

NEPETA MENTHOIDES BOISS. & BUHSE AND SPECIES ALLIED TO IT IN IRAN

Z. Jamzad

Jamzad Z. 1991.02.11: *Nepeta menthoides* and species allied to it in Iran. - *Iran. Journ. Bot.* 5(1): 17-27. Tehran.

A revision of *Nepeta menthoides* and species allied to it in Iran is presented. *N. binaloudensis* is described as a new species. *N. elymaitica* Bornm. formerly treated in group *stenostegiae* is placed in *N. menthoides* group. Similarities of the species in this group are discussed. Altogether 7 species are recognized in this group. An identification key, nomenclature, type localities, specimens seen, distribution map, illustrations, notes and comparison of the species with the other formerly considered groups are presented.

Ziba Jamzad, Research Institute of Forests and Rangelands, P.O. Box 13185-116, Tehran. Iran.

گونه *Nepeta menthoides* و گونه‌های نزدیک به آن در ایران

از: زیبا جمزاد

گونه *Nepeta menthoides* و گونه‌های نزدیک به آن در ایران مورد مطالعه قرار می‌گیرند. گونه *N. binaludensis* بعنوان گونه جدید نامگذاری و شرح داده می‌شود و گونه *N. elymaitica* که در گروه *Stenostegie* قرار داده شده بود به گروه گونه‌های *N. menthoides* منتقل می‌گردد. از این گروه ۷ گونه تشخیص داده می‌شود و کلید شناسائی آنها، اصول نامگذاری، رویشگاه نمونه تیپ، نمونه‌های دیده‌شده، نقشه انتشار، تصویر و توضیحاتی در رابطه با تفاوت آنها ارائه می‌گردد.

Introduction

Nepeta menthoides was considered by Boissier (1879 vol. 4, p. 637) in group *catariae* with three other representatives in Iran; *N. cataria*, *N. chionophila* and *N. crispa*. Rechinger (1982 p. 140) recognized the above mentioned species in addition a new species, *N. asterotricha* Rech. f., in section *cataria* Benth. p.p.: *N. menthoides* was described by Boissier and Buhse from the specimen collected by Buhse in Iran, Azarbayjan, M. Sabalan and also reported by Boissier in l.c. from Khorassan between Nishabour & Mashhad, leg. Bunge. Rechinger in l.c. reported it from Iraq (Kurdistan) and Iran (Azarbayjan, - Mazandaran: Alamout, leg. Aucher). He considered the specimen from Khorassan leg. Bunge as *N. assurgens* Hausskn. & Bornnm. of the section *spicatae* (Benth.) Pojark.

When I was identifying the herbarium materials of the genus *Nepeta* (specially the group *menthoides*) in the herbarium of Research Institute of Forests & Rangelands, (TARI), I noticed the materials collected from Mazandaran and Khorassan which had been collected from the same localities as mentioned by Boissier and Rechinger are quite different from *N. menthoides* and *N. assurgens*. Also *N. elymaitica* Bornm. formerly treated in group *stenostegiae* Boiss. has similar characters to other species of the group *menthoides*. In this account *N. menthoides* is revised. The specimen collected from Khorassan is described as a new species. The specimen collected from Mazandaran was described before

as *N. pogonosperma* (Jamzad, Z. & M. Assadi 1984). Also *N. asterotricha* Rech. f., *N. crispa* Wild., *N. chionophila* Boiss. & Hausskn. and *N. elymaitica* Bornm. are discussed as close relatives of *N. menthoides*. *Nepeta cataria* L. does not have the characters of the group. The shape of the corolla, the indumentum and seeds are different. The squamiform membranaceous leaves are absent on basal part of stem in *N. cataria* L. (fig. 1,2,3,4).

