



Fig. 1. *Scorzonera karabelensis* – photograph, from the type locality, by R. Ulrich, 2003.

*Scorzonera karabelensis* Parolly & N. Kilian, **sp. nova**

Holotype: Turkey, C2 Muğla: Fethiye - Korkuteli road, below Karabel Geçidi NE Kemer, 1040 m, steep, gravely, rocky slope, open *Pinus nigra* var. *caramanica* forest, N-exp., limestone, 20.5.2003, R. Ulrich 3/7a (B; isotypes: E, ISTE, herb. Parolly). – Fig. 1-2A.

Affinis *Scorzonerae pisdicae* Hub.-Mor., a qua foliis  $\pm$  oblanceolatis, obtusis vel subacutis, 2-5  $\times$  0.3-1.3 cm (nec lanceolatis vel ellipticis, longe acuminatis, 3-12  $\times$  0.5-1.5 cm), caulibus floriferis debilibus, arcuato-ascendentibus, c. 2-7 cm longis, 1-2 foliatis (nec validis, erectis, (5-)10-15 cm longis, plurifoliatis) et achaeniis propter pilos densos antrorsos appressos albo-sericeis (nec glabris) differt.

*Subscapigerous* perennial, 3-6 cm high, covered with a  $\pm$  densely sericeous, appressed, white-glossy,  $\pm$  evanescent indumentum of 3-5 mm long hairs, the green colour, however, always showing through. *Rootstock* cylindrical, branched or simple and with one or a few crowded leaf rosettes, almost without remains of the bases of former leaves. *Flowering shoots* one to several per rosette, weak, densely sericeous, ascending, 2-7 cm long, usually unbranched and bearing a single capitulum, with a few leaves in their basal part. *Leaves* entire, soft, concave, with flat margins, densely sericeous on both sides,  $\pm$  glabrescent with age, the parallel veins little conspicuous; *rosette leaves* 2-5  $\times$  0.3-1.3 cm, oblanceolate (sometimes very narrowly so), obtuse to acute and gradually narrowed towards the base; *cauline leaves* very similar to the rosette leaves but smaller and subacute. Flowering and fruiting *capitula* 13-16(-18) mm long, cup-shaped, with 15-20 flowers leaning against and little exceeding the involucre bracts. *Involucre* not lengthening significantly during anthesis, sericeous outside, glabrous inside; number and shape of involucre bracts variable; *outer involucre bracts* 6-8(-10), subulate to lanceolate, acute,  $(\frac{1}{3}-\frac{1}{2})/(\frac{2}{3}-\frac{2}{3})$  as long as the inner bracts; *inner involucre bracts* (7-)-8, linear-lanceolate, acute, subequal, 12-17  $\times$  2-3 mm, often with up to 5 additional,  $\pm$  linear innermost bracts, all adaxially green and with scarious margins. *Flowers* bright yellow; corolla 12-15 mm long, of that the tube c. 3 mm long (ir-

