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# Phycological biodiversity at the Natural Park Serra da Enciña da Lastra (Ourense, Spain)

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**Abstract**

López Rodríguez, M.C., Leira Campos, M. & Carballeira Coego, R. 2016. Phycological biodiversity at the Natural Park Serra da Enciña da Lastra (Ourense, Spain). *Anales Jard. Bot. Madrid* 73(1): e036.

We have studied the phycological diversity at the Natural Park of Serra da Enciña da Lastra (Ourense, Spain) and present here the algae checklist of the Galir river, the only permanent fluvial course in the area. This geographical zone is a SCI (Site of Community Importance) and is located within an European Nature Reserve belonging to the "Nature 2000" network. Despite its environmental importance there is no previous phycological survey to this study. We collected samples in three points along the river, and measured physical and chemical water parameters (pH, conductivity, temperature, and dissolved oxygen). The checklist includes 88 taxa: 6 Cyanophyta, 4 Rhodophyta, 60 Heterokontophyta (58 Bacillariophyceae, 2 Xantophyceae), 1 Dinophyta, 2 Euglenophyta, and 15 Chlorophyta. Within the Rhodophyta we highlight the presence of *Lemanea condensata,* as a new record to the Iberian Peninsula. In addition, we have identified 8 new records for Galicia and 14 for Ourense.

**Keywords:** Bacillariophyceae, Chlorophyta, Cyanophyta, Euglenophyta, freshwater algae, *Lemanea condensata,* Ourense, Rhodophyta, Serra Enciña da Lastra, Spain, Xanthophyceae.

**Resumen**

López Rodríguez, M.C., Leira Campos, M. & Carballeira Coego, R. 2016. Diversidad ficológica del Parque Natural Serra da Enciña da Lastra (Orense, España). *Anales Jard. Bot. Madrid* 73(1): e036.

Se ha estudiado la diversidad ficológica del río Galir, el único curso fluvial permanente del Parque Natural Serra da Enciña da Lastra (Orense, España). Es un Lugar de Importancia Comunitaria (LIC) incluido en la red de espacios naturales "Natura 2000". A pesar de su importancia ambiental, no hay ningún estudio ficológico previo al presente. El catálogo de la flora ficológica incluye táxones recogidos de tres puntos del río y se han tenido en cuenta algunos parámetros físico-químicos del agua: pH, conductividad, temperatura y oxígeno disuelto. El catálogo florístico incluye 88 táxones: 6 Cyanophyta, 4 Rhodophyta, 60 Heterokontophyta (58 Bacillariophyceae y 2 Xantophyceae), 1 Dinophyta, 2 Euglenophyta y 15 Chlorophyta. Entre las Rhodophyta destaca *Lemanea condensata,* por ser nueva cita para la Península Ibérica. Además, se han encontrado 8 nuevas citas para Galicia y 14 para la provincia de Orense.

**Palabras clave:** algas dulceacuícolas, Bacillariophyceae, Chlorophyta, Cyanophyta, España, Euglenophyta, *Lemanea condensata,* Orense, Rhodophyta, sierra de la Encina de la Lastra, Xanthophyceae.

## INTRODUCTION

The Natural Park Serra da Enciña da Lastra occupies 3,151.67 hectares in Rubiá (Ourense, Spain), in the southeast of Galicia, right on the border with the Bierzo (Leon) (Fig. 1). The Natural Park has an extraordinary uniqueness and a high proportion of endemic and rare species, hence its great biological interest primarily because of two features: first, the existence of limestone outcrops, rare in the rest of Galicia, and on the other, the low rainfall and strong Mediterranean climate. The only permanent freshwater course in the Sierra is the river Galir. The Peñarrubia reservoir, which collects the waters from the Sil river, is also included within the Park boundaries.

There are already several papers on the freshwater phycological flora in Galicia, among which are those of Bescansa (1907, 1908) on Conjugates of Ourense and Pontevedra, and Gamundi (1911) on diatoms. Allorge (1928) and Allorge & Allorge (1930) studied the flora of all four provinces of Galicia, and Margalef (1956) included algal communities in mountain streams in various parts of the provinces of Ourense, Pontevedra, León and Zamora. Varela (1976, 1982) and Varela & al. (1991) study diatoms in the surroundings of Santiago de Compostela, and Ector (1992) in rivers of A Coruña, Lugo, and Pontevedra. More recently, De la Peña (2003) has worked in rivers of A Coruña. A few studies have focused on the algae flora in hot springs (Noguerol 1984, 1990, 1991), and Cyanophyta (Temes, 1999; Temes & Noguerol, 2000, 2002). Studies on mountain areas include Noguerol (1993) who provides data of the SE mountains, Penalta & López Rodríguez (2007) and López Rodríguez & Penalta (2007) on rivers of the Massif Central.

