

ABSTRACT

Seaweed resources, their standing crop and their seasonal variation in occurrence were studied from nine locations along the Kerala coast for two years during 1998 and 1999 through quarterly sampling and data collection. Hydrographic conditions of the seaweed collection sites such as sea surface temperature (SST), pH, salinity dissolved oxygen (DO), dissolved phosphate (PO_4) and dissolved nitrate (NO_3) also were studied simultaneously.

Marine polysaccharides or the phycocolloids such as agar, alginic acid (algin) and carrageenan from the major commercially important seaweeds from the study sites were extracted and estimated to evaluate the yield of phycocolloids. Effect of repeated harvest of seaweeds from natural habitats on the regeneration capacity was also studied from two sets of permanent quadrates laid at Thirumallavaram coast through monthly harvest of *Gracilaria corticata* for another one year period.

A total of 37 species of seaweeds were observed and enlisted during 1998 and 1999. Out of the 37 species 13 were grouped under Class Chlorophyceae (green seaweeds), 7 under Phaeophyceae (brown seaweeds) and 17 under Rhodophyceae (red seaweeds). Agar yielding seaweeds were represented by seven species and the major resources were *Gracilaria corticata*, *G. foliifera*, *Gelidiopsis variabilis* and *Gelidium pusillum* during 1998 and 1999 besides the species of *Pterocladia* during 1999. Alginophytes were represented by *Sargassum wightii*, *S. duplicatum*, *S. tenerrimum*, *Stoechospermum marginatum*, *Dictyota dichotoma* and *Padina* spp. The carrageenan yielding red seaweeds were *Hypnea musciformis*, *H. valentiae* and a new resource *Gracilariopsis lemaneiformis* from Dhalavapuram and Kannur stations.

As the seaweed species *Chaetomorpha antennina* and *Gracilaria corticata* were only available in majority of the sampling locations and almost throughout the study period, their regression of biomass availability per unit area were plotted. When all the hydrographic variables studied were used, only PO₄ and NO₃ showed significant regression coefficient. The total seaweed biomass availability was significantly correlated positively ($p < 0.01$) with PO₄ only. Linear regression model was also constructed to predict the total seaweed biomass production with any one or many of the hydrographic variables studied from the sampling stations. The linear regression model tested was found unsuitable as a predictor of total seaweed biomass availability in the study locations based on their hydrographic variables.

Regeneration after repeated harvest every month showed only 27% in the handpicked quadrates, while regeneration was 53 % in the cut quadrates although the quantity of initial harvest (January 2000) was higher in the plucked treatment. In the subsequent harvests made every month, the wet biomass harvested was more in the cut quadrates. Hence the percentage regeneration after successive harvests also remained higher in the cut quadrates.

A total of seven agarophytes were observed from Kerala coast during the study period. Out of them, highest yield (% dry weight) of agar was obtained from *Gelidium pusillum* and the lowest from *Jania rubens*, although *Gracilaria corticata* from Bekal coast registered an yield of 38 % agar. Agar yield determined from *Gelidium pusillum* showed maximum values from Chettikulam samples (55%) and in the samples from Dharmadom (55% during December). However, *Gracilaria corticata* exhibited higher density and quantity of harvestable biomass as well as higher frequency of occurrence from Mullur, Thirumallavaram, Chettikulam and Kannur. *Gracilariopsis lemaneiformis*, though a major carrageenan yielding species yielded 27.84% of agar which were available in

Dhalavapuram and Kannur stations in appreciable quantities. *Pterocladia* sp though available scarcely in Chettikulam and Thikkodi coasts, its agar yield registered 24.75% of its dry weight. *Gracilaria foliifera* was also a raw material whose mean agar yield was maximum from Bekal coast (29 %).

Alginophytes of Kerala coast were represented by seven species during 1998 - 1999 belonging to four Genera. Mean yield of alginic acid (% dry weight) was highest (36.67%) for *Sargassum tenerimum* collected from Thikkodi followed by 35.56% for the *Sargassum wightii* samples collected from Mullur (34.25%), Thirumallavaram (36.67%), Thikkodi (35.75%) and Bekal (35%) coasts. *Stoechospermum marginatum* available in Thirumallavaram and Thikkodi rocky coasts showed a mean yield of 26%. *Sargassum duplicatum* also yielded 20.25% alginic acid but obtained only from Mullur coast.

Carrageenan yielding seaweeds of Kerala coast were represented by nine species and highest yield of carrageenan (% dry weight) was recorded by *Gracilariopsis lemaneiformis* (39.25%) occurring in the bay waters of Dhalavapuram and Kannur stations followed by *Hypnea musciformis* (37.5%) occurring in five stations. *Hypnea valentiae* observed from seven stations along the Kerala coast also contained fairly good quantity of carrageenan. Among the species of *Grateloupia* , *G. lithophila* registered higher yield of carrageenan (20.84%) than *G. filicina* (17.43%). Mullur station had maximum number of carrageenan yielding species including *Acanthophora spicifera* (20.43%), *Asperagopsis taxiformis* (17.5%) and *Laurencia paniculata* (26%).

KEY WORDS:

Phycocolloids, Seaweeds, Kerala coast, Hydrography of seaweed beds, Successive harvests, Agarophytes, Alginophytes, Carrageenophytes