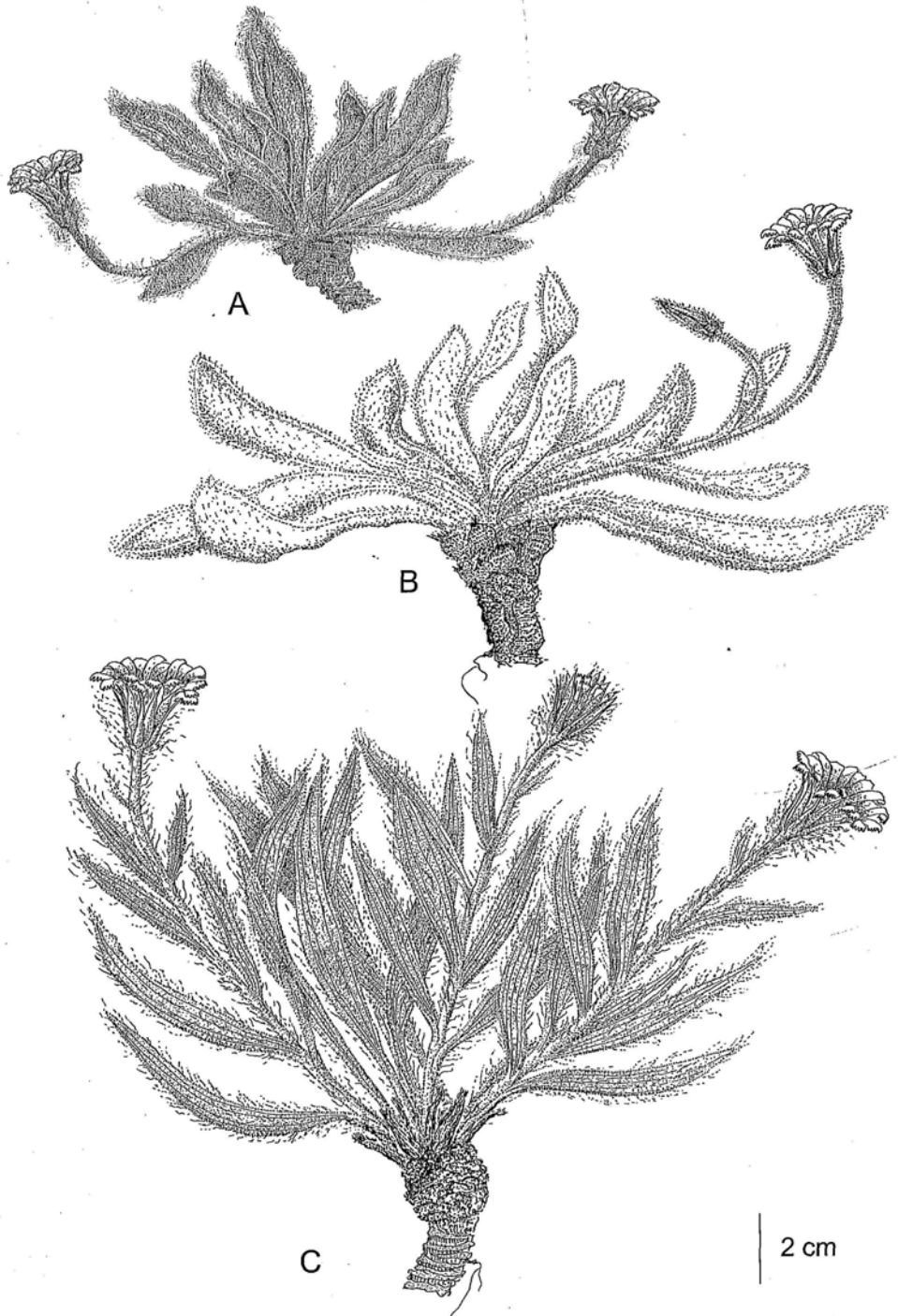


Fig. 2. *Scorzonera karabelensis* (A), *S. ulrichii* (B), *S. pisidica* (C). – A after R. Ulrich 3/7b, B after R. Ulrich 2/12, C after R. Ulrich 2/22; drawings by Alexander Ehler (BGBM).

reversibly shrinking at the end of anthesis), the limb c. 3.5 mm wide; anther tube (including basal and apical appendages) c. 5 mm long. *Achenes* [not fully mature] 5–6 mm long, slender, prismatic, smooth, densely covered with 3–6 mm long, snow-white, straight, soft, antrorse, appressed hairs. *Pappus* 8–9 mm long, its bristles straw-coloured, plumose with white fimbriae in the basal portion and barbellate above.

*Eponymy.* – The name refers to the type and only known locality of the new species, the Karabel Geçidi (Geçidi = pass). The plants have been collected below the saddle.

*Additional specimens seen.* – Type locality, 1090 m, NE-exp., 11.5.2002, *R. Ulrich 2/15 & 16* (herb. Parolly); *ibid.*, 10.5.2003, N-exp., 13.6.2002, *R. Ulrich 2/17-2/19* [with achenes] (B, herb. Parolly).

*Phenology.* – *Scorzonera karabelensis* starts to flower in early May, with a main flowering period from mid May to mid June when the first fruiting specimens were collected. *S. ulrichii*, gathered at comparable altitudes (1200–1430 m; Kilian & Parolly 2002, Ünal & Göktürk 2003, as *S. gokcheoglu*), flowers at least one month later (June to August) and sets fruit till October.

