

Clinopodium hakkaricum (Lamiaceae), a new species from Turkey

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Clinopodium hakkaricum Dirmenci & Firat (Lamiaceae) *sp. nova* from Hakkari province, SE Anatolia, Turkey is described and illustrated. It clearly differs from the other *Clinopodium* taxa in Turkey and adjacent areas. Affinities to and differences from *C. insulare*, *C. menthifolium*, *C. molle* and *C. nepeta* are elaborated. These related species are revised for Turkey and adjacent areas and an identification key is provided. The geographic localities of the examined specimens are presented in a distribution map.

Key words: *Clinopodium*, Lamiaceae, new species, taxonomy

A group in Lamiaceae whose generic taxonomy has caused much confusion is the *Satureja* complex. Briquet (1896) included a number of genera (e.g. *Satureja*, *Micromeria*, *Clinopodium*, *Acinos*, *Calamintha*) in *Satureja s. lato* while other authors (Bentham 1848, Ball & Getliffe 1972, Davis 1982, Dorozensko 1986) preferred a narrower circumscription of the genera and kept them separate.

More recently some species of *Satureja* along with those of *Micromeria* sect. *Pseudomelissa*, and the genera *Calamintha* and *Acinos* have been transferred to *Clinopodium* by Govaerts (1999), Harley and Granda (2000), Ryding (2005) and Bräuchler *et al.* (2006). The number of species included in *Clinopodium* thus exceeds 100, being mostly distributed in the New World and temperate Eurasia, but a few also found in Africa, tropical Asia and Indomalaysia (Harley *et al.* 2004).

The genus was previously revised for *Flora of Turkey* by Leblebici (1982), who recognised two species (three taxa). After the abovementioned changes in taxonomical concept, the number of species recorded for Turkey is 23.

During several expeditions to Zap Gorge in Hakkari province, Turkey in June 2006 and between June and September 2007 a number of specimens of an unusual *Clinopodium* were collected by the authors. Using the respective treatments of *Flora of Turkey* and *Flora Iranica* (Davis & Leblebici 1982a, 1982b, Leblebici 1982, Rechinger 1982, Tan 1988, Güner *et al.* 2000) and other relevant literature (Bentham 1848, Boissier 1879, Briquet 1896, Blakelock 1949, Ball 1972, Ball & Getliffe 1972, Hedge 1990, Morales & Luque 1997, Özhatay & Kültür 2006, Alan *et al.* 2007) the Hakkari specimens were identified as representing an undescribed species of the *Clinopodium* complex (with affini-



Fig. 1. Illustration of *Clinopodium hakkaricum* (from the holotype). — **A:** Habit. — **B:** Calyx.

ties to taxa formerly placed in *Calamintha* and *Micromeria* sect. *Pseudomelissa*). Extensive herbarium studies of specimens from Turkey and adjacent regions (using material in the herbaria ANK, AEF, BM, E, EGE, HUB, ISTE, ISTF and K) confirmed the Hakkari collections as a species new to science and with affinities to *C. insulare*, *C. menthifolium*, *C. molle* and *C. nepeta*.

Clinopodium hakkaricum Dirmenci & Firat
sp. nova (Figs. 1 and 2)

Affinis C. nepetae, caules flores plures, 5–20 cm alto, procumbens vel ascendens, glandulosus, utrinque glandulosa, vertisillastri 2–3, laxis, flores 2, calyces longus, 7–8.5 mm differt.

HOLOTYPE: Turkey. C9 Hakkari: 37 km from Hakkari to Çukurca, S of Üzümlü village, Zap valley, 37°28'067"N, 43°30'618"E, rocky crevices, 1062 m, 5.IX.2007 *M. Firat*

10202 & *T. Dirmenci* (holotype GAZI; isotypes E, HUB, ISTE, M).

