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Scleractinian Corals of Loha Barrack Crocodile Sanctuary, Andaman and Nicobar Islands

By Tamal Mondal, C. Raghunatha & K. Venkataraman
Zoological Survey of India, India

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Scleractinian Corals of Loha Barrack Crocodile Sanctuary, Andaman and Nicobar Islands

Tamal Mondal [α], C. Raghunathan [σ] & K. Venkataraman [ρ]

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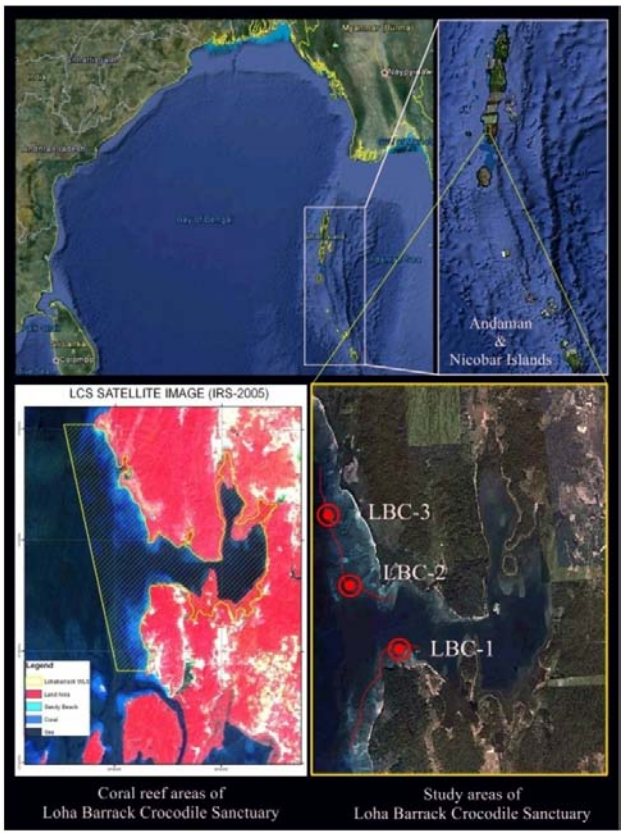
I. Introduction

Loha Barrack Crocodile Sanctuary is the only sanctuary of Andaman and Nicobar Islands which was designated in 1983 primarily to conserve the salt water crocodile and its habitat [1]. The sanctuary is spread across about an area of 22.80 sq. km. where 20.80 sq.km areas are covered by marine ecosystems. The three sides of the sanctuary are surrounded by seashore whereas the Bay of Bengal surrounds the western side. Marine biodiversity is the most important aspect, basically sustain on the scleractinian corals, are known as the founder species of tropical marine ecosystem [2]. These hard corals are the crucial organisms of marine ecosystem by providing settlement cues [3-5], suitable place of living [6-8], reducing mortality rate [9-11], and several sustainable work towards the successful development of a great deal of faunal communities [12]. The present paper dealt with the scleractinian corals of Loha Barrack Crocodile Sanctuary for taking proper conservation plan along with the target species of this sanctuary.

II. Material and Methods

The extensive surveys were conducted at 3 stations such as LBC-1 (Lat. 11°38.035'N and Long. 92°38.722'E), LBC-2 (Lat. 11°38.765'N and Long. 92°35.837'E) and LBC-3 (Lat. 11°39.693'N and Long 92°35.520'E) of Loha Barrack Crocodile Sanctuary during the month of May, 2011 to explore the faunal communities by employing Self Contained Underwater Breathing Apparatus (SCUBA) diving, snorkeling (Map 1). At first, observations were made by Manta tow study method [13, 14]. Underwater digital photography of individual species was made by underwater camera (Sony-Cyber Shot, Model-T900, marine pack, 12.1 megapixels). The recorded scleractinian species of corals were identified following Veron and Pichon [15-17], Veron *et al.* [18] Veron and Wallace [19], Veron [20] and Wallace [21].



