

## The Statices of the Canaries of the Subsection Nobiles. I.

BY

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IN a communication to the Gardeners' Chronicle of Dec. 17, 1904, Dr. G. Perez, of Orotava, called attention to the now complete disappearance of *Statice arborea* from its last refuge, adding some very interesting remarks on the probability of its having been a hybrid between *Statice fruticans* and *Statice macrophylla*, and the general readiness of the species of the subsection *Nobiles* to hybridize. Since Leopold von Buch<sup>1</sup> declared *Statice arborea* extinct and its subsequent rediscovery, it has, along with its allies, repeatedly been quoted as an instance of the vanishing old flora of the Canaries. Considerable material and much valuable information regarding the Statices of the subsection *Nobiles* having accumulated at Kew during the last few years, almost exclusively through the efforts of Dr. Perez, it appeared to me desirable to bring together what we know of the subject. Certain questions, as for instance those concerning the oecological and biological conditions under which those species still hold their own or slowly vanish, can, of course, not be solved satisfactorily at the distance and from dry material. Still much may be accomplished in the way of preparatory work that cannot be done in the field, and yet is indispensable as a sound starting basis for the more fortunate man who is able to work in Nature's own laboratory.

<sup>1</sup> Allgemeine Übersicht der Flora auf den Canarischen Inseln (1819), pp. 338-9. The Norwegian botanist, Christian Smith, accompanied Buch to the Canaries. His diary was published by F. C. Kiaer in 1889, and in it we find on p. 29 an entry relating that Buch brought him 'Stat(ice) fr(uticosa)'. To this Kiaer has added a footnote: '= *Limonium fruticosum*, Mill., *Statice cylindricum*, Forsk. eller maaske = *Statice arborea*, S. 137.' 'S. 137' refers to Buch's Physikalische Beschreibung der Canarischen Inseln (1825), where it says: 'Fuente del Rey, zwischen Puerto Orat. u. Realexo; aber in Gärten. Wo ist sie wild?' Kiaer's synonymy is certainly wrong. What Miller's *Limonium fruticosum* is, I do not know for certain, possibly *Statice axillaris*, Vahl., a species of both coasts of the Red Sea, whilst '*Statice cylindricum*, Forsk.,' or rather '*Statice cylindrifolia*, Forsk.,' as it should read, is a native of Yemen. Chr. Smith very likely meant *Statice arborea*.



All the Statices of the subsection *Nobiles* are endemic in the Canaries, some being restricted to a single locality of very limited extent, others to a single island, and none occur at the same time in more than two of the islands of the archipelago. As they are very conspicuous objects on account of their brilliant blue inflorescences, and to some degree familiar to the inhabitants—they call them ‘Siempreviva del mar’<sup>1</sup>—it is not probable that future exploration will add much to their areas as they are known at present. On the contrary, there is a considerable risk of their total disappearance.

The first species of the *Nobiles* group of *Statice* that became known was discovered by Francis Masson, who on his way to South Africa collected in Teneriffe in 1773. He found it, to quote his own note attached to his specimen in the British Museum, ‘on a rock in the sea, opposite the fountain which waters port Orotava.’ He presented to the younger Linnaeus a specimen which Solander<sup>1</sup> named *Statice arborea*, adding as locality: ‘Teneriffa, circa Ramla in rupibus maritimis.’ Masson’s discovery was, however, not made known until more than forty years later, when, in 1819, J. Smith<sup>1</sup> described it as *Statice arborea* from ‘the maritime rocks at Burao and Rambla in the isle of Teneriffe.’ The apparently conflicting statements concerning the locality can easily be reconciled. Burao is a slip for Burgado, a small cove immediately to the east of the Rambla del Castro, a well-known littoral terrace on the north coast of Teneriffe, about 5 kil. from Puerto d’Orotava. In that cove there are some calcareous springs<sup>2</sup>, probably Masson’s ‘fountain,’ and at a stone-throw’s distance from the shore two basaltic cliffs on which Berthelot and Webb actually found the plant growing in 1829<sup>3</sup>. Long before that, in 1796, however, Ledru, a botanist who accompanied Capt. Baudin on his expedition to the West Indies, had also collected the plant, but where is not exactly known, nor is there any reference to his find until 1817, when Poiret<sup>4</sup> called attention to it. A few years later, probably very soon after Humboldt’s short stay in Teneriffe, it was found again by Aug. Broussonet, an accomplished zoologist and botanist, who at that time was French Consul in the Canaries. Broussonet was soon afterwards appointed Professor in the University at Montpellier, where, in 1805, he published a catalogue<sup>5</sup> of the plants of the Botanic Garden then in his charge, enumerating in it a ‘*Statice arborescens*, Br.’ without any description or other remarks. He distributed, however, at the same time, herbarium specimens of that plant to several botanists, among them also to Willdenow<sup>6</sup>, who, in 1809, published a description of it under the name

<sup>1</sup> J. Smith in Rees, *Cyclopedia*, xxxiv (1819).

