

Teucrium teresianum sp. nov. (Lamiaceae) from southern Spain

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Teucrium teresianum, from southern Spain, is here newly described, illustrated, and compared with the most closely related species of the genus. The species is characterized by leaves that are 3(–4)-whorled, oblong to oblong-spathulate, and narrowly and progressively cuneate, and a calyx that is tubular-campanulate, not flattened in the proximal part and with mucronate lobes, and creamy corolla.

Teucrium L. (Lamiaceae) is a large genus, which includes some 250 species (Govaerts et al. 2010), with a subcosmopolitan distribution. In the Mediterranean region it has its main centre of diversity, being represented by around 90% of the total *Teucrium* species in the world (Puech 1978, 1980, 1984, Navarro and Rosúa 1990, Hedge 1992, Navarro and El Oualidi 2000a, Harley et al. 2004, Navarro 2010). In this region, *Teucrium* is the only genus of the subfamily Teucroideae (Cantino et al. 1992). It is characterized by leaves opposite or whorled, a corolla which frequently has a very reduced upper lip or is unilabiate, while in the latter the lower lip is pentalobate, with 2 latero-posterior lobes, 2 lateral lobes, and the anterior lobe much larger than the others. There are frequently 4 exerted stamens opposite the lower lip, the style is apical rather than gynobasic as in most Lamiaceae, and the nutlets are small and reticulate.

The traditional sectional classification of the genus *Teucrium* based on morphological characters disagrees with the results of phylogenetic studies (Abu-Assab and Cantino 1993). This controversy has led taxonomists to carefully examine palynological and micro-morphological characters, which may be of taxonomic significance (Dönmez et al. 1999, Navarro and El Oualidi 2000a, Dinç et al. 2009).

The section *Montana* Lázaro Ibiza is one of the richest and most diverse in the genus, the species of which are characterized essentially by being rock-dwelling half shrubs with simple hairs, subsessile leaves, pedicellate flowers, subactinomorphic calyx, and 1-lipped corolla having a long tube and well-developed lobes and two nectar guide-lines of hairs on the lower lips (Navarro 2010). This section includes a group of well-characterized species that have also been included in the subsection *Rotundifolia* Cohen ex Valdés-Berm. & Sánchez Crespo of the section *Polium* (Valdés Bermejo and Sánchez Crespo 1978, Navarro and El Oualidi 1997,

2000b), which presents flowers arranged in dense spiciform inflorescences that often elongates markedly during their development, with pedicellate and lanceolate bracteoles, the apical ones numerous and sterile, forming a noticeable tuft. This group, widespread throughout south Spain, Morocco, Algeria, Tunisia, Ethiopia, and southern Arabian mountains (Navarro and El Oualidi 2000b), includes the Mediterranean species *T. compactum* Clemente ex Lag. (southeast Spain and north Africa including Libya, Tunisia and Algeria), *T. rixanense* Ruiz Torre & Ruiz Cast. and *T. franchetianum* Rouy & Coincy (both from south Spain), and *T. alopecurus* De Noé (Tunisia and Algeria).

Populations at the classical locality and nearby areas (Granada province), but also populations in the sierras of Ojén, Blanca, and de las Nieves (Málaga province), have been referred to *T. rixanense*. However, Navarro (1995, 2010) indicated that the populations from Málaga differ notably from those of Granada, primarily by having whorled leaves and a creamy corolla, whereas those from Granada have opposite leaves and a pinkish corolla. Taking these differences into account and after reviewing the most important regional floras (Willkomm and Lange 1865–1870, Willkomm 1893, Coutinho 1939, Quézel and Santa 1963, Tutin et al. 1972, Pottier-Alapetite 1981, Valdés et al. 1987, Bolòs and Vigo 1995, Morales et al. 2010, Blanca et al. 2011), we conclude that the Málaga populations constitute a new species, which we describe and illustrate in the present paper, and discuss its characteristics, distribution, and habitat.

