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## Threatened Categories of Four *Nepeta* L. (*Lamiaceae*) Species Endemic to the East Anatolia

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**Abstract:** Four *Nepeta* L. species endemic to East Anatolia, *Nepeta baytopii* Hedge & Lamond, *N. crinita* Montbret & Aucher ex Bentham, *N. obtusirena* Boiss. & Kotschy ex Hedge and *N. sorgerae* Hedge & Lamond, are examined. The areas of these species are quite limited.

According to "The Red Book of Turkey" the threatened categories of these species are *N. baytopii*, EN; *N. crinita*, EN; *N. obtusirena*, LR(cd) and *N. sorgerae*, Lr(cd).

**Key Words:** *Nepeta*, threat categories, endemism

### Doğu Anadolu'ya Özgü, Dört *Nepeta* L. (*Lamiaceae*) Türünün Tehlike Kategorileri

**Özet:** Doğu Anadolu'da yetişen ve endemik olan dört *Nepeta* L. türünün; *Nepeta baytopii* Hedge & Lamond, *N. crinita* Montbret & Aucher ex Bentham, *N. obtusirena* Boiss. & Kotschy ex Hedge ve *N. sorgerae* Hedge & Lamond doğadaki durumları incelenmiştir. Bu türlerin yayılış alanları oldukça sınırlıdır.

"Türkiye Bitkileri Kırmızı Kitabı"na göre buldukları tehlike kategorileri şöyledir; *Nepeta baytopii*, EN; *N. crinita*, EN; *N. obtusirena*, LR(cd) ve *N. sorgerae*, LR(cd).

**Anahtar Sözcükler:** *Nepeta*, tehlike kategorisi, endemizm

### Introduction

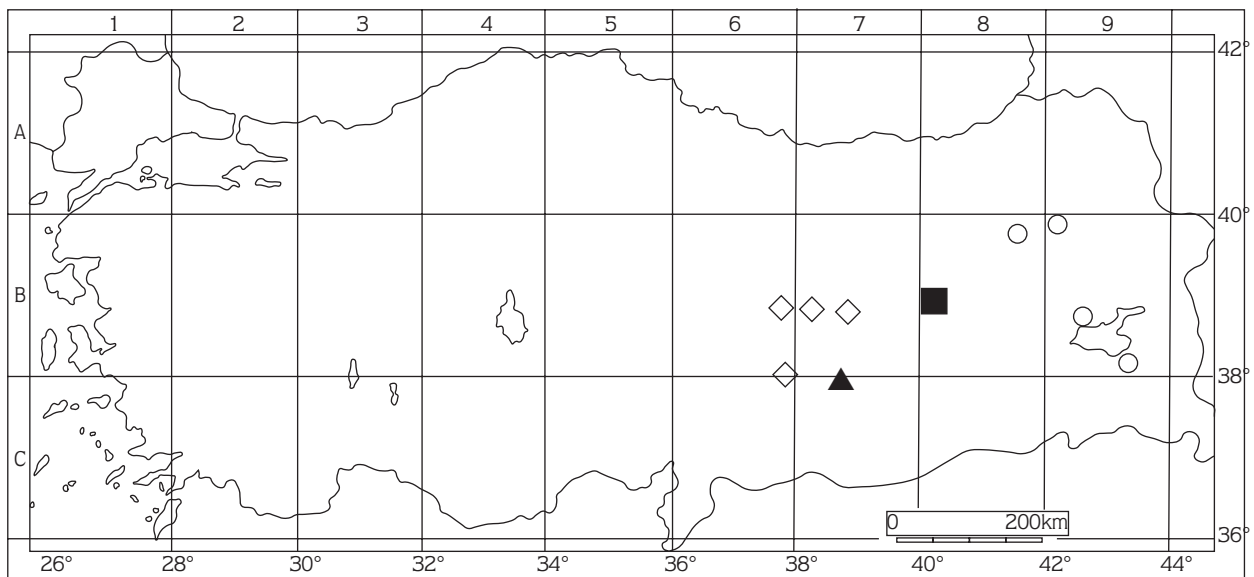
*Lamiaceae* is well-known world family. The multi-regional genus *Nepeta* L. contains approximately 250 species distributed mainly in South-West and Central Asia, Europe, Africa and North America and is one of the largest genera in the family (Hedge, 1986). The 40 *Nepeta* taxa growing in Turkey can be divided into 2 groups: Mediterranean (13 taxa) and Irano-Turanian (21 taxa). The Irano-Turanian taxa are found in the Central, South-east and East Anatolia, whereas the Mediterranean taxa grow mainly in the Mediterranean, Marmara and Aegean regions. The other taxa are widely distributed throughout Turkey. Eighteen taxa out of the 40 are endemic to Anatolia (12 taxa are Mediterranean and 6 are Irano-Turanian), and some of them are very local and

