

# Phycological Trailblazer

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### L. Kolderup Rosenvinge

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[Janus] Lauritz [Andreas] Kolderup Rosenvinge (1858-1939) was a Danish botanist and phycologist (Fig. 1), his major work being his investigations of marine macro-algae of Danish waters, including Greenland. While a student (Fig. 2), he was drawn to both vascular plants and the algae. Some of his earliest papers were on freshwater algae (Rosenvinge, 1879a, b). After he earned a Masters degree, he left Denmark, first going to Stockholm, where he worked in the lab of V. B. Wittrock (Hansen, 1985). He then moved on to the lab of Eduard Strasburger in Bonn, Germany. Next he moved on to the lab of plant physiologist Wilhelm Pfeffer in Tübingen. It was in the Pfeffer lab in 1884, where he carried out experiments to observe the effects of various environmental factors on morphogenesis. He was able to spend time studying on the Atlantic coast of France (Cherbourg) as well as on the Mediterranean coast. He also worked on the Norwegian coast. Some of the experiments were to study the earliest stages of germination and

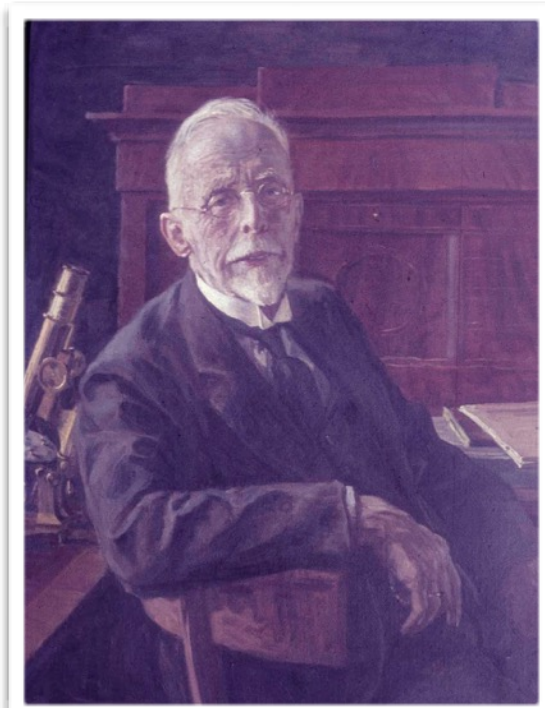


Fig. 1. L. Kolderup Rosenvinge. Photograph (made by Robert T. Wilce) of an oil painting in the Botanical Laboratory, University of Copenhagen.

the establishment of polarity in *Fucus* zygotes. These studies were incorporated into his thesis research. He demonstrated that the first plane of division was oriented perpendicular to the direction of incident light, the lower daughter cell producing the rhizoid and the upper cell developing into the erect thallus (Hansen, 1985). The broader scope of his thesis research was understanding the influence of external factors on polarity and organ formation in plants. So he looked at not only fucoids (*Fucus* and *Ascophyllum*) and some red algae (*Scinaia furcellata* and *Schizymenia dubyi*) but also genera of flowering plants: *Begonia*, *Pisum*, *Vicia*, *Fagus*, *Scutellaria* and others.

His thesis publication appeared in 1888.

Around this same time he received funding to carry out a study of both marine and terrestrial vegetation of western Greenland. This project was arduous and demanding under harsh circumstances. He was able to take advantage of transport on a boat from the Danish navy. He also carried out this study using an "umiaq", which is a primitive rowing boat used by the locals (Hansen, 1985). He published on the algae of Greenland in 1893 and described new species: *Laminaria groenlandica* [now = *Saccharina groenlandica*], *Myriocladia callitricha* [now = *Papenfussiella callitricha*], *Ralfsia ovata*, *Ectocarpus pycnocarpus* [now treated as conspecific with *E. fasciculatus*], *Ulvella confluens* [now = *Pseudopringsheimia*



Fig. 2. L. Kolderup Rosenvinge at age 22. [Acta Horti Bergiani 3(2), pl. 19 (1903)].

*confluens*], *Ulvella fucicola* [now = *Pseudendoclonium fucicola*], and *Urospora hartzii*, and new genera: *Coelocladia* (*C. arctica*), *Omphalophyllum* (*O. ulvaceum*) (Fig. 3), and *Symphyocarpus* (*S. strangulans*). Additional papers appeared on his work done on the marine algal flora of Greenland (Rosenvinge, 1894) and on eastern Greenland (1898a, b, c), based on the collections made by N. Hartz.

