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Full Length Research Paper

Mandragora officinarum L. (*Solanaceae*): A new record for the flora of Turkey

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***Mandragora officinarum* L. (*Solanaceae*) was collected from western area of the Mediterranean region of Turkey. *Mandragora autumnalis* Bertol. is widespread in the Mediterranean area at rock slopes, ruins, under *Pinus brutia*, olive trees and edges of fields in Turkey but *M. officinarum* L. has not been reported previously. In this study, the detailed morphological characteristics are discussed and compared with the mediterranean *M. autumnalis* Berthol. Line drawing, diagnostic characters and a distribution map of *M. officinarum* L. species of Turkey are presented.**

Key words: *Solanaceae*, *Mandragora*, new record, rare species, Turkey.

INTRODUCTION

Mandragora L. (mandrake) is an old world genus of Solanaceae with only 3 species: *M. officinarum* L., a circum-mediterranean species, *M. turcomanica* Mizg., a (sub) Irano-Turanian species and *M. caulescens* C. B. Clarke, a Sino-Himalayan species (Ungricht et al., 1998; Akhani and Ghorbani, 2003).

The mediterranean species of *M. autumnalis* Bertol. is well studied and represented by extensive collections in herbaria. However, *M. officinarum* L. is already unknown as a species from nonexistent localities in Turkey (Davis, 1978 ;Güner et al., 2000). In late May, 2005, a curious aromatic plant found in Sütçüler province which is located at western of mediterranean region, within administrative border of Isparta (Figure 1).

MATERIALS AND METHODS

M. officinarum L. was collected and observed or photographed in the area during fieldwork conducted between 2005 and 2008 in Sütçüler province. The collected samples were dried according to herbarium techniques, numbered and recorded (H.F. 3833). This species are kept at the herbarium of Süleyman Demirel University. It was realized that this plant belonged to Solanaceae and because of the stemless habit, it was easily keyed out as *M. officinarum* by using flora of Turkey (Davis, 1978) and Europaea (Heywood et al., 1972). It is named by the local people 'Adam otu' which means 'first prophet' in Turkish language, because of the human-like thick storage roots. Unfortunately, we were not able to obtain information of previous local uses of this old medicinal and mythically important plant.

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RESULTS AND DISCUSSION

The characteristic of *M. officinarum* L. are perennial herbs with stout, erect, often bifid, occasionally anthropomorphic, fleshy tap-root; acaulescent or with very short stem. Leaves are densely rosetted, simple, petiolate, ovate to ovate-lanceolate, entire, undulate and sparsely villous on veins at least when young. Pedicels are usually shorter than leaves. Flowers are solitary and axillary. Calyx are campanulate, 5-lobed, slightly accrescent much shorter than berry. Corolla is up to 2.5 cm long, greenish white, with narrowly triangular lobes. It has 5 stamens which are subexserted, inserted in lower half of corollatube; villous below filaments; dorsifixed anthers. Ovary is surrounded at base by glandular disc and stigma is capitates. It has berry fruit, becoming unilocular by obliteration of septum. Berry is globular and yellow (Table 1, Figures 2, 3).

Key to related *Mandrogora* L. species:

1) Corolla up to 2.5 cm, greenish-white, with narrowly triangular lobes, berry globose, 1-4 cm, leaves sparsely villous on veins at least when young = *M. officinarum.*

Table 1. A comparison of diagnostic characters of *M. officinarum* and *M. autumnalis* (Davis, 1978; Heywood et al., 1972).

Character	*M. officinarum* L.	*M. autumnalis* Bertol.
Leaves	Sparsely villous on veins at least when young, maximum 45 cm long	Subglabrous, maximum 40 cm long
Flowers	Greenish white to pale blue and violet, not more than 2.5 cm	Pale bluish violet, (2,5-) 3 - 4 cm
Fruits	1 - 4 cm diameter	2 - 3 cm diameter
Distribution	Circum-Mediterranean	Mediterranean area

