

***Reichardia gaditana* (Willk.) Samp. (Asteraceae, Cichorieae), a new addition to native Tunisian costal flora**

Ridha El Mokni ^{1, 2}

¹ University of Monastir, Laboratory of Botany, Cryptogamy and Plant Biology, Faculty of Pharmacy of Monastir, Avenue Avicenna, 5000-Monastir, Tunisia.

² University of Carthage, IRESA, Laboratory of Forest Ecology, National Research Institute of Rural Engineering, Water and Forests, 2080-Ariana, Tunisia.

Author for correspondence: ridha.elmokni@fphm.rnu.tn

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Abstract

The occurrence of *Reichardia gaditana* (Willk.) Samp. is here reported and documented for the first time as a new record to native costal flora of Tunisia following botanical surveys carried out during mainly the last decade within the centre-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 provided. Moreover, a discriminating key for known species of the genus in Tunisia is presented.

Key words: Chorology, Compositae, Floristics, North Africa, *Picridium*.

Resumen

***Reichardia gaditana* (Willk.) Samp. (Asteraceae, Cichorieae), una nueva adición a la flora costera nativa de Túnez**

Se informa y documenta por primera vez la presencia de *Reichardia gaditana* (Willk.) Samp. como nuevo registro para la flora costera nativa de Túnez, tras estudios botánicos realizados principalmente durante la última década en la zona centro-oriental del país. Se proporcionan las características generales y fotografías originales del material tunecino. Se incluyen notas sobre la fenología, el hábitat y la ecología de la especie en Túnez. Además, se presenta una clave de identificación para las especies conocidas del género en Túnez.

Palabras clave: Corología, Compositae, Florística, Norte de África, *Picridium*.

Reichardia Roth is a well delimited genus in the subtribe *Hyoseridinae* Less. (formerly known as *Sonchinae* Bremer) from the tribe *Cichorieae* Lam. & DC. (fam. *Asteraceae* = *Compositae*) (Cho *et al.* 2022). It is quite homogeneous in morphology and is easily recognizable, mainly due to its flower heads, which are often large and typically broadly conical when fruiting, and its heteromorphic fruits. Outer and medium phyllaries show typical scarious margins and a subterminal mucro. Cypselae are four-ribbed, outer transversely rugose, while compressed inner ones are paler and variably smooth. The pappus consists of numerous fine scabrid bristles (Cho *et al.* 2022).

The genus comprises ten herbaceous species with three hybrids (Gallego *et al.* 1980; POWO, 2026) bearing capitula with generally yellow florets, except for two species (*R. tingitana* and *R. gaditana*) where the base of the ligule is deep purple, among which only four are known to be native in North African inland, one perennial with woody base [*R. picroides* (L.) Roth]; a biennial-perennial [*R. gaditana* (Willk.) Samp.]; and two are annuals [*R. tingitana* (L.) Roth and *R. intermedia* (Sch. Bip.) Samp.]. In Tunisia, up to now, the genus was represented only by three species namely, *R. intermedia*, *R. picroides* and *R. tingitana* (Pottier-Alap  tite, 1981; Dobignard & Chatelain, 2011; Greuter, 2006+; APD, 2026; POWO, 2026; GBIF, 2026).

As part of ongoing studies on updating the taxa list of Asteraceae in Tunisia and North Africa (see e.g., El Mokni *et al.* 2022; El Mokni, 2024a, 2024b, 2025a, 2025b; Sakhraoui *et al.* 2024), I here report and document for the first time the occurrence of *Reichardia gaditana* as native to coastal flora of Tunisia. General characteristics as well as original phenology, habitat and ecological notes of the species are provided. Moreover, a discriminating key for known species of the genus in Tunisia is presented.

Recent botanical surveys undertaken during the last decade within the central-eastern of Tunisia (Mahdia, Monastir and Sousse governorates), have made possible the collection of specimens of another species of *Reichardia* in its flowering/fruiting period. The specimens were deeply examined, identified and later confirmed as *Reichardia gaditana* (Willk.) Samp., by comparison mainly with the details in Gallego *et al.* (1980), Blanca *et al.* (2011), Conti *et al.* (2015), Sicilia-Pasos *et al.* (2024) and Portela-Pereira in Flora-On (Flora de Portugal Interactiva 2026, via <http://www.flora-on.pt>). Another interesting species of the genus *Reichardia* with deep purpled ligula hitherto not reported (perhaps misidentified for a long time with *R. tingitana* s.lat.!) from the country (see e.g. Pottier-Alap  tite, 1981: 1122-1123; Dobignard & Chatelain, 2011: 356-358; Greuter, 2006+; APD, 2026; POWO, 2026; GBIF, 2026; WFO, 2026a). 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).