Despite the uniqueness of the Serra da Lastra Encina within the NW of the Iberian Peninsula, no studies of its phycological flora have been carried out, leading to an underestimation of the algae's regional richness in Spain. The aim of this work is the study of the phycological flora of water courses in this Natural Park in order to deliver a more complete account of the biodiversity in this Site of Community Importance (SCI) of the European natural reserve "Natura 2000".

The Natural Park Serra da Enciña da Lastra (Fig. 1) consists of a karstic massif which runs in direction NW-SE from the Oulego cliffs (960 masl), towards the Sil river valley which crosses through the limestone system. The Covas strait, territory located to river Sil West and the Páramo mountains, make up the total area of the Sierra da Lastra.

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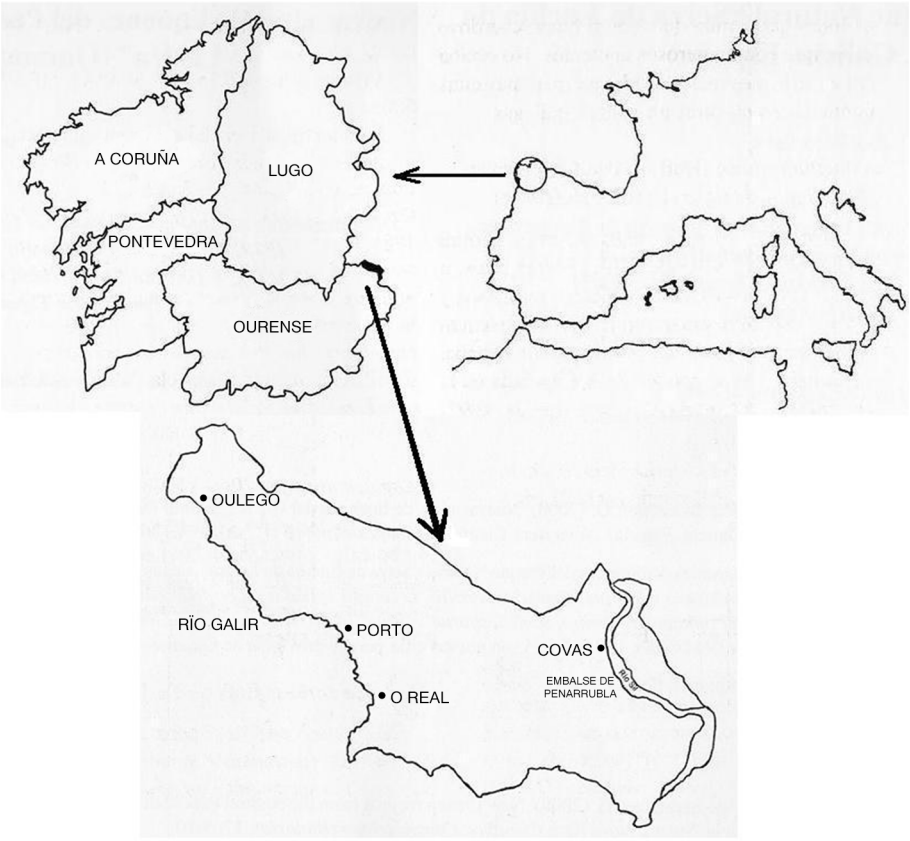


**Fig. 1.** Map of Europe, Galicia and Serra da Enciña da Lastra with sample sites in Galir river.

This Sierra comprises an important network of caves and chasms that are somewhat unusual in Galicia, and represents the best example of karst morphology in Galician land. The limestone substrates represent only 0.52% of Galician land, and Sierra da Enciña da Lastra is the most extensive zone.

There are no weather stations within the Park, but the data recorded by the three nearest stations show a temperate Mediterranean climate with a summer drought period lasting approximately three months (Carballeira & al., 1983). These conditions allow the growth of holm oak and other Mediterranean taxa, being the only known area for thyme in Galicia.

