

Benito Valdés

Early botanical exploration of the Maghreb*

Abstract

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The Maghreb is considered as the North African territories covered by Mauritania, Morocco, Algeria, Tunisia and Libya, an area which almost coincides with what it was named “The Barbary” by Europeans from the XVI to the XIX centuries. The period included in this paper ranges from the first botanical visit to Algiers by John Tradescant the Elder at the beginning of the XVII century to the end of the XVIII. It includes information on Tradescant, Balaam, Spotswood, Shaw, Vahl, Desfontaines, Broussonet, Durand, Jackson and Schousboe.

Key words: Tradescant, Balaam, Spotswood, Shaw, Vahl, Desfontaines, Broussonet, Durand, Jackson, Schousboe.

Introduction

The term Maghreb (Arabic for “western”) is used in its widest sense to denominate the North West part of Africa that covers Mauritania, Morocco (including West Sahara), Algeria, Tunisia and Libya, an area which it is separated from tropical Africa by the Sahel. The Maghreb coincides more or less with what was named from the XVI to the XIX centuries by Europeans “The Barbary”, this including all territories of N Africa west to Egypt.

The botanical exploration of this wide territory was initiated by Europeans as early as the XVII century and was initially limited to some coastal areas, sometimes only to the surroundings of some cities, due to the difficulties and often danger of penetrating inland in this territory which was practically forbidden to foreigners.

Pre-Linnaeans

John Tradescant

John Tradescant the Elder (1570-1638) was the first visitor to the Maghreb interested in plants (Fig. 1). He was not a botanist, but an excellent gardener and horticulturist. He was born

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in Holland (Pulteney 1790: 176; Johnson 1829: 98) in 1570. He began his professional career in 1609 as gardener to Robert Cecil, first Earl of Salisbury, to keep his gardens at Hatfield first and later at Salisbury House. He was gardener of Sir Edward Wotton at Canterbury during 1614 and 1615, before employed by George Villiers, Duke of Buckingham at New Hall, Essex, in 1625, and in 1636 appointed by King Charles the First as keeper of his garden, a post he maintained till his death (Ray 1994: 689). In 1625 he also created his own garden in Lambeth, which was maintained by his son, John Tradescant the Younger.

Tradescant travelled to several European countries, interested not only to obtain new cultivated and wild plants destined to the gardens for which he was responsible and for his own, but also to collect objects of Natural History and miscellaneous rarities to form in Lambeth a Natural History Cabinet, “The Ark”, (Pulteney 1790: 176-177) which is now part of the Ashmolean Museum of Oxford University.

In 1620 Tradescant joined a fleet sent by England against Algerian pirates (Johnson 1829: 98) and this gave him the opportunity to stay in Algiers for some time. It seems that Tradescant studied the plants growing in the city and its surroundings, because Parkinson, when referring to *Gladiolus* says that “Iohn Tradescant assured me, that hee saw many acres of ground in Barbary spread over with them” (Parkinson 1629: 190). It is said that Tradescant took back to England from Algeria samples of Gladiolus, wild pomegranate (it was probably naturalized, as *Punica granatum* L. is not native to N. Africa) and the Persian Lilac (*Syringa persica* L.). Tradescant prepared a Catalogue of the plants growing in his garden, which although printed was not formally published. The content of the single copy of this Catalogue was reproduced by Gunther (1922: 334-345); it includes more than 700 species and cultivars, plus separate lists of cultivars of apples, pearls, plums, cherries, apricots, “nectarious”, pitches and vines. Nothing indicates that he collected any herbarium material but cuttings and seeds. Amongst the plants listed in the printed “Catalogus” of Tradescant garden, one species bears the name “*Trifolium barbaricum stellat. Tradesc.*” (Gunther 1922: 342), which suggests that Tradescant knew *Trifolium stellatum* C. Bauh. (Bauhin 1620: 143; 1623: 329) from whom Linnaeus (1753: 769) took the specific epithet of *Trifolium stellatum* L., and that Tradescant wanted to differentiate from it the plant grown in his garden from seeds collected in Barbary, in this case in Algeria, which contradicts the statement of Pulteney that “he [Tradescant] is said to have brought the *Trifolium stellatum* L. from the island of Formentera” (Pulteney 1790: 176). His friend John Parkinson mentions him several times in *Paradisi in sole* (Parkinson 1629) and *Theatrum botanicum* (Parkinson 1640).

Alexander Balaam

The earliest notice of any botanical exploration in Morocco is by Alexander Balaam, a British trader who was established in Tangier (Zanoni 1675: 12; Ball 1877: 282) during the British occupation of the city, which extended from 1661 to 1684 (Martínez Ruiz 2005: 1045-1053). Not much is known about Balaam. Giacomo Zanoni, director of the Botanical Garden of Bologna, said that Balaam had provided seeds and plants from different origins to the Duke Gaston d’Orleans and that after the death of the Duke, Balaam moved to Tangier from where he sent him, that is, Zanoni, seeds and plants (Zanoni 1675: 12). Balaam also sent plant material to other botanists, at least to Morison (see, for example Morison 1680: 157, 583), who was then the first Professor of Botany and Director of the Botanic Garden of Oxford University.

Zanoni described some new species based on plants grown in the Botanical Garden of Bologna from seeds received from Balaam. This is the case, for instance, of *Acetosa dentata* di Tanger Zanoni (Zanoni 1675: 14, fig. 5) which was magnificently depicted (Fig. 2) and was accepted by Linnaeus as a distinct species: *Rumex tingitanus* L. (Linnaeus 1759: 991), a synonym of the previously described *R. roseus* L. (Linnaeus 1753: 337).

