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## Synopsis of *Teucrium* L. (*Labiatae*) in the Mediterranean region and surrounding areas

### Abstract

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In the Mediterranean area and its surrounding floristic regions (Macaronesian, Circumboreal, Irano-Turanian, and Saharo-Arabian) the genus *Teucrium* L. (*Labiatae*) has around 242 taxa grouped in 9 sections according to Bentham (1832-1836) with the additions made by Boissier (1879). Section *Teucriopsis* Benth. is endemic to the Canary and Madeira Islands. Section *Teucrium* comprises 28 perennial herbs and shrubs. Section *Stachyobotrys* (Benth.) Kastner is a section with 7 rare taxa, one of them endemic to Morocco and two to Turkey. Section *Scorodonia* (Hill) Schreb., includes 18 half-shrubs from open forests, 16 of them endemic to the western Mediterranean; the only one in the genus which shows a clear bilabiate calyx (excluding *T. abutiloides* L'Her. and *T. betonicum* L'Her. from sect. *Teucriopsis*). Section *Spimularia* (Boiss.) Kastner comprises the only winter-deciduous 7 herbs of the genus. Section *Isotriodon* with 16 small half-shrubs is found only in crevices and cliffs and seems to be of recent origin. Section *Chamaedrys* (Mill.) Schreb., is represented in all Mediterranean lands, with 35 taxa; they are mainly half-shrubs endemic to Turkey, Greece and SE Spain and perennial herbs with rhizomes. Section *Polium* (Mill.) Schreb., is a variable section in the leaves, calyx and indumentum, arranged in 4 subsections: (1) Subsection *Polium* including 64 gynodioecious half-shrubs and scrubs, 70% of them distributed in Spain and Morocco; (2) Subsection *Rotundifolia* Berm. & Sanchez Crespo includes 43 small half shrubs, 65% of them endemic to Cyprus, Arabia and NE Africa; (3) Subsection *Pumilum* Rivas Mart., with 7 species, found only in SE Spain; (4) Subsection *Simplicifolia* S. Puech with 10 species occur in SE Spain, NE Africa and S Arabia. The East Mediterranean seems to be the centre of origin of the genus and the Western Mediterranean the recent centre of speciation.

### Introduction

*Teucrium* L., is a large and interesting genus of the *Labiatae* widely distributed in Europe, Asia, Africa, America and Australia. The Mediterranean area without doubt represents the major area of distribution for the genus, since it is represented by 96% of the total species in the world. *Teucrium* is the only genus of the subfamily *Teucrioideae* in the Mediterranean area (Cantino 1992); it is characterised by the corolla with a very reduced upper lip and the lower elongate, four frequently exerted stamens opposed to the lower lip and the small reticulate nutlets; the style is unlike most *Labiatae*, not gynobasic.

Bentham (1832-1836) divided the genus into 9 sections: *Leucosceptrum* Smith, *Teucriopsis*, *Teucris* Benth., *Pycnobotrys* Benth., *Stachyobotrys*, *Scorodonia*, *Scordium*, *Chamaedrys* and *Polium*. Boissier (1879), described two new sections: *Spinularia* and *Isotriodon*, and Rouy (1909) make a new monospecific section: sect. *Botrys* Rouy. Kästner (1989), included the sect. *Polium* in *Chamaedrys* and the sects. *Spinularia* and *Botrys* in sect. *Scordium*. Navarro & El Oualidi (1998) included sect. *Botrys* in sect. *Spinularia*.

This study has two objectives; (1) to present a taxonomic synopsis of the genus in the Mediterranean area and its surrounding floristic regions including a sectional arrangement of its species based on Bentham (1832-1836) with additions made by Boissier (1879); and (2) to present a phytogeographical distribution of species following the floristic region of the world recognized by Takhtajan (1986).

All the sections, following Bentham (1832-1836), occur in the Mediterranean area, NW Africa, north of the Sahara Desert (Morocco, Algeria, Tunisia and Libya), north of Egypt to the Ethiopia mountains, SW Arabian mountains, the Sinai Peninsula and through the arid regions up through west Asia and Europe. Section *Pycnobotrys* is distributed in SE Asia and sect. *Leucosceptrum* only represented in India.

### Taxonomic and floristic synthesis of the sections

Section *Teucrium* includes 28 taxa, characterised by the wide, lilac, white or white-blue short tubed corolla with a spur in the tube; like the *Antirrhineae*. Most species are winter semi-deciduous perennials or short-lived herbs. They are semi-deciduous branched shrubs like *T. fruticans* and *T. brevifolium*, looking like the relict elements from the old tropical Mediterranean flora, and branched shrubs such as *T. malenconianum* and *T. chardonianum*. The leaves are entire to dissected; the flowers are grouped in verticillasters or axillary in upper leaves; the calyx is campanulate, actinomorphic; the nutlets are large and hairy. This section is distributed (Fig. 1) in the forests, shrub-lands and disturbed habitats in areas with an arid and semi-arid Mediterranean climate. Most species are found in the east Mediterranean and the majority of endemics occur in Turkey, Ethiopia and S Arabian mountains. The known chromosome numbers are  $2n = 30, 60$  ( $x=15$ ).

Section *Teucriopsis* appears to be the oldest in the genus and comprises three distinct species characterised by their weakly bilabiate corolla. They are semi-deciduous and semi-sclerophyllous shrubs: *T. heterophyllum* from Canary Islands, and two winter deciduous perennial herbs; *T. abutiloides* and *T. betonicum* from Madeira Islands. The leaves are crenate and in *T. abutiloides* and *T. betonicum*, sub-cordate at the base; flowers are clustered in verticillasters or in lax axillary cymes in the upper leaves. The corolla, blue, orange or cream is weakly bilabiate, wide and shortly tubular; it is the only section with a weakly bilabiate corolla in the genus; calyx campanulate, actinomorphic, some with an annulus of hairs inside; the nutlet is large and hairy. It is a diverse section in calyx, leaves and trichomes morphology. *T. betonicum* and *T. abutiloides* are very dissimilar from *T. heterophyllum* in calyx morphology, showing a broad upper tooth like species from sect. *Scorodonia*. It is an endemic section from the Macaronesian region (Fig. 2), distributed in forest, open habitats and rocky slopes.