Characters of the group

The group of species allied to *N. menthoides* Boiss. & Buhse is characterised by the following features:

1. Indumentum consists of short or long branched or stellate hairs, lax or dense in different species intermixed with sessile glands (Fig. 1).
2. Scale like membranaceous brown leaves exist on the basal parts of the stems.
3. Calyx with oblique throat (Fig. 2).
4. Corolla with narrow tube distinctly or slightly exerted from the calyx and abruptly dilated into a neck; upper lip deeply divided into two obtuse lobes, middle lobe of the lower lip notched in the middle and concave at the base (Fig. 3).
5. Inflorescence consists of verticillasters which are approximate in upper part and interrupted in lower part of the branches.
6. Nutlets are oblong or ovate with smooth surface or with a tuft of hairs on top (*N. pogonosperma*), the areol with narrow angle (Fig. 4).

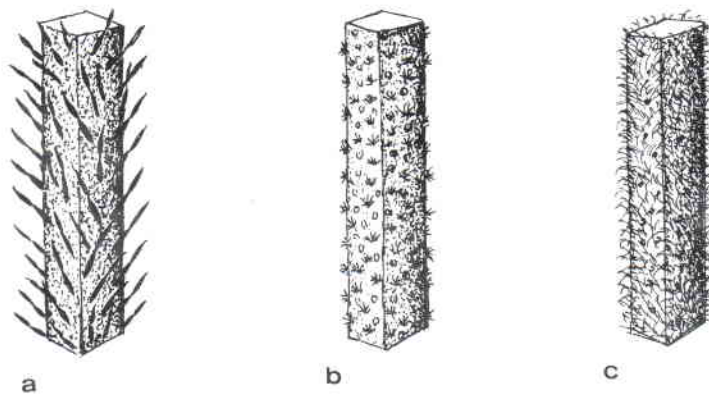


Fig. 1. Parts of stems showing indumentum in: a. *Nepeta assurgens*; b. *N. menthoides*; c. *N. cataria* (x 2).

Key to the species

- 1. Nutlets oblong, the surface smooth, densely hairy at the apex.
 - 2. *N. pogonosperma* Jamzad & Assadi.
- Nutlets oblong or ovate, the surface smooth, not hairy at the apex. 2
- 2. Cauline leaves 4-8.5 cm long, crenate-dentate, floral leaves entire.
 - 5. *N. elymaitica* Bornm.
- Cauline leaves 2-4 cm long, floral leaves not entire. 3
- 3. Leaves ovate-orbicular or triangular-ovate, the margins deeply cut into many triangular teeth. 4. *N. crispa* Wild.
- Leaves ovate-lanceolate, ovate-oblong or ovate-triangular, the margins not as above.4
- 4. Leaves canescent, densely covered by branched white hairs, concolored. Auxil-

lary branches well developed and floriferous, verticillasters close to each other, making a spike-like inflorescence with 2-3 remote verticillasters in lower parts of the branches.

- 1. *N. menthoides* Boiss. & Buhse
- Leaves green or glaucous, less hairy, if densely hairy then discolored, verticillasters mostly remote, a few of the uppers close. 5
- 5. Calyx teeth triangular with acute hooked tip. Laves with obscurely crenate margins. 6. *N. chionophila* Boiss.
- Calyx teeth triangular or triangular - lanceolate, the tip not hooked. Leaves distinctly crenate or dentate. 6
- 6. Leaves dentate with cordate base. Calyx 5.5-6.5 mm long, the teeth triangular-lanceolate. 3. *N. asterotricha* Rech. f.

