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**Autor:** Martis, Bruno de / Loi, M. Cecilia / Bonaria Polo, M.  
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# Contribution to a better understanding of the genus *Tamarix* in Portugal

BRUNO DE MARTIS  
M. CECILIA LOI  
& M. BONARIA POLO

## RÉSUMÉ

DE MARTIS, B., M. C. LOI & M. B. POLO (1986). Contribution à la connaissance du genre *Tamarix* au Portugal. *Candollea* 41: 293-298. En anglais, résumé français.

Les auteurs traitent les espèces du genre *Tamarix* présentes au Portugal. La présence de *T. africana* Poir. var. *africana*, *T. canariensis* Willd. et *T. gallica* L., pour lesquelles les données bibliographiques sont contradictoires, est confirmée. Pour la première fois, quatre espèces nouvelles et une variété sont signalées: *T. tetragyna* Ehrenb., *T. arborea* (Sieb. ex Ehrenb.) Bge., *T. hampeana* Boiss. & Heldr., *T. parviflora* DC. et *T. africana* Poir. var. *flumenensis* (Maire) Baum. Une clé analytique complète le travail pour faciliter la détermination des espèces.

## ABSTRACT

DE MARTIS, B., M. C. LOI & M. B. POLO (1986). Contribution to a better understanding of the genus *Tamarix* in Portugal. *Candollea* 41: 293-298. In English, French abstract.

The authors report on the species on the genus *Tamarix* sighted in Portugal. The presence of *T. africana* Poir. var. *africana*, *T. canariensis* Willd. and *T. gallica* L., for which literature data is discordant, is confirmed. The presence of new species *T. tetragyna* Ehrenb., *T. arborea* (Sieb. ex Ehrenb.) Bge., *T. hampeana* Boiss. & Heldr., *T. parviflora* DC. and a new variety *T. africana* Poir. var. *fluminensis* (Maire) Baum are recorded for the first time. An analytical key is provided to facilitate species identification.

In previous paper (DE MARTIS & CARTONI, 1983; DE MARTIS & al., 1984) we have reported the presence of numerous new species of *Tamarix* in Italy and Europe. Subsequent investigations extended to Mediterranean-Atlantic Europe, which led to the discovery of a new species for the Portuguese and European flora, enabled us to acquired a better understanding of the species of this genus present in Portugal.

The literature data for the genus *Tamarix* in Portugal are scarce and in some cases inconsistent. In fact COUTINHO (1939) has recorded the presence in the local flora of *T. africana* Poir. and *T. gallica* L. (cf. DE MARTIS & al., 1985), whilst according to FRANCO (1971) in agreement with BAUM (1968) *T. africana* Poir. and *T. canariensis* Willd. are present. The confusion stems from the fact that in a later work BAUM (1978) only mentions *T. africana* Poir. for Portugal, excluding the presence of other species in this regions.

Following the discovery of an exsiccatum specimen at the Herbarium of Estação Nacional de Melhoramento de Plantas of Elvas (ELVE), ascribable to *Tamarix mascatensis* Bge. (DE MARTIS & al., 1985), further investigations have been conducted, namely:

- a) examination of all the exsiccata made available by the Herbaria of Lisbon (LISU, LISFA), Coimbra (COI), Elvas (ELVE), Oeiras (LISE), as well as of Paris (P), Geneva (G), Florence (FI), Palermo (PAL) where Portuguese specimens were kept;
- b) determination of specimens collected by us in Spring 1984. Species have been identified by means of the analytical key recently proposed for the species present in Sardinia (DE

MARTIS, LOI & POLO, 1984) and consulting BAUM's latest monograph (1978) on the genus *Tamarix* whose terms we adopted for androecium structure.

In the sequel are presented:

1. a key to species for identifying the species of *Tamarix* recorded in Portugal;
2. the respective synonyms most commonly used;
3. the specimina selecta;
4. the area distribution known to date;
5. a brief description of the habitat of those species collected by us.

