On the original material of two austral American Senecio species (Compositae) collected during British naval expeditions in 1828, now located in the herbarium of Geneva

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On the original material of two austral American Senecio species (Compositae) collected during British naval expeditions in 1828, now located in the herbarium of Geneva

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Abstract

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The location of the original material of the austral American species *Senecio bipinnatifidus* Hook. & Arn. and *Senecio websteri* Hook. f. has been unknown for decades. In the course of curation labours in G, such material originating from Delessert's herbarium has been located. The name *Senecio bipinnatifidus* was described from Coquimbo (Chile) based on material collected in 1828 during the Captain Beechey's Expedition; the specimen found in G is designated as the lectotype of this name and the currently accepted *Senecio elquiensis* Cabrera placed under synonymy. The description of *Senecio websteri* was based on material collected in 1828 in Staten Island (Argentina) during the voyage to the Southern Atlantic Ocean lead by Captain Foster; the located specimen is considered here as the holotype of the name.

Keywords

ASTERACEAE – *Senecio* – Argentina – Chile – History of botany – Nomenclature – Taxonomy

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Introduction

By the mid-nineteenth century, the herbarium of Benjamin Delessert (1773–1847) was one of the most important private botanical collections worldwide, matched only by the herbaria of William J. Hooker (1785–1865) and Augustin-Pyramus de Candolle (1778–1841) (Stafleu, 1970: 928). The collection encompassed around 250,000 specimens, representing c. 86,000 out of the c. 95,000 species known at that time (Lasègue, 1845: 51). In 1869, Delessert's nieces bequeathed the herbarium to the city of Geneva (Stafleu, 1970: 933), becoming the nucleus of the general herbarium of the Conservatoire et Jardin botaniques (G).

In the course of curation labours in G, the original material of two species of *Senecio* L. (*Compositae*, *Senecioneae*) from the Southern Cone whose emplacement was unknown for a long time has been located. The vicissitudes behind the present whereabouts of the respective materials are discussed, as well as the historical events behind both names. One of these species is *S. bipinnatifidus* Hook. & Arn., which was described from Coquimbo (Chile, c. 30° lat. S) on the basis of material collected in 1828 during the expedition headed by Captain Frederick W. Beechey (1796–1856). On the other side, the description of *S. websteri* Hook. f. was based on material collected in 1828 in Staten Island (Argentina, c. 54° lat. S) during the voyage to the Southern Atlantic Ocean lead by Captain Henry Foster (1796–1831). The typification of both names and their taxonomic implications, when applicable, are discussed.

This work is part of the contributions aimed at resolving nomenclatural and taxonomic issues within the genus *Senecio* from the Southern Cone of South America (Calvo, 2020; Calvo & Morales-Fierro, 2021). It also highlights the invaluable heritage that the Herbarium Genavense harbours, which after the incorporation of the Delessert, Candolle, and Boissier herbaria, among others, became in the nineteen-forties an international referral center of plant taxonomy (Stafleu, 1970: 934).

Beechey's Expedition and Senecio bipinnatifidus

Captain Beechey's Expedition in the Pacific and Bering Strait was undertaken in His Majesty's Ship Blossom from 1825 to 1828. The expedition arrived at Rio de Janeiro on 4 July 1825 after leaving England, crossed the Magellan Strait towards the Chilean ports of Concepción and Valparaíso, and in November of the same year reached Easter Island (Rapa Nui). Early 1826 they were in the nowadays French Polynesia, arriving at Tahiti in March and at Hawaii in May. Then, they sailed into Kamchatka and crossed the Bering Strait sometime during July. In February 1827 they came back to Hawaii and headed again to Kamchatka and the Bering Strait. They left Port Clarence (now Alaska) in early September 1827 to Monterey (California, USA), San Blas (Nayarit, Mexico), and Acapulco (Guerrero, Mexico). In May 1828 they visited Coquimbo and Valparaíso once again, returned to Rio de Janeiro around August, and arrived in England in September of the same year (Hooker & Arnott, 1830: i, ii).