Reichardia gaditana (Willk.) Samp., Bol. Soc. Brot. 24: 68 (1909).

Basionym: *Picridium gaditanum* Willk., Prodr. Fl. Hispan. 2: 232 (1865).

Type (designated by Gallego *et al.* 1980) 'In arenosis isthmi gaditani prope Templum Santi Josephi, 11. III.1845', *Willkomm* (COI Willk., lectotype).

Morphology (Figures 1-3). Herbaceous, biennial-perennial (hemicryptophyte) plant, semi-woody to slightly woody at the base; *stems* 20-40(-45) cm tall, erect, much branched in the upper half (Figure 1A); *leaves* alternate, glaucous, toothed to cleft, rarely papillary, with margins slightly spinulose-denticulate, the basal ones oblanceolate, pinnatifid or sinuate, tapering into a short, broad petiole, the lower cauline leaves oblanceolate, auriculate, the upper ones ovate-lanceolate, generally acuminate and amplexicaule (Figure 2); *peduncles* (8-)15-100(-240) mm, clavate, with ovate-lanceolate, acuminate, cordate to auriculate bracts, with a broad, generally toothed, scarious margin; *capitula* solitary, large, erect, rectangular or square in outline; *involucre* (11-)14-22(-25) x (8-)15-24(-28) mm; *outer bracts* ovate, acuminate, cordate or auriculate, wide, ferruginous-scarious margins (0.35-)0.75-1.40(-1.75) mm, entire or weakly lobed (crenulate-plicate), mucro 1.0-2.0(-2.5) mm long (Figure 1A-B & E-G); *middle bracts* ovate to slightly pandurate, generally acuminate, auriculate, with a scarious margin (0.4-)0.75-1.5(-2) mm, mucro 1.0-2.5(-3.0) mm long (Figure 3A.b); *inner bracts* triangular-lanceolate, generally with a narrow scarious margin 0.15-0.90 mm, mucro 0.0-1.5 mm (Figure 3A.b); *ligula* (12-)14-23(-27) mm long, yellow with a purple base to the limb, *the outer ones* with a purple band on the back, *tube* (5.2-)6.0-10.0(-12.0) mm

long, *limb* (6.0–)7.0–10.0(–12.5) mm long (Figure 1E–G); *anthers* pink with a purple distal zone; *cypselae* heteromorphic (Figure 3), *the outer ones* (2.0–)2.3–3.0(–3.5) mm long, more or less ovoid, with four transversely tuberculate ribs, brown or black (Figure 3A.a), *the inner ones* 3.0–4.0(–4.5) mm long, polygonal to truncated pyramidal, smooth, with four ribs, whitish (Figure 3B.a); *pappus* (10–)11–14 mm long (Figure 3B.b).