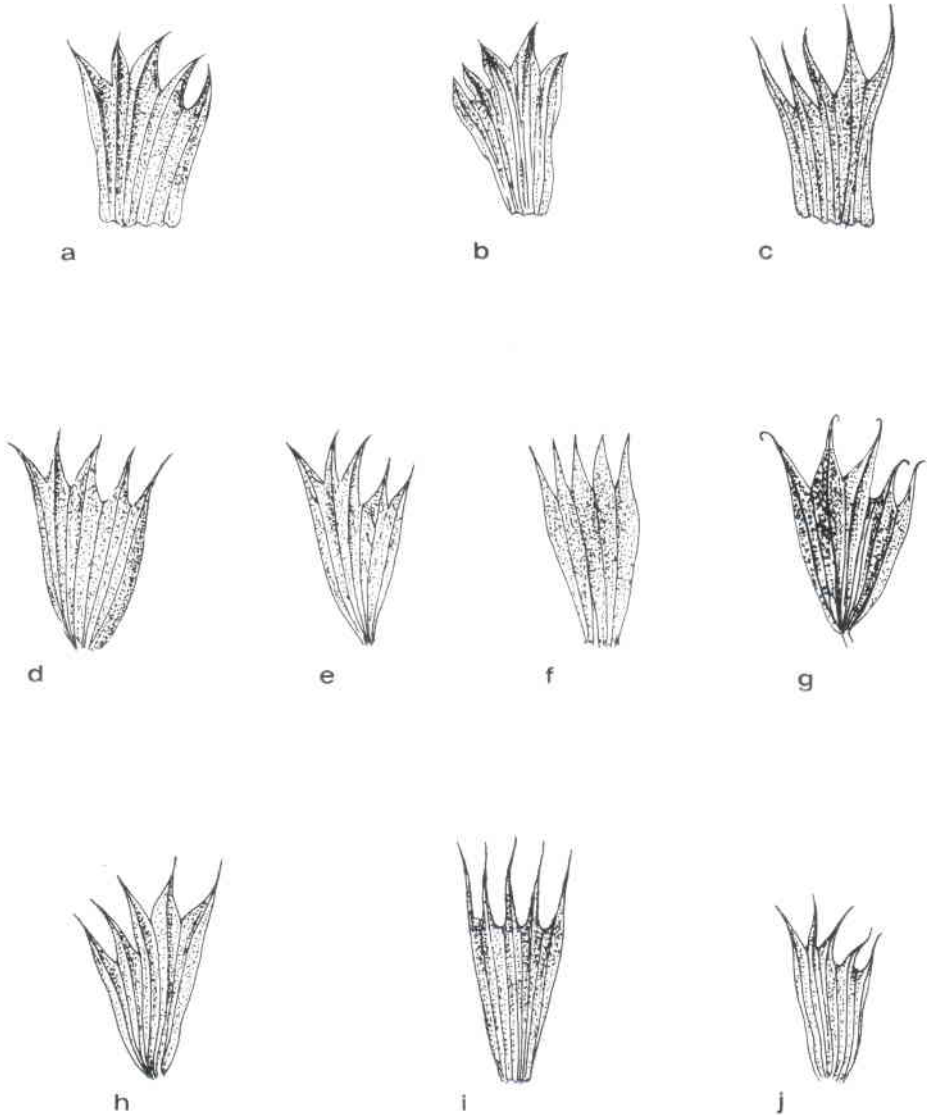


Fig. 2. Calyx dissections of different species: a. *Nepeta menthoides* (x 3.5); b. *N. pogonosperma* (x 3); c. *N. asterotricha* (x 5); d. *N. crispa* (x 3.5); e. *N. elymaitica* (x 3.7); f. *N. speciosa* (x 4); g. *N. chionophila* (x 4); h. *N. binaloudensis* (x 4); i. *N. assurgens* (x 4.3); j. *N. cataria* (x 3.5).

