KSÜ Tarım ve Doğa Derg 23 (2): 402-415, 2020
KSU J. Agric Nat 23 (2): 402-415, 2020
DOI:10.18016/ksutarimdoga.vi.570180

Lectotypification of Some Names in *Dianthus* L. (Caryophyllaceae)

Ergin HAMZAOĞLU[1]
Gazi University, Gazi Faculty of Education, Department of Mathematics and Science Education, 06500, Ankara, Turkey
https://orcid.org/0000-0001-6053-6796
✉: erginhamzaoglu@gazi.edu.tr

ABSTRACT

In this study, lectotypifications of 21 valid or synonym names of the genus *Dianthus* L. (Caryophyllaceae) were determined. Among these; the types of *D. acrochlorus* Stapf, *D. haussknechtii* Boiss., *D. hypochlorus* Boiss. & Heldr., *D. kastembeluensis* Freyn & Sint., *D. kotschyanus* Boiss. & Heldr., *D. lydus* Boiss., *D. micranthus* Boiss. & Heldr., *D. multipunctatus* Ser. var. *gracilior* Boiss., *D. pallens* Sibth. & Sm. var. *oxylepis* Boiss. and *D. striatellus* Fenzl were based upon the specimens collected from two or more localities. The types of *D. bitlisianus* Kotschy ex Boiss., *D. brevicaulis* Fenzl, *D. carmelitarum* Reut. ex Boiss., *D. cibrarius* Clem., *D. hymenolepis* Boiss., *D. muschianus* Kotschy ex Boiss., *D. polycladus* Boiss. and *D. setisquameus* Hausskn. ex Bornm. were based upon the specimens collected from a single locality without mentioning any "type". And *D. arpadianus* Ade & Bornm. var. *trojanus* Bornm. & Sint., *D. engleri* Hausskn. & Bornm. and *D. siphonocalyx* Blakelock were based upon the specimens for which multiple "types" were stated. Most of the specimens of the lectotypes determined in this study were collected from Turkey and the rest came from Syria and Iraq.

Research Article

Article History
Received : 15.05.2019
Accepted : 08.11.2019

Keywords
Dianthus
Typification
Turkey
Syria
Iraq

Dianthus L.'ta (Caryophyllaceae) Bazı İsimlerin Lektotipifikasyonu

ÖZET

Bu çalışmada, *Dianthus* L. cinsinde (Caryophyllaceae) geçerli veya sinonim durumda olan 21 ismin lektotipifikasyonu yapıldı. Bunlar arasında; *D. acrochlorus* Stapf, *D. haussknechtii* Boiss., *D. hypochlorus* Boiss. & Heldr., *D. kastembeluensis* Freyn & Sint., *D. kotschyanus* Boiss. & Heldr., *D. lydus* Boiss., *D. micranthus* Boiss. & Heldr., *D. multipunctatus* Ser. var. *gracilior* Boiss., *D. pallens* Sibth. & Sm. var. *oxylepis* Boiss. ve *D. striatellus* Fenzl'de tipler iki veya daha fazla adresten toplanmış örneklere dayandırılmıştır. *D. bitlisianus* Kotschy ex Boiss., *D. brevicaulis* Fenzl, *D. carmelitarum* Reut. ex Boiss., *D. cibrarius* Clem., *D. hymenolepis* Boiss., *D. muschianus* Kotschy ex Boiss., *D. polycladus* Boiss. ve *D. setisquameus* Hausskn. ex Bornm.'da tipler, "tip" belirtmeksizin tek adresten toplanmış örneklere dayandırılmıştır. Ve *D. arpadianus* Ade & Bornm. var. *trojanus* Bornm. & Sint., *D. engleri* Hausskn. & Bornm. ve *D. siphonocalyx* Blakelock'ta ise, birden fazla "tip" olarak belirtilmiş örneklere dayandırılmıştır. Bu çalışmada lektotip olarak belirlenen örneklerin çoğunluğu Türkiye'den, bir kısmı ise Suriye ve Irak'tan toplanmıştır.

Araştırma Makalesi

Makale Tarihçesi
Geliş Tarihi : 15.05.2019
Kabul Tarihi : 08.11.2019

Anahtar Kelimeler
Dianthus
Tipifikasyon
Türkiye
Suriye
Irak

To Cite : Hamzaoğlu E 2020. Lectotypification of Some Names in *Dianthus* L. (Caryophyllaceae). KSU J. Agric Nat 23 (2): 402-415. DOI: 10.18016/ksutarimdoga.vi.636135.

INTRODUCTION

Dianthus L. is the second largest genus in the family Caryophyllaceae, after *Silene* L. The genus, which includes ca. 300 species, is generally distributed in the Mediterranean region of Europe and Asia (Valente et al. 2010). The first study focusing on *Dianthus* species in the Turkish flora was carried out by Reeve (1967), and in that study 67 species were recorded. In recent years, 16 new species and 4 new records were added to the Turkish *Dianthus*. On the other hand, it was determined that 5 species are not grown in Turkey (Gemici & Leblebici, 1995; Menemen & Hamzaoğlu,

2000; Özhatay & Kültür, 2006; Vural, 2008; Yılmaz et al., 2011; İlçim et al., 2013; Hamzaoğlu et al., 2014; 2015a; 2015b; 2015c; 2017; 2018; Hamzaoğlu & Koç, 2015; 2018a; 2018b; 2019a; 2019b; 2019c; Deniz et al., 2016; Oskay, 2018). As a result of these studies, total species number of the genus *Dianthus* in Turkey has reached 82, of which 43 are endemic, so that the endemism rate is about 52 %.

Some taxa of the genus *Dianthus* determined in Turkey were based upon the specimens collected from two or more localities (i.e. syntypes) (Reeve, 1967). Some of these specimens were collected from a single locality, without any information about the type indicated on them. This situation caused a great uncertainty about which specimen is the "type" of the species. In some of the taxonomic studies "lectotypification" of some taxa, such as *D. viscidus* Bory & Chaub., *D. cruentus* Griseb., *D. anatolicus* Boiss., *D. transcaucasicus* Schischk., *D. tabrisianus* Bien. ex Boiss. and *D. crinitus* Sm. var. *crossopetalus* Fenzl ex Boiss., distributed also in Turkey, were carried out in recent years (Strid, 1986; Rechinger, 1988; Nersesyan, 2011). However, these studies are extremely limited. This study was concerned with the revision of *Dianthus* that provided some of the new data (TÜBİTAK, Project No. KBAG-111T873). The lectotypification process was carried out by using virtual images. The virtual herbaria images, significantly increased in recent years, made these types of studies much easier than in the past.