Teucrium teresianum Blanca, Cueto & J. Fuentes sp. nov. (Fig. 1–2)

Differs from *T. rixanense* Ruiz Torre & Ruiz Cast. by having 3(–4)-whorled, oblong to oblong-spathulate, narrowly and progressively cuneate leaves that are densely villose over the

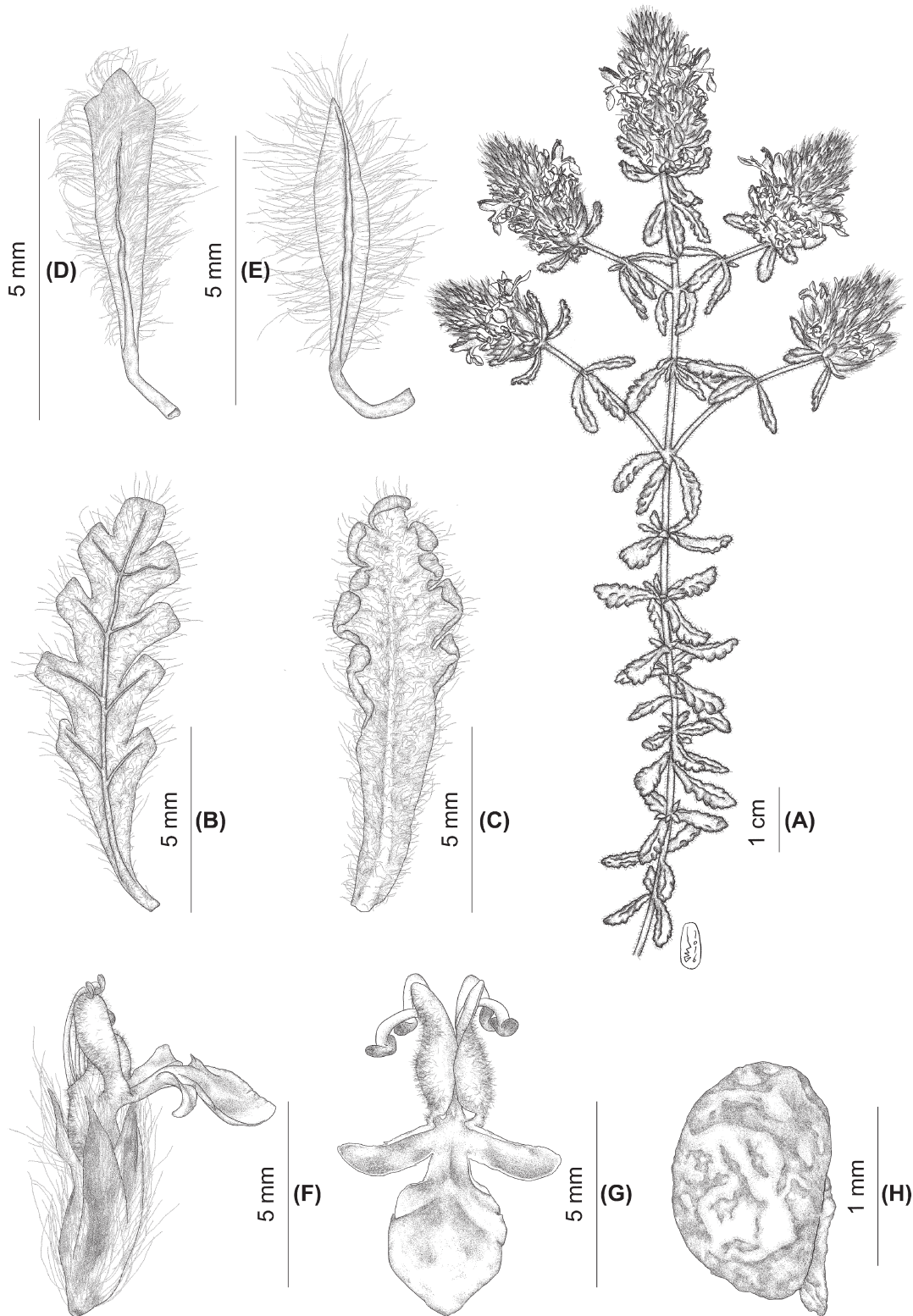


Figure 1. *Teucrium teresianum* sp. nov. (A) habit detail, (B) leaf (upper side), (C) leaf (underside), (D) lower bracteole, (E) middle bracteole, (F) flower, (G) corolla and stamens, (H) nutlet. Drawn by D. Belchí from the holotype.

entire surface, more densely on the veins on the underside; inflorescence slightly elongated at maturity (up to 4 cm); calyx tubular-campanulate, not flattened in the proximal part, with mucronate lobes; and creamy or whitish corolla.

