



**A new record for the Flora of Turkey: *Geranium macrorrhizum* L. (Geraniaceae)**

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**Abstract**

*Geranium macrorrhizum* L. was collected during a fieldwork around Kapıdağ Peninsula (Erdek, Balıkesir province) in May 2008, is added as a new record for the Flora of Turkey. It's diagnostic characters, description and detailed pictures are given. The geographical distribution in Turkey of the new record is mapped.

**Key words:** Geranium, Geraniaceae, New record, Kapıdağ Peninsula, Turkey

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**Türkiye Florası için yeni bir kayıt: *Geranium macrorrhizum* L. (Geraniaceae)**

**Özet**

*Geranium macrorrhizum* L., 2008 Mayıs ayında Kapıdağ Yarımadası (Erdek, Balıkesir ili) civarına düzenlenen bir arazi çalışması esnasında toplandı ve Türkiye Florası için yeni bir kayıt olarak eklenmiştir. Onun tanımlayıcı karakterleri, betimi ve ayrıntılı resimleri verilmiştir. Yeni kaydın Türkiye'de ki coğrafik yayılışı haritalandırılmıştır.

**Anahtar kelimeler:** Geranium, Geraniaceae, Yeni kayıt, Kapıdağ Yarımadası, Türkiye

**1. Introduction**

The genus *Geranium* L., belongs to the tribe *Geranieae* of family Geraniaceae (Boissier, 1867; Edgeworth, Hook, 1974; Melchior, 1964) and comprises about 350 species distributed in temperate and tropical alpine regions in the world (Lawrence, 1951; Porter, 1959; Willis, 1973, Aedo et al. 2005). The genus was monographed by Knuth (1912). Some taxa are valuable for ornamental and medicinal uses (Thomas, 1960). *Geranium* has been divided into three subgenera, 14 sections and 20 informal groups (Yeo, 2001). *Geranium* is divided into the subgenera *Geranium*, *Erodioidea* and *Robertium* (Yeo, 2001; Aedo et al. 1998, 2002).

Since the genus *Geranium* has been revised by Davis (1966) for the Flora of Turkey, some other new taxa, such as *Geranium davisianum* Peşmen, Güner, *G. sibiricum* L., *G. cinereum* subsp. *subcaulescens* var. *pisidicum* Peşmen, Güner, *G. platypetalum* var. *albipetalum* Fisch, Demirkuş; *G. chelikii* Kit Tan, Yıldız and *G. kalenderianum* İlçim, Behçet (Davis et al. 1988, Güner et al. 2000, İlçim, Behçet 2006) have been added to the Flora of Turkey. Totally 37 species, 10 subspecies and 9 variety have been recorded for the Flora of Turkey up to date. In this paper, *Geranium macrorrhizum* L. were added as a new record of *Geranium* species for Flora of Turkey. With this new record, the total number of *Geranium* species known from Turkey rise to 38.

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## 2. Materials and methods

During fieldwork for “*The study on fitosociological and fitoecological aspects of Kapıdağ Peninsula (Erdek-Balıkesir)*” Project in 2006 to 2009, some interesting specimens of *Geranium* was collected by first author in May 2008. These specimens were identified as *Geranium macrorrhizum* L. according to Flora of Turkey and the East Aegean Islands (Davis at all, 1966, 1988), Turkey and the East Aegean Islands (Supplement) (Güner, 2000.), Flora Europaea (Webb, Ferguson, 1968), Flora Orientalis (Boissier, 1867), Prodrömus Florea Peninsulae Balcanicae (Hayek 1927), Flora der Südalpen (Pitschmann&Reisigl, 1965), Illustrierte Flora von Mittel-Europa (Hegi, 1975), Flora of the USSR (Shishkin, 1949), Flora Bulgarica, Supplementum I (Velenowsky I, 1898). Consequently, *Geranium macrorrhizum* L. was described and illustrated a new record by authors for the Flora of Turkey.

