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Three new records of *Senecioneae* (*Asteraceae*) for the allochthonous Tunisian flora: occurrence and taxonomic notes

Abstract

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New records of allochthonous vascular Tunisian flora are here discovered. All the new taxa (*Jacobaea erucifolia* s.str., *Kleinia mandraliscae*, and *Senecio angulatus*) belong to the tribe *Senecioneae* (*Asteraceae*). Updated nomenclature, description and national distribution are provided for each species. *K. mandraliscae* is here reported for the first time from North Africa.

Key words: aliens, *Compositae*, *Jacobaea*, *Kleinia*, *Senecio*, North Africa.

Introduction

Senecioneae is one of the largest tribes in *Asteraceae* Bercht. & J. Presl (ca. 3000-3100 species and 150-155 genera), has a worldwide distribution, and exhibits remarkable morphological and ecological diversity (see e.g., Nordenstam 2007; Pelser & al. 2006, 2007, 2010). *Senecio* L. is the largest genus of the tribe including 1000-1250 species with a cosmopolitan distribution (APG III 2009; Pelser & al. 2010; APG IV 2016). Molecular and phylogenetic investigations (see e.g., Pelser & al. 2006, 2007, 2010; Milton 2009;) showed that this genus is non-monophyletic. As a consequence, some groups were split off (e.g. *Jacobaea* Mill., *Roldana* La Llave & Lexarza, *Delairea* Lemaire; see e.g. Barkley, 2006; Pelser & al. 2007), while other ones were merged with *Senecio* (see e.g., *Aetheolaena* Cass., *Culcitium* Humb. & Bonpl., *Lasiocephalus* Schlecht.; see e.g., Pelser & al. 2010; Salomón & Freire 2014).

As part of the ongoing researches aiming at improving the knowledge on the Tunisian non-native vascular flora and specially on *Asteraceae* (see e.g., El Mokni & El Aouni 2011; El Mokni & Iamónico 2018; Iamónico 2013a, 2013b, 2015, 2017; Iamónico & Hjertson 2015; Iamónico & Managlia 2015; Iamónico & Peruzzi 2016), three new *Senecioneae* taxa for the Tunisian flora were found during field work carried out in the period 2013-2018 from Jendouba (NW-Tunisia), Bizerta (NE-Tunisia), and Monastir Provence (CE-Tunisia). These three taxa are: *Jacobaea erucifolia* (L.) G. Gaertn. B. Mey. & Scherb subsp. *erucifolia*, *Kleinia mandralis-*

cae Tineo, and *Senecio angulatus* L. f. Descriptions, general and local distribution, taxonomic notes and original photographs are presented for each newly reported taxon.

Materials & Methods

The work is based on extensive field prospections with literature analysis, and in the personal collection of one of the authors (R. El Mokni) which is deposited in the Herbaria of the Faculty of Pharmacy of Monastir and of the Faculty of Sciences of Bizerta (not listed in Index Herbariorum). Taxons identification follows Fournier (1977), Rowley (1994), GISD (2015) (Retrieved from <http://www.iucngisd.org/gisd/species.php?sc=1603>), Podsiedlik & al. (2016) and Smith & al. (2017), with additional comments based on the authors' observations of the collected specimens.

Results & Discussion

1. *Jacobaea erucifolia* (L.) G. Gaertn. B. Mey. & Scherb subsp. *erucifolia*, Oekon. Fl. Wetterau 3(1): 208. 1801 \equiv *Senecio erucifolius* L., Fl. Suec. (ed. 2) 291. 1755.

Lectotype (designated by Kadereit In Jarvis & Turland, 1998: 366): “*Jacobaea incana repens herba*” in Barrelier 1714: 96, t. 153).

Flowering period: August to October.

Notes on general distribution: *Jacobaea erucifolia* subsp. *erucifolia* is an euro-asiatic species (Greuter 2006+), that is considered as introduced in North America (Konechnaya 2002). In North Africa, the taxon is currently recorded in Algeria only, but as doubtfully occurring (Greuter 2006+; APD 2018).

Occurrence in Tunisia and status of naturalization: Tunisian plants grow along road margins or in abandoned fields after seasonal cultivations, in the government of Jendouba (Fig. 1 A). Since the taxon was found only at two localities, we consider this occurrence as not-native. In particular, only about twenty individuals were observed, and this appears to be an occasional resulting from the use of imported seed mixtures for gardening purposes or for feeding domesticated birds drained to cultivated areas. According to Pyšek & al. (2004), and Richardson & Pyšek (2006) *Jacobaea erucifolia* s.str. is considered as casual in Tunisia.