#### Key to species

- |     |   |   |
|-----|---|---|
| 1.  | Vernal inflorescence .....  | 2   |
| 1a. | Aestival inflorescence .....  | 5   |
| 2.  | Haplostemonous androecium .....   | 3   |
| 2a. | Partially diplostemonous androecium, 5 antesealous stamens (0-4 antepetalous), bracts shorter than the calyx, apiculate anthers, paralophic disk .... | <b>T. tetragyna</b> Ehrenb.                                   |
| 3.  | 4 stamens only in tetramerous flowers, sepals with broad scarious edges, apiculate anthers, synlophic disk .....                                      | <b>T. parviflora</b> DC.                                      |
| 3a. | 5 stamens only in pentamerous flowers .....   | 4   |
| 4.  | Bracts shorter than the calyx, apiculate anthers, synlophic disk  | <b>T. africana</b> Poir. var. <b>africana</b>                 |
| 4a. | Bracts always exceeding the calyx, unapiculate anthers, synlophic disk  | <b>T. africana</b> Poir. var. <b>fluminensis</b> (Maire) Baum |
| 5.  | Racemes with papillose to minutley papillose rachis .....   | 6   |
| 5a. | Racemes with glabrous rachis .....  | 7   |
| 6.  | Pediculate flowers, obovate petals, synlophic or slightly paralophic disk, ovate apiculate anthers .....  | <b>T. canariensis</b> Willd.                                  |
| 6a. | Flowers sessile, trullate to ovate petals, disk paralophic to parasynlophic, slightly apiculate cordate anthers .....                                 | <b>T. mascatensis</b> Bge.                                    |
| 7.  | Synlophic disk, ovate petals, slightly apiculate anthers .....  | <b>T. gallica</b> L.  |
| 7a. | Paralophic disk .....   | 8   |
| 8.  | Linear-triangular bracts, elliptic petals, strongly apiculate anthers   | <b>T. arborea</b> (Sieb. ex Ehrenb.) Bge.                     |
| 8a. | Oblong boat-shaped bracts, trullate-ovate petals, elongated slightly apiculate anthers  | <b>T. hampeana</b> Boiss. & Heldr.                            |

**Tamarix tetragyna** Ehrenb., Linnaea 2: 258 (1827).

= *T. deserti* Boiss., Diagn. Pl. Or. Nov. 1(10): 9 (1849).

= *T. hampeana* Boiss. & Heldr. var. *syriaca* Stev. ex Bge., Tentamen 21 (1852).

= *T. gennesarensis* Zoh., Trop. Woods 104: 36 (1956).

#### Specimina selecta

Ribeira do Xarrama, 24.4.1968, *Nogueira 10556*, sub *T. africana* Poir. (COI); Trin-os Montes e Alto Doreso-Pocinho Quinta do Vale de Méao non margens do Doreso, 21.4.1955, *Beliz 1903*, sub *T. anglica* Webb. (ELVE); Alto Alentejo, alandroal: Rosario Herdo di Milreu, margem do Guadiana, 16.5.1968, *Malato Beliz 6295*, sub *T. africana* Poir. (ELVE); Alentejo, margem do Guadiana: confluencia do azavel, 4.1908, R. Pathuiha e F. Mendes, sub *T. africana* Poir. (LISU); province d'Algarve V. N. de Portimeto, s.d., *J. Daveau*, sub *T. gallica* L. (LISU).

*Observations*

The distribution of this species was originally confined to the East Mediterranean countries (Egypt, Israel, Jordan, Lebanon, Syria; Cyprus: BAUM, 1978; Lybia: KAISER & GHAFOOR, 1979) and subsequently extended to Sardinia (DE MARTIS, LOI & POLO, 1984). Its discovery in Portugal represents the westernmost sighting.

**Tamarix mascatensis** Bge., Tentamen, 60 (1852).

*Specimina selecta*

Alto Alentejo — Elvas Herdade da Alagada na lezíria do rio Guadiana, s.d., *Beliz I Runi*, sub *T. anglica* Webb. (ELVE).