Morison also described some new species based on plants grown in the University of Oxford Botanic Garden from seeds collected in Tangier by Balaam, which were later recognized by Linnaeus, such as *Lathyrus Tingitanus siliquis Orobii*, flore ampio ruberrimo (Morison 1680, 2: 55; *Lathyrus tingitanus* L.) or *Carduus humilis Tingitanus coeruleus*, magno strobilo, tenuius laciiniatus (Morison 1699, 3: 158; *Cynara humilis* L.).

Robert Spotswood

Much more important was the botanical contribution by Robert Spotswood (Spotteswoode 1637-1680), a surgeon who, like Balaam, lived in Tangier during the British occupation. He collected plants and seeds that he sent to Balaam and to Morison (Cossen 1881: 7). In 1673 Spotswood prepared a catalogue of the plants of Tangier, which he sent to Dr. Love Morley. Morley communicated it to the Royal Society of London, in whose Philosophical Transactions it was published in 1696 (Spotswood 1696) (Fig. 3). A short version was subsequently published in 1809 as a long footnote in vol. 4 of the Abridged Philosophical Transactions (Spotswood 1809).

This catalogue lists over 600 species arranged more or less alphabetically by its abbreviated name. Without descriptions or references to previous authors, it is difficult sometimes to identify the species, although the identification can be often worked out. For instance, he named two species of *Convolvulus*: Major and Minor (Spotswood 1696: 241). It is possible to assume that “Major” refers to *Calystegia sepium* (L.) R. Br., and “Minor” to *Convolvulus tricolor* L., particularly because Spotswood sent Morison seeds of a *Convolvulus* which was grown by Morison in the Botanic Garden of Oxford, who included it amongst its “*Convolvuli minores*” with the name “[*Convolvulus*] Peregrinus caeruleus, folio oblongo, flore peramoeno, triplici colore insignito, nobis” (Morison, 1680: 17), a name which was given by Linnaeus (1753: 158) as synonym of *Convolvulus tricolor* L., changing “triplici colore” to “tricolor” for the specific epithet; Linnaeus also took from Morison the reference to the native place: “Mauritania”, given by the former as “Mauritania Tingitana”. Indeed, the references given by Linnaeus in Species Plantarum to Mauritania were indirectly taken from Spotswood or Balaam or both, as, for instance, for *Lathyrus tingitanus* L.

Thomas Shaw

The most interesting pre-Linnaean explorer of the Maghreb is Thomas Shaw (1694-1751), a British cleric and traveler, chaplain to the British factory in Algiers between 1720 and 1733 (Todd 1791: 83-84). During his stay in Algiers he made a series of expeditions to Syria, Palestine, Arabia, Egypt, Tunisia and Algeria (Seccombe 1909: 1384), and made detailed observations on geography, climatology, geology, archeology, paleontology, zoology, botany, etc. of the different countries he visited. Back to England, he published his observations in a book, *Travels or Observations relating to parts of Barbary and Levant* (Shaw 1738), which was translated to German, Dutch and French (Seccombe 1909: 1385).

The second part of this book, with the title “A collection of such papers to serve to illustrate the foregoign observations”, with a separate pagination, is divided into 15 chapters, the second of which has the title “Specimen Phytographiae Africanae &c., or a Catalogue of some of the rarer plants of Barbary, Egypt and Arabia” (Shaw 1738: 37-47). It includes 632 plant species arranged alphabetically. Shaw was familiar with botanical literature, and gave polynomial names of previous authors to most of these species. But more than 100 species were new to him. He gave names to these new species, adding a diagnosis and sometimes a good illustration for c. 50 of them.

The problem with Shaw’s Catalogue is that the origin of the species is indicated very exceptionally¹; and although he indicates sometimes the common name given by the “Arabs”², this cannot be understood as that he collected the plant in Arabia, as “Arab” is a term that can be applied to peoples of North Africa, not only from Arabian Peninsula. Neither the word “Arabica” included in some polynomial names can be taken as being original of Arabia. This has given rise to some mistakes. By instance, Linnaeus, who recognized and gave binomial names to several species diagnosed and drawn by Shaw, named *Anthemis arabica* n. 58 of Shaw’s Catalogue: “*Asteriscus annuus triacanthophorus*” [*Crassas Arabibus dictum.*] (Fig. 4) and added as the area of origin “Habitat in Arabia” (Linnaeus 1753: 896). It is clear that *Cladanthus arabicus* (L.) Cass., the accepted name for *Anthemis arabica* L., does not occurs in Arabia as it is a W Mediterranean endemic.

Some of Shaw’s new species from the Maghreb were given binomial names by later authors. For instance, Linnaeus (1753) gave the name *Centaurea acaulis* to “*Jacea acaulos lutea, Erucae folio, squamarum ciliis candidis*” (Shaw 1738: 42, n. 342), and *Teucrium mauritanum* (accepted name *T. pseudochamaepitys* L.) to “*Teucro Delphinij folio, non ramosum*” (Shaw 1738: 46, n. 575).

However, Linnaeus failed to recognize and name other quite characteristic species which are very well represented by Shaw, such as “*Cypressus fructo quadrivalvi, foliis Equiseti instar articulate*” Shaw (1738: 40, n. 188) (Fig. 5), which had to wait until Vahl (1791, 2: 96) to be named *Thuja articulata* (accepted name: *Tetraclinis articulata* (Vahl) Mast.), and “*Bursa Pastoris hirsuta, Erucae flore, stilo prominente*” Shaw (1738: 38, n. 91), named *Psychine stilosa* by Desfontaines (1798, 2: 69).

