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A New Taxon of Stachys (Lamiaceae) from Bingöl - Türkiye

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ABSTRACT
Stachys woronowii (Schisk. ex Gross.) R.R.Mill subsp. *bingolensis*, which has been collected from Genç district (Bingöl-Türkiye), has been defined as a new subspecies on behalf of the scientific world. This subspecies; differs from typical subspecies in plant height, verticillate number and spacing, and seed characteristics. *Stachys woronowii* (Schisk. ex Gross.) R.R.Mill subsp. *bingolensis* grows on steppe slopes in the oak forest openings. Description, photographs and general ecological preferences of the newly identified taxon are given.

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Bingöl (Türkiye)'den Yeni Bir Stachys (Lamiaceae) Taksonu

ÖZET
Genç (Bingöl-Türkiye) ilçesinden toplanan *Stachys woronowii* (Schisk. ex Gross.) R.R.Mill subsp. *bingolensis*, bilim dünyası adına yeni bir alttür olarak tanımlandı. Bu alt tür; bitki boyu, vertisillat sayısı ve aralığı ve tohum özellikleri bakımından tip alt türden farklıdır. *Stachys woronowii* subsp. *bingolensis* meşe açıklıklarındaki step yamaçlarda yetişir. Yeni olarak tanımlanan alttürün betimlemesi, ekolojik tercihleri ve fotoğrafları verildi.

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INTRODUCTION

The genus *Stachys* is one of the largest genera of the Lamiaceae family with 362 species in the world (POWO, 2023). Although the distribution of some taxa of this genus is in Europe, North and South America; the majority of members of the genus are native to the warm temperature regions of the Mediterranean and southwestern Asia. The genus members consisting of annual, perennial grasses and subshrubs form taxa; they grow in different habitats such as steppe, forest openings, rocky places, limestone, fallow fields, meadows and stream banks (Bhattacharjee, 1980).

In Türkiye, the genus *Stachys* is represented by 95 species (122 taxa), 65 of which are endemic, and the distribution of a significant part of these taxa is in the Mediterranean floristic region of Türkiye (Güner, 2022).

The province of Bingöl is located in the transition zone from the Eastern Anatolia Region of Türkiye to the Southeastern Anatolia Region. In the northern areas of Bingöl, the winter season is much more continental and cold, and the vegetation period is shorter; the south of this province is the areas that extend towards the Syrian deserts and have more summer drought. Bingöl is in a transition zone between these two contrasting climates. In the last 10 years, several plant taxa new for the scientific world (Behçet et al., 2017; Behçet & Yapar, 2020, 2021; Hamzaoğlu et al., 2020;

İlçim & Behçet, 2016; Doğan et al., 2015; Sinan et al., 2021) were published from Bingöl. In addition, new distribution records for Türkiye (Pınar et al., 2018; Behçet & Altınsoy, 2023; Behçet & Cengiz 2023a and 2023b) and some interesting taxa (Behçet & Yapar, 2019; Doğan & Behçet 2021) were determined.

In May 2023, the second author collected some interesting *Stacyhs* samples (Figure 1) from Genç district, which is located within the provincial borders of Bingöl and located in the transition zone between the Eastern Anatolia region and the Southeastern Anatolia region. Although these collected annual *Stachys* samples are similar to *S. woronowii* (Schisk. ex Gross.) R.R.Mill (Syn*: Sideritis woronowii* Schischk. ex Grossh., *Sideritis balansae* Boiss. and *Stachys pseudosideritis* R.Bhattacharjee & Hub.-Mor.) it was different from it with some features (Verticillaster numbers, longer lower internodes, longer plant height and robust structure and nutlet sizes and structure). *S. worowii* is an annual species (Figure 2) known to spread from Iran, Lebanon-Syria, Transcaucasus and Türkiye. *Stachys* specimens collected from Bingöl were compared with the *S. woronowii* based on the descriptions in the flora works of Türkiye (Bhattacharjee 1982), Russia (Knorrring 1977) and Iran (Rechinger 1982), and holotype images from herbarium G and the photograph taken by L. Behçet in 2023 among the rocks in the northwest of Elazığ (Figure 2); *Stachys woronowii* subsp. *bingolensis* has been identified as a new subspecies.