Section *Stachyobotrys* is a rare section with seven taxa. They are the perennials or short-lived herbs and cushion-like half-shrubs, winter deciduous and summer semi-deci-

duous. The stems are villous; leaves dentate-crenate, petiolate; flowers in dense verticillasters like spikes; corolla with zygomorphic lobes, the lateral lobes reduced or absent (*T. collincola*) and, in some cases, the tube is resupinate; calyx campanulate, bilabiate often gibbous at the base, zygomorphic with spinescent teeth, upper tooth weakly broad, 2 lower teeth lanceolate and nutlets with glandular hairs. This section is distributed (Fig. 3), mainly on shady walls, rocky slopes, and sandy areas in the semi-arid and sub-humid climate regions. It is represented by two species in the western Mediterranean area — *T. bracteatum* (Morocco and Spain) and *T. collincola* endemic to Morocco — and by four species in the east Mediterranean area, mainly endemic to Turkey. It is a diverse section in the corolla and leaves morphology. The known chromosome number is  $2n=20$ .

Section *Scorodonia* is an interesting group comprising 19 taxa. They are the half-shrubs and perennial herbs, winter deciduous and summer semi-deciduous with asexual reproduction. The leaves are crenate and cordate at the base, petiolate or sub-petiolate; flowers in verticillasters; corolla lobes are developed and the tube long and narrow; calyx bilabiate with an annulus of hairs inside, campanulate, gibbous at the base, the upper tooth broader than the laterals and the lower teeth triangular; nutlet small and without sculpturing and hairs. It is a diverse section in trichome morphology. It is distributed (Fig. 4), mainly in the humid climate of the west Mediterranean area in forests, shrub-lands and valleys. The most widespread species is *T. scorodonia* and most endemics occur in Morocco. The known chromosome numbers are  $2n=31, 32$  ( $x=16$ ).

Section *Scordium* is represented by 4 taxa. They are the stoloniferous erect and prostrate short-lived herbs, summer deciduous and winter semi-deciduous. The leaves are toothed, crenate, sub-cordate at the base and sub-petiolate; flowers in verticillasters (2-8) flowered axillary in upper leaves; calyx tubular-campanulate, sub-actinomorphic; corolla tube developed with two nectar guides on lower lip; nutlets with glandular hairs. This is a widespread section (Fig. 5) in the meadows of the humid Mediterranean area. The most important species is *T. scordium*, a Saharo-Sindian species (Zohary 1963). The known chromosome numbers are  $2n=16, 36$  ( $x=8$ ).

Section *Spinularia* has 6 species. They are erect, prostrate and spinescent annual and short-lived herbs, winter and summer deciduous. The leaves are entire and toothed; 2-4 flowers in verticillasters, axillary in the upper leaves; calyx campanulate, zygomorphic and bilabiate with spinescent teeth; corolla with long and narrow tube sometimes resupinate, lateral lobes reduced; the small nutlets are without hairs. It is distributed (Fig. 6) mainly in the semi-arid and sub-humid regions of the western Mediterranean region (NW Africa), very common in exposed and disturbed habitats. The known chromosome numbers are  $2n=14, 62, 64$  ( $x=7$ ).

Section *Isotriodon* includes 16 taxa and seems to be a recent group. They are the half-shrubs, summer semi-deciduous species. In some cases it is difficult to differentiate the species. The stems are villous; leaves dentate or entire, often villous and petiolate; inflorescence in a sub-spiral raceme; calyx tubular-campanulate, sub-actinomorphic, slightly gibbous at the base,  $\pm$  pedicellate, upper tooth shortly ovate, lateral teeth ovate and the lower teeth narrower and acute; corolla with long tube and with well-developed lobes and two nectar guide-lines of hairs on the lower lip; nutlets have glandular hairs. The species of this section are restricted to cliffs, rocky slopes and fissures in the semi-arid and sub-humid regions mainly in the east Mediterranean area (Fig. 7), where it is represented by

species endemic to Turkey. In the west Mediterranean only *T. rupestre*. and *T. tananicum*, endemics to Morocco, occur.

Section *Chamaedrys* comprises 35 taxa, mainly occurring around the Mediterranean Sea (Fig. 8). They are small half-shrubs and perennial herbs with rhizome, winter deciduous and summer semi-deciduous, with asexual reproduction. The leaves are dentate and cuneate at the base; flowers in lax verticillasters or sub-spirally lax racemes; corolla with well-developed lobes, latero-posterior lobes long, acute and very hairy and the lower lip with two clear nectar guide-lines of hairs; calyx tubular-campanulate, actinomorphic with an annulus of hairs inside; nutlets hairy. It is distributed in open forests, shrub-lands and rocky slopes in semi-arid, arid and sub-humid climates. The most important species is *T. chamaedrys*, distributed through the Mediterranean and *T. divaricatu*, mainly in the E Mediterranean (Turkey and Greece). It is the only section of the genus found in all Mediterranean islands. It is diverse in inflorescence type and leaf morphology. The known chromosome numbers are  $2n = 28, 30, 32, 62$ .

Section *Polium* includes a very difficult group of 125 widespread species. It does not occur in Madeira or the Canary Islands. This section is very diverse from all points of view. Its variability results from many adaptive radiations and differentiations by polyploidy. In some cases (subsect. *Rotundifolia*), there are intermediate morphological characters between sects. *Polium* and *Chamaedrys*. Section *Polium* is arranged in the following four subsections.

