

A contribution to *Centaurea* sect. *Phaeopappa* (Asteraceae, Cardueae) in Iran

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Abstract

Centaurea ardabilica and *C. tabriziana*, two new species endemic to NW Iran, are described and illustrated. Both new species belong to *C.* sect. *Phaeopappa*. *Centaurea ardabilica* is closely related to *C. daralagoezica* and is distinguished by having median and upper cauline leaves decurrent, peduncle up to 20 mm long and median and upper cauline leaves often lyrate, and involucre smaller; *C. tabriziana* is distinguished from *C. phaeopappa* by having median cauline leaves decurrent, segments of basal cauline leaves in 6–20 pairs, phyllaries with a median appendage 15–22 mm long and a spine up to 10 mm long. An updated key to the species of *C.* sect. *Phaeopappa* in Iran is provided.

Key words: Compositae, new species, taxonomy

Introduction

Centaurea Linnaeus (1753: 909), a genus belonging to the tribe Cardueae of Asteraceae, is mainly distributed in Europe and Asia with some introductions in other more or less distant regions like North America, and has its centre of diversity in Central Asia (Davis *et al.* 1988, Bremer 1994, Susanna *et al.* 1995, Garcia-Jacas *et al.* 2000), with 189 taxa occurring mainly in the Mediterranean and Irano-Turanian regions (Wagenitz 1975, Davis *et al.* 1988, Wagenitz & Hellwig 1996, Wagenitz *et al.* 1998).

The paraphyletic nature of the classical delimitation of *Centaurea* is well known (Susanna *et al.* 1995, Garcia-Jacas *et al.* 2000), so that its revision is ongoing and depending on information derived from molecular characters in phylogenetic studies (Bremer 1994, Susanna *et al.* 1995, Wagenitz & Hellwig 1996, Garcia-Jacas *et al.* 2000). One result has been the segregation of certain groups traditionally included in *Centaurea* (e.g., *Rhaponticoides* Vaillant 1754: 165; or *Psephellus* Cassini 1826: 488), and re-incorporation of others that had been segregated into separate genera (see López & Devesa 2008).

The genus *Centaurea* in Iran has about 70 species. The high level of endemism (55%) supports the assertion that the country is one of the major centres of diversity for the genus (Wagenitz 1986, Wagenitz 1980, Ranjbar *et al.* 2012a, 2012b, 2013a, 2013b, Ranjbar & Negaresh 2012, 2013a, 2013b).

Centaurea sect. *Phaeopappus* (Candolle 1838: 560) Hoffmann (1895: 330) was treated in *Flora Iranica* by Wagenitz (1980) and later it was taxonomically revised by Ranjbar & Negaresh (2013c), and both revisions include descriptions of some new species from Iran. Herein we add two other new species, *Centaurea ardabilica* and *C. tabriziana*, which have been collected near Bogh Rodagh mountains in Ardabil province and in Kasabe mountains in East Azarbaijejan province (NW Iran). After examination of the literature as well as herbarium specimens and plants in the field, a preliminary list of the characters that had been or might be useful in delimiting *Centaurea* taxa was developed. The utility of these characters to distinguish species was assessed by examining specimens from across the range of the genus in NW Iran as well as from the plants collected in the field.

Material and methods

Plants were collected from different regions within the distribution area of *Centaurea* sect. *Phaeopappa* during several

TABLE 2. Comparison of *Centaurea tabriziana* and *C. phaeopappa*.

<i>Centaurea tabriziana</i>	<i>Centaurea phaeopappa</i>	
Up to 55	25–45	Plant height (cm)
Predominantly lyrate	Pinnatisect or pinnatipartite	Leaves, dissection
Longer than capitula	Shorter than capitula	Upper cauline leaves
5–10 × 0.5–3	4–6 × 0.2–0.4	Upper cauline leaves, length (cm)
4–8	Simple	Upper cauline leaves, segment pairs
Decurrent	Not decurrent	Base of upper cauline leaves
15–20	0	Upper cauline leaves, decurrent length (mm)
11–15 × 2–5	7.5–12 × 2–3	Median cauline leaves, decurrent length (mm)
Decurrent	Petiolate	Base of median cauline leaves
0	30	Median cauline leaves, petiole length (mm)
10–25	0	Median cauline leaves, decurrent length (mm)
14–29	20–25	Basal and lower cauline leaves, length (cm)
6–20	25–30	Basal cauline leaves, segment pairs
Decurrent	Not decurrent	Base of basal cauline leaves
Dense	Loose	Density of leaves
5	7–10 or sessile	Peduncle (mm)
30–40	ca. 20 × 25	Capitula (mm)
12–15 × 7–10	7–10 × 6–8	Median phyllaries, size (mm)
Brownish black	Brown or dark brown	Appendage colour
15–22	7–10	Median appendage (fimbriae and spine included), size (mm)
Whitish straw	Whitish brown	Fimbriae, colour
Up to 10	Up to 6	Spine, length (mm)

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