

ALGINIC ACID CONTENT OF SOME BROWN SEAWEEDS OF GOA

SOLIMABI AND S. W. A. NAQVI

National Institute of Oceanography, Dona Paula - Goa 403 004

ABSTRACT

Some of the brown algae from the Goa coast were examined for their alginic acid content. The yield ranged from 8% to 23% of dry weight. Highest yield was obtained from *Dictyota bartayresii* followed by *Spatoglossum asperum*, *Colpomenia sinuosa*, *Sargassum tenerrimum* and the lowest from *Dictyota dumosa* and *Padina tetrastomatica*.

The quantities of polysaccharides produced by marine algae are known to exceed those produced by land and fresh water plants together. It has been estimated that the algae fix 10^{11} tons of carbon annually. This is not only the source of carbon based food for all the animal population of the sea but also represents a vast potential resource for the industry which needs exploitation. The polysaccharides isolated from seaweeds include agar, carrageenan and alginic acid.

Alginic acid, a constituent of the cell walls of most brown seaweeds and a linear polymer of d-mannuronic acid and guluronic acid, is the only extract presently obtained from the brown seaweeds. Its commercial importance in pharmaceutical, food and leather industries is well known. Though the alginic acid content of a few species from different locations in India has

been determined by some workers (Valson, 1955; Pillai, 1957; Kappanna, Rao and Mody, 1962), no information is available on the alginic acid content of the seaweeds from the Goa coast. Therefore, a survey of the alginic acid content of the seaweeds of this region was undertaken at the request of the local Government. No previous data on the alginic acid content of some species reported here are available from any part of India.

The study deals with six species belonging to the class *Phaeophyceas* viz, (1) *Sargassum tenerrimum*, (2) *Dictyota dumosa*, (3) *Colpomenia sinuosa*, (4) *Dictyota bartayresii*, (5) *Padina tetrastomatica* and (6) *Spatoglossum asperum*.

Seaweeds were collected in December. The samples were washed well with fresh water, dried in the air, ground to a fine power and then the

extraction was done according to the method adopted by Pillai (1957) involving pre-extraction with dilute hydrochloric acid (0.2 N) followed by thrice extraction with 2% sodium carbonate solution and then precipitating the acid at pH 2-3 with 3% HCl. The precipitated acid was filtered off, suspended in water, decolourised with 2% $KMnO_4$ solution, filtered at the pump, washed free of acid and then dried in the dessicator to a constant weight. For each experiment, 10 gms of the dried weed was used. The percentage of alginic acid of the seaweeds on dry weight basis is given in Table 1.

From the table it can be inferred that the species *Sargassum tenerrimum*, *Colpomenia sinuosa*, *Spatoglossum asperum* and *Dictyota bartayresii*, contain a fairly good percentage of alginic acid ranging from 14.16% to 22.94%.

From the literature it is found that *S. tenerrimum* from South India contains as much as 34.6% of alginic acid (Varrier and Pillai, 1951) while the same species from Gujrat contains only 4.85% to 14.77% (Kappanna *et al* 1962).

The present study indicates an average alginic acid content of 15.16% in *S. tenerrimum* from the Goa coast. These observations show that there are considerable variations in the alginic acid content with locations. These variations may be attributed to the influence of prevailing environmental conditions and also to the collections of the samples at different stages of developmental cycle. The values obtained for *Padina tetrastomatica* are in agreement with those reported by Valson (1955) for the same species from the Gulf of Mannar.

The most common genera of brown algae along the Goa coast are *Sargassum*, *Dictyota* and *Padina*. Hence they hold good prospects of developing an alginic acid industry in Goa. Though the alginic acid in *Padina tetrastomatica* is low, this species can easily be taken as a good raw material in view of its abundance. *Colpomenia sinuosa* and *Spatoglossum asperum* were also found to contain considerable amount of alginic acid but their occurrence is restricted to certain areas only.

TABLE - I. Percentage of alginic acid on dry weight basis

Expt. No.	<i>Sargassum tenerrimum</i> %	<i>Dictyota dumosa</i> %	<i>Colpomenia sinuosa</i> %	<i>Padina tetrastomatica</i> %	<i>Dictyota bartayresii</i> %	<i>Spatoglossum asperum</i> %
1	15.17	13.12	16.12	8.13	22.96	17.04
2	15.24	13.44	17.01	8.76	22.84	16.83
3	15.08	13.48	16.82	8.54	23.01	17.56
Mean	15.16	13.34	16.65	8.48	22.94	17.14

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