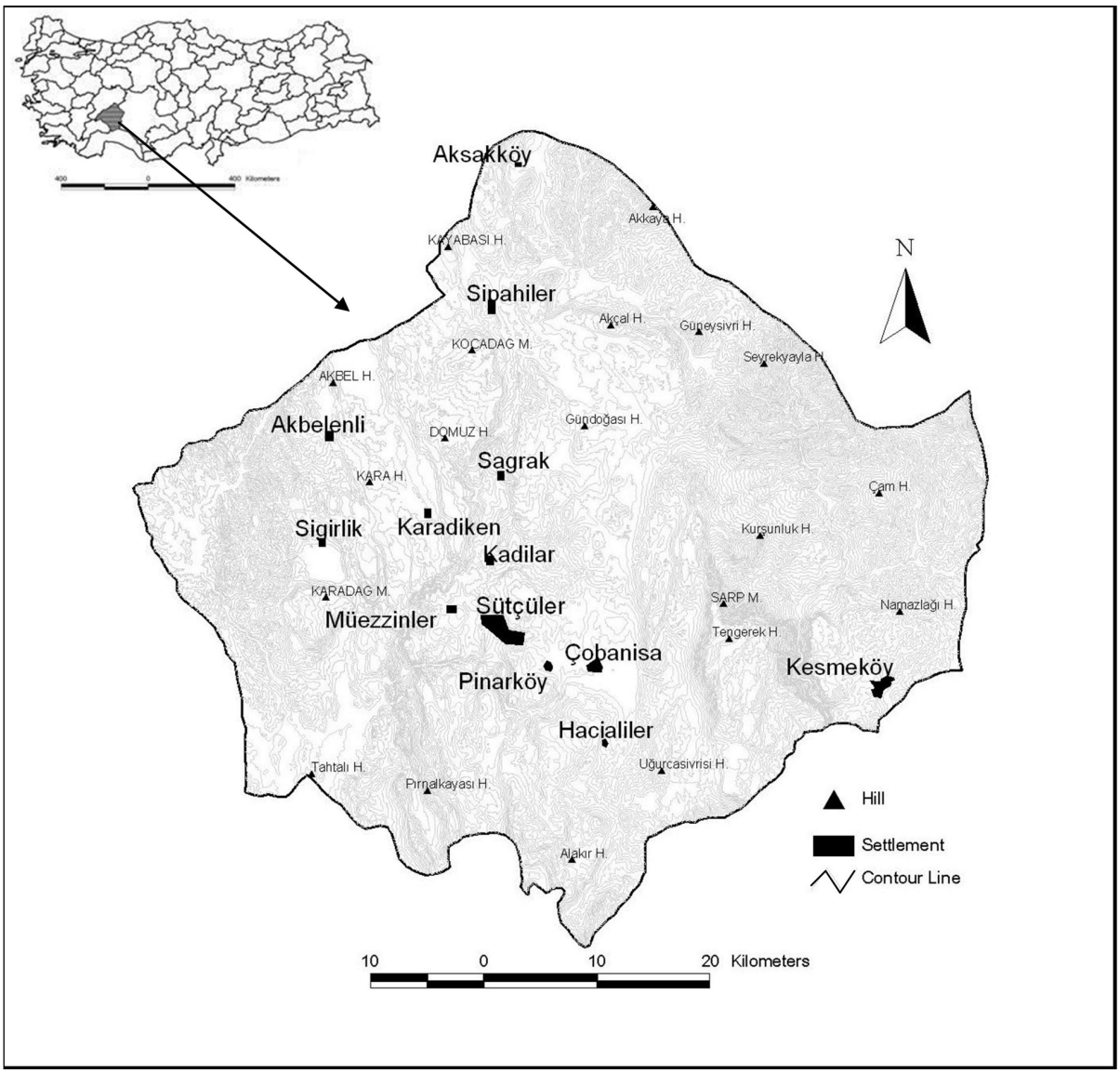

Figure 1. Distribution of *M. officinarum* in Turkey.

2) Corolla longer, violet, with wide triangular lobes berry elipsoid, 2-3 cm, leaves subglabrous = *M. autumnalis.*

M. officinarum was recorded for the first time for Turkey in Sütçüler province which located about 85 km south of the Isparta centre. According to information gleaned from local people, the species is not common around the Sütçüler province. The area in which *M. officinarum* was discovered is a transition zone between two phytogeographical provinces. Mediterranean phytogeographic region and Irano-Turanian phytogeographic region. *M. officinarum* grow on limestone with carstic landforms in the area.

