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Lectotypification of four Iranian endemic taxa of *Echinops* L. (Asteraceae, Cardueae)

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ABSTRACT

Four Iranian endemic taxa of *Echinops* L. (Asteraceae) are lectotypified, namely *Echinops ceratophorus* Boiss., *E. kernerii* Heimerl, *E. lalesarensis* Bornm., and *E. lalesarensis* var. *adenocaulis* Bornm.

RÉSUMÉ

Lectotypification de quatre taxons endémiques iraniens du genre Echinops L. (Asteraceae, Cardueae).
Quatre taxons endémiques iraniens du genre *Echinops* L. (Asteraceae) sont lectotypifiés, à savoir *Echinops ceratophorus* Boiss., *E. kernerii* Heimerl, *E. lalesarensis* Bornm., et *E. lalesarensis* var. *adenocaulis* Bornm.

INTRODUCTION

According to Rechinger (1979) the genus *Echinops* L. consists of 76 species in 5 sections of which 54 species are found in Iran. A taxonomic review of the genus in Iran showed that the number of species has been increased to 71 (Mozaffarian & Ghahreman 2002; Mozaffarian 2006; Montazerolghaem *et al.* 2016) and 50 of them are endemic (Negaresh 2018), so the endemism rate is about 70%. In Iran, the most species of genus are restricted to small habitats (Rechinger 1979; Negaresh 2018). This country can be considered as one of the centres (likely the most important) of origin and diversity of genus (Garnatje *et al.* 2005; Susanna & Garcia-Jacas 2009; Sánchez-Jiménez *et al.* 2010; Montazerolghaem *et al.* 2017).

Continuing my taxonomic study of the names in *Echinops* (Negaresh 2018, 2019), I realized the necessity to lectotypify four endemic taxa to Iran, i.e. *E. ceratophorus* Boiss., *E. kernerii* Heimerl, *E. lalesarensis* Bornm., and *E. lalesarensis* var. *adenocaulis* Bornm., because no specific herbarium sheet was cited as holotype in their protologues and the taxa were also not lectotypified earlier (Rechinger 1979; Mozaffarian 2008; Montazerolghaem *et al.* 2016, 2017). Following a thorough examination of the literature and of the type material, lectotypes are designated here for these taxa.

LECTOTYPIFICATIONS

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

Echinops ceratophorus Boiss.
(Fig. 1)

Diagnosis Plantarum Orientalium Novarum 1 (6): 100 (Boissier 1846).

Echinops villosissimus Bunge var. *glutinosissimus* Parsa, *Kew Bulletin* 3 (2): 208 (Parsa 1948). — Holotype: Iran. Fars Province, prope Shiraz, 15.VI.1885, O. Stapf 1695 (holo-, K[K000768891]!).

Echinops farsicus Rech. f., *Oesterreichische Botanische Zeitschrift* 97: 245 (Rechinger 1950). — Holotype: Iran. Fars Province, Kuh Tschah Siah, an der Pistaziengrenze, 16.VII.1885, O. Stapf 1276 (holo-, WU[WU0060105]!).

LECTOTYPE (here designated). — Iran. Chaharmahal and Bakhtiari Province: ad radices Kuh Delu prope Deremgun, 17.VI.1842, Th. Kotschy 548 (lecto-, G[G00765429]!; isolecto-, FI[F1006558]!, G[G00223648, G00223649] (two sheets comprising one specimen)!, H[H1052030]!, K[K000768890]!, L[L3680430]!, MO[MO-714042]!, P[P00711511, P00711514]!, W[W18890072845, W0022362, W0022363, W0022364]!, WAG[WAG0000565]!).

REMARKS

Fifteen herbarium specimens of the type of *Echinops ceratophorus* were found at FI, G, H, K, L, MO, P, W, and WAG, which have to be treated as syntypes (art. 40 note 1 of Turland *et al.* 2018). According to McNeill (2014), the existence of a holotype cannot be established in this case because there was more than one specimen for this species, housed in more

than one institution. The specimen G00765429 is selected here as the lectotype, because it clearly shows the characters mentioned in the protologue.

Rechinger (1950) described *Echinops farsicus* as a new species from Kuh Tschah Siah (Fars Province) for Iran. Twenty nine years later, Rechinger (1979) placed *E. farsicus* to synonymy of *E. ceratophorus*. As no morphological differences between both species can be seen, Rechinger's treatment is followed here.

Echinops kernerii Heimerl
(Fig. 2)

Denkschriften der Kaiserlichen Akademie der Wissenschaften, Mathematisch-naturwissenschaftliche Classe 50 (2): 61 (Heimerl 1885).

Echinops ecbatanus Bornm., *Beibefte zum Botanischen Centralblatt* 36 (2): 212 (Bornmüller 1918), *nom. nud.*; Bornm. ex Rech. f., *Candollea* 29 (1): 11 (Rechinger 1974), *nom. inval.*

LECTOTYPE (here designated). — Iran. Hamedan Province, in monte Elwend, 1882, T. Pichler s.n. (lecto-, WU[WU0065667]!; isolecto-, B[B100093525, B100094112]!, W[W1885-0006150]!, WU[WU0065666, WU0065668, WU0065669, WU0065670, WU0065671, WU0065672, WU0065673]!).