<sup>2</sup> Rothpletz in Petermann’s *Geographische Mitteilungen*, xxxv (1889), p. 245.

<sup>3</sup> Berthelot et Webb, *Histoire naturelle des Iles Canaries*, III, i, p. 8, and iii, p. 181. See also their *Atlas, Vues phytostatiques*, tab. viii, fig. 3.

<sup>4</sup> Poiret, *Encyclopédie méthodique*, Suppl. v, p. 236.

<sup>5</sup> Broussonet, *Elenchus Plantarum Horti Botanici Monspeliensis anno 1804* (1805), p. 58.

<sup>6</sup> Willdenow, *Enumeratio Plantarum Horti Regii Botanici Berolinensis* (1809), p. 337.



*Statice arborea*, the name (not *S. arborescens*) which Broussonet had used on the labels of the specimens of his own herbarium as well as of the duplicates which he gave away. This being the first description of *Statice arborea*, Broussonet also had the credit of the discovery. The locality where he found the plant was not known, or rather it was assumed that it was the same as Masson's. Through the courtesy of Prof. Flahault, I had, however, an opportunity of seeing Broussonet's own specimens, and found that he gives it as 'Sur les rochers au-dessus de la maison à Dauté.' Dauté, or El Dauté, is a place about 1 km. to the west of Garachico, and 18 km. to the west of the Burgado Cove. It has not been found again there, and evidently disappeared long ago from that neighbourhood, a district covered with vineyards. When Leopold von Buch stayed in Teneriffe in 1815, he found *Statice arborea* growing in gardens at Fuente del Rey, between Orotava and Realejo, but, as he adds, 'nowhere wild'. I have, however, already mentioned that it was in 1829 rediscovered by Berthelot and Webb on the same cliffs in the Burgado Cove where Masson collected it, and it was still growing in that locality in 1858 when Lowe gathered it there. A slight extension of this very small Burgado area became known through Webb, who, in 1845, obtained from Bourgeau specimens of *Statice arborea* from 'rupibus Teneriffae (genitive) oppositis' (that is, opposite to the two Burgado cliffs<sup>2</sup>), or, as Bourgeau himself says on the label (No. 65), from 'La Dehesa de los Frayles.' Here, on the mainland, Dr. Perez places also Gustav Mann's locality, 'La Longera,' where he collected *Statice arborea* in 1863. Since then it has not been recorded again from the cliffs in the Burgado Cove, and Dr. Perez states positively that it has disappeared altogether<sup>3</sup>. I may also add here that it was from the same spot that the plants were derived which Webb sent home—the first in 1829<sup>4</sup>—and which created such sensation when they flowered for the first time<sup>5</sup>.

Up to 1845 or 1846, when Berthelot and Webb issued the part of their *Phytographie des Iles Canaries* that contained the descriptions of the Canarian *Statice*s, there was no doubt about the homogeneous character of *Statice arborea* as a species, although Webb, in the later part of the *Phytographie*<sup>6</sup>, had revived Broussonet's catalogue name *Statice arborescens* in preference to *Statice arborea*, which was up till then in general use, and justly so. In 1846, however, E. Bourgeau, whose name is so intimately connected with the

<sup>1</sup> L. von Buch, *Physikalische Beschreibung der Canarischen Inseln* (1825), p. 137. See also note 1, p. 205.

<sup>2</sup> Berthelot et Webb, l. c., III, iii, p. 180.

<sup>3</sup> Perez in the *Gardeners' Chronicle*, 3rd ser., xxxvi (1904), p. 419.

<sup>4</sup> Loudon, *Encyclopaedia of Plants*, 1855, p. 1330.

