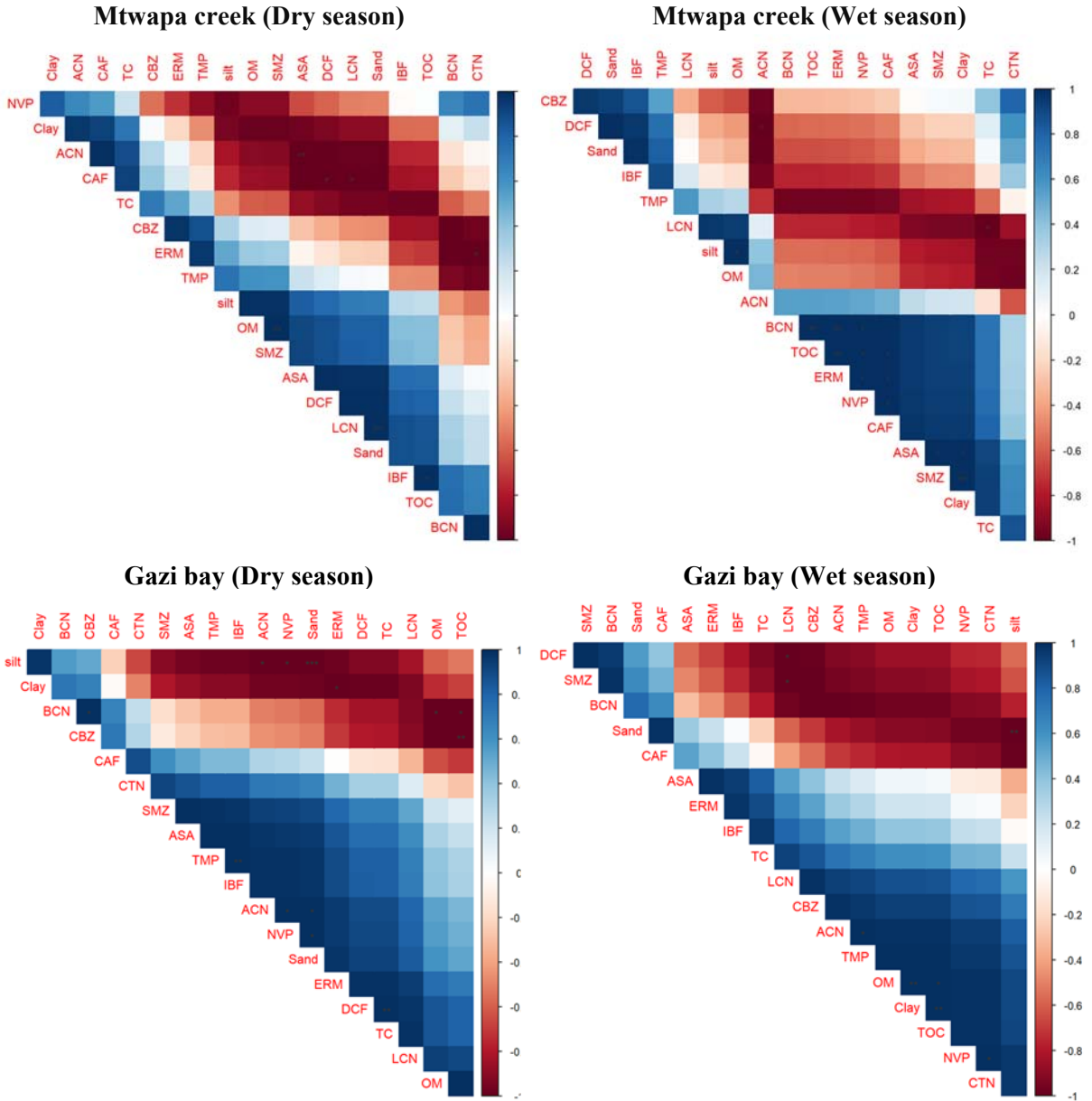


Figure S1: Relationships between measured physicochemical parameters and pharmaceuticals acetaminophen (ACN), acetylsalicylic (ASA), diclofenac (DCF), ibuprofen (IBF), trimethoprim (TMP), sulfamethoxazole (SMZ), tetracycline (TC), erythromycin (ERM), carbamazepine (CBZ), nevirapine (NVP), caffeine (CAF), cetirizine (CTN), lidocaine (LCN), bupivacaine (BCN) in surface sediment of Tudor creek, Mtwapa creek, Makupa creek, and Gazi bay [significant values 0.05, = (*), 0.01= (), 0.001= (***)].**

Table S1: Risk quotients in the dry season for the pharmaceutical residues detected in surface sediment of Tudor, Makupa, Mtwapa creeks, and Gazi bay. Potential ecological risks of sedimentary pharmaceuticals were classified into no risk ($\text{Log}_{10} \text{RQ} < -2$), low risk ($-2 < \text{Log}_{10} \text{RQ} < -1$), medium risk ($-1 < \text{Log}_{10} \text{RQ} < 0$), and high risk ($\text{Log}_{10} \text{RQ} > 0$) according to the Technical Guidance Document on Risk Assessment.

