

Appendix 1 Average (\pm SD) values of abiotic parameters of the three estuaries at each salinity zone (Eu; Euhaline, Poly-meso; Poly-mesohaline, Oligo; Oligohaline) across three seasons (Pr; Premonsoon, M; Monsoon, Po; Postmonsoon)

		Ulhas			Amba			Savitri		
		Pr	M	Po	Pr	M	Po	Pr	M	Po
Salinity	Eu	35.1 \pm 1.4	34.2	34.8	35.0 \pm 0.9	32.4 \pm 1.5	32.8 \pm 1.5	32.6 \pm 2.2	34.0 \pm 2.1	32.8 \pm 1.3
	Poly-meso	15.6 \pm 6.5	16.8	17.6 \pm 7.7	19.4 \pm 8.4	17.2 \pm 9.8	22.3 \pm 5.2	24.0 \pm 4.4	19.4	16.3 \pm 7.3
	Oligo	2.5 \pm 2.2	0.2 \pm 0.6	1.3 \pm 1.6	-	0.2 \pm 0.2	2.7	0.1	0.1 \pm 0.2	0
DO (mg l ⁻¹)	Eu	5.3 \pm 0.9	5.3	4.9	5.3 \pm 0.6	4.2 \pm 1.1	5.3 \pm 0.5	5.0 \pm 0.4	4.5 \pm 0.9	6.2 \pm 0.2
	Poly-meso	2.9 \pm 0.5	4.4	3.0 \pm 1.3	5.2 \pm 0.0	5.3 \pm 0.7	4.9 \pm 1.1	4.8 \pm 2.2	4.8	6.5 \pm 0.8
	Oligo	5.8 \pm 2.8	5.5 \pm 1.1	4.0 \pm 4.0	-	7.2 \pm 0.6	6.9	2.9	7.2 \pm 0.8	8.1
NO ₂ ⁻ -N (μ mol l ⁻¹)	Eu	0.2 \pm 0.2	1.2	0.3	2.7 \pm 3.7	1.2 \pm 0.2	2.1 \pm 1.7	0.9 \pm 1.1	0.2 \pm 0.1	1.2 \pm 0.8
	Poly-meso	16.9 \pm 12.8	2.1	16.8 \pm 6.1	5.5 \pm 5.0	0.8 \pm 0.3	0.5 \pm 0.3	6.9 \pm 6.4	0.1	4.6 \pm 4.1
	Oligo	3.0 \pm 2.8	0.9 \pm 0.7	3.9 \pm 3.7	-	0.7 \pm 0.2	2.4	0.01	0.2 \pm 0.0	0.1
NO ₃ ⁻ -N (μ mol l ⁻¹)	Eu	46.4 \pm 41.7	12.9	16.7	22.4 \pm 10.4	9.0 \pm 3.1	17.1 \pm 6.7	6.2 \pm 4.6	1.2 \pm 0.0	6.0 \pm 2.7
	Poly-meso	32.9 \pm 14.6	15.4	46.4 \pm 43.8	10.4 \pm 10.8	9.8 \pm 2.9	12.2 \pm 3.1	26.8 \pm 6.7	3.3	17.0 \pm 7.7
	Oligo	16.7 \pm 10.3	4.5 \pm 1.3	36.2 \pm 25.1	-	4.7 \pm 2.4	11.9	3.3	2.4 \pm 1.0	1.2