Figure 1. Habit of *Stachys woronowii* subsp. *bingolensis*
Şekil 1. Stachys woronowii subsp. *bingolensis'in habitusu*

MATERIALS and METHODS

Specimens belonging to *S. woronowii* subsp. *bingolensis* defined were collected from Genç district of Bingöl Province in Türkiye. In addition to the relevant literature (Bhattacharjee, 1982; Knorrring, 1977; Rechinger, 1982), samples from the herbaria BIN, GAZI, ANK, L, Max Nydegger and G were also used in the identification and evaluation of the specimens belonging to the subspecies.

RESULTS and DISCUSSION

Stachys woronowii (Schischk. ex Grossh.) R.R.Mill. subsp. *bingolensis* Behçet and Çetin, *subsp. nov.*

Type: Türkiye. B8 Bingöl: Genç district, west of Servi

town, around Harmancik village, 38° 33'541" K - 40° 15'595" D, openings of oak communities, cliffs-steppe areas, 1038 m a.s.l., 17.05.2023, *A. Çetin* 2711 (holo. BIN, iso. ANK, BIN) (Figures 1,3,4).

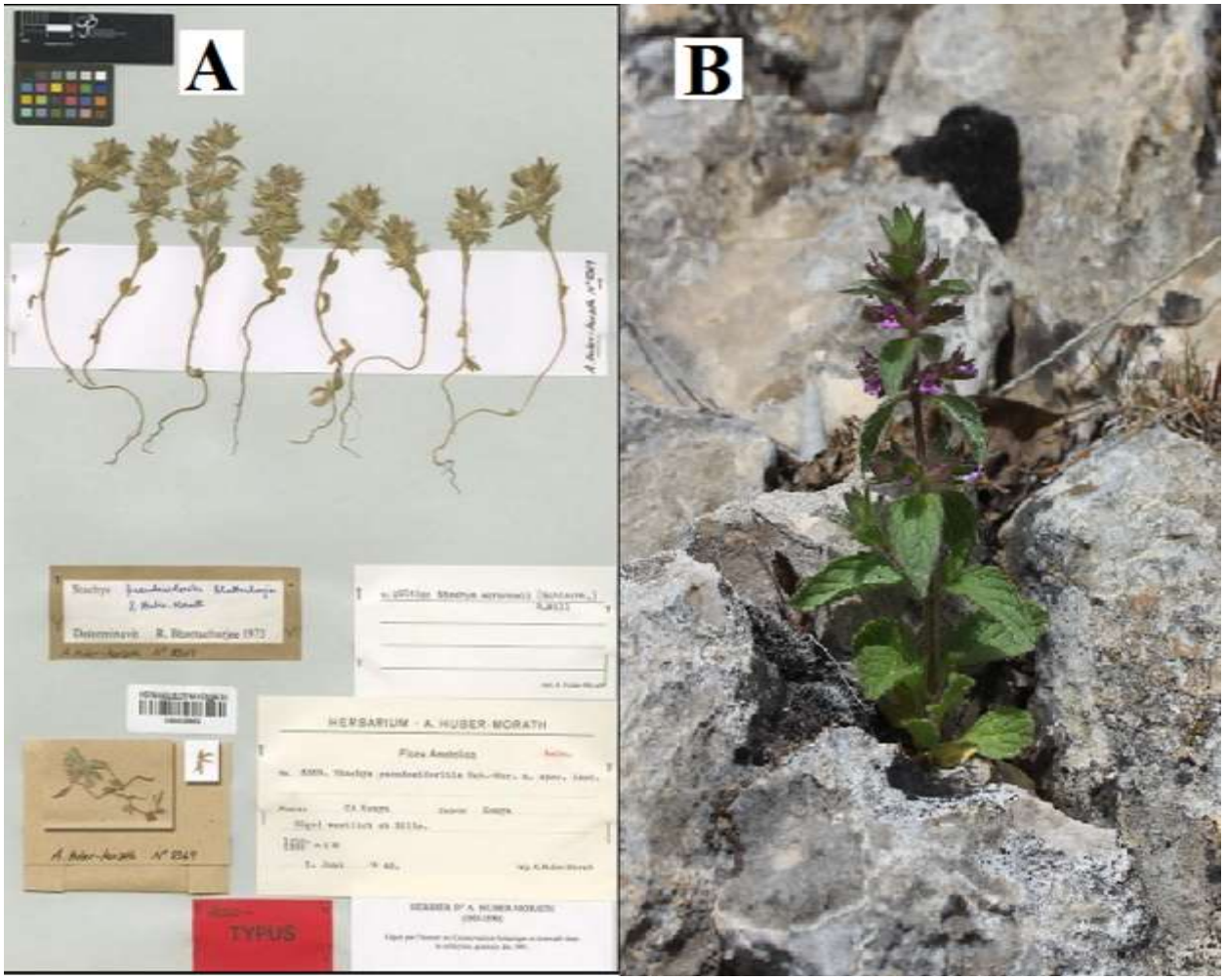

Figure 2. A. The image of *Stachys woronowii* holotype in Geneva Herbarium (G) (from JSTOR 2023), B. View of *Stachys woronowii* (subsp. *woronowii)* in its original habitat (Photo by L. Behçet)

Şekil 2. A. Cenevre Herbaryumundaki (G) Stachys woronowii holotipi'nin görünümü, B. Stachys woronowii (subsp. woronowii)'nin orjinal habitatındaki görünümü (fotoğraf L. Behçet)

Diagnosis: *Stachys woronowii* subsp. *bingolensis* differs from *Stachys woronowii* (subsp. *woronowii*)mainly because it has a plant height of 32 cm (not 2-24 cm); Verticillasters number up to 11 (not 2-8); lower verticillasters distance from each other to 37 mm (not 5-20 mm); nutlets 2 × 1.6 mm, smoth (not 1-1.5 × 1.2-1.5 mm and rugose).