Map 1 : Study areas of Loha Barrack Crocodile Sanctuary

III. Results and Discussion

The study revealed out 146 species of scleractinian corals under 49 genera and 14 families from Loha Barrack Crocodile Sanctuary (Table 1). The maximum number of 34 species was seen under the family Fungiidae followed by family Faviidae (31 species) and family Acroporidae (23), whereas the

Author α σ: Zoological Survey of India, Andaman and Nicobar Regional Centre, Andaman and Nicobar Islands, India.
e-mail: t_genetics@yahoo.com
Author ρ: Zoological Survey of India, M-Block, New Alipore. Kolkata. India

minimum of only one species was recorded from family Astrocoeniidae and Dendrophylliidae each (Fig 1). A maximum number of 11 genera were recorded under the family Faviidae whereas the minimum of only one genus was recorded under four families such as Oculinidae, Astrocoeniidae, Siderastreaidae and Dendrophylliidae (Fig 2).

Table 1 : Scleractinian corals of Loha Barrack Crocodile Sanctuary

Sl. No.	Scientific Names
	Family: ACROPORIDAE Verrill, 1902
	Genus: *Acropora* Oken, 1815
1.	*Acropora cuneata* (Dana, 1846)
2.	*Acropora palifera* (Dana, 1846)
3.	*Acropora tenuis* (Dana, 1846)
4.	*Acropora hyacinthus* (Dana, 1846)
5.	*Acropora cerealis* (Dana, 1846)
6.	*Acropora austera* (Dana, 1846)
7.	*Acropora robusta* (Dana, 1846)
8.	*Acropora subglabra* (Brook, 1891)
9.	*Acropora spicifera* (Dana, 1846)
10.	*Acropora nobilis* (Dana, 1846)
11.	*Acropora aspera* (Dana, 1846)
12.	*Acropora robusta* (Dana, 1846)
13.	*Acropora forskali* (Ehrenberg, 1834)
14.	*Acropora gemmifera* (Brook, 1892)
15.	*Acropora formosa* (Dana, 1846)
16.	*Acropora latistella* (Brook, 1891)
17.	*Acropora florida* (Dana, 1846)
18.	*Acropora microphthalma* (Verrill, 1859)
	Genus: *Montipora* de Blainville, 1830
19.	*Montipora verrucosa* (Lamarck, 1816)
20.	*Montipora aequituberculata* Bernard, 1897
21.	*Montipora danae* (MED and H, 1851)
	Genus: *Astreopora* de Blainville, 1830
22.	*Astreopora myriphthalma* (Lamarck, 1816)
23.	*Astreopora listeri* Bernard, 1896
	Family: OCULINIDAE Gray,1847
	Genus: *Galaxea* Oken, 1815
24.	*Galaxea astreata* (Lamarck, 1816)
25.	*Galaxea fascicularis* (Linnaeus, 1767)
	Family: POCILLOPORIDAE Gray, 1842
	Genus: *Pocillopora* Lamarck, 1816
26.	*Pocillopora damicornis* (Linnaeus,1758)
27.	*Pocillopora ankeli* Scheer and Pillai, 1974
	Genus: *Stylophora* Lamarck, 1816
28.	*Stylopora pistillata* Esper, 1797
	Genus: *Seriatopora* Schweigger, 1819
29.	*Seriatopora stellata* Quelch, 1886
30.	*Seriatopora hystrix* Dana, 1846
	Family: ASTROCOENIIDAE Koby, 1890

Genus: *Stylocoeniella* Yabe and Sugiyama, 1935

31. *Stylocoeniella armata* (Ehrenberg, 1834)

Family: SIDERASTREIDAE Vaughan and Wells, 1943

Genus: *Psammocora* Dana, 1846

32. *Psammocora digitata* MED and H, 1851
33. *Psammocora contigua* (Esper, 1797)
34. *Psammocora obtusangula* (Lamarck, 1816)

