

Achillea hamzaoglui (Asteraceae), a new species from Turkey

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Received 20 Mar. 2008, revised version received 29 May 2008, accepted 30 May 2008

Arabacı, T. & Budak, Ü. 2009: *Achillea hamzaoglui* (Asteraceae), a new species from Turkey. — *Ann. Bot. Fennici* 46: 459–463.

Achillea hamzaoglui Arabacı & Budak *sp. nova* (*Achillea* sect. *Santolinoidea*), is described from Kırşehir Province, inner Anatolia, Turkey. It is compared with *Achillea sintenisii* and *A. goniocephala*. Diagnostic characters, as well as a full description, a key to related species and figures of new species are provided.

Key words: *Achillea*, Asteraceae, new species, taxonomy

The genus *Achillea* (Asteraceae: Anthemideae) includes approximately 115 species, centered in SE Europe and SW Asia, with extensions through Eurasia to North America. The species demonstrate remarkable ecological adaptability (Ehrendorfer & Guo 2006). In Turkey it has 46 species (52 taxa) (including *Otanthus* and *Leucocyclus*) belonging to five sections. Twenty three of them are endemic to Anatolia, which is the main center of diversity of section *Santolinoidea* (Huber-Morath 1975, Duman 2000, Ehrendorfer & Guo 2005, Arabacı & Yıldız 2006a, Arabacı & Yıldız 2006b). A comprehensive revision of Turkish *Achillea* species has been undertaken by the first author since 2001.

The material reported here was collected in Kırşehir province in Inner Anatolia, Turkey, during the field studies made in 2007. Turkish species of *Achillea* collected from various localities, other specimens found in Turkish herbaria (ANK, BOZOK Hb., GAZI, INU, KNYA) and images of related species obtained from Botani-

cal Museum (LD) were examined. Furthermore, all the relevant literature was checked (Boissier 1875, Post 1933, Afanasev & Bochancev 1961, Richardson 1976, Huber-Morath 1986, Valant-Vetschera 1996, Valant-Vetschera 1999, Valant-Vetschera & Kästner 2000). After thorough examination, we concluded that the specimens collected in Kırşehir province belong in a hitherto undescribed species of sect. *Santolinoidea* and morphologically resembling *A. sintenisii* and *A. goniocephala*.

Achillea hamzaoglui* Arabacı & Budak, *sp. nova (Figs. 1–3)

Affinis *A. sintenisi* et *A. goniocephalae*; ab *A. sintenisii* foliorum segmentum 3-partitus (non indivisus vel 3-lobatus), pedunculis 10–20(–40) mm (non (10–)20–50 mm), involucro 5–6 × 4–6 mm (non 4–5 × (5–)6–10 mm), ovoideus ad hemisphaerium (non patelliformis et basi late



Fig. 1. *Achillea hamzaoglu*. — **A:** Plant habit. — **B:** Florets. — **C:** Capitula.

