RESEARCH REPORT OF LAMPI ISLAND FIELD TRIP

(Plankton, Seaweed and Seagrass)

Marine Biology Team

Saw Han Shein, Tint Wai, Thaung Htut and Tint Tun

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1. INTRODUCTION

Lampi Island is an island of Myeik Archipelago in Bok Pyin Township, Tanintharyi Division in southern Myanmar. Lampi Island was designated as National Marine Park in 1996. Biological and socioeconomic study tour to the Lampi and its neighbouring Islands from 24 February 2010 to 9 April 2010 was arranged by Biodiversity and Nature Conservation Association (BANCA) in coordination and collaboration with Forest Department (FD) and Istituto Oikos. Five teams comprising personnel from FD, BANCA, Forest Resource Environment Development and Conservation Association (FREDA) and, Marine Science Association, Myanmar (MSAM), participated in the study. Marine Biology Team (Fig. 1) is one of the teams and team members are one from MSAM and three from BANCA. The marine biology team mainly focused on the qualitative study on plankton, seaweed and seagrass of Lampi and some neighbouring Islands.

2. MARINE BIOLOGY TEAM MEMBERS

1. Professor Saw Han Shein (Retired Rector)
   Marine Science Association Myanmar (MSAM)
2. Tint Wai (Marine Biologist)
   Biodiversity and Nature Conservation Association (BANCA)
3. Thaung Htut (Marine Biologist)
   Biodiversity and Nature Conservation Association (BANCA)
4. Tint Tun (Marine Biologist)
   Biodiversity and Nature Conservation Association (BANCA)

Fig. 1. Marine Biology Team (Left to Right) Professor Saw Han Shein, Tint Tun, Tint Wai, Thaung Htut.

3. OBJECTIVES

1. To do baseline marine biodiversity research at Lampi Island.
2. To do qualitative study on plankton of coastal water of Lampi Island.
3. To do qualitative study on seaweed and seagrass of Lampi Island.

4. ITINERARY

Table 1. Daily activity of the marine biology team during the Lampi field trip.

Date	Activities
24/2/2010	Left Yangon for Kawthaung. Put up at Honey Bear Hotel, Kawthaung.
25/2/2010	Left Kawthaung for Ma Kyone Galet village. Loadged at a room of the Ma Kyone Galet Post Primary School.
26/2/2010	A sightseeing trip by boat along the eastern half shore of Lampi Island in the morning and along the southern shore in the afternoon.
27/2/2010	A trip to Labi Aw (small bay). Designation of site No.1 and investigation of seaweeds and seagrass at the intertidal zone.
28/2/2010	A trip to Khe Taung Aw. Designation of site No.2 and investigation of seaweeds and seagrass at the intertidal zone.
1/3/2010	A trip to Nyaung Bin Aw and Bullet Aw. Designation of site No.3 and investigation of seaweeds.
2/3/2010	A trip to Khe Aw. No designation of site was. Only a general survey on the intertidal zone was made. Later plankton collection was made offshore of Khe Aw and the spot was designated as plankton collecting station No.1.
3/3/2010	Ma Kyone Galet and the adjacent Kwe Lay Aw were designated as site No.4 and investigation of seaweeds and seagrass of the intertidal zone made.
4/3/2010	A trip to Tha Ku Aw. No designation of site was made due to lack of substantial seaweeds and seagrass. Later plankton collection station No.2 was designated at off shore Tha Ku Aw and collection was made.
5/3/2010	A second trip to Ma Kyone Galet Kwe Lay Aw (Site No.4) and survey on seaweeds and seagrass was done for the second time.
6/3/2010	A trip to the offshore of Nyaung Bin Aw and collection of plankton undertaken (Station No.3). Later disembarked from the boat and conducted generalized investigation of seaweeds at the northern part of Nyaung Bin Aw adjacent to Bullet Aw. Night collection of plankton done at Ma Kyone Galet.
7/3/2010	A trip to Jaletnge Aw and plankton collection was undertaken at the Aw (Station No.4). Later went ashore and conducted generalized investigation.
8/3/2010	Attended a meeting held at Ma Kyone Galet café where Ms. Lara Beffasti, Mr. Simoni Bianchi and all other teams' members were present.
9/3/2010	A trip to Ka Phawt Island. Site No.5 was designated and investigation of seaweeds and seagrass undertaken. Later went to the south western offshore region of Ko Phawt Islands group and plankton collecting station 5 was marked and plankton

	collected.
10/3/2010	A second trip to Ko Phawt Islands group. Investigation of seaweeds indertaken along the passage ways between island of the Ko Phawt group.
11/3/2010	A third trip to Ko Phawt Island for diving collection of the seagrass, *Enhalus acoroides* which grows in relatively deep water. This trip was also meant for the return journey of mammals and birds teams who had spent the last two nights on Ko Phawt Island. One of the members, U Tint Wai, went to south Bo Cho Island for the investigation of seagrass.
12/3/2010	Data processing and review of trip. Re examination of herbarium press and organizing things for tomorrow voyage to Warr Kyuun. Waited for the return of U Myint Sein, and the boat, from Kawthaung.
13/3/2010	Left Ma Kyone Galet for Warr Kyuun. Lodged at the Buddhist monastery.
14/3/2010	A trip to Karyan Aw offshore region where plankton collection station No 6 was marked and plankton collected. Later went to north Karyan Aw and adjoining Thin Aw and Site No. 6 was designated. Seaweeds and invertebrates were found to be quite abundant but seagrass was not found.
15/3/2010	A trip to the offshore of South West Warr Kyuun (between) South West Warr Kyuun and Thin Aw of East Lampi). Plankton collecting station No. 7 was designated and plankton collected. Later went ashore at north Thin Aw (site No. 6) and survey of seaweeds undertaken. Seagrass not found.
16/3/2010	A trip to East Lampi directly west of War Kyuun was marked and seaweeds investigated. Seagrass not found.
17/3/2010	Went to the offshore region of Ba La Chaik Island (between Ba La Chaik Island and Warr Kyuun Island) and designated station No. 7 and collected plankton. Later went ashore to North East Lampi (West of Than Lwin Island) and conducted survey work on seaweeds. No seagrass found. This place was designated as site No. 8.
18/3/2010	Went to Nipa Aw which is adjacent to site No. 8 (which was regarded as part of site No. 8) and made investigation on seaweeds. No. seagrass found. Later went to the eastern offshore region of Two Hills Island and collected plankton samples. This spot was designated as plankton collecting station No. 9. Night collection of plankton done at Warr Kyuun area.
19/3/2010	A trip to North East of Lampi Island and conducted survey along the coast line between site No. 7 and site No. 8; along coast line without significant Aws (bays). As seaweeds and invertebrates were found in relatively small numbers no site was designated. Later in the afternoon went to east coast of War Kyuun and investigated a few seaweed found there.
20/3/2010	Left Warr Kyuun for Ma Kyone Galet.
21/3/2010	Walked along North East coast of Bo Cho Island. Waited for the return of U Myint Sein and the boat.
22/3/2010	Two members went to the South West coast of Bo Cho Island while one member went to South East coast for overall survey of the seagrass.
23/3/2010	Went together with Dr. Valeria Gallenti and U Tint Tun to Nyaung Bin Aw (Site No. 3) and conducted investigation of seaweeds and especially seagrass. Attended a

	short meeting held at the café of Makyone Galet. Later left Ma Kyone Galet for Salet Galet together with Dr. Valeria, Ms. Lara Belfastti and U Tint Tun.
24/3/2010	A trip to Ka Lun Aw (on the northern shore of the Westward extension of Lampi Island). Plankton station No. 10 was designated and plankton collected. Later went ashore and did survey work on invertebrates. No seaweeds and seagrass found.
25/3/2010	A trip to Sa Lu Aw (on the southern shore of the westwards extension of Lampi Island). Plankton collection station No. 11 was designated and plankton collected. Later disembarked from the boat and investigated seaweeds of the region. The place was designated as site No. 9. No seagrass found.
26/3/2010	A trip to the Lagyan Aw (on the northern shore of the westward extension of Lampi Island). Plankton collection station No. 12 was designated and plankton collected. Later disembarked from the boat and conducted survey on the seaweeds and invertebrates in the intertidal zone. A few drifted and stranded seagrass found. It was assumed that the specimen come from the nearby bay. Later in the afternoon conducted survey around the shore and adjacent shore of Satet Galet. Seaweeds as well as seagrass were investigated. The place was designated as site No. 11.
27/3/2010	A trip to Kakat Aw (Dani Aw) on the northern site of Lampi Island. Plankton collecting station No. 13 was designated and plankton collected. Later went ashore site No. 12 was marked and seaweeds investigated. No seagrass found.
28/3/2010	A second trip to site No. 11, the area around Salat Galet, and more investigation on seaweeds and seagrass made. Night collection of plankton done at north of Satat Galet.
29/3/2010	A trip to Balaik Aw, North West of Lampi Island. Plankton station No. 14 was designated and plankton collected. Later went ashore and investigated seaweeds. No seagrass found.
30/3/2010	Left Salat Galet for Ma Kyone Galet. On the way stopped at Bawin Aw and went ashore and investigated seaweeds and seagrass. Later proceeded to Ma Kyone Galet.
31/3/2010	Review of trip and data processing. Re-labelling of plankton sample bottles. One member went to south east Bo Cho Island to investigate seagrass.
1/4/2010	A trip to the western village and then to the eastern village of Nyaung Wee and survey seaweeds and seagrass.
2/4/2010	Organized things and prepared herbarium sheets at Ma Kyone Galet.
3/4/2010	Collected a few seaweeds and seagrass at low tide and prepared additional herbarium sheets. All former sheets re-examined and if necessary re-labelled.
4/4/2010	Organizing things and final wrap up for return journey.
5/4/2010	Left Ma Kyone for Kawthaung; put up at Forest Department Guest House.
6/4/2010	Stranded Kawthaung due to logistic reason (No flight)
7/4/2010	Waiting for the flight.
8/4/2010	Waiting for the flight.
9/4/2010	Left Kawthaung for Yangon by air in the afternoon. The team arrived back Yangon at about 18:00hr.

5. METHOD

5.1 Plankton.

Fourteen plankton collection stations have been designated covering the whole coastal water region of Lampi Island. Each station was at least three hundred meter offshore and the depth of the water (measure by simple sounding method) was at least ten meters. Three types of plankton net were used and the same method was applied throughout the trip. The nets were:

1. Phytoplankton net – general purpose phytoplankton net; made in China; mouth diameter 8 cm; aperture µm.
2. Zooplankton net – general purpose zooplankton net; made in China; mouth diameter 8 cm; aperture µm.
3. Dip net – for macroscopic zooplankton; local made; mouth diameter 33 cm; aperture 500 µm (the initial plan work to furnish the net with the long handle but for practical purpose this plan was later discarded. Instead the mouth was fixed with bridles and the net was used a simple coarse plankton net).

The towing method used consistently throughout the trip included oblique tow and vertical tow (in the initial phase of the study horizontal tows were attended. But as the speed of the boat could not be steadily regulated that less than one knot that horizontal method was discarded).

The variation in the angles or the degree of the tows depends very much on the speed of the water current. Many oblique tows were almost horizontal due to strong current. Some vertical tows were not actually vertical i.e. 90°, but become slightly oblique e.g. to 80° inclination.

Phytoplankton net and zooplankton were towed two times each while the dip net was towed three times. After completion of the tow the net is washed down with seawater and the plankton plus seawater collected into the bucket is then poured into a small plastic bottle. The separate sample bottle was used for each net. The plankton sample plus seawater was preserved in four percent formaldehyde solution. All the sample water bottles were labeled, and a small piece of label paper was inserted into the bottle.

