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Notes on the genus *Echinops* L. (Asteraceae) in SE Europe

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ABSTRACT
The occurrence of *Echinops siculus* Strobl, previously considered endemic to Italy, is for the first time reported from the Balkan Peninsula based on plants collected in Corfu (Greece). Morphological similarities with other taxa of *Echinops* L. recorded in Greece are briefly discussed. Presence of *Echinops albidus* Boiss. & Spruner is excluded from Italy, *E. spinosissimus* Turra subsp. *neumayeri* (Vis.) Kožuharov is confirmed for Albania. Further notes concerning the occurrence of these three species on the Ionian Islands are provided. The names of the three taxa are lectotypified.

KEY WORDS
Albania,
Greece,
Italy,
Asteraceae,
lectotypification.

RÉSUMÉ
Notes sur le genre Echinops *(Asteraceae) en Europe du Sud-Est.*
Echinops siculus Strobl, jusqu'alors considérée comme endémique d'Italie, a été signalée pour la première fois dans la péninsule balkanique à partir d'individus récoltés à Corfou (Grèce). Les similarités morphologiques avec d'autres taxa d'*Echinops* L. connus en Grèce sont brièvement discutées. *Echinops albidus* Boiss. & Spruner est exclu d'Italie, *E. spinosissimus* Turra subsp. *neumayeri* (Vis.) Kožuharov est confirmé pour l'Albanie. Des notes complémentaires concernant la présence de ces trois espèces sur les îles ioniennes sont proposées. Les noms de trois taxa sont lectotypifiés.

MOTS CLÉS
Albanie,
Grèce,
Italie,
Asteraceae,
lectotypification.

INTRODUCTION

The genus *Echinops* L. comprises approximately 120-130 species (Bobrov 1962; Susanna & Garcia-Jacas 2007; Mabberley 2017) distributed in tropical and N Africa, the Mediterranean basin and the Middle East, in the continental parts of temperate Eurasia, from central Asia extending to Japan and China (Jäger 1987; Meusel & Jäger 1992). In Italy (including the islands) eight taxa are quoted (Bartolucci *et al.* 2018). On the Balkan Peninsula, 7 taxa are currently recorded from Albania (Barina *et al.* 2018) and 12 from Greece (Dimopoulos *et al.* 2013), from the Ionian Islands only *E. albidus* Boiss. & Spruner (*E. sphaerocephalus* L. subsp. *albidus* (Boiss. & Spruner) Maire & Petitm.) (sect. *Echinops*) and *E. spinosissimus* Turra (sect. *Ritropsis* Greuter & Rech.f.) have been reported so far (Dimopoulos *et al.* 2013, 2016). Earlier records of *E. ritro* L. could never be confirmed and thus remain doubtful (Flora Ionica Working Group 2016). Recent *Echinops* collections from this area, and discrepancies in earlier identification, stimulated a closer look on pertinent plants.

MATERIAL AND METHODS

Morphological analysis of *E. ritro*, *E. sphaerocephalus*, *E. albidus* and *E. spinosissimus* was mainly carried out on herbarium material present at the Vienna University herbarium (WU) and Herbarium Apenninicum (APP). Additionally, vouchers deposited at ADMONT, G, JE, PAD, UPA, and W (acronyms following Thiers 2019) were used for comparison and typification. Further herbaria considered in search for (type) material are B, BASSA, BP, FI, H, L, M, MSB, MW, OXF, P (acronyms follow Thiers 2019).

Datasets and digital photographs of the cited material from the herbaria JE, W and WU are available via Virtual Herbaria JACQ (https://herbarium.univie.ac.at/database/search.php).

RESULTS

Family Asteraceae Bercht. & J.Presl
Genus *Echinops* L.

Echinops siculus Strobl
(Fig. 1)

In Flora 65: 505 (1882). — *Echinops ritro* subsp. *siculus* (Strobl) Greuter, *Willdenowia* 33: 58 (2003).