NH ₄ ⁺ -N (μ mol l ⁻¹)	Eu	1.6 \pm 1.0	1.5	1.6	1.1 \pm 0.8	2.9 \pm 0.4	3.7 \pm 1.4	1.1 \pm 0.3	2.8 \pm 0.7	1.9 \pm 0.7
	Poly-meso	11.2 \pm 11.1	4.8	34.0 \pm 27.3	0.8 \pm 0.0	3.8 \pm 2.3	4.3 \pm 1.7	3.8 \pm 3.1	2.7	4.2 \pm 1.5
	Oligo	6.9 \pm 5.9	8.0 \pm 6.7	43.4 \pm 38.9	-	4.8 \pm 3.6	10.8	0.5	4.5 \pm 2.6	4.1
Sand (%)	Eu	30.9 \pm 39.4	11.3	7.2	10.3 \pm 7.2	6.8 \pm 1.1	5.4 \pm 7.8	73.9 \pm 46.0	39.6 \pm 55.0	46.6 \pm 65.7
	Poly-meso	22.6 \pm 33.0	19.8	10.9 \pm 6.3	73.9 \pm 0.6	12.7 \pm 7.3	8.8 \pm 6.8	56.1 \pm 47.4	82	65.9 \pm 35.4
	Oligo	32.9 \pm 42.8	17.8 \pm 19.6	26.2 \pm 26.8	-	7.9 \pm 6.7	5.1	3	57.7 \pm 45.5	28.8
Silt (%)	Eu	63.9 \pm 37.1	82.3	85.2	71.8 \pm 12.0	80.0 \pm 3.5	85.2 \pm 13.7	22.7 \pm 42.8	58.8 \pm 56.3	48.3 \pm 62.5
	Poly-meso	66.5 \pm 30.3	65.2	72.3 \pm 10.7	73.9 \pm 0.6	69.4 \pm 11.7	70.4 \pm 15.4	31.3 \pm 33.1	13.9	21.0 \pm 23.7
	Oligo	57.8 \pm 36.1	70.0 \pm 18.6	60.4 \pm 20.9	-	72.1 \pm 11.2	77.1	85.4	32.5 \pm 35.6	65.7
Clay (%)	Eu	5.2 \pm 2.4	6.4	7.6	18.0 \pm 6.7	13.2 \pm 2.4	9.4 \pm 6.1	3.4 \pm 3.3	1.6 \pm 1.3	5.2 \pm 3.2
	Poly-meso	10.9 \pm 6.9	15	16.8 \pm 6.9	18.2 \pm 1.9	17.9 \pm 6.6	20.9 \pm 10.5	12.6 \pm 14.5	4.1	13.1 \pm 12.3
	Oligo	9.2 \pm 6.8	12.2 \pm 9.7	13.4 \pm 6.1	-	20.0 \pm 4.9	17.8	11.6	9.8 \pm 14.5	5.5
C _{org} (%)	Eu	1.1 \pm 0.5	1.8	1.9	2.1 \pm 0.5	1.6 \pm 0.4	2.1 \pm 0.5	0.6 \pm 0.8	1.1 \pm 1.3	1.2 \pm 1.1
	Poly-meso	2.2 \pm 1.2	2.3	2.1 \pm 0.3	2.0 \pm 0.2	2.0 \pm 0.4	2.0 \pm 0.1	1.4 \pm 1.3	0.1	0.9 \pm 0.8
	Oligo	3.4 \pm 2.2	2.5 \pm 1.0	3.0 \pm 1.2	-	2.1 \pm 0.5	2.1	2.5	1.3 \pm 1.3	3.6

