

Lectotypification of several taxa of *Cystoseira* (Cystoseiraceae, Fucales) described by Sauvageau

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Abstract – Lectotypes of *Cystoseira adriatica* Sauvageau, *Cystoseira caespitosa* Sauvageau, *Cystoseira canariensis* Sauvageau, *Cystoseira mediterranea* Sauvageau var. *valiantei* Sauvageau, *Cystoseira platyclada* Sauvageau, *Cystoseira selaginoides* Valiante var. *gibraltarica* Sauvageau and *Cystoseira selaginoides* Valiante var. *polyoedematis* Sauvageau were designated from the original collections of Sauvageau held in the Herbarium of the Laboratoire de Cryptogamie of the Muséum national d'histoire naturelle of Paris (PC). The existence of the holotype of *Cystoseria bosporica* Sauvageau in the Thuret-Bornet Herbarium is also noted.

Cystoseira / Sauvageau / typification / nomenclature

Résumé – Lectotypification de plusieurs taxons de *Cystoseira* (Cystoseiraceae, Fucales) décrits par Sauvageau. Les lectotypes de *Cystoseira adriatica* Sauvageau, *Cystoseira caespitosa* Sauvageau, *Cystoseira canariensis* Sauvageau, *Cystoseira mediterranea* Sauvageau var. *valiantei* Sauvageau, *Cystoseira platyclada* Sauvageau, *Cystoseira selaginoides* Valiante var. *gibraltarica* Sauvageau et *Cystoseira selaginoides* Valiante var. *polyoedematis* Sauvageau ont été désignés à partir des collections originales de Sauvageau conservées dans l'Herbier du Laboratoire de Cryptogamie du Muséum national d'histoire naturelle de Paris (PC). De même nous signalons la présence de l'holotype de *Cystoseria bosporica* Sauvageau dans l'Herbier Thuret-Bornet.

Cystoseira / Sauvageau / typification / nomenclature

INTRODUCTION

Sauvageau described several species and varieties of the brown alga *Cystoseira* (Sauvageau in Hariot, 1911; Sauvageau, 1912; Sauvageau, 1920) from a great amount of material collected between 1905 and 1920, but he did not designate holotypes for the new taxa. Most of these specimens are conserved in the Sauvageau Herbarium, the Thuret-Bornet Herbarium and in the General

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Herbarium, at the Laboratoire de Cryptogamie of the Muséum national d'histoire naturelle of Paris (PC). Of these, *Cystoseira myriophylloides* Sauvageau [= *C. humilis* Kützting var. *myriophylloides* (Sauvageau) J.H. Price & D.M. John] was lectotypified by Feldmann (Roberts, 1968), *Cystoseira elegans* Sauvageau by Furnari *et al.* (1999) and *Cystoseira balearica* Sauvageau [= *C. brachycarpa* J. Agardh var. *balearica* (Sauvageau) Giaccone¹], *Cystoseira mauritanica* Sauvageau, *Cystoseira mediterranea* Sauvageau and *Cystoseira spinosa* Sauvageau by Gómez Garreta & Ribera (2002). In order to designate the lectotypes of *Cystoseira adriatica* Sauvageau [= *C. spinosa* Sauvageau], *Cystoseira caespitosa* Sauvageau [= *C. brachycarpa* J. Agardh var. *balearica* (Sauvageau) Giaccone], *Cystoseira canariensis* Sauvageau [= *C. humilis* Kützting], *Cystoseira mediterranea* Sauvageau var. *valiantei* Sauvageau, *Cystoseira platyclada* Sauvageau, *Cystoseira selaginoides* Valiante var. *gibraltaria* Sauvageau [= *C. mauritanica* Sauvageau] and *Cystoseira selaginoides* Valiante var. *polyoedematis* Sauvageau [= *C. sauvageauana* Hamel], we studied the Sauvageau material of these taxa held in PC.

RESULTS

Cystoseira adriatica Sauvageau

= *C. spinosa* Sauvageau, 1912: 201-220 (Cormaci *et al.*, 1992: 30).

This species was described by Sauvageau (1912: 249-251, 518) as follows: plant close to *C. spinosa* but differing in having more thin and abundant branches; axis attached to the substratum by a circular disc; small tophules spherical or oblong, very spinose; primary branches cylindrical and spinose at the base and sometimes flattened in the apical parts; triangular and corniculate spinose appendages present on branches of all orders; secondary branches flat and narrow with sparse cryptostomata; receptacles terminal, short and condensed with adjacent conceptacles, or longer with conceptacles in the inflated base of spinose appendages.