*Distribution.* – As a local endemic of the Western Taurus (Fig. 3), *Scorzonera karabelensis* is hitherto only known from the upper slopes of the Karabel Geçidi below (= SE) the Akdümen Tepe (1742 m) in the greater Boncuk Dağları range and has a surprisingly narrow altitudinal range (1000–1100 m).

*Site conditions and synecology.* – The site requirements of *Scorzonera karabelensis* are strikingly similar to those of *S. ulrichii*. Both grow on limestone in montane black pine forest (*Pinus nigra* var. *caramanica* (Loudon) Rehder) with a very open canopy, at comparable altitudes (1200–1430 m and 1000–1100 m, respectively). *S. karabelensis* often grows in masses, as the dominant plant of the herb layer, on steep and gravelly N facing slopes and undulated flats. Densely appressed to the soil surface, it is easily overlooked due to the matching colour of the base rock and the plants' indumentum. At places covered with a compact needle litter, it embellishes the forest floor prominently, locally growing together with *Pteroccephalus pinardii* Boiss. Associated species include *Eryngium pseudothorifolium* Contandr. & Quézel (co-dominant) and, less often, *Centaurea cariensis* subsp. *niveotomentosa* (Hub.-Mor.) Wagenitz, *Ebenus reesei* Hub.-Mor. and *Verbascum bellum* Hub.-Mor. The last four taxa are endemics of the Western Taurus.

*Recommended IUCN threat category.* – Although there appears to be a strong, healthy population with hundreds of mature individuals, its extremely localised area implies a certain risk of extinction. Hence, *Scorzonera karabelensis* should be classified as “Vulnerable (VU)” according to criterion D of the IUCN Red List Categories (2001).

*Relationship.* – *Scorzonera karabelensis* belongs to the group of subcaulescent or subscapigerous, perennial mountain species with a rosette of entire leaves and often a more or less dense indumentum, which in Turkey comprises some 20 species belonging to five different groups (Chamberlain 1975, Davis & al. 1988, Güner in Güner & al. 2000, Duran 2002, Duran & Sağiroğlu 2002, Kilian & Parolly 2002, Ünal & Göktürk 2003).

Together with the similar subscapigerous *S. pisidica* Hub.-Mor., *S. cinerea* Boiss., *S. ulrichii* Parolly & N. Kilian [= *S. gokcheoglu* O. Ünal & R. S. Göktürk, *syn. nov.*] (and perhaps *S. boissieri* Lipsch. and *S. sandrasica* Hartvig & Strid), as well as the caulescent *S. argyrea* Boiss., *S. eriophora* DC., *S. latifolia* (Fisch. & C. A. Mey.) DC., *S. tomentosa* L. and *S. veratrifolia* Fenzl, *S. karabelensis* forms a presumably natural group, which has been named *S. sect. Nervosae* Lipsch. (Lipšic 1935). It comprises c. 15 caulescent and, more rarely, subcaulescent perennials, mainly distributed in the mountains of Turkey, the Caucasus, Iraq and Iran (Heller & Heyn 1993, Lipšic 1935, 1964, Rechinger 1977). The members of this section are characterised by rather broad, distinctly parallel-pluriveined, entire, soft, usually hairy leaves, a vertical, non-

tuberous rootstock, a weakly to well developed but always densely leafy flowering stem, usually narrow involucre bracts, and lanate or glabrous, smooth achenes with an often variably straw-coloured to rusty-red pappus.