ADDITIONAL SPECIMENS EXAMINED (paratypes): — **Turkey.** C9 Hakkari: ca. 20 km from Hakkari to Çukurca, Zap valley, rocky crevices, ca. 1200 m, 09.VI.2006 *M. Firat* 10125 & *T. Dirmenci* & *M. Armağan* (GAZI, M); 37 km from Hakkari to Çukurca, S of Üzümlü village, 37°28'067"N, 43°30'618"E, rocky crevices, 1062 m, 24.VI.2007 *T. Dirmenci* 3427 (GAZI, M).

ETYMOLOGY: The species epithet is derived from the name of the province (Hakkari) where the type was collected.

Many stemmed, saxatile perennial with stout woody stock. Stems 5–20 cm, procumbent or ascending, slender, brittle; young branches densely glandular papillate, very sparsely to densely glandular pubescent. Leaves ovate, 7–20 × 5–15 mm, rounded to truncate at base, acute at apex; margin weakly dentate, teeth 1–3 per side; densely glandular papillate with sessile glands on both surfaces, sparsely eglandular pubescent on lower and sparsely to densely pubescent on



Fig. 2. Flowering stems of *Clinopodium hakkaricum*.

upper surface; veins 3–4 pairs, scarcely visible on upper surface, not reaching to margin, camptodromous or not; petiole generally 2–5 mm. Inflorescence lax with 2–3 verticillasters. Bracts linear, 2–4 mm, as long as pedicel or shorter, densely glandular papillate with eglandular hairs. Bracteoles 2, linear, 0.75–2 mm, clearly shorter than pedicel, densely glandular papillate with scattered eglandular hairs. Flowers 2 per verticillaster. Pedicel up to 4 mm. Calyx (6–)7–8.5 mm, bilabiate, tube 13-veined, straight, densely glandular papillate with a few eglandular hairs; throat sparsely hairy between the teeth; teeth sparsely ciliate or not, lower ones triangular acuminate, 2.5–3.5 mm, \pm equalling upper teeth, upper teeth triangular, 1–1.5 mm. Corolla 10–13(–15) mm, lavender-blue, tube straight, exceeding the calyx, puberulent. Stamens 4, didynamous, \pm included in corolla, lower pair longer than upper. Style bilobed, generally exserted from corolla tube. Nutlets 1–1.5 \times 0.75–1.25 mm, oblong, brown. Flowering in (June) July–September, fruiting (August) September–October.

HABITAT ECOLOGY: Rocky crevices, E face of Zap valley, 1050–1200 m. The associated taxa include e.g. *Cyclotrichium longiflorum*, *Campanula acutiloba*, *Ficus carica* subsp. *rupes-tris*, *Pelargonium quercetorum*, *Quercus petraea* subsp. *pinnatiloba*, *Primula davisii*, *Satureja*

cuneifolia, *Thymus kotschyanus*, *Vitis vinifera*, *Astragalus* sp. and *Silene* sp.

DISTRIBUTION: *Clinopodium hakkaricum* is endemic to Hakkari province, SE Anatolia, and belongs to the Irano-Turanian element (Fig. 3). It is restricted to a 20 km long stretch in Zap valley from Hakkari to Çukurca. Regeneration rate seems to be low for flowering stems were observed to carry a comparatively low number of seeds.

Key to morphologically similar *Clinopodium* species

1. Leaves ovate-orbicular, entire or scarcely notched, 3–10(–14) \times 3–8(–11) mm, densely white tomentose; flowers subsessile *C. insulare*
1. Leaves ovate to broadly ovate, \pm toothed, 7–60 \times 5–35 mm, pubescent (not tomentose) or glandular; flowers distinctly pedicellate 2
2. Stems to 20 cm, procumbent or ascending, brittle; young branches glandular papillate; leaves with 1–3 teeth per side; verticillasters 2–3 per inflorescence, lax, 2-flowered *C. hakkaricum*
2. Stems 20–75 cm, ascending to erect, stout, not glandular; leaves crenate-dentate or serrate-dentate; verticillasters 5–15 per inflorescence, lax to densely, often more than 2-flowered 3
3. Calyx (4–)5–9 mm; lower teeth 2–4 mm, densely long ciliate *C. menthifolium*
3. Calyx 3.5–5.5 mm; lower teeth 1–2 mm, sparsely short ciliate *C. nepeta*

