

THE GENUS *SCOLYMUS* TOURN. EX L. (ASTERACEAE): TAXONOMY AND DISTRIBUTION

by

FRANCISCO M. VÁZQUEZ

Departamento de Producción Forestal y Pastos, Servicio de Investigación y Desarrollo Tecnológico.
Apartado 22. Guadajira. E-06080 Badajoz (Spain)

Resumen

VÁZQUEZ, F.M. (2000). El género *Scolymus* Tourn. ex L. (Asteraceae): taxonomía y distribución. *Anales Jard. Bot. Madrid* 58(1): 83-100 (en inglés).

Se presenta una revisión taxonómica del género *Scolymus* Tourn. ex L., en la que se reconocen siete táxones, dos de ellos nuevos para la ciencia: *Scolymus hispanicus* subsp. *occidentalis* F.M. Vázquez, *subsp. nov.*, y *S. hispanicus* [subsp. *hispanicus*] f. *decoloratus* Fiori ex F.M. Vázquez, *f. nov.*; se propone una combinación a nivel de variedad: *S. hispanicus* [subsp. *hispanicus*] var. *aggregatus* (Ruch.) F.M. Vázquez, *comb. & stat. nov.* Se han revisado todos los sinónimos nomenclaturales y taxonómicos, y se incluye en el Apéndice I un listado de parte del material estudiado. Finalmente, se ilustra mediante figuras una parte de los táxones recogidos en el trabajo.

Palabras clave: *Scolymus*, taxonomía, distribución, tipificación, *Asteraceae*, región mediterránea.

Abstract

VÁZQUEZ, F.M. (2000) The genus *Scolymus* Tourn. ex L. (Asteraceae): taxonomy and distribution. *Anales Jard. Bot. Madrid* 58(1): 83-100.

A taxonomic study of the genus *Scolymus* Tourn. ex L. is presented. Seven taxa are recognised, two of them new to science: *Scolymus hispanicus* subsp. *occidentalis* F.M. Vázquez, *subsp. nov.*, and *S. hispanicus* [subsp. *hispanicus*] f. *decoloratus* Fiori ex F.M. Vázquez, *f. nov.*; a new combination, *S. hispanicus* [subsp. *hispanicus*] var. *aggregatus* (Ruch.) F.M. Vázquez, *comb. & stat. nov.*, is proposed. The type and full synonymy for each taxon are given. A selection of the specimens studied is presented in Appendix I. Some of the taxa are illustrated in figures.

Key words: *Scolymus*, taxonomy, distribution, typification, *Asteraceae*, Mediterranean Region.

INTRODUCTION

Scolymus Tourn. ex L., Sp. Pl. 2: 813 (1753) [*Gen. Pl.*, ed. 5: 355 (1754)] is included in the tribe *Lactuceae* Less., and it is integrated by three species and several infraspecific taxa. Their distribution is by the Mediterranean, Macaronesian and Near Orient areas.

The species of *Scolymus* L. differ from the rest of the taxa in the *Asteraceae* by the presence of ligulate flowers and by having dorsally compressed achenes which are surrounded by the paleae. Some have a pappus with two to five stiff scabrous bristles.

The objective of this paper is to revise the taxonomy of the genus *Scolymus* Tourn. ex L., study the infraspecific variations, verify the

distribution of each taxon and check the available names (choosing a lectotype when necessary).

BRIEF HISTORICAL REVIEW

One of the first references to the genus appear in the work of L'ECLUSE (1576) with the description of only one species: *Scolymus* ["Scolimus"] *Theophrasti* [= *S. hispanicus* L.]. In a later work, L'ECLUSE (1601) includes three species in *Scolymus*: a) *Scolymus Theophrasti Hispan.* [= *S. hispanicus* L. subsp. *hispanicus*]; b) *Scolymus Theophrasti Narbonensis* [= *S. maculatus* L.], and c) *Scolymus Dioscor. Castos Theophrasti* [= *S. grandiflorus* Desf.].

Later authors frequently used the term "*Scolymus*". BAUHIN (1623) [*Scolymus Theophrasti*] can be remembered in this way, together with DODART (1676) [*Scolymus Chrysanthemus*], TOURNEFORT (1700) [*Scolymus*], LINNÉ (1737, 1748) [*Scolymus*] and SAUVAGE (1751) [*Scolymus*].

Some other authors used for description of *Scolymus* species names like *Carduus Chrysanthemus* –DODOENS (1583) and CUPANI (1713)–, *Spina lutea* –BAUHIN & CHERLER (1650-51)– or *Cichorium luteum* –MORISON (1699).

LINNÉ (1753) described in the *Species Plantarum* two species: *Scolymus hispanicus* and *S. maculatus*, gave two of his own references for the genus –*Hortus Cliffortianus*, LINNÉ (1737), and *Hortus Upsaliensis*, LINNÉ (1748)–, and also references to previous descriptions by DODOENS (1583) and L'ECLUSE (1601) for *S. maculatus* L. and by SAUVAGE (1751), BAUHIN & al. (1650-51), DODOENS (1583) and L'ECLUSE (1601) for *S. hispanicus* L.

MATERIAL AND METHODS

An extensive bibliographic search of the genus has been carried out. The catalogue of available names has been completed and all names, when possible, have been typified.

Numerous collections and herbaria were visited in order to study the distribution of each taxon. The following herbaria, abbreviated according HOLMGREN & al. (1990), were consulted: BC, BC-Sennen, BM, COI, FI, G, G-Boiss, HSIA, JACA, MA, MPU, P-LAM, SEV, TUB, UNEX and Z. A selection of studied material is shown in the Appendix I.

RESULTS

Scolymus Tourn. ex L., Sp. Pl. 2: 813 (1753) [Gen. Pl., ed. 5: 355 (1754)]

Typus: Scolymus maculatus L. (selected by JEFFREY, 1993).

Description. Spiny annuals, biennials or perennials. Stems with spiny wings, simple or many ramified. Leaves alternate, pinnatifid, spiny-dentate, with prominent veins, scabrous to tomentose in the veins and glabrous to pubescent in the limb; margins with yellow prominent veins. Capitula sessile, ligulate, axillary or terminal, with involucre leaves, assembled in spike-like or raceme-like panicle. Involucre with many bracts in several rows, the upper herbaceous and longer than the lower, all very alike, membranous. Receptacle conical and somewhat short or elongate, paleaceous; paleae ovate, enclosing achenes. Ligules yellow to orange or white. Achenes dorsally compressed, the lower longer than the upper, enclosed in receptacular scales (paleae). Pappus absent or of 2 to 5 stiff scabrous bristles.

KEY TO SPECIES

- 1. Involucre leaves pinnatifid, more than 5 per capitulum; capitula terminal; ligules with black hairs; achenes without pappus **1. S. maculatus**
- Involucre leaves spiny-dentate, 1-3 per capitulum; capitula axillary or terminal; ligules without black hairs; achenes with pappus 2
- 2. Stems wings interrupted; receptacle (5)6-9.5(10.5) mm in diameter; involucre leaves glabrous outside; pappus with completely scabrous bristles **2. S. hispanicus**

- Stems wings uninterrupted; receptacle (10)13-18(21) mm in diameter; involuclral leaves pubescent outside; pappus smooth bristles
 **3. *S. grandiflorus***

Comments. Two sections can be recognised in *Scolymus*. The typical, sect. *Scolymus*, of annual taxa, with terminal capitula and achenes without pappus; represented only by *S. maculatus*. The second, sect. *Myscolus*, of annual, biennial to perennial taxa, axillary and terminal capitula and achenes with pappus, is represented by two species: *S. hispanicus* and *S. grandiflorus*.

Scolymus sect. 1. Scolymus

Diagnosis. Annual herbs. Involuclral leaves more than 5 per capitula. Capitula terminal. Achenes without pappus.

1. *Scolymus maculatus* L., Sp. Pl. 2: 813 (1753)

≡ *S. annus* Gérard, Fl. Gallo-Prov.: 175 (1761), nom. illeg.

= *S. angiospermus* Gaertn., Fruct. Sem. Pl. 2: 356 (1791) ["angiospermos"], nom. illeg.

= *S. paniculatus* Ucria, Arch. Bot. (Roemer) 1: 70 (1796). *Ind. loc.*: [Sicily, not clearly indicated: "Cup. Pamph." (CUPANI, 1713)]. *Typus*: Plate n. 199!, left (leaf) and central (inflorescence) figures in CUPANI (1713). Designated here.

= *S. pectinatus* Cass., Dict. Sci. Nat. 34: 87 (1825), nom. ut videtur illeg.

= *S. clusii* Bubani, Fl. Pyren. 2: 117 (1900), nom. illeg.

Ind. loc.: "Habitat in G. Narbonensi, Italia."

Typus: LINN 963.1!, single specimen [vide MATTHEWS (1985)].

Description. Annuals with stems up to 150 cm, glabrous or scabrous and with uninterrupted spiny-dentate wings. Leaves (7)9-14(16) cm, ovate to oblong, pinnatifid, spiny-dentate. Capitula terminal, with more than 5 pinnatifid involuclral leaves, aggregated in a corymb-like inflorescence appearing globose. Receptacle (6)7-11(13) mm. Involuclral bracts (10)11-18(22) mm, ovate

to lanceolate, acute, glabrous, with white-scarious margin. Ligules (15)17-24(27) mm, yellow, with black hairs. Achenes 3-4.5(5) mm, epappose. Flowering May to September.

Observations. It has not been possible to carry out the typification of the name *S. paniculatus* Ucria in herbarium material. In the original description of *S. paniculatus* Ucria, instead of a locality, the work of CUPANI (1713) is mentioned (*Cup. Pamph.*) Cupani never prepared a herbarium; however, in the work *Phamphytum Siculum* (*Cup. Pamph.*) there are numerous descriptions of plants and animals accompanied by plates. One of these plates has been selected here as type of the name *S. paniculatus* Ucria.

Morphology. The characters of *S. maculatus* are very constant. Variations exist in the size of the stem and the floral pieces as a consequence of living in different habitats. In calcareous areas, with high temperatures in summer and scarce precipitation, the specimens are usually small, while in humid areas and in places with mild temperatures, they are usually higher. In the places where *S. maculatus* and *S. hispanicus* grow together no hybrid was found hybrid.

Ecology. The distribution of *S. maculatus* is limited by the altitude and the frost. *S. maculatus* lives generally at an altitude below the 700 m and in areas with less than 15 frosty days in a year. It is frequent in the coast and in the basin of the Mediterranean interior depressions. It is a species conditioned by rubbish and rubble. It lives generally in places with loamy and compact soils, usually in association with *Carduus* spp., *Onopordum* spp., *Oryzopsis* spp., *Cichorium* spp. and *Sylibum* spp.

Distribution. *South of Mediterranean Region*: Algeria, Egypt, Morocco, Tunisia. *North of Mediterranean*: France, Greece, Italy, Portugal, Spain, Turkey. *East of Mediterranean*: Iraq, Israel, Lebanon, Syria. *Mediterranean Islands*: Balearic Islands, Cyprus, Malta, Sardinia, Sicilia. *Macaronesia*: Canary Islands, Madeira (see Appendix 1.1).

Scolymus sect. 2. **Myscolus** (Cass.) DC.,
Prod. 7: 76 (1838)

= *Scolymus* subgen. *Myscolus* Cass., Bull.
Soc. Philom. Paris 7(2): 33 (1818), basion.
= *Myscolus* (Cass.) Cass., Dict. Sci. Nat.
25(2): 60 (1822)

Typus: *Scolymus hispanicus* L. Designated
here.

Diagnosis. Annual, biennial or perennial
herbs. Involucral leaves not more than 3
per capitulum. Capitula terminal or axillary.
Achenes with pappus.