*Observations*

This species has been recorded by Baum in Oman, Iran, Saudi Arabia, South Yemen, Sokotra Island, Somalia and Ethiopia and by ZOHARY (1973) in Sudan. Its discovery in Portugal (DE MARTIS, LOI & POLO, l.c.), is for the time being, the only sighting for Europe.

**Tamarix gallica** L., Sp. Pl. 1: 270 (1753).

- = *T. anglica* Webb., Hooker J. Bot. 3: 430 (1841).
- = *T. matritensis* Pau e Villar, Broteria Bot. 23: 105 (1927).
- = *T. brachylepis* Sennen, Butl. Inst. Catal. Hist. Nat. 32: 90 (1932).

*Specimina selecta*

Arredores d'Elvas, 4.1880, Silva Senna (COI); Azenha de Villa Velha do Rodão, 7.1883, A. R. da Cunha (LISU); Estremadura, Cascais prov. Feral da Guia nas horridas junto au mar, s.d., s. coll., sub *T. anglica* Webb. (LISE).

*Observations*

Occurrence doubtful for Portugal. It has been described by Baum in France, Spain, Sicily, Italy and Switzerland. Its presence in Sardinia has also been recently ascertained (DE MARTIS, LOI & POLO, l.c.).

**Tamarix arborea** (Sieb ex Ehrenb) Bge., Tentamen, 67 (1852).

- = *T. gallica* L. var. *arborea* Sieb. ex Ehrenb., Linnaea 2: 269 (1827).
- = *T. arborea* (Sieb ex Ehrenb.) Bge. var. *subvelutina* Boiss., Fl. Or. 1: 776 (1867).
- = *T. sodomensis* Zoh., Woods 104: 35 (1956).

*Specimina selecta*

Proximo de Gavião Junto as Ramal para Bazagem le Beliez, 9.6.1971, A. & R. Fernandes & Matos 11611, sub *T. africana* Poiret (COI); Vila Velha de Rodas; Porto do Tejo, margem direita do rio, nos lugares humidos do leito do rio, 21.6.1959, Fernandes, Matos, Sarmiento 6863, sub *T. anglica* Webb. (COI); Jungens do Douro, Proximo de Buc d'Alvaz., 16.6.1958, J. Paiva & J. Matos 6508, sub *T. anglica* Webb. (COI); Painbal, 6.1892, Moller, sub *T. anglica* Webb. (COI); Montargil, 6.1883, Cortezao, sub *T. anglica* Webb. (COI); S. Martinho do Porto, 6.1888, J. Daveau, sub *Tamarix* sp. (LISU); Tamargueira on Tamarix, na praia, entre Aleochete eo Vao, 8.1883, A. X. Pereira Coutinho 1725, sub *T. anglica* L. (LISU); Margem do rio Tejo, Almerim, 9.1888, A. R. da Cunha, sub *T. gallica* (LISU); Oeiras, scarpata verso la spiaggia, 4.4.1984, De Martis (CAG); Carcavelos, rocce oltre la strada, 4.4.1984, De Martis (CAG).

*Observations*

This is second sighting for Europe after its discovery in Sardinia (DE MARTIS, LOI & POLO, l.c.). BAUM (1978) records having seen it in East Africa (Tunisia, Libya, Egypt, Israel), Jordan, Sudan and Sokotra Island.

We collected as specimen on the edge on the coast road between Oeiras and Cascais, together with *T. africana* Poiret var. *africana*, *T. hampeana* Boiss. & Heldr. and *T. parviflora* DC. The

numerous specimens have a more or less shrubby appearance probably due to excessive environmental stress caused by salt spray and the outcropping rock.

**Tamarix canariensis** Willd., Abh. Akad., Berlin Physik 1812-1813: 79 (1816).

= *T. gallica* L. var. *canariensis* (Willd.) Ehrenb., Linnaea 2: 268 (1827).

