

On the occurrence of *Ipomoea imperati* (Vahl) Griseb. (*Convolvulaceae*, *Ipomoeae*) within coastal dunes of Tunisia, the lost piece of the puzzle fell into place!

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Abstract

The occurrence of *Ipomoea imperati* (Vahl) Griseb. is here confirmed and clearly documented for the first time in Tunisia following botanical surveys recently carried out on coastal dunes within the north-western and central-eastern part of the country. General characteristics as well as original photographs are here provided for the Tunisian material. Phenology, habitat and ecological notes of the species in Tunisia are presented. Moreover, a discriminating key for known species of the genus in Tunisia is proposed.

Keywords: Chorology, *Convolvulus*, coastal dunes, North Africa, Solanales.

Resumen

Sobre la presencia de *Ipomoea imperati* (Vahl) Griseb. (*Convolvulaceae*, *Ipomoeae*) en las dunas costeras de Túnez, ¡la pieza perdida del rompecabezas encajó!

La presencia de *Ipomoea imperati* (Vahl) Griseb. se confirma y documenta claramente por primera vez en Túnez tras estudios botánicos realizados recientemente en las dunas costeras del noroeste y centro-este del país. Se proporcionan características generales y fotografías originales del material tunecino. Se presentan la fenología, el hábitat y las notas ecológicas de la especie en Túnez. Además, se propone una clave de discriminación para las especies conocidas del género en Túnez.

Palabras clave: Corología, *Convolvulus*, dunas costeras, Norte de África, Solanales.

Ipomoea L. is one of the richest genera in the *Convolvulaceae* family (Solanales, *Asteranae*), including c. 650 species with predominant occurrence in tropical and warm temperate regions of the world (Lonard & Judd 1999; Mabberly 2008). In Tunisia, until now, the genus was represented only by four species namely, *Ipomoea batatas* (L.) Lam., *I. indica* (Burm.) Merr. *I. purpurea* (L.) Roth and *I. sagittata* Poir. (El Mokni 2024). Recent botanical surveys undertaken during the autumn from September to December 2023

in Mahdia governorate within the central-eastern of Tunisia and during November to December 2024 within Jendouba governorate in the north-western part, have made possible the collection of specimens of an unfamiliar creeping species of *Convolvulaceae* in its flowering/fruitletting period. The specimens were later identified and confirmed as *Ipomoea imperati* (Vahl) Grisebach., by comparison with the details in Naik *et al.* (2019), Wood *et al.* (2020) and Caldarella *et al.* (2021). Another interesting species of *Ipomoea* hitherto doubtfully reported from the country (see e.g. Raab-Straube, 2018; Omezine, 2011: 80 sub *Ipomoea stolonifera* (Cyr.) J.F.Gmelin; APD, 2025; GBIF, 2025), despite its presence in all surrounding countries (POWO, 2025) and one observation of an individual bearing only leaves on May 11, 2022 reported on the online platform iNaturalist 2025 (<https://www.inaturalist.org/>). Voucher herbarium specimens are preserved in the personal herbarium of the author (Herb. R. El Mokni) at the Faculty of Pharmacy of Monastir (Univ. Monastir, not listed yet in Index Herbariorum), duplicates are deposited in SAF (acronym follows Thiers, 2025).

Ipomoea imperati (Vahl) Grisebach., Cat. Pl. Cubens. 203 (1866).

Basionym: *Convolvulus imperati* Vahl, Symb. Bot. (Vahl) 1: 17 (1790).

Type. ITALY, Campania without data; lectotype: Imperato, Hist. Nat. 671(pl.). 1692. Lectotypified by La Valva & Sabato, Taxon 32: 111-113. 1983.

