

## ТАКСОНОМИЧЕСКИЕ ОБЗОРЫ И НОВЫЕ ТАКСОНЫ

**LAMINARIA HIMANTHOPHYLLA (LAMINARIALES):  
LECTOTYPIFICATION AND UPDATED TAXONOMIC STATUS**© 2019 г. А. В. Klimova<sup>1,\*</sup>, Т. А. Klochkova<sup>1,\*\*</sup>, N. G. Klochkova<sup>1,\*\*\*</sup><sup>1</sup> Kamchatka State Technical University  
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The authentic specimen collected by the botanist K.G. Mertens from the Chilean coast during the round-the-world expedition by F.P. Litke and M.N. Stanyukovich (1826–1829) and later described by A. Postels and F.I. Ruprecht as a new species, *Laminaria himanthophylla* Postels et Ruprecht, was studied. We designate the lectotype of *L. himanthophylla* from the surviving specimens deposited in the herbarium of Komarov Botanical Institute (LE). From our study of the lectotype, original diagnosis and information on the distribution of the genera *Laminaria* and *Durvillaea* in the world ocean, we propose that *L. himanthophylla* should be treated as a heterotypic synonym of *Durvillaea antarctica* (Chamisso) Hariot.

*Ключевые слова:* *Durvillaea*, *Laminaria*, *D. antarctica*, *L. himanthophylla*, Litke expedition of 1826–1829, Chile, lectotypification, taxonomic revision

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Kelp taxa are among the most studied algae in the flora of the world ocean due to their high ecological and economic importance. For most regional floras, revision of kelp species composition is believed to be completed (Wynne, 1969). However, the validity of some species described in the past centuries is still questionable, and to solve such issues type specimens should be studied in some cases, although they may be difficult to find and access or can even be lost. In other cases, one should thoroughly compare different forms of species morphological variability, and in some cases, karyological, cultural, molecular-phylogenetic or other studies are required.

In the history of kelp study, different morphological forms of a species were described as different species or even different genera. For example, different morphotypes of the far eastern species *Hedophyllum bongardianum* (Postels & Ruprecht) Yendo were referred to the genera *Hedophyllum* Setchell (Yendo, 1903) and *Streptophyllum* Miyabe et Nagai (Nagai, 1940). Petrov and Suchovejeva (1976) described morphologically abnormal samples of *Laminaria gurjanovae* Zinova as a new species, *Laminaria multiplicata* Petrov et Suchovejeva (Klochkova et al., 2010). We suspect that haploid parthenosporophytes of the kelp species might have been described as new species at times, since their morphology differs from that in the diploid sporophytes of the same species, as shown in case of *Tauya basicrassa* Klochkova et Krupnova (Klochkova et al., 2017). In this paper, we investigated the case of incorrect description of the representative of genus *Durvillaea* Bory as a new species, *Laminaria himanthophylla* Postels et Ruprecht.

We studied the specimens of *Laminaria himanthophylla* collected during the round-the-world expedition by F.P. Litke and M.N. Stanyukovich (1826–1829), preserved in the Komarov Botanical Institute (Russia, St. Petersburg, LE) (Figs. 1–3). Also, in order to find any other existing specimens of *L. himanthophylla* we searched electronic catalogues of the herbaria of Swedish Museum of Natural History (Sweden, Stockholm, S), Muséum National d'Histoire Naturelle (France, Paris, PC) and British Museum of Natural History (UK, London, BM).

The species *L. himanthophylla* was described in 1840 (Postels, Ruprecht, 1840: 2, pl. 39: fig. 32) based on the study of herbarium materials collected by the botanist K.H. Mertens in Chile during the round-the-world expedition by F.P. Litke and M.N. Stanyukovich (1826–1829). Postels and Ruprecht (1840) provided a very brief description of its morphology and a single illustration of the blade cross-section (Fig. 4), indicating large thalli size, an unusual blade shape, presence of a hollow stipe, and 'sporidia' developing in the outer cortex layer of the blade as characteristic features of this species.

