KSÜ Tarım ve Doğa Derg 26 (3), 504-510, 2023
KSU J. Agric Nat 26 (3), 504-510, 2023
https://doi.org/10.18016/ksutarimdoga.vi.1163477

Clinopodium debile (Bunge) Kuntze (Lamiaceae), A New Record for the Flora of Türkiye

Lütfi BEHÇET[1] İrfan ALTINSOY[2]
[1,2] Molecular Biology and Genetics, Faculty of Arts and Sciences, Bingöl University, Bingöl, Turkey
[2] Biology Department, Institute of Sciences, Bingöl University, Bingöl, Turkey
[1]https://orcid.org/0000-0001-8334-7816, [2]https://orcid.org/0000-0002-5393-5630
✉: lbehcet@bingol.edu.tr

ABSTRACT
Clinopodium debile was collected from the oak forest in the north-northeast of Yolçatı Village (Bingöl/Türkiye) and it was given a new record for the flora of Turkey. Description, detailed photos, ecology and distribution maps of this new record are also presented.

Botany

Research Article

Article History
Received : 17.08.2022
Accepted : 06.10.2022

Keywords
Clinopodium debile
New record
Distribution
Bingöl/Türkiye

Clinopodium debile (Bunge) Kuntze (Lamiaceae), Türkiye Florası İçin Yeni Bir Kayıt

ÖZET
Clinopodium debile Yolçatı Köyü (Bingöl/Türkiye)'nün kuzey-kuzeydoğusundaki meşe ormanından toplanmış ve Türkiye florası için yeni kayıt olarak verilmiştir. Yeni kaydın betimi, detay fotoğrafları, ekolojisi ve dağılım haritaları da sunulmuştur.

Botanik

Araştırma Makalesi

Makale Tarihçesi
Geliş Tarihi :
Kabul Tarihi :

Anahtar Kelimeler
Clinopodium debile
Yeni kayıt
Yayılış
Bingöl/Türkiye

Atıf Şekli: Behçet, L., & Altınsoy, İ., (2023). *Clinopodium debile* (Bunge) Kuntze (Lamiaceae), Türkiye Florası İçin Yeni Bir Kayıt. *KSÜ Tarım ve Doğa Derg 26*(3), 504-510. https://doi.org/10.18016/ksutarimdoga.vi.1163477

To Cite : Behçet, L., & Altınsoy, İ., (2023) *Clinopodium debile* (Bunge) Kuntze (Lamiaceae), A New Record for the Flora of Türkiye. *KSU J. Agric Nat 26*(3), 504-510. https://doi.org/10.18016/ksutarimdoga.vi.1163477

INTRODUCTION

Data obtained through new research shows that Türkiye's biological richness is more than known. New taxa collected and published every year from Türkiye and publications on new records with newly determined distribution in Türkiye are the most important evidence of this claim.

During the botanical excursions made in Bingöl in 2022, some interesting Lamiaceae members were collected. It was not possible to identify the collected specimens with the keys and descriptions in the 7th volume of the Turkish flora (the volume containing the identification and differentiation keys of the Lamiaceae members)..

At first glance, the specimens resembled *Clinopodium caroli-henricana* (Kit Tan & Sorger) Govaerts (Syn: *Calamintha caroli-henricana* Kit Tan & Sorger), whose description is included in the 10th volume (supplement 1) of the flora of Turkey. A new distribution area for *Clinopodium caroli-henricana*, which was previously known from the type collection, was determined in 2007 from the moist rocks of the Güzelsu district of Van, and this new area was published in the study titled "Flora of the Zernek Dam Surroundings" (Gürpınar-Van/Turkey)" (Demir & Behçet, 2019). To clear the doubts about the diagnosis; *C. caroli-henricana* samples (Fig. 5) collected from Van were sent to Kit Tan and their identification confirmed.