2. **Scolymus hispanicus** L., Sp. Pl. 2: 813
(1753)

= *S. perennis* Gérard, Fl. Gallo-Prov.: 175
(1761), nom. illeg.

= *S. congestus* Lam., Fl. Fr. 2: 116 (1778).

Ind. loc.: "Cette plante croît aussi dans
les provinces méridionales." *Typus* (*lecto-*
typus): Drawing no. 2: *Scolymus Theophrasti*
Narbonensis, p. 153, in CLUSIO
(1601). Designated here.

= *S. gymnospermus* Gaertn., Fruct. Sem. Pl.
2: 355 (1791) ["gymnospermos"], nom.
illeg.

= *Myscolus microcephalus* Cass., Dict. Sci.
Nat. 34: 85 (1825), nom. ut videtur illeg.

= *Scolymus vivax* Sauvages ex DC., Prod.
7(1): 76 (1838), nom. illeg.

= *S. theophrasti* Lobel ex Bubani, Fl. Pyren.
2: 116 (1900), nom. illeg.

Ind. loc.: "Habitat in Italia, Sicilia, G. Narbonensi."

Lectotypus: LINN 963.2!, single specimen.
Designated here.

Description. Annual, biennial or perennial
plants up to 200 cm. Stems scabrous to
pubescent, with interrupted spiny-dentate
wings. Leaves (8)10-39(44) cm, ovate to
oblong, pinnatifid to pinnatisect, sometimes
runcinate, spiny-dentate. Capitula axillary,
with a small peduncle up to 0.5 cm and
1-3 incised to pinnatifid involucral leaves,
aggregated in a elongate, spike-like, paniculate
inflorescence or in a globose, paniculate,
very branched inflorescence. Receptacle

(4)5-11(14) mm diameter. Involucral bracts
(5)7-12(15) mm, ovate to lanceolate,
glabrous, acute to obtuse, with white-scarious
margin. Ligules (12)15-23(27) mm, yellow,
orange or white, without black hairs. Achenes
(3.5)4.5-6(6.5) mm, involved by paleae.
Pappus of 2 to 5 stiff scabrous bristles.
Flowering April to September.

Observations. The typification of *S. congestus* Lam. is difficult, because the lack of an adequate material in the P-LAM herbarium and the fact that LAMARK (1779) mentions only one synonym: *Scolymus theophrasti* Tournef. 480. In TOURNEFORT (1700), next to *Scolymus Chrysanthemos, annus* A.R. Par. III., we found the name *Scolymus Theophrasti Narbonensis* Clus. *Hist. clij.* and this should be the name mentioned in the protologue.

In the P-LAM herbarium at Paris there is a sheet of *S. hispanicus* L. with a hand-written note by Lamarck naming it *Scolymus theophrasti hispanicus* Clus. *hist.* In the work by CLUSIO (1601) two clearly different taxa exists: *S. theophrasti hispanicus*, with only a capitulum in each involucral leaf and little ramified inflorescence (CLUSIO, 1601, p. 153, drawing 1) and *S. theophrasti narbonensis*, with 2-3 capitula in each involucral leaf and very ramified inflorescence (CLUSIO, 1601, p. 153, drawing 2). The material conserved in P-LAM makes reference to the plant described by CLUSIO (1601) with only a capitulum in the involucral leaves and with few lateral branches. But in the description of *S. congestus* Lam. we read: "...; elle est aussi très-rameuse,... On trouve quelques fleurs solitaires, mais la plupart sont ramassées par paquets de trois ou quatre ensemble." and those characters point to the material described by CLUSIO (1601) with 2-3 capitula in each involucral leaf and with numerous lateral branches. Having this in mind, the material conserved in P-LAM can not be the type of the name *S. congestus* Lam. We know that Lamarck had used the well known work by CLUSIO (1601) and don't know whether Lamarck had directly studied some specimens of *Scolymus* in the Tournefort herbarium or not. The only possibility we

have for a *S. congestus* Lam. type would be looking for it in CLUSIO (1601). Consequently I have selected the drawing on page 153 as lectotype.

Morphology. In *S. hispanicus* there are four varieties based on the disposition of the floral organs, dimensions of the leaves and characteristic of the achenes.

The general inflorescence in *S. hispanicus* may be of two types: a spike-like paniculate inflorescence and in paniculate inflorescence. The plants with spike-like inflorescences have few ramifications and their capitula are grouped 1-3 in the axil of the fertile leaves. The plants with a paniculate inflorescence have numerous ramifications and their capitulum are grouped 2-5 in the axil of the fertile leaves.

The plants with a spike-like inflorescence are elongate, while the plants with a paniculate inflorescence are globose. Moreover, the plants with a paniculate inflorescence have a smaller receptacle and smaller achenes than the plants with spike-like inflorescences (see table 1).

These features, congruent with the chorological information, have been used to taxonomically separate two groups of individuals: those of elongate appearance from those of globose appearance.

In the group of specimens with elongate appearance we found also variations in the achene morphology, ligule and basal leaves size. The plants in the coast populations have all the achenes with three or more bristle, while the plants in the inland populations have some achenes with only two bristles. Coastal specimens have their capitula in groups of 1-3, while inland specimens usually have only a capitulum in each involucral leaf. The plants in the coastal populations present leaves and ligules longer than the plants in the inland populations (see table 1). Finally, the plants from Algeria and Morocco coastal populations have leaves and ligules bigger than the plants in the rest of the coastal populations of the Mediterranean basin.

Based on this, four groups have been established in *S. hispanicus*:

TABLE 1

MAIN MORPHOLOGICAL AND ECOLOGICAL CHARACTERISTICS OF RECOGNISED INFRASPECIFIC TAXA IN *SCOLYMUS HISPANICUS* L. (EXCLUDED *S. HISPANICUS* SUBSP. *HISPANICUS* FOR. *DECOLORATUS*)
(a: *Scolymus hispanicus* subsp. *hispanicus* var. *hispanicus*; b: *S. hispanicus* subsp. *occidentalis*; c: *S. hispanicus* subsp. *hispanicus* var. *aggregatus*; d: *S. hispanicus* subsp. *hispanicus* var. *aurantiacus*)

	a. var. <i>hispanicus</i>	b. subsp. <i>occidentalis</i>	c. var. <i>aggregatus</i>	d. var. <i>aurantiacus</i>
Morphology				
1. Stem	up to 55 cm	up to 160 cm	up to 145 cm	up to 120 cm
2. Basal leaves (in cm)	(4,5)8-16(27)	(4)6-14(25)	(6)9-21(26)	(15)25-39(44)
3. Capitula	paniculate	spike-like to paniculate	paniculate to spike-like	paniculate to spike-like
4. No. of capitula in each leaf	2-5	1	2-3	2-3
5. Receptacle dimensions (in mm)	(4)5,5-9(12)	(5)7-11(15)	(5)7-11(16)	(5)7-11(13)
6. No. of pappus setae in central achenes	3-6	2-3	3-5	3-5
7. Ligules (in mm)	(16)18-23(27)	(14)16-20(25)	(14)16-20(23)	(16)18-25(28)
8. Achenes (in mm)	(2,5)3-4(5)	(4)4,5-5,5(6)	(1,7)2,4-5(5,5)	(2)2,5-5(5,5)
Ecology				
9. Habitat	indifferent to soils	calcareous soils	sandy soils	sandy soils
10. Altitude range (in m)	100-1200	30-1400	0-40	0-50

- a) Specimens with globose appearance, very branched inflorescence, capitula in axillary groups and short ligules (subsp. *hispanicus* var. *hispanicus*).
- b) Specimens with elongate appearance, little ramified inflorescence, capitula in axillary groups, short ligules and short sterile leaves (subsp. *hispanicus* var. *aggregatus*).
- c) Specimens with elongate appearance, little ramified inflorescence, capitula in axillary groups, long ligules and long sterile leaves (subsp. *hispanicus* var. *aurantiacus*).
- d) Specimens with elongate appearance, little ramified inflorescence, capitula solitary, axillary, and short ligules (subsp. *occidentalis*).

The four infraspecific taxa recognised have a more or less different distribution. However, the area of each one overlap with the area of the others. We have assigned the subspecific rank to the group of elongate appearance and capitula solitary because it has a more clearly differentiated geographical distribution than the rest of the groups. Only on the coasts of South Spain and France and in the depression of Florence (Italy) is it possible to see, growing in the same habitat, populations of subsp. *occidentalis* and subsp. *hispanicus*. In this situation it is frequent to find specimens with intermediate characters. They may be hybrids.

Ecology. *Scolymus hispanicus* lives in very diverse habitats ranging from sea level to an altitude of 1000 m, both in sandy or clayey soils, in areas with a frosty period or free of frost, etc.

General distribution. *South of Mediterranean Region:* Algeria, Egypt, Libya, Morocco, Tunisia. *North of Mediterranean:* Albania, Bosnia-Herzegovina, Bulgaria, Croatia, France, Greece, Italy, Montenegro, Portugal, Romania, San Marino, Russia, Spain, South Switzerland, Turkey. *East of Mediterranean:* Israel, Lebanon, Syria. *Mediterranean Islands:* Balearic Islands, Corfu, Corsica, Cyprus, Crete, Malta, Sardinia, Sicilia. *Macaronesia:* Canary Islands.

KEY TO SUBSPECIFIC TAXA OF *S. hispanicus*

- 1. Some of the central achenes with 2 pappus bristles; achenes (4)4.5-5.5(6.5) mm; capitula solitary or in pairs; inflorescence elongate, spike-like **2b. subsp. occidentalis**
- All central achenes with 3-5 pappus bristles; achenes (1.7)2.4-5(5.5) mm; capitula in groups of 2-5; inflorescence elongate, spike-like, or paniculate and globose ... **2a. subsp. hispanicus**

2a. subsp. hispanicus

Description. Annual, biennial to perennial up to 145 cm. Stems short branched, shortly pubescent to very pubescent, sometimes cobwebby; purple. Basal leaves (5)8-39(44) cm, pinnatifid to pinnatisect, pubescent to cobwebby, frequently runcinate; margin spiny, with spine up to 2.5 mm. Capitula in axillary groups of 2-3(5), in a spike-like or paniculate inflorescence, with elongate to globose appearance. Receptacle (4)5.5-11(16) mm in diameter. Ligules (14)16-25(28) mm, yellow to orange, sometimes white. Achenes (1.7)2.4-5(5.5) mm. Pappus of 3-6 bristles in the central achenes, otherwise 3. Flowering April to September.

Morphology. It has the variations indicated in previous comments and it is possible to find specimens with white ligules. This variation is recognised here as a new form: *S. hispanicus* f. *decoloratus* Fiori ex F.M. Vázquez, *f. nov.* *Diagnosis:* a *S. hispanicus ligulis albis (nec flavidis) differt. Holotypus:* FI (s.n.)!, single specimen. Italia: Prov. di Pisa - Vada / Trello la Aagiore ferr. / Suolo sedimentario Alt. 2 m / 21-VII-1914 Adr. Fiori (Herbarium Adr. FIORI).

