

Sr. No.	Spices Name	Intertidal Area		
		Upper	middle	Lower
1	<i>Aplysia oculifera</i>	+	+	-
2	<i>Arabica arabica</i>	-	+	-
3	<i>Arabica eglantina</i>	-	+	-
4	<i>Architectonica laevigata</i>	-	-	+
5	<i>Astrea stellata</i>	+	+	+
6	<i>Babylaonia spirata</i>	-	+	+
7	<i>Mussel Sp.</i>	-	+	+
8	<i>Bursa granularies</i>	+	+	+
9	<i>Bursa spinosa</i>	-	+	+
10	<i>Bursa tuberculata</i>	-	+	+
11	<i>Cantharus spiralis</i>	-	-	+
12	<i>Cellana radiata</i>	+	-	-
13	<i>Cerithium morus</i>	+	+	+
14	<i>Cerithium obeliscus</i>	+	+	+
16	<i>Cerithium rubus</i>	+	-	-
15	<i>Chiton peregrinus</i>	+	+	-
17	<i>Conus capitaneus</i>	-	+	+
18	<i>Conus cumingii</i>	-	-	+
19	<i>Conus figulinus</i>	-	+	-
20	<i>Cyprea ocellata</i>	+	+	-
21	<i>Cypreaea tigris</i>	+	+	-
22	<i>Dhrupa konkanensis</i>	-	+	+
23	<i>Echinolittorina trochoides</i>	+	+	+
24	<i>Erosaria turdus</i>	-	+	-
25	<i>Eucheluls stricarinata</i>	+	+	+
26	<i>Gibbula swainsonil</i>	+	-	+
27	<i>Hexaplex cichoreus</i>	-	+	-
28	<i>Littorina intermedia</i>	+	+	-
29	<i>Lyncina lynx</i>	-	+	+
30	<i>Mitra (strigatella) scutulate</i>	-	+	-
31	<i>Murex brunneus</i>	+	+	+
32	<i>Murex mourus</i>	+	+	+
33	<i>Murex palmarosae</i>	-	-	+
34	<i>Murex tribulus</i>	-	-	+

35	<i>Nassarius canaliculata</i>	-	-	+
36	<i>Nerita albicilla</i>	+	+	+
37	<i>Octopus vulgaris</i>	+	+	+
38	<i>Oliva globosa</i>	+	+	+
39	<i>Oliva oliva</i>	+	+	+
40	<i>Onchidium verruculatum</i>	+	+	+
41	<i>Patelloida saccharina lanx</i>	-	+	-
42	<i>Paulonaria fimariata</i>	-	-	+
43	<i>Planaxis sulcatus</i>	-	-	+
44	<i>Purpura panama</i>	+	-	+
45	<i>Rhinoclavis sinensis</i>	+	+	-
46	<i>Siphonaria atra</i>	+	-	-
47	<i>Siphonaria laciniosa</i>	+	-	+
48	<i>Siphonaria siphonaria</i>	+	-	-
49	<i>Tibia delicatula</i>	+	+	-
50	<i>Tonna dolium</i>	-	-	+
51	<i>Trochus radiatus</i>	+	+	-
52	<i>Trochus stellatus</i>	+	+	-
53	<i>Turbo branneus</i>	+	+	+
54	<i>Turbo coronatus</i>	+	+	+
55	<i>Turbo intercostalis</i>	+	+	-
56	<i>Turritella terebra</i>	-	-	+
57	<i>Venus reticulate</i>	-	-	+
58	<i>Xancus pyrum</i>	-	-	+
59	<i>Xenophora solaris</i>	-	-	+

Table: 2 Molluscan diversity of sub-sites along the Mangrol coast.

