

## First record of a victorellid Bryozoan (Gymnolaemata: Victorellidae) from the Iberian Peninsula

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### ABSTRACT

#### First record of a victorellid bryozoan (Gymnolaemata: Victorellidae) from the Iberian Peninsula

The discovery of new organisms in the Albufera Lake is an encouraging sign, considering the deterioration of this ecosystem. The finding of *Victorella pavida* on the shores of the Albufera Lake, which is a new record for the Iberian Peninsula, allows us to consider the fact that many invertebrate species are waiting for a quick and definitive recovery of the lake so they can take back the place that once belonged to them.

**Key words:** *Victorella pavida*, Victorellidae, Ctenostomata, albufera de València, Spain.

### RESUMEN

#### Primera cita de un briozoo victorelido (Gymnolaemata: Victorellidae) para la Península Ibérica

La localización de nuevos organismos en el lago de l'Albufera es una señal esperanzadora frente al deterioro de este ecosistema. La desaparición de los macrófitos sumergidos entre los años 1960 y 70 provocó la eliminación de una fauna de invertebrados acuáticos de su lecho. El descubrimiento de *Victorella pavida* en el litoral de l'Albufera, como nueva cita para la Península Ibérica, nos permite pensar que numerosas especies de invertebrados están a la espera de una pronta y definitiva recuperación del lago para volver a ocupar el lugar que antaño les pertenecía.

**Palabras clave:** *Victorella pavida*, Victorellidae, Ctenostomata, albufera de València, España.

### INTRODUCTION

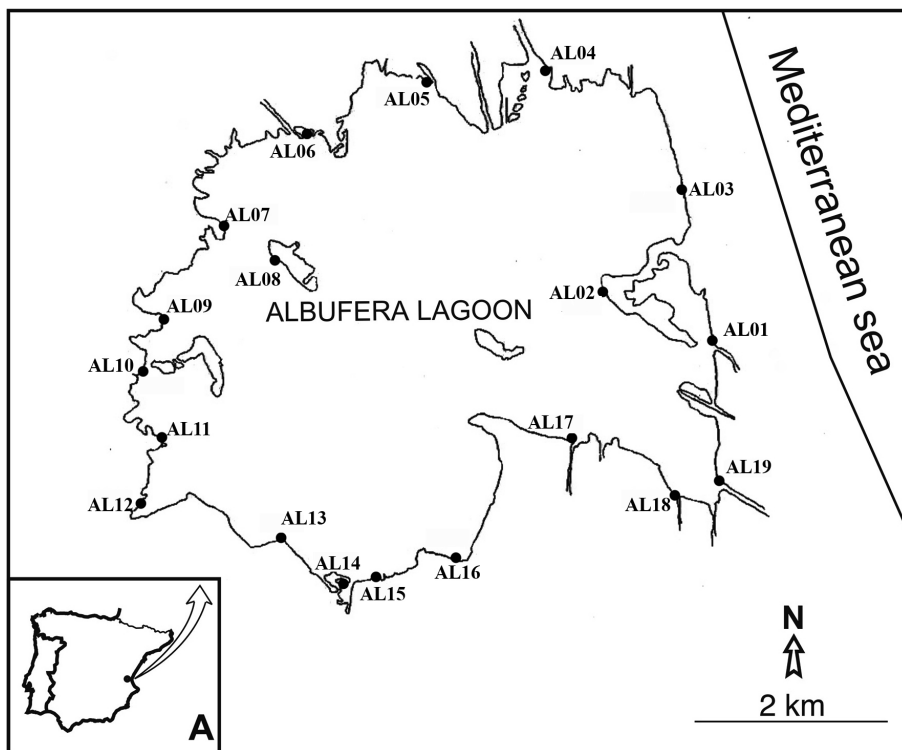
The Albufera Lake is located south of Valencia and occupies 2800 hectares of the Natural Park. There is a littoral bar to the east that isolates the lake from the Mediterranean Sea. There is an important centre of population that is spread out along a chain of municipalities west of the lake. One of the major rice fields on the Iberian

