

## Penaeid prawn resources along the east coast of India during 1991-2011

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The east coast of India with a coast line of 2,688 km and continental shelf area of about 0.56 million km<sup>2</sup>, provides a good habitat for the penaeid prawns in the adult phase. There are five major perennial rivers, number of creeks and low-lying areas offering nursery grounds for post larvae and juveniles that migrate to the sea after completion of nursery phase to get recruited to the fishery. Though as many as 23 species of penaeids are recorded along the east coast only about 19 species are supporting the regular fishery.

### Craft&gear

Trawl nets are the major gear which is exploiting more than 90% of penaeid prawn along the east coast. Trawlers are of different types depending on the size of the boat, engine capacity and size of the gear. These are Pablo (9.14 m), Royya (9.75-10 m), Sorrah (11.4 m) and Sona (13.1 m) boats. The major fishing harbours/ landing centres, which are bases for operation of trawlers are Diamond harbor, Digha, Paradeep, Visakhapatnam, Kakinada, Chennai, Mandapam and Tuticorin. Besides these trawlers, *Thalluvalai* along the Tamil Nadu coast and stake nets along the Andhra Pradesh coast are also operated for exploitation of juvenile prawns in shallow coastal waters, estuaries, creeks and backwaters.

### Penaeid prawn landings

Penaeid prawns, on average, contributed 9.8% of annual total marine fish landings along the east coast and their contribution ranged from 5.5% to 13.8% during 1991 - 2011. On an average, east coast, contributed 29% of total penaeid prawn catch of India and its share ranged from 17.4% to 41.2% during the 21 years period. Average annual catch was 86,969 t and it ranged from 33,131 t in 1991 to

2,19,054 t in 2011. During 1991-2000 catch has fluctuated with 0.054 compound annual growth rate whereas during 2001-2010 sharp increase in catch was recorded with 0.156 compound annual growth rate. Overall increasing trend was observed during 21 years period (Fig.1). Average instead of mean state wise contribution of penaeid prawns shows Tamil Nadu contributed the highest (32%) followed by Andhra Pradesh (26%), West Bengal (22%), Odisha (19%), and Puducherry (1%). The highest catch was recorded from West Bengal and Odisha in 2011, from Andhra Pradesh in 2010 and from Tamil Nadu and Puducherry in 2009. The lowest catch was registered from West Bengal, Odisha, Andhra Pradesh in 1991, from Tamil Nadu in 2001 whereas from Puducherry it was in 1997 (Table1). West Bengal has the highest compound annual growth rate (0.211) followed by Odisha (0.192), Andhra Pradesh (0.056) and Tamil Nadu (0.033) during 21 years period, whereas Puducherry showed negative compound annual growth rate (-0.006). All states

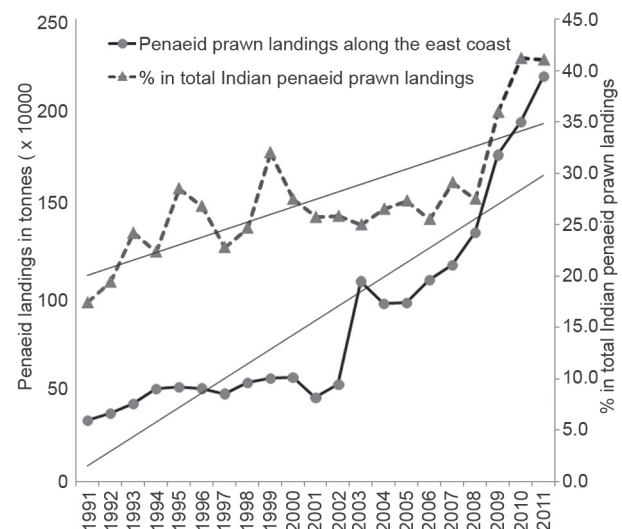


Fig. 1. Trends in penaeid landings and its share in total penaeid landings along the east coast

Table 1. Statewise penaeid prawn landings (t) along the east coast during 1991-2011

