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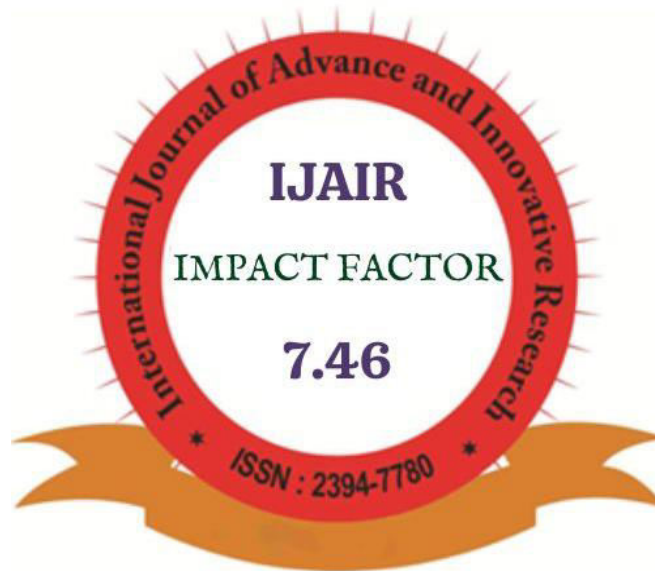
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**FISH DIVERSITY OF BENDUSARA RESERVOIR DIST BEED****P. V. Patil<sup>1</sup> and A.M. Budrukkar<sup>2</sup>**<sup>1</sup>Mrs. K.S K alias Kaku College Beed (MS)<sup>2</sup>Deogiri College, Aurangabad (MS)**ABSTRACT**

*Fishery is an important branch of agriculture. Fish cultural practices are done since last many centuries; India is second in the culture and production of fish. Bindusara originates in the hills of Balaghat near the village Waghira, in south of district Beed. It is a hilly area. Various small streams contribute to the river. The city of Beed is situated on the banks of Bindusura River. Bindusura is a rapid and seasonal river. A reservoir; Bindusura Project (capacity 7.106 million cubic meters) was constructed on the river in 1955 near the village of Pāli, about 10 km south of Beed. Bindusura river flows from south to north and meets Sindphana river, about 10 km north of Beed town. Total length of the river is about 40 km. The reservoir is present on National highway Solapur –Dhule Total area under irrigation of dam is 2500 ha. The latitude and longitude of the dam is 22°-615<sup>0</sup>-770 and 88°-411<sup>0</sup>-510 Water is mainly used for irrigation and drinking purpose. More than 20 villages are present near the reservoir. During study the diversity of fishes were studied by collection of fishes from local fishermen monthly. The fishes were identified as per the guidelines given by Jayram (1991) and Jhingran (1988). Study was conducted during 2021-2022 to find the fishery status. The details of fish diversity are given in the text.*

*Keyword: Bindusara, Fish diversity*

**INTRODUCTION**

India is the fourth largest inland fish producer in the world (4.7 million tonnes in 2008-09). But during the last few decades, the production scenario in inland sector has indicated a mixed trend-an upward looking aquaculture with a declining fishery from river sector.

At present, the major share of inland fish production in the country is from aquaculture and the share of rivers is very low. It is so because our open-water fishery resources, the prime means of sustenance to as estimated 0.45 million inland fishery as well as the only source fish germplasm, have brutally been assaulted through various omissions and commissions on the part of the human beings. The situation needs serious thought and desired action for sustainable fish production and to attain the targeted production of nearly 8.0 million tonnes from inland sector by 2020 (Sinha, 2002) Fish harvesting policies often occurs on industrialization and centralization of facilities in urban areas. During the post-independence phase, commissioning of a large number of river valley projects resulted in the creation of a large reservoir (3,150,000ha) and a network of canals (126,334 km), which have further enhanced the inland open-water fishery resources. The conservation and restoration of rivers are vital for harnessing the direct and indirect benefits from such an ecosystem on a sustainable basis. The water quality of the rivers in the country is being monitored by several agencies, at Central and State level, National River Conservation Directorate, Central Water Commission, State Ground Water Agencies and Central Ground Water Board.

Thus any strategy of fisheries development in the river in the sector needs to give equal emphasis to conservation of the bio-diversity and fish production. The CPCB, under the national programme of Monitoring of Indian National Aquatic Resources (MINARS) is monitoring water quality of ten river basins across India. To assess the impact of water quality on fisheries, Study was conducted during 2021-2022 to find the fishery status.

