

CHECKLIST OF TREMATODES FROM DIFFERENT FISHES OF KARACHI COAST

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ABSTRACT

Trematodes belonging to the Phylum Platyhelminth are poorly studied in fishes of Karachi coast and the literature is also widely scattered. Shaukat and Bilqees prepared a check list of Trematodes in 2005. But later no such work was conducted. Therefore; it was desired to prepare an updated checklist of Trematodes from Karachi coast. At present, a total of 198 species of trematodes are known from the Karachi coast of Pakistan reported by various authors.

Key-words: Fish parasites, Trematoda, Digenea, Monogenea, Karachi coast, Fish, Intestine.

INTRODUCTION

The importance of fish parasites is related directly to the importance of the fish that they may affect. As our world becomes more and more crowded with people, all food stuffs, including fish, become increasingly valuable. As a recreational asset, fish rank at or near the top, both for sport fishing and as one of the attractions of nature. Observing live fish, both in nature and in display aquarium, is enjoyable to young and old alike.

Parasitism is a ubiquitous phenomenon in the marine environment and it is probable that all marine fishes are infected with parasites (Ruiz, 1991). Trematodes of fishes are one of the common and interesting flatworms with complicated life cycle. The class trematoda comprises of a group of parasitic monozoic flatworms. The class is divided into three orders: Aspidobothrea (Monticelli, 1892) Faust and Tang, 1938; Monogenea Carus, 1863 (Nec Van Benden, 1858); and Digenea Carus, 1863 (Nec Van Benden, 1858).

Trematodes are not only interesting scientifically, but also become important by parasitizing fishes as definitive host, as well as the intermediate or reservoir hosts for a variety of trematodes of vertebrates of which the initial larval stages and most by develop in molluscs and crustaceans.

The fishes found along the coast of Pakistan were reported to be infected by various types of parasites among which trematodes are most common. Several species of trematodes have been reported from various fishes of Karachi coast by Bilqees (1981). Later, Shaukat and Bilqees, 2005 also prepared a check list of Trematodes from the fishes of Karachi coast.

The present checklist is prepared after an exhaustive survey of digenetic trematodes reported to parasitize the fishes of Karachi coast, Pakistan and the digenetic trematodes of fishes of Karachi coast. This compilation of checklist of all trematodes of Karachi coast known by now will provide relevant information for the workers who are interested in this subject. The species diagnosis given here are mostly from the original descriptions of the published works. Trematodes reported so far were found to belong to 198 species.

MATERIALS AND METHODS

To prepare the checklist the literature was searched from various libraries including Mehmood Hussain Library, Pakistan Science and Technology Information Centre, Professor Afzal Hussain Qadri Memorial Library, Vertebrate Pest Control Libraries, University of Karachi and present literature of Prof. Dr. Bilqees Mujib.

RESULTS AND DISCUSSION

A comprehensive account on digenetic trematodes of fishes of Karachi coast Pakistan was published about 25 years ago by Bilqees (1981). Then, Shaukat and Bilqees (2005) prepared check list which comprised 135 species of trematodes along with detailed Taxonomic status of all species, host and their distribution. An updated checklist of trematodes which includes both the digenetic and monogenetic trematodes with their hosts is presented in this paper. The name of fishes and authority have been adapted and corrected by the help of Munro (1955), Field guide published by Bianchi (1985) and Bilqees (1985). This manuscript should provide relevant information for Helminthologists, Parasitologists, as well as Ichthyologists and Marine biologists.

Table 1. List of trematodes from the intestine of the fishes of Karachi coast.

