

Phycological Trailblazer

No. 5

Frederick Børgesen

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Perhaps no other phycologist, past or present, lived such a charmed existence as Frederik Christian Emil Børgesen (1866- 1956). His titular position was as a librarian of the Botanical Garden, Copenhagen, but he was blessed with independent means, allowing him to travel throughout the world in his lifelong quest for algae, as well as for exotic plants to introduce into his garden at home. He made it his life's work to turn out beautifully executed floras that showed his deep knowledge of algae gained especially from field observations.

Børgesen was born in Copenhagen on New Year's Day, 1866. In 1884 he matriculated at the University of Copenhagen. In 1891 he earned the Masters of Science degree, and in 1904 he earned the degree of 'Dr. phil. [equivalent now to 'dr. scient.'] Over his long and productive career he turned his attention to various far-flung regions of the world, and a series of floristic studies resulted. Børgesen first visited the Danish West Indies as a young man in 1892, returning in 1895 and 1896. On the last trip he also visited Jamaica. He chose to study the marine algae of this island group in large part because they belonged to Denmark, and he was encouraged to do so by Prof. E. Warming, Chair

of Botany at the University of Copenhagen. He regarded the sea around St. Jan and St. Thomas as "full of incomparable treasures" and found that dredging the 10-20-fathom-deep sound separating these islands was ideal. He recognized that one could dredge repeatedly and turn up most interesting types of algae and not be troubled by corals, which made dredging difficult at nearby St. Croix. His first publication (with O. Paulsen) on botany of the Danish West Indies appeared in 1898 and dealt with halophytes.

This was followed by a steady flow of papers on the marine algal vegetation, culminating in an impressive flora (1913-1920). Unfortunate financial circumstances at the end of World War I forced Denmark to sell its West Indian islands to America, an event which caused Børgesen much sadness. He concluded his flora with the poignant words:

"With this I take leave of those beautiful small islands where so many of my thoughts and so much of my work has been centred for so many years, and the parting is the more painful since the tie, which bound the islands to my native land, has been severed."

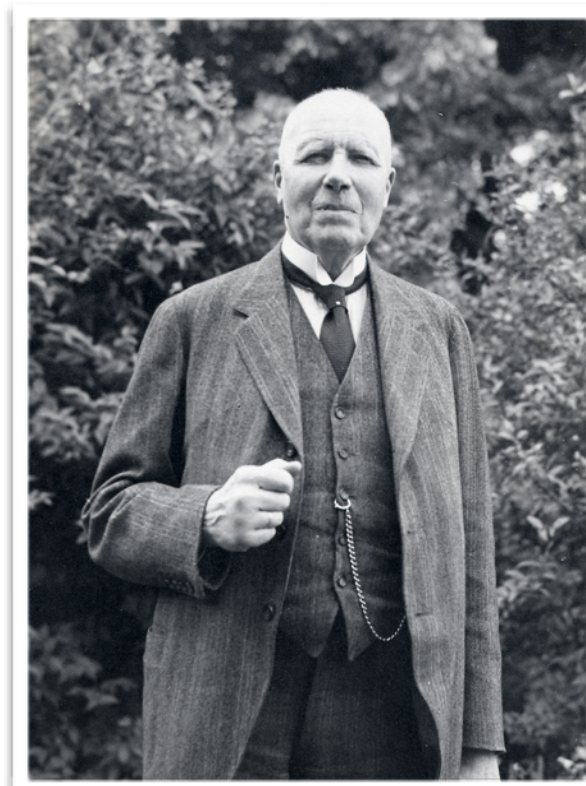


Fig. 1. F.R. Børgesen in 1937 (photo by W.R. Taylor).

the same nationalistic pride must have motivated him to study the algae of the Danish-owned Faeroe Islands in the North Atlantic, where he went on collecting expeditions in 1895, 1896, 1898, 1899, 1900, and 1902 (Wittrock, 1903). Papers on both the marine and freshwater algae of the Faeroes appeared in 1901 and 1902. Dickinson (1956) pointed out that Børgesen's work on the algae of the Faeroes was supplemented by an ecological account

