Hacquetia 24/2 • 2025, 171–177 DOI: 10.3986/hacq-2025-0013 sciendo

Phacelia tanacetifolia Benth. (Hydrophylloideae, Boraginaceae): a first report as casual alien to the vascular flora of Tunisia

Aman-Allah El Mokni[1], Ranim El Mokni[2] & Ridha El Mokni[3,4]

Key words: alien species, floristics, new record, Boraginaceae, Monastir

Ključne besede: tujerodne vrste, floristika, nova najdba, Boraginaceae, Monastir

Abstract

Floristic investigations in the central-eastern Tunisia (North Africa) led to the discovery of a small population of *Phacelia tanacetifolia* Benth. (Boraginaceae), a species reported native to the southwestern North America and naturalized in Europe, Australia and New Zealand. Our discovery represents the first record at the national level, and the third one for the southern Mediterranean shore (North Africa). Description, and phenology, together with its ecology in Tunisia are provided. Additionally, original photographs as well as a first assessment of the naturalization status of this taxon in Tunisia are here presented.

Izvleček

S florističnimi raziskavami v osrednjem in vzhodnem delu Tunizije (Severna Afrika) smo odkrili majhne populacije vrste *Phacelia tanacetifolia* Benth. (Boraginaceae), ki je domorodna v jugozahodni Severni Ameriki in naturalizirana v Evropi, Avstraliji in na Novi Zelandiji. Naše odkritje predstavlja prvo najdbo na državni ravni in tretje za južno sredozemsko obalo (Severna Afrika). Podali smo opis in fenologijo skupaj z njeno ekologijo v Tuniziji. Predstavljamo tudi izvirne fotografije in prvo oceno stopnje naturaliziranosti tega taksona v Tuniziji.

Corresponding author:
Ridha El Mokni
E-mail: ridha.elmokni@fphm.rnu.tn

Received: 9. 7. 2024
Accepted: 9. 1. 2025

1 Pilot high school 15 october 1963 of Bizerta (LPB), Bizerta, Tunisia.

2 Pilot preparatory school Farhat Hached of Bizerta (EPFHB), Bizerta, Tunisia.

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

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

Introduction

The Tunisian Republic, a central-southern Mediterranean country with an area of 163,610 km^2, and about 1,300 km of coastline including the African conjunction of the western and eastern parts of the Mediterranean Basin, is prone to plant invasions due mainly to its location on the crossroads within the Mediterranean. Such features, together with a high diversity of floristic communities from south to north and inter- and intra-continental movements of people, and the development of transport networks between the surrounding countries make the country a suitable place for an active settlement of many plant species outside their native areas. Thus, several alien species from all over the word were reported in the country as well established, mainly during the last two decades (see e.g. El Mokni & Iamonico, 2018a, 2018b, 2024; El Mokni & Domina, 2020; El Mokni et al., 2022, 2023, 2024; El Mokni, 2024). In the course of floristic surveys along coastal areas and saline wetlands, one more alien species (within the Boraginaceae s.l., genus *Phacelia*), not previously recorded for the vascular flora of the country is discovered, in 2024. The plant was found among roadside plant communities of cultivated fields in Menzel Ennour locality (Monastir, centraleastern Tunisia). *Phacelia* Juss. is a genus of approximately 200 species of annual and/or perennial herbaceous plants native to North and South America. The centre of diversity is in California where 93 taxa occur, of which 39 are endemic (Gilbert et al., 2005). Tunisian material was ascribed to one of these species that fits very well the descriptions of *Phacelia tanacetifolia* (subg. *Phacelia* sect. Ramosissimae (Rydb.) Waiden & R. Patt. (Walden & Patterson, 2012), a species, found native essentially in shrubland and woodland plant communities in California (Smither-Kopperl, 2018; Walden et al., 2023). The species is naturalized in Europe, Australia and New Zealand (see e.g., Essl & Rabitsch, 2002; Balogh et al., 2004; Lambdon et al., 2008; Medvecká et al., 2012; Pyšek et al., 2022; GBIF, 2024) and used as a cultivated catch crop around the world (GRIN, 2024). We here clarify its status of naturalization at the national level and confirm its casual occurrence to Algeria and Tunisia within the African continent. Description, and phenology together with its ecology in Tunisia are presented.