## MATERIAL AND METHODS

Sampling was carried out between 2006 and 2007 at four sites in the Galir river (Table 1). The samples were collected by scraping stones positioned in most cases in the middle of the river, and using a phytoplankton net at the reservoir. The material, pre-labeled, was kept in a cool-box until it reached the laboratory, where it was fixed with 4% formaldehyde. Samples for diatom analysis were treated with hot hydrogen peroxide at 3%, for 6-8 hours, they were then washed several times with distilled water and mounted in preparations with Naphrax (Kelly, 1998; Cen, 2003, 2004).

Measurements of some water physicochemical parameters were taken *in situ* (temperature, pH, conductivity, and dissolved oxygen), using a pH-meter HI-9024 / C, conductivity with probe HI-76302 C / Malt. HI-9033 and HI-9143 oximeter.

Algae were identified using standard literature for Cyanophyta (Anagnostidis & Komárek, 1985, 1988, 1990; Komárek & Anagnostidis, 1999, 2005), Rhodophyta (Kumano, 2002; Eloranta & Kwandrans, 2007, 2012; Eloranta & al., 2011), Euglenophyta and Dinophyta (John & al., 2002), Xantophyceae (Ettl, 1978), and Bacillariophyceae (Krammer & Lange-Bertalot, 1986, 1988, 1991a, 1991b; Lange-Bertalot & Krammer, 1989; Reichardt, 1999; Lange-Bertalot, 1996, 1999, 2001, 2011; Krammer, 1997a, 1997b, 2000, 2002, 2003). For Chlorophyta we followed the criteria of Förster (1982), Komárek & Fott (1983), Ettl & Gärnert (1988), Lokhorst (1999), and John & al. (2002). For authors and abbreviations we used Brummitt & Powell (1992) and Guiry & Guiry (2016).

## RESULTS

This floristic catalogue consists of 88 taxa: 6 Cyanophyta, 4 Rhodophyta, and 60 Heterokontophyta: 58 Bacillariophyceae and 2 Xantophyceae, one Dinophyta, 2 Euglenophyta, and 15 Chlorophyta. Within the catalogue there are new records for Ourense, Galicia, and the Iberian Peninsula. New cites for Ourense are indicated with one asterisk (*), two (**) for Galicia, and three (***) for the Iberian Peninsula.

**Table 1. Locations and physicochemical variables.**

| Sampling point | Altitude m | Coordinate | Data | Temperature water °C | pH | Conductivity µS/cm | Oxygen (mg/1) |
|---|---|---|---|---|---|---|---|
| Peñarrubia | 398 | 42° 28′ 32″ N | 29/03/06 | 10,1 | 7,7 | 135,6 | 12,6 |
| | | 6°49′ 50″ W | 21/07/06 | 23,4 | 8,1 | 232,0 | 8,9 |
| | | | 17/11/06 | 11,9 | 7,7 | 173,6 | 10,0 |
| | | | 08/05/07 | 16,9 | 7,9 | 168,1 | 9,9 |
| O Real | 442 | 42° 28′ 20″ N | 29/03/06 | 9,7 | 7,3 | 83,1 | 11,3 |
| | | 6° 53′ 17″ W | 21/07/06 | 17,3 | 7,4 | 133,8 | 9,0 |
| | | | 17/11/06 | 10,7 | 7,5 | 103,5 | 11,0 |
| | | | 08/05/07 | 12,8 | 7,7 | 96,0 | 11,2 |
| Porto | 459 | 42° 28′ 59″ N | 29/03/06 | | | | |
| | | 6° 53′ 46″ W | 21/07/06 | 17,6 | 7,3 | 100,3 | 8,6 |
| | | | 17/11/06 | 10,8 | 7,5 | 89,8 | 11,1 |
| | | | 08/05/07 | 12,8 | 7,7 | 80,8 | 11,3 |
| Oulego | 602 | 42°30′ 17″ N | 29/03/06 | 9,3 | 7,0 | 47,5 | 11,1 |
| | | 6°56′ 10″W | 21/07/06 | 16,1 | 7,4 | 110,6 | 9,8 |
| | | | 17/11/06 | 11,2 | 7,6 | 79,3 | 10,9 |
| | | | 08/05/07 | 12,7 | 7,4 | 84,2 | 10,8 |