Type: Spain, Málaga province, Istán, road to Monda, towards the bridge to Viruelas, 30SUF3053, 600 m a.s.l., 13 May 2015, limestone-dolomite taluses, J. Fuentes 62043 (holotype: GDA).

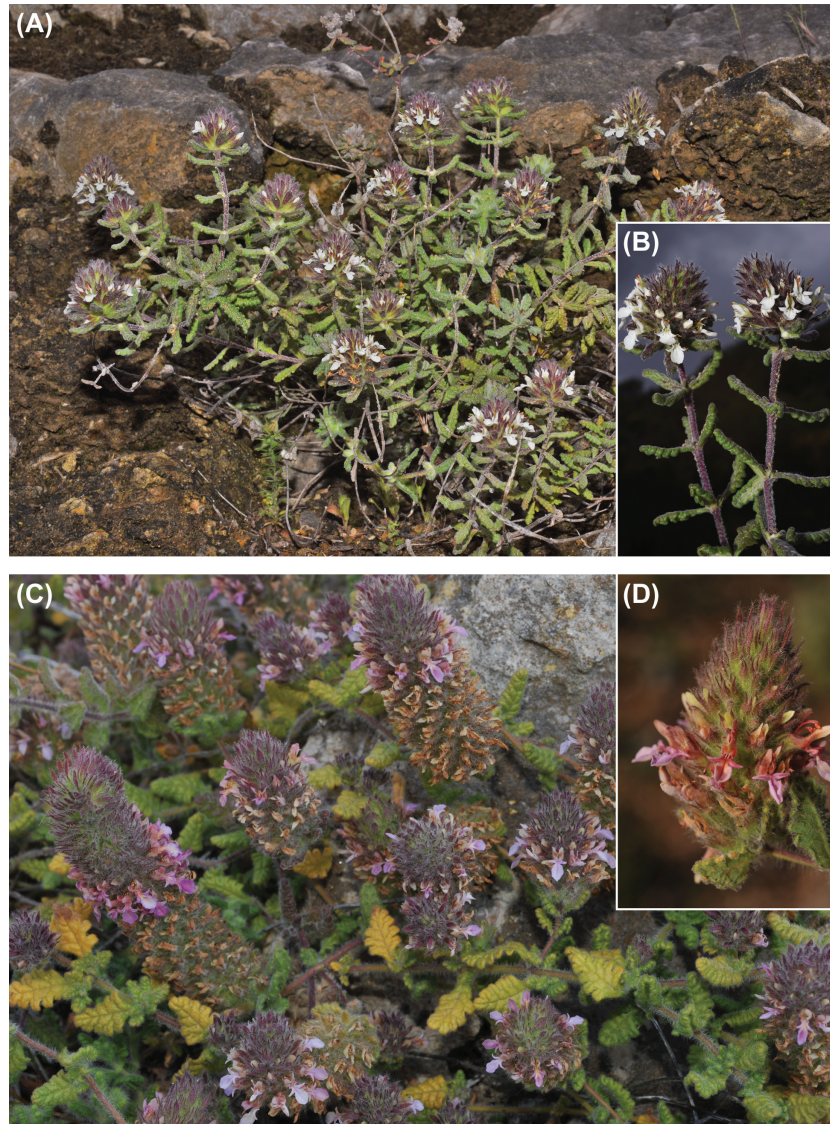


Figure 2. *Teucrium teresianum* sp. nov. (A) habit, (B) flowering spike. *Teucrium rixanense* (C) habit, (D) flowering spike.

Etymology

The specific epithet honours our friend and colleague Teresa Navarro (Univ. of Málaga, Spain), an authority in the genus *Teucrium*.

