

Lamiaceae in Turkey: Additional taxa 2000-2019

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Abstract

The diversity of vascular plants of Turkey was documented in the Flora of Turkey and the Eastern Aegean Islands edited by Prof. Peter H. Davis and published in nine volumes between 1965 and 1985. The identification of additional taxa has necessitated the publication of the supplementary volumes to the Flora of Turkey volume 10 in 1988, and the second supplemental volume, vol. 11 edited by Turkish scientists published in 2000. Lamiaceae is cited in Flora of Turkey vol. 7 as 523 species, with 2 monotypic genera: *Dorystaechas hastata* Boiss. & Heldr. ex Benth. and *Pentapleura subulifera* Hand.-Mazz. and endemism percentage is 43.60. In the supplementary volumes: 20 species are added to vol. 10 (1988) and 31 more species are added to the vol. 11 (2000). In this present study, after publication of vol.11 additional taxa to the Flora of Turkey are given in a systematic order since the year 2000. In eighteen years the number of additional taxa is 78 of which 53 are new taxa for science and 25 of them is new record for Turkish flora. During this period two genera, *Lophanthus* Adans. and *Perilla* L. are added. As a result the Lamiaceae in Turkey is represented by 653 species and endemism percentage increased to 47.62 according to recent publications.

Keywords

Additional taxa, flora of Turkey, Lamiaceae.

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INTRODUCTION

Turkey, a large peninsula with a land surface of 779.452 km², is bordered by three seas and extends across both Europe and Asia. The total area of Turkey-in-Europe (Trakya/Turkish Thrace) lying to the north of the Dardanelles and Bosphorus) is 23.500 km². Lying between 36' N and 42' N, Turkey boats three different climates: continental, oceanic and mediterranean.

Turkey falls within three distinctive phytogeographical regions that tie in closely with the three climatic zones, and these are the keys for understanding the floristic richness of Turkey. I. Euro-Siberian Phytogeographical Region: This region extends across North Anatolia immediately south of the Black Sea coast from Yıldız Mountains at the Bulgarian border, to Georgia. Within Turkey, the Euro-Siberian region is largely represented by the Euxine sub-region. II. Mediterranean Phytogeographical Region: This phytogeographical region covers western and southern Turkey with all Turkish Mediterranean vegetation belonging to the East Mediterranean

province. Maquis, phrygana and garrigue scrub communities typify much of the vegetation at below 1000 m., with a notable abundance of both bulbous and annual therephyte species. III. Irano – Turanian Phytogeographical Region: This region occupying Central and East Anatolia in the largest of the three phytogeographical regions in Turkey (Byfield *et al.*, 2010).

Lamiaceae, the sixth largest Angiosperm family, contains more than 245 genera and 7886 species, and distributed worldwide. It includes many economically and medicinally important species (The Plant List, 2013).

Phytogeographic distribution of Lamiaceae taxa in Turkey: According to Celep & Dirmenci (2017), 287 taxa (36.7%) are in the Irano-Turanian phytogeographic region, 293 taxa (37.4%) are in the Mediterranean phytogeographic region, 90 taxa (11.5%) are in the Euro-Siberian phytogeographic region and 112 taxa (14.3%) are unknown or multiregional element in Turkey.

MATERIALS AND METHODS

After the 11th volume (2000), the checklists entitled “Check-list of additional taxa to the supplement flora of Turkey”

have been published in a series paper by Ozhatay *et al.*, as Checklist III, IV, V, VI, VII, VIII and IX (Ozhatay and Kultur,

2006; Ozhatay *et al.*, 2009; 2011; 2013; 2015; 2017; 2019). This study is mainly based on these checklists and also recently published paper of Celep & Dirmenci (2017).

In this study, since 2000 after publication vol. 11 additional taxa to the flora of

Turkey are examined in a systematic view. Only taxa or species which are known from the mainland of Turkey (Anatolia/Asian part of Turkey & Thrace region/European part of Turkey) are included.

RESULTS

In eighteen years the number of additional taxa is 78 of which 53 are new taxa for science and 25 of them is new record for Turkish flora. During this period two genera, *Lophanthus turcicus* Dirmenci, Yıldız & Hedge from Van province and

Perilla frutescens (L.) Britton from Artvin province, it is naturalized species are added (Dirmenci *et al.*, 2010, Donmez 2002).

78 additional taxa of Lamiaceae family are listed below, arranged in an alphabetical order.