## CYANOPHYTA

*Lyngbya martensiana* Menegh. ex Gomont
*Nostoc sphaericum* Vaucher ex Bornet & Flahault
*Oscillatoria tenuis* C. Agardh ex Gomont
*Phormidium autumnale* Gomont
*Phormidium retzii* Kütz. ex Gomont
*Planktothrix agardhii* (Gomont) Anagn. & Komárek**

## RHODOPHYTA

*Audouinella* sp.
*Hildenbrandia rivularis* (Liebm.) J. Agardh
*Lemanea condensata* Israelson***
*Lemanea fluviatilis* (L.) C. Agardh

## HETEROKONTOPHYTA

### Bacillariophyceae

*Achnanthidium minutissimum* (Kütz.) Czarneki
*Achnanthidium subatomoides* (Hust.) O. Monnier, Lange-Bert. & Ector*
*Achnanthidium subatomus* (Hust.) Lange-Bert. *
*Achnanthidium subhudsonis* (Hust.) H. Kobayasi *
*Adlafia bryophila* (J.B. Petersen) Gerd Moser, Lange-Bert. & Metzeltin
*Amphora indistincta* Levkov **
*Cocconeis euglypta* Ehrenb.
*Cocconeis placentula* Ehrenb.
*Cocconeis pseudolineata* Geitler (Lange-Bert.) **
*Cyclotella meneghiniana* Kütz.
*Cymatopleura solea* (Bréb.) W. Sm. *
*Diadesmis perpusilla* (Grunow) D.G. Mann
*Diatoma mesodon* (Ehrenb.) Kütz.
*Diploneis ovalis* (Hilse) Cleve *
*Diploneis petersenii* Hust.
*Encyonema minutum* (Hilse) D.G. Mann
*Epithemia turgida* (Ehrenb.) Kütz. *
*Eunotia bilunaris* (Ehrenb.) Schaarschm.
*Eunotia exigua* (Bréb. ex Kütz.) Rabenh.
*Eunotia minor* (Kütz.) Grunow
*Eunotia praerupta* Ehrenb.
*Fragilaria gracilis* Østrup **
*Fragilaria rumpens* (Kütz.) G.W.F. Carlson *
*Fragilaria vaucheriae* (Kütz.) J.B. Petersen
*Frustulia vulgaris* (Thwaites) De Toni
*Gomphonema acuminatum* Ehrenb.
*Gomphonema gracile* Ehrenb.
*Gomphonema minutum* (C. Agardh) C. Agardh *
*Gomphonema parvulum* (Kütz.) Kütz.
*Gomphonema pumilum* var. *rigidum* E. Reichardt & Lange-Bert. **
*Gomphonema rhombicum* Fricke
*Hannaea arcus* (Ehrenb.) R.M. Patrick
*Hantzschia amphioxys* (Ehrengb.) Grunow
*Karayevia oblongella* (Østrup) Aboal
*Melosira varians* C. Agardh
*Meridion circulare* var. *constrictum* (Ralfs) Van Heurck
*Navicula cryptocephala* Kütz.
*Navicula cryptotenella* Lange-Bert. *
*Navicula gregaria* Donkin
*Navicula minima* Grunow
*Navicula radiosa* Kütz.
*Navicula rhyncocephala* Kütz.
*Nitzschia dissipata* (Kütz.) Rabenh.
*Nitzschia linearis* W. Sm.
*Nitzschia palea* (Kütz.) W. Sm.
*Nupela lapidosa* (Krasske) Lange-Bert.
*Pinnularia anglica* Krammer *

*Placoneis* cf. *anglica* (Ralfs) E.J. Cox
*Planothidium lanceolatum* (Bréb. ex Kütz.) Lange Bert.
*Psammothidium marginulatum* (Grunow) Bukhtiyarova & Round **
*Reimeria sinuata* (W. Greg.) Kociolek & Stoermer
*Rhoicosphenia abbreviata* (C. Agardh) Lange-Bert. *
*Rhopalodia gibba* (Ehrengb.) O. Müll. *
*Stauroneis anceps* Ehrengb.
*Surirella linearis* W. Sm.
*Tabellaria floculosa* (Roth) Kütz.
*Ulnaria biceps* (Kütz.) Compère *
*Ulnaria ulna* (Nitzsch) Compère

### Xantophyceae

*Vaucheria prona* T.A.Chr. *
*Vaucheria sessilis* (Vaucher) D.C. *

## DINOPHYTA

*Peridinium* sp.