Lectotype (designated here). — [Italy, Sicily:] "Flora Nebrodensis, *Echinops siculus* mihi/*[Echinops] ruthenicus* Gss., non MB. In regione nemorosa montium Madoniarum 600-1000 m, solo calc.", 18.VII.1874, *P. Gabriel Strobl s.n.* (lecto-, W[W0022366]!, Fig. 1; isolecto-, JE[JE00009438 digital photo!]; isolecto-, ADMONT [digital photo!]).

Further original material (syntypes) traced. — *Echinops siculus* mihi/[*Echinops*] *ruthenicus* Guss., aber nicht MB. Bei Castelbuono am Fuß der Nebroden. VII.1873, *P.G. Strobl s.n.* (WU[WU0103727]!; ADMONT [digital photo!]);
E. ruthenicus, In sylvaticis montosis, Piana dei Greci [Piana degli Albanesi], VII., *Plantae Siculae s.n.*, *Todaro* (W[W0078544]!); *Flora Sicula Exsiccata n. 1225* (WU[WU0095633]!; ADMONT[digital photo!]);
Echinops siculus P. G. Strobl. Italia (media) austral. in nemoribus et collibus apricis circa Vico in Gargano sol. calcar. 15.VI.1874, *Porta et Rigo s.n.* ex Itinere I italico (P[P03745561], W[W1889-0099501]!; WU[WU0103726!]);
Echinops siculus mihi. Gargano. a Porta [...] *Strobl s.n.* (ADMONT [digital photo!]);
E. siculus Strobl. Italia austral. Apulia. Gargano, in sylvis circa Vico et Giovanni Rotondo, sol. calcar. 1-2000 ft, 15.VI.1875, *Porta et Rigo 186* ex Itinere II italico (P[P03745560, P03745562, P03745563, digital photo!]; W[W1889-0058885, W1889-0058886, W1889-0154815]!; WU[WU0095635]!; JE[JE00009440, digital photo!]).

Ionian material seen. — **Corfu**. In Insula Corcyra [Corfù] prope Varypatades l[oco] d[icto] Magioru, VI.1912, *B. Tunta*, as *E. albidus*, Plantae exsic. *Florae Hellenicae 1595* (WU[WU0095636]); *ibidem*, l. d. Kyperi, VI.1912, *B. Tunta*, as *E. albidus*, Plantae exsic. *Florae Hellenicae 1596* (WU[WU0095637]); Santa, Sinies, Corfu, Greece, 39.754323 19.910913, 387 m, 4.VIII.2016, *M. Nikolouzou s.n.*, as *Echinops*; erroneously registered as *E. sphaerocephalus* subsp. *albidus* by W. Gutermann in 2016 (WU[WU0088904]).

Selected material used for comparison. — **Italia**. Abruzzo: Valle dell'Orta, presso Musellaro (Bolognano, Pescara), 19. IX.2009, *F. Conti* & *D. Tinti s.n.* (APP[APP59348]); Lecceta di Torino di Sangro, presso il centro visite, 18.VI.2009, *F. Conti* & *A. Manzi s.n.* (APP[APP41304]); Basilicata: Savoia di Lucania, V. del Tuorno, 40°34'52"N, 15°32'15"E, 500 m, margine boschivo, 7.VI.2013, *F. Conti* & *F. Bartolucci s.n.* (APP[APP52410]); Calabria: Torre Ruggiero, 400-600 m, s.d., *Zwierlein s.n.*, as *E. ritro* (WU[WU0103729, WU0103730]); Prov. Cosenza, S. Donato, in pascuis nemorosis, calc., 500-600 m, 5.VIII.1989, *G. Rigo*, Iter Ital. quartum no. 602, as *E. siculus* (W[W1898-0008636]; WU[WU0095632]); [Sicily:] In sylvaticis/sylvis arenosis in montosis Ficuzza, VII.1878, *M. Lo Jacono s.n.*, as *E. ritro* (WU[WU0103728, WU0095631]); in sylvaticis montosis Palermo, VI.1901, *H. Ross*, Herb. Sic. no. 348 as *E. ritro* (WU[WU0095638, WU0095639]); Madonie, Mongerrati, 18.VI.2010, *Domina, Scafidi, Schimmenti & Dillenberger s.n.* (APP[APP43256]).