KEY TO THE VARIETIES OF *S. hispanicus*
SUBSP. *HISPANICUS*

- 1. Stem many branched.; capitula 2-4(5) in each involucre leaf; inflorescence paniculate, with a globose appearance; receptacle (4)5.5-9(12) mm in diameter; basal leaves glabrous or pubescent, not cobwebby, pinnatifid ... **2a. var. hispanicus**
- Stem short branched; capitula 2-3 in each involucre leaf; inflorescence spike-like, with elongate appearance; receptacle (5)7-11(16) mm

- in diameter; basal leaves pubescent to cobwebby, pinnatifid to pinnatisect 2
2. Florets yellow; basal leaves (6)9-21(26) cm, pinnatifid **2a₂**. var. **aggregatus**
- Florets orange; basal leaves (20)25-39(44) cm, pinnatifid to pinnatisect ... **2a₃**. var. **aurantiacus**

2a₁. var. **hispanicus**

Description. Biennial to perennial with stems up to 55 cm, many branched, scabrous to pubescent. Basal leaves (4.5)8-16(27) cm, pinnatifid, not runcinate, glabrous to pubescent, with spiny margin; spines up to 2.5 mm. Capitula in axillary groups of 2-4(5), in a paniculate inflorescence with globose appearance. Receptacle (4)5.5-9(12) mm in diameter. Ligules (16)18-23(27) mm, yellow to orange, sometimes white. Achenes (2.5)3-4(5) mm. Flowering April to September (Fig. 1).

Ecology. The populations of var. *hispanicus* live in compact and clayey soils, with an acid or basic pH. This variety endures high thermic contrasts in areas with more than 20 days of frost a year. The var. *hispanicus* lives in the basin of the Mediterranean area from sea level to an altitude of 1200 m, together with *Onopordum* spp., *Carduus* spp., *Carthamus* spp., *Sylibum* spp., etc.

Distribution. *South of Mediterranean Region:* Algeria, Egypt, Libya, Morocco. *North of Mediterranean:* Albania, Bosnia-Herzegovina, Bulgaria, Croatia, France, Greece, Italy, Montenegro, Portugal, Romania, Russia, San Marino, Spain, South Switzerland, Turkey. *East of Mediterranean:* Israel, Lebanon, Syria. *Mediterranean Islands:* Cyprus (see Appendix 1.2a₁).

2a₂. **Scolymus hispanicus** var. **aggregatus** (Ruch.) F.M. Vázquez, comb. & stat. nov.

≡ *S. aggregatus* Ruch., Fl. Lidi Veneti: 198 (1818), basion.

Ind. loc.: “Nasce in tutte le spiagge arenose e specialmente in quella del Lido; ...”

Typus (lectotypus): Tab. 175, *Scolymus chrysanthemos!*, in ZANNICHELLI (1735). Designated here.

Description. Annual, biennial or perennial with stems up to 145 cm, shortly branched, slightly pubescent to densely pubescent, sometimes cobwebby, purple. Basal leaves (6)9-21(26) cm, pinnatifid, frequently runcinate, with spiny margins; spines (1.7)2.0-4.5(6.5) mm. Capitula in axillary groups of 2(3), in a spike-like paniculate inflorescence with a elongate appearance. Receptacle (5)7-11(16) mm in diameter. Ligules (14)16-20(23) mm, yellow. Achenes (1.7)2.4-5(5.5) mm. Flowering May to September (Fig. 2).

Observations. The drawing in ZANNICHELLI (1735) has been chosen as type of *S. aggregatus* Ruch. because one of the synonyms that RUCHINGER (1818) mentioned is *Scolymus Chrysanthemis* Zann. Ven. p. 240. 175 and no original material is preserved. The locality of *Scolymus Chrysanthemis* in ZANNICHELLI (1735) (“... Piante che nascono ne’Lidi in torno a Venezia”) is the same to that in the indication of locality of *S. aggregatus* Ruch.: “Nasce in tutte le spiagge arenose e specialmente in quella del Lido; ...”

Ecology. *S. hispanicus* var. *aggregatus* is a coastal Mediterranean plant living in sandy, loose soils, together with *Carduus* spp., *Onopordum* spp., *Arenaria* spp., etc. The habitat is high influenced by the sea. It does not have frost.

Distribution. *South of Mediterranean Region:* Morocco, Tunisia. *North of Mediterranean:* Croatia, France, Greece, Italy, Portugal, Spain. *East of Mediterranean:* Lebanon. *Mediterranean Islands:* Balearic Islands, Corfu, Corsica, Crete, Malta, Sardinia, Sicilia. *Macaronesia:* Canary Islands. (Appendix 1.2a₂).

2a₃. var. **aurantiacus** Maire, Bull. Soc. Hist. Nat. Afr. Nord 20: 27 (1929)

= *Scolymus hispanicus* f. *aurantiacus* (Maire) Font Quer, *Iter Maroccanum* 1930, no. 709 (1932)

Ind. loc.: “Hab. in arenosis Imperii Marocani occidentalis, junio et julio florens: in silva Mamora, prope urbem Rabat.” Original material not studied.

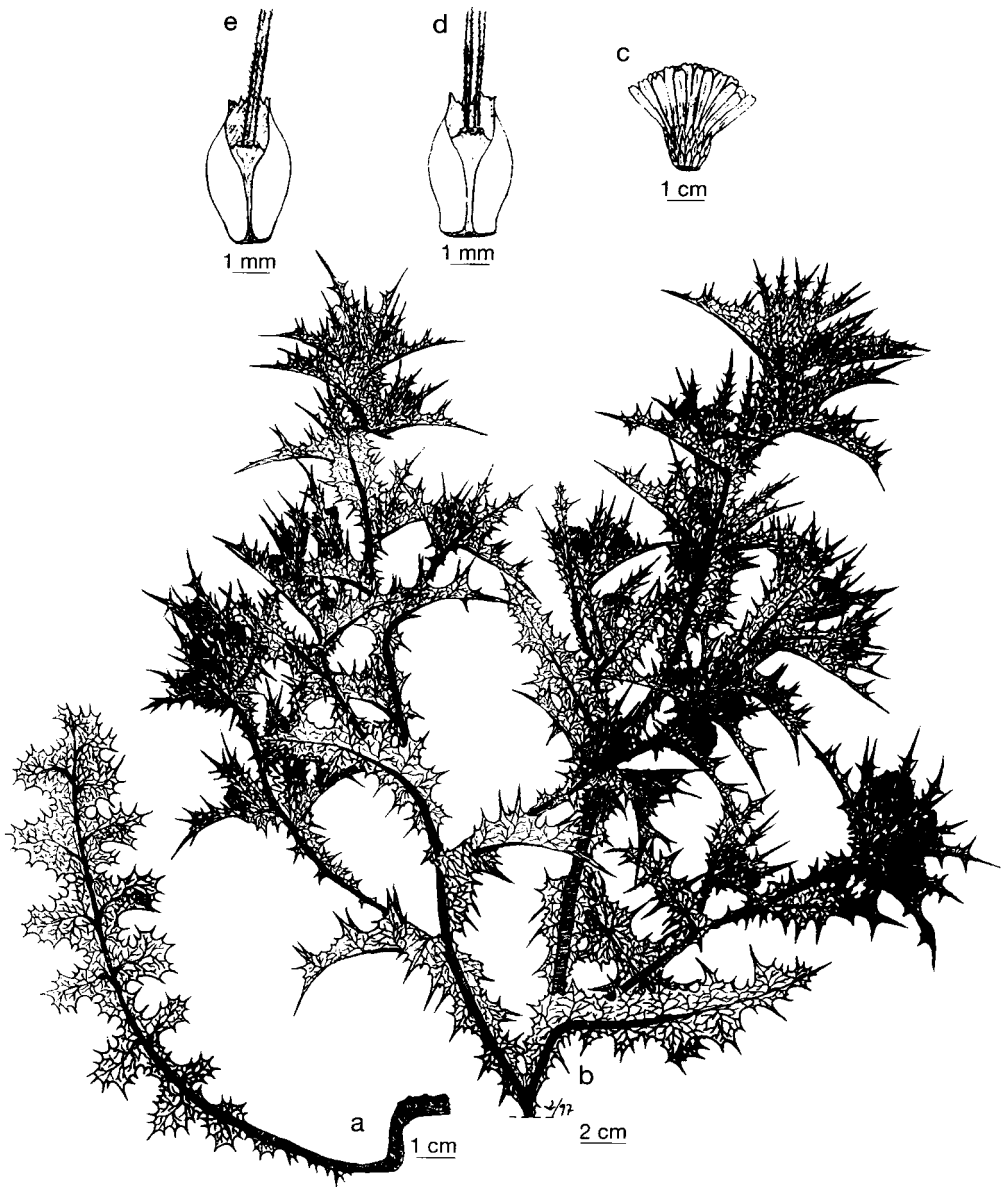


Fig. 1.—*Scolymus hispanicus* subsp. *hispanicus* var. *hispanicus*: a, basal leaf; b, habit; c, capitulum; d, e, central achenes.

Description. Annual, biennial or perennial up to 145 cm. Stems shortly branched, purple, slightly pubescent to very pubescent, sometimes cobwebby. Basal leaves (20)25-39(44) cm, pinnatifid to pinnatisect, occasionally runcinate, with spiny margins; spines (0.5)1-2(2.7) mm.

Capitula in axillary groups of (1)2(3), in a spike-like paniculate inflorescence with an elongate appearance. Receptacle (5)7-11(13) mm in diameter. Ligules (16)18-25(28) mm, orange. Achenes (2)2.5-5(5.5) mm. Flowering May to July (Fig. 3).

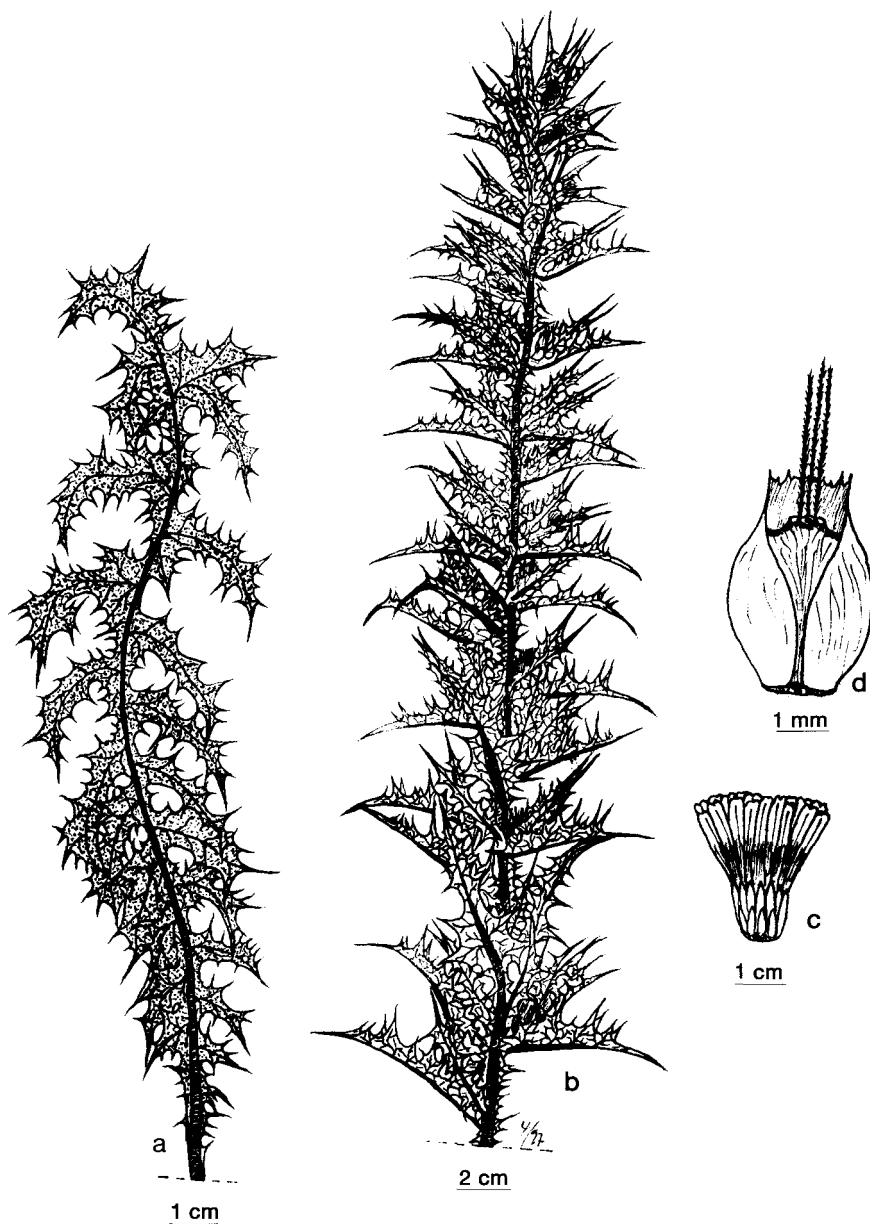


Fig. 2.—*Scolymus hispanicus* subsp. *hispanicus* var. *aggregatus*: a, basal leaf; b, habit; c, capitulum; d, central achene.