REMARKS

Heimerl (1885) described *Echinops kernerii* based on two collections: “in declivibus siccis montis Elwend leg. T. Pichler 1882” and “ad pagum Aftseha prope Teheran leg. T. Kotschy (Plantae Persiae borealis 1843 Nr. 622)”. Rechinger (1974) described *Echinops ecbatanus* Bornm. ex Rech. f. based on collection: “in declivibus siccis montis Elwend leg. T. Pichler 1882”. Since older name exists based on the same type, and according to Turland *et al.* (2018), the name *Echinops ecbatanus* Bornm. ex Rech. f. was not validly published.

The specimen WU0065667 is here selected as the lectotype because its capitula and leaves are more developed than in other specimens, and the characters of the specimen agree with the protologue. The labels of the specimens are slightly different. They have been distributed in a series named “Iter Persicum Dris J. E. Polak 1882”, but the collector is T. Pichler. On WU0065669 is the original handwritten label of Pichler “Auf sandigen Triften und Aabhängen [sic!] der Perge [sic!] um Jalpan [On sandy places and slopes of the mountains around Jalpan], 16. Juli 1882”. The specimen in B was sent by Wettstein in 1917 to Bornmüller and carries the handwritten name *E. ecbatanus* by Bornmüller, but is rather fragmentary. On WU0065668 are handwritten notes of the floral analysis by Rechinger.

The specimens B100093525, WU0065666 and WU0065668 were also annotated as *Echinops polygamus* Bunge. *Echinops kernerii* differs from *E. polygamus* by its height being 10–30 cm (vs 25–30 cm), stems simple or branched in median part, densely leafy throughout (vs branched in basal part, loosely leafy in lower part, leafless in upper part), leaves coriaceous (vs herbaceous), basal leaves 5–10 cm wide, distinctly petiolate (vs 4–5 cm wide, sessile and amplexicaulous), cauline leaves broadly lanceolate, with 4–8 mm long spines (vs oblong or



Fig. 1. — Lectotype of *Echinops ceratophorus* Boiss., Kotschy 548 (G00765429).



FIG. 2. — Lectotype of *Echinops kernerii* Heimerl, Pichler s.n. (WU0065667).



FIG. 3. — Lectotype of *Echinops lalesarensis* Bornm., Bornmüller 4055 (B100093507).

lanceolate-triangular, with *c.* 10 mm long spines), common involucre *c.* 10 mm long, with linear-cuneate phyllaries (vs *c.* 8 mm long, with lanceolate-cuneate phyllaries), and also phyllaries number *c.* 14, middle ones narrowly rhombic (vs 11-13, middle ones rigid-lanceolate).

Echinops lalesarensis Bornm.

(Fig. 3)

Beihefte zum Botanischen Centralblatt 36 (2): 202 (1918).

Echinops villosissimus Bunge [var.] *β. lalesarensis* Bornm., *nom. nud. in sched.*, Bornmüller: Iter Persico-Turcicum 1892-93, No. 4055.

Echinops lalesarensis var. *adenocaulis* Bornm., *Beihefte zum Botanischen Centralblatt* 36 (2): 203 (Bornmüller 1918). — Lectotype (here designated): Iran. Kerman Province, in regione inferior montis Kuh Lalesar prope pagum Lalesar, *c.* 3000 m, VII.1892, *J. F. N. Bornmüller 4055 p.p.* (lecto-, B[B100093502]!; isolecto-, K[K000768897]! right hand of the sheet).

LECTOTYPE (here designated). — Iran. Kerman Province, in regione inferiore montis Kuh Lalesar prope pagum Lalesar, *c.* 3000 m, 15.VII.1892, *J. F. N. Bornmüller 4055* (lecto-, B[B100093507]!; isolecto-, B[B100093503, B100093504, B100093505, B100093506]!, BR[BR0000005267729]!, G[G00223636, G00223637]!, JE[JE00008414, JE00008415]!, K[K000768896]! left hand of the sheet, LD[LD1044387]!, W[W0045820, W0045839, W18960003994]!).

REMARKS

Bornmüller first supposed this species to be a variety of *E. villosissimus* but later described it as species. Bornmüller (1918) described *Echinops lalesarensis* based on collections of him from Lalesar, but did not designate a holotype nor did mention the name of the herbarium where the specimens were housed. Subsequently, fifteen specimens of *E. lalesarensis* collected by Bornmüller from Lalesar were found at different herbaria. Of these, the specimen B100093507 is better preserved and more complete than the other specimens and best represents the species description given in the protologue, hence it is designated here as the lectotype.

Echinops lalesarensis var. *adenocaulis* was described by Bornmüller (1918). According to him, it is distinguished from the typical variety by having glandular indumentum on stem. In their account, Montazerolghaem *et al.* (2016), considering morphological data, placed var. *adenocaulis* to synonymy of *E. lalesarensis*. Montazerolghaem *et al.*'s treatment is followed here. Anyway a lectotype for this taxon is chosen here too.

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