S. No.	Parasite	Host
1.	<i>Helicometrina nimia</i> Linton (1910)	<i>Stromateus cinereus</i> Day (1875)
2.	<i>Lepidapedon elongatum</i> Nicoll (1915)	<i>Stromateus cinereus</i> Day (1875)
3.	<i>Bianium plicatum</i> Stunkard (1930)	<i>Tetrodon inermis</i> Temminck & Schlegel(1844)
4.	<i>Lecithocladium psenopsis</i> Yamaguti (1934)	<i>Stromateus sinensis</i> Day (1875)
5.	<i>Maganaacetabulum trachuri</i> Yamaguti (1934)	<i>Harpodon nehereus</i> Hamilton-Buchanan (1822)
6.	<i>Tubulovesicula anguillae</i> Yamaguti (1934)	<i>Harpodon nehereus</i> Hamilton-Buchanan (1822)
7.	<i>Tubulovesicula angusticauda</i> Yamaguti (1934)	<i>Muraenesox cinereus</i> Forsk. (1775)
8.	<i>Tubulovesicula spari</i> Yamaguti (1934)	<i>Muraenesox cinereus</i> Forsk. (1775)
9.	<i>Uterovesiculurus hamate</i> Yamaguti (1934)	<i>Otolithus argenteus</i> Cuvier (1830)
10.	<i>Stomachicola muraenesocis</i> Yamaguti (1934)	<i>Muraenesox cinereus</i> Forsk. (1775)
11.	<i>Prosorhynchus breviformis</i> Srivastava (1936)	<i>Harpodon nehereus</i> Hamilton-Buchanan (1822)
12.	<i>Mehrailla ovocaudatus</i> Srivastava (1937)	<i>Stromateus cinereus</i> Da (1875)
13.	<i>Monodharmis torpedinis</i> Dollfus (1937)	<i>Arius serratus</i> Day (1877)
14.	<i>Waretrema piscicola</i> Srivastava (1937)	<i>Scatophagus argus</i> Bloch (1788)
15.	<i>Lepidapedon genge</i> Yamaguti (1938)	<i>Parastromateus niger</i> Bloch (1795)
16.	<i>Pseudoplagioporos lethrini</i> Yamaguti (1938)	<i>Crenidens indicus</i> Day (1873)
17.	<i>Prosorhynchus platycephali</i> Yamaguti (1934), Srivastava (1938)	<i>Platycephalus scabar</i> Day (1875)
18.	<i>Acanthocolpus indicus</i> Srivastava (1939)	<i>Trichiurus savala</i> Cuvier (1829)
19.	<i>Bucephalus varicus</i> Manter (1940)	<i>Sphyræna obtusata</i> Cuvier (1829)
20.	<i>Lepocreadioides indicus</i> Srivastava (1941) *	<i>Platycephalus scabar</i> Day (1875)
21.	<i>Erilepturus lemeriensis</i> Manter (1947)	<i>Scomberoides</i> sp. Lacepede (1802)
22.	<i>Stephanostomom ditrematis</i> Manter (1947)	<i>Pseudosciaena diacanthus</i> Day (1865)
23.	<i>Prosorhynchus longus</i> Velasquez (1950)	<i>Psettodes erumei</i> Schneider (1801)
24.	<i>Bucephalopsis tenuis</i> Yamaguti (1952)	<i>Sphyræna obtusata</i> Cuvier (1829)
25.	<i>Pseudoiepidapedon lethrini</i> Yamaguti (1952)	<i>Polydactylus indicus</i> Shaw (1804)
26.	<i>Opistholebes diodontis</i> Cable (1956)	<i>Diodontis hystrix</i> Linnaeus (1794)
27.	<i>Aephiidiogenes senegalensis</i> Dollfus et Capon (1958)	<i>Crenidens crenidens</i> Forsk. (1775)
28.	<i>Pleorchis ghanensis</i> Fischthal & Thomas (1968)	<i>Otolithus argenteus</i> Cuvier (1830) <i>Pomadasys olivaceus</i> Day (1875) <i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