The absence of the type specimen illustration or records, that would specify which plants were studied by Postels and Ruprecht (1840) to describe *L. himanthophylla* did not allow to check its status as a species. However, it was taxonomically accepted by phycologists in 19th century. To date, there are few reports on *L. himanthophylla* in the checklists of kelp species from the world ocean (Endlicher, 1843: 27; Berger, 1846: 174; Le Jolis, 1855: 71; Kuntze, 1891: 914). Usually, all the reports repeated the same information as initially specified by Postels and Ruprecht and referred to their original work. Swedish scientist J. Agard first doubted the status of *L. himanthophylla* as a separate species, calling it as a doubtful species (species inquirendæ) (Agardh, 1848: 136). Later, De Toni (1895: 351) also attributed this species to the category of doubtful taxa (species maxima dubiæ). In the late 19th century, Setchell (1893) analyzed the distribution of the kelp species in the world ocean. As he noticed, among 28 representatives of the genus *Laminaria* only 1 species, *L. himanthophylla*, was described from the South Pacific American coast. He also noticed the lack of new collections of this species from 1827 to 1895, and considered its generic attribution controversial (Setchell, 1893: 363).

In the last decades, the genus *Laminaria* was repeatedly revised by Russian and foreign phycologists (Shchapova, 1948; Petrov, 1975; Kain, 1979; Bartsch et al., 2008; Bolton, 2010), but none mentioned *L. himanthophylla*. In modern references on the seaweed checklists and resources from Chile, *Laminaria* species were not mentioned, and the only kelp species reported from this region were *Durvillaea*, *Macrocystis*, and *Lessonia* (Bolton, 2010; Fraser et al., 2010; Camus et al., 2018). Thus, although *L. himanthophylla* is recognized as a separate species by AlgaeBase (Guiry, Guiry, 2019), no evidence exists that it is present in the southeastern Pacific Ocean.

The study of *L. himanthophylla* authentic specimens would solve a problem regarding its taxonomic status. The algal specimens collected during the round-the-world expedition by Litke and Stanyukovich (1826–1829) are known to be stored in S, PC, BM, and LE. We searched electronic databases at the official websites of S, PC, BM herbaria and, to the best of our knowledge, none contained specimens of *L. himanthophylla*. We also worked with the type herbarium collection in LE (St. Petersburg) and found surviving specimens of *L. himanthophylla*. One of them (specimen LE A0000302) is composed of two fragments of the blade and has no original label. On its modern label, only the species name and country are indicated – *Laminaria himanthophylla* P. et R., Chili. Currently, it is not possible to state whether this specimen was a part of the original material; however, it was stored with other type specimens, suggesting that it was used by Postel and Ruprecht in describing this species.

The second specimen (LE A0000301) is illustrated in Figs. 1–3. Its original label contains information in Ruprecht's handwriting: "*Laminaria himanthophylla* P. et R., Chile, leg D Mertens" (Fig. 3) and this information is consistent with *L. himanthophylla* protologue. Indeed, K.H. Mertens visited Chilean coast during the round-the-world expedition by Litke and Stanyukovich; therefore, this specimen (LE A0000301) is a part of the original material. Postels and Ruprecht did not specify exact collection site in the protologue, but according to their

publication (Postels, Ruprecht, 1840: 2) and the field diary of captain F.P. Litke (1835a), the ship “Senyavin” was at the coast of Chile in the Bay of Concepción on March 16–17, 1827 and in the Bay of Valparaíso on March 27–April 15, 1827.

In his records, Litke mentioned several days-long works of his expedition’s naturalists in the suburb of Almendral, Bay of Valparaíso (Litke, 1835b: 45, 48) and one day-long stay near Tome settlement in the Bay of Concepción (Litke, 1835b: 41). These two bays are located in the center of the Chilean coast, approximately 450 km apart from each other. Based on the available information, it is impossible to identify in which bay *L. himanthophylla* was collected, but it is certain that samples were collected between 32° and 36° South latitude on the Chilean coast.

