Study of Some European Wild Hybrids of Erica L. (Ericaceae), with Descriptions of a New Nothospecies: Erica ×Nelsonii Fagúndez and a New Nothosubspecies: Erica ×Veitchii Nothosubsp. Asturica Fagúndez

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Source: Candollea, 67(1) : 51-58

Published By: The Conservatory and Botanical Garden of the City of Geneva (CJBG)

URL: https://doi.org/10.15553/c2012v671a7

Study of some European wild hybrids of Erica L. (Ericaceae), with descriptions of a new nothospecies: Erica ×nelsonii Fagúndez and a new nothosubspecies: Erica ×veitchii nothosubsp. asturica Fagúndez

Jaime Fagúndez

Abstract

FAGÚNDEZ, J. (2012). Study of some European wild hybrids of Erica L. (Ericaceae), with descriptions of a new nothospecies: Erica ×nelsonii Fagúndez and a new nothosubspecies: Erica ×veitchii nothosubsp. asturica Fagúndez. *Candollea* 67: 51-57. In English, English and French abstracts.

Wild hybrids issued from crossing European species of genus *Erica* L. are described. The close study of the type material of *Erica* ×*lazaroana* Rivas Goday & Bellot (*Erica arborea* L. × *Erica umbellata* L.) shows that it should be regarded as a new synonym of *Erica arborea*. *Erica* ×*nelsonii* Fagúndez (*Erica cinerea* L. × *Erica tetralix* L.), a new nothospecies from Ireland, is described from herbarium material. *Erica* ×*veitchii* nothosubsp. *asturica* Fagúndez (*Erica arborea* × *Erica lusitanica* subsp. *cantabrica* Fagúndez & Izco) is also described. A study of seed micromorphology shows evidence of hybridization between *Erica tetralix* L. and *Erica ciliaris* L.

Key-words

ERICACEAE – *Erica* – Hybridization – Seed morphology – Taxonomy

Résumé

FAGÚNDEZ, J. (2012). Etude de quelques hybrides sauvages européens d'Erica L. (Ericaceae) avec les descriptions d'une nouvelle nothoespèce: Erica ×nelsonii Fagúndez et d'une nouvelle nothosous-espèce: Erica ×veitchii nothosubsp. asturica Fagúndez. *Candollea* 67: 51-57. En anglais, résumés anglais et français.

Des hybrides sauvages issus du croisement d'espèces du genre *Erica* L. sont décrits. L'étude détaillée du matériel type d'*Erica* ×*lazaroana* Rivas Goday & Bellot (*Erica arborea* L. × *Erica umbellata* L.) indique que ce type doit être inclus dans *Erica arborea* comme nouveau synonyme. *Erica* ×*nelsonii* Fagúndez (*Erica cinerea* L. × *Erica tetralix* L.), une nouvelle nothoespèce, est décrite sur la base de matériel type issu d'Irlande. *Erica* ×*veitchii* nothosubsp. *asturica* Fagúndez (*Erica arborea* × *Erica lusitanica* subsp. *cantabrica* Fagúndez & Izco) est aussi décrite. Une étude micromorphologique des graines permet de mettre en évidence une hybridation entre *Erica tetralix* L. et *Erica ciliaris* L.

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Submitted on September 16, 2010. Accepted on March 20, 2012. Edited by P. Bungener

Introduction

Erica L. *(Ericaceae)* is a large genus of over 850 species according to the most recent assessments (Oliver, 2000). The genus has a remarkable geographic distribution, with a north-south range from Scandinavia to South Africa (Oliver, 2000; Stevens & al., 2004). There is also a high morphological variability on plant habit, vegetative characters, indumentum, corolla size and type, fruit type, pollen or seeds (Stevens & al., 2004). Hybridization on the genus has been known since the description by Bentham (1839: 665) of *Erica* ×*watsonii* Benth. as the cross of the European species *E. ciliaris* L. and *E. tetralix* L. Since then, three more hybrids have been described from wild populations and several others from garden plants or artificial crosses (Griffiths, 1985). Hybridization has been recorded for several species of the Cape (Oliver, 1986) and some hybrids between European species, Cape species and even between Cape and European species have been produced for gardening purposes (Nelson & Oliver, 2004). However, hybridization within *Erica* is low, and only few crosses have been described considering the large number of species of the genus with a sympatric geographic distribution. It is remarkable that most of the hybrids are formed by only a few species that are involved in more than one cross. This is the case for the Cape hybrids (Oliver, 1986), and also for the European species for which *E. tetralix* is one of the parents of three recognized hybrids. In this paper, the status of several crosses from the study of original material is discussed, and one new hybrid is described.

