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The family Bignoniaceae in Tunisia, first survey including new floristic records to North Africa with nomenclatural notes

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Key words: Aliens, floristics, Lamiales, new records, typification.

Ključne besede: tujerodne vrste, floristika, Lamiales, novi podatki, tipizacija.

Abstract

Botanical surveys carried out during the last 13 years throughout central and northern Tunisia (North Africa) allow to find first national and continental N-African records of non-native taxa belonging to Bignoniaceae. The genera *Catalpa*, *Podranea*, and *Tecomaria* are new for N-Africa (*Catalpa* is new for the whole Africa). *Tecomaria capensis* is here considered as a naturalized alien species, whereas *Campsis radicans*, *Catalpa bignonioides*, *Jacaranda mimosifolia*, *Podranea brycei*, *P. ricasoliana*, and *Tecoma stans* are casuals. Distribution in Tunisia, phenology, and original photographs are provided for each species. A diagnostic key for Tunisian Bignoniaceae is also given. Moreover, the name *Tecoma ricasoliana* (basionym of *Podranea ricasoliana*) is lectotypified on a specimen preserved at K (isolectotypes at FI), whereas the holotype indication of the name *Bignonia capensis* (basionym of *Tecomaria capensis*), made in *Flora of Tropical East Africa*, is here corrected according to the Art. 9.10 of *Shenzhen Code* (lectotype at UPS; isolectotype, here reported for the first time, at LD).

Izvleček

V zadnjih 13 letih smo z botaničnimi raziskavami, izvedenimi v srednji in severni Tuniziji (severna Afrika), dobili prve nacionalne in kontinentalne (severna Afrika) podatke o tujerodnih vrstah iz družine Bignoniaceae. Nove najdbe za severno Afriko so vrste iz rodov *Catalpa*, *Podranea* in *Tecomaria* (*Catalpa* je nova za celotno Afriko). Vrsto *Tecomaria capensis* obravnavamo kot naturalizirano tujerodno vrsto, ostale vrste *Campsis radicans*, *Catalpa bignonioides*, *Jacaranda mimosifolia*, *Podranea brycei*, *P. ricasoliana* in *Tecoma stans* pa so prehodne tujerodne vrste. Za vsako vrsto smo prikazali razširjenost v Tuniziji, fenologijo in originalne fotografije. Naredili smo tudi določevalni ključ za vrste iz družine Bignoniaceae v Tuniziji. Poleg tega smo lektotipizirali ime vrste *Tecoma ricasoliana* (bazionim od *Podranea ricasoliana*) na osnovi primerka iz K (izolektotipi na FI). Opis holotipa vrste *Bignonia capensis* (bazionim od *Tecomaria capensis*) v *Flora of Tropical East Africa* pa smo popravili v skladu z Art. 9.10 Šenženskega kodeksa (*Shenzhen Code*) (lektotip v UPS; izolektotip, o katerem poročamo tukaj prvič pa v LD).

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Introduction

Bignoniaceae Juss. (Lamiales Bromhead *sensu* APG IV, 2016) includes about 80 genera and more than 800 species (Lohmann & Ulloa-Ulloa, 2016; POWO, 2024) mainly occurring in Neotropics (rarely in temperate regions) where are found predominantly in humid forests, but sometimes in dry forests, subdesertic zones, highlands, or rocky outcrops (Lohmann, 2004). Morphologically, Bignoniaceae are characterized by woody habit, opposite and compound leaves, large and showy flowers which are hermaphrodite and gamopetalous, bearing four didynamous stamens and one staminode, bicarpellate ovary with axile or parietal placentation and numerous ovules, dehiscent capsule with flat, exalbuminous seeds, frequently with a hyaline wing that surrounds the embryo (see e.g., Watson & Dallwitz, 1992-onward; Simpson, 2019; Lohmann, 2004). According to APG IV (2016), Bignoniaceae are classified into eight tribes (Bignonieae Dumort., Catalpeae DC. ex Meisn., Coleeaea Bojer, Crescentiae G.Don, Jacarandeae Fenzl, Oroxyleae A.H.Gentry ex Reveal & L.G.Lohmann, Tecomeae Endl., and Tourrettieae G.Don) plus two informally named clades, i.e. "Tabebuia Alliance" and "Paleotropical clade". Among these eight groups, Bignonieae is the largest one by including 385 species and 21 genera of Neotropical lianas and shrubs (APG IV, 2016).

As part of the ongoing study on the flora of Tunisia (see e.g., El Mokni, 2022, 2023; El Mokni & Iamonico, 2020, 2023; El Mokni et al., 2022, 2023; Iamonico & El Mokni, 2020, 2021, 2022), we here present a first survey of Bignonieae from continental N-Africa.

Material and methods

The present research is based on field surveys carried out by the first author (REM) in Tunisia over the last 13 years. Collected specimens are part of the personal collection of one of the authors (Herb. El Mokni) housed in the Herbarium of Monastir University (not yet listed in *Index Herbariorum*). Analysis of relevant literature dealing with morphological features and distributive areas of different collected material were carried out besides examination of specimens preserved at FI, GH, K, LD, RO, and UPS (herbarium codes follow Thiers (2024) [continuously updated]). Tribal ranks according to Olmstead et al. (2009), Reveal (2012) and Olmstead (2021). Names and homotypic synonyms mainly according to POWO (2024).

Results and discussion

Names are given in alphabetical order per rank. Tribes are listed using Roman numbers; genera are listed using Arabic numbers; species are listed using two Arabic numbers, the first one denoting the genus according to our numbering (1.1, 1.2 ... 3.1, 4.1, etc.).

I. Catalpeae DC. ex Meisn., Pl. Vasc. Gen.: Tab. Diagn. 300, Comm. 208 (1840).
1. *Catalpa* Scop., Intr. Hist. Nat. 170 (1777).
Type (Scopoli 1777: 170). *Bignonia catalpa* L. (≡ *Catalpa bignonioides* Walter).

Richness and distribution. The genus comprises 8 species worldwide distributed, of which 2 occur in China, 2 in the eastern United States, and 4 in the Greater Antilles (Olsen & Kirkbride, 2017: 493). Only *Catalpa bignonioides* Walter was reported within Mediterranean area in Croatia, France and Italy (as naturalized alien) and Belgium, Bosnia-Herzegovina, and Czech Republic (as casual alien) (see Raab-Straube, 2018+).