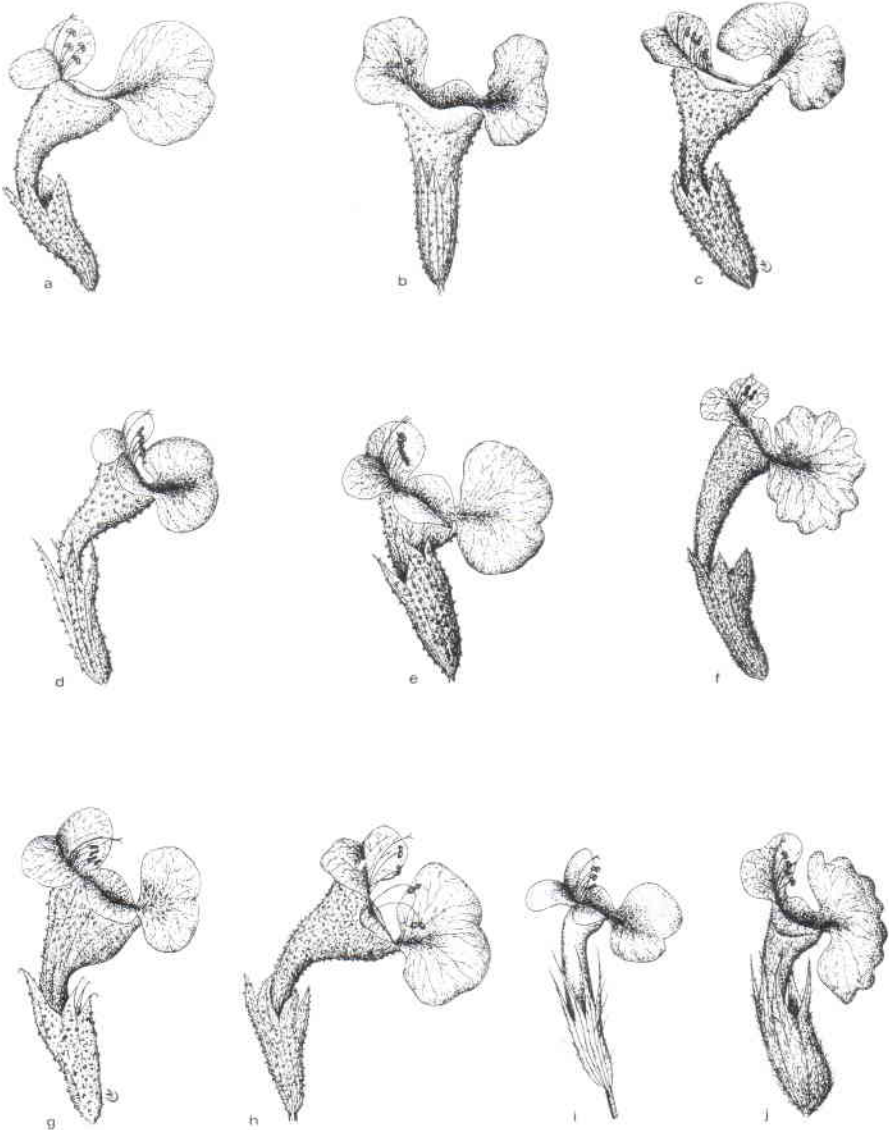


Fig.3. Flowers in different species: a. *Nepeta menthoides* (x 2.85); b. *N. pogonosperma* (x 2.15); c. *N. asterotricha* (x 3); d. *N. crispa* (x 2.3); e. *N. elymaitica* (x 2.35); f. *N. speciosa* (x 2.5); g. *N. chionophila* (x 3); h. *N. binaloudensis* (x 3); i. *N. assurgens* (x 3); j. *N. cataria* (x 4).