Characteristics of *C. caroli-henricana* (flower color rose-pink; verticulates 5-7; plant height 4-7 cm, smaller leaf sizes); we found that the samples belonging to the genus *Clinopodium* L. that we collected in 2022 (from Bingöl) differed from their characteristics. In the *Clinopodium* samples collected from Bingöl; flower colors are bluish white, light blue,

bluish, pinkish white (not rose pink); verticillaster numbers 5-11 (not 5-7); plant heights vary between 7-20 cm (not 4-7 cm). Considering that the samples were different from *C. caroli-henricana* with the specified characteristics, it was thought that it might be a taxon whose distribution is unknown in Turkey. It was determined that these specimens were *Clinopodium debile* (Bunge) Kuntze [synonym: *Calamintha debilis* (Bunge.) Benth.] with the help of keys and descriptions in the corresponding volume of the Lamiaceae family of the Russian flora (Borisova, 1977).

The number of members of the genus *Clinopodium* in Türkiye, revised by Leblebici (1982) in the 7th volume of the flora of Turkey, was given as 3 taxa (1 species and 2 subspecies). But later, when some members of Lamiaceae were transferred to *Clinopodium* (Govaerts 1999, Harley and Granda 2000, Ryding 2005, Bräuchler et al. 2006), the number of members of this genus in Türkiye increased to 31 (14 species, 17 subspecies) in studies published by researchers such as Dirmenci (2012).

The number of *Clinopodium* taxa in Türkiye has reached 32 with this new record, which was defined as *Clinopodium debile* with the help of keys and definitions in the 21st volume of the Flora of Russia (the volume containing the Lamiaceae members). In this study, with an emphasis on the definition, photographs and chorology of *C. debile*; a contribution has been made to the flora of Türkiye.

MATERIAL and METHODS

Clinopodium debile specimens (Figure 1-4) were collected from the parts of the oak forest close to the stream in the north-northeast of Yolçatı Village, 15 km west of the city center of Bingöl. Initial attempts to name them using the Flora of Turkey (Davis & Leblebici, 1982; Leblebici, 1982; Davis et al., 1988; Güner et al., 2000) were not successful. Eventually, using the account in Flora Russian (Borisova, 1977), the specimens were identified as *Calamintha debilis* (Bunge) Benth (now this name is a synonym for *Clinopodium debile*). The herbarium specimens of *Clinopodium debile* are deposited at the herbarium of Bingöl University. The description below is based on the Turkish specimens and varies in some respect from that in Flora USSR (quod vide).

RESULTS and DISCUSSION

Clinopodium debile (Bunge) Kuntze. First published in Revis. Gen. Pl. 2: 515 (1891). Govaerts, R. (1999). World Checklist of Seed Plants 3(1, 2a & 2b): 1-1532. MIM, Deurne. (Figure, 1-6)

Syn: *Calammintha debilis* (Bunge) Benth. in DC. Prodr. XII (1848) 232; Ldb. Fi. Ross. Ill, 352; Kryl. Fl. Alt. IV, 1014. - *Thymus debilis* Bunge. in Ldb. Fl. alt. II (1830) 391. - *Satureja debilis* Briq. in Pflanzenfam. IV, 3a, 3b (1897) 302; Kryl. Fl. Zap. Sib. IX, 2378. - *S. annua* (Schrenk) B. Fedtsch. Rast. Turk. (1915) 682. - *Melissa debilis* Benth. Lab. Gen. et sp. (1832-1836) 391. - *Calamintha annua* Schrenk in Bull. Acad. Sc. Petersb. X (1842) 353 et Enum. pi. nov. 2 (1842) 26; Ldb. Fl. Ross. Ill, 351; O. and B. Fedch. Perech. rast. Turk. V, 130; Benth. in DC. Prodr. XII, 227. - *C. caucasica* Somm. et Lev. in Nuov, Giorn. Bot. Ital. (1897) 207; Tr. Bot. sada, XVI, 386. - Ic: Ldb. Ic. pi. fl. Ross. V, tab. 438. - Exs.: PI. or. exs. No. 218.