But the identity of some Shaw’s species is still to be resolved. For instance, “*Chrysosplenii foliis Planta aquatica, flore flavo, pentapetaloo*” Shaw (1738: 39, n. 149). The figure which represents this species in the Catalogue (Fig. 6) is clearly a *Sibthorpia* species, and so was recognized by Linnaeus, who named it *Sibthorpia africana* with only the phrase-name *Sibthorpia [africana] foliis orbiculatis integris crenatis, pedunculis solitariis. Gen. nov. 1099* and Shaw’s name as a synonym, adding “Habitat in Africa” (Linnaeus 1753: 631). The phrase-name is in fact the name given by Linnaeus to this species under n. 1099 in *Nova Plantarum Genera* (Linnaeus 1751) where only the name of Shaw is added as a synonym, and the indication “Habitat in Africa”. Shaw (1738) gave no indication on where this plant was collected, and Linnaeus supposed that it was native of

¹“*In Arabia invenit*” for n. 391; “... *quae in Africa coluntur*” for n. 410; “*quam copiose inveni super ripas Fluminis Salfi, inter montis Al Bee-ban dictos*” for n. 482; “*copiose crescit per totam Africam*” for n. 570.

²By instance, “*Crassas arabibus dictum*” for n. 58; “*Doom Arabum*” for n. 143; “*Arabibus Guntufs dicitus*” for n. 138; “*Seedra Arabum*” for n. 632.

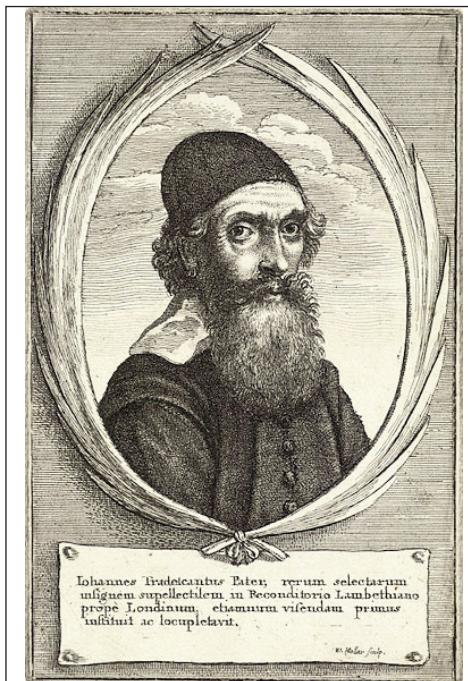


Fig. 1. John Tradescant the Elder. Engraving by Václav Hollar (1607-1677).



Fig. 2. *Acetosa dentata* di Tanger Zanoni (1675, Istoria botanica: 12, fig.5) (*Rumex tingitanus* L.).

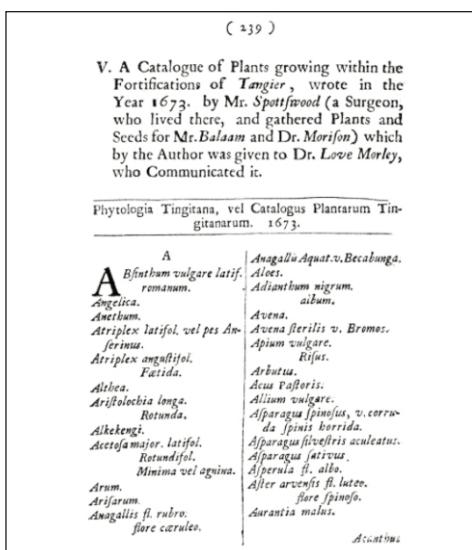


Fig. 3. Philosophical Transactions of the Royal Society 19: 239 (1693).

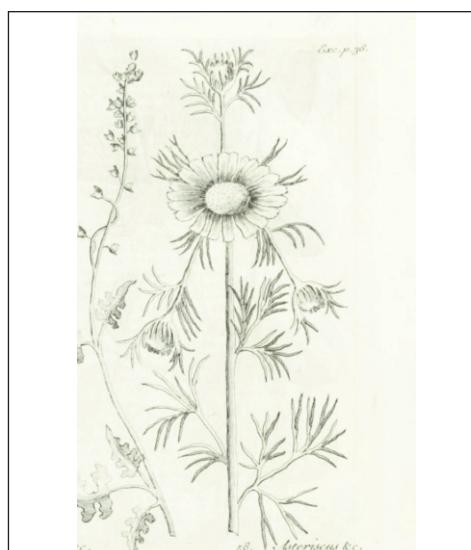


Fig. 4. *Asteriscus annuus trianthophorus* Shaw (1738, Specimen Phytographiae Africanae: 38, n. 58) (*Cladanthus arabicus* (L.) Cass.).

Africa. But this plant has never been collected again in N Africa. In his treatment for Flora Iberica, Rico (2009: 436) considers *Sibthorpia africana* L. as an endemic of the Balearic Islands, with *S. balearica* Knoche as a synonym, adding the following observation: “The epithet *africana* and the loco-typical indication are based in a possible error, as the only species of the genus that lives in Africa in a natural state is *S. europaea*”. This may be true, as in Africa *S. europaea* only occurs in high mountains of the tropics, as indicated by Rico (2009: 435). But when Knoche described *S. balearica* he stated that “Grâce à l’obligéance de M. le Dr. Stapf, j’ai pu voir, à Kew, la plante de Shaw. M. Stapf a appelé mon attention sur les différences qui existent entre cette plante et les plantes des îles Baléares … Les graines de la plante de Shaw sont lisses, tandis que celles de ma plante ont la surface creusée de petites fossettes. …” (Knoche 1922: 391). But there is little doubt that Shaw’s plant was collected either in N Africa or in other territories he visited during his stay in Algiers so, the problem remains to be resolved.

At his death, the plants Shaw collected along with all his other volumes of dried plants in his possession, books of Natural History, manuscripts, etc., were deposited in the University of Oxford, as this was his last wish (Todd 1791: 86).

Linnaeans

After the explorations by Thomas Shaw, and once the Linnaean binomial system of nomenclature had been adopted, the botanical exploration of the Maghreb during the XVIII century was covered by five well known botanists and a trader: Vahl and Desfontaines in Tunisia and Algeria and Broussonet, Durand and Schousboe in Morocco, to which we must add Jackson. They contributed to the knowledge of the flora of NW Africa through their rich collections and their publications, and were responsible for the description of many endemic taxa of this broad territory.

