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MARINE LIVING RESOURCES OF THE UNION TERRITORY OF LAKSHADWEEP —

An Indicative Survey With Suggestions For Development

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
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P. S. B. R. JAMES
Director
Central Marine Fisheries Research Institute
Cochin 682031, India

Edited by

C. SUSEELAN
Scientist
Central Marine Fisheries Research Institute
Cochin 682031, India

14. SEAWEED AND SEAGRASS RESOURCES

N. Kaliaperumal, P. Kaladharan and S. Kalimuthu

INTRODUCTION

All macroscopic algae occurring in the marine habitat and coastal brackish waters are known as seaweeds. They from one of the important marine living resources and belong to four major classes namely Chlorophyceae (green algae), Phaeophyceae (brown algae), Rhodoyhyceae (red algae) and Cyanophyceae (blue-green algae). Seaweeds are the only source for the production of phytochemicals namely agar-agar, carrageenan and algin, which are extensively used in various industries such as food, confectionary, textiles, pharmaceuticals, dairy and paper industry mostly as gelling, stabilising and thickening agents. Seaweeds are also used as human food animal feed and manure in several countries.

At present there are about 30 agar and 28 algin industries situated in Tamil Nadu, Gajarat, Maharashtra, Karnataka, Kerala, Andhra Pradesh and Orissa. They get the raw material mainly from the natural beds occurring in Tamil Nadu coast. Since 1970 many seaweed industries are coming up in India and the raw meterial from natural seaweed beds are insufficient to meet the requirements of these industries. Hence surveys of seaweed resources have been carried out from time to time in different regions of the mainland, Lakshadweep and Andaman-Nicobar islands to locate the seaweed growing areas and to assess the standing crop of seaweeds, like in Chilka Lake (Mitra, 1946); Andhra Pradesh (Anon, 1984); Tamil Nadu (Chacko and Malu Pillai, 1958; Thivy, 1960; Varma and Krishna Rao, 1962; Desai, 1967; Umamaaeswara Rao, 1973 and Anon, 1978) Kerala coast (Koshy anb John, 1948); Goa (Untawale and Dhargalar' 1975); Maharashtra (Chauhan, 1978 and Untawale *et al.*, 1979); Gujarat (Sreenivasa Rao *et al.* 1964; Desai, 1967; Chauhan and Krishnamurthy, 1968; Bhanderi, 1984; Bhanderi and Raval, 1975; Bhanderi and Trivedi, 1975 and Chauhan and Mirch, 1978 Lakshadweep (Anon, 1979) and Andaman-Nicobar islands (Gopinathan and Panigrahy, 1983). To Study the potential resources of seaweeds and seagrasses in all the islands of Lakshadweep, investigation was conducted during January-March 1987 and the results are presented in this paper.

MATERIALS AND METHODS

In the present investigation, all the 12 islands of Lakshadweep namely Chetlat, Kiltan, Kadmat, Amini, Bitra, Bangaram, Agatti, Androth, Kavaratti, Kalpeni, Suheli and Minicoy were surveyed. In each island several equidistant transects were selected covering the inter-tidal region, lagoon, reef flat, reef and outer reef areas. Seaweeds were harvested from one square metre area from these areas along the transects and the biomass (wet weight) for individual species was determined. Samples from deeper areas were collected by skin diving. After measuring the biomass, representative samples were preserved for detailed examination in the laboratory and herbaria were also prepared for type specimens. Taxonomic identification was made later in the laboratory.

The quantification of biomass was done using the following formula:

$$\text{Estimable biomass from a zone} = \frac{\text{Total wt of seaweed harvested from the sampled area}}{\text{Area studied in the zone}} \times \text{Total area of zone}$$

Area of the zone was calculated by measuring the length and width of the extent of the vegetation cover and compared with the admirality chart. From each island, zone wise sampling was subjected to statistical analysis in order to give species wise resources estimates. *Gelidiella acerosa* and *Graci, laria edulis* are grouped under agarophytes-species of *Sargassum* and *Turbinaria* under alginophytes, and all other algae under 'other seaweeds'.

RESULTS

Seaweeds

Altogether 62 genera and 114 species of seaweeds were recorded from all the 12 Islands of which 18 genera and 43 species belong to Chlorophyceae, 11 genera and 14 species to Phaeopayceae, 30 genera and 54 species to Rhodophycea and 3 genera and 3 species to Cyanophyceae. The number of genera and species recorded in each island is given in Table 1. The list of seaweeds and seagrasses occurring in each island is given in have been shown in Figs 1 to 3.

Seag rasses

A total number of 6 species of seagrasses *Cymodocea rotundata, C. serrulata, Halodula uninervis, Halophila ovata, Syringdium* and *Thalassia hemprichii* occurred in the islands surveyed (see Table 2 given at the end). Seagrasses were found in 10 islands and not observed in Kiltan and Bitra.

ISLAND-WISE DISTRIBUTION AND ABUNDANCE

Chetlat: 34 species of seaweeds are from the potential area of 156 ha. The estimable biomass or seaweeds is 805.680 tonne (wet weight) consisting of 18.440 tonnes of agarophytes, 183.860 tonnes of alginophytes and 603.380 tonnes of other seaweeds.

