INTRODUCTION

The genus Logfia Cass. was described by Cassini in 1819, based on Filago gallica L. The author carried out a detailed review of the genus Filago L. described by Linnaeus in 1753. In his study, Cassini split the genus Filago into six different taxonomic units [Filago, Gifola Cass., Iflaga Cass., Leontopodium Cass., Logfia and Ogilfa (Cass.) Cass.], which were considered to be morphologically very similar. Thus, believing that they should be taxonomically very close he used mainly anagrams of the word Filago to name them. Traditionally these genera constitute the subtribe Filaginarinae (Bentham, 1873) or the Filago complex (Anderberg, 1991), a very intricate taxonomic group, characterized by a general scarcity of morphological traits traditionally considered useful to delimitate genera and species.

Furthermore, ancient hybridization has been proposed as the most plausible explanation for the incongruence found between phylogenies obtained using different inherited types of DNA (Galbany-Casals & al., 2010), and could also be the cause for the apparent homoplasy or erratical distribution of some character states among the species included in the group. This has probably contributed additionally to obscure the limits among the genera that integrate the Filago complex.

In this regard, one of the most problematic cases is the limit drawn between Filago and Logfia. They have been considered as two independent genera by some authors (Pomel, 1874; Holub, 1975, 1976; Devesa, 1987; Anderberg, 1991), while others have considered that Logfia should be included in Filago (Candolle, 1837; Willkomm, 1870; Smoljaninova, 1959; Wagenitz, 1969, 1980; Bolos & Vigo, 1996; Devesa, 2002; Greuter, 2008). Recently Galbany-Casals & al. (2010) obtained the first phylogeny of the Filago group based in nuclear and plastid DNA sequence data. Two well supported lineages were recovered, one of them includes the genus Logfia together with the North American representatives of the Filago group and the other is composed by the Eurasian representatives of the complex excluding Logfia.

An additional problem is that related with the identity and delimitation of Ogilfa. Since Cassini (1819) described the genera Logfia and Ogilfa they have been considered either synonyms (Candolle, 1837; Battandier, 1888; Wagenitz, 1969, 1980; Anderberg, 1991), or two different taxa (Cosson & Germain, 1843; Willkomm, 1870; Smoljaninova, 1959). The available data on DNA sequences (Galbany-Casals & al., 2010) and genome size (Andrés-Sánchez & al., 2013) support the idea that Ogilfa and Logfia should be considered two independent taxonomic entities. In our opinion, Logfia should be treated as an independent genus, while Ogilfa --composed of Filago arvensis L., F. griffithii (A. Gray) Andrés-Sánchez & Galbany and F. paradoxa Wagenitz-- meres the subgeneric...
The diagnostic characters that help to differentiate *Logfia* from the remainder genera of the *Filago* group are: first leaves of seedlings linear; involucre always present; external receptacular paleae enclosing female florets, which are coriaceous in fruit; corolla of the external female florets slightly laterally tacular paleae enclosing female florets, which are coriaceous attached to a reniform achene, and achene always glabrous (Galbany-Casals & al., 2010).

There is a single chromosome number known for the species of *Logfia*, i.e., $2n = 2x = 28$ (e.g., Fernandes & Queiroz, 1971; Watanabe, 2012; Andrés-Sánchez & al., 2013).

The aim of this study is to elaborate a complete taxonomic account for the genus *Logfia* in the Mediterranean region, which includes detailed descriptions and complete nomenclatural treatments of all taxa, as well as an identification key to the species.

We also cite or provide types for the accepted name of each taxon, as well as for the corresponding most widely used synonyms.

MATERIAL AND METHODS

The overall taxonomic treatment accepted here is that proposed by Galbany-Casals & al. (2010) and Andrés-Sánchez & al. (2011).