Specimina Visa: TUNISIA: Jendouba (Fernana), herbaceous formations along road margins of cultivated areas, 36°38' 49"N, 08°41'30"E, 261 m a.s.l., 27 September 2013, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Sciences of Bizerta); Jendouba (Boussalem), abandoned fields after seasonal cultivations of *Solanaceae* and *Fabaceae* taxa 36°36' 53"N, 08°58'58"E, 154 m a.s.l., 11 October 2013, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Sciences of Bizerta).

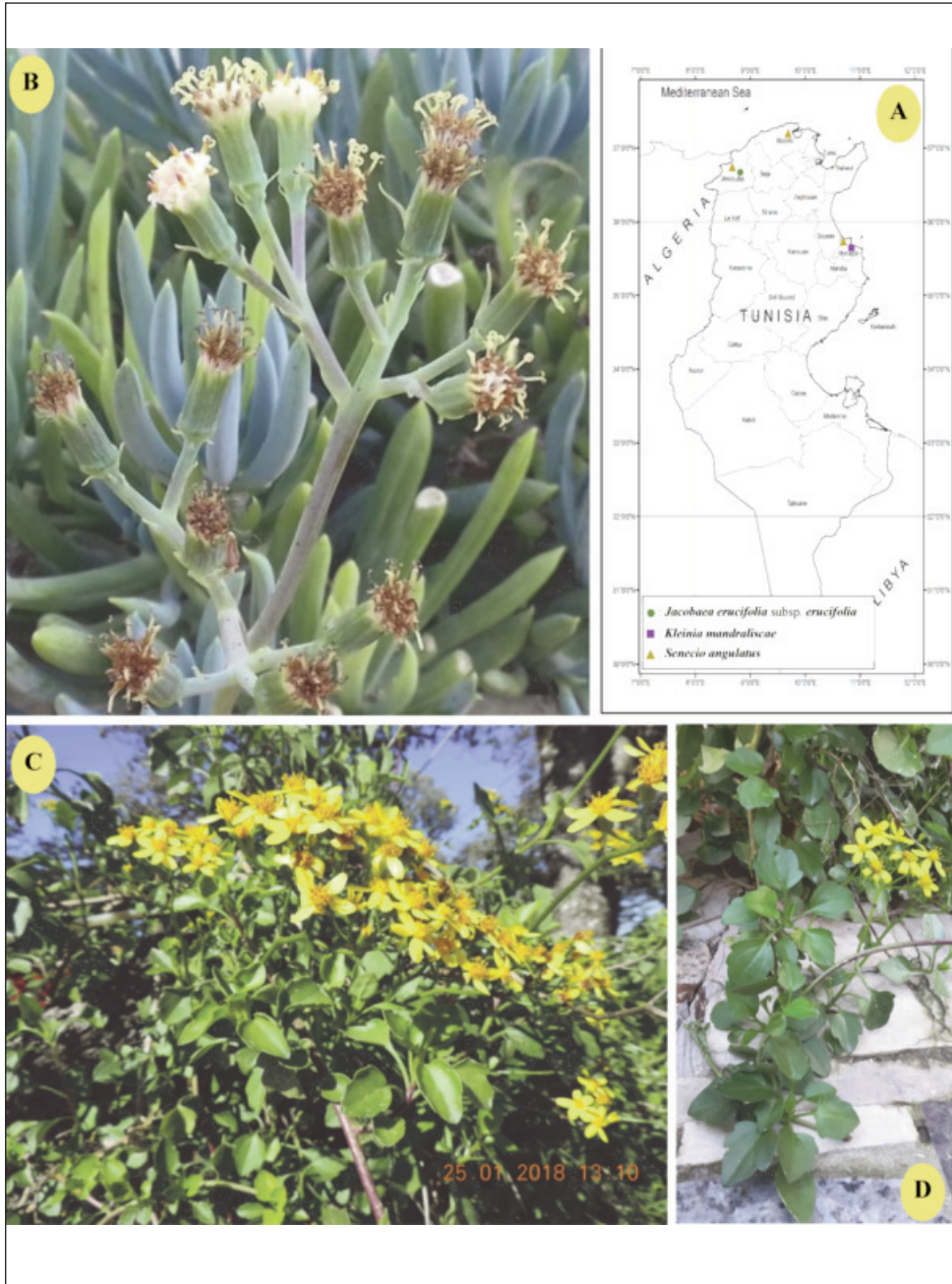


Fig. 1. A) Map of different localities of the new records in Tunisia; B) *Kleinia mandraliscae*, in blooming period (within local coastal rocky of Monastir, Center of Tunisia); C) *Senecio angulatus*, habit in blooming period (within Kroumiria region, North-western of Tunisia); D) *S. angulatus* within Bizerta town, North-eastern of Tunisia). Photos by Ridha El Mokni.