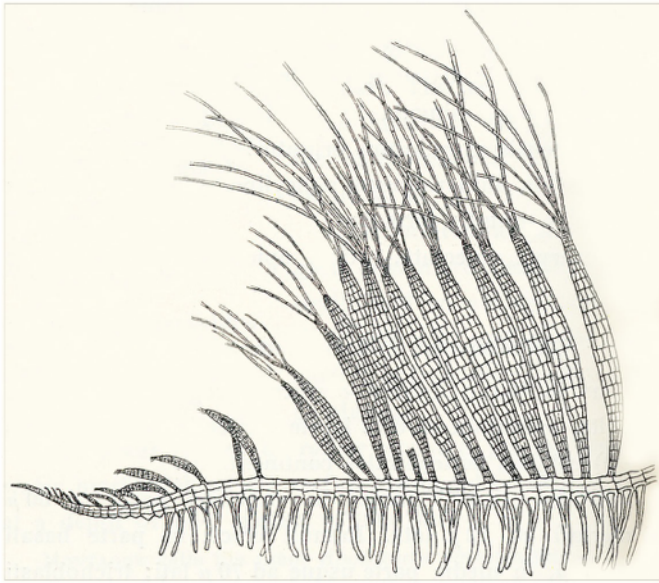


Fig. 2. *Stichothamnion cymatophilum*
(Fig. 49 in Børgesen, 1930).

written when ecology was still very much a novelty. Making good use of collections made by others, Børgesen also published on the algae of other high latitude islands: Greenland (1910), the Shetlands, and Jan Mayen Island. Most of his early papers were written in Danish, but later papers were mainly in English. It is obvious that over his long and productive career he gradually shifted his attention from cold-water sites to those of balmy climes, which seems like a reasonable transition. He journeyed to the Canary Islands in the winter of 1920-21. On Gran Canaria he settled into a sea-side hotel, from which it was easy to collect from the nearby exposed reef and a lagoon, where he dredged at a depth of 3-4 fathoms "with pretty good results." The resulting flora came out in parts from 1925 through 1936. A striking resemblance to the flora of the West Indies was evident, supporting Wegener's theory of the shifting of the continents, or plate tectonics.

Over the years Børgesen made repeated visits to the museums in London and Paris, and he made algal collections during trips to Corsica, Monaco, Norway, and Clare Island on the west coast of Ireland. He was next invited by the University of Bombay to come to study the marine flora of India. During the winter of 1927-28 Børgesen visited Bombay and Tuticorin



Fig. 3. *Lyengaria stellata*. (Specimen in Dhofar, Oman, photo by M. Wynne, 2000)

in southern India (Børgesen, 1930-1933, 1935, 1937). He reached Dwarka and Okha Port in the State of Gujarat, India, and also Karachi (Pakistan). He found the algal vegetation of these sites especially rich (Børgesen, 1934). He called attention to the fact that some species from the Indian sub-continent were disjuncts with species known from Australia, Japan, and South Africa. In connection with his 1927-28 Indian visit he made a short trip to Galle, Sri Lanka, accompanied by Prof. M. O. P. Iyengar of Madras (1936). Børgesen benefited from collections sent to him by Iyengar (1938a). He also relied upon the collections made by M. Køie to publish on the marine algal flora of the Persian Gulf (1939). He worked up Skottsberg's collections from Easter Island (1924). Similarly, he received collections made by others to produce a marine algal flora of Mauritius (1940, 1943, 1944, 1946, 1948-1949, 1950-1954, 1957), the final part being published posthumously by Tyge Christensen.

Børgesen was comfortable working with all macro-algal divisions, although for certain groups he relied upon experts, such as Mme. Lemoine for the Corallinaceae, P. Frey for the Cyanophyceae, and H. E. Petersen for Ceramium. Børgesen was responsible for the description of many new genera: *Tenaciphyllum*, *Coelothrix*,