Within *Scorzonera* sect. *Nervosae*, *S. karabelensis* shows a strong similarity to *S. pisidica* and, together with *S. ulrichii* and the two caulescent species *S. argyrea* (from Caria) and *S. eriophora*, forms a natural subgroup of closely allied taxa. *S. karabelensis* and *S. pisidica* share the sericeous, appressed, white-glossy,  $\pm$  evanescent indumentum of 3-5 mm long hairs, a feature also present *S. eriophora*, that sets all of them clearly apart from *S. ulrichii* with its persistent, dense, white-tomentose indumentum of c. 2 mm long spreading hairs. The leaves of *S. pisidica* are lanceolate (to elliptic), long-attenuate into an acute tip, and with prominent veins, whereas those of *S. karabelensis* are  $\pm$  oblanceolate, in general obtuse rather than acute, with much less distinct veins, and are also smaller. The short, weak and thin, ascending, only 1-2-leaved flowering shoot of *S. karabelensis* make for a conspicuous difference in habit when compared to the erect, strong, leafy shoots of *S. pisidica*, which appears to be short-caulescent rather than subscapigerous. The capitula of *S. pisidica* (involucre well over 20 mm long) are clearly larger than those of *S. karabelensis*, and the outer involucre bracts are subulate and equal the inner in length. The achenes of *S. karabelensis* are densely covered with 3-6 mm long, antrorse, appressed hairs, but those of *S. pisidica* are entirely glabrous. Finally, *S. pisidica*, in contrast to the calcicolous *S. karabelensis*, seems to be an exclusive serpentinophyte, known only from a few neighbouring localities on ultramafic soils in C2 Burdur (Nydegger-Hügli 2000 [with photograph]; new record from Fethiye - Çameli road, Tuzla Beli, 14.6.2002; R. Ulrich [herb. Parolly]).

From the species with ovoid-spherical tubers of the *Scorzonera lanata* group (= *S. sect. Tuberosae* Lipsch.), including *S. judaica* Eig (= *S. pseudolanata* Grossh.) and *S. sublanata* Lipsch., *S. karabelensis* differs by its cylindrical taproot.

From those with a caespitose or cushion-like habit of the *Scorzonera sericea* group (*S. sect. Pulvinares* Lipsch.), including *S. sericea* DC., *S. rigida* Aucher (= *S. aytatchii* A. Duran & Sağıroğlu, **syn. nov.**), *S. lasiocarpa* D. F. Chamb., *S. pygmaea* Sm., *S. seidlitzii* Boiss. and, probably, *S. longiana* H. Sümbül, *S. karabelensis* differs by its softer and wider leaves. All but one species of the latter group have glabrous achenes (in *S. rigida* the young achenes are sometimes pubescent, later glabrescent); the exception with lanate achenes is *S. longiana*, a tiny plant with leaves that are only 2-3 cm long and have an undulate margin.

The species of the *Scorzonera suberosa* group (*S. subg. Pseudopodospermum* Lipsch.), including *S. szowitzii* DC., *S. semicana* DC., *S. inaequiscapa* Boiss., *S. phaeopappa* (Boiss.) Boiss., and *S. suberosa* K. Koch, differ from *S. karabelensis* in particular by glabrous achenes with a hollow base, often tuberous roots and, in the case of the last two species, by lilac or purplish flowers.

The single facultatively subscapigerous, name-giving representative of the *Scorzonera parviflora* group (*S. sect. Parviflorae* Lipsch.), in contrast to *S. karabelensis*, is entirely glabrous.

**Phytogeography.** – *Scorzonera karabelensis*, *S. pisidica* and *S. ulrichii* constitute a group of vicarious species (Fig. 3). *S. karabelensis* and *S. ulrichii* grow in different portions of the Taurus range, the former in the Western Taurus (Lycian Sector), the latter in the western part of the Central Taurus (Pisidian-Isaurian Sector), but in the same type of mountain forest (the forest communities are geo-vicariads, with sectorally differentiated herb and shrub layers). By contrast, *S. pisidica* (Western Taurus) is a substrate vicariant (specialised on ultramafic soils), morphologically closer to *S. karabelensis*.

Assuming that *Scorzonera boisseri* belongs to this group, it would be a pseudovicarious species (differing in altitudinal range and habitat, Chamberlain 1975) of the Cilician Sector, thus completing the often observed pattern of a tripartite division of the Taurus range (Parolly 1995; for the naming of phytogeographic units and the phytogeography of the Taurus System, see Parolly 2004).

