

A reinstated species name for north-eastern Pacific *Macrocystis* (*Laminariaceae*, *Phaeophyceae*)

Sandra C. Lindstrom¹

¹Department of Botany, #3156 – 6270 University Blvd., University of British Columbia, Vancouver, BC, Canada V6T 1Z4 (correspondence: Sandra.Lindstrom@botany.ubc.ca)

Macrocystis C.Agardh 1820 is a distinctive genus of floating kelps widely distributed in temperate regions, except the North Atlantic and the north-western Pacific, where the absence of consistent upwelling may not have favoured floating kelps. Because of its large size, ecosystem functions, and economic value, it is one of the most-studied genera of seaweeds. Despite this, its infrageneric taxonomy has been uncertain for some time. In general, two widely distributed species, occurring in both the southern and northern hemispheres, have been recognized: *Macrocystis pyrifera* (Linnaeus) C.Agardh with a conical holdfast, and *M. integrifolia* Bory with a rhizomatous holdfast. Demes & al. (2009) observed a continuum of holdfast morphologies from the intertidal to the subtidal and proposed the synonymization of these two species, as well as the less widely distributed *M. angustifolia* Bory and *M. laevis* C.H.Hay. This synonymization has been followed by AlgaeBase (Guiry & Guiry 2023; searched on 23 July 2023) and others.

Using whole-genome molecular data, Gonzalez & al. (2023) recently showed that the taxonomy of *Macrocystis* is much more complicated than recognizing a single, morphologically variable species. Their results showed that *M. integrifolia* and *M. pyrifera* are genetically distinguishable from each other, and the northern (California) and southern (Chilean) populations of both species are likewise distinct. Since both *M. integrifolia* and *M. pyrifera* and most other *Macrocystis* names have southern hemisphere types, species names with northern hemisphere types are required for the northern taxa.

Of the names available, only *M. tenuifolia* Postels & Ruprecht (1840: 9, pl. 7), with a type locality of “*in sinu Norfolk* [Norfolk Sound, now Sitka Sound, Alaska] *ad littora Americae boreali-occidentalis*” appears to be available and appropriate. Thus, I recommend that all north-eastern Pacific specimens north of Point Conception, California, previously recognized as *M. integrifolia* and *M. pyrifera*, now be called *M. tenuifolia* pending further molecular work (Gonzalez & al. showed that specimens from south of Point Conception were more distinct from more northerly specimens than South American *M. integrifolia* and *M. pyrifera* were from each other, suggesting a different name is required for this population). It should be noted that Sitka Sound *Macrocystis* has a conical holdfast like California specimens in contrast to the rhizomatous holdfast more common at intervening localities. I have seen a syntype of *M. tenuifolia* in S, and this specimen is designated here as the lectotype ([Link](#)). No type material of *Macrocystis tenuifolia* was found in LE when the herbarium was visited in 1996.

Lectotype of *Macrocystis tenuifolia* Postels & Ruprecht: here designated, ex “*Herb. Acad. Petrop. Sitcha, Amer. ross. Dr. Mertens.*” Herb. J.E. Areschoug, S ([Link](#)).

PhycoBank registration: <http://phycobank.org/103923>

Two other older “*Macrocystis*” species names from the northeast Pacific are currently considered to be species of *Egregia*: *Macrocystis menziesii* (Turner) C.Agardh and *Macrocystis obtusa* Harvey. *Macrocystis menziesii* has as its basionym, *Fucus menziesii* Turner, which is also the basionym for the type of *Egregia*. *Macrocystis obtusa* has a rather more complicated history. AlgaeBase lists it under the most recently available name, *Phyllospora obtusa* (Harvey) Endlicher, but *M. obtusa* has

a type locality of California, and AlgaeBase currently shows *Phyllospora* as being endemic to temperate regions of Australia. An image of the **BM** type of *M. obtusa* (BM000568783) is available on [JSTOR Global Plants](https://www.jstor.org/stable/2372911). This specimen clearly represents a plant with the morphology of *Egregia* with a strap-like thallus beset by dense projections, small blades and mostly solitary pneumatocysts (only occasionally subtending a blade). The specimen was annotated by Paul C. Silva (1922–2014) as “*E. obtusa* (Harvey) Silva *comb. nov.*” in 1957, although that name has not been published. Therefore, I provide the following nomenclatural information to effect that transfer:

Egregia obtusa (Harvey) P.C.Silva ex S.C.Lindstrom *comb. nov.*

Basionym: *Macrocystis obtusa* Harvey, In: *The botany of Captain Beechey's voyage* p.163, 1833.

Phycobank registration: <http://phycobank.org/103925>

Type locality: “California”.

Note: This species may be conspecific with *Egregia menziesii* (Turner) Areschoug, but further study is necessary.

- Demes, K.W., Graham, M.H. & Suskiewicz, T.S. (2009). Phenotypic plasticity reconciles incongruous molecular and morphological taxonomies: the giant kelp, *Macrocystis* (Laminariales, Phaeophyceae), is a monospecific genus. *Journal of Phycology* 45: 1266–1269.
- Gonzalez, S.T., Alberto, F. & Molano, G. (2023). Whole-genome sequencing distinguishes the two most common giant kelp ectomorphs. *Evolution* 77(6): 1354–1369.
- Guiry, M.D. & Guiry, G.M. (2023) AlgaeBase. World-wide electronic publication, National University of Ireland, Galway. <https://www.algaebase.org>.
- Harvey, W.H. (1833). Algae. In: *The botany of Captain Beechey's voyage*; comprising an account of the plants collected by Messrs Lay and Collie, and other officers of the expedition, during the voyage to the Pacific and Bering's Strait, performed by His Majesty's Ship Blossom, under the command of Captain F.W. Beechey, R.N., F.R. & A.S., in the years 1825, 26, 27, and 28. (Hooker, W.J. & Arnott, G.A. Eds), pp. 163-165. London: Henry G. Bohn, No. 4 York Street, Covent Garden.
- Postels, A. & Ruprecht, F.J. (1840). *Illustrationes algarum in itinere circum orbem jussu imperatoris Nicolai I. Atque auspiciis navarchi Friderici Lütke annis 1826, 1827, 1828 et 1829 celoce Seniavin exsecuto in Oceano pacifico, inprimis septentrionale ad littora rossica asiaticoamericana collectarum*. pp. [i–vi], [i]–iv, 1–28 [1–2, index], [Latin:] [–iv], [1]–22, [1–2, index], 40 pls. Petropoli [St. Petersburg]: Typis Eduardi Pratz.