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Notas / *Notes*

A synthesis of known Iberian localities for *Craspedacusta sowerbii* Lankester, 1880 (Cnidaria: Hydrozoa): new record for Spain from low Guadalquivir River

J. L. Medina-Gavilán[1] & M. M. González-Duarte[2, *]

[1] Sociedad de Estudios Ambientales (SOCEAMB). C/ Perú, 4, 2ª planta. 41100. Coria del Río (Sevilla), Spain.
ORCID iD: http://orcid.org/0000-0002-5099-220X

[2] Instituto Universitario de Investigación Marina (INMAR), Campus de Excelencia Internacional/Global del Mar (CEIMAR), Department of Biology, University of Cádiz. Avda. República Saharaui s/n. 11510. Puerto Real, (Cádiz), Spain.
ORCID iD: http://orcid.org/0000-0002-1243-8232

* Author for correspondence: mangonduarte@gmail.com

ABSTRACT

Alien invasive species are one of the major threats to biodiversity. Particularly, cnidarian species are frequently spread far from their native areas, through human activities. Indeed, many hydroids have been successfully transported as fouling on ship hulls, in ballast waters and as fauna associated with the commercial traffic of other aquatic species. *Craspedacusta sowerbii* Lankester, 1880 (Hydrozoa: Olindiidae) is the most widely distributed freshwater medusa around the world. This hydrozoan species is probably considered native to the Yangtze valley (China) and invasive in freshwater systems worldwide. In this note, we report the presence of an established population of *C. sowerbii* from the low Guadalquivir River (western Andalusia, southwestern Spain) and provide the environmental data associated with its occurrence. The spatial distribution of *C. sowerbii* in the Iberian Peninsula is still poorly studied and most information is derived from regional academic publications, technical reports of limited access, naturalists' observations or press news on environmental issues. Therefore, all sparse Iberian records for this species have been revised and presented here. This note contributes to know its distribution in the Iberian Peninsula, an important preliminary step to later assess the impact of this invasive species on the Iberian ecosystems.

Key words: alien invasive species; Hydrozoa; Olindiidae; *Craspedacusta*; Iberian Peninsula; chorological review; Guadalquivir River; Mediterranean seasonal stream.

RESUMEN

Una síntesis de las localidades ibéricas conocidas para *Craspedacusta sowerbii* Lankester, 1880 (Cnidaria: Hydrozoa): nuevo registro para España procedente de la vega del Guadalquivir

Las especies exóticas invasoras son una de las mayores amenazas para la biodiversidad. Particularmente, las especies de cnidarios son frecuentemente dispersadas lejos de sus áreas de origen por mediación de actividades humanas. Así, muchos hidrozoos han sido exitosamente transportados en las aguas de lastre, fijadas en los cascos de los barcos y como fauna asociada al tráfico comercial de otras especies acuáticas. *Craspedacusta sowerbii* Lankester, 1880 (Hydrozoa: Olindiidae) es la medusa de agua dulce más ampliamente distribuida en el planeta. Esta especie de hidrozoo es considerada probablemente nativa del valle del Yangtze (China) e invasora en ambientes epicontinentales de prácticamente todo el mundo. En esta nota, señalamos la presencia de una población de *C. sowerbii* establecida en el bajo Guadalquivir (Andalucía Occidental, Suroeste de España) y proporcionamos los datos ambientales asociados con su ocurrencia. La distribución espacial de *C. sowerbii* en la Península Ibérica está aún poco estudiada y la mayoría de la información proviene de publicaciones académicas regionales, informes técnicos de limitado acceso, observaciones puntuales de naturalistas o noticias de prensa sobre cuestiones ambientales. Por tanto, se han revisado estas fuentes para presentar reunidos todos los registros conocidos sobre esta especie en la Península Ibérica. Esta nota contribuye al conocimiento de su distribución en la Península Ibérica, un importante paso previo para evaluar posteriormente el impacto de esta especie invasora en los ecosistemas ibéricos.

Palabras clave: especies exóticas invasoras; Hydrozoa; Olindiidae; *Craspedacusta*; Península Ibérica; revisión corológica; Río Guadalquivir; arroyo estacional mediterráneo.