The plants collected by George T. Lay and Alexander Collie and other officers during the expedition were treated by William J. Hooker and George A.W. Arnott (1799–1868) in *The Botany of Captain Beechey's Voyage* published in ten parts between 1830 and 1841 (Stafleu & Cowan, 1979). The plant material was deposited in Arnott's herbarium, which was acquired by the University of Glasgow [GL] and is currently housed in E (Stafleu & Cowan, 1979; based on a quote from Asa Gray). However, Hooker also owned a set, which seems to be in part at K and E. The dispersal and present whereabouts of Hooker's set entails further uncertainties because Hooker also sent one lot of Beechey's plants to London that was further divided between Robert Brown and Aylmer B. Lambert (information according to Hooker, who received such particulars through a Lambert letter addressed to him; see Miller 1970: 514). Brown's herbarium was split up after his death in 1876 and most of this material found its final destination at BM, K, and E. On the other hand, Lambert's rich herbarium was shortly after his death divided into 317 lots and acquired at a public auction by 16 buyers (Miller, 1970). Beechey's plants of Lambert were bought by Delessert, now at G. In this regard, Lasègue (1845), who was the last and the long-lasting curator of Delessert's herbarium, mentioned "Elles font partie de l'herbier de M. Delessert, qui possède même quelques-uns des échantillons uniques [they are part of Mr. Delessert's herbarium, and even some specimens are unique]".

The type material of *Senecio bipinnatifidus* was collected in Coquimbo (Chile). Although no date is indicated in the protologue, Beechey's Expedition only visited this locality once during the outbound journey to Magellan Strait, in May 1828 as indicated above. Until now, the location of the original material of this species remained unknown, which contributed to keep this name neglected for years (Freire, 2008; Rodríguez et al., 2018). In this line, the species was treated as dubious by the foremost specialist on Chilean *Senecio* (Cabrera, 1949). Nonetheless, and based on the brief Latin description provided in the protologue, Cabrera presumed a potential affinity with the species belonging to *Senecio* subsect. *Disecti* Cabrera (e.g. *S. cerberoanus* J. Rémy, *S. elquiensis* Cabrera, *S. viscosissimus* Colla).

A Beechey's specimen identified as *Senecio bipinnatifidus,* most probably in Hooker's handwriting, was found in G. The locality is missing but the plant perfectly matches the original description of the species (Fig. 1). It is therefore selected to serve as nomenclatural type, hence, the name is resurrected.

Fig. 1. – Lectotype of *Senecio bipinnatifidus* Hook. & Arn. [G00432676; Conservatoire et Jardin botaniques de Genève]

Senecio bipinnatifidus Hook. & Arn., Bot. Beechey Voy. 1: 32. 1830.

Lectotypus (designated here): **Chile:** *sine loco* [Coquimbo], s.d. [V.1828], *Beechey Exped. s.n.* (G [G00432676]!).

= *Senecio elquiensis* Cabrera in Lilloa 15: 416. 1949, **syn. nov. Holotypus: Chile. Coquimbo Region:** Rivadavia, 800 m, 6.XI.1923, *Werdermann 99* (SI [SI001011] image!; iso-: E [E00251534] image!, G [G00432675]!, GH [GH00012126] image!, LIL [LIL001824] image!, LP [LP000477] image!, MO-909953 image!, S-R-5694 image!, UC [UC238373] image!).

Notes. – As it is nearly impossible to know if Hooker used no other element when preparing the account of the new species, the specimen at G is designated as the lectotype of the name *Senecio bipinnatifidus*. Because of the pinnatisect, glandular-pubescent leaves, the long tomentose involucres, and the white-sericeous achenes, among other characters, I identify it as *S. elquiensis* [1949], a species described from the surroundings of Rivadavia (Elqui, Coquimbo Region). This name, widely accepted thus far (Cabrera, 1949; Freire, 2008; Rodríguez et al., 2018), has to be treated as a later heterotypic synonym of the priority name *S. bipinnatifidus* [1830]; accordingly, the new synonymy is proposed above.