Over the years Rosenvinge received algal collections made on Danish or Norwegian expeditions, and he published on his results. He had a good eye for novelties. From the “Danmark-Expedition” to northeastern Greenland (north of 76° N latitude), with collections made by the botanist A. Lundager, he described the new species *Cruoriopsis hyperborea* [now = *Rhodophysemopsis hyperborea*] and *Punctaria glacialis* (Rosenvinge, 1910). The lack of the usual hairs present in the alleged *Punctaria* was a clue to its unusual taxonomic

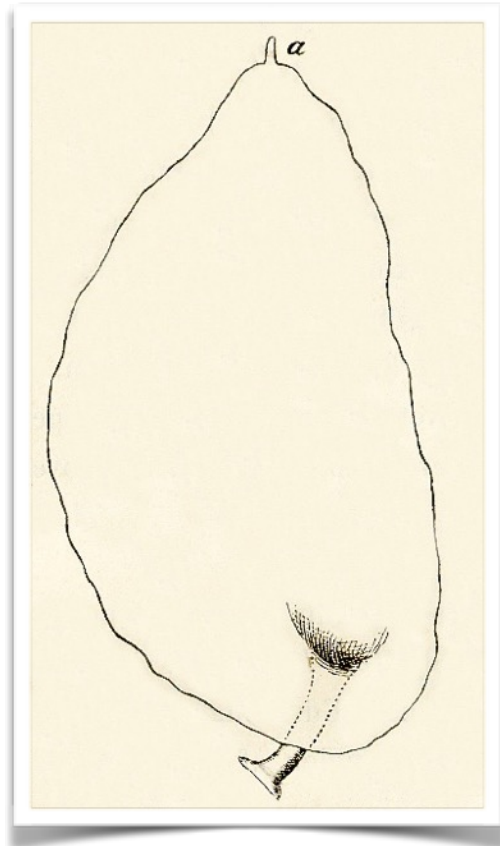


Fig. 3. *Omphalophyllum ulvaceum* Rosenv. Habit. (Fig. 19A in Rosenvinge, 1893).

status. Recent molecular phylogenetic studies on this and related taxa by Kawai et al. (2013) revealed that three genera, including this *P. glacialis*, may deserve recognition as a new family and order of brown algae.

Rosenvinge (1924) worked up the algal collections made by Johannes Gandrup on an expedition to Jan-Mayen Island in the Arctic Ocean as well as those made by H. G. Simmons on the 2<sup>nd</sup> Norwegian Arctic Expedition in the “Fram” (Rosenvinge, 1926). He also received collections of algae brought back from “King Christian IX’s Land” (East Greenland) and described the new brown algal genus and species *Acrocystis groenlandicus* (Rosenvinge, 1933). But because the material was not reproductive, this taxon remains of uncertain status. In collaboration with zoologist Th.

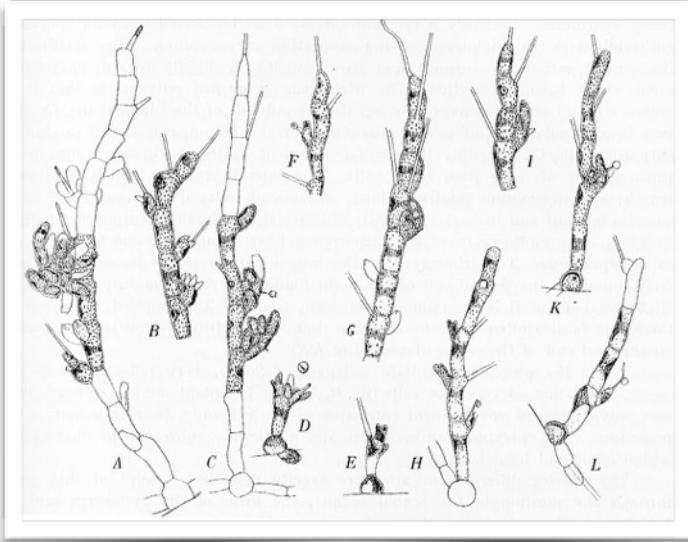


Fig. 4. *Chantransia gynandra* Rosenv. [now *Acrochaetium gynandrum* (Rosenv.) Hamel] (Fig. 18 in Rosenvigne, 1909.)