Kiltan: From the potential area of 153 ha, a total of 33 species of seaweeds are recorded. The estimable biomass of seaweeds is 665.760 tonnes (wet weight) consisting of 25.900 tonnes of agarophytes, 78.200 tonnes of alginophytes and 561.600 tonnes of other seaweeds.

Kadamat: From the potential area of 179 ha, 30 species of seaweeds are recorded. The estimable biomass of seaweeds is 984.. 380 tonnes (wet weight), of which 143.200 tonnes are aragrophytes, 146.100 tonnes are

Table 1 Number of genera and species of marine algae collected from Lakshadweep

Name of the island	Chlorophyceae		Phaeophyceae		Rhodophyceae		Cyanophyceae		Tatal	
	Genera	Species	Genera	Species	Genera	Species	Genera	Species	Genera	Species
Chetlat	11	12	5	5	13	17	—	—	29	34
Kiltan	11	14	2	2	13	17	—	—	26	33
Kadamat	10	11	5	5	11	14	—	—	26	30
Amini	10	11	3	3	12	13	—	—	25	27
Bitra	4	4	3	3	9	10	1	1	17	18
Bingaram	6	6	6	6	17	20	—	—	29	32
Agatti	9	12	5	6	13	18	1	1	28	37
Androth	9	12	6	7	13	17	2	2	30	38
Kavaratti	13	17	4	4	18	23	3	3	38	47
Kalpeni	14	26	8	10	23	28	1	1	46	64
Suheli	6	7	7	8	13	16	2	2	28	33
Minicoy	12	21	6	6	18	23	2	2	38	52

Table 2 The estimated total standing crop of the marine algae for all the 12 islands was 19,345. tonnes (wet weight). The group wise biomass for each islands is given in table 3. The commercially important seaweeds *Gelidiella acerosa, Gracilaria edulis, Sargassum duplicatum* and *Turbinaria ornata* and some of the other common algal species collected

