Lagascalia 19(1-2): 249-262 (1997)

SYNOPSIS OF THE GENUS THYMUS L. IN THE MEDITERRANEAN AREA

RAMÓN MORALES

Abstract

Around 110 species of *Thymus* occur in the Mediterranean area. Five out of eight sections in which Jalas subdivided the genus are restricted to the Western Mediterranean (Iberian Peninsula and NW Africa) and Macaronesia: *Mastichina, Micantes, Piperella, Pseudothymbra* and *Thymus*. Section *Mastichina* comprises two species endemic to the Iberian Peninsula. Section *Micantes* comprises two woody Moroccan species besides the herbaceous looking Iberian and Macaronesian *Th. caespititius*. The monotypic section *Piperella* is exclusive to E Spain. Of the nine species included in the long-flowered section *Pseudothymbra*, seven occur on the Iberian Peninsula and the other two in NW Africa. Section *Thymus* comprises 11 species, three of them *(Th. hyemalis, Th. zygis* and *Th. willdenowii)* distributed both on the Iberian Peninsula and in N Africa, seven are only found on the Iberian Peninsula and one, *Th. vulgaris* in E Spain, S France and N Italy. Of the remaining three sections, section *Teucrioides* includes three montane endemic Greek species. Section *Hyphodromi* comprises 46 species arranged in three subsections: *Thymbropsis* with 14 N African and Asian species, *Subbracteati* with 19 C and E Mediterranean species and *Serpyllastrum* with 13 N Mediterranean species. Section *Serpyllum,* occuring throughout the area of the genus, is apparently the oldest and taxonomically the most difficult, with more than 30 species in the Mediterranean area belonging to six different subsections.

Thymus is one of the eight most important genera as regards number of species within the Labiate family. This family comprises more o less 220 genera. *Thymus* belongs to the tribe *Mentheae,* subfamily *Nepetoideae*. Although the number of species within this genus varies depending on the taxonomical viewpoint, if we adopt a synthetic criterion, it comprises more than 200 species. It is only exceeded in number of species by *Salvia, Hyptis, Scutellaria, Stachys, Teucrium, Nepeta* or *Plectranthus*.

Thymus is distributed in the Old World and on the coasts of Greenland, from the Macaronesian Region (Canary Islands, Madeira and Azores), Northwest Africa North of the Sahara Desert (Morocco, Algeria, Tunis and Libya), the mountains of Ethiopia and the southwest Arabian Mountains, the Sinai Peninsula, through the arid regions of West Asia up to the Himalayas, and reaching the limits of the tropical region up to East Asia and Japan. In the North it occurs in Siberia and Northern Europe all the way to the coasts of Greenland (Fig. 1).

Introduced populations, now growing wild are known to exist in regions as distant as Canada *(Th. serpyllum* and *Th. pulegioides),* Chile *(Th. vulgaris)* or New Zealand *(Th. pulegioides* and *Th. vulgaris).*

But the central area of this genus sourrounds the Mediterranean Sea. According to JALAS (1971), *Thymus* is divided into eight sections: *Micantes, Mastichina, Piperella, Teucrioides, Pseudothymbra, Thymus, Hyphodromi* and *Serpyllum* (Table 1). Only species of two sections occur outside this area (Fig. 1). The West Mediterranean Region seems to be the centre of origin of the genus. Species of seven sections inhabit the

Iberian Peninsula and Northwest Africa and five of them are endemic. I would like to give you a general overview of this interesting genus and indicate its most important taxonomic problems. I will comment on the different sections and species.

Section *Micantes* comprises three species: one Ibero-Macaronesian and two North African. The two North African occur in Morocco: *Th. saturejoides* and *Th. riatarum*. Both are woody species. The first one inhabits the High Atlas region. *Th. riatarum* is a prostrate plant and lives in the Rif mountains. The Ibero-Macaronesian species *Th. caespititius* Brot. (1804) is the valid name for *Th. micans* Solander ex Love (1831),

I. Sect. MICANTES

II. Sect. MASTICHINA

III. Sect. PIPERELLA

IV. Sect. TEUCRIOIDES

V. Sect. PSEUDOTHYMBRA
- a) Subsect. PSEUDOTHYMBRA
- b) Subsect. ANOMALAE

VI. Sect. THYMUS
- a) Subsect. THYMASTRA
- b) Subsect. THYMUS

VII. Sect. HYPHODROMI
- a) Subsect. SUBBRACTEATI
- b) Subsect. SERPYLLASTRUM
- c) Subsect. THYMBROPSIS

VIII. Sect. SERPYLLUM
- a) Subsect. INSULARES
- b) Subsect. KOTSCHYANI
- c) Subsect. PSEUDOPIPERELLAE
- d) Subsect. ISOLEPIDES
- e) Subsect. ALTERNANTES
- f) Subsect. PSEUDOMARGINATI
- g) Subsect. SERPYLLUM

Table 1. Sections and subsections of the genus *Thymus*.