endangered (Davis, 1982; Güner et al., 2000; Aytaç et al., 1996; Budantsev, 1991).

In recent years, some studies have been carried out on the endemic plants of Turkey, and these are classified according to IUCN categories (Ekim et al., 2000).

### Materials and Methods

As the materials of this study 4 *Nepeta* species (*N. baytopii* Hedge & Lamond, *N. crinita* Montbret & Aucher ex Bentham, *N. obtusirena* Boiss. & Kotschy ex Hedge, *N. sorgerae* Hedge & Lammond) were chosen. The specimens were obtained from East Anatolia between 1999 and 2002 (Figure 1). The specimens were collected at the flowering and fruiting stages during field studies.

Figure 1. Distribution map of four *Nepeta* species.

■ *N. baytopii* Hedge & Lamond ◇ *N. crinita* Montbret & Aucher ex Bentham ○ *N. obtusicrena* Boiss. & Kotschy ex Hedge ▲ *N. Sorgerae* Hedge & Lamond

Colour photos and slides were taken and the population densities of the species were examined. The species descriptions were developed based on the new materials collected from the areas. The specimens are kept in the Balıkesir University Herbarium.

## Results

Various data have been obtained from field studies concerned with *Nepeta* over the last 3 years. These studies showed that the populations of some local endemics have declined rapidly due to over-grazing, erosion, competition, habitat destruction and land clearance. For these reasons, the IUCN categories of some endemics should be changed (IUCN, 2001).

### *N. baytopii* Hedge & Lamond (Figure 2)

Perennial, stems arcuate ascending, 25-70 cm, shortly and retrorsely pilose with scattered longer spreading hairs and sessile glands. Leaves ovate-triangular, 1.5-3 x 0.8-2.4 cm, crenate, pilose and shortly pilose with longer hairs on veins and numerous sessile glands beneath; upper pairs remote and much smaller. Petiole c. 3 cm, verticillasters distant below (1-2), conferted into terminal heads above. Bracteoles linear-lanceolate, 7-12 mm, attenuate-aristate at apex, membranous. Calyx ± tubular, 11-13.5 mm, straight or

± curved, mouth oblique, teeth oblong-ovate to narrowly triangular, acuminate-aristate, ± membranous, lower lip cleft, with short antrorse hairs on veins, lilac-tinged. Corolla lilac, 21-25 mm, tube straight or slightly curved, long exerted from calyx teeth, pilose throughout, hairs on lips longer than those on tube, with many sessile glands. Nutlets oblong, trigonous, smooth, c 2.5 x 1.2 mm. Flowering: July

### Distribution

B8 Diyarbakır: Diyarbakır to Bingöl, 25 vii 1970, T.Baytop ISTE 18250!

B8 Diyarbakır: 50 km from Bingöl to Diyarbakır, 1200 m, 16.07.2001, T.Dirmenci 1432!

At present, *N. baytopii* is known only from the type locality. In field studies performed between Diyarbakır and Bingöl, no specimens were found except for the locus classicus. Although this species was included in the EN category, according to field observations a total of 1000 individuals are growing in this habitat. The area is near the main road and subjected to grazing. For all these reasons it should be inserted into the CR category.

### *Nepeta crinita* Montbret & Aucher ex Bentham (Figure 3)

Perennial; stems erect or ascending, 35-70 cm, branched or unbranched, very finely eglandular pilose.



