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Achillea salicifolia Besser subsp. *salicifolia* (Asteraceae) in Turkey, with Taxonomic Remarks

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Abstract: This study includes taxonomical improvements of *Achillea salicifolia* Besser subsp. *salicifolia* and distributions in Turkey. Differences between *A. salicifolia* subsp. *salicifolia* and relatives are discussed, and synonyms are established. Furthermore, description, localities, distribution map, and key of allied species are given.

Key Words: *Asteraceae*, *Achillea*, Taxonomy, New record

Achillea salicifolia Besser subsp. *salicifolia* (Asteraceae)'nın Türkiye'deki Durumu ve Taksonomik Özellikleri

Özet: Bu çalışma, *Achillea salicifolia* Besser subsp. *salicifolia*'ın taksonomik gelişimi ve Türkiye'deki yayılışını içermektedir. *A. salicifolia* subsp. *salicifolia*'nın yakın akraba türlerle olan farklılıkları tartışılmış ve sinonimleri belirtilmiştir. Ayrıca, betimi, lokaliteleri, yayılış haritası ve akraba türleri ile ayırım anahtarı verilmiştir.

Anahtar Sözcükler: *Asteraceae*, *Achillea*, Taksonomi, Yeni kayıt

Introduction

The essentially Eurasian genus *Achillea* L. (Asteraceae: Anthemideae) contains about 130 species throughout the world. It has a wide distribution range, from desert and sea coasts to nival pioneer biota, and from rock fissures and talus to ruderal habitats. According to recent studies of the Turkish *Achillea*, this genus is represented by 43 species (49 taxa) of which 22 are endemic to Turkey (Huber-Morath, 1975; Demirkuş, 1999; Güner, 2000; Guo, 2004). We have been engaged in a comprehensive revision of Turkish *Achillea* since 2001.

Achillea salicifolia Besser s.l. is a diploid ($2n = 18$) member of the genus *Achillea* sect. *Ptarmica* (Mill.) W.Koch (Guo, 2004). At the species level, it was first described in 1812 by Besser, but included as a synonym to *A. cartilaginea* Ledeb. by Richardson in Flora Europaea.

According to recent studies of the Turkish *Achillea*, *A. cartilaginea* was recorded as a new species for the Flora of Turkey by Demirkuş & Kaya (Demirkuş, 1999).

Materials and Methods

We collected the specimens during field studies in 2004 and 2005 while they were flowering. However, another specimen belonging to Demirkuş sheet No. 7008 was investigated. These specimens were identified by referencing the written Floras (Afanasev, 1961; Hu, 1965-1976; Huber-Morath, 1975; Richardson, 1976; Güner et al., 2000). Specimens were investigated at the University of Vienna by Friedrich Ehrendorfer and Karin M. Valant-Vetschera, and at the University of Helsinki by Pertti Uotila, who are all experts on the genus *Achillea*.

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Collected plant materials were deposited in the Herbarium of İnönü University in Malatya and in ISTE.

Results and Discussion

Achillea salicifolia Besser subsp. *salicifolia*, Suppl. Catal. Pl. Jard. Botan. Krzemieniec 3 (1812).

Lectotype: (selected by Bochantsev, 1961) Described from Dniester (LE).

Syn: *Achillea cartilaginea* Ledeb., in Rchb. Fl. Germ. Exs. 2(2):849 (1832).

A. speciosa auct., non Spreng. (1806); Ledeb., Fl. Alt. 4:122 (1833).

Ptarmica ircutiana DC., Prodr. 6:22 (1837).

P. vulgaris Blackw. ? *cartilaginea* DC., Prodr. 6:23 (1837).

P. speciosa DC., Prodr. 6:23 (1837).

P. cartilaginea Ledeb., Fl. Ross. 2(2):530 (1845).

A. speciosa Henckel subsp. *occidentalis* Rupr., in Mater. Blizh. Pozn. Prozya-baemosti Ross. imper 2 (1845).

Ptarmica lenensis Turcz., in Bull. Soc. Nat. Mosc. 25(4):431 (1852).

Achillea lenensis Turcz., in Bull. Soc. Nat. Mosc. 25(4):431 (1852).

A. ircutiana Sch.-Bip., in Flora 38:15 (1855).

A. cartilaginea Ledeb. var. *latifolia* Rupr., Fl. Ingr. 587 (1860).

Ptarmica vulgaris DC. var. *pycnocephala* Trautv., in Bull. Soc. Nat. Mosc. 39(2):345 (1866).

Achillea ptarmica L. subsp. *cartilaginea* (Ledeb ex Rchb.) Heimerl., Denkschr. Math.-Naturw Cl. 48:174 (1884).