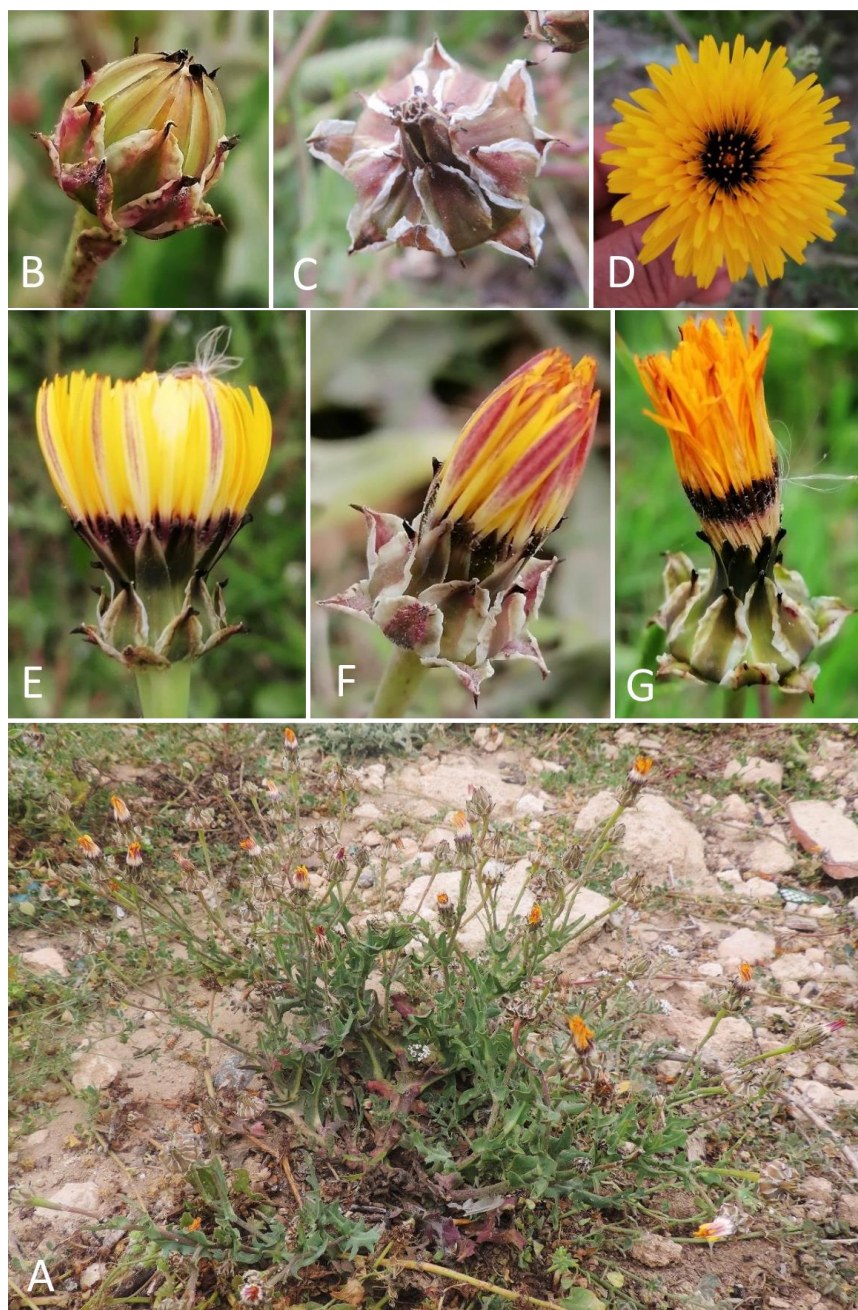


Figure 1. *Reichardia gaditana* (subsp. *gaditana*) in Tunisia. A) Habit and habitat. B–G) sequential stages of capitula bearing wide outer bracts with typical ferruginous-scarious margins. Photographs by R. El Mokni.

Figura 1. *Reichardia gaditana* (subsp. *gaditana*) en Túnez. A) Hábito y hábitat. B–G) Etapas secuenciales de los capítulos con brácteas externas anchas y márgenes ferruginosos-escariosos típicos. Fotografías de R. El Mokni.



Figure 2. *Reichardia gaditana* (subsp. *gaditana*) in Tunisia. A) roots. B) basal leaf. C) lower cauline leaf. D) upper cauline leaf. Photographs by R. El Mokni.

Figura 2. *Reichardia gaditana* (subsp. *gaditana*) en Túnez. A) Raíces. B) Hoja basal. C) Hoja caulinar inferior. D) Hoja caulinar superior. Fotografías de R. El Mokni

Iconography. See Gallego *et al.* (1980, Figure 3: 183).

Phenology. Flowers and fruits from March to May(-June) in Tunisia. Elsewhere the plant is reported flowering from April to June in Portugal (Pereira Coutinho, 1939), from November to May in Andalusia (Spain) (Blanca *et al.* 2011).

Global distribution. *Reichardia gaditana* has a limited distributive range to the Iberian Peninsula together with Morocco (named historically as *R. tingitana* subsp. *tingitana*) and Algeria (as *R. tingitana* subsp. *tingitana*) in North Africa (Jahandiez & Maire, 1934; Sampaio, 1947; Quézel & Santa, 1963; Gallego *et al.* 1980; APD, 2026; Greuter, 2006+; POWO, 2026; GBIF, 2026; WFO, 2026a). With the present discovery, its occurrence extends to Tunisia within the North African coasts in the southern Mediterranean shore, its record within other national coastal localities toward the southern part or even in Libyan coasts are highly expected.

