

[Review]

Marine Algae and Early Explorations in the Upper North Pacific and Bering Sea

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A synthesis of early exploration and the discovery of marine algae in the upper North Pacific and Bering Sea is presented covering the period from the late 1730s to around 1900. Information is provided about these early efforts to gather natural objects, including seaweeds, and names of these algae are enumerated. The first collections of marine algae in this broad region were those made by Steller and Krasheninnkov from the Kamchatka Peninsula, Russia, during the Second Kamchatkan Expedition (1735-1742) and were described by Gmelin (1768). The first known algal collections in Alaska were those made by Merck in his 1790-1791 visits to Unalaska Island during the Billings expedition (1785-1794). British-sponsored expeditions for commercial purposes and for exploration and discovery allowed surgeon-naturalist Archibald Menzies to gather seaweeds that Dawson Turner and others worked up back in Europe. Several of the Russian expeditions during the first half of the 18th century had naturalists aboard. The first Russian circumnavigation of the globe (1803-1806), with the ships 'Nadeshda' and 'Neva,' under the command of Capt. Adam von Krusenstern had naturalists Langsdorff, Tilesius, and Horner, all of whom collected seaweeds. The naturalist Adelbert Chamisso accompanied the Romanzof Expedition (1815-1818) on the Russian vessel 'Rurik' under the command of Otto von Kotzebue and made collections of algae in the Aleutians as well as in the Kurils and Kamchatka. The Lütke expedition of 1826-1829 consisted of two ships. Feodor Lütke was in command of the 'Seniavin' with K.H. Mertens aboard as physician-naturalist, and the 'Moller' was under the command of Staniukovich accompanied by the naturalist G. Kastalsky. The first American-sponsored scientific expedition (1838-1842) was that commanded by Charles Wilkes, and the algae that were collected were worked up by J.W. Bailey and W.H. Harvey. The Russian naturalist Ilya Voznesenskii spent the period 1839-1849 in Russian America (Alaska and northern California) energetically traveling and making numerous collections of natural objects as well as ethnographic artefacts. His algae were described by F.J. Ruprecht back in St. Petersburg. The Swedish scientific vessel, the 'Vega' (1878-1880), was under the command of Nordenskiöld. The naturalist F.R. Kjellman made algal collections from Port Clarence, Alaska, as well as from Bering Island and St. Lawrence Island in the Bering Sea. The Harriman Alaskan Expedition in the summer of 1899, with the ship 'George W. Elder,' was sponsored by railroad magnate E. H. Harriman of New York City and had several scientific personnel aboard, including the phycologist De Alton Saunders. Algae were collected in Alaska and Washington. During the same summer of 1899 a scientific expedition organized by the University of California and including W.L. Jepson, L.E. Hunt, A.A. Lawson, and W.A. Setchell as participants also visited Alaska and made collections of algae from various locations.

Key Words: Alaska, Bering Sea, early exploration, *Eualaria*, *Eualaria fistulosa* comb. nov., marine algae, North Pacific

INTRODUCTION AND OVERVIEW

Exploration for benthic marine algae in the upper North Pacific and the Bering Sea began incidentally with the naturalists approaching from the west, that is, from Russia, when Georg W. Steller, as part of the Second Kamchatkan Expedition, or the Great Northern Expedition (1735-1742), spent time living in Kamchatka starting in the winter of 1740. In fact, his fellow naturalist

Stepan P. Krasheninnkov had arrived in Kamchatka in October, 1737, three years prior to Steller's arrival (Rowell 1973). Both men collected and studied the plant life of Kamchatka, compiling lists and making reference to any economic uses. Frost (in Steller 1988) characterized Steller as "a new breed of naturalist," one preferring to travel light to cover great distances with few helpers and minimal provisions. Unlike his predecessors and contemporary scientists, he did without assistants, servants, and cooks, drinking from a single cup and preparing his own food from a single plate. In 1741 Steller joined Vitus Bering on a voyage to discover Alaska. In

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his journal Steller (1988) reported seeing seaweeds sometimes in great quantity, and he gave such examples as "*Fucus clavae effigie*," "*Quercus marina glandifera Bauhinii*," "*Alga dentata Raji*," and "*Fuci membranacei calyciformes*," all pre-Linnaean polynomials and thus invalid names. The Bering Expedition made their first landing in Alaska at Kayak Island in the Gulf of Alaska. Bering's name for the island was Saint Elias. Steller was said to be the first to jump ashore, "the first white man to set foot on Alaskan soil" (Stejneger 1936). Although no seaweed or plant collections from Alaska made their way back to St. Petersburg (Shetler 1967; Kawai *et al.* 2008), a handful of Steller's plants did reach the hands of Linnaeus (Hultén 1968). Reveal (1991) has discussed that Linnaeus first proposed the name "*Mitella foliis ternatis*" based on a plant collected by Steller on Cape St. Elias, Kayak Island, Alaska, and in 1753 the name of this plant became validated as *Tiarella trifoliata* L. (Linnaeus 1753). Similarly, the type locality of *Claytonia sibirica* L. was either Kayak Island or Bering Island (Hultén 1968). Also, a lengthy list of plants observed by Steller on Kayak Island did survive. This catalogue contains approximately 140 pre-Linnaean names of flowering plants, conifers, ferns, lichens, fungi, and one apparent alga: "*Fucos vide seorsim inferius*" (Stejneger 1936, Appendix E). This impressive list was compiled by Steller in a matter of 6 hours of the single day in July of 1741 on their stop at Kayak Island. There is no evidence that Steller made any collections of plants in the Aleutian Islands (Hultén 1937). On the homeward voyage, the 'St. Peter' was shipwrecked on a desolate island, later to be called Bering Island in the archipelago of the Commander Islands, situated in the southwest corner of the Bering Sea between the Aleutian Islands and the Kamchatka Peninsula (Cline 2005). Half of the crew died of scurvy and malnutrition during that winter of 1741-1742, Captain-Commander Vitus Bering dying in December. A memorial was later erected in tribute to him (Lauridsen 1969). After barely surviving the aftermath of that voyage, Steller returned to Kamtchatka in 1742 and spent two additional years exploring the Kamtchatka peninsula and making collections of natural objects (Arwidsson 1932). His collections of seaweeds from Kamchatka did make their way back to St. Petersburg, and many were described and depicted in S.G. Gmelin's (1768) *Historia fucorum*. Gmelin's tome is notable in being the first work dealing exclusively with algae and using the binomial system of nomenclature (Silva *et al.* 1996).

Another voyage of discovery from Russia was that of

the "Northeastern Secret Geographical and Astronomical Expedition" of 1785-1794, commissioned by Empress Catherine II of Russia. The commander of the expedition was the English navigator Capt. Joseph Billings, and the two ships were 'Slava Rossie' and the 'Chornie Orel.' Carl Merck was the naturalist. According to Hultén (1937), Merck made plant collections in the Aleutian Islands, Prince William Sound, St. Lawrence Island, and the Seward Peninsula. A translation of Merck's journal of his trip from Siberia to Alaska was published (Merck 1980). Specimens of algae were collected by Merck, and unpublished plates now in the National Herbarium of Victoria and brief accounts depicting those algae made by Tilesius exist. Merck's material of *Mikamiella ruprechtiana* (Zinova) M.J. Wynne represents the earliest known collection of algae from Alaska (Wynne 2006b).

Subsequent voyages, either for commercial purposes or for exploration and discovery, entered the North Pacific. The Scottish surgeon-naturalist Archibald Menzies (Fig. 1) accompanied two voyages, first that with Capt. Colnett's ship 'Prince of Wales' (1786-1789) and later on Capt. George Vancouver's 'Discovery' (1791-1795) (Scagel 1957). He was characterized as a being "a complete botanist," who collected all plant groups, although the cryptogams, especially lichens and mosses, were his favorite plants (Galloway 1995). Menzies (1993) left behind his journal detailing his observations made during his time on the 'Discovery,' and a list of his botanical collections has been compiled by J. F. Thilenius (in Menzies 1993). Dawson Turner (Fig. 2) in Yarmouth, England, described a number of Menzies' algal collections. A few of Menzies' collections, loaned by Turner as fragments to Eugen Esper, ended up being described as new species by Esper (Esper 1797-1808; Silva 1953).

According to Komarov (1926), the adjunct, or associate, Redovski made some of the first collections of marine algae from the region of the Okhotsk Sea, and his collections and those later collected by Alexander von Middendorff from the Shantar Islands were included in Ruprecht's (1850, 1851) "*Algae Ochotenses*," a work in which 26 species of red algae, 20 species of brown algae, and 11 species of green algae were described.

Several other expeditions set out from Russia. The 'Nadeshda' under Capt. Adam von Krusenstern (1803-1806), the Romanzof Expedition (1815-1818) with the 'Rurik' under Otto von Kotzebue, and the 'Seniavin' under the command of Feodor Lütke (1826-1829). Krusenstern had convinced Count Nikolai Petrovitch



Figs 1-6. Fig. 1. Archibald Menzies. (Portrait by Eden Upton Eddis). Fig. 2. Dawson Turner. Fig. 3. Georg von Langsdorff. Fig. 4. Adelbert Chamisso. Fig. 5. Franz J. Ruprecht. Fig. 6. Jacob W. Bailey. [Fig. 1 by permission of the Linnean Society of London; Fig. 2 engraving by Mrs. Turner from a drawing by Thomas Phillips in 1816; from Munby (1962); Fig. 3 from Langsdorff (1813-1814); Fig. 4 from Chamisso (1856); Fig. 5 from Maximowicz (1871); Fig. 6 from University of Michigan Herbarium archives]

Romanzof, the Grand Chancellor of the Russian Empire, that a scientific expedition to the South Pacific islands and the polar regions would be timely now that the Napoleonic Wars had abated. The purposes of the expedition were several: to impress the world with the prestige of the Imperial Russian Navy, to explore for new geographic discoveries, such as a possible passage between Baffin Bay and the northwest coast of America, and to gather plant and animal specimens from these

remote shores (Brosse 1983). This voyage under the command of Krusenstern proved to be the first Russian circumnavigation of the globe. Georg Langsdorff (Fig. 3) was naturalist on the 'Nadeshda,' and his plant descriptions have been called "detailed and precise" (Rowell 1973). Langsdorff was called an "indefatigable naturalist" by Saint-Hilaire (Daniels & Stafleu 1979). Several versions of his accounts have been published (Langsdorff 1813-1814, 1927, 1993). He departed the expedition in



Figs 7-9. Fig. 7. William H. Harvey. Fig. 8. Ilya G. Voznesenskii. Fig. 9. F.R. Kjellman. [Fig. 7 frontispiece from Harvey (1849); Fig. 8 adapted from Komarov (1926, plate opposite p. 120); Fig. 9 frontispiece from Kjellman's 1906 'Festkrift']

Kamchatka, but he was able to make use of a boat provided by the Russian-American Company to explore St. Paul Island in the Pribilofs, Unalaska Island in the Aleutians, Kodiak Island, the Alaska Peninsula, and Sitka (Hultén 1937), all the time making collections and compiling a list of the land plants that he saw. Langdorff's and Horner's algal collections from the North Pacific were described by Dawson Turner in England and by Carl Agardh in Sweden.

The charismatic figure Adelbert von Chamisso (Fig. 4), author, poet, and broadly based naturalist was the collector that accompanied the Romanzof Expedition. He was responsible for making collections of algae from the shores of Kamchatka and the Kuril Islands as well as Unalaska Island in the Aleutians. Several of Chamisso's collections from Kamchatka and Unalaska Island were described by Agardh. He is also credited as the first botanist to have produced a thorough and systematic survey of the land plants of the Aleutian islands (Rowell 1973). With D. von Schlechtendal, Chamisso published the botanical results of the Romanzof Expedition in the journal *Linnaea* between 1826 and 1833.

Ferdinand von Wrangel commanded a Russian voyage around the world in 1825-1827, and the accompanying botanist Rieder collected seaweeds in Kamchatka. Later, Wrangel was to serve as governor of the Russian colonies in Alaska. He ordered the construction of a stockade that was named Redoubt Saint Dionysius, near settlements of the local Tlingits. The city of Wrangell in southeast Alaska is on the site of the original stockade.