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Craspedacusta sowerbii Lankester, 1880 (Fig. 1) is a hydrozoan species belonging to the family Olindiidae and characterized for inhabiting inland water environments (Jankowski *et al.*, 2008). The life cycle of this species include both a benthic polyp and a free-swimming medusa stages. The polyps are inconspicuous, minute and without tentacles. Medusa has an umbrella of 10–20 mm in wide, broad and well-developed velum with a large manubrium extending beyond the umbrella margin. The statocysts are within elongated vesicles enclosed in velum (Bouillon *et al.*, 2004). *Craspedacusta sowerbii* has a cosmopolitan distribution, colonizing all continents apart from Antarctica; actually, it is the most widely distributed freshwater medusa (reviewed in Dumont, 1994 and Jankowski *et al.*, 2008).

Within the genus *Craspedacusta* Lankester, 1880, more than ten species have been originally described (Jankowski, 2001). However, the lack of a systematic revision at world level has not yet resolved the main question about the number of valid species in *Craspedacusta* and further molecular data are needed before to may conclude this issue (Fritz *et al.*, 2009; Zhang *et al.*, 2009; Karaouzas *et al.*, 2015). Eastern Asia seems to be the center of diversity for *Craspedacusta*, showing the highest concentration of species (Jankowski, 2001; Zhang *et al.*, 2009). Moreover, from the classical works of Sowerby (1941) and Kramp (1950), the idea of a putative center of origin in China for *Craspedacusta* continues to be a suggestive study hypothesis on the basis of biological and biogeographical indicia (Dumont, 1994), in replacement of its early neotropical ascription (Lankester, 1880). Particularly, *C. sowerbii* is widely considered native to the Yangtze valley (*e.g.*: Fritz *et al.*, 2007, 2009; Gasith *et al.*, 2011; Karaouzas *et al.* 2015), until a conclusive phylogeographical study emerges.

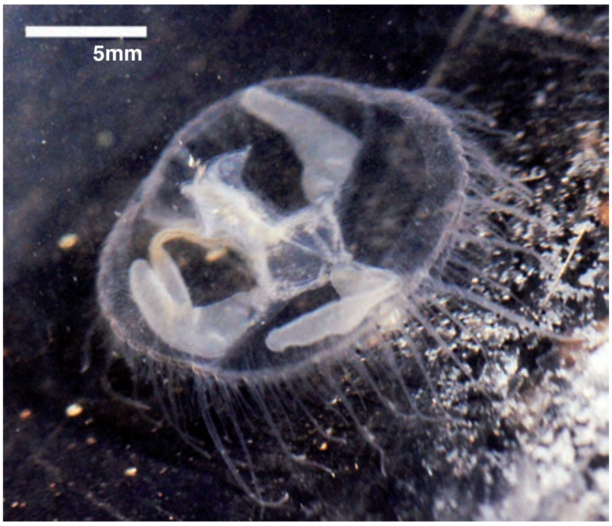

Fig. 1.— *Craspedacusta sowerbii* sampled in Sietearroyos River (Villaverde del Río, Seville).

Fig. 1.— *Craspedacusta sowerbii* muestreada en el río Sietearroyos (Villaverde del Río, Sevilla).

The first description about the existence of *C. sowerbii* occurred in 1880, at the Royal Botanic Garden of London (Lankester, 1880). This finding already revealed the potential invasiveness of this species and the importance of human activities as vectors of its long-distance dispersal. In mainland Europe, *C. sowerbii* was initially reported in 1901 (Sowerby, 1941). Since then, it was recorded from a rapidly increasing number of localities through the first half of the 20th century, both in artificial and natural environments (Kramp, 1950). During the last years, published citations on the presence of *C. sowerbii* in different European countries have increased again (*e.g.*: Arbaciauskas & Lesutiene, 2005; Lundberg *et al.*, 2005; Pérez-Bote *et al.*, 2006; Fritz *et al.*, 2007; Jacovček-Todorović *et al.*, 2010; Stefani *et al.*, 2010; Gomes-Pereira & Dionísio, 2013; Morpurgo & Alber, 2015; Minchin *et al.*, 2016), with the occurrence of more than one independent colonization event (Karaouzas *et al.*, 2015). It is likely that this scenario will not only be due to a plausible biological reality (i.e.: progressive colonization of new localities), but also to a greater effort of sampling, observation, monitoring and control of water bodies in relation to exotic species (Cardoso & Free, 2008), together with the phenomenon of universalization of information made possible by new communication technologies (Silva & Roche, 2007).