<sup>5</sup> This is a passage by Lindley from *Botanical Register*, 1839, tab. 6, referring to a specimen exhibited by Messrs. Lucombe, Pince & Co. : '6 ft. high, and covered with large clusters of flowers, the brilliancy of whose blue neither precious stones nor metallic preparations could even approach'! For this plant the Gold Banksian Medal was awarded (*Proc. Hort. Soc. London*, 1838, p. 10).

<sup>6</sup> Berthelot et Webb, l. c., III, iii, p. 180, tab. 194.



botanical exploration of the Canaries as of many other countries, discovered a *Statice* very similar to *Statice arborea*, but of smaller stature and, above all, with a much reduced stem, and distributed it as *Statice fruticans*, Webb. Of this specimens were sent, probably by Webb, to Van Houtte's establishment in Ghent, where they flowered in 1847, and a description and figure were published by Lemaire<sup>1</sup> in the *Flore des Serres* early in the following year, the name being changed from *Statice fruticans* into *Statice frutescens*. The plants were not quite 6 dm. high, instead of 12–18 dm. as was the case with *Statice arborea*, and the leaves also were smaller than in that species. Soon after the publication of Lemaire's *Statice fruticans*, vol. xii of De Candolle's *Prodromus* was issued, containing Boissier's monograph of the Plumbagineae. There the author, although aware of Lemaire's publication, adopted Webb's name *Statice fruticans*<sup>2</sup> for the supposed new species, and *Statice arborescens*, Brouss., for the old *Statice arborea*, but with this distinction, that he claimed the specimen which Willdenow had received from Broussonet for *Statice fruticans*, and he consequently quoted *Statice arborea* as synonym under *Statice fruticans*. Some specimen of Broussonet's—it is not specified—was, however, still referred to *Statice arborescens*, that is the arborescent, large-leaved plant, as represented in Webb's own collecting and by the English illustrations<sup>3</sup> of *Statice arborea*. Bourgeau collected the plant, which thus became the 'type' of *Statice frutescens*, Lem. (= *S. fruticans*, Webb ex Boiss.), on a rocky promontory called El Freyle, not far from Cape Teno, the westernmost point of Teneriffe, and it is still there, or at any rate was there until quite recently, when the Rev. R. P. Murray gathered it in 1889. In 1855, however, H. de la Perraudière (Bourgeau's companion on his second journey to the Canaries) collected a *Statice* at 'P<sup>te</sup> Orotava, in scopulis maritimis,' which in the Montpellier herbarium lies under the name *Statice arborescens*, Brouss., whilst it was distributed by Bourgeau (No. 1494) as *Statice fruticans*, the locality being quoted by him as 'Dehesa de los Frayles in rupibus maritimis.' I have no doubt that Perraudière's plants came from the cliffs of the Burgado Cove, either those in the sea or those on the mainland opposite. These herbarium specimens of the *Statice fruticans* from Burgado are so similar to those from El Freyle that no botanist would hesitate to sort them together. If we admit Boissier's distinction of *Statice arborescens* and *Statice fruticans*—or, as they should be called, for reasons of priority, *Statice arborea* and *Statice frutescens*—we find that both species grew together in the Burgado area as well

<sup>1</sup> Lemaire in *Flore des Serres*, 1st ser., iv (1848, March), tab. 325.

<sup>2</sup> Boissier in De Candolle, *Prodromus Systematis Naturalis Regni Vegetabilis*, xii (1848), p. 636.

<sup>3</sup> Paxton, *Magazine of Botany*, iv (1838), tab. 217; Maund, *The Botanist*, i (1838), tab. 47; *Botanical Register*, xxv (1839), tab. 6; *Botanical Magazine* (1840), tab. 3776. See also *Horticulture Universelle*, vi (1845), tab. 164.