Sauvageau described the distribution of this species as the Adriatic Sea (Trieste, Miramar, Tasana, Cherso). In the protologue, he referred to specimens of *C. montagnei sensu* Hauck collected by M. J. Schiller, in May 1909, from Trieste and by Hauck (Weber-van Bosse Herbarium) from Trieste (June 1884), Miramar, Tasana (January 1889) and Cherso (without date).

Sauvageau's Herbarium contains six specimens labelled as "*Cystoseira montagnei* Hauck, J. Schiller leg., Ed. Bornet, ded. Sauv., Trieste, May 1909" (SA4727-SA4732). The Thuret-Bornet Herbarium contains four specimens with the same label. Specimens are the following: Trieste, May 1909 (TA6996, TA 6997, TA7000, TA7001).

All the above specimens, identified by Sauvageau and examined by us, belong to *Cystoseira adriatica*. They predate the protologue and constitute original material according to the Art. 9.2, Note 2 of the ICBN (Greuter *et al.*, 2000). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from the

1. According to Pizzuto (1998: 145) this variety is not distinct from the autonym *C. brachycarpa* var. *brachycarpa*.

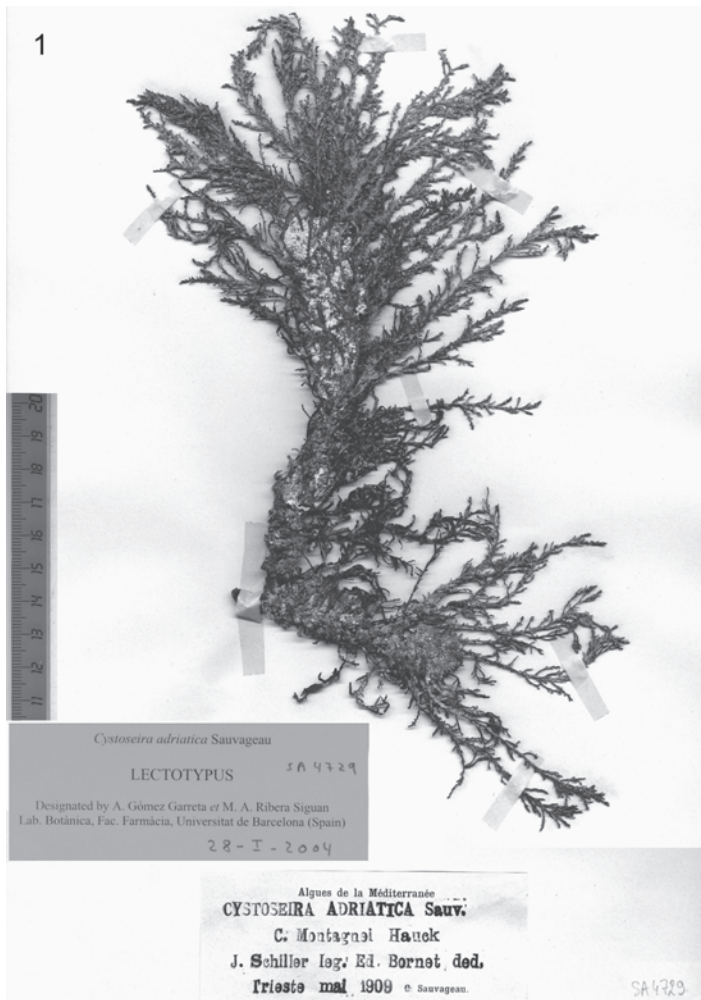


Fig. 1. Lectotype specimen of *Cystoseira adriatica* Sauvageau.

Sauvageau Herbarium SA4729 (Fig. 1), collected at Trieste in May 1909, is here designated as the lectotype since it is a representative fertile specimen agreeing with the protologue.

Cystoseira caespitosa Sauvageau

= *C. brachycarpa* J. Agardh var. *balearica* (Sauvageau) Giaccone in Ribera *et al.*, 1992: 124 (Cormaci *et al.*, 1992: 23).

This species was described by Sauvageau (1912: 223-228, 526) as follows: plant small, caespitose, without vesicles, and slightly iridescent; spinose appendages with cryptostomata; axes attached to the substrate by a loosely

compact disc formed by haptera; axes cylindrical with deciduous spines and apices flattened and smooth; primary branches round, with basal part smooth or covered with divaricate spines; secondary branches produced by spinose appendages; receptacles initially diffused with conceptacles differentiated in spinose appendages and then compact.