= *T. brachystilis* J. Gay ex Batt. & Trab., Fl. Alg., 1(2): 321 (1889).

#### *Specimina selecta*

Arredores da Figueira da Foz Buarcos, 9.1911, *A. G. de Carvahlo*, sub *Tamarix* sp. (COI); Coimbra, Choupali, 6.1876, *Moller*, sub *T. gallica* Bert. (COI); Alto Alentejo, Elvas: Q.ta de Sto. Onofre, 28.5.1970, *J. A. Guerra 770*, sub *T. africana* Poiret (ELVE); Alto Alentejo: entre Reguengos e Monrao: margens do Guadiana na zone da ponte, 24.5.1968, *Malato Beliz 6503*, sub *T. africana* Poiret (ELVE); Tramagal, margen do rio Tejo; 9.1887, *A. R. da Cunha*, sub *T. gallica* L. (LISU); Tamargueira, on *Tamarix*, S. Pedro de Muel, estio 1880, *M. de Mendia 1726*, sub *T. anglica* L. (LISU); Coste da Caparica, 3.1882, *A. R. da Cunha*, sub *T. gallica* L. (LISU).

#### *Observations*

The presence of this species in Portugal, contrary to the findings of BAUM (1968), but in agreement with BAUM's (1978) latest monograph, is thus confirmed.

**Tamarix africana** Poiret, Voy. Barb. 2: 139 (1789) var. **africana**

= *T. gallica* L., Sp. Pl. 1: 270 (1753).

= *T. gallica* L. var. *hispanica* Bge., Tentamen 62 (1852).

= *T. hispanica* Boiss., Diagn. Pl. Or. Nov. 2(2): 56 (1856).

#### *Specimina selecta*

Baixo Alentejo chacneca Barranco das Lagos enchaccadigo seco no olivar, 19.5.1981, Franco, *Guerra 16384*, sub *T. africana* Poiret (ELVE); Figueira da Foz: Buarcos, 4.4.1943, *F. de Sousa*, sub *T. africana* Poiret (ELVE); afurava a Cabedello (V. N. de Gaia), 5.1912, *A. R. Jorge*, sub *T. africana* Poiret (LISU); Freixo de Espada à Cinta: margem do rio Duro, 11.4.1944, *A. Rozeira & J. Castro*, sub *T. hispanica* Boiss. (LISE); Estremadura, Cascais prov. Feral da Guia nas horridas junto an mar, s.d., s. coll., sub *T. africana* Poiret (LISE); Cascais junt à Astr. para a Boca do Inferno, 13.5.1959, *M. H. Dias*, sub *T. gallica* (LISFA); Carcavelos, rocce oltre la strada, 4.4.1984, *De Martis* (CAG); Oeiras, scarpata verso la spiaggia, 4.4.1984, *De Martis* (CAG); Estoril, lungo la strada panoramica verso Cascais, 4.4.1984, *De Martis* (CAG); Cascais, lungo la strada panoramica prima del centro abitato, 5.4.1984, *De Martis* (CAG).

#### *Observations*

This species has been found in central western Mediterranean countries the Canary Island, Morocco, Algeria and Tunisia (BAUM, 1978).

The habitat of the specimens we collected is the same as that of *T. arborea*, *T. hampeana* and *T. parviflora*. In this environment it outnumberes the other species.

**Tamarix africana** Poiret var. **fluminensis** (Maire) Baum

= *T. brachystilis* J. Gay var. *fluminensis* Maire, Bull. Soc. Hist. Nat. Afr. N. 26. 184 (1935).

= *T. africana* Poiret var. *rangusii* Vill., Bull. Soc. Nat. Maroc 28: 36 (1948).

