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1-1-1993

Porphyra amplissima (Kjellman) Setchell et Hus: New records of an “Arctic” seaweed in southern Maine, New Hampshire and northern Massachusetts

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Recommended Citation

Hehre, E.J. and A.C. Mathieson. 1993. *Porphyra amplissima* (Kjellman) Setchell et Hus: New records of an “Arctic” seaweed in southern Maine, New Hampshire and northern Massachusetts. *Rhodora* 95:184-187.

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Rhodora

[Cambridge, Mass., etc.]New England Botanical Club [etc.]

<https://www.biodiversitylibrary.org/bibliography/721>

v.95 (1993): <https://www.biodiversitylibrary.org/item/103383>

Article/Chapter Title: Article: PORPHYRA AMPLISSIMA (KJELLMAN)
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PORPHYRA AMPLISSIMA (KJELLMAN)
SETCHELL *ET* HUS: NEW RECORDS OF AN
"ARCTIC" SEAWEED IN SOUTHERN MAINE,
NEW HAMPSHIRE AND NORTHERN
MASSACHUSETTS¹

EDWARD J. HEHRE² AND ARTHUR C. MATHIESON

The occurrence of *Porphyra amplissima* (Kjellman) Setchell *et* Hus in the southern portion of the Gulf of Maine represents a significant extension of its previously known range. Recent accounts limit this species to Norway and Spitzbergen in the Eastern Atlantic (South and Tittley, 1986) and to the Arctic, Maritime Provinces of Canada, and coastal Maine (Bird and McLachlan, 1992). Taylor (1957) included this species as *Porphyra miniata* (C. Agardh) C. Agardh var. *amplissima* (Kjellman) Rosenvinge, citing the arctic and Maine coasts as its range in North America. However, Taylor's vague description of var. *amplissima* as a distinct entity and the lack of any published references pertaining to the Maine records of this taxon have previously cast doubt as to its occurrence in this region. The recent account (Bird and McLachlan, 1992) of this species from the Atlantic Coast of Nova Scotia and lower Bay of Fundy has provided the impetus to search for its presence in the Gulf of Maine. The distribution of *Porphyra amplissima* in New England and the southern part of the Bay of Fundy is substantiated by an examination of *P. miniata* specimens deposited in the Farlow Herbarium, Harvard University (FH) and the Hodgdon Herbarium, University of New Hampshire (NHA).

The majority of our collections of *Porphyra miniata* from Campobello (Stone et al., 1970) and the Wolf Islands (Hehre et al., 1970), both of which are in the southern Bay of Fundy, are without a doubt *P. amplissima*. In addition, we have records of *P. amplissima* from the nearshore open coast of Maine (from Cutler to York), New Hampshire, and as far south as Cape Ann, Massachusetts. We have also recorded *P. amplissima* from several off-

¹ Scientific Contribution Number 1815 from the New Hampshire Agricultural Experiment Station; also issued as Contribution Number 277 from the Jackson Estuarine Laboratory/Center of Marine Biology.

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shore islands in Maine (e.g., Boon, Hurricane, Smuttynose, and Two Bush) and within estuarine sites near North Lubec, Maine and Dover-Portsmouth, New Hampshire. The New Hampshire sites are within the outer reaches of the Great Bay Estuary System where strong tidal currents occur, simulating open coastal environments (cf. Mathieson et al., 1977, 1983; Reynolds and Mathieson, 1975). The estuarine tidal rapid at Dover Point (approximately 8.5 miles inland) represents the innermost estuarine collection. The presence of *P. amplissima* from Pigeon Cove on Cape Ann (Massachusetts) is of interest for two reasons: this is the apparent southern limit of the taxon in the Western Atlantic; our collections include beautiful specimens collected by Mary Hitchcock, ca. 1900.

Both *Porphyra amplissima* and *P. miniata* are primarily "arctic" species whose southern distributional limits reach northern Massachusetts. They are both annuals (April–November), with identical reproductive phenologies (May–November). The plicate nature of the thallus and the intermixed mosaic of carposporangial and spermatangial tissue on the margins of the blade serve to distinguish *P. amplissima* from *P. miniata* (cf. Bird and McLachlan, 1992). The latter criterion had been used previously to describe *P. miniata* (Taylor, 1957). Our sublittoral data for *P. amplissima* (i.e., 0–30 feet) agree with those of Bird and McLachlan (1992).

The marine algal flora of New Hampshire has been studied in detail during the past 25 years (see Mathieson and Hehre, 1986). Based upon these studies we believe that *Porphyra amplissima* is an uncommon species that occurs sporadically in this part of its range. *Porphyra miniata* is definitely the more common of the two species in the southern Gulf of Maine, but *P. amplissima* becomes increasingly more prevalent as one goes east along the Maine coast towards the Bay of Fundy. Further studies are needed before we can ascertain the importance of *P. amplissima* to the marine algal flora of Maine.

