PYROPIA SMITHII IS PYROPIA PULCHRA COMB. NOV.

SANDRA C. LINDSTROM
Department of Botany and Beatty Biodiversity Museum, #3529 – 6270 University Blvd, University of British Columbia, Vancouver, B.C., Canada V6T 1Z4
Sandra.Lindstrom@botany.ubc.ca

JEFFERY R. HUGHEY
Division of Science and Mathematics, Hartnell College, 411 Central Avenue, Salinas, CA 93901

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Some species originally placed in Porphyra C. Agardh were excluded from the major revision of the genus because of lack of sequenced material (Sutherland et al. 2011). Among these was Porphyra pulchra Hollenberg. Porphyra pulchra was described in Smith and Hollenberg (1943) on the basis of Hollenberg 2890 (UC 2036529), the type specimen housed in the Herbarium at the University of California at Berkeley. This specimen (Fig. 1) consists of a blade epiphytic on Phyllospadix Hook that was cast ashore at Moss Beach, Pacific Grove, CA. Another specimen, UC 536729 from Santa Cruz, CA, was also referred to this species by Smith and Hollenberg (1943).

Porphyra pulchra was distinguished by its epiphytic habit, its delicately mottled violet color, and the presence of two chloroplasts in each cell. At the time of its description, this latter feature was known only in P. lanceolata (Setchell & Hus) G.M. Smith and P. pulchra among Pacific North American species in the genus. Subsequent studies have shown that the two-chloroplast condition in P. lanceolata is due to chloroplast division prior to cell division in the formation of reproductive cells; vegetative cells have only a single chloroplast (Lindstrom and Cole 1992). Species with two chloroplasts per vegetative cell have a much broader area separating the two chloroplasts than species in which the two-chloroplast condition precedes reproductive cell formation (e.g., compare Figs. 10 and 12 in Smith and Hollenberg 1943). After the publication of P. pulchra, two additional species with two chloroplasts per cell were described from the west coast of North America: Porphyra smithii Hollenberg & I.A. Abbott (1968, pp. 1241–1243) and Porphyra kanakaensis Mumford (1973, p. 239). These species were transferred to Pyropia as Pyropia smithii (G.J. Hollenberg & I.A. Abbott) S.C. Lindstrom and P. kanakaensis (T.F. Mumford) S.C. Lindstrom, respectively, and are not closely related (Sutherland et al. 2011).

Although it is also epiphytic [on Mastocarpus agardhii (Setchell & N.L. Gardner) S.C. Lindstrom, Hughy and Martone and other mid-intertidal algae], Pyropia smithii has not been observed on surfgrass. In contrast to P. pulchra, which was recorded only from the Monterey Bay and Bodega Bay areas by Abbott and Hollenberg (1976), P. smithii is widely distributed on the Pacific coast of North America, from the Monterey Peninsula in California to Haida Gwaii in British Columbia, Canada (Hollenberg and Abbott 1968; Kucera and Saunders 2012). It has also been collected on Calvert Island, on the central coast of British Columbia, in the low intertidal on algae-encrusted rock (UBC A90511; GenBank KT988905) as well as epiphytically on mid-intertidal Mastocarpus (UBC A90806; GenBank KT988908) and Fucus (UBC A90446, GenBank KT988906; UBC A90447, GenBank KT988904). Other differences between the species noted by Hollenberg and Abbott (1968), including tidal elevation, thallus shape, thickness and color, can be highly variable in species of foliose Bangiales.

Recently, the complete plastid genome of Porphyra pulchra was sequenced from a herbarium specimen collected at the type locality (UC1879714) (Lee et al. submitted; GenBank KT266789 unpublished). Dr. Hwan Su Yoon (pers. comm.) shared the rbcL gene sequence with us. Comparison of the rbcL gene of P. pulchra with that of Py. smithii shows that the sequences differ by only 2 bp. Both polymorphisms are transitions in the third codon position, accounting for less than 0.1% difference across the gene. This difference is not sufficient to warrant recognition of separate species. To confirm that the holotype specimen of P. pulchra is the same species as UC1879714 and P. smithii, we sequenced a 123 bp and a 241 bp region of the rbcL gene following previously described methods and precautionary guidelines (Hughey and Gabrielson 2012; Lindstrom et al. 2015). The holotype sequence (GenBank KT988909) was identical to the topotype sequence and that of P. smithii for these short, species-specific variable targets. Porphyra pulchra is the older specific epithet; we therefore make a new combination in Pyropia and place P. smithii in synonymy.

TAXONOMIC TREATMENT

Pyropia pulchra (Hollenberg) S.C. Lindstrom & Hughey, sp. nov.