Family: AGARICIIDAE Gray, 1847

Genus: *Pachyseris* Milne Edwards and Haime, 1849

35. *Pachyseris speciosa* (Klunzinger, 1879)
36. *Pachyseris foliosa* Veron, 1990
37. *Pachyseris rugosa* (Lamarck,1801)
38. *Pachyseris gemmae* Nemenzo, 1955

Genus: *Pavona* Lamarck,1801

39. *Pavona venosa* (Ehrenberg, 1834)
40. *Pavona varians* Verrill, 1864
41. *Pavona duerdeni* Vaughan, 1970
42. *Pavona maldivensis* (Gardiner, 1905)

Genus: *Leptoseris* Milne Edwards and Haime,1849

43. *Leptoseris mycetoseroides* Wells, 1954

Genus: *Gardineroseris* Scheer and Pillai, 1974

44. *Gardineroseris planulata* (Dana, 1846)

Family: FUNGIIDAE Dana,1846

Genus: *Cycloseris* Milne Edwards and Haime,1849

45. *Cycloseris somervillei* (Gardiner, 1909)
46. *Cycloseris erora* (Doderlein, 1901)
47. *Cycloseris costulata* (Ortmann, 1889)
48. *Cycloseris colini* Veron, 2002
49. *Cycloseris sinensis* MED and H, 1849
50. *Cycloseris cyclolites* (Lamarck, 1801)
51. *Cycloseris vaughani* (Boschma, 1923)
52. *Cycloseris patelliformis* (Boschma, 1923)
53. *Cycloseris curvata* (Hoeksema, 1989)

Genus: *Diaseris* Edwards and Haime ,1849

54. *Diaseris distorta* (Michelin, 1843)

Genus: *Ctenactis* Verrill, 1864

55. *Ctenactis ecninata* (Pallas, 1766)
56. *Ctenactis crassa* (Dana, 1846)

Genus: *Herpolitha* Eschscholtz, 1825

57. *Herpolitha limax* (Houttuyn, 1772)
58. *Herpolitha weberi* Horst,1921

Genus: *Fungia* Lamarck,1801

59. *Fungia concinna* Verrill, 1864
60. *Fungia corona* Doderlein, 1901
61. *Fungia danai* MED and H,1851
62. *Fungia fralinae* Nemenzo,1955
63. *Fungia fungites* (Linnaeus,1758)

64. *Fungia granulosa* Klunzinger, 1879
65. *Fungia horrida* Dana, 1846
66. *Fungia klunzingeri* Doderlein, 1901
67. *Fungia moluccensis* Horst, 1919
68. *Fungia paumotensis* Stutchbury, 1833
69. *Fungia puishani* Veron and De Vantier, 2000
70. *Fungia repanda* Dana, 1846
71. *Fungia scutaria* Lamarck,1801
72. *Fungia scabra* (Doderlein,1901)

Genus: *Podabacia* Milne Edwards and Haime,1849

73. *Podabacia crustacea* (Pallas, 1766)
74. *Podabacia lankaeneis* Veron, 2002

Genus: *Lithophyllon* Rehberg, 1892

75. *Lithophyllon lobata (*Horst, 1921)
76. *Lithophyllon undulatum* Rehberg, 1892

Genus: *Polyphyllia* Quoy and Gaimard,1833

77. *Polyphyllia talpina* (Lamarck, 1801)

Genus: *Sandalolitha* Quelch, 1884

78. *Sandalolitha robusta* Quelch, 1886

Family: FAVIIDAE Gregory, 1900

Genus: *Diploastrea* Matthai, 1914

79. *Diploastrea heliopora* (Lamarck, 1816)

Genus: *Leptoria* Milne Edwards and Haime,1848

80. *Leptoria phrygia* (Ellis and Solander, 1786)

Genus: *Cyphastrea* Milne Edwards and Haime, 1848

81. *Cyphastrea chalcidicum* (Forskal, 1775)
82. *Cyphastrea microphthalma* (Lamarck, 1816)
83. *Cyphastrea japonica* Yabe and Sugiyama, 1932