The specimens of *L. himanthophylla* from LE herbarium collection are well-preserved. The specimen illustrated in Fig. 1 has a thallus up to 1 m long, with a cylindrical stipe 7 cm long and 1 cm wide in its basal part, and without organs of attachment. In the blade’s basal part, the stipe is slightly wider. The blade’s basal part is wedge-shaped, leathery, thicker than the upper part (Fig. 2). At the distance of 9–12 cm from its basal part, it splits into 21 straplike blades 7 to 80 cm long and 2–5 cm wide. The straplike blades have smooth edges and are narrower in the basal part than in the upper part. The organs of attachment are missing, so we cannot accurately identify these surviving specimens on the species level, but their genus level is obvious.

Postels and Ruprecht (1840) did not mention organs of attachment in *L. himanthophylla*, although they clearly described them for other laminarialean algae. Thus, we assume that they studied the plants of *L. himanthophylla* without the organs of attachment, and the specimen from Fig. 1 was probably the only specimen with an intact blade. It is also confirmed by the identity of size characteristics of the specimen studied by us with the data specified in the protologue of *L. himanthophylla*. It seems unlikely that a new *Laminaria* species was described solely based on the specimen LE A0000302, which consists only of two blade fragments. Also, it is not possible to prove that the authors described *L. himanthophylla* using only specimen LE A0000301. Based on Art. 9.3 of the International Code of Nomenclature for algae, fungi, and plants (Turland et al., 2018) we designate the sample shown in Fig. 1 as the lectotype.

The species description was accompanied by a drawing (Fig. 4) and explanation of the blade internal structure (Postels, Ruprecht, 1840). As they noted, *L. himanthophylla* had ‘sporidia’ located in the outer cortex and visible to the naked eye (Postels, Ruprecht, 1840: 5, pl. XXXIX: fig. 32). Until early 1900s, the term ‘sporidia’ was used as a synonym for the term ‘spore’, but nowadays this term is outdated and not used regarding the brown algae. Also, asexual and sexual reproduction has not yet been described in the laminarialean algae at the time of publication of ‘Illustrationes algarum’ (Postels, Ruprecht, 1840), thus some inconsistency is found with the modern phycological terminology. However, Postels and Ruprecht clearly indicated that the structures designated by them as ‘sporides’ were associated with reproduction (Postels, Ruprecht, 1840: 7, §10).

Based on ‘sporidia’ location on the thallus, Postels and Ruprecht attributed *L. himanthophylla* to the same group with *Fucus*, *Cystoseira*, and *Corallina* in the section “Addition to the seaweed anatomy” (Postels, Ruprecht, 1840: 7); however, the location of reproduction organs in these algae differs from the laminarialean algae. It is currently known that in the above-mentioned genera conceptacles are the reproductive structures, but they are not found in all kelp species. As to remaining laminarialean algae, Postels and Ruprecht (1840) attributed them to another group based on the type of sporangial sori location. This clearly indicates that the sample, which they described as *L. himanthophylla* does not belong to the genus *Laminaria*, although it shows great similarity with its representatives.

In addition, as noted above, only representatives of *Macrocystis* and *Lessonia* are found from the laminarialean algae on the coast of Chile. Morphologically, they differ significantly from all species of the genus *Laminaria*. Their stipes are dichotomously branched, the blades are formed due to splits in the basal part, and each new branch of the stipe carries a separate



Fig. 1. The authentic specimen of *Laminaria himanthophylla* collected by K.G. Mertens from the Chilean coast during the expedition by F.P. Litke and M.N. Stanyukovich (1826–1829) and preserved in LE. 1 – general view of the specimen, 2 – blade's basal part, 3 – original label written in F.I. Ruprecht's handwriting, 4 – original illustration of the internal structure provided by Postels and Ruprecht (1840). Scale: 1 – 10 cm, 2 – 5 cm.

blade. In addition, *Macrocystis pyrifera* has pneumatocysts, which are absent in the specimen of *L. himanthophylla* seen by us. Finally, because Postels and Ruprecht indicated the presence of conceptacles in this species, it is obvious that it does not belong to the genus *Laminaria*, as well as to the order Laminariales.