Sr. No.	Name Of Species	S1	S2	S3	S4	S5
1	<i>Aplysia oculifera</i>	-	-	+	-	-
2	<i>Astraea stellata</i>	+	-	-	-	-
3	<i>Bursha granulosa</i>	+	+	-	-	+
4	<i>Bursha tuberculata</i>	-	-	+	-	-
5	<i>Cantharus spirallis</i>	-	-	+	+	-
6	<i>Cellana radiata</i>	+	+	+	+	+
7	<i>Cerithium columna</i>	+	+	-	-	+
8	<i>Cerithium morus</i>	+	+	+	-	+
9	<i>Cerithium obeliscus</i>	-	-	+	-	+
10	<i>Cerithium rubes</i>	+	-	-	-	-
11	<i>Cerithium scabridum</i>	+	-	-	-	-
12	<i>Chiton peregrinus</i>	-	+	+	-	+

13	<i>Ciphonaria laciniosa</i>	-	-	-	-	+
14	<i>Clanculus ceylanicus</i>	+	+	-	-	+
15	<i>Conus capitaneus</i>	-	-	-	-	+
16	<i>Conus figulinus</i>	+	+	-	-	-
17	<i>Conus galinus</i>	-	-	-	+	-
18	<i>Dhruva konkanensis</i>	-	-	+	-	-
19	<i>Euchelus asper</i>	-	-	-	-	+
20	<i>Euchelus tricarinata</i>	+	-	-	-	-
21	<i>Hexaplex cichoreus</i>	-	+	-	-	-
22	<i>Littorina intermedia</i>	-	-	-	-	+
23	<i>Lyncina lynx</i>	-	-	+	-	-
24	<i>Murex brunneus</i>	+	+	-	-	-
25	<i>Nerita albicilla</i>	+	-	-	-	+
26	<i>Onchidium verruculatum</i>	+	+	+	+	-
27	<i>Siphonaria laciniosa</i>	-	+	-	-	-
28	<i>Terbo bruneus</i>	-	+	+	-	+
29	<i>Terbo coronatus</i>	+	-	-	-	-
30	<i>Terbo intercostalis</i>	+	+	+	+	+
31	<i>Tertela terebra</i>	-	-	-	+	-
32	<i>Trochus radiatus</i>	+	-	-	-	-
33	<i>Trochus stellatus</i>	-	-	-	-	+

Table: 3 Molluscan native dweller species checklist observed as per sub-sites along the Mangrol coast.

Year	S1	S2	S3	S4	S5
1 st Year	506	598	598	260	1123
2 nd Year	1122	757	536	266	912
3 rd Year	991	1073	890	391	1291
4 th Year	623	676	621	309	861
5 th year	634	548	564	490	811
Total	3876	3652	3209	1716	4998

Table: 4 Total populations of Mollusc individuals as per sub-sites along the Mangrol coast.

Sub-site	1 st year	2 nd year	3 rd year	4 th year	5 th year
S1	2.256	2.262	2.344	2.284	2.367
S2	2.018	2.152	2.168	2.045	2.416
S3	2.041	2.034	2.019	1.975	2.093
S4	1.479	1.502	1.397	1.387	1.471
S5	2.203	2.366	2.412	2.357	2.498

Table: 5 Molluscan indices as per sub-sites with respective years along the Mangrol coast.

Name Of Spices	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
<i>Astrea stellata</i>	0.299	0.243	0.487	0.281	0.289	0.320
<i>Bursa granularies</i>	0.253	0.165	0.282	0.204	0.244	0.229
<i>Cellana radiata</i>	0.433	0.388	0.395	0.358	0.563	0.427
<i>Cerithium obeliscus</i>	0.451	0.274	0.433	0.307	0.396	0.372
<i>Nerita albicilla</i>	0.311	0.274	0.298	0.277	0.274	0.287
<i>Onchidium verruculatum</i>	0.549	0.508	0.538	0.321	0.563	0.496
<i>Turbo coronatus</i>	0.332	0.344	0.357	0.336	0.599	0.394
<i>Turbo intercostalis</i>	0.360	0.380	0.437	0.266	0.492	0.387
Average	0.373	0.322	0.403	0.294	0.428	0.364

Table: 6 Mean density values of key species as per respective sub-site and years along the Mangrol coast.

Name Of Spices	1 st year	2 nd year	3 rd year	4 th year	5 th year	Total	Average
<i>Astrea stellata</i>	2.042	1.554	1.681	1.878	1.583	8.738	1.748
<i>Bursa granularies</i>	1.596	1.475	1.811	1.333	1.548	7.764	1.553
<i>Cellana radiata</i>	2.898	1.958	2.474	1.690	1.914	10.933	2.187
<i>Cerithium obeliscus</i>	2.176	1.885	1.537	1.151	2.167	8.916	1.783
<i>Nerita albicilla</i>	1.437	1.441	1.291	1.583	1.286	7.038	1.408
<i>Onchidium verruculatum</i>	1.731	1.625	1.133	1.205	1.654	7.348	1.470
<i>Turbo coronatus</i>	1.185	1.500	1.771	1.878	1.439	7.772	1.554
<i>Turbo intercostalis</i>	1.135	1.722	1.316	1.123	1.540	6.835	1.367
	1.775	1.645	1.627	1.480	1.641	8.168	1.634

Table: 7 Mean abundance values of key species as per respective site-site and years along the Mangrol.