We have studied more than 3400 sheets in order to get a precise idea of the morphological variability of the taxa in order to elaborate complete morphological descriptions, reliably delimit the geographical distribution of the species involved and provide typification of some names in order to fix their usage and precise application. The revised sheets are deposited in the following 32 herbaria or collections, listed by their acronyms according to Thiers (2012, continuously updated): ABH, ALME, B, BC, BGN, BM, C, COA, COI, COI-WILLKOMM, G-DC, GDA-GDAC, GOET, JACA, JAEN, K, LINN, LPA, MA, MAF, MG, MJG, MPU, MPU-DELILE, MPU-MAIRE, P, P-LAMARCK, PO, SALA, SEV, W, WU. With the aim of completing the information obtained, we have visited several populations in their natural habitat. We also looked for new populations, mainly of those taxa with restricted or poorly known distribution areas. In total, we have visited more than 80 populations and, at least one sheet from each one was lodged in the herbarium SALA.

Due to the large amount of information obtained, it is shown here only partially. Thus, we provide a list of selected studied material (indication of the locality, collection date, collectors and herbarium number) after the description of each species. Whenever possible we have cited three localities corresponding to each country where the species is present.

For the Iberian Peninsula and the Balearic Islands, three sheets corresponding to each province were listed. This information is indicated in the general distribution of the taxon through abbreviations of the Spanish provinces and Portuguese regions according to the model used in *Flora iberica* (Castroviejo, coord. gen., 1986-2012). For some provinces there is no herbarium material supporting references published in the botanical literature and in these cases the provincial abbreviation is shown in brackets in the chorological summary. Finally we have prepared maps of the selected material with the software DIVA-GIS 7.5.0.

For the nomenclatural section we have examined more than 600 publications including articles, protologues and other taxonomic literature. We have found 45 names for the 4 species included in this study. For each species we have listed the accepted name and all the corresponding homotypic synonyms arranged chronologically, as well as the heterotypic synonyms ordered by date of publication of basionym. All names are accompanied by the author who proposed them together with the place and the date of publication. We have used the following abbreviations whenever necessary: “[basion.]” basyonim, “nom. inval.” invalid name, “nom. illeg.” illegitimate name, followed by a reference to the relevant article of the International Code of Botanical Nomenclature (ICBN, McNeill & al., 2006).

Following the group of names that share the same basionym we cite or provide their type. In each case, we mention the holotype, or the selected lectotype, or neotype. We have selected a lectotype according to Art. 9.2 from the latest edition of the ICBN (McNeill & al., 2006) or a neotype (Art. 9.6 ICBN), whenever necessary. We only mention isotypes and syntypes when we have directly checked them.

TAXONOMIC TREATMENT

*Logfia* Cass.

Annual herbs, unarmed, densely hairy, with indumentum eglandular, villose-tomentose, grayish to gray-whitish, adpressed. Stems erect or ascending, unbranched, branched from the base or dichotomically branched in the inflorescence, in this case cymose in dichiasium, pleoschiasium or monochiasium. Leaves of the stem alternate, ± patent to adpressed, linear to elliptic, entire, acute, with a small scarious brownish mucro, flat to undulate in the margin, sessile; involucrant leaves 2-7, in rosette surrounding the clusters, similar length or clearly longer than the capitula, linear to spatulate, entire, acute, with a small scarious brownish mucro, with the margin straight to undulate and flat to involute. Inflorescence in clusters or solitary capitula, arranged like to cymes: dichiasium, pleoschiasium or monochiasium, sometimes spiciform, lax to ± contracted; clusters with 1-14 capitula, subglobose, lax, some terminals and other axillary. Capitula disciform, heterogamous, sessile or pedunculated, ovoid, with or without marked angles, villose-tomentose. Involucre of 3-5 phyllaries, narrowly lanceolate to elliptic, acute, scarious in fruit, green to brownish with hyaline margin, sometimes purple, glabrous to villose-tomentose on the abaxial face and glabrous on adaxial. Receptacle obconic. Receptacular paleae 8-12, imbricate, apparently arranged in two whorls, ± patent
in fruit; external 3-7, ovate, navicular – deeply or completely enclosing a female floret placed in this axil–, acute to subacute, green with hyaline margin, sometimes purple at the tip, herbaceous in flower and coriaceous in fruit, glabrous to villose-tomentose in the abaxial face and glabrous on adaxial; internal 5-7, lanceolate to elliptic, slightly concave, surrounding together the inner florets, obtuse, green with hyaline margin, sometimes purple at the tip, herbaceous in flower and scarios in fruit, glabrous to villose-tomentose in the abaxial face and glabrous on adaxial. External florets 3-7, female, filiform, corolla slightly laterally attached, whitish-yellowish, with the tip reddish to brownish, entire or slightly lacerated; inner florets of two types: 3-20 female, filiform, similar to external florets but the corolla apically attached; and 2-8 hermafrodite florets, fully fertile, tubular, whitish-yellowish to greenish, with 4 toothed reddish. Anthers with basal appendages. Achenes heteromorphic; external reniform, usually compressed dorsiventrally, brown-olive green, glabrous; inner cylindrical to ellipsoidal, slightly compressed dorsiventrally, brown-olive green, pappillose. Pappus of the external florets absent and of the internal ones always present, with 12-25 white scabrid bristles.