29.	<i>Pseudoplagioporos interruptus</i> Durio & Manter (1968)	<i>Crenidens indicus</i> Day (1873)
30.	<i>Acerointestinecola karachiensis</i> Jehan (1970)	<i>Cybbium</i> sp. Cuvier (1829)
31.	<i>Allostomachicola chirocentri</i> Jehan (1970)	<i>Chirocentrus dorab</i> Forsk. (1775)
32.	<i>Orientodiploproctodaeum diacanthi</i> Bhutta & Khan (1970)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
33.	<i>Monodharmis elongates</i> Bilquees (1970)	<i>Erethistes elongate</i> Day (1872)
34.	<i>Multigondus microcecus</i> Bilquees (1970)	<i>Myrmillo monazo</i> Bleeker (1857)
35.	<i>Lecithocladium octovitellari</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
36.	<i>Ectenurus crenidensis</i> Bilquees (1971)	<i>Crenidens indicus</i> Day (1877)
37.	<i>Lecithocladium anteporus</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
38.	<i>Lecithocladium arabiana</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
39.	<i>Lecithocladium hexavitellarii</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
40.	<i>Lecithocladium microcaudum</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
41.	<i>Lecithocladium microductus</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
42.	<i>Lecithocladium tetravitellarii</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)
43.	<i>Magnacetabulum galandocaudum</i> Bilquees (1971)	<i>Arius serratus</i> Day (1877)
44.	<i>Qadriana fusiformis</i> Bilquees (1971)	<i>Sciaena glauca</i> Day (1878)
45.	<i>Prosorhynchus hexavitellatus</i> Bilquees (1971)	<i>Stromateus sinensis</i> Day (1875)
46.	<i>Prosorhynchus yamaguti</i> Bilquees (1971)	<i>Stromateus sinensis</i> Day (1875)
47.	<i>Prosorhynchus stromatei</i> Bilquees (1971)	<i>Stromateus sinensis</i> Day (1875)
48.	<i>Cameronia octovitellarii</i> Bilquees (1971)	<i>Muraenesox cinereus</i> Forsk. (1775)
49.	<i>Cameronia pakistani</i> Bilquees (1971)	<i>Muraenesox cinereus</i> Forsk. (1775)
50.	<i>Cestodera gastrocecus</i> Bilquees (1971)	<i>Arius serratus</i> Day (1877)
51.	<i>Cestodera unicecus</i> Bilquees (1971)	<i>Arius serratus</i> Day (1877)
52.	<i>Segmentatum cinereusis</i> Bilquees (1971)	<i>Muraenesoxcinereus</i> Forsk. (1775)
53.	<i>Segmentatum karachiensis</i> Bilquees (1971)	<i>Muraenesox cinereus</i> Forsk. (1775)
54.	<i>Segmentatum magnaesophagustum</i> Bilquees (1971)	<i>Muraenesox cinereus</i> Forsk. (1775)
55.	<i>Segmentatum qadrii</i> Bilquees (1971)	<i>Muraenesox cinereus</i> Forsk. (1775)
56.	<i>Bicaudum interruptum</i> Bilquees (1971)	<i>Cynoglossus sindensis</i> Day (1875)
57.	<i>Bicaudum otolithii</i> Bilquees (1971)	<i>Otolithus argenteus</i> Cuvier (1830)
58.	<i>Tritesticulum biovarium</i> Bilquees (1971)	<i>Stromateus</i> sp. Day (1875)