Results and discussion

1. ***Erica*** ×***lazaroana*** Rivas Goday & Bellot (*E. arborea* L. × *E. umbellata* L.) in Anal. J. Bot. Madrid 6: 152. 1946.

   Lectotypus (designated by Pizarro Domínguez, 2007): **Spain. Jaén:** "Habitat cum E. arboreae et umbellatae, in quercetis suberis, inter Santa Elena et Aliseda, in montibus Marianis", 11.V.1941, *Rivas Goday & Bellot s.n.* (MAF [20627]).

   = *Erica arborea* L., Sp. Pl.: 353. 1753 (lectotypified by Jarvis & McClintock, 1990: 517).

The original description of this hybrid does not propose a type specimen. However, the authors' material is found in MAF, and one single specimen is labelled as *E.* ×*lazaroana.* The locality is the same as what is mentioned in the protologue, so there is no doubt that this specimen should be considered the type. A copy of the description, probably by the authors, is included with the specimen. It lacks a latin diagnosis, but the authors refer to *E. umbellata* var. *subcampanulata* DC. as a synonym of *E.* ×*lazaroana*. This variety was described as having a *"Corola fauce apertiore, staminibus brevioribus"* (Bentham, 1839: 666), from south Spain.

The main features to differentiate this hybrid from its parents are: (1) from *E. arborea*, shorter flower pedicels, exerted style with a subbifidous stigma, campanulate corolla and an oblong, congest synflorescence with flowers in umbels, and (2) from *E. umbellata*, the higher habit, included anthers and non urceolate corolla. There is also a description that mentions these characters and the apendiculate anthers and curved leaves. After a close study of the cited specimen and the description proposed, we conclude that *E.* ×*lazaroana* is a form of *E. arborea*, with no characters that could resemble *E. umbellata* other than the number of flowers in each umbel, which is high for *E. arborea*, and the congested synflorescence. Presence of divided hairs on the stems, coloured saccate calyx, the whitish, shortly campanulate corolla, included apendiculate anthers, capitate stigma and every other character are those of *E. arborea*. Therefore, a new synonymy is made here.

The authors also mention the occurrence of hybridisation between *E. arborea* and *E. scoparia* L. in the area but no description or new name is proposed for this cross. Moreover there is no material deposited at MAF identified by the authors as this possible hybrid. The locality of the type specimen, described in detail by Rivas Goday & Bellot Rodríguez (1946), was prospected in May 2009. No intermediates were found for any of these heathers.

Specimens examined. – (sub. *E. arborea*). **Spain. Jaén:** Santa Elena, road to La Aliseda, 38º20'21''N 3º34'1''W, 730 m, 9.V.2009, *Fagúndez 3119, 3120, 3121* (SANT).

2. ***Erica*** ×***nelsonii*** Fagúndez (*E. cinerea* L. × *E. tetralix* L.), **nothosp. nova** (Fig. 1).

   Hybrida ex E. cinerea et E. tetralix genita, caulibus pilis simplicibus, sine pilis multiseriatis glanduliferis, foliis marginibus partim revolutis, floribus in umbellis terminalibus axillarisque dispositis, corolla apice pubescenti, antheris appendiculis longis, ovario sparse pubescenti.

   Holotypus: Ireland. Galway: West Galway (Watsonian vice H16) 1.5 miles from Roundstone junction along the link road to Clifden. Edge of eroded peat at side of lough, 31.VIII.1964, *P. F. Hunt 1636* (K, upper left fragment).