#### *Specimina selecta*

Lagoa de Santo André, nos terrenos cultivados arenosos, 18.4.1968, *Nogueira 10227a*, sub *T. africana* Poiret (COI); Alentejo littoral, Rocha da Trafana, 5.1980, *J. Deaveau*, sub *Tamarix* sp. (LISU); Ribeira do Xarrama, proximo de Torrao, conc. de Alcacer do Sal, dist. de Setubal, prov. Baixo Alentejo, 24.4.1968, *Sobrinho & Augusto*, sub *T. africana* Poiret (LISU); ad rivulos prope Faro N. S. da Sande, 5.1847, s. coll., sub *T. gallica* (LISU); Buarcos, 3.1855, *A. Goltz de Carvalho*, sub *T. africana* Poiret (LISU).

*Observations*

This is the second sighting for Europe, the first was recently recorded in Sardinia (DE MARTIS, LOI & POLO, l.c.). BAUM (1978) reports having seen it only in Morocco.

**Tamarix hampeana** Boiss. & Heldr., emend. Boiss., Fl. Or. 1: 767 (1867).

- = *T. hampeana* Boiss. & Heldr., in Boiss., Diagn. Pl. Nov. 1(10): 8 (1848).
- = *T. hampeana* Boiss. var. *phalerea* Bge., Tentamen 20 (1852).
- = *T. phalerea* (Bge.) Ndz., De Genere Tamarice 5 (1895).

*Specimina selecta*

Estoril, lungo la strada panoramica verso Cascais, 4.4.1984, *De Martis* (CAG); Carcavelos, rocce oltre la strada, 4.4.1984, *De Martis* (CAG).

*Observations*

New to the Portuguese flora. Already recorded by BAUM (1968-1978) in Greece and Aegean coasts. Also sighted in Sardinia (DE MARTIS, LOI & POLO, l.c.). BAUM (1978) also records its presence in Turkey and Israel (probably introduced). The samples we collected came from a very small number of plants growing alongside *T. africana*, *T. parviflora* and *T. arborea*.

**Tamarix parviflora** DC., Prodr. 3: 97 (1828).

- = *T. laxa* Willd. var. *subspicata* Ehrenb., Linnaea 2: 254 (1827).
- = *T. parviflora* DC. var. *cretica* (Bge.) Boiss., Fl. Or. 1: 770 (1867).
- = *T. rubella* Batt., Bull. Soc. Bot. France 44: 256 (1907).

*Specimina selecta*

Arredores de Lisboa: Barreiro, 5.1887, *Moller 373*, sub *T. gallica* L. (COI); de Barreiro à Seixal, 3.1881, *Deveau*, sub *T. gallica* Bert. (COI); Praia de Mira, lado Sud, s.d., *A. Fernandes, J. Matos 6863*, sub *T. gallica* Webb. (COI); Oeiras, scarpata verso la spiaggia, 4.4.1984, *De Martis* (CAG); Cascais, lungo la strada panoramica prima del centro abitato, 5.4.1984, *De Martis* (CAG).

*Observations*

The first sighting for Portugal. This species has been recorded by BAUM (1978) in Turkey, Greece, Crete, Yugoslavia, Italy, Corsica and, introduced, in Spain and Algeria.

Numerous specimens have been found very close to each other, which tend to further spread due to natural propagation. It could be suggested that escaped cultivation and is thus in the process of being established.

The present investigation, by no means conclusive, has led to the identification in Portugal of four new species (*T. tetragyna* Ehrenb., *T. arborea* (Sieb. ex Ehrenb.) Bge., *T. hampeana* Boiss. & Heldr. and *T. parviflora* DC.), of a new variety (*T. africana* Poiret var. *fluminensis* (Maire) Baum). The presence of *T. africana* Poiret var. *africana*, *T. canariensis* Willd. and *T. gallica* L., not agreed by all authors, has been confirmed.

Here we do not advance any suggestion concerning the occurrence of these species, new to the Portuguese flora, since in our opinion a more accurate knowledge of the genus *Tamarix* in all the Mediterranean-Atlantic countries is required before any interpretation of a phytoclimatic and ecologic nature can be made.

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