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**GROWTH AND REPRODUCTIVE STATE OF INTERTIDAL AND  
SUBTIDAL SARGASSUM (SARGASSACEAE, PHAEOPHYTA)  
POPULATIONS IN BOLINAO, PANGASINAN**

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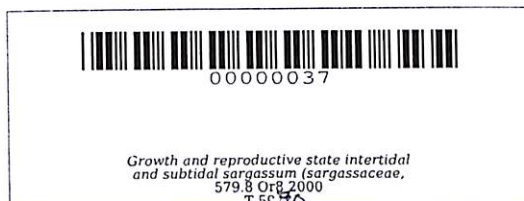
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# Growth and Reproductive State of Intertidal and Subtidal *Sargassum* (Sargassaceae, Phaeophyta) Populations in Bolinao, Pangasinan

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## ABSTRACT

*Sargassum* plants were tagged and their growth rates monitored over a period of 14 months (May 1996-June 1997). The monthly data of seawater temperature, salinity, DF index factor, pH, amount of rainfall and relative humidity were correlated using the three measures of correlation, namely: Pearson's, Spearman's rho, and Kendall tau b coefficient of correlation with growth rate (SGR%) per day for 1<sup>st</sup> year and 2<sup>nd</sup> year populations of *Sargassum* in the intertidal and subtidal portions of the bed in Bolinao, Pangasinan. Seawater temperature and salinity were significantly negatively correlated with growth of *Sargassum* plants ( $P < 0.01$  level). DF index factor, amount of rainfall, and relative humidity were significantly positively correlated with growth (SGR%) per day ( $P < 0.01$  level). The pH has no significant correlation with the growth of *Sargassum*.

Regression analysis showed that 66% of the variability of growth of 1<sup>st</sup> year age plant and 70% for the 2<sup>nd</sup> year group is explained by seawater temperature, salinity, DF index factor, amount of rainfall, and relative humidity. An estimated 0.244 increase in percent growth of *Sargassum* for 1<sup>st</sup> year and 0.680 for 2<sup>nd</sup> year age group would result when temperature is increased by 1°C holding salinity, DF, amount of rainfall, and relative humidity constant.

Two-way ANOVA also showed significant temporal differences in the growth rate of *Sargassum* populations in the intertidal over those in the subtidal region at  $P < 0.05$  level. For 1<sup>st</sup> year population, Tukey's HSD test showed higher growth rate during the month of November 1996 (7.05%) and least in June 1996 (1.20%). The 2<sup>nd</sup> year populations, however, exhibited high growth rate in October 1996 (8.59%) and least in May 1997 (1.69%).

The associated seaweed species in *Sargassum* bed, showed a significant and temporal variations over a period of one year in the intertidal populations as compared to that in the subtidal *Sargassum* bed ( $P < 0.05$ ). These were represented by higher numbers of associated species in the intertidal populations than those in the subtidal populations, but the ratio of percentage of each species to total populations remains almost the same.

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## INTRODUCTION

*Sargassum* is an ecologically dominant genus in the shallow waters throughout the tropics and the subtropics of the world. They proliferate in vast areas along coastal waters housing myriad life forms making them one of the most important and productive communities. In the Philippines, eighty (80) species were recorded of which *Sargassum cristaefolium* C.A.Agardh, *S. crassifolium* J.G.Agardh, *S. polycystum* C.A.Agardh, and *S. oligocystum* Montagne are the most dominant (Silva *et al.*, 1987). The genus *Sargassum* is frequently the largest and most dominant in terms of standing crop, percent cover, and height in tropical high subtidal and low intertidal zones of the marine environment (Svedelius, 1906, Lawson, 1957; Widdowson, 1965; Doty, 1971; Tsuda, 1972; De Wreede, 1976; Verheij & Erfteijer, 1993).

A multitude of environmental factors usually affect the biomass and extent of any given seaweed community (De Wreede, 1976). It is well-known that growth and distribution of marine algae are usually influenced by the interaction of several environmental factors (Southward, 1958; Saraya, 1976; Fortes, 1986). *Sargassum* communities have gradual boundaries of distribution directly related to tidal gradation of emersion factors. These factors are considered to be important forces in structuring communities within seaweed and seagrass beds (Orth, 1977; Young & Young, 1977; Nelson, 1979; Summerson & Peterson, 1984). Tidal forces, monsoons and their effect on the current system, and rainfall distribution, are likely to be the most operative factors in affecting the distribution of various forms of algae in the country (Fortes, 1992). *Sargassum* populations are subjected to various