KEY TO THE SPECIES

1. Involucrant leaves linear to linear-lanceolate, clearly longer than the capitula, or sometimes longer than the capitula, with the margin involute; external receptacular palea completely enclosing corresponding floret. ........................................... 1. L. gallica
2. Involucrant leaves lanceolate to elliptic or spatulate, similar length than the capitula, or sometimes longer than the capitula, with the margin flat, rarely slightly involute; external receptacular palea completely enclosing corresponding floret ................................. 2
3. Involucrant leaves with the margin involute; external receptacular paleae completely enclosing corresponding florets ........................................... 1. L. heterantha
2. Capitula solitary, rarely 2-3 grouped together in clusters, pedunculated, rarely sessile; involucrant leaves with the margin slightly undulate; external receptacular palea deeply enclosing corresponding floret ......... ........................................... 4. L. heterantha
2. Capitula in clusters of 1-7, sessile or rarely short pedunculated; involucrant leaves with the margin straight; external receptacular completely enclosing or deeply enclosing corresponding floret ... 2
3. Capitula in clusters of 1-3, with 5 highly marked angles; receptacular paleae 8-10, externally completely enclosing corresponding florets; inner female florets 4-7 ........................................... 2. L. clementei
3. Capitula in clusters of 3-7, rarely solitary, with 5 slightly marked angles; receptacular paleae 10-12, external deeply enclosing corresponding floret; inner female florets 8-15 ........................................... 3. L. minima

Species descriptions


Iconographies. Cosson & Germain (1843: 293, Pl. 13 Fig. A); Reichenbach f. (1854: 36 lam. CMXLVII, fig. 1); Valdés, Talavera & Galiano (eds.) (1987: 26); Fig. 1a; Fig. 2 s-v.

Annual herb densely hairy, with indumentum grayish to gray-whitish. Stems 2-3.3 cm, branched or unbranched. Leaves of the stem 8-28 × 0.2-2 mm, adpressed to ± patent, linear to linear-lanceolate, flat in the margin; involucrant leaves 4.5-4.26 × 0.2-2 mm, clearly longer than the capitula, linear to linear-lanceolate, with the margin straight and involute. Inflorescence in clusters arranged like to dichasium or pleochasium, some of them like to monochasium, usually lax; clusters with 13-14 capitula, lax. Capitula 3.5-5 × 2.5-3 mm, sessile or rarely short pedunculated, with 5 marked angles. Phyllaries 2.25 × 0.5-1 mm, lanceolate to elliptic, green to brownish with hyaline margin, rarely purple at the tip, glabrous to villose-tomentose on the abaxial face. Receptacular paleae 10-12; external 5, 3-5.4 × 1-1.5 mm, completely enclosing the external female floret, acute to subacute, green with hyaline margin, sometimes purple at the tip, coriaceous in fruit, glabrous to villose-tomentose in the abaxial face; internal 5-7, 3-4 × 0.8-1.5 mm, surrounding together the inner florets, obtuse, green with hyaline margin, sometimes purple at the tip, scarious in fruit, glabrous to villose-tomentose in the abaxial face. External florets 5, 2-3 mm, female; inner florets of two types, 8-17 female similar to external florets and 2-6 hermafrodite of 2.5-3 mm. Achenes of the external florets 0.5-1.1 × 0.2-0.5 mm; inner 0.4-0.7 × 0.2-0.5 mm. Pappus of the internal florets with 20-25 bristles. 2n = 28.

