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A NEW SUBSPECIES OF *CREPIS PALAESTINA* (ASTERACEAE) FROM TURKEY

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Abstract

Crepis palaestina subsp. *babcockii* Inceer & Aksu Kalmuk subsp. nov. (Asteraceae, Cichorieae) is described and illustrated. It grows in shady places and red pine forest in southwest Anatolia, Turkey. The chromosome number of the new subspecies is $2n = 2x = 8$. The diagnostic morphological characters that distinguish *C. palaestina* subsp. *babcockii* from morphologically similar taxa *C. palaestina* subsp. *palaestina* and *C. pulchra* are discussed, and a conservation status for the new taxon is suggested.

Introduction

Crepis L. is a large, critical and taxonomically difficult genus in the tribe Cichorieae of the family Asteraceae. It comprises over 200 species (Bremer, 1994), mainly distributed throughout the northern hemisphere and Africa (Enke, 2009). Ekim (2012) listed 42 Turkish taxa of *Crepis*, but our recent taxonomic data obtained from revision of *Crepis* in Turkey indicate that the genus together with the inclusion of the new subspecies described here has 40 taxa in Turkey, of which 8 are endemic. Among the species occurring in Turkey, *C. palaestina* (Boiss.) Bornm. is one of the rare species and is found only in Manavgat of Antalya province in southwest Anatolia (Lamond, 1975). According to a recent taxonomic review of *Crepis*, this species belongs to the section *Intybellioides* Froel. (Enke, 2009).

C. palaestina was reported with a brief description from a single locality, which had no completely mature achenes, in the *Flora of Turkey and the East Aegean Islands* (Lamond, 1975). Lamond (*l.c.*) pointed out that the specimens of *C. palaestina* in Turkey differed from East Mediterranean specimens in having glandular-pubescent basal leaves. Hence, a detailed taxonomic treatment of this species was necessary.

During our field work for the taxonomic revision of *Crepis* in Turkey, we collected some intriguing specimens of *C. palaestina* from the Antalya Province. After studying the morphological characters, examining the specimens deposited in the herbaria ANK, BULU, EGE, GAZI, HUB, IST and VANF, and consulting relevant floras and literature (Post and Dinsmore, 1933; Babcock, 1947; Lamond, 1975; Mouterde, 1983), we concluded that the specimens represented an undescribed subspecies of *C. palaestina*.

Material and Methods

Plant material

The materials were collected in the field from native populations in the Antalya Province, Turkey. Vouchers were deposited in the herbarium at the Karadeniz Technical University, Department of the Biology (KTUB).

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Chromosome counts

Root tips obtained from the germinated achenes were pre-treated with 0.05% aqueous colchicine solution for 3–5 h at room temperature and then fixed in absolute ethanol-glacial acetic acid (3:1) for at least 24 h at 4°C (Inceer and Hayirlioglu-Ayaz, 2007). They were hydrolyzed in 1N HCl at 60°C for 12–15 min. Staining was carried out in 1% lacto-propionic orcein for 12–18 h at room temperature and squash preparations were made in 45% acetic acid (Inceer *et al*., 2016). Five well-spread metaphase plates were used for chromosome counts.

Results and Discussion

Crepis palaestina subsp. **babcockii** Inceer & Aksu Kalmuk, **subsp. nov.** (**Fig. 1**).

Diagnosis: *Crepis palaestina* subsp. *babcockii* closely resembles *C. palaestina* subsp. *palaestina*, but differs in having glandular-pubescent basal and cauline leaves (not eglandular-pubescent), small ligule teeth (0.2–0.3 mm long, vs 0.4–1.0 mm), corolla tubes (3.25–3.5 mm long, vs. 5.0–6.5 mm), style branches (1.0–1.2 mm long, vs. 1.4–2.25 mm) and achene morphology (not biform).

Type: Turkey, C3 Antalya: Manavgat, 10 m, 24 April 2015, *Inceer* 1142 (*Holotype:* KTUB!; *Isotype*: ANK!).