Description: Annual herb, pale green, robust, divaricately branched or simple, 12-32 cm, densely glandular patent-pilose. Lower cauline and median leaves broadly obovate to elliptic, 20-35 × 8-16 mm, serrate, apex obtuse to broadly acute, base attenuate into 2-5 mm petiole. Floral leaves short-petioled to sessile, oblong to obovate, 15-25 × 5-10 mm. Vertici1lasters 8-11, lower ones distinctly remote, congested above, spicate, 5-37 mm apart, lower internodes far longer than the calyx length; (4-)6-flowered, Bracteoles linear to linear-lanceolate, herbaceous, softly spinescent, 6-7 mm, pilose. Pedicels 2-4 mm. Calyx deflexed, bilabiate, subcampanulate, 9-12 mm, base gibbous, constricted in upper part; calyx-teeth as long as or slightly shorter than tube, erect or spreading, tube strongly nerved, patent pilose; teeth unequal, erect, ovate-lanceolate mucronate, upper and lower teeth 3.5-4 and 5-5.5 mm respectively; abruptly attenuate to 1-1.5 mm mucro. Corolla pink, 8-10 mm, almost included. Stamens little exserted from corolla tube. Nutlets obovoid, 2 × 1.6 mm, smoth. Fl. 4-5; Fr.5-6. Oak forest scrub clearings, rocky limestone ridges, slopes, 1000-1100 m.

Ecology: *Stachys woronowii* subsp. *bingolensis* is a local endemic taxon which is distributed around Harmancık village within the borders of Genç district in the south and southwest of Bingöl Province in eastern Türkiye (Figure 4).