Subsection *Polium* includes 64 erect, prostrate, cushion-like, half-shrubs or scrubs and perennial herbs, summer and winter semi-deciduous. They have dense, racemose, spiral inflorescence and an indumentum with branched hairs. Leaves are entire or crenate, sessile and often revolute; gynodioecious flowers in dense, simple, terminal or compound raceme; calyx tubular and sub-actinomorphic; corolla shortly tubular closed by a tuft of hairs and with short lateral and latero-posterior lobes; nutlets with reticulate ridges without hairs. It is the most widespread subsection (Fig. 9), mainly distributed in exposed and disturbed areas and forming part of degraded shrub-lands. The most important and taxonomically hard species are *T. polium* L. and *T. capitatum* L., that occur throughout the Mediterranean and Irano-Turanian regions. 70 % of species are found in the western Mediterranean area (SE Spain and N Morocco). The subsection is diverse in inflorescence type, leaf and trichome morphology. The known chromosomic numbers are  $2n=26, 52, 78, 80, 91$  ( $x=13$ ).

Subsection *Simplicipilosa* includes 10 taxa, seven of them are endemic in SE Spain, and three, *T. rhodocalyx*, *T. descalsnei* and *T. leuclidum*, from the east Mediterranean area and SW Asia. The first two are endemic to Ethiopia and the S Arabian Peninsula (Fig. 10), they are erect, prostrate, cushion-like half-shrubs. The leaves are crenate, linear or wide at the base and the indumentum is simple hairs. The known chromosome number is  $2n = 26$ .

Subsection *Pumilum* is endemic to the Iberian Peninsula (Fig. 11) and comprises 7 species. They are erect, summer semi-deciduous or deciduous mainly occur in saline soils. The leaves are entire or weakly crenate often revolute; calyx tubular and indumentum consists of simple vermiform hairs. The most widespread species is *T. pumilum*.

Subsection *Rotundifolia* is an interesting and diverse subsection including 43 taxa, distributed throughout Mediterranean area, NE Africa, the Arabia peninsula and W Asia (Fig. 12) and characterised by the indumentum of simple hairs and a corolla with well-develo-

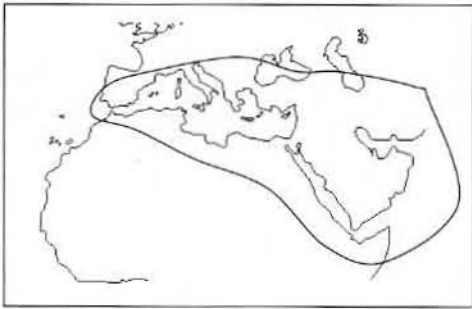


Fig. 1. Phytogeographical distribution of section *Teucrium*.

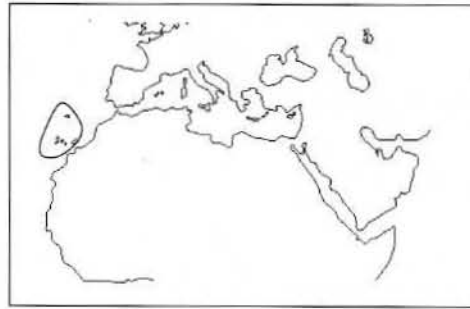


Fig. 2. Phytogeographical distribution of section *Teucropsis* Benth.

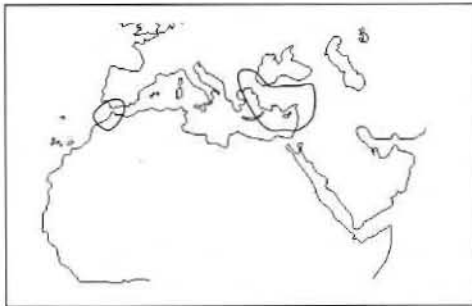


Fig. 3. Phytogeographical distribution of section *Stachybotrys* (Benth.) Kastner.

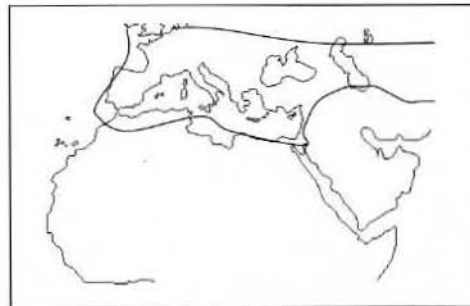


Fig. 4. Phytogeographical distribution of section *Scorodonia* (Hill) Schreb.

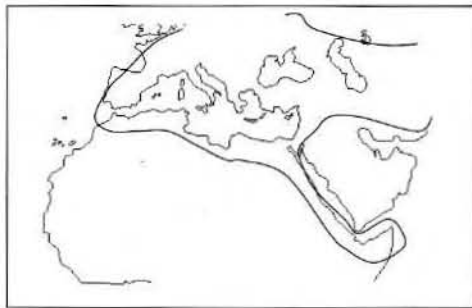


Fig. 5. Phytogeographical distribution of section *Scordium* Kastner.

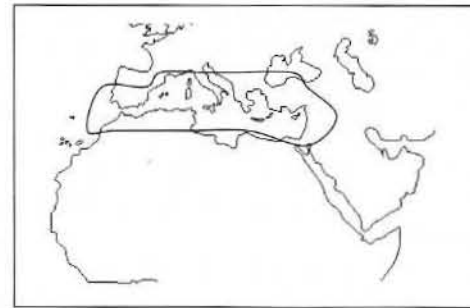


Fig. 6. Phytogeographical distribution of section *Spinularia* (Boiss.) Kastner.

ped latero-posterior lobes. They are half-shrubs, summer and winter semi-deciduous species. The leaf is entire or crenate, often villous, petiolate or sub-petiolate; the inflorescence is a lax sub-spirally raceme; calyx tubular-campanulate, sub-actinomorphic sometimes inflated; corolla with a long tube and well-developed lobes and two nectar guide-lines of hairs on the lower lip; nutlets, in some cases, with glandular hairs. Species of this subsection occur on rocky slopes, fissures and cliffs.