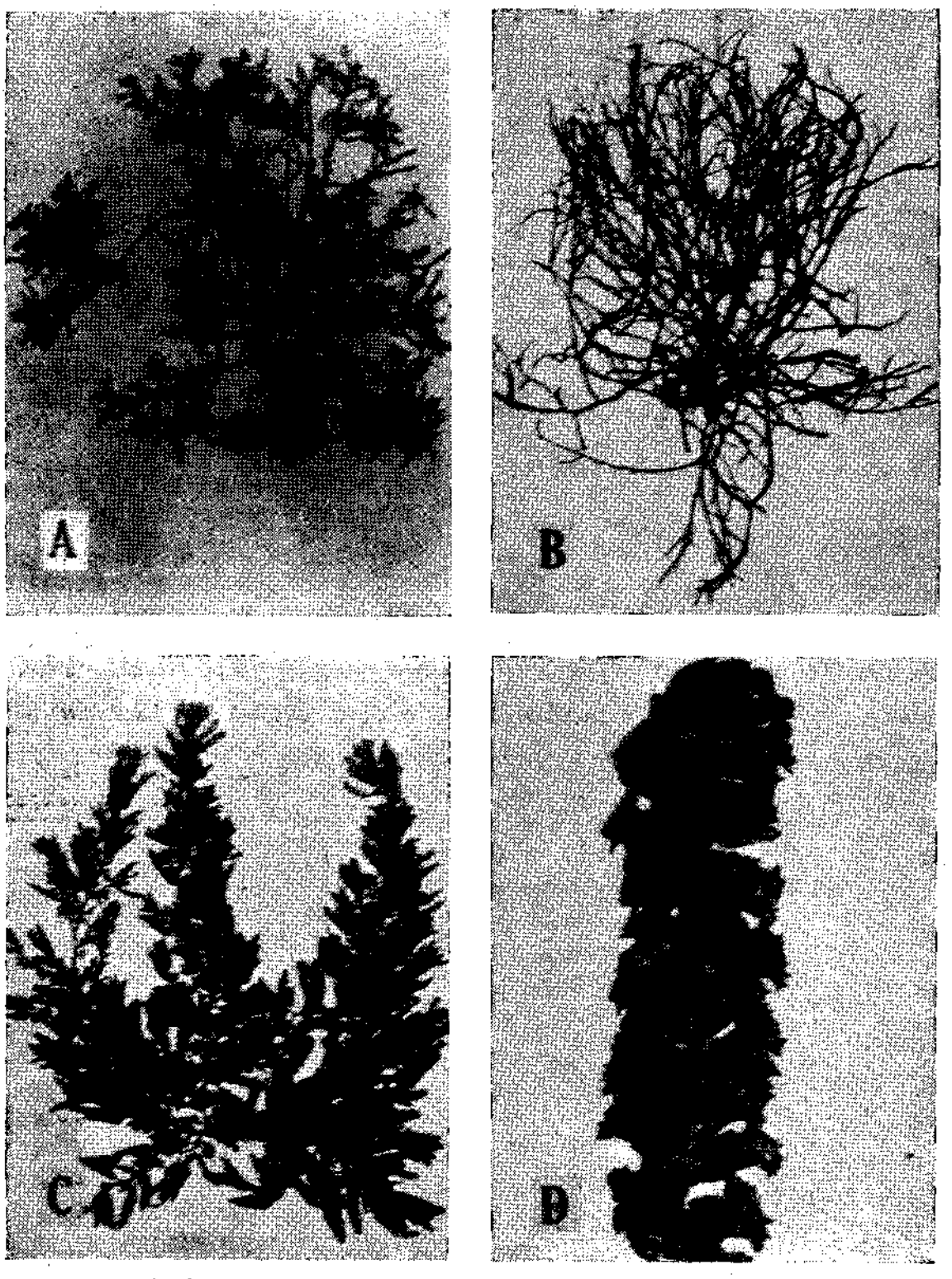

Fig. 1. A. *Gelidiella acerosa;* B. *Gracilaria edulis*
C. *Sargassum duplicatum;* D. *Turbinaria ornata*