Peninsula is located around the Albufera Lake. Since the 1970s, this aquatic system has suffered substantial degradation. Though it started as an oligo-mesotrophic lake from which water could be drunk, due to its numerous inner springs, it has become a hypereutrophic toxic lake due to the presence of cyanobacteria from the genera *Planktothrix* (Bradt & Villena, 2002) and *Microcystis* (Romo *et al.*, 2008). The aquatic vegeta-

tion on the lake bed disappeared because of direct organic and industrial discharges. At the moment, vegetation only exists on the shoreline of the lake. It is for this reason that the project of an aquatic macroinvertebrates register was considered by the Valencia Town Council. During a unique campaign in July 2013, previously unrecorded species for this area were located, such as the new record of Cladocera *Ilyocryptus agilis* Kurz 1878 (Rueda *et al.*, 2013) for the Iberian Peninsula or the new record for the province of Valencia of the Trichoptera *Ecnomus tenellus* (Rambur, 1842) (Rueda *et al.*, 2014). Previous works on Rotifera (Arévalo, 1917a), Cladophora (Arévalo, 1916; 1917b), zooplankton in general (Arévalo, 1914), naiads (Haas, 1918), Coleoptera (Moróder, 1923; 1924), bivalve mollusks (Haas, 1924) and Porifera (Arndt, 1926), among others, shed light on the existing macroinvertebrate fauna in the waters of the Albufera Lake at the beginning of the 20th century. At that time, there were no recordings of bryozoa in the lake.

## METHODS

Samples were taken from 19 points on the lake shore (Fig. 1); however, Bryozoa were only collected in AL04. This location corresponds to the end of an old ravine that used to receive numerous discharges. Currently, the situation is more controlled in this area. A first preliminary survey of the habitat was conducted before the sampling of aquatic invertebrates commenced at point AL04. Difficulties in sampling the shore line on foot made the use of a boat compulsory (Fig. 2). A hand-net with a 250  $\mu$ m mesh was used for this sampling. In the highly homogenous selected environments, ten searches using a 1-m hand net along a one-meter transect line were conducted. Every sub-sample was concentrated on a plastic tray of 30 cm by 40 cm. Bryozoan colonies were present at a depth of 30-40 cm on pieces of dead reed among the roots that were growing out from the shore line. Along with the field samples from the Albufera Lake, the



**Figure 1.** Location of sampling site in the Albufera lake, Valencia (A: Iberian Peninsula). *Localización de los puntos de muestreo en la Albufera de Valencia (A: Península Ibérica).*

oxygen content, conductivity, salinity and water temperature were measured in situ using a multimeter WTW 330i (Table 1). Concurrently, we collected water samples for laboratory analyses of alkalinity and chloride. The bryozoan colonies were examined with a Leica MZ16 stereomicroscope and a Leica DM 2000 optical microscope. Photographs were taken with a Leica DFC 425 digital camera coupled to the optics, and measurements were taken directly on the photographs. Part of the samples were deposited in the *Museo Nacional de Ciencias Naturales, Madrid* (MNCN).

## RESULTS

Phylum: BRYOZOA Ehrenberg, 1831  
Class: GYMNOLAEMATA Allman, 1856  
Order: CTENOSTOMATA Busk, 1852  
Family: *VICTORELLIDAE* Hincks, 1880  
Genus: *Victorella* Saville-Kent, 1870

Species: *Victorella pavida* Saville-Kent, 1870 (Fig. 3).

*Victorella pavida* Saville-Kent, 1870: 34, pl. 4; Hincks 1880: 561, pl. 79, figs. 4-7; Prenant & Bobin 1956: 240, fig. 106 I-VIII; d'Hondt 1983: 53, figs. 27A, 28A; Hayward 1985: 96, figs. 30A, 31.

## Material examined

Site AL04, (UTM: 30 North, 729148mE, 4359978mN), 30-40 cm depth, 07/23/2013. Several colonies of bryozoan on pieces of dead reed close to the roots that grew out from the water.

## Description

Colony encrusting, delicate and transparent, composed by elongate, cylindrical autozooids forming dense clumps. Autozooids composed by a slender proximal portion, usually very short



**Figure 2.** Sample site: AL04 (C. Molina). *Estación de muestreo: AL04 (C. Molina).*

and thin, a short, adnate basal portion, slightly wider than the erect, long peristomial tube, 1.20-2.35 mm long by approximately 0.15 mm diameter, with its distal extreme quadrangular. Buds developed distally and laterally from the adnate basal portion of each autozooid or, typically, from the peristomial tube. In this case, the bud can give rise to new stolons or, if it is located more distally, to new autozooids, which can be divided again. Polypide with 8 tentacles. Gut elongate, with equal sized fore and hind cardia separated by a sphincter; caecal lobe about as long as the combined length of the cardia and foregut. Setae of the collar very long, jointed by a pleated, delicate membrane.