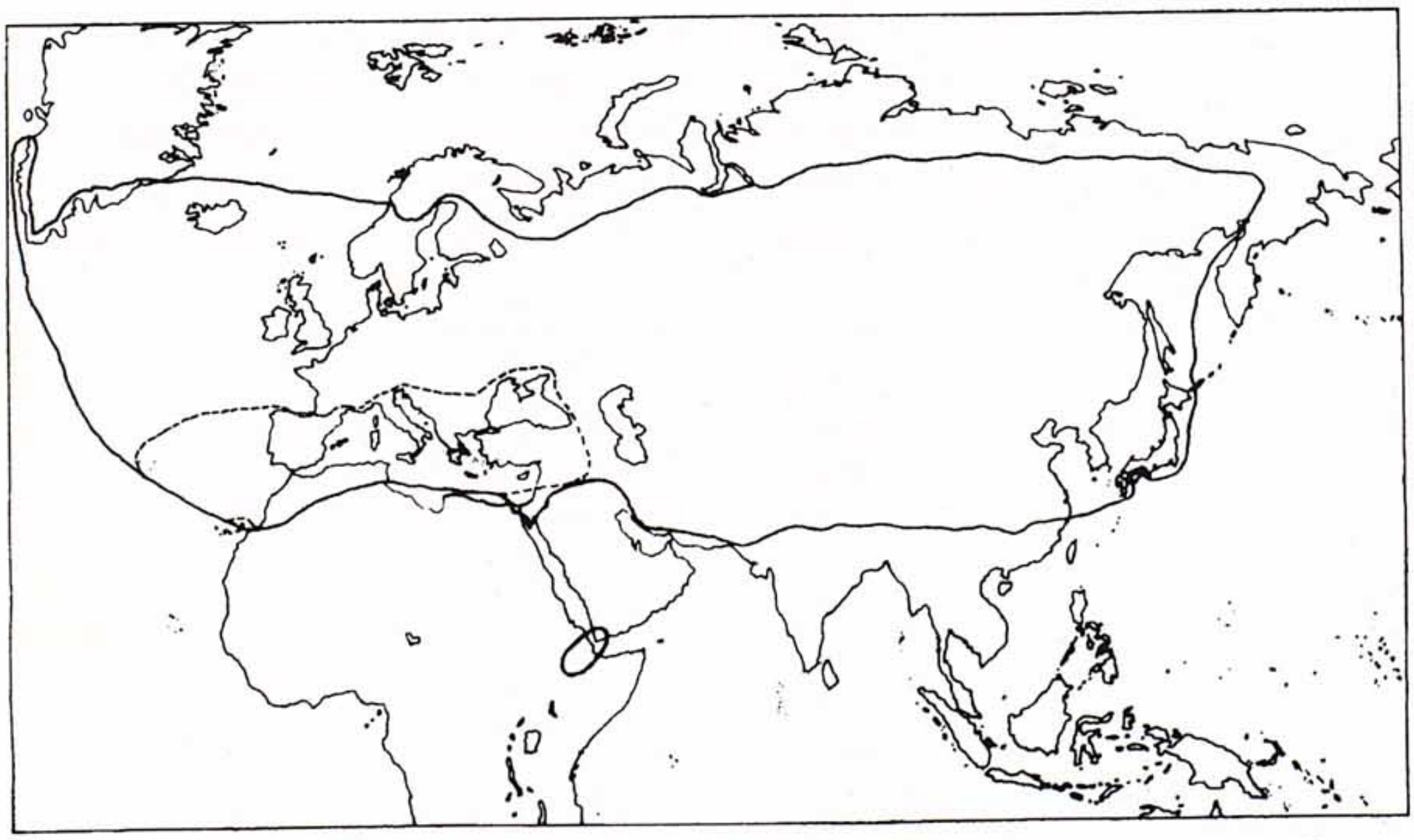

Fig. 1. Distribution of *Thymus*. Dotted line represents all sections except *Th.* sect. *Serpyllum* and *Th.* sect. *Hyphodromi* subsect. *Serpyllastrum*

but this last one gives the section its name. It occurs in the West of the Iberian Peninsula and also in the Madeira and Azores archipelagos (Fig. 2). The known chromosome numbers in this section are 2n=30 for both *Th. caespititius* and *Th. saturejoides*. If we take into account their plesiomorphic features, like flat, not revolute and glabrous leaves, and their geographical distribution, this section seems to be very old.

Section *Mastichina* is endemic to the Iberian Peninsula (Fig. 3). It comprises three taxa: *Th. mastichina,* with two subspecies and *Th. albicans*. *Th. mastichina* subsp. *mastichina* is a very common plant in Spain and Portugal. Its popular name is "mejorana silvestre" or wild marjoram. It is a tetraploid (2n=58, 60). The subspecies *donyanae* occurs only in the southwest of the Iberian Peninsula around the "Coto de Doñana" and in some locations in the "Algarve". Its chromosome number is 2n=30. The other species, *Th. albicans* (2n=30) is also living in the Southwest in the pinewoods of *Pinus pinea*. These taxa *(Th. mastichina* subsp. *donyanae* and *Th. albicans*, 2n=30) are a good example for patroendemism (FAVARGER & CONTANDRIOPOULOS, 1961), that probably is the origin of the tetrapoid apoendemic *Th. mastichina* subsp. *mastichina*. This new plant has spread throughout the entire Iberian Peninsula.

Section *Piperella* is monotypic with the paleoendemic species *Th. piperella* (2n=28), that occurs in Valencia province and surrounding areas (Fig. 3).

Section *Teucrioides* is endemic to the Balkan Peninsula. It inhabits the mountains of Greece and Albania (Fig. 3). Three species can be recognised within this section: *Th. teucrioides, Th. rechingeri* and *Th. leucospermus*, that have been studied by HARTVIG (1987) (*). Chromosome numbers of these species are not known yet.

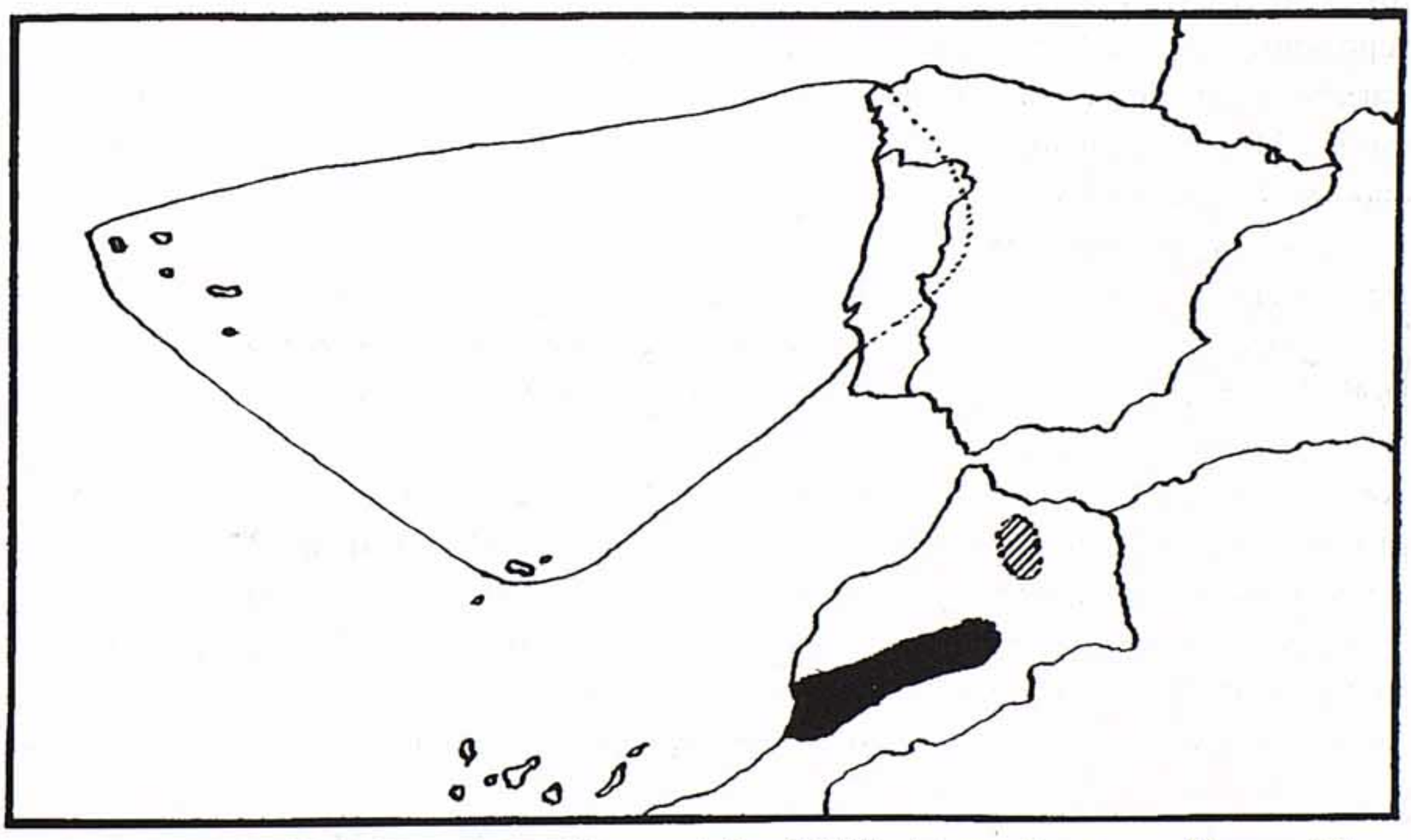

Fig. 2. Distribution of Sect. *Micantes*. ■ *Th. saturejoides;* ▨ *Th. riatarum;* large area - *Th. caespititius*

(*) It is necessary to give a new name to *Th. rechingeri* Hartvig (1987) non Ronniger in *Oesterr. Bot. Z.* 85: 60 (1936). I propose for this **Thymus hartvigi** Morales, **nom. nov.** = *Th. rechingeri* Hartvig in *Pl. Syst. Evol.* 155(1-4): 205 (1987) non Ronniger; and also the new nomenclatural combination **Thymus hartvigi** subsp. **macrocalyx** (Hartvig) Morales, **comb. nov.** = *Th. rechingeri* subsp. *macrocalyx* Hartvig in *Pl. Syst. Evol.* 155(1-4): 206 (1987).