Senecio bipinnatifidus is characterized by the combination of the following characters: stems with scattered, short glandular trichomes, leaves bipinnatisect, glandular-pubescent, semi-amplexicaul the upper ones, capitula radiate, involucral bracts with long tomentose indumentum on the abaxial surface, supplementary bracts linear, a half as long as the involucral bracts, achenes white-sericeous. As emphasized in the original description ("involucro tomentoso"), this species is easily recognizable by the c. 1.5 mm long trichomes covering the involucre, which let one separate it from the similar species *S. hirsutulus* Phil. and *S. balsamicus* Phil. Other species with long tomentose indumentum on the involucre and occurring in the same region are *S. coquimbensis* Phil. and *S. pubescens* Phil. *Senecio bipinnatifidus* differs from the former in leaf division (bipinnatisect vs. pinnatifid to pinnatipartite in *S. coquimbensis*) and from the latter in stem indumentum (with scattered, short glandular trichomes vs. dense, long glandular-hirsute trichomes in *S. pubescens*) and in having slightly shorter involucral bracts (6–8 mm vs. 8–8.5 mm in *S. pubescens*). *Senecio bipinnatifidus* has also been confused with *S. chamomillifolius* Phil. (see *Werdermann 99*), a species with very similar leaves. However, this latter species has rather glabrous involucres or with very short glandular-pubescent trichomes; it is known from lower latitudes in the Atacama Region.

Additional material examined. – **Chile. Coquimbo Region:** La Serena, Compañía Baja, 17–20.IX.1933, *Looser 2837* (G).

Captain Foster's Expedition and Senecio websteri

Captain Henry Foster received in 1827 the Copley Medal of the Royal Society for his philosophical experiments in the Arctic Regions, and in 1828 was entrusted by the Lords Commissioners of the Admiralty to sail in the Chanticleer for a voyage to the Southern Atlantic Ocean that lasted from 1828 to 1830. The principal objects of the voyage were experiments with the pendulum, and, next to them, the determination of longitude by means of the chronometer. On Saturday 17 January 1835, the two-penny weekly magazine *The Mirror of Literature, Amusement, and Instruction* (nº 702) dedicated an article to this expedition starting with the following words: "This is, in many respects, one of the most interesting of all the recent voyages of discovery, and its results to science have been more important than many enterprises of our time". Indeed, the article is a review of the book *Narrative of a voyage to the Southern Atlantic Ocean, in the years 1828, 29, 30 […],* which was published in 1834 in two volumes and contained a detailed account of the Chanticleer Voyage written by William H.B. Webster (1793–1875), who was the surgeon of the expedition.

The Chanticleer left Portsmouth on 21 April 1828, and on 16 July harboured in Rio de Janeiro after touring the way Madeira, Tenerife, Cape Verde Islands, and Fernando de Noronha. Then, the expedition sailed southward to Cape Horn visiting Staten Island ["for though an island in itself, and not of very large dimensions either, it is called Staten Land" (Webster, 1834a: 96–97), Fig. 2] and Deception Island during the austral summer of 1828–1829. After a long passage of twenty-seven days of navigation, on 21 June 1829 they reached the Cape of Good Hope. On 13 December the Chanticleer left the Cape towards St. Helena, Ascension Island, and once again to the Island of Fernando de Noronha (June 1830). Thence, they continued along the coast of South America northward to St. Louis (Maranhão, Brazil), Amazon River, Port of Spain (Trinidad and Tobago), and La Guaira (Venezuela). They arrived at Porto Bello (Portobelo, Panama) at the end of 1830 to survey the Isthmus of Darien (Isthmus of Panama). On 5 February 1831 Captain Foster fatefully drowned in Chagres River when he fell from his canoe. Due to this tragic event, the expedition left Porto Bello via Jamaica, Cuba, Crooked Island, Bermuda, and arrived at Falmouth (England) on 17 May 1831 after completing a voyage of more than three years (Webster, 1834a; see map depicted to face title page).