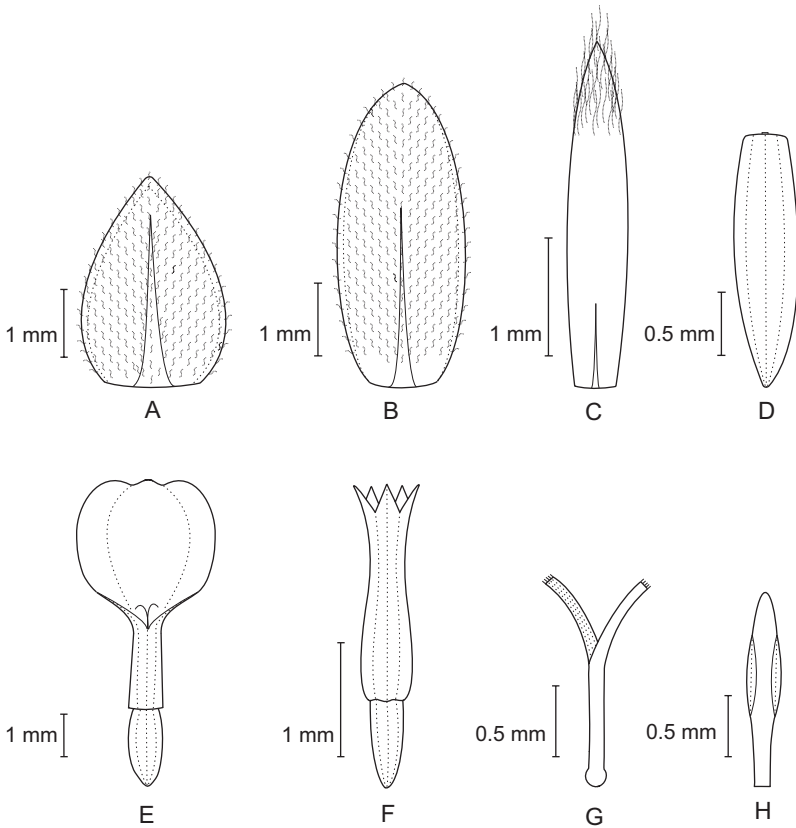


Fig. 2. *Achillea hamzaoglu* (from the holotype). — **A:** Outer phyllary. — **B:** Inner phyllary. — **C:** Palea. — **D:** Achene of disc floret. — **E:** Ray floret. — **F:** Disc floret. — **G:** Style of disc floret. — **H:** Stamen.

rotundato), *phyllariis externus obtusis* (non subacutis vel acutis), 3–4 mm (non 2–2.5 mm) longis, *phyllariis interiora oblongus* (non ovatus ad oblongus), 4–4.5 mm (non 3–4 mm) longis, *palea pilosus ad apicem* (non glabra), 3–3.5 mm (non 2.5 mm) longis, *flosculis ligulatis eburneus* (non albus), *laminaris* 2.5–4 × 2.5–4 mm (non 3–6 × 3–4.5 mm), *flosculis disci* 30–40 tantum (non 50–60) differt. Ab *A. goniocephala capitulis* 1–3 (non (1)–4–12), *phyllariis externus* 3–4 mm (non 2–3 mm) longis, *phyllariis interiora oblongus* (non ovatus), *flosculis ligulatis eburneus* (non albus), *flosculis disci luteus* (non albus) recedit.

TYPE: Turkey. B5 Kırşehir: Between Kırşehir and Mucur, junction of Bahçecik, Kervansaray Mountain, Hasanpaşa foothill, calcareous, 1400 m, 39°07'376"N, 34°16'829"E, 5.VI.2007, *Arabacı* 2222 & *Budak* (holotype INU; isotypes ANK, BOZOK Hb., ERCIYES Hb., GAZI, HUB, ISTE).

ETYMOLOGY: This species is named after Prof. Dr. Ergin Hamzaoğlu who is a well-known plant taxonomist from Turkey.

Perennial herb, with thick woody rootstocks, primary root strongly developed. Stems numerous, 15–30 cm, erect, with short sterile shoots, unbranched, obtuse-angled, longitudinally striate, tomentose. Leaves homomorphic, linear, (6–)10–15(–20) × 0.8–1.5 mm, pinnatisect, woolly; primary leaf segments imbricate, 0.5–0.7 × 0.8–1.5 mm, 3-partite, covered rachis; lobes subequal, broadly obovate to cuneate, 0.5–0.7 × 0.4–0.5 mm, margins narrowly cartilaginous tips, spiniform-dentate with one distinctly elongated main tooth. Peduncles 10–20(–25) mm long. Capitula 1–3; involucre broadly ovoid to hemispherical, 5–6 × 4–6 mm, tomentose; phyllaries 3–4 seriate; outer broadly ovate, 3–4 × 1.5–2.5 mm, obtuse, carinate, often with pellucid margins; inner oblong, 4–4.5 × 1.5–2 mm, obtuse, with very narrow pellucid margins; receptacle paleaceous, palea lanceolate, 3–3.5 × 0.5–0.8 mm, acute, membranaceous, hairy at apex. Ray florets 6–8, ivory white, limb semielliptic and 3-crenate, 2.5–4 × 2.5–4 mm, female, fertile, style 2–2.5 mm, style arms brownish, 0.4–0.5 mm; Disc florets ca. 30–40, yellow, 2.5–3 mm long; style 1.5–2 mm, style arms brownish, 0.7–0.8 mm, pale yellow at apex; stamen 5, 1.5–2 mm long, anthers pale yellow, 1–1.2 mm, obtuse at base, filament 0.5–0.8 mm; ovary 1.4–1.6 mm.