**MATERIAL AND METHOD**

During study the fishes were collected from local fishermen monthly and identified on the spot. During collection and identification netting operation and collection method was observed. The local fishermen using the traditional nets i.e. nylon thread nets for fishing. The fish farmer introducing the seeds available from local area. The fishermen use the traditional nets. The details of species identification was done as per the guidelines given by Jayram (1981, 1999, 2006), Talwar and Jhingran(1991), Jhingran(1997).

**Fish Species Diversity**

<p><b>Order: Osteoglossiformes</b></p> <ol style="list-style-type: none"> <li>1. Dorsal fins small</li> <li>2. Anal fin very long and tapering, more than 100 rays, confluent with small caudal fin</li> <li>3. Pelvic fin rudimentary</li> <li>4. Bony tongue with curved teeth</li> </ol> <p><b>Family: Notopteridae</b></p> <ol style="list-style-type: none"> <li>1. Body deep and strongly compressed</li> <li>2. Abdomen serrated before pelvic fins</li> <li>3. Barbells absent</li> <li>4. Dorsal fin small and cylinder, with eight to ten rays</li> <li>5. Anal fin long based(100to135rays)</li> <li>6. Scales very small Laterallinecomplete,withabout180scales</li> </ol> <p><b>Species: Chitala chitala</b></p> <ol style="list-style-type: none"> <li>1. Maxilla extends considerably beyond posterior edge of eye</li> <li>2. Scales small on opercula's, of equal size as on body</li> <li>3. Pre-orbital smooth</li> <li>4. Pelvic fin rudimentary</li> <li>5. Anal fin very long, confluent with reduced caudal fin</li> <li>6. Five to nine black, rounded spots near caudal region</li> <li>7. Lateral line curved and complete</li> <li>8. Bodycoppery-brownonnarrowbackwithabout15transverse silverybars</li> <li>9. Maximumsize:122cm</li> </ol> <p><b>Species: Notopterus notopterus</b></p> <ol style="list-style-type: none"> <li>1. Maxilla extends to mid orbit</li> <li>2. Pre-orbital serrated</li> <li>3. Large scales on opercula's than those on the body</li> <li>4. No transverse bars on back</li> <li>5. No rounded spots near caudal origin</li> <li>6. Pectoral fin moderate, extends beyond anal fin origin</li> <li>7. Lateral line straight and complete</li> <li>8. Body silvery-white with numerous fine grey spots</li> <li>9. Maximumsize:61cm</li> </ol> <p><b>Order: Cypriniformes</b></p> <ol style="list-style-type: none"> <li>1. Mouth usually protractile and always toothless</li> <li>2. Body covered with cycloid scales , head scale less</li> <li>3. Pectoral fin devoid of anosseousspine</li> <li>4. Lateral line almost always present and complete</li> </ol> <p><b>Family: Cyprinidae</b></p> <ol style="list-style-type: none"> <li>1. Barbells present or absent if present, one or two pairs</li> </ol>	<ol style="list-style-type: none"> <li>1. Abdomen more or less rounded</li> <li>2. Upper lip absent</li> <li>3. Dorsal fin inserted slightly behind pelvic fin base</li> <li>4. Scales small, lateral line incomplete</li> <li>5. Abroadsil very lateral band on body</li> <li>6. Maximumsize:20cm</li> </ol> <p><b>Species: Arilius gatensis</b></p> <ol style="list-style-type: none"> <li>7. Body deep</li> <li>8. Mouth moderate , jaws short, maxilla extends to below the middle of orbit</li> <li>9. Barbells with pair, often wanting</li> <li>10. Dorsal fin inserted in advance of anal fin, extending to above the third anal fin ray</li> <li>11. Scales moderate, with few radii</li> <li>12. Tubercles large and well developed on snout and lower jaw</li> <li>13. Bodysilvery-greywith13-15verticalbars</li> <li>14. Maximumsize:15cm</li> </ol> <p><b>Species: Chelafasciata</b></p> <ol style="list-style-type: none"> <li>15. Body greatly compressed</li> <li>16. Head slightly turned upwards</li> <li>17. Mouth small, obliquely directed upwards, cleft not extending to below front edge of eye</li> <li>18. Pectoral fins long, outer ray of pelvic finger much beyond origin of anal fin</li> <li>19. Lateral line complete</li> <li>20. Upper half of body grayish while lower half and belly lighter in colour, a dark broad lateral stripe on sides commencing just behind eye and running along middle of body to about base of caudal fin.