Morphology (Figures 1-3). Perennial, creeping herb, 60-120(–500) cm in length. Stems trailing, concolour, glabrous and rooting at nodes (Figures 1 and 2). Leaves petiolate, oblong, lanceolate or ovate, 3–5 × 1.5–4 cm, fleshy, slightly succulent, base shallowly cordate, margin entire or undulate, young leaves entire (Figures 2A & 2C), mature leaves with 3–5 lobes (Figure 2B); lobes ovate to oblong, lateral lobes small, apex obtuse or emarginate, surfaces adaxially pale green and minutely glandular, abaxially thick green and shining. Flowers axillary, solitary (Figures 3A), bisexual, white to yellow (Figure 3B); peduncle 2–3 cm long; *bracts* lanceolate, 5 mm long, green, glabrous; pedicel 1–1.5 cm long; *sepals* oblong, unequal, in whorls (3+2) outer two sepals 7–11 mm long; inner sepals c. 1.5 cm long, leathery, apex obtuse to acute or mucronate, glabrous, pale green; *corolla* white, with a pale-yellow tube without and dark yellow centre, funnelform, 4–6 cm diameter, glabrous (Figure 3B); *stamens* 5 (3+2), unequally arranged; staminal tube base thick, villous, white; *anthers* oblong, pale yellow; *filaments* white glabrous (Figure 3B); *ovary* oblong, glabrous, pale green; stigma bilobed, minutely ridged, white; *style* bilobed, slightly rigid. Capsule enclosed with calyx (Figure 3C), ellipsoid, glabrous. Seeds c. 6 mm (free after capsule dehiscence), tomentose, margins with long simple hairs (Figure 3C).

Phenology. Flowers and fruits from November to December in Tunisia. Elsewhere the plant flowers in spring and early summer (Naik *et al.*, 2019; Caldarella *et al.*, 2021).

Global distribution. *I. imperati* (known as beach morning glory) is a rhizomatous geophyte with a pantropical distribution. It has been recorded from several temperate-warm and tropical areas of Central and North America, Pacific and Atlantic islands, Africa, Australia, Brazil, Canary Islands, Caribbean, China, Europe, Indonesia, Japan (Ogasawara and Ryukyu Islands), Malaysia, Pacific Islands, Philippines, Sri Lanka, Thailand, the Mediterranean Basin and Vietnam (Fang & Staples, 1995; Lonard & Judd, 1999; Silvestre, 2012; Caldarella *et al.*, 2021) and insular India (Naik *et al.*, 2019).

As reported by Caldarella *et al.* (2021), the native status of *I. imperati* in the Mediterranean is still debated (see e.g. McDonald, 1991; Silvestre, 2012). In fact, the taxon is considered by many authors as an alien invasive species (see e.g. Sanz Elorza *et al.*, 2001, 2004; García De Lomas *et al.*, 2015). The genetic study on the structure of *I. imperati* undertaken by Cennamo *et al.* (2012) identifies in one or more transatlantic migration events (not attributable to anthropic and pre-Columbian causes) the arrival and subsequent dispersion of the species on coasts of the Mediterranean. The occurrence of small populations of *I. imperati* on the coasts of various Atlantic islands supports this hypothesis: the Azores Islands, the Cape Verde Islands (Hansen & Sunding, 1993) and the Madeira Archipelago (Da Silva, 2002). Recent molecular investigations attempted by Wood *et al.* (2020) seems to confirm the American origin of the species. In North Africa, the plant was reported from all coastal countries except Tunisia (Raab-Straube, 2018; APD, 2025; POWO, 2025), where it is here its first illustrated and confirmed report. Thus, with this discovery, the final/lost piece of the puzzle fell into place and confirm the occurrence of *I. imperati* on all the North African coasts within the southern Mediterranean shore.

Habitat and ecology in Tunisia. Two extended populations (more than 500 specimens in an area that exceeded two hectares) were observed along coastal littoral dunes of Mahdia (35°30'36"N 011°03'18"E, 20 m a.s.l., central-eastern Tunisia) and Tabarka (36°57'37"N 008°45'32"E, 01 m a.s.l., north-western Tunisia) (Figures 1–3). The plants of *I. imperati* were gathered in groups, with many juvenile seedlings, among which many were with flowers and/or fruits accompanied mainly by *Andryala integrifolia* L., *Cakile maritima* Scop. (subsp. *maritima*), *Centaurea polyacantha* Willd., *Cyperus capitatus* Vand., *Eryngium maritimum* L., *Euphorbia paralias* L., *Launaea fragilis* (Asso) Pau subsp. *fragilis*, *Limbarda crithmoides* (L.) Dumort., *Pancratium maritimum* L., *Reichardia picroides* (L.) Roth, *Silene nicaeensis* All., *Sporobolus pungens* (Schreb.) Kunth, *Thinopyrum junceum* (L.) Á.Löve.

Specimens examined: TUNISIA, Mahdia, sandy coastal dunes, 21 November 2023, R. El Mokni s.n. (Herb. R. El Mokni, Univ. Monastir; SAF100157), *ibidem*, 10 December 2023, R. El Mokni s.n. (Herb. R. El Mokni, Univ. Monastir; SAF100158), *ibidem*, 01 November 2025, R. El Mokni s.n. (Herb. R. El Mokni, Univ. Monastir); Jendouba, Tabarka, sandy coastal dunes, 12 December 2024, R. El Mokni s.n. (Herb. R. El Mokni, Univ. Monastir).