Remarks on the lectotype

Strobl described *E. siculus* providing a detailed description, and quoting the following type localities (Strobl 1882): "An steinigen, buschigen Abhängen der Kastanien- und Eichenregion der Nebroden von 600 bis 1100 m, ziemlich häufig: Ob Castelbuono gegen den Bosco, besonders beim Abbeveratojo di Monticelli, um Ferro, Gonato!, Castelbuono, Polizzi, Collesano (Guss. Syn. et Herb.!), San Guglielmo (Mina in Guss.) S. Add. et Hb. Mina!). Fehlt in Bert. Fl. Ital. und DC. Prodr. Findet sich auch an einigen anderen Waldorten Siziliens und am Gargano in Apulien (Porta & Rigo!)." We were able to trace several herbarium specimens housed in ADMONT, JE, P, W and WU which can be considered original material (Art. 9.4 of the ICN; Turland *et al.* 2018). These herbarium specimens are complete, well conserved and agree with the protologue and with the current application of the name. The specimen W0022366 is selected here as lectotype for *E. siculus*.

Fig. 1. — Lectotype of *Echinops siculus* Strobl (W0022366).

Description

Echinops siculus can be recognized by the slightly bluish colour of capitula (that are more dark-coloured in *E. ritro* and usually paler in *E. sphaerocephalus* and *E. albidus*). Plants of *E. siculus* lack glandular hairs on involucral bracts, a feature shared with *E. albidus*. However, in the latter as well as in *E. sphaerocephalus* the leaves are adaxially densely covered by short glandular hairs which are at least 0.2 mm (up to 0.6 mm) long, while these hairs are extremely short (up to 0.1 mm) and very sparse or even absent in *E. siculus*. Furthermore from *E. ritro* (with leaves eglandular, adaxially loosely arachnoid-tomentose, becoming glabrescent) the plants differ by its less deeply divided leaves.

Echinops siculus was considered endemic to Italy (Peruzzi *et al.* 2014) where it is known from Emilia-Romagna and Toscana to Calabria and Sicily, in Marche it is doubtfully present (Bartolucci *et al.* 2018). Kožuharov (1976) included it as synonym in *E. ritro* subsp. *ritro,* while Greuter (2003, 2006) separated it as "doubtful subspecies" within *E. ritro*.

However, we could clearly identify three gatherings deposited as "*E. sphaerocephalus* subsp. *albidus*" in WU and originating from Corfu (Ionian Islands, Greece) as *E. siculus*. The identification is based on comprehensive examination of morphological features following the relevant literature (Pignatti 1982) as well as comparison with the original material of this species (at ADMONT, JE, W and WU) and additional exsiccata (APP, WU).

Echinops albidus Boiss. & Spruner
(Figs 2, 3)

In Boissier, *Diagnoses Plantarum Orientalium* 6: 97 (1846). — *Echinops sphaerocephalus* subsp. *albidus* (Boiss. & Spruner) Maire & Petitm., *Matériaux pour Servir à l'Étude de la Flore et de la Géographie botanique de l'Orient* 4: 120 (1908).

Lectotype [designated here]. — *Hymettus, s.d., Spruner, s.n.* (as *E. sphaerocephalus*) (lecto-, G-BOIS[G00765089, digital photo!, Fig. 2]; isolecto-, G-BOIS[G00765089a, digital photo!, Fig. 3]).

Further original material (syntypes) traced. — "Thebas Spruner, ex *Flora Graeca* (as *E. ruthenicus*)" (G-BOIS[G00765088 digital photo!, G00765088a digital photo!]).

Ionian material seen. — **Corfu**. Ins. Kerkyra: mons Pantokrator, ad cacumen, alt. 850-910 m, in saxosis calc., 27.VII.1982, *O. Georgiou 145* (UPA[UPA13187, UPA13188, UPA13189]); mons Pantokrator, in declivibus orientalibus supra pagum Nisaki, alt. 300-500 m; in saxosis calc., 28.VII.1982, *O. Georgiou 236* (UPA[UPA13190, UPA13191]); ad ruinas pagi Palio Chorio, 27.VII.1982, *O. Georgiou 239* (UPA[UPA13192]).