In the area under discussion, among the brown algae (Phaeophyceae) only the fucalcan species are characterized by large thalli and the presence of conceptacles. Representatives of the genus *Durvillaea* have the greatest morphological similarities with *L. himanthophylla*. The genus *Durvillaea* includes 6 species (Hay, 1979; Fraser et al., 2010, 2012; Guiry, Guiry, 2019) and the center of its species diversity is Australia and New Zealand (Fraser et al., 2010). Currently, it is known that in the southeastern Pacific, in particular off the coast of Chile, the only *Durvillaea* species is *D. antarctica*. Obviously, it was described by Postels and Ruprecht as *L. himanthophylla*. We propose to exclude it from the genus *Laminaria* and consider as heterotypic synonym of *D. antarctica*.

It is noteworthy that *Durvillaea potatorum* was recorded from Chile, however, it was based on Bory de Saint-Vincent's records (1826–1828) and requires confirmation (Kim, 1971;

Ramírez, Santelices, 1991). During the last 200 years, there has not been a single documentary evidence of this species being present in South America. In all revisions, *D. potatorum* was recorded as an Australian endemic species (Hay, 1979; Fraser et al., 2010). Therefore, we exclude the possibility of attributing our specimen to this species (see Fig. 1).

During an investigation of the Chilean marine algal flora, there was a similar example of describing *Durvillea* species as a new *Laminaria* taxon. In the early 19th century, *Laminaria caepaestipes* (Montagne, 1839) was described from the Pacific coast of South America, but it was later transferred to the genus *Durvillaea* (Skottsberg, 1907).

Herein, we present the following taxonomic information on *L. himanthophylla*:

***Laminaria himanthophylla* Postels et Ruprecht**

**Status of name:** heterotypic synonym of *Durvillaea antarctica* (Chamisso) Hariot.

**Description:** Postels et Ruprecht 1840: 2, pl. XXXIX: fig. 32.

**Type locality:** central part of Chile (Bay of Concepción, Bay of Valparaíso).

**Lectotype** (here designated): LE A0000301, dried specimen deposited at Herbarium of Komarov Botanical Institute (LE!) (Figs. 1–3).

**Collector:** K.H. Mertens.

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#### REFERENCES

- Agardh J.G. 1848. Species genera et ordines algarum, seu descriptiones succinctae specierum, generum et ordinum, quibus algarum regnum constituitur. Volumen Primum. Algas fucoideas complectens. Lund. 363 p.
- Bartsch I., Wiencke C., Bischof K., Buchholz C.M., Buck B.H., Eggert A., Feuerpfel P., Hanelt D., Jacobsen S., Karez R., Karsten U., Molis M., Roleda M.Y., Schubert H., Schumann R., Valentin K., Weinberger F., Wiese J. 2008. The genus *Laminaria* sensu lato: recent insights and developments. – European Journal of Phycology. 43:1–86.  
<https://doi.org/10.1080/09670260701711376>
- Berger E. 1846. Catalogus Herbarii oder vollständige Aufzählung der phanerogamischen und cryptogamischen Gewächse Deutschlands. III. Theil. 191 p.
- Bolton J.J. 2010. The biogeography of kelps (Laminariales, Phaeophyceae): a global analysis with new insights from recent advances in molecular phylogenetics. – Helgoland Marine Research. 64(4): 263–279.  
<https://doi.org/10.1007/s10152-010-0211-6>
- Camus C., Hernández-González M.C., Buschmann A.H. 2019. The seaweed resources of Chile over the period 2006–2016: Moving from gatherers to cultivators. – Botanica Marina.  
<https://doi.org/10.1515/bot-2018-0030>
- De Toni G.B. 1895. Sylloge algarum omnium hucusque cognitarum. Vol. III. Fucoideae. Padua. 638 p.
- Endlicher S.L. 1843. Mantissa botanica altera. Sistens genera plantarum supplementum tertium. Vienna. 111 p.
- Fraser C.I., Winter D.J., Spencer H.G., Waters J.M. 2010. Multigene phylogeny of the southern bull-kelp genus *Durvillaea* (Phaeophyceae: Fucales). – Molecular Phylogenetics and Evolution. 57 (3): 1301–1311.
- Fraser C.I., Spencer H.G., Waters J.M. 2012. *Durvillaea poha* sp. nov. (Fucales, Phaeophyceae): a buoyant southern bull-kelp species endemic to New Zealand. – Phycologia. 51 (2): 151–156.
- Guiry G.M., Guiry M.D. 2019. AlgaeBase. World-wide electronic publication. Nat. Univ. Ireland. Galway. 2018. <http://www.algaebase.org> (Accessed: 24.06.2019).