Year	West Bengal	Odisha	Andhra Pradesh	Tamil Nadu	Puducherry	Total (east coast)	All India prawn landings	Contribution of east coast to all India prawn landings (%)	Total marine fish landings	Contribution of prawn landings to total marine fish landings (%)	Total marine fish landings of east coast	Contribution of prawn landings to total marine fish landings of east coast (%)
1991	1223	1972	10759	18523	654	33131	190210	17.4	2251255	8.4	600917	5.5
1992	2677	2738	10797	20286	400	36898	189840	19.4	2310052	8.2	660693	5.6
1993	2754	2986	16200	19833	146	41919	173204	24.2	1976143	8.8	669937	6.3
1994	1247	2520	15513	30176	785	50241	224623	22.4	2359525	9.5	688127	7.3
1995	3352	5350	13863	28038	458	51061	178874	28.5	2258832	7.9	700222	7.3
1996	3799	3557	15138	27528	361	50383	187791	26.8	2380842	7.9	747442	6.7
1997	3030	2966	14193	27284	104	47577	208540	22.8	2692409	7.7	807752	5.9
1998	3123	2276	19011	28348	702	53460	216343	24.7	2635670	8.2	758894	7.0
1999	2704	4323	24967	23443	368	55805	174071	32.1	2401706	7.2	737464	7.6
2000	4272	6911	22657	22004	339	56183	204278	27.5	2652928	7.7	751484	7.5
2001	8780	4105	16221	16202	154	45462	176448	25.8	2292703	7.7	684856	6.6
2002	9434	4947	16391	21266	653	52691	203801	25.9	2589645	7.9	809999	6.5
2003	36104	8826	28382	34723	221	108256	432571	25.0	2587095	16.7	824638	13.1
2004	23905	12587	26607	32395	704	96198	362214	26.6	2538105	14.3	885609	10.9
2005	29646	17293	22158	27146	248	96491	352776	27.4	2295490	15.4	749385	12.9
2006	28135	13094	30350	35775	1619	108973	426416	25.6	2710988	15.7	866749	12.6
2007	28158	23077	33214	32078	500	117027	401688	29.1	2888461	13.9	1033225	11.3
2008	37703	29266	30656	35450	1441	134516	488669	27.5	3207205	15.2	1146745	11.7
2009	49191	54453	34001	37127	1861	176633	490722	36.0	3205453	15.3	1450125	12.2
2010	47952	73225	36922	35358	932	194389	471291	41.2	3346687	14.1	1411678	13.8
2011	68645	79111	33877	36840	581	219054	532851	41.1	3820207	13.9	1599885	13.7
Total	395834	355583	471877	589823	13231	1826348	6287221	29.0	55401401	11.3	18585826	9.8
Mean	18849	16933	22470	28087	630	86969	299391	29	2638162	11.3	885039.3	9.8
CAGR for 1991-11	0.211	0.192	0.056	0.033	-0.006	0.094	0.050	0.042	0.026	0.024	0.048	0.044
CAGR for 1991-2000	0.133	0.134	0.077	0.017	-0.064	0.054	0.007	0.047	0.017	-0.009	0.023	0.031
CAGR for 2001-2010	0.185	0.334	0.086	0.081	0.197	0.156	0.103	0.048	0.039	0.062	0.075	0.076

CAGR: Compound annual growth rate

including Puducherry had higher compound annual growth rates during 2001-2010 than those during 1991-2000.

### Species Composition

Species composition of penaeid prawn catches along the east coast was computed using the species composition data collected at Paradeep,

Visakhapatnam, Kakinada, Chennai, Mandapam and Tuticorin fishing harbours/ landing centres. Among the 23 species recorded 19 species had supported theregular fishery (Table 2). *Metapenaeus dobsoni* dominated the catch by contributing 21.4% followed by *M. monoceros* (3.2%), *Metapenaeopsis* spp (9.4%), *Penaeus semisulcatus* (9.2), *Fenneropenaeus indicus* (7.5%), *Parapenaeopsis maxillipedo* (4.3%),

Table 2. Common name and local names in four regional languages for penaeid prawns along the east coast