MATERIAL and METHOD

The materials of this study were the virtual images obtained from the K, E, P, JE, WU, BM, PH and BR Herbaria and related protologues. In addition to these images mentioned above, the topotype specimens in the GAZI and ANK Herbaria were also utilized. The names attributed to the specimens were discussed in the framework of type localities indicated on the labels and the details indicated in the protologues by the authors themselves in their own handwriting. The rules and recommendations of the ICN (Art. 9.3 and 9.12, Rec. 9A and 9C) have been followed while designating the lectotype (Turland et al. 2018).

RESULTS

The lectotyped names were evaluated in alphabetical order and the names of the species were indicated in italic and bold as follows: The first paragraph of the lectotypification of the species includes the name of the taxon, author and the identity. The second and third paragraphs contain the protologue citation and the specimen chosen as a lectotype, respectively. Finally, the reasons for lectotyping of the names were explained. Whether the lectotyped names are valid or a synonym was outside the scope of this article. In addition, the incomplete or incorrect localities on the labels were corrected in square brackets.

Dianthus acrochlonis Stapf, Denkschr. Kaiserl. Akad. Wiss., Wien. Math. -Naturwiss. Kl. 51: 350 (1886)!

Protologue citation: "Lycia: Ad Karakiöi (2.viii.1882); in ruinis monasterii supra Owadjik. (2.VIII.1882.)".

Lectotype (designated here): "Passhöhe ober Karakiöi, 2 August 1882, Luschan" (WU 066702), Figure 1.

Other syntype specimens: "Lycia: In ruinis monasterii supra Owadjik. (2.VIII.1882)".

Note: The epithet of this species has been corrected from the protologue "*acrochlorus*" to "*acrochlonis*" in accordance with Article 60.8 of the ICN (Turland et al., 2018; IPNI, 2019; The Plant List, 2019). It was defined based on specimens collected from two localities in Antalya Province, Turkey (Karakiöi [Karaköy] and Owadjik [Ovacık] villages, [Elmalı District]) (Stapf, 1886). There was a sheet collected by Luschan from Karaköy village present in the WU Herbarium. This specimen with the barcode of "WU0066702" was chosen as the lectotype (Figure 1).

Dianthus arpadianus Ade & Bornm. var. ***trojanus*** Bornm. & Sint., Repert. Spec. Nov. Regni Veg. 36: 385 (1934)!

Protologue citation: "Collectus a cl. Sintenis in monte Kapudagh montium Ida, in Asia minore (Mysia), 1.VII.1883 et distributus sub No. 556".

Lectotype (designated here): "P. Sintenis: Iter trojanum 1883. M. Ida, in marmor montis Kapu-Dagh, 1/7, No. 556" (E [E00301902] Virtual image!; **isolectotypes**: E [E00301899] Virtual image!; [E00301901] Virtual image!; K [K000725436] Virtual image!; [K000725437] Virtual image!; P [P05294835] Virtual image!; JE [JE00015045] Virtual image!; [JE00015046] Virtual image!; [JE00015047] Virtual image!), Figure 1.

Note: According to the protologue, this taxon is defined based on specimens collected from Balıkesir Province, Turkey (Kapudagh [Kapıdağ, Kaz Dağı]) (Ade, 1934). There were nine sheets collected by Sintenis from Kapıdağ in the E, K, JE, and P Herbaria. Three of the nine sheets had "type specimen" written on them in the E. Also, there was a sheet in the K with "isotypus" written on it (K000725436). However, nothing was written on the remaining sheets in the K (K000725437), P (P05294835) and JE (JE00015045, JE00015046, JE00015047). Since the holotype was not clearly specified, the sheet in the E with the barcode of "E00301902" was chosen as the lectotype (Figure 1).

Dianthus bitlisianus Kotschy ex Boiss., Fl. Orient. 1: 483 (1867)!

Protologue citation: "In aridis prope Bitlis Armenia meridionalis (Ky!)".

Lectotype (designated here): "In aridis ad urbem Bitlis alt. 4600′. Diebus Sept., Kotschy Suppl. 762" (P [P04980977] Virtual image!; **isolectotype.**

Figure 1. Lectotype of *Dianthus acrochlonis* (A), *Dianthus arpadianus* var. *trojanus* (B), *Dianthus bitlisianus* (C) and *Dianthus brevicaulis* (D, specimens on the bottom of sheet).

Şekil 1. Dianthus acrochlonis (A), Dianthus arpadianus var. trojanus (B), Dianthus bitlisianus (C) ve Dianthus brevicaulis (D, kartonun altındaki örnek)'in lektotipi.

P [P04980976] Virtual image!; JE [JE00017149] Virtual image!), Figure 1.

Note: The type locality of the taxon was given as "Bitlis" in the protologue (Boissier, 1867). There were three identical sheets found in the P and JE Herbaria, labelled "Bitlis, Kotschy 762". One of these sheets, (P04980976), was selected as the lectotype (Figure 1).

Dianthus brevicaulis Fenzl, Pug. Pl. Nov. Syr. 10-11 (1842)!

Protologue citation: "In alpibus Tauri occidentalis (Kotschy coll. n. 91".

Lectotype (designated here): "In monte Tauro, Aestate 1836, legit Th. Kotschy N° 91" (K [K000725515] Virtual image!, specimens on the bottom of sheet; **isolectotype**: K [K000725513] Virtual image!; [K000725514] Virtual image!; WAG [WAG0004000] Virtual image!; S [S07-16787] Virtual image!; L [1706160] Virtual image!; BM [BM000571476] Virtual image!; H [H1341175] Virtual image!), Figure 1.

Note: According to the protologue, this species was defined based on specimens collected from west of the Taurus Mountains in Turkey (Fenzl, 1842). There were eight sheets found in the K, WAG, S, L, BM, and H Herbaria, labelled "Kotschy 91". On some of them, only the "Type" or "Type Number. HERB. KEW." was written. Since the holotype was not clearly specified, the sheet in the K with the barcode of "K000725515" was chosen as the lectotype (Figure 1).