2. *Kleinia mandraliscae* Tineo, Ann. Agric. Siciliana 3: 315. 1855 \equiv *S. mandraliscae* (Tineo) H.Jacobsen, Sukkulentenk. 4: 90. 1951 \equiv *Senecio talinoides* subsp. *mandraliscae* (Tineo) G.D.Rowley, Cact. Succ. J. (Los Angeles) 62(6): 283. 1990 \equiv *Curio talinoides* var. *mandraliscae* (Tineo) P.V.Heath, Calyx 6(2): 55. 1999.

Lectotype (designated by Domina & al. 2005: 7): Sicily, “Vulcano, rimessa da Enrico Pirajno Barone di Mandralisca, il primo che la rinvenne in detta isola, vulgo Erva di Caddi”, 08-10-1855, E. Pirajno s.n. (PAL).

Flowering period: November to December (-January).

Notes on general distribution: the ‘Blue Chalk Sticks’ is an upright, blue grey succulent with long fleshy leaves having pointed tips is native to the Cape Region of South Africa (Pignatti 1982; Pasta 2003; Domina 2005). This taxon is reported within the Mediterranean basin, as naturalized to the Aeolian Islands, as casual alien in Sicily (Greuter 2006+; Galasso & al. 2018), and as alien (with unknown status) in Spain. No records were made up till now for North Africa (see Greuter 2006+; APD 2018).

Occurrence in Tunisia and status of naturalization: we found *Kleinia mandraliscae* only in one Tunisian locality, a coastal rocky of Monastir city (Fig. 1 A). We consider this occurrence as occasionally introduced, resulting from seed escaped from cultivation of ornamental plants. One small population was observed (about 3-5 plants). According to Pyšek & al. (2004) and Richardson & Pyšek (2006) *K. mandraliscae* is casual for Tunisia.

Taxonomic notes: *Senecio mandraliscae* is still a “mysterious taxon, probably a hybrid” between *S. talinoides* and *S. citrifolius*. It can be distinguished from the similar *S. talinoides* in young stage by the short branches and leaves. It is the bluest of the “talinoides” with a waxy white coating that protects it from hot, sunny, and dry conditions (Rowley 2002).

Specimina Visa: TUNISIA: Monastir, in local coastal rocky within *Crithmum maitimum* communities, 35°46' 04"N, 10°50'34"E, 1 m a.s.l., 13 December 2017, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Pharmacy of Monastir), idem 35°46' 04"N, 10°50'34"E, 1 m a.s.l., 11 January 2018, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Pharmacy of Monastir).

3. *Senecio angulatus* L. f. Suppl. Pl.: 369. 1782.

Lectotype (designated by Iamónico, 2017: 284, Figure 1): South Africa, *Caput bonae Spei*, *Thunberg s.n.* (UPS-19537!).

Flowering period: May to January (April to May in other parts of Africa; see e.g., Wells & al. 1986; Paczkowska & Chapman 2000; Navie & Adkins 2008).

Notes on general distribution: *Senecio angulatus* is a native to South Africa (NGRP 2013), and introduced as an ornamental to many other countries in S-America, Asia, Australia and Europe and the Mediterranean basin (see e.g., Greuter 2006+; Ugarte & al. 2011; Murray & Phillips 2012; GISD 2015). In North Africa, the taxon was cited only for Lybia as cultivated in large scale (Greuter 2006+; APD 2018) and more recently as occurring in Algeria (Miara & al. 2018).

Occurrence in Tunisia and status of naturalization: *Senecio angulatus* grows only within very local ancient buildings and sometimes overlaps with lianas of dune formations. Since the taxon was found only at three localities (Fig. 1 A), we consider its occurrence as not-native. In particular, only about 5-6 clumped plants were observed. According to Pyšek & al. (2004), and Richardson & Pyšek (2006) *Senecio angulatus* is to be considered as casual in Tunisia.

Taxonomic notes: other similar and sometimes confused *Senecio* species are *Delairea odorata* and *Senecio tamoides*, which can be distinguished being weak-stemmed climbers, not shrubs, and having thinner textured leaves, which are sharply, not bluntly, angular.

Specimina Visa: TUNISIA: Monastir, in ancient buildings within *Opuntia ficus-indica* and *Ephedra fragilis* communities, 35°46' 14"N, 10°47'34"E, 21 m a.s.l., 13 December 2016, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Pharmacy of Monastir); Bizerta in ancient buildings within the center of the town, 37°16' 15"N, 09°52'24"E, 9 m a.s.l., 10 February 2017, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Pharmacy of Monastir); Jendouba (Fernana-Aîn Draham), colonising by climbing on the toasting seats of a private garden 36°43'45"N, 08°40'44"E, 778 m a.s.l., 25 January 2018, El Mokni (Personal Herbarium of Ridha El Mokni at the Faculty of Pharmacy of Monastir).

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