Appendix 2 Ecological group (EG) classification of taxa recorded at three studied estuaries (Ulhas, Amba and Savitri).

Ecological group I	<i>Grandidierella</i> sp. *	Ecological group II	<i>Nephtys hystrix</i>	<i>Neanthes chilkaensis</i> *	<i>Lagis koreni</i>	Not assigned taxa
<i>Abra opalina</i> *	Holothuroidea	<i>Alpheus</i> sp.	<i>Ninoe</i> sp.	Nemertea	<i>Linopherus acarunculatus</i> *	<i>Baharilana richmondi</i>
<i>Acetes indicus</i> *	<i>Idunella chilkaensis</i> *	<i>Ampelisca diadema</i>	<i>Ophiactis</i> sp.	<i>Nereis falcaria</i>	<i>Mediomastus capensis</i>	<i>Branchiodrilus</i> sp.
<i>Acetes</i> sp. *	<i>Idunella picta</i>	<i>Amphilocheus</i> sp.	<i>Paraehlersia ferrugina</i>	<i>Nereis</i> sp.	<i>Namalycastis indica</i>	<i>Cloridina ichneumon</i>
<i>Aglaophamus dibranchis</i>	<i>Idunella</i> sp. *	<i>Amphiura</i> sp.	<i>Phoronis psammophila</i>	<i>Notomastus</i> sp. *	<i>Namalycastis senegalensis</i>	Corophidae
<i>Ampelisca aequicornis</i>	<i>Iphinoe</i> sp.	Anthozoa	<i>Podocerus spongicolus</i> *	<i>Oncholaimus oxyuris</i> †	<i>Paraprionospio cordifolia</i> *	Dotillidae
<i>Ampelisca scabripes</i> *	<i>Laternula</i> sp.	<i>Aulophorus furcatus</i> †	Pycnogonida	<i>Pagurapseudopsis gymnophobia</i>	<i>Paraprionospio cristata</i> *	Eucopiidae
<i>Ampelisca</i> sp.	<i>Lembos</i> sp.	<i>Bodotria</i> sp. *	<i>Siliqua</i> sp.	<i>Paradoneis lyra capensis</i>	<i>Polycirrus</i> sp.	<i>Exhippolysmata</i> sp.
<i>Ampelisca spinipes</i>	<i>Lembos websteri</i>	<i>Caprella</i> sp.	<i>Sinelobus stanfordi</i>	<i>Paraonis fulgens</i>	<i>Polydora ciliata</i>	<i>Gitanopsis gouriae</i>
<i>Ampelisca typica</i>	<i>Leucothoe richiardii</i>	<i>Cirolana aldabrensis</i>	<i>Stenothoe gallensis</i> *	<i>Podocerus brasiliensis</i>	<i>Prionospio cirrifera</i>	<i>Gitanopsis</i> sp.
<i>Amphipholis misera</i> *	<i>Lygdamis indicus</i>	<i>Clibanarius</i> sp.	<i>Stenothoe marina</i>	<i>Pseudopolydora kempfi</i>	<i>Prionospio elongata</i> *	<i>Heptaceras quinquedens</i>
<i>Amphipholis</i> sp.	<i>Magelona cincta</i>	<i>Diogenes</i> sp.	<i>Stenothoe</i> sp.	<i>Sigambra parva</i>	<i>Prionospio pulchra</i>	<i>Macroclymene</i> sp.
<i>Armandia intermedia</i>	<i>Melita dentata</i> *	<i>Dorippoides facchino</i>	<i>Sthenelais boa</i>	<i>Sphaeroma walkeri</i> *	<i>Prionospio sexoculata</i>	<i>Pilumnidae</i>
<i>Barnea birmanica</i> *	<i>Melita</i> sp.	<i>Echiura</i>	<i>Xenanthura orientalis</i> *	<i>Sternaspis scutata</i>	<i>Schistomeringos rudolphi</i>	<i>Platorchestia platensis</i>