In the Iberian Peninsula, the first known identification dates back to 1968, when it was recorded in the Sau reservoir (Barcelona) (Margalef, 1977: 246). After fifty years, *C. sowerbii* is well distributed throughout the Iberian territory, with records in numerous Spanish provinces and several Portuguese districts (Table 1, Fig. 2). Unfortunately, most information about the presence of this invasive species in the Iberian Peninsula is provided by regional academic publications, technical reports of limited access, sparse naturalists' observations or press news on environmental issues. This circumstance makes it difficult for the scientific community and environmental management institutions to stay informed of the updated distribution of *C. sowerbii* in this territory. Therefore, the goals of the present

Table 1.— Revised list of Iberian locations for *Craspedacusta sowerbii*. AP: academic publication; TR: unpublished technical report; PS: preserved specimen; PN: press news; ON: observation in field by naturalists; (*): no further details in the source.

Tabla 1.— Lista revisada de las localizaciones ibéricas conocidas para *Craspedacusta sowerbii.* AP: publicación académica; TR: informe técnico; PS: especimen preservado; PN: noticia de prensa; ON: observación por naturalistas; (*): sin más detalles en la fuente.

Year	Code in Fig. 2	Locality	Province/District	Centroid coordinates	Habitat	Source
1968	6	Pantano de Sau	Barcelona	41°58'24" N 2°23'08" E	Reservoir	AP (Margalef, 1977)
1977	3	Lago Banyoles	Gerona	42°07'30" N 2°45'19" E	Lake	AP (Prat, 1979)
1981	37	Barragem do Vilar	Viseu	40°57'24" N 7°32'19" W	Reservoir	AP (Ferreira, 1985)
1983	36	Barragem da Idanha	Castelo Branco	39°57'50" N 7°11'48" W	Reservoir	AP (Ferreira, 1985)
1983	21	Río Guarrizas	Jaén	38°12'33" N 3°34'21" W	Stream /reservoir	AP (Ruiz *et al.*, 1992)
1983	22	Río Yeguas	Jaén-Córdoba	38°04'43" N 4°13'50" W	Stream /reservoir	AP (Ruiz *et al.*, 1992)
1990	7	Embalse de La Baells	Barcelona	42°09'07" N 1°52'38" E	Reservoir	AP (Viladrich *et al.*, 1990)
1990	8	Pantano de Fuïves	Barcelona	42°04'26" N 1°54'11" E	Reservoir	AP (Viladrich *et al.*, 1990)
1994	45	Embalse de San Esteban	Orense-Lugo	42°23'45" N 7°37'43" W	Reservoir	AP (Cobo & González, 2003)
1995	11	Embalse de Canelles	Huesca-Lérida	41°59'04" N 0°36'59" E	Reservoir	TR (Montserrat, 2017)
1998	28	Río Hozgarganta	Cádiz	36°28'40" N 5°30'23" W	Stream	ON
2000	17	Embalse del Cíjara	Cáceres-Ciudad Real	39°21'05" N 4°55'23" W	Reservoir	ON
2001	31	Barragem de Póvoa e Meadas	Portalegre	39°30'25" N 7°34'48" W	Reservoir	TR (Ministério do Ambiente e do Ordenamiento do Território, 2001)
2004	20	Embalse de Proserpina	Badajoz	38°58'14" N 6°21'48" W	Reservoir	AP (Pérez-Bote *et al.*, 2006)
2004	16	Embalse de Peñarroya	Ciudad Real	39°02'15" N 2°57'59" W	Reservoir	ON
2004	39	Embalse de San Juan	Madrid	40°23'03" N 4°20'18" W	Reservoir	ON
2004	14	Huerta Lugar	Valencia	39°13'59" N 0°55'47" W	Reservoir	SP (GBIF, 2017)
2004	15	Barranco del Betún	Valencia	39°09'05" N 0°39'40" W	Reservoir	SP (GBIF, 2017)
2005	25	Pantano de La Breña	Córdoba	37°50'33" N 5°02'43" W	Reservoir	PN (Diario de Córdoba, 16/10/2005)
2005	29	Río Guadiaro	Málaga	36°32'51" N 5°22'00" W	Stream	ON
2006	**26**	**Río Sietearroyos**	**Sevilla**	**37°37'23" N 5°53'13" W**	**Stream**	**AP (Present Study)**
2004	42	Embalse de Añarbe	Navarra-Guipúzcoa	43°13'07" N 1°52'41" W	Reservoir	AP (Fraile *et al.*, 2008)
2008	12	Parque Samà	Tarragona	41°06'22" N 1°01'14" E	Artificial pond	ON
2008	27	Río Guadiamar	Sevilla	37°31'50" N 6°11'26" W	Stream	ON
2009	5	Río Fluviá	Gerona	42°08'18" N 2°26'58" E	Artificial pond	PN (Diari de Gerona, 25/08/2009)
2009	4	Río Llierca	Gerona	42°14'01" N 2°36'30" E	Stream	PN (Diari de Gerona, 25/08/2009)