## EUGLENOPHYTA

*Lepocinclis ovum* (Ehrenb.) Lemmerm. **
*Trachelomonas hispida* var. *coronata* Lemmerm.

## CHLOROPHYTA

*Cladophora glomerata* (L.) Kütz. *
*Closterium acerosum* Ehrenb. ex Ralfs
*Closterium ehrenbergii* Menegh. ex Ralfs
*Closterium littorale* F. Gay
*Closterium lunula* Ehrenb. & Hemprich ex Ralfs
*Closterium moniliferum* Ehrenb. ex Ralfs
*Closterium turgidum* Ehrenb. ex Ralfs
*Cosmarium* sp.
*Klebsormidium flaccidum* (Kütz.) P.C. Silva & al.
*Microspora amoena* (Kütz.) Rabenh.
*Microspora amoena* var. *gracilis* (Wille) De Toni **
*Oedogonium* sp.
*Spirogyra* sp.
*Staurastrum muticum* Bréb. ex Ralfs *
*Ulothrix* sp.

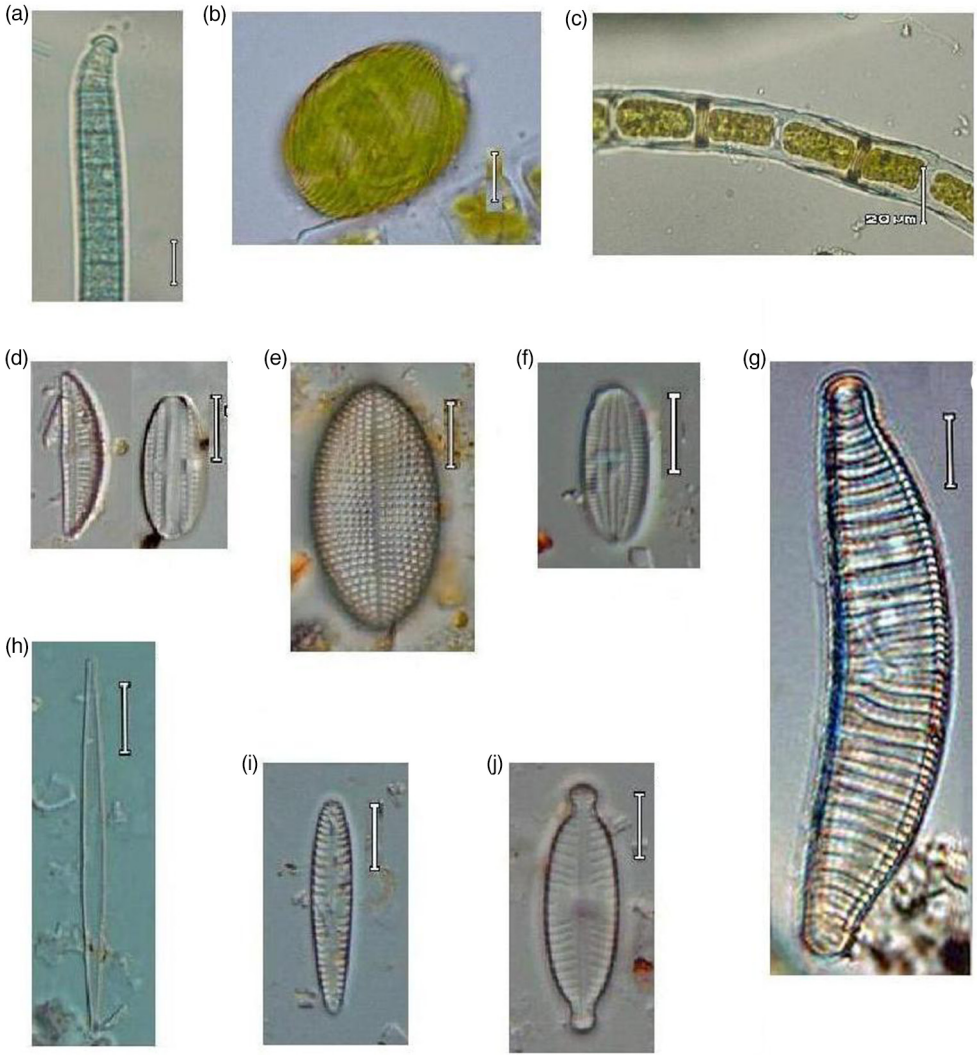


**Fig 2.** Cyanophyta: **a,** *Plantothrix agardhii*. Euglenophyta: **b,** *Lepocinclis ovum*. Chlorophyta: **c,** *Microspora amoena* var. *gracilis*. Heterokontophyta (Bacillariophyceae): **d,** *Amphora indistincta;* **e,** *Cocconeis pseudolineata;* **f,** *Diploneis peterseni;* **g,** *Epithemia turgida;* **h,** *Fragilaria gracilis;* **i,** *Gomphonema pumilum* var. *rigidum;* **j,** *Placoneis* cf. *anglica*. Scale 6 µm, except for *Epithemia turgida,* 9 µm.

## DESCRIPTION OF SOME RELEVANT SPECIES

***Planktothrix agardhii*** (Gomont) Anagnostidis & Komárek (Fig. 2a)
*Oscillatoria agardhii* Gomont
[Cyanophyta; Oscillatoriales; Phormidiaceae]

Trichomes solitary, immotile, blue-green colour, free-floating. Cells 3 µm long, up to 6 µm wide. Apical cells somewhat curved and convex with caliptra.

Distribution: It is widely distributed in temperate zones. New record to Galicia.

***Lemanea condensata*** Israelson (Fig. 3)
[Rhodophyta; Florideophyceae; Batrachospermales; Lemaneaceae]

Rhodophyte with cylindrical stem (Fig. 3 a) in the form of cartilaginous unbranched tufts, somewhat curved, gradually narrowing towards the base, lacking the typical constriction of other species such as *Lemanea fluviatilis.* Spermatangial prominent papillae more or less regularly distributed in number up to 3 per node (Fig. 3 b, d). *Chantransia* phase (Fig. 3 c) is represented by irregularly branched filaments without terminal hairs.