Genus: *Caulastrea* Dana, 1846

84. *Caulastrea furcata* Dana, 1846
85. *Caulastrea connata* (Ortmann, 1892)

Genus: *Goniastrea* Milne Edwards and Haime ,1848

86. *Goniastrea minuta* Veron, 2002
87. *Goniastrea retiformis* (Lamarck, 1816)
88. *Goniastrea edwardsi* Chevalier,1971

Genus: *Favia* Oken, 1815

89. *Favia pallida* (Dana, 1846)
90. *Favia matthaii* Vaughan, 1918
91. *Favia rotumana* (Gardiner, 1899)
92. *Favia danae* Verrill, 1872

Genus: *Platygyra* Ehrenberg, 1834

93. *Platygyra pini* Chevalier, 1975
94. *Platygyra sinensis* (MED and H, 1849)
95. *Platygyra acuta* Veron, 2002
96. *Platygyra verweyi* Wijsman-Best 1976

Genus: *Favites* Link, 1807

97. *Favites spinosa* (Klunzinger, 1879)

98. *Favites pentagona* (Esper, 1794)
99. *Favites russelli* (Wells, 1954)
100. *Favites complanata* (Ehrenberg, 1834)
101. *Favites vasta* (Klunzinger, 1879)

Genus: *Montastrea* de Blainville, 1830

102. *Montastrea colemani* Veron, 2002
103. *Montastrea salebrosa* (Nemenzo, 1959)
104. *Montastrea valenciennesi* (MED and H, 1848)

Genus: *Echinopora* Lamarck, 1816

105. *Echinopora lamellosa* (Esper, 1795)
106. *Echinopora horrida* Dana, 1846
107. *Echinopora pacificus* Veron, 1990

Genus: *Leptastrea* Milne Edwards and Haime, 1848

108. *Leptastrea purpurea* (Dana, 1846)
109. *Leptastrea aequalis* Veron, 2002

Family: PORITIDAE Gray, 1842

Genus: *Porites* Link, 1807

110. *Porites lobata* Dana, 1846
111. *Porites monticulosa* Dana, 1846
112. *Porites murrayensis* Vaughan, 1918
113. *Porites cylindrica* Dana, 1846
114. *Porites rus* (Forskal, 1775)
115. *Porites solida* (Forskal, 1775)

Genus: *Goniopora* de Blainville, 1830

116. *Goniopora columna* Dana, 1846
117. *Goniophora lobata* MED and H, 1860
118. *Goniopora stokesi* Milne Edwards and Haime, 1851
119. *Goniopora minor* Crossland, 1952

Family: MUSSIDAE Ortmann, 1890

Genus: *Symphyllia* Milne Edwards and Haime, 1848

120. *Symphyllia radians* MED and H,1849
121. *Symphyllia recta* (Dana,1846)
122. *Symphyllia valenciennesii* Milne Edwards and Haime, 1849
123. *Symphyllia agaricia* MED and H, 1849

Genus: *Lobophyllia* de Blainville, 1830

124. *Lobophyllia corymbosa* (Forskal,1775)
125. *Lobophyllia hemprichii* (Ehrenberg, 1834)

Genus: *Cynarina* Bruggemann , 1877

126. *Cyanarina lacrymalis* (MED and H, 1848)

Family: PECTINIDAE Vaughan and Wells, 1943

Genus: *Pectinia* Oken, 1815

127. *Pectinia paeonia* (Dana, 1846)
128. *Pectinia alcicornis* (Saville-Kent,1871)
129. *Pectinia lactuca* (Pallas, 1766)

Genus: *Echinophyllia* Klunzinger,1879

130. *Echinophyllia orpheensis* Veron and Pichon, 1980
131. *Echinophyllia echinoporoides* Veron and Pichon, 1980

132. *Echinophyllia aspera* (Ellis and Solander, 1788)
133. *Euphyllia ancora* Veron and Pichon, 1980