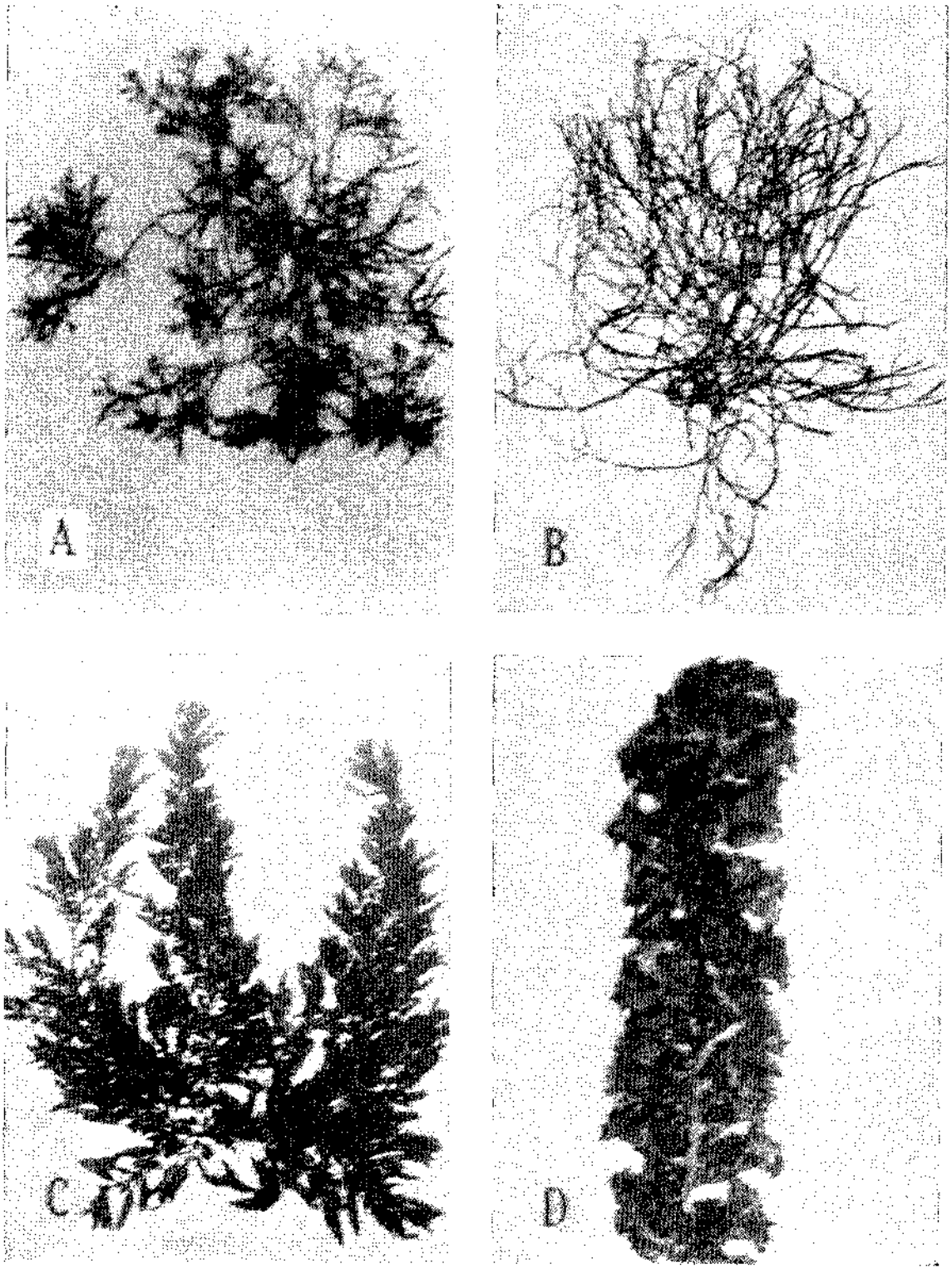

Fig. 1 A. *Gelidiella acerosa;* B. *Gracilaria edulis*
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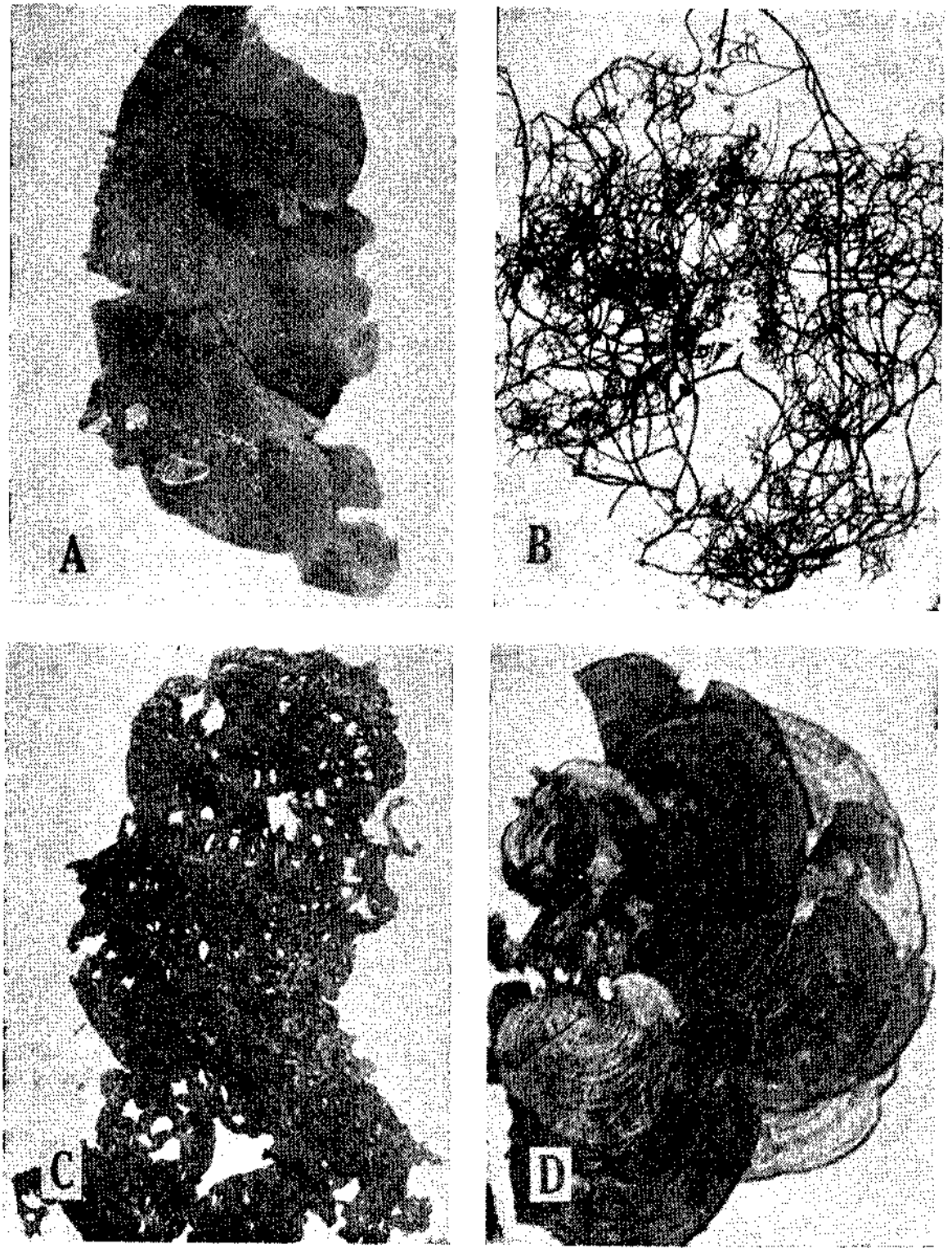

Fig. 2. A. *Dictyosphaeria cavernosa;* B. *Chnoospora implexa*
C. *Hydroclathrus clathratus;* D. *Padina boergeseni*