In Africa, no record of *Catalpa* appears to be published (Raab-Straube, 2018+; POWO, 2024). Hyde et al. (2024) reported the species as cultivated in gardens in Zimbabwe). Therefore, we consider the report of the genus as the first one at continent level.

1.1 *Catalpa bignonioides* Walter, Fl. Carol. 64 (1788).
Neotype [designated by Reveal et al. (1990: 17) as "holotype", corrected by Kirkbride & Olsen (2011: 627) according to the Art. 9.10 of ICN]. United States. South Carolina, *Fraser 28-D* (BM-SL, f. 28, Photo in Rembert 1980: Fig. 7).
Epitype (designated by Ward, 2007: 1098 as "neotype", corrected by Kirkbride & Olsen (2011: 627) according to the Art. 9.10 of ICN): United States. South Carolina, Lexington County, just behind (N of) Truck Stop and "44 Restaurant", on E Side of SC Hwy 34 at I-20, about 9 mi SE of Leesville, 20 May 1997, *John B. Nelson 18315* (GH!, image available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.gh00277015?loggedin=true; isoepitype USCH, *non vidi fide* Kirkbride & Olsen, 2011: 627).
= *Bignonia catalpa* L., Sp. Pl. 2: 622 (1753).
Lectotype (designated by Reveal et al., 1990: 17): *Bignonia Urucu foliis flore sordide albo, intus maculis purpureis & luteis asperso, siliqua longissima & angustissima"* in Catesby (1730: 49, t. 49; image of the lectotype available at https://www.biodiversitylibrary.org/item/126524#page/216/mode/1up).

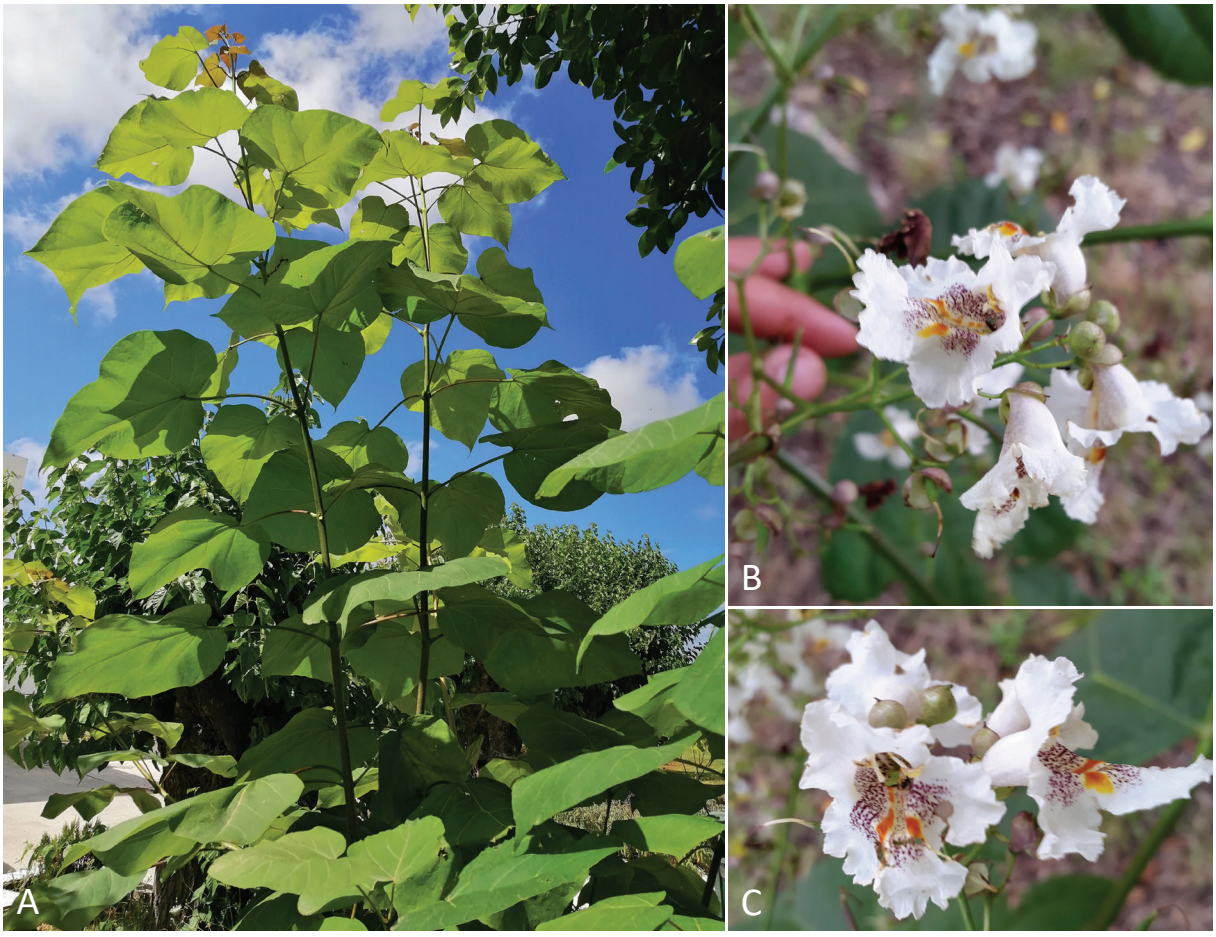

Figure 1: *Catalpa bignonioides* in Tunisia. A: habit; B, C: flowers. Photographs by R. El Mokni.
Slika 1: *Catalpa bignonioides* v Tuniziji. A: značilna oblika; B, C : cvetovi. Fotografije R. El Mokni.

Morphology. Evergreen trees (Figure 1) up to 30 m tall. A detailed description is available, e.g. in ref. Olsen & Kirkbride (2017: 407).