In order to gain some knowledge on the night time zooplankton of this region three night time tows of zooplankton have been conducted. Night station 1 was Ma Kyone Galet, 2 was Warr Kyuun and the 3 was at the Salat Galet. Zooplankton net and dip net were used in night time plankton collection.

As in the case of survey sites the location of every station was recorded by GPS. Sea surface temperature and seawater transparency was routinely measured at each station.

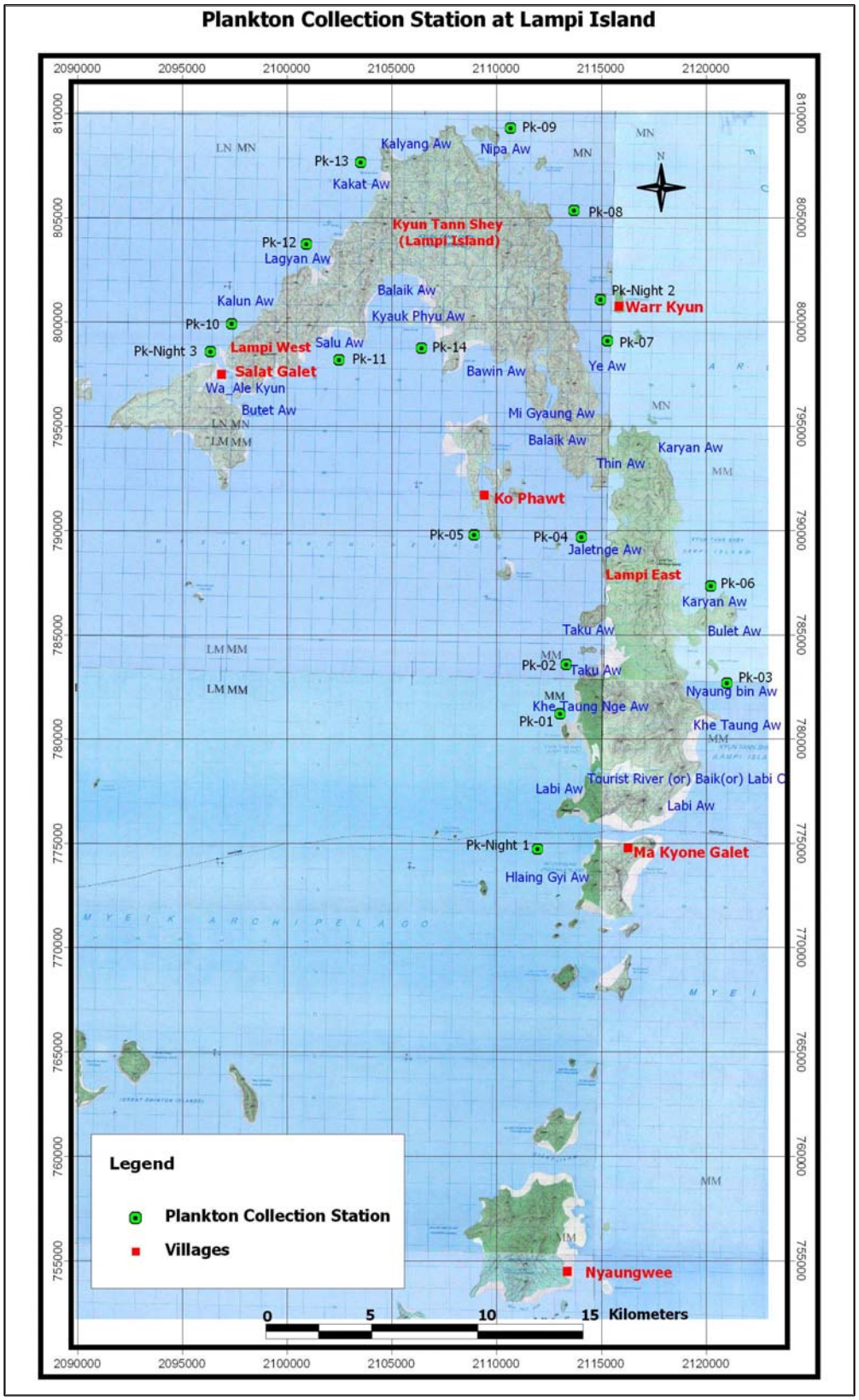

Figure 2. Map showing the plankton collection stations around the Lampi Island.

Qualitative study is simply a taxonomic study. But it is hard work and time consuming. Macroplankton could be identified with a naked eye or a hand lens. But for the large majority of plankton organism a compound microscope is essential. Examination and identification of plankton was undertaken in Yangon. Macrozooplakton were sorted out first and identified with naked eyes or a hand lens. Some were identified with the aid of a low magnification microscope. The large majority of zooplankton was identified with the aid of a microscope relatively high magnification (x40). All the phytoplankton were identified under high power magnification (x100). The identification work was chiefly done by U Saw Han Shein, with the help of other members.

Table 2. Waypoints of Plankton collection stations.

Station	Date	Time	Latitude	Longitude
PK Night 1	6/3/2010	21:49	N10 40.572	E98 13.365
PK Night 2	19/3/2010	19:05	N10 54.521	E98 14.647
PK Night 3	28/3/2010	18:56	N10 53.289	E98 04.553
PK 01 (Khe Taung Nge Aw)	2/3/2010	10:02	N10 44.085	E98 13.889
PK 02 (Taku Aw)	4/3/2010	09:32	N10 45.377	E98 14.013
PK 03 (Nyaungbin Aw)	6/3/2010	08:32	N10 44.771	E98 18.213
PK 04 (Jaletnge Aw)	7/3/2010	09:54	N10 48.674	E98 14.354
PK 05 (SW of Ko Phawt Island)	9/3/2010	9:53	N10 48.708	E98 11.505
PK 06 (Karyan Aw)	14/3/2010	9:37	N10 47.487	E98 17.743
PK 07 (Between Warr Kyuun & Thin Aw)	15/3/2010	12:49	N10 53.772	E98 14.919
PK 08 (NE of Lampi)	17/3/2010	13:09	N10 57.147	E98 13.974
PK 09 (Nipa Aw)	18/3/2010	08:57	N10 59.240	E98 12.268
PK 10 (Kalun Aw)	24/3/2010	12:00	N10 54.010	E98 05.090
PK 11(Salu Aw)	25/3/2010	08:47	N10 53.151	E98 07.913
PK 12 (Lagyan Aw)	26/3/2010	10:02	N10 56.122	E98 07.005
PK 13 (Kakat Aw)	27/3/2010	08:45	N10 58.280	E98 08.377
PK 14 (Balaik Aw)	29/3/2010	09:18	N10 53.472	E98 10.059

Due to the time limitation, out of 14 collecting stations and 3 night tows only 9 collecting stations and the 3 night tows were selected for examination. These 9 collecting stations and 3 night tows well-covered and well-represented. The East, West, North and South-East and South-West of the island.

Samples for each stations consisted of 4 sample bottles. Only 3 aliquot samples (approximately 3 ml) from each bottle were examined. First, all macroplankton were sorted out and identified. The remaining microzooplankton and phytoplankton were thoroughly stirred and aliquot taken, and then examined under a compound light microscope. The same procedure was

applied for night tow samples. As regard samples collected by coarse dip net, all were examined since samples included only macro zooplankton.

Megaloplankton (Jelly fish) which could not be caught by the plankton net were identified on the spot and their locations of occurrence assigned to the nearest of adjacent collecting stations.

5.2 Seaweed

First of all, looked for a rocky shore. Sandy shore and muddy shore are, to a great extent, barren lands. Altogether 14 sites were designated around the island (Figure 3, Table 3). Location of the sites were recorded with GPS. Survey could be done only during low tides when the seaweeds were exposed. In order to have sufficient time for survey and collection, and to cover more area the rule of the thumb is “follow the tide”. Follow the tide when it goes down and return with the tide when it goes up. Local people are asked for the information about the time of the rise and fall of local tide.

Only really needed specimen, representative specimen for each taxon, were collected. Seaweed can be easily picked out from the substrate but some smaller plants may need scrapping with a knife. Plastic/Polythene bags were essential for seaweed collection. Small plants were kept in smaller bags with a few drops of sea water and small rubber rings were needed for tying the top of the bags.

Seaweeds were preserved in 4 per cent formalin solution. For practical purpose, especially when travelling by plane, the press method, that is, preservation by means of dried press, is the best. A press consisting of a pair of wooden lattice frame, sheets of herbarium papers, pieces of blotting and sheets of old newspapers. A piece of blotting cloth was put on the herbarium sheet (together with the seaweed specimen on it) and then the sheet was sandwiched between two sheets of newspaper. Afterward place all the herbarium sheets (together with the bolting cloth and papers) between two lattice frames and tightly tied the bundle with a rope. The bundle of herbarium press was placed in the sun light in a standing position for drying.

All the sheets were labeled with pencil. If time was not affordable for labeling each sheet, the whole lot will had only one label and a bundle of sheet represents only a collection site. Individual sheet were labeled later. A label comprises at least the date and time of collection, the location of the site and the name of collector. The initial examination and identification of the seaweeds was done at the camp site. If the specimen could be identified on the spot the generic and specific name were written on the sheet. Specimen were identified later at the laboratory in coordination with Mawlamyine University with available references.