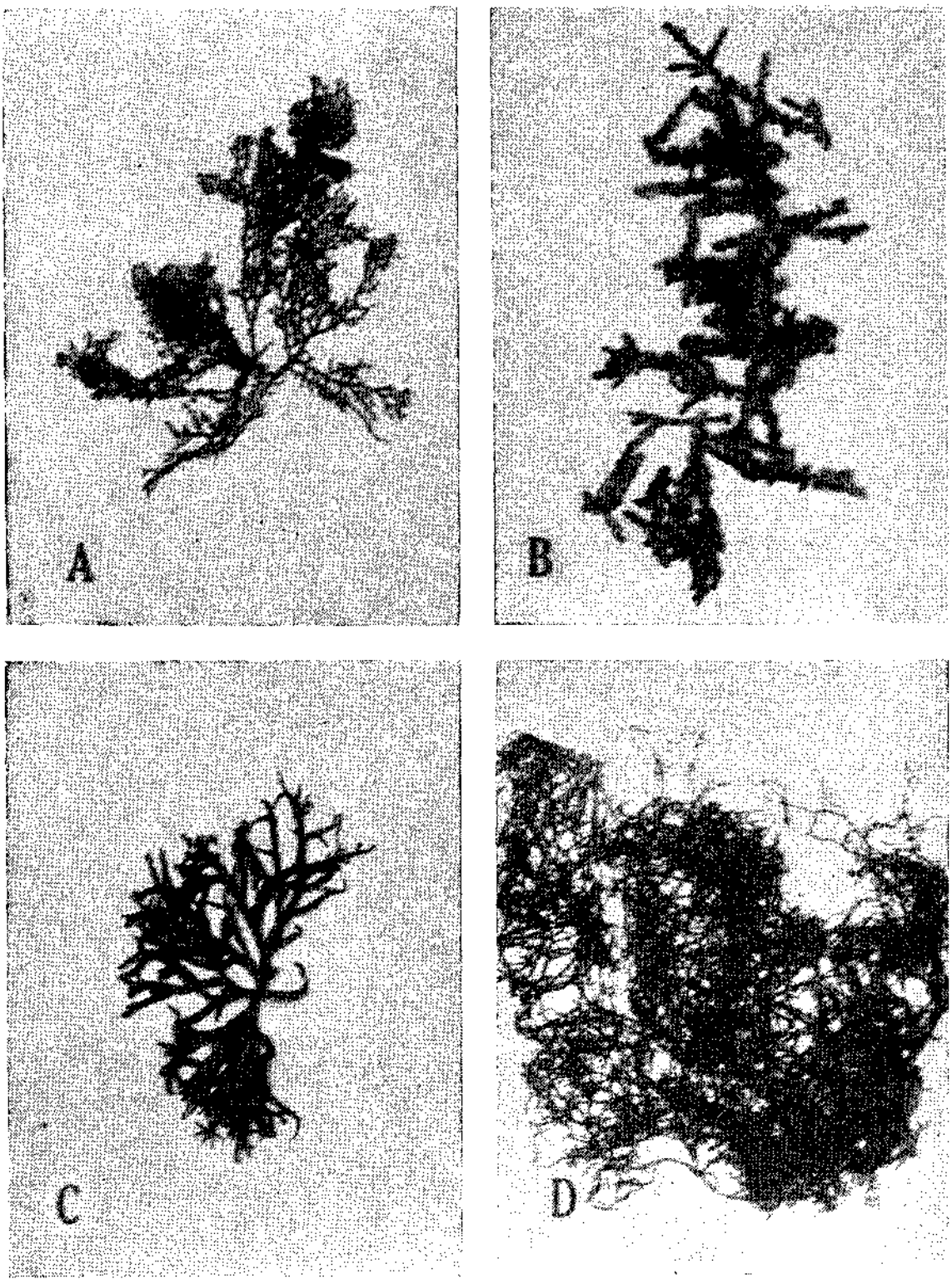

Fig. 3. A. *Chondrococcus hornemanii;* B. *Laurencia papillosa;* C. *Gracilaria arcuata;* D. *Hypnea valentiae*

Table 3 Estimated standing crop of agarophytes, alginophytes and other seaweeds in the islands of Lakshadweep

Name of the island	Agarophytes		Alginophytes		Other seaweeds	Total
	G. acerosa	*G. edulis*	*Sargassum* ssp	*Turbinarie* ssp		
Chetlat	18.440	—	18.160	165.700	603.380	805.680
Kiltan	25.900	—	11.200	67.000	561.660	665.760
Kadamat	143.200	—	18.400	127.700	695.070	984.370
Amini	72.400	—	—	84.200	357.150	513.750
Bitra	—	—	—	642.600	342.900	985.500
Bingatum	2.640	—	—	235.200	256.800	494.640
Agatti	6.325	415.250	—	768 075	2647.150	3836.800
Androth	0.800	—	0.100	2.200	273.600	276.700
Kavaratti	46.354	313.295	—	355.950	2167.208	2882.807
Kalpeni	30.725	70.175	0.350	18.200	1441.300	1560.300
Suheli	9.000	—	49.500	783.000	3796.260	4637.760
Minicoy	16.400	—	—	50.000	1635.000	1701.400
Total	371.734	798.720	97.710	3299.825	14777.478	19345.467

alginophytes and 695.070 tonnes are other species.

Amini: from the potential area of 148 ha 27 species of seaweeds are recorded, The estimable biomass (wet) of seaweeds is 513. 750 tonnes consisting of 72.400 tonnes of agarophytes, 84.200 tonnes of alginophytes and 355.150 tonnes of other algae.

Bitra: It has a very extensive lagoon with very deep middle area. the shore area is sandy and devoid of vegetation. Algal vegetation occurs in the areas extending from the reef to the middle lagoon attached to the dead corals. Among the islands surveyed, minimum number of algal species (18 species) were recorded with a total standing crop of 985.5 tonnes (wet weight). *Turbinaria ornata* is the only economically important alga growing in this island with a harvestable standing crop of 642.600 tonnes (wet weight).

Bangaram: The lagoon encircles four islands namely Bangaram, Tinnakara, Cheriya Parali and Valia Parali islands. The shore area is sandy and the vegetation is less with the growth of *Cladophora fasciculrais* and *Cheatomorpha area* attached to pebbles. *Gracilaria edulis* and *Sargassum* spp were not recorded. The standing crop of *Gelidiella acerosa* and *Turbinaria ornata* is 2.640 and 235.200 tonnes (wet weight) respectively. A total number of 32 species with a total standing crop of 494 640 tonnes were recorded.