Ecology. The same as *S. hispanicus* var. *aggregatus*.

Distribution. South of Mediterranean Region: Only in the North coast of Algeria and Morocco (Appendix 1.2a₃).

2b. *Scolymus hispanicus* subsp. *occidentalis* F.M. Vázquez, subsp. nov.

Holotypus: HSIA (1796)!, single specimen divided in two fragments. Spain: Badajoz, Monesterio, 29SQC04, 15-VI-1991, *F. Espárrago* & F.M. Vázquez.

Diagnosis. Subspeciei *S. hispanicus* subsp. *hispanicus* valde similis, a qua imprimis capitulis fere semper solitariis atque achaeniorum centralium pappo squamis duobus aut tribus instructo differt.

Description. Annual to biennial up to 160 cm. Stems shortly branched, glabrous, scabrous to slightly pubescent. Basal leaves (4)6-14(25) cm, pinnatifid, glabrous to pubescent, with spiny margins; spines up to

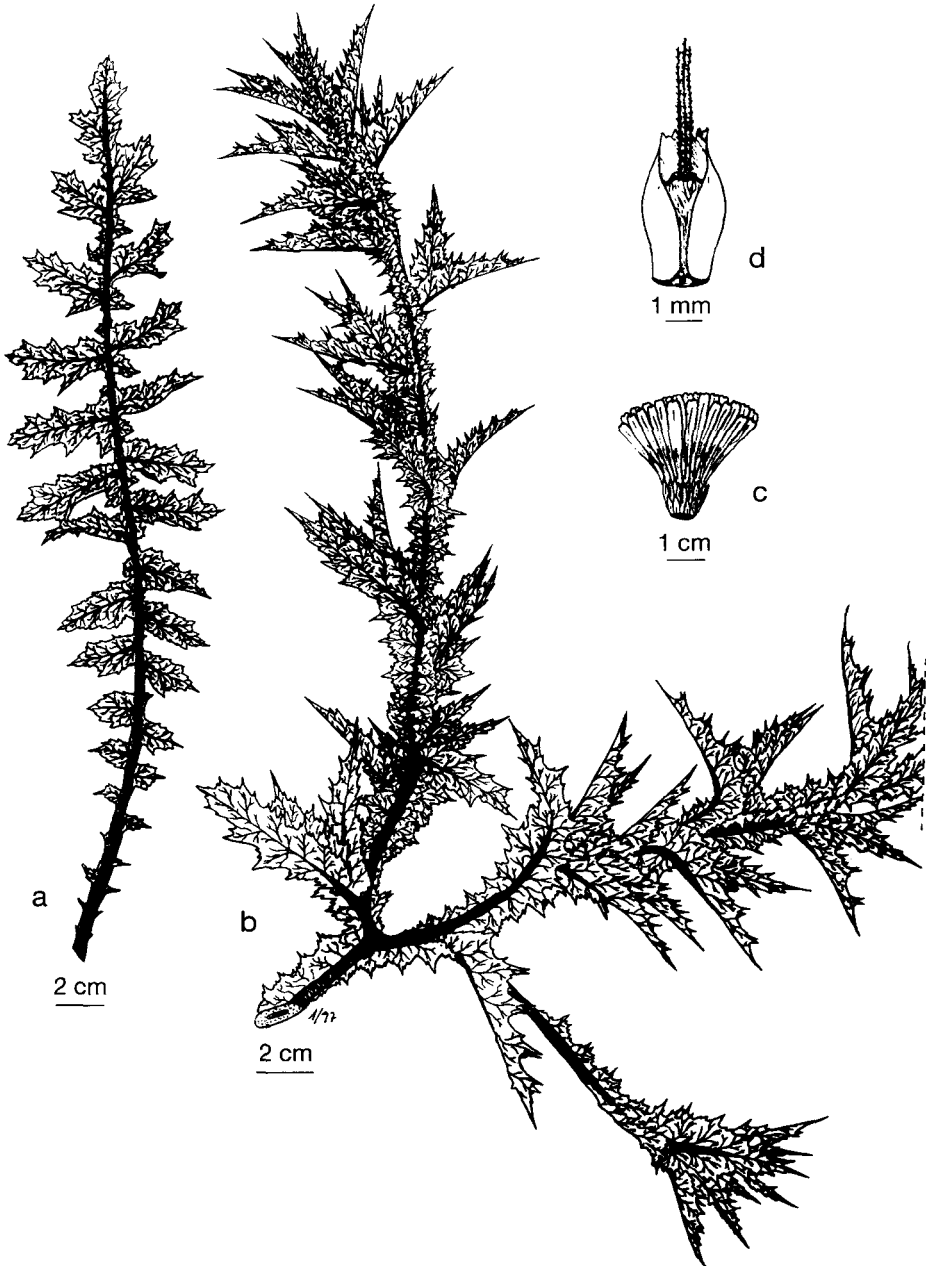


Fig. 3.—*Scolymus hispanicus* subsp. *hispanicus* var. *aurantiacus*: a, basal leaf; b, habit; c, capitulum; d, central achene.

2,3 mm. Capitula solitary, in a spike-like paniculate inflorescence with an elongate appearance. Receptacle (5)7-11(15) mm in diameter. Ligules (14)16-20(25) mm, yellow. Achenes (4)4.5-5.5(6.5) mm. Some central pappus with two bristles, another with three. Flowering April to November (Fig. 4).

Observations. This taxon had been recognised previously by some pre-Linnaean authors such as DODOENS (1583) who refers to two variants of the *Carduus Chrysanthemus*: a) *Carduus Chrysanthemus* [= *S. hispanicus* subsp. *occidentalis*] and b) *Cardui Chrysanthemi Alterum* [= *S. hispanicus* subsp. *hispanicus*]. Also CLUSIO (1601) recognised this taxon under *Scolymus Theophrasti*: a) *S. Theophrasti Hispanicus* [= *S. hispanicus* subsp. *occidentalis*] and b) *S. Theophrasti Narbonensis* [= *S. hispanicus* subsp. *hispanicus*]. Later authors such as LAMARK (1779) made also the distinction between the two taxa, and one of the taxa by CLUSIO (1601) [*S. Theophrasti Narbonensis*] is a synonym of *S. congestus* Lam. While authors like BAUHIN (1623), TOURNEFORT (1700) and LINNEO (1753) united the two taxa under *Scolymus Theophrasti* Bauh. or *S. hispanicus*.

Ecology. The subspecies *S. hispanicus* subsp. *occidentalis* lives from near sea level to an altitude of 1400 m. This subspecies supports strong frost and thermic contrasts, and grows on soils from compact to loose, with basic pH, of clayey to muddy texture. They are wasteland plants, growing in the margins of highways and roads, associated with species like *Notobasis syriaca* (L.) Cass., *Mercurialis tomentosa* L., *Carduus bourgeanus* Boiss. & Reut.; *Sylibum marianum* (L.) Gaertn., etc.

Distribution. Distributed by the Western half of the Mediterranean basin. *South of Mediterranean Region:* Algeria, Morocco, Tunisia. *North of Mediterranean:* France, Italy, Portugal, Spain. *East of Mediterranean:* Israel, Lebanon, Syria. *Mediterranean Islands:* Balearic Islands, Sardinia. *Macaonesia:* Canary Islands (Appendix 1.2b).

3. *Scolymus grandiflorus* Desf., Fl. Atl. 2: 240, Tab. 218 (1799)
= *Myscolus megacephalus* Cass., Dict. Sci. Nat. 34: 84 (1825), nom. illeg.

Ind. loc.: "In arvis incultis vulgatissima."

Typus: P-DESF. (s.n.)!, central specimen. Herbarium de la FLORE ATLANTIQUE donné au Museum par M. DESFONTAINES N° / *Scolymus grandiflorus*. Designated here.

Isotypus: G (s.n.)!

Description. Annual or biennial up to 75 cm. Stems with uninterrupted spiny-dentate wings, pubescent to glabrous, sometimes scabrous. Basal leaves (8)10-16(24) cm, ovate to oblong, pinnatifid, spiny-dentate. Capitula terminals, sometimes axillary, with 2-3 involucre leaves per capitulum, in a spike-like paniculate inflorescence with an elongate appearance. Involucre leaves (7)9-15(19) mm, ovate to lanceolate, sometimes obtuse, pubescent to scabrous, spiny-dentate, with scarious margin. Receptacle (10)13-18(21) mm in diameter. Ligules (20)25-37(44) mm, yellow to orange. Achenes 3.5-5.5(6.5) mm. Pappus of three to seven bristles in central achenes, otherwise three to five. Flowering May to July.

Morphology. In the Algeria populations of *S. grandiflorus* Desf. it is possible to find specimens with the bracts of the involucre very pubescent and with short appendices, but this variation isn't considered worthy of taxonomic recognition in this paper.

Ecology. This species usually lives in coastal areas, on sandy soils. It is a wasteland plant, that cohabits with *Carduus* spp., *Carthamus* spp., *Onopordum* spp., etc.

Distribution. *S. grandiflorus* Desf. has a wide distribution in the Mediterranean basin. However, it is more frequent to find this species in the Northwest of Africa coasts and in Sicily. In the rest of its area of distribution it appears forming small populations without continuity. Moreover, the absence of this species in the east of the Iberian Peninsula and Balearic Island and in the south of the Balkan Peninsula is note worthy. *South of Mediterranean Region:* Algeria, Libya, Morocco, Tunisia. *North of Mediterranean:* France, Italy, Turkey. *East of Mediterranean:* Lebanon. *Mediterranean Islands:* Malta, Sardinia, Sicilia (Appendix 1.3).