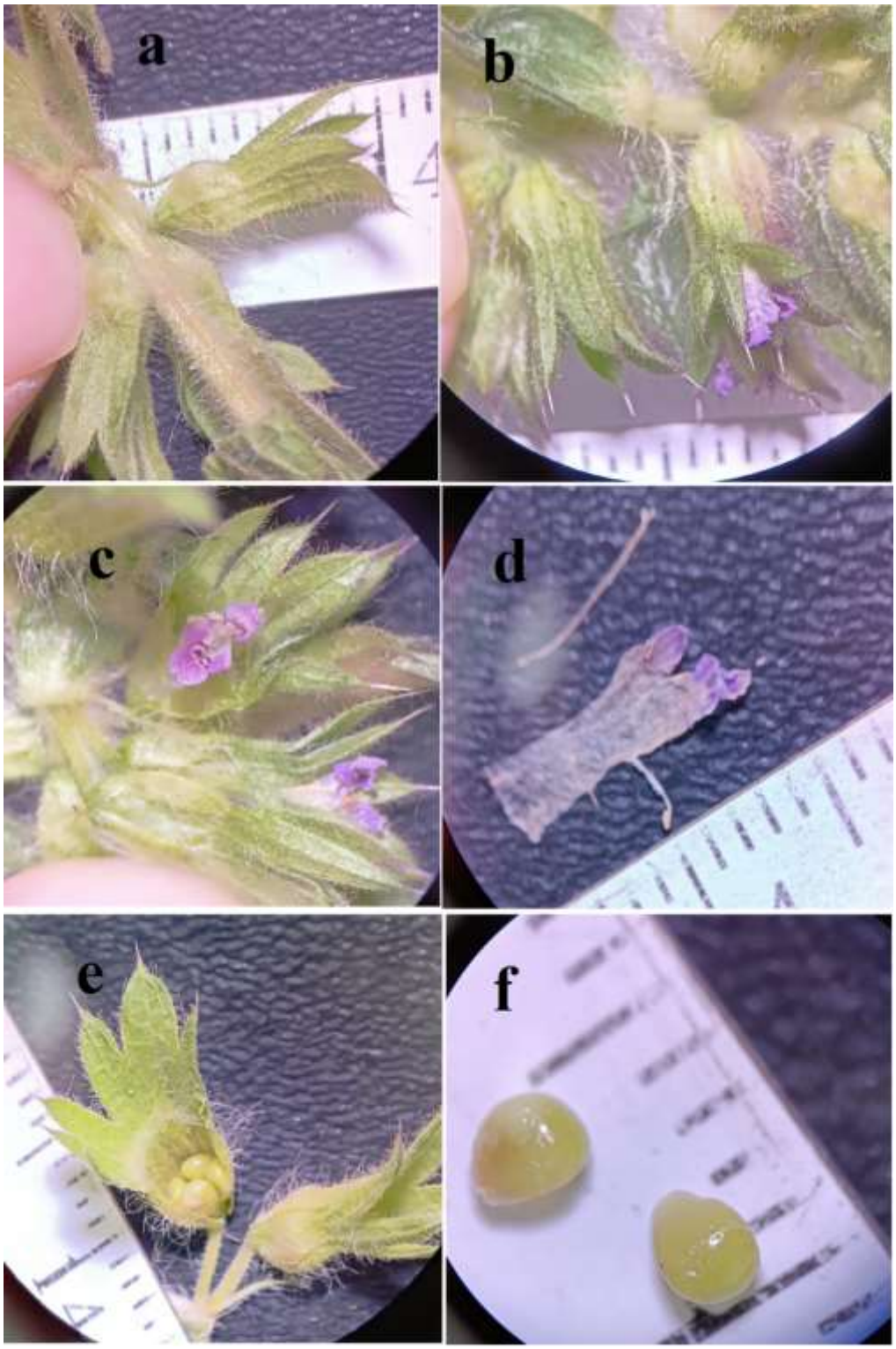

Figure 3. Stachys woronowii subsp. *bingolensis.* (a) Calyx, (b) Image of calyces in verticillasters, (c) Image of corolla shorter than calyx, (d) Style and dissected corolla, (e) The appearance of nutlets inside the calyx, (f) Nutlet structure.

Şekil 3. Stachys woronowii subsp. bingolensis. (a) Kaliks (b) Vertisillattaki kaliks görüntüsü (c) Kaliksten kısa olan korolla görünümü (d) Sitilus (boyuncuk) ve korollanın boyuna kesit görünümü(e) kaliks içindeki nutletlerin görünümü (f) Nutlet yapı ve boyut görünümü.