Habitat and ecology in Tunisia. Several extended populations were observed along coastal littoral dunes and rocky grasslands of Monastir and Mahdia (central-eastern Tunisia). The plants of *R. gaditana* were gathered in groups, with hundreds of specimens, among which many were with flowers and/or fruits

accompanied mainly by *Allium* sp., *Anacyclus clavatus* (Desf.) Pers., *Andryala arenaria* (DC.) Boiss. & Reut, *Bupleurum semicompositum* L., *Cakile maritima* Scop. (subsp. *maritima*), *Centaurea bimorpha* Viv. (a North African endemic), *Chenopodiastrum murale* (L.) S.Fuentes, Uotila & Borsch, *Convolvulus lineatus* L., *Dactylis glomerata* subsp. *hackelii* (Asch. & Graebn.) Cif. & Giacom, *Delphinium* sp., *Dipcadi serotinum* (L.) Medik., *Echium sabulicola* Pomel, *Ephedra fragilis* Desf., *Euphorbia terracina* L., *Glebionis segetum* (L.) Fourr., *Hedypnois cretica* (L.) Dum.Cours., *Helichrysum stoechas* (L.) Moench, *Limbarda crithmoides* (L.) Dumort., *Limoniastrum monopetalum* (L.) Boiss., *Limonium* spp., *Lycium schweinfurthii* Dammer, *Medicago* spp., *Mesembryanthemum crystallinum* L., *Moraea sisyrinchium* (L.) Ker Gawl., *Reaumuria vermiculata* L., *Rostraria cristata* (L.) Tzvelev, *Sonchus tenerrimus* L., *Suaeda* sp., *Teucrium luteum* subsp. *luteum* (Batt.) Greuter & Burdet, *Zygophyllum creticum* (L.) Christenh. & Byng. and others.

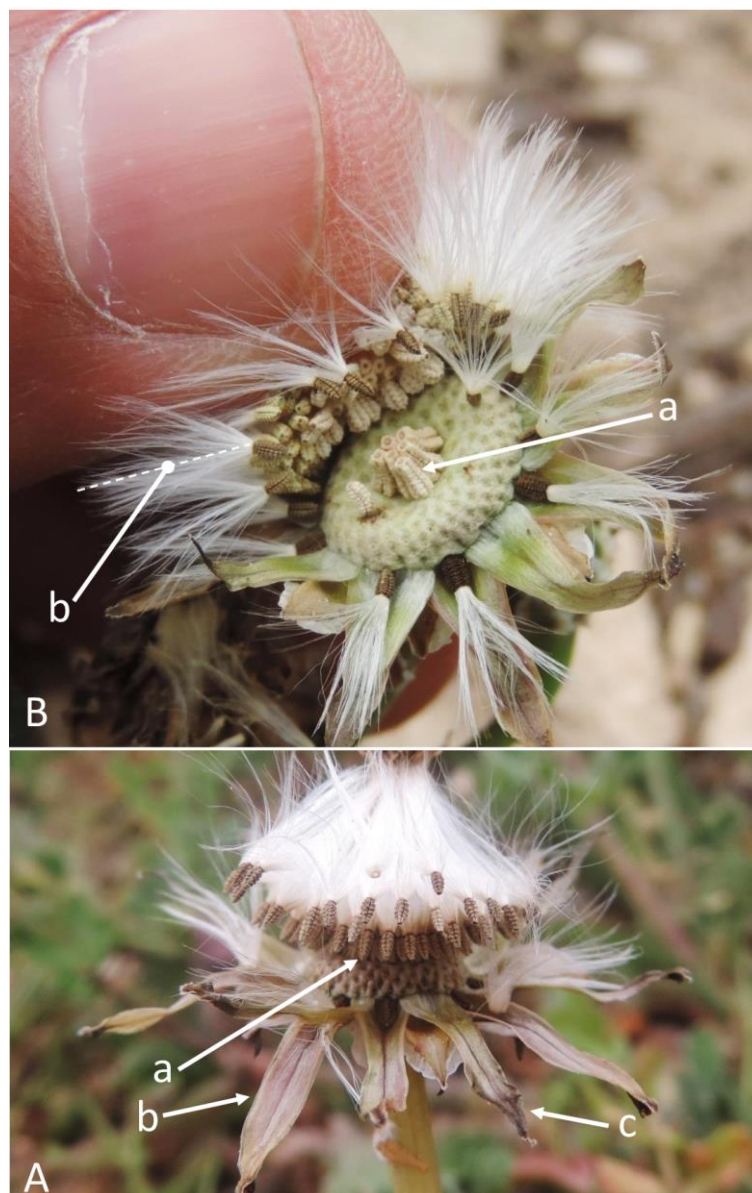


Figure 3. *Reichardia gaditana* (subsp. *gaditana*) in Tunisia. A) A dehiscent capitulescence, a. outer brown cypsela, b. middle bract, c. inner bract. B). capitulescence after dehiscence, a. inner whitish cypsela, b. pappus. Photographs by R. El Mokni.