Description: Annual. **Stems** simple or branched, weak, ascending or erect, 7—20 cm high, densely glandular and sparsely eglandular hairy, 4-angled. **Leaves** flat, attenuating into (3—)5—15 mm petioles (sometimes nearly equaling the blade), lamina 10—20 x 4—15 mm, ovate, oblong-ovate, broadly acute,, glabrous or with sparse short glandular and eglandular hairs, glandular- punctate, dark green, glaucescent, margines sparsely and shallowy denticulate or entire and sparsely ciliate, entire at the base. **Verticillasters** 5—11(—12), usually remote below ± congested above and 2—10(—12)-flowered, axillary, dichotomously branched, on peduncles about half the length of leaves. **Peduncles** and **pedicels** eglandular or glandular puberulent, slender, shorter or longer than calyx, 4—7 mm long. **Bracts** small, lanceolate, setiform, acute, glandular hairy. C**alyx** bilabiate, drooping, 5—7 mm long, tubular, with sparse hairs on the nerves outside, with sparse exserted setiform hairs in throat, prominently nerved; upper lip of calyx with 3 broadly lanceolate, aristate, spreading ciliate, reflexed teeth; lower lip 2-toothed, the teeth lanceolate, subulately point-tipped, somewhat longer than the upper; calyx-tube slightly longer than the limb, slightly gibbous at base. **Corolla** small, about as long as calyx, sometimes silaghtly longer or shorter, whitish, bluish white, light blue, pinkish white; 2-lipped, tube gradually dilated; upper lip emarginate, straight; lower lip reflexed, 3-lobed, middle lobe longer than lateral lobes. **Stamens** not exceeding the calyx; anthers of the interior stamens abortive. **Style** shorter than corolla, complanate or 2-cleft at apex, scabrid above; **Nutlets** oblong-ovoid, rounded, 0.5—1 mm long, naked, brown, blackish brown.

Flowering: May-June

Fruiting: June-August

Distribution: Afghanistan, Altay, Iran, Kazakhstan, Kirgizstan, North Caucasus, Tadzhikistan, Transcaucasus, Uzbekistan, West Siberia, Xinjiang and Türkiye (Borisova, 1977; POWO, 2022) (Figure 4).

Type: in Leningrad (LE).

Specimens examined: ***Clinopodium debile***: Türkiye, B8 square: Bingöl, Yolçatı village, moist sections of the oak forest, 3-5.km north-northeast of Yolçatı Village, close to the stream, oak shadows, 1200-1300 m, 11.06.2022, *L.Behçet & İrfan Altınsoy* 615; ibid. 25.06.2022, *L. Behçet & İrfan Altınsoy* 765.

Figure 1.A and B- A view from the original habitat of *Clinopodium debile* (during flowering), C- Indumentum view of the stem of *Clinopodium debile*

Şekil 1. A ve B- Clinopodium debile'nin orijinal habitatından iki görünüm (çiçeklenme dönemi), C- Clinopodium debile gövdesinin tüy örtüsü görünümü

Figure 2. A view from the original habitat of *Clinopodium debile* (in the fruiting period).

Şekil 2. Clinopodium debile'nin original habitatından bir görünüm (meyve dönemi).

Figure 3. A- View of a scanned specimen of *Clinopodium debile,* B- A view of scanned specimens of *Clinopodium debile*.

Şekil 3. A- Clinopodium debile'nin scan edilmiş tek örneğinin görünümü, B- Clinopodium debile'nin scan edilmiş örneklerinin görünümü.