Mortensen, Rosenvinge described some interesting algae that were thought to be parasitic on their marine hosts, namely, various starfish taxa (Mortensen & Rosenvinge, 1910, 1933, 1934).

The major accomplishment in Rosenvinge's professional career was the marine algal flora of Denmark. Part I of the red algae (Rosenvinge, 1909) included his precise account of the hundreds of sampling stations, which were usually dredging sites, including data on the nature of the bottom and the water temperature and salinity. Danish waters included the North Sea, the Skagerak, the Limfjord, the Kattegat (divided into several parts), the Samsø area, the Little Belt, South Fyen waters, Great Belt, Smaaland Sea, the Sound, and the Baltic Sea. Although he had started making collections of Danish algae toward the end of the 1870s, it was not until 1890 that he began energetically to carry out extensive collections, which continued over the years 1891-1895. He made use of a triangular dredge with sharp steel teeth, the so-called Reinke's model.

Most of his collections were preserved as herbarium specimens, which reached about 8,000 in all. He also put hundreds of his specimens into alcohol and formalin and kept a large number of stones with encrusting algae. He did his own artwork, and his illustrations were done with great care and accuracy. In the genus *Chantransia*, Rosenvinge recognized a total of 24 species, of which 15 were newly described (Fig. 4). He also established the new genus *Kylinia*, named for Harald Kylin and based on the new species *K. rosulata*. Although close to the genus *Chantransia*, *Kylinia* was regarded by Rosenvinge as distinctive because of the androphore cells and the production of the carpogonia on the very small plants. Current taxonomic schemes treat his marine species of *Chantransia* as well as his *Kylinia* as within *Acrochaetium*.

Rosenvinge (1927) made observations on the "sliding" movements of monospores, tetraspores, carpospores, and even spermatia in a number of red algae, including both Bangiophyceae and Florideophyceae. The highest velocity was observed in *Erythrotrichia reflexa*, where the monospores moved about 140  $\mu\text{m}$  in one minute. In a demonstration of his powers of observation, Rosenvinge (1928) was able to show that in *Phyllophora brodiaei* [now *Coccotylus truncatus*] the monoecious plants have the auxiliary cells forming a number of protuberances that give rise to filaments that produce wart-like nemathecia with radiating filaments of seriate tetrasporangia. Cystocarps are never produced. Rosenvinge (1932) was not persuaded by Hamel's (1931) merger of *Monostroma obscura* into *M. fuscum* and presented his justification for maintaining them as separate species. These species are now known as *Ulvaria obscura* and *U. splendens*, respectively.

In regard to Rosenvinge's academic career, he earned the Ph.D. degree in 1888



Fig. 5. *Rosenvingea sanctae-crucis* Børgesen. Caracas, Venezuela, coll. Gisela Falcon no. 63, 1957. (In MICH).

from the University of Copenhagen. His early employment (1886 through 1900) was as a librarian and assistant at the botanical garden in Copenhagen. Starting in 1895, he was a lecturer at the University of Copenhagen, and from 1900 he also lectured at the Polytechnic (Stafleu & Cowan, 1983). He became Professor of Botany in 1910 and continued until his retirement in 1928. Another accomplishment was his long tenure as editor of *Botanisk Tidsskrift*, serving from 1894 through 1931 (vols. 19-41).

In 1928 a “Festschrift” was published by *Dansk Botanisk Arkiv* on the occasion of Rosenvinge’s 70<sup>th</sup> birthday, with numerous articles on algae and fungi, including papers by H. Kylin, F. Børgesen, C. H. Ostenfeld, Henning E. Petersen, and J. Boye Petersen. Earlier, Børgesen (1914) named the brown algal genus *Rosenvingea* (Fig. 5) in his honor,

while Silva’s (1957) *Rosenvingiella* was a replacement name for Rosenvinge’s (1893) *Gayella*, which was a later homonym. Søren Lund undertook his dissertation research under the supervision of Rosenvinge. Lund (1959) recognized his mentor with the generic name *Kolderupia* in the brown algae, including in it the two species, *K. maritima* (Kjellman) S. Lund [which was later designated the generitype by Wilce (1966)] and *K. lucifuga* (Kuckuck) S. Lund. Wilce (1966), however, presented evidence to treat *K. maritima* as conspecific with *Pleurocladia lacustris* A. Braun, and *K. lucifuga* was also transferred to *Pleurocladia*, thus merging *Kolderupia* within *Pleurocladia*.

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