S.No.	Species	Common Name	Local name			
			Bengali	Oriya	Telugu	Tamil
1	<i>Metapenaeus dobsoni</i>	Kadalshrimp	Garangchingri	Khopra, Ranichingudi	Chinkiroyya	Chemakkaraeral
2	<i>Metapenaeus monoceros</i>	Speckled shrimp	Kara chingri	Khopra, Ranichingudi	Chakuroyya/ Kalandhan	Valuchaeral
3	<i>Penaeus semisulcatus</i>	Green tiger prawn	Bagda	Bagada, Katlareyya	Nooneroyya	Varieral
4	<i>Peneaus indicus</i>	Indian white shrimp	Chapra	Chapda, Tellareyya	Tellaroyya/ Narran	Vellaeral/ Vellaieral
5	<i>Metapenaeus affinis</i>	Jingashrimp	Chamneychingri	Khopra, Kalireyya	Gullaroyya/ Keliroyya	Chayavaluchaeral
6	<i>Penaeus monodon</i>	Giant tiger shrimp	Keleghari, Bagda	Bagada, Katlareyya	Katlaroyya	Karuvandueral/ Kathambaeral
7	<i>Penaeus merguensis</i>	Banana shrimp		Chapda, Pettireyya	Kalliroyya	Vellaeral/ Vellaieral
8	<i>Parapenaeopsis stylifera</i>	Kiddi shrimp	Matka	Koddi, gullareyya	Gullaroyya / Karrkadi	Vandueral
9	<i>Parapenaeopsis hardwickii</i>	Spear shrimp	Lalchingri	Khodi, gullareyya	Gullaroyya/ Karrkadi	Vandueral
10	<i>Metapenaeus lysianassa</i>	Bird shrimp	—	—	—	Vellaiveluchaeral
11	<i>Solenocera spp.</i>	Coastal mudshrimp	—	Nallichingudi, Errareyya	Kukkaroyya	Kalleral
12	<i>Metapenaeopsis spp.</i>	Fiddler shrimp/ Velvet shrimp	—	—	Gullaroyya	Pottueral
13	<i>Parapenaeopsis maxillipedo</i>	Torpedo shrimp	—	—	Gullaroyya	Karikkada/ Vandueral
14	<i>Parapenaeopsis uncta</i>	Uncta shrimp	—	—	Gullaroyya	Vandueral
15	<i>Trachypenaeus spp.</i>	Rough shrimp	—	—	Garukugullaroyya	Vandueral
16	<i>Metapenaeus moyebi</i>	Moyebi shrimp	—	—	—	—
17	<i>Parapenaeus longipes</i>	Flamingo shrimp	—	—	—	Thattaieral
18	<i>Metapenaeus brevicornis</i>	Yellow shrimp	Chamneychingri	Khopra, Kali reyya	Pasupuroyya / Puvvalin	Manjavalucheral
19	<i>Penaeus japonicus</i>	Kuruma shrimp	Kaonra, Pamra	Bagada, Katlareyya	Kalliroyya	Kathampaeral
20	Other penaeids	—	—	—	—	—

Table 3. Species composition of penaeid landings by weight (t) along the east coast

Species	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Average	%
1 <i>Metapenaeus dobsoni</i>	6581	7592	10200	11423	9521	11281	9044	13867	11986	10670	8035	9064	10217	21.4
2 <i>Metapenaeus monoceros</i>	3384	3540	4818	5611	6636	5361	5647	8744	10111	8854	5971	6619	6271	13.2
3 <i>Peneaus misulcatus</i>	4524	4851	4332	3476	2503	5080	5520	4613	4347	4578	3644	4838	4382	9.2
4 <i>Peneaus indicus</i>	2926	3130	2928	4402	4116	3654	3412	4361	3262	3485	2769	3519	3568	7.5
5 <i>Metapenaeus affinis</i>	1000	1119	1558	1171	2297	1484	1275	1152	1498	2048	2407	2638	1460	3.1
6 <i>Peneaus monodon</i>	404	426	592	1389	734	811	616	667	791	966	791	961	739	1.6
7 <i>Peneaus merguensis</i>	270	298	133	177	184	174	173	156	195	308	322	357	207	0.4
8 <i>Parapenaeopsis stylifera</i>	484	671	1321	2379	2288	2210	2418	2173	2398	2525	2512	2754	1887	4.0
9 <i>Parapenaeopsis hardwickii</i>	300	509	1444	819	2185	1962	2122	2119	2557	3483	3801	4224	1750	3.7
10 <i>Metapenaeus lysianassa</i>	637	1054	372	726	1271	796	762	528	821	1175	1269	1408	814	1.7
11 <i>Solenocera</i> spp.	452	545	1738	1650	2678	2358	1705	1982	2995	3278	2938	3241	1938	4.1
12 <i>Metapenaeopsis</i> spp.	4634	4999	3644	4144	5494	5104	4732	4202	3884	4015	3426	4165	4485	9.4
13 <i>Parapenaeopsis maxillipedo</i>	1264	1363	1551	3730	2853	2079	1822	2551	1829	1627	1227	1633	2067	4.3
14 <i>Parapenaeopsis suncta</i>	201	217	343	524	592	570	500	489	494	459	425	508	439	0.9
15 <i>Trachypenaeus</i> spp.	1459	1574	1538	2596	2770	2401	1830	1932	1741	1949	1287	1697	1979	4.2
16 <i>Metapenaeus moyebi</i>	264	284	689	1391	1449	2014	2409	677	2008	921	518	665	1211	2.5
17 <i>Parapenaeus longipes</i>	22	24	615	674	794	36	386	395	400	1123	693	758	447	0.9
18 <i>Metapenaeus brevicornis</i>	0	0	720	1111	661	681	669	1167	827	1571	978	989	741	1.6
19 <i>Peneaus japonicus</i>	0	0	77	92	55	47	51	37	42	64	44	44	47	0.1
20 Other penaeids	4327	4702	3306	2757	1980	2280	2485	1650	3619	2961	2404	2609	3007	6.3
<b>Total</b>	<b>33131</b>	<b>36898</b>	<b>41919</b>	<b>50241</b>	<b>51061</b>	<b>50383</b>	<b>47577</b>	<b>53460</b>	<b>55805</b>	<b>56061</b>	<b>45462</b>	<b>52690</b>	<b>47654</b>	<b>100.0</b>