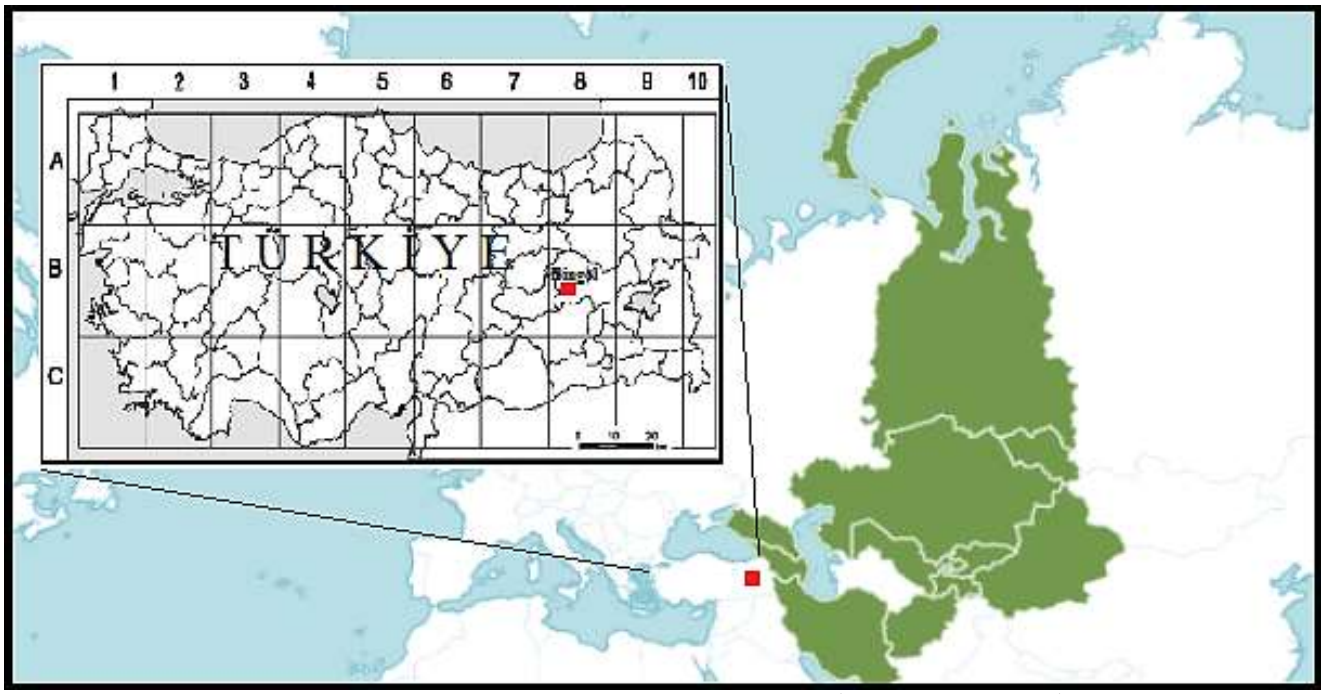

Figure 4. Distribution of ***Clinopodium debile*** in World and Türkiye (from POWO 2022).

Şekil 4. ***Clinopodium debile****'nin dünya ve Türkiye'deki yayılışı (POWO 2022'den).*

Clinopodium caroli-henricana: Türkiye, B9 square: Van, Hoşap, Between Zernek Dam and Hoşap (Güzelsu) town, humid rocky - stony slopes, 38º 20'819" N 043º 45'040" E, 1850 m, 30 vi 2007, *İ Demir* 595 (VANF).

Ecology: Specimens of this taxon; it was collected for the first time in Turkey from the oak forest area to the north-northeast of Yolçatı Village, west of the city center of Bingöl. *Quercus petraea* (Matt.) Liebl. subsp. *pinnatiloba* (K.Koch) Menitsky, the dominant member of the oak forest in which the new record plant is distributed, accompanies the second-degree *Q. libani* G.Olivier. The habitat of this plant, which was collected on 11.06.2022 from the moist parts of the forest close to the stream beds; is 1200—1300 m above sea level. In addition to the oak taxa mentioned where *C. debile* develops, there are rare distributions of plants such as *Cotoneaster nummularius* Fisch.&C.A.Mey., *Crataegus azarolus* L. var*. ponticus* (K.Koch) K.I.Chr., *C. orientalis* Pall. ex M.Bieb. subsp.*orientalis, Lonicera nummulariifolia* Jaub.

&Spach and *Sorbus torminalis* (L.) Krantz., in the form of trees or shrubs. The important herbaceous taxa growing in the habitats where *C. debile* is distributed are as follows; *Achillea millefolium L.* subsp. *millefolium*, *Elymus panormitanus* (Parl.) Tzvelev, *Juncus bufonius* L., *Milium vernale* M. Bieb., *Minuartia hybrida* (Vill.) Schischk., *Ranunculus arvensis* L., *Trifolium campestre* Schreb., *T. nigrescens* Viv. subsp. *petrisavii* (Clementi) Holmboe, *T. phleoides* Willd., *Veronica arvensis* L., *V. bozakmanii* M.A. Fisch.