59.	<i>Buckleytrema postacetabulorchis</i> Bilqees (1971)	<i>Arius serratus</i> Day (1877)
60.	<i>Pseudohurleytrema magna</i> Bilqees (1971)	<i>Fish of unknown Identity</i>
61.	<i>Podocotyloides sindensis</i> Bilqees (1971)	<i>Cynoglossis sindensis</i> Day (1875)
62.	<i>Ectenurus indicus</i> Bilqees (1971)	<i>Cynoglossis indicus</i> Day (1875)
63.	<i>Tormopsolus spatulatum</i> Bilqees (1972)	<i>Cybbium</i> sp. Cuvier (1829)
64.	<i>Diplobulbus vitellus</i> Bilqees (1972)	<i>Tetradon lunaris</i> Bloch & Schneider (1801)
65.	<i>Paradiplobulbus heterorchis</i> Bilqees (1972)	<i>Tetradon lunaris</i> Bloch & Schneider (1801)
66.	<i>Paradiplobulbus isorchis</i> Bilqees (1972)	<i>Tetradon lunaris</i> Bloch & Schneider (1801)
67.	<i>Lecthochirium canadus</i> Bilqees (1972)	<i>Rachycentron canadum</i> Linnaeus (1776)
68.	<i>Lecthochirium harpodoni</i> Bilqees (1972)	<i>Harpodon nehereus</i> Hamilton–Buchanan (1822)
69.	<i>Lecthochirium musculoatrium</i> Bilqees (1972)	<i>Lactarius delicatulus</i> Valenciennes (1833)
70.	<i>Lecthochirium spindale</i> Bilqees (1972)	<i>Fish of unknown Identity</i>
71.	<i>Sterrhurus stromatei</i> Bilqees (1972)	<i>Stromateus sinensis</i> Day (1875)
72.	<i>Notoporus hystrix</i> Bilqees (1972)	<i>Chelomyxterus hystrix</i> Linnaeus (1758)
73.	<i>Pseudocoitocaecum thirssoclessis</i> Bilqees (1972)	<i>Thirssocles purava</i> Hamilton (1822)
74.	<i>Allopodocotyle korangiai</i> Bilqees (1972)	<i>Muraenesax cinereus</i> Forsk. (1775)
75.	<i>Allopodocotyle trichiuri</i> Bilqees (1972)	<i>Trichiurus purava</i> Hamilton (1822)
76.	<i>Helicometrina otolithi</i> Bilqees (1972)	<i>Otolithus argenteus</i> Cuvier (1830)
77.	<i>Helicometrina delicatulus</i> Bilqees (1972)	<i>Lactarius delicatulus</i> Valenciennes (1833)
78.	<i>Helicometrina karachiensis</i> Bilqees (1972)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
79.	<i>Plagioporus mujibi</i> Bilqees (1972)	<i>Crenidens indicus</i> Day (1873)
80.	<i>Podocotyloides trachuri</i> Bilqees (1972)	<i>Trichiurus savala</i> Cuvier (1829)
81.	<i>Podocotyloides dorabii</i> Bilqees (1972)	<i>Chirocentrus dorab</i> Forsk. (1775)
82.	<i>Sterrhurus stromatei</i> Bilqees (1972)	<i>Stromateus sinensis</i> Day (1875)
83.	<i>Stephanostomum dicotylus</i> Bilqees (1972)	<i>Cybbium gattatum</i> Cuvier (1829)
84.	<i>Karachiterma trilobata</i> Bilqees (1973)	<i>Caranx affinis</i> Ruppell (1836)
85.	<i>Laruea straightum</i> Jehan (1973)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936) <i>Rachycentron canadum</i> Linnaeus (1766)
86.	<i>Allostomachicola chirocentri</i> Jehan & Azam (1975)	<i>Chirocentrus dorab</i> Forsk. (1775)
87.	<i>Proisorhynchus thapari</i> Manter (1973)	<i>Plectorhynchus pictus</i> Tortonesel (1935)
88.	<i>Trifoliovarium tricanthi</i> Bilqees (1973)	<i>Tricanthus brevisrostris</i> Temmink & Schlegel (1850)
89.	<i>Helicometrina plectorhynchii</i> Jehan (1973)	<i>Plectorhynchus</i> sp. Cuvier (1830)