Martin Vahl

Interesting biographical data on Martin Vahl (1749-1804) are given by Smith (1819), who facilitated Vahl to study Linnaeus’ herbarium while in his property, and gave the reasons for the personal problems Vahl had had with Carl Linnaeus and Sir Joseph Banks. Vahl was born in Bergen (Norway) in 1749 (Fig. 7). In 1766, he entered the University of Copenhagen where he resided for two years with the Rev. Hans Ström, who passed on to Vahl his deep interest in zoology and botany. To go deeper into the knowledge of both subjects, Vahl moved to the University of Uppsala where he studied for four years under Carolus Linnaeus, who was by then at the zenith of his profession. In 1773, Vahl moved to Copenhagen, where he was appointed Lecturer in Botany at the Botanic Garden in 1779. Three years later, he was asked by the King of Denmark to undertake scientific travels when he visited the Netherlands, England, France, Spain, Switzerland and Tunisia. Back to Copenhagen in 1785, Vahl was appointed the Professor of Natural History at the University and editor of the *Flora Danica*, for which purpose he explored several little-known areas, particularly of this own country, and in 1799 and 1780 he made scientific journeys to the Netherlands and Paris. Vahl died in Copenhagen in 1804 (Smith 1819).

Vahl spent several months in northern Tunisia, where he made important plant collections. A part of his records are included in the three volumes of *Symbolae Botanicae* (Vahl 1790-1794). The *Symbolae* were devoted mainly, as the title and introduction infer, to go

deeper into the work of Forsskål (Helsinki 1732; Yemen 1763), one of the “apostles” of Linnaeus, which took part in a Danish expedition to the Middle East (Bernardi 1979) where he collected abundant plant material and prepared a Flora Aegyptiaco-Arabica, edited post-mortem by Carsten Niebuhr (Forsskål 1775). But Vahl also made known in the Symbolae many of his own findings and described many new species, not only from Tunisia, but above all, and most particularly in the third volume or the Symbolae, American and Asian species based on material he received from his numerous correspondents. About 20 new species were described by Vahl from material he collected in Tunisia. Several of them are still used as the accepted names for Mediterranean species, such as *Anthemis punctata* Vahl, *Calendula suffruticosa* Vahl, *Scrophularia laevigata* Vahl and *Stachys arenaria* Vahl, or as the basionym of other Mediterranean taxa, such as *Senecio delphinifolius* (*Jacobaea delphinifolia* (Vahl) Pelser), *Thuja articulata* (*Tetraclinis articulata* (Vahl) Mast.), *Scabiosa rutifolia* (*Lomelosia rutifolia* (Vahl) Avino) or *Picris aculeata* (*Helminthotheca aculeata* (Vahl) Lack), to give only a few examples.

Vahl did not give precise information on the places where he had collected his plants, neither in his herbarium (Cosson 1881: 10) nor for most of the Tunisian species included in the Symbolae³, where their origin is generally indicated by: “Habitat in Regno Tunetano”, “Legi passin Tuneti”, “Legi Tuneti”, etc., or the most general indications “Frequents in Barbaria”, “Habitat in Barbaria”, or even “Legit in Mauritania”, that could be interpreted as meaning that he collected plants in other parts of the Maghreb, as Algeria or Morocco. But the precise locotypic locality for *Cistus lanceolatus*: “circa Bizertam Barbariae” (Vahl 1791: 62) which refers to the city of Bizerta, c. 65 km NW Tunis, indicates that “Barbaria” and “Mauritania” of Vahl must refer to Tunisia.

His herbarium, formed by the plants he collected along his travels, augmented by those sent to him by his numerous correspondents, is kept in the Natural History Museum of Denmark, Copenhagen (Lanjow & Stafleu 1964: 50).

René Louiche Desfontaines

It is not true that no naturalist had visited the Maghreb before Desfontaines (Malle 1838: 1); but indeed, the first extensive and well programmed exploration of this region is due to the French botanist René Louiche Desfontaines (1750-1833). He was born in Temblay in 1750 and in 1773 went to Paris to study Medicine, regularly attending the lectures by Louis G. Lemonnier, Professor of Botany at the Jardin des Plantes. In August 1783, Desfontaines left France to undertake an exploratory travel which covered most of Tunisia and Algeria, coming back to Paris in the first months of 1786 with a rich collection

³Exception are the following: *Salicornia amplexicaulis* Vahl (“prope Bardo”; Vahl, 1791: 1), *Poa littoralis* Gouan (“iacus Sipharae”; Vahl, 1791: 12), *Scabiosa rutaefolia* Vahl (“circa cap Zebibo”; Vahl, 1791: 26), *Sedum caeruleum* L. (“ad Manub”; Vahl, 1791: 51), *Cistus lanceolatus* Vahl (“circa Bizertam”; Vahl, 1791: 62), *Ranunculus millefoliatus* Vahl (“circa promontorium Cartaginis”; Vahl, 1791: 63), *Stachys circinata* L'Hér. (“montium plumbeum”; Vahl, 1791: 63), *Stachys arenaria* Vahl (“inter Cap. Blanco & Zebido ad urbem Rafs”; Vahl, 1791: 64), *Scrophularia laevigata* Vahl (“ad Zowan”; Vahl, 1791: 67), *Scrophularia mellifera* Vahl (“circa portum Farinam”; Vahl, 1791: 68), *Scorzonera resedifolia* L. (“circa promontorium Carthaginis”; Vahl, 1791: 84), *Scorzonera brevicaulis* Vahl (“ad Hammelif”; Vahl, 1791: 88), *Picris aculeata* Vahl (“ad Zowan”; Vahl, 1791: 89), *Calendula suffruticosa* Vahl (“circa Portum Farinam”; Vahl, 1791: 94), *Thuja articulata* Vahl (“circa Hamamelif, montes Plumbeos & Schibel Ifchel”; Vahl, 1791: 96) and *Periploca laevigata* Aiton (“Monte Schibel Ifchel”; Vahl, 1794: 45).

of plant material and manuscripts. He was appointed that same year the Professor of Botany at the Jardin des Plantes, to substitute his former professor and friend Lemonnier, and he lectured in botany there for more than 40 years (Flourens 1838). He was also the Director of the Muséum National d'Histoire Naturelle, and one of the founders of the Institut de France.

