

Scorzonera pacis (Asteraceae), a new species from Hatay, Turkey

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A new species, *Scorzonera pacis* Güzel, Kayıkçı & S. Yıldız (Asteraceae) from Hatay Province, South Anatolia is described. It is a very distinct species with its saw-toothed, winged achenes. SEM micrographs of the achenes, notes on the habitat and distribution, and a comparison with its morphologically closest species are provided.

Scorzonera (Asteraceae) is a Mediterranean-originated Asteraceae genus that is widely distributed in arid areas of Eurasia, Central Asia, and Africa (Lack 2007, Duran *et al.* 2011). Species richness and the presence of many rare species in Anatolia render that region one of the diversity centres of the genus (Makbul *et al.* 2012, Coşkunçelebi *et al.* 2012). After Chamberlain (1975) treated 39 species for Turkey, ten new taxa or new records have been added to the flora of the country (Davis *et al.* 1988, Güner 2000, Duran 2002, Kilian & Parolly 2002, Parolly & Kilian 2003, Duran & Hamzaoğlu 2004, Hamzaoğlu *et al.* 2010, Doğan *et al.* 2011, Duran *et al.* 2011, Coşkunçelebi *et al.* 2012, Makbul *et al.* 2012).

During a botanical expedition on the south slopes of Kızıldağ Mountains, we found an interesting, fruiting *Scorzonera* population. Following a thorough examination of specimens, comparison with many specimens or specimen photos in GAZI, ANK, HUB, P, E, W, B, and KEW, and consultation of relevant literature (Boissier 1875, Lipschitz 1964, Chamberlain

1975, Chater 1976, Rechinger 1977, Davis *et al.* 1988, Özhatay *et al.* 1999, Güner 2000, Duran 2002, Kilian & Parolly 2002, Parolly & Kilian 2003, Duran & Hamzaoğlu 2004, Özhatay & Kültür 2006, Özhatay *et al.* 2009, Hamzaoğlu *et al.* 2010, Duran *et al.* 2011), we concluded that this population represented an undescribed species.

We describe this new *Scorzonera* species in this paper. The description is complemented with SEM micrographs of the achenes, obtained with a JEOL-14 JSM-55LV scanning electron microscope.

Scorzonera pacis Güzel, Kayıkçı & S. Yıldız, *sp. nova* (Figs. 1, 2, 3, 4a, 5a).

HOLOTYPE: Turkey. C6 Hatay, Antakya, around Karaali town, Maquis, 410 m a.s.l., 36°18'30.96" N lat, 36°9'9.57" E long, 14. VI. 2011. S. Yıldız 551 & S. Kayıkçı (holotype GAZI; isotypes HUB, MKU).

ETYMOLOGY. *Pax* is Latin for peace. We chose this name because the species was found in Hatay, which is known as a province of peace and tolerance.

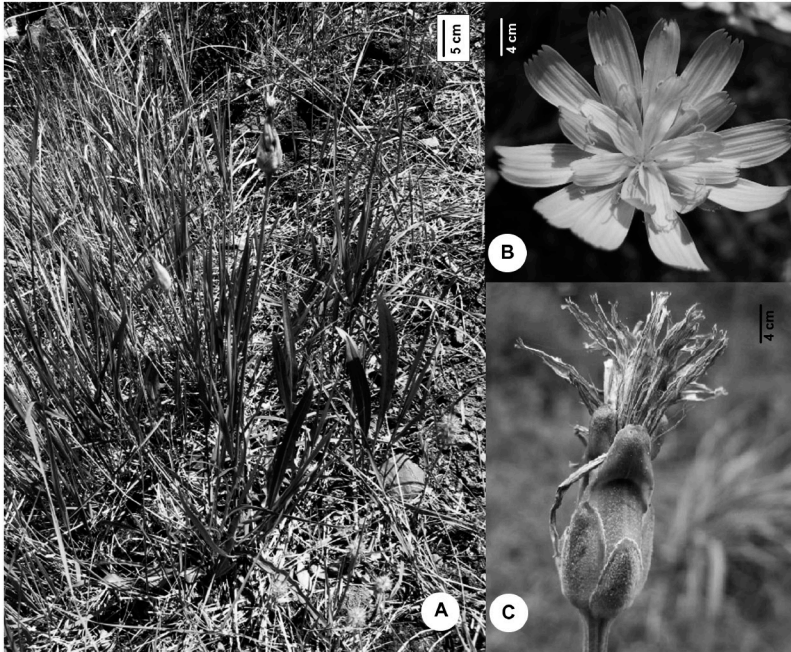


Fig. 1. *Scorzonera pacis* (from the type locality). — **A:** Habit. — **B:** Florets. — **C:** Involucre.