Selected material used for comparison. — **Greece**. Vodena Macedoniae [i.e. Edessa] circa Gavaliotissa, 12.VII.1862, *Th. Orphanides 83* (WU[WU0095629]); in monte Corydalo Atticae, 28.VII.1849, *Th. Orphanides 351* (P[P03744458]; WU[WU0095630, WU0103716]); Attica, in collibus saxosis prope Athenas, in colle Ardetto, 13.VII.1893, *Th. Heldreich*, *Herb. Graec. Norm. no. 1255* (P[P03744445, P03744446]; WU[WU0103722, WU0103723]); Attica, ad radices montis Hymetti [type region!], 6.VII.1888, *E. Halácsy s.n.* (WU[WU0103717]); Isthmus Corinthiacus: in aridis Acrocorinthi, 9.VII.1888: *E. Halácsy s.n.* (WU[WU0103719]); Attica in collibus saxosis prope Eleusis, VII.1910, *B. Tuntas 866* (WU[WU103718]); Flora thessala, in mt. Olympo prope Miluna, 13.VIII.1913, *B. Tuntas 1825* (WU[WU0103720]); Thracia occidentalis: in collibus inter Didimotichon et Souflion, 19.IX.1957, *K. H. Rechinger 15779* (W[W1960-0006046]); Insula Euboea centralis: in saxosis calc. supra pagum Steni, 350-500 m, 27.VI.1958, *K. H. Rechinger 19204* (W[W1959-0002832]); Epirus, in saxosis calcareis montis Mitzikeli, 5 km a Perama orientem versus prope Joannina, 18.VII.1958, *K. H. Rechinger 21602* (W[W1960-0006051]); West-Thraziern, Nomarchia Evros, Umgebung von Esimi (Essimi, Aisymi), 20 km NNE Alexandroupolis, 1-11.VII.1963, *K. Bauer 245* (W[W1965-0004596]); Macedonia orientalis: in declivibus maritimis ad sinum Orphani ab ostiis fluvii Strymon *c.* 10 km occidentem versus, 21.VII.1970, *K. H. Rechinger 38643* (W[W1981-0011000]); Ioannina, sopra il lago, sulla strada per Tricala, 4.VIII.2009, *F. Conti* & *D. Uzunov s.n.* (APP[APP56785]); Monastero di Kipinas, presso Kallarites, Pindo sud, 19.VII.2018, *F. Conti* & *V. Giacanelli s.n.* (APP[APP60532]).
Albania. Umgebung von Shkodra, steinige Abhänge beim Kiri-Fluss nächst dem Dorf Tepe, 26.VII.1916, *E. Janchen s.n.*, as *E. albidus* (WU[WU0095628]); Weideplätze bei Brutti, *c.* 250 m, 17.VIII.1917, *H. Zerny s.n.* (W[W1958-24342]); presso la Piana di Argirocastro, 10.VII.2012, *F. Conti s.n.* (APP[APP49072]); Nemercka presso Kaluth, 11.VII.2012, *F. Conti* & *M. Manilla s.n.* (APP[APP48839]).
Bulgaria. Ad pedem montis Dschendem tepe pr[ope] u[rbem] Philippopolim [i.e. Plovdiv], VI.1890, *Th. Pichler s.n.*, as *E. albidus* (WU[WU0095627]); in sterilibus ad Stanimaka [i.e. Asenowgrad], VII.1894, *V. Stříbrnýs s.n.* (P[P03744442, P03744443, P03745770]; WU[WU0103724]); tra Haskovo e Kardzhali, 25°22.207'N, 41°48.842'E, 300 m, 12.VIII.2009, *F. Conti* & *D. Uzunov s.n.* (APP[APP60622]); Rodopi occidentali, Goce Delčev, 23°57.036'N, 41°33.964'E, 658 m, 12.VIII.2009, *F. Conti* & *D. Uzunov s.n.* (APP[APP60549]).