Habitat, phenology and distribution (Fig. 3). Ruderal, road margins, fallow lands, culture edges, stony areas, forest or...
scrub gaps, salt marshes, dry riverbeds, soil indifferent; 0-
1800 m. III-VIII. Europe, Macaronesian Islands, N of Africa
and SW of Asia, introduced in the United States, Chile and
India. Distributed almost throughout the Iberian Peninsula
and the Balearic Islands. **Esp.:** A Ab Al Av B Ba Bi Bu C Ca
Cc Co CR Cs Ge Gr H J Le Lo Lu M Ma Mu Na O Or (P) PM
Po S Sa Se Sg So SS T (Te) To V Va Vi Z Za. **Port.:**
AAl Ag BA BAL BB BL DL E Mi R TM. **N.v.:** yerba para las
calenturas; port.: erva do picanço.

**Observations.** Willkomm (1847) described *Filago germanica*
var. *longibracteata* Willkk. from the Iberian Peninsula and later
(Willkomm, 1870) he transferred this variety to *Filago gallica.*
The diagnostic characters proposed for this taxon were: weaker
stems covered by a less dense indumentum than that shown
by the nominated variety, and involucral leaves more than
three times longer than clusters. However, neither morpholog-
ical characters nor distribution areas allow us to clearly dis-
criminate between the two taxa. A detailed study of these char-
acters from both, herbarium and fresh material, together with
the consideration of further diagnostic traits, have showed that
the characters used by Willkomm to describe the var. *longi-
bracteata* are within the range of variability of the species. This
species is very polymorphic and strongly influenced by the en-
vironmental conditions and anthropic pressure.

**Selected material**

**ALBANIA:** Vallona, ad pagum Pogdania prope Suernec, 29-VI-1894, A.
Baldacci (K, P). **ALGERIA:** Gran Kabilia, Mº Djurjura, commune de Aim
Hamma, 19-VI-2010, M. M. Martinez-Ortega, & al. MO5320 (SALA 139152);
Alger, collines, V-1839, N. Bové (K); Alger, près d’Alger, est de la forêt de
Réghaia, 24-IV-1960, A. Dubuis (MPU DUBUIS). **CHILE:** prope la Quinta,
in declivibus, asperisque collium Quillota, 1X-1828/1829, Unio [ittine
Herb. Bertero ne.; Herb. Schultz Bip. (P). **CROATIA:** Istriae, ad oppidum
Pola, VII-1877, J. Freyn – Dr. C. Baenitz, Herbarium Europaeum
(GOET Old Herbarium, WU-Hal-Eur); Medolino Istria, VI, T. Pichler
(MPU). **CY-
PRUS:** Larnaka, Stavrovouni, 15-IV-1991, 429 OPTIMA, Iter Medit. IV (vgl.
Bocconea 11: 35. 1999) (GOET); Region 1, bei Meikle, Akamas-Halbinsel,
am Smiyes-(Smigies) Naturlehrpfad westl. Neo Chorion, VI-1999,
G. Wagenitz 4996 (GOET); Bei Kalapanayiotis (NNW Troodos), 19-IV-1999,
G. Wagenitz 4942 (GOET). **FRANCE:** Corse, Solenzara, Iemkies, 16-VII-
1932, P. Aellen – Flora von Corsica 475 (K); Hérault, Roquehaute, VI-1954,
Herbier Albaille (MPU); Pyrénées-Orientales, östl. vom Canigou, zwischen
Fourques u. Llauro, 8-VI-1974, G. Wagenitz 2569 (GOET). **GERMANY:**
Saarbrück, Saalfelder, 36 Herbarium W. de Schoenefeld (MPU); Baden,
Karlsruhe (GOET); Neuburg, Herb. Vocke (GOET Old Herbarium),
GREECE: Thessalia, Caterinan (prope), 12/24-VII-1877, T. G. Orphanides
(WU-Hal-Grac); Dodecanese, Patmos, in short turf on a headland, SW
coast of the island due W of the Monastery, 6-IV-1969, C.C. Townsend – Flo-
ra of Greece 69/62 (K); Creta, Creta occidentalis au Ennea Horia, VI-1846,
C. Townsend – Flora of Greece 69/62 (K); Creta, Creta occidentalis anu
Ennea Horia, VI-1846, C. Townsend – Flora of Greece 69/62 (K); Creta, Creta occidentalis anu
Ennea Horia, VI-1846, C. Townsend – Flora of Greece 69/62
Fig. 2. Logfia clementei, Garrobiño, Águilas, Murcia (SALA 139202): a, b, habit; c, stem leaf; d, inflorescence; e, involucrant leaf; f, g, capitulum, without phyllaries; h, phyllary; i, hermafrodite floret; j, k, receptacular paleae and female floret; l, external female floret; m, achene of external female floret. L. minima, Villarino de los Aires, Salamanca (SALA 134221): n, cluster; o, involucrant leaf; p, capitulum, without external phyllaries; q, phyllary; r, receptacular paleae and external female floret. L. gallica, entre Breda y Sant Celoni, Barcelona (SALA 139203): s, cluster; t, capitulum, with phyllaries; u, external receptacular paleae, lateral view; v, external receptacular paleae, abaxial view.
Fig. 3. Distribution map of the selected studied material corresponding to Logafia gallica.