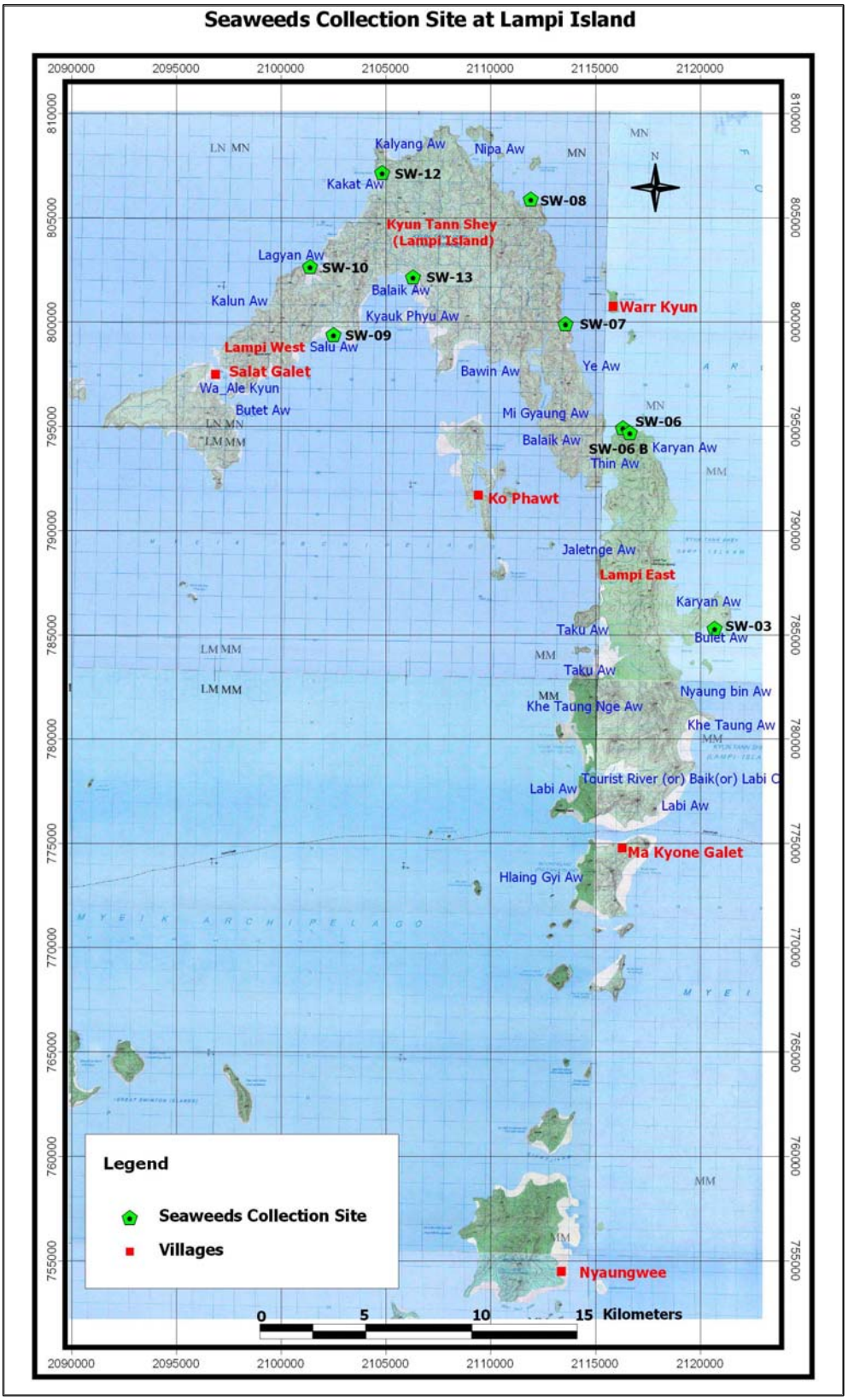

Figure 3. Map showing the seaweed collection sites around the Lampi island.

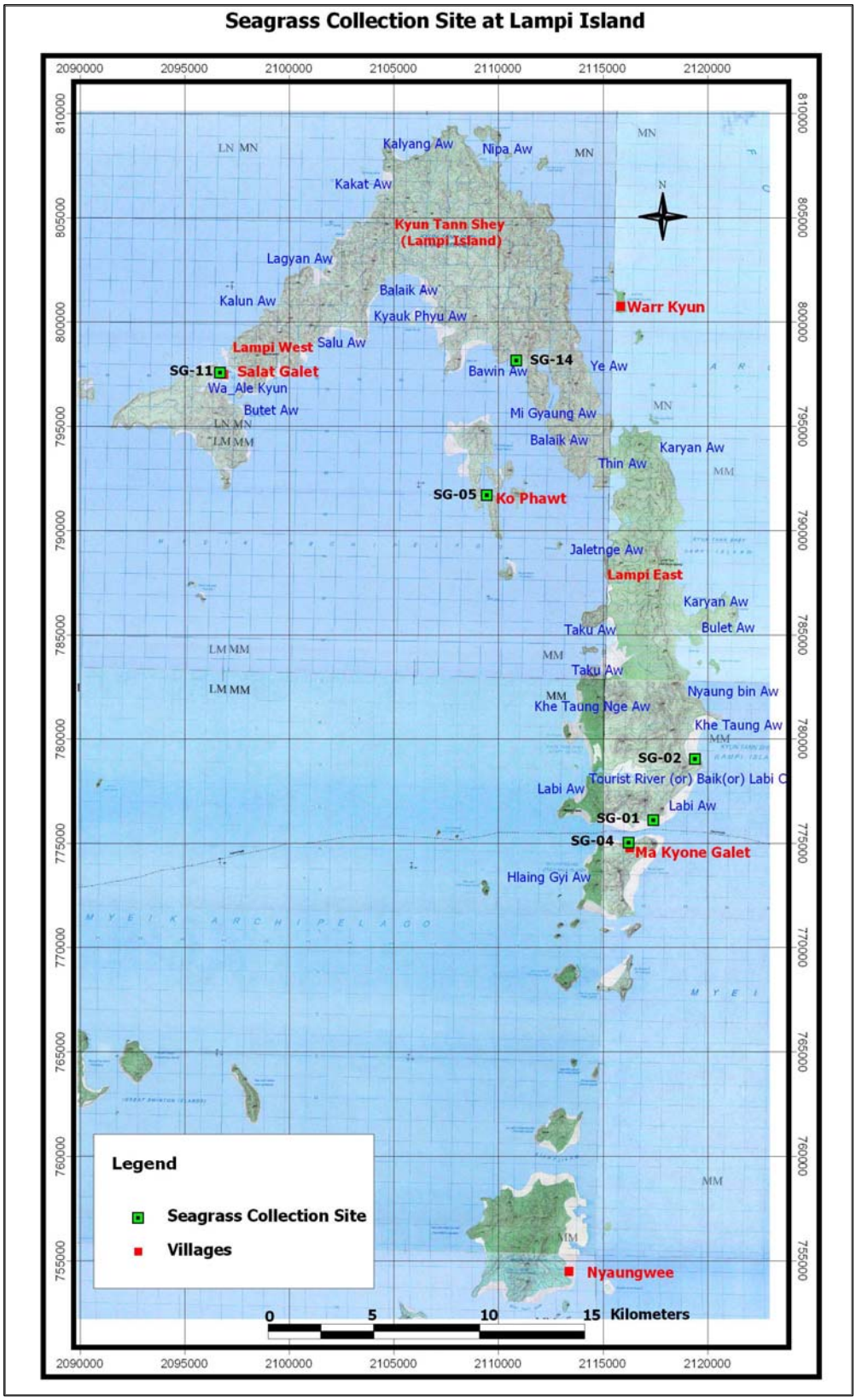

Figure 4. Map showing the seagrass collection sites around the Lampi Island.

5.3 Seagrass

First, underwater seagrass beds were searched by a small boat. Coral reef flats mixed with sandy and/or a little bit muddy condition beaches are prioritized areas. Collection and preservation methods for seagrass were the same with seaweed survey. The initial examination and identification of seagrass was carried out in the field and at the camp site. As in the case of seaweeds the specimen of seagrass were sent to Marine Science Department, Mawlamyine University for confirmation. Of the 14 designated sites for seaweeds and seagrasses, seagrass occurred in six sites, namely site No. 1, 2, 4, 5, 11 and 14 (Figure 4, Table 3).

Table 3. Seaweed/Seagrass collection sites.

Site	Date	Time	Latitude	Longitude	
SW 01 (Labi Aw)	27/2/2010	12:46	N10 41.385	E98 16.331	SG
SW 02 (Khe Taung Aw)	28/2/2010	13:32	N10 42.987	E98 17.387	SG
SW 03 (Bulet Aw)	1/3/2010	15:25	N10 46.389	E98 18.016	
SW 04 (Front of Makyone galet village)	3/3/2010	06:00	N10 40.647	E98 15.732	SG
SW 05 (Front of Kaphawt village)	10/3/2010	10;30	N10 51.721	E98 11.639	SG
SW 06 (Thin Aw)	14/3/2010	16:05	N10 49.711	E98 11.796	
SW 06 (Thin Aw)	16/3/2010	13:07	N10 51.543	E98 15.516	
SW 07 (W of Warr Kyuun)	16/3/2010	16:11	N10 54.201	E98 13.961	
SW 08 (NE of Lampi) near small island	17/3/2010	14:03	N10 57.419	E98 12.984	
SW 09 (Salu Aw)	25/3/2010	09:35	N10 54.088	E98 07.423	
SW 10 (Lagyan Aw)	26/3/2010	11:54	N10 55.603	E98 07.212	
SW 11 (West of Salet galet village)	26/3/2010	15:18	N10 52.757	E98 04.762	SG
SW 12 (Kakat Aw)	27/3/2010	09:35	N10 58.030	E98 09.090	
SW 13 (Balaik Aw)	29/3/2010	10:32	N10 55.327	E98 09.958	
SW 14 (Bawin Aw)	30/3/2010	09:10	N10 53.230	E98 12.505	SG

SG = Seagrass collection site

Figure 5. Seaweed and seagrass collection.

Figure 6. Plankton seen through the eyepiece of microscope.

6. RESULTS

6.1 Plankton

6.1.1 Phytoplankton

Altogether 49 genera and 136 species of phytoplankton were observed. They are -

1. *Bacillaria paradoxa*
2. *Bacteriastrum comosum*
3. *Bacteriastrum elongatum*
4. *Bacteriastrum hyalinum*
5. *Bacteriastrum varians*
6. *Bellerochea malleus*
7. *Biddulphia sinensis*
8. *Campylodiscus undulatus*
9. *Corataulina bergoni*
10. *Ceratium candelabrum*
11. *Ceratium deflexum*
12. *Ceratium dens*
13. *Ceratium extensum*
14. *Ceratium fusus*
15. *Ceratium macroceros*
16. *Ceratium pennatum*
17. *Ceratium ponectum*
18. *Ceratium pulchellum*
19. *Ceratium sumatranum*
20. *Ceratium tenue*
21. *Ceratium trichoceros*
22. *Ceratium tripos*
23. *Ceratium turca*
24. *Ceratium vulture*
25. *Chaetoceros affinis*
26. *Chaetoceros coarctatus*
27. *Chaetoceros compressus*
28. *Chaetoceros curvisetus*
29. *Chaetoceros decipiens*
30. *Chaetoceros denticulatum*
31. *Chaetoceros lauderi*
32. *Chaetoceros lorenzianus*
33. *Chaetoceros paradoxum*
34. *Chaetoceros peruvianus*

35. *Chaetoceros pseudicrinatus*
36. *Chaetoceros pseudicurvisetus*
37. *Chaetoceros rostratus*
38. *Chaetoceros siamensis*
39. *Chaetoceros subtilis*
40. *Chaetoceros tortissimus*
41. *Chaetoceros weisfiogii*
42. *Climacodium biconcavum*
43. *Climacodium frauenfeldianum*
44. *Cocconeid pediculus*
45. *Coscinodiscus astromphalus*
46. *Coscinodiscus cintrales*
47. *Coscinodiscus concinnus*
48. *Coscinodiscus excentricus*
49. *Coscinodiscus gigas*
50. *Coscinodiscus janesianus*
51. *Coscinodiscus lineatus*
52. *Coscinodiscus nodulifer*
53. *Coscinodiscus oculus-iridis*
54. *Coscinodiscus radiatus*
55. *Coscinodiscus subtilis*
56. *Cyclotella comta*
57. *Dictyocha fibula*
58. *Dinophysis homunculus*
59. *Dinophysis miles*
60. *Diplosalis lenticulata*
61. *Ditylum brightwelll*
62. *Ditylum sol*
63. *Eucampia cornuta*
64. *Eucampia zoodiacus*
65. *Frgilaria oceanica*
66. *Gonyaulax polygramma*
67. *Gonyaulax sp.*
68. *Guinardia flaccida*
69. *Gymnodinium sp*
70. *Gyrosigma sp*
71. *Hemiaulus indica*
72. *Hemiaulus sinensis*
73. *Hemidiscus cuneiformis*
74. *Hyalodiscus stelliger*