Dianthus carmelitarum **Reut. ex Boiss.**, Fl. Orient. 1: 512 (1867)!

Protologue citation: "In monte Techdagh Armenia (Huet)".

Lectotype (designated here): "In montibus Tech-Dagh supra Erzeroum, in pascuis, Jul. 1853, Huet du Pavillon" (K [K000725526] Virtual image!; **isolectotype**: K [K000725527] Virtual image!), Figure 2.

Note: The type locality of the taxon was given as "above Erzurum, Tekdağ" in the protologue (Boissier, 1867). There were two specimens collected by Huet from "Tekdağ" present at the virtual herbarium in the K. One of these sheets (K000725526) was selected as the lectotype, since they are similar (Figure 2).

Dianthus cibrarius Clem., Mem. Reale Accad. Sci. Torino, II, 16: 256 (1857)!

Protologue citation: "Copiose occurrit in convalle quadam alpina Olympi bith. latere S.E. Floret Augusto mense".

Lectotype (designated here): "In herbidy alpin. Olympi bith., 18 aug 1850, Clementi collegit" (K [K000725530] Virtual image!; **isolectotypes**: K [K000725532] Virtual image!, specimen on the left of sheet; BM [BM000571465] Virtual image!), Figure 2.

Note: The type locality of the taxon was indicated as "Olympi bith. [Uludağ, Bursa]" in the protologue (Clementi, 1857). There were three sheets collected by Clementi from "Olympi bith." present at the virtual herbarium in the K. Since the holotype was not clearly specified, the sheet in the K with the barcode of "K000725530" was chosen as the lectotype (Figure 2).

Dianthus engleri Hausskn. & Bornm., Mitt. Geogr. Ges. (Thüringen) Jena 9: 16 (1890)!

Protologue citation: "alpine Region des kappadok. Akdagh 1900 m, Exsicc. Nr. 984".

Lectotype (designated here): "Cappadociae bor.: in summo jugo Karababa in monte Ak-dagh, alt. 2300 m, 2.8.1889", Bornmüller 984" (K [K000725512] Virtual image!; **isolectotypes.** PH [00011434] Virtual image!; BR [0000006969462] Virtual image!; BM [BM000571474] Virtual image!; JE [JE00013305] Virtual image!; KFTA [KFTA0000031] Virtual image!; GB [GB0047145] Virtual image!), Figure 2.

Note: The type locality of the species was written, "[Turkey A5 Amasya] in the summo cacumine "Kara baba" mountains is Akdagh, 2700 m, 1 vii 1889, Bornm. 984" in the *Flora of Turkey and the East Aegean Islands* where both the name of the province and the altitude were indicated erroneously (Reeve, 1967). Floristically, the location of Amasya "Akdağ" is included in the "Galatia" Region (Davis, 1965). However, it was clearly stated in the protologue that the species was distributed in the "Cappadocia" Region (Haussknecht, 1890). In addition, there is no hill with the name of "Karababa" in the Amasya "Akdağ" mountain range. "Karababa" hill is located in the "Akdağ" mountain range between Sivas and Yozgat Provinces. The altitude of this hill is 2350 meters, which does not comply with the altitude of 2700 meters indicated in the *Flora of Turkey*. Specimens collected from the Karababa hill and the region in its close proximity also verified this fact (Ekim 4132, ANK; Hamzaoğlu 3947 and 6488, GAZI). There were six sheets, with the identification of "Bornmüller 984, Karababa, Akdağ", found in the BM, PH, KFTA, K, JE, and BR Herbaria. Furthermore, there is no collector's number on the sheet label with the barcode "JE00013306" in the JE Herbarium. However, it was written "orig.", that is, "original" in parentheses by Haussknecht. Of these seven sheets, there was no expression of "type" or "holotype" written on any of them by Bornmüller or Haussknecht. Among these sheets, only the ones found in the BM, KFTA, and BR Herbaria were described as the "isotype". On the other hand, "typus" was written by Kuzmina in 2000 on a sheet with the barcode of "JE00013305" found in the JE Herbarium. However, no lectotype publication was found that would support and make this note valid. As a result, there were no signs whatsoever indicating the type of the specimens obtained from the K, PH, and JE Herbaria. Since the "holotype" of the species was not clearly specified, the specimen barcoded "JE00013305" in the JE Herbarium has been chosen as the lectotype (Figure 2).

Dianthus haussknechtii Boiss., Fl. Orient. 1: 489 (1867)!

Protologue citation: "In monte Masmeneudagh Cappadocia (Bal!), in graminosis montis Berytdagh Cataonia alt. 6000′ (Haussk!). Fl. Aug.".

Lectotype (designated here): "In graminosis Berytdagh, Taurus Cataonicus, 6000′, 10.8.65, Haussknecht 1181" (JE [JE00017212] Virtual image!), Figure 3.

Other syntype specimens: "In monte Masmeneudagh Cappadocia (Bal!)".

Note: The species was defined based on specimens collected from two localities in Adana and Kahramanmaraş Provinces, Turkey (Masmeneudagh [Karanfil Mountain, Pozantı] and Berytdagh [Berit Mountain, Göksun]) (Boissier, 1867). There was a sheet collected by Haussknecht from "Berit Mountain"

Figure 2. Lectotype of *Dianthus carmelitarum* (A), *Dianthus cibrarius* (B) and *Dianthus engleri* (C).
Şekil 2. Dianthus carmelitarum (A), Dianthus cibrarius (B) ve Dianthus engleri (C)'nin lektotipi.

present at the virtual herbarium in the JE. The sheet with the barcode of "JE00017212" was chosen as the lectotype (Figure 3).

Dianthus hymenolepis Boiss., Diagn. Pl. Orient. 1(8): 64 (1849)!

Protologue citation: "In Mesopotamia loco non indicato Kotschy pl. Assyr. Nº 161".

Lectotype (designated here): "Pl. Mesopot., 1841, Kotschy 169" (K [K000725525] Virtual image!; **isolectotype**: K [K000725524] Virtual image!), Figure 3.