## 3. Results and discussion

*Geranium macrorrhizum* L., *Sp. Pl* 680 (1753) (Figure 1, 2)

Perennial, with stout, elongated, 6 - 13 mm wide, cylindrical, horizontal rhizome. Stem 20 - 60 cm, erect. Leaves orbicular, 7 - 17 cm wide, divided for 4/3 of the radius into 5 - 7 obovate, pinnatifid lobes; segments obtuse but conspicuously mucronate, glandular-pubescent. Petiole 5 - 55 mm. Inflorescence with 2 - 7 flowers in a corymb or umbel, densely short and long glandular-pubescent. Bracts 2, 2 - 4 mm. Pedicel 11 - 27 mm. Sepals erect, 5 - 7 mm, ovate with longitudinally 3-nerved, long aristate at apex, greenish to reddish, densely glandular-pubescent. Petals c. 15 mm, obovate to spatulate, entire, patent or deflexed, dull purplish-red limb, glabrous. Stamens 22 - 26 mm; filaments reddish, curved at apex; anther reddish; pollen yellowish. Style up to 40 mm, reddish. Mericarps glabrous to slightly pubescent, transversely rugose. Flowering and fruting in May and June.

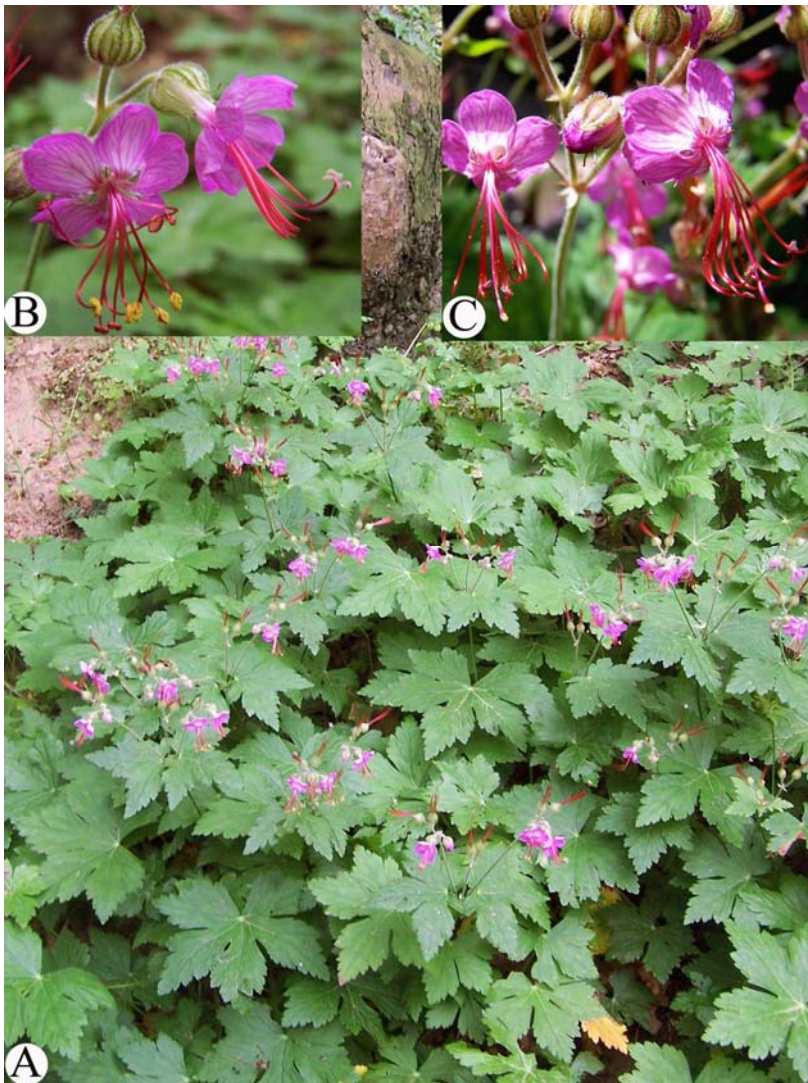


Figure 1. *G. macrorrhizum* A) Habit, B - C) Flowers.