The genus *Scorzonera* has an Irano-Turanian centre of diversity, with close to 70 species in the Flora Iranica area (Rechinger 1977). Turkey harbours 46 species, including the present addi-

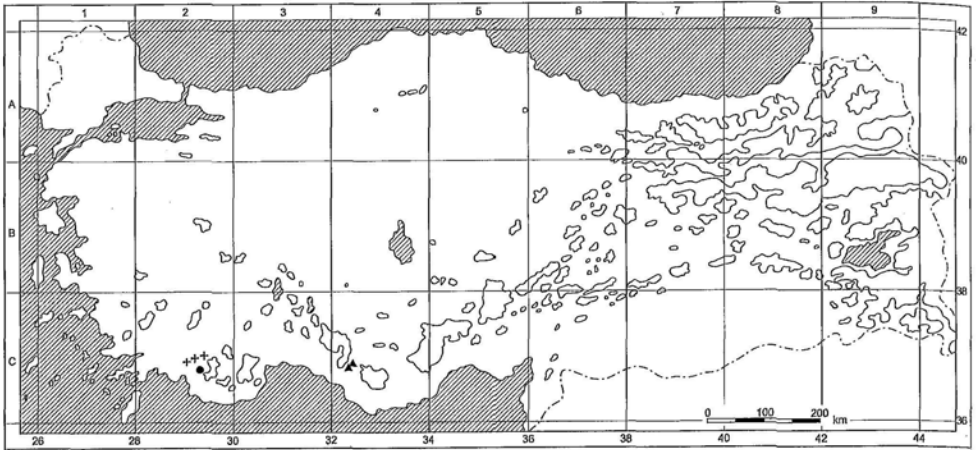


Fig. 3. Distribution of *Scorzonera karabelensis* (●), *S. pisidica* (+) and *S. ulrichii* (▲). – Indication of elevations over 2000 m based on Ekim & Güner (1986).

tion. Thirty-three of the Turkish species represent the Irano-Anatolian chorotype in a wider sense: 16 Anatolian endemics of Irano-Anatolian origin (geno-elements) and 17 Irano-Anatolian species in the strict sense (Chamberlain 1975, Davis & al. 1988, Güner & al. 2000, Duran 2001, Duran & Sağıroğlu 2002). *Scorzonera* is known for including many widespread species along with steno-endemics such as *S. argyrea*, known from a single collection from Caria, *S. pisidica* from a small area in the Burdur and Muğla provinces (Fig. 3), *S. sandrasica* from Sandras Dağı, *S. longiana* from the Taşeli Plateau close to the *S. ulrichii* locality, *S. boissieri* Lipsch. from Bozoğlan Dağı in the Saimbeyli district, *S. davisii* Lipsch. and *S. mirabilis* Lipsch., both from the Hakkari-Taurus, to name only the taxa of the Taurus range.

*Scorzonera karabelensis* is one more steno-endemic of E Mediterranean (montane) origin, as opposed to the Irano-Anatolian distribution of *S. sect. Nervosae* in general. Its discovery provides additional support to an assumed secondary centre of speciation for this section in the E Mediterranean (*S. argyrea*, *S. boissieri*, *S. pisidica*, *S. ulrichii*), as may also be true for the *S. sericea* group (*S. sect. Pulvinares*).

### Key to the entire-leaved subscapigerous *Scorzonera* species of the Turkish mountains

The following key includes all facultatively or consistently subscapigerous entire-leaved *Scorzonera* species of the Anatolian mountain ranges included as such in "Flora of Turkey", its supplements and subsequent addition (Chamberlain 1975, Davis & al. 1988, Güner & al. 2000, Kilian & Parolly 2002). To these we add *S. eriophora*, which also can sometimes be subscapigerous (e.g., A2 Bilecik, inter Biledschik et Yenischeher, *Bornmüller 5241* p.p.; A6 Sivas, Yıldız Dagh, *Bornmüller 1651* p.p.; C2 Antalya, Elmalu, *Bourgeau 168*) and *S. (sect. Incisae Lipsch.) violacea* D. F. Chamb., which very occasionally combines entire leaves and a subscapigerous habit.

Description of the rootstock of *Scorzonera semicana* and *S. szowitzii* as either tuberous or cylindrical is contradictory in the standard floras (e.g. Chamberlain 1975, Lipšic 1935, 1964, Rechinger 1977). At least for the latter, all Anatolian material seen by us appears to be non-tuberous. We keep *S. szowitzii* as distinct from *S. mollis* M. Bieb. (following Lipšic 1935, 1964 and Rechinger 1977 rather than Chamberlain 1975).

The features given by Duran & Sağıroğlu (2002) to separate *Scorzonera aytatchii* from *S. rigida* fall fully within the range of variation observed in *S. rigida*. This holds true not only for