

On the rediscovery of *Euphorbia amygdaloides* subsp. *robbiae* and its type

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Received: 19.10.2011 • Accepted: 20.06.2012

Abstract: *Euphorbia amygdaloides* L. subsp. *robbiae* (Turrill) Stace was first collected by Mrs Mary Anne Robb. She collected a wild growing *Euphorbia* L. specimen in 1891 from an unknown locality near İstanbul, and carried this plant in a bonnet box to England. Since 1891, this well-known cultivated plant has not been collected from any wild locality. This paper reports the wild specimens from İstanbul with morphological detail. We also present the composite image illustrations of the specimen, and images of the type specimen. The article also reveals that the date of the type specimen of *Euphorbia amygdaloides* subsp. *robbiae* does not match the literature, and it is proposed that the specimen dated 12 May 1949 be treated as the holotype. This paper explains why a lectotypification of the specimen is unnecessary.

Key words: *Euphorbia amygdaloides*, *Euphorbia robbiae*, Euphorbiaceae, İstanbul

Introduction

With over 2150 species (Bruyns et al., 2006), *Euphorbia* L. (Euphorbiaceae) is one of the largest genera of flowering plants. The genus is also one of the most diverse genera; life forms from herbaceous annuals to trees are present, but it is best known for its cactus-like succulent forms, which we can see in almost every textbook, under the title 'convergent evolution'. In Turkey, *Euphorbia* is represented by more than 90 species (Radcliffe-Smith, 1982), with highest diversity in the Mediterranean region. The Mediterranean region of Turkey has one of the richest biodiversities, where new taxa can be found (Aytaç & Türkmen, 2011; Hamzaoğlu et al., 2011; Karavelioğulları et al., 2011; Tekşen & Aytaç,

2011; Genç et al., 2012). Yıldırım (2004) reported 92 species, 4 subspecies, 10 varieties, 11 cultivated specimens, and 14 endemic species from Turkey. The last 3 *Check-list of additional taxa to the supplement Flora of Turkey* papers (Özhatay & Kültür, 2006; Özhatay et al., 2009; Özhatay et al., 2011) suggest no further additional taxa to the genus.

According to Stearn (1973), *Euphorbia amygdaloides* L. subsp. *robbiae* (Turrill) Stace was first collected by Mary Anne Robb (*née* Boulton), granddaughter of the famous engineer and Lunar Society member Matthew Boulton, from an unknown locality. After a journey to Greece in 1891, Mrs Robb made a visit to Turkey. Near İstanbul, she collected a wild growing *Euphorbia*, which she transported in a

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special box to England. This special box was meant to be carrying her bonnet instead of the plant; thus this taxon received a jocular nickname, “Mrs Robb’s bonnet”. After her arrival in England she cultivated the plant successfully in her garden and shared it with friends (Stearn, 1973). Because of Mrs Robb, this plant is still a popular garden plant in northern Europe, especially in the UK and the Netherlands.

Turrill described the taxon as a new species and named it *Euphorbia robbiae* Turrill, after Mrs Robb (Turrill, 1953). The features by which Turrill distinguished *E. robbiae* from *E. amygdaloides* are glabrous and coriaceous cauline leaves, and bigger capsules. He also reported a chromosome count of this taxon, and recorded that count as $2n = 42$. In 1976, Radcliffe-Smith also reported a chromosome count of the taxon, but as $2n = 40$, in his study in which he reduced *E. amygdaloides* subsp. *robbiae* to varietal rank under *E. amygdaloides*. According to Radcliffe-Smith, specimens of *E. amygdaloides* subsp. *robbiae* can only be identified by their sucker-shoots from a wide-spreading root system, since the *Euphorbia amygdaloides* from different localities can show differences in their leaves. However, Stace (1989) changed the status from variety to subspecies, due to different chromosome numbers and restricted distribution in north-western Turkey.

E. amygdaloides subsp. *robbiae* is well known in cultivation, but poorly known as a wild plant. Khan (1964) included *E. robbiae* in his *Taxonomic revision of Euphorbia in Turkey* and pointed out that the taxon “has not been collected again from any wild locality, and its origin remains something of a mystery”. Although Radcliffe-Smith (1982) examined a number of herbarium specimens for his Euphorbiaceae chapter in P.H. Davis’s *Flora of Turkey*, he was unable to find a “true *robbiae*”, because most of the specimens were missing underground parts.

We observed several herbarium specimens of the taxon (ISTF, ISTE, K). Although the diagnostic characters seem stable, we needed to see wild living specimens. In May 2011, the first author arranged a field trip. Searching for Thracian *Euphorbias*, we came upon *E. amygdaloides* subsp. *robbiae* in a *Fagus* and *Quercus* forest, north-west of İstanbul.