Compounds	Trophic level	Organism/Species	PNEC water ($\mu\text{g}/\text{L}$)	Mean MEC ($\mu\text{g}/\text{kg}$)				RQ (in Dry season)			
				Tudor	Makupa	Mtwapa	Gazi	Tudor	Makupa	Mtwapa	Gazi
Acetaminophen	Fish	<i>Oryzias latipes</i>	160	28.93	56.58	11.42	12.69	1.8	2.1	1.4	1.4
	Crustacea	<i>Artemia salina</i>	100					2.0	2.3	1.6	1.6
	Algae	<i>Phaeodactylum tricornutum</i>	265.8					1.6	1.9	1.2	1.2
Sulfamethoxazole	Fish	<i>Oryzias latipes</i>	750	0.27	1.24	0.19	0.10	-1.3	-0.7	-1.5	-1.7
	Crustacea	<i>Artemia salina</i>	100					-0.5	0.2	-0.6	-0.9
	Algae	<i>Skeletonema marinoi</i>	5.35					0.8	1.5	0.7	0.4
Trimethoprim	Fish	<i>Oryzias latipes</i>	100	5.80	2.29	0.89	2.91	0.9	0.4	0.04	0.6
	Crustacea	<i>Artemia salina</i>	100					0.9	0.4	0.04	0.6
	Algae	<i>Phaeodactylum tricornutum</i>	5.1					2.1	1.7	1.3	1.8
Carbamazepine	Fish	<i>Oryzias latipes</i>	35.4	25.64	5.79	11.65	3.61	0.4	-0.2	0.1	-0.4
	Crustacea	<i>Artemia salina</i>	100					-1.0	-1.7	-1.4	-1.9
	Algae	<i>Phaeodactylum tricornutum</i>	62.5					0.2	-0.5	-0.2	-0.7
Nevirapine	Fish	Fish	0.621	0.23	5.39	0.72	1.37	0.1	1.4	0.6	0.8
	Daphnia	Daphnia	1.621					-0.4	1.0	0.1	0.4
	Algae	Algae	3.523					-0.7	0.7	-0.2	0.1

Table S2: Risk quotients in the wet season for the pharmaceutical residue detected in surface sediment of Tudor, Makupa, Mtwapa creeks, and Gazi bay. Potential ecological risks of sedimentary pharmaceuticals were classified into no risk ($\text{Log}_{10} \text{RQ} < -2$), low risk ($-2 < \text{Log}_{10} \text{RQ} < -1$), medium risk ($-1 < \text{Log}_{10} \text{RQ} < 0$), and high risk ($\text{Log}_{10} \text{RQ} > 0$) according to the Technical Guidance Document on Risk Assessment.

Compounds	Trophic level	Organism/Species	PNEC water ($\mu\text{g/L}$)	Mean MEC ($\mu\text{g/kg}$)				RQ (in Wet season)			
				Tudor	Makupa	Mtwapa	Gazi	Tudor	Makupa	Mtwapa	Gazi
Acetaminophen	Fish	<i>Oryzias latipes</i>	160	14.09	12.25	17.30	10.48	1.5	1.4	1.6	1.4
	Crustacea	<i>Artemia salina</i>	100					1.7	1.6	1.8	1.6
	Algae	<i>Phaeodactylum tricorutum</i>	265.8					1.3	1.2	1.4	1.1
Sulfamethoxazole	Fish	<i>Oryzias latipes</i>	750	0.09	0.22	0.10	0.18	-1.8	-1.4	-1.8	-1.5
	Crustacea	<i>Artemia salina</i>	100					-0.9	-0.6	-0.9	-0.6
	Algae	<i>Skeletonema marinoi</i>	5.35					0.3	0.7	0.4	0.6
Trimethoprim	Fish	<i>Oryzias latipes</i>	100	1.33	1.50	0.16	3.36	0.2	0.3	-0.7	0.6
	Crustacea	<i>Artemia salina</i>	100					0.2	0.3	-0.7	0.6
	Algae	<i>Phaeodactylum tricorutum</i>	5.1					1.5	1.6	0.6	1.9
Carbamazepine	Fish	<i>Oryzias latipes</i>	35.4	8.73	3.56	7.28	17.88	-0.1	-0.4	-0.1	0.3
	Crustacea	<i>Artemia salina</i>	100					-1.5	-1.9	-1.6	-1.2
	Algae	<i>Phaeodactylum tricorutum</i>	62.5					-0.3	-0.7	-0.4	0.01
Nevirapine	Fish	Fish	0.62	0.62	5.98	0.43	0.53	0.5	1.5	0.3	0.4
	Daphnia	Daphnia	1.62					0.1	1.1	-0.1	0.0
	Algae	Algae	3.52					-0.3	0.7	-0.4	-0.3