The Fedor Petrovich Lütke expedition of 1826-1829 consisted of two ships, the 'Seniavin' and the 'Moller' (Lütke 1835-1836, 1837, 1971). The former ship, under the command of Lütke, had aboard Karl Heinrich Mertens (physician and naturalist), Alexander Postels (geologist and illustrator), and F.K. von Kittlitz (ornithologist and illustrator). The magnificent elephant folio volume *Illustrationes algarum* by Postels and Ruprecht was a major achievement from this expedition (Fig. 18). The latter ship was under the command of M.N. Staniukovich and was accompanied by the naturalist G. Kastalsky, who also made some collections of algae. Several of Kastalsky's collections were included in the *Illustrationes algarum*. In all, some 2,500 specimens of dried plants and of algae were gathered on the expedition. Postels' co-author F.J. Ruprecht (Fig. 5) was Curator and later Director of the Botanical Museum [later the Komarov Botanical Institute] of the Russian Academy of Sciences in St. Petersburg (Shetler 1967).

Charles Wilkes commanded the first American voyage of exploration (1838-1842), and some macroalgae and diatoms were described from the collections by Jacob Bailey (Fig. 6) of West Point, New York, and William Harvey (Fig. 7) of Trinity College, Dublin (Harvey and Bailey 1851; Bailey and Harvey 1862). Harvey, a distinguished Irish botanist, also had the responsibility of determining the algal collections brought back by the British expedition, H.M.S. 'Blossom,' commanded by Captain Beechey, but most of this algal specimens on that expedition were collected from Monterey and San

Francisco, California (Harvey 1833, 1841).

The Russian Ilya G. Voznesenskii [Wosnessenski] (Fig. 8) was a collector not on an expedition *per se* but was on his own, a “free-lancer” traveling extensively throughout the North Pacific in the period 1839 through 1849. At the age of 24 he was commissioned to make scientific collections in the Russian possessions of America. His travels were sponsored by the Russian Academy of Sciences with major assistance from the Russian-American Company. He managed to take passage on several different Russian ships during this 10-year period, making stops at St. Lawrence Island, Unga, Unalaska, Kodiak, and the Pribilof Islands of Alaska. He was on remote Atka and Attu in August, 1844 (Hultén 1937). Taking passage on the ship ‘Naslednik Alexandr,’ he sailed from Sitka to Isla Carmen in the Gulf of California, Mexico. The purpose of the voyage was to obtain for the Russian colony a three-year supply of salt from the deposits on the island (Carter 1979). On the ship he observed massive rafts of seaweeds near Guadalupe Island, Mexico (Alekseev 1990). Voznesenskii spent the winter of 1841-1842 on Isla Carmen as well as Port Loreto, Baja California, and he reached as far south as Puerto Escondido, Oaxaca, in southern Mexico, making collections of plants and animals (Carter 1979; Alekseev 1990). He spent time at Fort Ross, in northern California, and at Novo-Arkhangel’sk [now Sitka], southeast Alaska, always in a quest for natural history objects: animals, plants, geological specimens, and the handiwork of the natives (Chevigny 1965). He also visited Bering Island, Attu, Atka, and spent the winters of 1843-1844 and 1844-1845 in Novo-Arkhangel’sk. Voznesenskii deposited a duplicate set of his specimens for the museum of natural history and ethnography in Novo-Arkhangel’sk, but according to Black (2004) those collections were pilfered during American rule in Alaska. He extended his wanderings by spending two years on the Kamchatka peninsula making additional collections. Arwidsson (1932) listed some of the species of algae collected by Voznesenskii from the west coast of Kamchatka and published by Ruprecht (1850, 1851). He left Petropavlovsk in mid-October of 1848 and sailed back to Novo-Arkhangel’sk and stayed for 16 days before setting sail for home on the ‘Atkha,’ via Hawaii, Cape Horn, and Rio de Janeiro. He finally reached the port of Kronstadt near St. Petersburg in June, 1849, with 150 cases of samples (Alekseev, 1990). His collections included animals (3,887 specimens), plants (almost 2,000 herbarium sheets including a “rich diversity of marine plants (algae)”), fossils, minerals, and

anthropological artifacts. He also made 156 sketches, 96 of which were in color. His collections of land and sea animals, including numerous remains of the extinct Steller sea-cow, were regarded by Schmidt (1926) as of “exceptional value”. These collections were presented to the Zoological Museum of the Imperial Academy of Sciences, St. Petersburg (Alekseev 1987). Upon his return to St. Petersburg, Voznesenskii was appointed Conservator of the Museum by the Academy of Science, a post that he held for 22 years. With the permission of the Tsar, he was promoted to the rank of “collegiate registrar” in 1852 and to the rank of “gubernia secretary” the next year (Alekseev 1990). But the unfortunate fact is that the bulk of his diaries and notes remained unworked at the time of his death in 1871.

The ill-fated French expedition (1785-1788) with the ships ‘La Boussoule’ and ‘L’Astrolabe’ commissioned by Louis XVI, King of France, and under the command of de La Perouse and with a full crew of scientists, visited Alaskan and Russian coasts (Milet-Mureau 1797; La Pérouse 1799, 1801). On July 13, 1786 in their exploration of the Alaskan coastline of present-day Glacier Bay National Park, La Pérouse discovered the fjord that he named Port des Français [now Lituya Bay], but the treacherous tidal currents capsized two of their three long boats, and 21 men perished (La Pérouse 1969). Later both ships were lost, and the crews disappeared in the South Pacific. The two frigates had been shipwrecked during a storm (Davidson 1975). Later, traces of the two ships were found at Vanikoro in the eastern part of the Solomon Islands. Relics from the ships are on display in the French Naval Museum in Paris (Bellec 1985).

The Spanish-based Malaspina Expedition (1789-1794), a very ambitious undertaking, reached the Gulf of Alaska. Expedition artist Tomás de Sureia sketched Mount St. Elias and a native settlement at Yakutat (Archer 1980). Some algae from the expedition were collected and described (Papenfuss 1976; Silva 1996), but due to circumstances after the voyage the results were disappointing (Wynne 2006a).

The British ship H.M.S. ‘Herald’ under the command of Captain Henry Kellett explored and surveyed the American west coast, northward to Alaska and the Arctic Sea, with stops at Port Clarence and Kotzebue Sound (Fig. 23). Recommended for the position by Sir William J. Hooker, the German Berthold C. Seeman served as botanist on this voyage, along with two other naturalists, T. Edmonston and J. Goodridge. Seeman’s modest collections of Alaskan algae were worked up by Harvey

(1852b). The list included no new species. The expedition also made stops in Hawaii, Hong Kong, the East Indies, and Cape Town, South Africa. Seeman (1852-1857) published a more extensive account of the plants collected during the voyage.

The Swedish expedition of 1878-1880 of the 'Vega' under the command of Nordenskiöld with F.R. Kjellman (Fig. 9) as the botanist entered the Bering Sea from the north, and many algae were collected and described. An American expedition was organized and sponsored by railroad magnate E.H. Harriman from New York in the summer of 1899, and marine algae were collected from the State of Washington and along the coast of Alaska. An additional expedition to Alaska that same summer of 1899 was sponsored by the University of California and was comprised of several scientists from that institution. The services of several shipping companies and the U.S. Coast Guard were utilized in reaching a wide variety of locations throughout Alaska. The publication by Setchell & Gardner (1903) included results from not only that 1899 expedition but numerous other small and large collections from Alaska, British Columbia, and Washington. At the time it represented the most complete account of the species of benthic marine algae for the coast of northwestern America.

SUMMARY OF INFORMATION OF EXPEDITIONS AND RESULTS ON ALGAE

Dates of voyage: Sept. 1740-Oct. 1741

Ships: 'St. Peter' (the flagship), 'St. Paul'

Nationality: Russian "Second Kamtchatkan Expedition," also "Great Northern Expedition" (1733-1743)

Commanders of expedition: Capt. Commander Vitus Bering; Capt. Aleksey I. Chirikov.

Scientists on board: G.W. Steller (naturalist), Stepan P. Krasheninnikov (Johann Gmelin's personal representative), de la Croyère (astronomer & naturalist).

Phycological publication: Gmelin (1768). For material from Kamchatka, Gmelin cited Steller as the collector for some but not for all the newly described species.

Selected taxa [with current names]:

Fucus agarum S.G. Gmel. [= *Agarum clathratum* Dumortier] Syntype localities: "Oceanus Indiae orientalis et mare Kamschaticum." See Silva (1991) for a clarification of the complicated nomenclatural history of this species.

Fucus angustifolius S.G. Gmel. [= *Alaria esculenta* (L.) Grev. f. *latifolia* Post. & Rupr.] collected by

Krasheninnikov at Bolshaya River, Irkutsk, eastern Russia.

Fucus bifidus S.G. Gmel. [= *Arthrothamnus bifidus* (S.G. Gmel.) Rupr.] A Kamchatka collection by Steller.

Fucus clathrus S.G. Gmel. (Fig. 10) [= *Thalassiophyllum clathrum* (S.G. Gmel.) Postels & Rupr.] Syntype localities of "Oceanus indicus et Mare Kamtschatkam".

Fucus corymbiferus S.G. Gmel. [= *Odonthalia corymbifera* (S.G. Gmel.) J. Agardh]. Collected at Kamchatka. The name of the collector was not cited, but it was presumably Steller or Krasheninnikov.

Fucus crenatus S.G. Gmel. [= *Phycodrys rubens* (L.) Batters] Syntype localities of Cornwall, England, and Kamchatka, Siberia.

Fucus crinitus S.G. Gmel. [= *Tichocarpus crinitus* (S.G. Gmel.) Rupr.] Kamchatka.

Fucus dulcis S.G. Gmel. nom. illeg. [= *Palmaria palmata* (L.) Kuntze] Kamchatka.

Fucus fimbriatus S.G. Gmel. [= *Alaria esculenta* (L.) Grev. f. *latifolia* Post. & Rupr.] Collected by Steller from the Kamchatka Sea.

Fucus myrica S.G. Gmelin [= *Cystoseira myrica* (S.G. Gmel.) C. Agardh] collected by Krasheninnikov The type locality would seem to be the shores of Kamtchatka but is confused by Gmelin's preceding it with "Mare mediterraneum?".

Fucus polyphyllus S.G. Gmel. [= *Alaria esculenta* (L.) Grev. f. *pinnatifida* Postels & Rupr.] Collected by Steller at Kamtchatka.

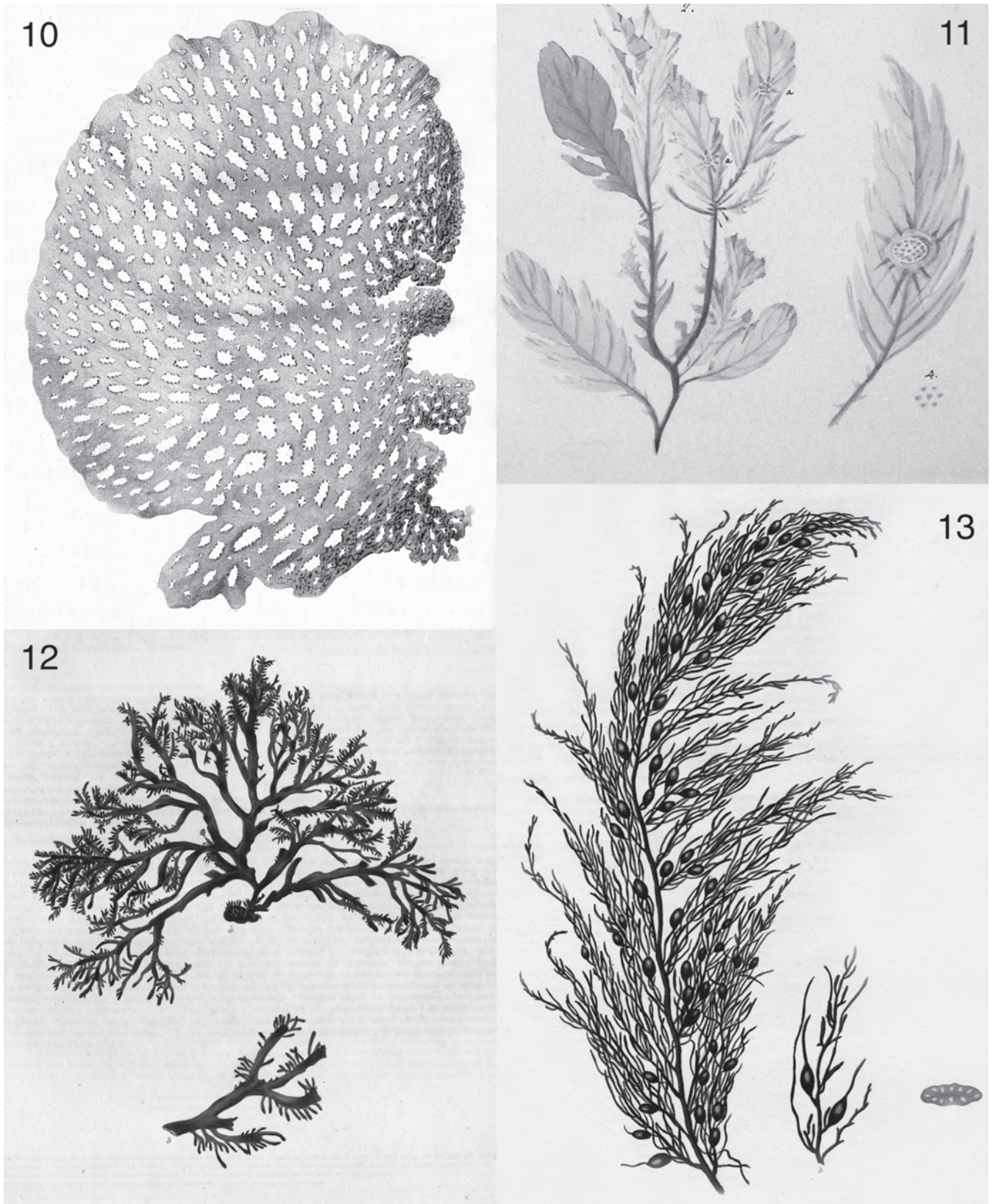
Fucus rosa-marinus S.G. Gmel. [= *Constantinea rosa-marina* (S.G. Gmel.) Postels & Rupr.] Collected at Lopatka, Kamchatka.