Within this subsection a group of species similar to *T. montanum* is distinguished. These

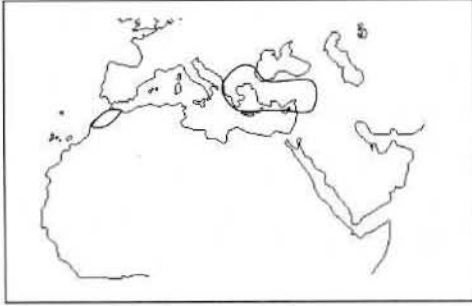


Fig. 7. Phylogeographical distribution of section *Isotriodon* Boiss.

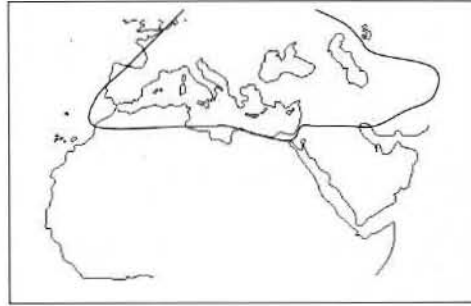


Fig. 8. Phylogeographical distribution of section *Chamaedrys* (Mill.) Schreb.

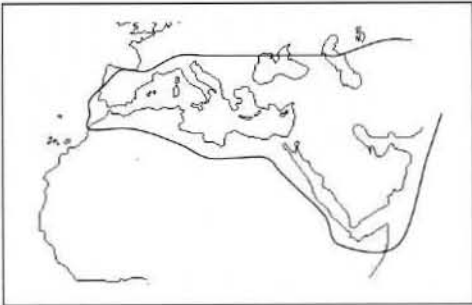


Fig. 9. Phylogeographical distribution of section *Polium* (Mill.) Schreb. subsection *Polium*.

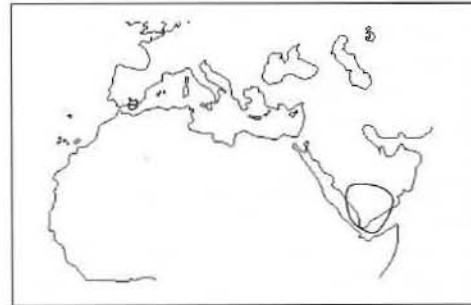


Fig. 10. Phylogeographical distribution of section *Polium* subsection *Simplicipilosa* S. Puech.

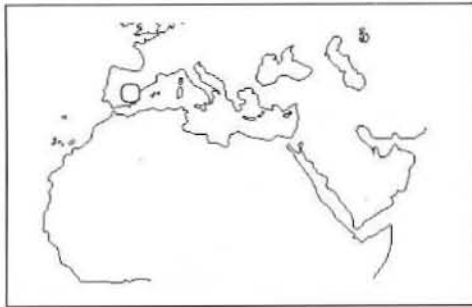


Fig. 11. Phylogeographical distribution of section *Polium* subsection *Pumilum* Rivas. Mart.

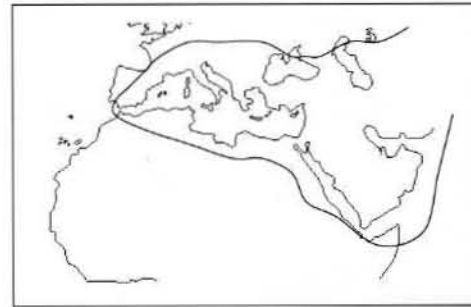


Fig. 12. Phylogeographical distribution of section *Polium* subsection *Rotundifolia* (Cohen) ex Valdés Berm. & Sánchez-Crespo.

are characterized by the entire or sub-entire discolorous, elliptic to linear and sub-sessile leaves, with an indumentum consisting of vermiform and adpressed hairs, distributed in S and E Europe, western Mediterranean area and in the mountains of the south Arabian Peninsula. This group shows intermediate characters with the section *Chamaedrys*. Other species are morphologically close to *T. rotundifolium*, whose main features are: leaves con-

colorous, petiolate or sub-petiolate, cordate at the base and an indumentum formed by long, erect hairs. It occurs in NE Spain, N Africa, E Mediterranean (Turkey, Greece and Cyprus) and in the arid regions of SW Asia. Finally a third taxonomically hard group includes of species similar to *T. compactum* whose main features are: crenate, sub-sessile leaves cuneate at the base; indumentum of erect hairs, rarely vermiform; inflorescence in a dense and very long raceme spike-like and inflated calyx. This group is found in S Spain, Morocco, Algeria, Tunisia, Ethiopia and S Arabian mountains, in open and arid habitats such as steppe. The known chromosome numbers are  $2n=26, 34, 78$  ( $x=13$ ).

## Discussion

*Teucrium* is widespread in the Mediterranean, Macaronesian, Irano-Turanian and Saharo-Arabian Regions (Fig. 13), but shows two centres of richness located in the east and western region of the Mediterranean Sea. This fact is exemplified by the geographical distribution of sections *Stachyobotrys*, *Isotriodon* and section *Polium* subsection *Simplicipilosa*. However, other sections, such as *Scordium*, have homogeneous distribution in all the areas and are mainly represented by Saharo-Sindian species. The sections *Teucrium*, *Chamaedrys*, *Isotriodon*, and *Stachyobotrys* mainly occur in the E Mediterranean and Irano-Turanian region. *Polium*, *Scorodonia* and *Spinularia* are predominantly in the W Mediterranean area. *Teucriopsis* is restricted to the Macaronesian region.