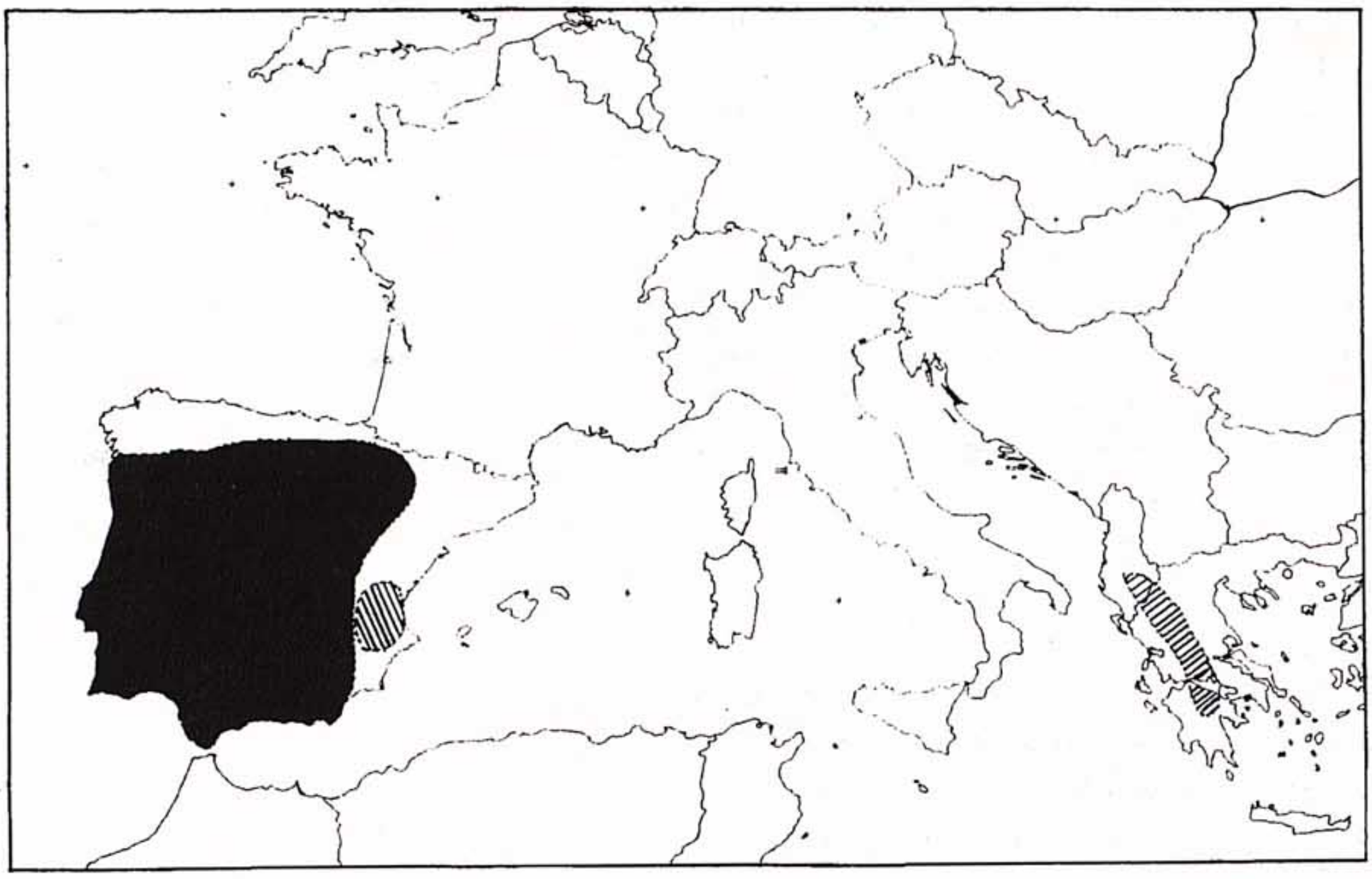

Fig. 3. Distribution of ■ Sect. *Mastichina;* ▨ Sect. *Piperella*; ▨ Sect. *Teucrioides*

Section *Pseudothymbra* is an interesting group of nine Ibero-North-African species (Fig. 4), which have very characteristic features: long corollas up to 2 cm, bracts rather different from the leaves and more o less subglobose inflorescences. This section is represented in North Africa by two species: Th. bleicherianus the common and very variable *Th. munbyanus*, that inhabits a large area extending from the Middle Atlas and the Rif Mountains as far as the Algerian Mountains. There are some problems with this species. Usually it is possible to recognise two subspecies in it. However in some cases it is very difficult. Probably hybridization takes place and there exist intermediate forms between this species and *Th. algeriensis* from section *Hyphodromi* subsection *Subbracteati* and *Th. willdenowii* from section *Thymus*. *Th. bleicherianus* is only know from three locations, one in Algeria and two more in the North of Morocco. The other species of this section are all Iberian. *Th. lotocephalus* (2n=30) is endemic of the Algarve. *Th. villosus* occurs in Southwest Spain (Cáceres, Toledo and Ciudad Real provinces) and Portugal. Four species are found in Southeast Spain: *Th. longiflorus, Th. membranaceus, Th. moroderi* and *Th. funkii*. Their chromosome numbers are 2n=28. *Th. antoninae* (2n=56), an apoendemic in the sense of FAVARGER & CONTANDRIOPOULOS (1961), is an anomalous thyme in this section (subsection *Anomalae),* without bracts and with lax inflorescences, but it has a very long calyx and corolla.

Section *Thymus* is only represented by species in the Western Mediterranean Region (Fig. 5). The most important species are *Th. vulgaris, Th. zygis* and *Th. willdenowii*. The first one is distributed in Northern Italy, South of France and the Eastern half of Spain. It usually occurs on basic soils. Its chromosome numbers are 2n=28, 30; or 2n=58 for the subspecies *aestivus*, that inhabits the Valencian Region and Ibiza, and flowers later than the subspecies *vulgaris*. *Th. zygis* is a very common species in the Iberian