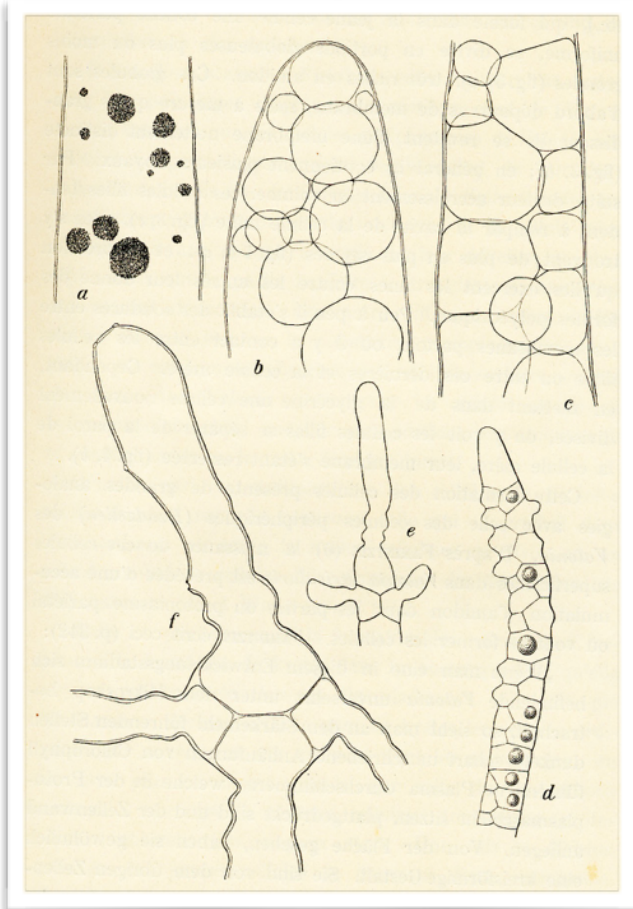


Fig. 4. *Siphonocladus tropicus*. Different stages of cellular formation. (Fig. 3 in Børgesen, 1905).

Coelarthrum, *Ceramiella*, *Mesothamnion* [now included in *Pleonosporium*], *Cottoniella*, *Platysiphonia*, *Spirocladia*, and *Stichothamnion* (Fig. 2) in the Rhodophyta; *Rosenvingea*, *Iyengaria* (Fig. 3), and *Hamelella* in the Phaeophyta; and *Cladophoropsis*, *Ernodesmis*, *Geppella*, *Pseudochlorodesmis*, *Valoniopsis*, and *Willella* in the Chlorophyta. He seldom erred, but his *Vaughniella* turned out to be merely a prostrate growth-form of *Padina*. He is remembered by the names *Boergesenia* (Feldmann, 1950) of the Chlorophyta and *Boergeseniella* (Kylín, 1956) of the Rhodophyta (Hansen, 1974). Algae collected by Petrus Forsskål during the Danish Expedition to Egypt and Arabia had been deposited in the Botanical Museum of the University of Copenhagen, and Børgesen (1932a) re-examined the types that still existed, clarifying the nomenclature.

Børgesen was an astute observer and is credited for discovering the process of segregative-cell division in certain green algae. In 1905 he described what he regarded to be a remarkable pattern of "ball-cell-division" in *Siphonocladus*. This mode of division involves coenocytic protoplasts dividing into a number of small balls which then expand to fill the entire lumen of the parent-cell (Fig. 4). Børgesen (1912) recognized the similarity in the pattern of development in *Dictyosphaeria favulosa* and *Struvea elegans* to that of the earlier-observed *Siphonocladus*, and in 1913 he introduced the term "segregative cell division".

Børgesen was also an avid gardener and horticulturalist, bringing back many exotics to introduce into his own elaborate garden at Hellebaek close to Elsinore. It covered about 2 hectares in size. He published many notes and longer papers reporting on these higher plants. His initial interest was alpinists, which he gathered in the mountains of Sweden, Norway, and Switzerland. In later years the alpinists were replaced with small shrubs. He was the first to introduce *Rhododendron intricatum*, and its success inspired him to collect other rhododendrons, many from the mountains of Asia via Børgesen's many visits to Kew Gardens (Erstad & Nellemann, 1947). The cold winters killed off many specimens, but he still had about 100 different species of rhododendrons thriving in the 1940s. The Royal Horticultural Society of



Fig. 5. Card with Christmas greetings sent by Mr. and Mrs. F. R. Børgesen to the Taylors, Dec. 1953.

England made him an honorary member in 1935. Even in his 80s, he was sending *Rhododendron* species to Kew for identification (Dickinson, 1956). He and Wm. Randolph Taylor had a cordial correspondence over the years (Fig. 5), and Børgesen gave daylilies (*Hemerocallis*) to WRT for his garden back in Ann Arbor, transplants of which now thrive in my own backyard.

Børgesen's personality was reserved, and he was alleged to have had a rather humble attitude to his scientific accomplishments, comparing his life's work to a grain of sand in a pyramid (Hansen, 1985). Børgesen's personal herbarium was deposited in the Botanical Museum in Copenhagen, while his library was acquired by the Chinese Academy of Sciences at the urging of C. K. Tseng. Børgesen's complete bibliography appears in the obituary written by Feldmann (1957). He left behind a legacy that will provide much of value for his phycological successors around the world.

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