ACKNOWLEDGEMENTS

We thank Dr. R. Cabezas de Herrera for correcting the original diagnosis into Latin, Dr. G. López,

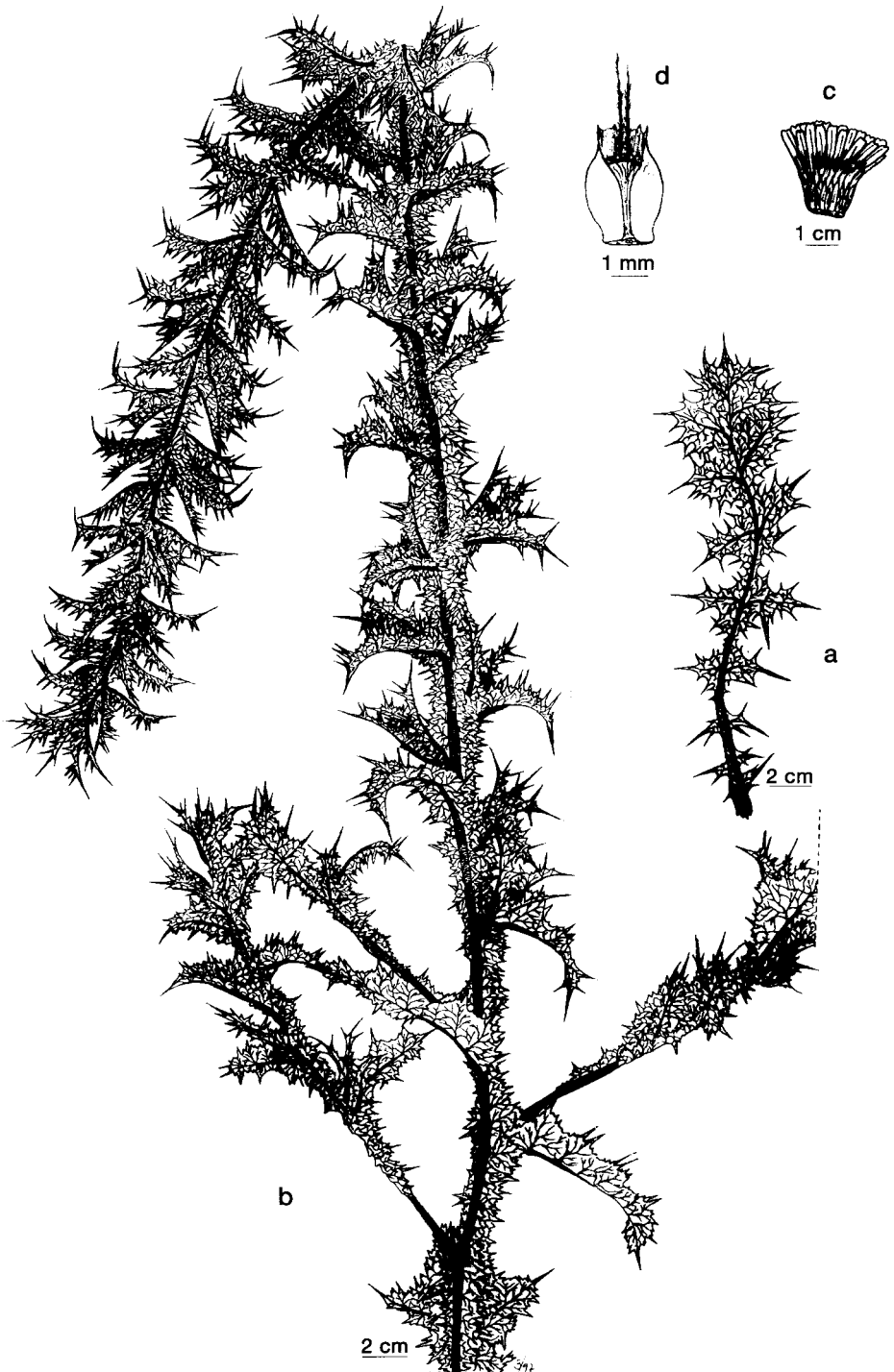


Fig. 4.—*Scolymus hispanicus* subsp. *occidentalis*: a, basal leaf; b, habit; c, capitulum; d, central achene.

Dr. C.E. Jarvis and Dr. R. Rutishauser for the help and recommendations and Dr. Rafael Alejo for translating parts of the original manuscript into English.

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- EGYPT. Oases of Western Desert, Wadi Natrum, *Boulos* (1995). Region Nilotica, V-1869, *A.T. Targioni* (FI).
- MOROCCO. Fez, Blet bus Slag, 3-VII-1971, *M. Ditrach* (G 157903). Kebdana, cape of Agua, 4-VI-1932, *F. Sennen & H. Mauricio* (BC-Sennen). Tetuan, S'Uger des Barrage, Ajras, 22-VI-1989, *D. Podlech* (G 359668). Xauen, 25-VII-1928, *P. Font Quer* (BC 38701). Between Khemisset and Meknés, 24-V-1994, *M.J. Díaz, M.A. Mateos, E. Moreno, A. Taleb & B. Valdés* (SEV). Nador, Farkhana, 2-VII-1993, *M.J. Díaz, M. Etlaftski & B. Valdés* (SEV). Taza, road to Aknoul, 8 km of Taza, 25-V-1994, *M.J. Díaz, M.A. Mateos, E. Moreno, A. Taleb & B. Valdés* (SEV). Tanger, 22-VI-1989, *D. Podlech* (G 359668). Melilla (Spain), Sidi, 26-V-1915, *A. Caballero* (MA 136880). Melilla (Spain), Hidum, in the crops and beaches, V-1930, *H. Mauricio* (BC 141687).
- TUNISIA. Chebba (D. Duza), 18-VI-1951, *H. Pabot* (G). Rhahir (Radir), 23-VI-1913, *A.D. Cuénod* (G).
- North of Mediterranean (South Europe)*
- FRANCE. ALPES MARITIMES: Pégomas, VII-1961, *G. Garelle* (MA 181992). AUDE: La Nouvelle, 22-V-1899, *F. Sennen* (BC-Sennen). Narbonne, VIII-1879, *C.I. Fauconnet* (G). BOUCHES-DU-RHÔNE: Marsella, 19-IV-1836, *M.F. Dunal* (BC 675316). Martigues, VII-1887, *A. Antheman* (G). HÉRAULT: Montpellier, VII-1855, *M. Bernet* (G). Hérault the Vegne close Bizziens, 2-VIII-1891, *H. Coste* (FI). Nègre close Beziers, 6-VIII-1891, *F. Mouret* (G 1239bis). VAR: Toulon, without date, *Daenen* (G). VAUCLUSE: Avignon, without date, *E. Requien* (G-BOIS).
- GREECE. Kabes ad Kolamia, 16-VII-1893, *A. Baldacci* (G). Island of Kos, 6-VI-1935, *K.H. & F. Rechinger* (BM). Kreta, *Rechinger* (1943). Mytilene, *Rechinger* (1943). Samos, *Rechinger* (1943). Rhodos, *Rechinger* (1943).
- ITALY. ABRUZZO: San Valentino, VIII-1900, *G. Rigo* (FI). CALABRIA: Bianco, 12-VI-1877, *G. Arcangeli* (FI). Crotona, 18-VII-1883, *A. Fiori* (FI). CAMPANIA: Barano of Ischia, 26-V-1892, *S. Sommier* (FI). LIGURIA: Maurizio, VIII-1840, *P. Bertin* (FI). LANZIO: Port Galera, 18-VII-1860, *Molli* (FI). PUGLIA: River of the Ofanto, Bari, without date, *S. Sommier* (FI). TOSCANA: Campalbio, IX-1865, *E. Levier* (FI). Pisa, VIII-1867, *O. Beccari* (FI). Port Sgalera, close Port'Ercole, 2-VII-1886, *E. Levier & S. Sommier* (FI).
- PORTUGAL. ALGARVE: Castro Marin, V-1887, *A. Moller* (COI). Tavira, 2-V-1994, *C. Pintos-Gomes & F.M. Vázquez* (HSIA). BAIXO ALENTEJO: Setubal, VI-1892, *A. Moller* (COI). BEIRA LITORAL: Cantanhede, 19-VII-1967, *J. Nogueira* (COI). Coimbra, Sant'Anna, V-1882, *A. Moller* (COI). Coimbra, Sousellas, VI-1895, *M. Ferreira* (COI). ESTREMADURA: Lisboa, without date, *F. Welwitsch* (G-BOIS). Lisboa, Oeiras, 19-VII-1967, *A. Fernandes* (COI). Pouços, Vala de Rega de Ponte de Pedra, 7-VII-1982, *M. Correia, H. Barcelar & J. Cardoso* (G 361271). Mountain of Caregado, VI-1840, *F. Welwitsch* (G).
- SPAIN. ALICANTE: Altea, 2-VII-1890, *J.B. Saint-Lager*

APPENDIX 1

(Selected specimens)

1. *Scolymus maculatus**South of Mediterranean (North Africa)*

ALGERIA. Alger. 1840, *M. Fauché* (G). Between Tizi

(G). BADAJOZ: Burguillos del Cerro, 20-VI-1992, *M.C. Pérez & F.M. Vázquez* (HSIA). GUADAJIRA, 16-VI-1995, *F.M. Vázquez* (HSIA). Mérida, 28-VII-1987, *J.A. Devesa & A. Ortega* (UNEX 18903). Villafranca de los Barros, 20-VI-1992, *F.M. Vázquez* (HSIA). Villar del Rey, 2-VII-1992, *M.C. Pérez & F.M. Vázquez* (HSIA). BARCELONA: Barcelona, VIII-1949, *F. Masclans* (BC 112909). CÁDIZ: Algeciras, 16-VII-1887, *E. Reverchon* (G). Algodonales, 10-V-1980, *A. Aparicio* (SEV 59840). Los Barrios, IV-1961, *J. Borja & A. Rodríguez* (MA 183519). Jerez de la Frontera, 28-V-1978, *A. Martínez* (SEV 43527). Puerto Real, 12-V-1981, *C. Vergara & al.* (SEV 64055). Ubrique, 3-VI-1970, *E.F. Galiano, F.G. Bernáldez & B. Valdés* (SEV 43528, 55412). CÓRDOBA: Hornachuelos, 15-XI-1980, *Corral & Fernández* (SEV 61433). Villar del Río, 28-VI-1962, *E.F. Galiano* (SEV 5608). HUELVA: Aroche to Rosal de la Frontera, 26-VI-1979, *P. Gibbs, J. Rivera & S. Talavera* (SEV 49679). Doñana, IV-1967, *A. Segura-Zubizarreta* (MA 356359). Hinojos, 19-V-1977, *M. Costa & B. Valdés* (SEV 59105). MADRID: Cerro Negro, VI, without year, *P. Isern* (MA 136886). MÁLAGA: Periana to La Viñuela, 29-V-1985, *P. García & J.A. Mejías* (SEV 115630). Pizarra, 10-VI-1964, *P. Montserrat* (JACA 122864). Ronda, 28-VIII-1983, *A. Aparicio* (MA 460921). Torremolinos, 11-V-1916, *E. Gros* (MA 136874). MURCIA: Alhama, VII-1891, *A. Guirao* (MA 136871). Cartagena, 31-V-1903, *F. de P. Jiménez* (MA 136873). Lorca, 28-VI-1929, *F. Sennen & H. Jerónimo* (BC-Sennen, BC 84514, FI 15831). SEVILLA: Alcalá de Guadaíra, 13-VII-1978, *J.A. Devesa, J. Rivera & B. Valdés* (SEV 55413). Aznalcázar, 23-VI-1981, *J. Pastor, S. Talavera & B. Valdés* (SEV 63981). Constantina, 31-V-1981, *P. Escalza, M. López & R. Luque* (SEV 64351). Villamartín, 27-VII-1992, *M.C. Pérez & F.M. Vázquez* (HSIA). TOLEDO: Between Torrijos and Huescas, 11-VII-1982, *S. Laorga* (SEV 90900). TURKEY. Mugla, Ölü Deniz (S. Fethiye), 17-V-1990, *Turland* (BM). Sivas, Susehri, 26-VIII-1957, *J. Davis & I.C. Hedge* (BM).

East of Mediterranean

IRAQ. Baghdad, *Rechinger* (1964). Hillah, V-1918, *R.D. Graham* (BM). ISRAEL. Jerusalem, V-1858, *A. Schmidel* (G). Khan Yubb Yusuf, 15-V-1911, *F.S. Meyers & J.E. Dinsmore* (G). LEBANON. Al-Biqaa, 14-VI-1953, *H. Pabot* (G). Beyout (Beirut), 21-VI-1879, *E. Peyron* (G 664). Between Jounié and Jubayl, 4-V-1954, *H. Pabot* (G). SYRIA. Magdala (Al-Magdal) (S. Syria), 1863-1864, *B.T. Lowne* (BM).