Logfia in the Mediterranean region


Iconographies: Fig. 1b, Fig. 2 a-m.

Annual herb densely hairy, with indumentum grayish to gray-whisht. Stems 2-10 cm, branched or rarely unbranched. Leaves of the stem 6-10 × 0.5-1.5 mm, adpressed, linear to linear-elliptic, flat in the margin; involucrum leaves 4-7, 0.5-1.5 × 2-1.5 mm, similar length in the capitula, lanceolate to elliptic, with the margin straight and flat. Inflorescence in clusters arranged like to dichasium or pleochasium in the base, and like to monochasium with short branches and spiciform appearance on the top, ± lax; clusters with 3-5 capitula, lax. Capitula 3-4 × 2.2-5 mm, sessile, with 5 marked angles. Phyllar-

green with hyaline margin, sometimes purple at the tip, coriaceous in fruit, villose-tomentose in the abaxial face; internal 5-6, 2.3 × 0.8-1.1 mm, surrounding together the inner florets, obtuse, green with hyaline margin, sometimes purple at the tip, scarious in fruit, glabrous to subglabrous in the abaxial face. External florets 3-5, 2-2.5 mm, female; inner florets of two types, 4-7 female similar to external florets and 4-7 hermaphrodite of 2.2-2.5 mm. Achenes of the external female florets 0.8-1 × 0.3-0.4 mm; inner 0.6-0.8 × 0.3-0.4 mm. Pappus of the internal florets with 12-25 bristles. 2n = c. 28.

Habitat, phenology and distribution (Fig. 4). Ruderal, road margins, fallow lands, stony areas, terophytic pastures in forest or scrub gaps, salt marshes, dry riverbeds, limestone or chalky; 0-1700 m. III-VI. Iberian Peninsula, Canary Islands, Morocco and Algeria. SE of the Iberian Peninsula. Esp.: Al Gr Mu.

Observations. Willkomm in Prodomus Florae Hispaniae (1870) proposed L. clementei and Filago ramosissima Lange as synonyms. This mistake could be caused by the fact that the sheet of F. ramosissima (COI 00035430) revised by Willkomm is a duplicate of a collection of Lange in Barranco Bermejo (Granada) and, in fact, the material lodged in this sheet corresponds to L. clementei. Moreover both taxa are macro-morphologically very similar, as evidenced by the fact that Lange mixed material of both species in his own collections of F. ramosissima, as we have verified while revising the herbarium materials lodged at CA as well as in the herbarium sheet that was sent by Lange to Willkomm.

Later, Maire (1935) and Wagenitz (1968) mentioned and cleared this mistake on the basis of morphological characters. Recent molecular studies (Galbany-Casals & al., 2010) support this idea: they are two independent species, that even belong to two different genera.

The typification of L. clementei is also problematic. Wagenitz (1968) suggested that the possible type of this taxon could be lodged at MA. But, according to Art. 7.10 of the ICBN (McNeill, 2006), Wagenitz did not definitively typify this species because he did not checked whether the sheet collected by Clemente was effectively deposited at MA. We have found three sheets that can be considered relevant material for the typification of the name F. clementei, two of them lodged at MA and the other one at COI. We chose as lectotype the sheet COI 00035429 because it is included in the herbarium of the author who first described the taxon.