Ulva glandiformis S.G. Gmel. [= *Halosaccion glandiforme* (S.G. Gmel.) Rupr.] A collection from Kamchatka, Russia. The original material, now lost, was collected by either Steller or Krasheninnikov (Ruprecht 1850, 1851). It is accepted that Gmelin's material is the same as Postels & Ruprecht's *Dumontia hydrophora* (see Hawkes & Scagel 1986).

Ulva priapus S.G. Gmel. [apparently *Nereocystis luetkeanus* (K. Mert.) Postels & Rupr., although this species is known to occur in the attached condition only as far west as Umnak Island, west of Unalaska Island in the Aleutians according to Miller & Estes (1989)] Collected by Steller at Kamtchatka.

Related publications: Stejneger (1936); Krasheninnikov (1760, 1763, 1764, 1972); Rowell (1973); Steller (1988); Frost (2003)

Notes: The plant collections made in Alaska were lost,



Figs 10-13. Fig. 10. *Fucus clathrus* S.G. Gmel. Fig. 11. *Palmetta aleutica* Tilesius ined. Fig. 12. *Fucus crinitus* S.G. Gmel. Fig. 13. *Fucus scoparius* Turner. [Fig. 10 from Gmelin (1768, pl. XXXIII); Fig. 11 image of a plate in National Herbarium of Victoria; Fig. 12 from Turner (1809, pl. 123); Fig. 13 from Turner (1809, pl. 132)]

but the historical records of the collections are preserved in St. Petersburg (Hultén 1940; Shetler 1967).

Dates of voyage: 1785-1794

Ships: 'Slava Rossie' [Glory of Russia], 'Chornie Orel' [Black Eagle]

Nationality: Russian

Commander of expedition: Capt. Joseph Billings

Scientists on board: Carl Heinrich Merck (naturalist); John Mains (assistant)

Phycological publications: C. Agardh (1820a, 1821, 1822-1823); Postels & Ruprecht (1840)

Selected taxa [with current names]:

Gigartina muricata Postels & Rupr. [= *Endocladia muricata* Postels & Rupr.] J. Agardh] A Merck collection from Unalaska Island, Alaska.

Palmetta aleutica Tilesius ined. (Fig. 11) [= *Mikamiella ruprechtiana* (Zinova) M.J. Wynne]

Related publications: Sauer (1802); Sarychev (1806-1807); Rowell (1973); Merck (1980); Wynne (2006b)

Dates of voyage: 1786-1789

Ships: 'Prince of Wales' and 'Princess Royal'

Nationality: British

Commander of expedition: Captain Colnett

Scientist on board: Archibald Menzies (surgeon, naturalist) (Fig. 1)

Phycological publications: Turner (1809); Harvey (1853)

Selected taxa [with current names]:

Fucus ovalis Hudson [var.] *subarticulatus* Turner [= *Neogastroclonium subarticulatum* (Turner) L. Le Gall, Dalen & G.W. Saunders (2008)] According to Hawkes (1986), specimens of this alga were collected by Menzies in 1787 and later in 1793. A collection from the latter expedition became the lectotype.

Polysiphonia nigrescens Grev. [var.] *Menziesii* Harvey [uncertain status at present]. Harvey (1853: 50) indicated that this new variety was collected on the "West coast" in 1788.

Ptilota plumosa C. Agardh [= *Ptilota filicina* J. Agardh]. According to Harvey (1853) a Menzies collection made at Prince William Sound, Northwest America, in 1787.

Rhodomela pilulifera Grev. According to Harvey (1853), this was a Menzies collection made at Nootka in 1787. The name used by Greville (1830) was based on *Fucus pilulifer* Turner nom. illeg. Greville had missed Turner's (1819) use of *F. globulifer* nom. nov. on pg. 3 of Turner's Index.

Related publications: Scagel (1957); Godley (1960); Menzies (1993); Galloway & Groves (1987); Groves (1998)

Note: According to W.M. Olson in the introduction to Menzies (1993), the primary purpose of this expedition was to purchase furs, and the collection of "curiosities" was banned. But Sir Joseph Banks prevailed upon the ship's owner to allow Menzies, an amateur but ardent botanist, to collect "plants and other curiosities beneficial to science". Menzies made plant collections in the woods near Nootka Sound on the west coast of Vancouver Island and also seems to have visited the Queen Charlotte Islands and Banks Island (Scagel, 1957). According to Groves (1998) a list of the plants collected on this expedition has not survived.

Dates of voyage: 1791-1795

Ship: 'Discovery' [and 'Chatham']

Nationality: British

Commander of expedition: Capt. George Vancouver

Scientist on board: Archibald Menzies (Fig. 1)

Phycological publications: Esper (1802-1804); Turner (1807-1819)

Selected taxa [with current names]:

Fucus asplenioides Esper [= *Neoptilota asplenioides* (Esper) Kylin] Based on a Menzies collection from Prince William Sound, Alaska, sent to Esper by Turner (Fig. 2). Turner (1807-1808) later cited collections made by Menzies from Prince William Sound, by Horner from Kamchatka, and by Brown from Bass Strait, Australia.

Fucus costatus Turner nom. illeg. [= *Costaria costata* (C. Agardh) D.A. Saunders] A Menzies collection. The stated provenance, "on the west coast of South America," was an obvious error for North America.

Fucus floccosus Esper [= *Odonthalia floccosa* (Esper) Falkenb]. Although Esper (1802) indicated Nootka Sound as the provenance and that it had been brought back by Capt. James Cook, Turner (1808) disagreed, stating that the collector was Archibald Menzies and that it was from Port Trinidad, northern California (See Silva, 1953).

Fucus globulifer Turner (1819). This was a replacement name for *Fucus pilulifer* Turner nom. illeg. (1819), non *F. pilulifer* Turner (1808) [= *Sargassum pilulifer* (Turner) C. Agardh (1820b)]. Collected by Menzies from Nootka Sound, Vancouver Island, British Columbia. This has been treated by De Toni (1903) to

be a taxonomic synonym of *Odonthalia floccosa* (Esper) Falkenb.

Fucus herbaceus Turner nom. illeg. [= *Desmarestia herbacea* J.V. Lamour.] A Menzies collection from the north-west coast of America.

Fucus larix Turner [= *Neorhodomela larix* (Turner) Masuda]. A Menzies collection from Nootka Sound [Vancouver Island, British Columbia, Canada.]

Fucus linearis Turner nom. illeg. [= *Gymnogongrus linearis* (C. Agardh) J. Agardh] Based on a collection made from Trinidad, northern California.

Fucus menziesii Turner [= *Egregia menziesii* (Turner) Aresch.] A Menzies collection from the western coast of North America.

Fucus nootkanus Esper [= *Bonnemaisonia nootkana* (Esper) P.C. Silva] Although this material was originally thought by Silva (1953) to be from Nootka Sound (Vancouver Island, Canada), Silva *et al.* (1996) later regarded the provenance of this material as uncertain. The biota associated with an isotype specimen occurs in tropical and subtropical waters, and therefore Nootka Sound can be dismissed as the type locality.

Fucus osmundaceus Turner [= *Cystoseira osmundacea* (Turner) C. Agardh] A Menzies collection from Port Trinidad, northern California.

Fucus ovalis Hudson [var.] *subarticulatus* Turner [= *Neogastroclonium subarticulatum* (Turner) L. Le Gall, Dalen & G.W. Saunders (2008)] A specimen collected by Menzies in 1793 from Nootka Sound, Vancouver Island, British Columbia, was designated the lectotype (Hawkes 1986).

Fucus saccatus Lepech. [= *Halosaccion saccatum* (Lepech.) Kjellm.] A collection from Nootka Sound, Vancouver Island, Canada; but its identity seems more likely to be *H. glandiforme* (S.G. Gmel.) Rupr.

Related publications: Newcombe (1923); Balfour (1945); Vancouver (1984); Galloway & Groves (1987); Naisch (1989); Menzies (1993); Groves (1998); Wynne (2003b)

Dates of voyage: 1803-1806

Ship(s): 'Nadeshda' [and 'Neva']

Nationality: Russian

Commander(s) of expedition: Adam Johann Krusenstern [Urey Lisianski]

Scientists on board: Wilhelm G. Tilesius (surgeon, naturalist, artist); G. H. von Langsdorff (academician, naturalist, collector) (Fig. 3); Dr. Horner (astronomer and collector)

Phycological publications: Turner (1807-1819); C. Agardh (1812, 1815, 1820a, 1820b, 1821, 1822-1823, 1824); Postels & Ruprecht (1840); Kützing (1843); Ruprecht (1850); J. Agardh (1851b, 1868); Yoshida (1978)

Selected taxa [with current names]:

Carpacanthus trichophyllus Kütz. [= *Sargassum trichophyllum* (Kütz.) Kuntze]

Dumontia saccata (Lepech.) Grev. [= *Halosaccion saccatum* (Lepech.) Kjellm.], A Tilesius collection from Kamchatka.

Fucus asplenoides Esper [= *Neoptilota asplenoides* (Esper) Kylin ex Scagel *et al.*] Turner (1807-1808) included a collection made by Horner from Kamchatka.

Fucus crassipes Turner [= *Cystoseria crassipes* (Turner) C. Agardh] A collection by Horner from the sea near Japan.

Fucus crinitus S.G. Gmel. (Fig. 12) [= *Tichocarpus crinitus* (S.G. Gmel.) Rupr.] Collections made from Kamchatka by Horner and from Sakhalin by Tilesius.

Fucus evanescens C. Agardh [= *Fucus evanescens*] Syntype localities of Sakhalin (a Tilesius collection) and Kamchatka (a Chamisso collection). Athanasiadis (1996) designated the Chamisso collection from Kamchatka as the lectotype.

Fucus filifolius C. Agardh [= *Cystoseira filifolia* (C. Agardh) C. Agardh] A Tilesius collection from the Sea of Japan.

Fucus flagelliformis O.F. Müller [= *Chordaria flagelliformis* (O.F. Müll.) C. Agardh] Collected by Horner from Kamchatka.

Fucus horneri Turner [= *Sargassum horneri* (Turner) C. Agardh] From Strait of Korea.

Fucus fulvellus Turner [= *Sargassum fulvellum* (Turner) C. Agardh] From Strait of Korea, and a Tilesius collection from the Japanese Archipelago.

Fucus langsdorfii Turner [= *Coccophora langsdorfii* (Turner) Grev. A Langsdorff collection from the coast of Japan.

Fucus microceratius Turner [= *Sargassum microceratium* (Turner) C. Agardh] A Horner collection from the Strait of Korea.