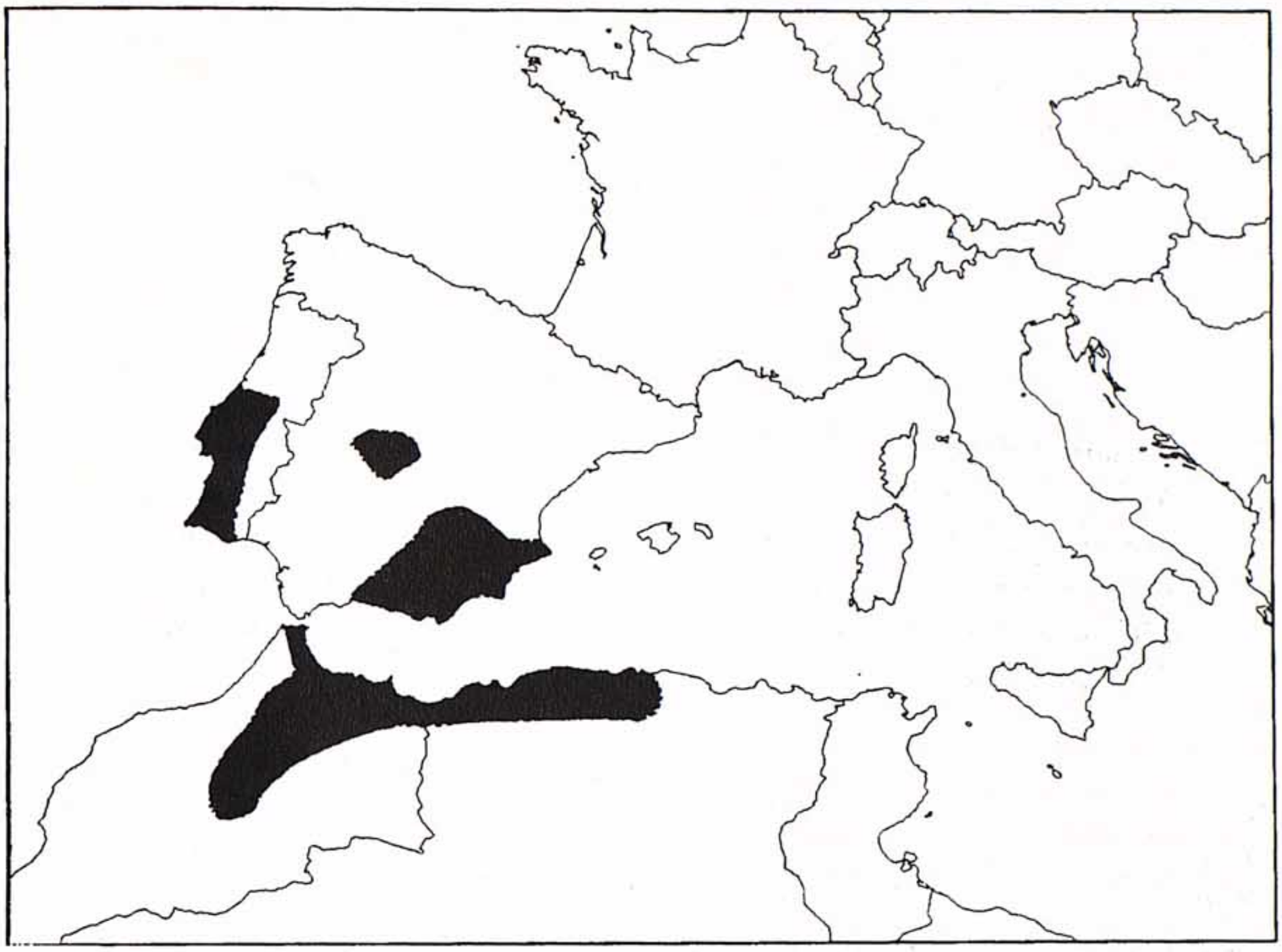

Fig. 4. Distribution of Sect. *Pseudothymbra*

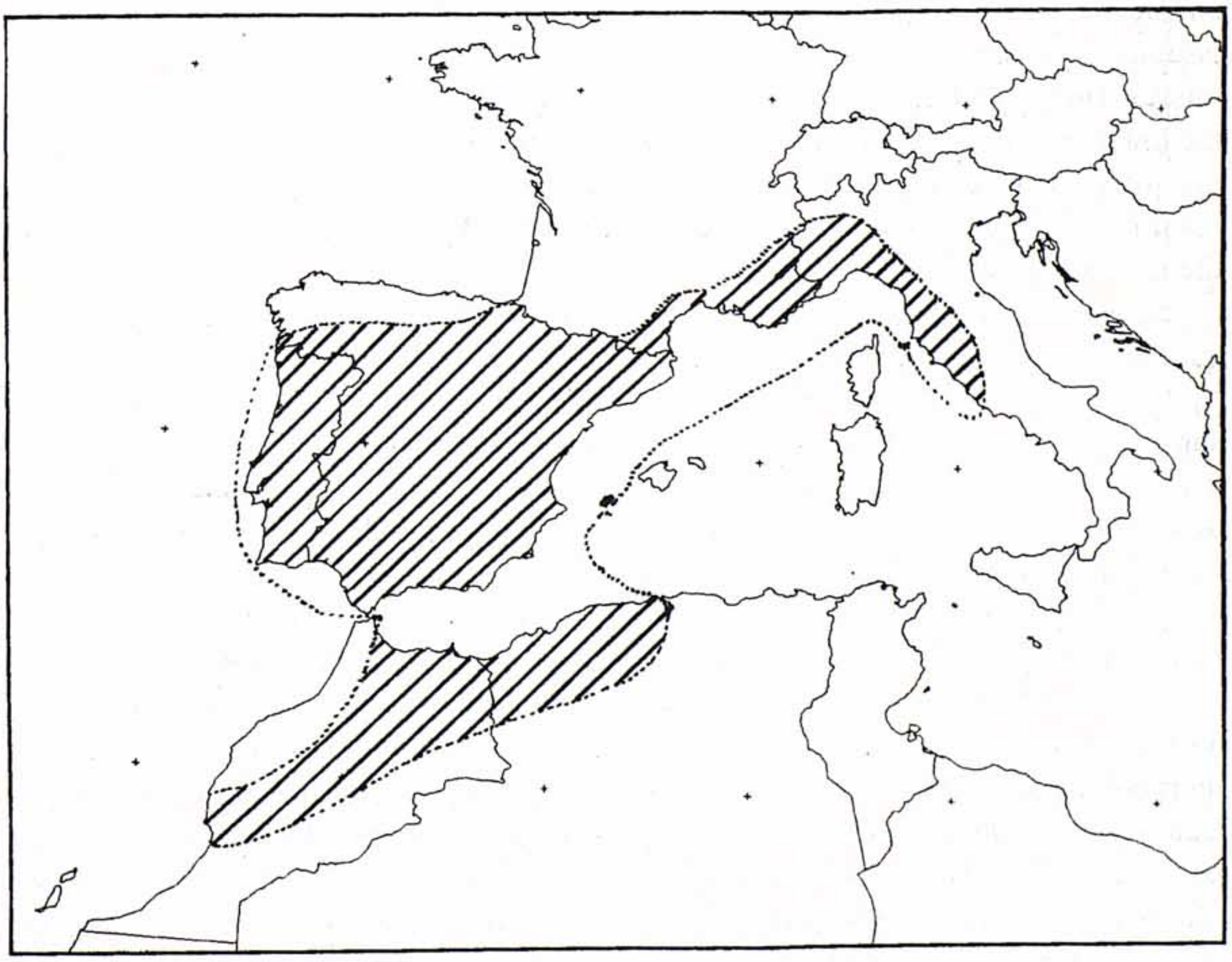

Fig. 5. Distribution of Sect. *Thymus*

Peninsula, with three subspecies: subsp. *gracilis* (2n=28), that occurs in Southeast Spain and also in Morocco; subsp. *zygis* (2n=28) from the North half of the Iberian Peninsula; and subsp. *sylvestris* (2n=56), a tetraploid, that occurs in the Southwest quarter. *Th. willdenowii* (2n=30) is common in North Africa (Morocco and Algeria) and also grows only in Gibraltar in Spain. This species probably produces hybrids with *Th. munbyanus* and *Th. algeriensis*. The other species of this section are: *Th. capitellatus* and *Th. camphoratus* of Portugal, both with a 2n=30 chromosome number, *Th. carnosus* (2n=56), that only grows on coastal sand-dunes in the Southwest, *Th. orospedanus* (2n=28) which is probably of hybridogenous origin, *Th. baeticus* (2n=58), that occurs in the South of Spain, *Th. loscosii* (2n=54), an endemic of the Ebro basin, and *Th. serpylloides*, that grows in the Penibetic and Betic mountains. Only *Th. hyemalis* occurs in the coastal regions of the Southeast of Spain and also in Northern Morocco.