Selected material


Iconographies: Reichenbach f. (1853): 27, lam. CMXLVI, fig. I, sub Ogila minima); Valdés, Talavera & Galiano (eds.) (1987: 27); Fig. 1c; Fig. 2 n-r.

Annual herb densely hairy, with indumentum grayish to gray-whitish. Stems 2.5-30 cm, branched or unbranched. Leaves of the stem 1-11(20) × 0.5-2.5 mm, ± adpressed, linear to lanceolate, flat in the margin; involucrata leaves 2.5-2.10 × 0.5-1.5 mm, similar length than the capitula, lanceolate to el- liptical, with the margin straight and flat. Inflorescence in clusters arranged like to dichasium or pleochasium, some of them like to monochasium, sometimes spiciform, usually lax; clusters with (1)3-7 capitula, lax. Capitula 2.5-4 × 1.5-3 mm, sessile or rarely short pedunculated, with 5 slightly marked angles. Phyllaries 0.5-1.5 × 0.5-1 mm, narrowly lanceolate to el-

Fig. 4. Distribution map of the selected studied material corresponding to Logfia clementei.
lipic, green with hyaline margin, exceptionally pure at the tip, villose-tomentose on the abaxial face. Receptacular paleae 10-12; external 4-5, 3-3.5 × 1-1.5 mm, deeply enclosing the external female floret, acute to subacute, green with hyaline margin, exceptionally pure at the tip, coriaceous in fruit although less rigid than in the other species, villose-tomentose in the abaxial face; internal 5-7, 2-3 × 0.5-1.5 mm, surrounding together the inner florets, obtuse, green with hyaline margin, exceptionally pure at the tip, scarious in fruit, glabrous to villose-tomentose in the abaxial face. External florets 4-5, 2-3 mm female; inner florets of two types, 8-15 female similar to external tomentose and 2-6 hermaphrodite of 2-3 mm. Achenes of the external florets 0.8-1 × 0.2-0.4 mm; inner 0.5-0.8 × 0.2-0.3 mm. Pappus of the internal florets 15-20 bristles. 2n = 28, n = 14.

Habitat, phenology and distribution (Fig. 5): Ruderal, road margins, fallow lands and culture edges, sandy soils, forest or scrub gaps, terophytic pastures, soil indifferent; 0-2800 m. III-VIII. Europe from the Iberian Peninsula to Russia, Macaronesian Islands and N of Africa from Morocco to Libya. Distributed almost throughout the Iberian Peninsula. And. Esp.: A Ab Al Av Ba Bi Bu Ca Ce Co CR Cu Ge Gr Gu H Hu J L Le Lu Ma (Mu) Na O Or Po P So Sg So (SS) T Te To V Va Vi Z Za. Port.: AAL Ag BA BAI BB BL DE LI TM. N. V.: tacillas de algodón.

Selected material


Distribution map of the selected studied material corresponding to Logfa minima.
León: Ponferrada, Montes de Valdende (Montes Aquilanos), 30-V-1979, J. Tempuro ET222 (MAL 31629); Castro del Condado, 24-VI-1969, J. Andrés (MAL 568983); Soto de Valdevel, 24-VI-1978, C. García González 790 (JACA 87888).