Table 1. — (Continued)

Year	Code in Fig. 2	Locality	Province/District	Centroid coordinates	Habitat	Source
2009	40	Embalse de Alcorlo	Guadalajara	41°01’22’’ N 3°01’24’’ W	Reservoir	TR (Asociación de Pescadores por la Conservación de los Ríos, 2011)
2009	10	Laguna de Montcortés	Lérida	42°19’50’’ N 0°59’41’’ E	Lake	AP (Oscoz *et al.*, 2010)
2009	46	Río Dorna	Lugo	42°56’21’ N 7°32’47’’ W	Artificial pond	PN (El Progreso, 23/10/2009)
2009	43	Presa de Etxebarri	Vizcaya	43°15’06’’ N 2°52’46’’ W	Reservoir	TR (Ministerio de Medio Ambiente, y Medio Rural y Marino, 2009)
2010	24	Embalse del Guadalmellato	Córdoba	38°03’45’’ N 4°40’56’’ W	Reservoir	ON
2011	33	Barragem do Cabril	Castelo Branco-Leiria	39°56’21’’ N 8°07’27’’ W	Reservoir	PN (Sol, 22/09/2011)
2011	34	Ribeira da Isna	Castelo Branco	39°47’46’’ N 7°57’09’’ W	Reservoir	PN (Sol, 22/09/2011)
2011	35	Ribeira do Alvito (Alvito)	Castelo Branco	39°49’26’’ N 7°47’53’’ W	Reservoir	PN (Sol, 22/09/2011)
2011	23	Embalse de Quéntar	Granada	37°12’33’’ N 3°26’07’’ W	Reservoir	PN (Ideal, 12/08/2011; ed. Granada)
2012	30	Monte da Rocha	Beja	37°42’56’’ N 8°17’29’’ W	Reservoir	AP (Gomes-Pereira & Dionísio, 2013)
2012	1	Lago de la Sorrera	Gerona	42°17’18’’ N 3°11’39’’ E	Lake	ON
2009	43	Embalse de Aranzelai	Vizcaya	43°14’46’’ N 2°51’13’’ W	Reservoir	AP (Rallo & García-Arberas, 2012)
2012	13	Embalse de Ulldecona	Castellón	40°40’36’’ N 0°13’52’’ E	Reservoir	TR (Confederación Hidrográfica del Júcar, 2013)
2013	19	Río Salor	Cáceres	39°21’26’’ N 6°17’35’’ W	Stream	ON
2013	2	Río Orlina	Gerona	42°20’12’’ N 3°00’53’’ E	Stream	TR (Campos *et al.*, 2013)
2014	18	Río Guadalemar	Badajoz	39°05’13’’ N 4°54’40’’ W	Reservoir *	TR (Consejería de Medio Ambiente y Rural, Políticas Agrarias y Territorio, 2014)
2014	32	Barragem de Castelo do Bode	Santarém	39°34’25’’ N 8°15’42’’ W	Reservoir	AP (Rodrigues e Silva, 2015)
2014	12	Riudoms	Tarragona	41°08’21’’ N 1°03’15’’ E	Artificial pond *	AP (Ortiz & Merseburger, 2014)
2015	9	Riera de Mura	Barcelona	41°43’15’’ N 1°52’51’’ E	Stream	ON
2015	38	Río Águeda	Salamanca	40°31’24’’ N 6°28’42’’ W	Reservoir	TR (Salvador Vilariño, 2015)
2015	35	Ribeira do Alvito (Cerejeira)	Castelo Branco	39°48’35’’ N 7°45’10’’ W	Reservoir	ON
2015	41	Embalse de la Cuerda del Pozo	Soria	41°51°05’’ N 2°44’30’’ W	Reservoir	TR (Salvador Vilariño, 2015)
2015	9	Río Cardener	Barcelona	41°43’15’’ N 1°49’48’’ E	Stream	ON
2016	44	Embalse de Valparaíso	Zamora	41°58’52’’ N 6°17’35’’ W	Reservoir	ON

