Occurrence of the Genus *Sargassum* (Phaeophyta) on Two Pacific Atolls[1]

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In a discussion of the distribution of *Sargassum* on Pacific islands, Doty (1954) hypothesized that the genus *Sargassum* may be restricted to only high islands, i. e., islands of igneous origin. The hypothesis was based on the few records of this genus from low islands, i. e., islands of limestone composition, in the literature and from personal observations in the field as well as from studies of herbarium specimens. The only records were the presence of *Sargassum* on two low islands in the leeward Hawaiian Islands. Reinbold (1899) and Lemmerman (1905) report *S. polyphyllum* J. Ag. from Laysan Islands. Howe (1934) reports both *S. vulgare* J. Ag. and *S. piluliferum* (Turn.) C. Ag. from Pearl and Hermes Reef.

Since 1954, floristic accounts have appeared in the literature based on algae collected from Pacific atolls. *Sargassum* was not among the algae collected from six atolls in the Gilbert Islands (Tsuda, 1964). Dawson (1956, 1957) did not report *Sargassum* from any of the atolls in the Marshall Islands. Trono (1969) reported *Sargassum* only from the high islands of Palau, Truk, Ponape and Kusaie; none was reported from any of the atolls in the Caroline Islands. *Sargassum* is quite abundant in the high islands of Guam (Tsuda, 1972) and the other northern Mariana Islands (William J. Tobias, personal communications).

Sargassum was not found on Johnston Atoll (Buggeln and Tsuda, 1969) nor was it found on Howland Island and Baker Island (Tsuda and Trono, 1968). A large algal collection from several low islands in the Line and Phoenix Islands collected under the auspices of the Pacific Ocean Biological Survey Program, Division of Birds, Smithsonian Institution, and which I examined (unpublished) did not reveal *Sargassum* in these two island groups. In addition, extensive collections from Fanning Atoll in the Line Islands (De Wreede and Doty, 1970; Tsuda et al., 1973) did not include *Sargassum*.

Other than records from the two low islands in the Hawaiian Islands, *Sargassum* has never been reported from atolls in the central Pacific Ocean. This paper reports on the occurrence of *Sargassum* on two Pacific atolls and speculates on the reasons why these species were not reported earlier by others. All specimens cited

[1] Contribution No. 79, University of Guam Marine Laboratory. I am grateful to both Maxwell S. Doty and Robert E. De Wreede for their constructive criticisms of the paper. Special thanks to Richard H. Randall and Charles E. Birkeland for calling my attention to the *Sargassum* stands during our stay on Kayangel Atoll.

are deposited in the herbarium of the University of Guam Marine Laboratory.

The first collection of *Sargassum* from a Pacific atoll was made on June 19, 1968 by R. S. Jones who collected fertile thalli of *Sargassum crassifolium* J. Ag. at Ulithi Atoll (9°56′N, 139°40′E). The thalli were growing abundantly in water one meter deep on the seaward side of the reef margin due north of the east end of Sorlen Islet (RT 2153) and off Eoet Islet (RT 2148). A second collection (RDW 46b) from Ulithi Atoll was made by R. De Wreede, who had been informed of Jones' previous collection, off the seaward reef margin off Eoet Islet on July 13, 1968. All of the specimens collected during June and July, 1968, were about 15–20 cm high and fertile.

The next collection (RT 4773) of this same species was made on January 17, 1976 in water one meter deep on the seaward reef margin on the east side of Kayangel Atoll, Palau (8°03N, 134°43E). This species was by no means rare, since it formed a zone (Fig. 1) about 75 meters wide between Ngajangel and Ngariungs Islets, covering an estimated 50 percent of the substratum. Another smaller population (RT 4774) was found between Ngariungs and Ngaraplas Islets. The majority of the thalli observed were less than 10 cm high and sterile.