Chorology. Native to northern Florida, southern Georgia, southern Alabama, southern Mississippi, southern Louisiana, eastern most edge of Texas, and Vermont (Weniger, 1996; POWO, 2024). Now widely cultivated in temperate areas of the world, and considered as alien in eastern and western U.S.A., some countries of central and southern Europe, west Himalaya, China, and Korea (POWO, 2024). In the Mediterranean area, the taxon is reported (as a naturalized alien) only in Croatia, France, and Italy, whereas no mentions there are for Africa (see e.g., Raab-Straube, 2018+; GBIF, 2024; APD, 2024; POWO, 2024). So, our discover represent the first one, not only for Tunisia, but also for African continent as a whole.

Occurrence and habitat in Tunisia. Few individuals of *Catalpa bignonioides* were found in disturbed areas surrounding rivers at Al Houamdia-Tabarka (Jendouba governorate) and Chott Mariem (Sousse). In the latter site, the plant found produces regularly flowers and fruits since the year 2000 (M. Kalboussi, pers. comm.). We here consider *C. bignonioides* as a casual alien for Tunisia.

Phenology in Tunisia. Flowering-fruiting times from June to July.

Notes. *Catalpa bignonioides* could be confused with *C. speciosa* (Warder ex Barney) Warder ex Engelm. from which it could be easily distinguished by its crowded inflorescences with 60–80 flowers, and a rachis about 12–26(–28) cm long [*vs.* inflorescences with 28–40(–75) flowers, and a rachis about 7.0–12.5(–18.0) cm long]. Moreover, corollas in *C. bignonioides* are shorter [15–25 × 8–12 mm *vs.* 23–25(–40) × 13–19 mm in *C. speciosa*]. Also, *C. bignonioides* shows shorter stamens than those in *C. speciosa* (16–22 mm long *vs.* 22–26 mm) (see more in Olsen & Kirkbride, 2017: 398).

Specimens examined. **TUNISIA. Jendouba:** Tabarka, 13 June 2019, *El Mokni s.n.* (Herb. El Mokni!).

II. Jacarandeae Seem., Ann. Mag. Nat. Hist., ser. 3, 10: 31. Jul 1862.
2. *Jacaranda* Juss. Gen. Pl. 138 (1789).
Type (Jussieu 1789 : 138). *Jacaranda caerulea* (Linnaeus) Jussieu, Gen. pl. 138 (1789).

Richness and distribution. The genus *Jacaranda* contains about 49 species that are native to central and South America and the Caribbean (POWO, 2024; APD, 2024). Most species are trees with 1 to 45 m tall (Gentry, 1992). Only two of them are reported as casual aliens in Euro+Med area (which includes also N-Africa; see Raab-Straube, 2018+), i.e. *J. mimosifolia* D.Don (Tenerife, Canary Islands) and *J. ovalifolia* R.Br. (Sicily, south Italy).

2.1 *Jacaranda mimosifolia* D.Don, Bot. Reg. 8: t. 631 (1822).
Lectotype (designated by Gentry & Morawetz, 1992: 88). Illustration no. 631 in Don (1822; image of the lectotype available at https://www.biodiversitylibrary.org/page/62007104#page/126/mode/1up).
Morphology. A medium to large tree up to 15 m tall (Figure 2). A detailed description is available, e.g. in refs. Woodson et al. (1973: 863–864) and Gentry, (1992: 88–89).

Figure 2: *Jacaranda mimosifolia* in Tunisia. A: habit; B: detail of leave; C: flower shape. D. fruit (capsule). E. seedling. Photographs by R. El Mokni.
Slika 2: *Jacaranda mimosifolia* v Tuniziji. A: značilna oblika; B : podrobnost lista; C: oblika cveta; D: plod (kapsula). E. klica. Fotografije R. El Mokni.

Chorology. *Jacaranda mimosifolia* is native to a well-defined area in central and eastern South America, including Uruguay, parts of Argentina (Entre Rios, Jujuy, Salta, Tucuman), Brazil, Paraguay (Alto Paraguay, Cordillera) and Bolivia (USDA-ARS, 2016; POWO, 2024). The species is used as ornamental and was able to escape from cultivation in some countries out of S-America (Gentry, 1992; POWO, 2024). In particular, it has proved to be a significant and successful invader in northern and eastern South Africa and a current estimate is that it has "invaded about 1.8 million ha, but mainly at very low densities" (CABI, 2024). It is also naturalized or invasive alien throughout Africa, in Rwanda, Kenya, South Africa, Tanzania and Zambia (Henderson, 2002; Dharani, 2005; Witt & Luke, 2017).

Our discover represents the first one for Tunisia (as a casual alien).

Occurrence and habitat in Tunisia. Several juvenile individuals of *Jacaranda mimosifolia* were found in human-made habitat between *Opuntia* plantations. Two places in Tunisia in Monastir governorate, i.e. Frina, where we found both seedlings and young individuals up to 170 cm high, and Menzel-Nour, where several shrubby individuals of different heights and diameters growing near aged trees within *Opuntia* plantations.

Phenology in Tunisia. Flowering-fruiting times from June to July(-January).

Notes. Despite that *Jacaranda mimosifolia* shares many features with *J. acutifolia* Humb. & Bonpl. (mainly elliptic leaflets < 12 mm long and broadly campanulate calyx < 3 mm long, 5-denticulate or with short triangular teeth), it can be easily distinguished by its capsules mostly > 4.5 cm wide, usually about as wide as long, rarely cuspidate (*vs*. capsules mostly < 4.5 cm wide, usually slightly longer than wide, often slightly cuspidate in *J. acutifolia*) (Gentry, 1992: 52−53).

Specimens examined. **TUNISIA. Monastir:** Frina, 13 Oct 2021, *El Mokni s.n.* (Herb. El Mokni!), *ibidem*, 30 Oct 2022, *El Mokni s.n.* (Herb. El Mokni!); Menzel Nour, 17 Jul 2022, *El Mokni s.n.* (Herb. El Mokni!), *ibidem*, 30 Oct 2022, *El Mokni s.n.* (Herb. El Mokni!).

III. Tecomeae Endl., Gen. Pl.: 711. Jan 1839.
3. *Campsis* Lour., Fl. Cochinch.: 358, 377. (1790).
Type. *Campsis grandiflora* (Thunb.) K. Schum., Nat. Pflanzenfam. 4(3b): 230. (1894).