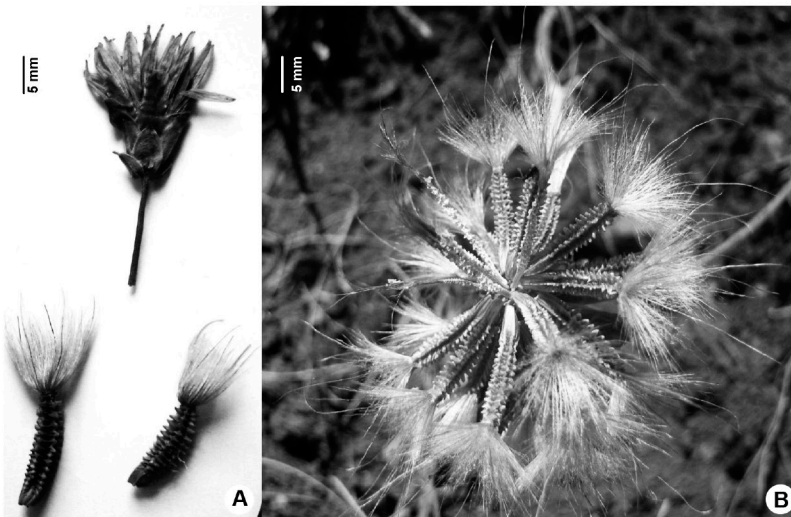


Fig. 2. *Scorzonera pacis* (from the holotype). — **A:** Capitula and achenes. — **B:** Mature capitula.

Perennial, caulescent, up to 75-cm-tall herb. Rootstock thickened, cylindrical. Leaf residues present, not fibrous. Stems usually several and branched, ascending. Whole plant sparsely arachnoid-floccose, becoming glabrous at fruit maturity time. Basal leaves $15\text{--}25 \times 0.2\text{--}1.2$ cm, linear to lanceolate, entire, acuminate. Plant sometimes heterophyllous with linear and lanceolate leaves together. Cauline leaves $4\text{--}22 \times 0.2\text{--}0.4$ cm. Capitula (1)–2–4 per stem, $1.5\text{--}3$

$\times 1\text{--}2$ cm when flowering, becoming $2.5\text{--}4 \times 3\text{--}3.5$ cm in fruit. Outer surface of phyllaries sparsely arachnoid-floccose, especially in base; inner surface glabrous. Outer phyllaries ovate, acute to obtuse, $0.5\text{--}1 \times 0.3\text{--}0.6$ cm. Inner phyllaries ovate-lanceolate, acute to obtuse, $0.8\text{--}1.7 \times 0.3\text{--}0.6$ cm when flower and $1.4\text{--}3.8 \times 0.7\text{--}1.2$ cm in fruit. Florets yellow, exceeding involucre. Achenes $1.3\text{--}1.4 \times 0.3\text{--}0.4$ cm, excluding pappus, milky-brown or red-brown, narrowly

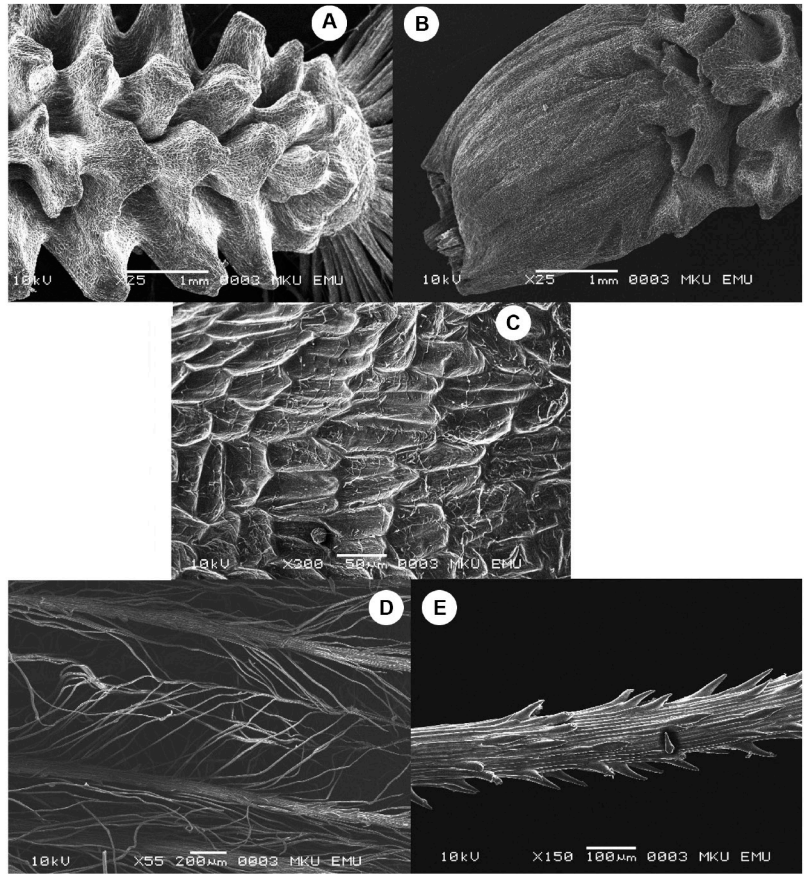


Fig. 3. SEM micrographs of the achene of *Scorzonera pacis* (from the holotype). — **A:** Overview of top of achene. — **B:** Overview of achene base. — **C:** Surface detail of achene. — **D:** Plumose region of pappus hairs. — **E:** Barbellate region of pappus hairs.