The study of the plants collected in Algeria and Tunisia engaged Desfontaines for several years, finally publishing his most important work: *Flora Atlantica* (Desfontaines 1798-1799) in two volumes, which can be considered the first Flora of the Algerian-Tunisian territory. This Flora includes the description of c. 1600 species, of which c. 300 are new, arranged according the Linnaean sexual system of classification, and including a series of 260 excellent plates most of them depicted by the artists Charles Laurent Marechal and Pierre Joseph Redouté and engraved by François Noël Sellier (see, by instance, Fig. 8).

Desfontaines did not give details on his itineraries in *Flora Atlantica*. However, he regularly sent letters to Lemonnier (Flourens 1838: 13) and enabled Malle (1838) to make a detailed description of his travels based on those letters and Desfontaines' unpublished manuscripts.

The plants collected by Desfontaines are kept in several institutions. The main collection, including the plants from Algeria and Tunisia is conserved in the Muséum National d'Histoire Naturelle of Paris, with duplicates mainly in the Erbario Centrale, Università degli Studi di Firenze and also in the Institute de Botanique de l'Université de Montpellier, the Conservatoire et Jardin Botaniques, Genève, the Botanisches Museum, Berlin and the Natural History Museum, London (Lanjouw & Stafleu 1954: 159).

Pierre Marie Auguste Broussonet

After Balaam and Spotswood, the first botanist to explore Morocco was Pierre Marie Auguste Broussonet (1761-1807). He was born in Montpellier, where he graduated in Medicine. However, he had developed a strong interest in biology, mainly zoology but also in botany and agronomy. He stayed in London from 1780 to 1782 and when back in France he devoted his efforts to zoology and agriculture. Fleeing the French Revolution which he had initially joined, he arrived in Madrid in 1794, where he was well received by Casimiro Gómez Ortega and Antonio José Cavanilles. He later visited part of Portugal and other parts of Spain. In 1795, Broussonet moved to Tangier as a doctor in the service of the Consul of the United States of America, whom he had met in southern Spain, returning to France that same year. In 1795 he was named vice-consul of Mogador (today Essaouira), where he moved with his family; but in 1801 he left for the Canary islands (Ruiz Álvarez 1965: 124-143), escaping from the plague that devastated Morocco in 1799 and 1801 and which was described in detail by Jackson (1809: 269-285; 1820: 159-190). Back in France, Broussonet was appointed Director of the Jardin des Plantes in Montpellier, where he died in 1807.

In Morocco Broussonet explored the surroundings of Tangier, Mogador and other cities, such as Salé and Ksar-el-Kebir, with an incursion inland to Meknès and Fès. He collected abundant plant material and sent collections of his plants to the main botanist of that time: Willdenow in Berlin, Desfontaines in Paris, Gouan in Montpellier and Cavanilles in Madrid. Consequently, Broussonet's plants are not only well represented in the herbarium of Montpellier, but also in the Muséum National d'Histoire Naturelle of Paris, the Real

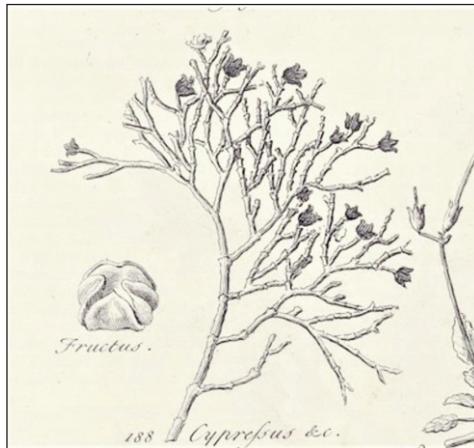


Fig. 5. *Cypressus fructu quadrivalvi, foliis Equiseti instar articulatis* Shaw (1728, l. c.: 40, n. 188) (*Tetraclinis articulata* (Vahl) Mast.).



Fig. 6. *Crisosplenii foliis Planta aquatica, flore flavo, pentapetalo* Shaw (1738, l. c.: 39, n. 149) (*Sibthorpia africana* L.).



Fig. 7. Martin Vahl. Engraving by Ambroise Tardieu (with permission of Alamy).

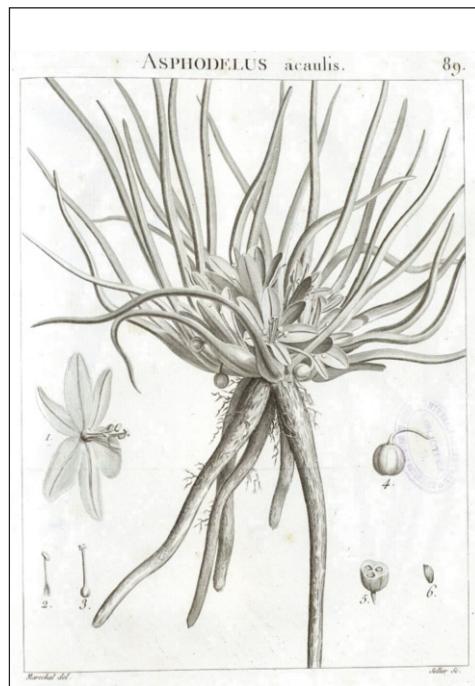


Fig. 8. *Asphodelus acaulis* Desf. (1798, Flora Atlantica 1: 302, Tab. 89; drawing by C.L. Marechal; engraving by F.N. Sellier).