Agatti; It consists of two islands, Agatti and Kalpitti. The lagoon exists in the western side. In the eastern side of the island the entire shore area is with rocks, dead corals and live corals. Totally 37 species with a standing crop of 3836.800 tonnes were recorded. Among the three islands with *Gracilaria edulis* vegetation, maximum biomass of G. *edulis* (415.250 tonnes-wet weight) was observed in Agatti. *G. edulis* was found growing attached to seagrasses in the nearshore area of the lagoon. *Gelidiella acerosa* and *Turbinaria ornata* occurred on the reefs in the eastern and western side of the island with a standing crop of 6.325 and 768.075 onnes respectively. *Sargassum* sp was not recorded in this island.

Androth: There is no lagoon in this island. Totally 38 species of algae were recorded. *Gelidiella acerosa* and *Turbinaria* ssp. were distributed sparsely on the reef at northern and southern side of the island in very small quantity. Very young plants of *Sargassum* sp were seen on the reef in the southern side

while *Gracilaria edulis* was not observed in this island. Among all islands surveyed the tatal standing crop of seaweeds was found to be very less in this island and it was only 276.700, tonnes (wet weight).

Kavaratti: Altogether 47 algal species with total biomass of 2882.807 tonnes (wet weight) were recorded in this island. More number of algal species were found growing in the lagoon side of the island. The vegetation was poor on the opposite side of the lagoon with only 10 species. *Gelidiella acerosa* and *Turbinaria ornata* occurred almost continuously in 50 m wide zone along the reef in the lagoon side. *Gracilaria edulis* was distributed discontinuously in the nearshore area of lagoon at the depth ranging from 0.5 to 3.0 m.

Kalpeni : It consists of 8 islands namely Cheriyam, Kodithala, Kalpeni, Tilakkam I, II and III and Pitti I and II. Maximum number of algae (64 species) with a total standing crop of 1560.300 tonnes (wet weight) were found growing in this island. Harvestable quantity of *Gelidiella acerosa* (30.275 tonnes - wet weight) occurred continuously in the 10 m wide zone of the intertidal rocky region from the light house in the northern side to the southern end of the island. *Gracilaria edulis* was found in 0 5 m depth near the jetty and in 1.0 m depth in the nearshore area of the lagoon at the southern end of Cheriyam island. Species of *Turbinaria* was sparsely distributed on the reefs at both sides of the island and it was not available in harvestable quantity (18.200 tonnes-wet weight). *Sargassum* spp with standing crop of only 0.350 tonnes (wet weight) were seen in the intertidal rocky area at the eastern side of the island.

Suheli: It consists of 2 islands namely Valiakara and Cheriakara with a wide lagoon. Totally 33 species of marine algae occurred in the submerged reef, lagoon and in the intertidal area around Cheriakara island. Among all the islands surveyed, maximum standing crop of seaweeds (4637.760 tonnes wet weight) occurred in Suheli. Abundant growth of *Turbinaria* spp (3796.260 tonnes wet weight) were seen in about 20 m wide zone along the entire reef area with continuous distribution. Detached plants of *Turbinaria* were seen floating on the sea around these two islands and large quantity was cast ashore. Plants of *Gelidiella acerosa* and *Sargassum duplicatum* were found on the reef. *Gracilaria edulis* was not observed at Suheli.

Minicoy : It consists of 2 islands Minicoy and Viringil with a vast lagoon. A total number of 52 algal species with a standing crop of 1701.400 tonnes (wet weight) was recorded in this island. *Gelidiella acerosa* and *Turbinaria ornata* occurred in the lagoon and the reef area around the islands. Only few plants of *Sargassum* sp were seen on the reef in the other side of the island and *Gracilaria edulis* was not observed in Minicoy.

REMARKS

The present survey indicates that seaweed and seagrasses resources of Lakshadweep is quite considerable in quantity. Harvestable quantities of agar yielding seaweeds *Gelidiella acerosa* and *Gracilaria edulis* are available at Kadmat, Amini, Agatti and Kalpeni and algin yielding seaweed *Turbinaria* spp in all islands. At present no commercial harvest of seaweeds is in practise in Lakshadweep. Hence the seaweed industry in the mainland can exploit these seaweeds from the above mentioned islands for manufacture of agar-agar and algin. Based on the available agarophytes and alginophytes resources agar and algin industry could also be established in Lakshadweep.

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Table 2. List of seaweeds and seagrasses collected from Lakshadweep

S. No.	Species	Chetlat (1)	Kiltan (2)	Kadmat (3)	Amini (4)	Bitra (5)	Bingaram (6)	Agatti (7)	Androth (8)	Kavaratti (9)	Kalpeni (10)	suheli (11)	Minicoy (12)
	Class: Chlorophyceae Order: Ulvales Family: Ulvaceae												
1.	*Enteromorpha clathrata* (Roth) J. Ag.							+					
2.	*E. compressa* (Linn.) Grev.		+	+	+		+				+	+	+
3.	*E. Intestinalis* (Linn.) Link	+		+	+								
4.	*E. tubulosa* Kuetz.							+		+			