Section *Hyphodromi* extends throughout the Mediterranean area and comprises around 60 species. Three subsection can be distinguished in this section: *Subbracteati, Serpyllastrum* and *Thymbropsis*.

Subsection *Subbracteati* is characterized by more o less revolute leaves and seems to be Oriental (Fig. 6). Only one species occurs in North Africa, from Morocco to Libya: *Th. algeriensis* (2n=30, 56), and another species occurs in Central Spain: *Th. mastigophorus* (2n=28). *Th. spinulosus* (2n=56) occurs in Sicily and Italy, and *Th. striatus* (2n=26, 28, 42, 54, 56, 84) in the Italian and Balkan Peninsulas. Both species vary in shape. The leaves of the second species vary from linear to lanceolate. *Th. argaeus, Th. brachychillus, Th. cappadocicus, Th. cherlerioides, Th. convolutus, Th. pulvinatus* and *Th. revolutus* occur only in Turkey; *Th. boissieri, Th. dolopicus* and *Th. plasonii* only in the Balkan Peninsula; *Th. atticus, Th. parnassicus* and *Th. leucotrichus* inhabit Turkey and the Balkan Peninsula. The last species also grows in Syria and in the Lebanon. *Th. integer* is only found on the island of Cyprus. This species is probably not different from *Th. leucotrichus*. *Th. samius* occurs in the Aegean islands. *Th. borsthenicus* and *Th. pallasianus* occur North of the Black Sea, *Th. persicus* South of the Caucasus, but only one location for this species is known.

Subsection *Serpyllastrum* is a group of species characterized by prostrate stems and flat leaves, the latter being more o less wide (Fig. 7). It is well-represented in Spain by five species: *Th. bracteatus* (2n=56, 58), *Th. leptophyllus* (2n=28, 56), with three subspecies, one of them (subsp. *izcoi)* is in some cases near to *Th. praecox* forms and very difficult to distinguish from it. The remaining three are *Th. fontqueri* (2n=56), *Th. granatensis* (2n=28) and *Th. lacaitae* (2n=28). It is also well represented in the East, but no species occur in Italy and North Africa. *Th. aznavourii, Th. bracteosus* and *Th. comptus* (2n=26, 28, 52) occur in the Balkan Peninsula; *Th. canoviridis, Th. haussknechtii, Th. pectinatus* and *Th. sphatulifolius* are found in Turkey. *Th. zygioides* (2n=56, 60, 62, 90) extends from the Balkan Peninsula as far as the Crimean Peninsula and also in Turkey. This species and the Spanish endemic *Th. lacaitae* are morphologically very similar. There is also a group of species that occur only in the Caucasus: *Th. dagestanicus* (2n=28), *Th. hadzhievii* (2n=28), *Th. helendzhicus, Th. karjagnii, Th. ladjanuricus, Th. lipskyi, Th. madjopiensis* (2n=28) and *Th. sosnowskyi* (2n=60). Seven species more from Central Asia are considered as part of this subsection although there is some doubt.