Part of the floristic richness of *Teucrium* is the high number of endemic species (63%) (Fig. 14). The main part of them (50%) are found in the Iberian Peninsula and Morocco and a high number (18%) in Turkey and Greece. 46% of species in the section *Teucrium* are endemic to Turkey and Morocco. Sections *Scorodonia* and *Spinularia* include a lower num-

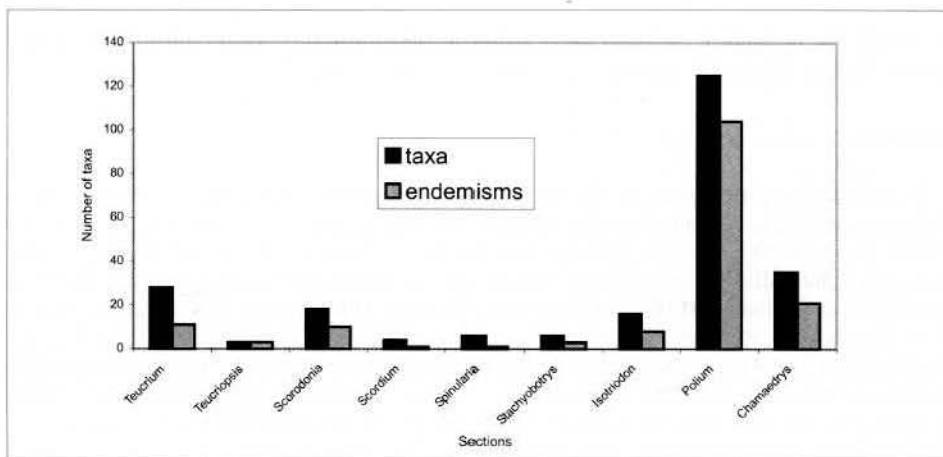


Fig. 13. Distribution of the number of taxa and endemisms of the genus *Teucrium* L., in the main floristic regions of the Mediterranean area (WM; Western Mediterranean Region. EM; East Mediterranean Region. CM; Central Mediterranean Region. IT; Irano-Turanian Region. AS; Saharo-Arabian Region. C-M; Circumboreal and Mediterranean Regions. WS; Widespread taxa in all Mediterranean area. MA; Macaronesian Region).

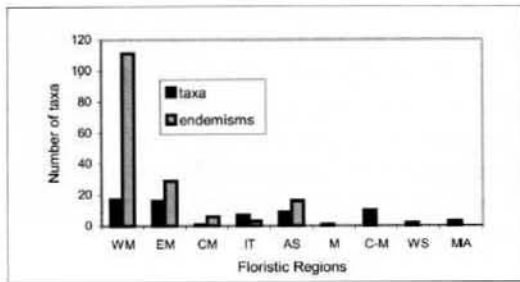


Fig. 14. Distribution of the number of taxa and endemisms in the sections of the genus *Teucrium* L., in the Mediterranean area and surrounding regions.

ber of endemics: in the section *Scorodonia* only 5% are endemic to Morocco and Spain; *Spinularia* has only one endemic species, *T. mauritanicum* occurring in Algeria. In section *Polium* subsection *Polium*, 82% of species are endemic to Spain, Morocco and Libya and all the taxa close to *T. rotundifolium* (section *Polium* subsection *Rotundifolia*) are endemic to Morocco and Spain. Finally, 50% of species in the section *Isotriodon* and *Stachyobotrys* are endemics to Morocco and Turkey.

The E Mediterranean region, the south of the Arabian Peninsula and NE Africa are centres of floristic diversity the sections *Teucrium* and *Polium* subsections *Polium* and *Rotundifolia*. The centre of richness for the section *Chamaedrys* is the area around the Mediterranean Sea, including their islands.

The E Mediterranean region and SW Asia seem to be the centre of origin of the *Teucrium* other genera of *Labiatae*. In fact all the sections except *Polium* and *Scorodonia* occur in this area. The W Mediterranean region (SE Spain, N Morocco and Algeria) appears to be a recent centre of speciation because of the high number of infraspecific, endemic and polyploid species are found in this area.

#### Acknowledgments

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#### Appendix

List of the complete names of the species and subspecies of the genus *Teucrium* L. in the Mediterranean and its surrounding regions and their phytogeographical distribution. Nomenclature follows King (1988), Navarro (1995), Navarro & El Oualidi (1997) and Ryding (1998). Phytogeographical distribution in mainly floristic regions: M (Mediterranean Region); CM (Central Mediterranean Region); EM (East Mediterranean Region); WE (Western Mediterranean Region); C (Circumboreal Region); IT (Irano-Turanian Region); AS (Saharo-Arabian Region); MA (Macaronesian Region); SS (Saharo-Sindian species). The endemic species (\*) are pointed out: Sp (Spain); Mo (Morocco); Po (Portugal); Fr (France); Al (Algeria); Ly (Libya); Ar (Arabia); Et (Ethiopia); So (Socotra); Ye (Yemen); Tz (Tunisia); Tu (Turkey); Gr (Greece); Cr (Crete); Ir (Iran); ICa (Canary Islands); IMa (Madeira Islands); IBa (Balearic Islands); Cy (Cyprus); Pak (Pakystan); Om (Oman). Arrangement of the section according to Boissier, (1879).