ACKNOWLEDGMENTS

We would like to express our sincere appreciation to the personnel of the Farlow Herbarium of Harvard University for their assistance and loan of herbarium specimens.

REPRESENTATIVE SPECIMENS: CANADA: **New Brunswick**, **South Wolf Island**—*R. A. Stone & E. J. Hehre*, 4 June, 1968 (NHA 13,500); *E. J. Hehre & J. R. Conway*, 13 August, 1968 (NHA 14,051 & 14,052). **Campobello Island**—East Head Harbor, *E. J. Hehre*, 21 May, 1966 (NHA 1,258); Harbour de Loutre, *R. A. Stone & E. J. Hehre*, 14 June, 1967 (NHA 9,141); *J. R. Conway, E. J. Hehre, R. A. Stone & R. A. Fralick*, 18 May, 1968 (NHA 13,349); Herring Cove, *E. J. Hehre*, 20 May 1966 (NHA 4,626); *J. R. Conway & E. J. Hehre*, 11 August, 1968 (NHA 14,099); Little Duck Pond, *R. A. Stone, E. J. Hehre and R. B. Pike*, 5 June, 1968 (NHA 13,350); *E. J. Hehre & J. R. Conway*, 12 August, 1968 (NHA 14,149 & 14,150); Mulholland's Bend, *R. A. Stone & E. J. Hehre*, 15 June, 1967 (NHA 9,261 & 9,270); *E. J. Hehre & J. R. Conway*, 9 August 1968 (NHA 14,125); Raccoon Point, *E. J. Hehre & R. A. Stone*, 16 June, 1967 (NHA 9,175); *E. J. Hehre & J. R. Conway*, 10 August, 1968 (NHA, 14,177); Whiterock Cliffs, *R. A. Stone & E. J. Hehre*, 17 June, 1967 (NHA 9,313). UNITED STATES. **Maine** (nearshore)—Pirates Creek, North Lubec, *D. Lavoie*, 21 May, 1966 (NHA 1243); Cutler, *F. S. Collins*, 6 July, 1902 (FH); East Machias, *G. Vagenas*, 21 May, 1966 (NHA 1,245); Long Sands, York, *J. Kotheimer*, 6 June, 1966 (NHA 1,255 & 1,256); (offshore islands)—Hurricane Island, Penobscot Bay, *J. Hambrook*, 29 May, 1986 (NHA 49,943); *J. Hambrook* (—10 to —20 feet), 1 June, 1986 (NHA 49,935); Two Bush Island, near Hurricane Island, Penobscot Bay, *J. Hambrook*, 12 June, 1985 (NHA 49,164); Boon Island, York (—20 to —30 feet), *A. C. Mathieson*, 30 June, 1976 (NHA 27,897 & 27,932); Smuttynose Island, Kittery, *A. C. Mathieson*, 19 November, 1976 (NHA 39,505). **New Hampshire** (nearshore)—Jaffrey Point (Fort Stark), New Castle, *E. J. Hehre & A. C. Mathieson*, 9 August, 1967 (NHA 10,321); Rye Ledge, Rye, *J. Shipman & J. Conway*, 21 June, 1966 (NHA 1,275); (estuarine)—Fort Constitution (Fort Point), New Castle (0.8 miles inland), *J. R. Conway & J. Shipman*, 22 June, 1966 (NHA 1,277); *E. J. Hehre*, 29 May, 1967 (NHA 9,035); *E. J. Hehre*, 23 June, 1967 (NHA 8,957); Bridge at Rte. 1 Bypass, Portsmouth, west bank (4.0 miles inland), *E. J. Hehre*, 29 May, 1967 (NHA 9,036); Dover Point (Hilton Park), Dover, junction of Little Bay and Piscataqua River (8.6 miles inland), *E. J. Hehre*, 23 June, 1967 (NHA 9,392); *N. B. Reynolds*, 15 May, 1969 (NHA 15,491); *N. B. Reynolds*, 17 June, 1969 (NHA 15,492). **Massachusetts** (nearshore)—Pigeon Cove, Cape Ann, *E. J. Hehre*, 23 June, 1966 (NHA 1,269); *M. Hitchcock*,

ca. 1900 (NHA 1,244, 1,246, 1,247); Halibut Point, Cape Ann, I. M. Lamb and M. Zimmermann, 17 June, 1962 (FH, A-455); Nahant, F. S. Collins, 24 June, 1882 (FH).

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