The thallus of our specimens measured 2.4 cm in length, although Eloranta & al. (2011) suggest that they may reach up to 3 cm. Internodes length of 480-620 µm and 100-250 µm wide. Nodes width including spermatangial papillae varies from 250-375 µm, these measurements are slightly higher (220-350 µm) than those described by Israelson (1942), Kumano (2002), Eloranta & Kwandrans (2007), and Eloranta & al. (2011).

*Lemanea borealis* resembles *L. condensata* regarding the small size of the thallus, although the former can reach 5 cm, but differs from *L. condensata* in that 2 to 5 spermatangial papillae are present in spots that do not protrude into the thallus.

It is possible that our specimens correspond to *L. hispanica,* described and identified for the first time in 1928 by Budde (1929) in the Sierra de Guadarrama (La Granja, Segovia, Spain) in a mountain stream with a strong current on granite stones. The size of these specimens (1-2 cm), the unthinned base, and the presence of two spermatangial papillae, are characteristics that agree with those observed in our specimens in the Galir river, so it might be considered the same species. However Israelson (1942) indicates that due to the lack of proper diagnosis a closer comparison between *L. condensata* and *L. hispanica* is not possible.

Distribution: It is restricted to the northern European countries: Sweden, Finland, and Norway (Eloranta & al., 2011).

***Amphora indistincta*** Levkov (Fig. 2 d)
[Heterokontophyta; Bacillarophyceae; Thalassiophysales; Catenulaceae]

Cells 13 µm long, 5 µm wide. Ventral grooves 13/10 µm converging radially outward. Dorsal striae 12/10 µm. Dorsal area present. Dorsal punctae visible. Valves semilanceolate, with the ventral margin nearly straight or slightly concave, but convex dorsal margin. Ends rounded, narrow and slightly obtuse, directed forward. Raphe branches slightly curved or straight.