Sauvageau gave the following distribution of the species in the Mediterranean Sea: Lion Gulf (Banyuls) and Algeria (Matifou), from the surface to several meters depth. In the protologue, he referred to specimens collected in different months and years from Banyuls-sur-Mer (France), Port Lligat (Spain) and from Cap Matifou (Algeria).

Sauvageau's Herbarium contains fifty-seven specimens labelled as "*Cystoseira caespitosa* Sauv." Specimens, grouped according to place and date of collection, are as follows: Banyuls-sur-Mer, 10-20 Janv. 1907 (SA4966), 6 June 1907 (SA4956, SA4957, SA4964, SA4965, SA5011, SA5012, ink pad of Sauvageau noting 6-18 June 1908), 19 Oct. 1907 (SA4991, SA4992, some meters depth); Banyuls-sur-Mer, Cap Doune, 24 Apr. 1907, (SA4958-SA4961, SA5007, SA5008, 3-4 meters depth); Banyuls-sur-Mer, droite de la Jetée, 22 Apr. 1907 (SA5005, SA5006); Banyuls-sur-Mer, Baie du Troque, 26 Apr. 1907 (SA4973, SA4999-SA5002); Banyuls-sur-Mer, Ile Grosse, 6 May 1907, SA4993-SA4998), 17 Jan. 1908 (SA4968-4972), 16 Feb. 1908 (SA4967); Port-Lligat (Cap de Creus, Espagne), 3 Jan. 1907 (SA4962, SA4963, SA5003, SA5004); Jean Bart (Cap Matifou, Algérie), 16 Mar. 1910 (SA4974, SA4977-SA4982, SA4985-SA4990), 18 Apr. 1910 (SA4975, SA4976, SA4983, SA4984, SA5009, SA5010).

The Thuret-Bornet Herbarium contains fourteen specimens of this species. These specimens, grouped according to place and date of collection, are as follows: Banyuls-sur-Mer, 17 Jan. 1908 (TA7208); Banyuls-sur-Mer, without date (TA7211); Banyuls-sur-Mer, Cap Doune, 24 Apr. 1907 (TA7216, TA7216bis, 3-4 m depth); Banyuls-sur-Mer, Ile Grosse, 6 Apr. 1907 (TA7214, TA7217); Banyuls-sur-Mer, Baie du Troque, 26 Apr. 1907 (TA7212, TA7213, TA 7215); Port-Lligat (Cap de Creus, Espagne), 3 Jan. 1907 (TA7221, TA7222); Cap Matifou (Algérie), 16 Apr. 1910 (TA7210), 18 Apr. 1910 (TA7209, TA7218).

The General Herbarium contains four specimens of this taxon: Banyuls-sur-Mer, Baie du Troque, 26 Apr. 1907 (AB15341); Port-Lligat (Cap de Creus, Espagne), 3 Jan. 1907 (AB13228); Jean Bart (Cap Matifou, Algérie), 16 Mar. 1910 (AB13227), 18 Apr. 1910 (AB13229).

All the above specimens, identified by Sauvageau and examined by us, belong to this species. They predate the protologue and constitute original material (Art. 9.2, Note 2 of the ICBN). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from Sauvageau's Herbarium **SA4957** (Fig. 2), collected at Banyuls-sur-Mer on 6 June 1907, is here designated as the **lectotype**, since it is a representative fertile specimen agreeing with the protologue. The five specimens SA4956, SA4964, SA4965, SA5011, SA5012 from Sauvageau's Herbarium become isolectotypes.

Cystoseira canariensis Sauvageau

= *C. humilis* Kützing, 1860: 18 (Levring, 1974: 44).

This species was described by Sauvageau (1912: 466-472, 530-531) as follows: plant small, elegant, caespitose, non-iridescent and without vesicles; axes attached to the substratum by an irregular disc; apices of the axes smooth and not