work were: (i) to present a synthesis of known Iberian localities for this species, and (ii) to report the presence of an established population of *C. sowerbii* from the low Guadalquivir River (western Andalusia, southwestern Spain). In addition, environmental data associated with its occurrence are provided.

Fig. 2.— Distribution of *Craspedacusta sowerbii* in the Iberian Peninsula, from published and unpublished recordings. Localities are numbered in the Table 1. Presence data are expressed in 10x10 UTM squares; in black, present study. Grey lines define administrative units: provinces (Spain) and districts (Portugal).

Fig. 2.— Distribución de *Craspedacusta sowerbii* en la Península Ibérica, a partir de registros publicados e inéditos. Las localidades se enumeran en la Tabla 1. Los datos de presencia se expresan en cuadrículas UTM 10x10; en negro, el presente estudio. Las líneas grises definen las unidades administrativas: provincias (España) y distritos (Portugal).

Iberian Distribution. To our knowledge, *C. sowerbii* has been detected at least in 50 localities from 26 Spanish provinces and 6 Portuguese districts (Table 1, Fig. 2). All annotated records occurred in the bell-shaped jellyfish stage, which must be taken into account as a possible factor of underestimation about its real distribution in Spain. Indeed, the presence of *C. sowerbii* is usually ignored when the organism is only present as a polyp (Duggan & Eastwood, 2012).

Lentic waters define the characteristic biotope of *C. sowerbii* (Jankowski, 2001), which explains that reservoirs and lakes were the dominant habitat in the Iberian Peninsula (74%). Medusae were also frequent in temporary rivers (22%), where inhabit ponds and backwaters from middle to low courses (Table 1). In these environments, the absence of strong currents and the remarkable increase of the water temperature during the summer favour polyp fixation and medusa budding respectively (De Vries, 1992).

Warm temperature, low salinity and high dissolved organic matter have been interpreted as some of the main environmental factors favouring the development of *C. sowerbii* medusae (Zhang *et al.*, 2016; Caputo *et al.*, 2018). Unfortunately, the autoecology of this species is still little explored in the Iberian Peninsula and limnological data associated to its records are uncommon. Nevertheless, these scarce data suggest that *C. sowerbii* prefers mesotrophic lentic water-bodies and it is usually found in calm, freshwater reservoirs, lakes or pounds connected to river systems, with a maximum depth of 10 m and summer temperature above 15°C. The occurrence of medusae is between July-November, but they could be absent during several consecutive years (Ferreira, 1985; Ruiz *et al.*, 1992; Pérez-Bote *et al.*, 2006; Fraile *et al.*, 2008; Gomes-Pereira & Dionísio, 2013; Montserrat, 2017).

Low Guadalquivir River. On August 19th 2006, a population of *C. sowerbii* was found at Sietearroyos River, in Villaverde del Río, Seville, southwestern Spain (37°37’23” N -5°53’13” W). Specimens were identified according to macromorphological diagnostic characters reviewed by Jankowski (2001) (Fig. 1). This locality has been monitored since then, having detected medusa blooms during most summers of the last 12 years. It is the first documented record of *C. sowerbii* from low Guadalquivir and also the first published for western Andalusia.