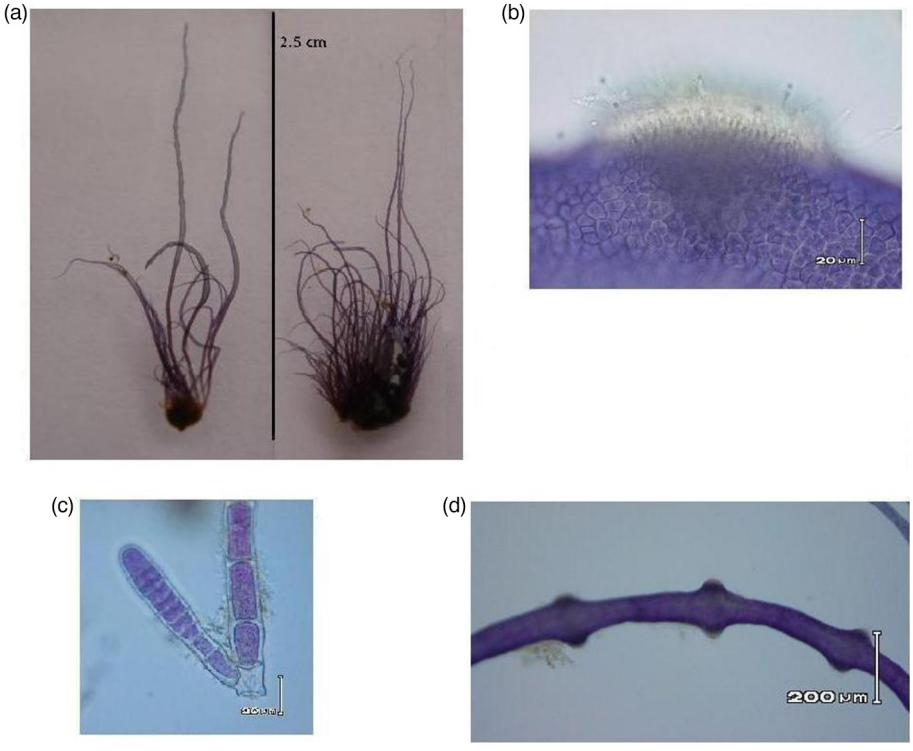


**Fig 3.** Rhodophyta: *Lemanea condensata*: a, habit; b, spermatangial papillae; c, *Chantrasia*; d, thallus with two spermatangial papillae.

Distribution: Widely distributed in Spain. New record in Galicia.

***Cocconeis pseudolineata*** Geitler (Lange-Bertalot) (Fig. 2 e)
*Cocconeis placentula* var. *pseudolineata* Geitler
[Heterokontophyta; Bacillarophyceae; Achnanthales; Cocconeidaceae]

Cells 17-20 µm long, 9-12 µm wide. Valve shape elliptic or elliptical-linear. Raphe with a narrow linear axial area and a small circular central area. Striae very thin, almost parallel in the centre and radially towards the poles. The rapheless valve shows striae with larger areolae, slightly elongated and arranged in more or less regular rows.

Distribution: Widely distributed in Spain.

***Diploneis peterseni*** Hustedt (Fig. 2 f)
[Heterokontophyta; Bacillarophyceae; Naviculales; Diploneidaceae]

Cells 12 µm long, 4.8 µm wide. Valves broadly elliptic to weakly elliptical, but almost strictly linear. Broadly rounded ends. Striae radial with delicate appearance. The points in the striae can not be resolved under light microscopy.

Distribution: Only one citation in Andorra and in Galicia. It was found in Ourense province by Antelo (1991) at the Barbaña river.

***Epithemia turgida*** (Ehrenberg) Kützing (Fig. 2 g)
*Navicula turgida* Ehrenberg
[Heterokontophyta; Bacillarophyceae; Rhopalodiales; Rhopalodiaceae]

Cells 67.5 µm long, 15.5-16 µm wide. Striae 8-10/10 µm; ribs 4-5/10 µm; 2-3 striae between ribs. Ventral margin slightly concave. Raphe channel placed against the ventral margin at the distal ends of the valve and arched towards the back in the middle of the valve, reaching nearly half the distance to the posterior margin.

Distribution: Widely distributed in Spain.

***Fragilaria gracilis*** Oestrup (Fig. 2 h)
[Heterokontophyta; Bacillarophyceae; Fragilariales; Fragilariaceae]

Cells 32 µm long, 1.8 µm wide. Striae 19-23 striae in 10 µm. Valves nearly linear with subcapitated or gradually attenuated apices. Striae shortened, evident in the margin and dotted near the axial zone.

Distribution: Although it has been found repeatedly in Portugal (Beira Litoral; Gil, 1988; Gil & al., 1991; Almeida, 1998;), its presence in Spain is uncertain. It has recently been cited in the catalogue of phytoplankton quality elements for the assessment of the ecological status (MAAM, 2012), but it does not provide distributional data.