75. *Lauderia borealis(annulata)*
76. *Leptocylindrus danicus*
77. *Melosira borreri*
78. *Navicula cuspidata*
79. *Navicula sp.1*
80. *Navicula sp.2*
81. *Nitzschia closterium*
82. *Nitzschia seriata*
83. *Nitzschia sigma*
84. *Nitzschia sp*
85. *Noctiluca scintillans*
86. *Ornithocercus magnificus*
87. *Ornithocercus steini*
88. *Peridinum(Protoperidinium) catenatum*
89. *Peridinum(Protoperidinium) cerasus*
90. *Peridinum(Protoperidinium) conicum*
91. *Peridinum(Protoperidinium) depressum*
92. *Peridinum(Protoperidinium) divergens*
93. *Peridinum(Protoperidinium) oceanicum*
94. *Peridinum(Protoperidinium) steini*
95. *Pinnularia sp*
96. *Pleurosigma aesturii*
97. *Pleurosigma intermedia*
98. *Pleurosigma nicobaricum*
99. *Pleurosigma normani*
100. *Pleurosigma sp.1*
101. *Pleurosigma sp.2*
102. *Podolampas biped*
103. *Pyrocystis fusiformis*
104. *Pyrocystis lunula*
105. *Pyrocystis noctiluca*
106. *Pyrophacus horologicum*
107. *Rhizosolenia (Proboscia)alata*
108. *Rhizosolenia (Pseudosolinia) calcaravis*
109. *Rhizosolenia alata f. innermis*
110. *Rhizosolenia alata f. indica*
111. *Rhizosolenia bergoni*
112. *Rhizosolenia castracenei*
113. *Rhizosolenia clevei*
114. *Rhizosolenia imbricata*

115. *Rhizosolenia rhombus*
116. *Rhizosolenia robusta*
117. *Rhizosolenia setigera*
118. *Rhizosolenia stoltertofothii*
119. *Rhizosolenia styliformis*
120. *Schrodirella delicatula*
121. *Skeletonema costatum*
122. *Stephanopyxis palmeriana*
123. *Streptotheca thamensis*
124. *Thalassiaosira sp.1*
125. *Thalassioira gravida*
126. *Thalassionema nitzschioides*
127. *Thalassiosira rotula*
128. *Thalassiosira subtilis*
129. *Thalassiothrix frauenfeldii*
130. *Thallassiothrix longissima*
131. *Thallassiothrix mediterranea*
132. *Triceratium favus*
133. *Triceratium reticulatum*
134. *Triceratium revale*
135. *Trichodesmium theibauti*
136. *Trichodesmiun (Oscillatoria) erythraeum*

6.1.2 Zooplankton

Altogether 93 genera and 150 species of zooplankton were observed. They are -

1. *Abyla hakaeli*
2. *Abylopsis eschscholtzi*
3. *Acartia centula*
4. *Acartia erythraea*
5. *Acartia spinicauda*
6. *Acetes indicus*
7. *Acrocalanus gibbe*
8. *Acrocalanus gracilis*
9. *Aequorea macrodactyla*
10. *Aequorea sp.*
11. *Alciopa sp.*
12. *Aulophaera sp.*
13. *Aurellia sp.*

14. *Beroe cucumis*
15. *Beroe forskali*
16. *Bolivina sp.*
17. *Bougainvilea pyramidata*
18. *Brachycelus sp.*
19. *Calanopia elliptica*
20. *Calanus sp.*
21. *Callizona sp.*
22. *Candacia bradyi*
23. *Canthocalanus pouper*
24. *Cavolinia longirostris*
25. *Centropages furcatus*
26. *Clytemnestra rostrata*
27. *Clytemnestra scutellata*
28. *Codonellopsis morchella*
29. *Codonellopsis ostenfeldi*
30. *Codonellopsis parva*
31. *Conchoecia elegans*
32. *Conchoecia sp.*
33. *Corycaeus andrewsi*
34. *Corycaeus catus*
35. *Corycaeus latus*
36. *Corycaeus sp.1*
37. *Corycaeus sp.2*
38. *Corycaeus speciosus*
39. *Creseis acicula*
40. *Cypridina noctiluca*
41. *Dactylometra pacifica*
42. *Diphyes appendiculata*
43. *Diphyes chamisonis*
44. *Diphyes dispar*
45. *Disoma sp.*
46. *Doliolum denticulatum*
47. *Doliolum nationalis*
48. *Dromosphoera sp.*
49. *Eirene sp.*
50. *Eucalanus crassus*
51. *Eucalanus minachus*
52. *Eucalanus subcrassus*
53. *Euchaeta concinna*

54. *Euphysa bigelowi*
55. *Euterpona acutifrons*
56. *Eutintinnus lusus-undae*
57. *Evadne teroestina*
58. *Fritillaria formica*
59. *Fritillaria haplostoma*
60. *Fritillaria pellucida*
61. *Fritillaria venusta*
62. *Gammaris (undefinified)*
63. *Gastrosaccus sp.*
64. *Globigerina bulloides*
65. *Globoquadrina sp.*
66. *Heliocladus sp.*
67. *Hyperia sp.*
75. *Iasis zonaria* (solitary forms)
68. *Krohnitta subtilis*
69. *Labidocera acuta*
70. *Labidocera bengaliensis*
71. *Labidocera euchaeta*
72. *Labidocera minuta*
73. *Labidocera pectinata*
74. *Laophonte sp.*
76. *Lensia conoidea*
77. *Lensia sp.*
78. *Leprotintinnus nordqvisti*
79. *Leucosolenia(spicules) sp.*
80. *Liriope tetraphylla*
81. *Lopadorhynchus sp.*
82. *Lucicutia flavicornis*
83. *Lucifer penicilifer*
84. *Macrosetella gracilis*
85. *Mastigias papua*
86. *Metacalanus sp.*
87. *Microsetella morvigeca*
88. *Microsetella rosea*
89. *Notholca sp.* (Loricas)
90. *Obelia sp.*
91. *Oikopleura cophocerca*
92. *Oikopleura dioica*
93. *Oikopleura longicauda*

94. *Oithona brevicornis*
95. *Oithona linearis*
96. *Oithona nana*
97. *Oithona plumefera*
98. *Oithona rigesa*
99. *Oithona similis*
100. *Oncaea conifera*
101. *Oncaea venusta*
102. *Paracalanus aculetus*
103. *Paracalanus crassirostris*
104. *Paracalanus parvus*
105. *Pegantha sp.*
106. *Pegea confoederata*
107. *Pelagia noctiluca*
108. *Pelagobia longicirrata*
109. *Penilia avirostris*
110. *Phialidium discoida*
111. *Phtisica marina*
112. *Pleurobrachia pileus*
113. *Pleurobranchia rhodopis*
114. *Pontella andersoni*
115. *Pontella danae*
116. *pontellopsis scotti*
117. *Pseudodiaptomus aurivilli*
118. *Pterosagitta draco*
119. *Pyrocypris sp.*
120. *Rhopilema asamushi*
121. *Rhopilema esculenta*
122. *Sagitta bedoti*
123. *Sagitta crassa*
124. *Sagitta enflata*
125. *Sagitta hexaptera*
126. *Sagitta neglecta*
127. *Sagitta pulchra*
128. *Sagitta terox*
129. *Salpa fusiformis* (solitary and aggregate forms)
130. *Salpa maxima* (s*olitary form)*
131. *Saphirella sp.*
132. *Sapphirina nigromaculata*
133. *Stegosoma magnum*

134. *Stomolophus sp*
135. *Sulculeoria biloba*
136. *Temora discaudata*
137. *Temora turbinata*
138. *Thalassomysis sewelli*
139. *Thalia democratica* (solitary form)
140. *Tintinnopsis aperta*
141. *Tintinnopsis beroidea*
142. *Tintinnopsis butschlii*
143. *Tintinnopsis cylindrica*
144. *Tintinnopsis gracilis*
145. *Tintinnopsis mortenseni*
146. *Tintinnopsis nana*
147. *Tintinnopsis radix*
148. *Tortanus forcipatus*
149. *Undinula vulgaris*
150. *Vorticella oceanica*

6.1.3 Meroplankton

The following meroplankta are observed in Lampi Island water.

1. Actinotrocha of Phoronids
2. Alim of Stomatopods (various)
3. Arachnactis larva of anthozoa
4. Auricularia of Holothurouds
5. Bipinnaria of Starfish
6. Copepodite of various taxa of Copepods (various development states 1-4)
7. Cydippid larva of ctenophore
8. Cypris of Acorn barnacle
9. Echinopluteus of Echinoids
10. Juvenile of Acetes
11. Juvenile of Cryptonisidis
12. Juvenile of Leptochela
13. Lanice larva
14. Larvae of Alciopids
15. Larvae of alpheid caridean (various)
16. Larvae of Anomuran (Pagurid)
17. Larvae of Megalonids
18. Larvae of Nereid (various)

19. Larvae of Palae monid caridean (various)
20. Larvae of Processid caridean (various)
21. Larvae of Savellarids
22. Larvae of Spionids
23. Larvae of Tuberellids
24. Megalopa of brachyuran (various)
25. Metanectochaete (late) larvae (various)
26. Mitraria larvae
27. Mysis of Penaeids (various)
28. Nauplius of Acorn barnacle
29. Nauplius of Calanoids (various)
30. Nauplius of Cyclopoids (various)
31. Nauplius of Goose barnacle
32. Nauplius of Pontillids (various)
33. Nectochaete larvae (various)
34. Ophipluteus of Brittle star
35. Pilidium larvae
36. Planktonic fish eggs
37. Planktonic fish larvae
38. Planula larva of hydrozoa
39. Polydora larva
40. Trochophora larvae (various)
41. Veligers of gastropods (various)
42. Viligers of bivalves (various)
43. Young nematodes (unidentified)
44. Zoea and juveniles of Lucifer
45. Zoea of brachyuran (various)
46. Zoea of Penaeids (various)
47. Zoea of Porcellanids (various)

6.2 Seaweed

Altogether 46 genera and 73 species of seaweeds were found at Lampi Island.

6.2.1 Blue-green algae (Phylum : Cyanophyta)

Two blue-green seaweed species were observed during the study. They are –

1. *Lyngbya sp.* and
2. *Oscillatoria sp.*

6.2.2 Green algae (Phyum : Chlorophyta)

A total of 11 gerera and 24 species of green algae were found. They are -

1. *Anadyomen e stellata*
2. *Avrainvillea erecta*
3. *Boergesenia forbesii*
4. *Boodlea composita*
5. *Caulerpa racemosa*
6. *Caulerpa serrulata*
7. *Caulerpa sertulariodes*
8. *Caulerpa taxifolia*
9. *Caulerpa verticillata*
10. *Chaetomorpha gracilis*
11. *Chaetomorpha sp1.*
12. *Chaetomorpha sp2.*
13. *Cladophora sp1.*
14. *Cladophora sp2.*
15. *Codium arabicum*
16. *Codium edule*
17. *Codium geppei*
18. *Halimeda discoidea*
19. *Halimeda macroloba*
20. *Halimeda opuntia*
21. *Rhizoclonium sp.*
22. *Ulva intestinalis*
23. *Ulva reticulata*
24. *Ulva sp.*

6.2.3 Brown algae (Phylum: Phaeophyta)

A total of five genera and nine species of brown algae were found. They are -

1. *Dictyota bartayresiana*
2. *Dictyota divaricata*
3. *Lobophora variegata*
4. *Padina minor*
5. *Padina australis*
6. *Padina sp.*
7. *Sargassum stolonifolium*
8. *Sargassum polycystum*