Name Of Spices	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
<i>Astrea stellata</i>	14.634	15.642	28.992	14.964	18.274	18.501
<i>Bursa granularies</i>	15.854	11.173	15.546	15.328	15.736	14.728
<i>Cellana radiata</i>	14.939	19.832	15.966	21.168	29.442	20.269
<i>Cerithium obeliscus</i>	20.732	14.525	28.151	26.642	18.274	21.665
<i>Nerita albicilla</i>	21.646	18.994	23.109	17.518	21.320	20.518
<i>Onchidium verruculatum</i>	31.707	31.285	47.479	26.642	34.034	34.229
<i>Turbo coronatus</i>	28.049	22.905	20.168	17.883	41.624	26.126
<i>Turbo intercostalis</i>	31.707	22.067	33.193	23.723	31.980	28.534
Average	22.409	19.553	26.576	20.484	26.335	23.071

Table: 8 Mean frequency values of key species as per respective sub-site and years along the Mangrol coast.

	Year	Density	Abundance	Frequency
<i>Astrea stellata</i>	1 st year	0.299	2.042	14.634
	2 nd year	0.243	1.554	15.642
	3 rd year	0.487	1.681	28.992
	4 th year	0.281	1.878	14.964
	5 th year	0.289	1.583	18.274
	Avarage	0.312	1.740	17.921

Table: 9 : Density, Abundance and Frequency of *Astrea stellata*

	Year	Density	Abundance	Frequency
<i>Bursa granularies</i>	1 st year	0.433	2.898	14.939
	2 nd year	0.388	1.958	19.832

	3 rd year	0.395	2.474	15.966
	4 th year	0.358	1.690	21.168
	5 th year	0.563	1.914	29.442
	Avarage	0.419	2.131	19.642

Table: 10 : Density, Abundance and Frequency of *Bursa granularies*.

	Year	Density	Abundance	Frequency
<i>Cellana radiata</i>	1 st year	0.433	2.898	14.939
	2 nd year	0.388	1.958	19.832
	3 rd year	0.395	2.474	15.966
	4 th year	0.358	1.690	21.168
	5 th year	0.563	1.914	29.442
	Avarage	0.419	2.131	19.642

Table: 11: Density, Abundance and Frequency of *Cellana radiate*.

	Year	Density	Abundance	Frequency
<i>Cerithium obeliscus</i>	1 st year	0.451	2.176	20.732
	2 nd year	0.274	1.885	14.525
	3 rd year	0.433	1.537	28.151
	4 th year	0.307	1.151	26.642
	5 th year	0.396	2.167	18.274
	Avarage	0.366	1.726	21.219

Table: 12: Density, Abundance and Frequency of *Cerithium obeliscus*.

	Year	Density	Abundance	Frequency
<i>Nerita albicilla</i>	1 st year	0.311	1.437	21.646
	2 nd year	0.274	1.441	18.994
	3 rd year	0.298	1.291	23.109
	4 th year	0.277	1.583	17.518
	5 th year	0.274	1.286	21.320
	Avarage	0.287	1.412	20.358

Table: 13: Density, Abundance and Frequency of *Nerita albicilla*.

	Year	Density	Abundance	Frequency
<i>Onchidium verruculatum</i>	1 st year	0.549	1.731	31.707
	2 nd year	0.508	1.625	31.285
	3 rd year	0.538	1.133	47.479
	4 th year	0.321	1.205	26.642
	5 th year	0.563	1.654	34.034
	Avarage	0.496	1.474	33.635

Table: 14: Density, Abundance and Frequency of *Onchidium verruculatum*.