Jardín Botánico, Madrid, and the Botanisches Museum of Berlin, and in some other herbaria, such as the Conservatoire et Jardin Botaniques de Genève, the Museo di storia naturale di Firenze and the Botanical Museum and Herbarium, University of Copenhagen.

Broussonet did not publish any new plant species based on the material he collected in Morocco. But he had given names to many potentially new species on the herbarium labels and some of them were later validated by other authors. This is the case, for example, of *Polygonum salicifolium* Brouss. ex Willd. (a synonym of the circummediterranean *Persicaria decipiens* (R. Br.) K.L. Willson), *Frankenia pulverulenta* Brouss. ex DC. (endemic to Morocco, but now considered as a subspecies of *Frankenia laevis* L.), *Mimosa leptophylla* Brouss. ex Lag. (a synonym of *Painteria leptophylla* (DC.) Britton & Rose, doubtfully native in Morocco), *Euphorbia pulchella* Brouss. ex Lag. & Rodr. (currently considered as a synonym of the circummediterranean *Euphorbia pithyusa* L.) and *Illecebrum mauritanicum* Brouss. ex Roemer & Schult., one of the synonyms of the cosmopolitan *Paronychia argentea* L. Besides, some authors have described new species based on plants collected by Broussonet in Morocco. For instance, Cavanilles (1801) described *Campanula afra* Cav. (currently considered a synonym of the Mediterranean *C. dichotoma* L.), *Eryngium aquifolium* Cav. (endemic to south Spain and north west Morocco), *Hyacinthus fulvus* Cav. (the basyonym of *Dipcadi fulvum* (Cav) Webb and Berth, of Morocco, south Spain and the Canary Islands), and *Celsia sinuata* Cav. (substitute synonym of the W Mediterranean *Verbascum erosum* Cav.), from plants collected by Broussonet in Salé, Tangier and Algeciras, Mogador and Tangier, respectively. But care has to be taken with the use of his material because, as indicated by Ball (1878: 283) “Broussonet seems to have been somewhat careless respecting the localities whence his specimens came, and to have sometimes intermixed those from The Canary Islands, South Morocco, Tangier and Spain”.

Abbé Phillippe Durand

Contemporary of Broussonet, and one of his friends, is the Abbé Phillippe Durand, who was appointed in 1804 Curator of plant collections at the Jardin des Plantes of Montpellier while Broussonet was the director of the gardens. He held this post until he left in 1810, mainly for misunderstandings with the young Agustin Pyramus de Candolle who had replaced Broussonet in Montpellier (Michaud 2018). Durand collected Moroccan plants, generally with Broussonet, at least in Tangier, Fès and Meknès, and according Ball (1878: 284) he was the first European to visit the Forêt de la Mamora. According Lanjouw & Stafleu (1954: 172) his plants are deposited in the Muséum National d’Histoire Naturelle, Paris, the Museo di storia naturale di Firenze, the Natural History Museum, London and the Missouri Botanical Garden.

James Gray Jackson

The Englishman James Gray Jackson was an interesting explorer and a clever and keen observer. He was not a botanist but a trader who stayed in Agadir (Santa Cruz at that time) and Essaouira (formally called Mogador) for about 16 years as “British Consul and Agent of Holland, Sweden and Denmark at Santa Cruz” as he described himself (Jackson 1820: 418). Jackson visited most coastal areas of W Morocco from Agadir, Tiznit and Tafraoute in the south to Tangier in the north, but he also visited the Rif, the Atlas, Marrakech

(Marocco), Meknès and Fès (Fig. 9). He described his travels through “west and south Barbary” on the base of a series of letters written to London to James Willis between 1792 and 1802 (Jackson 1820: 55-155). He was the first European to cross the High Atlas in a journey from Agadir to Marrakech accompanying a military detachment, along which he observed three types of vegetation from the lower areas to the summits. He published a very interesting book (Jackson 1809: 69-81) in which he briefly described a cactiform Euphorbia (*Euphorbia officinarum* L.) represented by a drawing made by himself (Fig. 10) and gave indications on how the inhabitants of arid areas of Morocco obtained its medicinal gums, and also other plants, such as the “Gum-sandarac tree” or “Arar” (*Tetraclinis articulata* (Vahl) Mast.), and truffles (*Terfezia arenaria* (Moris) Trappe, according his description)

Peder Korolf Anker Schousboe

The most important plant collector in Morocco at the end of the XVIII century was the Danish botanist Peder (Peter) Korolf Anker Schousboe (1766-1832). He was interested in algae and vascular plants. Between 1791 and 1793 he made extensive collections in south-