Low shrub, ramified from the base. Stems glabrous or with some simple, woolly hairs at the apex. Leaves in whorls of 3 in young twigs and 4 in mature stems, patent or slightly erect in the upper part, 2-3 mm, ovate, with half-rolled margins on the base, some slightly curved, glabrous or almost in the adaxial surface, abaxial surface with some hairs on the midrib. Axillary fascicles of leaves sometimes present. Inflorescence a terminal umbel of 4-10 flowers. Synflorescence one to several umbels, these at the apex of long lateral branches and at the end of short branches below the apex. Hairy pedicels

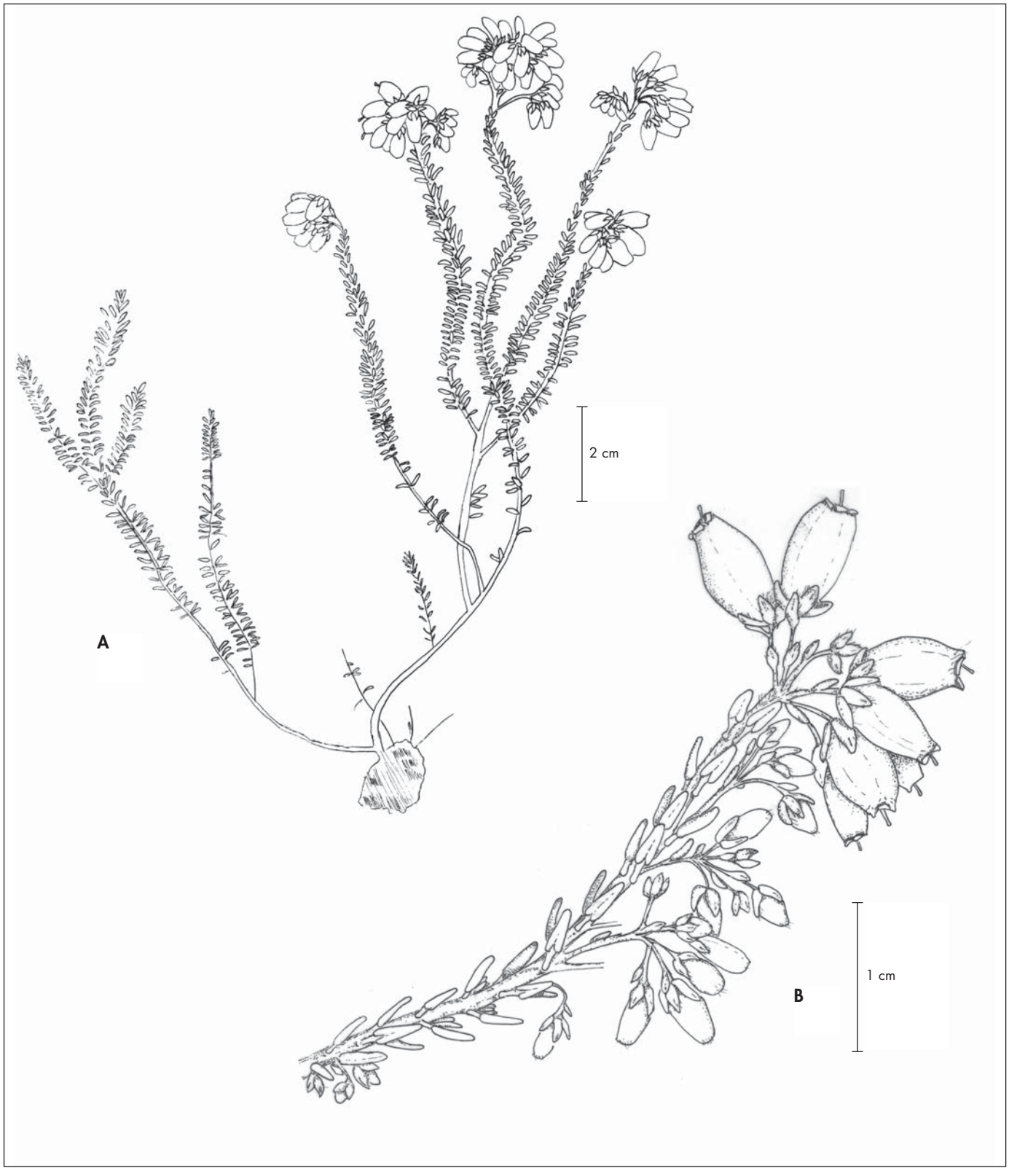

Fig. 1. – *Erica* ×*nelsonii* Fagúndez. **A.** Synflorescence of upper left fragment (typus); **B.** General view of upper right fragment.
[*P. F. Hunt 1636*, K] [Drawn by the author]