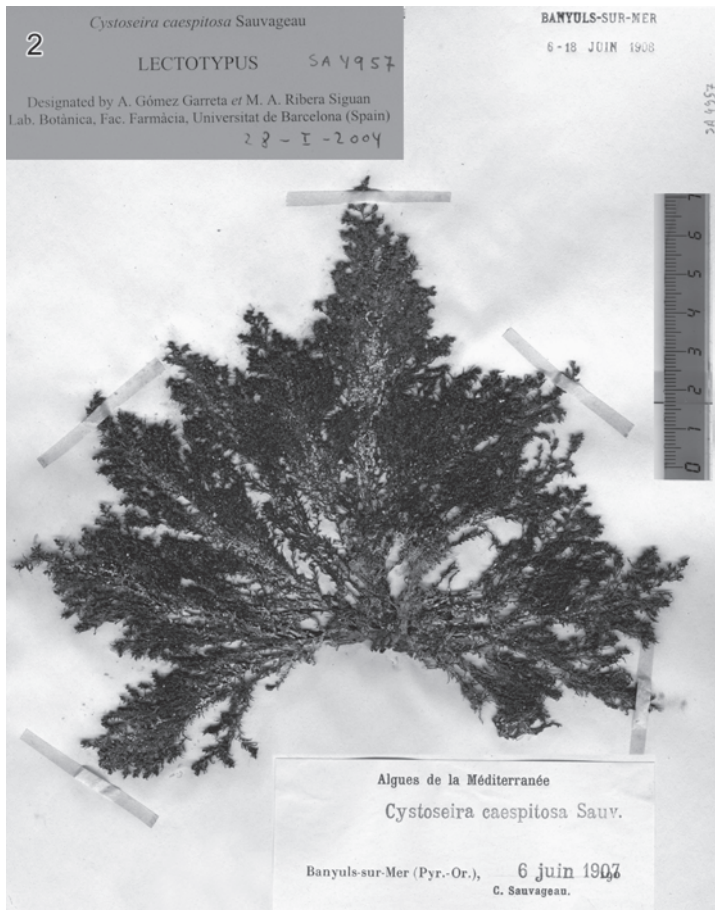


Fig. 2. Lectotype specimen of *Cystoseira caespitosa* Sauvageau.

very prominent; primary branches cylindrical with pedicellate crytostomata and leaving a scar on the axis when falling; secondary branches filiform, first short and simple then longer and branched, decreasing in size to the top; receptacles simple or branched, slightly tuberculate; conceptacles male, female and hermaphrodite on a same conceptacle.

Sauvageau gave the following distribution of the species in the Atlantic Ocean: Tenerife, in pools in the eulittoral zone. In the protologue, he referred to specimens collected from Puerto Orotava (Tenerife, Canary Island) in December 1904, January and February 1905 and he mentioned also some specimens of Montagne (Montagne's Herbarium, as *Cystoseira barbata*) from Punta Teno (Tenerife).

Sauvageau's Herbarium contains six specimens labelled as "Algues marines des Canaries, *Cystoseira canariensis* Sauv., *C. barbata* Montg. non al., Puerto Orotava (Ténérife), 24 Dec. 1904" (SA5116-SA5121) and 8 specimens

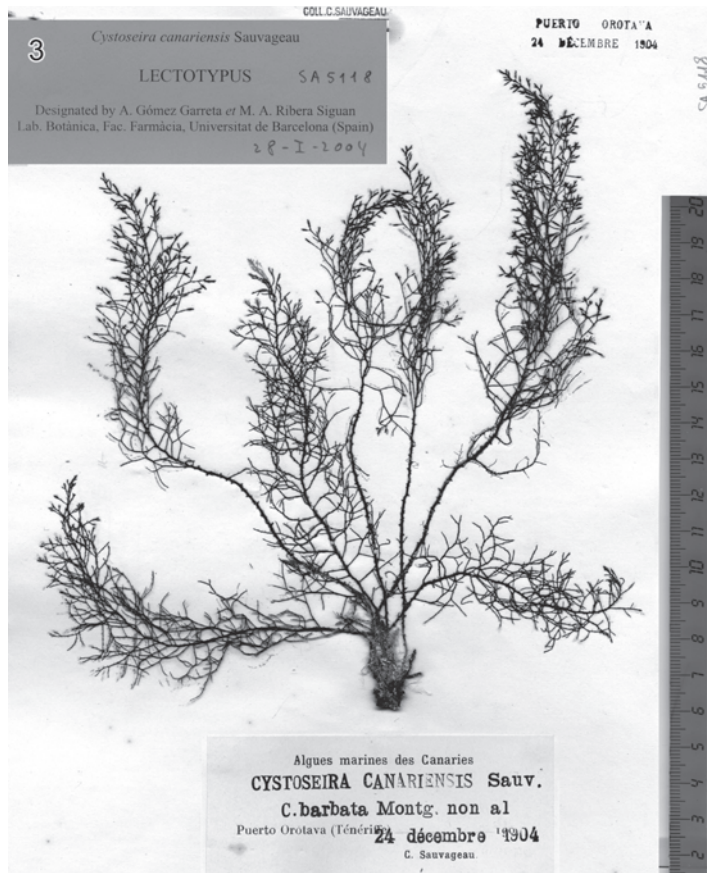


Fig. 3. Lectotype specimen of *Cystoseira canariensis* Sauvageau.

labelled as “Algues marines des Canaries, *Cystoseira canariensis* Sauv. forme naine, Puerto Orotava (Ténérife), 20-30 Jan. 1905” (SA5108-SA5115).

