ISSN - 0254-0436
PGSI.II.LVI (SPL)
550-2001 (DSK-II)

लक्षद्वीप के वैज्ञानिक डेटाबेस की वर्तमान दशा पर कार्यशाला की कार्यवाही

PROCEEDINGS OF WORKSHOP ON STATUS OF SCIENTIFIC DATABASE ON LAKSHADWEEP ISLANDS

भारतीय भूवैज्ञानिक सर्वेक्षण

विशेष प्रकाशन 56

GEOLOGICAL SURVEY OF INDIA
SPECIAL PUBLICATION 56

भारत सरकार के आदेश से प्रकाशित
PUBLISHED BY ORDER OF THE GOVERNMENT OF INDIA

Geol. Surv. Ind. Spl. Pub. No. 56
2001; pp 121-124

SEAWEED RESOURCE POTENTIAL OF LAKSHADWEEP

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ABSTRACT

Resource assessment surveys carried out by the Central Salt and Mairne Chemicals Research Institute, Bhavnagar and by the Central Marine Fisheries Research Institute, Kochi indicate nearly 10000 to 19000 tonnes (wet biomass) of standing crop of seaweeds are available in 12 atolls of the Laccadive Archipelago, comprising 114 species belonging to 62 genera. Of these resources, 25% of the standing crop of seaweeds are commercially important and can be exploited for the production of valuable phycocolloids such as agar-agar and alginic acid. The other 75% include edible and carrageenan yielding potential resources. These resources can be taped for industrial purposes either by regulated harvest or by attempting mariculture in the lagoons.

INTRODUCTION

Ail macroscopic algae occurring in the marine habitat and coastal brackish waters are termed as seaweeds. They form one of the important marine living resources belonging to three major classes namely Chlorophyceae (green algae), Phaeophyceae (brown algae) and Rhodophyceae (red algae). Seaweeds are the only source for the production of phycocolloids viz., agar-agar, carrageenan and alginic acid which are widely used in various industries such as food, confectionery, textiles, pharmaceuticals, dairy and paper industry mostly as gelling, stabilising and thickening agents. They are also used as human food, animal feed and as manure in several countries.

Early information on the marine algae of Maldive Archipelago and the Laccadive Archipelago are available from the Cambridge University expedition (Barton, 1903) led by Prof. J.S. Gardiner, John Murray expedition (Newton 1953) and from the International Indian Ocean Expedition (Hackett, 1977). Qualitative as well as quantitative accounts of marine algae of Lakshadweep are brought out by Subbaramaiah et al (1979), after a detailed survey conducted jointly by the C.S.M.C.R.I., Bhavnagar and the Department of Fisheries, Union Territory of Lakshadweep. A decade later C.M.F.R.I., Kochi made an extensive resources assessment survey on the marine living resources of 12 Lakshadweep atolls with due importance to seagrasses and seaweed resources (Kaliaperumal et al. 1989). Untawale and Jagtap (1984) reported the marine macrophytes of Minicoy coral atoll and enlisted 37 species of marine algae.

Based on these reports an attempt is made, at present, to bring out the standing crop and harve stable biomass and the utilisation of seaweed resources of Laccadive Archipelago.

Standing crop:

Subbaramaiah et al (1979), in seaweed resources survey carried out during December 1977 and January 1978 from 10 islands have reported 4940-10110 tonnes wet biomass of standing crop of seaweeds covering an area of 1334 ha consisting of 980-2100 tonnes of agarophytes, 10-16 tonnes of alginophytes and 3950-7980 tonnes of other seaweeds. Kaliaperumal et al (1989) have estimated the standing crop of seaweed resources of all the 12 Islands from January - March 1987 and recorded 19345 tonnes (wet wt.) of seaweeds comprising 1170 tonnes of agarophytes, 3398 tonnes of alginophytes and 14777 tonnes of other seaweeds including edible and carragennan yielding seaweeds (Table 1).

Species composition :

According to Subbaramaiah et al (1979) the major agarophytes observed are *Gelidiella acerosa*, *Gracilaria edulis*, *Gelidium regidum* and *Gelidiopsis repens*. Alginophytes are represented by *Turbinaria* and *Sargassum* spp. observed in

TABLE 1

RESOURCE ASSESSMENT SURVEYS ON SEAWEEDS OF LAKSHADWEEP

Survey	I	II
Year	1979	1989
Institute/Dept.	C.S.M.C.R.I & Dept. of Fisheries, U.T. Lakshadweep	C.M.F.R.I.
Reference	Subbaramaiah et al., 1979	Kaliaperumal et al., 1989
No. of Sp.	82	114
No. of genera	56	62
Standing crop (wet wt.)	4940 - 10110 t	19345 t
Rhodophyta (agar yielding)	980 - 2100 t	1170 t
Phaeophyta (Alginic acid yielding)	10 - 16 t	3398 t
Other seaweeds	3950 - 7980 t	14777 t
Islands covered	10	12