Figure 2. *N. baytopii* Hedge & Lamond; Habitus, flowers and verticillasters.



Figure 3. *N. crinita* Montbret & Aucher ex Bentham; Habitus, flowers and verticillasters.

Leaves ovate, 1-4 x 0.8-3, thickish in texture, crenate, cordate, finely pilose with very short hairs; lower leaves petiole c. 2 cm, upper leaves 0-2 mm. Verticillasters many-flowered, shortly pedunculate, distant below, approximating and sub-conferted above. Bracteoles filiform, subulate, finely strigulose, c. 7-12 mm. Calyx narrowly tubular, purplish, 9.5-11(-13) mm, straight, mouth suboblique, strigulose with very short eglandular hairs and sessile glands, teeth unequal, finely filiform, aristate, 4-7 mm. Corolla purplish, 11-14.5(-15) mm,

tube narrow, curved, shorter than/equal to calyx teeth. Nutlets oblong, c. 2 x 1 mm, tuberculate. Flowering: July. Habitat: rocky slopes, mountain steppe, 1450-1800 m.

#### Distribution

B7 Malatya: Kube Dağı, Malatya to Pötürge, 1680 m, Hub-Mor. 9121; B7 Malatya: Kube Dağı, Malatya to Pötürge 32. km. 1800 m. 14.07.2000, T.Dirmenci 11011; C6: Malatya: Doğanşehir, Erkenek, Alıçlı, rocky slopes, 1450 m, 28.07. 1987. E.Aktoklu, 0851aI.

### Status

*N. crinita* is endemic to Malatya province. The type locality was wrongly given as Elazığ. Akdağ is not located in Elazığ province, but in the south of Malatya. Detailed studies were performed but the species was not found outside Malatya province.

According to field observations, the populations of *N. crinita* are well adapted to their habitats and the plants grow vigorously with healthy seeds. Vigorous individuals and seeds provide advantages for the future of the species.

It might be considered that the population of *N. crinita* will increase and that it should be put in the "VU" (vulnerable) category. But *N. crinita* is found only in areas totalling 1000-3000 m<sup>2</sup> and its 1000-1500 individuals and its habitats are subjected to erosion, overgrazing, competition etc. The population will decrease by 50% in the next 10 years or so. For this reason, the species should be placed in the "EN" (endangered) category according to IUCN rules.

***Nepeta obtusirena* Boiss. & Kotschy ex Hedge (Figure 4)**

Perennial; stems ascending, few or many-branched, 40-70 cm, glabrescent to pilose or scabridulous, with or without glandular papillae or sessile glands. Leaves ovate-triangular to broadly triangular, 0.9-4 x 0.9-3 cm, truncate to cordate, crenate-dentate, ± puberulous with glandular papillae and sessile glands. Inflorescence

verticillate, verticillasters crowded at apex or not, lowermost cymes pedunculate, often c. 1-2 cm, sometimes to 4 cm, flowers congested. Bracteoles elliptic to linear-lanceolate, 3.5-7 x 0.5-1 mm. Calyx tubular, straight or slightly curved, 7-9 mm, with triangular to oblong, acuminate teeth, 1.5-2 mm, mouth oblique, lower lip cleft, pilose and shortly scabridulous, with glandular papillae and many sessile glands. Corolla ± lavender blue, 12-16 mm, tube somewhat curved, exerted from calyx teeth. Nutlets oblong, oblong-trigonous, ± smooth, c. 2 x 1 mm. Flowering: July, August. Habitat: steppe, volcanic banks, 1800-2250 m.

### Distribution

B8 Erzurum: Abdurrahman Gazi, 17.07.2001, T.Dirmenci 1442a! & F.Satlı; B9 Bitlis: Tatvan to Ahlat, nr Söğüt, 2000 m, D. 24609; ob. cit 18.07.2001, T.Dirmenci 1442!; B9 Bitlis: 3. km from Tatvan to Nemrut Mountain 1800 m, 17.07.2000, B.Yıldız & T.Dirmenci 1114!; B9 Bitlis: Tatvan, Nemrut Mountain, in crater, 2250 m, 17.07.2000, B.Yıldız & T.Dirmenci 1105!; B9 Erzurum: from Horasan to Karaorgan, 1850 m, 21.07.2000, B.Yıldız & T. Dirmenci 1135!.