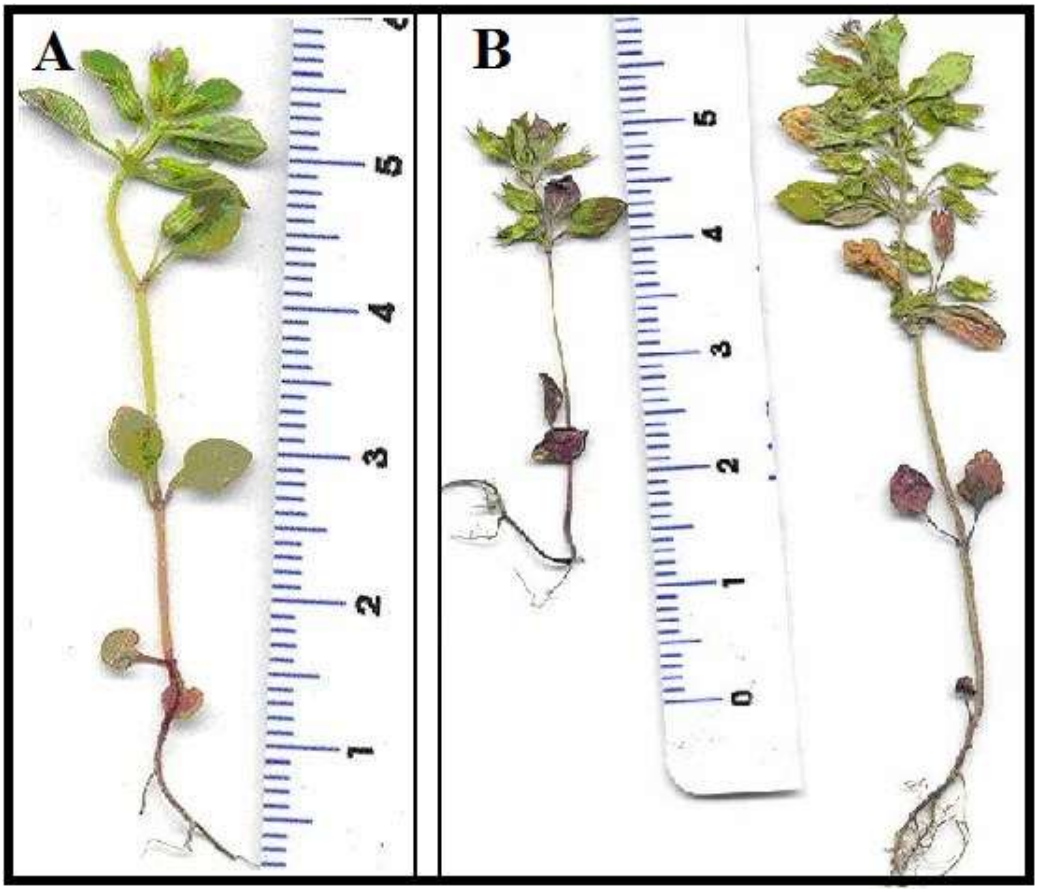

Figure 5. Figure1.Views of scanned *Clinopodium caroli-henricana* (KitTan & Sorger) Govaerts (Syn: *Calamintha caroli-henricana* Kit Tan & Sorger): A- Fresh sample B- Dry samples

Şekil 5. *Clinopodium caroli-henricana (KitTan & Sorger) Govaerts'in taranmış görüntüleri (Sinonim: Calamintha caroli-henricana Kit Tan & Sorger): A- Taze numune B- Kuru numuneler*

CONCLUSION

The number of species included in the genus *Clinopodium* exceeds 100 and most of these species are distributed in the New World and temperate Eurasia. Few members of this genus have distributions in Africa, tropical Asia and Indomalesia (Harley et al., 2004). The number of taxa belonging to this genus in Türkiye has reached 32 with this record. The distribution of *C. debile*, which is known to be distributed in many countries (Afghanistan, Altay, Iran, Kazakhstan, Kirgizstan, North Caucasus, Tadzhikistan, Transcaucasus, Uzbekistan, West Siberia, Xinjiang) in the east of Türkiye (Figure 4) is not a surprise. Especially; considering the distribution and development of this plant in forest areas, it is expected to be found in forest areas with similar ecology in Türkiye.