Hay C.H. 1979. Nomenclature and taxonomy within the genus *Durvillaea* Bory (Phaeophyceae: Durvilliales Petrov). – *Phycologia*. 18 (3): 191–202.

Kim D.H. 1971. A guide to the literature and distribution of the Benthic algae in Chile. Part I. Chlorophyceae – Phaeophyceae. *Gayana (Botanica)*. 1: 3–82.

Kain J.M. 1979. A view of the genus *Laminaria*. – *Oceanography and Marine Biology: An Annual Review*. 17: 101–161.

Klochkova T.A., Klochkova N.G., Yotsukura N., Kim G.H. 2017. Morphological, molecular, and chromosomal identification of dwarf haploid parthenosporophytes of *Tauya basicrassa* (Phaeophyceae, Laminariales) from the Sea of Okhotsk. – *Algae*. 32 (1): 15–28.  
<https://doi.org/10.4490/algae.2017.32.1.31>

Klochkova T.A., Kim G.H., Lee K.M., Choi H.-G., Belij M.N., Klochkova N.G. 2010. Brown algae (Phaeophyceae) from Russian Far Eastern seas: re-evaluation of *Laminaria multiplicata* Petrov et Suchovejeva. – *Algae*. 25 (2): 77–87.  
<https://doi.org/10.4490/algae.2010.25.2.077>

Kuntze O. 1891. *Revisio generum plantarum*. Vol. 2. Felix, Leipzig. P. 375–1011.

Le Jolis A. 1855. Examen des espèces confondues sous le nom de *Laminaria digitata* auct., suivi de quelques observations sur le genre *Laminaria*. – *Mémoires de la Société Impériale des Sciences Naturelles de Cherbourg*. 3: 241–312.

Litke F.P. 1935a. Puteshestvie vokrug sveta, covershennoe po povelenyu imperatora Nikolaya I na voennom shlyupe Senyavin v 1826, 1827, 1828 i 1829 godah, flota kapitanom Fedorom Litke: otdelenie morekhodnoe [Journey around the world, committed at the behest of the Emperor Nicholas I, on board ship “Senyavin” in 1826, 1827, 1828 and 1829, by the fleet captain Fedor Litke: Marine division with atlas]. St. Petersburg. 356 p. (In Russ.).

Litke F.P. 1935b. Puteshestvie vokrug sveta, covershennoe po povelenyu imperatora Nikolaya I na voennom shlyupe Senyavin v 1826, 1827, 1828 i 1829 godah, flota kapitanom Fedorom Litke: otdelenie istoricheskoe [Journey around the world, committed at the behest of the Emperor Nicholas I, on board ship “Senyavin” in 1826, 1827, 1828 and 1829, by the fleet captain Fedor Litke: Historical division with atlas]. T. 2. St. Petersburg. 286 p. (In Russ.).

Montagne C. 1839. *Sertum patagonicum*. Cryptogames de la Patagonie. – In: *Voyage dans l'Amérique méridionale*. V. 7. Pt 1. Paris. P. 1–19.

Nagai M. 1940. Marine algae of the Kurile Islands. I. – *J. Fac. Agric. Hokkaido Imp. Univ.* 46(1): 1–137.

Petrov J.E., Suchovejeva M.V. 1976. *Laminaria multiplicata* sp. nov. iz Okhotskogo morya [*Laminaria multiplicata* sp. nov. from the Sea of Okhotsk]. – *Novosti Sistematiki Nizshikh Rastenii*. 13: 51–53 (In Russ.).