### Status

*N. obtusirena* now is known from 3 different localities. The locus classicus of the species is Siirt-Müküs (Bahçesaray). No specimens were found at the type locality. This may be due to the unclear type locality given in the original description or to the species becoming



Figure 4. *N. obtusirena* Boiss. & Kotschy ex Hedge; Habitus, flowers and verticillasters.

extinct in this area.

The species was also collected from 2 new localities during the field studies (T.Dirmenci 1442a!; T. Dirmenci 1135!). In addition, it was observed that individuals of *N. obtusirena* are healthy and growing abundantly on Nemrut Mountain (Bitlis) between 1800 and 2250 m. The existence of the species in 2 somewhat distant localities leads us to believe that this species is more widespread than is thought. This means that there is no risk to *N. obtusirena* in the near future. Although this species was included in the LR(cd) category, according to our observations it should be placed into the LR(lc) category.

#### *N. sorgerae* Hedge & Lamond (Figure 5)

Perennial; stems ascending-erect, branched or unbranched, 25-60 cm, densely glandular villous, with long and short glandular hairs and glandular papillae. Leaves ovate, sometimes broadly ovate, c. (1.2-)1.5-4 x (0.6-)1.2-3.8 cm, darkish green, densely glandular villous with long and short hairs, crenate-serrate, subcordate to cordate, lower leaves with petioles c. 1 cm, upper leaves sessile and  $\pm$  adpressed to stem. Verticillasters clearly distant below,  $\pm$  approximating above, verticillasters many-flowered. Bracteoles linear-lanceolate, 6-9.5 x 0.5-1.2 mm. Calyx broadly tubular, 9-11 mm, straight or slightly curved, mouth markedly oblique from a deep anterior split, densely glandular villous, in mouth scarcely pilose and minutely papillose,

teeth unequal 3-4.5 mm, incl. c. 1.5 mm mucros in lower lip. Corolla pale purple, pinkish to purple spotted in lower lip, 10-13.5 mm, tube slender, curved, stamens purplish. Nutlets, broadly oblong, rounded, trigonous c. 2 x 1 tuberculate, black. Flowering: July. Habitat: rocky slopes, mountain steppe, 2100-2300 m.

#### Distribution

C7 Adiyaman: Nemrut Dađı, 2100-2300 m, Ehrend. et al. 787-60. loc. cit. 20.07.2000, B.Yıldız 14905 & T.Dirmenci!

#### Status

*N. sorgerae* was included in the LR(cd) (conservation dependent) categories in "The Red Book of Turkey". *N. sorgerae* is endemic to Nemrut Mountain (Adiyaman) and grows in an area of only 2000 m<sup>2</sup> around the tumulus. Approximately 500-1000 individuals survive in the area. A huge tumulus and statues stand on Nemrut mountain, which is visited by many people every year. Since *N. sorgerae* grows near the tumulus and pathways, visitors cause extensive damage to the habitat and individuals.

During the field studies, it was observed that some individuals had been crushed by visitors. With its small growing area, the scarcity of individuals in the population and the destruction in its habitat, *N. sorgerae* will become extinct in the near future. For all these reasons the species should be placed into the "CR" (critically endangered) category.



Figure 5. *N. sorgerae* Hedge & Lamond; Habitus, flowers and verticillasters.

## Suggestions

The distribution areas and the population densities of the 4 *Nepeta* species growing in East Anatolia have been carefully observed for 4 years. Previously, these species were classified according to IUCN rules in "The Red Book of Turkey". The data obtained from the field studies revealed that the most endangered species are *N. sorgerae* and *N. baytopii*. These species must be

protected in situ and ex situ. For in situ protections tourist guides, visitors and the public visiting Nemrut Mountain should be informed of the importance of *N. sorgerae*.

The seeds of all 4 species should be collected and deposited in seed banks, otherwise these species will very soon become extinct.

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