The Thuret-Bornet Herbarium contains five specimens from Puerto Orotava (Tenerife), three with the date 24 Dec. 1904 (TA7223-TA7225) and two with the date 20-30 Jan. 1905 (TA7226, TA7227).

All the above specimens, identified by Sauvageau and examined by us, belong to this species. They predate the protologue and constitute original material (Art. 9.2, Note 2 of the ICBN). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from Sauvageau’s Herbarium SA5118 (Fig. 3), collected at Puerto Orotava on 24 Dec. 1904, is here designated as the **lectotype**, since it is a representative fertile specimen agreeing with the protologue. The five specimens SA5116, SA5117, SA5119-SA5121 from Sauvageau’s Herbarium and the three specimens TA7223-TA7225 from the Thuret-Bornet Herbarium become isolectotypes.

***Cystoseira mediterranea* Sauvageau var. *valiantei* Sauvageau**

This taxon was described by Sauvageau (1912: 355-357, 516) as follows: plant denser than the type variety and with more grey iridescence; axis shorter, sometimes with small, cylindrical and spinose tophules; primary branches thinner and flexible; spinose appendages longer; spring receptacles with spaced spinose appendages; autumn receptacles similar to the spring receptacles of the type variety.

Sauvageau gave the following distribution of the species in the Mediterranean Sea: Lion Gulf (Banyuls), Naples Gulf, with doubt “?”. According to Ribera *et al.* (1992), this taxon is distributed in France, Western Italy and Sicily. In the protologue, he referred to specimens collected among specimens of the *typus* or usually deeper in different months of the years 1908 and 1909 from the region of Banyuls-sur-Mer (France).

Sauvageau's Herbarium contains seven specimens labelled as “*Cystoseira mediterranea* Sauv. var. *valiantei* Sauv”. These specimens are the follows: Banyuls-sur-Mer, 24 Sep. 1909 (SA4442, SA4447); Banyuls-sur-Mer, Ile Grosse, 17 Jan. 1908 (SA4443); Banyuls-sur-Mer, Baie du Troque, 31 Mar. 1908 (SA4444, 15-20 meters depth); Banyuls-sur-Mer, Cap l'Abeille, 18 June 1908 (SA4441, SA4445, SA4446, 20 meters depth).

The Thuret-Bornet Herbarium contains one specimen collected at Banyuls-sur-Mer, Cap l'Abeille, 18 June 1908, with a note handwritten by Sauvageau: “Dragué par une vingtaine de mètres” and numbered as TA7617.

All the above specimens, identified by Sauvageau and examined by us, belong to this species. They predate the protologue and constitute original material (Art. 9.2, Note 2 of the ICBN). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from Sauvageau's Herbarium **SA4442** (Fig. 4), from Banyuls-sur-Mer (according the protologue was collected from La Ginestère near the Laboratoire Arago of Banyuls-sur-Mer) on 24 September 1909, is here designated as the **lectotype** since it is a representative fertile specimen agreeing with the protologue. The specimen SA4447 from Sauvageau's Herbarium becomes an isolecotype.

***Cystoseira platyclada* Sauvageau**

This species was described by Sauvageau (1912: 244-248, 521-522) as follows: plant tophulous, no iridescent, without vesicles; axis simple or branched attached to the substratum by a circular disc; apex of the axis smooth and prominent; tophules smooth; primary branches issued from tophules or directly from the axis, cylindrical and without spinose appendages at the base and flattened in the apical part; first secondary branches, mainly simple, foliaceous, nerved, with a margin entire; ultimate secondary branches short, narrow, cylindrical to slightly compressed, simple or branched, with spinose appendages; receptacles rare or absent in the spinose appendages, sparse at the top of the latter foliaceous branches and more abundant on the cylindrical branches.

According to Roberts (1978) it is possible that *C. platyclada* taxonomically lies close to *C. nodicaulis* (Withering) M. Roberts or *C. usneoides* (Linnaeus) M. Roberts. Ribera *et al.* (1992) included *C. platyclada* in **Taxa Inquirenda**.