Richness and distribution. *Campsis* consists of 2 lianous species, one native to eastern North America, the other to eastern Asia (see e.g., Gentry, 1992: 17; Raulston & Grant, 1994; Wen & Jensen, 1995). Both species have been widely cultivated [and perhaps their hybrid, *Campsis* ×*tagliabuana* (Vis.) Rehd. (Rehder, 1932), even more] and becoming popular garden plants in more temperate areas in Europe (Alexander, 2000).

3.1 *Campsis radicans* (L.) Bureau, Monogr. Bignon. 2(Atlas): 16 (1864) ◦ *Bignonia radicans* L., Sp. pl., ed. 1,2:624. 1753 ≡ *Gelseminum radicans* (L.) Kuntze, Revis. Gen. Pl. 2: 479 (1891) ≡ *Tecoma radicans* (L.) Duhamel, Traité Arbr. Arbust., nouv. éd., 2: 9 (1804).
Lectotype (designated by Dandy, 1958: 112). *Bignonia, Fraxini foliis, coccineo flore minore* in Catesby (1731: t. 65).

Morphology. A high-climbing, woody liana (Figure 3). A detailed description is available, e.g. in ref. Gentry (1992:17).

Chorology. A high-climbing, native to central and eastern United States of America (Wennerberg, 2004; POWO, 2024) and widely cultivated as ornamental in south America (Argentina and Ecuador; see also Gentry, 1992: 17), Europe (Belgium, Croatia, Germany, Italy; see also Raab-Straube, 2018+; Galasso et al., 2020: 60; Iamonico, 2022) and Africa [Algeria (see also Zeddam & Raus, 2019) and Lybia (eflora Maghreb, 2024)]. The species is here recorded for the third time in N-Africa (first time for the Tunisian flora) and it is considered as a casual alien.

Occurrence and habitat in Tunisia. *Campsis radicans* occurs along roadsides, and is represented by numerous long wines on around planted trees and abandoned outdated houses. Four localities were found:

- Bizerta-city (Bizerta governorate): several shrubs of different heights in the 'Corniche Road', climbing on palm tree along roadsides with red corollas and abundant fruits;
- Sousse-city (Sousse governorate): a huge shrub (about 4 m height) with long vines of different lengths with red corollas;
- Tabarka (Jendouba governorate): an extended caespitose shrub with orange-reddish/yellow corollas and mature fruits;
- Ariana-city (Ariana governorate); extended caespitose shrub with red corollas.

Phenology in Tunisia. Flowering-fruiting times from July to November.

Notes. The exact identity of the plants in cultivation (and as escapes) remains sometimes critical as the hybrid known as *Campsis* ×*tagliabuana* (Vis.) Rehd. [*C. radicans* × *C. grandiflora* (Thunb.) K. Schumann] is more common than its parents (see Oates et al., 2014).

Figure 3: *Campsis radicans* in Tunisia. A: habit of the plant climbing on palm; B- D: flowers; E: detail of a leave. F. fruit; G: adventitious aerial roots in dense groups at some nodes. Photographs by R. El Mokni.

Slika 3: *Campsis radicans* v Tuniziji. A: značilna oblika rastline, ki pleza po palmi; B-D: cvetovi; E: podrobnost lista. F. plod; G: adventivne zračne korenine v gostih skupinah na nekaterih nodijih. Fotografije R. El Mokni.

Specimens examined. **TUNISIA. Bizerta:** Aîn Mariem, 13 Jul 2019, *El Mokni s.n.* (Herb. El Mokni!), *ibidem*, 01 Jul 2021, *El Mokni s.n.* (Herb. El Mokni!); Bizerta North (Corniche), 21 Aug 2021, *El Mokni s.n.* (Herb. El Mokni!); Bizerta-city, 02 Oct 2021, *El Mokni s.n.* (Herb. El Mokni!); **Sousse:** Sousse-city, 31 Apr 2022, *El Mokni s.n.* (Herb. El Mokni!); **Ariana**: Ariana-city, 20 Jul 2020, *El Mokni s.n.* (Herb. El Mokni!).

4. *Podranea* Sprague, Fl. Cap. 4(2): 449 (1904).
Type. *Podranea ricasoliana* (Tanfani) Sprague, Fl. Cap. 4(2): 450 (1904).

Richness and distribution. *Podranea* is a genus of 2 species of woody, evergreen climbers from open woodland in tropical southeast Africa (Malawi, Zimbabwe, Mozambique) and South Africa with pinnate leaves and trumpet-shaped flowers. It was separated/segregated from *Pandorea* Spach (*Podranea* is an anagram of this latter), a genus from the western Pacific, New Caledonia and Australia. *Pandorea* differs from *Podranea*, among other characters, by its shorter, oblong capsules with woody valves and non-ventricous calyx (see Gentry, 1992; Burger & Gentry, 2000; Ulloa-Ulloa & Govaerts, 2011).

4.1 *Podranea ricasoliana* (Tanfani) Sprague, Fl. Cap. 4(2): 450 (1904) ≡ *Pandorea ricasoliana* (Tanfani) K. Schum., H.G.A.Engler & K.A.E.Prantl, Nat. Pflanzenfam. 4(3b): 230 (1894) ≡ *Tecoma ricasoliana* Tanfani, Bull. Soc. Tosc. Ortic. 17: 16-18 (1887) ◦ *Tecomaria ricasoliana* (Tanfani) Kraenzl., Repert. Spec. Nov. Regni Veg. 17: 225 (1921).
Lectotype (here designated). Italy. Tuscany region, Monte Argentario, Giardino della Casa Bianca, October 1886, *Ricasoli s.n.* [K000779168!, image of the lectotype available at https://www.gbif.org/occurrence/912592467; isolectotypes: FI012557! (image of the isolectotype at https://parlatore.msn.unifi.it/img_450/FI012557.jpg) and FI012558! (image of the isolectotype available at https://parlatore.msn.unifi.it/img_450/FI012558.jpg).
Morphology. A vigorous woody evergreen climber or climbing shrub with strong stems that may grow up to 10 meters high (Figure 4), but also as a subshrub, scandent undershrub, showy climber and small tree (Men-

Figure 4: *Podranea ricasoliana* in Tunisia. A: habit; B, C: details of some flowers; D: dense inflorescence. Photographs by R. El Mokni.
Slika 4: *Podranea ricasoliana* v Tuniziji. A: značilna oblika; B, C: podrobnost cvetov; D: gosto socvetje. Fotografije R. El Mokni.

ninger, 1970). A detailed description is available, e.g. in refs. Gentry (1977), Malan & Notten (2002), Liogier (1995), Spencer (2002), Bailey (1949) and Bidgood et al. (2006).