<i>Branchiomma serratibranchis</i> *	<i>Meretrix</i> sp.	<i>Eteone siphodonta</i>		<i>Trochochaeta</i> sp. *		<i>Platylicoa</i> sp.
<i>Cerapus</i> sp.	<i>Microdeutopus</i> sp.	<i>Glycera capitata</i>	Ecological group III		Ecological group V	Podoceridae
<i>Cheiriphotis megacheles</i> †	<i>Microprotopus maculatus</i>	<i>Glycera longipinnis</i>	<i>Allomelita pellucida</i>	Ecological group IV	<i>Capitella capitata</i>	Portunidae
<i>Cheiriphotis trifurcata</i> †	<i>Microprotopus</i> sp.	<i>Glycine kameruniana</i> *	<i>Americorophium</i> sp.	<i>Boccardia polybranchia</i>	<i>Capitella</i> sp.	Prosthiostomidae
<i>Cyprinotus</i> sp.	<i>Neanthes glandicincta</i>	<i>Goniada emerita</i>	<i>Apseudes</i> sp. †	<i>Branchiura sowerbyi</i>	<i>Enchytraeidae</i>	<i>Synidotea harfordi</i>
<i>Diopatra cuprea</i>	<i>Notopoma crassicornis</i> †	<i>Grandidierella bonnieroides</i>	<i>Belzebub hanseni</i>	<i>Caulleriella acicula</i> *	<i>Limnodrilus hoffmeisteri</i>	
<i>Diopatra hupferiana monroi</i> *	<i>Photis longicaudata</i>	<i>Harmothoe</i> sp.	<i>Chironomidae</i>	<i>Caulleriella capensis</i> *	<i>Maldanella</i> sp. †	Ignored taxa
<i>Diopatra monroi</i> *	<i>Photis</i> sp.	<i>Lepidonotus carinulatus</i> *	<i>Corophium</i> sp.	<i>Cossura coasta</i>	<i>Streblospio gynobranchiata</i> †	Decapod larvae
<i>Erichthonius brasiliensis</i>	<i>Pista</i> sp. *	<i>Lepidonotus</i> sp.	<i>Dexamine spinosa</i>	<i>Dendronereis arborifera</i>	<i>Tubificoides amplivasatus</i>	<i>Ectopria</i> sp.
<i>Erichthonius</i> sp.	<i>Podocoryna</i> sp. *	<i>Lumbrineris hartmani</i> *	<i>Dulichia</i> sp.	<i>Dendronereis</i> sp. *	<i>Tubificoides heterochaetus</i>	Gastropoda (Juvenile)
<i>Eriopisa</i> sp.	<i>Protodorvillea egena</i>	<i>Lumbrineris heteropoda difficilis</i>	<i>Ficopomatus uschakovi</i>	<i>Heteromastides bifidus</i>	<i>Tubificoides</i> sp.	Bivalvia (Juvenile)
<i>Excirolana</i> sp.	<i>Scoloplos</i> sp.	<i>Lumbrineris heteropoda</i>	<i>Grandidierella japonica</i>	<i>Heteromastides</i> sp. *		Crab (Juvenile)
<i>Gammaropsis</i> sp.	<i>Sipuncula</i>	<i>Lumbrineris meteorana</i> *	<i>Kalliapseudes</i> sp.	<i>Kirkegaardia dorsobranchialis</i>		
<i>Gammarus</i> sp.	<i>Urothoe pulchella</i>	<i>Lumbrineris</i> sp.	<i>Leptonereis</i> sp.	<i>Hirudinea</i>		
<i>Gari</i> sp.	<i>Urothoe</i> sp.	<i>Mesopodopsis orientalis</i> *	<i>Levinsenia gracilis</i>	<i>Laeonereis</i> sp. *		
<i>Grandidierella megnae</i> *	<i>Urothoe viswanathi</i> *	<i>Nematopalaemon tenuipes</i> †	<i>Loimia medusa</i>			