B1: Balıkesir: Erdek, Kapıdağ Peninsula (Figure. 3), slopes, shady and wet areas, meadows and especially under *Castanea sativa*, *Carpinus betulus*, *Fagus orientalis*, *Platanus orientalis* and *Tilia tomentosa* groups, on brown forest soils where on the granite and granodiorite main rocks, 200 - 650 m, 27.05.2008, H. Öner 646. The plant specimens are deposited in Ege University Herbarium (EGE) (Figure 2).

The associated species with *G. macrorrhizum* include; *Achillea grandiflora*, *Alliaria petiolata*, *Arbutus unedo*, *Cardamine bulbifera*, *Corylus avellana*, *Crataegus monogyna*, *Daphne pontica*, *Doronicum orientalis*, *Festuca sylvaticum*, *Fritillaria pinardii* *Geum urbanum*, *Helleborus orientalis*, *Hypericum calycinum*, *Laurus nobilis*, *Mespilus germanica*, *Phillyrea latifolia*, *Primula vulgaris* *Polygonatum multiflorum*, *Quercus coccifera*, *Q. infectoria* subsp *infectoria*, *Rosa canina*, *Rubus canescens*, *R. discolor*, *R. idaeus*, *Ruscus hypoglossum*, *Silene vulgaris*, *Sytrax officinalis*, *Trachystemon orientalis*, *Vicia cracca* and *Viola sieheana*.

*G. macrorrhizum* is naturally distribution on the Balkan Peninsula, S., E. Carpathians, S. Alps, Appennini mountains (Italy). Cultivated elsewhere for ornament and often naturalized (Albania, Austria, France, Greece, Italy, Jugoslavia, Romania, Belgium, Britain, Germany, Crimea and middle-upper Black sea countries) (Webb and Ferguson, 1968) . It was not previously recorded in Turkey. It was found in a narrow area around Kapıdağ Peninsula (Erdek-Balıkesir) firstly.