as in that of Dauté, whilst *Statice frutescens* alone occurs on El Freyle. But here the question arises, are the two supposed species really distinct, or have we in them simply arborescent and subacaulescent forms or individuals of one species; or, finally, is Dr. Perez right in assuming that *Statice arborea* was a hybrid of *Statice frutescens* with *Statice macrophylla*? Boissier<sup>1</sup> supported his view that they were distinct species by pointing out the differences in stature, in the size of the leaves, the length of the flowering branches, and other less obvious characters, such as the width of the wings of the branches, the shape of the auricles of the spike-bearing branchlets, the presence or absence of cilia on the uppermost (inner) bract, and the width of its keel. I may state at once that these less obvious differences do not hold good. They are slight, and differences of the same degree may be found in one and the same individual plant. On the other hand, it must be admitted that the herbarium specimens can readily be sorted by the dimensions of their leaves and inflorescences into two sets, one corresponding to *Statice arborea* as represented by Webb's and Bourgeau's specimens from the Burgado cliffs, and the other to *Statice frutescens* as represented by Bourgeau's specimens from El Freyle. There are only few cases where one might hesitate. As to stature, the herbarium material, as it is, tells us nothing. Now Broussonet, who is supposed to have collected both species in the same place, mounted both forms on the same sheet in his own herbarium, there being three branches—one with large leaves, and two with small leaves like those of the specimen which he gave to Willdenow—but to him they were no doubt all *Statice 'arborea.'* In a similar way Perraudière himself put the plant collected by him on the Burgado cliffs down as '*Statice arborescens,*' and it was only Bourgeau, the distributor, who, from the similarity of the branches cut by Perraudière and his own from El Freyle, referred them to '*Statice fruticans,*' implying that they had been taken from a subacaulescent plant. It seems clear that neither Broussonet nor those who collected on the Burgado cliffs were ever struck by the presence of two distinct species, such as Boissier suggested. There would, of course, be taller and shorter individuals, and, in the same individual, perhaps robust and weak branches; and it would depend on chance or the idiosyncrasy or object of the collector whether he would cut his specimens from one or the other set of individuals or branches. In fact, there is at present growing in the Temperate House at Kew a fine specimen of *Statice arborea macrophylla*, communicated by Dr. Perez, from which specimens representing either form might be obtained. It, however, also seems to be the case that on El Freyle only a subacaulescent small-leaved form occurs. It has been in cultivation in Europe and in Dr. Perez's garden without chang-

<sup>1</sup> Boissier, l. c., p. 637.



ing its stunted growth ; but this does not seem to prove that that feature has in the El Freyle plant become fixed, as one would expect of a character good enough for specific distinction. If, as I believe, those cultivated specimens were propagated from cuttings, representing short axes of the second or third rank, one would not expect them to behave necessarily like the primary axis of *Statice arborea*, which seems to have a natural tendency to grow, under favourable circumstances, into an erect leafless stem, bearing at its top on short branches a compound rosette of leaves, otherwise very like that which in the other stemless species rests on the ground. But even if it should not be possible to raise the arborescent form from the seed of the stunted *Statice* of El Freyle, it would hardly stand to reason to treat it as a species on that account only.

Now as to Dr. Perez's theory<sup>1</sup> of hybridization referred to in the introductory lines of this paper. He assumes that the arborescent form, the *Statice arborea* or *Statice arborescens* of the authors, was a hybrid of *Statice 'fruticans'* and *Statice macrophylla*. In support of this he points out that in the Botanic Garden at Orotava there was growing until lately a very old specimen representing in his opinion the now extinct typical (i. e. arborescent) *Statice arborea*, and more or less intermediate between the suggested parents, and that this is also the case with the daughter plants raised from the former ; and secondly that *Statice 'fruticans'* and *Statice macrophylla* actually grew together in the Burgado Cove. *Statice 'fruticans'* and *Statice macrophylla* are plants easy enough to distinguish. Both have a short primary axis with the ramification and leaf-arrangement in compound rosettes, so common in *Statice* ; but the blades of the former are small and contracted into a long petiole, whilst they are large, lanceolate to obovate-oblong, and long-attenuated at the base, and practically sessile in *Statice macrophylla*. The wings of the flowering branches of *Statice 'fruticans'* are narrow, and those of the ultimate branchlets produced into acute, often sickle-shaped auricles ; but they are broad and produced into obtuse auricles in *Statice macrophylla*. Further, *Statice 'fruticans'* has glabrous or almost glabrous inner bracts with a laterally compressed obtuse keel near the apex and a very narrow, scarious margin. In *Statice macrophylla*, however, these bracts are whitish-pubescent, rounded on the back without a keel, and bordered towards the apex with a broad, blue, crisped frill. The flowers are finally somewhat larger in *Statice macrophylla* than in *Statice 'fruticans.'* Dr. Perez has supplied me with photographs and ample dried material of the Orotava garden plant mentioned above.