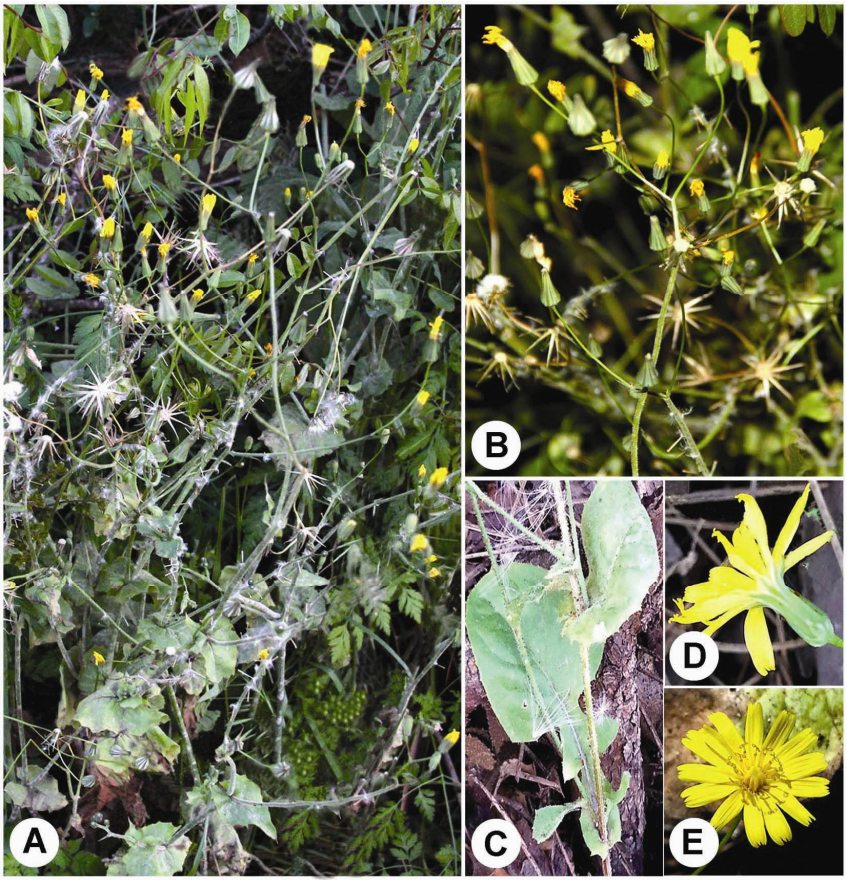

Fig. 1. *Crepis palaestina* subsp. *babcockii*, **subsp. nov.** A. Habit; B. Branch with synflorescences; C. Cauline leaves; D. Capitulum from side; E. Capitulum from top side.

Caulescent annual, 65–120 cm long with short caudex. Stem erect, slender or robust, terete, striate, glandular pubescent above, ± pubescent near base. Basal leaves 15–23×2.0–3.5 cm, soon withering, lyrate-pinnatifid, terminal segment large, reniform, glandular-pubescent, lateral lobes triangular, glandular-pubescent. Cauline leaves numerous, 2.0–8.5×0.5–4.0 cm, lowest similar to the basal leaves, middle ones ovate-lanceolate, acute, sessile, auriculate, glandular-pubescent, upper ones ± bract-like. Peduncles 2.0–7.5 cm long, strict or arcuate, glandular-pubescent below, glabrous above, swollen near base of fruiting heads. Capitula 30–40 flowered. Involucre cylindrical, 11.5–15.0×8.0–9.5 mm, dark green, becoming straminous and indurate in fruit, glabrous or the bracts ± pubescent with pale glandless hairs. Outer bracts 6–8, minute, 2.5–4.0×0.5–1.5 mm, ovate, acute, pale-margined; inner bracts 10–13, 12–14×2.0–2.5 mm, lanceolate, acute, appressed-pubescent on inner face, sometimes pale-margined, becoming very prominently carinate dorsally and pale spongy-thickened confluent with base. Receptacle areolate, glabrous. Ligules yellow, 16–20×2.0–2.5 mm, teeth 0.2–0.3 mm, corolla tube 3.2–3.5×0.2–0.3 mm, densely pubescent. Anthers 5, coherent along most of their length and forming a tube 3.0–3.3 mm long around style, yellow, tinged green at summit; filament 0.7–0.8 mm long, appendages 0.4–0.5 mm long, lanceolate, acute. Style 7–8×0.1–0.2 mm, dark green below, yellow above, branches 1.0–1.2×0.05-0.1 mm, dark green, slightly expanded at tip. Achenes triform, straminous, 15–20 striate, outermost (marginal) achene 8.8–9.1×0.8-0.9 mm, ± obcompressed, and lateraly alate, narrowly summit, intermediate achene 8.0–8.4×0.5–0.6 mm, densely spiculate, gradually attenuate upward, with slightly expanded pappus disk, ± dilated at the hollow base, innermost achene 8.1–8.5×0.5–0.6 mm, striate, gradually attenuate upward, with slightly expanded pappus disk, ± dilated at the hollow base. Pappus white, 4.1–5.5 mm, multiseriate, fine, soft, flexuous, ± persistent, included in involucre.