### Remarks

Bryozoa are aquatic organisms that are normally colonial and largely marine. Approximately 6000 living species have been recognized. Among the three classes of the phylum, only the Phylactolaemata, with 74 species worldwide (Massard

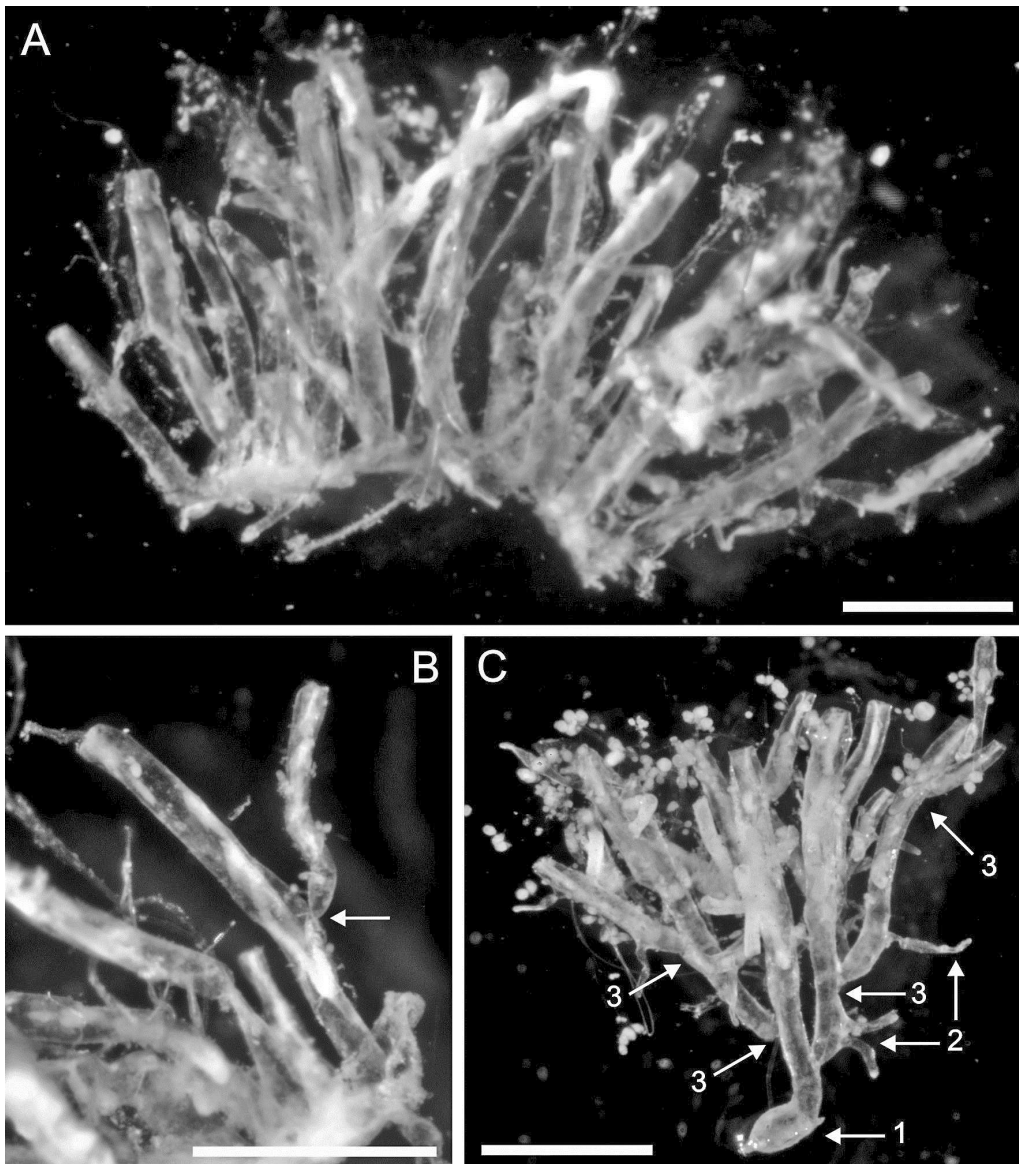
& Geimer, 2008), are entirely restricted to fresh water. The Stenolaemata are exclusively marine, whereas in the Gymnolaemata, the largest class (approx. 5200 species according to Gordon *et al.*, 2009), most of the species are marine, and only a few of them live in brackish or fresh waters. The family Victorellidae Hincks, 1880 includes four genera and ten species of Gymnolaemate Ctenostomatous bryozoans (Bock & Gordon, 2013), almost all of which are from brackish and fresh waters. None of these bryozoans were previously collected in the Iberian Peninsula. *Victorella pavid*a is a species difficult to find, as well as to be identified as a bryozoan. This species was originally described in the brackish waters of the Victoria Docks in London (Saville-Kent, 1870). It was later collected in many locations: the North Sea and the Baltic Sea, the Mediterranean Sea and the Black Sea, Brasil, the USA, India and Japan (Hayward, 1985). There is a previous record of the species near Spain, in Banyuls-sur-Mer (South of France), although according to Zabala (1986), this record