Although the expedition was mainly meant to attempt more accurate calculations of the shape of the earth and the law of the variation of gravity in different points of its surface, they were entrusted to take advantage of research in several departments of natural history. The report of the committee on which the foregoing voyage was ordered is clear in this respect and concerning the botanical pursuits stated: "[...] they confine themselves to suggesting that an additional person

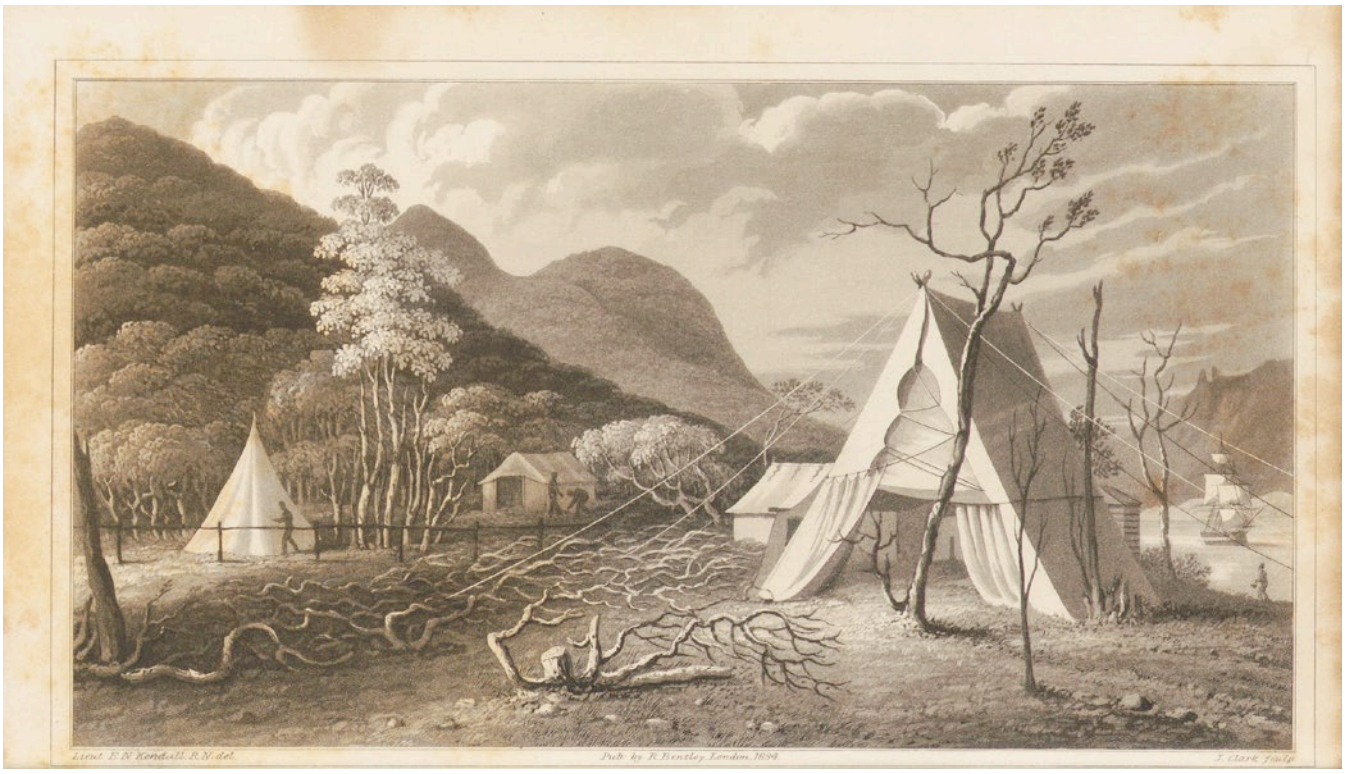

Fig. 2. – Pendulum Station at Port Cook, Staten Island. [Webster, 1834a: 99] [© ETH-Bibliothek Zürich, http://dx.doi.org/10.3931/e-rara-73979]

be appointed to serve with the expedition in the character of botanical collector, whose exclusive duty it shall be to procure and preserve botanical specimens and seeds, and whose collections shall from time to time be delivered to the care of the commanding officer, to be transmitted to England as occasion may occur" (Webster, 1834b: 380). And it continued as follows: "That Mr. Webster, the surgeon of the ship, be directed to attend to the collection and preservation of specimens in zoology, mineralogy, and geology united; and the Committee will hold themselves in readiness to furnish to Mr. Webster and to the botanical collector, such further instructions in detail as may be required" (Webster, 1834b: 380–381). The presumed botanical collector is not afterwards mentioned by Webster in his account, which makes one think that Webster himself was who finally held such responsibility. In fact, the botanical specimens originated from this expedition were attributed to him and housed in K. This second statement is not mentioned in Webster's account but becomes logical knowing the royal nature of the expedition. Moreover, Webster's specimens are mentioned several times in the later *Flora Antartica* by Joseph D. Hooker (1817–1911), who developed most of his career in Kew.