TABLE 2

NUMBER OF GENERA AND SPECIES OF MARINE ALGAE COLLECTED FROM LAKSHADWEEP

Islands	Chlorophyta Genera	sp.	Phaeophyta Genera	sp.	Rhodophyta Genera	sp.	Cyanophyta Genera	sp.	Total G/sp.
Agatti	9	12	5	6	13	18	1	1	28/37
Amini	10	11	3	3	12	13	-	-	25/27
Androth	9	12	6	7	13	17	2	2	30/38
Bangarum	6	6	6	6	17	20	-	-	29/32
Bitra	4	4	3	3	9	10	1	1	17/18
Chetlat	11	12	5	5	13	17	-	-	29/34
Kadamat	10	11	5	5	11	14	-	-	26/30
Kalpeni	14	25	8	10	23	28	1	1	46/64
Kavaratti	13	17	4	4	18	23	3	3	38/47
Kiltan	11	14	2	2	13	17	-	-	26/33
Minicoy	12	21	6	6	18	23	2	2	38/52
Suheli	6	7	7	8	13	16	2	2	28/33

Kalpeni, Androth and Minicoy Islands. Among the other seaweeds, *Halimeda, Dictyota, Laurencia, Jania, Tolypiocladia, Caulerpa* and *Chondrococcus* constitute 75% of the total estimate and belong to 62 species out of the total of 82 reported. However, 114 species belonging to 62 genera are reported (Kaliaperumal et al., 1989) from 12 Islands comprising 43 species under 18 genera of Chlorophyceae, 14 species belonging to 11 genera under Phaeophyceae, 54 species belonging to 30 genera of Rhodophyceae and 3 species and 3 genera of Cyanophyceae (blue green algae, microscopic). An Island-wise distribution of seaweed species and genera are presented in detail in (Table 2).

Commercial resources :

The resource assessment surveys carried out in the Laccadive Archipelago indicate the availa-

TABLE 3

STANDING CROP OF AGAROPHYTES, ALGINOPHYTES AND OTHER SEAWEEDS IN LAKSHADWEEP (In Tonnes)

Islands	agarophytes		alginophytes		Other seaweeds	Total
	G. acerosa	G. edulis	Sargassum sp.	Turbinaria sp.		
Agatti	6.32	415.25	-	768.07	2647.15	3836.80
Amini	72.40	-	-	84.20	357.15	513.75
Androth	0.80	-	0.10	2.20	273.60	276.70
Bangarum	2.64	-	-	235.20	256.80	494.64
Bitra	-	-	-	642.60	342.90	985.50
Chetlat	18.44	-	18.16	165.70	603.38	805.68
Kadamat	143.20	-	18.40	127.70	695.07	984.37
Kalpeni	30.72	70.17	0.35	18.20	1441.30	1560.30
Kavaratti	46.35	313.29	-	355.95	2167.28	2882.80
Kiltan	25.90	-	11.20	67.00	561.66	665.76
Minicoy	16.40	-	-	50.00	1635.00	1701.40
Suheli	9.00	-	49.50	783.00	3796.26	4637.76
Total	**371.734**	**798.72**	**97.71**	**3299.82**	**14777.47**	**19345.46**

bility of economically important agarophytes, alginophytes and edible seaweeds. Island-wise data on the standing crop of agarophytes, alginophytes and edible and carrageenan yielding seaweeds are given in Table 3. Fine grade agar can be obtained from processing *Gelidiella acerosa* which is luxuriently growing in Kadamat Island and *Gracilaria edulis* in Agatti and Kavaratti Islands which offer an immediately exploitable resource for establishing an agar-agar production unit. *Gracilaria edulis* has been introduced and acclimatised in Minicoy lagoon for mariculture purposes in the year 1989-90 (Kaladharan and Chennubhotla, 1993). Alginic acid can be manufactured from *Turbinaria and Sargassum* spp. These dynamic resources are available in huge quantities (3396 tonnes) in all the Islands and can be judiciously exploited for alginic acid production.

The marine algal crop at the Lakshadweep, although represented by many species (Table 1) was observed to be quantitatively poor and generally sparce compared to those from the Maldive Archipelago (Untawale and Jagtap, 1984). Prospects of harvesting seaweeds from the natural beds for commercial use is limited. Hence these important seaweeds have to be cultivated. The common cultivable agarophytes found in the islands are *Gelidiella acerosa* and *Gracilaria edulis* and the available alginophytes are *Sargassum* spp and *Turbinaria* spp. Since many seaweed based industries are coming up in India and the raw material supply from natural seaweed beds is inadequate to meet the ever growing demand of the industries, it has now become essential to attempt mariculture of these resources. The availability of seedling stock, suitable site for farming (calm lagoons), highly nutritive and clear, high saline water devoid of silt and sediments are great assets for promoting mariculture of seaweeds in Lakshadweep.

ACKNOWLEDGEMENTS

The author is gratefull to Dr. M. Devaraj, Director, C.M.F.R.I. for the encouragement received.

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