with simple hairs, bract and bracteoles leaf-like but reduced in size, the bract half way on the pedicel and bracteoles right below the calyx. Corolla pink, broadly urceolate, 6-7 mm with some long, simple hairs below the lobes. Ovary with some sparse hairs, mostly at the apex. Stamens with filaments geniculate below the anthers, these with slightly curved appendages, with some broad teeth on margins.

Dedicated to Ernest Charles Nelson (born in Belfast, 1951), a well-known Irish botanist with much interest and research done on European heathers.

The main differences between the new nothospecies and its parents are shown on Table 1. It can be easily distinguished from both by its sparsely hairy ovary, from *E. cinerea* by its corolla and leave shape and the hairs on its corolla and from *E. tetralix* by the synflorescence arrangement and the lack of glandular, multiseriate hairs on leaves and stems. Leaves are 3-nate as in *E. cinerea* or 4-nate as in *E. tetralix*, in some stems the number of leaves per whorl is not clear.

This material was originally labelled as *E. cinerea* by P. F. Hunt, but recognized as a possible hybrid by R. Ross in 1973. He stated in a note "probably a hybrid? *E. cinerea* × *E. mackaiana* or *E. cinerea* × *E. tetralix*". A close study of the three plants on the sheet clearly shows that this is a hybrid. *E. cinerea* and *E. mackayana* Bab. both have a glabrous ovary therefore these cannot be the parents, as the hybrid has a hairy ovary although not as dense as in *E. tetralix* type. Leaves have some similarities with those of *E. mackayana*, with no simple hairs, but it lacks the pluricellular, multiseriate glandular hairs that characterize the leaves of *E. mackayana*. These are also found in *E. tetralix*, sometimes eglandular.

The locality of the type was intensely prospected in August 2009 but no plants with these intermediate characters were found.

Several natural hybrids involve *E. tetralix*: *E.* ×*watsonii* *(E. ciliaris* × *E. tetralix), E.* ×*stuartii* (MacFarl.) Mast. *(E. mackayana* × *E. tetralix)* or *E.* ×*williamsii* Druce *(E. vagans* L. × *E. tetralix).* The only one that may involve *E. cinerea* is the artificial hybrid raised by K. Kramer *E.* ×*arendsiana* E. C. Nelson (Nelson, 2008) formed with *E. terminalis* Salisb., a species with no clear systematic position, but somewhat close to *E. cinerea* according to some features such as seed morphology (Fagúndez & Izco, 2009). Sturm (1901: 219) mentions the existence of the *E. tetralix* and *E. cinerea* cross in England but this is most probably a mistaken record (Griffiths, 1985).

Specimens examined. – (sub. *E. tetralix*). **Ireland. Co Galway:** Connemara, North margin of Ballynalinch Lake, 53º27.993'N 9º49.858'W, 110 m, 2.VIII.2009, *Fagúndez 3172, 3173, 3175* (SANT); "The bog road" between Roundstone and Clifden, 53º26.625'N 9º55.707'W, 70 m, 2.VIII.2009, *Fagúndez 3182, 3183* (SANT); North face of Mnt. Errisbeg, near Nawleney Lake, 53º24.363'N 9º58.531'W, 40 m, 3.VIII.2009, *Fagúndez 3188, 3189* (SANT); South margin of Ballynalinch Lake, road side near the castle, 53º27.096'N 9º52.194'W, 170 m, 2.VIII.2009, *Fagúndez 3191* (SANT).