* EG assignation based on genus

† EG assignation based on expert judgement

Appendix 3 Ecological Quality Status (EcoQS) derived from five biotic indices and index value for each station of Ulhas estuary during the three seasons (Pr=Premonsoon, M=Monsoon, Po=Postmonsoon)

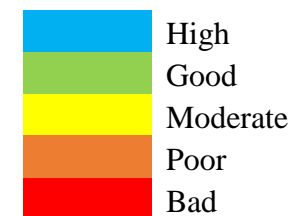
Samples	AMBI			MAMBI			BENTIX			BOPA			BO2A		
	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po
U1	2.8	3.6	1.1	0.37	0.36	0.92	2.5	3.4	4.5	0.1845	0.1845	0.0290	0.1845	0.1845	0.0290
U2	3.1	4.4	4.3	0.48	0.23	0.41	3.4	2.0	2.0	0.1311	0.2983	0.2553	0.1311	0.2983	0.2553
U3	2.5	4.3	4.1	0.49	0.45	0.80	5.5	2.3	2.9	0.0414	0.2846	0.2093	0.0414	0.2846	0.2093
U4	4.0	4.5	5.5	0.39	0.18	0.19	2.4	2.0	2.1	0.1047	0.3010	0.2866	0.1047	0.3010	0.2866
U5	3.5	4.5	4.1	0.61	0.18	0.70	2.3	2.0	2.9	0.2406	0.3010	0.1256	0.2406	0.3010	0.1256
U6	5.4	4.5	5.9	0.26	0.18	0.07	2.0	2.0	2.0	0.2711	0.3010	0.3012	0.2711	0.3010	0.3012
U7	6.0	4.5	4.3	0.04	0.18	0.59	2.0	2.0	3.5	0.3010	0.3010	0.1761	0.3010	0.3010	0.1761
U8	7.0	4.6	5.8	0.00	0.47	0.09	0.0	2.0	2.0	Azoic	0.2978	0.3010	Azoic	0.3010	0.3010
U9	7.0	4.5	6.4	0.00	0.40	0.24	0.0	2.0	2.0	Azoic	0.3010	0.3010	Azoic	0.3010	0.3010
U10	6.0	5.1	5.4	0.16	0.31	0.18	2.0	2.0	2.0	0.0116	0.3010	0.3010	0.3010	0.3010	0.3010
U11	4.4	4.0	4.2	0.47	0.45	0.50	2.0	2.0	2.0	0.2518	0.1856	0.2089	0.2604	0.1856	0.2089
U12	2.3	3.2	3.3	0.89	0.49	0.58	3.4	2.0	2.0	0.0807	0.0000	0.0934	0.0821	0.0290	0.0934
Euhaline	2.8	3.6	1.1	0.45	0.36	0.92	3.9	3.4	4.4	0.1190	0.1845	0.0290	0.1190	0.1845	0.0290
Poly-mesohaline	5.5	4.4	4.7	0.22	0.23	0.46	1.4	2.0	2.6	0.2294	0.2983	0.2257	0.2294	0.2983	0.2257
Oligohaline	4.2	4.4	4.8	0.51	0.33	0.32	2.5	2.0	2.0	0.1147	0.2574	0.2411	0.2145	0.2606	0.2411



Azoic zones are considered 'Bad' as per Dauvin and Ruellet, 2007

Appendix 4 Ecological Quality Status (EcoQS) derived from five biotic indices and index value for each station of Amba estuary during the three seasons (Pr=Premonsoon, M=Monsoon, Po=Postmonsoon)