Petrov J.E. 1975. *Laminariевye i fukusovye vodorosli morey SSSR (morfologiya, filogeniya, sistematika)* [Laminariacean and Fucacean algae of the USSR]: Diss. ... Doct. Sci. Leningrad. 325 p. (In Russ.).

Postels A., Ruprecht F. 1840. *Illustrationes algarum in itinere circum orbem jussu imperatoris Nicolai I. Atque auspiciis navarchi Friderici Lütke annis 1826, 1827, 1828 et 1829 celoce Senyavin exsecuto in Oceano pacifico, inprimis septemtrionale ad littora rossica asiatico-americana collectarum*. St. Petersburg. P. 1–22 (In Russ. and Latin).

Ramírez M.E., Santelices B. 1991. Catálogo de las algas marinas bentónicas de la costa temperada del Pacífico de Sudamérica. – *Monografías Biológicas*. 5: 1–437.

Shchapova T.F. 1948. Geograficheskoe rasprostranenie predstaviteley poryadka Laminariales v severnoy chasti Tikhogo okeana [Geographic distribution of the members of Laminariales in the northern part of the Pacific Ocean]. *Trudi Instituta Okeanologii* 2: 89–138 (In Russ.).

Setchell W.A. 1893. On the classification and geographical distribution of the Laminariaceae. – *Transactions of the Connecticut Academy of Arts and Sciences*. 9: 333–375.

Skottsberg C. 1907. Zur Kenntnis der subantarktischen und antarktischen Meeresalgen. I. Phaeophyceen. – In: *Wissenschaftliche Ergebnisse der Schwedischen Südpolar-Expedition 1901-1903 unter Leitung von Dr. Otto Nordenskjöld*. Stockholm: Lithographisches Institut des Generalstabs. 4 (1). P. 1–172.

Turland N.J., Wiersema J.H., Barrie F.R., Greuter W., Hawksworth D.L., Herendeen P.S., Knapp S., Kuster W.-H., Li D.-Z., Marhold K., May T.W., McNeill J., Monro A.M., Prado J., Price M.J., Smith G.F. (eds.) 2018: International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. *Regnum Vegetabile* 159. Glashütten: Koeltz Botanical Books.  
<https://doi.org/10.12705/Code.2018>.

Wynne M.J. 1969. Life history and systematic studies of some Pacific North American Phaeophyceae (brown algae). — University of California Publications in Botany. 50: 1–88.

Yendo K. 1903. *Hedophyllum spirale*, sp. nov., and its relation to *Thalassiophyllum* and *Arthrothamnus*. — Botanical Magazine. 17 (201): 165–173.

## LAMINARIA HIMANTHOPHYLLA (LAMINARIALES): ЛЕКТОТИПИФИКАЦИЯ И СОВРЕМЕННЫЙ ТАКСОНОМИЧЕСКИЙ СТАТУС

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Приведены результаты изучения аутентичного образца, собранного ботаником К.Г. Мертенсом у берегов Чили в ходе кругосветной экспедиции Ф.П. Литке и М.Н. Станюковича (1826–1829 гг.) и описанного А. Постельсом и Ф.И. Рупрехтом в качестве нового для науки вида *Laminaria himanthophylla* Postels et Ruprecht. Из сохранившихся и депонированных в гербарии Ботанического института им. В.К. Комарова РАН (LE) гербарных образцов этого вида выделен лектотип. Исходя из изучения типового образца, оригинального диагноза вида и сведений о распространении в Мировом океане представителей родов *Laminaria* and *Durvillaea* сделан вывод о том, что *L. himanthophylla* является гетеротипным синонимом *D. antarctica* (Chamisso) Hariot.

*Ключевые слова:* *Durvillaea*, *Laminaria*, *D. antarctica*, *L. himanthophylla*, экспедиция Литке 1826–1829 гг., Чили, лектотипификация, таксономическая ревизия

### БЛАГОДАРНОСТИ

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