Sauvageau gave the following distribution of the species: Biscay Bay (plateau de Saint-Jean-de-Luz, Atlantic Ocean), Alger (Mediterranean Sea). In the protologue, he referred to specimens collected at Guéthary (plateau de Saint-Jean-de-Luz, France) in different months of 1898.

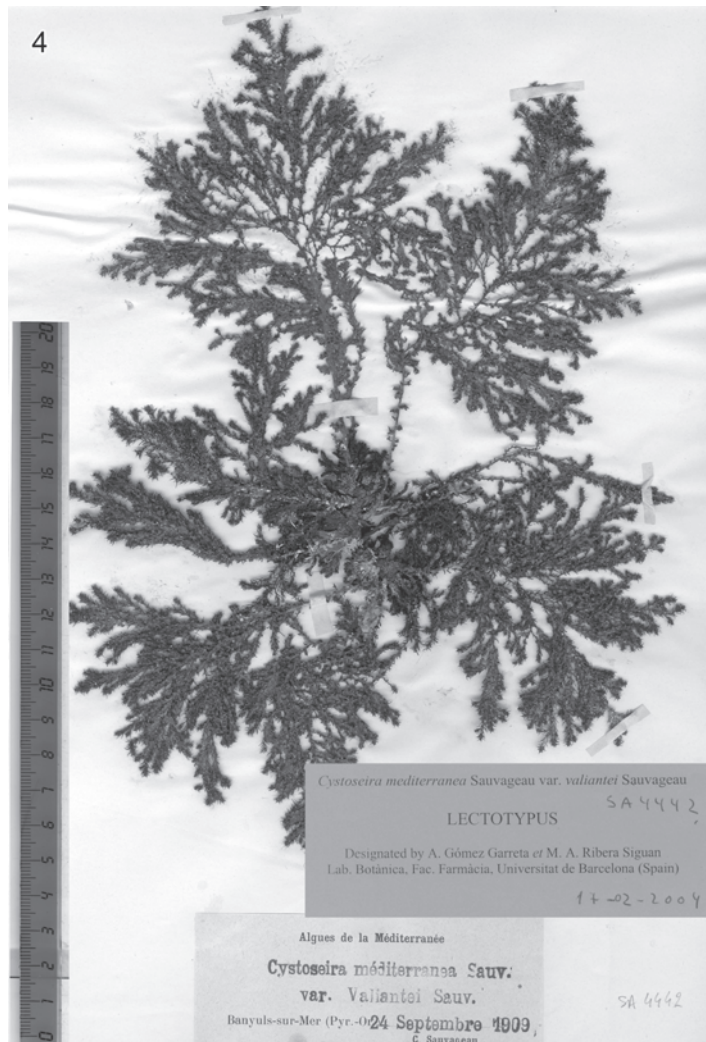


Fig. 4. Lectotype specimen of *Cystoseira mediterranea* Sauvageau var. *valianteri* Sauvageau.

Sauvageau's Herbarium contains eighteen specimens labelled as "Algues marines du golfe de Gascogne, *Cystoseira platyclada* Sauv., rapportée par les pêcheurs". These specimens are the following: Guéthary (plateau de Saint-Jean-de-Luz), 16 June 1898 (SA4835), 23 June 1898 (SA4831-SA4834), 20 July 1898 (SA4845), 29 July 1898 (SA4846), Sept. 1898 (SA4830, SA4836-SA4844, SA4847).

The Thuret-Bornet Herbarium contains four specimens with the same label: Guéthary (plateau de Saint-Jean-de-Luz), 23 June 1898 (TA7696), Sept. 1898 (TA7694, TA7695, TA7697).



Fig. 5. Lectotype specimen of *Cystoseira platyclada* Sauvageau.

The General Herbarium contains one specimen with the same label: Guéthary (plateau de Saint-Jean-de-Luz), Sept. 1898 (AB6306).

All the above specimens, identified by Sauvageau and examined by us, belong to this species. They predate the protologue and constitute original material (Art. 9.2, Note 2 of the ICBN). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from Sauvageau's Herbarium SA4847 (Fig. 5), collected at Guéthary in September 1898, is here designated as the **lectotype**, since it is a representative fertile specimen agreeing with the protologue.

***Cystoseira selaginoides* Valiante var. *gibraltarica* Sauvageau**

= *C. mauritanica* Sauvageau in Hariot 1911: 440 (Roberts, 1978: 402).