Chorology. Native of south an tropical east Africa (POWO, 2024), it is an alien in Australia and New Zealand (Hassler, 2016; Atlas of Living Australia, 2022), Hawaii (Starr et al., 2004), central and south America (Acevedo Rodriguez, 2005; Hassler, 2016; POWO, 2024), Iandi and the Philippines (Hassler, 2016); it has also probably escaped to the wild in Texas from specimens brought for horticultural reasons (Lee et al., 2016).

In N-Africa, the species is reported only from Canary Islands, Morocco, and Algeria (GBIF, 2024; POWO, 2024). As a consequence, it is here reported for the first time in Tunisia (as a casual alien).

Occurrence and habitat in Tunisia. *Podranea ricasoliana* is represented by numerous and vigorous woody evergreen climber or climbing shrubs in the following localities:

- Nadhour (Bizerta governorate): several shrubs of different heights in the 'Corniche Road' within roadsides were observed;
- Bizerta-city (Bizerta governorate): several shrubs of different heights climbing on planted Mediterranean cypress trees within roadsides were observed;
- Monastir-city (Monastir governorate): huge shrubs (about 6 m height) with long vines of different lengths climbing on planted paperflower within roadsides were reported;
- Sahline (Monastir governorate): extended caespitose shrubs along roadsides were reported;
- Mahdia-city (Mahdia governorate): extended caespitose shrubs along roadsides were reported.

Phenology in Tunisia. Flowering-fruiting times from July–November.

Typification of the name Tecoma ricasoliana. Tanfani (1887: 16–18) published *Tecoma ricasoliana* providing a detailed diagnosis and two plates (Tav. I and II; image at https://books.google.it/books?id=c3-LFeLoaN4C&printsec=frontcover&hl=it&source=gbs_ge_summary_r&cad=0#v=onepage&q=tecoma&f=false) which are part of the original material for the name; the author also specified that he dedicated the new species to Vincenzo Ricasoli who cultivated, at the Botanical Garden "Casa Bianca" (= White House) of Porto d'Ercole (a small town in Grosseto Province, Tuscany region, central Italy), seeds from Paranà (Brazil) sent by Goya. Moreover, Tanfani (1887: 16) stated that some specimens were sent to the Kew Garden where the species "giace innominata" (= lie idle unnamed). So, Tanfani (1887) cited a syntype according to the Art. 9.6 of ICN (Turland et al., 2018). We traced three specimens at FI (barcodes FI012557 and FI012558) and K (barcode K000779168) referred to plants cultivated at the garden of Casa Bianca in 1886; K specimen is clearly a syntype according to the Art. 9.6 of ICN and is here designated as the lectotype of the name *Tecoma ricasoliana* matching Tanfani's diagnosis based on both vegetative [woody habit, stem glabrous, leaves opposite and imparipinnate (3–4 pairs of leaflets), leaflets ovate, more or less acuminate, dentate, and shortly petiolate] and sexual characters (inflorescences compound, branched, with small bracts, flowers large, campanulate, with gamopetalous corollas, 5 glabrous petals, calyx shorter than corolla). FI specimens are considered as duplicates.

Specimens examined. **TUNISIA. Bizerta:** Aîn Mariem, 13 Jul 2019, *El Mokni s.n.* (Herb. El Mokni!), *ibidem*, 01.07.2021, *El Mokni s.n.* (Herb. El Mokni!); Bizerta North (Corniche), 21 Aug 2021, *El Mokni s.n.* (Herb. El Mokni!); Bizerta-city, 02 Oct 2021, *El Mokni s.n.* (Herb. El Mokni!); **Sousse:** Sousse-city, 31 Apr 2022, *El Mokni s.n.* (Herb. El Mokni!); **Ariana:** Ariana-city, 20 Jul 2020, *El Mokni s.n.* (Herb. El Mokni!).

4.2 *Podranea brycei* (N.E.Br.) Sprague, D.Oliver & auct. suc. (eds.), Fl. Trop. Afr. 4(2): 515 (1906) ≡ Pandorea brycei (N.E.Br.) Rehder, Mitteil. Deutsch. Dendrol. Ges. 1915: 227 (1915) ≡ Tecoma brycei N.E.Br., Bull. Misc. Inform. Kew 1901: 130 (1901).

Lectotype (designated by Drummond, 1975: 230). Zimbabwe, Mashonaland, in dry places, about 1372 m [4500 feets in the protologue], may 1896, *Bryce s.n.* (K000430286!, image of the lectotype available at https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.k000430286?loggedin=true).

Morphology. Vigorous climbing plant with stems, 8–10 m long (Figure 5). A detailed description is available, e.g. in ref. Sánchez de Lorenzo Cáceres (2023).

Chorology. The plant shows a native range limited to South Tropical Africa, Malawi, Mozambique, and Zimbabwe (Sánchez de Lorenzo Cáceres, 2023). It was reported also in Kenya, in the United States of America (California, Santa Barbara, El Salvador and Peru), in India, and in New Zealand (POWO, 2024; GIBF, 2024).

It is here its first record as a casual alien to Mediterranean area from Tunisia.

Occurrence and habitat in Tunisia. *Podranea brycei* occurs as a casual alien along watercourses at Mesjed-Aïssa (Monastir governorate). Several extended caespitose shrubs in blooming period within roadsides were found. The species is here considered as a casual alien.