Hooker honoured the botanical labours of Webster naming *Senecio websteri* a very distinct species from Staten Island (Isla de los Estados, Tierra del Fuego, Argentina) that the latter collected sometime between 25 October and 21 December 1828. In another sense, he also emphasized in the protologue that "Mr. Webster's specimens are very insufficient". Indeed, referring to the original material of *S. websteri*, Hooker expressed: "Caulis exemplare a me viso manco 4 unc. longa [the stem of the specimen I saw barely is 4 inches long]". This sentence reveals with little doubt that Hooker based his description on a single, and sparing, specimen. This material, not located for a long time (Cabrera, 1949; Cabrera, 1971; Freire et al., 2014), has been found in G. The specimen perfectly matches the details stated by Hooker and it bears two labels: (1) shows the name "Senecio Websteri, H.f." in Hooker's handwriting; (2) reads "Staten Island (Detroit de Magellan) M. Webster", most probably transcribed from the original source into French by the at that time Herbarium Delessert's curators Antoine Guillemin or Antoine Lasègue (Fig. 3). On this basis, no reason prevents me from considering this specimen the holotype of the name *S. websteri*.

Because of the calligraphy in French of the second label, it is quite clear that Webster's specimen arrived at Geneva through Delessert's herbarium. However, determining which curator made the transcriptions becomes difficult due to the similarity of their respective calligraphies. Likewise, how and when Delessert acquired Webster's specimens (I also found a specimen of *Senecio eightsii* Hook. & Arn. from Staten Island) remain unknown.