Vegetation of the neighbouring area indicates that the

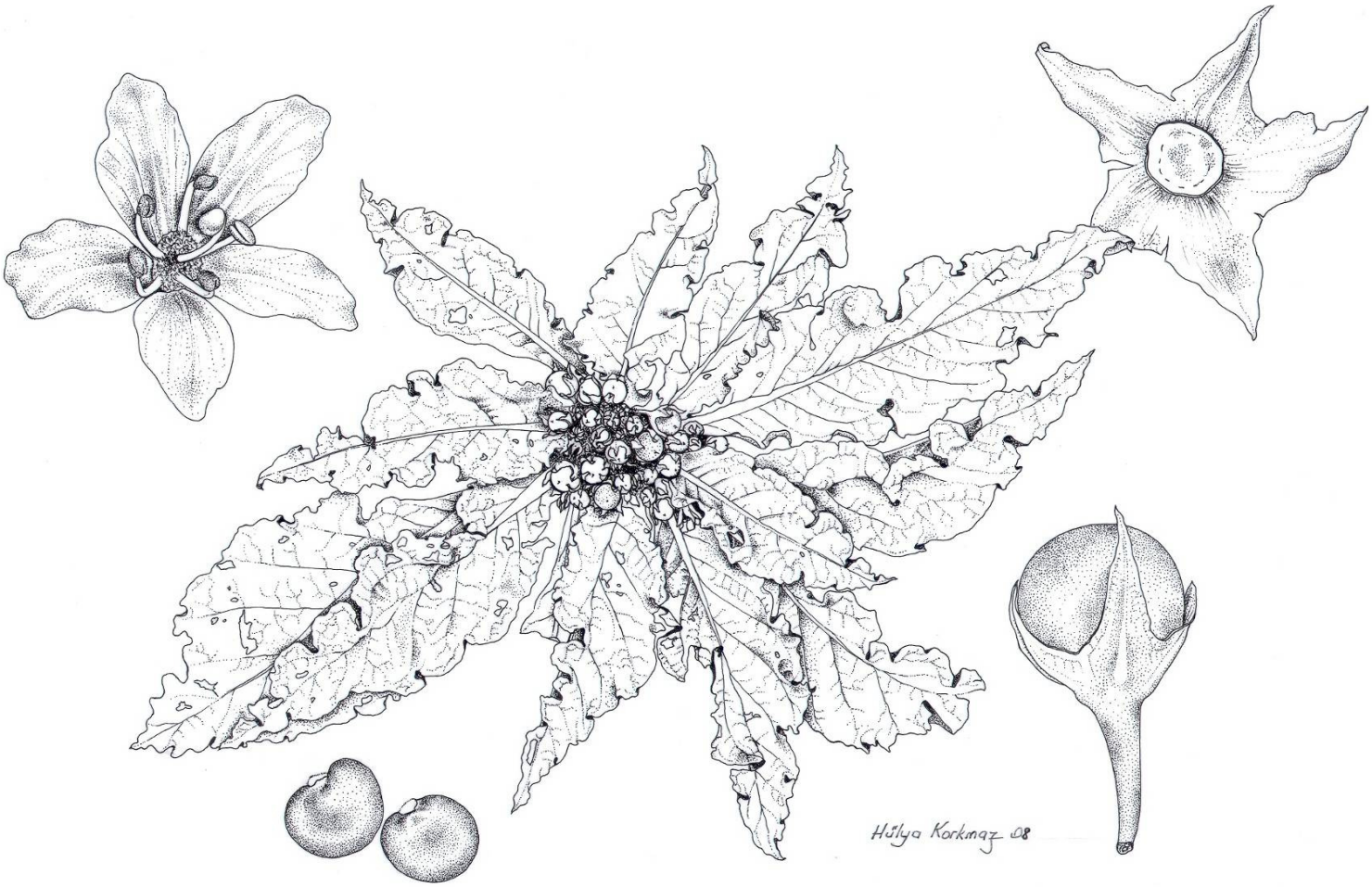

Figure 2. *M. officinarum* L. (habit, flower, fruit, seeds).

area must have been covered by trees, shrubs and herbal and bulp plants, such as *Ficus carica* L., *Juglans regia* L., *Fraxinus excelsior* L., *Quercus coccifera* L., *Pistacia terebinthus* L. subsp. *palaestina* (Boiss.) Engler, *Phillyrea latifolia* L., *Juniperus oxycedrus* L. subsp. *oxycedrus*, *Crataegus monogyna* Jacq. subsp. *monogyna, Bromus tectorum* L., *B. sterilis* L., *Mercurialis annua* L., *Cirsium arvense* (L.) Scop., *Galium aparine* L., *Arum italicum* Miller, *Sternbergia lutea* (L.) Ker-Gawl., *Climatis cirhosa* L. *Origanum onites* L., *Sedum album* L., *Hypericum ternatum* Poulter, *Phlomis fruticosa* L., *Holesteum umbellatum* L. var. *umbellatum, Umbilicus erectus* D.C.,*Ceterach officinarum* D.C., *Salvia tomentosa* Miller, *Calendula arvensis* L., *Scandix pectenveneris* L., *Sonchus oleraceus* L., *Orchis anatolica* Boiss. and *Cyclamen cilicicum* Boiss and Heldr.

Climate of the area was examined using data from the meteorology station in Sütçüler (DMİGM, 1995). The meteorological data were obtained from 1958 to 1993. The main annual precipitation in the area is 914.7 mm. The most arid and hottest months are July and August, with an mean temperature of 22.6ºC. Mean temperature as yearly is 13.0ºC. Typical climate of mediterranean predominates, characterized by hot and dry summers and rainy winters (Akman, 1990). When climatic data was used in Emberger's formula of rain and temperature factors, it was determined that the research area has a mediterranean humid climate. Heavy rain can be seen in winter from November, till February, while the dry period extends from beginning of June to end of October (Akman, 1990).