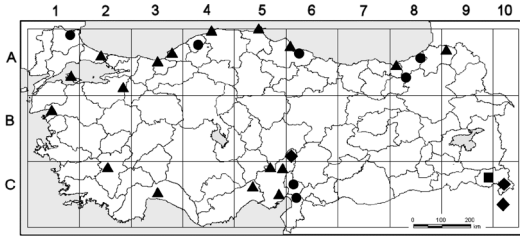


Fig. 3. Distribution map of *Clinopodium hakkaricum* (■), *C. nepeta* (▲), *C. menthifolium* (●) and *C. molle* (◆) for Turkey and adjacent regions.

From morphological point of view the position of *Clinopodium hakkaricum* among its congeners in Turkey, Iran and Iraq seems to be isolated. Herbarium studies and literature research revealed it as best being placed closer to *C. insulare*, *C. menthifolium*, *C. molle* and *C. nepeta*. The specific differences are summarised in Table 1.

SPECIMENS EXAMINED. — *Clinopodium insulare*. **Turkey.** C1. Aydın: Samsundağ, above Priene, *Davis 18346* (K); Antalya: Alanya, *Davis 14487* (K); Muğla: 1 km SW of Bodrum, *Lambert & Thorpe 517* (K). C6. Hatay: Samandağ, Çevlik, *T. Dirmenci 3456b* & *E. Akçiçek*. **Cyprus.** Lysi, A. *Genneau 1631* (K); 3 km from Pelendria towards Kato Amiando, *IK & LF Ferguson 4548* (K). **Israel.** Samaria, *Meyers 8121* (K). **Iraq.** *Sintenisi 1888:1402* (K). — *Clinopodium menthifolium* subsp. *menthifolium*. **Turkey.** A4. Zonguldak: Kozlu, *Khan et al. 799* (K). A6. Samsun: Karadağ, E of Samsun, *Tobey 830* (E, K). *C. menthifolium* subsp. *ascendens*. **Turkey.** A1. Kırklareli: nr Dereköy, A. *Baytop (ISTE 14171)* (E). A8. Bayburt: Çoruh valley, 1 km E of Karşıgeçit village, A. *Güner et al. 9698* (GAZI); Rize: Hemşin, Meydan Kobaca-Mollaveysa, *Davis 21378* (E, K, BM); Karadere, Günece, *Davis 20838* (E). C6. Adana: Bahçe, Döldül Da., Başkonuş yayla, Hüseyinoluk çeşme, *Davis 16394* (E); Hatay: Amanus, Gavur Da., Erzin, *Wagenitz 409* (E). — *Clinopodium molle*. **Turkey.** C6. Adana: 10 km N of Saimbeyli, *T. Dirmenci 3460* & *E. Akçiçek*; ibid, *T. Dirmenci 3490*, *T. Arabacı* & *C. Bräuchler*. C10. Hakkari: Cilo Dag, *Davis 23883* (ANK, BM, E, K). **Iraq.** Pl. Mesopotamia, Kurdistan et Mossul, *Kotschy 552a* (holotype K!); Erbil, faucium infra Rowanduz, *Rehinger 11263* (E, K); Sirsang-Mosul, Gara mt., *Agnew 691* (E); ibid, *Agnew 694* (E); Mosul liwa, Dohuk gorge, *Agnew 734* (E). — *Clinopodium nepeta* subsp. *nepeta*. **Turkey.** B1. Balıkesir: Edremit, Akçay, *K. Çilenti s.n.* (GAZI). C3. Antalya: Aksu, Ağalar village, *AEF-6738* (AEF). C5. Mersin: Çamlıyayla, İkiyüzalan place, Z. *Aytaç 7061* & *N. Adıgüzel* (GAZI); Adana: Pozantı, 5 km N on Toros Da., *Aberdeen Univ. Amanus Exped. B1 78* (E). C6. Adana: Bahçe, nr Haruniye, *Davis 16375* (E, ANK); Hatay: Amanus, *Haradj. 4575* (E); Amanus, *Haradj. 4650* (E); Amanus, N of İskenderun, *Aberdeen Univ. Amanus Exped. L1 765* (E); Hatay: Valley above Yeşilkent, *Darrah 600* (E); Dörtöl, Amanos Mt., Çökek Y., *Y. Akman 7625*

Table 1. Comparison of distinguishing characters of *Clinopodium hakkaricum* with *C. nepeta*, *C. menthifolium*, *C. molle* and *C. insulare*.