Material and methods

Since 2015, continuous botanical surveys have been carried out in various regions in central Tunisia to update the wild/alien flora. Data on the plant population and the habitat of the recorded taxon were also compiled. For the identification of the species, relevant literature (see e.g. Kirk, 2005; Kilian, 2016; Smither-Kopperl, 2018; Walden et al., 2023) and examination of specimens preserved at some accessible herbaria were used (CLF, LY, LYJB, MPU, NCY, P, REN, SLA and STR acronyms follow Thiers 2024 [continuously update])). Collected specimens were deposited at the personal herbarium of one of the authors (Herb. Ri. El Mokni) housed in the Herbarium of Monastir University (not listed in *Index Herbariorum*). Nomenclature of reported taxa is according to APD (2024) and the online Euro+Med PlantBase (Euro+Med, 2006 continuously updated). Family follows APG IV (2016).

Results and discussion

Taxonomic treatment

Phacelia tanacetifolia Benth., Trans. Linn. Soc. London 17: 280 (1835)

= *P. tanacetifolia* var. *cinerea* Brand, Botany 4:216. 1912; *P. tanacetifolia* var. *pseudodistans* Brand, H.G.A. Engler (ed.), Das Pflanzenreich IV, Vol. 251 (Heft 59), Verlag von Wilhelm Engelmann, Leipzig. 1913; *P. tanacetifolia* subvar. *tenuisecta* Brand, H.G.A.Engler (ed.), Pflanzenr., IV, 251: 91 (1913).

Lectotype. designated by Cecchi and Selvi, 2013 [2014]: USA, California, 1833, D. Douglas s.n. **holotype**: K000857695! (wild collected material on right, excluding left plant of K000857694! *P. tanacetifolia* grown in garden of Bentham at Kew) [Kew Catalogue, JStor]; **isolectotypes**: E 00288426 (wild-collected material on right, excluding two plants on left grown in garden of Bentham at Kew) [RGBE, JStor], G-DC-00134391 (wild-collected material on left, excluding plant on the right *P. distans sensu lato*) [ville.ge], CGE064606!; **paralectotypes**: E00288426 (two plants on left grown in garden of Bentham at Kew, excluding wild-collected material on right), K000857694! (*P. tanacetifolia* grown in garden of Bentham at Kew on left, excluding wild-collected material K000857695! on right).

Description. *Phacelia tanacetifolia* is a fast-growing annual rough-hairy plant with branches in the upper part with upright or sloping stems, minutely glandular, that reach a height of about 70(–100) cm (Figure 1). The deeply cut leaves (fernlike) are alternate (Figure 2B). The flowers are quintuple, bell-shaped, and violet-blue in colour (due to the abundance of facelianin, Mori et al., 2006), clustered in inflorescences of scorpioid types (cf. Buys & Hilger, 2003; Figure 3). The flowers show a discoid nectary located on the flower base that

Figure 1: *Phacelia tanacetifolia* in Tunisia. Habitus and habitat on roadsides. Photograph by Ra. El Mokni (26. March 2024).
Slika 1: *Phacelia tanacetifolia* v Tuniziji. Habitus in rastišče ob cestah. Avtor fotografije Ra. El Mokni (26. 3. 2024).

Figure 2: *Phacelia tanacetifolia* in Tunisia. A) opened flowers with pinkish blue to lilac bell-shaped corollas; B) alternate fernlike, deeply cut leaves. Photographs by A-A. El Mokni (26. March 2024).
Slika 2: *Phacelia tanacetifolia* v Tuniziji. A) odprti cvetovi z rožnato modrimi do lilastimi zvončičastimi venci; B) spiralasto nameščeni, praprotim podobni, globoko razdeljenimi listi. Avtor fotografij A-A. El Mokni (26. 3. 2024).

is protected by throat scales. The calyx lobes are about 4–6(–7) mm, 6–8 mm in fruit, ± linear, densely long-hairy. The corolla ± persistent in fruit (Figure 3D), consists of five fused petals that are pale pinkish blue to lilac, in shades of blue and lavender or violet (Figures 2A, 3A, B & C) and 6–10 mm long. The stamens in number of five born on the corolla tube and project beyond the end of the corolla, 9–15 mm long, glabrous with purple filaments and violet anthers (Figures 2A, 3A, B & C). The style 11–15 mm, cleft 2/3–3/4, glabrous, deeply divided into two and also projects beyond the corolla when mature (Figures 2A, 3A, C & D). The fruit (capsule, Figure 3D) 3–4 mm, ± ovoid, glabrous proximally, puberulent to short-hairy distally. The seeds 1 or 2, 2–3 mm, wrinkled, pitted (Walden et al., 2023).