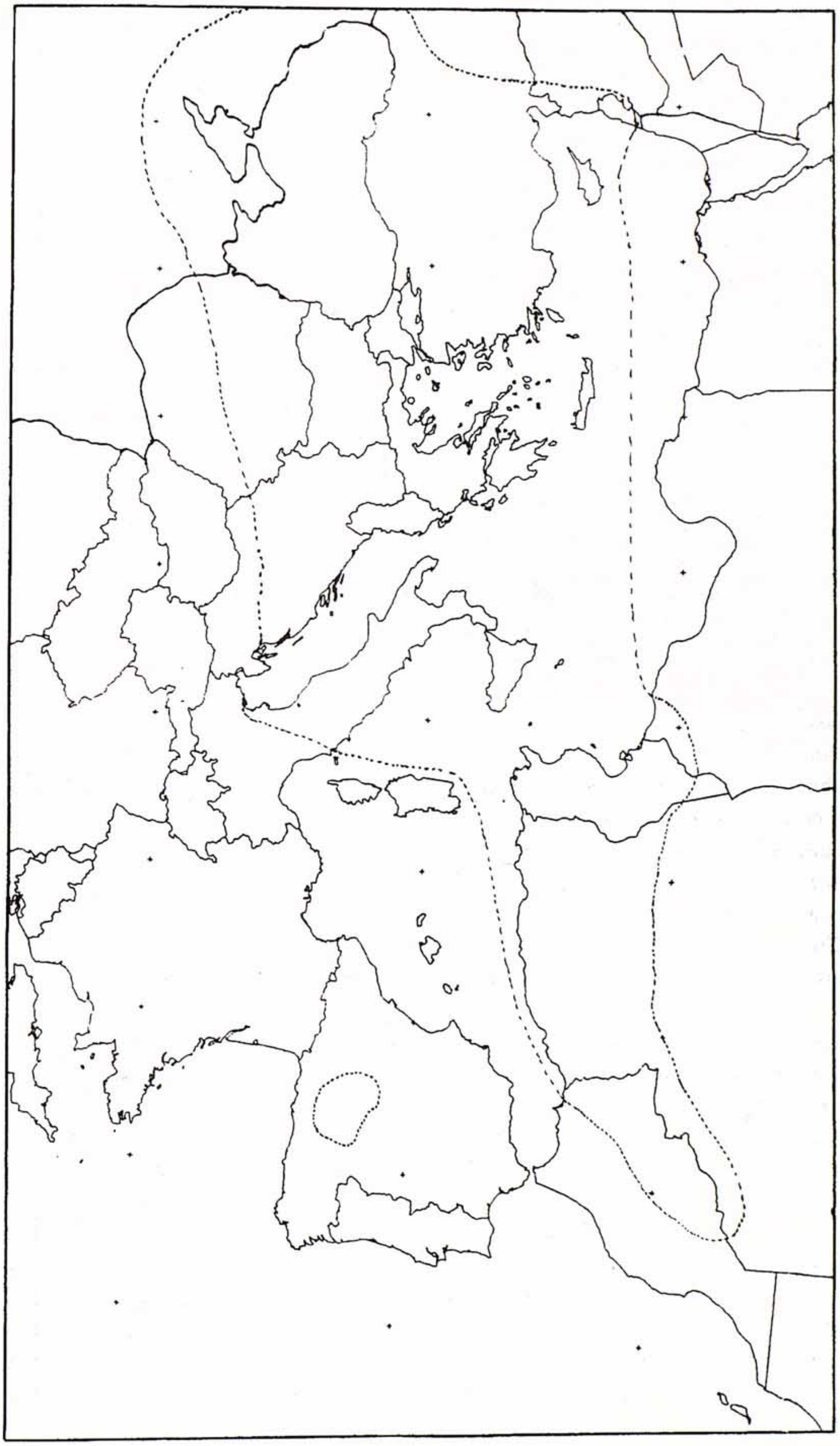

Fig. 6. Distribution of Sect. *Hyphodromi* subsect. *Subbracteati*

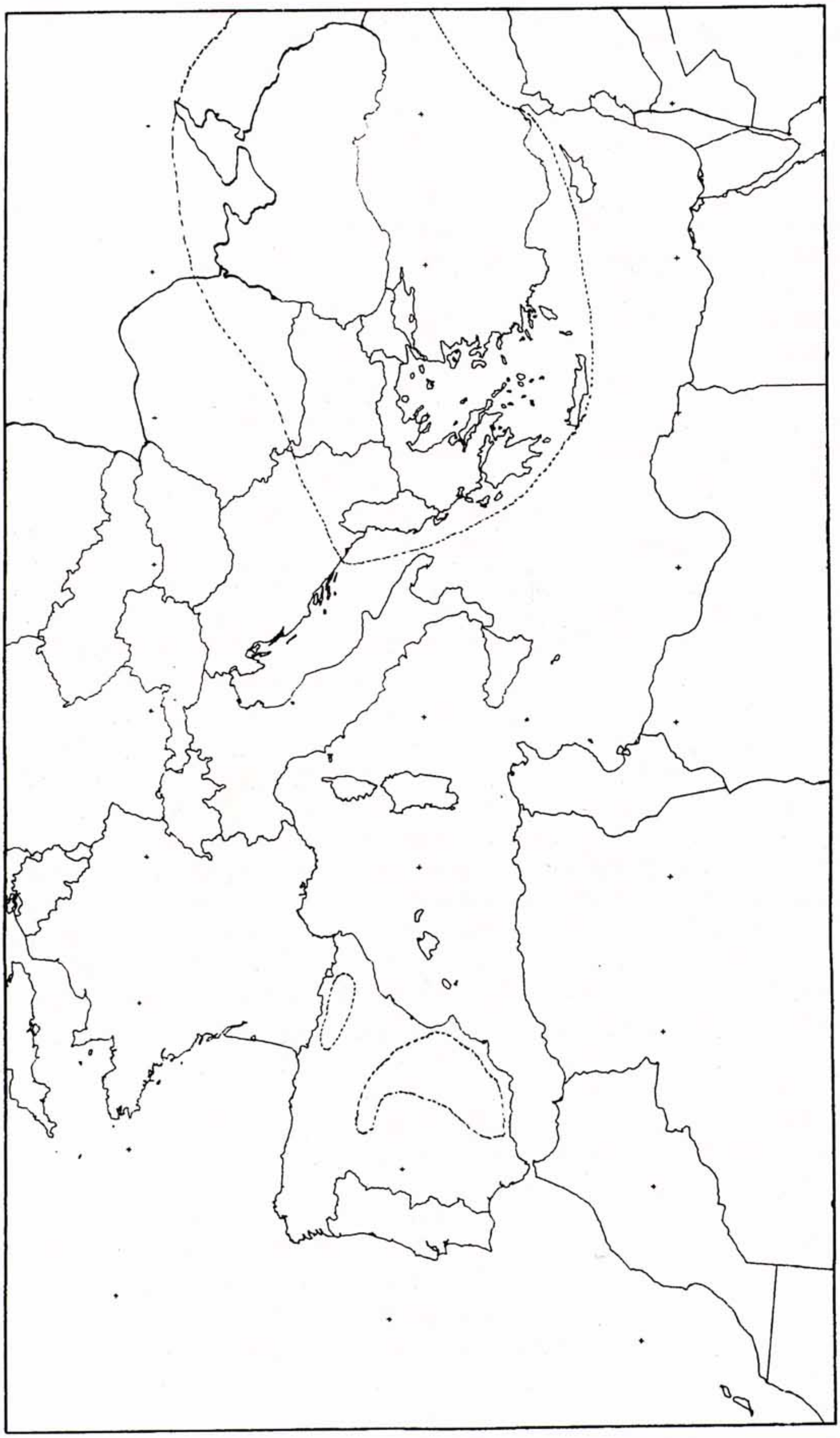

Fig. 7. Distribution of Sect. *Hyphodromi* subsect. *Serpyllastrum*

Subsection *Thymbropsis* includes the North African *Th. broussonetii, Th. maroccanus, Th. lanceolatus, Th. numidicus, Th. pallescens,* and the two endemic species from Greece *Th. laconicus* and *Th. holosericeus* (2n=28). Five more species from this section are found in Turkey: *Th. cariensis, Th. cilicicus, Th. eigii, Th. leucostomus* and *Th. sipyleus. Th. syriacus* (incl. *Th. neurophyllus)* ocurrs in the Lebanon, Syria and a location in Northern Irak; *Th. bovei* lives in the Sinai Peninsula, Israel, Jordan, Irak and Saudi Arabia; and *Th. decussatus* in Sinai and Saudi Arabia. This subsection appears to be a group of species predominantly North African and West Asian (Fig. 8).

Section *Serpyllum* appears to be the oldest in the genus. Around 124 species belong to this section. They occur throughout the area of the genus, except in Madeira and the Azores. It is in this section that we find the biggest chromosomal variation. There are also woody species that grow in the mountains in arid areas e.g. *Th. origanoides* in Lanzarote (Canary Islands), *Th. serrulatus* and *Th. schimperi* in Ethiopia, *Th. laevigatus* in the southwest of the Arabian Peninsula. Another group of species are more or less herbaceous and occur in the Mediterranean mountains and the rest of Eurasia as far as Japan and also along the coasts of Greenland. The species of the last group seem to be younger in evolutionary terms and have probably been actively evolving since the last glaciation when this group colonized the new lands free of ice. This group is also very difficult taxonomically and corresponds to the three last subsections. Few species of these subsections are present in the Mediterranean area. JALAS (1971) divided this section into 7 subsections.

Subsection *Insulares* (Fig. 9) comprises *Th. willkommii* (2n=56), an endemic species that occurs in the mountains of the provinces of Castellón and Tarragona (Eastern Spain), *Th. richardii,* with three subspecies: subsp. *richardii* (2n=28, 30) from Mallorca and Yugoslavia, subsp. *ebusitanus* (2n=30) from Ibiza and subsp. *nitidus* (2n=28) from Marettimo island near Sicily. The North African *Th. dreatensis* and *Th. guyonii,* the Canary Island *Th. origanoides* (2n=28) and the endemic species of northwest Turkey *Th. bornmuellerii.*

Subsection *Pseudopiperellae* (Fig. 10) comprises *Th. herba-barona* from Mallorca (2*n*=28), Corsica (2*n*=56) and Sardinia (2*n*=84) (MAYOL & al., 1990) and *Th. nitens* (2n=28) from the South of France.

Subsection *Kotschyani* includes a lot of Asian species, but only *Th. fallax* and *Th. transcaucasicus* occur in Turkey. Other interesting species occuring outside the Mediterranean area are *Th. laevigatus* from the mountains of Yemen or *Th. schimperi* (2n=c.30) and *Th. serrulatus* from the Ethiopian Mountains.