Phenology: April to May.

Etymology: This new subspecies is named after Professor Ernest Brown Babcock, who contributed very much to the taxonomy and genetics of *Crepis*.

Distribution and habitat: *C. palaestina* subsp. *babcockii* is known only from type locality in southwest Anatolia. It grows in shady places and *Pinus brutia* (red pine) forest at an altitude of 10 m a.s.l.

Conservation status: CR: B1ab (i, ii, iii)+2ab (i, ii, iii). The population of *C. palaestina* subsp. *babcockii* in the type locality seems to be small and scattered. It should therefore be regarded as Critically Endangered CR (IUCN, 2014) because of its local distribution and small population size.

Additional specimen examined: Turkey, C3 Antalya, Manavgat, 10 m, 29 May 2014, *Inceer* 1086 (KTUB!).

Taxonomic and cytological notes: *C. palaestina* subsp. *babcockii* is also closely related to *C. pulchra* which is distributed in other regions of Antalya, and thus they are sympatric on this region. *C. palaestina* subsp. *babcockii* can be easily distinguished from *C. pulchra* by the shape of fruits (achene-cypsela). *C. palaestina* subsp. *babcockii* has lyrate basal leaves with a large terminal lobe, whereas *C. pulchra* has the basal leaves denticulate to runcinate-pinnatifid (Table 1).

The present study reveals that *C. palaestina* subsp. *babcockii* is a diploid taxon with $2n = 2x = 8$ chromosomes (Fig. 2). This taxon has the same chromosome number with the members of the section *Intybellioides* such as *C. palaestina* subsp. *palaestina*, *C. reuteriana*, *C. pulchra*, *C. stojanovii* and *C. pterothecoides* (Babcock, 1947).

Table 1. Comparison of the diagnostic characters of *Crepis palaestina* subsp. *babcockii* subsp. nov., *C. palaestina* subsp. *palaestina* and *C. pulchra*.

Characters	*C. palaestina* subsp. *babcockii* **subsp. nov.**	*C. palaestina* subsp. *palaestina*	*C. pulchra*
Basal leaves	Lyrate-pinnatifid, terminal segment large, reniform, glandular-pubescent	Oblanceolate, obtuse or subacute, lyrate-pinnatifid, terminal segment large, oblong-cordate to reniform, eglandular-pubescent	Oblanceolate or obovate, denticulate to runcinately dentate or pinnatifid, on both sides pubescent
Cauline leaves (middle ones)	Ovate-lanceolate, auriculate	Mostly lanceolate, runcinate-pinnatifid, broadly auriculate	Lanceolate, denticulate to subpinnatifid, sub-amplexicaul, on both sides pubescent, pale glandular hairs
Ligule teeth	0.2–0.3 mm long	0.4–1.0 mm long	0.1–0.2 mm long
Corolla tubes	3.25–3.5 mm long	5.0–6.5 mm long	4.0–4.5 mm long
Style branches	1.0–1.2 mm long	1.4–2.3 mm long	0.8–1.1 mm long
Achene forms	Triform	Biform	Biform
Outermost achenes	± Obcompressed, laterally alate, narrow summit	± Obcompressed, laterally broadly alate, narrow summit	± Obcompressed, ± attenuate, spiculate, slightly expanded pappus disk
Intermediate achenes	Densely spiculate, gradually attenuate upward, with slightly expanded pappus disk, ± dilated at the hollow base	Absent	Absent
Innermost achenes	Striate, gradually attenuate upward, ± dilated at the hollow base	Striate, gradually attenuate upward, conspicously dilated at the hollow base	Striate, ± attenuate

Fig. 2. Somatic metaphase chromosomes of *C. palaestina* subsp. *babcockii*. (Scale bar: 10 µm).

Acknowledgements

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