Fucus myagroides Mert. ex Turner [= *Myagropsis myagroides* (Mert. ex Turner) Fensholt.] A Horner collection from Nagasaki harbor, Japan.

Fucus pallidum Turner [= *Sargassum pallidum* (Turner) C. Agardh] From Strait of Korea.

Fucus pilulifer Turner [= *Sargassum piluliferum* (Turner) C. Agardh] A Horner collection from Nagasaki ['Nangasaki'] harbor, Japan.

- Fucus pinnatifolius* C. Agardh [= *Sargassum pinnatifolium* (C. Agardh) C. Agardh] A Tilesius collection from the Japanese archipelago.
- Fucus saccatus* Lepech. [= *Halosaccion saccatum* (Lepech.) Kjellm.] A Tilesius collection from Kamchatka.
- Fucus scoparius* Mert. ex Turner nom. illeg. (Fig. 13) [= *Sargassum siliquastrum* (Turner) C. Agardh] A Horner collection from the Strait of Korea.
- Fucus serratifolius* C. Agardh [= *Sargassum serratifolium* (C. Agardh) C. Agardh] A Tilesius collection from near Satsuma, the Sea of Japan.
- Fucus siliquastrum* Mert. ex Turner [= *Sargassum siliquastrum* (Mert. ex Turner) C. Agardh] A Horner collection from Nagasaki harbor, Japan.
- Fucus sisymbrioides* Turner [= *Myagropsis myagroides* (Turner) Fensholt] A Horner collection from Strait of Korea.
- Fucus tilesii* C. Agardh [= *Coccophora langsdorfii* (Turner) Grev.] A Tilesius collection from the Sea of Japan.
- Fucus tubulosus* Tilesius ex C. Agardh nom. illeg. [= *Halosaccion tilesii* Kjellm. (1889) nom. nov. = *Devaleraea ramentacea* (L.) Guiry]. A Tilesius collection from Kamchatka.
- Halochloa pachycarpa* Kütz. [= *Sargassum siliquastrum* (Turner) C. Agardh] A Tilesius collection from the Japan Sea.
- Halochloa macranthus* Kütz. [= *Sargassum siliquastrum* (Turner) C. Agardh] A Tilesius collection from the Japan Sea.
- Halochloa polyacantha* Kütz. [= *Sargassum siliquastrum* (Turner) C. Agardh] A Tilesius collection from the Japan Sea.
- Halochloa micracantha* Kütz. [= *Sargassum micranthum* (Kütz.) Endl.] A Tilesius collection from the Japan Sea.
- Halochloa tenuis* Kütz. [= *Sargassum siliquastrum* (Turner) C. Agardh] A Tilesius collection from the Japan Sea.
- Halochloa schizophylla* Kütz. [= *Sargassum patens* C. Agardh var. *schizophylla* (Kütz.) Yendo] A Tilesius collection from the Japan Sea.
- Halosaccion glandiforme* (S.G. Gmel.) Rupr. [= *Halosaccion glandiforme*] A Tilesius collection from Sakhalin, Russia.
- Halymenia platyna* C. Agardh [= *Iridaea platyna* (C. Agardh) Postels & Rupr.] A collection made by Tilesius from Sakhalin.
- Halymenia saccata* (Lepech.) C. Agardh. [= *Halosaccion saccatum* (Lepech.) Kjellm.] A collection made from Kamchatka by Tilesius.
- Laminaria agarum* (S.G. Gmel.) J.V. Lamour. [= *Agarum clathratum* Dumortier] A collection from Kamchatka, Siberia, by Tilesius.
- Laminaria ensiformis* J. Agardh nom. illeg. A Tilesius collection from Kamchatka.
- Laminaria latifolia* C. Agardh [= *Laminaria digitata* (Huds.) J.V. Lamour. *fide* De Toni (1895)] A collection made from Kamchatka by Tilesius.
- Laminaria saccharina* (L.) J.V. Lamour. [= *Saccharina latissima* (L.) C.E. Lane, C. Mayes, Druehl & G.W. Saunders] A collection from Kamchatka, Siberia, by Tilesius.
- Myagropsis camelina* Kütz. [= *Myagropsis myagroides* (Turner) Fensholt]. A collection from the Japan Sea by Tilesius.
- Padina deusta* (C. Agardh) Grev. [= *Ralfsia fungiformis* (Gunnerus) Setch. & N.L. Gardner] At Kamchatka and a collection from Unalaska Island, Alaska, by Tilesius.
- Rhodomela corymbifera* (S.G. Gmel.) C. Agardh [= *Odonthalia corymbifera* (S.G. Gmel.) Grev.]
- Sphaerococcus rigens* C. Agardh [= *Chylocladia rigens* (C. Agardh) J. Agardh] A collection from the Sea of Japan by Tilesius.
- Talarodictyon tilesii* Endl. [= *Hydroclathrus clathratus* (C. Agardh) M. Howe *fide* Sinkora & Wynne (1991)] A Tilesius drift collection from Nagasaki Harbor, Japan.
- Zonaria deusta* C. Agardh [= *Ralfsia fungiformis* (Gunnerus) Setch. & N.L. Gardner]
- Related publications: Krusenstern (1813); Langsdorff (1813-1814, 1927, 1993); Tilesius von Tilenau (1813); Rowell (1973); McKelvey (1991); Lowenstern (2003); Wynne (2006b)

Dates of voyage: 1815-1818

Ship: 'Rurik' [the Romanzof Expedition]

Nationality: Russian

Commander of expedition: Otto von Kotzebue

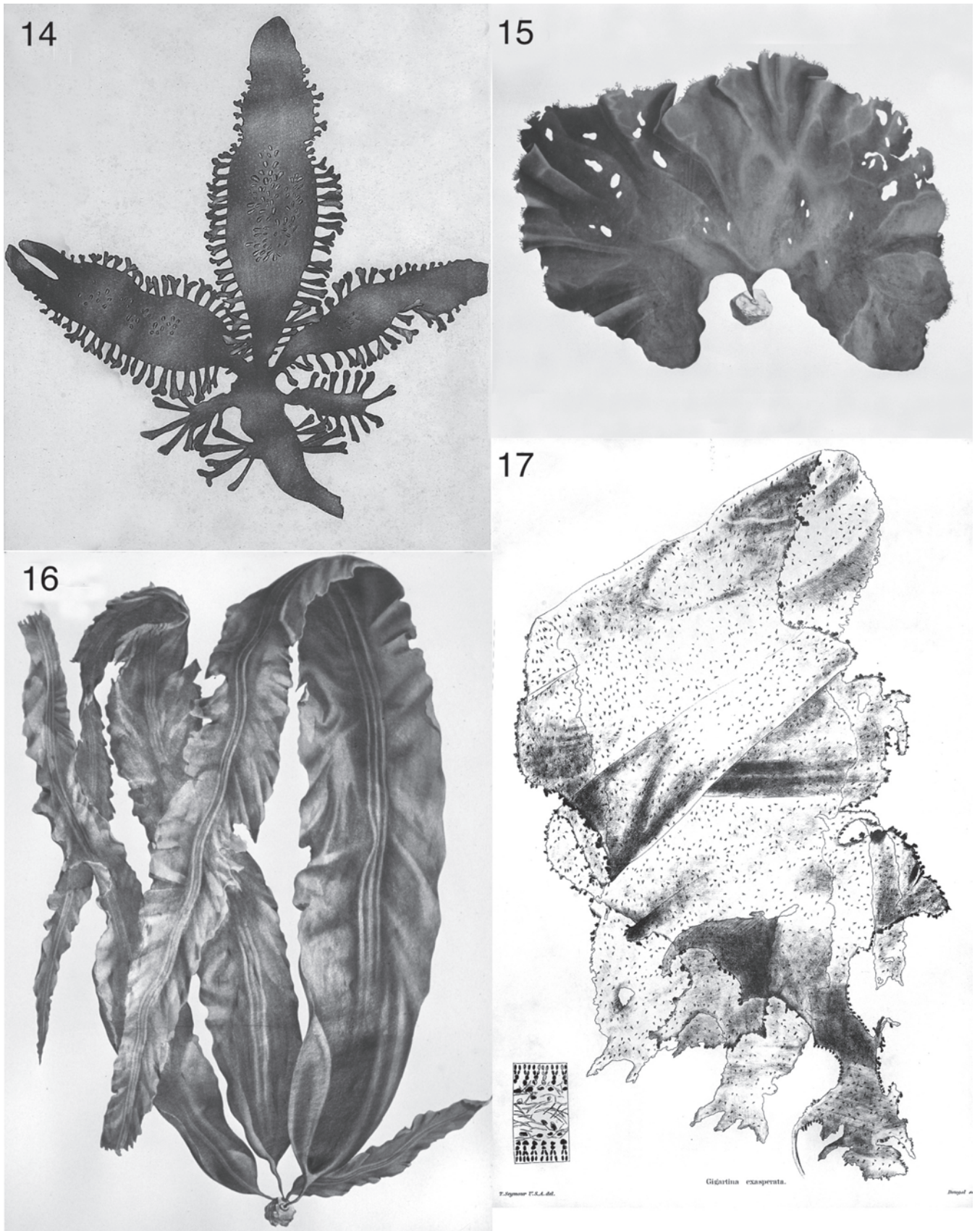
Scientists on board: Johann F. Eschscholtz (surgeon); Adelbert von Chamisso (naturalist) (Fig. 4); Louis A. Choris (artist); Morten Wormskold (Danish botanist, who left the expedition at Kamchatka before it reached North America)

Phycological publications: Esper (1802); C. Agardh (1820a, b, 1821, 1822); Postels & Ruprecht (1840); J. Agardh (1846, 1851); Kützing (1843, 1865)

Selected taxa [with current names]:

Batrachospermum kamschaticum C. Agardh [= *Draparnaldia*

- kamtschatica* (C. Agardh) J. Agardh (1846)] A collection made by Chamisso in the waters of the Kamchatka Peninsula, Siberia, Russia.
- Conferva chamissonis* Rupr. [= *Acrosiphonia saxatilis* (Rupr.) Vinogradova] A Chamisso collection from Unalaska, Alaska.
- Cystoseira spicigera* C. Agardh. [= *Cystoseira spicigera*] A Chamisso collection from Kamchatka.
- Desmarestia intermedia* Postels & Rupr. [= *Desmarestia aculeata* (L.) J.V. Lamour.] Based on Chamisso collections made at Unalaska, the Kuril Islands, and the shores of Kamchatka.
- Desmarestia viridis* (O.F. Müll.) J.V. Lamour. [= *Desmarestia viridis*]
- Fucus evanescens* C. Agardh [= *Fucus evanescens*] Collections from Sakhalin by Tileius and from Kamchatka by Chamisso.
- Fucus floccosus* Esper [= *Odonthalia floccosa* (Esper) Falkenb.]. *Rhomela aleutica* C. Agardh [= *Odonthalia aleutica* (C. Agardh) J. Agardh = ? *Odonthalia floccosa* (Esper) Falkenberg]. Although what had been called *Odonthalia aleutica* in Japanese waters was later identified by Masuda & Yamada (1980) as *O. annae* Perestenko, these authors stated that it was uncertain whether genuine *O. aleutica* was an independent species or a taxonomic synonym of *O. floccosa*.
- Fucus furcatus* C. Agardh nom. illeg. [= *Fucus gardneri* P.C. Silva] A Chamisso collection from Unalaska Island, Alaska.
- Lophura macracantha* Kütz. [= *Odonthalia floccosa* (Esper) Falkenb.] A Chamisso collection from Kamchatka.
- Rhomela aleutica* C. Agardh [= *Odonthalia aleutica* (C. Agardh) J. Agardh] A Chamisso collection from Unalaska, Alaska.
- Rhodophylls veprecula* J. Agardh [= *Fimbrifolium dichotomum* (Lepchin) G.I. Hansen] Greenland, the Faeroe Islands, and the Kamchatka Peninsula (Russia) were the three syntype localities cited. A syntype specimen collected from Kamchatka by Wormskjold, once in the Sonder Herb., is now in the National Herbarium of Victoria (MEL), Australia.
- Sphaerococcus papillatus* C. Agardh [= *Mastocarpus papillatus* (C. Agardh) Kütz.] Although Oahu, Hawaii, was indicated as the type locality, Setchell & Gardner (1903) believed that that was an error and that it was actually Unalaska Island, Alaska. Later, Setchell & Gardner (1933) thought that San Francisco, California, was most likely the type locality.
- Sphaerococcus volans* C. Agardh (Fig. 14) [= *Mazzaella volans* (C. Agardh) Fredericq] A Chamisso collection incorrectly stated to be from the Cape of Good Hope.
- Sporochnus medius* C. Agardh [= *Desmarestia viridis* (O.F. Müll.) J.V. Lamour.] A Chamisso collection from Unalaska Island, Alaska.
- Sporochnus viridis* (O.F. Müll.) C. Agardh var. *major* C. Agardh [= *Desmarestia viridis* (O.F. Müll.) J.V. Lamour.] A Chamisso collection from Unalaska, Alaska.
- Related publications: Kotzebue (1821); Chamisso (1830, 1836, 1986); Mahr (1932); Schmid (1942); Rowell (1973); Pierce (1980); Brosse (1983); Kratz (1986); Wynne (1997); Mornin (2002)
- Dates of voyage: 1825-1828**
Ship: 'Blossom'
Nationality: British
Commander of expedition: Frederick W. Beechey
Scientists on board: Mr. Lay (naturalist); Mr. Collie
Phycological publication: Hooker & Arnott (1830-1841)
Selected taxon [with current name]:
Fucus vesiculosus L. var. *minor* Hook. & Arn. [= *Fucus distichus* L.]. This was the only taxon reported from Kotzebue Sound, Alaska (Hooker & Arnott, 1832), whereas a number of new taxa were described from California (Harvey, 1833, 1841).
Related publications: Beechey (1831)
- Dates of voyage: 1825-1827**
Ship: 'Krotky'
Nationality: Russian
Commander of expedition: Ferdinand von Wrangel
Scientist on board: Rieder
Phycological publications: Ruprecht (1850); Woronichin (1914)
Selected taxon [with current name]:
Halosaccion compressum Rupr. [= *Devaleraea compressa* (Rupr.) O.N. Selivanova & N.G. Klochkova in Klochkova & Selivanova. A Rieder collection from Kamchatka, Siberia, Russia.
Note: This voyage was a circumnavigation of the globe. Rieder went on to live in Petropavlovsk for the period 1828-1836. Baron Wrangel served as the first governor of the Russian colonies in Alaska for the period 1829-1835. He strongly opposed the sale of Alaska to the United States.
Related publications: Arwidsson (1932); Wrangel (1980)