New taxa for science (53 taxa) (in alphabetical order):

Ballota antalyanse F. Tezcan & H. Duman, Türkiye Bitkileri Listesi p. 896 (2012). [Güner (ed.), 2012]

Calamintha pamphylica Boiss. et Heldr. in Diagn. Ser. 1 (12) 52 (1853) subsp. *alanyense* S.Alan et Ocağ in Ann. Bot. Fennici 44:309 (2007). [Alan et al., 2007]

Clinopodium hakkaricum Dirmenci & Fırat in Ann. Bot. Fenn. 46: 452 (2009). [Fırat & Dirmenci, 2009]

Clinopodium serpyllifolium (M.Bieb.) Kuntze subsp. *sirnakense* Fırat & Akçiçek in Phytotaxa 201(2): 132 (2015). [Fırat et al. 2015]

Lamium artvinense Yıldırımılı in Ot Sist. Bot. Dergisi, 19(1): 26 (2012). [Yıldırımılı, 2012a]

Lamium bilgili Celep in Phytotaxa 312 (2): 264 (2017) [Celep 2017].

Lophanthus turcicus Dirmenci, Yıldız & Hedge in Turk. J. Bot. 34: 125 (2010). [Dirmenci et al., 2010]

Marrubium amasiense Akgül & Ketenoğlu in Ot Sist. Bot. Dergisi 24(2): 39 (2017) [Akgül et al. 2017]

Marrubium cephalanthum Boiss. & Noë subsp. *montanum* Akgül & Ketenoğlu in Ot Sist. Bot. Dergisi 21(1): 23 (2014) [Akgül and Ketenoğlu 2014]

Marrubium lanatum Akgül in Ot Sist. Bot. Dergisi 25(2): 25 (2018). [Akgül, 2018]

- Marrubium sivasense* Aytaç, Akgül & Ekici in Turk J Bot 36: 444 (2012). [Aytaç et al., 2012]
- Marrubium yıldırımlii* Akgül & B. Selvi in Ot Sist. Bot. Dergisi 21(2):17 (2014) [Akgül and Selvi 2014]
- Micromeria aybala* H. Duman & T. Dirmenci in Turk J Bot 41: 385 (2017). [Duman & Dirmenci, 2017]
- Micromeria maritima* Yıldırımli, Sadıkoğlu et Keskin in Ot Sist. Bot. Dergisi 13: 29 (2006). [Yıldırımli et al., 2006]
- Nepeta dirmencii* Yıldırımli & M.Dinç in Ot Sist. Bot. Dergisi 10(1): 4 (2004). [Yıldırımli et al., 2004]
- Nepeta sibthorpii* Benth. subsp. *tumeniana* T.Dirmenci in Bot. J. Linn. Soc. 147: 229 (2005). [Dirmenci, 2005]
- Origanum* × *adae* Dirmenci & Yazıcı in Turk J Bot 42: 80 (2018). (*Origanum ayliniae* Dirmenci & Yazıcı × *Origanum sipyleum* L.) [Dirmenci et al. 2018b]
- Origanum* × *malyeri* Dirmenci & Yazıcı in Phytotaxa 371 (3): 148 (2018) (*Origanum vulgare* L. subsp. *hirtum* (Link) A. Terracc. × *Origanum boissieri* Ietsw.) [Dirmenci et al. 2018a].
- Origanum* × *sevcaniae* Dirmenci, Arabacı & Yazıcı in Phytotaxa 371 (3): 150 (2018) (*Origanum vulgare* L. subsp. *hirtum* (Link) A. Terracc. × *Origanum vogelii* Greuter & Burdet) [Dirmenci et al. 2018a].
- Origanum ayliniae* Dirmenci & Yazıcı in Turk J Bot 42: 78 (2018). [Dirmenci et al. 2018b]
- Phlomis dinci* Yıld. in Ot Sist. Bot. Dergisi 13: 3 (2006) [Yıldırımli, 2006]
- Phlomis isiliae* Yıld. in Ot Sist. Bot. Dergisi 13:3 (2006) [Yıldırımli, 2006]
- Phlomis* × *ekimii* M.Y.Dadandı & H.Duman in Ann. Bot. Fennici 40(4): 287 (2003). (*Phlomis bruguieri* Desf. × *Phlomis capitata* Boiss.). [Dadandı & Duman, 2003]
- Phlomis* × *vuralii* Dadandı in The Karaca Arboretum Magazine 7(2): 60 (2003). (*Phlomis bourgaei* Boiss. × *Phlomis chimerae* Boissieu). [Dadandı, 2003]
- Salvia anatolica* Hamzaoğlu et A.Duran in Ann. Bot. Fennici 42: 216 (2005) [Hamzaoğlu et al., 2005]
- Salvia brachyantha* (Bordz.) Pobed. subsp. *tankutiana* Bagherpour, Celep, Kahraman & Doğan in Turk J Bot 35: 345 (2011). [Bagherpour et al., 2011]
- Salvia cadmica* Boiss. var. *bozkiriensis* Celep, Kahraman & Doğan in Pl. Ecol. Evol. 144 (1): 113 (2011). [Celep et al., 2011]
- Salvia ekimiana* Celep & Doğan in Ann. Bot. Fenn. 47: 63 (2010). [Celep & Doğan, 2010]
- Salvia ertekinii* Yıld. in Ot Sist. Bot. Dergisi 15(1): 5 (2008). [Yıldırımli & Ertekin, 2008]