Description

Suffrutescent or sometimes perennial herb, 10–30 cm tall, caespitose, summer and winter semi-deciduous, with simple hairs. Stems decumbent, thin, terete, tinged dark purple in the upper part, villose with hairs 1.0–1.2(–2.0) mm long, straight or slightly flexuous, mixed with glandular and very short or sessile. Leaves 3(–4)-whorled, sessile or subsessile, the basal ones $3\text{--}5 \times 1.0\text{--}1.2$ mm, the cauline ones $8\text{--}13 \times 2.0\text{--}3.5$ mm, oblong to oblong-spathulate, narrowly and progressively cuneate, crenate in the upper $1/2$ (– $2/3$), with 3–6 obtuse and often revolute teeth on each side, with a rough upper surface, greyish green, densely villose over the entire surface, more densely so on the veins on the underside. Inflorescence $1.3\text{--}3.5$ (– 4.0) $\times 1.2\text{--}1.8$ cm, well differentiated from the vegetative part, at the first capituliform, at

maturity slightly elongated and spike-like, dense, comprised by 2-flowered verticillasters arranged helicoidally. Bracts similar to the cauline leaves, as long as the flowers. Bracteoles petiolate (petiole up to $1/3$ of the total length), the lower ones $6\text{--}7 \times 1.1\text{--}1.3$ mm, oblanceolate, obtusely tridentate or slightly sinuate; the intermediate ones $6\text{--}7 \times 0.8\text{--}1.0$ mm, linear-lanceolate, entire; the upper ones without flowers, progressively shorter, densely arranged, forming a tuft. Flowers subsessile, hermaphroditic. Calyx (5.5–) $6.0\text{--}7.0$ mm, somewhat acrescent when fruiting, tubular-campanulate, not flattened in the proximal part, its outer side densely villose, with hairs 0.7–1.1 mm long, straight or slightly arched, mixed with glandular and very short, on the inner side sparsely pilose; without carpostegium; subactinomorphic, with 5 lobes that are 1.2–1.5 mm, triangular, mucronate, often tinged dark purple; the 3 upper lobes somewhat wider than the 2 lower ones. Corolla 8–10 mm, uni-labiate, penta-lobate, creamy or whitish; tube 3.0–3.5 mm, straight, notably thinner than the calyx; lobes latero-posterior, 2.0–2.5 mm, pointing upwards, oblong, obtuse,

ciliate; lateral lobes 1.5–1.8 mm, \pm horizontal, lanceolate, divergent, acute; central lobe 2.0–2.5 mm, spatulate, \pm horizontal, concave, with throat flanked by two lines of erect hairs. Stamens exerted, erect, protected and partially hidden by the latero-posterior lobes of the corolla, with curved ends, sparsely hairy, with reniform anthers, introrse, connivent, orangish. Style apical, as long as the upper stamen, with some glandular hairs or glabrous; stigma bifid, with equal branches. Nutlets 1.5–1.7 \times 0.8–1.0 mm, ovoid, reticulate, glabrous, black.

Phenology

Flowering and fruiting occurs in May and June.

Distribution and ecology

Teucrium teresianum is endemic to the province of Málaga (southern Spain), where it inhabits the sierras of Ojén, Blanca, las Nieves and other smaller nearby sierras (Fig. 3). Here it grows in thickets on rocky or pebbly slopes, and in cracks of boulders, on limestone substrate or dolomite, between 200–1900 m a.s.l.

Similar species

Table 1 lists the main differences between the most closely related *Teucrium* species that inhabit the Mediterranean region. Particularly, *T. rixanense*, the species in which the populations of the new species had previously been included, is distinguished by greater morphological differences: i.e. opposite, ovate and sharply cuneate leaves, inflorescence strongly elongated at maturity, calyx larger and flattened in the proximal part, with subulate lobes, and a pinkish corolla.

Teucrium teresianum also has affinities with *T. chrysotrichum* Lange, first described from the Sierra de Mijas (Málaga province), especially regarding the leaves, which are also 3(–4)-whorled and oblong. However, *T. chrysotrichum* has

inflorescences up to 6 cm long that do not have a terminal tuft of sterile bracteoles, and furthermore it has a characteristic yellowish-golden colour at maturity, its stamens are long exerted and are not protected by the latero-posterior lobes of the corolla, being far shorter (1.0–1.5 mm) and also completely glabrous.