Figs 14-17. Fig. 14. *Sphaerococcus volans* C. Agardh. Fig. 15. *Iridaea pustulosa* Postels & Rupr. Fig. 16. *Laminaria triplicata* Postels & Rupr. Fig. 17. *Gigartina exasperata* Harv. & Bailey. [Fig. 14 from C. Agardh (1821, pl. XVIII); Fig. 15 from Postels & Ruprecht (1840, pl. XXXII); Fig. 16 from Postels & Ruprecht (1840, pl. X); Fig. 17 from Bailey & Harvey (1862, pl. V)]



Fig. 18. Naval cadets gathering seaweeds. [frontispiece from Postels & Ruprecht (1840)]

Dates of voyage: 1826-1829

Ship(s): 'Seniavin' and ['Moller']

Nationality: Russian

Commander(s) of expedition: Feodor P. Lütke [M.N. Staniukovich]

Scientists on board: Karl Heinrich Mertens (physician, naturalist] Alexander Postels (geologist; illustrator]; F.K. von Kittlitz (ornithologist, illustrator); [G. Kastalsky]

Phycological publications: J. Agardh (1851a); Mertens (1829); Postels & Ruprecht (1840); Kützing (1860)

Selected taxa [with current names]:

Agarum gmelinii Postels & Rupr. [= *Agarum clathratum* Dumort.] Kamchatka, Siberia; Unalaska Island, Alaska.

Agarum pertusum (K. Mert.) Postels & Rupr. (Fig. 19) Collected by Kastalsky at Unalaska Island and washed ashore at Avacha Bay. Two varieties were described: var. *platyneurum* Postels & Rupr, with

Sitka Island, Alaska, as type locality, and var. *brassicaeforme* Postels & Rupr., based on two collections, one from Kamchatka by Postels and one from Kodiak Island, Alaska, by Kastalsky.

Agarum turneri Postels & Rupr. [= *Agarum clathratum* Dumort.] Avatcha Bay, Kamchatka; Karaginsk Island, western Bering Sea, collected by Postels.

Alaria esculenta (L.) Grev. [= *Alaria esculenta*] Collections made by the Lütke Expedition at Kamchatka.

Alaria fistulosa Postels & Rupr. [= *Eualaria fistulosa* (Postels & Rupr.) M.J. Wynne comb. nov.]

Basionym: *Alaria fistulosa* Postels & Ruprecht, Illustrationes algarum: 11, Tab. XVI. 1840. (Fig. 20)

This species has recently been made the basis of the monotypic genus *Druelhia* segregated from *Alaria*, namely, *D. fistulosa* (Postels & Rupr.) C.E. Lane & G.W. Saunders in Lane *et al.* (2007)]. However, the genus *Eualaria* Areschoug (1884), based on *Alaria fistulosa*, is a valid, legitimate, and available name.



19

TAB. XXIII. AGARUM PERTUSUM.



20

TAB. XVI. ALARIA FISTULOSA.

Figs 19-20. Fig. 19. *Agarum pertusum*. Fig. 20. *Alaria fistulosa*. [from Postels & Ruprecht: Fig. 19: pl. XXIII, Fig. 20: pl. XVI]

Although Areschoug cited *A. fistulosa* as the only species, he did not effect the binomial *Eualaria fistulosa*, which is herein proposed. *Eualaria* is not included in the on-line ING (Farr & Zijlstra 2008) nor in AlgaeBase (Guiry & Guiry 2008). But the name is listed in Silva's Index Nominum Algarum (2008).

Collected by Kastalsky from Kodiak Island and by Postels from Karaginsk Island in the western Bering Sea; observed by K. Mertens at Unalaska Island, Alaska.

Alaria marginata Postels & Rupr. [= *Alaria marginata*] Unalaska Island, Alaska.

Atomaria aleutica Rupr. (*Fucus aleuticus* K. Mertens ined.) [= *Odonthalia setacea* (Rupr.) Perest.] Note: Silva [<http://ucjeps.berkeley.edu/INA.html>] explained that Ruprecht (1850) proposed the name *Atomaria setacea* for the specimen of *Fucus aleuticus* in Herb. Mertens in that it was different from *Rhodomela aleutica* C Agardh (1820). Ruprecht changed the epithet to avoid confusion.

Chorda filum (L.) Stackh. [= *Chorda filum*] Different varieties were recognized from Sitka and Unalaska Island, Alaska, and from Kamchatka, Siberia.

Chordaria flagelliformis (O.F. Müll.) C. Agardh [= *Chordaria flagelliformis*] On the shores of Kamchatka, Siberia.

Codium tomentosum (Hudson) Stackhouse [= *Codium fragile* (Suringar) Hariot]. Norfolk Sound, Alaska, and Nootka, Vancouver Island, Canada.

Conferva cohaerens Rupr. [= *Acrosiphonia arcta* (Dillw.) Gain] A Mertens collection from Awatscha Bay, Kamchatka.

Conferva linum O.F. Müll. [= *Chaetomorpha linum* (O.F. Müll.) Kütz.] Sitka Island, Alaska. But according to Setchell & Gardner (1903), plants of *Conferva linum* of Postels & Ruprecht and collected from Sitka are half the thickness of those of European *Ch. linum*. They may be *Chaetomorpha tortuosa* (Dillwyn) Kütz. or even more likely are the same as *Ch. cannabina* (Aresch.) Kjellm.

Conferva mertensii ['Mertensi'] Rupr. nom. illeg. [=

- Acrosiphonia duriuscula* (Rupr.) Yendo] *vide* Vinogradova (1979). A Mertens collection from Sitka, Alaska.
- Conferva tortuosa* Dillw. var. *crassior* Rupr. [= *Rhizoclonium tortuosa* (Dillw.) Kütz. ?] A Mertens collection from Sitka, Alaska.
- Conferva viminea* Rupr. [= *Acrosiphonia duriscula* (Rupr.) Yendo] Collections from Sitka and Unalaska, Alaska.
- Constantinea rosa-marina* (S.G. Gmel.) Postels & Rupr. [= *Constantinea rosa-marina*] A Mertens collection from harbor of St. Peter and St. Paul [= Petropavlovsk], Kamchatka.
- Constantinea sitchensis* Postels & Rupr. [= *Constantinea rosa-marina* S.G. Gmel.] From Sitka Island, Alaska. According to Setchell (1906), who proposed this taxonomic synonymy, the three fragments of the type of *C. sitchensis* in the Herbarium of St. Petersburg (LE) were from the Lütke Expedition.
- Corallina arbuscula* Postels & Rupr. [= *Corallina pilulifera* Postels & Rupr.]. A collection from Unalaska Island, Alaska, by Mertens.
- Corallina cretacea* Postels & Rupr. [= *Pachyarthron cretaceum* (Postels & Rupr.) Manza] Collected by Kastalsky from Unalaska Island, Aleutian Archipelago, Alaska.
- Corallina frondescens* Postels & Rupr. [= *Corallina frondescens*] A collection from Unalaska Island, Alaska, by Mertens.
- Corallina tuberculosa* Postels & Rupr. [= *Calliarthron tuberculosum* (Postels & Rupr.) E.Y. Dawson]. A Kastalsky collection from Sitka Island, Alaska.
- Costaria turneri* Grev. [= *Costaria costata* (C. Agardh) D.A. Saunders]. Sitka Island, Alaska, and shores of northwestern North America.
- Cystophyllum geminatum* (C. Agardh) J. Agardh [= *Cystoseira geminata* C. Agardh] J. Agardh (1848) cited a collection from Kamchatka made by the Lütke Expedition.
- Cystoseira thyrSIGERA* Postels & Rupr. [= *Cystoseira geminata* C. Agardh *vide* Agardh (1848)] A collection from Avatcha Bay, Kamchatka.
- Delesseria serrata* Postels & Rupr. [= *Membranoptera serrata* (Postels & Rupr.) Kuntze] From Kamchatka and Unalaska Island, Alaska.
- Desmarestia intermedia* Postels & Rupr. [= *Desmarestia aculeata* (L.) J.V. Lamour.] This taxonomic synonymy was supported by Selivanova & Zhigadlova (1997b). Klochkova (1996) recognized it as distinct from *D. aculeata*. From the shores of Kamchatka, the Kuril Islands, and a Chamisso collection from Unalaska Island, Alaska.
- Desmia herbacea* (Turner) Postels & Rupr. [= *Desmarestia herbacea* (Turner) J.V. Lamour.] Norfolk [Sitka] Sound, Alaska, and shores of Northwest America.
- Dumontia clava* Postels & Rupr. [= *Dumontia clava*] North Pacific Ocean.
- Dumontia coronata* Postels & Rupr. [= *Halosaccion coronatum* (Postels & Rupr.) Kütz.]. Pacific Ocean.
- Dumontia decapitata* Postels & Rupr. [= *Halosaccion fucicola* (Postels & Rupr.) Kütz. *vide* Ruprecht (1851)] Sitka Island, Alaska.
- Dumontia firma* Postels & Rupr. [= *Halosaccion firmum* (Postels & Rupr.) Kütz.]. Avacha Bay, Kamchatka, Siberia.
- Dumontia fucicola* Postels & Rupr. [= *Halosaccion fucicola* (Postels & Rupr.) Kütz.]. Sitka Island, Alaska.
- Dumontia furcata* Postels & Rupr. [= *Gloiopeltis furcata* (Postels & Rupr.) J. Agardh]. North Pacific Ocean.
- Dumontia hydrophora* Postels & Rupr. [= *Halosaccion glandiforme* (S.G. Gmel.) Rupr. *vide* Adey *et al.* (2008)] Occurring at Kamchatka; also at Sakhalin Islands according to Tilesius.
- Ectocarpus aleuticus* Kütz. [Of uncertain status. Although Setchell & Gardner (1903) suggested that this species belonged to *Pylaiella littoralis*, its organization looks quite different (Kützing 1860, Tab. 2, fig. 1). A Mertens collection from Unalaska, Aleutians, Alaska.
- Ectocarpus littoralis* (L.) Lyngb. [= *Pylaiella littoralis* (L.) Kjellm.] Kamchatka, Siberia, and North America.
- Fucus cornucopiae* K. Mert. [= *Arthrothamnus bifidus* (S.G. Gmel.) J. Agardh] *vide* Postels & Rupr. (1840)] Avatcha Bay, Kamchatka, Siberia.
- Fucus cribrosus* K. Mert. [= *Agarum clathratum* Dumort.] Avatcha Bay, Kamchatka.
- Fucus damaecornis* K. Mert. Kamchatka. The status of this taxon is uncertain.
- Fucus luetkeanus* K. Mert. [= *Nereocystis luetkeana* (K. Mert.) Postels & Rupr.] Sitka Island; Illuik Bay on Unalaska Island, Alaska; reportedly the shore of Kamchatka by Steller.
- Fucus pertusus* K. Mert. [= *Agarum pertusum* (K. Mert.) Postels & Rupr. [= *Agarum clathratum* Dumort.]
- Gigartina fastigiata* Postels & Rupr. nom. illeg. [= *Ahnfeltia fastigiata* (Endl.) Makienko] Collected from Sitka Island, Alaska.
- Gigartina muricata* Postels & Rupr. nom. illeg. [= *Endocladia muricata* (Endl.) J. Agardh]. Collected from Sitka Island by Kastalsky and from Unalaska Island,