Chromosome number. 2n=22 (Walden et al., 2023).

Flowering period. The natural flowering period is from March to May in its native distribution (California: southern Nevada, Arizona; Walden et al., 2023), but when planted as a crop it can be found in flower from April to December (northern hemisphere) or October to June (southern hemisphere), according to time of sowing. Under dry conditions in the Mediterranean, it flowers only from April to July (Kirk, 2005).

Phenology in Tunisia. According to our observations, *Phacelia tanacetifolia* (Figures 1, 2, 3) begins to vegetate in (end of January-) February, flowers in March, and fruits at the beginning of April.

Distribution. The species grows naturally on sandy or gravelly open plains and slopes in southwestern North America (including California, Nevada, Arizona and Mexico) but it was introduced to Europe in the early nineteenth century and other countries worldwide (e.g. Smither-Kopperl, 2018). It is now planted widely in many temperate regions, particularly Europe and Australia (see e.g. Tutin, 1992; Kirk, 2005; Farkas & Zajàcz, 2007). On the African continent, the plant was reported only as 'cultivated' in the Canary-Islands, as 'introduced'/'introduced:

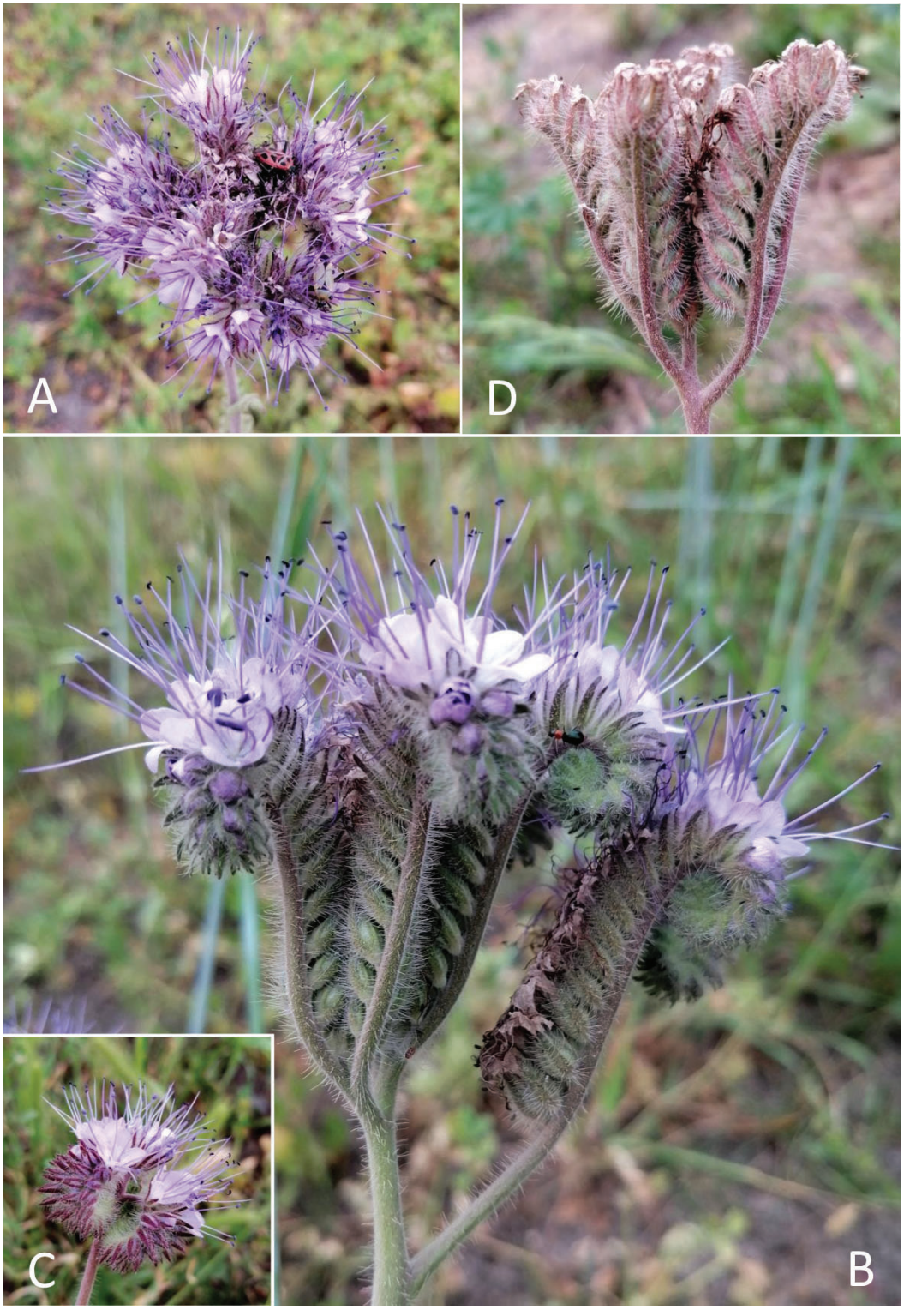

Figure 3: *Phacelia tanacetifolia* in Tunisia. A-C) clustered flowers in typical helicoid cyme and scorpioid inflorescences types; D) details of fruits (capsules) with persistent corollas. Photographs by Ri. El Mokni.

Slika 3: *Phacelia tanacetifolia* v Tuniziji. A-C) grozdasti cvetovi v tipičnih helikoidnih in skorpijoidnih socvetjih; D) podrobnosti plodov (kapsul) z obstojnimi venčki. Fotografije Ri. El Mokni.

uncertain degree of naturalization' in Morocco with no clear status of naturalization or as adventitious/casual, and for Algeria as casual alien (see e.g. Raab-Straube, 2017+; Meddour et al., 2020; APD, 2024; GBIF, 2024; POWO, 2024). On the online platform iNaturalist 2024 (https://www.inaturalist.org/), reports of *Phacelia tanacetifolia* were mentioned from South Africa in