This variety was described by Sauvageau (1920: 27-32) as a taxon with characters intermediate between *C. granulata* auct. [= *C. nodicaulis* (Withering) M. Roberts] and *C. selaginoides* Valiante (= *C. sauvageauana*), being its following main features: tophules, secondary and tertiary branches narrow and flattened and, occasionally, aerocysts.

Sauvageau gave the following distribution of the taxon in the Gibraltar Straits: Tanger, Algeciras, Ceuta. In the protologue, he referred to one specimen collected from Algeciras (Spain) on 22 April 1903 and cited as *C. selaginoides* in Sauvageau (1912: 288), and commented on other specimens from Algeciras, Tanger (Morocco) and Ceuta (Spain) without indication of the date.

The Sauvageau's Herbarium contains only the specimen from Algésiras (= Algeciras) collected on 22 April 1903 (SA4537). Since no holotype was indicated by Sauvageau (1920), and no other syntypes were found, this specimen in Sauvageau's Herbarium **SA4537** (Fig. 6) is here designated as the **lectotype**.

***Cystoseira selaginoides* Valiante var. *polyoedematis* Sauvageau**

= *C. sauvageauana* Hamel, 1939: 399 (Motta, 1989: 325).

This taxon, which differs from the type variety by the presence of swollen zones in the axis, was described by Sauvageau (1912: 288-292, 517) as follows: axis erect either simple to few branched or, more or less, very branched; swollen zones homogeneous or similar to pseudo-tophules; apex of the axis prominent, smooth or spinose; primary branches leaving a cylindrical or tophules-like stump on the axis when falling. According to Motta (1989) this taxon does not differ from the type variety because the presence of pseudo-tophules is an inconstant and seasonal character.

Sauvageau gave the following distribution of the taxon in the Mediterranean Sea: Lion Gulf (Sète), Naples Gulf, Algeria (Matifou, Cherchell). In the protologue, he referred to specimens collected by M. Collin from Sète (France) in different months of 1910, and also to specimens from Cap Matifou and Cherchell (Algeria).

Sauvageau's Herbarium contains twenty-one specimens labelled as "*Cystoseira selaginoides* Val. var. *polyoedematis* Sauv." These, grouped according to place and date of collection, are the following: Cette, 5 Jan. 1910 (SA4620, SA4621), 20 Jan. 1910 (SA4608-SA4610, SA4617-SA4619), 6 May 1910 (SA4611, SA4612, SA4614), 13 July 1910 (SA4613, SA4615), 24 Nov. 1910 (SA4606, SA4607, SA4616, SA4622); Cherchell, 10 Apr. 1910 (SA4623-SA4626).

The Thuret-Bornet Herbarium contains four specimens identified by Sauvageau as *Cystoseira selaginoides* Val. var. *polyoedematis* Sauv.: Cette, 20 Jan. 1910 (TA7703), 6 May 1910 (TA7714), 24 Nov. 1910 (TA7710); Cherchell, 10 Apr. 1910 (TA7708, TA7713).

The General Herbarium contains one specimen of this taxon: Cherchell, 10 Apr. 1910 (AB13641)

All the above specimens, identified by Sauvageau and examined by us, belong to this variety. They predate the protologue and constitute original material (Art. 9.2, Note 2 of the ICBN). Since no holotype was indicated by Sauvageau (1912), they must be considered syntypes and they are eligible for selection as lectotype. The specimen from Sauvageau's Herbarium **SA4613** (Fig. 7), collected at Cette (Sète) on 13 July 1910, is here designated as the **lectotype**, since it is a rep-