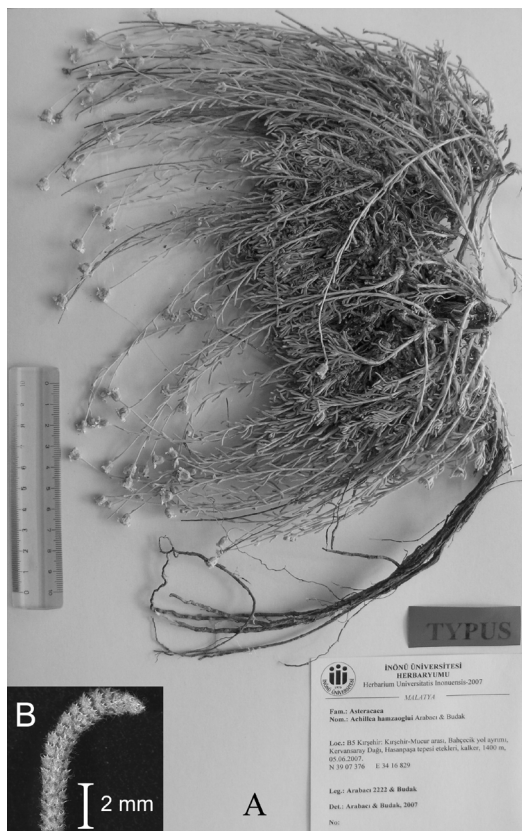


Fig. 3. *Achillea hamzaoglui*. — A: Dried herbarium specimen. — B: Part of median cauline leaf.

Cypselas oblong, 2 × 0.5 mm, compressed dorsally. Pappus absent. Flowering and fruiting in June.

Achillea hamzaoglui is endemic in Kırşehir province in Inner Anatolia and thus represents Irano-Turanian element. It grows in calcareous areas and is known from only the type locality.

Achillea hamzaoglui belongs to *Achillea* sect. *Santolinoidea* and is clearly different from the other species in the section. It has some similarities with *A. sintenisii* and *A. goniocephala* but differs from them in several characters (Table 1) and can be distinguished by the following key.

Key to *Achillea hamzaoglui*, *A. sintenisii* and *A. goniocephala*

1. Leaf segment 3-lobed to 3-partite, lobe margins spiniform dentate; peduncles 5–20(–40) mm; involucre broadly ovoid to hemispherical, narrowly rounded at base, 5–7 × 4–6 mm; palea hairy at apex, 3–4 × 0.5–1 mm 2

Table 1. Morphological comparison of *Achillea hamzaoglu*, *A. sintenisii* and *A. gonioccephala*