***Gomphonema pumilum*** var. ***rigidum*** Reichardt & Lange-Bertalot (Fig. 2 i)
*Gomphonema intricatum* var. *pumila* Cleve-Euler
[Heterokontophyta; Bacillarophyceae; Cymbellales; Gomphonemataceae]

Cells 18.4 µm long, 3.6 µm wide. Striae 13-14/10 µm, slightly radial, hardly bent. Valves linear-lanceolate with rounded ends. Head pole moderately wider than the foot pole. The axial area is presented in a variable form, from linear to lanceolate. The central area wide, rectangular-shaped in transverse direction, ending in a short ridge on each side. Raphe quite simple, filiform. The stigma near the central node is clearly separated from the central striae.

Distribution: Mainly in the western part of the Iberian Peninsula.

***Placoneis*** cf. ***anglica*** (Ralfs) Cox (Fig. 2 j)
*Navicula anglica* Ralfs
[Heterokontophyta; Bacillarophyceae; Cymbellales; Cymbellaceae]

Cells 22 µm long, 6 µm wide. Valves elliptical-lanceolate, the margins convex, with apices rostrate and elongated. Axial area lanceolate, narrow at the apex and extending towards the centre, where it expands in the transverse direction. Raphe straight and filiform with rounded proximal end and the distal deflected in the opposite direction. Striae slightly curved and radial arrangement along the length of the valve.

Distribution: Common in the Iberian Peninsula but can be confused with *P. elginensis,* which is distinguished by its elliptical to linear-elliptical form.

***Lepocinclis ovum*** (Ehrenberg) Lemmermann (Fig. 2 b)
*Euglena ovum* Ehrenberg
[Euglenophyta; Euglenophyceae; Euglenales; Phacaceae]

Cells 24 µm long, 18 µm wide, ovoid, colour olive green. It presents a posterior end with a short blunt tail-piece and many discoidal chloroplasts. Pellicle covered with spiral striae.

Distribution: Probably cosmopolitan, living as planktonic.

***Microspora amoena*** var. ***gracilis*** (Wille) De Toni (Fig. 2 c)
*Conferva amoena* Kützing
[Chlorophyta; Chlorophyceae; Microsporales; Microsporaceae]

Uniseriate filaments, unbranched, with "H-shaped" segments in the cell wall. Cells 11.5-15 µm wide and 35 µm long; wall 3,32 µm wide.

Distribution: Probably cosmopolitan, as it appears both in Europe and North America. New record to Galicia.

## DISCUSSION AND CONCLUSIONS

For the first time, we provide data on the phycological flora of an uncommon area in Galicia due to the presence of limestone outcrops. In particular, *Amphora indistincta, Coconeis pseudolineata, Ephitemia turgida, Gomphonema pumilum* var. *rigidum* y *Placoneis* cf. *anglica* are alkaliphic and are present in this study; while they are absent or unimportant in the freshwater environment of the Galicia-Costa river basins.

In high and middle sections of Galician rivers, the diatom flora is characterized by circumneutral to acidophilic taxa, typical to waters with moderate to low electrolyte content.

However, in Serra da Enciña da Lastra there are species which can only be found in Galicia in the lower river stretches with marine water influence. This is the case for *Cocconeis* spp., *Ephitemia* spp., and some fragilarioid taxa that are common in coastal lagoons (Delgado & al., 2010; Carballeira, pers. comm.).

We highlight the presence of *Lemanea condensata* for being a new record in the Iberian Peninsula. Although this species is typical of northern areas and cited only in the nordic countries, it appears in Galician mountains, though not outstanding in altitude, such as Oulego Penedos of the Serra da da Lastra Encina, which does not exceed 960 meters. Another interesting record is *Fragilaria gracilis,* a common and frequent diatom in Portugal (Almeida, 1998; Gil, 1988; Gil & al., 1991), and for which, although it has recently been cited in Spain (MAAM, 2012), we lack precise distributional data.

The location of the Serra da Enciña da Lastra, between the Mediterranean and Atlantic climate and its lithological peculiarities within the regional context, suggests that we might expected a significant increase in the number of species in future studies, similar to the results obtained, in terms of the singularity and diversity of vascular plants (Gimenez de Azcárate & Amigo, 1996).

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