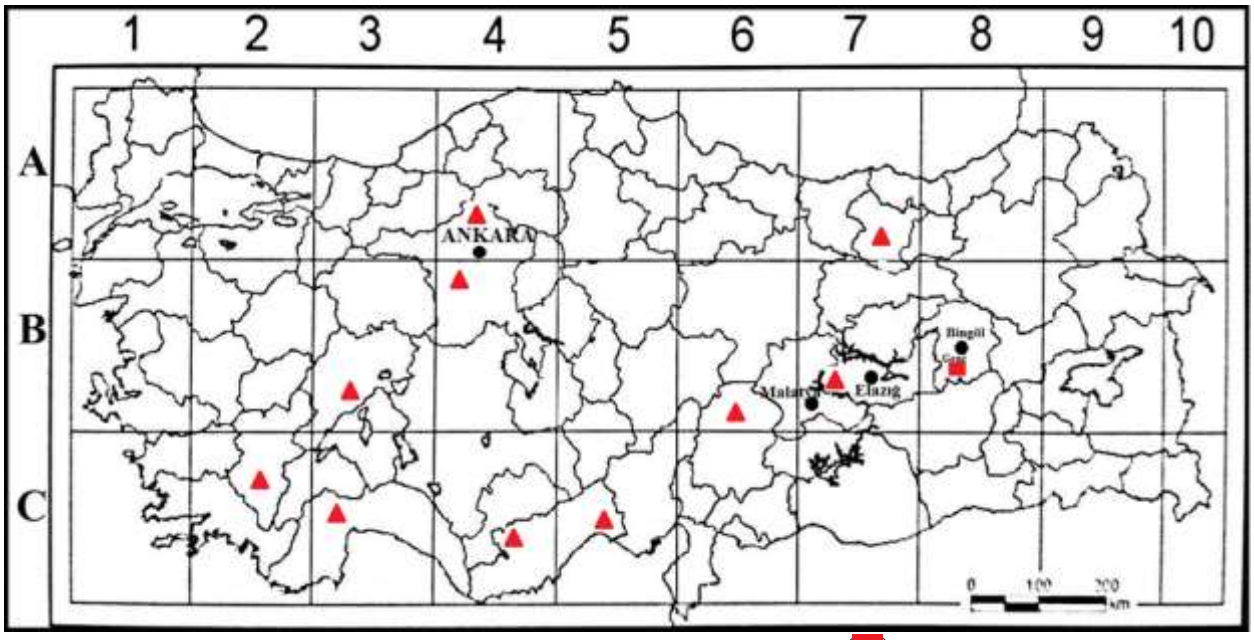

Figure 4. Distribution map of *Stachys woronowii* subsp. *bingolensis* (■) and *Stachys woronowii* subsp. *woronowii* (▲) in Türkiye

Şekil 4. Stachys woronowii subsp. bingolensiss (■) ve subsp. woronowii (▲)'nin Türkiye'deki dağılış haritası

It prefers rocky slopes in oak clearings and grows at altitudes of 1000-1100 m. Other important taxa accompanying the subspecies in the area where it is distributed are: *Adiantum capillus-veneris* L., *Antitoxicum tmoleum* (Boiss.) Pobed. *Bromus scoparius* L. *B. tectorum* L., *Campanula reuteriana* Boiss. & Balansa, *Cota coelopoda* (Boiss.) Boiss., *Crepis foetida* subsp. *rhoeadifolia* (M.Bieb.) Čelak., *Crepis alpina* L., *Dactylis glomerata* subsp. *hispanica* (Roth) Nyman, *Marrubium parviflorum* Fisch. & C.A.Mey. *Nepeta italica* L. *Polypogon viridis* (Gouan) Breistr., *Stachys annua* (L.) L., *Umbilicus luteus* (Huds.) Webb & Berthel, *Veronica orientalis* Mill. subsp. *orientalis, V. triloba* Opiz, *Vulpia ciliata* Dumort subsp. *ciliata*

In the 7th volume of the Flora of Turkey and the East Aegean Islands; *Stachys woronowii* is reported to be close to *Stachy obscura* Boiss. & Ball. in Sect Sideritopsis Bhattacharlee and differs from it with attenuate-based obovate leaves, linear-lanceolate bracts, short included corollas and deflexed calyx (Bhattacharjee 1980). *Stachys woronowii*, which grows on rocky slopes, plains and forest-bush environments; it is distributed in Iran, Lebanon-Syria, Transcaucasus and Türkiye. Specimens collected from Genç district are close to annual *Stacys woronowii* with their features (especially with its deflexed calyx structure) (Figure 2, 3).