Note: The type locality of the taxon was indicated only as "Mesopotamia" in the respective protologue (Boissier, 1849). There were two sheets present at the virtual herbarium in the K, labelled "Mesopot., 1841, Kotschy 169". Although the labels indicated the correct form as "Kotschy 169", the author mistakenly quoted this number as "Kotschy 161" in the protologue. Due to fact that these sheets bear no sign related to typification, the specimen barcoded "K000725525" was selected as the lectotype (Figure 3).

Dianthus hypochlorus **Boiss. & Heldr.**, Diagn. Pl. Orient. 1(8): 67 (1849)!

Protologue citation: "In pascuis siccis Tauri Isaurici inter valles Tourtchalar et Ermenek alt. 3000′ et in regione alpina montis Anemas alt. 7000′ (forma minor) (Heldreich)".

Lectotype (designated here): "In pascuis sicuis vallis Ermenek Isauria. Jul. 1845, Heldreich" (K [K000725510] Virtual image!, specimens on the bottom right of sheet; **isolectotype**: K [K000725511] Virtual image!; H [H1505683] Virtual image!; WAG [WAG0004002] Virtual image!; GOET [GOET005973] Virtual image!), Figure 3.

Other syntype specimens: "In pascuis montis Anemas, Lycaonia, Aug. 1845, Heldreich" (K [K000725508] Virtual image!, as var. *alpina*; [K000725509] Virtual image!, as var. *alpina*).

Note: There were two the different type localities of the taxon indicated in the protologue as "Tourtchalar [Turcalar, Sarıveliler] et Ermenek" and "montis Anemas [Dedegöl Dağı]" (Boissier, 1849). A sheet with the protologue of "Anemas" was determined in the K Herbarium. Two labels, two barcodes and four specimens are present on the sheet (K000725508 and K000725509). "*Dianthus hypochlorus* Boiss. & Heldr. var. *alpina*" was written on the labels. These specimens were determined to be "forma minor" in the protologue of the original publication, whereas, in the explanation section, they were determined to be "forma alpina". However, the specimens under "forma alpina (var. *alpina*)" were not given as "type" but were given as "syntype" under "*Dianthus hypochlorus*". Consequently, the name "forma alpina (var. *alpina*)" was not published as valid and remained as a "nomen nudum". A total of five sheets with the protologue of "Ermenek" were determined. "Type" was written on one of these, "syntype HERB. KEW." was written on two of these, whereas, "isosyntype" was written on the other two. Since the holotype was not clearly specified, the sheet with the barcode of "K000725510" was selected as the lectotype (Figure 3).

Dianthus kastembeluensis **Freyn & Sint.**, Oesterr. Bot. Z. 43: 375 (1893)!

Protologue citation: "Paphlagonia ad Kastemuni: in collibus inter Taschlö Chan Eliots die 15. aug. (Exsicc. no. 4964) et in collibus siccis supra Seidler die 17. aug. 1892 (Exsicc. no. 5018) leg. Sintenis".

Lectotype (designated here): "Kastambuli: in pascuis montis supra Seidler. 17.VIII, 1892, Sintenis 5018" (K [K000725518] Virtual image! **isolectotypes.** GOET [GOET005953] Virtual image!; JE [JE00017198] Virtual image!; BM [BM000572329] Virtual image!; PRC [PRC455183] Virtual image!; KFTA [KFTA0000030] Virtual image!; S [S07-16959] Virtual image!; LD [LD-1220430] Virtual image!; [LD-1220490] Virtual image!), Figure 3.

Other syntype specimens: "Kastambuli: inter Taschlik-Chan et Eliod. 15.VIII, 1892, Sintenis 4964" (K [K000725519] Virtual image!; JE [JE00017199] Virtual image!; LD [LD-1220190] Virtual image!; [LD-1220550] Virtual image!).

Note: This taxon is defined based on specimens collected from two localities in Kastamonu Province, Turkey (Taschlö [Taşlık] and "Seidler [Seydiler] villages) (Freyn, 1893). There were nine sheets present at the virtual herbaria in the K, JE, S, LD, KFTA, PRC, BM, GOET labelled "Seydiler, Sintenis 5018". Of these, "type" was written on two sheets in the LD Herbarium, "isosyntype" was written on the sheets in the BM and PRC Herbaria and "syntype" was written on the sheet in the KFTA Herbarium. Whereas, there is no writing at all related to the typology on the sheets in the K, GOET, S and JE Herbaria. Since the holotype was not clearly specified, this sheet (K000725518) was selected as the lectotype (Figure 3).

Dianthus kotschyanus Boiss. & Heldr., Diagn. Pl. Orient. 1(8): 68 (1849)!

Protologue citation: "In Tauro Cilicia Kotschy Nº 86 sub *D. pallenti*, Tauro Lycaonica in monte Karadagh supra Larenda et inter Beychehr et Koniah. (Heldreich)".

Lectotype (designated here): "In monte Tauro, Aestate 1836, legit Th. Kotschy Nº 86" (K [K000725439] Virtual image!; **isolectotype.** K [K000725438] Virtual image!), Figure 4.

Note: This taxon is defined based on specimens collected from three localities in Turkey (Taurus Mountains, above Karadağ, and between Beyşehir and Konya) (Boissier, 1849). There were two sheets present

in the K Herbarium, labelled "in monte Tauro, Kotschy 86". There were three specimens on these sheets with two different barcodes of "K000725439" and "K000725438". The specimens have been indicated with three different names on the sheets as "*Dianthus kotschyanus*", "*Dianthus anatolicus*" and "*Dianthus pomeridianus*". There was only "Syntype HERB. KEW." written on them. Since the holotype was not clearly specified, the sheet with the barcode of "K000725439" was chosen as the lectotype (Figure 4).

Dianthus lydus **Boiss.**, Diagn. Pl. Orient. 1(1): 20 (1843)!

Figure 3. Lectotype of *Dianthus haussknechtii* (A), *Dianthus hymenolepis* (B), *Dianthus hypochlorus* (C, specimens on the bottom right of sheet) and *Dianthus kastembeluensis* (D).

Şekil 3. Dianthus haussknechtii (A), Dianthus hymenolepis (B), Dianthus hypochlorus (C, kartonun altında sağdaki örnek) ve Dianthus kastembeluensis (D)'in lektotipi.

