

## A New Record for the Flora of Turkey: *Orobanche palaestina* Reut. (Orobanchaceae)

Golshan Zare\*, Ali A. Dönmez, Aslı D. Koca

Hacettepe University, Faculty of Science, Department of Biology, Ankara, Turkey

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### Abstract

*Orobanche palaestina* Reut. is a species that was first described from Palestine by Reuter in 1847. *Orobanche* L. is a large genus mainly distributed throughout subtropical and temperate regions of the northern hemisphere. The Mediterranean region is one of the most important centers of diversity. The species was collected for the first time from the seashore of Samandağ in Hatay and it is a new record for the flora of Turkey. The description, pictures of the type species from the Geneva herbarium and field, and a distribution map are given. Diagnostic characters and its taxonomic relationship with closely allied taxa are discussed here. The genus *Orobanche* has been represented by 39 species due to this new record in Turkey.

## INTRODUCTION

*Orobanche* L. is a large genus mainly distributed throughout subtropical and temperate regions of the northern hemisphere. The Mediterranean region is one of the most important centers of diversity [1]. The genus is represented by 38 species in Turkey [2,3] and 9 species in the Flora of Palaestina [4].

This genus belongs to holoparasitic members of Orobanchaceae Vent. and contains about 170 species [5]. Following the latest monograph of the

genus by Beck-Mannagetta [6], most authors have divided *Orobanche* into four sections; the two large ones *Orobanche* (=sec. *Osproleon* Wallr.) and *Trionychon* Wallr. in the Old World and the two small sections *Gymnocaulis* Nutt. and *Myzorrhiza* (Philippi) Beck. in the New World. *O. palaestina* Reut. belong to *Orobanche* section. Some *Orobanche* species are agricultural pests and can cause major crop losses. A few *Orobanche* species growing in agricultural land in the Mediterranean countries and the near East have become real plagues; they cause extensive damage to various crops [7].

Most species of *Orobanche* grow in sunny, preferably in arid and semi-arid grasslands. Some species are found frequently in ruderal pastures, in thickets (especially in the Mediterranean region) and

\* Correspondence to: Golshan Zare

Hacettepe University, Faculty of Science, Department of Biology, Ankara, Turkey

Tel: +90312 297 6165 Fax: +90312 299 2028

E-mail: g\_zare@hacettepe.edu.tr

at the edges of arable fields. Many species infect only a single type of host plant while others parasitize a range of hosts in members of a certain family or members of various families.

During field trips in the Mediterranean region of Turkey an unusual specimen of *Orobanche* was collected by the second author from Samandağ located in Hatay in southern Turkey in 2009. At first glance, it looks like *O. minor*. After a detailed examination with the Flora of Turkey [2,3] and the relevant Floras [4,6,8-12], the specimen was identified as *O. palaestina*, which has been known from Palestine, Syria and Israel so far (Figure 2). Comprehensive studies in literature, herbaria and databases for identifying the specimens have been revealed that the identification is correct and it is a new record for the flora of Turkey.

***Orobanche palaestina*** Reut. in DC., Prodr. 11: 718 (1847); Boiss., Fl. 4: 506; Post, Fl. 2:315; G. Beck, op. cit. 216 (1930). G. Beck, op. cit. 197 as *O. grisebachii* Reut.

**Iconography:** Figure 364 in Flora Palaestina (1978) 3: 364.

Parasitic herb, annuals, (15-)30-60 cm, pubescent with crisped and glandular hairs. Stem simple. Scales 1.5-2.5 cm, oblong-lanceolate. Inflorescence spike with many-flowers, 15-20 cm, mostly dense, often very long. Bracts 15-20 mm, ovate-lanceolate, long-acuminate, much longer than flower, forming a tuft at the apex of the young spikes. Calyx 8-12 mm, shorter than corolla; segments free, oblong, undivided or unequally 2-lobed; lobes linear-subulate. Corolla 15-17 mm, tubular, scarcely constricted, moderately curved outwards, glabrous to sparsely hairy, cream-colored with a violet-tinged limb, becoming light brown when dry; limb short, hardly reaching 10 mm in diameter; middle lobe of

lower lip somewhat larger than lateral lobes. Stamens inserted on the lower third of corolla, near the base; filaments c. 8 mm, hairy at base; anthers glabrous. Stigma glabrous or scarcely glandular. Capsule 3 × 6 mm, oblong. Seed black.

[Turkey] C5: Antakya: Samandağ 3 km from Çevlik to Keldağ, on seashore, 36° 05' 571" N 035° 56' 371" E, 0 m, 26. vii. 2009, A. A. Dönmez 15970.

**Distribution:** Rare. Turkey, Syria, Israel and Palestine (Figure 3).

**Phenology and ecology:**

Flowering in June, Alluvial and sandy soils, seashore, 0- 210 m.

Hosts: Annual leguminosae, *Notobasis syriaca* Cass., *Cirsium phyllocephalum* Boiss., *Eryngium maritimum* L.

