

NOTES

SOME OBSERVATIONS ON THE LIBERATION AND VIABILITY OF OOSPORES IN *SARGASSUM WIGHTII* (GREVILLE) J. AGARDH

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ABSTRACT

Some observations made on the output and viability of oospores in *Sargassum wightii* are presented. Maximum output of healthy spores was observed for seven days in the laboratory experiments, without any periodicity in the liberation of oospores. Spore-shedding season extends for three months, from November to January, with the highest value in December. In viability experiments 47.6% of the sporelings have been found in healthy condition at the end of 60 days.

Information on the spore-shedding seasons and other aspects needed for large-scale cultivation of Indian alginophytes are very limited. Chauhan and Krishnamurthy (1967) reported on the spore liberation, viability and germination in *Sargassum swartzii*. In the present contribution, some observations made on the oospore output in *Sargassum wightii* during the fruiting cycles of 1971-72 and 1972-73 are presented, together with experiments conducted on the viability of oospores under laboratory conditions.

Sargassum wightii growing in the infralittoral fringe zone of Mandapam coast were used for estimating the oospore output. In general the fruiting plants occur around Mandapam during the maximum-growth period extending from October to December or January (Umamaheswara Rao 1969), with slight variations from one year to the other. Five to ten fruiting plants were collected every month and the total number of receptacles present on each plant were counted. From each plant four mature receptacles with well-developed oogonia were selected and then placed in petri dishes immersed in finger bowls containing boiled and filtered seawater. Oospores liberated and settled

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in petri dishes were counted every day for a period of 10 to 15 days, using a binocular microscope. The seawater in the finger bowls was changed daily and all the experimental sets were kept near a light source of 14 watts day-light fluorescent lamp for 8 h, from 9.00 A.M. to 5.00 P.M., to provide illumination during day time in the laboratory.

In the first year of this study (1971-72), experiments were commenced from December 71 and fruiting plants were not found in the field from February 1972 onwards. In the second year, observations on the oospore output were made up to December 1972. In January 1973 receptacles were not in good condition and they did not liberate spores even after 7 days.

To study the viability of oospores, three sets of oospores liberated in a single day were used. These oospores were maintained in enriched seawater medium for two months and the number of healthy germlings present in the petri dishes were counted at 10-day intervals.

Mean values of all the experiments conducted during the two fruiting seasons of *Sargassum wightii* are plotted in Fig. 1 to show the daily changes in the liberation of oospores from the receptacles. In many experiments spores

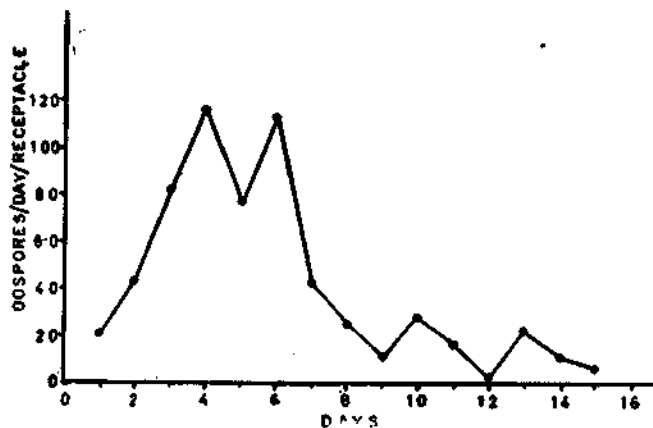


FIG. 1. Liberation of oospores from the receptacles of *Sargassum wightii*.

liberated on the next day, and in some cases they were seen in petri dishes after one or two days. Soon after liberation, spores in different stages of development were found attached to the receptacles as recorded in *Sargassum tenerrimum* (Prakasa Rao 1946), *Sargassum swartzii* (Chauhan and Krishnamurthy 1967), *Cystoseria* (Maira and Krishnamurthy 1968) as also in *Turbinaria* species (unpublished). Because of this settlement on the receptacles, and also due to delay in the liberation, the spore output per receptacle was less for the first two days and a large number of spores were liberated between

third and seventh day (Fig. 1). From 8th day onwards spore output was again low probably be due to lack of fully developed and fertilized oogonia in the receptacles, or due to the development of mucilaginous coating on the receptacles, preventing the liberation of spores. In addition to these changes in the number of oospores, majority of the spores liberated for six or seven days are in healthy condition and the spores liberated after 7 days are single celled and in degenerating condition. These observations indicate that mature receptacles of *Sargassum wightii* liberated healthy oospores continuously for a period of seven days. Periodicity in the liberation of oospores has not been observed (Fig. 1) in the present study unlike in the earlier reports (Prakasa Rao 1946 and Chauhan and Krishnamurthy 1967).

The oospore output in *Sargassum wightii* varied in different months of the fruiting season. The mean values obtained on the number of receptacles per plant, number of oospores liberated per receptacle and the total oospore output per plant are given in Table 1. The total output per plant was estimated by multiplying the value obtained per plant per day by 7, since maximum number of healthy oospores has been liberated by the receptacles up to seven days (Fig. 1).

TABLE 1. *Oospore output in Sargassum wightii in two fruiting seasons.*

1971-72	December	747	47	35,109	2,45,763
	January	365	46	16,790	1,17,530
	February	0	0	0	0
1972-73	October	0	0	0	0
	November	711	22	15,642	1,09,494
	December	608	87	52,896	3,70,272
	January	—	—	—	—

— no liberation.

The above estimates for two fruiting seasons clearly show that in *S. wightii* the spore shedding period commences from November and ends by January with a peak output of oospores in December. The spore output computed per plant of *S. wightii* was much less than that of *S. swartzii* (Chauhan and Krishnamurthy 1967), but the number of receptacles per plant and output of spores per receptacle varied in these two species.

Data obtained in the experiments conducted to assess the viability of oospores are plotted in Fig. 2. All the oospores used in viability experiments developed into healthy and branched sporelings. At the end of 10 days 69.6% of germlings survived in the cultures and from then onwards the death rate

was low (Fig. 2). At the end of 60 days 47.6% of the germlings were in healthy condition and these observations suggest that about 50% of the oospores liberated by a plant of *S. wightii* may survive and grow under laboratory conditions.

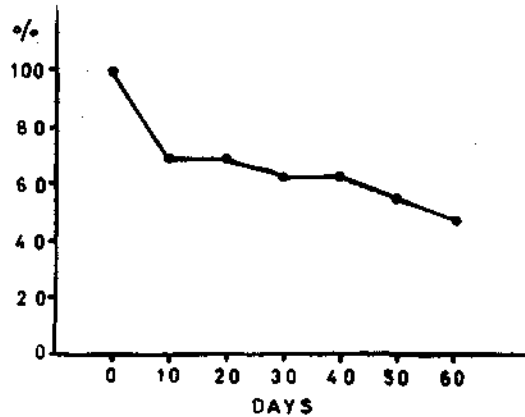


FIG. 2. Viability of germlings of *Sargassum wightii*.

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