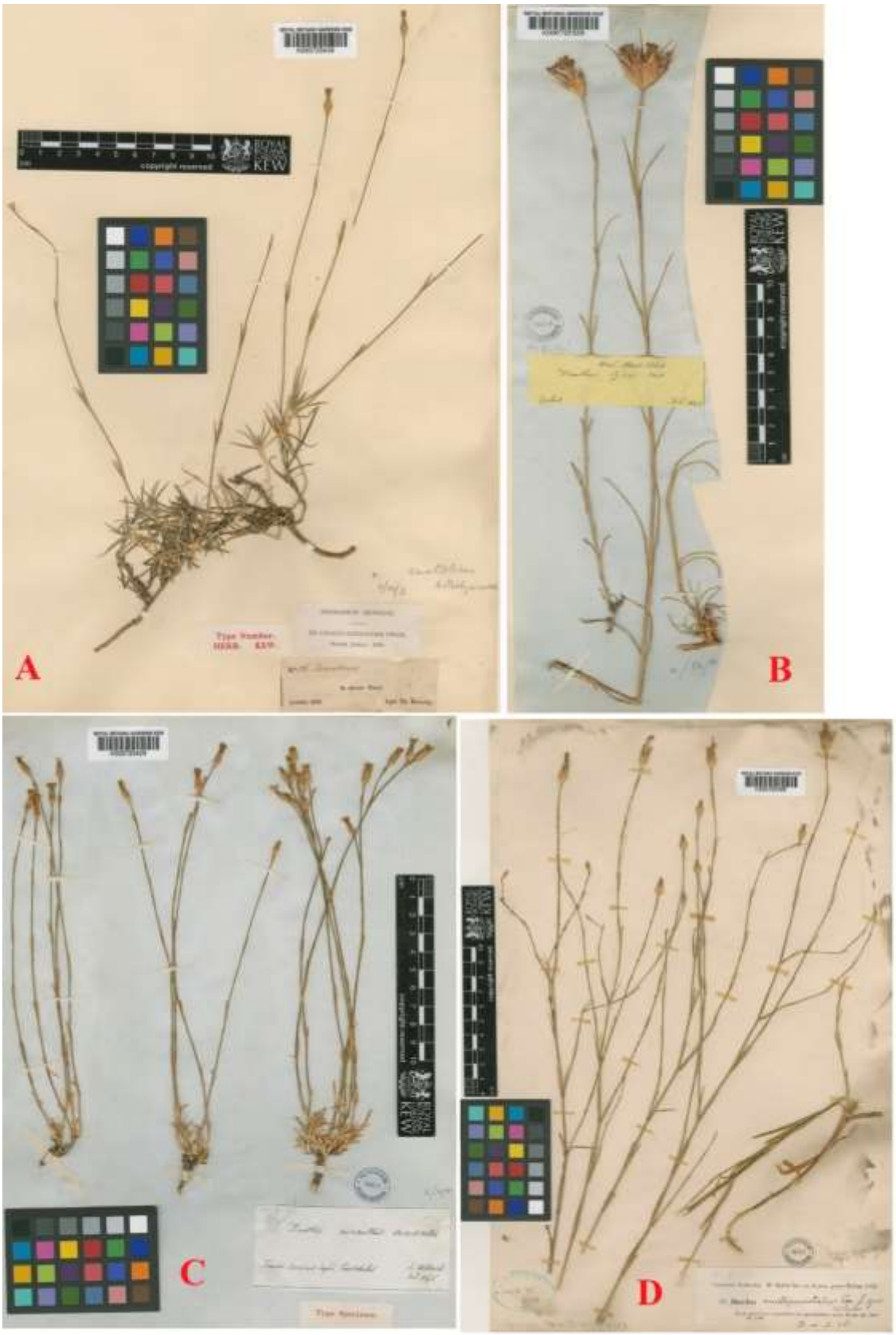

Figure 4. Lectotype of *Dianthus kotschyanus* (A), *Dianthus lydus* (B, specimens on the left of sheet), *Dianthus micranthus* (C) and *Dianthus multipunctatus* var. *gracilior* (D).

Şekil 4. Dianthus kotschyanus (A), Dianthus lydus (B, kartonun solundaki örnekler), Dianthus micranthus (C) ve Dianthus multipunctatus var. gracilior (D)'un lektotipi.

Protologue citation: "In montibus Lydia Tmolo, Sypilo ubi legi Jun. 1842".

Lectotype (designated here): "Sipylus, Jul. 1842, Boissier" (K [K000725528] Virtual image!, specimens on the left of sheet; **isolectotypes**: E [E00301863] Virtual image!, specimens on the right of sheet; P [04986544] Virtual image!, specimens on the right of sheet), Figure 4.

Note: This taxon is defined based on specimens collected from two localities in Manisa Province, Turkey (Lydia Tmolo [Bozdağ] and Sypilo [Spil Dağı]) (Boissier, 1843). Three sheets collected by Boissier from "Sipylus" were found in the E, K and P Herbaria. The sheet in the K with the barcode of "K000725528" was chosen as the lectotype (Figure 4).

Dianthus micranthus Boiss. & Heldr., Diagn. Pl. Orient. 1(8): 69 (1849)!

Protologue citation: "In herbidis Tauri Isaurici, in montibus supra Tourtchalar alt. 4000′ et in parte occidentali montis Gheidagh. Alt. 6000′. (Heldr.)".

Lectotype (designated here): "Taurus Isauricus supra Tourtchalar, Jul. 1845, Heldreich" (K [K000725428] Virtual image!; **isolectotype.** K [K000725430] Virtual image!, only "Taurus Isauricus" written on the label; E [E00301886] Virtual image!, GOET [GOET005955] Virtual image!, H [H1341470] Virtual image!, WAG [WAG0004044] Virtual image!), Figure 4.

Other syntype specimens: "In saxosis montis Gheidagh, Isauri, a. 6000′, Jul. 1845, Heldreich" (K [K000725429] Virtual image!, as var. *minor*; GOET [GOET005954] Virtual image!, as var. *minor*).