	Year	Density	Abundance	Frequency
<i>Turbo coronatus</i>	1 st year	0.332	1.185	28.049
	2 nd year	0.344	1.500	22.905
	3 rd year	0.357	1.771	20.168
	4 th year	0.336	1.878	17.883

	5 th year	0.599	1.439	41.624
	Avarage	0.378	1.493	25.305

Table: 15: Density, Abundance and Frequency of *Turbo coronatus*.

	Year	Density	Abundance	Frequency
<i>Turbo intercostalis</i>	1 st year	0.360	1.135	31.707
	2 nd year	0.380	1.722	22.067
	3 rd year	0.437	1.316	33.193
	4 th year	0.266	1.123	23.723
	5 th year	0.492	1.540	31.980
	Avarage	0.378	1.354	27.957

Table: 16: Density, Abundance and Frequency of *Turbo intercostalis*.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	32	33	35	35	34	33.8
February	33	35	36	36	37	35.4
March	34	36	35	36	35	35.2
April	36	38	37	38	35	36.8
May	39	41	39	39	37	39
June	38	36	36	38	35	36.6
July	35	34	35	37	37	35.6
August	32	33	34	35	36	34
September	34	29	31	35	34	32.6
October	34	32	33	34	35	33.6
November	31	32	31	34	36	32.8
December	35	35	34	35	36	35
Average	34.42	34.50	34.67	36.00	35.58	35.24

Table :17 Average Salinity of the year as per sub-sites and Mean average of Salinity along the Mangrol coast.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	7.622	7.622	7.648	7.524	7.562	7.60
February	7.496	7.618	7.514	7.496	7.568	7.54
March	7.398	7.386	7.476	7.424	7.406	7.42
April	7.554	7.574	7.518	7.328	7.548	7.50
May	7.574	7.498	7.588	7.41	7.44	7.50
June	7.668	7.620	7.638	7.564	7.534	7.60
July	7.422	7.404	7.522	7.6	7.47	7.48
August	7.302	7.322	7.392	7.604	7.444	7.41
September	7.556	7.556	7.474	7.676	7.594	7.57
October	7.628	7.562	7.530	7.558	7.752	7.61
November	7.796	7.550	7.676	7.496	7.476	7.60
December	7.958	7.858	7.856	7.496	7.536	7.74
Average	7.58	7.55	7.57	7.51	7.53	7.55

Table :18 Average pH of the year as per sub-sites and Mean average of pH along the Mangrol coast.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	420	436	413.4	428.6	433.8	416.6
February	415.2	415.8	413.6	435.2	427.2	412.2
March	411.6	416.6	410.6	444.2	424.2	414.4
April	449	429.2	405.2	427.8	432.4	407.8
May	452	443.6	432.8	433.4	445	422
June	441.6	431.2	435.2	441.8	446.2	426.6
July	430.6	438.8	434.2	435	434.4	441
August	439	455.6	423.6	447	438.8	445.4
September	450.4	443.6	421.8	448.6	439.2	440.8
October	434.8	427.2	420.8	450	433	441.6
November	438.6	413.8	425	436.4	430.4	424.6
December	432	435.4	425.2	436.4	430.6	410.2
Average	434.5667	432.2333	421.7833	438.7	434.6	432.38

Table: 19 Average Ca^{++} Hardness of the year as per sub-sites and Mean average of Ca^{++} Hardness along the Mangrol coast.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	1193.6	1236.2	1233	1217.2	1211.6	1218.32
February	1209	1273.6	1233.2	1245.6	1225.6	1237.4
March	1217.4	1267	1239	3214.4	1236.6	1234.88
April	1220.2	1187	1175.4	1252.8	1256.6	1218.4
May	1268.6	1249.4	1265.6	1247.8	1215.4	1249.36
June	1158.8	1179.6	1170.8	1252.6	1240.2	1200.4
July	1148.4	1179.6	1151	1219.6	1196.8	1179.08
August	1176.6	1186.6	1181	1231.8	1261.8	1207.56
September	1199.2	1217.6	1148.4	1258.6	1252	1215.16
October	1208.2	1222.8	1190.6	1219.4	1224	1213
November	1221	1230	1214.8	1264	1238.8	1233.72
December	1235.6	1225.4	1236.6	1258.2	1223.8	1235.92
Average	1204.72	1221.23	1203.28	1240.17	1231.93	1220.27