</li> </ol> <p><b>Species: Salmostoma bacaila</b></p> <p>Body elongate and strongly compressed, abdomen not hardened</p> <ol style="list-style-type: none"> <li>21. Mouth oblique, lower jaw with a well-developed knob</li> <li>22. Dorsal fin inserted well behind pelvic fin sand in advance of anal fin</li> <li>23. Scales very small, lateral line slightly curved</li> <li>24. Uppersidegreyish-green,oftensilvery;abroad,gleamingwhite-greenbandalong flank</li> <li>25. Maximumsize:18cm</li> </ol> <p><b>Species: Salmostoma novacula</b></p> <p>Body elongate and compressed</p> <ol style="list-style-type: none"> <li>26. Mouth oblique, lower jaw with a distinct process</li> <li>27. Dorsal fin inserted opposite on anal fin</li> <li>28. Scales small, lateral line gently curved downwards</li> <li>29. Body silvery with a bright with lateral band</li> <li>30. Maximumsize:12.5cm</li> </ol> <p><b>Species: Salmostoma phulo</b></p> <p>Body elongate and greatly compressed</p>
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2. Paired fins laterally inserted	31. Abdomen alkeel not hardened
3. Abdomen rounded or with a sharp edge	32. Mouth oblique, lower jaw with a distinct symphyial process
<b>Sub-family: Cyprininae</b>	33. Dorsal fin inserted opposite to origin of anal fin
1. Abdomen not compressed and no keel is formed	34. Scales small, lateral line curves gently downwards
2. Barbell present or absent	35. Body silvery with a bright silvery lateral band
3. Scales on anal sheath	Maximumsize:12cm
4. Scales small to large, always less than100 along lateral line	<b>Species: <i>Salmostoma sardinella</i></b>
5. Upper lips separated from skin of snout by a groove	Body elongate and compressed
6. Mouth terminal, sub-inferior or distinctly inferior	36. Mouth oblique, lower jaw with rudimentary symphyial process
7. Lower lip without a Suctorial disc	37. Dorsal fin inserted above or slightly behind origin of anal fin
8. Lower jaw with out any symphyial process	38. Scales medium
9. Dorsal fin inserted before or opposite to origin of pelvic fins, generally with a spine	39. Body silvery
10. Lateral line running along median line of caudal peduncle	40. Maximumsize:15cm
<b>Species: <i>Catlacatla</i></b>	<b>Species: <i>Securiculagora</i></b>
1. Body deep, head enormously large	41. Body fairly elongate and compressed
2. Mouth wide and upturned, with a prominent protruding lower jaw; upper lip absent	42. Mouth oblique left extending to front edge of eye
3. Scales conspicuously large	43. Abdomen with a sharp keel, extends from below operculum to anal fin
4. Barballs absent	44. Dorsal fin short, inserted slightly in advance of origin of anal fin
5. Maximumsize:270cm	45. Scales very small
<b>Species: <i>Cirrhinusreba</i></b>	46. Body bright silvery
1. Body fairly elongate ,its depth much more than head length	47. Maximumsize:23cm
2. Mouth broad; upper lip entire, often fringed in juveniles; a thin cartilaginous covering in side lower jaw	<b>Sub-family: Rasborinae</b>
3. One pair of short rostralbar bels generally present	48. Abdomen not compressed and no keel is formed
4. Scale hexagonal and moderate	49. Barbells present or absent
5. Color dark grey dorsally, silvery on flanks and belly	50. No scales on anal sheath
6. Maximumsize:30cm	51. Scales small to large,always less than 100 along lateral line
<b>Species: <i>Cyprinus carpio</i></b>	52. Upper lips Separated from skin of snout by a groove
1. Body robust, more or less compressed, abdomen rounded	53. Mouth terminal, sub-inferior or distinctly inferior
2. Mouth small, terminal and protrusible, lips thick and fleshy	54. Lower lip without Suctorial disc
3. Barbellstwopairs;onepaireachrostralandmaxillary;maxillarypairlonger	55. Lower jaw generally with asymphyial process,
4. Dorsal fin very long , dorsal spines tout and serrated	56. Dorsal fin inserted behind base of pelvic fins, devoid of spine
5. Caudal fin deeply emarginated	57. Lateral line, if present, abruptly bent downwards and, if complete, running along lower half of caudal peduncle
6. Lateral line straight	<b>Species: <i>Parluciosoma labiosa</i></b>
7. Side soft body golden-yellow, fins with reddish or gold	1 Body elongate and compressed
8. Maximumsize:110cm	58. Mouth small; lower lip hypertrophied, more fleshy and flabby than upper lip and project s beyond jaw, with three distinct lobe-like structures
<b>Species: <i>Hypselobarbus</i></b>	59. Pectoral fins short than head length
1. Body relatively deep and compressed with considerable rise in the profile from dorsal	60. Lateral line incomplete, extends posterior anal fin
	61. A broad black lateral band on side; along