Note: This species was defined based on specimens collected from two localities in Karaman and Antalya Provinces, Turkey (Tourtchalar [Turcalar, Sarıveliler] and Gheidagh [Geyik Dağları]) (Boissier, 1849). Two sheets with the protologues "Gheidagh" were determined in the K and GOET Herbaria (K000725429, GOET005954). "*Dianthus micranthus* Boiss. & Heldr. var. *minor*" was written on the labels of these sheets. These specimens in the protologue of the original publication were given as "syntype" under "*Dianthus micranthus*". Consequently, it was not published as a valid "var. *minor*" name and remained as a "nomen nudum". Six sheets were found in the K, E, H, GOET, and WAG Herbaria, labelled "Taurus Isauricus supra Tourtchalar". "Type" was written on four of these sheets, whereas, "syntype" and "isosyntype" were written on the other two. Since the holotype was not clearly specified, the sheet with the barcode of "K000725428" was chosen as the lectotype (Figure 4).

Dianthus multipunctatus Ser. var. ***gracilior*** Boiss., Fl. Orient. 1: 483 (1867)!

Protologue citation: "In regione inferiori Tauri circa Gulek (Ky exs. 88!), Syria in Amano (Ky exs. 69!), circa Suadieh et Antiochiam (Boiss!), ad Aintab (Haussk!)".

Lectotype (designated here): "Locis graminosa-repestribus ad aquaeduetum supra Beilan alt. 3000′ 23. junii, Kotschy 69" (K [K000725408] Virtual image!, **isolectotype.** BM [BM000572318] Virtual image!), Figure 4.

Other syntype specimens: "Tulluk p. Aintab, 27.6. 1865, alt. 3000′" (K [K000725407] Virtual image!), "Syria Antiochei jul 1846, Boissier" (K [K000725409]).

Note: There were four different type localities mentioned in the protologue of the taxon as "Gülek [pass]", "Amanos", "Samandağ and Antakya", and "Gaziantep" (Boissier, 1867). There were two sheets present at the virtual herbaria in the K and BM, labelled "Belen, Kotschy 69" and "syntype". Since the holotype was not clearly specified, the sheet in the K with the barcode of "K000725408" was chosen as the lectotype (Figure 4).

Dianthus muschianus Kotschy ex Boiss., Fl. Orient. 1: 510 (1867)!

Protologue citation: "In alpibus Armenia australis supra Musch alt. 7500′ (Ky exs. 439!). Fl. aest.".

Lectotype (designated here): "Plantae ex schistosis in alpibus prope Musch lectae, ad nives deliquescentes frequens, 7500′. Die 6 Sept. 1859, Kotschy 439" (K [K000725520] Virtual image!; **isolectotypes**: P [P04998389] Virtual image!; [P04998390] Virtual image!; [P04998391] Virtual image!; JE [JE00017196] Virtual image!; H [H1341530] Virtual image!; S [S07-17165] Virtual image!; BM [BM000571464] Virtual image!), Figure 5.

Note: According to the protologue, this taxon was defined based on specimens collected from Muş Province, Turkey (supra Musch [above Muş]) (Boissier, 1867). Eight sheets collected by Kotschy (no. 439) from Muş Province were found in the K, P, BM, H, S, and JE Herbaria. There were two sheets in the H and BM Herbaria with "type" written on their labels (H1341530, BM000571464). However, nothing was written on the remaining sheets in the K, P, S and JE. Since the holotype was not clearly specified, the sheet in the K with the barcode of "K000725520" was chosen as the lectotype (Figure 5).

Dianthus pallens Sibth. & Sm. var. ***oxylepis*** Boiss., Fl. Orient. 1: 485 (1867)!

Protologue citation: "In Syria boreali ad Aleppo (Oliv!), in deserto propi Orfa (Haussk!), ad Siwereek (Ky exs. 99!), in Antilibano versus Damascum (Gaill!), deserto ad Palmyram (Bl!), montibus Persiae bor. (Buhse! Ky exs. 445!)".

Lectotype (designated here): "Pl. Mesopot., Kurdistan & Mossul, ad Süvereck (=Severek), 1841, Kotschy No. 99" (K [K000725421] Virtual image!; **isolectotype.** K [K000725422] Virtual image!), Figure 5.

Figure 5. Lectotype of *Dianthus muschianus* (A), *Dianthus pallens var. oxylepis* (B) and *Dianthus polycladus* (C).
Şekil 5. Dianthus muschianus (A), Dianthus pallens var. oxylepis (B) ve Dianthus polycladus (C)'un lektotipi.

Other syntype specimens: "In m. Elbrus pr. Derbend., 5 Jul. 1843, Kotschy 445" (BM [BM000572326] Virtual image!).

Note: There were six different type localities stated in the protologue of the taxon as "Aleppo", "Urfa", "Siverek", "Damascum [Sam]", "Palmira" and "Northern Iranian Mountains" (Boissier, 1867). There were two sheets found in the K Herbarium, labelled "Kotschy 99". The sheet with the barcode of "K000725421" was chosen as the lectotype (Figure 5).

Dianthus polycladus Boiss., Diagn. Pl. Orient. 1(8): 65 (1849)!

Protologue citation: "In montibus aridis et humulioribus Syriae inter Darkousch ad Orontem et planitiem Aleppensem. Legi Jun. 1846".

Lectotype (designated here): "Syria, inter Edlips et Darkousch, Jun. 1846, Boissier" (K [K000725418] Virtual image!; **isolectotype.** K [K000725419] Virtual image!; PH [PH00011440] Virtual image!; LECB [LECB0000542] Virtual image!), Figure 5.

Note: There was only one type locality quoted in the protologue of the species as "between Asi river and Aleppo in Darkush, Idlib province, Syria" (Boissier, 1849). There were four sheets found in the K, PH and,

LECB Herbaria, labelled "between Idlib and Darkush". These sheets bear no marks about the typification of the species. Therefore, the specimen barcoded "K000725418" was selected as the lectotype (Figure 5). A label that wrote "syntypus" was pasted onto the sheet found in the LECB Herbarium. It is thought that this note was written incorrectly, because the taxon was defined from only one protologue and consequently, it could not have a "syntype" specimen.

Dianthus setisquameus Hausskn. ex Bornm., Mitt. Geogr. Ges. (Thüringen) Jena 9: 15 (1890)!

Protologue citation: "alpine Region des kappadok. Akdagh 17–1900 m, Bornmüller. (Exciss. Nr. 975)".