Mediterranean Islands

BALEARIC ISLANDS. MALLORCA: Port de Inca, 9-VI-1917, *F. Bianor-Maire* (BC 38702). La Torre del Pan, 15-IX-1946, *P. Ferrer* (MA 136876). CYPRUS. In mountain close Kyrenia, 24-V-1880, *H. Groves* (FI). MALTA. Island of Malta, 7-V-1907, *S. Somier* (FI). SARDINIA. Island S. Antiooco, 7-VIII-1894, *U. Martelli* (FI). River Tirso, 6-IX-1895, *U. Martelli* (FI). SICILIA. Agrigento, Girgenti, 8-V-1873, *S. Sommier* (FI). Palermo, 1886, *M. Todaro* (FI). Partinico, VII-1836,

F. Parlatore (FI). Siracusa, 24-VIII-1912, *A. Vaccari* (FI 689).

Macaronesia

CANARY ISLANDS. GRAN CANARIA: Barranco de Tenayor, VIII-1905, *C. Sobrado* (BC 38700). TENERIFE: Laguna, 23-VI-1929, *R.P. Manoy* (G). Santa Ursula, 5-V-1933, *E. Asplund* (G 1121).

MADEIRA. Close N.S. of Piedade, Gate S. Lourenço, V-1865, *G. Mandon* (G).

2a. *Scolymus hispanicus* subsp. *hispanicus* var. *hispanicus*

South of Mediterranean (North Africa)

ALGERIA. Mehldia, 9-VI-1975, *J. Davis* (BM).

EGYPT. Amdid (Timay al-Amdid), 31-V-1964, *V. Täckholm* (MA 246900). Alejandría, VIII-1870, *R. Parquet* (BM).

LIBYA. Without locality, date and collector (ALAVI, 1983).

MOROCCO. Ait Baha, 4-VI-1974, *BM-expedition* (BM). Beni Mellal, Zaonite, 31-VII-1964, *R.M. Harley & T.E. Lankester* (BM). Ibleit, North of Marrakech, 13-IV-1964, *P. & J. Davis* (BM). Kenifra, Moulay-Bou-Se-Iham, 27-III-1973, *J. Davis* (BM). Marrakesh-Rabat, 20-IV-1931, *D. Alice* (BM). Oulad Ali, 29-VII-1975, *E. Stanes* (BM). Oulad M'Barek to Ouauzärht, 25-V-1972, *J.C.M. Alexander & F.K. Kupicha* (BM).

North of Mediterranean (South Europe)

ALBANIA. Antibanum, Primorja, VIII-1900, *A.P. Hannibal* (BM). Frankula and Cerani to Muxkija, 16-VIII-1894, *A. Baldacci* (FI).

BOSNIA I HERZEGOVINA. Herzegovina, 10-VII-1897, *Matulic* (FI). Close Mostar, 27-VII-1908, *K. Maly* (G).

BULGARIA. Momcilgrad, 24-VII-1954, *N. Stojanov, B. Kitanov & V. Velcev* (MA 181993). Sliven, 25-VII-1907, *C.K. Schneider* (BM).

CROATIA. Dalmatia, without date, *A. Botteri* (BM). Dalmatia, Lesina, 1826, *D. Lagger* (G). Monte Fiume (Rijeka), 19-IX-1863, *A.M. Smitto* (FI). Velebit, South of Starigrad-Paklenika, 16-IV-1962, *B. Mathew & D. Pycraft* (BM).

FRANCE. ALPES MARITIMES: Nizza, without date, *Roeger* (G). AUDE: Narbonne, VII-1814, *E.G. Paris* (FI).

BOUCHES-DU-RHÔNE: Marseille, VII-1856, *Clamut* (G). GIRONDE: Blaye-Gironde, 15-VII-1874, *L. Montelay de Bourdeaux* (FI). Talence, VII-1923, *J. Fiton* (G 4506).

HAUTE GARONNE: Toulouse, VIII-1863, *Timbal-Lagrange* (G). HÉRAULT: Hérault, VII-1891, *Ph. Paiche & A. Geneve* (G). Montpellier, VII-1842, *T.A. Helicherrum* (FI).

LOIRE: Loire inferior, 16-VIII-1888, *E. Gadeceau* (FI). LOT-ET-GARONNE: Villiers, VIII-1884, *E. Martin* (MA 136928). PUY-DE-DÔME: Clermond-Ferrand, VII-1898, without collector (BM).

PYRÉNÉES ORIENTALES: Perpignan, VII-1857, *Campanyo* (G). VAR: Toulon, VII-1893, *Dapin* (G).

GREECE. ATTIKI: Athenas, 10-VII-1856, *G. Orphanides* (FI). Attique-Ktypito, 1-VII-1928, *F. Guiol* (BM). Crfti: Cagliari, 1846, *M.E. Thomas* (G). Kaenurio, Ambeluzos, 29-VI-1942, *K.H. Renchinger* (BM).

MAKEDONIA: D'Ostrov, in the base of the Mountain Kaimaktchalan, IX-1938, *H. Humbert* & *S. Topoli* (G 267g). Kastoria, 27-VI-1932, *A.H.G. Alston* & *N.Y. Sandwith* (BM). S.E. of Lembot, about 3 m N.E. of Salonica, 25-VI-1918, *N.L. Gillespie* (BM). PELOPÓNNISOS: Korinthia, Stimgalia, 9-VIII-1976, *A. Charpin* & *al.*, (G 105932). Olympia, Mercchia, 18-VIII-1931, *C. Regel* (G). THESSALONIKI: Valdonmas, East of Yannina, 12-VII-1964, *R.W. Mariott* (BM).

ITALY. ABRUZZO: Cermignano, VIII-1899, *G. Rigo* (FI). Mountain Velino, 8-IX-1907, *R.L. Vaccari* (FI). BASILICATA: Potenza, S. Maria, 24-VII-1937, *N. Gavioli* (FI 7892). Potenza, Lucania, 28-VIII-1905, *N. Gavioli* (FI 5281). CALABRIA: Catanzaro, Sta. Eufemia Lamezia, 1-X-1960, *M. Padula* (FI). Spartivento, 9-VI-1877, *G. Arcangeli* (FI). CAMPANIA: Avellino, 1888, *G.B. Milani* (FI). Napoli, VII, without year, *U. Martelli* (FI). Pozzuoli, 6-X-1868, *F. Parlatore* (FI). EMILIA: Parma, 27-VII-1918, *M. Minio* (FI). Mountain Donato, close Bologne, 11-VII-1885, *A. Fiori* (FI). Rimini, 19-VII-1877, *S. Somier* (FI). FRIULI-VENEZIA GIULIA: Paye in Trieste, IX-1863, *E. Levier* (FI). Trieste Zaulze, 23-VIII-1868, *A. Marchesetti* (FI). LANZIO: Roma, Monterotondo, 22-X-1950, *C. Steinberg* (FI). MARCHE: San Gregorio, 15-II-1940, *A. Bettini* (FI). Urbino, 1-II-1916, *F. Funari* (FI). PUGLIE: Lesina, without date, *M. Bottero* (G). Manfredonia, VII-1893, *U. Martelli* (FI). TOSCANA: Arezzo, 12-X-1904, *M. Savelli* (FI). Florence, IX-1868, *E. Levier* (FI). Livorno, 22-IX-1821, *S. Sommier* (FI). S. Vincenzo Livorno, VIII-1933, *R. Gabriellith* & *R. Corradi* (FI). Pisa, 25-VII-1887, *P. Fantozzi* (FI). VENETO: Albitazione, Brondalo-Chioggia, Lido de Mare, 19-VII-1896, *L. Vaccari* (FI). Combetta, 8-X-1888, *A. Giovann* (FI). Close Verona, 1821, *A. Rainer* (G). Lido, 9-VII-1899, *R. Pampanini* (FI). Venezia, IV-1893, *W. Barbey* (G). Venezia to Lido, 29-VII-1868, *F. Parlatore* (FI). Venecia, Vittorio, 3-VII-1893, *R. Pampanini* (FI).

MONTENEGRO: Mjegusi, loco Krstac, VIII-1911, *J. Rohlena* (BM). Odzavibza, VII-1908, *Bierbach* (BM).

PORTUGAL. ALTO ALENTEJO: Elvas, 17-VII-1953, *J.A. Guerra* (MA 246898). Campo Maior, VII-1886, *D. Philippe* (COI). Montemor or Velho, Santa Eulalia, VII-1883, *A. Moller* (COI). Vendas Novas, 15-IX-1948, *R. & A. Fernandes* (COI). BAIXO ALENTEJO: Beja, 1-VII-1978, *Malato-Beliz* & *J.A. Guerra* (MA 246895). BEIRA LITORAL: Coimbra, 17-VII-1982, *A. Marques* (MA 393948). ESTREMADURA: Close Olisiponem, VII-1840, *F. Welwitsch* (G). RIBATEJO: Montegil, Serra do Monte, VII-1892, *A. Moller* (COI). TRAS OS MONTES: Valley of Ponte Nova, between Pinelo and Oteiro, 15-VIII-1926, *J.M. Mirandes* (COI). Vimioso, St. Adriaco, VIII-1917, *J.A. Henriques* (COI).

ROMANIA. Dobrogea, Tulcea, 13-VII-1923, *A. Borza* & *E.I. Nyarody* (G, BM).

RUSSIA. CRIMEA: Oppidi Simpheropol, 27-VII-1977, *V. Vasák* (G 311854). Tauria, Saki Sakskoje, 9-VII-1908, *I. Schivaevsky* (MA 356450, G 23106).

SAN MARINO. M. Carlo, 4-IX-1920, *R. Pampanini* (FI 3527). S. Mustiola, 7-IX-1920, *R. Pampanini* (FI 3528). S. Canamira, 13-X-1916, *R. Pampanini* (FI 3529). M. Titano, 25-VII-1912, *R. Pampanini* (FI 3525).