#### Section *Teucrium*

*T. alyssifolium* Stapf EM (Tu)\*

*T. aristatum* Pérez Lara WM (Sp)\*



- T. aroanium* Orph. ex Boiss. **EM**  
*T. brevifolium* Schreb. **EM-WM** (NW Africa)  
*T. campanulatum* L. **WM**  
*T. chardonianum* Maire & Wilczek **WM (Mo)\***  
*T. clementiae* Ryding **AS** (EN Africa-Et)\*(SS)  
*T. creticum* L. **EM**  
*T. eburneum* Thulin **AS** (NE Africa-Et)\* (SS)  
*T. fruticans* L.  
     subsp. *fruticans* **C-WM**  
     subsp. *postratum* Gattef. & Maire **WM (Mo)\***  
*T. jolyi* Mathez & Sauvage **WM (Mo)\***  
*T. malenconiamum* Maire **WM (Mo)\***  
*T. marum* Boiss. **AS (Ir)\***  
*T. multicaule* Montbret & Aucher ex Benth.  
     subsp. *multicaule* **EM**  
     subsp. *planifolium* Post. **EM**  
*T. oliverianum* Ging. **AS (Ar)\***  
*T. orientale* L.  
     subsp. *orientale* **IT**  
     subsp. *glabrescens* Hausskn. ex Bornm **IT**  
     subsp. *puberulens* T. Ekim **EM (Tu)\***  
     subsp. *taylori* Boiss. **AS**  
*T. parviflorum* Schreb. **IT**  
*T. pestalozzae* Boiss. **EM (Tu)\***  
*T. procerum* Boiss. **AS-IT**  
*T. pruinatum* Boiss. **AS-EM**  
*T. pseudo-chamaepitys* L. **WM**  
*T. rigidum* Benth. **EM**  
*T. sandrasicum* O. Schwarz. **EM (Tu)\***

**Section *Teucriopsis*** Benth.

- T. abutiloides* L'Hér. **MA (IMa)\***  
*T. betonicum* L'Hér. **MA (IMa)\***  
*T. heterophyllum* L'Hér. **MA (ICa-IMa)\***

**Section *Stachyobotrys*** (Benth.) Kästner

- T. arduinii* L. **EM**  
*T. bracteatum* Desf. **WM**  
*T. collincola* Greuter & Burdet **WM (Mo)\***  
*T. hyrcanicum* L. **EM (Tu)\***  
*T. lamiifolium* d'Urv.  
     subsp. *lamiifolium* **EM (Tu)\***  
     subsp. *stachyophyllum* (P. H. Davis) Hedge & Ekim **EM-AS**  
*T. santae* Quézel **WM (Al)\***

**Section *Scorodonia*** (Hill) Schreb.

- T. afrum* (Emb. & Maire) Pau & Font Quer  
     subsp. *afrum* **WM**  
     subsp. *riphaeum* (Font Quer & Pau) Castrov. & Bayon **WM (Mo)\***  
     subsp. *rubriflorum* (Font Quer & Pau) Castrov. & Bayon **WM (Mo)\***

- T. asiaticum* L. **WM (IBa)\***  
*T. atratum* Pomel **WM (NW Africa)**  
*T. kotschyianum* Poech (*T. smyrneum*) **EM**  
*T. massiliense* L. **EM-CM (S Europe)**  
*T. oxylepis* Font Quer  
     subsp. *oxylepis* **WM (Sp)\***  
     subsp. *marianum* Ruiz Torre & Ruiz del Cast. **WM (Sp)\***  
*T. pseudo-scorodonia* Desf. **WM-CM (N Africa)**  
*T. royleanum* Benth. **IT**  
*T. salviastrum* Schreb. **WM (Po)\***  
*T. scorodonia* L.  
     subsp. *scorodonia* **WM (S Europe)**  
     subsp. *baeticum* (Boiss. & Reuter) Tutin **WM (Sp)\***  
     subsp. *euganeum* (Vis.) Arcangeli **CM**  
*T. serpylloides* Maire **WM (Mo)\***  
*T. siculum* (Rafin.) Guss. **WM**  
*T. wernerii* Emb. **WM (Mo)\***  
*T. zaianum* Emb. & Maire **WM (Mo)\***

#### Section *Scordium* Kästner

- T. auraniticum* Post. **EM-AS**  
*T. melissoides* Boiss. **IT(Ir)\***  
*T. scordioides* Schreb. **EU-WM (NW Africa)-SA**  
*T. scordium* L. **M-IT-AS (NE Africa-Et) (SS)**

#### Section *Spinularia* (Boiss.) Kästner

- T. botrys* L. **WM**  
*T. decipiens* Coss. & Balansa **WM (NW Africa)**  
*T. maghrebianum* Greuter & Burdet **WM (NW Africa)**  
*T. mauritanicum* De Noe **WM (Al)\***  
*T. resupinatum* Desf. **WM-CM**  
*T. spinosum* L. (*T. mucronatum* L.) **AS-M**

#### Section *Isotriodon* Boiss.

- T. antitauricum* Ekim. **EM (Tu)\***  
*T. cavernarum* P. H. Davis **EM (Tu)\***  
*T. chasmophyticum* Rech. **IT**  
*T. francis-wernerii* Rech. **EM (Tu)\***  
*T. halaesycianum* Heldr. **EM (Tu)\***  
*T. haradjanii* Briq. **EM**  
*T. heliotropifolium* Barbey **EM**  
*T. montbretii* Benth.  
     subsp. *montbretii* **EM-AS**  
     subsp. *judaicum* P. H. Davis **AS**  
     subsp. *libanoticum* P. H. Davis **AS**  
     subsp. *pamphylicum* P. H. Davis **EM (Tu)\***  
*T. odontites* Boiss. **EM (Tu)\***  
*T. paederotoides* Boiss. **EM-AS**  
*T. persicum* Boiss. **IT**  
*T. rupestre* Coss. & Balansa **WM (Mo)\***

*T. tananicum* Maire **WM (Mo)\***

**Section *Chamaedrys*** (Mill.) Schreb.

*T. barbarum* Jahand. & Maire **WM (Mo)\***

*T. barbeyanum* Aschers & Taubert ex Dunard & Barratte **EM (Ly)\***

*T. cavernarum* P. H. Davis **WM(Tu)\***

*T. chamaedrys* L.