All things here mentioned claimed a number of five species are now known in Tunisia, among which three are non-natives (*I. batatas* (L.) Lam., *I. indica* (Burm.) Merr., and *I. purpurea* (L.) Roth; El Mokni, 2024). An updated diagnostic key to the species of the genus *Ipomoea* in Tunisia is hereafter provided (adopted mainly from Wood *et al.*, 2020; Williams *et al.*, 2024).

Key to the species of the genus *Ipomoea* in Tunisia (new record in bold)

- 1a. Plants with subterranean tubers; outer sepals 5-10 mm, mucronulate, glabrous to pilose abaxially, margin ciliate or fimbriate; corolla 1.5-4 cm..... *I. batatas*
- 1b. Plants without tubers; Outer sepals 10-16 mm, not mucronulate, purplish bristly or hirsute abaxially, margin neither ciliate nor fimbriate; corolla 5-7 cm..... **2**
- 2a. Prostrate seaside plant, rooting at the nodes; corolla white; flowers solitary..... *I. imperati*
- 2b. Plants of various habits; corolla pink or bluish-purple, flowers solitary or in cymes..... 3
- 3a. Flowers solitary (rarely paired); leaves strongly sagittate; corolla pink 4–7 cm long; sepals oblong-elliptic, 3–7 mm wide, smooth *I. sagittata*
- 3b. Flowers several in cymes, rarely solitary; leaves varied in shape; corolla colored differently; sepals narrowly ovate to oblong-lanceolate, 2–5 mm wide, pubescent to hispid-pilose..... 4
- 4a. Flowers clustered in a sub-capitate bracteolate inflorescence; pedicels 2–7 mm long; leaves ovate or, commonly, shallowly 3-lobed; sepals 3–5 mm wide, pubescent; corolla usually bluish-purple 5–6 cm long; bracteoles pubescent, usually narrowly linear-lanceolate, acuminate, 4–10 mm long..... *I. indica*
- 4b. Flowers in lax cymes; pedicels >10 mm long; leaves ovate (rarely 3-lobed to half way), shortly acuminate, cordate with rounded auricles; sepals 2–3 mm wide, hispid-pilose; corolla tube white, limb usually pink, more (rarely cream or bluish) 4–5 cm long; bracteoles inconspicuous, linear, filiform 2–8mm long..... *I. purpurea*



Figure 1. *Ipomoea imperati*, habit and habitat within coastal dunes of Mahdia (CE Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 21 November 2023). Photograph by R. El Mokni.

Figura 1. *Ipomoea imperati*, hábito y hábitat dentro de las dunas costeras de Mahdia (CE Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 21 de noviembre de 2023). Fotografía de R. El Mokni.



Figure 2. *Ipomoea imperati*. A) Creeping stem with young petiolate leaves in Mahdia (CE of Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 21 November 2023). B) Young petiolate leaves in Tabarka (NW of Tunisia, 36°57'37"N 008°45'32"E, 01 m a.s.l., 12 December 2024). C) Creeping stem with developed 3-5 lobed leaves in Mahdia (CE of Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 21 November 2023). Photographs by R. El Mokni.

Figura 2. *Ipomoea imperati*. A) Tallo rastrero con hojas jóvenes pecioladas en Mahdia (centro de Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 21 de noviembre de 2023). B) Hojas jóvenes pecioladas en Tabarka (noroeste de Túnez, 36°57'37"N 008°45'32"E, 1 m s.n.m., 12 de diciembre de 2024). C) Tallo rastrero con hojas desarrolladas de 3 a 5 lóbulos en Mahdia (centro de Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 21 de noviembre de 2023). Fotografías de R. El Mokni.