(sub. *E. cinerea*). **Ireland. Co Galway:** Connemara, North margin of Ballynalinch Lake, 53º27.993'N 9º49.858'W, 110 m, 2.VIII.2009, *Fagúndez 3171, 3174* (SANT); North face of Mnt. Errisbeg, near Nawleney Lake, 53º24.363'N 9º58.531'W, 40 m, 3.VIII.2009, *Fagúndez 3185* (SANT); South margin of Ballynalinch Lake, road side near the castle, 53º27.096'N 9º52.194'W, 170 m, 2.VIII.2009, *Fagúndez 3190* (SANT).

Table 1. – Main differences between *Erica* ×*nelsonii* Fagúndez and its parents.

	***E. cinerea* L.**	***E.* ×*nelsonii* Fagúndez**	***E. tetralix* L.**
Inflorescence	Umbels of 1-4 flowers in very short lateral branches and at the end of the main branch	Umbels of 4-10 flowers at the end of long branches and some very short branches near the apex	Umbels of 8-12 flowers at the end of long lateral branches
Indumentum	Some short unicelular hairs in young stems. Leaves glabrous	Some short to long hairs in stems, pedicels and sepals. Leaves nearly glabrous	Long, woolled simple hairs and pluricelular, glandular, multiseriate hairs in stems, leaves, pedicels and sepals
Leaves	3-nate, totally revolute, no abaxial surface visible	3-nate in young twigs, 4-nate half revolute, abaxial surface at least partially visible	4-nate, half revolute, abaxial surface at least partially visible
Corolla	Urceolate or tubular-urceolate, 4-6 mm, glabrous	Broadly urceolate, 6-7 mm, hairy at the top	Broadly urceolate, 6-8 mm, glabrous or hairy at the top
Calyx	Sepals acute with a scarious margin	Sepals rounded at top, without a scarious margin	Sepals rounded at top, without a scarious margin
Anther appendages	Straight, shorter than tecae, spinulose	Almost straight, longer than tecae, toothed	Mostly curved, longer than tecae, smooth or with 1-3 teeth
Ovary	Glabrous	Sparsely hairy	Hairy

3. ***Erica* ×*veitchii*** nothosubsp. ***asturica*** Fagúndez (*E. arborea* L. × *E. lusitanica* subsp. *cantabrica* Fagúndez & Izco), **nothosubsp. nova**

Typus: Spain. Oviedo: (sub. *E. arborea*), Candamo, Laracha, 29TQJ4010, 105 m, 8.IV.2002, *J. J. Lastra s.n.* (holo-: SANT [47856]; iso-: LIST!).

Hybrida ex E. arborea et E. lusitanica subsp. cantabrica genita, caulibus pilis simplicibus non pilis divisis, floribus bractea et bracteola ad basim pedicelli instructis, corolla 3-3.5 mm, filamentis staminorum glabris, antheris 0.8 -1 mm appendiculis spinulosis.

This hybrid was proposed in Fagúndez (2006) but the name *E. lusitanica* subsp. *cantabrica* Fagúndez & Izco was only validly published one year later (Fagúndez & Izco, 2007). The type for *E.* ×*veitchii* Bean has been proposed by Nelson (2008) and it should apply to nothosubsp. *veitchii*. *E.* ×*veitchii* was described by Bean (1905) based on a plant discovered in a nursery in Exeter (UK). Its parents were plants cultivated at the nursery; none of the species are native in the UK. The first reference to this cross was provided by Laguna (1883), but there is no reference material and no name was proposed. I have studied some material labelled as the cross of *E. arborea* and *E. lusitanica* Rudolphi from different herbaria. All of these turned out to be within the variability of *E. arborea*.

Specimens examined. – (sub. *E. arborea*). **Spain. León:** Ancares, 1973, *Benítez* (COA [21331] [labelled *Erica* ×*veitchii,* det. Pujadas 1996]). **Jaén:** Valles del Linarejo, 5.III.1967, *Ladero* (MAF [118272] [labelled *Erica arborea* × *E. lusitanica*]). **Cáceres:** Sierras de Altamira y Carbonera, 5.IV.1967, *Ladero* (MAF [147963 [labelled *Erica arborea* × *E. lusitanica*]).