M. officinarum is a very rare species in Turkey. It was collected from one locality in Sütçüler. Natural habitat of the species should be protected. Heavy grazing pressure from many existing herds in and around the Sütçüler province and usual land degradation are large threats to the small remnants of *M. officinarum* in Turkey. Several measures need to be considered such as a search for the species in surrounding areas, a population census, restoration of vegetation, transferring the species in surroun-

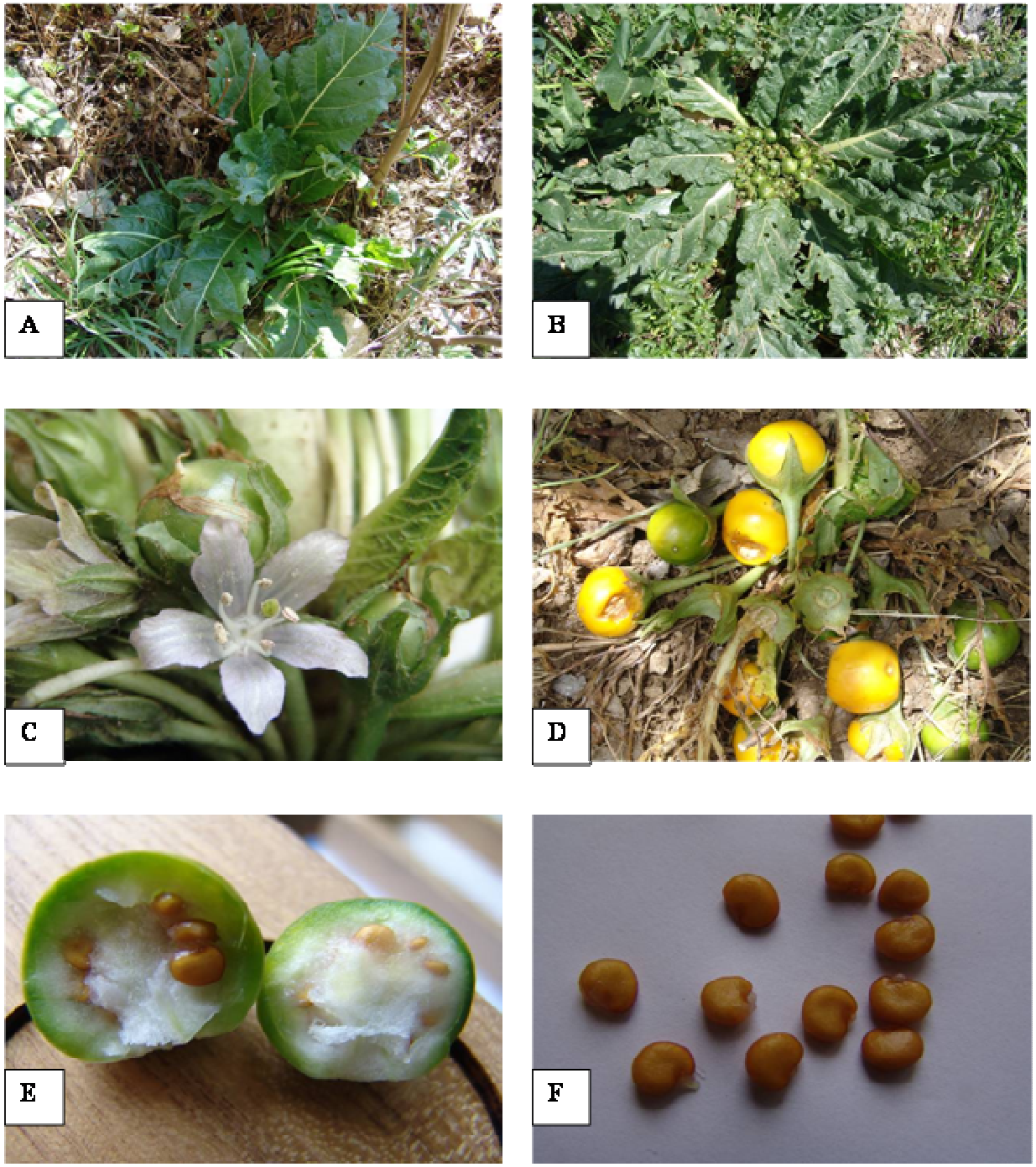

Figure 3. *M. officinarum* photographed in Sütçüler province. A: Young roset, B: Habit C: Flower; D: Ripe fruits. E: Fruit F: Seeds (Photo: H.Fakir).

rounding areas and cultivation in botanical gardens.

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