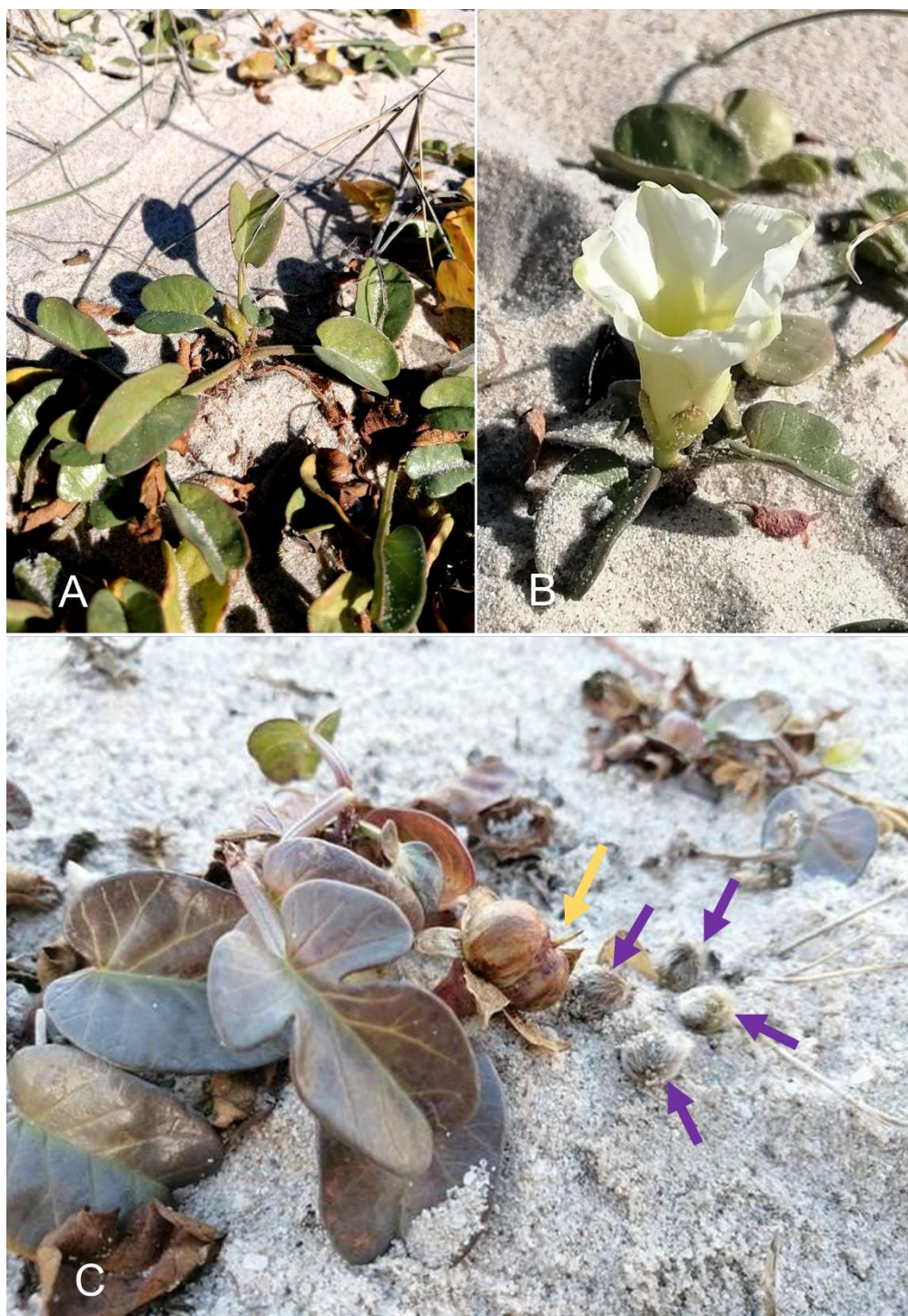


Figure 3. *Ipomoea imperati*. A) Plant before blooming with axillary, solitary flower in Mahdia (CE of Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 21 November 2023). B) front view of a solitary white-yellow typical flower in Mahdia (CE of Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 21 November 2023). C) non-dehiscent capsule (indicated by yellow arrow) and free seeds (indicated by purple arrows) in Mahdia (CE of Tunisia, 35°30'36"N 011°03'18"E, 20 m a.s.l., 10 December 2023). Photographs by R. El Mokni.

Figura 3. *Ipomoea imperati*. A) Planta antes de florecer, con una flor axilar solitaria, en Mahdia (centro de Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 21 de noviembre de 2023). B) Vista frontal de una flor típica, solitaria, de color blanco amarillento, en Mahdia (centro de Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 21 de noviembre de 2023). C) Cápsula no dehiscente (indicada con flecha amarilla) y semillas libres (indicadas con flechas moradas) en Mahdia (centro de Túnez, 35°30'36"N 011°03'18"E, 20 m s.n.m., 10 de diciembre de 2023). Fotografías de R. El Mokni.

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