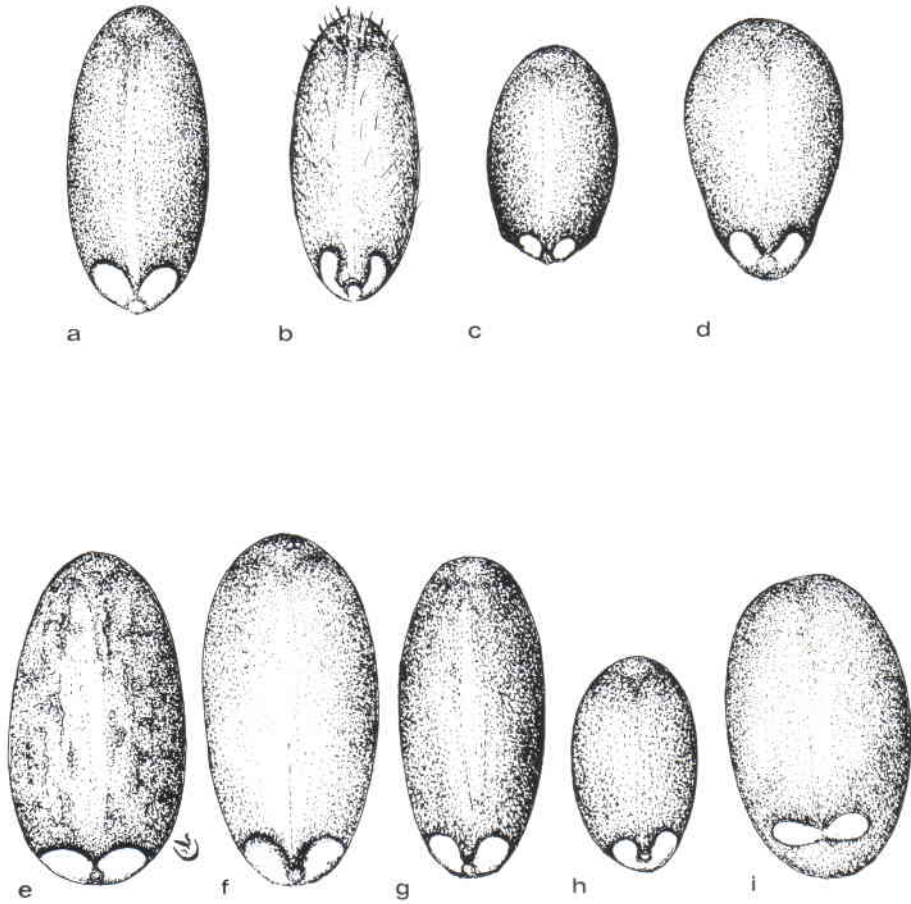


Fig.4. Nutlets in different species: a. *Nepeta mentheoides* (x 21.5); b. *N. pogonosperma* (x 13); c. *N. asterotricha* (x 20); d. *N. crispa* (x 20.4); e. *N. elymaitica* (x 24); f. *N. chionophila* (x 25); g. *N. binaloudensis* (x 20); h. *N. assurgens* (x 20); i. *N. cataria* (x 20.4).

-Leaves crenate with truncate-cuneate base.

Calyx 7-7.5 mm long, the teeth triangular.

7. *N. binaloudensis* Jamzad

1. *N. menthoides* Boiss. & Buhse, Nouv. Mem. Soc. Nat. Mosc. 12: 174(1846).

Type. Iran: M. Savalan, 11000 ped. 19. VIII, 1847, Buhse. (G-Boiss.).

Specimens seen. Azarbayjan: Kuh-e Sabalan, 2680-2900 m, Rejamand 7279; Foroughi & Assadi 13852; Termeh 14525-E; Bostan-Abad, Atmishalti, Sahand, Kuh-e Darvish, 2100-3100 m, Termeh & Mousavi-E.

The characteristic features of this species are the inflorescence consisting of verticillasters which are close to each other and spike-like at the end of main and axillary branches, canescent concolored leaves, calyx violet and seeds with smooth surface.

I have not seen the specimens recorded from Iraq by Rechinger (l.c.) but the materials from Mazandaran, Alamout collected by Assadi & Maassoumi and S. of Ramsar, Lapasar, by Runemark & Maassoumi had distinct differences from *menthoides* which will be discussed under *N. pogonosperma* Jamzad & Assadi. The Khorassan specimen reported by Boiss. also has obvious differences from *N. menthoides* and *N. assurgens* (identified by Rechinger in l.c.). it will be discussed under *N. binaloudensis*.

So *N. menthoides* in Iran is confined to Azarbayjan.

2. *N. pogonosperma* Jamzad & Assadi,

Iran. Journ. Bot. 2(2): 98 (1984).

Type. Iran: Prov. Mazandaran, S. of Ramsar, Lapasar, 2950 m, Runemark & Maassoumi 21689 (TARI)

Specimens seen. Mazandaran: Ca. 40 km S. of Ramsar, N. slope of Khash-e Chal mountain. (VA4) 2900-3600 m, 11.7.1984, Assadi & Maassoumi 51228; Lapasar, 2950 m, Runemark & Maassoumi 21689; Ghazvin, Alamout area, above the village Evan, S. slope of Khash-e Chal mountain (VA4) 2800-3300 m, 10.7.1984, Assadi & Maassoumi 51094.