Genus: *Mycedium* Oken,1815

134. *Mycedium elephantotus* (Pallas, 1766)

Genus: *Oxypora* Saville Kent,1871

135. *Oxypora crassispinosa* Nemenzo, 1979
136. *Oxypora lacera* (Verrill, 1864)

Family: MERULINIDAE Verrill,1866

Genus: *Merulina* Ehrenberg, 1834

137. *Merulina ampliata* (Ellis and Solander, 1786)
138. *Merulina scabricula* Dana, 1846

Genus: *Hydnophora* Fischer de Waldheim,1807

139. *Hydnophora exesa* (Pallas,1766)
140. *Hydnophora microconos* (Lamarck, 1816)
141. *Hydnophora rigida* (Dana, 1846)

Genus: *Scapophyllia* Milne Edwards and Haime, 1848

142. *Scapophyllia cylindrica* MED and H, 1848

Family: EUPHYLLIDAE Veron, 2000

Genus: *Euphyllia* Dana, 1846

143. *Euphyllia glabrescens* (Chamisso and Eysenhardt, 1821)

Genus: *Plerogyra* Milne Edwards and Haime, 1848

144. *Plerogyra sinuosa* (Dana, 1846)

Genus: *Physogyra* Quelch, 1884

145. *Physogyra lichtensteini* MED and H, 1851

Family: DENDROPHYLLIIDAE Gray, 1847

Genus: *Turbinaria* Oken, 1815

146. *Turbinaria peltata* (Esper, 1794)

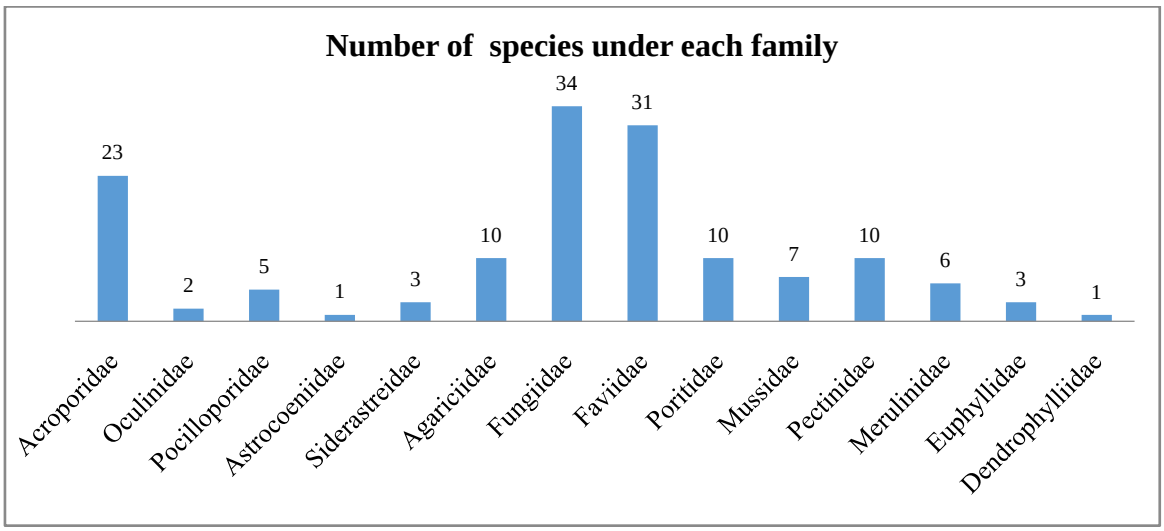


Figure 1 : Number of species present under each family at Loha Barrack Crocodile Sanctuary