- Salvia hasankeyfense* Dirmenci, Celep & O. Guner in Phytotaxa 227 (3): 290 (2015). [Celep et al. 2015]
- Salvia hedgeana* Dönmez in Botanical Journal of the Linnean Society, 137(4): 413 (2001). [Dönmez, 2001]
- Salvia marashica* İlcim, Celep & Doğan in Ann. Bot. Fenn. 46: 76 (2009). [İlcim et al., 2009]
- Salvia sericeotomentosa* Rechinger f. var. *hatayica* Celep & Doğan, in Novon 19: 432 (2009). [Celep et al., 2009a]
- Salvia siirtica* Kahraman, Celep & Doğan, in Nord J Bot 29: 397 (2011). [Kahraman et al., 2011]
- Scutellaria anatolica* M. Cicek & O. Ketenoglu in Ann. Bot. Fenn. 48: 277 (2011) [Çiçek & Ketenoğlu, 2011]
- Scutellaria* × *ketenoglui* M. Çiçek & Yaprak in Phytotaxa 29: 51 (2011). (*Scutellaria tortumensis* (Kit Tan & Sorger) A. P. Khokhr. × *Scutellaria sosnowskyi* Takht. subsp. *sosnowskyi*). [Çiçek & Yaprak, 2011]
- Scutellaria yildirimlii* M. Çiçek & Yaprak in Phytotaxa 132 (1): 54 (2013). [Çiçek & Yaprak, 2013]
- Stachys cretica* L. subsp. *kutahyensis* Akçiçek in Turk J Bot, 34: 132 (2010). [Akçiçek, 2010]
- Stachys gaziantepensis* M. Dinç & S. Doğu in Proc. Natl. Acad. Sci. İndia, Sect. B Biol. Sci. 86: 631. [Dinç and Doğu 2016]
- Stachys hakkariensis* Akçiçek & Fırat in Phytotaxa 257(2): 168 (2016). [Akçiçek et al. 2016]
- Stachys ketenoglui* Kaynak, Daşkın & Yılmaz, in Nord. J. Bot. 27: 238 (2009). [Daşkın et al., 2009]
- Stachys marashica* İlcim, Cenet & Dadandı in Ann. Bot. Fenn. 45: 151 (2008). [İlcim et al., 2008]
- Stachys namazdagensis* Yıld., in Ot Sist. Bot. Dergisi 17(2): 85 (2010). [Yıldırım, 2010]
- Stachys pseudobombycina* Kaynak, Daşkın & Yılmaz in Nord. J. Bot. 28: 341 (2010). [Yılmaz et al., 2010]
- Stachys vuralii* Yıldız, Dirmenci & Akçiçek in Ann. Bot. Fenn 48: 403 (2011). [Dirmenci et al., 2011]
- Stachys yildirimlii* M.Dinç in Ann. Bot. Fennici 43: 143 (2006) [Dinç & Doğan, 2006]
- Teucrium aladagense* Vural & H.Duman in Turk J Bot 39: 319 (2015). [Vural et al. 2015]
- Teucrium microphyllum* Desf. in Ann. Mus. Par. x. 300 (1807). [Greuter & Raus, 2006]

Teucrium pruinosum Boiss. var. *aksarayense* M. Dinç & S. Doğu in Modern Phytomorphology 9: 15 (2016). [Dinç and Doğu 2016]

Teucrium pseudaroanium Parolly, Erdağ et Nordt in Willdenowia 37: 252 (2007). [Parolly & Eren, 2007]

Teucrium sirnakense Özcan & Dirmenci in Turk J Bot 39: 312 (2015). [Özcan et al. 2015]

Thymus ekimi Yıldırımli in Ot Sist. Bot. Dergisi, 19(2): 30 (2012). [Yıldırımli, 2012b]

Thymus turkmenii Yıldırımli in Ot Sist. Bot. Dergisi, 19(1): 30 (2012). [Yıldırımli, 2012a]

New records for Flora of Turkey (25 taxa) (in alphabetical order):

Lamium garganicum L. subsp. *striatum* (Sm.) Hayek in Prodr. Fl. Balc. 2: 275 (1929). [Tuzlacı & Bulut, 2012]