9. *Turbinaria ornata*

6.2.4 Red algae (Phylum: Rhodophyta)

A total of 28 genera and 38 species were observed. They are –

1. *Acanthophora spicifera*
2. *Actinotrichia fragilis*
3. *Amphiroa fragilissima*
4. *Asterocystes ornate*
5. *Bostrychia binderii*
6. *Catenella nipae*
7. *Centroceras clavulatum*
8. *Ceramium sp1.*
9. *Ceramium sp2.*
10. *Dichotomaria marginata*
11. *Dichotomaria obtusata*
12. *Endosiphonia clavigera*
13. *Galaxaura filamentosa*
14. *Galaxaura rugosa*
15. *Gelidiella acerosa*
16. *Gelidium arenarium*
17. *Gracilaria*
18. *Gracilaria canaliculata*
19. *Grateloupia durvillaei*
20. *Grateloupia filicina*
21. *Hydropuntia eucheumoides*
22. *Hypnea pannosa*
23. *Hypnea charoides*
24. *Hypnea musciformis var. hippuriodes*
25. *Hypnea saidana*
26. *Jania sp.*
27. *Martensia fragilis*
28. *Phyllophora sp.*
29. *Plocamium cartilagineum*
30. *Polysiphonia sp1.*
31. *Polysiphonia subtilissima*
32. *Portieria hornemanii*
33. *Rhodymenia sp.*
34. *Spondylothamnion sp.*

35. *Tolypiocladia calodictyon*
36. *Tolypiocladia glomerulata*
37. *Vanvoorstia spectabilis*
38. *Wrangelia hainanensis*

6.3 Seagrass

A total of 10 species of seagrass were found. They are –

1. *Thalassia hemprichii*
2. *Cymodocea rotundata*
3. *Cymodocea serrulata*
4. *Halophila ovalis*
5. *Halophila minor*
6. *Halodule uninervis*
7. *Halodule pinifolia*
8. *Halophila baccarii*
9. *Enhalus accoroides*
10. *Syringodium isoetifolium*

Sites No. 1 Labi Aw and No. 2 Khe Taung Aw (Figure 4) have the highest biodiversity of seagrass. *Enhalus*, the largest and most conspicuous seagrass was found only in Ko Phawt Islands area but in relatively large number.

Table 4. Sea grass distribution of Lampi Marine National Park

No	Species	SW 01	SW 02	SW 04	SW 05	SW 11	SW 14
1	*Cymodocea rotundata*	√	√	√		√	
2	*Cymodocea serrulata*	√	√	√		√	√
3	*Syringodium isoetifolium*						√
4	*Enhalus accoroides*				√		
5	*Halodule pinifolia*	√	√	√			
6	*Halodule uninervis*		√				√
7	*Halophila baccarii*		√				
8	*Halophila minor*		√				
9	*Halophila ovalis*	√	√	√			
10	*Thalassia hemprichii*	√					

6.4 Discussion

Plankton and seaweed of Myanmar water have been studied by the then Department of Botany, Zoology and Marine Biology at Mawlamyine Degree College for more than three decades. Series of plankton and seaweed papers were presented at various research congress. Nowadays, Department of Marine Science at Mawlamyine, Pathein and Myeik Universities are studying Myanmar marine fauna and flora.

In order to assess the biodiversity of coastal water environment of Lampi Island, investigation on plankton has been conducted and only qualitative study could be done during the present trip.

The large majority of decapods (prawns and crabs) are either active bottom dwelling or nektonic (actively swimming) animals. The only holoplanktonic decapods known in Myanmar are *Lucifer* and *Acetes*, both of which were found in this study. However, almost all decapods have meroplanktonic larvae. Jelly fish are members of megaloplankton but because of their big size they were not caught in the plankton net.

The overall work involved overall survey of the area for seaweeds and, virtually, the whole coast line of the Lampi Island has been explored. Altogether fourteen sites were designated for seaweed collection around the island. Of the 14 sites designated site No. 1 and 2 have higher biodiversity of seagrass.

Small microscopic green algae, *Chaetomorpha* and *Rhizoclonium* as well as coralline green algae *Helimeda opuntia* were fairly widely distributed around Lampi Island. *Avrainvillea* and *Codium* were found to be very rare and their distribution seems to be very limited.

Ulva reticula seemed to confine only to the south and south eastern parts of Lampi Island. *Colpomenia sp.* also showed a rather similar distribution. The coralline algae *Amphiroa* and *Jania* were relatively abundant in the eastern and north eastern half of the Island. *Halimeda opuntia*, although never found in large number were rather widely distributed.

Among the brown algae *Padina spp.* were most dominant (also dominants all other groups of algae) and most widely distributed around Lampi Island. They could be found at all three intertidal zones of the shore but more conspicuously in middle intertidal zone.

The large brown algae *Sargassum* and *Turbinaria* were rare throughout the shoreline of Lampi Island. Some plants observed were mostly young plants. Most brown algae were found in the middle intertidal zone with the exception of *Padina spp.* which could be found in all three zones.

No red algae species seems to dominate other plants clearly. But *Hypnea spp.* were found to be common, and occurred in group or tuft. Red and conspicuous species such as *Halymenia* or *Kathymenia* found to be quite rare. *Catenella* species was found only at one site on the root of mangrove. *Amphiroa* and *Jania* were prominent member of the lower intertidal zone.

Some regions not designated as sites, such as east and west of Bo Cho Island the south eastern part of Nyaung Wee Island also supported extensive bed of seagrass. These two regions

were not designated as sites simply due to the reason that they are outside the Lampi Island proper.

7. HIGHLIGHT

7.1 Plankton

Although economically unimportant, plankton plays a very big role in the ecology of the seas and oceans. The role played by plankton in the ecology of the seas is really great indeed. Phytoplankton are the primary producers of the sea while zooplankton which feed on phytoplankton are the primary consumers. These zooplankton are then fed upon by either larger zooplankton or small fish and prawn, which were their fed upon by larger ones. Certain large fish feed directly on phytoplankton while others, such as baleen whale, feeds on zooplankton (euphausiids). Thus phytoplankton and zooplankton play the basic and secondary roles in the food chains or food webs of the sea. Plankton are thus the basic of virtually all lives in the heremetic oceanic environments of the seas and oceans. In order to assess the biodiversity of coastal water environment of Lampi Island, investigation on plankton has been conducted but only qualitative study could be done during the present trip.

However, the following species can be identified as new records for Myanmar from the present study. They are -

1. *Pleurosigma nicobaricum* (Pennate diatom)
2. *Pegantha sp.* (Hydromedusa)
3. *Pelagia noctiluca* (Jelly fish)
4. *Pleurobranchia rhodopis* (Ctenophore)
5. *Phtisica marina* (Amphipod)
6. *Thallassomysis sewelli* (Mysid)
7. *Salpa maxima* (Salp)
8. *Iasis zonaria* (Salp)

7.2 Seaweed

The points we also would like to highlight are the economic and ecological importance of seaweeds and seagrass. Some genera of green algae, such as *Catenella, Caulerpa* and *Ulva* can be used for the production of health foods and sea vegetables. *Catenella* which is known as “Kyauk Pwint” in Myanmar, is a famous seafood item and it is used as food and medicine to cure or prevent goitre. Certain species of brown algae could be utilized for the production of alginates, manitol and iodine, for example, *Dicthyota*, *Padina*, *Turbinaria* and *Sargassum*. Certain species of red algae, such as *Gracilaria* could be used for the production of agar-agar while species of *Catenella*, *Hypnea and Acanthophora* could be harvested for the production of carrageenans compounds.

From an ecological point of view the seaweeds beds serve as feeding, spawning and nursery grounds for mahy marine invertebrates and vertebrates. The seaweed beds are thus important for the productivity of the coastal environment of Myanmar.

7.3 Seagrass

Seagrasses, although not economically important as seaweeds, have profound ecological important in the ecosystem of the coastal water environment. Seagrass are the main food of the marine turtles of Myanmar. Beds of seagrass, particularly larger species, provide sheltered habitats as crucial feeding, spawning and nursery grounds for a wide variety of sea animals including marine invertebrates, coral reef fishes and the sea cow, *Dugong dugon*. Dugong trails were observed on the seagrass beds at Khe Taung Aw and east coast of Nyaung Wee Island by one of the team member, Tint Tun and his colleague Canadian scientist, Barry Bendell, in 2008.

During the present trip to Lampi, a dugong stranding was informed by a villager on 27th. March at about 19:00hr at Ma Kyone Galet village. According to the information, the villager was a Salone ethnic and he found stranded dugong at Wa Kyuun when he was fishing around the island. It was too late to find a boat and tide was flooding. Therefore, the animal could float again and could escape from stranding and drifted again with flood tide. The team gave up their attempt to go and find the animal.

According to the previous seagrass studies, a total of 10 seagrass species were recorded from Myanmar water and eight species were observed at Lampi. From the present study, two seagrass species, *Syringodium isoetifolium* and *Halophila minor*, are the new record for Lampi and *Halophila minor* is the new record for Myanmar.

8. LIMITS AND CONSTRAINTS

As we look materials and training for scuba diving and underwater survey all our works were confined to the intertidal zone of the shore. This was again very limited by the period of neap tide (about 15 days of this trip), during which time works could be done only in the upper and middle intertidal zone. All the three intertidal zones would be investigated only during low water (low tide) of spring tide period and the period of lowest water of spring tide was coincided with inconvenient hours of the day i.e. too early in the morning or too late in the evening.

In a few occasion due to logistic issue the surveying time coincided with high water (high tide). In order not to lose one day, all that we could do was walking along the supralittoral zone of the beach or at most upper intertidal zone, investigating stranded died sea shells, bits and pieces of dead corals, and drifted seaweeds and sea grass. Our works were thus reduced to the work of amateur shell collectors or tourists. In such cases we have to assume that all these dead sea shells, coral pieces and stranded seaweeds naturally come from the nearby bay.

Generally speaking, some taxonomic groups are found only or more abundant in sub tidal zone. This is the zone that waits for the marine biologists of Myanmar to be explored. Henceforth, scuba diving training should be taken into consideration for further study.

The issue regarding the phenomena of tides mentioned above was, of course, merely a natural issue. This could be easily solved if logistic issue was tackled. For instance, the marine biology group can have a separate small boat and go and return at appropriate time by tides, regardless of inconvenient hours, i.e. Between 5am in the morning to 6pm in the evening, as long as there is daylight. The only issue that could be arisen is the extra cost of hiring a separate boat for the marine biology group.

Materials are limited and constraint for the marine biology team. Plankton nets used for plankton sample collection were provided by a team member, Tint Wai. Plankton sampling nets fitted with flow meter, reversing bottles for temperature determination and water sampling from various depths, handheld refrectometer for salinity determination and portable spectrophotometer for other parameters of seawater, compound microscope (with accessories for camara to take photographs) and disserting microscope are still in need for both qualitative and quatitative plankton studies.

Literature and references are essential for qualitative studies. But, we have limited source of literature and references at our disposal. Due to his many years experience in plankton study and his personal compilation of literature concerned, Professor Saw Han Shein could identification very well planktaon of east, west and north Lampi Island coastal water. But, the team requested help from Professor Soe Tun, Professor and Head of Department of Marine Science at Mawlamyine University where vast of literature on seaweeds and seagrass is compiled for seaweeds and seagrasses identification.

9. CONCLUSION AND RECOMMENDATION

The ultimate goal is conservation and sustainable management of Lampi Marine National Park. This is really a great task that involves multi disciplinary approaches in order to achieve the goal.

For the present purpose the marine biology did baseline research work on the marine flora and fauna of the island. Therefore, the first and foremost goal is biodiversity study on the plankton, seaweeds and seagrass of the coastal area of the Lampi Island. Of condition permits the biodiversity of the whole fauna, including all marine invertebrates as well as vertebrates (fishes and sea mammals) should be assessed.