90.	<i>Anterodiscus biseminalis</i> Bilqees (1974)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
91.	<i>Anterodiscus triuteri</i> Bilqees (1974)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
92.	<i>Multiovarium heteroformis</i> Bilqees (1974)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936) <i>Cybbium guttatum</i> Cuvier (1829)
93.	<i>Multiovarium interruptum</i> Bilqees (1974)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
94.	<i>Acanthocolpus elongates</i> Bhutta & Khan (1975)	<i>Ribbon fish</i> Gupta (1966)
95.	<i>Tormopsolus longisaccus</i> Bhutta & Khan (1975)	<i>Stromateus cinereus</i> Day (1875)
96.	<i>Sterrhurus orientalis</i> Bhutta & Khan (1975)	<i>Lutjanus johnii</i> Bloch (1792)
97.	<i>Hamacreadium karachiensis</i> Bilqees & Maqsood (1975)	<i>Rastreltiger kanagurta</i> Cuvier (1817)
98.	<i>Hamacreadium rastrellii</i> Bilqees & Maqsood (1975)	<i>Rastreltiger kanagurta</i> Cuvier (1817)
99.	<i>Proisorhynchus erumenis</i> Bilqees (1976)	<i>Psettodes erumei</i> Schneider (1801)
100.	<i>Paradiscogaster niger</i> Bilqees (1976)	<i>Parastromateus niger</i> Bloch (1795)
101.	<i>Pseudohypertrema karachiense</i> Bilqees (1976)	<i>Pomadasys olivaceum</i> Day (1875)
102.	<i>Crassicutis caranxi</i> Bilqees (1976)	<i>Caranx affinis</i> Ruppell (1837)
103.	<i>Lepidapedon parastromatei</i> Bilqees (1976)	<i>Terapon jarbua</i> Forsk. (1775)
104.	<i>Olivacreadium pyllorchis</i> Bilqees (1976)	<i>Pomadasys olivaceum</i> Day (1875)
105.	<i>Olivacreadium heterorchis</i> Bilqees (1976)	<i>Lutjanus johnii</i> Bloch (1792)
106.	<i>Helicometrina chilomyxteri</i> Bilqees (1976)	<i>Chilomyxterus hystrix</i> Linnaeus (1758)
107.	<i>Acanthostomum niger</i> Zaidi & Khan (1977)	<i>Pampus niger</i> Bloch
108.	<i>Allcicornis karaachi</i> Zaidi & Khan (1977)	<i>Platycephalus scabar</i> Day (1875)
109.	<i>Telorhynchus scaberi</i> Zaidi & Khan (1977)	<i>Platycephalus scaber</i> Day (1875)
110.	<i>Callodistomum minutus</i> Zaidi & Khan (1977)	<i>Lates calcarifer</i> Bloch (1790)
111.	<i>Ectenurus minutus</i> Zaidi & Khan (1977)	<i>Caranx sansun</i> Forsk. (1775)
112.	<i>Lecithocladium karachi</i> Zaidi & Khan (1977)	<i>Carangoides praeustus</i> Bennett (1830)
113.	<i>Lecithocladium pakistanensis</i> Zaidi & Khan (1977)	<i>Carangoide malabaricus</i> Bloch & Schneider (1801) <i>Megalaspis cordyla</i> Linnaeus (1758)
114.	<i>Lampritrema savalai</i> Zaidi & Khan (1977)	<i>Trichiurus savala</i> Cuvier (1829)
115.	<i>Enenterum theraponii</i> Zaidi & Khan (1977)	<i>Terapon jarbua</i> Forsk. (1775)
116.	<i>Proctotrematoides diacanthi</i> Zaidi & Khan (1977)	<i>Epinehelus diacanthus</i> Valenciennes (1828)
117.	<i>Mecoderus cordylai</i> Zaidi & Khan (1977)	<i>Megalaspis cordyla</i> Linnaeus (1758)
118.	<i>Lecithochirium harpodontis</i> Zaidi & Khan (1977)	<i>Harpodon nehereus</i> Hamilton–Buchanan (1822)