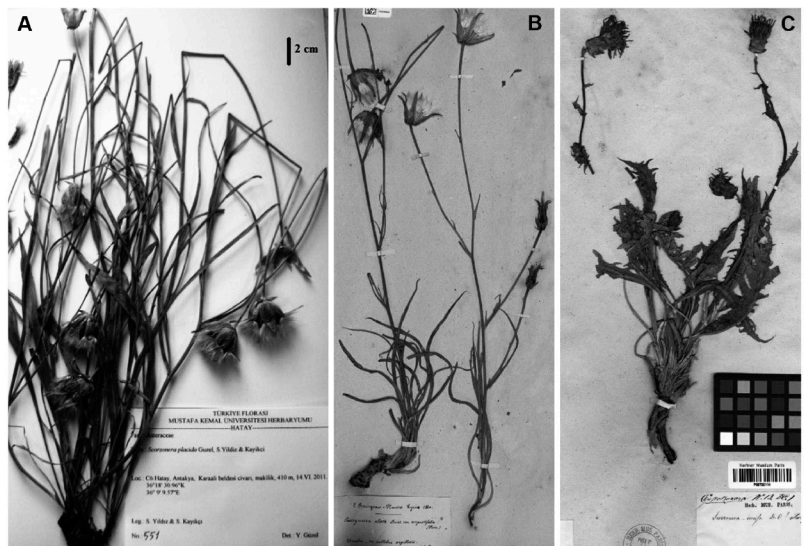


Fig. 4. — **A:** Holotype of *Scorzonera pacis*. — **B:** *Scorzonera elata* (Bourgeau, P03753562). — **C:** Isotype of *Scorzonera incisa* (Aucher, P00720114).

ellipsoid, 1–1.5 mm, with 5(–6) distinctly and regularly toothed wings. Lower 2–4 mm of achene wingless and hollow. Pappus 0.8–1 cm,

heteromorphic, short hairs plumose, long hairs plumose below and barbellate above. Flowering April–May, fruiting May–July.



Fig. 5. Comparison of achenes. — **A:** *Scorzonera pacis*, toothed and winged (from the holotype). — **B:** *Scorzonera incisa*, deeply sulcate and somewhat verrucose (from *Y. Altan 5414*). — **C:** *Scorzonera elata*, cylindrical and thin (from *Bourgeau P03753562*).

HABITAT AND DISTRIBUTION. *Scorzonera pacis* grows in maquis or *Pinus brutia* forests in association with *Lavandula stoechas*, *Myrtus communis*, *Cotinus coggyria*, *Pistacia terebinthus* subsp. *palaestina*, *Rhus coriaria*, *Ferula elaeochytris*, *Cistus creticus*, *Cistus salviifolius*, *Centaurea arifolia*, *Glycyrrhiza flavescens*, *Quercus coccifera*, *Gladiolus antakiensis*, *Thymus eigii*, *Thymbra spicata* var. *spicata* and *Scutellaria heterophylla*. It is endemic to Hatay, Anatolia, where it is only known from the type locality and represented by only two populations within an area of less than 10 km².

Scorzonera pacis is a very distinct species, particularly due to its saw-toothed and winged achenes. Although it is quite different from the stipe encountered in the subgenus *Podospermum*, it has a 2–4 mm long, wingless and hollow tubular basis.

Scorzonera pacis can be compared to several species. It resembles *S. papposa* or *S. incisa* in terms of the achene morphology and its caulescent habit. Both *S. papposa* and *S. incisa* have deeply sulcate and somewhat verrucose achenes, but none of the achenes have dentate wings. The flowers of *S. papposa* are pink to lilac. Its leaves are shorter and wider, 6–10 × 0.8–2(–6) cm. The achenes of *S. papposa* are 6.5–8.5 × ca. 2 mm, and thus shorter and thinner than in *S. pacis*. *Scorzonera incisa* is compared in detail with *S. pacis* (see Table 1, Figs. 4 and 5). The leaves of *S. pacis* are linear as in *S. mollis*, *S. elata*, and *S. phaeopappa*. Nevertheless, none of

those have entirely the same features as *S. pacis*. Thus, while it has some morphological similarities with several species, there is apparently no close relative. Additionally, although there are tuberculate or muricate achenes in some species, such as in *S. semicana*, *S. coriacea*, *S. violacea*, *S. lacera*, or Syrian *S. verrucosa*, the distinctly toothed, winged achenes are unique to *S. pacis*.