<p>fin</p> <ol style="list-style-type: none"> <li>Mouth slightly sub terminal</li> <li>Barbels one pair, extend beyond mid-orbit</li> <li>Scales relatively small</li> <li>Dorsal fin inserted anterior to pelvic fins</li> <li>Maximum size: 30cm</li> </ol> <p><b>Species: Labeoangra</b></p> <ol style="list-style-type: none"> <li>Dorsal profile of the body more convex than ventral</li> <li>Snout over hanging mouth, with a distinct lateral lobe on each side</li> <li>Mouth rather small, lips and continuous</li> <li>Barbells one short maxillary pair</li> <li>Body with a black strip</li> <li>Maximum size: 22cm</li> </ol> <p><b>Species: Labeobata</b></p> <ol style="list-style-type: none"> <li>Mouth inferior, lips thin, lower lip slightly fringed, a small tubercle above mandibular syphylis</li> <li>Barbells pair of minute maxillary</li> <li>Golden-yellow above and on dorsal half of lanks, silvery on lower half of lanks and belly</li> <li>Maximum size: 61cm</li> </ol> <ol style="list-style-type: none"> <li><b>Species: Labeo calbasu</b></li> <li>Mouth inferior, lips thick and conspicuously fringed</li> <li>Barbells two pairs (rostral and maxillary)</li> <li>Dorsal fin with a fairly long base</li> <li>Body blackish-green, lighter below</li> <li>Maximum size: 90cm</li> </ol> <ol style="list-style-type: none"> <li><b>Species: Labeorohita</b></li> <li>Snout fairly depressed, projects beyond mouth, devoid of lateral lobe</li> <li>Mouth small and inferior; lips thick and fringed with a distinct inner fold to each lip</li> <li>Barbells one pair of small maxillary, concealed in lateral groove Scales moderate</li> <li>Body bluish along back, becoming silvery on the flanks and beneath, with reddish mark on each scale during breeding season</li> <li>Maximum size: 100cm</li> </ol> <p><b>Species: Puntiuschola</b></p> <ol style="list-style-type: none"> <li>Body fairly deep and compressed</li> <li>Barbells one short maxillary pair</li> <li>Last unbranched ray of dorsal fin osseous, fairly strong and smooth</li> <li>Lateral line complete</li> <li>Rosy spot/blotch on operculum and a deep black blotch near base of caudal fin</li> <li>Maximum size: 12cm</li> </ol> <p><b>Species: Puntius guganio</b></p> <ol style="list-style-type: none"> <li>Mouth terminal</li> <li>Barbells absent</li> <li>Last unbranched dorsal fin ray osseous,</li> </ol>	<p>dorsum, a narrow black median line from occiput to base of caudal fin</p> <ol style="list-style-type: none"> <li>Maximum size: 8.5cm</li> </ol> <p><b>Family: Gobidae</b></p> <ol style="list-style-type: none"> <li>Pelvic fins united, usually forming adhesive sucking disc</li> <li>Usually two dorsal fins, but often one; spinous dorsal fin when present separate from soft dorsal fin and with 2-17 flexible spines</li> <li>Body scales ctenoid or cycloid, often partly or totally absent</li> <li>Teeth generally small and conical in one to several rows on both jaws</li> </ol> <p><b>Species : Giossogobius</b></p> <p>Body elongated and somewhat compressed</p> <ol style="list-style-type: none"> <li>Eyes small; iris without process in pupil</li> <li>Branchiostegal membranes attached to side of isthmus</li> <li>Body yellowish-brown with five dark blotches on flank</li> <li>Maximum size: 30cm</li> </ol> <p><b>Sub-order: Channoidei</b></p> <ol style="list-style-type: none"> <li>Dorsal and anal fins very long</li> <li>Fin spines absent</li> <li>Accessory branchial organ present</li> <li>Caudal fin rounded</li> <li>Scales small, but scales on head larger than on body</li> </ol> <p><b>Family: Channidae</b></p> <ol style="list-style-type: none"> <li>Body elongate and cylindrical</li> <li>Shape of the head resembles that of snake</li> <li>Dorsal and anal fins very long and entirely soft rayed</li> <li>Mouth large with toothed jaws and palate</li> <li>Supra-branchial organ well developed</li> <li>Pelvic fins usually present with six rays</li> <li>Caudal fin