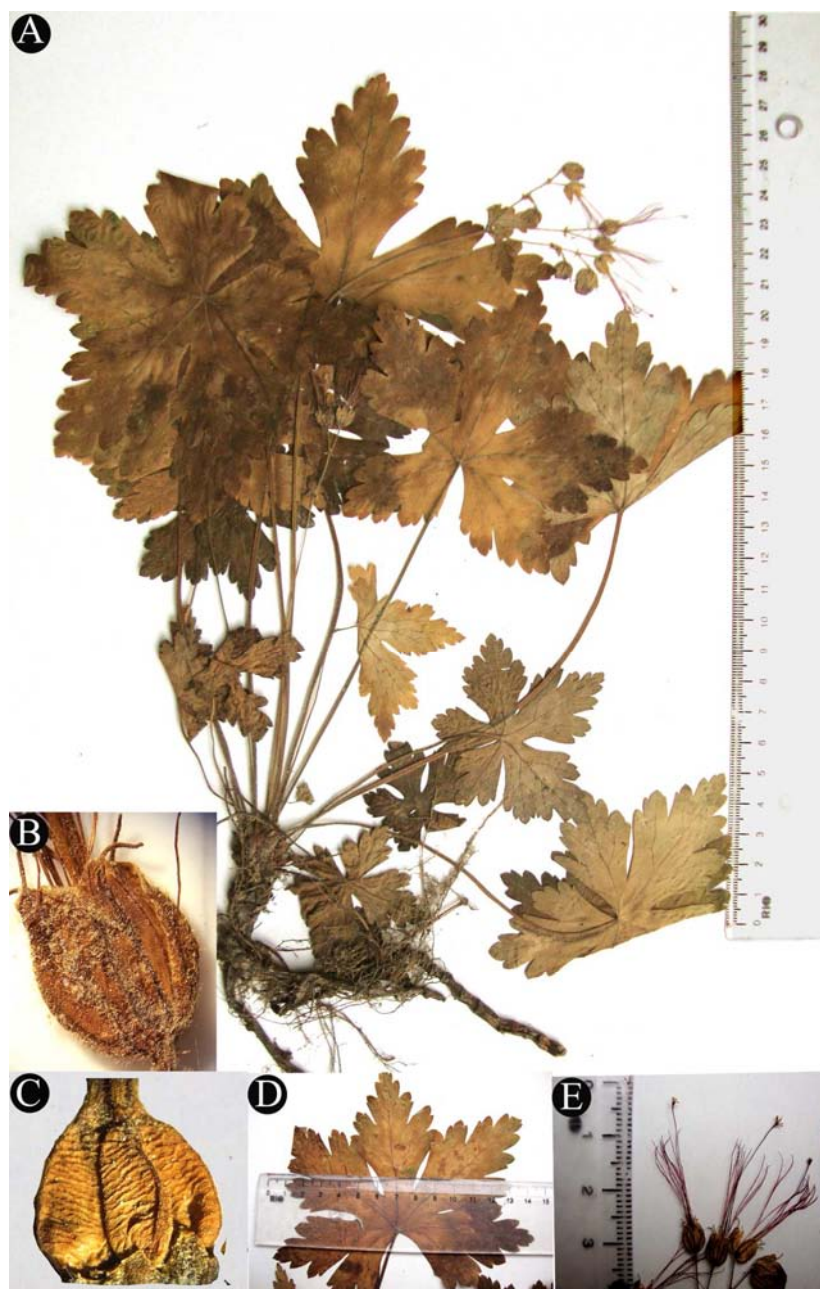


Figure 2. *G. macrorrhizum* A) Habit, B) Calyx, C) Mericarps, D) Basal leaf, E) Style, stamens and calyx.

*G. macrorrhizum* is clearly different from other *Geranium* species in Turkey. It can be easily distinguished from other *Geranium* species by the following features. Rhizome (horizontally, elongated, 6-13 mm wide), leaves wide and lobes (7 - 17 cm wide, divided for 4/3 of the radius into 5 - 7 obovate pinnatifid lobes), stamens length (22 - 26 mm) and style length (up to 40 mm).

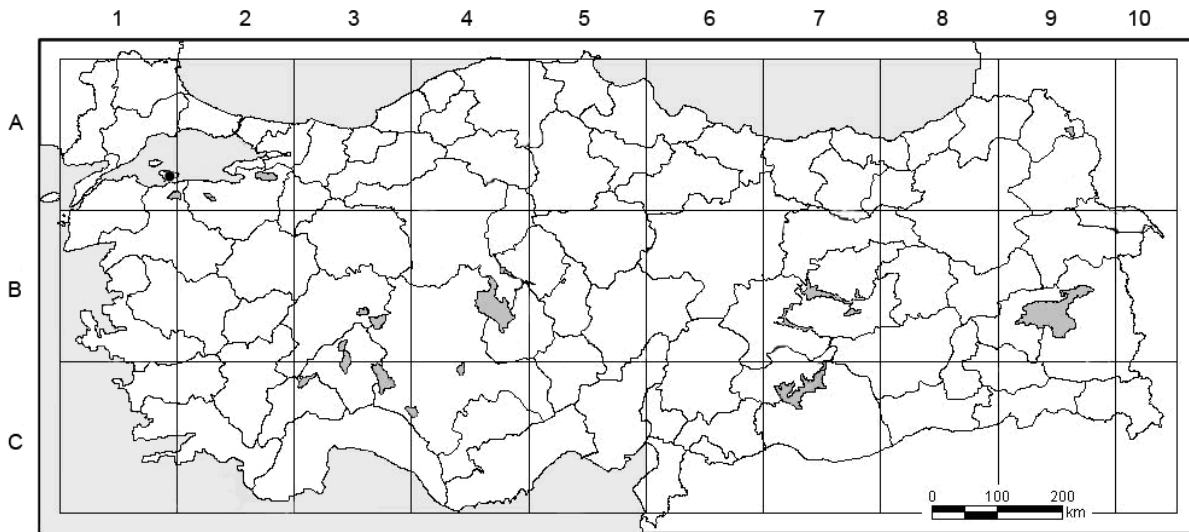


Figure 3. Distribution map of (●) *G. macrorrhizum* in Turkey

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(Received for publication 10 November 2009; The date of publication 01 August 2010)