The first thing that strikes one is that the supposed hybrid shows an arborescent habit which is altogether absent in the parents. As to the leaves, they are very large and rather intermediate between those

<sup>1</sup> Perez in the Gardeners' Chronicle, 3rd ser., xxxvi (1904), p. 419.



of typical *Statice arborea* and *Statice macrophylla*. The wings of the branches are more developed than in *Statice 'fruticans'*, and the wing-auricles as a rule obtuse as in *Statice macrophylla*. The bracts again have the characteristic pubescence of *Statice macrophylla*, and also frequently a small blue frill, whilst the dorsal keel is much less distinct than in *Statice 'fruticans'* and overtopped by the frill. The flowers, finally, are certainly larger than in *Statice 'fruticans'*. Compared, however, with the finest specimens of *Statice arborea* collected by Webb and Bourgeau and the figures<sup>1</sup> of the plants of that species grown in England between 1830 and 1850, the supposed hybrid of the Orotava garden agrees with them much more than with *Statice 'fruticans'*, the main differences being in the marked pubescence of the inner bract, the reduction of the dorsal keel, and its tendency to run into a frill. As to the auricles of the ultimate branchlets, I would remark that their shape is fairly constant in *Statice macrophylla*, but rather variable in *Statice arborea* (including *Statice 'fruticans'*). The Orotava garden plant may therefore have been very well a descendant of a specimen of the typical *Statice arborea* growing in the garden by the side of *Statice macrophylla*, and therefore exposed to the chances of fertilization from the latter. I admit readily its hybrid character, but the parents would be typical *Statice arborea* (not *Statice 'fruticans'*) and *Statice macrophylla*. Otherwise we would, indeed, have to assume that the reduction of the stem in *Statice 'fruticans'* is so little fixed a character that the latent tendency towards the arborescent habit, which it might have inherited from its ancestors, could assert itself in the cross product with *Statice macrophylla* to such a degree as to become quite paramount. However that may be, it seems to me a perfectly untenable hypothesis that the arborescent *Statice* from the Burgado cliffs itself could have been a cross between the stunted *Statice 'fruticans'* and *Statice macrophylla*, free as it is from any taint traceable to the latter.

As to the presence of *both* supposed parents on the Burgado cliffs we have no clear evidence. I have already pointed out that the assumption of the former occurrence of *Statice 'fruticans'* in that locality rests chiefly on Bourgeau's determination of some specimens which Perraudière collected there in 1855. Of more importance is the fact that there is at Kew a sheet of *Statice macrophylla* collected by Gustav Mann in 1863 with the indication 'La Longera.' This 'La Longuera,' as it ought to be spelled, Dr. Perez says is a place not more than a stone-throw's distance from the Burgado islets. I have, of course, no reason to doubt that there is some locality of that name in the Burgado Cove, the less so as Mann's specimen of *Statice arborea*, also marked 'La Longera,' points to that

<sup>1</sup> See note 3 on p. 208.



neighbourhood. But, as *Statice macrophylla* has never been observed by any one else in this locality, but only some distance to the east of Orotava, I would suggest the following explanation. On both labels Herr Mann adds after 'La Longera' in brackets: 'sea coast.' May he not have meant in both cases 'La Longuera' simply to stand for sea coast or shore, not considering it necessary to be more precise? 'Longuera' in Spanish means any long and narrow strip of land, and so he may have used it as 'nomen genericum,' whilst to a native of Teneriffe 'La Longuera' would be the Longuera κατ' ἐξοχήν and some perfectly definite spot, such as the shore opposite the Burgado rocks.

Considering all the circumstances, it seems quite certain to me that the typical and now extinct *Statice arborea* of Masson and Broussonet was a perfectly distinct species which inhabited at some time within the last 110 years two very small areas on the north coast of Teneriffe, one at the Burgado Cove, the other at Dauté, whilst a third equally small area, on the El Freyle, harbours still a much stunted form of it. Whether the latter formerly occurred along with the arborescent state in the other two areas we do not know, nor how far its subcaulescent habit has become fixed or is merely the result of the conditions of the habitat. It may, however, for the present, be distinguished from typical *Statice arborea* as *Statice arborea* forma *frutescens*. Plants of *Statice arborea* were early taken into cultivation in Teneriffe, and the specimens now in possession of Dr. Perez, and (one) of Kew are descendants of the extinct species with a distinct strain of *Statice macrophylla*.





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