Five species found in the Balkan Peninsula belong to the subsection *Isolepides*: *Th. bulgaricus, Th. glabrescens* (2n=28, 32, 52, 56, 58), *Th. longedentatus* (2n=30, 90), *Th. pannonicus* (2n=28, 35) and *Th. sibthorpii* (2n=28).

The following subsections are not well-represented in the Mediterranean area; only they have a few species that usually live in the mountains in this area.

Subsection *Alternantes* includes the species *Th. pulegioides* (2n=28, 30) and *Th. froelichianus* (2n=56) from the European countries of the Mediterranean basin, *Th. alpestris* (2n=28) from France and Spain, *Th. oehmianus* from Yugoslavia; and *Th. bihoriensis* and *Th. comosus* (2n=28, 58) from Rumania.

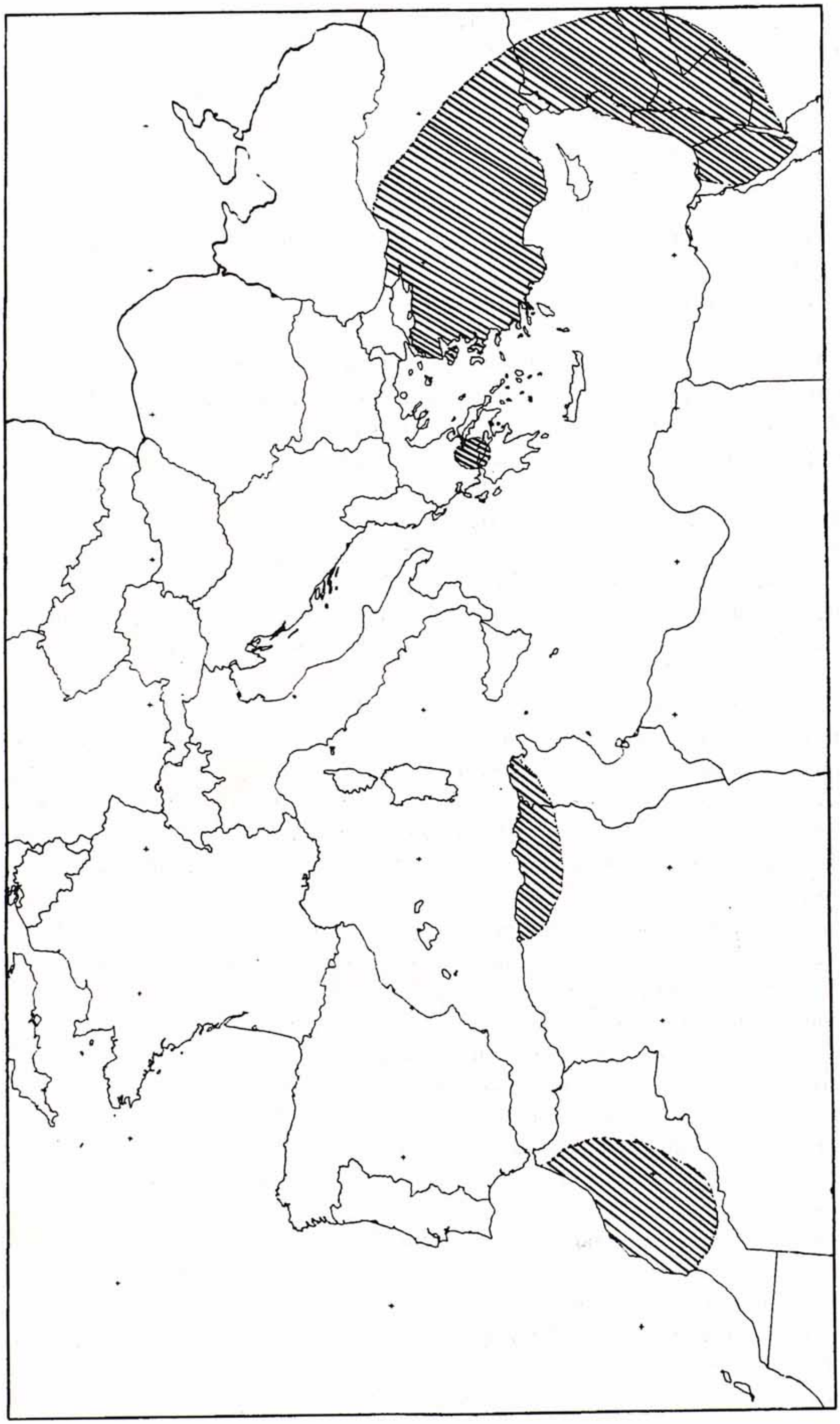

Fig. 8. Distribution of Sect. *Hyphodromi* subsect. *Thymbropsis*

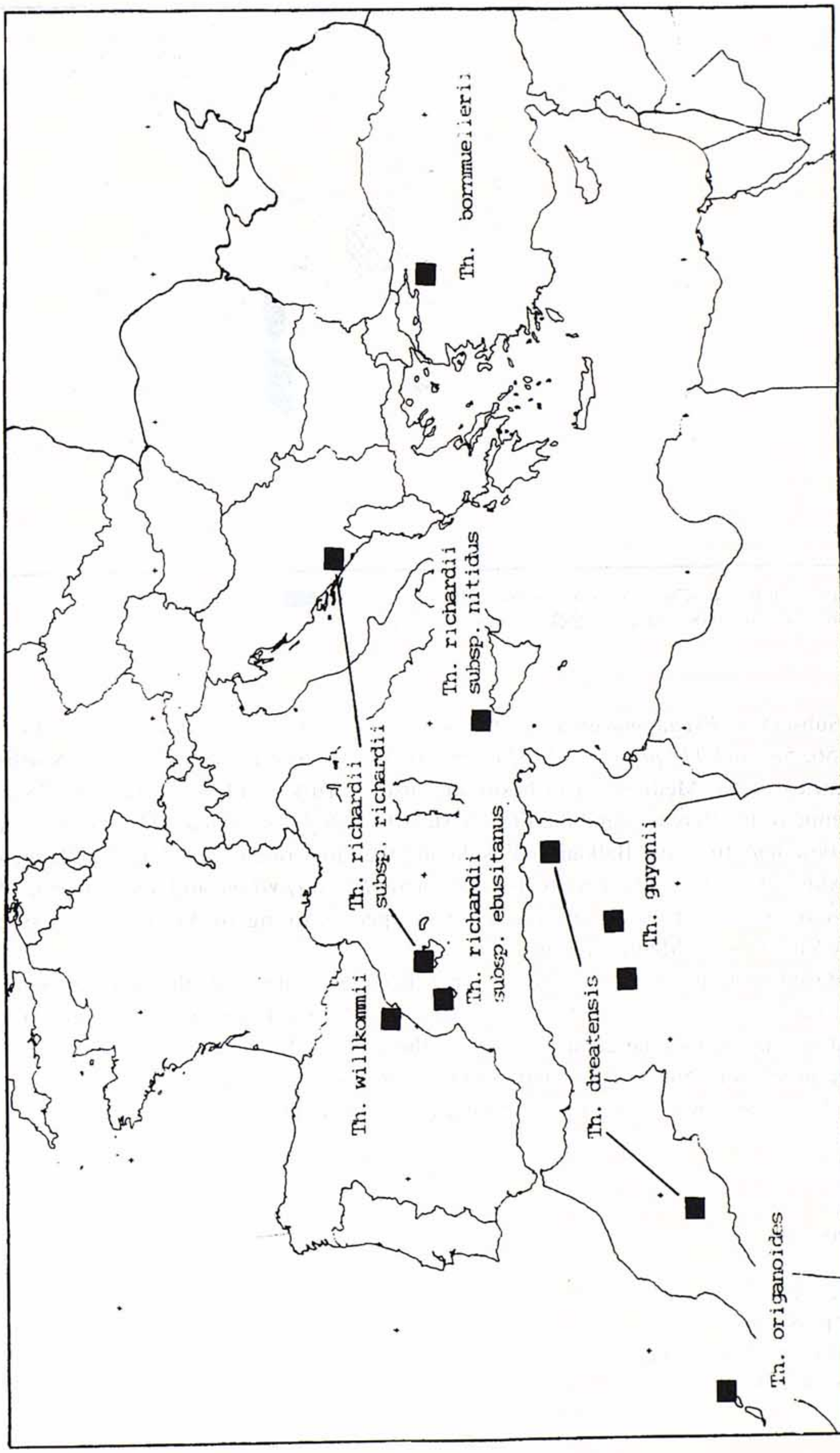

Fig. 9. Distribution of Sect. *Serpyllum* subsect. *Insulares: Th. bormmuellerii, Th. dreatensis, Th. guyonii, Th. origanoides, Th. richardii, Th. willkommii*

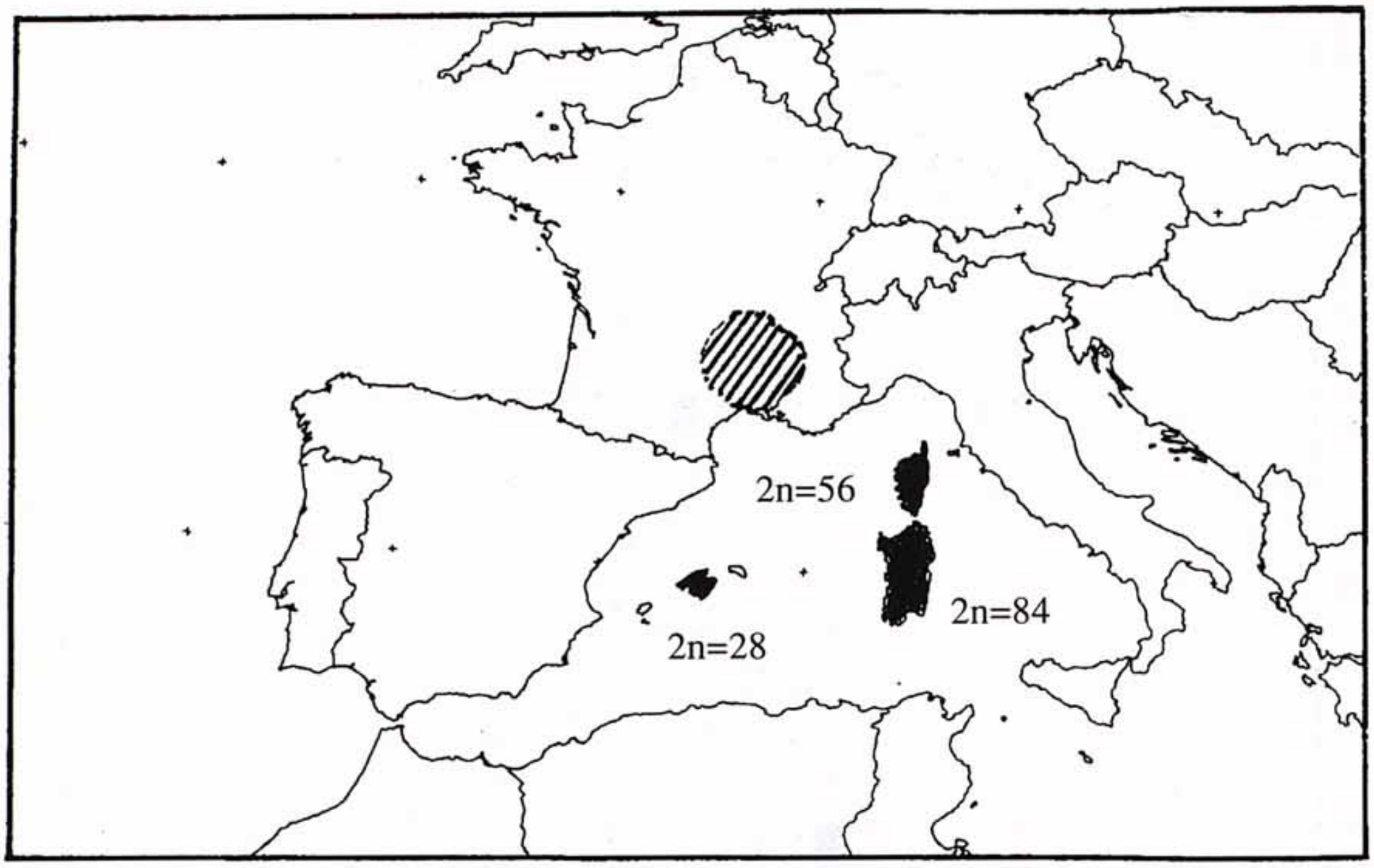

Fig. 10. Distribution of Sect. *Serpyllum* subsect. *Pseudopiperellae*: ■ *Th. herba-barona* 2n=28 (Mallorca), 2n=56 (Corsica), 2n=84 (Sardinia); ▨ *Th. nitens* (2n=28)

Subsection *Pseudomarginati* includes the species *Th. longicaulis* (2n=26, 28, 30, 50, 56, 58) and *Th. praecox* (2n=24, 28, 50, 54, 56, 58), present in all the Northern countries of the Mediterranean basin and also in Turkey, *Th. nervosus* (2n=28), an endemic of the Pyrenees and the French Massif Central, *Th. ocheus, Th. stojanovii* and *Th. thracicus* from the Balkan Peninsula and the latter one is also found in Turkey.