The next step will be quantitative study of the flora and fauna. This quantitative undertaken for several years in order to assess the increase or decrease of the biodiversity as well as the biomass of the flora and fauna.

Generally speaking, some taxonomic groups are found only or more abundant in sub tidal zone. This is the zone that waits for the marine biologists of Myanmar to be explored. Henceforth, scuba diving training should be taken into consideration for further study.

Marine Science Departments at Mawlamyine, Pathein and Myeik Universities have capacities and a research vessel. More intensive marine biological studies can be conducted by cooperation and collaboration with the Universities through proper channel.

While effectively protecting the island we should simultaneously get involve in educative talk and persuasion. All members involved in the marine national park should be good speaker and persuasive and patient enough when dealing with the local people. Educative talk should be given whenever or wherever dreams necessary. We should patiently give them lengthy explanation on the merit of conserving this island or keeping this island intact. And that one day when this island become a true and successful national park the income generated from tourisms can greatly exceed the income generated form exploiting the natural resources, plants and animals, of this island.

From the facts mentioned above we are urgently in need of protecting the island. This should be given first priority. Other conservation works will follow. It is heartening to know that soon a head quarter or ranger post or an infrastructure will be set up at north of Bo Cho Island for the management of the marine national park. The mere presence of staff members at Ma Kyon Kalet village will be at least refrain the illegal loggers, hunters and trappers, and fishermen from doing illegal works.

Once again we would like to emphasize the first and foremost talk of protecting the island. Since the island is a big one (80 square miles) protecting the island effectively might not be easy. But one the other hand one can argue rightly, that protecting an island is easier than protecting a land. People have to go to the island by boat and while people can hide in the forest it is not so easy to conceal a boat. Diligent monitoring and patrolling works could greatly reduce enroachements or can eventually stop them completely.

We emphasize the protection of the island, because we really believe that once the island is effectively protected and left undisturbed the flora and fauna (both terrestrial and marine) could revive or regenerate easily. Complex or complicated conservation and rehabilitation programs may not be necessary. The flora and fauna are resilient enough to regenerate within a few years. Just protect the island effectively and leave it to nature. Nature will then take care of the island efficiently.

After all Lampi Island is a national park and a national park should be a true nation park not a pseudo-park.

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations.

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Cyanophyta	Cyanophyceae	Oscillatoriales	Oscillatoriaceae	1	*Trichodesmiun (Oscillatoria) erythraeum*	√	√		√	√	√		√	√	√	√	
				2	*T. theibauti*		√			√	√	√		√	√	√	√
Bacillariophyta	Bacillariophyceae	Centralis	Melosiraceae	3	*Melosira borreri*	√										√	
(Chromophyta)				4	*Hyalodiscus stelliger*	√	√	√					√	√			
			Coscinodiscaceae	5	*Coscinodiscus astromphalus*	√				√	√		√	√			
				6	*C. cintrales*	√		√		√				√			
				7	*C. concinnus*	√	√	√	√		√		√			√	
				8	*C. excentricus*	√										√	
				9	*C. gigas*	√	√	√			√		√	√	√	√	√
				10	*C. janesianus*		√	√	√	√				√		√	
				11	*C. lineatus*	√		√		√	√	√					
				12	*C. nodulifer*									√			
				13	*C. oculus-iridis*	√	√			√					√		
				14	*C. radiatus*	√	√	√			√	√					√
				15	*C. subtilis*				√								
				16	*Cyclotella comta*	√									√		
				17	*Hemidiscus cuneiformis*	√	√	√	√		√			√	√	√	
			Leptocylindraceae	18	*Leptocylindrus danicus*	√	√	√	√		√				√	√	
				19	*Guinardia flaccida*		√				√				√	√	√
			Skeletonemaceae	20	*Skeletonema costatum*					√							

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				21	*Stephanopyxis palmeriana*	√	√	√	√		√			√	√	√	
			Thalassiosiraceae	22	*Thalassioira gravida*			√			√					√	
				23	*Thalassiosira rotula*	√					√				√	√	
				24	*T. subtilis*	√	√	√	√	√	√	√		√	√	√	
				25	*Thalassiaosira sp.1*	√		√	√	√	√		√	√	√	√	
				26	*Lauderia borealis(annulata)*	√	√	√	√		√		√	√	√	√	
				27	*Schrodirella delicatula*	√	√	√	√	√	√	√	√		√	√	
			Rhizosoleniaceae	28	*Rhizosolenia bergoni*	√		√	√	√	√		√	√	√		
				29	*R. castracenei*		√		√	√			√			√	
				30	*R. clevei*				√	√			√		√		
				31	*R. imbricata*	√	√				√			√	√	√	
				32	*R. rhombus*	√		√							√	√	
				33	*R. robusta*	√	√	√			√	√		√	√	√	
				34	*R. setigera*		√	√						√	√	√	
				35	*R. stoltertofothii*	√	√	√	√	√			√	√	√	√	
				36	*R. styliformis*	√		√		√	√	√	√	√	√	√	
				37	*R. (Proboscia)alata*	√	√	√	√	√	√	√	√	√	√	√	√
				38	*R. alata f. indica*	√		√	√	√		√		√	√		√
				39	*R. alata f. innermis*			√	√				√		√		
				40	*E. (Pseudosolinia) calcaravis*	√	√	√	√		√		√		√	√	

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
			Bacteriastraceae	41	*Bacteriastrum comosum*		√	√	√	√	√		√	√	√	√	
				42	*B. elongatum*	√	√	√									
				43	*B. hyalinum*	√	√		√	√	√			√	√	√	
				44	*B. varians*			√	√		√			√		√	
			Chaetoceraceae	45	*Chaetoceros affinis*	√		√	√	√				√		√	
				46	*C. coarctatus*		√	√	√	√	√	√	√	√	√	√	√
				47	*C. compressus*				√			√		√			
				48	*C. curvisetus*	√	√	√	√	√	√		√	√		√	√
				49	*C. denticulatum*	√		√									
				50	*C. decipiens*	√					√						
				51	*C. lauderi*			√	√	√		√	√			√	
				52	*C. lorenzianus*	√	√	√	√	√	√		√	√	√	√	√
				53	*C. paradoxum*	√	√			√	√		√	√			
				54	*C. peruvianus*	√	√							√	√		
				55	*C. pseudicrinatus*	√				√							
				56	*C. pseudicurvisetus*	√			√	√	√		√			√	
				57	*C. rostratus*								√	√			
				58	*C. siamensis*	√			√								
				59	*C. subtilis*					√			√				
				60	*C. tortissimus*	√		√		√				√		√	

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				61	*C.weisfiogii*	√		√		√			√	√	√		
			Biddulphiaceae	62	*Biddulphia sinensis*	√	√		√		√		√	√	√	√	
				63	*Triceratium favus*	√					√			√		√	
				64	*T. reticulatum*									√	√		√
				65	*T. revale*	√											
				66	*Cerataulina bergoni*	√	√	√	√		√	√	√	√	√	√	√
				67	*Hemiaulus indica*	√	√	√									
				68	*H. sinensis*	√	√	√	√				√		√		
				69	*Bellerochea malleus*	√											
				70	*Ditylum sol*	√	√	√	√	√			√	√		√	
				71	*D. brightwelll*	√											
			Eucampiaceae	72	*Eucampia zoodiacus*	√		√					√	√	√	√	
				73	*E.cornuta*	√									√		
				74	*Climacodiun biconcavum*	√	√	√		√	√		√	√	√	√	√
				75	*C. frauenfeldianum*	√				√						√	
				76	*Streptotheca thamensis*						√						
		Pennales	Fragilariaceae	77	*Frgilaria oceanica*						√	√	√	√			
				78	*Thalassionema nitzschioides*	√	√	√	√	√	√	√	√	√	√	√	√
				79	*Thalassiothrix frauenfeldii*	√	√	√	√	√	√		√	√	√	√	√
				80	*T. longissima*	√				√	√	√		√	√	√	

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				81	*T. mediterranea*		√	√	√	√	√			√	√	√	
			Achnanthaceae	82	*Cocconeid pediculus*	√											
			Naviculaciceae	83	*Navicula cuspidata*			√		√							
				84	*N. sp.1*	√	√		√		√			√			
				85	*N. sp.2*		√	√									
				86	*Pinnularia sp*	√	√					√					
				87	*Gyrosigma sp*						√						
				88	*Pleurosigma aesturii*	√		√									
				89	*P. intermedia*		√	√			√		√	√			
				90	*P. nicobaricum*		√		√	√	√		√	√	√		
				91	*P. normani*	√	√	√	√	√			√	√	√		
				92	*P. sp.1*		√	√					√		√		
				93	*P. sp.2*	√	√		√								
			Nitzchiaceae	94	*Nitzschia closterium*	√							√				
				95	*N. sigma*		√				√						
				96	*N. seriata*			√	√				√	√			
				97	*N. sp*	√			√	√		√	√	√			
				98	*Bacillaria paradoxa*	√		√					√		√		
Bacillariophyta	Bacillariaphyceae	Pennales	Surirellaceae	99	*Campylodiscus undulatus*	√											
Chrysophyta	Chrysophyceae	Silicoflagellata	Dictyochaceae	100	*Dictyocha fibula*			√									

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Pyrrophyta	Dinophyceae	Dinophysiales	Dinophysiaceae	101	*Dinophysis homunculus*	√	√	√		√		√			√	√	
				102	*D. miles*	√				√	√	√	√	√	√	√	√
				103	*Ornithocercus magnificus*											√	
				104	*O.steini*										√	√	
		Dinoflagellata	Noctilucaceae	105	*Noctiluca scintillans*	√				√	√	√			√		√
			Gymnodiniaceae	106	*Gymnodinium sp*							√					
				107	*Peridinum(Protoperidini um) catenatum*											√	
				108	*P. cerasus*					√					√		
				109	*P. conicum*	√	√	√			√		√	√	√	√	√
				110	*P. depressum*	√	√			√	√	√	√	√	√	√	√
				112	*P. divergens*	√	√			√			√		√		
				112	*P. oceanicum*	√	√			√	√		√	√	√	√	√
				113	*P. steini*					√						√	
				114	*Diplosalis lenticulata*	√	√				√					√	
				115	*Pyrophacus horologicum*	√		√	√	√				√	√	√	√
			Gonyaulaceae	116	*Gonyaulax polygramma*											√	
				117	*G. sp*											√	
			Podolampaceae	118	*Podolampas biped*						√						
			Ceratiaceae	119	*Ceratium candelabrum*											√	√
				120	*C. deflexum*	√	√		√	√	√	√	√		√	√	√

Appendix (I). Classified list of phytoplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				121	*C. dens*		√			√	√	√	√	√	√	√	√
				122	*C. extensum*			√		√				√			
				123	*C. turca*	√	√			√			√	√	√	√	
				124	*C. fusus*	√	√		√				√		√	√	
				125	*C. macroceros*	√	√			√	√	√	√	√	√	√	
				126	*C. pennatum*	√				√				√		√	
				127	*C. ponectum*			√		√			√			√	
				128	*C. pulchellum*	√		√		√	√			√		√	√
				129	*C. sumatranum*					√					√		
				130	*C. tenue*	√	√	√	√	√	√	√	√	√	√	√	√
				131	*C. trichoceros*	√	√	√	√	√			√	√	√		√
				132	*C. tripos*		√	√	√	√	√		√	√	√	√	√
				133	*C. vulture*		√			√	√						
		Dinococcales	Dinococcaceae	134	*Pyrocystis fusiformis*			√				√			√	√	√
				135	*P. lunula*											√	
				136	*P. noctiluca*										√	√	

Note.

