Studies on the growth variation, Alginic acid and Mannitol contents in Padina gymnospora (Kuetzing) Vickers

V. S. Krishnamurty Chennubhotla, S. Kalimuthu, N. Kaliaperumal and J. Ramalingam

Introduction

The alginic acid content of some Indian brown algae has been studied by Valson (1955), Pillai (1957), Kappanna *et. als.* (1962) Umamaheswara Rao (1969), Umamaheswara Rao and Kalimuthu (1972) and Kaliaperumal and Kalimuthu (1976). In recent years information on growth variations and mannitol and alginic acid contents in certain alginophytes was made available by the studies of Umamaheswara Rao (1969), Umamaheswara Rao and Kalimuthu (1972) and Kaliaperumal and Kalimuthu (1976). In the present account variation in growth, and mannitol contents in *Padina gymnospora* observed over a period of 2 years (January 1975 to December 1976) are given.

Material and Methods

Padina gymnospora plants growing on the rocks in the intertidal zone at Pudumadam was collected every week and their length measurements noted. The plants were first thoroughly washed, sun dried for 4 or 5 days and ground to a fine powder. Extraction of alginic acid was made by the method outlined by Suzuki(1955). The periodic acid method of Cameron *et al* (1948) was followed for estimation of mannitol. The analysis was carried out in four replicates and mean values were taken.

Results and Discussion

As can be seen from fig.1 A,the maximum height for *Padina gymnospora* was observed in the months of January 1975 and February 1976 and May 1976. In general, the height of the plants fluctuated between 4 to 8 cm.

The alginic acid content varied from 9.4% to 24.8% throughout the period of observation (fig. 1 B). The variation for the first year was 9.4% in September'75, to 24.8% in March 75 and in the second year from 14.2% in July '76 to 21.1% in October, '76 The mannitol content showed a variation from 0.6% in september to 2.1% in December in 1975 and 0.5% in July to 1.8% in March 1976 (fig. 1 C).