119.	<i>Plagioporus heterorchis</i> Bilqees (1977)	<i>Pomadasys olivaceum</i> Day (1875)
120.	<i>Tergestia karachiense</i> Bilqees (1978)	<i>Stromateus sinensis</i> Day (1875)
121.	<i>Pseudocacnoderia karachiense</i> Bilqees & Malik (1980)	<i>Pomadasys</i> sp. Day (1875)
122.	<i>Lecithocladium arabicum</i> Farooq & Khanum (1980)	<i>Caranx djedaba</i> Forsk. (1775)
123.	<i>Lecithocladium stromatei</i> Farooq & Khanum (1980)	<i>Stromateus niger</i> Bloch (1788)
124.	<i>Complexobursa magna</i> Bilqees (1980)	<i>Lates calcarifer</i> Bloch (1790)
125.	<i>Monorchis heterorchis</i> Bilqees (1980)	<i>Muraenesox cinereus</i> Forsk. (1775)
126.	<i>Prosogonotrema karachiensis</i> Bilqees & Durani (1980)	<i>Lutjanus Johnii</i> Bloch (1792)
127.	<i>Prosogonotrema diacanthi</i> Bilqees & Durani (1980)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
128.	<i>Erilepturus karachiensis</i> Bilqees & Nighat (1981)	<i>Cybius guttatum</i> Cuvier (1829)
129.	<i>Tubulovesicula magna</i> Bilqees & Nighat (1981)	<i>Pomadasys olivaceum</i> Day (1875)
130.	<i>Opistholebes equicostylus</i> Bilqees & Nighat (1981)	<i>Diodontis hystrix</i> Linnaeus (1758)
131.	<i>Lecithocladium thynensis</i> Bilqees & Nighat (1981)	<i>Thynnus</i> sp. Cantor (1850)
132.	<i>Sterhurus tetradontus</i> Shaikh et al. (2002)	<i>Tetrodon lunaris</i> Bloch & Schneider (1801)
133.	<i>Stomaturus otolithi</i> Bilqees et al. (2003)	<i>Otolithus argenteus</i> Cuvier (1830)
134.	<i>Stomaturus karachiensis</i> Bilqees & Khatoon (2003)	<i>Stromateus niger</i> Bloch (1788)
135.	<i>Neodiptherostomum karachiensis</i> Bilqees et al. (2003)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
136.	<i>Diacanthomonorchis karachiensis</i> Bilqees et al. (2004)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
137.	<i>Parapolylecithum karachiensis</i> Bilqees et al. (2004)	<i>Cybius guttatum</i> Cuvier (1829)
138.	<i>Hysterolecitha flaticaudata</i> Bilqees et al. (2004)	<i>Engraulis purava</i> Hamilton (1822)
139.	<i>Neoneuteun Minutum</i> Bilqees et al. (2004)	<i>Thynnus thunnia</i> Cantor (1850)
140.	<i>Allodiscocotyla elongatum</i> Bilqees et al. (2004)	<i>Chorinemus moadetta</i> Day (1875)
141.	<i>Dujardinascaris karachiensis</i> Bilqees et al. (2004)	<i>Pomadasys olivaceum</i> Day (1875)
142.	<i>Podocotyle pakistanicus</i> Bilqees & Khatoon (2004)	<i>Trichiurus savala</i> Cuvier (1829)
143.	<i>Pedunculotrema pakistanicus</i> Bilqees & Shahina (2004)	<i>Trichiurus savala</i> Cuvier (1829)
144.	<i>Thynstehopera lobata</i> Bilqees and Khatoon (2004)	<i>Thynnus thunnia</i> Cantor (1850)
145.	<i>Lecithocladium arii</i> Bilqees et al. (2005)	<i>Arius serratus</i> Day (1877)
146.	<i>Stomaturus otolithi</i> Bilqees et al. (2005)	<i>Otolithus argenteus</i> Cuvier (1830)
147.	<i>Lecithocladium olivaceae</i> Bilqees et al. (2006)	<i>Pomadasys olivaceum</i> Day (1875)
148.	<i>Bucephalus hexalobatus</i> Bilqees et al. (2006)	<i>Pomadasys olivaceus</i> Day (1875)
149.	<i>Pleorchis otolithi</i> sp. n. Shaukat & Bilqees (2006)	<i>Otolithus argenteus</i> Cuvier (1830)
150.	<i>Thynotrema elongatum</i> Bilqees et al. (2007)	<i>Thynnus thunnia</i> Cantor (1850)
151.	<i>Thynotrema thynotrema</i> Bilqees et al. (2007)	<i>Thynnus thunnia</i> Cantor (1850)
152.	<i>Rastridostomum kanagurtae</i> Bilqees et al. (2007)	<i>Rastrelliger kanagurta</i> Cuvier (1817)
153.	<i>Stephanostomum gibsoni</i> Bilqees et al. (2008)	<i>Pomadasys olivaceum</i> Day (1875)
154.	<i>Opegaster alykhani</i> Bilqees et al. (2009)	<i>Lutjanus argentimaculatus</i> Forsk. (1775)
155.	<i>Qadriana otolithi</i> Bilqees et al. (2009)	<i>Otolithus argenteus</i> Cuvier (1830)
156.	<i>Microvesicula otolithi</i> Bilqees et al. (2009)	<i>Otolithus argenteus</i> Cuvier (1830)
157.	<i>Prosorsynchus longivesicula</i> Bilqees et al. (2009)	<i>Caranx affinis</i> Ruppell (1836)
158.	<i>Tubulovesicula magnacirrosa</i> Bilqees et al. (2009)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
159.	<i>Tubulovesicula dorabi</i> Bilqees et al. (2010)	<i>Chirocentrus dorab</i> Forsk. (1775)
160.	<i>Neodichadena magnavesicula</i> Bilqees et al. (2010)	<i>Triacanthus brevirostris</i> Temmink & Schlegel (1850)
161.	<i>Macrorchirhynchus macrorchis</i> Bilqees et al. (2010)	<i>Psettodes erumei</i> Schneider (1801)
162.	<i>Allomicrocotyla niger</i> Hadi and Bilqees (2010)	<i>Parastromateus niger</i> Bloch (1795)
163.	<i>Pleorchis karachiensis</i> Bilqees et al. (2010)	<i>Sciaena dussumieri</i> Day (1865)
164.	<i>Conica trilobata</i> Bilqees et al. (2011)	<i>Otolithus argenteus</i> Cuvier (1830)