East and S.E. Lampi			West and S.W. Lampi			North Lampi		
Station	Latitude	Longitude	Station	Latitude	Longitude	Station	Latitude	Longitude
PK Night 2 (Lampi East)	N10 54.521	E98 14.647	PK Night 1 (Lampi West & SW)	N10 40.572	E98 13.365	PK Night 3 (Lampi North)	N10 53.289	E98 04.553
PK 03 (Nyaungbin Aw)	N10 44.771	E98 18.213	PK 01 (Khe Taung Nge Aw)	N10 44.085	E98 13.889	PK 09 (Nipa Aw)	N10 59.240	E98 12.268
PK 06 (Karyan Aw)	N10 47.487	E98 17.743	PK 05 (SW of Ko Phawt Island)	N10 48.708	E98 11.505	PK 10 (Kalun Aw)	N10 54.010	E98 05.090
PK 08 (E of Lampi)	N10 57.147	E98 13.974	PK 14 (Balaik Aw)	N10 53.472	E98 10.059	PK 13 (Kakat Aw)	N10 58.280	E98 08.377

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations.

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Protozoa	Sarcodina	Foraminifera	Globigerinidae	1	*Globigerina bulloides*	√					√			√			√
				2	*Globoquadrina sp.*						√						
			Bolivinidae	3	*Bolivina sp.*	√		√						√			
		Radiolaria	Acanthometridae	4	*Dromosphoera sp.*					√	√			√	√		
			Aulophaeridae	5	*Aulophaera sp.*					√					√		
			Siscoidae	6	*Heliocladus sp.*					√					√	√	
	Ciliata	Peritricha	Vorticellidae	7	*Vorticella oceanica*		√	√	√		√	√		√	√	√	√
		Holotrich	Codonellidae	8	*Tintinnopsos aperta*	√											
				9	*T. beroidea*	√		√					√	√			
				10	*T. butschlii*	√								√			
				11	*T. cylindrica*	√		√		√			√	√			
				12	*T. gracilis*	√	√						√				
				13	*T. mortenseni*	√											
				14	*T. nana*	√											
				15	*T. radix*	√		√			√		√	√			
				16	*Leprotintinnus nordqvisti*	√							√				
			Codonellopsidae	17	*Codonellopsis morchella*						√		√				
				18	*C. ostenfeldi*					√			√				
				19	*C. parva*								√		√		
			Tintinnidae	20	*Eutintinnus lusus-undae*										√		

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Porifera	Calcarea	Homocoela		21	*Leucosolenia(spicules) sp.*								√	√			
Coelenterata	Hydrozoa	Hdromedusae	(Sub-order Antomedusae)	22	*Pegantha sp.*								√				
				23	*Bougainvilea pyramidata*							√	√				
				24	*Euphysa bigelowi*			√									
			(Sub-order Antomed (Sub-Leptomedusae)	25	*Aequorea macrodactyla*		√										
				26	*Aequorea sp.*		√										
				27	*Phialidium discoida*		√	√					√		√		√
				28	*Eirene sp.*		√				√				√		√
				29	*Obelia sp.*							√					
		Trachylina	(Sub-order Trachomedusae	30	*Liriope tetraphylla*							√			√		
					(Undentified young medusae)		√	√	√				√		√	√	√
		Siphonophora	(Sub-order Calycophorae)	31	*Abylopsis eschscholtzi*										√		
				32	*Abyla hakaeli*										√	√	
				33	*Diphyes appendiculata*		√									√	
				34	*D. chamisonis*			√	√			√		√			
				35	*D. dispar*		√	√							√	√	
				36	*Lensia conoidea*		√	√		√	√			√	√	√	
				37	*Lensia sp.*		√				√						
				38	*Sulculeoria biloba*									√	√		

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
	Scyphozoa	Semaeastomae		39	*Aurellia sp.*								√				
				40	*Dactylometra pacifica*								√				
				41	*Pelagia noctiluca*		√		√								
		Rhizostomae		42	*Stomolophus sp*								√				
				43	*Mastigias papua*	√					√						
				44	*Rhopilema asamushi*	√	√				√			√			
				45	*R. esculenta*	√					√						
Ctenophora	Lobata	Cydippidea		46	*Pleurobrachia pileus*			√								√	
				47	*P. rhodopis*			√									
	Nuda	Beroidea		48	*Beroe cucumis*							√					√
				49	*B. forskali*												√
Trochelminthes	Rotifera	Monogononta		50	*Notholca sp.* (Loricas)			√									
Annelida	Polychaeta	Errantia	Phyllodocidae	51	*Lopadorhynchus sp.*									√			
				52	*Pelagobia longicirrata*					√				√	√	√	
			Alciopidae	53	*Alciopa sp.*										√		
				54	*Disoma sp.*										√		√
				55	*Callizona sp.*										√		
Chaetognatha	Sagittoidea	sagittoida	Sagittoidae	56	*Sagitta bedoti*			√	√					√	√		√
				57	*S. crassa*	√		√	√	√		√		√	√	√	√
				58	*S. enflata*	√	√	√	√	√	√	√	√	√	√	√	√

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				59	*S. terox*			√			√						
				60	*S. hexaptera*		√		√	√	√	√		√	√	√	
				61	*S. neglecta*			√								√	√
				62	*S. pulchra*									√			√
				63	*Krohnitta subtilis*	√								√			
				64	*Pterosagitta draco*						√						
Arthropoda	Crustcea (Sub-class Anostraca)	Cladocera	Polyhemidae	65	*Evadne teroestina*					√	√				√	√	√
				66	*Penilia avirostris*					√	√					√	√
		Ostrocoda	Halicypridae	67	*Conchoecia elegans*		√	√	√	√				√	√	√	√
				68	*Conchoecia sp.*		√		√						√		
				69	*Cypridina noctiluca*			√									√
				70	*Pyrocypris sp.*			√								√	√
	Crustacea (Sub-class copepoda)	Calanoida	Calanidae	71	*Calanus sp.*				√			√			√	√	√
				72	*Canthocalanus pouper*				√			√			√		
				73	*Undinula vulgaris*										√		√
			Eucalanidae	74	*Eucalanus crassus*			√			√	√			√	√	√
				75	*E. minachus*			√	√			√	√		√		
				76	*E. subcrassus*	√	√	√	√	√	√		√		√	√	
			Paracalanidae	77	*Paracalanus aculetus*	√	√	√	√	√		√	√	√	√		√
				78	*P. crassirostris*	√			√				√				

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				79	*P. parvus*	√	√	√	√	√		√	√	√	√		√
				80	*Acrocalanus gibbe*	√	√	√	√	√			√	√	√		
				81	*A. gracilis*	√	√	√		√		√	√	√	√		√
			Metacalanidae	82	*Metacalanus sp.*	√	√			√	√		√	√			√
			Euchaetidae	83	*Euchaeta concinna*									√	√		
			Pseudodioptomidae	84	*Pseudodiaptomus aurivilli*	√			√								
			Centropagidae	85	*Centropages furcatus*					√		√			√	√	√
			Temoridae	86	*Temora discaudata*	√		√						√	√	√	√
				87	*T. turbinata*			√	√	√		√		√	√		√
			Candaciidae	88	*Candacia bradyi*		√								√		
			Lucicutiidae	89	*Lucicutia flavicornis*											√	
			Pontellidae	90	*Calanopia elliptica*		√										
				91	*Labidocera acuta*									√			
				92	*L. bengaliensis*		√										
				93	*L. euchaeta*	√							√		√		
				94	*L. minuta*				√						√		
				95	*L. pectinata*				√						v		
				96	*Pontella andersoni*				√								
				97	*P. danae*			√									
				98	*pontellopsis scotti*				√							√	

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
			acartiidae	99	*Acartia centula*			√							√		
				100	*A. erythraea*					√		√			√	√	
				101	*A. spinicauda*					√			√	√	√	√	√
			Tortinidae	102	*Tortanus forcipatus*						√						
		Harpacticoida	Ectinosomidae	103	*Microsetella morvigeca*	√			√				√	√	√	√	√
				104	*M. rosea*	√	√	√	√	√		√	√	√		√	√
			Macrosetellidae	105	*Macrosetella gracilis*											√	√
			Tachydiidae	106	*Euterpona acutifrons*	√	√		√	√			√	√	√		√
			Clytemnestridae	107	*Clytemnestra rostrata*					√					√		√
				108	*C. scutellata*					√		√					√
				109	*Laophonte sp.*	√				√			√	√			
			Harpacticidae	110	*Saphirella sp.*	√			√			√					√
		Cyclopoida	Oithonidae	111	*Oithona brevicornis*	√	√	√	√	√			√	√			
				112	*O. linearis*			√				√	√			√	√
				113	*O. nana*	√			√	√			√	√			
				114	*O. plumefera*	√			√	√			√		√	√	√
				115	*O. rigesa*	√	√	√	√	√			√	√	√		√
				116	*O. similis*		√					√		√	√	√	√
			Oncacidae	117	*Oncaea conifera*					√			√				√

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				118	*O. venusta*	√				√			√		√	√	√
			Corycacidae	119	*Corycaeus andrewsi*	√	√			√		√			√	√	√
				120	*C. catus*		√	√	√	√		√	√		√	√	√
				121	*C. latus*		√					√				√	√
				122	*C. speciosus*	√							√				√
				123	*Corycaeus sp.1*		√			√							
				124	*Corycaeus sp.2*				√				√				
			Sapphirinidae	125	*Sapphirina nigromaculata*											√	
	Crustacea (Sub-class Malacostraca)	Amphipoda	Hyperiidae	126	*Hyperia sp.*				√			√				√	
				127	*Brachycelus sp.*				√								
			Gammaridae	128	*Gammaris (undefinified)*				√								
			Caprellidae	129	*Phtisica marina*								√				
		Mysidacea	Mysidae	130	*Gastrosaccus sp.*				√								
				131	*Thalassomysis sewelli*		√										
		Mysidacea	Luciferidae	132	*Lucifer penicilifer*	√	√	√	√	√	√	√	√	√	√	√	√
			Sergestidae	133	*Acetes indicus*	√			√						√		
Mollusca	Gastropoda (sub-class Opisthobranchia)	Pteropoda	Cavolinidae	134	*Cavolinia longirostris*							√				√	
				135	*Creseis acicula*	√		√	√			√		√	√	√	√

Appendix (II). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Protochordata	Urochordata (Tunicata)	Appendicularia	Oikopleuridae	136	*Oikopleura cophocerca*	√	√		√	√	√		√	√	√	√	√
				137	*O. dioica*	√	√		√	√				√		√	
				138	*O. longicauda*	√	√		√	√	√		√	√	√	√	√
				139	*Stegosoma magnum*									√		√	
				140	*Fritillaria formica*						√			√	√		
				141	*F. haplostoma*						√				√	√	
				142	*F. pellucida*					√	√			√	√	√	
				143	*F. venusta*						√			√	√		
	Thaliacea	Salpoda	Salpodae	144	*Salpa fusiformis* (solitary and aggregate forms)							√					√
				145	*S. maxima*(*solitary form)*												√
				146	*Thalia democratica* (solitary form)							√	√		√	√	√
				147	*Iasis zonaria* (solitary forms)							√				√	√
				148	*Pegea confoederata*							√	√				√
		Doliolida	Doliolidae	149	*Doliolum denticulatum*							√			√	√	
				150	*D. nationalis*							√				√	

Note.