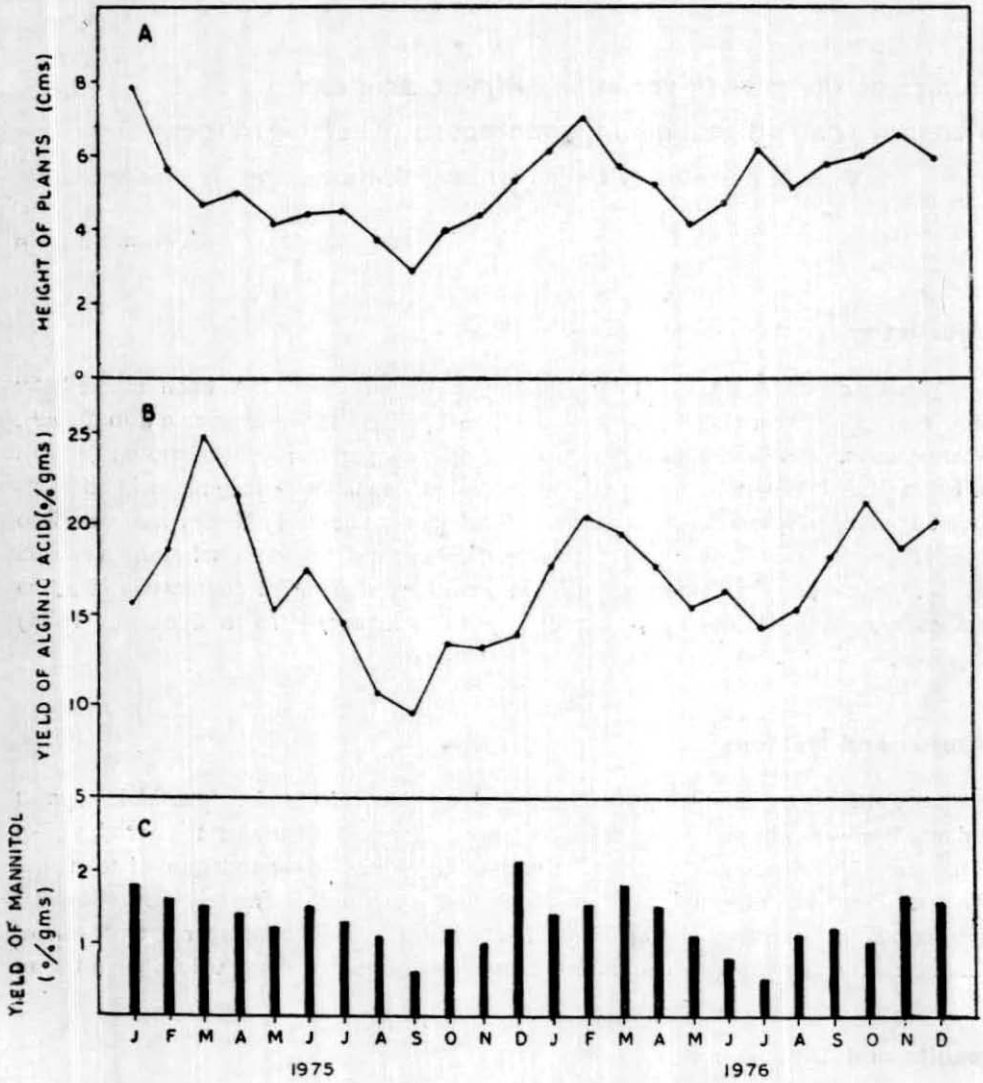

Fig. 1. Growth, alginic acid and mannitol contents in *Padina gymnospora* over two years

The alginic acid was maximum when the plant was at its maximum height during the second year of observation but during the first year of observation the maximum alginic acid content (the maximum observed for the whole period of observation) was when the plant was only of average size, viz. 4 7 cm.

The mannitol content was high during December in 1975 and during March in 1976. The mannitol content was lowest when the alginic acid content as well as the size of the plant were also at their minimum during the first year of observation.

During the second year of observation, alginic acid as well as mannitol content were minimum in July though the plants were 6.2 cm in height.

The alginic acid and mannitol contents observed in *Padina gymnospora* are low when compared to the yields in other brown algae described by earlier workers. However the abundance of this species recommends it and the period between November and March will be the most suitable season for harvesting this alginophyte to get the maximum yield of alginic acid and mannitol.

Acknowledgements

Our thanks are due to Dr. E. G. Silas, Director, Central Marine Fisheris, Research Inatitute, for encouragement and to Dr. P. V. Ramachandran Nair for going through the manuscript.

Literature cited

Cameron, M. C , A. G. Ross and E.G.V.Percival 1948 Methods of the routine estimation of mannitol, alginic acid and combined fucose in seaweeds *J. Sci. Chem. Ind. London*, 67 : 161 - 164.

Chapman, V. J. 1970 Seaweeds and their uses. Methuen & Co. Ltd., London Second Edition.

Kaliaperumal, N. and S. Kalimuthu 1976 Changes in Growth, Reproduction, Alginic acid and Mannitol contents of *Turbinaria decurrens*. Bory *Bot. mar.* 19 (3) : 157 - 159

Kappanna, A. N., A.Visweswara Rao and I.C.Mody 1962 Alginic acid content of the brown seaweeds of Sourashtra Coast. *Curr. Sci.*, 31 : 463 - 444.

Pillai, V. K. 1957 Alginic Acid from *Sargassum* seaweeds Res. *Indust.* 2:70-71

Sadasivan Pillai, K. 1961 Alginic acid from *Sargassum* seaweeds of Indian coast-its extraction on a cottage Industry basis *Chemical Age, India*, 12 : 425 - 430.

Suzuki, N. 1955 Studies on the manufacture of algin from algae. *Mem. Fac. Fish.* 3 : 93 - 158.

Umamaheswara Rao, M.	1969	Seasonal variations in growth, alginic acid and mannitol contents of *Sargassum wightil* and *Turbinaria conoides* from the Gulf of Mannar, India. *Proc. 6th Int. Seaweed symp.* pp. 579 - 584
Umamaheswara Rao, M. and S. Kalimuthu	1972	Changes in mannitol and alginic acid contents of *Turbanaria oranta* (Turner). J. Agardh in relation to growth and fruiting *Bot. mar.* 15, 57 - 59.
Valson, A. P.	1955	Alginic acid content of some of the common seaweeds of the Gulf of Mannar area *Curr. Sci.*, 24 : 343.