Ptarmica vulgaris Clus. var. *cartilaginea* DC., in B. et O. Fedch., Perech. Rast. Turk. 4:181 (1911).

Achillea borystenica Klokov, in Vizn. Rosl. URSS 543 (1950).

A. cartilaginea Ledeb. subsp. *borystenica* Sakalo, in Vizn. Rosl. URSS 543 (nom. subnud.) (1950).

Ptarmica borystenica Klokov et Sakalo, in Bot. Mat. Gerb. Bot. Inst. AN SSSR 16:357 (1954) (Figure).

Perennial, with woody rootstocks. Plant usually grey-green, densely or sparsely pubescent with short curly hairs. Stem 60-150 cm high (incl. inflorescences), straight, terete, longitudinally striate, foliated, branched, lower branches shortened, sterile, middle and upper ones long, crowned with heads. Leaves linear-lanceolate, 0.2-1.2 x 0.05-1.7 cm, flat, entire, sessile, biserrate-toothed

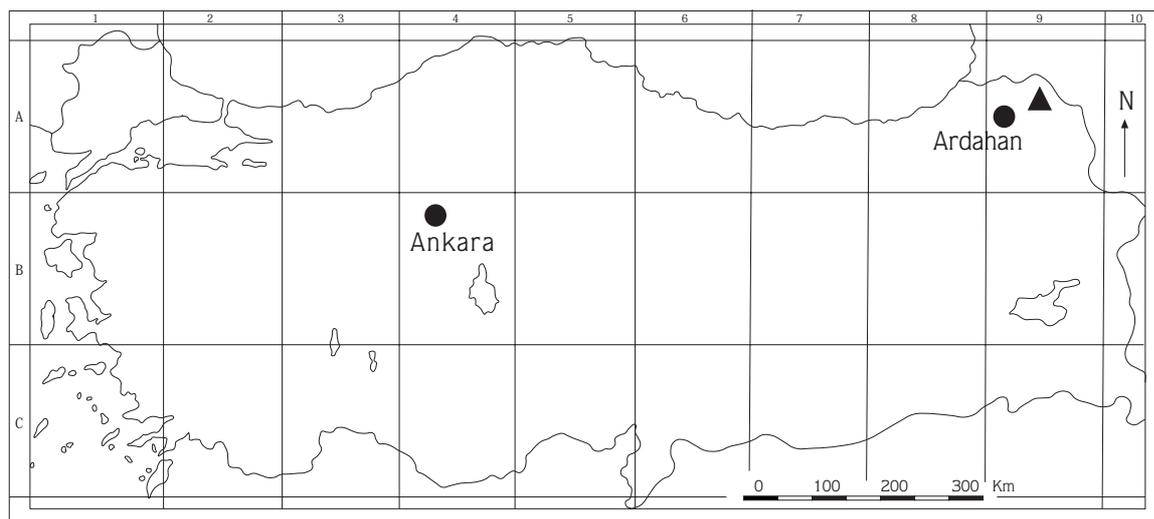


Figure. Distribution of *Achillea salicifolia* subsp. *salicifolia* (▲) in Turkey.

along margin, acute to acuminate, diminishing from base to apex of the stem, somewhat wrapped up on the upper surface, usually covered with dotted glands above and beneath, lower cauline leaves deciduous by the time of anthesis. Inflorescences corymbs, 3-15 cm broad, with 20-80 capitula. Peduncles 1-10 cm. Involucre ovate to hemispherical, 3-5.5 x 3-5 mm (without ligules). Phyllaries imbricate, 3-seriate, herb-like in middle part, yellowish-green, with protruding midrib, membranous, brown or yellow with brown border along margin; outer ovate, 1.8-2.5 x 1-1.5 mm, subacute to obtuse; inner broadly lanceolate, 2.5-4.1 x 1.25-2.2 mm, obtuse, pubescent, often subglabrous. Paleae lanceolate, 2.5-3.5 x 0.75-1.25 mm, acute, membranous, brown along margin, diminishing from periphery to centre. Marginal florets 7-8 in number, pistillate, ligulate, (2-)3-6 mm long, tube with solitary capitate glands. Ligules white or white with violet base, \pm elliptic, (1-)2-4.2 x (1.3-)2.5-4 mm, with 3 rounded denticules at apex. Disc florets 5-toothed, white, tubular, bisexual, (1.5-)2-3 mm long, pubescent, with solitary capitate glands, c. 30-40. Achenes dorsally compressed, oblong or oblanceolate, (1-)1.5-2.4 x (0.75-)1-1.2 mm, smooth, with thick, lip-shaped wing. $2n=18$. Fl. 6-8. Damp grassland, banks of rivers and lakes, coastal shrubs, and littoral sands.