*, Some authors consider this species to be the synonymous to *Lepocreadioides orientalis* Park, 1939 (Kazmi and Naushaba (2013). (Also < www.marine-species.org/aphia.php?p=taxdetails&id=727392>).

Table 2. List of trematodes from the stomach of the fishes of Karachi coast.

S. No.	Parasite	Host
1.	<i>Pleorchis heterorchis</i> Shaukat (2008)	<i>Lutjanus johnii</i> <i>Otolithus argenteus</i> Bloch (1798) Cuvier (1830)
2.	<i>Decemtestis johnii</i> Shaukat (2008)	<i>Lutjanus johnii</i> Bloch (1798)
3.	<i>Lecithocladium cybii</i> Shaukat (2008)	<i>Cybius guttatum</i> Cuvier (1829)
4.	<i>Lecithocladium karachiensis</i> Shaukat (2008)	<i>Parastromateus niger</i> Bloch (1795)
5.	<i>Lecithocladium magnasoma</i> Shaukat (2008)	<i>Stromateus sinensis</i> Day (1875)
6.	<i>Lecithocladium magnavesicula</i> Shaukat (2008)	<i>Pomadasys olivaceum</i> Day (1875)
7.	<i>Lecithocladium lateropharyngium</i> Shaukat (2008)	<i>Stromateus sinensis</i> Day (1875)
8.	<i>Tubulovesicula olivaceus</i> Shaukat (2008)	<i>Pomadasys olivaceum</i> Day (1875)
9.	<i>Tubulovesicula microcaudum</i> Shaukat (2008)	<i>Otolithus argenteus</i> Cuvier (1830)
10.	<i>Tubulovesicula Magnacirrosa</i> Shaukat (2008)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)

11.	<i>Tubulovesicula karachiensi</i> Shaukat (2008)	<i>Pseudosciaena diacanthus</i> Weber & de Beaufort (1936)
12.	<i>Lecithochirium Johnii</i> Bilqees et al. (2009)	<i>Lutjanus johnii</i> Bloch (1792)
13.	<i>Lecithochirium diacanthi</i> Bilqees et al. (2009)	<i>Sciaena diacanthus</i> Day (1865)
14.	<i>Tubulovesicula macrovesicula</i> Bilqees et al. (2010)	<i>Plectorhynchus cinctus</i> Cuvier (1830)
15.	<i>Tubulovesicula microrchis</i> Bilqees et al. (2010)	<i>Plectorhynchus cinctus</i> Cuvier (1830)

Table 3. List of trematodes from the gills of the fishes of Karachi coast.