Lectotype (designated here): "Cappadocia borealis in regione superiore montis Ak-Dağ, 2000 m, 1/viii 89, Bornmüller No: 975 (K [K000725452] Virtual image!; **isolectotypes.** JE [JE00017232] Virtual image!; S [S07-17201] Virtual image!; BM [BM000571469] Virtual image!; LECB [LECB0000543] Virtual image!; BR [BR0000005231782] Virtual image!; KFTA [KFTA0000636] Virtual image!; GOET [GOET005961] Virtual image!), Figure 6.

Note: The type locality of the species is erroneously quoted in *Flora of Turkey and the East Aegean Islands* as "[Turkey A5 Amasya] in regione alpina montis Ak dagh, 1900 m, 1889, Bornmüller 975" (Reeve, 1967). The species was collected from the same locality as "*Dianthus engleri*" mentioned above. That is why the collection numbers follow each other (Bornmüller 975 and 984). Apart from that, in both the protologue and the label of the species, it was clearly stated that the species grow in the "Cappadocia" Region (Haussknecht, 1890). In a recent study, there have been specimens belonging to the same species collected from the Nalbant hill (Yozgat, Akdağmadeni) in 2017 (Koç 3193, GAZI). "Karababa hill" and "Nalbant hill" belong to the "Akdağ" mountain range located between Sivas and Yozgat Provinces. There were eight sheets found belonging to Bornmüller's "975, Akdağ" in the K, JE, S, BM, LECB, KFTA, GOET, and BR Herbaria. Since these specimens had no sign whatsoever of typification, the specimen barcoded "K000725452" in the K Herbarium was chosen as the lectotype (Figure 6). A label written "syntypus" was pasted on the sheet found in the KFTA Herbarium. It is thought that this note was written incorrectly, because the taxon was defined only from this protologue and consequently, it could not have a "syntype" specimen.

Dianthus siphonocalyx Blakelock, Kew Bull. 3: 397 (1948)!

Protologue citation: "N. 'IRAQ: Jabal Rubal (or Robal), S. of Atrush, 750 m., rocky limestone slope (scrub oak forest), 14.7.33, E. Guest 3654".

Lectotype (designated here): "Flora of Irak. Jabal Rubal, S of Atrust, E.R. Guest 3654" (K [K000725443] Virtual image!; **isolectotypes.** K [K000725442] Virtual image!; [K000725444] Virtual image!; [K000725445] Virtual image!; [K000725446] Virtual image!), Figure 6.

Note: The type of the related taxon was indicated as "Guest 3654" in the protologue (Blakelock, 1948). But there were five sheets in the K Herbarium, all labelled "Type" and "Guest 3654". Since the holotype was not clearly specified, one of them with the barcode of "K000725443" was chosen as the lectotype (Figure 6).

Dianthus striatellus Fenzl, Pug. Pl. Nov. Syr. 10 (1842)!

Protologue citation: "In Syria prope Svedie ad ostia Orontis et in regione inferiore Tauri occidentalis (Kotschy coll. n. 88)".

Lectotype (designated here): "In monte Tauro, Aestate 1836, legit Th. Kotschy N° 88" (K [K000725398] Virtual image!; **isolectotypes.** K [K000725397] Virtual image!; [K000725399] Virtual image!; [K000725400] Virtual image!; [K000725401] Virtual image!; [K000725402] Virtual image!; GOET [GOET005966] Virtual image!), Figure 6.

Note: There were two different type localities of the species quoted in the protologue as "Asi river mouth, in Samandağ [Hatay]" and "Taurus" (Fenzl, 1842). The specimens were given the same number, although they were collected from two different localities (Kotschy coll. n. 88). The specimens numbered "Kotschy 88" were used later as a "syntype" in the definition of *Dianthus multipunctatus* var. *gracilior* (Boissier, 1867).

ADDITIONAL SPECIMENS SEEN

Dianthus engleri Hausskn. & Bornm. Turkey, Prov. Yozgat, Akdağmadeni, above Kızılcaova village, Karababa Mountain, 2020 m, 16.6.2006, *Hamzaoğlu 3947* (GAZI); ibid., 2170 m, 24.7.2012, *Hamzaoğlu 6488* (GAZI); ibid., Demirkaya Hill, c. 2000-2200 m, *Ekim 4132* (ANK). ***Dianthus setisquameus*** Hausskn. ex Bornm. Turkey, Prov. Yozgat, Akdağmadeni, near Kızılcaova village, Nalbant Pass, 2120 m, 13.7.2017, *Koç 3193* (GAZI).

ACKNOWLEDGEMENTS

I am indebted to the Scientific and Technological Research Council of Turkey (TÜBİTAK) for financial support (Project No. KBAG-111T873). I also thank the curators of the herbaria in the BM, BR, E, GB, GOET, H, JE, K, KFTA, L, LECB, LD, P, PH, PRC, S, WAG, and WU for the virtual images of the type specimens.

Statement of Conflict of Interest

Author have declared no conflict of interest.

Figure 6. Lectotype of *Dianthus setisquameus* (A), *Dianthus siphonocalyx* (B) and *Dianthus striatellus* (C).
Şekil 6. Dianthus setisquameus (A), Dianthus siphonocalyx (B) ve Dianthus striatellus (C)'un lektotipi.

REFERENCES

Ade A 1934. *Dianthus arpadianus* Ade et Bornmüller spec. nov. Repertorium Specierum Novarum Regni Vegetabilis, 36: 385-388.

Blakelock RA 1948. The Rustam Herbaria, Iraq: Part 1. Systematic List. Kew Bulletin, 3(3): 375-444.

Boissier E 1843. Diagnoses Plantarum Orientalium Novarum, vol 1(1). Typographia Ferd. Ramboz, Genevae, 20.

Boissier E 1849. Diagnoses Plantarum Orientalium Novarum, vol 1(8). Typographia Ferd. Ramboz, Genevae, 64-69.

Boissier E 1867. Flora Orientalis, vol 1. H. Georg, Geneva & Basel, 483-512.

Clementi J 1857. Sertulum Orientale seu recensio plantarum in Olympo Bithynico, in agro Byzantino et Hellenico, nonnullisque aliis Orientis Regionibus annis 1849-1850. Memorie della Reale Accademia delle Scienze di Torino, 16: 239-337.