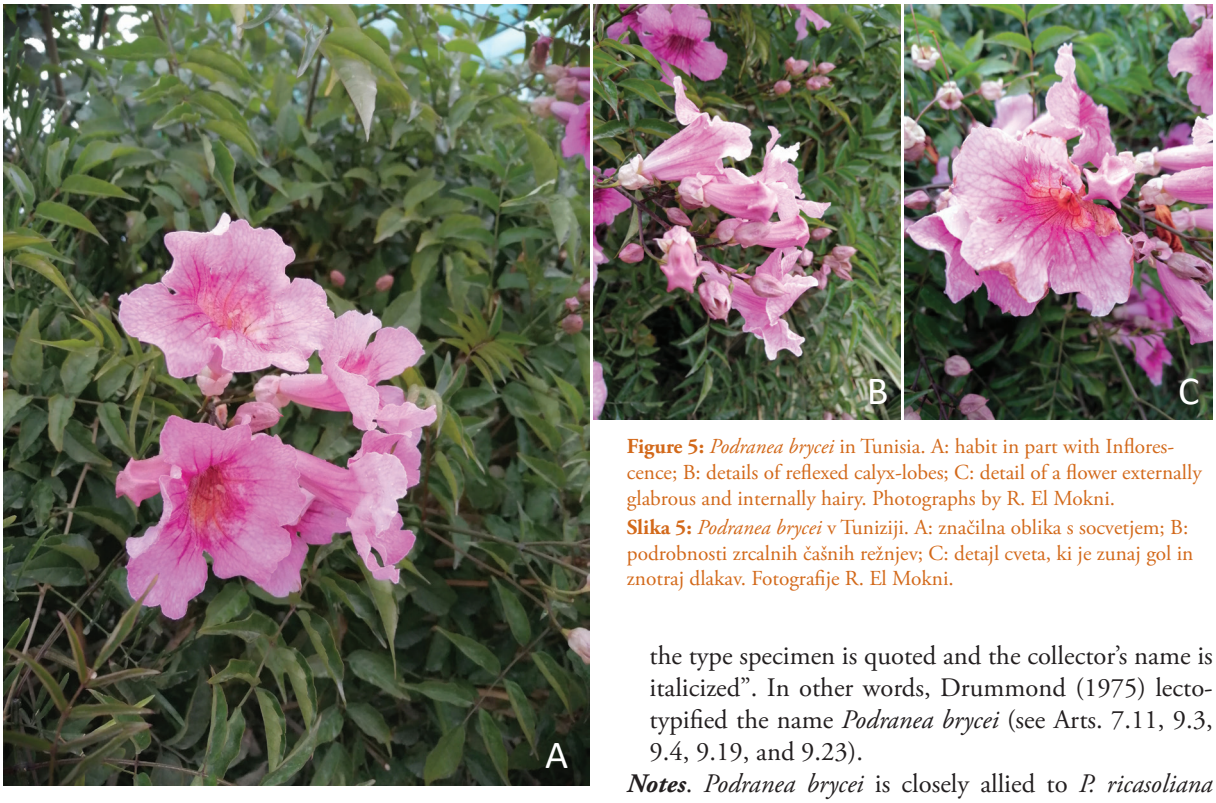

Figure 5: *Podranea brycei* in Tunisia. A: habit in part with Inflorescence; B: details of reflexed calyx-lobes; C: detail of a flower externally glabrous and internally hairy. Photographs by R. El Mokni.
Slika 5: *Podranea brycei* v Tuniziji. A: značilna oblika s socvetjem; B: podrobnosti zrcalnih čašnih režnjev; C: detajl cveta, ki je zunaj gol in znotraj dlakav. Fotografije R. El Mokni.

Phenology in Tunisia. Flowering-fruiting times from December–June.

Typification of the name Tecoma brycei. Brown (1901: 130) validly published this species by a description and a citation of the following syntype (Art. 9.6 of ICN): "Rhodesia. Mashonaland, in dry places, 4500 ft., *Right Hom. J. Bryce*". We traced at K (where Brown' collection and types are preserved; see, HUH-Index of Botanists, 2013-onward) a specimen collected by J. Bryce in May 1896 at Mashona Land (Zimbabwe). This specimen (K000430286) is part of the original material for *Tecoma brycei*, matches Brown's original description.

Diniz (1988) cited the abovementioned K specimen as "holotype". However, Brown (1901: 130) cited a syntype. Therefore, according to the Art. 9.10 of ICN, Diniz's would be treated as an error to be corrected to lectotype. However, Drummond (1975: 173) previously cited *Bryce* specimen at K as follow: "1026. **P.** [*Podranea*] **brycei** (N. E. Brown) Sprague … *Bryce s.n.*"; note that Drummond (1975: 230) stated in the Introduction of the paper "Cited specimens: One specimen is cited for each taxon. As far as possible specimens have been cited which are represented at the National Herbarium, Salisbury, and which have been sent as duplicates to other herbaria such as Kew, Lisbon and Pretoria. Where the species is described from Rhodesia, the type specimen is quoted and the collector's name is italicized". In other words, Drummond (1975) lectotypified the name *Podranea brycei* (see Arts. 7.11, 9.3, 9.4, 9.19, and 9.23).

Notes. *Podranea brycei* is closely allied to *P. ricasoliana* (see above), from which it differs mainly in the early reflexed calyx-lobes and the smaller, more abruptly campanulate corolla, which is villous within, and has the basal cylindric portion included in the calyx-tube.

Specimens examined. **TUNISIA. Monastir:** Mesjed-Aïssa, 05 February 2023, *El Mokni s.n.* (Herb. El Mokni!).

5. *Tecomaria* Spach. Hist. Nat. Vég. 9: 137 (1840).
Type. *Tecoma stans* (Linnaeus) Jussieu ex Humboldt, Bonpland & Kunth.

Richness and distribution. The genus *Tecomaria* includes 2 species, naturally distributed in central and southern Africa, whereas it is alien in some countries of the other continents (POWO, 2024).