*Trachypenaeus* spp (4.2%), *Solenocera* spp (4.1%), *Parapenaeopsis tylifera* (4%), *P.hardwickii* (3.7%), *M. affinis* (3.1%), *M. moyebi* (2.5%), *M. lysiansa* (1.7%), *P. monodon* (1.6%), *M. brevicornis* (1.6%) and *Parapenaeus longipes*. *M. brevicornis* has emerged as a regular species from 1993 onwards. Contribution of *P. stylifera*, *P. hardwickii*, *Solenocera* spp, *P. longipes* and *M. moyebi* had significantly increased from 1993 onwards. Threefold increase in the catch of *P. monodon* was observed in 1994 and thereafter its contribution was more or less stable. Contribution of *F. indicus*, *M. dobsoni*, *M. monoceros* and *P. maxillipedo* were gradually increased up to 1994 and since then their status was maintained.

**West Bengal and Odisha:** About 11 species supported the fishery of which *P. hardwickii* (24.1%) dominated followed by *M. dobsoni* (18.5%), *P. stylifera* (11.7%), *M. lysianassa* (10.4%), *Solenocera* spp (7.9%) and *M. monoceros* (6.6%). Commercial species like *P. monodon*, *F. indicus* and *P. merguensis* contributed only in low quantities (Table4).

**Andhra Pradesh:** About 18 species supported the fishery. *M. dobsoni* (19.1%) dominated followed by *M. monoceros* (25.2%), *Solenocera* spp. (7.1%), *M. brevicornis* (4.8%) *P. stylifera* (4.1%), *F. indicus* (3.8%), *M. affinis* (3.3%), and *M. spp* (3.0%). Other highly commercial species like *P. monodon* (1.8%), *P. semisulcatus* (1.3%) and *P. merguensis* (0.6%) were contributed in low volumes only.

**Tamil Nadu and Puducherry:** About 16 species contributed to the fishery. *P. semisulcatus* contributed high (17.3%) followed by others (16.2%), *M. dobsoni*(15.8%), *P. indicus*(11.8%), *P. maxillipedo* (8.1%), *Trachypenaeus* spp (7.7%), *M. monoceros* (6.9%), and *M. moyebi*(4.5%). The commercial species like *P. monodon* (1.7%) and *P. merguensis* (0.04%) were contributed in low quantities.

This is the first report on species composition of penaeid prawn landings along the east coast of India from different maritime states such as West Bengal, Odisha, Andhra Pradesh, Tamil Nadu and Puducherry. Species composition, size range and modal groups of both sexes of commercial species at different fishing harbours/landing centres of present report can be utilized for future comparative studies.

Table 4. Species wise landings (t) of penaeid prawns along West Bengal and Odisha coasts