Table:20 Average Mg^{++} Hardness of the year as per sub-sites and Mean average of Mg^{++} Hardness along the Mangrol coast recorded.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	1613.6	1672.2	1646.4	1489.2	1585.4	1601.36
February	1624.2	1689.4	1646.8	1616.8	1537.2	1622.88
March	1629.0	1683.6	1649.6	1593.4	1577.2	1626.56
April	1669.2	1616.2	1580.6	1594.2	1518.2	1595.68
May	1720.6	1693.0	1698.4	1604.2	1586.6	1660.56
June	1600.4	1610.8	1606.0	1612.2	1594.6	1604.8
July	1579.0	1618.4	1585.2	1504.6	1598.4	1577.12
August	1615.6	1642.2	1604.6	1593.4	1545.2	1600.2
September	1649.6	1661.2	1570.2	1646.4	1569.8	1619.44
October	1643.0	1650.0	1611.4	1583.6	1627.0	1623
November	1659.6	1643.8	1639.8	1593.2	1646.6	1636.6
December	1667.6	1660.8	1661.8	1608.8	1665.8	1652.96

Average	1639.28	1653.47	1625.07	1586.67	1587.67	1618.43
---------	---------	---------	---------	---------	---------	---------

Table:21 Average Total Hardness of the year as per sub-sites and Mean average of Total Hardness along the Mangrol coast recorded.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	360	351.2	378.4	385	346	354.36
February	363	380.4	346.4	365	382	358.72
March	356.6	386.6	380.2	348	312	365.44
April	376	384.2	392	321	421	370.28
May	385	400.4	375.6	456	379	384.16
June	362.8	389.8	378.4	404	346	376.4
July	376.6	376.8	384	387	315	378
August	369	371.6	374.6	356	376	368.8
September	378.6	375.2	377.2	354	315	363.4
October	375.6	391.2	386.4	308	415	376.36
November	378.4	390.2	379.4	349	456	375.28
December	363.4	390.8	369.4	356	327	363.36
Average	370.42	382.37	376.83	354.80	363.32	369.55

Table:22 Average Potassium content of the year as per sub-sites and Mean average of Potassium content along the Mangrol coast recorded.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	2728.4	545.7	2692.6	2694.2	2691.8	2671.84
February	2749.6	549.9	2737.0	2537.4	2728.6	2668.64
March	2738.0	547.6	2657.6	2626.6	2707.8	2678.96
April	2755.2	551.0	2716.2	2732.8	2665	2726.04
May	2777.4	555.5	2720.6	2664.2	2623.6	2707.8
June	2640.4	528.1	2746.4	2700.2	2732	2709.84
July	2760.2	552.0	2737.0	2632.4	2657.6	2718.24
August	2719.4	543.9	2765.8	2567.0	2690.4	2697.16
September	2772.2	554.4	2619.4	2666.2	2626	2697.44
October	2753.8	550.8	2824.0	2729.0	2701	2725.68
November	2747.8	549.6	2696.0	2696.6	2649	2709.84
December	2679.0	535.8	2715.2	2719.2	2702.2	2701.04
Average	2735.12	2706.05	2718.98	2663.82	2681.25	2701.04

Table: 23 Average Sulphate (SO₄²⁻) content of the year as per sub-sites and Mean average of Sulphate(SO₄²⁻) content along the Mangrol coast recorded.

Month	1 st year	2 nd year	3 rd year	4 th year	5 th year	Average
January	5.16	4.32	0.86	3.9	4.8	4.60
February	4.7	4.4	0.88	4.3	4.5	4.44
March	6.52	6.36	1.27	4.1	3.6	5.57
April	6.12	5.82	1.16	3.7	5.1	5.59
May	4.26	3.6	0.72	3.8	4.9	4.52
June	5.42	4.56	0.91	5.2	4.5	5.09
July	6.32	5.86	1.17	6.1	4.4	5.80
August	4.58	4.28	0.86	4.3	4.5	4.86
September	4.64	3.92	0.78	3.6	4.8	4.46
October	5.1	5.26	1.05	3.8	4.7	4.95
November	4.18	4.3	0.86	4.4	5.6	4.49
December	4.26	3.52	0.70	4.2	3.9	4.32
Average	5.11	4.68	4.99	4.83	4.85	4.89

Table: 24 Average Dissolve Oxygen of the year as per sub-sites and Mean avarage of Dissolve Oxygen along the Mangrol coast recorded.