5.1 *Tecomaria capensis* (Thunb.) Spach., Hist. Nat. Veg. 9: 137. (1840) ≡ *Bignonia capensis* Thunb., Prodr. Pl. Cap.: 105. (1794) ≡ *Tecoma capensis* (Thunb.) Lindl., Bot. Reg. 13: t. 1117. (1828) ≡ *Gelseminum capense* (Lindl.) Kuntze in Revis. Gen. Pl. 2: 479 (1891).
Lectotype (designated by Bidgood et al., 2006; here corrected according to the Art. 9.10 of ICN). South Africa: Cape Province, *s.d.*, *Thunberg s.n.* (UPS-THUNB14226!, Figure 6; isolectotype (here reported for the first time) LD1747354!, image available at htt-

Figure 6: Lectotype of the name *Bignonia capensis* (UPS-THUNB14226!). The magnification of the annotation reported on reverse of the sheet is framed (top-right of the figure).
Slika 6: Lektotip imena vrste *Bignonia capensis* (UPS-THUNB14226!). Povečava opombe na zadnji strani lista je uokvirjena (zgoraj desno na sliki).

ps://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.ld1747354?loggedin=true).

Morphology. A clambering or semi-erect shrub up to 3–4 m in length (Figure 7). A detailed description is available, e.g. in ref. Acevedo-Rodríguez (2005).

Chorology. The species is native to an African area ranging from Tanzania to South Africa (Ulloa-Ulloa 2016, Mutshinyalo & Notten, 2016; POWO, 2024). It is more or less commercialized and cultivated as an ornamental in the other continents, i.e. Asia (India, Singapore, Australia, tropical America and on islands in the Indian and the Pacific Oceans) (PIER, 2016; USDA-ARS, 2016), Europe [casual alien in Italy (Galasso et al., 2021) and Spain (Verloove et al., 2018)], America [U.S.A (Everett, 1982), Hawaii (ZipCodeZoo, 2016), central and southern America (Smithsonian Museum

Figure 7: *Tecomaria capensis* in Tunisia. A: habit in part with details of flowers and dehiscent fruits (long capsules); B: juvenile individual from rooting of branches, in blooming period. Photographs by R. El Mokni.
Slika 7: *Tecomaria capensis* v Tuniziji. A: značilna oblika s podrobnostmi cvetov in razpadlih plodov (dolge kapsule); B: mladi primerki iz ukoreninjenih vej, v obdobju cvetenja. Fotografije R. El Mokni.

of Natural History, 2016; POWO, 2024), Australia [Queensland, New South Wales, and eastern Victoria (Weeds of Australia, 2016)] and New Zealand (NZ-PCN, 2016).

In N-Africa, the plant is reported from Canary Islands and Morocco (GBIF, 2024). It is here its first record as a naturalizing alien from Tunisia.

Occurrence and habitat in Tunisia. *Tecomaria capensis* grows in different areas, as a casual alien mainly in the following localities:

- Bizerta-city (Bizerta governorate): several shrubs to small trees of different heights with many seedlings in many sites along roadsides have been found;
- Monastir towards Sousse (Monastir governorate): extended caespitose shrubs along roadsides were reported;
- Bekalta (Monastir governorate): extended caespitose shrubs, in flowering period, within edges of public gardens and roadsides were reported besides many juvenile individuals from rooting of branches that lie on the ground;
- Borj-Arif (Mahdia governorate): extended caespitose shrubs in flowering and fruiting periods, within edges of on both sides of the Sahel metro railways were found, with many juvenile individuals from seedlings;
- Mornag (Ben Arous governorate): several shrubby individuals of different heights along roadsides have been reported.

Phenology in Tunisia. Flowering-fruiting times: almost all over the year.

Typification of the name Bignonia capensis (tribe Bignonieae Dumort.). Thunberg (1794: 105) provided a short diagnosis ("B. [*Bignonia*] foliis impari-pinnatis glabris: pinnis ovatis serratis, corollis vurvatis clavatis"), without further information. According to HUH Index of botanists (2013b-onward), Thunberg's herbarium and types are mainly preserved at UPS (duplicates in other european herbaria). We found one specimen (UPS-THUNB14226) bearing two flowered branches with the annotation (bottom-right corner of the sheet) "*Bignonia capensis*" and (on reverse) "*e Cap. b. Spei. Thunberg*". This specimen is part of the original material used by Thunberg (1794: 105) to describe *Bignonia capensis*. In addition, a specimen at LD (LD1747354), also part of the original material, was found and it bears one fragment of a plant (with three leaves and one damaged flower) collected by C. P. Thunberg (an annotation on the bottom-right corner of the sheet); the sheet is further annotated with the script "*B. capensis*" (bottom-right corner of the sheet). Both UPS and LD types match the protologue and the original concept in *Bignonia* (see e.g., Bidgood et al., 2006).

Bidgood et al. (2006) reported "Type: South Africa, without locality, Thunberg (UPS, holo.; microfiche!)". According to the Art. 9.10 of ICN, the use of the term "holotype" is an error to be corrected to "lectotype", since Thunberg (1794: 105) Thunberg (1794: 105) did not cited the holotype. Correction is made here (see above in the Taxonomic Treatment).

Notes. For long times, botanists working on this family considered that there was no robust morphological evidence to support the separation of the genera *Tecomaria* from *Tecoma*, treating them as one (see e.g., Wood, 2008; Stevens, 2012). Molecular studies, however, have shown that the genus *Tecomaria* is actually closely related to *Podranea* (the only other African member of the clade Tecomeae) not *Tecoma* (Olmstead et al., 2009).

Tecomaria capensis includes 2 known subspecies. Subsp. *capensis*, to which belongs Tunisian collections, can be distinguished from subsp. *nyassae* (Oliv.) Brummit by its leaves with 2–3(–5) pairs of leaflets (*vs*. leaves with (3–)4–5(–6) pairs of leaflets in subsp. *nyassae*) and its cylindrical calyx with (8–)10–18(–23) mm [*vs*. campanulate to shortly cylindrical calyx with (4–)5–8 mm long] (see e.g., Brummitt, 1974).

Specimens examined. **TUNISIA. Mahdia:** Borj-Arif, on both sides of the Sahel metro railways, 7 May 2019, *R. El Mokni s.n.* (Herb. El Mokni!); **Bizerta:** Bizerta-city, within roadsides, 11 June 2020, *R. El Mokni s.n.* (Herb. El Mokni!), *ibidem*, 3 July 2021, *R. El Mokni s.n.* (Herb. El Mokni!); **Monastir:** Monastir towards Sousse, 5 December 2019, *R. El Mokni s.n.* (Herb. El Mokni!), Bekalta, 30 October 2022, *R. El Mokni s.n.* (Herb. El Mokni!); **Ben Arous:** Mornag, 4 March 2023, *El Mokni s.n.* (Herb. El Mokni!).

