



Constituents of Low Value Trawl By-catch Caught off Veraval

Puthra Pravin and R.C. Manohardoss*

Veraval Research Centre of CIFT, Matsya Bhavan
Bhidia, Veraval-362 265
Gujarat, India

87 species belonging to 42 families were recorded in the low value by-catch from small and medium mechanised trawlers based at Veraval, Gujarat. Percentage contribution of these species in the by-catch has been worked out.

Key words : Trawl by-catch, Veraval, India.

The trawl gear contributes about 80% of the total marine fish landings in Gujarat coast. About 2000 small and medium trawlers of sizes ranging from 10-17 m are fishing for 1-6 days in depths up to 200 m from Veraval fishing harbour. Currently as much as 60% of trawl catch is utilised to make low value fish meal (Philipose, 1994).

Finfish constituents of trawl by-catch off Visakhapatnam have been reported by Sujatha (1995). Major varieties of fishes in the by-catch of shrimp trawls in Gujarat have been reported by Badonia *et al.* (1990). Trawl catch on board the trawler is usually sorted into quality finfishes, shell fishes, other edible fishes and by-catch of miscellaneous fishes locally called "kutta". Low value by-catch consists of small sized fishes, juveniles of commercially important fishes, small prawns, crabs, squilla, jelly fish, sea snakes, etc. Region-wise check lists of trawl by-catch constituents are helpful in furthering ichthyological knowledge of the region and as an aid in fisheries management (Sujatha, 1995). The present study was taken up to identify the different species of fish constituting the low value by-catch of mechanised trawlers operating from Veraval, Gujarat.

Random samples (1-2 kg) of trawl by-catch each were collected from the landings of commercial trawlers undertaking daily trips and long trips of 5-6 days; and also from the Departmental Fishing Vessel Fish tech. No. VIII attached to the Veraval Research Centre of CIFT on different days during the fishing season from mid-September 1991 to mid-May 1992. The samples were sorted out in the laboratory after proper washing and fishes, squids, cuttle fish and prawns were identified (Fisher & Bianchi, 1984; Roper *et al.*, 1984; Jhingran, 1982) and percentages were worked out (Table 1).

Table 1. Constituents of low value trawl by-catch off Veraval

	Percentage by weight
Order LAMNIFORMES	
Family CARCHARHINIDAE	0.15
1. <i>Carcharhinus limbatus</i> (Valenciennes)	0.15
Order CLUPEIFORMES	
Family ENGRAULIDAE	12.84
2. <i>Thryssa setirostris</i> (Broussonet)	0.01
3. <i>Thryssa dussumieri</i> (Valenciennes)	9.94
4. <i>Thryssa vitrirostris</i> (Gülich & Thompson)	1.70
5. <i>Coilia dussumieri</i> (Valenciennes)	1.14
6. <i>Stolephorus commersoni</i> (Lacepede)	0.05
Family CLUPEIDAE	0.65
7. <i>Sardinella longiceps</i> (Valenciennes)	0.11
8. <i>Sardinella gibbosa</i> (Bleeker)	0.17