SPAIN. ÁLAVA: Haro, Salinillas de Buradón, 26-IX-

1983, *G. Montserrat* & *D. Gómez* (JACA 154583). ALBACETE: La Molata, 18-VII-1934, *G. Albo* (MA 136926). ÁVILA: Ávila, 2-VIII-1863, *E. Bourgeau* (G). BADAJOZ: Alburquerque, 2-VI-1992, *F.M. Vázquez* (HSIA). Burguillos del Cerro, 4-X-1986, *F.M. Vázquez* & *J.A. López* (UNEX 7961). Oliva de la Frontera, 14-VI-1989, *I. Montero* (UNEX 10230). Villafranca de los Barros, 20-VII-1992, *F.M. Vázquez* (HSIA). Zafra, 17-VI-1953, *J. Borja*, *A. Rodríguez* & *P. Palomares* (MA 161776). BURGOS: La Quinta, 21-VII-1914, *P. Font Quer* (BC 38691). La Revilla, 24-VII-1979, *A. Pons-Sorolla* & *A. Susanna* (MA 257777). CÁCERES: Between Logrosán and Berzocana, 17-VII-1986, *R. del Arco* & *al.* (UNEX 104). Puebla de Obando, 28-V-1988, *J.A. Devesa*, *P. Gómez* & *M.C. Viera* (UNEX 18901). Santa María de las Lomas, 15-VII-1983, *T. Ruiz* (MA 257778). CIUDAD REAL: Alhambra, Sierra de Alhambra, 7-VII-1987, *C. Monge* & *A. Romero* (MA 506995). Between Almadén and Almadanejos, 3-VI-1955, *D. López* (BC). Monreal del Campo, VII-1894, *F. Benedicto* (BC 38696). CÓRDOBA: Espiel, new Thermic Central, 2-VI-1980, *E. Ruiz de Clavijo* & *J. Varela* (SEV 55400). Pozoblanco, Cortijo Muñoz, 31-VIII-1976, *J.A. Devesa* (SEV 33691). Between Santa Eufemia and Belalcazar, 8-VI-1978, *E.F. Galiano* & *A. Ramos* (SEV 55398). Villanueva del Duque, 13-VIII-1976, *J.A. Devesa* (SEV 33689). HUELVA: Between Aroche and Rosal de la Frontera, 26-VI-1979, *J. Rivera*, *P. Gibbs* & *S. Talavera* (SEV 49675). Reservoir of Aracena, 7-VII-1978, *J. Rivera* (SEV 49679). LEÓN: León, 17-VII-1892, *D.E. Lomax* (MA 136922). MADRID: Escorial, VII-1852, *Isern* (MA 136887). Guadalix de la Sierra, 30-VII-1983, *F. Gómez* (MA 450474). Pinto, 21-X-1978, *R. Morales* (MA 448350). San Agustín de Guadalix, 23-VII-1981, *J.C. Moreno* (MA 388821). SALAMANCA: Guijuelo, 14-IX-1963, *P. Montserrat* (JACA 157163). SORIA: Estepa de San Juan, 16-VIII-1980, *J. Fernández Casas*, *I. Granizow* & *J.P. Zaballos* (G 222996). Soria, 7-IX-1970, *A. Segura-Zubizarreta* (MA 356299). TOLEDO: Los Yebenes, Quintos de Mora, 3-VII-1986, *F. Gómez* (MA 380432). Talavera, river Alberche, 15-XI-1968, *P. Montserrat* (JACA 425468). VALLADOLID: Quintanilla de Trigueros, VII-1962, *G. Cruz* (MA 181991). Portillo, 4-VII-1975, *A.R. Burgaz* (MA 309010). ZAMORA: Close of Miranda del Duero, 27-X-1891, *F. Sennen* (BC-Sennen). Zamora, 6-VIII-1939, *A de Bolòs* (BC 91912). ZARAGOZA: Calatayud, 6-VII-1907, *B. & C. Vicioso* (MA 136916).

SWITZERLAND. Blatte, X-1874, *L. Motelay de Bordeaux* (FI). Dom, 6-VIII-1902, *J. Girod* (G).

TURKEY. Anamur, VI-1872, *A. Peronim* (BM). Ankara, Galatia, 1892, *J. Bornmuller* (G). Anitkaya, VI-1872, *Postian* (BM). Kadiköy, 27-VI-1917, *J. Robert* (G). Trebizond, 7-VII-1934, *E.K. Balls* (BM).

East of Mediterranean

ISRAEL. Jerusalem, 15-VI-1939, *A. Grizi* (BC 145492, FI). Kfar Giladi, Sayda, 27-V-1945, *Z.H. Norris* (BM).

LEBANON. Lake Hula, 23-VIII-1935, *R.F. Jones* (BM).

SYRIA. Al-Biqāā (Litini), 7-VIII-1952, *H. Pabot* (G). Alep, 10-VIII-1895, *E. Peyron* (G). El Hulah, 1863-64, *B.T. Lowne* (BM). Latakia (Al-lād hiqiyah), 24-VI-1952, *H. Pabot* (G).

Mediterranean Islands

CYPRUS. Eno of Komi Kebri, 10, 17-V-1912, *M. Haradjian* (G 294). Kyshaeam, 1880, *C. Rigo* (BM).

2a. *Scolymus hispanicus* subsp. *hispanicus* var. *aggregatus**South of Mediterranean (North Africa)*

MOROCCO. Rabat, Forest of Mamora, 24-V-1994, *M.J. Díaz, M.A. Mateos, E. Moreno, A. Taleb & B. Valdés* (SEV). Ifni, Buchuch, 19-VI-1934, *A. Caballero* (MA 136932). Kenitra, Moulay-Bou-Se-Iham, 27-III-1973, *J. Davis* (BM). Tamanar, 3-VI-1984, *J. Lewalle* (BM).

TUNISIA. Carthage, 28-VII-1932, *R. & L. Oberder* (BM).

North of Mediterranean (South Europe)

CROATIA. Istra, VIII-1900, *V. Engelhardt* (G). Istra, Pula, 18-VII-1901, *Wntely* (G).

FRANCE. ALPES MARITIMES: Niza, 1868, *H. van Heurck* (BC 675318). PYRÉNÉES ATLANTIQUES: Bayona, 1826, *Lefauvaux* (G). PYRÉNÉES ORIENTALES: Pyrennes Orientales, St. Cyprien, 10-VIII-1969, *H.M. Burdet* (G 37870).

GREECE. Thessalia, beach of Kato-Lenomio, 19-VI-1935, *G. Beauverd* (G).

ITALY. CAMPANIA: Paestum, VII-1973, *P. Lucion* (G). LANZIO: Island of Ponza, 26-VII-1966, *Anzalone* (FI). TOSCANA: Island of Elba, Mont Capannello, 27-VII-1972, *R. Barazzano & R. Serra* (FI). Island Pianosa, 15-VIII-1885, *A. Biondi* (FI). Isla Giglio, 27-IX-1894, *S. Somier* (FI). Livorno, in the beach 23-VII-1872, *A. Biondi* (FI). Puerto Ercole, 9-X-1871, *P. Danieli* (FI). Scopietai, Lungo the Greve, 27-VII-1897, *E. Baromi* (FI). VENETO: Venecia, beach, 1847, *F. Parlatore* (FI). Venecia, reservoir to Toledella, 15-X-1882, *A. Fiori* (FI). Venezia to Lido, in the beach, 18-VII-1897, *R. Pampanini* (FI).

PORTUGAL. ALGARVE: Castro Marín, V-1887, *A. Moller* (COI). Faro, VIII-1880, *J. de Guimares* (COI). Manta Rota, 3-VI-1985, *A. Moura* (MA 419078). Mountain of San Miguel, 4-VI-1985, *A. Moura* (COI). Vila Real de San Antonio, IX-1882, *J. de Guimares* (COI). BEIRA LITORAL: Buarcos, Figueira da Foz, 1-X-1882, *A. Moller* (COI). Cape Mondego, IX-1882, *A. Moller* (COI). Coimbra, VII-1882, *A. Moller* (G). DOURO: Pedra Salgada, VI-1881, *C. Johnston* (COI). Porto, Areinho, VII-1891, *J.C. Barbosa* (COI). ESTREMADURA: Lisboa, 26-V-1966, *S. Vantiez* (G). Sesimbra, reservoir of Albufeira, 16-VII-1988, *A. Moura* (MA 479428). Setubal, VII-1892, *A. Moller* (COI).

SPAIN. ALMERÍA: Almería, 18-V-1944, *H. Jerónimo* (MA 348723). Cabo de Gata, 7-VIII-1990, *R. Morales* (MA 486866). BARCELONA: Barcelona, VII-1940, *A. de Bolòs* (BC 99548). CÁDIZ: Barbate, 27-VI-1979, *J. Rivera & S. Silvestre* (SEV 51933). La Línea, 12-VI-1985, *P. Arroyo, J.A. Mejías & S. Talavera* (SEV 115631). Puerto de Santa María, 20-V-1848, *E. Bourgeau* (G). Tarifa, 17-VI-1980, *J. Arroyo* (SEV 62295). LA CORUÑA: Carballo, 29-VII-1964, *B. Bellot & B. Casaseca* (FI). GERONA: Torroella de Montgril, VII-1917, *P. Font Quer & L. Pericó* (BC 38693). HUELVA: El Rocío, Coto del Rey, 21-VI-1977, *E. Valdés, S. Rivas-Martínez, M.*

Costa & S. Castroviejo (MA 245165). MÁLAGA: Nerja to Punta Torrox, 18-VI-1950, *O. de Bolòs* (BC 114280). PONTEVEDRA: Beach of La Lanzada, 9-VIII-1984, *J.R. García* (MA 410971). Villanueva de Arosa, 27-VIII-1988, *E. Lago & L.A. Samartín* (MA 476820). TARRAGONA: L'Hospitalet del Infant, 24-V-1972, *R. Folch* (BC 641681). Salou, 15-VII-1924, *H. Gonzalo* (BC-Sennen).

East of Mediterranean

LEBANON. Ghazir, 10-VI-1957, *H. Pabot* (G).

Mediterranean Islands

BALEARIC ISLANDS. MALLORCA: Port del Inca, 19-VII-1917, *F. Bianor-Marie* (BC 130231, BC 38697). Majorca, VI-1869, *E. Bourgeau* (FI). Port de Soller, 8-VII-1951, without collector (BC 116582).

CORFU, VIII-1962, *P.R.O. Bally* (G 1312447).

CORSE. HAUTE CORSE: Bastia, XI-1869, *G. Puccini* (FI).

CRETE. Island Dionysades, 13-V-1942, *K.H. Re-chinger* (G). Island Karpathos, Tristonio, 17-V-1886, *F. Major* (G).

MALTA. Island of Malta, 7-V-1907, *S. Somier* (FI).

SARDINIA. Pula, 29-V-1883, *C. Marchesetti* (FI).

SICILIA. Palermo, VII-1886, *A. Todaro* (COI, FI).

Macaronesia

CANARY ISLANDS. GOMERA: San Sebastian, 11-III-1973, *A.E. Aldridge* (BM). GRAN CANARIA: Tafire, 25-II-1966, *G. Kunkel* (G 121130). LA PALMA: Bay of the Confital, 25-V-1933, *E. Asplund* (G).

2a. *Scolymus hispanicus* subsp. *hispanicus* var. *aurantiacus**South of Mediterranean (North Africa)*

ALGERIA. Orbal, Orán, V-1921, *Ch. d'Alleizette* (MA 136937).

MOROCCO. El Araix, 13-V-1930, *P. Font Quer* (BC 137289, G). Guedira, 16-IV-1930, *P. Font Quer* (BC 810974). Kenitra, 26-VI-1932-41, *R. Maire* (MPU). Laraix, 26-VII-1930, *P. Font Quer* (BC 810975).

2b. *Scolymus hispanicus* subsp. *occidentalis**South of Mediterranean (North Africa)*

ALGERIA. Alger, 1898, *M. Bove* (G). La Sainite, Alger, 18-VI-1889, *A. Chabert* (FI). Orán, 1850, *G.L. Durando* (FI).

MOROCCO. Alhoceina, Ajdir, 30-VI-1993, *M.J. Díaz, M. Etlafski & B. Valdés* (SEV). Beside main Azrou. Timahdit, 4-VIII-1968, *J.E. Elsley* (SEV 5609). Chefchaouen, between Bab Taza and Bab Berred, 20 km to Bab Berred, 23-VI-1994, *S. Talavera & al.* (SEV). Nador, Planicie of Gereb, 36 km to Selonane, 31-V-1993, *M.A. Mateos & B. Valdés* (SEV). Oujda, between Beni Drar and Ahfir. Col de Guerbourss, 29-V-1993, *M. Etlafski, M.A. Mateos & B. Valdés* (SEV). Between Taourit and El Aioun, 28-V-1993, *M. Etlafski, M.A. Mateos & B. Valdés* (SEV). Taza, 4 km to Guercif, road to Saka, 28-V-1993, *M. Etlafski, M.A. Mateos & B. Valdés* (SEV). Targuist, 15-VI-1927, *P. Font Quer* (BC 38689,

MA 136929). Tnant (Saka), Djebel Menguer, 1-VII-1993, *M.J. Díaz, M. Etlafski & B. Valdés* (SEV). Tetuan, 5-VI-1932, *F. Sennen & H. Mauricio* (BC-Sennen). Tetouan, Beni Hozmar, 10-VII-1971, *M. Dittich* (G 157918).