Subsection *Serpyllum* with the European *Th. serpyllum* and *Th. talijevii*, *Th. quinquecostatus* from Japan, and a lot of species living in Asian Russia, is not represented in the Mediterranean area.

Based on all the previous work by Opiz, Ronniger, Jalas and other authors, an their very valuable knowledge of the genus, and on my own, I have gained a more o less good overall view of the genus. Almost all the published names are known and listed. A big problem for me, and probably for other botanists, is the study of the russian sheets and their labels. But I hope to understand this interesting genus in its entirety before I retire.

References

FAVARGER, C. & J. CONTANDRIOPOULOS (1961) Essai sur l'endémisme. *Ber. Schweiz. Bot. Ges.* **71**: 384-408.

HARTVIG, P. (1987). A taxonomical revision of Thymus sect. Teucrioides (Lamiaceae). *Pl. Syst. Evol.* **155**: 197-213.

JALAS, J. (1971). Notes on Thymus L. (Labiatae) in Europe. I. Supraspecific classification and nomenclature. *Bot. J. Linn. Soc.* **64**: 199-215.

MAYOL, M., J. A. ROSSELLO, M. MUS & R. MORALES (1990). *Thymus herba-barona* Loisel., novedad para España, en Mallorca. *Anales Jard. Bot. Madrid* **47**: 516.

Address of the author:

Dr. R. Morales, Real Jardín Botánico, C.S.I.C., Plaza de Murillo 2, 28014 Madrid, Spain.