Remarks on the lectotype

Boissier & Spruner described *E. albidus* providing a detailed description, in Boissier (1846) and quoting the following type localities: "Hab. in Hymetto Atticae et prope Thebas Spruner (sub. *Ech. ruthenico*,)" We were able to trace two herbarium specimens housed in G-BOIS, which can be considered original material (Art. 9.4 of the ICN; Turland *et al.* 2018). These herbarium specimens are complete, well conserved and agree with the protologue and with the current application of the name. There are two sheets with identical labels: G00765089 and G00765089a. The specimen G00765089 is selected here as lectotype for *E. albidus*.

Description

Echinops albidus was quoted for the Balkan Peninsula and for SE Italy according to Kožuharov (1976, as *E. sphaerocephalus* subsp. *albidus*). In Italy, it is indicated as doubtful for Abruzzo and Campania though still recorded in Basilicata (Conti *et al.* 2018; Bartolucci *et al.* 2018). Thorough search did not reveal any records of the species from the reported localities in the Majella mountains (Tammaro 1986). As these are the only findings published for Abruzzo, the species has been excluded from this region (Conti *et al.* 2019). Similarly the occurrence in Basilicata and Campania is not supported by any specimens in FI, APP and in HLUC herbaria, thus, at the given point, it is to be excluded from Italy at all.

From the Ionian Islands, the species was first reported by Georgiou (1988, as *E. sphaerocephalus* subsp. *albidus*). Ac-

Fig. 2. — Lectotype of *Echinops albidus* Boiss. & Spruner. (G-BOISS[G00765089]).

cording to relevant literature (Kožuharov 1976), it is said to differ from typical *E. sphaerocephalus* by its smaller capitula (with involucres less than 18(-20) mm long) and accordingly smaller synflorescences, and by its glabrous involucral bracts. However, based on comparison with collections present in WU (from Greece, Albania, Bulgaria) this has to be corrected: with exception of young synflorescences, the material shows involucre lengths between (16-)18-22(-25) mm, and usually at least some of the (outer) phyllaries are furnished, so often sparse, with minute glandular papillae (of only *c.* 0.05-0.1 mm) or subsessile glandular hairs at the tips (seen also in material from the type region). In the Ionian collections measurements of involucre length slightly exceed this with 19-25 (-27) mm and are more or less congruent with those of C European *E. sphaerocephalus*. The latter differs from the Ionian (Corfu) plants by glandular hairs of the phyllaries up to 0.2 mm long, and present in abundance abaxially on the apical part of outer and middle phyllaries. In *E. albidus*, leaves are more deeply divided and spines are longer than in typical *E. sphaerocephalus*. We think that given the characteristic combination of features it is adequate to consider this taxon at the species level.

Echinops spinosissimus Turra subsp. ***neumayeri*** (Vis.) Kožuharov

In Botanical Journal of Linnean Society 71 (1): 41 (1975). — *Echinops neumayeri* Vis., *Flora Dalmatica* 2: 25, t. 10 (1847).

LECTOTYPE [DESIGNATED HERE]. — *s.loc., s.d., s.n., Neumayer*/ Visiani, Flora Dalmatica. [Montenegro/Herzegovina:] In m[ont] e Orjen [mountain range N of Herceg Novi], *Neumayer* (lecto-, PAD[PAD, digital photo!], Fig. 4).

DALMATIAN MATERIAL COMPARED. — **Croatia**. Locus unicus, steiniger Eichenwald bei Ragusa: Cibaca im Brenotale, 12 m, 29.VIII.1911, *R. Berger s.n.* (W[W1927-0005326]), Brenotal bei Ragusa , 6 m, 29.VIII.1911, *R. Berger s.n.* (W[W1919-0016192]); Čibača prope Dubrovnik (Ragusa), 5.X.1925, *V. Loschnigg s.n.* (W[W1929-0011984]).

ALBANIAN MATERIAL SEEN. — **Albania**. presso la costa tra Dermi e Saranda, pendii aridi e rupestri, 10.VII.2012, *F. Conti s.n.* (APP[APP49070, APP49071]); presso Porto Palermo, bordo strada, 27 m, 40°04'08"N, 19°47'22"E, 24.VI.2015, *F. Conti, A. Stinca & R. Pennesi s.n.* (APP[APP56391]).