rounded</li> <li>Scales small, cycloid or ctenoid</li> <li>Colour usually in shades of grey, brown and black, often with distinctive markings</li> </ol> <p><b>Species: Channamarulius</b></p> <ol style="list-style-type: none"> <li>Body elongate and fairly rounded in cross section</li> <li>Eyes moderate</li> <li>Mouth large, deeply cleft, maxilla extends behind orbit</li> <li>Caudal fin rounded</li> <li>Body above lateral line greyish-green, with 5-6 dark oval blotches on flank; dorsal and anal fins with white spots; a distinct pale-edged ocellus at base of caudal fin towards upper side; juveniles with an orange band running from eye to middle of caudal fin</li> <li>Maximum size: 180cm</li> </ol> <p><b>Species: Channa punctatus</b></p>
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<p>strong and serrated on its posterior edge</p> <p>4. Lateral line in complete</p> <p>5. One small black spot at base of anterior dorsal fin rays and a black blotch at side of caudal fin</p> <p>7. Maximum size: 8cm</p> <p><b>Species: Puntius singhala</b></p> <p>1. Body elongate with a convex dorsal profile</p> <p>2. Mouth sub-terminal and small</p> <p>3. Barbels absent</p> <p>4. Last unbranched dorsal fin ray non-osseous, weak and smooth</p> <p>5. Scales large; lateral line complete</p> <p>6. Dorsal and caudal fins reddish with black tips</p> <p>7. Maximum size: 15cm</p> <p><b>Species: Puntius ticto</b></p> <p>1. Body elongated</p> <p>2. Mouth terminal and small</p> <p>3. Barbells absent</p> <p>4. Dorsal fin inserted slightly posterior to pelvic fin origin.</p> <p>5. Last unbranched dorsal fin ray osseous, fairly strong and serrated at its posterior edge</p> <p>6. Scales medium, lateral line usually complete, often ceases after 6 scales</p> <p>7. Body often with two lateral spots; first one extending over third and fourth scales, and second one over 18<sup>th</sup> and 19<sup>th</sup> scales of lateral line, dorsal fin in male with red border</p> <p>8. Maximum size: 10cm</p> <p><b>Species: Rohteeogilbii</b></p> <p>Body deep and strongly compressed, dorsal profile more convex, than abdomen</p> <p>1. Mouth small, lower jaw shorter</p> <p>2. Barbells absent</p> <p>3. Dorsal spine strong and coarsely serrated; a pre-dorsal spine present, somewhat concealed by scales</p> <p>4. Scales small</p> <p>5. Body purplish-silvery along back, fading to silvery-white on belly</p> <p>6. Maximum size: 15cm</p> <p><b>Sub-family: Channidae</b></p> <p>1. Body elongated, sub cylindrical anteriorly, abdomen rounded, head depressed with plate like scales</p> <p>2. Gill opening wide, Accessory respiratory organ are in the form of a thin bony lamellae present in a cavity in gill chamber.</p> <p>3. Dorsal fin long with 39 to 40 rays, anal fin</p>	<p>91. Body elongate and fairly rounded in cross section</p> <p>92. Eyes moderate</p> <p>93. Mouth large, lower jaw longer, maxilla reaching below the hind border of eye</p> <p>94. Pectoral fin extend to anal fin, pelvic fin about 75% of pectoral fin length, caudal fin rounded</p> <p>95. Scales on summit of head, large</p> <p>96. Body black to light green on dorsal side and flanks while ventral side white to pale yellow, several dark blotches on flanks; some specimens with numerous black spots on body, also on dorsal, anal and caudal fins</p> <p>97. Maximum size: 31cm</p> <p><b>Sub-order: Mastacembeloidei</b></p> <p>98. Body eel like, compressed and elongated with minute scales, head long and pointed</p> <p>99. Dorsal and anal fins long</p> <p>100. Anterior part of dorsal fin composed of isolated spin</p> <p>101. Caudal fins short, either confluent with dorsal and anal or narrowly separated</p> <p>102. Pelvic fins absent</p> <p><b>Family: Mastacembelidae</b></p> <p>103. Body eel-like and compressed, with a characteristic elongated shape</p> <p>104. Snout pointed with a fleshy rostral appendage</p> <p>105. Dorsal fin long, preceded by a series of isolated stout