It is interesting that only this one species, *Sargassum crassifolium*, was found on both Ulithi and Kayangel Atolls. This species closely resembles *S. cristaefolium* C. Ag. in having turbinarioid leaves and firm discoid holdfasts, but differs conspicuously in its terete branches (J. Agardh, 1848) as opposed to flattened branches. The various species in the *S. cristaefolium* group are reviewed by De Wreede (1973).

Fig. 1. *Sargassum crassifolium* stand in water one meter deep on seaward margin at Kayangel Atoll. Photo taken by R. H. Randall on January 17, 1976.

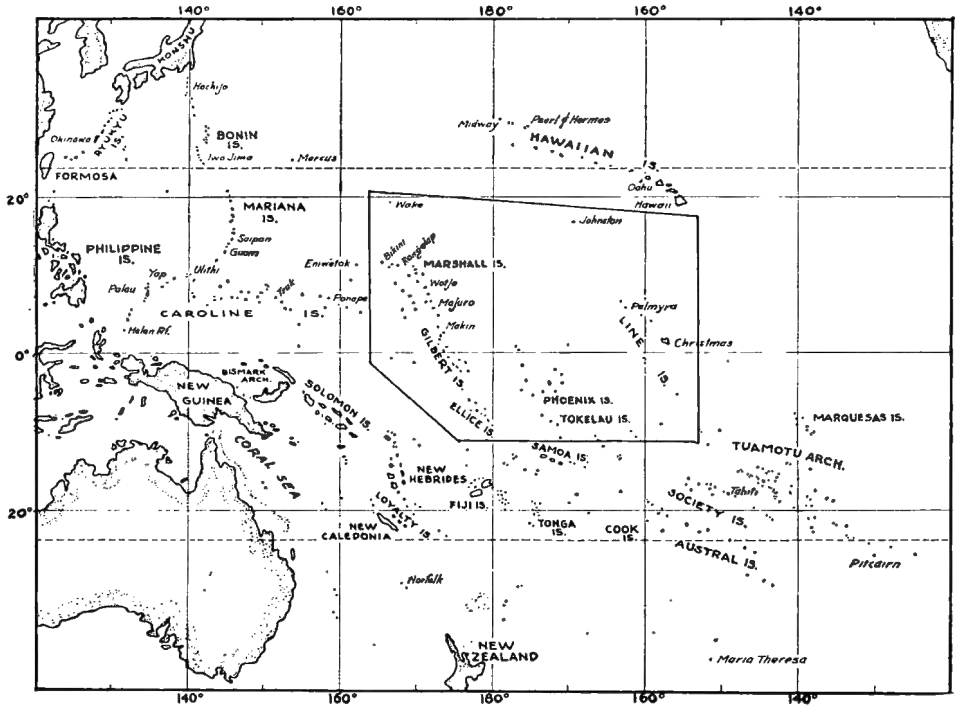

Fig. 2. Map of the central Pacific Islands. Enclosed area represents the contiguous low islands where *Sargassum* has not been reported.

On both atolls, the *Sargassum* populations were found on the windward side of the atoll growing in the high energy surf zone. This is an area where few collections and observations are made, and may explain partially why this species has not been collected previously. In addition, the presence of smaller sterile thalli observed in January at Kayangel Atoll and the larger fertile thalli collected in June and July from Ulithi Atoll seems to indicate that this species is present only during certain months, similar to *S. cristaefolium* [*S. duplicatum* J. Ag.] which inhabits the inner reef margin on Guam (Tsuda, 1971) only during the months of December to September. However, this still does not explain the absence of quieter water species of *Sargassum*, e. g., *S. polycystum* C. Ag., in the lagoons of atolls, especially since I have observed this species in the lagoons of Truk, Ponape, and Palau.

The fact still remains that after 22 years no species of *Sargassum* has been found in the contiguous low island area (Fig. 2) of the Marshall, Gilbert, Ellice, Line, Phoenix and Tokelau Islands. As Doty (1954) points out, "This central region may prove to be an important biotic province".

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