**Table 1.** UTM location, physical and chemical data of sampling sites. *Localización UTM y valores de la físico-química de las muestras de agua.*

Sites	UTM ETRS89 30 S	Conductivity μS/cm	Salinity g/L	Oxygen mg/L	Temperature °C	pH	Chloride mg/L	Alkalinity mmol/L
AL01	0731031/4356937	2182	1.1	8.4	27.9	8.7	325	0.5
AL02	0729963/4357512	2184	1.1	8.6	28.3	9.3	350	0.4
AL03	0730736/4358526	2275	1.2	8.1	27.6	9.5	460	0.4
AL04	0729148/4359978	2519	1.3	8.4	29.0	8.5	490	1.4
AL05	0727866/4359916	2274	1.2	7.9	28.8	8.8	470	0.5
AL06	0726961/4359189	2244	1.1	7.5	30.1	9.5	440	0.4
AL07	0725896/4358168	2264	1.1	7.8	30.0	9.5	460	0.5
AL08	0726355/4358002	2327	1.2	7.5	30.6	10.0	490	0.4
AL09	0725250/4357284	2342	1.2	8.0	30.5	9.6	460	0.5
AL10	0725277/4356696	2314	1.2	6.9	30.7	9.8	480	0.4
AL11	0725068/4355920	1902	1.0	7.7	29.5	8.5	250	0.7
AL12	0725045/4355273	2041	1.0	7.2	30.9	9.4	300	0.5
AL13	0726385/4354877	1937	1.0	8.0	30.5	9.1	270	0.6
AL14	0727253/4354402	1626	0.8	7.8	30.9	8.5	210	1.2
AL15	0727560/4354454	2027	1.0	8.2	29.1	8.4	270	1.2
AL16	0728360/4354697	1924	1.0	7.7	28.0	8.8	280	0.6
AL17	0729712/4355960	1317	0.7	8.0	27.7	8.3	160	1.3
AL18	0730656/4355644	2041	1.0	8.2	26.6	8.3	280	1.7
AL19	0731065/4355526	2252	1.1	8.0	27.4	8.4	320	1.4

is more likely to be a misidentification. *Victorella pavid* lives mainly in brackish waters, although there also several records in fresh waters. The colonies studied were collected in the location that had the highest salinity among the 19 points of sampling (Table 1). It was not collected from

any other locality that had a lower level of salinity. Point AL04 corresponds to the end of a ravine that used to receive numerous discharges, although the situation is presently improved. The first sampling was conducted in July 2013, and colonies were collected in the following months.



**Figure 3.** *Victorella pavid* Saville-Kent, 1870. (A) portion of a dense colony; (B) a young autozooid budded from the peristomial tube of maternal zooid (arrow: budding point); (C) portion of a colony originated from a single autozooid; note the basal adnate portion (1), the slender pseudostolons (2) and the successive peristomial buds (3). (scales: 1 mm). *Victorella pavid* Saville-Kent, 1870. (A) porción de una densa colonia; (B) un joven autozooide creciendo sobre el tubo persitomial del autozooide materno (flecha: punto de gemación); (C) porción de una colonia, originada a partir de un único autozooide; a destacar la porción incrustante basal (1), los finos pseudostolones (2) y los brotes peristomiales sucesivos (3). (escalas: 1 mm).

*V. pavidus* is usually found with the hydroid *Cordylophora* and the phylactolaemate bryozoan *Plumatella repens* (see Hayward, 1985). The present material was found together with small colonies of an unidentified species of *Plumatella*, most likely *Plumatella repens*.

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