two locations, 1) South Africa, State Presedent C R Swart, Brenton-on-Sea, 6571, -34.06628, 23.02099, 1 Mai 2021, iNaturalist-observation: https://www.inaturalist.org/observations/77632765; 2) South Africa, Red Route, Greater Hermanus, WC, ZA, -34.36879, 19.24898, 6 oct. 2023, iNaturalist-observation: https://www.inaturalist.org/observations/186411962.

Occurrence in Tunisia and status of naturalization. We found only one small population (about 25 plants including few seedlings) of *Phacelia tanacetifolia* in one Tunisian locality (CE, Monastir, Menzel Ennour region) within an area of approximately one ha. So far, the original vector for the introduction of *P. tanacetifolia* in Tunisia is still unknown. However, the observation of this plant on the edge of cultivated fields raises the possibility of its accidental introduction due to contaminated annual crop seeds, without excluding other pathways of introduction as an accidental escapee from pots of ornamental plants. According to Pyšek et al. (2004) and Richardson & Pyšek (2006), we assess here *P. tanacetifolia* as a casual alien for Tunisia.

Habitat and ecology in Tunisia. *Phacelia tanacetifolia* has been observed in an anthropogenic site (roadsides and borders of plantations and cultivated lands) growing mainly with *Ammi majus* L., *Anagallis arvensis* L., *Avena sterilis* L., *Chenopodiastrum murale* (L.) S. Fuentes, Uotila & Borsch, *Centaurea sicula* L. subsp. *sicula*, *Convolvulus althaeoides* L. subsp. *althaeoides*, *Emex spinosa* (L.) Campd., *Galactites tomentosus* Moench, *Glebionis segetum* (L.) Fourr., *Hordeum murinum* L., *Launaea* sp., *Lupinus pilosus* L., *Malva parviflora* L., *Medicago intertexta* subsp. *ciliaris* (L.) Ponert, *Medicago polymorpha* L., *Melilotus sulcatus* Desf., *Ononis reclinata* L., *Phalaris canariensis* L., *Plantago afra* L., *P. lagopus* L., *P. lanceolata* L., *Pseudopodospermum undulatum* (Vahl) Zaika, Sukhor. & N.Kilian, *Scorpiurus muricatus* L., *Scorzonera laciniata* L., *Sinapis arvensis* L., *Sonchus oleraceus* L., etc.