subsp. *chamaedrys* **C-EM**

subsp. *albarracini* (Pau) Rech. **WM (Sp)\***

subsp. *germanicum* (F. Herm.) Rech. **WM (Fr)\***

subsp. *gracile* (Batt.) Rech. **WM (Mo)\***

subsp. *lydium* O. Schwarz. **EM**

subsp. *olympicum* Rech. **EM (Gr)\***

subsp. *sinuatum* (Celak.) Rech. **IT (Ir)\***

subsp. *syspirense* (C. Koch) Rech. **EM-IT**

subsp. *tauricum* Rech. **EM (Tu)\***

subsp. *trapezunticum* Rech. **EM (Tu)\***

*T. coniortoides* Boiss. **AS**

*T. divaricatum* Heldr.

subsp. *divaricatum* **EM**

subsp. *athoum* (Hausskn.) Bornm. **EM (Gr)\***

subsp. *canescens* (Celak.) Holmb. **EM (Cy)\***

subsp. *graecum* (Celak.) Bornm. **EM**

subsp. *sieberi* (Celak.) Holmb. **EM (Gr)\***

subsp. *villosum* (Celak.) Bornm. **EM**

*T. flavum* L.

subsp. *flavum* **M**

subsp. *glaucum* (Jordan & Fourr.) **WM**

subsp. *gymnocalyx* Rech. **EM (Gr)\***

subsp. *hellenicum* Rech. **EM (Cr)\***

*T. fragile* Boiss. **WM (Sp)\***

*T. intricatum* Lange **WM (Sp)\***

*T. leucophyllum* Montbret. & Aucher ex Benth. **EM (Tu)\***

*T. lucidum* L. **M**

*T. marum* L. **WM**

*T. microphyllum* Desf. **EM (Cr)\***

*T. schoenbergeri* Nabli. **WM (Tz)\***

*T. socinianum* Boiss. **EM-AS**

*T. subspinosum* Pourr. **WM (IBa)\***

*T. webbiana* Boiss. **WM (Sp)\***

*T. yebrudi* Post. **AS**

**Section *Polium*** (Mill.) Schreb.

**Subsection *Polium***

*T. aguilasense* S. Puech **WM (Sp)\***

*T. algarbiense* (Cout.) Cout. **WM (Po)\***

*T. angustissimum* Schreb. **WM (Sp)\***

*T. antiatlanticum* (Maire) Sauvage & Vindt **WM (Mo)\***

*T. apollinis* Maire & Weiller **EM (Ly)\***

*T. aragonense* Loscos & Pardo **WM (Sp)\***

- T. aureum* Schreb. (*T. luteum* (Mill.) Degen)  
 subsp. *aureum* WM (S Europe)  
 subsp. *flavovirens* (Batt.) S. Puech WM (NW Africa)  
 subsp. *gabesianum* (S. Puech) WM (Tu)\*
- T. balfourii* Vierh. AS (So)\*
- T. bicoloreum* Pau WM (Sp)\*
- T. brachyandrum* S. Puech WM (Fr)\*
- T. capitatum* L.  
 subsp. *capitatum* C-IT  
 subsp. *gracillimum* (Rouy) Valdés Berm. & Sánchez Crespo WM (Sp)\*  
 subsp. *majoricum* (Rouy) T. Navarro & Rosúa WM (IBa)\*
- T. carthaginense* Lange WM (Sp)\*
- T. chlorostachyum* Pau & Font Quer  
 subsp. *chlorostachyum* WM (Mo)\*  
 subsp. *melillense* (Maire) El Oualidi, J. Mathez & T. Navarro WM (Mo)\*
- T. corymbiferum* Desf. WM (NW Africa)
- T. cossonii* D. Wood WM (IBa)\*
- T. cylindraceum* Greuter & Burdet WM (NW Africa)
- T. cyrenaicum* (Maire & Weiller) Brullo & Furnari CM (Tz)\*
- T. davaeanum* Coss. WM (Ly)\*
- T. doumerguei* Sennen WM (Mo)\*
- T. dunense* Sennen WM (Sp)\*
- T. edetanum* M.B. Crespo, Mateo & T. Navarro WM (Sp)\*
- T. embergeri* (Sauvage & Vindt) El Oualidi, T. Navarro & A. Martin WM (Mo)\*
- T. eximium* O. Schwarzl. AS (Ye)\*
- T. expansum* Pau WM (Sp)\*
- T. gnaphalodes* L'Hér. WM (Sp)\*
- T. gypsophilum* Maire WM (Mo)\*
- T. helichrysoides* (Diels) Greuter & Burdet WM (NW Africa)
- T. hieronymi* Sennen WM (Sp)\*
- T. homotrichum* (Font Quer) Rivas Mart. WM (Sp)\*
- T. joannis* (Sauvage & Vindt) El Oualidi, T. Navarro & A. Martin WM (Mo)\*
- T. leonis* Sennen WM (Sp)\*
- T. lerrouxi* Sennen WM (Sp)\*
- T. lini-vaccarii* Pamp. WM (Ly)\*
- T. lusitanicum* Schreb.  
 subsp. *lusitanicum* WM (Sp)\*  
 subsp. *clementiae* T. Navarro, El Oualidi & A. Martin WM (Sp)\*
- T. mascatense* Boiss. AS (Om)\*
- T. mesanidum* (Litard. & Maire) T. Navarro & Rosúa WM (Mo)\*
- T. micropodioides* Rouy WM (Cy)\*
- T. mideltense* (Batt.) Humbert WM (Mo)\*
- T. murcicum* Sennen WM (Sp)\*
- T. nablii* S. Puech CM (Tz)\*
- T. poliooides* Ryding AS (NE Africa-Et)\*
- T. polium* L.  
 subsp. *polium* IT-AS-EU-M (SS)  
 subsp. *clapae* S. Puech WM (Fr)\*
- T. popovi* R. A. King AS (So)\*
- T. radicans* Coss. CM (Tz)\*