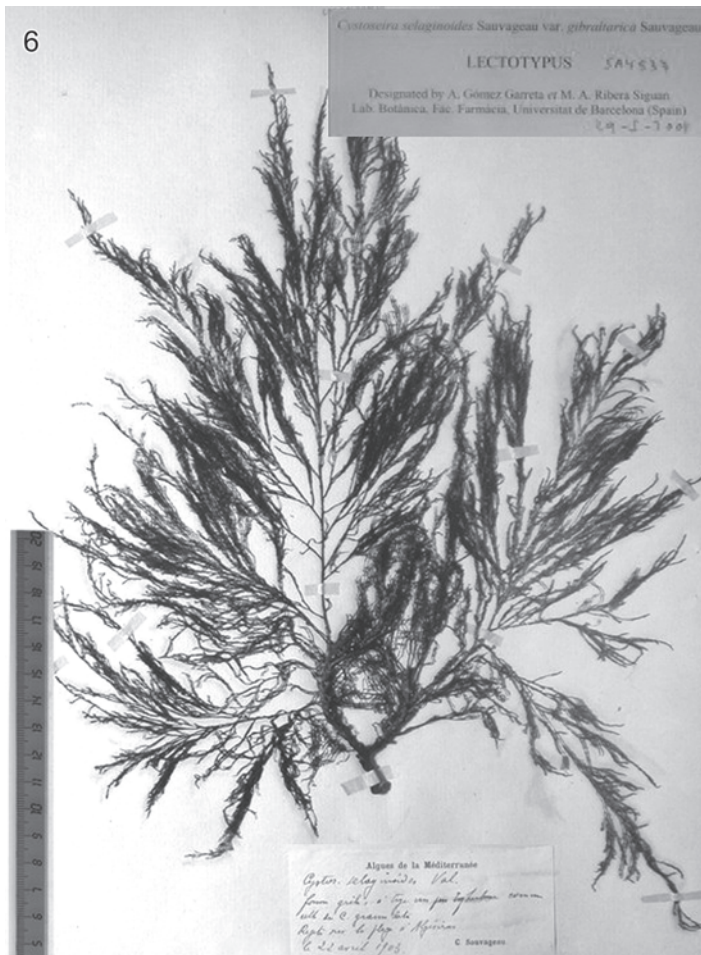


Fig. 6. Lectotype specimen of *Cystoseira selaginoides* Valiante var. *gibraltaria* Sauvageau.

representative fertile specimen agreeing with the protologue. The specimen SA4615 from Sauvageau's Herbarium becomes an isolectotype.

Comments on the type of *Cystoseira bosporica* Sauvageau [= *C. crinita* Duby f. *bosporica* (Sauvageau) Zinova & Kalugina, 1974: 118-120]

In the protologue, Sauvageau referred to only one specimen collected by Thuret from Buyuk-Déré Gulf (Bosphore) in October 1840. This specimen is conserved in the Thuret-Bornet Herbarium (TA7005), labelled by Thuret as "*Cystoseira abies-marina* Ag., Bosphore, Golfe de Buyuk-Déré (ad lapides submersas), Octobre 1840, Gustave Thuret" and with a handwritten note of Sauvageau "Cet échantillon avait été placé par M. Bornet dans le cahier du *C. barbata* avec les deux autres échantillons de *C. barbata* récoltés par Thuret à Constantinople.

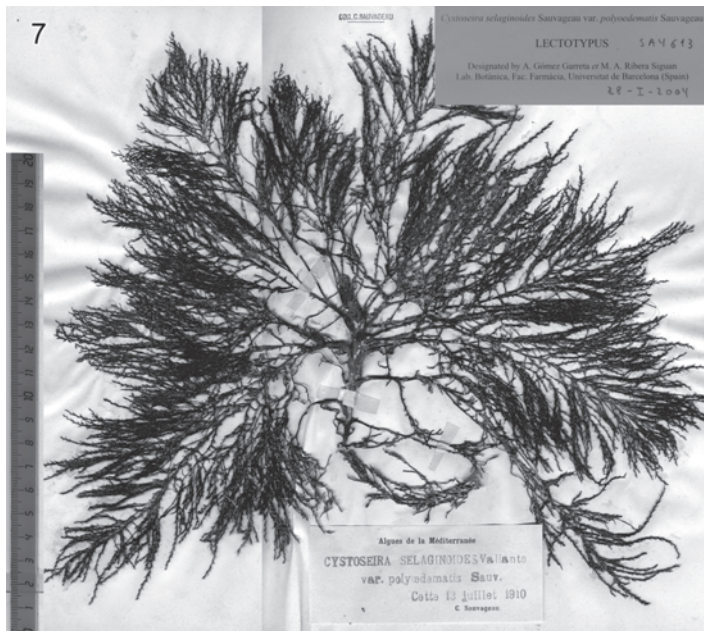


Fig. 7. Lectotype specimen of *Cystoseira selaginoides* Valiante var. *polyoedematis* Sauvageau.

J'en ai fait une espèce indépendante *C. bosphorica* Sauv.". Since the diagnosis of *Cystoseira bosphorica* was based by Sauvageau on only this specimen and no other specimens are quoted in the protologue, according to the Art. 9.1, Note 1 of the ICBN, this specimen **TA7005** must be accepted as the **holotype**.

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