East and S.E. Lampi			West and S.W. Lampi			North Lampi		
Station	Latitude	Longitude	Station	Latitude	Longitude	Station	Latitude	Longitude
PK Night 2 (Lampi East)	N10 54.521	E98 14.647	PK Night 1 (Lampi West & SW)	N10 40.572	E98 13.365	PK Night 3 (Lampi North)	N10 53.289	E98 04.553
PK 03 (Nyaungbin Aw)	N10 44.771	E98 18.213	PK 01 (Khe Taung Nge Aw)	N10 44.085	E98 13.889	PK 09 (Nipa Aw)	N10 59.240	E98 12.268
PK 06 (Karyan Aw)	N10 47.487	E98 17.743	PK 05 (SW of Ko Phawt Island)	N10 48.708	E98 11.505	PK 10 (Kalun Aw)	N10 54.010	E98 05.090
PK 08 (E of Lampi)	N10 57.147	E98 13.974	PK 14 (Balaik Aw)	N10 53.472	E98 10.059	PK 13 (Kakat Aw)	N10 58.280	E98 08.377

Appendix (III). Classified list of meroplankton of Lampi Island and their occurrence at various collection stations.

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
Coelenterata	Hydrozoa			1	Planula larva of hydrozoa	√											
	Anthozoa			2	Arachnactis larva of anthozoa					√					√		√
Ctenophora				3	Cydippid larva of ctenophore		√	√	√			√				√	
Nemathelminthes	Nematoda			4	Young netodes(unidentified)						√						
Nemertea				5	Pilidium larvae					√	√	√					
Annelida	Polychaeta			6	Trochophora larvae(various)	√	√	√	√	√	√	√	√	√	√	√	√
				7	Nectochaete larvae(various)	√		√						√	√		
				8	Metamectochaete(late) larvae(various)	√		√						√			
				9	Mitraria larvae							√					
				10	Larvae of Alciopids	√	√			√							
				11	Larvae of Savellarids	√			√	√			√			√	
				12	Larvae of Spionids	√	√	√				√		√	√	√	
				13	Larvae of Tuberellids							√		√			
				14	Larvae of Megalonids					√				√	√	√	
				15	Lanice larva			√				√					
				16	Polydora larva			√		√			√		√		
				17	Larvae of Nereid (various)	√		√		√				√	√		√
Arthropoda	Crusteceae(sub-class Cirripedia)			18	Nauplius of Acorn barnacle	√	√	√	√	√	√	√	√	√	√	√	√
				19	Cypris of Acorn barnacle				√			√					√

Appendix (III). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				20	Nauplius of Goose barnacle				√							√	
	(Sub-class Copepoda)	Calanoida		21	Nauplius of Calanoids (various)	√	√	√	√	√	√	√	√	√	√	√	√
				22	Nauplius of Pontillids(various)	√	√	√	√	√	√	√	√	√	√	√	√
		Cyclopoida		23	Nauplius of Cyclopoids(various)	√	√	√	√	√	√	√	√	√	√	√	√
				24	Copepodite of various taxa of Copepods (various development states 1-4)	√	√	√	√	√	√	√	√	√	√	√	√
		Isopoda		25	Juvenile of Cryptonisidis	√			√								
	Crustacea (Sub-class Malacostraca)	Decapoda		26	Zoea and juveniles of Lucifer	√	√	√	√	√	√	√	√	√	√	√	√
				27	Juvenile of Acetes	√	√	√	√	√	√	√	√	√	√	√	√
				28	Zoea of Penaeids (various)	√	√	√	√	√	√	√	√	√	√	√	√
				29	Mysis of Penaeids (various)	√	√	√	√	√	√	√	√	√	√	√	√
				30	Larvae of alpheid caridean (various)	√	√	√			√			√	√	√	√
				31	Larvae of Processid caridean (various)			√						√	√	√	
				32	Larvae of Palae monid caridean (various)			√							√		
				33	Juvenile of Leptochela				√						√		
				34	Larvae of Anomuran (Pagurid)							√					
				35	Zoea of brachyuran (various)	√	√	√	√	√	√	√	√	√	√	√	√
				36	Megalopa of brachyuran (various)			√	√					√			

Appendix (III). Classified list of zooplankton of Lampi Island and their occurrence at various collection stations. (*Continue*)

Phylum	Class	Order	Family	Sr. No	Genera and species	East Lampi				West Lampi				North Lampi			
						PK 3	PK 6	PK 8	NT	PK 1	PK 5	PK 14	NT	PK 9	PK 10	PK 13	NT
				37	Zoea of Porcellanids (various)			√								√	
		Stomatopoda		38	Alim of Stomatopods (various)			√									
Mollusca	Bivalvia			39	Viligers of bivalves (various)	√	√	√	√	√	√	√	√	√	√	√	√
	Gastropoda			40	Veligers of gastropods (various)	√	√	√	√	√	√	√	√	√	√	√	√
Echinodermata	Asteroidea			41	Bipinnaria of Starfish						√					√	
	Ophioroidea			42	Ophipluteus of Brittle star	√	√	√	√	√	√	√	√	√	√	√	√
	Echinoidea			43	Echinopluteus of Echinoids	√	√	√	√	√	√	√	√	√	√	√	√
	Holithuroidea			44	Auricularia of Holothurouds											√	
Phoronidea				45	Actinotrocha of Phoronids		√										
Chordata	Pices (Teleostei)			46	Planktonic fish eggs	√		√		√	√		√	√	√	√	
				47	Planktonic fish larvae		√	√							√	√	√

Note.

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Appendix (IV). Classified list of Blue-green, green, brown and red algae of Lampi Island.

Phylum	Class	Order	Family	Sr.No.	Scientific Name
Blue-green algae					
Cyanophyta	Cyanophyceae	Oscillatoriales	Oscillatoriaceae	1.	*Lyngbya sp.*
				2.	*Oscillatoria sp.*
Green algae					
Chlorophyta	Ulvophyceae	Ulvophyceae	Ulvaceae	1.	*Ulva. reticulata* Forsskal
				2.	*Ulva intestinalis* Linnaeus
				3.	*Ulva sp.*
		Siphonocladales	Boodleaceae	4	*Boodlea composita* (Harvey) F. Brand
	Cladophorophyceae	Cladophorales	Cladophoraceae	5	*Chaetomorpha gracilis* Kuetzing
				6	*Chaetomorpha sp.1*
				7	*Chaetomorpha sp.2*
				8	*Cladophora sp.1*
				9	*Cladophora sp.2*
				10	*Rhizoclonium sp.*
			Anadyomenaceae	11	*Anadyomene stellata* (Wulfen) C. Agardh
				12	*Boergesenia forbesii* (Hervey) Feldmann
			Caulerpaceae	13	*Caulerpa racemosa* (Forsskal) J. Agardh
				14	*C. serrulata* (Forsskal) J. Agardh
				15	*C. verticillata* J. Agardh
				16	*Caulerpa taxifolia* (Vahl) C. Agardh
				17	*C. sertulariodes* (Gmelin) Howe

Appendix (IV). Classified list of Blue-green, green, brown and red algae of Lampi Island. (*Continue*)

Phylum	Class	Order	Family	Sr.No.	Scientific Name
			Halimedaceae	18	*Halimeda macroloba* Decaisne
				19	*H. discoidea* Decaisne
				20	*H. opuntia* (Linnaeus) Lamouroux
			Codiaceae	21	*Codium edule* Silva
				22	*C. geppei* O.C.Schmidt
				23	*C. arabicum* Kutzing
			Udotea-ceae	24	*Avrainvillea erecta* (Berkeley) A. Gepp et E.S.Gepp
Brown algae					
Phaeophyta	Phaeophyceae	Dictyotales	Dictyotaceae	1.	*Dictyota bartayresiana* Lamouroux
(Ochrophyta)				2.	*D. divaricata* Lamouroux
				3.	*Lobophora variegata* (Lamouroux) Womersley ex Oliveira
				4.	*Padina minor* Yamada
				5.	*P. australis* Hauck
				6.	*Padina sp.*
		Fucales	Sargassaceae	7.	*Sargassum stolonifolium* Phang et Yoshida
				8.	*S. polycystum* C. Agardh
				9.	*Turbinaria ornata* (Turner) J. Agardh
Red algae					
Rhodophyta	Bangiophyceae	Porphyridiales	Goniotrichaceae	1.	*Asterocystes ornate* (C. Agardh.)Hamel
	Florideo-phyceae	Nemaliales	Galaxauraceae	2.	*Dichotomaria obtusata* (Ellis et Solander) Lamarck

Appendix (IV). Classified list of Blue-green, green, brown and red algae of Lampi Island. (*Continue*)

Phylum	Class	Order	Family	Sr.No.	Scientific Name
				3.	*D. marginata* (Ellis et Solander) Lamarck
				4.	*Galaxaura rugosa* (Ellis & Solander) Lamouroux
				5.	*G. filamentosa* Chou
			Galaxauraceae	6.	*Actinotrichia fragilis* (Forsskal) Boergesen
		Corallinales	Corallinaceae	7.	*Amphiroa fragilissima* (Linnaeus) *L*amouroux
				8.	*Jania sp.*
		Gelidiales	Gelidiaceae	9.	*Gelidium arenarium* Kylin
			Gelidiellaceae	10.	*Gelidiella acerosa* (Forsskal) Feldmann and Hamel
		Halymeniales	Halymeniaceae	11.	*Grateloupia filicina* (Lamouroux) C. Agardh
				12.	*H. durvillaei* Bory de Saint-Vincent
		Gigartinales	Caulacanthaceae	13.	*Catenella nipae* Zanardini
			Cystocloniaceae	14.	*Hypnea charoides* Lamouroux
				15.	*H. musciformis var. hippuriodes* (Kutzing) Weber-van Bosse
				16.	*H. saidana* Holmes
				17.	*H. pannosa* J. Agardh
			Plocamiaceae	18.	*Plocamium cartilagineum* (Linnaeus) Dixon
		Cryptonemiales	Phyllophoraceae	19.	*Phyllophora sp.*
			Rhizophyllidaceae	20.	*Portieria hornemanii* (Lyngbye) Silva
		Gracilariales	Gracilariaceae	21.	*Gracilaria canaliculata* Sonder
				22.	*G. foliifera* (Forsskal) Boergesen
				23.	*Hydropuntia eucheumoides* (Harvey) Gurgel & Fredsricq

Appendix (IV). Classified list of Blue-green, green, brown and red algae of Lampi Island. (*Continue*)

Phylum	Class	Order	Family	Sr.No.	Scientific Name
		Rhodymeniales	Rhodymeniaceae	24.	*Rhodymenia sp.*
		Ceramiales	Ceramiaceae	25.	*Ceramium sp. 1*
				26.	*Ceramium sp. 2*
				27.	*Centroceras clavulatum* (C.Agardh) Montagne
				28.	*Spondylothamnion sp.*
				29.	*Wrangelia hainanensis* Tseng
			Delesseriaceae	30.	*Vanvoorstia spectabilis* Harvey
				31.	*Martensia fragilis* Harvey
			Rhodomelaceae	32.	*Acanthophora spicifera* (Vahl) Boergesen
				33.	*Polysiphonia subtilissima* Montagne
				34.	*Polysiphonia sp.1*
				35.	*Tolypiocladia glomerulata* (C. Agardh) Schmitz
				36.	*Tolypiocladia calodictyon* (Harvey ex Kutzing)Silva
				37.	*Bostrychia binderii* Harvey
				38.	*Endosiphonia clavigera* (Wolny)Falk