spines (usually 14-35), anal fin usually with 2-3 spines and 30-90 soft rays, no pelvic fins, caudal fin distinct, often connected to posterior ray of dorsal or anal fin</p> <p>106. Scales small and cycloid</p> <p>107. <b>Species: Macrogathus aral</b></p> <p>108. Body elongate</p> <p>109. Long fleshy snout with trilobed tip</p> <p>110. No spines on preorbital or preoperculum bones</p> <p>111. Mouth very small</p> <p>112. Dorsal fin inserted far behind tip of pectoral fin, last dorsal spine small</p> <p>113. Caudal fin rounded and distinctly separated from dorsal and anal fins</p> <p>114. Lateral line well developed</p> <p>115. Body brownish or greenish, marbled above and yellowish below; body with two broad pale longitudinal bands extending its entire length; dorsal fin often with 3-11 ocellated base; dorsal and caudal fin with numerous fine streaks</p> <p>116. Maximum size: 38cm</p> <p><b>Species: Mastacembelus armatus</b></p> <p>Body relatively slender</p> <p>117. Preopercle with 2-3 usually conspicuous spines</p> <p>118. Preorbital spines strong and usually piercing</p>
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<p>with 26 rays, caudal fin rounded .</p> <p>4. A black spot white edged ocellus on the basal portion of the caudal fin is present.</p> <p>5. Fish distributes throughout India, Srilanka, Pakistan, Bangladesh.</p> <p>Sps. <i>Channa marulius</i></p> <p><b>Sub-family: Channidae</b></p> <p>1.Body elongated, sub cylendrical anteriorly, abdomen rounded, head depressed with plate like scales on the body</p> <p>2.Gill opening wide, Accessory respiratory organ are in the form of a thin bony lamellae present in a cavity in gill chamber.</p> <p>3. Dorsal fin long with 40 to 42 rays, anal fin with 26 rays, caudal fin rounded.</p> <p>4. Body is silver white .elongated.</p> <p>5. Fish distributes throughout India and allied countries.</p> <p>Sps. <i>Channa punctatus</i></p> <p><b>Species: Ambelypharyngodola</b></p> <ol style="list-style-type: none"> <li>1. Bodyelongate</li> <li>2. Mouthlarge</li> <li>3. Barbelsabsent</li> <li>4. Abdomenmoreorlessrounded</li> <li>5. Upper lipabsent</li> <li>6. Dorsalfininsertedslightlybehindpelvicfinbase</li> <li>7. Scalessmall, laterallineincomplete</li> <li>8. Abroadsilverylateralandonbody</li> <li>9. Maximumsize:20cm</li> <li>10. Abdomenmoreorlessrounded</li> <li>11. Upper lipabsent</li> <li>12. Dorsalfininsertedslightlybehindpelvicfinbase</li> <li>13. Scalessmall, laterallineincomplete</li> <li>14. Abroadsilverylateralandonbody</li> <li>15. Maximumsize:20cm</li> <li>16. Abdomenmoreorlessrounded</li> <li>17. Upper lipabsent</li> </ol>	<p>skin</p> <p>119. Mouth small</p> <p>120. Spinous dorsal fin inserted above middle or posterior third of pectoral fin, last dorsal spine small and hidden beneath skin</p> <p>121. Dorsal and anal fins broadly joined to caudal fin</p> <p>122. Body rich brown and usually with zigzag lines; often a black band through eye continuing in an undulating course along upper half of side,often a row of black spots along base of soft dorsal fin, and short black bands over back under dorsal spines</p> <p>123. Maximumsize:61cm</p> <p><b>Family: Siluridae-</b></p> <p><b>Species:Walgoattu</b></p> <ol style="list-style-type: none"> <li>1.Body elongated, sub cylindrical , Abdomen rounded, Head snake like Snout some what obtuse, Mouth opening moderate.</li> <li>2. Eyes lateral Dorsal fin long with 29 to 55 rays.</li> <li>3Anal fin long with 21 to 36 rays.</li> <li>3. Caudal fin rounded scale small, pelvic fin more than half of the pectoral fin..</li> <li>4. Lateral line interrupted with 37 to 100 scales, fish found in India, Nepal Pakistan.</li> </ol>
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**DISCUSSION**

The fishes collected during the study belonged to five different orders and families. Various species recorded were identified

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