Samples	AMBI			MAMBI			BENTIX			BOPA			BO2A		
	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po
A1	2.7	6.3	3.0	0.85	0.11	0.53	3.8	1.3	3.4	0.1455	0.1614	0.1828	0.1455	0.1614	0.1828
A2	2.8	4.2	3.2	0.57	0.38	0.44	3.8	5.8	2.9	0.0864	0.0095	0.1836	0.0864	0.0095	0.1836
A3	3.3	4.1	3.0	0.66	0.20	0.21	3.8	2.0	2.0	0.0226	0.2041	0.0000	0.0226	0.2041	0.0000
A4	3.3	4.6	3.8	0.52	0.14	0.21	3.0	2.0	2.6	0.2392	0.2788	0.2688	0.2392	0.3010	0.2688
A5	2.6	1.5	2.7	0.64	0.55	0.42	3.2	5.3	2.9	0.1740	0.0000	0.1603	0.1740	0.0000	0.1603
A6	3.4	5.5	4.9	0.54	0.76	0.27	4.6	4.6	2.6	0.0908	0.0191	0.2553	0.0908	0.0191	0.2553
A7	2.8	3.9	1.5	0.59	0.41	0.88	4.3	2.8	4.8	0.1082	0.1741	0.0116	0.1270	0.1741	0.0116
A8	3.6	3.6	2.6	0.59	0.48	0.50	3.2	3.1	4.4	0.1773	0.2088	0.0986	0.2028	0.2088	0.1249
A9	2.3	3.9	2.1	0.79	0.89	0.49	3.9	2.5	5.1	0.0358	0.1988	0.0642	0.0358	0.1988	0.0642
A10	2.0	6.4	2.2	0.40	0.23	0.47	5.2	1.0	5.2	0.0821	0.0235	0.0484	0.0821	0.0235	0.0484
A11	1.8	4.1	3.6	0.48	0.38	0.43	5.0	2.5	2.9	0.0090	0.2304	0.1885	0.0090	0.2304	0.1965
A12	4.4	4.5	6.7	0.44	0.20	0.09	5.6	2.0	0.8	0.0314	0.3010	0.0000	0.0314	0.3010	0.0000
A13	4.5	4.8	6.4	0.12	0.35	0.24	2.0	2.0	2.0	0.2993	0.2434	0.2983	0.2993	0.3010	0.2983
Euhaline	2.8	5.2	3.4	0.60	0.25	0.35	4.0	4.1	2.7	0.1064	0.0854	0.1751	0.1105	0.0854	0.1751
Poly-mesohaline	4.4	3.9	3.1	0.25	0.42	0.48	3.8	4.9	3.9	0.1654	0.1475	0.0685	0.1654	0.1512	0.0743
Oligohaline		4.7	6.4		0.41	0.24		2.2	2.0		0.1994	0.2983		0.2110	0.2983



Appendix 5 Ecological Quality Status (EcoQS) derived from five biotic indices and index value for each station of Savitri estuary during the three seasons (Pr=Premonsoon, M=Monsoon, Po=Postmonsoon)

Samples	AMBI			MAMBI			BENTIX			BOPA			BO2A		
	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po	Pr	M	Po
S1	1.1	3.9	4.4	0.79	0.22	0.41	4.6	2.5	2.1	0.0061	0.2742	0.2918	0.0061	0.2742	0.2918
S2	1.6	0.0	0.8	0.72	0.43	0.77	4.2	6.0	5.7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S3	3.9	1.8	2.4	0.38	0.33	0.72	4.0	5.7	3.9	0.0000	0.0348	0.0908	0.0000	0.0348	0.0908
S4	1.4	3.8	1.5	0.49	0.68	0.37	6.0	2.7	6.0	0.0000	0.2385	0.0000	0.0000	0.2385	0.0000
S5	2.4	4.1	3.0	0.72	0.74	0.81	3.7	2.4	3.1	0.0474	0.2128	0.1759	0.0474	0.2128	0.1759
S6	1.4	4.0	3.6	0.58	0.48	0.75	5.8	2.4	2.3	0.0180	0.2745	0.1784	0.0180	0.2745	0.1784
S7	1.4	6.0	5.6	0.56	0.05	0.27	3.6	2.0	1.7	0.1657	0.0000	0.0000	0.1800	0.3010	0.2891
S8	1.5	7.0	5.3	0.33	0.00	0.30	6.0	0.0	3.0	0.0000	0.0000	0.0000	0.3010	0.0000	0.0000
Euhaline	2.0	2.0	2.6	0.60	0.33	0.59	5.3	4.2	3.9	0.0015	0.1371	0.1459	0.0015	0.1371	0.1459
Poly-mesohaline	1.8	1.8	3.2	0.62	0.33	0.59	4.9	5.7	3.7	0.0770	0.0348	0.0890	0.0818	0.0348	0.1468
Oligohaline	1.5	5.0	5.3	0.33	0.38	0.30	6.0	2.4	6.0	0.0000	0.1451	0.0000	0.3010	0.2054	0.0000