Additional specimens examined (selection)

Teucrium alopecurus De Noé, Tunicia. Gabes: Djebel Tébaga, 300 m a.s.l., 24 May 1992, J. Molero and J. Vicens 557383 (MA); Matmata, Gliat-er-Rmat, in aridis, Apr 1910, C. J. Pitard 98463 (MA); Matmata, in rupestribus, Apr 1908, C. J. Pitard 98464 (MA).

Teucrium compactum Clemente ex Lag., Spain. Almería: Bacares, Sierra de Filabres, 16 Jun 1991, J. Peñas 4301 (HUAL); Gérgal, Sierra de Filabres, El Chaparral, 17 May 2002, J. Peñas 7270 (HUAL); Serón, Sierra de Filabres, Los Santos, 3 Jun 1991, J. Peñas 4282 (HUAL); Sierra de Filabres, 30 Jun 1989, F. Alcaraz 857 (MUB); Sierra de Filabres, barranco Barrancón, 1700 m a.s.l., 3 Jun 1979, M. Honrubia et al. 14232 (GDA); Sierra de Filabres, barranco del Lugar, 1650 m a.s.l., 6 Jun 2006, J. F. Mota et al. 14692 (HUAL); Sierra de Filabres, Benizalón, 850 m a.s.l., 20 May 1987, C. Morales and A. B. Robles 48805 (GDA); Sierra de Filabres, Macael, 21 Jul 1984, T. Navarro 22784 (GDAC); Sierra Nevada, El Almirez, 13 Jun 1985, J. L. Rosúa and T. Navarro 22786 (GDAC); Turrillas, Sierra Alhamilla, northwest pico Colativí, 8 Sep 2004, F. J. Pérez-García et al. 7677 (HUAL); Vélez Rubio, 19 Jun 1986, García Gea 19625 (MUB). Granada: Capileira, cortijo Naute, 1750 m a.s.l., 17 Sep 1978, J. Molero Mesa 9750 (GDA); entre Trevélez y Portillo de Cástaras, 23 Jun 1987, O. Socorro 20294 (GDA); Haza del Lino, 11 Jun 1988, J. M. Nieto and A. Pérez Latorre 23191 (MGC); Lanjarón, 20 Jul 1979, J. Molero Mesa 9050 (GDA); Lanjarón, barranco río Lanjarón, 1900 m a.s.l., 20 Jul 1979, J. Molero Mesa 9747 (GDA); Lanjarón, Tello,

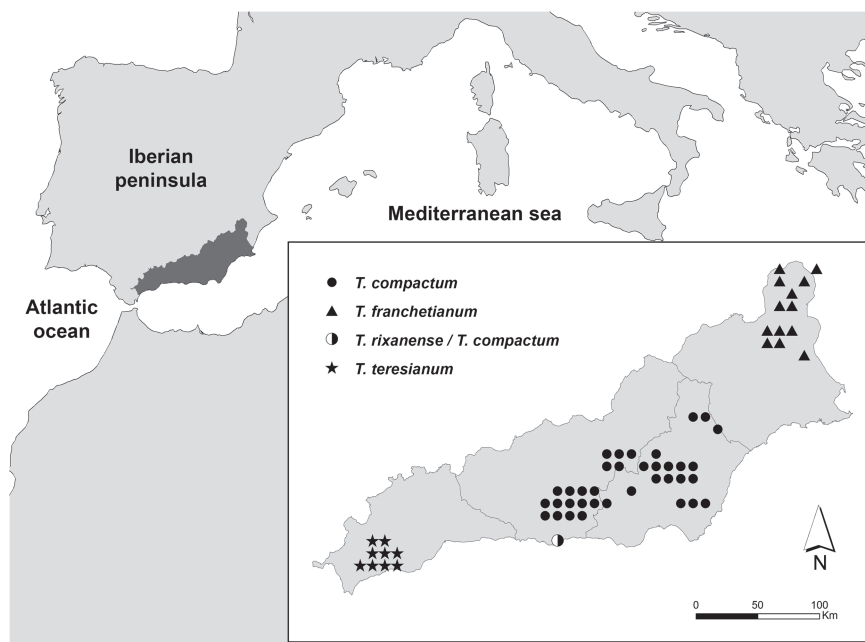


Figure 3. Distribution map of the Iberian Peninsula *Teucrium* species studied.