Species	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total	Mean	%
<i>Metapenaeus dobsoni</i>	1151	1951	1377	849	1201	1386	1105	1057	1178	1617	1863	2079	16814	1401	18.5
<i>Metapenaeus monoceros</i>	114	193	293	113	305	377	329	416	533	961	1107	1236	5978	498	6.6
<i>Penaeus semisulcatus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Penaeus indicus</i>	73	124	11	5	17	15	17	22	28	82	94	105	594	50	0.7
<i>Metapenaeus affinis</i>	128	218	695	551	1349	819	824	553	685	1373	1582	1766	10543	879	11.6
<i>Penaeus monodon</i>	11	18	38	22	35	30	50	51	72	151	174	195	848	71	0.9
<i>Penaeus merguensis</i>	33	55	29	25	78	58	101	114	151	261	301	335	1542	128	1.7
<i>Parapenaeopsis stylifera</i>	242	410	554	402	1166	966	839	631	852	1323	1524	1701	10610	884	11.7
<i>Parapenaeopsis hardwickii</i>	300	509	929	486	1906	1638	1590	1630	2112	3147	3626	4047	21921	1827	24.1
<i>Metapenaeus lysianassa</i>	597	1011	234	443	1123	722	625	415	715	1032	1189	1327	9432	786	10.4
<i>Solenocera</i> spp.	102	173	289	160	1096	819	343	376	507	972	1119	1249	7205	600	7.9
<i>Metapenaeopsis</i> spp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Parapenaeopsis maxillipedo</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Parapenaeopsis uncta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Trachypenaeus</i> spp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Metapenaeus moyebi</i>	0	0	0	0	0	0	0	0	0	0	133	149	282	23	0.3
<i>Parapenaeus longipes</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Metapenaeus brevicornis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Penaeus japonicus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other penaeids	444	752	1291	710	426	524	173	134	195	265	171	191	5277	440	5.8
<b>Total</b>	<b>3195</b>	<b>5415</b>	<b>5740</b>	<b>3767</b>	<b>8702</b>	<b>7356</b>	<b>5996</b>	<b>5399</b>	<b>7027</b>	<b>11183</b>	<b>12885</b>	<b>14381</b>	<b>91046</b>	<b>7587</b>	<b>100.0</b>

Table 5. Species wise landings (t) of penaeid prawns along the Andhra Pradesh coast

Species	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total	Mean	%
<i>Metapenaeus dobsoni</i>	2871	2881	5669	4264	3573	5904	4120	6758	7297	5675	3903	3944	56859	4738	29.1
<i>Metapenaeus monoceros</i>	2414	2422	3195	3058	4086	3311	3607	6173	8104	6016	3443	3479	49310	4109	25.2
<i>Penaeus semisulcatus</i>	397	399	290	340	170	78	160	113	132	204	135	136	2553	213	1.3
<i>Penaeus indicus</i>	952	956	705	458	686	596	455	485	497	581	517	523	7413	618	3.8
<i>Metapenaeus affinis</i>	510	511	674	571	496	455	299	421	678	410	708	716	6449	537	3.3
<i>Penaeus monodon</i>	216	217	285	1010	328	257	184	74	302	242	184	186	3485	290	1.8
<i>Penaeus merguensis</i>	184	185	105	152	106	114	70	41	42	48	21	21	1089	91	0.6
<i>Parapenaeopsis stylifera</i>	0	0	612	1006	664	616	1008	772	954	825	821	830	8107	676	4.1
<i>Parapenaeopsis hardwickii</i>	0	0	515	333	279	324	531	488	445	336	175	177	3603	300	1.8
<i>Metapenaeus lysianassa</i>	0	0	120	225	84	74	138	113	106	143	80	81	1162	97	0.6
<i>Solenocera</i> spp.	68	68	1418	1228	1404	1121	982	1052	2064	1750	1352	1366	13871	1156	7.1
<i>Metapenaeopsis</i> spp.	0	0	377	396	105	509	223	322	549	827	1290	1304	5900	492	3.0
<i>Parapenaeopsis maxillipedo</i>	0	0	0	0	0	0	0	0	0	26	36	36	99	8	0.1
<i>Parapenaeopsis uncta</i>	0	0	0	0	0	0	0	0	0	182	188	190	560	47	0.3
<i>Trachypenaeus</i> spp.	0	0	16	0	143	0	0	0	0	127	86	86	458	38	0.2
<i>Metapenaeus moyebi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<i>Parapenaeus longipes</i>	0	0	187	34	148	36	6	41	128	873	518	524	2496	208	1.3
<i>Metapenaeus brevicornis</i>	0	0	720	1111	661	681	669	1167	827	1571	978	989	9373	781	4.8
<i>Penaeus japonicus</i>	0	0	77	92	55	47	51	37	42	64	44	44	553	46	0.3
Other penaeids	3147	3158	1234	1237	876	1015	1691	954	2800	2672	1742	1760	22284	1857	11.4
<b>Total</b>	<b>10759</b>	<b>10797</b>	<b>16200</b>	<b>15513</b>	<b>13863</b>	<b>15138</b>	<b>14193</b>	<b>19011</b>	<b>24967</b>	<b>22573</b>	<b>16221</b>	<b>16391</b>	<b>195626</b>	<b>16302</b>	<b>100.0</b>