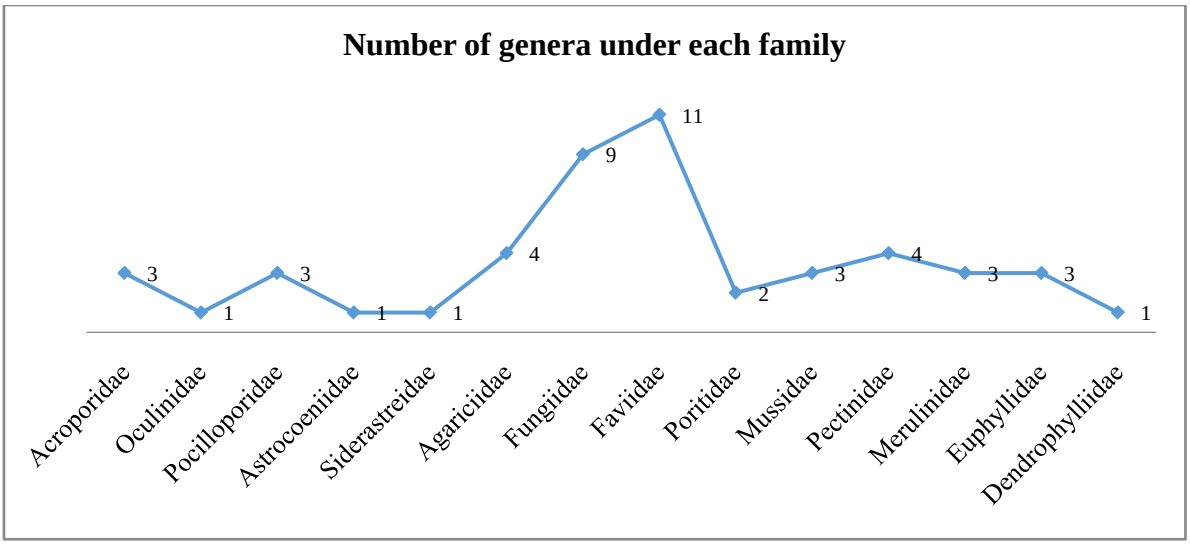


Figure 2 : Number of genera present under each family at Loha Barrack Crocodile Sanctuary

Coral are the most productive ecosystem in marine environment. Out of 34 described phyla, 32 are recorded from the coral reef ecosystem [22]. Andaman and Nicobar Islands are the place with fringing type of coral reef mostly in the eastern part and the barrier type reefs can be seen in the western part of these groups of islands [23]. The present study was carried out at the western continental shelf of Andaman and Nicobar Island, but the immediate western continental shelf of the islands also showed fringing type reef in and around Loha Barrack Crocodile Sanctuary area. The studies on scleractinian corals of the said sanctuary were not made earlier though the reports are available on other parts of the Andaman and Nicobar Islands. In 2003, the gross exploration of the scleractinian lives of Andaman and Nicobar Islands stated 208 species of corals [23]. Later on in 2010, Ramakrishna *et al.* enlisted a total number of 418 hard corals from different areas of Andaman and Nicobar Islands [24]. Later on 2012, Tamal Mondal *et al.* listed 479 species of corals under 17 families from these groups of islands through the data collected by Zoological Survey of India [25]. Development and growth of scleractinian corals are highest in an oligotrophic environmental condition [26]. The presence of 30.48% of total species and 82.35% of total genera content of Andaman and Nicobar Islands reported from Loha Barrack Crocodile Sanctuary denotes the favorable ecological attributes of that area for their sustainable progression. The reports of present study will be helpful to conserve the coral reefs of the Loha Barrack Crocodile Sanctuary besides Crocodiles.

IV. Conclusion

Loha Barrack Crocodile Sanctuary is the only sanctuary for the crocodiles among the 96 of Andaman and Nicobar Islands. Due to the presence of this target animal i.e. crocodile, it is quite difficult to make underwater studies on scleractinian corals. But extensive SCUBA diving was made at the LBC Sanctuary to record the scleractinian corals to make proper conservatory measures along with the crocodile. A total of 146 species of hard corals were documented from the study areas which signifies the enriched biogenic marine habitat of this sanctuary.

V. Acknowledgement

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