Segovia: Cuéllar, Casa Forestal de Fuentemacanda, 10-VI-31 (MAL 57543); Abla, 30-V-1971, E. Cano (MAL 623561); Potes, de Potes al Monasterio de Santa Toribia de Liébana, 6-VIII-1971, T. Salazar & B. Valdés (MAL 15337); Sierra de las Nieves, 9-VII-1930, F. Martín & C. Aedo (MAL 123785); Aravell, sobre el Ulas d'Enoqueta, Alt Uesca, 28-VII-1984, F. Masclans (MAL 589586).
An annual herb densely hairy, with indumentum grayish to gray-whitish. Stems 2-3 cm, branched or unbranched. Leaves of the stem 5-15 x 1-2.5 mm, ± adpressed, linear-elliptic to linear-spatulate, slightly undulate in the margin; involucrant leaves 2-3, 3-10 x 1-2.5 mm, similar length to clearly longer than the capitula, lanceolate to spatulate, with the margin slightly undulate and flat to slightly involute. Inflorescence of solitary capitula, sometimes clusters, generally arranged like to monochasium with short branches and spiciform appearance, rarely like dichasium of pleochasium, ± contracted; clusters when they are present with 2-3 capitula, lax. Capitula 3.5-5 x 2.5-4 mm, pedunculated or rarely sessile, with 5 marked angles. Phyllaries 1.5-2.8 x 0.5-1 mm, lanceolate to elliptic, green or brownish with hyaline margin, never purple at the tip, villose-tomentose on the abaxial face. Receptacular paleae 10-12, 5-7, 3-4 x 1-1.5 mm, deeply enclosing the external female floret, acute to subacute, green with hyaline margin, never purple at the tip, scarious in fruit, glabrous to villose-tomentose in the abaxial face; internal 5-6, 1.5-3 x 0.8-1 mm, surrounding to one-third of the female floret, obtuse, green with hyaline margin, never purple at the tip, scarious in fruit, glabrous to villose-tomentose in the abaxial face. External florets 5-7, 2-3 mm, female; inner florets of two types, 3-20 female similar to external florets, obtuse, green with hyaline margin, never purple at the tip, scarious in fruit, glabrous to villose-tomentose on the abaxial face; internal 5-6, 1.5-3 x 0.8-1 mm, surrounding to one-third of the female floret, obtuse, green with hyaline margin, never purple at the tip, scarious in fruit, glabrous to villose-tomentose in the abaxial face. Achenes of the external female florets 0.8-1.3 x 0.3-0.6 mm; inner 0.8-1.6 x 0.2-0.4 mm. Pappus of the internal florets with 15-25 bristles.

Habitat, phenology and distribution (Fig. 6). Terophytic pastures in open areas, ruderal, forest or scrub gaps, preferably on basic substrate; 600-1900 m. V-VII. Corsica, Sardinia, Sicily and N of Africa from Morocco to Tunisia.

Observations. According to Staefe & Cowan (1983), the Rafinesque’s herbarium and his types, are lodged mostly at the herbarium P-DU, although some material is also lodged at DWC, FI, G, G-DC, LE, NAP, NY, P, PH, PI, W, WIS and WS. We have sought material of Gnaphalium heteranthum Raf. in all these herbaria but we didn’t succeed. For this reason we propose a neotype for this taxon. We chose a sheet containing material collected in Sicily, SALA 106783, because it is the population used by Galbany-Casals & al. (2010) for the molecular phylogenetic analyses and because this population grows near the populations cited by Rafinesque in the protologue. Finally there are duplicates of this sheet in other herbaria as MA, PAL and VAL.

Selected material


ACKNOWLEDGEMENTS

We are grateful to J. Castillo for the careful elaboration of the drawings shown in Figure 2, which were kindly transferred from Flora iberica, and to Dr. A. Marrero who has confirmed the presence of Logfia heterantha in the Canary Islands. Many thanks go also to the curators of the herbaria mentioned under Material and Methods and in the Observations section corresponding to Logfia heterantha. Regarding this species, we would like to express our deep gratitude to Dr. A. Freire-Fierro who searched for us the protologue by Rafinesque in the library of the Academy of Natural Sciences of Philadelphia (USA). This work fits within the project Flora iberica and has been supported by the Spanish Ministry of Science and Innovation (Ministerio de Ciencia e Innovación) through projects CGL2005-05471-C04-03, CGL2008-02982-C03-02/CLI and CGL2009-07555 and by the Regional Government of Castilla y León (Junta de Castilla y León) through the project SA142A08. The first author was supported by a research grant (reference BES-2006-11909) financed also by the Spanish Ministry of Science and Innovation.

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Evax, Filago & Logfia, in Lybia Flora

Fig. 6. Distribution map of the selected studied material corresponding to Logfia heterantha.


Associate Editor: Juan A. Devesa

Received: 30-XI-2012

Accepted: 7-II-2013
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