Figura 3. *Reichardia gaditana* (subsp. *gaditana*) en Túnez. A) Capitulescencia dehiscente, a. cipsela externa marrón, b. bráctea media, c. bráctea interna. B) Capitulescencia después de la dehiscencia, a. cipsela interna blanquecina, b. vilano. Fotografías de R. El Mokni.

Specimens examined: **TUNISIA**, Monastir, 27 March 2020, abandoned ruderal fields, *R. El Mokni s.n.* (Herb. R. El Mokni, Univ. Monastir); Monastir, sandy coastal dunes, 0-5 m a.s.l., 35°46'38.26" N, 010°50'01.30" E, 06 March 2025, *R. El Mokni s.n.* (Herb. R. El Mokni, Univ. Monastir); *ibidem*, 25 & 28 March 2025, *R. El Mokni s.n.* (Herb. R. El Mokni, Univ. Monastir); Monastir, Jazirat Sidi al Ghudamisi, on rocky lands within coastal communities, 0-5 m a.s.l., 35°47'05.32" N, 010°50'14.17" E, 06 May 2026, *R. El Mokni s.n.* (Herb. R. El Mokni, Univ. Monastir); Mahdia, sandy coastal dunes, 08 May 2026, 0-5 m a.s.l., 35°30'36.56" N, 010°03'15.27" E, *R. El Mokni s.n.* (Herb. R. El Mokni, Univ. Monastir).

Notes. Historically, *Reichardia tingitana* had three subspecies, subsp. *discolor* (Pomel) Maire, subsp. *orientalis* (L.) Maire (Both subspecies are today under the subsp. *tingitana* s.s.) and the subsp. *tingitana* $\equiv$ *Picridium tingitanum* var. *gadianum* (Willk.) Pérez Lara (today under the species *gaditana* (Willk.) Samp). Actually, the species *Reichardia gaditana* (Willk.) Samp. has two accepted subspecies, the subsp. *gaditana* (Willk.) Samp., with a distributive range limited to Spain, Gibraltar, Morocco and Algeria (WFO, 2026b) and the subsp. *lusitanica* (Cout.) P.Silva & Bacelar, endemic to Portugal (WFO, 2026c). This latter taxon differs from the typical one mainly by its very swollen peduncles at the top (Pereira Coutinho, 1939 :797). The Tunisian material shows almost slender peduncles at the top (Figure 1A-B & E-G) thus belongs to subsp. *gaditana*, as for all known locations of the species in North African.

All things here mentioned claimed a number of four native species of the genus *Reichardia* in Tunisia. An updated diagnostic key to these species is hereafter provided (adopted from Gallego *et al.* 1980; Pottier Alapetite, 1981; Blanca *et al.* 2011; Conti *et al.* 2015; Sicilia-Pasos *et al.* 2024).

The discovery of *Reichardia gaditana* subsp. *gaditana* in Tunisia fills an important distribution gap in North Africa. The species has long been known as native only from the Iberian peninsula in European Mediterranean and only from Morocco and Algeria within the southern Mediterranean shore. The present record therefore represents the easternmost confirmed occurrence in Mediterranean North Africa and suggests that the species is probably still overlooked elsewhere within the Tunisian coastal area and records from Libyan coast remain very probable.

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

- 1a. Phyllaries not imbricate; ligule surface yellow at base; involucre bracts with a narrow scarious margin..... 2
- 1b. Phyllaries imbricate; ligule surface purplish-black at base; involucre bracts with a broad, scarious margin..... 3
- 2a. Perennial, with lignified radix, cypselae heteromorphic, the outer ones (2.0–)2.3–3.0(–3.5) mm long while the inner ones (2.5–)3.0–4.0(–4.5) mm long.....*R. picroides*
- 2b. Annual, with non-lignified radix, cypselae heteromorphic, the outer ones 2.5–3.5(–4.3) mm long while the inner ones 3.5–6.0 mm long*R. intermedia*
- 3a. Involucre 8.5–18 × 4.5–21 mm; ligules 8–22 mm long; pappus 6–10(–10.5) mm long..... *R. tingitana* var. *tingitana*
- 3b. Involucre 14–25 × 15–25 mm; ligules (12–)14–27 mm long; pappus 11–14 mm long.....***R. gaditana* subsp. *gaditana***

Conflict of interest

The author declare that he has not conflicts of interest relevant to the content of this manuscript.

Declaration of use of artificial intelligence (AI)

The author declare that he have not used AI to generate the content of this manuscript.

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