Material studied (our collections). TUNISIA. Monastir: Menzel Ennour, on borders of cultivated lands and roadsides, 35°39'22"N, 010°46'15"E (coordinate system, WGS84), 27–30 m a.s.l., 26. March 2024, El Mokni s.n. (Herb. Univ. Monastir), ibidem, 3. April 2024, El Mokni s.n. (Herb. Univ. Monastir).

Notes. *Phacelia tanacetifolia* shows very close features to *Phacelia distans* Benth. with which it can be sometimes confused. The latter differs from *P. tanacetifolia* mainly by its short calyx lobes, 3–4 mm long in flower and 4–5 mm long in fruit, its short style, 7–12 mm long, and its richest capsules with 2–4 seeds [*vs*. calyx lobes 4–6(–7) mm long in flower, 6–8 mm long in fruit, style 11–15 mm long, and capsules with only 1 or 2 seeds] (cf. Horner, 1977).

Conclusion

We report a new casual alien plant species, *Phacelia tanacetifolia*, for the vascular flora of Tunisia, the third report to North Africa and the fourth record to the whole African continent. According to this record, also the genus *Phacelia* (Hydrophyllaceae included in Boraginaceae) is now new for the flora of Tunisia. Early detection of introduced species allows decisions to be made to prevent the species from spreading and becoming invasive, if not properly managed. It is important to take measures to eradicate this species in its actual habitats before its establishment. More field prospections should be planned in the nearer future to see whether the species continues to spread and, above all, whether there are further populations in Tunisia (and then – later – measures for control should also be considered). Otherwise, *P. tanacetifolia* can be maintained, under supervision, specifically as a forage source for bees. The plant is listed among the top 20 pollen producing flowers for honeybees and is highly attractive to pollinator insects including bumblebees (cf. Hayden, 2014). It is well known to produce a high density of flowers over a long time (Bloom season varies with location: Almost two months in the Mediterranean climate and can be extended more in several temperate regions (see e.g., Kilian, 2016)), particularly if there are successive monthly sowings, and is distinguished by providing a rich source of nectar and pollen.

Acknowledgements

Our thanks go to anonymous reviewers for their valuable feedback and to the journal editor for the improvements made to the first versions of our manuscript.

ORCID iDs
Ridha El Mokni https://orcid.org/0000-0003-3849-1039

References

APD [African Plant Database] (2024). *Phacelia tanacetifolia* Bentham. – Genève: Conservatoire et Jardin botaniques de la Ville de Genève; Pretoria: South African National Biodiversity Institute. Available from: https://africanplantdatabase.ch/fr/nomen/specie/48807/phacelia-tanacetifolia-benth [last accessed 15 April 2024].

APG [Angiosperm Phylogeny Group] (2016). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. *Botanical Journal of the Linnean Society*, *181*(1), 1–20. https://doi.org/10.1111/boj.12385

Balogh, L., Dancza, I., & Király, G. (2004). A magyarországi neofitonok időszerű jegyzéke és besorolásuk inváziós szempontból [Actual list of neophytes in Hungary and their classification according to their success]. In Z. Botta-Dukát, & B. Mihály (Eds.), *Biologiai Invaziok Magyarországon: Ozonnovenyek [Biological Invasions in Hungary: Invasive Plants]* (pp 61–92) Természet BÚVÁR Alapítvány Kiadó.[in Hungarian]

Buys, M. H., & Hilger, H. H. (2003). Boraginaceae cymes are exclusively scorpioid and not helicoid. *Taxon*, *52*, 719–724.