Scorzonera pacis should also be compared with *S. elata* in terms of habit and leaves, and with *S. incisa* in terms of achene morphology and branching (Table 1, Figs. 4 and 5).

SELECTED SPECIMENS EXAMINED. — *S. incisa*: **Turkey.** A7: Gümüşhane Monti Chamacada, 1862, *Bourgeau*, Pl. Armeniae, B 10 0326676 (B, photo), P03695518 (P, photo). B7: In Cappadocia ad Euphratem, *Aucher 3315*, P00720114, (isotype, P, photo); Erzincan, Egin (Kemaliye), Hoschneider, *Sint. 1891:2312*, 15.V.1890, P00720134, (type of *S. bicolor*, P, photo); Erzincan, Kemaliye, *H. Akan 5036* (HUB). B9: Van, Gürpınar, *Y. Altan 5414* (GAZİ). C6: Kahramanmaraş, Göksun, *B. Yıldız 2032* (HUB). — *S. calyculata*: (This Iranian species was examined because it was indicated as closely allied to *S. incisa* in *Flora of Turkey*) **Iran.** In monte Demavend Persiae bor., P00720135, *Kotschy 341* and P00720136, *Kotschy 324* and *342*, (type samples, P, photo). — *S. elata*: **Turkey.** B1 İzmir: Selçuk, Hayırlı Tepe civarı, *B. Özdoğru 2925* (HUB). C2 Muğla: Köyceğiz, Beyobası Köyü, *A. Güner 8994* (HUB); Rodhos, 1860, *Bourgeau 88*, P0375352, P03753558 and P03753561, (P, photo); “Turkey”, *Dudley, Theodore R 34975*, E00224262, (E, photo); *Fleischer, Johann Gottlieb (Theophilus)*, E00493933 (E, photo). B1: Balamont Kaivé, between İzmir and Manisa, *B. Balansa 263*-Pl. D’orient, P04272779, P03753555 and P03753557 (P, photo). C3: Elmalı, Antalya, 1860, *Bourgeau, Plantae Lyciae*, P03753559 and P03753562 (P, photo) (The last two samples, collected by Bourgeau in Turkey have not

Table 1. Comparison of the diagnostic characters of *Scorzonera pacis*, *S. elata* and *S. incisa*.

Characters	<i>S. pacis</i>	<i>S. elata</i>	<i>S. incisa</i>
Root	thickened cylindrical with non-fibrous leaf residues	tuberous cylindrical with non-fibrous leaf residues	cylindrical crowned by dead petiole remains
Stem	usually several, each one is branched	one, profusely branched	one, branched
Indumentum	sparsely arachnoid-floccose	glabrous	sparsely arachnoid pubescent
Leaves	linear to lanceolate, entire, basal leaves 15–25 × 0.2–1.2 cm	linear, entire, basal leaves 5–20 × 0.1–0.2 cm	narrowly to broadly elliptic in outline, dentate to pinnatifid, basal leaves 10–23 × 2.4–8 cm
Capitula	(1–)2–4 per stem 15–30 mm long	(1–)3–7 per stem 28–32 mm long	1–2(–4) per stem (35–)40–50 mm long
Flowers	yellow	yellow	yellow with dark purple tube
Inner phyllaries	8–17 mm, ovate-lanceolate	19–22 mm, lanceolate	ca. 25 mm, lanceolate
Achene size	13–14 × 3–4 mm	8 × 1–2 mm	12–17 × 2–3 mm
Achene shape	narrowly ellipsoid with toothed wings, base of the achene not winged, hollow	cylindrical ridged, irregularly verrucose, stipitate	narrowly ellipsoid deeply sulcate, with warty wings, not stipitate
Pappus	brownish	white	dirty white

been mentioned in *Flora of Turkey*). — *S. mollis*: **Turkey**. B6: Kahramanmaraş, Çardak, *B. Yıldız 1762* (HUB). — *S. phaeopappa*: **Turkey**. C6: Kahramanmaraş, Ahır Dağı, *Z. Aytaç 4668*, *H. Duman* (HUB). — *S. semicana*: **Turkey**. C8: Mardin, *Aucher 3335*, G00203502, (holotype G-DC, photo). B3: Isparta, Şakirkaraağaç, *B. Mutlu 579* (HUB). — *S. papposa*: **Turkey**. C7: Adıyaman, Gölbaşı çevresi, 7.VI.1968, *A. Pamukçuoğlu, Quezel* (HUB). — *S. lacera*: **Turkey**. C6: Kahramanmaraş, *B. Yıldız 1962* (HUB).

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