Table 1. Comparison of *Teucrium teresianum* sp. nov. with the more related Mediterranean species of the genus.

	<i>T. compactum</i>	<i>T. rixanense</i>	<i>T. teresianum</i>	<i>T. franchetianum</i>	<i>T. alopecurus</i>
Cauline leaves arrangement	Opposite sessile or subsessile	Opposite sessile or subsessile	3(-4)-whorled sessile or subsessile	Opposite shortly petiolate or subsessile	Opposite sessile or subsessile
attachment shape	ovate, sharply cuneate	ovate, sharply cuneate	oblong to oblong-spathulate, narrowly and progressively cuneate	oblong to oblong-lanceolate to linear, cuneate	oblong to oblong-spathulate, narrowly and progressively cuneate
margin	Crenate in the upper 2/3	Crenate in the upper 2/3	Crenate in the upper 1/2(-2/3)	Crenate in the upper 1/2(-1/3), or entire	Crenate in the upper 1/2(-2/3)
Inflorescence at maturity	Slightly elongated (to 5 cm)	Strongly elongated (to 15 cm)	Slightly elongated (to 4 cm)	Slightly elongated (to 3 cm)	Strongly elongated (to 10 cm)
Inferior bracteoles (mm)	9-13 × (1.5-2.0-4.5, oblanceolate, obtusely tridentate or slightly sinuate)	6-9 × 1.8-3.0, ovate to oblong, crenate or sinuate	6-7 × 1.1-1.3, oblanceolate, obtusely tridentate or slightly sinuate	8-10 × (1.6-1.8-3(-3.5), linear-lanceolate to oblanceolate, entire	9-12 × 1.7-2.2 linear to linear-lanceolate, slightly sinuate
Calyx Length (mm)	(7.0-7.5-8.0(-9.0))	(6.5-7.0-8.0)	(5.5-6.0-7.0)	(8-10-11)	8-11
shape	ventricose, not flattened in the proximal part	tubular-campanulate, flattened in the proximal part	tubular-campanulate, not flattened in the proximal part	tubular-campanulate, not flattened in the proximal part	ventricose, not flattened in the proximal part
lobes	mucronate	subulate	mucronate	mucronate	mucronate
Colour corolla	White, creamy, yellowish (pinkish, purple)	Pinkish	Creamy or whitish	Creamy	Pinkish
Distribution	Southeast Spain and north Africa (Libya, Tunisia and Algeria)	Granada province (south Spain)	Málaga province (south Spain)	Albacete and Murcia provinces (southeast Spain)	South Tunisia and northwest Algeria

9 Jul 1944, J. M. Muñoz Medina 18937 (GDA); Laroles, camino forestal de las Alpujarras, 1700 m a.s.l., 18 Jun 1978, J. Molero Mesa 9749 (GDA); Laroles, El Monte, 1300 m a.s.l., 22 Jun 1988, A. Hervás 28712 (GDA); Sierra de Baza, Cerro de Gor, 8 Jun 1983, J. Torres et al. 26772 (GDA); Sierra de Baza, Cortijo de la Almariza, 14 Jun 1984, J. Torres et al. 29024 (GDA); Sierra Nevada, 12 Jun 1987, A. Ortíz 27883 (GDA); ibidem, 30 Jun 1942, Hno. Jerónimo 5236 (ALME); Trevélez, barranco río Trevélez, 1800 m a.s.l., 24 Sep 1978, J. Molero Mesa 9751 (GDA).

Teucrium franchetianum Rouy & Coincy, Spain. Albacete: Caudete, 720 m a.s.l., 30SXH7182, 13 Jul 1989, J. Herranz and F. Alcaraz 486917 (MA). Murcia: Abarán y Cerro de Blanca, 22 May 1928, Cuatrecasas 98554 (MA); Cieza, 14 May 1968, A. Rigual 256760 (MA); Cieza, Sierra del Lloro, 400 m a.s.l., Jun 1968, F. Esteve 328936 (MA); Ibidem, 900 m a.s.l., 19 Jun 1975, J. Fernández Casas 198647 (MA); Sierra del Oro, Cieza, 550 m a.s.l., 8 Jun 1980, F. Alcaraz 14231 (GDA).