El Mokni, A-A., El Mokni, Ra., & El Mokni Ri. (2023). First report of a well-established *Ambrosia* (Asteraceae) to the non-native African flora. *Flora Mediterranea*, *33*, 243–250. https://doi.org/10.7320/FlMedit33.243

El Mokni, R. (2024). New records of coniferous species (Gymnospermae, Pinidae) for the non-native woody flora of Tunisia and North Africa. *Hacquetia*, *23*(1), 119–136. https://doi.org/10.2478/hacq-2023-0004

El Mokni, R., & Iamonico, D. (2018a). Three new records of *Senecioneae* (*Asteraceae*) for the allochthonous Tunisian flora: occurrence and taxonomic notes. *Flora Mediterranea*, *28*, 385–392. https://doi.org/10.7320/FlMedit28.385

El Mokni, R., & Iamonico, D. (2018b). A new record for the non-native flora of Tunisia, *Eclipta prostrata* (Asteraceae), and a note on the national status of *Erigeron bonariensis*, *Symphyotrichum squamatum* (Asteraceae), and *Lepidium didymum* (Brassicaceae). *Flora Mediterranea*, *28*, 145–153. https://doi.org/10.7320/FlMedit28.145

El Mokni, R., & Domina, G. (2020). Additions to terrestrial flora of Tunisia: occurrence and taxonomic notes. *Check List*, *16*(3), 553–561. https://doi.org/10.15560/16.3.553

El Mokni, R., & Iamonico, D. (2024). The family Bignoniaceae in Tunisia, first survey including new floristic records to North Africa with nomenclatural notes. *Hacquetia*, *23*(2), 221–237. https://doi.org/10.2478/hacq-2024-0001

El Mokni, R., Fedorova, A. V., Kushunina, M., & Sukhorukov, A. P. (2024). Morphological and molecular data confirm the first record of *Dysphania cristata* (Dysphanieae, Chenopodioideae, Amaranthaceae) in the Mediterranean basin. *BioInvasions Records, 13*(1), 17–26. https://doi.org/10.3391/bir.2024.13.1.03

El Mokni, R., Iamonico, D., Véla, E., Verloove, F., & Domina, G. (2022). New records of *Asteraceae* for the non-native flora of Tunisia and north Africa with some nomenclatural remarks. *Mediterranean Botany*, *43*(e73688), 1–19. https://doi.org/10.5209/mbot.73688

Essl, F., & Rabitsch, W. (2002). Neobiota in Österreich. Umweltbundesamt.

Euro+Med (2006+) [continuously updated]. Euro+Med PlantBase – the information resource for Euro-Mediterranean plant diversity. – Published at http://www.europlusmed.org [last accessed 2–14 April 2024].

Farkas, A., & Zajàcz, E. (2007). Nectar production for the Hungarian honey industry. *The European Journal of Plant Science and Biotechnology*, *1*(2), 125–148.

GBIF [Global Biodiversity Information Facility] (2024). Global Biodiversity Information Facility. *Phacelia tanacetifolia* Benth. – Available from: https://www.gbif.org/species/2928226 [last accessed 13 April 2024].

Gilbert, C., Dempcy, J., Ganong, C., Patterson, R., & Spicer, G. S. (2005). Phylogenetic Relationships within *Phacelia* subgenus *Phacelia* (Hydrophyllaceae) Inferred From Nuclear rDNA ITS Sequence Data. *Systematic Botany*, 30, 627–634.

GRIN [Germplasm Resources Information Network] (2024). Beltsville (MD): United States Department of Agriculture, Agricultural Research Service. Available from: http://www.ars-grin.gov/ [last accessed 14 April 2024].

Horner, P. F. (1977). *Biosystematics of the Phacelia distans – P. tanacetifolia complex* [Botany dissertation]. University of California Riverside.

Hayden, J. (2014). Investigating Ways to Improve Native Pollinator Floral Resources by Comparing Multipurpose Cover Crops of Phacelia, Buckwheat, and a Commercial Bee Forage Mix. Project funded by USDA-SARE. www.sare.org/project-reports and search by project number FNE13-781 [last accessed 29 December 2024].

iNaturalist (2024). https://www.inaturalist.org/ [last accessed 10 December 2024].

Kilian, R. (2016). Lacy Phacelia, *Phacelia tanacetifolia* Benth. A native annual forb for conservation use in Montana and Wyoming. USDA NRCS Plant Materials Tech. Note. MT 113.