Characters	<i>A. hamzaoglu</i>	<i>A. sintenisii</i>	<i>A. gonioccephala</i>
Leaf segment	3-partite	undivided or 3-lobed	3-lobed to 3-partite
Lobes margins	spiniform-dentate with one distinctly elongated main tooth	distantly crenulate-dentate	regularly shortly spiniform-dentate
Peduncles	10–20(–25) mm	(10–)20–50 mm	5–20(–40) mm
Capitula	1–3	1–4(–7)	(1–)4–12
Involucre	broadly ovoid to hemispherical, narrowly rounded at base 5–6 × 4–6 mm	patellate, broadly rounded at base, 4–5 × (5–)6–10 mm	broadly ovoid to hemispherical, narrowly rounded at base (5–)6–7 × (4–)5–6 mm
Outher phyllaries	3–4 × 1.5–2.5 mm, obtuse	2–2.5 × 1.5–2 mm, subacute to acute	2–3 × 1.5 mm, obtuse
Inner phyllaries	oblong, 4–4.5 × 1.5–2 mm	ovate to oblong, 3–4 × 1.5–2 mm	ovate, 4–5 × 1.5–2 mm
Palea	3–3.5 × 0.5–0.8 mm, hairy at apex	2.5 × 0.7 mm, glabrous	3.5–4 × 1 mm, hairy at apex
Ligules	ivory white, lamina 2.5–4 × 2.5–4 mm	white, lamina 3–6 × 3–4.5 mm	white, lamina 2.5–6 × 2.5–3.5 mm
Disc florets	yellow, ca. 30–40	yellow, ca. 50–60	white, ca. 30–40

1. Leaf segment undivided or 3-lobed, lobe margins crenulate-dentate; peduncles (10–)20–50 mm; involucre patellate, broadly rounded at base, 4–5 × (5–)6–10 mm; palea glabrous, 2.5 × 0.7 mm *A. sintenisii*
2. Margins of leaf lobes regularly shortly spiniform-dentate; capitula (1–)4–12; outer phyllaries 2–3 × 1.5 mm, inner phyllaries ovate; ligules and disc florets white
..... *A. gonioccephala*
2. Margins of leaf lobes spiniform-dentate with one distinctly elongate main tooth; capitula 1–3; outer phyllaries 3–4 × 1.5–2.5 mm, inner phyllaries oblong; ligules ivory white, disc florets yellow *A. hamzaoglu*

ADDITIONAL SPECIMENS EXAMINED. — *Achillea hamzaoglu* (paratype): **Turkey**. B5 Kırşehir: Kervansaray Mountain, Hasanpaşa foothill, *Aydoğdu & Hamzaoglu 1077* (BOZOK Hb.). — *A. gonioccephala*: **Turkey**. B6 Kahramanmaraş: Binboğa Da., in ravine above Yalak, *P.H. Davis 19953* (ANK!, KNYA!); Binboğa Da., above Yeşilkent (Yalak), *Dirmenci 1974* (INU!); Gökşun Yeşilkent (Yalak), around Doğanonak village, *Yıldız & Arabacı 1730* (INU!); Between Keklikoluk and Doğanonak villages, calcareous areas, *Yıldız 15686* (INU!); C3 Antalya: İbradı, Ürtünlü vilage, opposite part of Altınbeşik hill, *Mutlu 8082* (INU!); C5 Niğde: Çamardı-Kamışlı, Yelatan, rocky slopes, *Vural 7456 & Adıgüzel* (GAZI!); C6 Hatay: Belen, around Radar, rocky slopes, *Aytaç 5971* (GAZI!). — *A. sintenisii*: **Turkey**. B6 Sivas: Ulaş, Tecer village, steppe, *Yıldız 10787 & Aktoklu* (INU!); Ulaş, Ziyaret hill, gypsum areas, *Yıldız 15237 & Dirmenci* (INU!); Between İmralı and Zara, 15. km, gypsum areas, *Arabacı 1474* (INU!); Between Sivas and Hafik, 12. km, *Arabacı 1477* (INU!); Between Sivas and Kayseri, junction of Ulaş, gypsum areas, *Arabacı (1522)* (INU!); B7 Erzincan: Kurutschai (Kuruçay), in montosis inter Hassanar et Nerskiep, *Sintenis 1039* (holotype LD) (photo !); Hasanova, gypsum areas, *Kandemir 6069* (ERZINCAN Hb.).

Acknowledgements

The authors are thankful to TÜBİTAK (Project No: 104T291 and 106T240) and İnönü University Research Fund (Project No: 2003/58) for their financial support during this study. Also, our thanks are due to curators of herbaria ANK, BOZOK Hb., GAZI, INU, KNYA and LD, and to Professor Chris Humphries for correcting the English and reviewing the paper.

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