Euphorbia amygdaloides subsp. *robbiae* has been studied by Turrill (1953), Stearn (1973), Radcliffe-Smith (1976), Palmer (1985), Stace (1989), and Clement (1997), but unfortunately all of them studied

cultivated plants. Moreover, even the type specimen was prepared from a cultivated plant, and it has a nomenclatural problem. Under these conditions, we decided to study on its type problem in detail and we present a composite image (Figure 1) from the wild.

Materials and methods

Observations were based on living material of *E. amygdaloides* subsp. *robbiae* from the field and İstanbul University Alfred Heilbronn Botanical Garden. Living material from the Netherlands (cultivated from an English stock) was used for comparison (provided by Pjotr Lawant). In addition, herbarium specimens from ISTF (İstanbul University Science Faculty Herbarium), ISTE (İstanbul University Pharmacy Faculty Herbarium), and K (Royal Botanic Gardens, Kew Herbarium) were examined (Appendix). Morphological data on *E. amygdaloides* subsp. *robbiae* were obtained from the wild and herbarium specimens (ISTF 40785, 40786).

Illustrations of the taxon were prepared as a composite image by following Simpson and Barnes (2008) and Erol et al. (2009).

Results and discussion

Morphological description

Perennial plant (Figure 1A) with long dark brown rhizomes (Figure 1B), bearing buds and leafy shoots. Flowering stems biennial, to 65 cm. First year cauline leaves (on flowering stems) shortly petiolate, obovate to elliptic, (1-)3-6 × 1-2.7 cm, apex round to obtuse with minutely retuse tip, upper surface dark green, lower surface glaucous; second year cauline leaves shortly petiolate to sessile, obovate-oblong or elliptic, 1-2 × 0.3-1.2 cm, apex obtuse, rounded at base. Upper and lower surface of lamina glabrous, petioles hairy (Figure 1C). Raylet-leaf ‘cups’ (1-)1.5-2(-2.3) cm across. Rays 5-8, once or twice dichotomous. Cyathial glands rhomboid to ovate in outline, base thicker and larger than horns (Figure 1D and 1E). Seeds ovoid, 2 × 1 mm, smooth, dark grey with black dots; caruncle small, whitish, patelliform, adpressed to top of seed.

Locality: A2(E) Province İstanbul: Çatalca - between Karacaköy and Karamandere, *L.Can* & *O.Erol* s.n. (ISTF40785); A1 Province Kırklareli: between Demirköy and Yenice, *L.Can* & *O.Erol* s.n. (ISTF40786).