In Bingöl and its surroundings, where there is insufficient information about its flora, new taxa for the scientific world in recent years (Behçet et al., 2017, 2019; Behçet & Yapar, 2020, 2021; Hamzaoğlu et al., 2020; İlçim & Behçet, 2016; Doğan et al., 2015; Sinan et al., 2021), a new record for Türkiye (Pınar et al., 2018) and, interesting distribution of a lost endemic taxon (Behçet & Yapar, 2019).have been published. Such studies and publications also show that there is more work to be done on plant diversity in Bingöl and Türkiye.

C. debile which is annual (Figure 1-3,6) ; it is similar to *C. caroli-henricana*, which is endemic to Türkiye, with its general appearance and calyx features, which is known to be distributed among the moist forestless rocks formed by lava flows in the Eastern Anatolian region of Türkiye (Figure 5).

However, *C. debile* samples; with features such as corolla color (bluish white, light blue, bluish, pinkish white), leaf color (dark green), longer peduncle, vertisillaster numbers (between 5—11), and plant height (7—20 cm) (much more difference is given in the description of *C. debile* given above) differs from *C.*

caroli-henricana. One of the important differences is that while the *C. caroli-henricana*, develops among bare moist lava flows, *C. debile* develops more in forest areas. Some prominent differences in characteristics of *C. debile* and *C. caroli-henricana* are shown in Table 1.