Marrubium eriocephalum Seybold in Stuttgarter Beitr. Naturk., A 310: 25 (1978) [Fırat 2016]

Mentha × *villosa-nervata* Opiz in Nomencl. Bot. 60 (1831). (*M. longifolia* (L.) Hudson × *M. spicata* L.) [Tarımcılar & Kaynak, 1997]

Micromeria persica Boiss. in Diagn. Pl. Or. Nov. Ser. 1, 7: 48 (1846) [Keskin & Sadıkoğlu, 2007]

Perilla frutescens (L.) Britton in Mem. Torrey Bot. Club 5: 277 (1894). [Dönmez, 2002]

Phlomis × *praetervis* Rech. f. Öst. Bot. Zeitschr. 89: 296 (1940). (*Phlomis bruguieri* Desf. × *Phlomis kurdica* Rech. f.), [Kaya & Ertekin, 2012]

Salvia aristata Aucher ex Benth. in DC. Prodr. 12: 270 (1848). [Behcet & Avlamaz, 2009]

Salvia macrosiphon Boiss Diagn. Pl. Or. Nov. Ser. 1, 5: 11 (1844). [Kahraman et al., 2009]

Salvia sylvestris L. in Sp. Pl. 24 (1753). [Greuter & Rous, 2002]

Salvia viscosa Jacq. in Misc. 2: 328 (1781). [Celep et al., 2009b]

Satureja avromanica Maroofi in Iranian J. Bot. 16: 79 (2010). [Fırat 2015]

Satureja icarica P.H. Davis in Notes R.B.G. Edinb. 38: 51 (1980). [Tümen et al., 2000]

Satureja pilosa Velen. in Sitzungsber. Konigl. Bohm. Ges. Wiss. Prag, Math.-Naturwiss. cl. 899(40): 6 (1899). [Tümen et al., 2000]

Stachys cretica L. subsp. *cretica* in Sp. Pl. 2: 581 (1753). [Akçiçek et al., 2012].

Stachys cretica L. subsp. *salviifolia* (Ten.) Rech.f. in Ann. Naturhist. Mus. Wien 48: 170 (1937). [Akçiçek et al., 2012].

Stachys megalodonta Hausskn. & Bornm. ex P.H.Davis subsp. *megalodonta* in Notes Roy. Bot. Gard. Edinburgh 21: 46 (1951). [Güner and Akçiçek 2015]

Stachys thracica Davidov in in Spisan. B'lghar. Akad. Nauk. xii. 109 (1915). [Akçiçek et al., 2012].

- Stachys tymphaea* Hausskn. in Mitt. Bot. Ver. Jena v. 70 (1887). [Akçiçek et al., 2012].
- Teucrium chasmophyticum* Rech.f. in Pl. Syst. Evol. 134: 287 (1980) [Dönmez, 2006]
- Teucrium krymense* Juz. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 14: 19 (1951). [Ocakverdi, 1986]
- Teucrium melissoides* Boiss. & Hausskn. ex Boiss. in Flora Orientalis 4: 813 (1879). [Dönmez et al., 2010]
- Ziziphora clinopodioides* Lam. subsp. *elbursensis* (Rech.f.) Rech.f. in Fl. Iranica 150: 487 (1982) [Firat 2017]
- Ziziphora clinopodioides* Lam. subsp. *filicaulis* (Rech.f.) Rech.f. in Fl. Iranica 150: 486 (1982) [Firat 2017]
- Ziziphora clinopodioides* Lam. subsp. *kurdica* (Rech.f.) Rech.f. in Fl. Iranica 150: 487 (1982) [Firat 2017]
- Ziziphora clinopodioides* Lam. subsp. *rigida* (Boiss.) Rech.f. in Fl. Iranica 150: 483 (1982) [Firat 2017]

DISCUSSION AND CONCLUSION

The results proven that Turkey is one of the centers of diversity for Lamiaceae in the Old World. In addition, Turkey has about 10% of all Lamiaceae members in the World. The largest five genera in the country based on the taxon number are *Stachys* (118 taxa), *Salvia* (107 taxa), *Sideritis* (54 taxa), *Phlomis* (53 taxa) and *Teucrium* (49 taxa). According to taxon number, five genera with the highest

endemism ratio are *Dorystaechas* (1 taxon, 100%), *Lophantus* (1 taxon, 100%), *Sideritis* (54 taxa, 74%), *Drymosiphon* (9 taxa, 67%), and *Marrubium* (27 taxa, 63%).

In this review, we have updated the latest taxonomic status of genera and species in the family for Turkish Lamiaceae members.

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