S. No.	Species	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
5.	*Ulva lactuca* Linn.	+	+	+	+		+	+	+	+	+		+
6.	*U. reticulata* Forsskal							+					
	Order: Cladophorales												
	Family: Cladophoraceae												
7.	*Chaetomorpha aerea* (Dillw.) Kuetz.	+	+				+	+	+	+	+		+
8.	*C. antennina* (Bory) Kuetz.												+
9.	*C. linoides* (Ag.) Kuetz.	+	+	+	+						+	+	+
10.	*C. tortuosa* Kuetz.									+			
11.	*Cladophora fascicularis* (Mertens) Kuetz.	+					+	+	+		+	+	
12.	*Cladophora sp*			+	+			+	+	+	+	+	+
	Order : Siphonales												
	Family : Derbesiaceae												
13.	*Derbesia turbinata* Howe et Hoyt										+		
	Family: Bryopsidaceae												
14.	*Bryopsis pennata* Lamour.										+		
15.	*B. plumosa* (*Huds.*) *Ag.*	+	+		+						+		
	Family: Caulerpaceae												
16.	*Caulerpa cupressoides* (Vahl.) Ag.				+						+		+
17.	*C. microphysa* (Web. van Bosse) Feldmann										+		
18.	C. *peltata* Lamour.								+	+	+		+
19.	*C. racemosa* var. *macrophysa* (Kuetz.) Taylor	+	+								+		+
20.	*racemosa* var. *laetevirens f. cylindracea* (Sonder) Weber van Bosse												+
21.	*C. serrulata* var. *typica f. lata* (Weber van Bosse) Tseng		+				+						
22.	*C. sertularioides* (Gmelin) Howe										+		
23.	*C. taxifolia* (Vahl.) C. Ag.												+
24.	*Caulerpa sp*												+
	Family: Codiaceae												
25.	*Avrainvillea ridleyii*		+							+			
26.	*Codium adhaerens* Anderson		+		+					+	+		
27.	*C. tomentosum* (Hudson) Stackhouse		+										

+ Present

S. No.	Species	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
28.	*Codium* sp					—				—			
29	*Halimeda gracilis* Harv. ex J. Ag.	—	—	—	—	—	—	—	—	—	—	—	—
30.	H. *incrassata*										—		
31.	*H. macroloba* Decaisne								—		—		
32.	*H. opuntia f typica* (Lamour.) Barton									—	—		
33.	*Penicillus sibogae* Gepp.										—		—
	Family: Valoniaceae												
34.	*Anadyomene stellata* (Wulf. C. Ag.	—			—	—				—	—	—	—
35.	*Boergesenia forbesii* (Harv). Feldmann	—	—	—	—			—	—	—	—		—
36.	*Cladophoropsis zollingeri* (Keutz.) Boergs.	—	—	—	—	—		—					
37.	*Dictyosphaeria cavernosa* (Forssk.) Boergs.		—					—	—	—	—		—
38.	*D. favulosa* (Ag.) Decaisne								—	—	—	—	—
39.	*Microdictyon tenuis* (Ag.) Decaisne							—					
40.	*Valonia aegagrophila* C. Ag.	—		—						—			
41.	*V. macrophysa*										—		—
42.	*Valonia* sp												—
43.	*Valoniopsis pachynema* (Mertens) Boergs.								—	—			—
	Class: Phaeophyceae Order: Ectocarpales Family : Ectocarpaceae												
44.	*Ectocarpus* sp								—	—	—		—
	Order: Sphacelariales Family: Sphacelariaceae												
45.	*Sphacelaria furcigera* Kuetz.										—	—	
	Order: Dictyotales Family: Dictyotaceae												
46.	*Dictyopteris delicatula* Lamour.						—						
47.	*Dictyota barayresiana* Lamour.			—				—	—	—	—	—	—
48.	*D. dichotoma* (Huds.) Lamour.	—					—	—					
49.	*Padina boergesenii* Allender et Kraft	—		—	—	—	—	—	—	—	—	—	—

— Present

S. No.		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
50.	*Lobophora minima* (Umamaheswara Rao) Krishnamurthy and Baluswami					—			—		—	—	—
	Order: Dictyosiphonales Family: Punctariaceae												
51.	*Hydroclathrus clathratus* C. Ag.							—	—				
52.	*Rosenvingea intricata* (J. Ag.) Boergs											—	
	Family: Chnoosporaceae												
53.	*Chnoospora implexa*	—		—			—	—			—		
	Order: Fucales Family: Sargassaceae												
54.	*Sargassum duplicatum* J. Ag.	—	—	—	—						—	—	
55.	*Sargassum* sp								—		—		—
56.	*Turbinaria conoides* (J. Ag.) Kuetz.								—		—	—	
57.	*T. ornata* J. Ag.	—	—	—	—	—	—	—	—	—	—	—	—
	Class: Rhodophyceae Order: Nemalionales Family: Chandransiaceae												
58.	*Acrochaetium* sp						—						
	Family: Chaetagiaceae												
59.	*Actinotrichia fragilis* (Forssk.) Boergs.							—		—	—		—
60.	*Galaxaura marginata* Lamour.												—
61.	*G. rugosa* Lamour. Family: Bonnemaisoniaceae				—								
62.	*Asparagopsis taxiformis* (Delile) Collins et Harvey								—	—	—	—	—
	Order : Gelidiales Family: Gelidiaceae												
63.	*Gelidium pusillum* (Stackhouse) Le Jolis	—			—				—		—		
64.	*Pterocladia heteroplaots* (Boergs.) Umamaheswara Rao and Kaliaperumal Family: Gelidiellaceae						—	—		—	—		—
65.	*Gelidiellacaea acerosa* (Forsk.) Feldmann et Hamel	—	—	—	—		—	—	—	—	—	—	—