IONIAN MATERIAL SEEN . — **Corfu**. Paleokastrítsa, Klosterberg von Kímisis bis Theotókou, M: 34S CJ 8892, 10-50 m, ruderalisierte Lichtungen im Hartlaubwald, steinige Wegböschungen, 25.IV.1989, *W. Gutermann 23633* (Herb. Gutermann).
Lefkada. Ghialós Paralía WNW unter Athání, nördlicher Abschnitt des Strandes, UTM: 34S DH 6180, 0-40 m, Kiesschuttflur, 14.VII.1996, *E. Hörandl et al. 7765* (Herb. Gutermann).
Ithaca. Bucht von Péra Pighádhi NE unter der Arethusa-Quelle [Arethoúsa Kríni], 2 km WNW Akr. Moúnta, UTM: 34S DH 7742, 0-3 m, strandnahe, sehr lückige Felsfluren, 6.VII.1994, *A. Lindhof 257* (WU[WU0103731], Herb. Gutermann [5 capitula]).

REMARKS ON THE LECTOTYPE

Echinops neumayeri was described by Visiani (1847) "in Dalmatia, unde absque loci speciali indicatione, sed probabiliter ex Narenta communicavit Fr. Neumayer". In PAD, where the main collection of Visiani is stored (Stafleu & Cowan 1986) we traced a specimen with two labels: the first one without locality, collector Neumayer. The second label shows: Visiani, Flora Dalmatica [printed], in m[ont]e Orjen, Neumayer. Even though this localization is not congruent with the protologue, the tab. X^{ter} of Visiani's Flora Dalmatica obviously was drawn from the mounted plant and the specimen perfectly fits the description. It can be assumed that the second label giving the locality (positioned in SE Dalmatia) was added to the specimen only after publication of the Flora Dalmatica. We thus here designate the above discussed voucher as lectotype for *E. neumayeri*.

Until recently *E. spinosissimus* was known from Greece only from the Aegean region, i.e. from Kithira (S of Peloponnesus), Crete, the Cyclades and East Aegean Islands (Strid 2016); all these records were assigned to either subsp. *spinosissimus* or subsp. *bithynicus* (Dimopoulos *et al.* 2013), or to frequent intermediates between them (Strid 2016). Additional records of the species from the Ionian Islands and the nearby mainland were accepted under the binominal heading only (Dimopoulos *et al.* 2016) though the latter record was published as subsp. *neumayeri* (Sánchez-Jiménez *et al*. 2012a). The Ionian plants have likewise been relegated to that taxon (cf. Sánchez-Jiménez *et al.* 2012b; Flora Ionica Working Group 2016) based on collections from Corfu, Lefkada, Ithaca, and field observations from Cephalonia. Recently, it was recorded also west of the Adriatic Sea, in Puglia (Wagensommer & Medagli 2014), where, according to the photograph given by the authors, the plants show bluish corollas as the Albanian ones, while the Ionian plants are white-flowering as those known from Dalmatia, the type region. We think that this population needs further study.

It was recorded from Albania (Meyer 2011) though erroneously as the specimens collected by F. K. Meyer have been revised and assigned to *E. sphaerocephalus* (Barina 2017, Barina *et al.* 2018). When revised by us, these specimens turned out to belong to *E. albidus*. Nevertheless, our own collections from Albania quoted above do confirm the occurrence of *E. spinosissimus* subsp. *neumayeri* in this country.

The taxonomy of the *E. spinosissimus* aggregate is linked with uncertainties that make a safe discrimination between the subspecies as currently defined dissatisfying. Only the complex of South Mediterranean plants (represented in Europe by subsp. *spinosus* Greuter) are set apart by eglandular leaves with very narrow, linear-lanceolate segments and by the bristles subtending the capitula distinctly longer than the outer phyllaries. As already noted by Meikle (1985) and Strid (2016) there are frequent intermediates between subsp. *bithynicus* and subsp. *spinosissimus* as presently defined, following "*Flora Europaea*" (Kožuharov 1976). The variation of discriminating features still is insufficiently studied.