Distribution: Endemic. E. Mediterranean element. Voucher specimens were deposited at the herbarium of Hacettepe University (HUB).

**DISCUSSION**

According to Beck-Mannagetta [6], *O. palaestina* has not bracteoles and it has calyx with 2 lateral halves. Due to these characters it has been placed in *Orobanche* section. The species is closely related to *O. minor* and *O. grisebachii* and they are all placed in *O. minoris* group. *O. palaestina* is very similar to *O. grisebachii* but it is remarkably different from *O. grisebachii* and *O. minor* by having slightly longer flowers and the calyx segments that are often deeply divided to two unequal teeth. In contrast to this, the segments of calyx in *O. palaestina* are entire and Beck-Mannagetta claim that *O. palaestina* is distinguishable by stigma with deep yellow color [6].



Figure 1. Picture of the type material from the Geneva herbarium.





Figure 2. *O. palaestina* with *Eryngium maritimum* on sandy habitat (Photo by Ali A. Dönmez).

*O. palaestina* was first described by Reuter (1847) in *Prodromus systematis* [13]. A comprehensive description of this species with an illustration was prepared by Feinbrun-Dothan, N. in 1978 [4]. Type materials of the species have been deposited at the Geneva herbarium (G). Pictures of them have been examined, and it has been concluded that identification of the specimen that have been collected from Turkey is correct (Figure 2). Beside this, it requires typification work because there are several type material .

The description given by Feinbrun-Dothan [4] has been slightly amended in consideration of the new data. Length of the species is given as 45- 60 cm in

the Flora of Palestina by Feinbrun-Dothan, but the studies on the fresh material and type materials demonstrate that individuals are shorter than 45 cm. We observed that some individuals are 30 cm high and even shorter than this. Subsequently length of the species is corrected as (15-) 30-60 cm.

Post [8], was explained that *O. palaestina* is a perennial herb in the Flora of Syria. In additional to this, Feinbrun-Dothan [4] categorized *O. palaestina* as an annual and perennial plant in the Flora of Palaestina, with a question mark. However, according to our field observation and examination on the collected materials with respect to life span, perennial individuals cannot exist. Furthermore,