Teucrium rixanense Ruiz Torre & Ruiz Cast., Spain. Granada: Castell de Ferro, 14 May 1983, F. Alcaraz 9932 (MUB); Calahonda, 3 Jun 1989, F. Alcaraz 29552 (MUB); entre Castell de Ferro y Calahonda, 12 Jun 1976, A. Asensi and B. Díez 7560 (MGC); Gualchos, entre Castell de Ferro y Calahonda, 125 m a.s.l., 20 Apr 1990, C. Morales and J. Peñas 32322 (GDAC); Lújar, Sierra del Jaral, Hoya del Cojo, 30SVF6269, 880 m a.s.l., 29 May 2013, J. Fuentes 60099 (GDA); Sierra de Lújar, encima de Carchuna, 3 Jun 1998, L. R. López 43100 (GDAC); Sierra Rijana, cerca del barranco de Zacatín, 30SVF6462, 98 m a.s.l., 16 May 2010, J. Fuentes 57088 (GDA).

Teucrium teresianum Blanca et al. (paratypes), Spain. Málaga: Benahavís, garganta del Guadalmina, 14 Jun 1994, A. V. Pérez Latorre et al. 39340 (MGC); Istán, base de Sierra Blanca, Casa del Moreno, 500 m a.s.l., 2 Jun 1994, J. M. Nieto et al. 39295 (MGC); Istán, base de Sierra de Canucha, 550 m a.s.l., 21 Jun 1994, J. M. Nieto et al. 39296 (MGC); Istán, Sierra Blanca, desde Puerto de Vinuelas a Caserío de Moratán, 515 m a.s.l., 5 Jun 2016, G. Blanca et al. 62527 (GDA); Marbella, 1 Jun 1994, A. Pérez Latorre et al. 39987 (MGC); Marbella, Nagüeles, 24 Mar 1990, M. Recio 32382 (MGC); ibidem, 1 Jun 1994, A. V. Pérez Latorre et al. 39987 (MGC); Marbella, Sierra Blanca, Arroyo de los Monjes, 250 m a.s.l., 5 Jul 2006, M. Zafra Valverde 67770 (MGC); Ojén, Monte del Juanar, 19 Aug 1990, M. Recio 32384 (MGC); Ojén, Sierra de Ojén, dehesa de Boornoque, 1 Jun 1983, B. Cabezudo et al. 11736 (MGC); Ojén, Sierra Blanca, Mirador de Juanar, 1 Jun 1984, A. V. Pérez Latorre et al. 39988 (MGC); Ojén, Sierra Blanca, Puerto de Ojén, 15 Jul 1982, D. Merino and J. Guerra 11734 (MGC); Ojén, Sierra Blanca, vereda parador-pinsapar, 1050 m a.s.l., 1 Jun 1994, A. V. Pérez Latorre et al. 39772 (MGC); Parauta, 1120 m a.s.l., 27 Jun 1994, A. V. Pérez Latorre et al. 40156 (MGC); Parauta, Sierra de las Nieves, nacimiento del río Verde, 7 May 1997, Pérez Latorre et al. 45014 (MGC); Parauta, Sierra de las Nieves, subida a los Pilones, 1450 m a.s.l., 23 Jun 1995, B. Cabezudo et al. 43478 (MGC); Ronda, Sierra de las Nieves, 1 Jun 1990, B. Cabezudo 32385 (MGC); Sierra de Canucha, Los Cuchillos, Alto de Canucha, 1200 m a.s.l., 3 Jun 2004, F. C. Soriguer 58250

(MGC); Sierra de Tolox, loma del Hornillo, 30SUF2358, 13 May 2015, J. Fuentes 62042 (GDA); Tolox, proximidades de la Casa de Andrés Rivero, 580 m a.s.l., 16 Jun 2016, M. Cueto and G. Blanca 26063 (HUAL); Tolox, Sierra de Tolox, Puerto Coronas, 1190 m a.s.l., 22 May 1997, A. V. Pérez Latorre et al. 45017 (MGC).

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