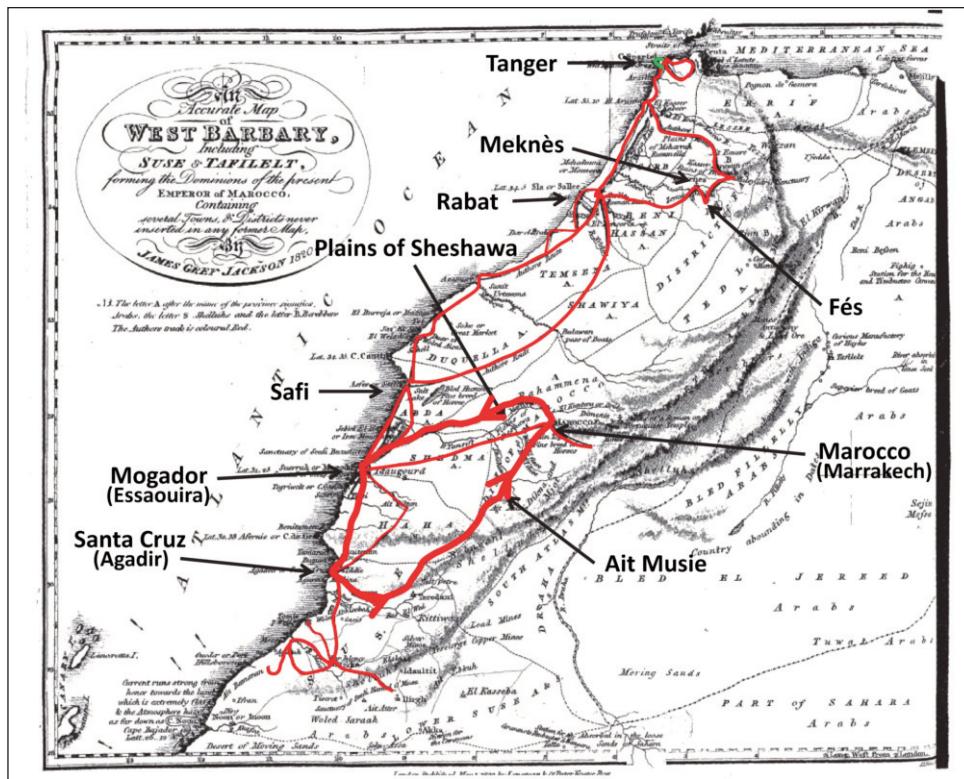


Fig. 9. Itineraries in Morocco made by Gray Jackson (Jackson 1809, Travels). Thicker line, itinerary including the High Atlas.

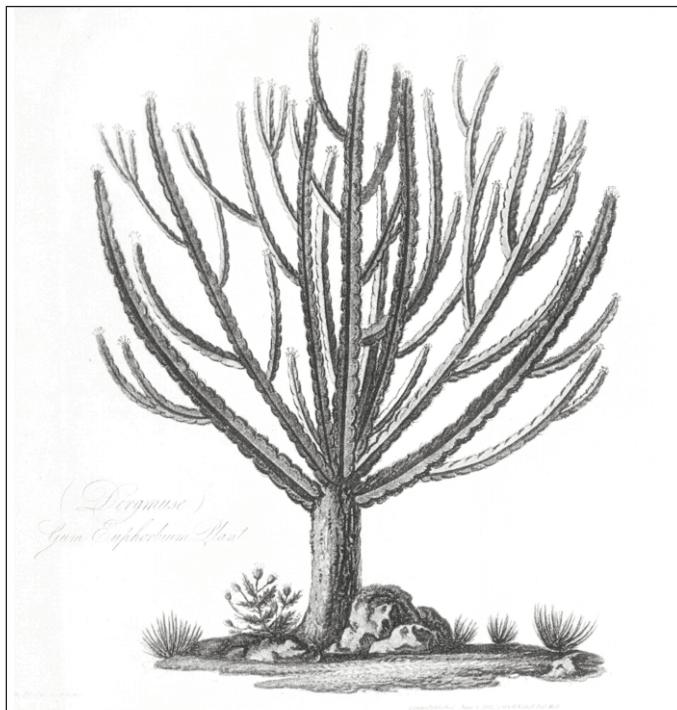


Fig. 10. Euphorbium or Dergmuse (Jackson, 1809, l. c. Plate VII) (*Euphorbia officinarum* L.).

ern Morocco in Essaouira (Mogador) and in general in the province of Haha and in the Safi area, as well as in the north in the area of Tangier. He also travelled to Marrakech, Meknès and Fès (Cosson 1881: 10-11). In 1800, he was appointed general consul of Denmark in Tangier, where he stayed until his death, greatly increasing his collections (Ball 1877: 283), particularly of algae. His main collections are deposited in the Botanical Museum and Herbarium, University of Copenhagen, with duplicates in Paris (Cosson Herbarium) and other European herbaria.

In 1800, Schousboe published the *Iagttigelser over vextriget i Marokko*, “first part” of which, if completed, would have been an excellent first Flora of Morocco. It was published in Danish and Latin, printed in two columns (Schousboe 1800) and translated to German one year later. It was also translated into French by E.-L. Bertherand and also printed in two columns, in Latin and French (Schousboe 1874) with additional synonyms by John Lange. This volume covers the Linnaean classes Monandria to Enneandria, with several species belonging to other classes, particularly to Singenesia, at the end. Seven excellent plates with analysis are added. In the *Iagttigelser*, Schousboe described 49 plant species as new. But as he had given names and added descriptive notes in the labels of many of his herbarium specimens (Cosson 1881: 11), another c. 40 Schousboe’s names were validated by other authors, particularly by Ball, who revised the duplicates of Schousboe’s collec-

tions sent to Kew Gardens by Cosson (Ball 1877: 283). Although some of these names are now included in the synonymy of different species, many of them are still in current use, as for instance *Salvia interrupta* Schousb. and *Bupleurum canescens* Schousb., Morocco endemics, and *Onopordum macracanthum* Schousb. a west Mediterranean endemic, or are the basionyms of other Mediterranean plants, as, for example, *Feeria angustifolia* (Schousb.) Buser, a Moroccan endemic.

Epilogue

Altogether, the collections and publications made by all these early explorers of the Maghreb, laid the foundations for all future floristic studies, and contributed to the preparation of modern Floras and checklists, of which excellent examples are the Flore Pratique du Maroc (Fennane & al. 1999, 2007, 2014) and the Index Synonymique de la Flore d'Afrique du Nord (Dobignard & Chatelain 2010-2013).