- T. reverchonii* Willk. **WM (Sp)\***  
*T. rivanum* (Maire & Sennen) T. Navarro & El Oualidi **WM (Mo)\***  
*T. rouyanum* Coste & Soulié **WM (Fr)\***  
*T. sauvagei* Le Houér. **CM (Tz)\***  
*T. similatum* Pau ex T. Navarro & Rosúa **WM (Sp)\***  
*T. stocksianum* Boiss.  
     subsp. *stocksianum* **AS-IT**  
     subsp. *incanum* (Aitch. & Hemsl.) Rech. **IT**  
     subsp. *patulum* (Hedge & Lamond) Rech. **IT (Pak)\***  
     subsp. *stenophyllum* R. A. King. **AS (Om)\***  
*T. somalense* Ryding **AS (NE Africa-Et)\***  
*T. turdetanum* (Devesa & Valdés Berm.) Peris, Figuerola & Stübing. **WM (Sp)\***  
*T. vincentinum* Rouy **WM**  
*T. zanonii* Pamp. **CM (Ly)\***

**Subsection *Simplicipilosa*** S. Puech

- T. almeriense* C.E. Hubb. & Sandwith **WM (Sp)\***  
*T. charidemi* Sandwith **WM (Sp)\***  
*T. chrysotrichum* Lange **WM (Sp)\***  
*T. descaisnei* C. Presl. (*T. pilosum*) **EM-AS**  
*T. eriocephalum* Willk. **WM (Sp)\***  
*T. haenseleri* Boiss. **WM (SW Europe)**  
*T. lanigerum* Lag. **WM (Sp)\***  
*T. leucocladum* Boiss. **EM-AS**  
*T. reverchonii* Willk. **WM (Sp)\***  
*T. rhodocalyx* Schwarz. **AS (Ye)\***

**Subsection *Rotundifolia*** (Cohen) ex Valdés Berm. & Sánchez-Crespo

- T. albidum* Munb. **WM (Al)\***  
*T. alopecurus* De Noé **CM (Tz)\***  
*T. alpestre* Sibth.  
     subsp. *alpestre* **EM (Cr)\***  
     subsp. *gracile* (Barbey & Fors. Major) D. Wood **WM (Mo)\***  
*T. bullatum* Coss. & Balansa **WM (Mo)\***  
*T. buxifolium* Schreb. **WM (Sp)\***  
*T. cavanillesianum* Font Quer & Jerónimo **WM (Sp)\***  
*T. cincinnatum* Maire **WM (Mo)\***  
*T. compactum* Clemente ex Lag. **WM-CM**  
*T. cyprium* Boiss.  
     subsp. *cyprium* **EM (Cy)\***  
     subsp. *kyreniae* P. H. Davis **EM (Cy)\***  
*T. dealianum* Emb. & Maire **WM (Mo)\***  
*T. ducellieri* Batt. **WM (Mo)\***  
*T. faurei* Maire **WM (Mo)\***  
*T. franchetianum* Rouy & Coincy **WM (Sp)\***  
*T. freynii* Willk. **WM (Sp)\***  
*T. gattefossei* Emb. **WM (Mo)\***  
*T. gossypinum* Rech. **EM (Cr)\***  
*T. grosii* Pau **WM (Mo)\***  
*T. helianthemoides* Adam. **EM (Cr)\***

- T. hifacense* Pau WM (Sp)\*  
*T. hijazicum* Hedge & R. A. King AS (Ar)\*  
*T. huotii* Emb. & Maire WM (Mo)\*  
*T. mascatense* Boiss. AS (Ar)\*  
*T. mitecum* Ibn Tattou & El Oualidi WM (Mo)\*  
*T. montanum* L.  
     subsp. *montanum* M-C  
     subsp. *jailae* (Juz.) Soo C  
     subsp. *pannonicum* (A. Kern) Domin C  
*T. musimonum* Humbert WM (Mo)\*  
*T. nummularifolium* Baker AS  
*T. parnassicum* Celak. C  
*T. pyrenaicum* L.  
     subsp. *pyrenaicum* WM (Sp)\*  
     subsp. *guarensis* P. Monts. WM (Sp)\*  
*T. ramossissimum* Desf. WM (NW Africa)  
*T. rivasii* Rigual ex Greuter & Burdet WM (Sp)\*  
*T. rivas-martinezii* Alcaraz, Garre, Mart. Parras & Peinado WM (Sp)\*  
*T. rixanense* Ruíz Torre & Ruíz del Cast. WM (Sp)\*  
*T. rotundifolium* Schreb.  
     subsp. *rotundifolium* WM (Sp)\*  
     subsp. *sanguisorbifolium* (Pau & Font Quer) Cohen WM (Mo)\*  
     subsp. *transatlanticum* Emb. ex Greuter, Burdet & Long WM (Mo)\*  
*T. sokotranum* Vierh. AS (So)\*  
*T. thymifolium* Schreb. WM (Sp)\*  
*T. yemense* Deflers AS

#### Subsection *Pumilum* Rivas-Mart.

- T. balthazaris* Sennen WM (Sp)\*  
*T. carolipau* Vicioso ex Pau  
     subsp. *carolipau* WM (Sp)\*  
     subsp. *fontqueri* (Sennen) Rivas Mart. WM (Sp)\*  
*T. lepicephalum* Pau WM (Sp)\*  
*T. libanitis* Schreb. WM (Sp)\*  
*T. pumilum* L. WM (Sp)\*  
*T. turredanum* Losa & Rivas-Mart. WM (Sp)\*

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