It is a perennial with woody base and scale-like membranaceous dark brown leaves in basal part of the stems, specially characterised by the nutlets which are oblong and covered with a tuft of hairs at the apex and few scattered hairs on the other parts. Leaves ovate-oblong with rotundate-cuneate base and some short sterile branches. Indumentum consists of branched hairs and sessile glands but not as dense as in *N. menthoides*.

Distribution. Endemic

3. *N. asterotricha* Rech. f., Fl. Iran. no. 150: 144(1982).

Type. Iran: Yazd, Shir-Kuh, Supra Deh-bala, secus rivulos, 3050 m, 12. VIII, 1939, Davis 785, E.

Specimens seen. Yazd: Deh-bala, Shir-kuh mountain, 2700 m, Foroughi & Assadi 17919; Tezerjan, Barf-khaneh, 2850 m, Foroughi 5562; Deh-bala, Shir-kuh, 2720-2780 m, Foroughi 1859.

It is one of the species in this group from central Iran. The indumentum consists of white, short, dense and stellate hairs. Leaves coarsely dentate, bicolored; lower surface more densely covered with white stellate hairs.

4. **N. crispa** Wild., Spec. Plant. 3:50 (1850).

Syn.: *N. betonicoides* Stapf, Denkschr. Akad. Wien Math. - Nat. Kl. 50:45 (1895).

Type. not indicated.

Specimen seen. Hamadan: Hamadan to Asad-Abad, Vahnan, Alvand Mnts. Chafar-Kuh, 2150-2400 m, Mozaffarian 64667.

Bentham (1848) considered *N. crispa* Wild. in section *Macronepeta*. Boissier in l. c. classified it in group *Catariae* and Rechinger in l.c. considered it in section *Cataria* Benth. Lab. Gen. sp. 466, 476 (1834) p.p. It obviously belongs to *N. menthoides* group. It is easily distinguished from the other species by its ovate-orbicular to triangular-ovate leaves which are deeply cut into many triangular teeth.

I have not seen the type specimen of *N. betonicoides* Stapf, but comparing the description of *N. betonicoides* & *N. crispa* reveals it that they are identical.

Distribution. Iran. Endemic

5. **N. elymaitica** Bornm. Beih. Bot. Centrbl. 28,2: 487(1911).

Type. In monte Schuturun-kuh, Luristaniae (Elymeae), 28, VII. 1902, Strauss, holotypus B. Specimens seen. Lorestan: Dorud, neck mt. be-

tween Saravand and Gahar lake (SU1), 2300-3500 m, Mozaffarian & Sardabi 42346; Dorud, Oshtoran-Kuh, 2200-3300 m, Mozaffarian & Sardabi 42399; Oshtoran-kuh, above the village Tihun (US1), 2500-3200 m, Assadi & Mozaffarian 37144; Aligoudarz, Shoul-Abad, Ghali-kuh (SU1) 2200-3500 m, Mozaffarian & Sardabi 42554 and Mousavi & Satei 15686-E.

This species was described by Bornmüller. He considered it in the group *stenostegiae* Boiss. and *N. speciosa* Boiss. & Noe, *N. autraniana* Bornm. as its close relatives. Rechinger in l.c. treated it in the section *stenostegiae*. The section *stenostegiae* is characterized by calyx throat straight (as in *N. speciosa* fig. 2), corolla tube exerted (fig 3) and nutlets with distinct tubercles (fig. 4). In *N. speciosa* calyx throat is straight, corolla tube distinctly exerted from the calyx, the middle lobe of the lower lip with marginal teeth, the nutlets (immature) verrucose, indumentum consists of simple hairs. In *N. elymaitica* calyx throat is oblique, corolla tube slightly exerted, the middle lobe of lower lip without marginal teeth, the nutlets smooth and indumentum consists of branched hairs. Besides, existence of the scale-like membranaceous basal leaves in *N. elymaitica* leads us to the fact that *N. elymaitica* is related to *N. menthoides* group rather than to *N. speciosa*. I have not seen any specimen of *N. autraniana* but through the description it belongs to the section *stenostegiae* and is not close to *N. elymaitica*.