— Present

S. No.		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
66.	*G. indica* P. S. Rao										—		—
	Order: Cryptomemiales Family: Rhizophyllidaceae												
67.	*Chonerococcus hornemanii* (Mert.) Schmitz	—	—	—		—	—	—	—	—	—		—
	Family: Corallinaceae												
68.	*Amphiro anceps* (Lamk.) Decsne.	—	—										
69.	*A. fragilissima* (L.) Lamour.							—	—				—
70.	*Amphiroa* sp										—		
71.	*Cheilosporum spectabile* Harvay												—
72.	*Janie capillaceae* Harvey	—	—	—	—	—	—	—	—	—	—	—	—
73.	*J. iyengarii*			—									
74.	*Lithothamnion* sp										—	—	
	Family: Grateloupiaceae												
75.	*Halymenia floresia* (Clem.) Ag.		—	—						—			
76.	*H. gelinickii* Gruenow						—						
	Order: Gigartinales Family: Gracilariaceae												
77.	*Gelidiopsis intricata* (Ag. Vickers	—											
78.	*G. variabilis* (Grev.) Schmitz	—	—	—	—	—	—	—	—	—	—	—	—
79.	*Gracileria arcuata* Zanard.						—		—				
80.	*G. edulis* (Gmel.) Silva							—	—	—			
81.	*Gracilaria* sp				—				—				—
	Family: Solieriaceae												
82.	*Sarconema filiforme* (Sond.) Kylin						—						
83.	*S. furcellatum* Zanard.							—					
	Family: Hynpeaceae												
84.	*Hypnea musciformis* (Wulf.) Lamour.						—						—
85.	*H. pannosa* J. Ag.	—	—	—		—	—	—	—	—	—	—	—
86.	*H. spinella* J. Ag.						—	—		—			
87.	*H. valentiae* (Turn.) Mont.	—	—	—	—	—	—	—	—	—	—	—	—
	Family: Gigartinaceae												
88.	*Gigartina acicularis* (Wulf.) Lamour.										—	—	

— Present

S. No.	Species	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Order: Rhodymeniales												
	Family: Lomentariaceae												
89.	*Chimpia parvula* (Ag.) Harvey		—				—		—	—		—	
	Order: Ceramiales	—	—	—	—	—		—		—	—		—
	Family: Ceramiaceae												
90.	*Centroceras clavulatum* (Ag.) Mont.												
91.	*Ceramium diaphanum*					—							
92.	C. *fimbriatum* Setchell and Gardner						—			—	—	—	
93.	*Ceramium* sp	—	—	—									—
94	*Spyridia alternans* Boergs.											—	
95.	S. *filamentosa* (Wulf.) Harvey	—	—		—		—			—	—		
	Family : Dasyaceae												
96.	*Dictyurus purpuresens*	—									—		
	Family : Rhodomelaceae												
97.	*Acanthophora dendroides* Harvey									•		—	
98.	*Spicifera* (Vahl.) Boergs.		—	—	—	—	—	—	—	—	—	—	—
99.	*Chondira dasyphylla*								—	—	—		—
100.	C. *transversalis* Boergs.			—									
101.	*Herposiphonia secunda* (C. Ag.) Ambronn									—			
102.	*Laurenica ceylanica* J. Ag.							—		—			
103.	*L. nana* Howe							—					
104.	*L. obtusa* (Huds.) Lamour.							—	—		—		—
105.	*L. papillosa* (Forssk.) Greville	—	—	—	—	—	—	—	—	—	—	—	—
106.	*L. parvula* Boergs.	—	—										
107.	*L. poitei* (Lamour.) Howe	—	—	—					—	—	—	—	—
108.	*Laurenica* sp		—	—						—	—		
109.	*Leveillea jungermannioidea* (Martet Hering) Harvey				—	—	—				—		
110.	*Lophocladia lallemaudi* (Mont.) Schimtz											—	
111.	*Tolypocladia glomeruleta* (Sonder) Silva						—		—		—		—

— Present

S. No.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Class: Cyanophyceae												
Order: Nostacales												
Family: Oscillatoriaceae												
112. *Lyngbya confervoiees* C. Ag. Gomont					—		—	—	—	—	—	—
113. *Oscillatoria* sp									—		—	
114. *Phormidium* sp								—	—	—		—
SEAGRASSES												
Family: Potomogetanaceae												
1. *Cymodocea rotundata* Ehrenb. & Hemp. ex Aschers						—	—		—	—		
2. *C. serrulata* (R. Br.) Aschers & Magnus	—		—	—			—		—	—		—
3. *Holodule unirervis* (Forssk.) Aschers												—
4. *Syringodium isoetifolium* (Aschers) Dandy									—			—
Family: Hydrocharitaceae												
5. *Halophila ovata* Gaudin Freycin											—	—
6. *Thalassia hemprichii* (Ehrenb.) Aschers			—	—				—	—	—		

— Present