TUNISIA. Hammam Lif, IV-1909, *J. Pitard* (G). Rhabir (Radi), 3-XI-1913, *D.A. Cuénod* (G).

North of Mediterranean (South Europe)

FRANCE. ALPES MARITIMES: Pégomas, VII-1961, *G. Gavelle* (MA 181992). BOUCHES-DU-RHÔNE: Marseille, IX-1842, *F. Mutel* (MA 155576). HÉRAULT: Montpellier, VII-1890, *S. Perror* (G).

ITALY. LIGURIA: Genova, Castellaccio, 24-VI-1899, *Dilim* (MA 356347). TOSCANA: Arno, to Cascine of Firenze, 8-VII-1958, *A. Contardo* (G 273606). Florencia, IX-1886, *D. Bergeer* (FI). Origin of Fiume to Pisa, X-1875, *Roberti* (FI). Monteferrato, 22-VII-1886, *C. Costa-Rechini* (FI). Pisa, VIII-1858, *P. Savi* (G).

PORTUGAL. ALGARVE: Mountain of Monchique, 29-VI-1978, *Malato-Beliz & J.A. Guerra* (MA 246896). S^a Bras of Alportel, 15-V-1979, *Malato-Beliz & J.A. Guerra* (MA 246894). ESTREMADURA: Bombarral, between Reguengo Grande and Zambufeira, 13-XII-1974 *Malato-Beliz & J.A. Guerra* (MA 246897).

SPAIN. ALBACETE: Hellín, without date and collector (MA 136911). ALICANTE: Barranco, between Polop and Nucia, 9-VII-1933, *M. Martínez* (MA 136915). ALMERÍA: Berja, 11-VI-1967, *P.W. Ball, A.D. Chater, I.K. Ferguson & B. Valdés* (SEV 5607). Rioja-Benahadax, 15-VI-1988, *B. Valdés & al.* (G 415027). BADAJOZ: Monesterio, 15-VI-1991, *F.M. Vázquez & F. Espárrago* (HSIA, holotype). Segura de León, 16-VI-1995, *F.M. Vázquez* (HSIA). BARCELONA: Baladona to Barña, 10-VI-1869, without collector (BC 38690). CÁDIZ: Algodonales, mountain of Lijar, 31-V-1979, *A. Aparicio & al.* (SEV 59365). Benalup de Sidonia, 15-VI-1979, *J. Malto, T. Luque, J.L. Libera & B. Valdés* (SEV 55298). Cádiz, V-1812, without collector (FI). Grazelema, mountain of El Endrinal, 12-VII-1984, *A. Aparicio & S. Silvestre* (MA 469019). Jerez de la Frontera, 28-V-1978, *A. Martínez* (SEV 36984). Between Urbrique and Port Galiz, 14-VII-1978, *J.A. Devesa, J. Rivera & B. Valdés* (SEV 57835). CÓRDOBA: Priego de Córdoba, 14-VIII-1977, *J.A. Devesa* (SEV 42432). Rute, farmhouse of Vichira, 14-VII-1973, *J.L. Ubera* (SEV 52388). Valley of the Guadiato, Las Viejas, 22-VI-1979, *J. Varela* (SEV 52714). GERONA: Cadaqués, VII-1887, *F. Tremols* (MA 136917). Castle of Ampuries, 13-VII-1978, *M. Fragosó* (MA 356403). Peralada, 2-IX-1912, *Codina* (BC 38692). GRANADA: Sierra Nevada, El Veleta, 30-VI-1982, *J. Arroyo, I. Fernández & J. Pastor* (UNEX 1103). GUADALAJARA: Alcolea del Pinar, 6-XI-1971, *P. Montserrat* (JACA 740671). HUELVA: Mountain of Aracena, between Higuera de la Sierra and Valdezufre, 7-VIII-1979, *J. Rivera* (SEV 49677). Between Ayamonte and El Empalme, 18-V-1979, *S. Silvestre & S. Talavera* (SEV 42433). Mazagón to Palos de la Frontera, 26-VI-1979, *P. Gibbs, J. Rivera & S. Talavera* (SEV 44325). Palma del Condado, 30-VII-1992, *M.C. Pérez & F.M. Vázquez* (HSIA). Zufre, 6-VII-1979, *J. Rivera* (SEV 49678). JAÉN: Zumeta-Tobos, 25-VI-1988, *B. Valdés & al.* (G 415262).

MADRID: Madrid, 28-VI-1920, *C. Vicioso* (MA 136885). San Fernando de Henares, VII-1980, *M. Luceño* (MA 448238). Valdemoro, without date, *F. Isern* (MA 136889). MÁLAGA: Antequera, 14-VI-1988, *B. Valdés & al.* (G 415026). Cerro de San Antón, VI-1914, *C. Vicioso* (MA 136921). MURCIA: Cartagena, 14-VII-1901, *F. de P^a Jiménez* (MA 136912). Horticuela, to Pacheco, 1-VII-1874, *R. Codorniu* (BC 675317). Lorca, 20-VI-1929, *F. Sennen & H. Jerónimo* (BC-Sennen). SEVILLA: Alcalá del Río, 4-VI-1973, *E.F. Galiano, S. Talavera & B. Valdés* (SEV 42434). Algámitas, 23-XII-1974, *E. Domínguez & S. Talavera* (SEV 28912). Coripe, 16-VI-1984, *A. Martínez & al.* (SEV 106072). Morón, river Guadaira, 13-VI-1978, *B. Cabezudo, E. Ruiz de Clavijo & S. Silvestre* (SEV 31838). Between Osuna and Martín de la Jara, 6-V-1977, *E. Ruiz de Clavijo* (SEV 28913). Villanueva to Constantina, 2-VI-1984, *I. Aguilera & al.* (SEV 107175). TARRAGONA: Tortosa, 1934, *Gallardo* (BC 125989). TERUEL: La Fuenlabrada, close Orihuela del Tremedal, 2-IX-1936, *P. Font Quer* (BC 642859). Singra. Pass of Singra, 7-X-1978, *P. Montserrat* (JACA 436078). Valdefuentes, sierra de Albarracín, 15-VIII-1936, *P. Font Quer* (BC 642860). Vistasella del Maestrazgo, 17-VII-1981, *J. Vigo* (BC 146530). TOLEDO: Torrijos to Huescas, 11-VII-1982, *S. Laorga* (SEV 91191). VALENCIA: Alcira, IX-1945, *J. Borja* (MA 181990). Alcoi, 10-VII-1958, *A. de Bolós & O. de Bolós* (BC 149674). ZARAGOZA: Ariza, 24-IX-1986, *P. Montserrat* (JACA 579086). Las Cuerlas, 23-IX-1980, *G. Montserrat, J. Ferrer & D. Gómez* (JACA 581680). Gallocanta, 5-VIII-1981, *G. Montserrat* (JACA 493281). Morata de Jalón, 1984, *A. Martínez* (JACA 348485).

Mediterranean Islands

BALEARIC ISLANDS. IBIZA: Santa Eulalia, 2-VII-1918, *E. Gros* (BC 38688). MALLORCA: Mahón, 2-X-1918, *E. Rioja* (MA 136919). MENORCA: Menorca, 1-VI-1985, *A. Charpin & D. Masson* (G 287609).

SARDINIA. Cagliari, Villasimius, cape Carbonera, 3-VI-1983, *A. Charpin, M. Dittich & D. Jeanmonod* (G 235402). Fort of S. Giuliano, Sennori, X-1852, *L. Calden* (FI). Oristano, Marcedi, VII-1899, *U. Martelli* (FI). Pula, 29-V-1883, *C. Marchesetti* (FI).

Macaronesia

CANARY ISLANDS. TENERIFE: Santa Cruz de Tenerife, VI-1900, *C. Sobrado* (MA 136933). GOMERA: Gomera, 6-VI-1973, *G. Kunkel* (G 121131). HIERRO: Valverde, VIII-1900, *C. Sobrado* (MA 136934).

3. *Scolymus grandiflorus*

South of Mediterranean (North Africa)

ALGERIA. Alger, close Komba, 1879, *M. Gandoger* (FI). Arbal, south of Oran, VI-1918, *C.H. Alleizette* (G). Bouira, 4-VI-1971, *J. Davis* (BM). Boukarik (Bou Kadir) (S. Alger), 4-V-1971, *J. Davis* (BM). Coasts of Hemeccen, 12-VI-1856, *U. Martelli* (FI). Constantina, Sidi Meadi, 16-VI-1869, *E.G. Paris* (FI). Constantina, between Esimin of Chelata and Akbou, 28-VI-1879, *H. Duhamel* (G). Kabylie, Jakouren, Azazza, 20-VII-1909, *J.B. Saint-Lager* (G). Plain of the Mitidja, prés Larbah, VI-1850, *P.*

Jamin (G). Plain of the Tlelat Oran, 31-V-1852, *G.L. Durando* (G). Tlemcen, 12-VI-1856, *E. Bourgeau* (G).

MOROCCO. Aidum, (Aioun), 10-V-1931, *F. Sennen & H. Mauricio* (BC-Sennen). Muley-Redrid, 21-V-1932, *F. Sennen & H. Mauricio* (BC-Sennen). Between Oujda and Ahfir, Col of Guerbones, 30-V-1995, *M. Etlaftski, M.A. Mateos & B. Valdés* (SEV). Melilla (Spain), 9-VI-1932, *F. Sennen* (BC-Sennen).

LIBYA. Between Cirene and Apollonia, Ridotta Friuli, 1-V-1934, *R. Pampanini & R. Pichi* (FI, G 9451). Messa (Marsa), 9-V-1934, *R. Pampanini & R. Pichi* (FI).

TUNISIA. Dougga, near Tebourouk, 10-V-1975, *J. Davis & J.M. Lamond* (BM). Kalâa Iriša, V-1910, *C.J. Pitard* (G). Tunes, V-1904, *Hiernod* (G).

North of Mediterranean (South Europe)

FRANCE. PYRÉNÉES ORIENTALES: Collioure, VII-1834, *D. Aenen* (G). Font Carié, 18-V-1902, *L. Verguin* (G). Perpignan, 28-VI-1850, *E. Ayasse* (G).

ITALY. CAMPANIA: Island of Capri, 17-VII-1921, *Gourbenoz* (BM). Salerno, Bovine of Solunto, 9-IX-1895, *S. Sommier* (FI). TOSCANA: Grosseto, Talamore, 15-V-1927, *A. Fiori* (FI).

TURKEY. Estambul, Davout-Pacha, 17-VI-1900, *G.V. Aznavour* (G). Kanli Kavak, 4-VI-1908, *G.V. Aznavour* (G).

East of Mediterranean

LEBANON. Beyrouth (Beirut), 1922, *P. Monterde* (G).

Mediterranean Islands

MALTA. Island of Malta, 7-V-1907, *S. Somier* (FI).

SARDINIA. Sassari, between Alghero and Olmedo, 8-VI-1981, *J. Lambinon & J. Rousselle* (JACA 99486).

SICILIA. Agrigento, IV-1968, *E.C.* (BM). Caltanissetta, V-1890, *I. Giovanni* (FI). Island Pantelleria, 31-V-1906, *S. Sommier* (FI). Lizaenza, V-1898, *Cenalgrandi* (MA 136936). Close Girgenti, V-1873, without collector (FI). Palermo, Mountain Castellaccio, 14-V-1942, *R. Corti* (FI). Palermo, Mountain Pellegrino, 6-V-1983, *A. Charpin, D. Jeanmonod & M. Dittich* (G 235410). Siracusa, Dmironi of Augusta, V-1898, *U. Martinelli* (FI). Sommatino to Compi, VI-1901, *U. Martinelli* (FI).

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