- Alaska, by Merck.
- Halymenia palmata* (L.) C. Agardh var. *prolifera* Postels & Rupr. A Kastalsky collection from Unalaska Island, Alaska.
- Hymenena fimbriata* Postels & Rupr. [= *Cryptopleura ruprechtiana* (J. Agardh) Kylin] From Norfolk [= Sitka] Sound, Alaska, and from Kamchatka.
- Hypophyllum ruprechtianum* Zinova [= *Mikamiella ruprechtiana* (Zinova) M.J. Wynne] Collected by Postels from St. Paul Island, Bering Sea. Originally mis-identified as *Delesseria crassifolia* Rupr. See Wynne (2006b).
- Iridaea affinis* Postels & Rupr. [= *Kallymeniopsis lacera* (Postels & Rupr.) L.P. Perestenko. On shores of Kamchatka Peninsula, Siberia.
- Iridaea cornucopiae* Postels & Rupr. [= *Mazzaella laminarioides* (Bory) Fredericq]. Although the type allegedly came from the North Pacific Ocean, it probably came from Chile (Hughey *et al.*, 2001).
- Iridaea heterocarpa* Postels & Rupr. [= *Chondrus crispus* Stackhouse, *vide* Hughey *et al.*, 2001] Collection from North Pacific Ocean.
- Iridaea lacera* Postels & Rupr. [= *Kallymeniopsis lacera* (Postels & Rupr.) L.P. Perestenko] From North Pacific Ocean. (= Unalaska Island, Alaska).
- Iridaea lilacina* Postels & Rupr. [= *Mazzaella phyllocarpa* (Postels & Rupr.) Selivanova & Zhigadlova] From the shores of northwestern America. Hughey *et al.* (2001) explained why they chose this name over *Mazzaella liliacina* (Postels & Rupr.) Leister, a name with equal priority.
- Iridaea mertensiana* Postels & Rupr. [= *Turnerella mertensiana* (Postels & Rupr.) F. Schmitz] Avatcha Bay, Kamchatka.
- Iridaea ornata* Postels & Rupr. (Fig. 21) [= *Opuntiella ornata* (Postels & Rupr.) A.D. Zinova]. From Kamchatka, Siberia.
- Iridaea phyllocarpa* Postels & Rupr. Shores of Kamchatka. [= *Mazzaella phyllocarpa* (Postels & Rupr.) L.P. Perestenko] Shores of Kamchatka.
- Iridaea pinnata* Postels & Rupr. [= *Grateloupia postelsii* P.G. Parkinson in Chapman & Parkinson] Norfolk [= Sitka] Sound, Alaska.
- Iridaea punicea* Postels & Rupr. [= *Turnerella mertensiana* (Postels & Rupr.) F. Schmitz] A Kastalsky collection from Sitka Island, Alaska.
- Iridaea pustulosa* Postels & Rupr. (Fig. 15) [= *Velatocarpus pustulosus* (Postels & Rupr.) L.P. Perestenko] On shores of Kamchatka.
- Iridaea socialis* Postels & Rupr. [= *Dilsea socialis* (Postels & Rupr.) L.P. Perestenko. North Pacific Ocean.
- Laminaria bifida* (S.G. Gmel.) Postels & Rupr. [= *Arthrothamnus bifidus* (S.G. Gmel.) J. Agardh] On the shores of Kamchatka and Avatcha Bay, Siberia.
- Laminaria bongardiana* Postels & Rupr. [= *Saccharina bongardiana* (Postels & Rupr.) Selivanova, Zhigadlova & G.I. Hansen] Collected from Avatcha Bay, Kamchatka.
- Laminaria crassifolia* Postels & Rupr. [= *Saccharina crassifolia* (Postels & Rupr.) Kuntze]. Kamchatka.
- Laminaria latifolia* C. Agardh [possibly *Laminaria digitata* (Hudson) Lamouroux or *Saccharina latissima* (L.) C.E. Lane, C. Mayes, Druehl & G.W. Saunders] A Sitka Island collection by Kastalsky; a Kamchatka collection by Tilesius.
- Laminaria saccharina* (L.) J.V. Lamour. [= *Saccharina latissima* (L.) C.E. Lane, C. Mayes, Druehl & G.W. Saunders] Collections from Kamchatka and Sitka Island, Alaska. However, according to Selivanova *et al.* (2007), records of *S. latissima* from the Far Eastern seas of Russia need verification.
- Laminaria saccharina* f. *angustifolia* Postels & Rupr. [= *Laminaria longipes* Bory] Agardh (1848) proposed this taxonomic synonymy. Setchell (1899) discussed the background on *Laminaria longipes*, saying that *Laminaria repens* Rupr. and its alternative name *Lessonia repens* Rupr. (Ruprecht 1850) are taxonomic synonyms.
- Laminaria saccharina* f. *cuneata* Postels & Rupr. Collected from Sitka Island, Alaska, and Kamchatka.
- Laminaria taeniata* Postels & Rupr. [= *Saccharina bongardiana* (Postels & Rupr.) Selivanova, Zhigadlova & G.I. Hansen f. *taeniata* (Postels & Rupr.) Selivanova, Zhigadlova & G.I. Hansen] Collected by Kastalsky from Kamchatka.
- Laminaria triplicata* Postels & Rupr. (Fig. 16) [= *Cymathaere triplicata* (Postels & Rupr.) J. Agardh] From the northern Pacific Ocean.
- Laurencia spectabilis* Postels & Rupr. [= *Osmundea spectabilis* (Postels & Rupr.) K.W. Nam] Collected by Kastalsky at Norfolk [= Sitka] Sound, Alaska, and from California by Douglas.
- Lessonia ciliata* Postels & Rupr. [= *Macrocystis pyrifer* (L.) C. Agardh] A Kastalsky collection from Sitka, Alaska.
- Lessonia laminariaeoides* Postels & Rupr. [= *Pseudolessonia laminarioides* (Postels & Rupr.) G.Y. Cho, N.G. Klochkova, T.N. Krupnova & Boo] From the Sea of



TAB. XXXI. IRIDAEA ORNATA.

Fig. 21. *Iridaea ornata*. [from Postels & Ruprecht, pl. XXXI]

Okhotsk. This species was designated the type for a newly recognized genus (Cho *et al.* 2006).

Macrocystis pyrifer (L.) C. Agardh. Unalaska Island, and Sitka, Alaska; Sea of Okhotsk.

Macrocystis tenuifolia Postels & Rupr. [= *M. pyrifer* (L.) C. Agardh] On shore of Norfolk [Sitka] Sound, Alaska.

Padina deusta (C. Agardh) Greville [= *Ralfsia fungiformis* (Gunnerus) Setch. & N.L. Gardn.]. At Kamchatka and a collection from Unalaska Island, Alaska, by Tilesius.

Polysiphonia bipinnata Postels & Rupr. [= *Pterosiphonia bipinnata* (Postels & Rupr.) Falkenberg]. Kamchatka, Siberia.

Polysiphonia purpurea Postels & Rupr. [= *Pterosiphonia bipinnata* (Postels & Rupr.) Falkenberg *fide* De Toni (1903)]. Kamchatka, Siberia.

Porphyra pertusa Postels & Rupr. (Fig. 22) [= *Sparlingia pertusa* (Postels & Rupr.) G.W. Saunders, Strachan & Kraft]. Kamchatka, Siberia. The monotypic genus *Sparlingia* was segregated from *Rhodymenia* by Saunders *et al.* (1999).

Prionitis jubata J. Agardh [= *Prionitis sternbergii* J. Agardh (1851a)] Gabrielson (2008) designated as lectotype a specimen collected by K. Mertens from Sitka, Alaska, and now in the Lund Herbarium.

Ptilota asplenioides (Esper) Postels & Rupr. [= *Neoptilota asplenioides* (Esper) Kylin]

Pylaiella atrovioleacea Rupr. [possibly *P. littoralis* (L.) Kjellm.] Collections from Sitka, Alaska (by Mertens), and the Sea of Okhotsk.

Pylaiella ? clavaegera Rupr. [uncertain status] From North Pacific Ocean and western Aleutians, Alaska.

Rhodomela aleutica C. Agardh [= *Odonthalia aleutica* (C. Agardh) J. Agardh] A Chamisso collection from Unalaska, Alaska. According to Masuda (1982), Japanese material that had been called *O. aleutica* is identical to *O. annae* Perestenko (1973) in that genuine *O. aleutica* has terete main axes and ovoid cystocarps.

Rhodomela floccosa (Esper) C. Agardh [= *Odonthalia floccosa* (Esper) Falkenberg] Collected from Unalaska Island by Kastalsky and observed at Norfolk [Sitka]



TAB: XXXVI PORPHYRA PERTUSA.

Fig. 22. *Porphyra pertusa*. [from Postels & Ruprecht, pl. XXXVI]

Sound, Alaska, by K. Mertens.

Rhodomela larix (Turner) C. Agardh [= *Neorhodomela larix* (Turner) Masuda]

Soranthera ulvoidea Postels & Rupr. [= *Soranthera ulvoidea*] Collected by the Lütke Expedition, Sitka Island, Alaska.

Thalassiophyllum clathrus (S.G. Gmel.) Postels & Rupr. [= *Thalassiophyllum clathrus*] Sitka Island, Unalaska Island, and Amaknak Island, Alaska; less abundant in Awatscha Bay, Kamchatka.

Ulva fenestrata Postels & Rupr. Kamchatka, Siberia. [= *Ulva lactuca* L. *vide* Hayden *et al.* (2003)]

Ulva fusca Postels & Rupr. nom. illeg. [= *Ulvaria splendens* (Rupr.) Vinogradova]. North Pacific Ocean. Vinogradova (1979) recognized this taxonomic synonymy.

Ulva splendens Rupr. [= *Ulvaria splendens* (Rupr.) Vinogradova] Western Aleutian Islands, Alaska.

Wormskioldia ruthenica Postels & Rupr. [= *Hymenena ruthenica* (Postels & Rupr.) A.D. Zinova.] A collection from Kamchatka, Siberia.

Related publications: Anonymous (1837) *vide*

Woelkerling *et al.* (2008); Harvey (1852a, pp. 85-87, for a translation of Mertens' account of *Fucus* [*Nereocystis*] *luetkeanus*); Pierce (1980, 1987); Silva (1991); Alekseev (1996); Wynne (2005a)

Dates of voyage: 1838-1842

Ships: 'Vincennes,' ['Peacock'], 'Oregon,' 'Porpoise,' ['Relief'], ['Flying Fish'], ['Sea Gull']

Nationality: American

Commander of expedition: Charles Wilkes

Scientists on board: botanists: W.D. Brackenridge and W. Rich; zoologist: Charles Pickering; artist and naturalist: Titian Peale

Phycological publications: Harvey & Bailey, 1851; Bailey (Fig. 6) & Harvey (Fig. 7) (1862)

Selected taxa [with current names]: These taxa were described from Northwest America, chiefly Puget Sound:

Dasya plumosa Harv. & Bailey [= *Rhodoptilum plumosum* (Harv. & Bailey) Kylin]

Gigartina exasperata Harv. & Bailey (Fig. 17) [= *Chondracanthus exasperatus* (Harv. & Bailey) Hughey



Fig. 23. The ice cliffs of Kotzebue Sound, Alaska. [frontispiece from Seaman (1852-1857)]

in Hughey *et al.*]

Gigartina mollis Harv. & Bailey [= *Farlow mollis* (Harv. & Bailey) Farl. & Setch.].