Although there are many similarities between *Stachys woronowii* subsp. *woronowii* and *Stachys woronowii* subsp. *bingolensis*, there are also some important morphological differences, the most important of which are the high number of verticillasters (8-11), lower verticillasters being distinctly distant (to 37 mm), lower internodes far longer than the calyx length, nutlets larger and their surfaces are smooth (Table 1).

Table 1. Diagnostic characters between *Stachys woronowii* subsp. *bingolensis* and *Stachys woronowii* (subsp. *woronowii*).

Çizelge 1. *Stachys woronowii* subsp. *bingolensis* ve *Stachys woronowii* (subsp. *woronowii*) arasındaki ayırt edici karakterler

Characters / Karakterler	Stachys woronowii subsp. bingolensis	Stachys woronowii (subsp. woronowii)
Habit/Bitki	12-32 cm long, robust	2-24 cm long, slender
Verticillasters/Vertisillatlar	8-11, lower verticillasters distinctly remote, up to 3.7 cm apart and far longer than the calyx length, upper verticillasters approximate, 0.3-10 mm apart	2-8, verticillasters usually congested, 0.5-2 cm apart, usually the internodes shorter than calyx;
Nutlets/ Nutletler	2 × 1.6 mm, smooth	1-1.5 × 1-1.5 mm, rugose

While the distribution of *Stachys woronowii* subsp. *woronowii* is not found in the areas further east of Türkiye's A7 and B7 squares; distribution of *S. woronowii* subsp. *bingolensis* in B8 square was determined (Figure 4).

The number of taxa increased to 121 with this new subspecies of the genus *Stachys*, which is represented by 93 species and 120 taxa (endemism rate 53.3%) in Türkiye.

Additional Specimens: *Stacyhs woronowii* (subsp. *woronowii*): Türkiye, B7 Elazığ: northwest of Baskil district, east of İçlikaval village, rocky-steppe areas to the north of the irrigation dam, 1500-1600 m, 05.05.2022, *L.Behçet* 20701(BIN); ibid.,14.07.2022, *L.Behçet* 20830 (BIN); ibid, the rocky slopes between the villages of Odabaşı and Tavşanuşağı, 1400-1500 m, 12.05.2023 *L.Behçet* 20929 (BIN and Figure 2B); Türkiye, C4 Konya: Hügel westlich ob Sille, 1250-1300 m, 5.June 1948, *A.Huber.-Morath* 8369 (G; E−Photo!) (Holotypus); Türkiye, Tunceli: 7 km SW of Pertek, near the bridge the over, in the road Murat, in the road Elazığ-Erzurum), stony, glassy slope near the river, 1200 m, 28.05.1959 *E.HENNIPMAN, P.NIJHOFF, C.SWENNEN, AS.TULP, WJM.VADER, WJJO. DE WILDE* 1551 (L; E−Photo!); Türkiye, B6 Maraş: Elbistan-Darende 30. km, serpentine rocky-steppe areas, 1600 m, 09.07.1981, Herbarium Max Nydegger Flora Anatolica 16752 (E−Photo! Although it is identified as *Stachys pseudosideritis* Bhattacharjee & Hub.-Mor., which is the synonym of *Stachys woronowii*; it resembles *Stachys ramosissima* Montbret & Aucher ex Benth. in that the specimen's corolla length significantly exceeds the calyx length and the calyces are erect (not deflexed).)

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Author's Contributions

The contribution of the authors is equal.

Statement of Conflict of Interest

Authors have declared no conflict of interest.

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