Davis PH 1965. Flora of Turkey and the East Aegean Islands, vol 1. Edinburgh University Press, Edinburgh, 10-11.

Deniz İG, Aykurt C, Genç İ, Aksoy A 2016. A new species of *Dianthus* (Caryophyllaceae) from Antalya, South Anatolia, Turkey. PhytoKeys, 63: 1-12.

Fenzl E 1842. Pugillus Plantarum Novarum Syria et Tauri Occidentalis Primus. F. Beck, Vindobonae, 10-11.

Freyn von J 1893. Plantae Novae Orientales, III. Oesterreichische Botanische Zeitschrift, 43: 372-377.

Gemici Y, Leblebici E 1995. Seven new species for the Flora of Turkey. Candollea, 50: 41-50.

Hamzaoğlu E, Koç M 2015. *Dianthus burdurensis* (Caryophyllaceae), a new species from South-western Turkey. Phytotaxa, 233: 196-200.

Hamzaoğlu E, Koç M 2018a. Presence of *Dianthus glutinosus* in Turkey and new variety of this species. Biodicon, 11(3): 149-152.

Hamzaoğlu E, Koç M 2018b. *Dianthus sancarii* (Caryophyllaceae), a new species from eastern Turkey. Biodicon, 11(1): 30-34.

Hamzaoğlu E, Koç M 2019a. Bazı *Dianthus* (Caryophyllaceae) taksonlarının Türkiye'deki varlığı üzerine bir araştırma. Gümüşhane Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 9(4): 620-627.

Hamzaoğlu E, Koç M 2019b. Türkiye florası için yeni *Dianthus* (Caryophyllaceae) kayıtları. KSÜ Tarım ve Doğa Derg, 22(3): 381-388.

Hamzaoğlu E, Koç M 2019c. Taxonomic contributions to the genus *Dianthus* section *Carthusiani* of Turkey (Caryophyllaceae). Biodicon, 12(1): 66-88.

Hamzaoğlu E, Koç M, Aksoy A 2014. A new pricking Carnation (Caryophyllaceae) grows on tuff from Turkey. Biodicon, 7: 159-162.

Hamzaoğlu E, Koç M, Büyük İ, Aksoy A, Soydam Aydın S 2015a. Presence of *Dianthus roseoluteus* Velen. (Caryophyllaceae) in Turkey and a new species: *Dianthus macroflorus* Hamzaoğlu. Syst Bot, 40(1): 208-213.

Hamzaoğlu E, Koç M, Büyük İ, Aksoy A, Soydam Aydın S 2015b. A new serpentine-adapted carnation (Caryophyllaceae) from Turkey: *Dianthus serpentinus* sp. nov. Nord J Bot 33: 57-63.

Hamzaoğlu E, Koç M, Aksoy A 2015c. *Dianthus aticii*, a new species from Turkey (Caryophyllaceae). Phytokeys, 48: 21-28.

Hamzaoğlu E, Koç M, Büyük İ 2017. *Dianthus ucarii* (Caryophyllaceae): a new species from the northwest of Turkey. Turk J Bot, 41(5): 486-492.

Hamzaoğlu E, Koç M, Büyük İ 2018. Two new spiny species of *Dianthus* (Caryophyllaceae) from Turkey. KSÜ Tarım ve Doğa Derg, 21(4): 545-554.

Haussknecht C 1890. Referat über die auf der Frühjahrshauptversammlung zu Rudolstadt 1890 vorgelegten und besprochenen Pflanzen. Mitteilungen der Geographischen Gesellschaft für Thüringen zu Jena, 9: 10-23.

İlçim A, Behçet L, Mükemre M 2013. *Dianthus vanensis* (Caryophyllaceae), a new species from Turkey. Turk J Bot, 37: 219-224.

IPNI 2019. The International Plant Names Index, *Dianthus acrochlonis*. http://www.ipni.org/ipni/plantnamesearchpage.do (Access date: 12.07.2019].

Menemen Y, Hamzaoğlu E 2000. A new species of *Dianthus* (Caryophyllaceae) from Salt Lake (Central Anatolia), Turkey. Ann Bot Fenn, 37: 285-287.

Nersesyan AA 2011. Genus *Dianthus* L. (Caryophyllaceae) in southern Transcaucasia. Takhtajania, 1: 44-51.

Oskay D 2018. *Dianthus somanus* (Caryophyllaceae), a new species from Turkey. Phytotaxa, 347(4): 263-271.

Özhatay N, Kültür Ş 2006. Check-list of additional taxa to the supplement Flora of Turkey III. Turk J Bot, 30: 281-316.

Rechinger KH 1988. *Dianthus* L. (Flora Iranica, vol 163. Akademische Druck-u Verlagsanstalt, Graz) 128-188.

Reeve H 1967. *Dianthus* L. (Flora of Turkey and the East Aegean Islands, vol 2. Edinburgh University Press, Edinburgh: Ed. Davis PH) 99-131.

Stapf O 1886. Beitrage zur flora von Lycien, Carien und Mesopotamien. Aun. 1881, 1882, 1883. Plantae collectae a D^{re} Felix Luschan, II. Theil. Denkschriften der Kaiserlichen Akademie der Wissenschaften/Mathematisch-Naturwissenschaftliche Classe, 51: 347-384.

Strid A 1986. *Dianthus* L. (Mountain Flora of Greece, vol 1. Cambridge University Press, Cambridge) 176-200.

The Plant List 2019. *Dianthus acrochlonis*. http://www.theplantlist.org (Access date: 12.07.2019).

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber W-H, Li D-Z, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Veg 159. Koeltz Botanical Books, Glashütten, 1-254.

Valente LM, Savolainen V, Vargas P 2010. Unparalleled rates of species diversification in Europe. Proc Biol Sci, 277: 1489-1496.

Vural C 2008. A new species of *Dianthus* (Caryophyllaceae) from Mount Erciyes, central Anatolia, Turkey. Bot J Linn Soc, 158: 55-61.

Yılmaz Ö, Kaynak G, Daşkın R, Meriçlioğlu A 2011. *Dianthus goekayi* (Caryophyllaceae), a new species from Turkey. Ann Bot Fenn, 48: 74-78.