Rhodymenia wilkesii Harv. & Bailey [= *Sparlingia pertusa* (Postels & Rupr.) G.W. Saunders, Kraft & Strachan]

Related publications: Collins (1912); Dawson (1959); Viola & Margolis (1985); Wynne (1994, 2003a)

Dates of travels: 1839-1849

Ship(s): 'Nikolai I' (commander N. K. Kadnikov), 'Elena' (commander N. K. Kadnikov), 'Okhotsk,' 'Naslednik Aleksandr' and 'Atkha,' 'Proymssel,' 'Okhotsk,' and other ships.

Nationality: Russian

Collector: Ilya Gavrilovich Voznesenskii [Wosnessenski] (Fig. 8)

Phycological publications: Ruprecht (1850 [1851], 1852)

Selected taxa [with current names]:

Arthrothamnus radicans Rupr. From the southwest coast of Kamchatka, Siberia.

Callophyllis ['*Calliphyllis*'] *rhynchocarpa* Rupr. [= *Callophyllis rhynchocarpa*] A Voznesenskii collection

from Ajan Bay, Sea of Okhotsk, Russia.

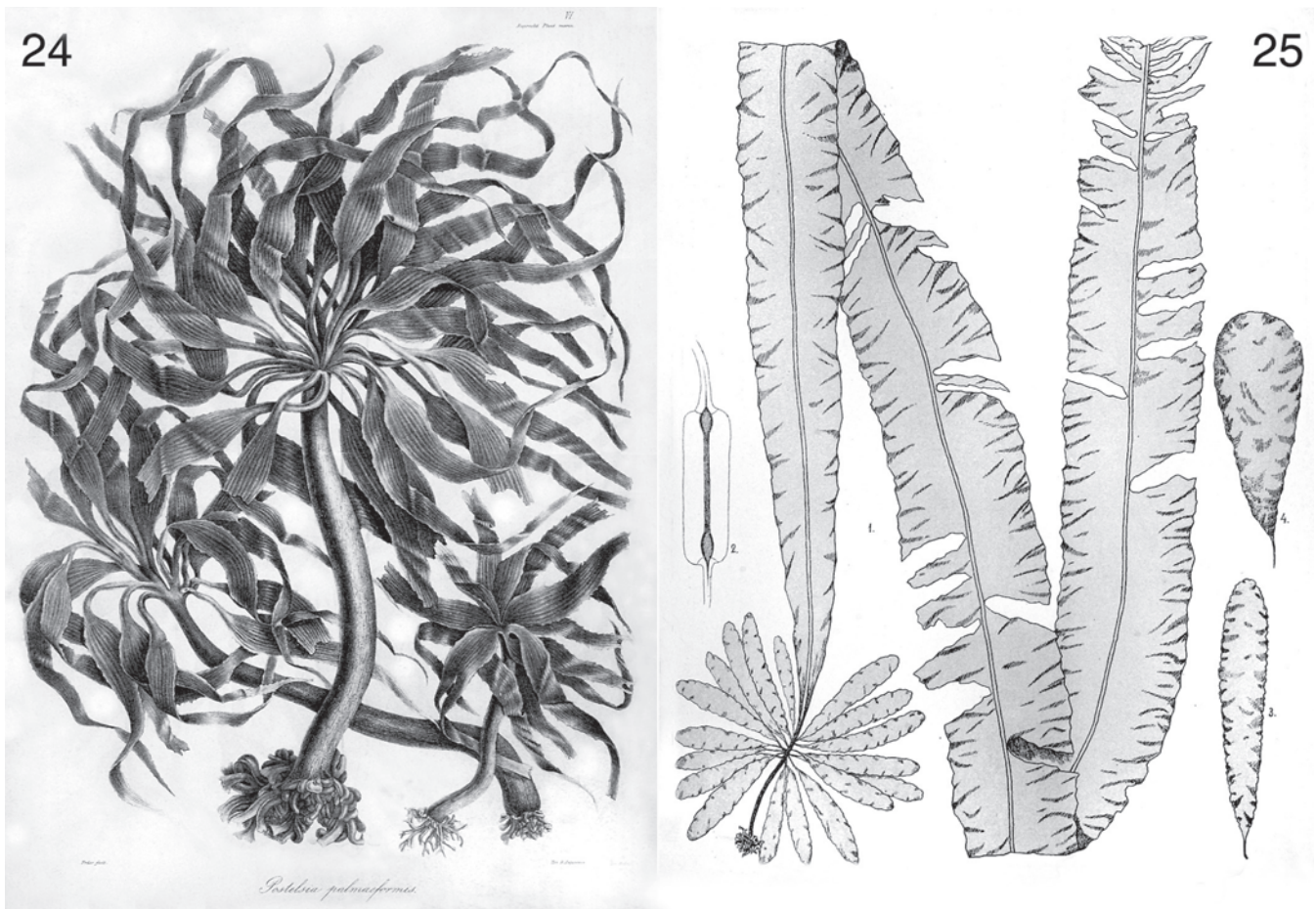
Chondrus mamillosus (Gooden. & Woodw.) Stackh. var. *unalaschcensis* Rupr. [= *Mastocarpus pacificus* (Kjellm) Perestenko; *vide* Perestenko (1980)] A Voznesenskii collection from Unalaska, Aleutians, Alaska.

Conferva coalita Rupr. [= *Acrosiphonia coalita* (Rupr.) Scagel, Garbary, Golden & Hawkes] A collection by Voznesenskii from Ross, northern California.

Conferva duriuscula Rupr. [= *Spongomorpha duriuscula* (Rupr.) Collins] A collection by Voznesenskii from Ayan Bay, the Sea of Okhotsk. The assignment of this species to *Spongomorpha* rather than to *Acrosiphonia* was supported by Selivanova & Zhigadova (1997a).

Delesseria kurilensis Rupr. (1850) [= *Congregatocarpus kurilensis* Rupr.) M.J. Wynne] A Voznesenskii collection from Urup [Uruppu] Island, Kuril Islands. Wynne (2005b) presented evidence for this taxonomic assignment.

Delesseria Middendorffii Rupr. (1850) [= *Neohypophyllum middendorffii* (Rupr.) M.J. Wynne] A Voznesenskii collection from the Sea of Okhotsk.



Figs 24-25. Fig. 24. *Postelsia palmaeformis* Rupr. Fig. 25. *Alaria praelonga* Kjellm. [Fig. 24 from Ruprecht (1852, pl. VI); Fig. 25 from Kjellman (1889, pl. IV)]

Dictyoneurum californicum Rupr. (1852) [= *Dictyoneurum californicum*] A Voznesenskii collection from Ross, northern California. Kuntze's (1898) *Wosnessenskia* to replace Ruprecht's (1852) *Dictyoneurum* is regarded as a superfluous substitute name and thus illegitimate.

Halosaccion glandiforme (S.G. Gmel.) Rupr. [= *Halosaccion glandiforme*] A Voznesenskii collection from the southwest coast of Kamchatka, Russia.

Halosaccion microsporum Rupr. (1850) [= *Devaleraea microspora* (Ruprecht) O.N. Selivanova & Klochkova in Klochkova & Selivanova (1989)] Collection from Awatscha Bay, Kamchatka, Siberia.

Microcladia borealis Rupr. (1850) [= *Microcladia borealis*] Voznesenskii collections from the Sea of Okhotsck and the bay of Unalaska, Alaska.

Palmaria expansa Stackh. var. *marginifera* (Turner) Rupr. [= *Palmaria palmata* (L.) Kuntze] From the southwest coast of Kamchatka, Siberia.

Phasganon alatum Rupr. nom. illeg. fide Widdowson

(1971) [= *Alaria esculenta* (L.) Grev.] From the southwest coast of Kamchatka, Siberia.

Phasganon fistulosum (Postels & Rupr.) Rupr [= *Eualaria fistulosa* Postels & Rupr.) M.J. Wynne] From the southwest coast of Kamchatka, Siberia.

Phasganon marginatum (Postels & Rupr.) Rupr. [= *Alaria marginata* Postels & Rupr.] Voznesenskii collection from Ross, northern California.

Postelsia palmaeformis Rupr. (1852) [= *Postelsia palmaeformis*] (Fig. 24). A Voznesenskii collection from Bodega Bay, California.

Pterygophora californica Rupr. (1852) [= *Pterygophora californica*] A Voznesenskii collection from Ross, northern California.

Scytosiphon tortilis Rupr. nom. illeg. (1850) [= *Stictyosiphon tortilis* (Aresch.) Reinke] Type locality was the Sea of Okhotsk with no citation of the collector. In the alleged absence of original material, Naylor (1958) designated a specimen in the Herbarium of the Academy of Sciences St.

Petersburg (LE) collected by Voznesenskii from the Sea of Okhotsk to be a "Neotype." The provenance of that Voznesenskii collection certainly suggests that it is the actual Type.

Related publication: Carter (1979); Pierce (1980); Alekseev (1987, 1990)

Dates of expedition: 1842-1845

Nationality: Russian, Siberian expedition sponsored by the Academy of Sciences of Russia

Scientist: Academician Alexander Middendorff

Phycological publication: Ruprecht (1850, 1851)

Selected taxa [with current names]:

Asperococcus cystoseirae Rupr. [= *Coilodesme cystoseirae* (Rupr.) Setch. & N.L. Gardn.]

Cruoria middendorffii Rupr. [= *Petrocelis middendorffii* (Rupr.) Kjellm.] Äsä Island, Ochotsk Sea. According to Polanshek & West (1975) gametophytes derived from field-collected plants of *P. middendorffii* were interfertile with field-collected plants of *Mastocarpus (Gigartina) pacificus* from the same locality. No data were then available on the interfertility of their plants with those from the Ochotsk Sea. See also Guiry *et al.* (1984).

Elachista lubrica Rupr. [= *Elachista fucicola* (Velley) Aresch.] Cape Nichta, Mamgabai, Äsä Island, Ochotsk Sea.

Hormiscia flacca (Dillw.) Örsted [= *Ulothrix flacca* (Dillw.) Thuret] Äsä Island, Ochotsk Sea

Spinularia intermedia (Postels & Rupr.) Rupr. [= *Desmarestia aculeata* (L.) J.V. Lamour.]

Related publication: Schmidt (1926)

The richest collections were the mammals, birds, and reptiles, and these were worked up by Middendorff himself. The results demonstrated the general nature of the arctic and subarctic fauna.

Dates of voyage: 1845-1851

Ship(s): H.M.S. 'Herald'

Nationality: British

Commander(s) of expedition: Capt. Henry Kellett

Scientists on board: Berthold C. Seeman (German botanist); Thomas Edmonston and John Goodridge (naturalists)

Phycological publications: "Algae" pp. 49-50 by W. H. Harvey in Seeman (1852-57)

A brief list of algal species from the Arctic Sea, Kotzebue Sound (Fig. 23), and Port Clarence; no new species.

Related publication: Seeman (1852-1857)

Dates of voyage: 1878-1880

Ship: 'Vega'

Nationality: Swedish

Commander of expedition: A. E. Nordenskiöld

Scientists on board: F.R. Kjellman (professor of botany in Uppsala) (Fig. 9), Ernst B. Almquist (surgeon), *et al.* Collections made at Port Clarence, Alaska, St. Lawrence Island and Bering Island, both in the Bering Sea.

Phycological publications: Kjellman (1883, 1889), Kjellman & Petersen (1885) Although Kjellman (1883) primarily dealt with algae of the Arctic Sea, its Table 1 provided data on the distribution of species in the northern Pacific Ocean.

Selected taxa [with current names]:

Alaria angusta Kjellm. [= *Alaria angusta*] Bering Island.

Alaria crassifolia Kjellm. & Petersen [= *Alaria crassifolia*] Hakodate near Isl. Jezo, Japan.

Alaria crispa Kjellm. [= *Alaria crispa*] St. Lawrence Island, Bering Sea.

Alaria lanceolata Kjellm. [= *Alaria taeniata* Kjellm. *fide* Widdowson (1971)] Bering Island.