Characters	<i>C. hakkaricum</i>	<i>C. nepeta</i>	<i>C. menthifolium</i>	<i>C. molle</i>	<i>C. insulare</i>
Habitus	5–20 cm, ascending or procumbent, brittle	20–75 cm, ascending to erect, stout	25–70 cm, ascending to erect, stout	5–30 cm, slender, flexuous, brittle	10–25 cm, ascending to decumbent, stout
Stem indumentum	glandular papillate, often sparsely eglandular hairy	sparsely to densely long hairy, crispitate or puberulous	short and long-haired, eglandular	softly puberulent to pubescent or villosulous	often glandular and very densely hairy
Leaves	ovate, 7–20 × 5–15 mm dentate, 2–3 teeth per side	8–35(–43) × 6–20(–25) mm, shallowly to conspicuously toothed rarely entire, camptodromous	ovate to broadly ovate, (25–)30 × (20–)25–35 mm, crenate serrate or serrate-dentate, camptodromous	ovate to ovate-orbicular, 5–15 × 5–15 mm, subentire	ovate-orbicular, 3–10(–14) × 3–8(–11) mm, entire or scarcely notched, camptodromous
Verticillasters per inflorescence	2–3, lax, 2-flowered	(2–)5–15, many flowered	flowered	lax, 2–6 flowered	6–15, compact, 4–6 flowered
Calyx	7–8.5 mm, bilabiate	3.5–5.5 mm, bilabiate	5.5–8(–8.5) mm, bilabiate	2.5–4 mm, ± actinomorphic	3–4.5(–5) mm, bilabiate
Lower calyx teeth	2.5–3.5 mm	1–2 mm	1.25–4 mm	2.5–4 mm	1–1.5(–2) mm
Corolla	10–13(–15) mm	6.5–12 mm	9–20 mm	5–9 mm	8–10 mm

(ANK); subsp. *glandulosum*. **Turkey**. A1. İstanbul: Sarıyer, 20 km N of İstanbul, *Edmondson 429* (E); Balıkesir: Marmara adası, *A. Baytop (ISTE 13678)* (E). A2. İstanbul: Beykoz, machie, *H. Şağban 3363* (HUB); Bursa: Uludağ, *Davis 14871* (E, K); Gemlik, Karacaali village, *AEF-6345* (AEF). A3. Bolu: Akçakoca, *Wagenitz 201* (E). A4. Zonguldak: Balıksık, nr Yenice, *Davis 37973* (E, K); Between Zonguldak and Kozlu, *AEF-1974* (AEF); E of Ereğli, *Davis et al. 37527* (K); Keltepe, Sorgun Y., *Davis et al. 37844* (K); Bartın: Amasra peninsula, *Khan et al. 776* (E, K). A5. Kastamonu: Küre-İnebolu road, *Aytaç et al. 3481* (GAZI); Sinop: above Ayancık, *Davis 38160* (E, K); Sinopburnu, *AEF-15172* (AEF). A6. Ordu: 20 km E of Terme, *Jenkins 2243* (E). A8. Trabzon: 10 km SW of Trabzon, *Walton 9* (E). A9. Artvin: Arhavi, Dikyamaç village, *AEF-16775* (AEF). C2. Denizli: Babadağ, above Kadıköy, *Davis 18421* (E); Denizli: Taşocağı, *Davis 13237* (E, ANK); Muğla: Köyceğiz, Beyobası, *A. Güner et al. 9593* (GAZI, HUB).

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