S. No.	Parasite	Host
1.	<i>Allopyragraphorus niger</i> Hadi (2009)	<i>Parastromateus niger</i> Bloch (1975)
2.	<i>Axinoidea belangerii</i> Hadi (2009)	<i>Johnius belangerii</i> Cuvier (1830)
3.	<i>Heteraxinoidea karachiensis</i> Hadi (2009)	<i>Scomberomorus guttatus</i> Bloch & Schneider (1801)
4.	<i>Pseudochauhannea forsteri</i> Hadi (2009)	<i>Sphyraena forsteri</i> Cuvier (1829)
5.	<i>Allodiscocotyla pakistanensis</i> Hadi (2009)	<i>Chorinemus tol</i> Cuvier (1832)
6.	<i>Bicotylophora blochii</i> Hadi (2009)	<i>Trachinotus blochii</i> Lacepede (1801)
7.	<i>Asymmetra elongate</i> Hadi (2009)	<i>Epinephelus malabaricus</i> Schneider (1801)
8.	<i>Asymmetra asymmetra</i> Hadi (2009)	<i>Epinephelus malabaricus</i> Schneider (1801)
9.	<i>Cathucotyle arabiansis</i> Hadi (2009)	<i>Scomberomorus guttatus</i> Bloch & Schneider (1801)
10.	<i>Cathucotyle bilqeesae</i> Hadi (2009)	<i>Scomberoides commersonnianus</i> Lacepede (1802)
11.	<i>Neocathucotyle Pakistanensis</i> Hadi (2009)	<i>Scomberomorus lineolatus</i> Cuvier (1831)
12.	<i>Neogotocotyla rohdi</i> Hadi (2009)	<i>Scomberoides lysan</i> Forsk. (1875)
13.	<i>Cynoscionicola calcariferi</i> Hadi (2009)	<i>Lates calcarifer</i> Bloch (1790)
14.	<i>Polynemicola indicus</i> Hadi (2009)	<i>Polynemus indicus</i> Shaw (1804)
15.	<i>Microcotyle rubrum</i> Hadi (2009)	<i>Otolithus ruber</i> Schneider (1801)
16.	<i>Microcotyle argenticus</i> Hadi (2009)	<i>Pampus argenteus</i> Euphrasen (1788)
17.	<i>Microcotyle Jonii</i> Hadi (2009)	<i>Lutjanus johnii</i> Bloch (1792)
18.	<i>Allomicrocotyla niger</i> Hadi and Bilqees (2010)	<i>Parastromateus niger</i> Bloch (1795)
19.	<i>Microcotyle argenticus</i> Bilqees (2011)	<i>Pampus argenticus</i> Bloch (1795)

Trematodes listed in this check list are organ specific. Most of the digenetic trematodes inhabited in the intestine while others were in stomach. Among monogenetic trematodes, all of them parasitized the gill lamellae. Digenetic trematodes reported from the intestine were 164. There were 15 species from the stomach, while only 19 species of monogenetic trematodes were found to parasitize the gills of Karachi coast fishes. Up till 2011, the total number of trematodes (monogenetic and digenetic) thus are reported 198 from different fishes of Karachi coast (Table 1-3). There was a great degree of host-parasite specificity. Four intestine-inhabiting parasites viz., *Pleorchis ghanensis* Fischthal & Thomas (1968), *Laruea straightum* Jehan (1973), *Multiovarium heteroformis* Bilqees (1974) and *Lecithocladium pakistanensis* Zaidi and Khan (1977) were, however, found to have more than one hosts.

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