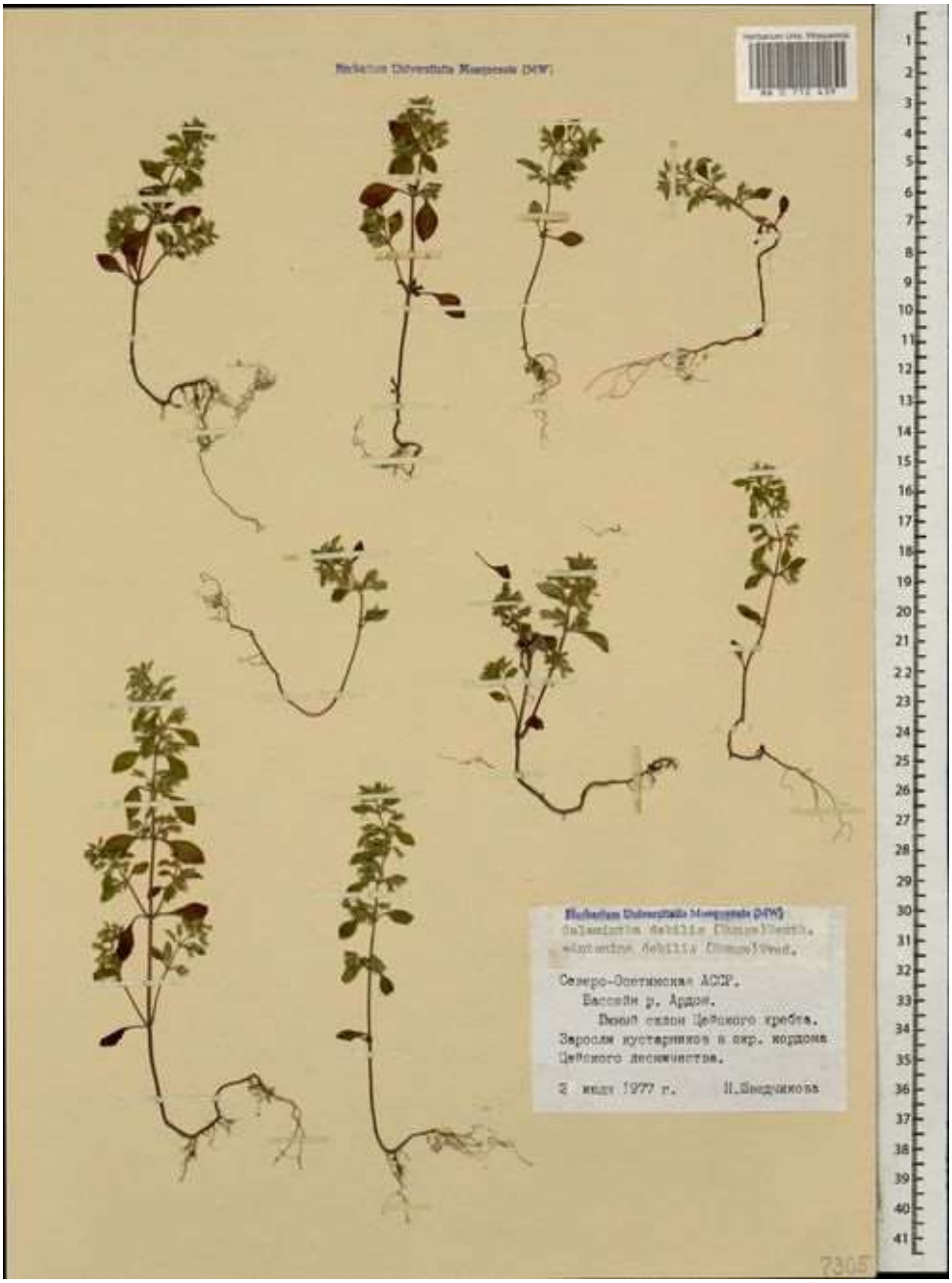

Figure 6. Photographs of *Clinopodium debile* samples in Moscow University Herbarium (MW0712439) (Seregin, 2022).
Şekil 6. Moscow University Herbarium (MW0712439)'undaki Clinopodium debile örnekleri (Seregin, 2022).

Table 1. Comparison of some characteristics of *Clinopodium debile* and *C. caroli-henricana.*
Çizelge 1. Clinopodium debile ile *C.caroli-henricana*'nın bazı özelliklerinin karşılaştırılması

Characters	*C.debile*	*C. caroli-henricana*
Stem	7—20 cm, densely glandular and sparsely eglandular hairy (Figure 1c)	4—7 cm, eglandular and glandular puberulent
Leaves	lamina 10—20 x 4—15 mm and with (3) 5—15 mm petiole	8—14 x 5—8mm, with 2—4 mm petiole
Verticilaster	5—11(—12), with 2—10(—12) flower	5—7, with 2—6 flower
Calyx	5—7 x 1.5—2 mm	4.5—5.5 x 1—1.5mm
Corolla	5—7.5 mm long, as long as calyx, sometimes silaghtly longer or shorter, whitish, bluish white, light blue, pinkish white	4 mm, included in calyx, rose-pink
Habitat	Moist canopy of the oak forest	moist rocky slopes in unforested lava flow fields

Statement of Conflict of Interest

Authors have declared no conflict of interest.

Author's Contributions

The contribution of the authors is equal.

REFERENCES

Behçet, L. & İlçim, A. (2015). *Paracaryum bingoelianum* (Boraginaceae), a New Species from Turkey. *Turkish Journal of Botany 39* (2), 334-340.

Behçet, L. & Yapar, Y. (2021). *Bromus orientalis* (Poaceae: B. sect. Bromopsis), a New Species from Turkey. *Nordic Journal of Botany 39*(4),1-7.

Behçet, L. & Yapar, Y. (2020). *Lactuca anatolica* (Asteraceae: Lactucinae), a New Species from Eastern Anatolia (Turkey). *Phytotaxa 455*(4), 287-294.

Behçet, L. & Yapar, Y. (2019). Rediscovery of the lost endemic *Micromeria cymuligera* (Lamiaceae) in Eastern Anatolia-Turkey. *Nordic Journal of Botany 37*(10), 1-6.

Behçet, L., İlçim, A. & Yapar, Y. (2017). *Centaurea bingoelensis* (Asteraceae), a New Species from Turkey. *Turkish Journal of Botany 41*,180-188.

Borisova, A. G. (1977). *Calamintha* Lam. In: Shishkin, B. K. (ed.) Flora of the USSR. Vol. 21 (Translated from Russian): Israel Program for Scientific Translation, Jerusalem, 307-311.