9. <i>Dussumteria acuta</i> Valenciennes	0.03	40. <i>Alepes djedaba</i> (Forsskal)	0.22
10. <i>Opisthopterus tardoore</i> (Cuvier)	0.34	Family APOGONIDAE	1.08
Order ANGUILLIFORMES		41. <i>Apogon multileaniatus</i> (Cuvier & Valenciennes)	1.08
Family MURAENESOCIDAE	0.40	Family TRICHIURIDAE	8.90
11. <i>Congresox talabonoides</i> (Bleeker)	0.26	42. <i>Trichiurus lepturus</i> Linnaeus	1.09
12. <i>Muraenesox cinereus</i> (Forsskal)	0.14	43. <i>Lepturacanthus savala</i> (Cuvier)	7.65
Order SILURIFORMES		44. <i>Eupleurogrammus muticus</i> (Gray)	0.16
Family PLOTOSIDAE	0.08	Family MULLIDAE	0.55
13. <i>Plotosus anguillaris</i> (Bloch)	0.08	45. <i>Upeneus sulphureus</i> Cuvier	0.31
Family ARIIDAE	0.03	46. <i>Upeneus laeniopterus</i> Cuvier	0.02
14. <i>Arius caelatus</i> Valenciennes	0.01	47. <i>Upeneus moluccensis</i> (Bleeker)	0.22
15. <i>Arius thalassinus</i> (Ruppell)	0.02	Family DREPANIDAE	0.07
Order MYCTOPHIFORMES		48. <i>Drepane longimana</i> (Bloch & Schneider)	0.07
Family HARPADONTIDAE	0.06	Family NEMIPTERIDAE	3.89
16. <i>Harpadon nehereus</i> (Hamilton-Buchanan)	0.06	49. <i>Nemipterus japonicus</i> (Bloch)	3.67
Family SYNODONTIDAE	0.13	50. <i>Scolopsis vosmeri</i> (Bloch)	0.22
17. <i>Saurida tumbil</i> (Bloch)	0.06	Family POLYNEMIDAE	4.88
18. <i>Saurida undosquamis</i> (Richardson)	0.07	51. <i>Polynemus heptadactylus</i> Cuvier	4.75
Order GADIFORMES		52. <i>Polynemus sextarius</i> Schneider	0.07
Family BREGMACEROTIDAE	0.09	53. <i>Polynemus indicus</i> Shaw	0.06
19. <i>Bregmaceros maclellandi</i> (Thompson)	0.09	Family STROMATEIDAE	0.17
Order SCORPAENIFORMES		54. <i>Pampus chinensis</i> (Euphrasen)	0.17
Family SCORPAENIDAE	0.02	Family HAEMULIDAE	0.02
20. <i>Scorpaenopsis barbata</i> Ruppel	0.02	55. <i>Pomadasys maculatum</i> (Bloch)	0.02
Family PLATYCEPHALIDAE	1.64	Family ARIOMMIDAE	0.81
21. <i>Platycephalus indicus</i> (Linnaeus)	0.09	56. <i>Ariomma indica</i> (Day)	0.81
22. <i>Grammoplites suppositus</i> (Troschel)	1.55	Family GOBIDAE	0.06
Order PERCIFORMES		57. <i>Gobius macrostoma</i> (Gunther)	0.06
Family LACTARIDAE	4.16	Family SERRANIDAE	0.13
23. <i>Lactarius lactarius</i> (Bloch & Schneider)	4.16	58. <i>Epinephelus diacanthus</i> (Valenciennes)	0.13
Family SCIAENIDAE	15.64	Family SPHYRAENIDAE	0.29
24. <i>Johnius glaucus</i> (Day)	0.94	59. <i>Sphyræna forsteri</i> Cuvier	0.17
25. <i>Johnius belangerii</i> (Cuvier)	0.31	60. <i>Sphyræna barracuda</i> (Walbaum)	0.04
26. <i>Johnieops dussumieri</i> (Cuvier)	0.33	61. <i>Sphyræna obtusata</i> Cuvier	0.08
27. <i>Johnieops macrorhynchus</i> Mohan	0.14	Family PRIACANTHIDAE	0.01
28. <i>Johnieops sina</i> (Cuvier)	1.06	62. <i>Priacanthus hamrur</i> (Forsskal)	0.01
29. <i>Otolithes ruber</i> (Schneider)	5.83	Family POMACENTRIDAE	0.03
30. <i>Otolithes cuvieri</i> Trewavase	7.01	63. <i>Pomacentrus sulfureus</i> (Klungzinger)	0.03
31. <i>Protonibea diacanthus</i> (Lacepede)	0.02	Family SPARIDAE	0.09
Family LEIOGNATHIDAE	3.29	64. <i>Argyrops spinifer</i> (Forsskal)	0.09
32. <i>Secutor insidiator</i> (Bloch)	2.77	Family TRYPAUCHEIDAE	0.01
33. <i>Leiognathus lineolatus</i> (Valenciennes)	0.16	65. <i>Trypauchen vagina</i> (Bloch & Schneider)	0.01
34. <i>Gazza minuta</i> (Bloch)	0.36	Family TERAPONIDAE	0.02
Family CARANGIDAE	2.78	66. <i>Terapon jarbua</i> (Forsskal)	0.02
35. <i>Caranx para</i> (Cuvier)	0.79	Order PLEURONECTIFORMES	
36. <i>Carangoides malabaricus</i> (Bloch & Schneider)	0.21	Family CYNOGLOSSIDAE	2.38
37. <i>Decapterus russelli</i> (Ruppell)	0.38	67. <i>Cynoglossus puncticeps</i> (Richardson)	0.61
38. <i>Atropus atropus</i> (Schneider)	0.18	68. <i>Cynoglossus arel</i> (Schneider)	1.36
39. <i>Formio niger</i> (Bloch)	1.00	69. <i>Cynoglossus macrostromus</i> Norman	0.41