6. **N. chionophila** Boiss. & Hausskn. in Boiss. Fl. Or. 4: 643(1879).

Type. *Infra nives gregatim montium* Kellal et Ssebse-kuh Persiae austro-occidentalis, IX, 1868, Haussknecht G-Boiss.

Specimen seen. Chaharmahal-e Bakhtiari: Douab-e Samsami Kuh-e Mili, 2850 m, 13.5.1986, Mozaffarian 58058.

It is a highly scented plant, branched almost from the base to many slender branches. Distinct from the other species of the group by its habit, inflorescence, indumentum and calyx teeth which is acute and hooked.

Distribution. Endemic.

7. *N. binaloudensis* Jamzad, sp. nov.

Typus. Khorassan: Mashhad, N. slope of Binaloud Mts. above Zoshk village, Rudkhan-e Abdollah, 2000 - 3000 m, 3.4.1984, Mozaffarian 48860 (holotypus TARI).

Perennis, caulis 70 cm altus, ramosus, omnino pilis ramosis albido-villosis. Folia basalia squamiformia, membranacea, brunescientia. Caulis paucifoliatu; internodia 4 - 7 cm longa. Folia caulina inferiora 1.5-2 cm longa, ovato-triangularia, basi truncato - cuneata, margine crenato - serrata, glaucescenti - viridia, petiolata; petioli 2-4 mm longi, Folia superiora decrecentia, \pm sessilia. Verticillastri inferiores 1-3, remoti, breviter pedunculati, superiores 2-3, \pm sessiles, approximati. Bractee oblongilanceolatae. Corolla 13 mm longa, liliacina, lobium inferius lobo mediano 2 mm longa, 6 mm lata. Calyx 3-7 mm longus, ore obliquus, pilis ramosis et glandulis sessilibus obsitis. Nux



Fig. 5. *Nepeta binaloudensis* (x 0.55).

1.8-2 mm longa, oblonga, laevius.

Perennial, 70 cm high, erect, branched, almost from the lower part. Stem furrowed, dark in lower part, covered by short branched hairs, denser in upper part. Basal leaves scale-like membranaceous, brown. Cauline leaves ovate-triangular, crenate-serrate, with truncate-cuneate base; internodes 4-7 cm long. Lower cauline leaves 1.5-2 cm long, petiolate, petioles 2-4 mm long. Floral leaves \pm sessile, smaller. Lower verticillasters 1-3, shortly pedunculate, remote, upper verticillasters \pm sessile, 2-3, approximate. Bracts lanceolate, at the margins densely covered by branched hairs. Corolla 13 mm long, blue, middle lobe of the lower lip 2 mm long, 6 mm wide, notched in the middle.

Calyx 6-7 mm long, with oblique throat, covered by branched hairs and sessile glands, the upper teeth triangular, acute, lower teeth lanceolate. Nutlets oblong, 1.8-2 mm long, the surface smooth.

The new species differs from *N. menthoides* which has the following characters: indumentum denser, leaves longer, canescent with cuneate base and verticillasters close to each other at the end of the branches making a spike-like inflorescence with 2-3 distant verticil-

lasters in lower parts. It also differs from *N. asurgens* Bornm. which has the following characters: indumentum consists of long simple articulated hairs, the calyx with straight throat, the teeth linear, inflorescence oblong-cylindrical spikes and nutlets ovate. *Nepeta asurgens* grows in Kerman, Kuh-e Lalehzar.