6. *Tecoma* Jussieu, Gen. pl. 139. 1789.

Type. *Tecoma stans* (Linnaeus) Jussieu ex Humboldt, Bonpland & Kunth.

Richness and distribution. It is a Western Hemisphere tropical and subtropical genus of about 16 shrubs species (Pelton, 1964).

6.1 *Tecoma stans* (L.) Juss. ex Kunth, Gen. Pl. [Jussieu] 139. 1789 [4 Aug 1789] ≡ *Bignonia stans* L., Sp. Pl. ed. 2. 871. (1763) ≡ *Stenolobium stans* (L.) Seeman in J. Bot. 1: 88 (1863) ≡ *Gelsimum stans* (L.) Kuntze, Rev. Gen. 2: 479 (1891).

Lectotype (designated by Gentry 1992: 285): *Bignonia foliis pinnatis* in Plumier (1756: t. 54).

Figure 8: *Tecoma stans* in Tunisia. A: habit; B: details of flowers and indehiscent fruits (long capsules); C: dehiscent fruits. Photographs by R. El Mokni.

Slika 8: *Tecoma stans* v Tuniziji. A: značilna oblika; B: podrobnosti cvetov in nerazpadlih plodov (dolge kapsule); C: razpadli plodovi. Fotografije R. El Mokni.

Morphology. A very variable shrub or small tree up to 10 m (Figure 8). A detailed description is available, e.g. in ref. Wood (2008: 148).

Chorology. A species with a wide natural distribution in tropical and subtropical America, whereas it is an alien in some countries of Africa and Asia (Gentry, 1992; POWO, 2024) where it is used as ornamental plant; in several American Countries (for example in Bolivia, Argentina, Brazil, and several islands in the West Indies) its origin is doubtful (see Pelton, 1964). The invasive status of *Tecoma stans* is likely to increase dramatically in many countries of introduction as it changes from a "sleeper weed" to its invasive stage. According to GISD (2008), it has been listed as a noxious weed in South Africa, Australia and America.

In N-Africa, no records there are up to now (see GBIF, 2024) and, therefore, our finding is the first one (as a casual alien).

Occurrence and distribution in Tunisia. *Tecoma stans* is a weed of roadsides and occurs as a casual alien in many localities:

- Sousse towards Sahloul (Sousse governorate): about 60 individuals, caespitose shrubby of different height in blooming-fruiting period were reported;
- Jemmal (Monastir governorate): one shrub in blooming-fruiting period were reported;
- Monastir-city (Monastir governorate): many caespitose shrubs in blooming-fruiting period were reported;
- Sidi Abdelhamid (Sousse governorate): two caespitose shrubs in blooming-fruiting period were reported;
- Mornag (Ben Arous governorate): several shrubby individuals and small trees of different heights along roadsides in blooming-fruiting period have been reported.

Phenology in Tunisia. Flowering-fruiting times from December-July.

Notes. *Tecoma stans* is a variable species which can be classified into at least three varieties [var. *velutina* A.DC., var. *sambucifolia* (Kunth) J.R.I.Wood, and var. *stans*]. *Tecoma stans* var. *stans* is characterized by its lanceolate or oblong-lanceolate, acute to acuminate leaflets (*vs.* leaflets broadly oblong to oblong-elliptic, acute in var. *sambucifolia*) which are glabrous or only sparsely pubescent on the veins beneath (*vs.* leaves densely grey-tomentose beneath in var. *velutina*) (cf. Wood, 2008:149). Tunisian material is identifiable as *Tecoma stans* var. *stans*.

Specimens examined. **TUNISIA. Sousse:** Sousse towards Sahloul, 07 Mars 2016, *El Mokni s.n.* (Herb. El Mokni!); Sidi Abdelhamid, 05 February 2023, *El Mokni s.n.* (Herb. El Mokni!); **Monastir:** Jemmal, 28 April 2020, *El Mokni s.n.* (Herb. El Mokni!); Monastir-city, 28 July 2022, *El Mokni s.n.* (Herb. El Mokni!); **Ben Arous:** Mornag, 04 March 2023, *El Mokni s.n.* (Herb. El Mokni!).

Key to genera and species of the Bignoniaceae occurring in Tunisia and N-Africa

1. Climbing vines, with opposite compound pinnate leaves; capsules more or less elongate septicidal or loculicidal **2**
1'. Larger trees or erect shrubs; leaves various; capsules subcylindrical or rounded to ovate **6**
2. Plants with adventitious aerial roots in dense groups on both sides of stem at some nodes; leaflets usually serrate ..... ***Campsis***
2'. Plants without adventitious roots at nodes; leaflets usually not serrate **3**
3. Corollas pink with red stripes; stamens included; plant at wining vine; leaflets entire **4**
4. Leaves with 9−11(−15) leaflets, normally entire; flowers with early reflexed calyx-lobes and a campanulate abruptly corolla densely hairy to villous throat..... ***P. brycei***
4'. Leaves with 7−9 leaflets, normally toothed; flowers with cupular-campanulate calyx, strongly 5-dentate, apiculate lobes and a glabrous corolla or slightly hairy throat..... ***P. ricasoliana***
3'. Corollas of different colour; stamens enclosed or protruding; plant a scrambling shrub; leaflets serrate **5**
5. Corolla yellow (sometimes with reddish veins), ventricose above a shortly cylindrical, strongly demarcated base, ± campanulate in form; stamens enclosed; leaves 3−9-foliate, margins sawtoothed ..... ***Tecoma***
5'. Corolla orange to orangey-red (sometimes yellow coloured), corolla tube curved, narrowly funnel-shaped; stamens protruding; leaves usually 7−11-foliate; leaflets margins coarsely toothed ..... ***Tecomaria***
6. Fertile stamens two; leaves simple; corollas white with purple, yellow, pink or orange markings in varying patterns; fruits subcylindrical loculicidal capsules..... ***Catalpa***
6'. Fertile stamens four; leaves twice pinnately compound; corollas blue or violet; fruits rounded to oval, laterally-flattened capsules ..... ***Jacaranda***

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