Alaria laticosta Kjellm. [= *Alaria angusta* Kjellm. *fide* Yendo (1919) and Widdowson (1971)] Bering Island.

Alaria praelonga Kjellm. (Fig. 25) [*Alaria praelonga*] Bering Island.

Alaria taeniata Kjellm. [= *Alaria marginata* Postels & Rupr. *fide* Lane *et al.* (2007)] Bering Island.

Analipus fusiformis Kjellm. [= *Analipus filiformis* (Rupr.) Papenf.] Bering Island.

Cruoria pacifica Kjellm. [= *Cruoria pacifica*] Port Clarence, Alaska.

Diploderma variegatum Kjellm. [= *Porphyra variegata* (Kjellm.) Kjellm.] Bering Island and Commander Islands.

Gigartina pacifica Kjellm. [= *Mastocarpus pacificus* (Kjellm.) Perest.] Bering Island.

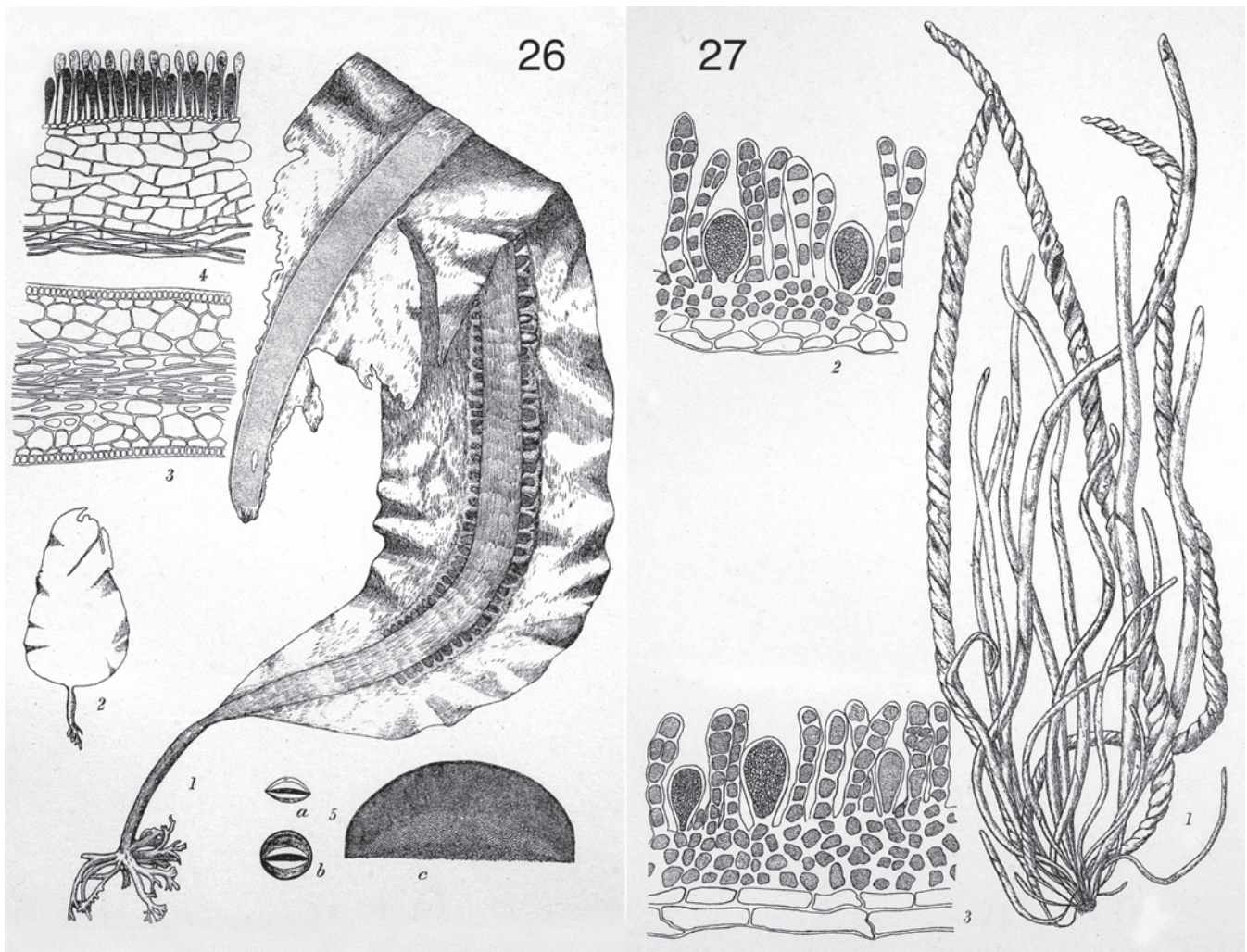
Laminaria bullata Kjellm. [= *Laminaria bullata*] St. Lawrence Island, Bering Sea.

Laminaria dentigera Kjellm. [= *Saccharina dentigera* (Kjellm.) C.E. Lane, C. Mayes, Druehl & G.W. Saunders] Bering Island.

Lithophyllum tenue Kjellm. [= *Leptophytum tenue* (Kjellm.) Athanas. & W.H. Adey] Port Clarence, Alaska. Athanasiadis & Adey (2006) proposed this transfer.

Lithothamnion durum Kjellm. [= *Clathromorphum circumscriptum* (Strömf.) Foslie] Port Clarence, Alaska.

Lithothamnion loculosum Kjellm. [= *Clathromorphum loculo-*



Figs 26-27. Fig. 26. *Pleurophycus gardneri* D.A. Saunders. Fig. 27. *Myelophycus intestinalis* D.A. Saunders. [Fig. 26 from Saunders (1901, pl. LII); Fig. 27 from Saunders (1901, pl. XLVII)]

sum (Kjellm.) Foslie] Bering Sea [Bering Island fide Foslie (1929)].

Monostroma crassiusculum Kjellm. [= *Monostroma crassiusculum*] Bering Island

Ralfsia deusta (C. Agardh) J. Agardh [= *Ralfsia fungiformis* (Gunnerus) Setch. & N.L. Gardner] Collections from St. Lawrence Bay and Port Clarence, Alaska.

Rhodomela lycopodioides (L.) C. Agardh var. *ramentacea* Kjellm. [= *Rhodomela confervoides* (Huds.) P.C. Silva] A collection from Port Clarence, Alaska.

Note: In addition, a number of new species of *Laminaria* and *Alaria crassifolia* were described from various parts of Japan based on collection made on the 'Vega' Expedition (Kjellman & Petersen (1885). Certain of the species originally assigned to *Laminaria* are now treated within other genera (*Eckloniopsis*, *Saccharina* and *Undariopsis*).

Related publication: Lindstrom (1977); Wynne (1995)

Dates of voyage: 1899 (1 July-30 August)

Ship: steamship *George W. Elder*

Nationality: American

Leader of expedition: Mr. Edward Henry Harriman of New York City organized and funded the expedition.

Scientists on board: about 30 scientists, including De Alton Saunders (phycologist), William Trelease (botanist), Trevor Kincaid (entomologist), William Ritter (zoologist), and John Muir (naturalist)

Phycological publications: Saunders (1901); Setchell & Gardner (1903)

Selected taxa [with current names]:

Alaria fragilis D.A. Saunders [= *Alaria fragilis* D.A. Saunders] From Glacier Bay, Prince William Sound,

and Kukak Bay, Alaska. Lane *et al.* (2007) recently proposed a more broadly circumscribed *Alaria marginata* Postels & Rupr., which would include *A. fragilis* in its taxonomic synonymy.

Coilodesme linearis D.A. Saunders. [= *Coilodesme linearis*] Popof Island, Kukak Bay, Alaska.

Dilsea arctica (Kjellm.) D.A. Saunders [= *Neodilsea integra* (Kjellm.) Z. Zinova] Shumagin Islands.

Homeostroma lobatum D.A. Saunders [= *Punctaria lobata* (D.A. Saunders) Setch. & N.L. Gardner] From Sitka and Prince William Sound, Alaska.

Mesogloia simplex; D.A. Saunders [= *Saundersella simplex* (D.A. Saunders) Kylin] Sitka, Alaska.

Monostroma groenlandicum J. Agardh [= *Pseudothrix borealis* Hanic & S.C. Lindstrom] A collection from Kukak Bay, near Seldovia, Alaska. Hanic & Lindstrom (2008) demonstrated that Alaskan material that had been identified in the past (Saunders 1901; Setchell & Gardner 1903) as *Monostroma groenlandicum*, or *Capsosiphon groenlandicus* (J. Agardh) K.L. Vinogradova, represented a new genus and species, *Pseudothrix borealis*, in the Ulotrachaceae. The North Atlantic *M. groenlandicum* was assigned to the new genus as *Pseudothrix groenlandica* (J. Agardh) Hanic & S.C. Lindstrom.

Myelophycus intestinalis D.A. Saunders (Fig. 27) [= *Melanosiphon intestinalis* (D.A. Saunders) M.J. Wynne]

Pleurophycus gardneri Setch. & D.A. Saunders ex Tilden (Fig. 26) [= *Pleurophycus gardneri*] San Juan Island, Washington.

Pylaiella littoralis (L.) Kjellm. f. *acuta* D.A. Saunders [= *Pylaiella littoralis*] From Kukak Bay, Alaskan Peninsula.

Streblonema pacificum D.A. Saunders [= *Streblonema pacificum*] From Yakutat Bay, Alaska.

Streblonema irregulare D.A. Saunders [= *Streblonema irregulare*] From Sitka, Alaska.

Streblonema minutissimum D.A. Saunders [= *Streblonema minutissimum*] From Sitka, Alaska.

Related publications: Harriman Alaskan Expedition published by the Proceedings of the Washington Academy of Sciences (Washington D.C.) vols. 2-4 (1900-1902); Goetzmann & Sloan (1982); Litwin (2005)

Dates of expedition: 1899 (summer)

Ships: with assistance from the Alaska Commercial Company, the Pacific Steam Whaling Company, the

Pacific Coast Steamship Company, and the U.S. Coast Guard

Nationality: American (University of California Botanical Expedition to Alaska)

Personnel: W.A. Setchell, W.L. Jepson, L.E. Hunt, A.A. Lawson, W.E. Ritter

Phycological publications: Reed (1902); Setchell & Gardner (1903)

Selected taxa [with current names]:

Alaria valida Kjellm. & Setch. [= *Alaria marginata* Postels & Rupr. *vide* Widdowson (1971)] Based on collections from Unga, Alaska, by Lawson and from the west coast of Whidbey Island, Washington, by N. L. Gardner

Cladophora alaskana Collins in Setchell & Gardner [= *Acrosiphonia duriuscula* (Rupr.) Yendo, *vide* Vinogradova (1979)] Based on collections by Setchell and Lawson from St. Paul Island and Amaknak Island, Alaska.

Codium ritteri Setch. & N.L. Gardn. [= *Codium ritteri*] A collection made by Professor Ritter from Berg Bay on the west shore of Glacier Bay, Alaska.

Laminaria dentigera Kjellm. f. *longipes* Setch. & N.L. Gardn. [= *Saccharina dentigera* (Kjellm.) C.E. Lane, C. Mayes, Druehl & G.W. Saunders] Based on collections from Unga Island and Kodiak Island, Alaska, by Lawson and Setchell.

Prasiola borealis M. Reed [= *Prasiola borealis*] Based on Setchell collections from Kodiak Island and Iliuik, Unalaska, Alaska.

Pterosiphonia arctica (J. Agardh) Setchell & N.L. Gardner [= *Pterosiphonia hamata* Sinova] Collection from Iliuliuk, Alaska. According to Wynne (1985), Setchell & Gardner's (1903) collection was correctly identified as *Pterosiphonia hamata* Sinova (1940), a name that predated Hollenberg's (1969) *Pt. gardneri*.

Rhodymenia palmata (L.) Grev. f. *mollis* Setch. & N.L. Gardn. [= *Palmaria mollis* (Setch. & N.L. Gardn.) van der Meer & C.J. Bird] Based on a number of collections from sites in Alaska, British Columbia, Canada, and Washington.

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Ruprecht (1840) *Illustrationes algarum* made from the copy in the Hancock Library of Biology and Oceanography, University of Southern California. I acknowledge John West for his constructive review of the manuscript. I also thank Ms. Jamie Shriver, Hunt Institute for Botanical Documentation, Carnegie-Mellon University, for her assistance.

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