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References

- Ball, J. 1877-1878: Spicilegium Florae Maroccanae. – J. Linn. Soc., Bot. **16**: 281-772.
Bauhin, C. 1620: Prodromus theatri botanici. – Francofurti.
— 1623: Pinax theatri botanici. – Basileae.
Cavanilles, A. J. 1801: De las plantas que el Ciudadano Augusto Broussonet colectó en las costas septentrionales de la África y en las islas Canarias. – Anales Ci. Nat. **3(7)**: 5-78.
Bernardi, L. 1979: L'étoile polaire: Linné. – Rév. Mus., Genève (separate edition).
Cosson, E. 1881: Compendium Florae Atlanticae, **1**. – Paris.
Desfontaines, R. L. 1789-1799: Flora atlantica **1-2**. – Paris.
Dobignard, A. & Chatelain, C. 2010-2013: Index Synonymique de la Flore d'Afrique du Nord, **1-5**. – Genève.
Fennane, M., Ibn Tattou, M., Mathez, J., Ouyahya, A., El Oualidi, J. (eds) 1999: Flore Pratique du Maroc, **1**. – Rabat.
—, —, Ouyahya, A. & El Oualidi, J. (eds) 2007: Flore Pratique du Maroc, **2**. – Rabat.
—, — & El Oualidi, J. (eds) 2014: Flore Pratique du Maroc, **3**. – Rabat.
Floureens, P. 1838: Éloge Historique de R. Louiche Desfontaines. – Mém. Accad. Sci. Inst. France **16**: I-XIX.
Forsskål, P. 1775: Flora Aegyptiaco-Arabica. – Hauniae.
Gunther, R. Th. 1922: British Botanists and their gardens, based on unpublished writings by Goodyer, Tradescant and others. – Oxford.
Jackson, J. G. 1809: An account of the empire of Morocco and the district of Suse. – London.
— 1820: An account of the Timbuctoo and Housa, territories in the interior of Africa to which is added, letters descriptive of travels through west and south Barbary. – London.
Johnson, G. W. 1829: A History of English Gardening. – London.
Knoche, H. 1922: Flora Balearica, **2**. – Montpellier.

- Lanjouw, J. & Stafleu F. A. 1954: Index Herbariorum, 2, first Instalment A-D. – *Regnum Vegetabile* 2.
- & Stafleu, F. A. 1964: Index Herbariorum 1. The Herbaria of the World, ed. 5. – Utrecht.
- Linnaeus, C. 1751: *Nova Plantarum Genera* (Publicae proponit Leonhard Joh. Chenon). – Upsaliae.
- 1753: *Species Plantarum*. – Holmiae.
- 1759: *Systema Naturae*, ed. 10, **2**. – Holmiae.
- Malle, D. 1838: *Peyssonnel et Desfontaines. Voyage dans les Régences de Tunis et d'Alger*, **2**, Fragments d'un voyage dans les Régences de Tunis et d'Alger fait de 1783 a 1786 par Louiche René Desfontaines. – Paris.
- Martínez Ruiz, J. I. 2005: De Tánger a Gibraltar: el estrecho en la praxis comercial e imperial británica (1661-1776). – *Hispania* **65(3)**: 1043-1062.
- Michaud, F. 2018: Le Jardin des Plantes, quelques éléments pour une nouvelle écriture de l'histoire de la botanique à Montpellier. – *Patrimoines Sud* **8**.
- Morison, R. 1680: *Plantarum Historiae Universalis Oxoniensis*, **2**. – Oxonii.
- 1699: *Plantarum Historia Oxoniensis Universalis*, **3**. – Oxonii.
- Parkinson, J. 1629: *Paradisi in sole paradisus Terrestris*. – London.
- 1640: *Theatrum botanicum*. – London.
- Pulteney, R. 1790: *Historical and Biographical Sketches of the progress of Botany in England*, **1**. – London.
- Ray, D. 1994: *Dictionary of British and Irish Botanists and Horticulturists. Including plants collectors, flower painters and garden designers (with the assistance of C. Ellwood)*. – London.
- Rico, E. 2009: *Sibthorpia* L. – Pp. 434-437 in: Benedi, C., Rico, E., Güemes, J. & A. Herrero, A. (eds) *Flora Iberica*, **13**. – Madrid.
- Ruiz Álvarez, A. 1965: Apuntes para una biografía del doctor Augusto Broussonet (1761-1807). – Anuario Est. Atlánt. **11**: 129-147.
- Seccombe, T. 1909: Shaw, Thomas (1694-1751) – Pp. 384-385 in: Lee, S. (ed.), *Dictionary of National Biography*, **17**. – New York.
- Shaw, T. 1738: *Travels or Observations relating to several parts of Barbary and the Levant*. – Oxford.
- Schousboe, P. K. A. 1800: *Iagttagelser over Vextriget i Marocco*, **1**. – Kjöbenhavn.
- 1874: *Observations sur le Règne Végétal au Maroc*. – Paris.
- Smith, J. E. 1819: Vahl [without indication of authorship] in: Ress, A. (ed.), *The Cyclopaedia; or, Universal Dictionary of Arts, Sciences and Literature*, **16**. –London.
- Spotswood, R. 1696: A catalogue of Plants growing within the Fortifications of Tanger in 1673. “*Phytologia Tingitana, vel Catalogus Plantarum Tingitanarum*”. – *Philos. Trans. Royal Soc.* **19**: 239-249.
- 1809: A catalogue of Plants growing within the fortifications of Tanger in 1673. *Phytologia Tingitana, vel catalogus Plantarum Tingitanarum*. – *Philos. Trans. Royal Soc. Abridge* **4**: 85-87.
- Todd, Henry [Oxoniensis] 1791: The life of Thomas Shaw, D. D. Principal of St. Edmund's Hall, Oxford. – *European Mag.*, London Rev. **19(1)**: 83-86.
- Vahl, M. H. 1790-1794: *Symbolae Botanicae*, **1-3**. – Hauniae.
- Zanoni, G. 1675: *Istoria Botanica*. – Bologna.

Address of the author:

Benito Valdés,

Departamento de Biología Vegetal y Ecología, Facultad de Biología, Universidad de Sevilla. Avda. Reina Mercedes s/n, 21012, Sevilla, Spain. E-mail: bvaldes@us.es