Distribution in Turkey: A9 Ardahan: *Roop, Wardapatiantz*. Göle, Karlıyazı village, Ahmet meadows, Kura river bank, 1850 m, 27 vii 1997, N.Demirkuş 4551. N.Demirkuş 7008 (photo)! 4 km from Ardahan to Posof, banks of Putka (Sazara) Lake, lat 41°07'61"N, long 42°46'39"E, 1903 m, 12 viii 2004, B.Yıldız 15884! Op. cit., 11 vii 2005, T.Arabacı 2092!

General distribution: Transcaucasia and Central Europe. Euxine element.

Three *Achillea* species that grow in Turkey are characterised by entire leaves. A species key to this group, in which the most useful characteristics are considered, is given below.

1. Leaves oblong to linear oblong, comb-like callose serrate along margin; ligules yellow . . . *sieheana*
1. Leaves lanceolate to linear-lanceolate, biserrate-toothed along margin; ligules white
2. Leaves glabrous above, adpressed-pilose below; ligules 4-8 x 3-6 mm *biserrata*
2. Leaves densely or sparsely pubescent with short curly hairs on both surfaces; ligules (1-)2-4.2 x (1.3-)2.5-4 mm . . . *salicifolia* subsp. *salicifolia*

After being described by Besser in 1812, *A. salicifolia* was recognised as a separate taxon until the beginning of the second half of the twentieth century. It was well circumscribed in Flora USSR by Bochantsev (Afanasev, 1961). A specimen collected by Dniester, which is preserved in LE, was annotated with Besser's own hand writing as "*Achillea salicifolia* Bess." This specimen was selected as the lectotype of *A. salicifolia* Besser by Bochantsev.

A. cartilaginea was first described in 1832 by Ledebour in Flora Germanica Excursoria (Reichenbach, 1832). Bochantsev included this species in Flora USSR, and indicated differentials from *A. salicifolia* by sparsely pubescent and green involucral bracts with brown membranous margins. The involucral bracts of *A. salicifolia* were described as densely pubescent, yellowish-green, and with yellow or yellow with brown border. Differences in the form of these characteristics are common within species. However, the sizes of the ligules were reported to be smaller than *A. cartilaginea*'s (1-3 x 1.3-3.25 mm, not 3-4.2 x 3-4.2 mm). Ligule sizes are remarkably different in *Achillea*, but these measurements can be variable inter-species. Except for these differences, the descriptions of both *A. salicifolia* and *A. cartilaginea* are quite similar, and there are no remarkable differences between their habitats. Furthermore, *A. salicifolia* has the same geographical distribution range as *A. cartilaginea*.

Another new combination given by Bochantsev in Flora USSR is *A. septentrionalis* (Sergievsk.) Botsch. According to the Bochantsev, it is similar to *A. cartilaginea*, but is differentiated by its lack of dotted glands on the leaves.

In the Flora of Turkey, there are no records of these relevant species, save for one doubtful specimen. This specimen collected from Ardahan province was recorded by Bordzilowski as *A. cartilaginea*. In additional studies of the Flora of Turkey, we can see another record given by Demirkuş from the same province (Demirkuş & Kaya, 1999). In this study, Demirkuş reported *A. cartilaginea* as a new record for the Flora of Turkey and compared it with another species of Turkish *Achillea*, *A. biserrata*. These 2 species have distinct differences, as Demirkuş also reported and illustrated.

Richardson realised correlations between these 3 species in Flora Europaea. He included *A. salicifolia* and *A. septentrionalis* as a synonym to *A. cartilaginea*, but he did

not notice one point (nor did Demirkuş), namely *A. salicifolia* has *priority*. Relevant studies performed by several authors support these taxonomic remarks (Uotila, 1978; Uotila, 1980; Valant-Vetschera, 1985; Guo, 2004).

In 1980, Uotila accepted *A. septentrionalis* as a separate subspecies, namely, *A. salicifolia* Besser subsp. *septentrionalis* (Sergievsk.) Uotila. It differs from subsp. *salicifolia* by its glabrous to sparsely hairy and greenish leaves without glandular pits. Further, its leaves are often acute and usually with sharply biserrate margins. The capitula are generally fairly large. The specimens from Turkey are also very similar to subsp. *salicifolia*.

On this basis, *A. salicifolia* s.l. has validity as a separate species including *A. cartilaginea* and *A. septentrionalis*; however, *A. salicifolia* subsp. *salicifolia* is distributed in Turkey.

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