4. Cross-pollination of *Erica tetralix* and *E. ciliaris*

During the study of seed morphology of *E. tetralix* and related species (Fagúndez & Izco, 2009) one of the samples collected from an *E. tetralix* population clearly differed from the rest of the population with respect to the shape of the seeds and secondary sculpture. The seed morphology and details of the secondary ornamentation of this sample and a regular population of *E. tetralix* and *E. ciliaris* are shown in Fig. 2. The seeds of *E. tetralix* are ovoid or ellipsoid, of ca. 0.4 mm, with a reticulate primary ornamentation and a smooth to vermiculate secondary sculpture of outer periclinal walls (Fagúndez & Izco, 2009). The seeds of *E. ciliaris* are similar in size, but with an oblong-ellipsoid shape, a very faintly reticulate pattern and an indented secondary ornamentation (Fagúndez & Izco, 2009). In this intermediate population, seeds are largely ellipsoid or ovoid, with a slightly reticulate pattern and an indented secondary ornamentation.

The parent plants were studied and the population was visited at the same locality in flowering time (Cercedo, July 2007, see specimens studied). This population is part of a humid heathland with *Ulex* L. where *Erica ciliaris* is abundant and *E. tetralix* occurs whenever soils are moist. The plants are *E. tetralix* with no intermediate characters. Thus, we conclude that these seeds are product of the pollination of *E. tetralix* plants with pollen from *E. ciliaris*.

Erica ×*watsonii (E. ciliaris* × *E. tetralix)* is the most common of the European hybrids, described by Bentham (1839: 665) from plants found by H. Watson and well known in the British Isles (Hooker & Arnott, 1850: 255) and France (Neyraut, 1900; Rouy, 1908: 109). There are also references from the Iberian Peninsula (Pereira-Coutinho, 1939: 550; Bayer, 1993: 506) although we have not found any material or precise localities. In the British populations of *E. ciliaris*, where *E.* ×*watsonii* is common, a very low percentage of seedlings have intermediate values for *E. ciliaris* and *E. tetralix* and may produce hybrid plants (Rose, 2007). In Spain no intermediates are commonly found although both species coexist in many localities (pers. obs.).

The indented surface in the secondary sculpture of the *E. ciliaris* seeds is uncommon for the European species of the genus. We have only recorded this feature in *E. ciliaris* and some populations of *E. sicula* Guss. (Fagúndez & Izco, 2011). The outer periclinal walls of the testa cells are collapsed to the inner walls that present pits, allowing the cell surface to display this indented pattern.

Specimens examined. – (sub. *E. tetralix*). **Spain. Pontevedra:** Cercedo, Quireza, 42º34'48''N 8º27'54''W, 690 m, 28.IX.2006, 2.VIII.2007, *Fagúndez 3266* (SANT). **A Coruña:** Carnota, O Pindo, 11.XI.1999, *Fagúndez s.n.* (SANT-BG [119]). **Ciudad Real:** Cabañeros, 2.X.2000, *Fagúndez s.n.* (SANT-BG [211]).

(sub. *E. ciliaris*). **Spain. Cádiz:** Los Alcornocales, 25.IX. 2002, *Fagúndez & Reyes s.n.* (SANT-BG [266]).

Portugal: Matas de Faia, 11.IX.2001, *s.coll.* (SANT-BG [273]).