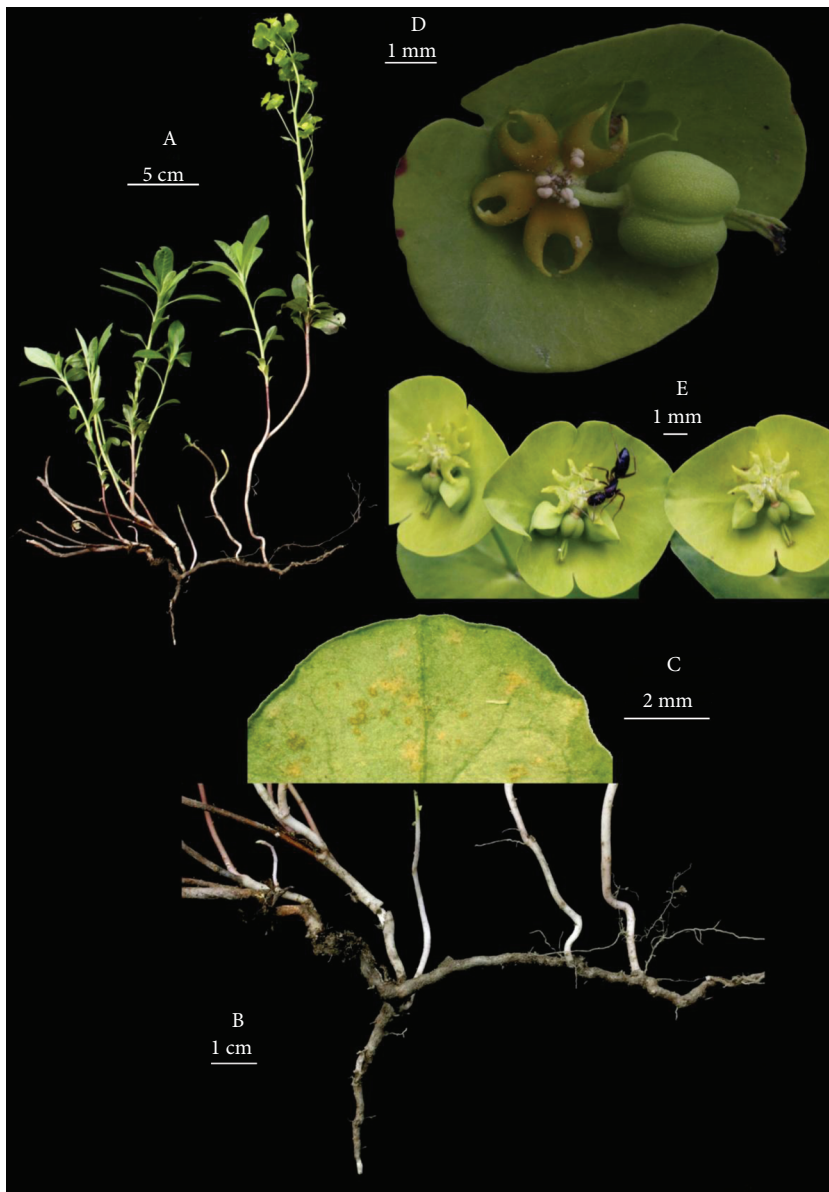


Figure 1. Composite image of the *Euphorbia amygdaloides* subsp. *robbiae*. A- habitus, B- rhizomatous underground part, C- lower surface of leaf, D- cyathium, E- cyathia with pollinator.

Type specimen of *Euphorbia amygdaloides* subsp. *robbiae*

E. amygdaloides subsp. *robbiae* began its taxonomic voyage with Turrill, who designated the type specimen from K, and recorded ‘Type in Herbarium Kew Cultivation, Herbarium Experimental Ground, Kew, 13 April 1949’ (Figure 2).

However, in a survey related to this taxon, we noticed that the date (12 May 1949) on the specimen

at Kew, to which a copy of the original illustration was attached, and Turrill’s published collection date did not match. We also inspected the original drawing, which was also labelled ‘12 May 1949’. It is probable that Turrill noted the collection date as 13 Apr 1949 and published it in his paper, though the date of the illustration (12 May 1949) was copied onto the herbarium sheet and taken as the collection date in some publications. Lectotypification of the specimen is unnecessary; however, it is proposed that



Figure 2. Type specimen of the *Euphorbia amygdaloides* subsp. *robbiae*, (Cultivation Herbarium Experimental Ground, Kew. 12.05.1949). (© The Board of Trustees of the Royal Botanic Gardens, Kew. Reproduced with the consent of the Royal Botanic Gardens, Kew).

the specimen dated 12 May 1949 be treated as the holotype. Radcliffe-Smith used the same type details as Turrill, in his edition of the genus *Euphorbia* in *Flora of Turkey and the East Aegean Islands* (Radcliffe-Smith, 1982).

This paper resolved a question about this mysterious and popular taxon. With the rediscovery

of *E. amygdaloides* subsp. *robbiae*, we will perform DNA analysis and submit definite results in the near future.

Acknowledgements

We are grateful to Katherine Challis, Rafaël Govaerts, Christine Barker, and Irina Belyaeva for

discussions on the nomenclatural matter. We also thank Assist Prof Dr Nadim Yilmazer for discussions on the manuscript. The first author wants to thank EDIT-DEST (especially Isabella Van de Velde) and Pjotr Lawant for providing us with specimens for comparison with specimens cultivated from English stock and for matching literature. This research was supported by the Research Fund of İstanbul University, İstanbul, Turkey (Project Number: 5481). We also thank HLAA Royal Botanic Gardens, Kew, and Sue Zmarzty for the type specimen images.

Appendix:

Representative specimens of *Euphorbia amygdaloides* examined in this study: Amasya (ISTE 37903); Artvin (ISTE 52561); Balıkesir (ISTE 18793, 51763;

ISTF 32593, 33099); Bolu (ISTE 32370, 36819, 62808, 62809; ISTF 6742, 6780, 18618); Bursa (ISTE 5723, 59987; ISTF 2656, 2828, 3028, 3048, 12607); Edirne (ISTE 28456); England, UK (ISTE 33842, 33843; K 12/v/49 holotype); Europe (ISTE 896); İstanbul (ISTE 2736, 2737, 2738, 3557, 4447, 7177, 7222, 7543, 7559, 8705, 11500, 17702, 19383, 21413, 21431, 28483, 60394; ISTF 759, 1548, 11705, 14453, 18937, 25246, 25925, 40785); Kastamonu (ISTE 21771); Kayseri (ISTE 897); Kırklareli (ISTE 13244, 13266, 13862, 24273, 24459, 27638, 27675, 30084; ISTF 17515, 40786, 40787); Kocaeli (ISTE 24613); Muğla (ISTF 6270); Sakarya (ISTF 33202); Samsun (ISTE 9052); Tekirdağ (ISTE 39445; ISTF 40788); Tokat (ISTE 9066); Unknown (ISTF 17422, 17887); Yalova (ISTF 1500); Zonguldak (ISTF 10948).

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