Family SOLEIDAE	0.03
70. <i>Solea elongata</i> Day	0.03
Family BOTHIDAE	0.23
71. <i>Pseudorhombus arsius</i> (Hamilton)	0.23
Family PSETTODIDAE	0.01
72. <i>Psettodes crumei</i> (Schneider)	0.01
Order TETRAODONTIFORMES	
Family DIADONTIDAE	1.22
73. <i>Chilomycterus orbicularis</i> (Bloch)	1.19
74. <i>Diodon holocanthus</i> Linnaeus	0.03
Order DECAPODA	
Family SOLENOCERIDAE	1.97
75. <i>Solenocera crassicornis</i> (H. Milne Edwards)	1.97
Family PENAEIDAE	2.21
76. <i>Parapenaeopsis stylifera</i> (H. Milne Edwards)	0.65
77. <i>Parapenaeopsis hardwickii</i> (Miers)	0.33
78. <i>Parapenaeopsis uncta</i> Alcock	0.24
79. <i>Metapenaeopsis stridulans</i> (Alcock)	0.87
80. <i>Metapenaeus monoceros</i> (Fabricius)	0.04
81. <i>Metapenaeus affinis</i> (H. Milne Edwards)	0.02
82. <i>Trachypenaeus curvirostris</i> (Stimpson)	0.06
Family SERGESTIDAE	4.00
83. <i>Acetes indicus</i> H. Milne Edwards	4.00
Order SEPIODEA	
Family SEPIIDAE	2.23
84. <i>Sepiella inermis</i> (Orbigny)	1.09
85. <i>Sepia aculata</i> (Orbigny)	1.06
86. <i>Sepia pharaonis</i> (Ehrenberg)	0.08
Order TEUTHOIDAE	
Family LOLIGINIDAE	5.46
87. <i>Loligo duvauceli</i> (Orbigny)	5.46

87 species belonging to 42 families constituted 82.7 per cent of the low value by-catch landed by mechanised trawlers operating off Veraval. Sciaenids constituted 15.6 per cent followed by engraulids (12.84%), ribbon fishes (8.9%), penaeid and non penaeid prawns (8.2%), squids and cuttle fishes (7.7%), polymemids (4.9%), white fish (4.2%), nemipterids (3.9%), leiognathids (3.3%), carangids (2.8%), flat fish (2.7%) and others (7.7%). Balance 17.3 percent is constituted by shells, jelly fish, squilla, crabs, sea snakes and unidentified groups. By-catch contained juveniles of commercially important finfish and shell

fish. Very small mesh size of 10-15 mm (stretched) are being used in the codends of trawls in Gujarat coast, which do not permit escapement of juveniles. The fishermen are aware of the consequences of using very small codend meshes. However, they continue to use small meshed codends as by-catch also contribute to the economic returns.

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