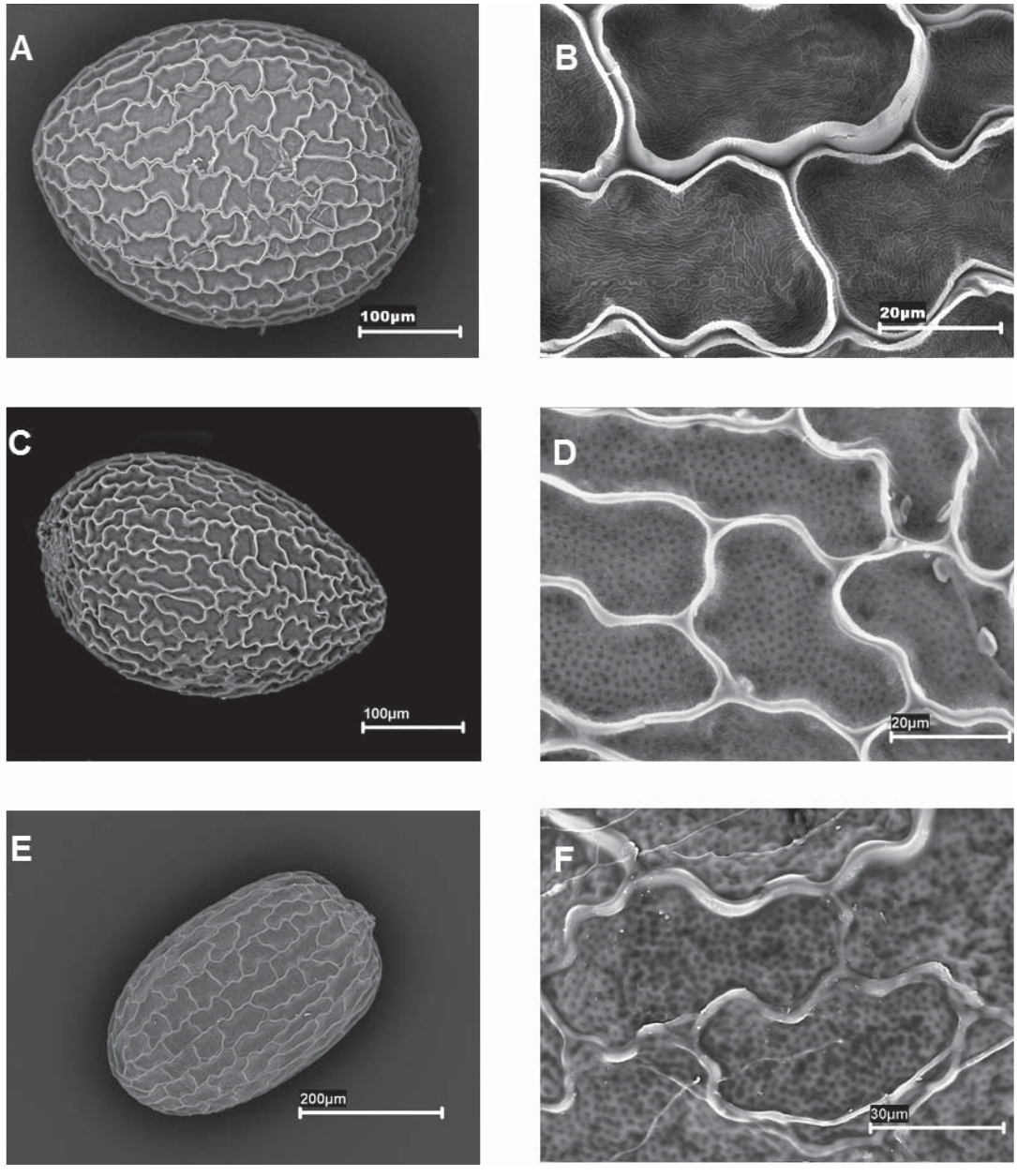

Fig. 2. – Seeds of different species of *Erica* L. **A:** *Erica tetralix* L.; **B:** *E. tetralix* (detail of surface cells); **C:** *E. tetralix* × *E. ciliaris*; **D:** *E. tetralix* × *E. ciliaris* (detail of surface cells); **E:** *E. ciliaris* L.; **F:** *E. ciliaris* (detail of surface cells).

[**A:** *Fagúndez s.n.*, SANT-BG [119]; **B:** *Fagúndez s.n.*, SANT-BG [211]; **C-D:** *Fagúndez 3266*, SANT; **E:** *Fagúndez & Reyes s.n.*, SANT-BG [266]; **F:** *Fagúndez & Reyes s.n.*, SANT-BG [273]]

Acknowledgements

I wish to acknowledge the curators of the consulted herbaria and J. Izco from University of Santiago de Compostela. Latin translation by M. A. Garland. The journal reviewers and editor made useful comments. This work was partially supported by the Science and Education ministry of Spain (project CGL2006-06890).

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