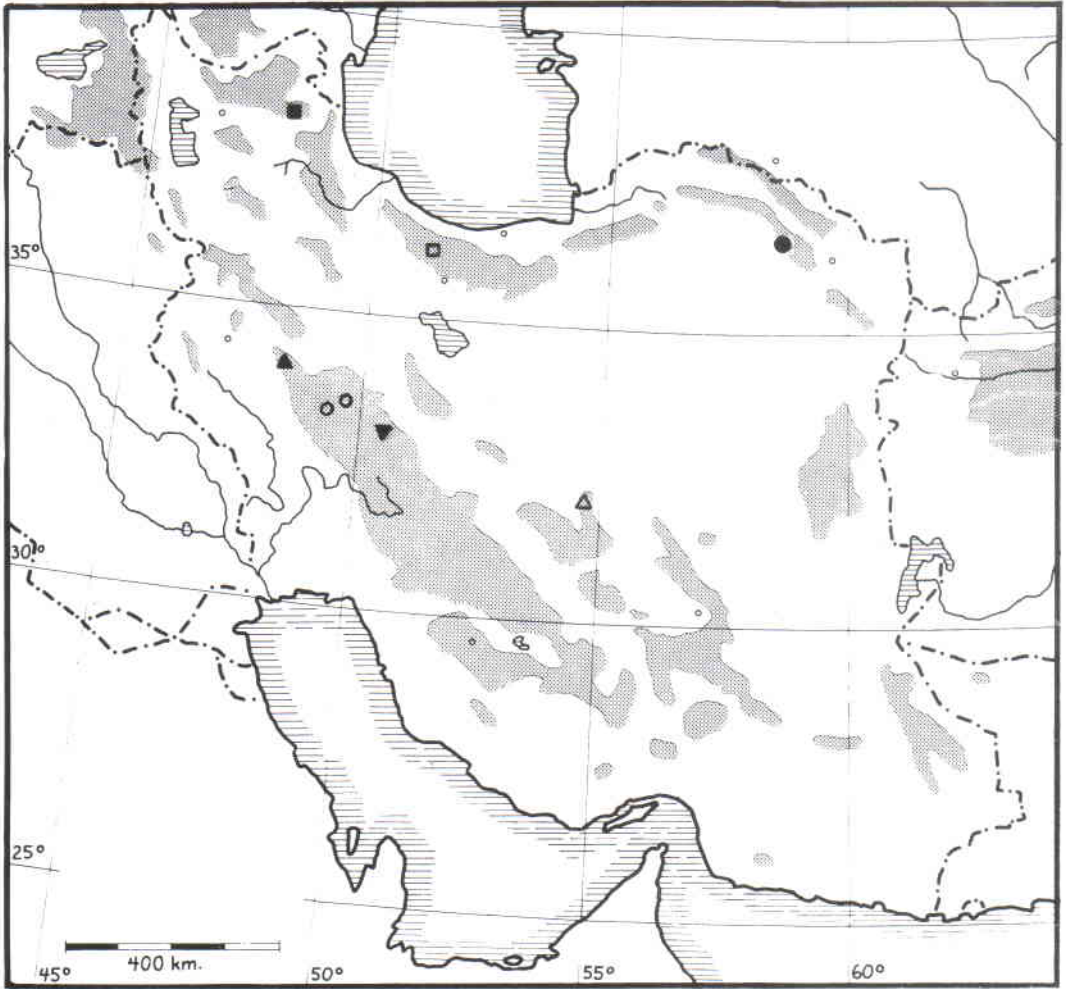
Distribution. Endemic.

Acknowledgements

Thanks are due to Mr. E. Moradi, the artist of the Research Institute of Forests and Rangelands for drawing illustrations and Mr. M. Niktash for preparing the map.

References

- Bentham, G. 1848: Labiatae in De Candolle Prod. Syst. Nat. Reg. Veg. vol. 12. - Parisiis.
 Boissier, E. 1879: Flora Orientalis vol. 4 - Genevae & Basiliae.
 Jamzad, Z. & M. Assadi 1984: New species of the genera *Nepeta* and *Ajuga* (Labiatae) from Iran.- Iran. Journ. Bot. 2(2), p. 98-100.
 Rechinger, K.H. 1982, Flora Iranica, no. 150. - Graz.



Map.1. Distribution of: *Nepeta menthoides* ■ *N. pogonosperma* □ *N. asterotricha* Δ *N. crispa* ▲ *N. elyamitica* ○ *N. chionophila* ▼ *N. binaloudensis* ●