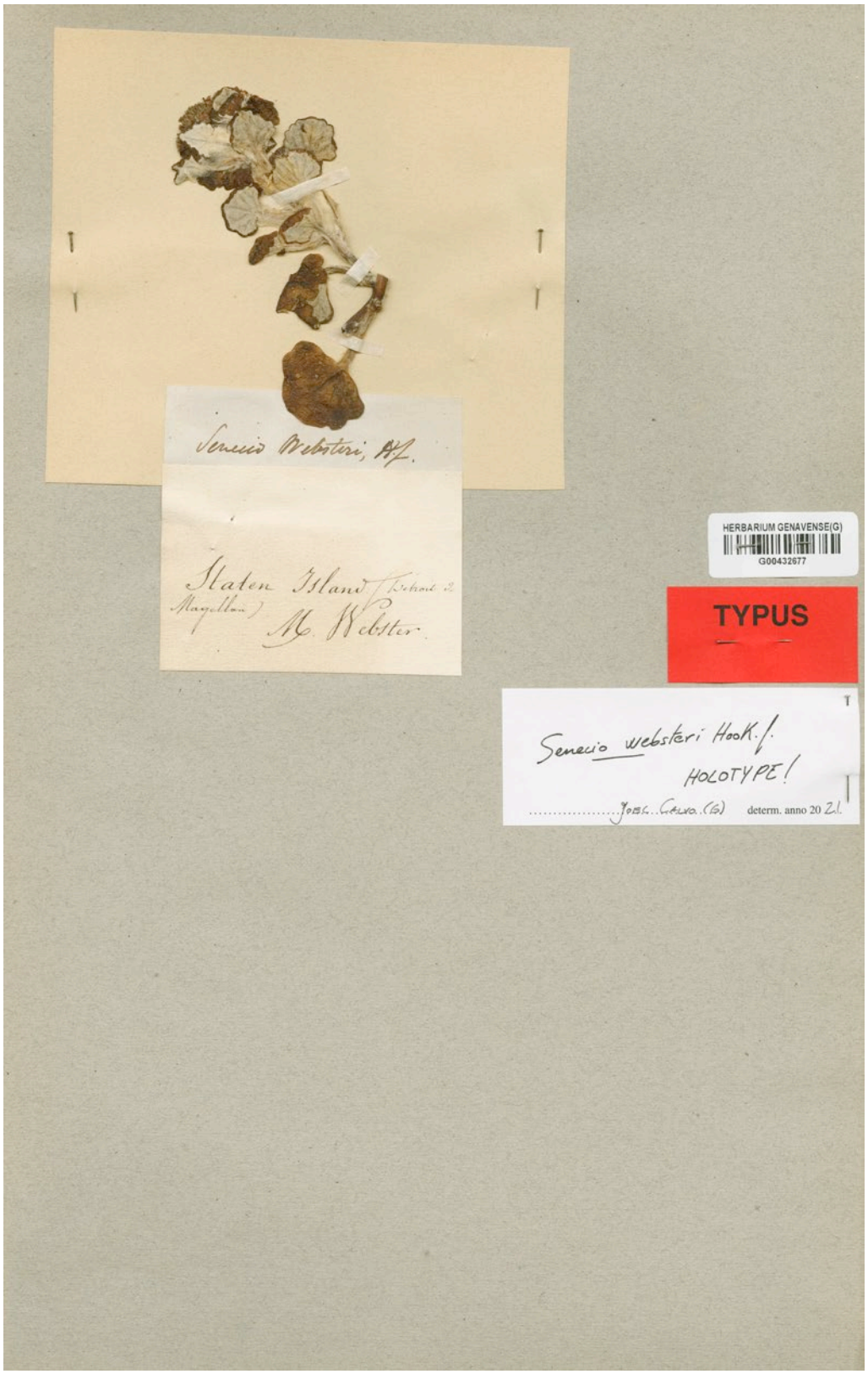

Fig. 3.– Holotype of *Senecio websteri* Hook. f. [G00432677; Conservatoire et Jardin botaniques de Genève]

Senecio websteri Hook. f., Bot. Antarct. Voy. (Fl. Antarct.) 2: 317. 1846.

Holotypus: Argentina. **Tierra del Fuego:** Staten Island, s.d. [25.X–21.XII.1828], *Webster s.n.* (G [G00432677]!).

= *Senecio websteri* var. *subdiscoideus* A. Gray in Proc. Amer. Acad. Arts 5: 141. 1861. **Lectotypus** (designated here): **Chile. Magallanes Region:** Orange Harbor, Fuegia, [55°31'S 68°05'W], *Wilkes Exped. s.n.* (US [US00829297] image!; isolecto-: GH image!, K [K000527618] image!).

Notes. – The reniform, orbicular, or flabellate leaf laminas make this species very distinctive among other austral American *Senecio*; any confusion seems therefore unlikely.

As pointed out by Cabrera (1949), *Senecio websteri* var. *subdiscoideus* is a mere form displaying very short ray florets that does not deserve taxonomic recognition. This name is lectotypified here based on the specimen kept at US, which bears a label handwritten by Gray and it is also the most complete material. The duplicates at GH and K also have labels in Gray's handwriting but are largely meagre. It is important to note that Wilkes' material represented the nucleus of the US herbarium, institution that currently houses the main set of this important collection (Bartlett, 1940; Stafleu & Cowan, 1988).

Additional material examined. – **Argentina. Tierra del Fuego:** Isla de los Estados [as IE hereinafter], Bahia Crossley, islet called Faro Le Maire, 17.X.1971, *Dudley et al. 380A* (E); IE, Bahia Crossley, near baliza Tte. Palet, 18.X.1971, *Dudley et al. 558* (E); IE, Pto. San Juan del Salvamento, 26.X.1971, *Dudley et al. 928* (E); IE, Puerto Vancouver, 29.X.1971, *Dudley et al. 1037* (E); IE, Bahia Liberty, 2.XI.1971, *Dudley et al. 1252* (E); IE, Bahia Flinders, 6.XI.1971, *Dudley et al. 1501* (E); IE, Puerto Parry, 11.XI.1971, *Dudley et al. 1749* (E); Cabo San Vicente, north of Bahia Thetis, 23.XI.1969, *Goodall 2342* (US).

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