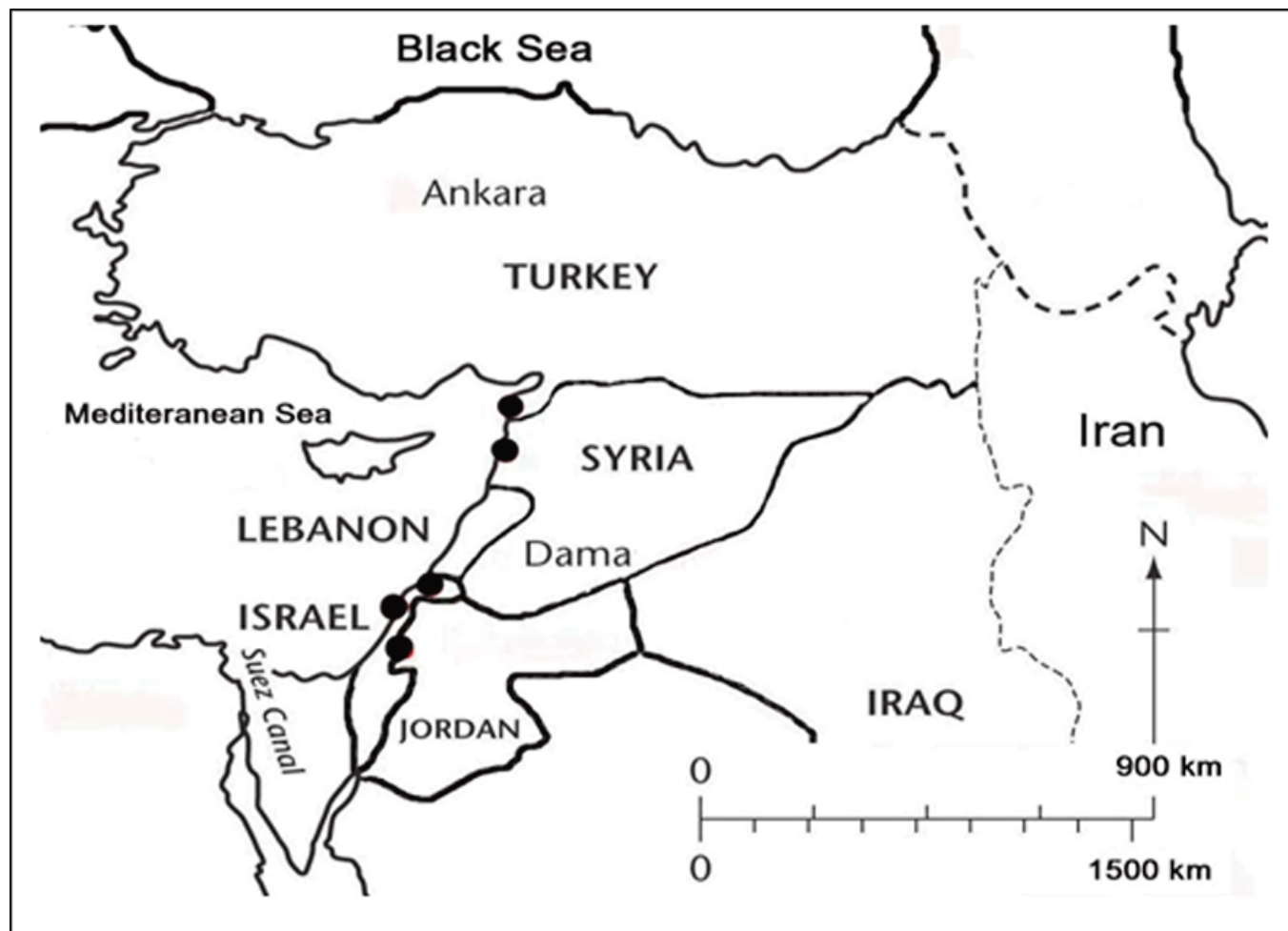


Figure 3. Distribution map of *O. palaestina* (●)

*Notobasis syriaca* which is the main host of *O. palaestina* according to Feinbrun-Dothan, is an annual herb. Because of this, *O. palaestina*'s perennial life duration on an annual herb is impossible. However, more studies for clarifying life strategy of this species are needed.

*O. palaestina* has restricted to the coastal region of eastern Mediterranean (Figure 3); distribution range of the species starts from the center of Israel and reach to Palestine and Syria. Thus the present Turkish collection extends the occupation area of the species. The vegetation in this area is formed by herbaceous plants specially *Eryngium maritimum*. Unfortunately, we could not find any more material in Turkish herbarium related to this taxon.

*Orobanche* spp. are obligatory root parasites. *O. palaestina* Reut. has been previously reported as a wild plant that parasitizes annual legumes and

thistles, *Notobasis syriaca* L. and *Cirsium phyllocephalum*. In recent experiments it was found that among agricultural cultivations *Lactuca sativa* L. and *Cynara scolymus* L. are susceptible to *O. palaestina*. Since cultivated Asteraceae crops are grown within the distribution range of *O. palaestina* and share the same growth season, this information is essential, and should be taken into consideration before planting the susceptible crops in *O. palaestina* infested fields.

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## REFERENCES

1. Plaza, L., Fernandez, I., Juan, R., Pastor, J., Pujadas, A., Micromorphological studies on seeds of *Orobanche* species from the Iberian Peninsula and the Balearic Islands, and their systematic significance, *Ann. Bot.*, 94, 167, 2004.
2. Gilli, A. *Orobanche L.*, In Davis, P. H., (ed.), *Flora of Turkey and the East Aegean Islands*, Edinburgh University Press, Edinburgh, 7, 1, 1978.
3. Davis, P.H., Mill, R.R., Tan, K. (ed.), *Flora of Turkey and the East Aegean Islands*, Edinburgh University Press, Edinburgh, 10(Suppl.), 200, 1988.
4. Feinbrun-Dothan, N., In *Flora Palaestina* (ed. M. Zohary), The Israel Academy of Sciences and Humanities, Jerusalem, 3, 210, 1978.
5. Uhlich, H., Pusch, J., Barthel, K.J., *Die Sommerwurzarten Europas, Gattung Orobanche*. Westarp Wissenschaften, Magdeburg, Germany, 1995.
6. Beck-Mannagetta, G., *Monographie der Gattung Orobanche L.* Theodor Fischer, Cassel, 1890.
7. Kreutz, C.A.J., *Orobanche L. in the European broomrape species: a field guide 1. Central and Northern Europe*. Stichtung Natuurpublicaties, Limburg, 1995.
8. Post, G.P., *Orobanche L.* In *Flora of Syria, Palestine and Sinai*, Syrian Protestant Collece, Beirut, Syria, 601, 1980.
9. Boissier, E., *Orobanche L.*, In *Flora Orientalis*, A. Asher and Co B.V., Amsterdam, 4, 502, 1879.
10. Meikle, R.D., *Orobanche L.*, In *Flora of Cyprus*, Published by the Bentham- Moxon Trust, Royal Bot. Garden., Kew, 2, 1233, 1985.
11. Forskal, P., *Flora Aegyptiaco-Arabica*. *Orobanche L.*, 112, 1775.
12. Beck-Mannagetta, G., *Orobanchaceae*. In: Engler, A. (ed.), *Das Pflanzenreich. Regni Vegetabilis Conspectus*. Wilhelm Engelmann, Leipzig, IV. 261, 1, 1930.
13. Reuter, G. F., In *Prodromus Systematis Naturalis Regni Vegetabilis*, (ed. A. De Candolle), *Orobanche L.*, Parisiis, 11, 718, 1847.