Kirk, W. D. J. (2005). *Phacelia*. *Bee World*, *86*(1), 14–16. https://doi.org/10.1080/0005772X.2005.11099643

Lambdon, P. W., Pyšek, P., Basnou, C., Hejda, M., Arianoutsou, M., Essl, F., Jarošík, V., Pergl, J., Winter, M., Anastasiu, P., Andriopoulos, P., Bazos, I., Brundu, G., Celesti-Grapow, L., Chassot, P., Delipetrou, P., Josefsson, M., Kark, S., Klotz, S., Kokkoris, Y., Kühn, I., Marchante, H., Perglová, I., Pino, J., Vilà, M., Zikos, A., Roy, D., & Hulme, P. E. (2008). Alien flora of Europe: species diversity, temporal trends, geographical patterns and research needs. *Preslia*, *80*(2), 101–149.

Meddour, R., Sahar, O., & Fried, G. (2020). A preliminary checklist of the alien flora of Algeria (North Africa): taxonomy, traits and invasiveness potential. *Botany Letters*, *167*(4), 453–470. https://doi.org/10.1080/23818107.2020.1802775

Medvecká, J., Kliment, J., Májeková, J., Halada, Ľ., Zaliberová, M., Gojdičová, E., Feráková, V., & Jarolímek, I. (2012). Inventory of the alien flora of Slovakia. *Preslia*, *84*(2), 257–309.

Mori, M., Kondo, T., Toki, K., & Yoshida, K. (2006). Structure of anthocyanin from the blue petals of *Phacelia campanularia* and its blue flower color development. *Phytochemistry*, *67*, 622–629.

POWO [Plants Of the Word Online] (2024). Plants of the World Online. *Phacelia tanacetifolia* Benth. – Available from: https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:432789-1 [last accessed 13 April 2024].

Pyšek, P., Richardson, D. M., Rejemánek, M., Webster, G. L., Williamson, M., & Kischner, J. (2004). Alien plants in checklist and floras: towards better communication between taxonomist and ecologist. *Taxon*, *53*(1), 131–143.

Pyšek, P., Sádlo, J., Chrtek, J. Jr., Chytrý, M., Kaplan, Z., Pergl, J., Pokorná, A., Axmanová, I., Čuda, J., Doležal, J., Dřevojan, P., Hejda, M., Kočár, P., Kortz, A., Lososová, Z., Lustyk, P., Skálová, H., Štajerová, K., Večeřa, M., Vítková, M., Wild, J., & Danihelka, J. (2022). Catalogue of alien plants of the Czech Republic (3rd edition): species richness, status, distributions, habitats, regional invasion levels, introduction pathways and impacts. *Preslia*, *94*(4), 447–577.

Raab-Straube, E. von (2017+). *Phacelia*. In: Euro+Med Plantbase – the nformation resource for Euro-Mediterranean plant diversity. https://europlusmed.org/cdm_dataportal/taxon/cc33d0a7-5bdc-45eb-b325-21c74eb8de8a [last accessed 13 April 2024].

Richardson, D. M., & Pyšek, P. (2006). Plant invasion: merging the concepts of species invasiveness and community invasibility. *Progress in Physical Geography*, *30*, 409–431. https://doi.org/10.1191/0309133306pp490pr

Smither-Kopperl, M. (2018). Plant Guide for Lacy Phacelia (*Phacelia tanacetifolia*). USDA-Natural Resources Conservation Service, Lockeford Plant Materials Center, Lockeford, CA 95237.

Thiers, B. (2024). Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Available from: http://sweetgum.nybg.org/ih [last accessed 13 April 2024].

Tutin, T. G. (1992). *Phacelia* Juss. In T. G. Tutin, V. H. Heywood, N. A. Burges, D. M. Moore, D. H. Valentine, S. M. Walters, & D. A. Webb (Eds.), *Flora Europaea. Vol. 3: Diapensiaceae to Myoporaceae* (p. 374). Cambridge University Press.

Walden, G. K., & Patterson, R. (2012). Nomenclature of subdivisions in *Phacelia* (Boraginaceae). *Madroño*, 59(4), 211–222.

Walden G. K., Patterson R. W., Garrison L. M., & Hansen D. R. (2023). *Phacelia tanacetifolia*. In Jepson Flora Project (Eds.) Jepson eFlora, Revision 12, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=37579 [last accessed 10 December 2024].