Bräuchler, C., Meimberg, H. & Heubl, G. (2006). New names in Old World *Clinopodium* – the transfer of the species of *Micromeria* sect. *Pseudomelissa* to *Clinopodium. Taxon 55*, 977–981.

Davis, P. H. & Leblebici, E. (1982). *Calamintha* Miller In: Davis, P. H. (ed.) Flora of Turkey and the east aegean islands, vol: 7, Edinburgh Univ. Press, Edinburgh, 323–329.

Davis, P. H., Tan, K &, Mill, R. R. (eds) (1988). *Flora of Turkey and the East Aegean Islands, vol: 10 (suppl. 1)*, Edinburgh University Press, Edinburgh.

Dirmenci, T. (2012). *Clinopodium* L. In: Güner, A., Aslan, S., Ekim, T., Vural, M. & Babaç, M. T(eds.) *Türkiye bitkileri listesi (Damarlı bitkiler)*. İstanbul: Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını, 550-553.

Doğan, M., Behçet, L. & Sinan, A. (2015). *Pseudophleum anatolicum*, a New Endemic Species of *Pseudophleum* (Poaceae) from East Anatolia, Turkey. *Systematic Botany 40*(2), 454-460.

Duran, A., Behçet, L. & Öztürk, M. (2015). *Diplotaenia bingolensis* (Apiaceae), New Species from East Anatolia, Turkey. *Plant Syst Evol 301*, 467–478.

Govaerts, R. (1999). *World checklist of seed plants — the species*, vol 3(1). — Book & Media Publ., Antwerp.

Güner, A., Özhatay, N., Ekim, T. & Başer, K. H. C. (eds.) (2000). *Flora of Turkey and the East Aegean Islands, vol.11.* Edinburgh Univ. Press, Edinburgh.

Hamzaoğlu, E., Behçet, L. & Yapar, Y. (2020). A New Suffruticose Taxon of *Dianthus* (Caryophyllaceae) from Bingöl, Turkey. *KSÜ Tarım ve Doğa Dergisi 23*(6), 1529-1534.

Harley, R. M. & Granda, A. P. (2000). List of species of Tropical American *Clinopodium* (Labiatae), with new combinations. *Kew Bull 55*, 917–927.

Harley, R. M., Atkins, S., Budantsev, A., Cantino, P. D., Conn, B., Grayer, R. J, Harley, M. M., De Kok, R., Krestovskaja, T., Morales, A., Paton, A. J., Ryding, O. & Upson, T. (2004). Labiatae. — In: Kadereit, J. W. (ed.), *The families and genera of vascular plants, vol. 6* (Lamiales): Springer Verlag, Berlin, 241–242.

İlçim, A., & Behçet, L. (2016). *Astragalus topalanense* (Fabaceae), a New Species from Turkey. *Turkish Journal of Botany 40*, 74-80.

Leblebici, E. (1982). *Clinopodium* L. In: Davis, P. H. (ed.) *Flora of Turkey and the east aegean islands, vol: 7*, Edinburgh Univ. Press, Edinburgh, 329–331.

Pınar, S. M., Fidan, M., Behçet, L. & Eroğlu, H. (2018). A New Record for The Flora of Turkey: Onopordum cinereum Grossh. (Asteraceae). *Erzincan University Journal of Science and Technology 11*(1), 85.

POWO. (2022). Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet: http://www.plantsofthe Worldonline. org/ (Access: 04.08.2022).

Ryding, O. (2005) Revision of the *Clinopodium abyssinicum* group (Labiatae). *Botanical Journal of the Linnean Society 150*, 391–408.

Seregin, A. (2022). Moscow University Herbarium (MW). Version 1.245. Lomonosov Moscow State University. Occurrence dataset https://doi.org/ 10.15468/cpnhcc accessed via GBIF.org on 2022-08-12. https://www.gbif.org/ occurrence/1697829920

Sinan, A., Behçet, L. & Yapar, Y. (2021). *Ranunculus solhanensis* (Ranunculaceae), a New Species from Eastern Turkey. *Phytotaxa 497*(2), 157-164.