The Ionian plants are consistent with material from Dalmatia (where the original material for this taxon was gathered: Visiani 1847: 25). They correspond to the definition of subsp. *neumayeri* in "Flora Europaea", we thus provisionally adopt this name for the material quoted above pending further comparative studies with plants of the E Mediterranean.

FIG. 3. — Isolectotype of *Echinops albidus* Boiss. & Spruner (G-BOIS[G00765089a]).

The nomenclatural situation is also somewhat confusing. *Echinops spinosissimus* was founded on plants said to originate from Crete (obviously relying on Tournefort), but were characterised by leaves being tomentose on both sides (Turra 1765). The latter feature points to subsp. *spinosus* (see above) not known from Crete, where subsp. *bithynicus* as well as subsp. *spinosissimus* (*sensu* "*Flora Europaea*") are indicated. Typification of the name *E. spinosissimus* is needed, but with careful consideration of nomenclatural complications linked to the still unsolved taxonomy of the complex.

DISCUSSION AND PROSPECTS

Italian and Balkan peninsulas shows many similarities due to their role as major glacial refugia for temperate species during the glacial interglacial cycles of the Quaternary (Stinca 2019) and for a terrestrial connection following the drying of the Mediterranean. Such amphi-Adriatic plants are especially represented in the Abruzzo region regarding oromediterranean plants, while (eu-)mediterranean species are usually confined to S Italy (often also Sicily), or are limited to Puglia or Calabria. An amphi-Adriatic distribution pattern is present in e.g. *Anchusella cretica* (Mill.) Bigazzi, E. Nardi & Selvi (Bigazzi *et al.* 1997), *Cerinthe retorta* Sm. (Wagensommer *et al.* 2014), *Ephedra foeminea* Forssk. (Govaerts 2019a), *Linum elegans* Spruner ex Boiss. (Wagensommer *et al.* 2017), *Lomelosia crenata* (Cirillo) Greuter & Burdet subsp. *dallaportae* (Boiss.) Greuter & Burdet (Jasiewicz 1976), *Pentanema verbascifolium* (Willd.) (Willd.) D. Gut.Larr., Santos-Vicente, Anderb., E. Rico & M.M. Mart.Ort. (Greuter 2006), *Quercus ithaburensis* Decne. subsp. *macrolepis* (Kotschy) Hedge & Yalt. (Goevarts 2019b). Most of these taxa are more widespread on the Balkan Peninsula and of comparatively restricted and isolated occurrence in Italy. This seems to be the case of *Echinops spinosissimus* subsp. *neumayeri.* However, in *E. siculus* the opposite is true: it is more widespread in central and southern Italy and Sicily (similar to *Anchusella cretica*), but on the Balkan Peninsula it seems to be restricted to Corfu, comparable to e.g. *Ptilostemon gnaphaloides* (Cirillo) Soják subsp. *gnaphaloides* (Flora Ionica Working Group 2016), a South Mediterranean, relictic cliff species (cf. Greuter 1971). Obviously such "amphi- (or trans-) Adriatic" distribution patterns constitute a historically rather heterogeneous phenomenon, as may also be illustrated by W Mediterranean species like *Avellinia festucoides* (Link) Valdés & H.Scholz (de Bolós & Vigo 2001; Flora Ionica Working Group 2016), or *Coronilla repanda* Boiss. (Flora Ionica Working Group 2016; Greuter & Lassen 1999), which have their single Balkan occurrences on the Ionian Islands, or only very few further east. The heterogeneity of trans-Adriatic chorotypes was recently underlined by molecular studies (of e.g. *Euphorbia barrelieri* group: Frajman & Schönswetter 2017, *Centaurea* subsect. *Phalolepis*: Garcia-Jacas *et al.* 2019). Such thorough investigations still are needed to elucidate correct relationships (as e.g. presented by Gargiulo *et al.* 2015 for *Asperula* sect. *Cynanchicae* (DC.) Boiss.) and to understand the individual evolutionary histories.

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FIG. 4. — Lectotype of *Echinops neumayeri* Vis. (PAD).

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