Sietearroyos is a seasonal Mediterranean stream, direct tributary of the Guadalquivir River and one of the few courses of the province that maintain water throughout the year. During summer, including the driest years, the lower and middle course have permanent waters with a marked influence of the Guadalquivir in their confluence, while the upper course only retains points with isolated stagnant water-bodies or weakly connected to each other with very low flows. As a whole, the lower course is integrated in an alluvial-plain geomorphological unit with deep and fertile soils, accompanied by a deciduous riparian forest (*Nerio oleandri-Populetum albae*) within a cropland landscape matrix. On the other hand, the upper course is enclosed in a narrow valley excavated on micaschistous bedrock, embedded within an agroforestry mosaic with open sclerophyll vegetation (*Flueggeion tinctoriae* and *Oleo-Ceratonion*). Particularly, *C. sowerbii* population inhabits the middle-upper course of the stream, in a system of shallow ponds that form a single water-body of meandering topology, with a total length of 200 m, maximum width of 15 m and depth up to 3 m (Fig. 3). This zone is located at altitude of 33 m above sea level, separated 8.6 km from the confluence with the Guadalquivir River and freely exposed to direct sunlight throughout the day. Its main physicochemical water parameters associated with the occurrence of *C. sowerbii* are listed in the Table 2.

Water temperature is a key factor in jellyfish blooms (Purcell, 2005; Prieto *et al.*, 2010). In particular, the polyps of *C. sowerbii* release medusae at a threshold of 21°C (Folino-Rorem *et al.*, 2016), which is consistent with summer temperature in the study area (Table 2). Alkaline levels of pH recorded in Sietearroyos were similar to others reported for the Iberian Peninsula (Ruiz *et al.*, 1992; Ferreira, 1985; Pérez-Bote *et al.*, 2006) or zones with comparable latitude in Europe (Karaouzas *et al.*, 2015). Nevertheless, records in pH from 6.5 (Litton, 1984; Fraile *et al.*, 2008) to more than 8.5 (Raposeiro *et al.*, 2011; Kozuharov *et al*., 2017) indicate the wide range of pH tolerance for this species. Analogously, values of electrical conductivity in Sietearroyos are also included within the wide range of values reported in the literature for this species: from 60–70 µS/cm^2 (Fraile *et al.*, 2008) to 1260–1340 µS/cm^2 (Ruiz *et al.*, 1992), in the Iberian Peninsula. However, as a surrogate of salinity, values of electrical conductivity would be expected low in optimal habitats for *C. sowerbii* medusae (Zhang *et al.*, 2016). Moreover, measurements of water quality reveal high values of salinity from July to October (28.5–61.2 mg/l Na^+) downstream of the sample point (41503 DMA Station, Hydrographic Confederation of the Guadalquivir Basin), in spite of freshwater nature of this species.

Craspedacusta sowerbii is considered an invasive species in freshwater systems worldwide, which has established populations in natural, as well as artificial and human-modified habitats (Dumont, 1994;

Table 2.— Field instantaneous measurements of physicochemical water parameters of ecological interest for *Craspedacusta sowerbii* in the study area, through a standard year.

Tabla 2.— Mediciones instantáneas de parámetros fisicoquímicos de interés ecológico para *Craspedacusta sowerbii* en el área de estudio, a lo largo de un año típico.

Parameter	**Value**
Water temperature	
Winter	9.5 °C
Spring	18 °C
Summer	22.5 °C
Fall	18 °C
pH	7-8
Conductivity	550 - 1500 mS/cm

Fig. 3.— Habitat of *Craspedacusta sowerbii* in Sietearroyos River: quiet, shallow open ponds at the middle-upper course, on rocky substrate.

Fig. 3.— Hábitat de *Craspedacusta sowerbii* en el río Sietearroyos: pozas despejadas, someras y de aguas tranquilas en el tramo medio-alto de su curso, sobre sustrato rocoso.

Jankowski *et al.*, 2008; Duggan & Eastwood, 2012). Its wide range of sexual and asexual reproductive strategies makes it an efficient invader. Furthermore, the life cycle of this species includes an encysted phase and it can remain dormant for many years (Bouillon *et al.*, 2004). This characteristic makes this species a perfect invader, allowing withstand by long periods of extreme environmental conditions and facilitating the anthropogenic transport (Jankowski, 2001). Several dispersal vectors have been suggested to explain the cosmopolitan pattern of *C. sowerbii*, all them associated with the larval (frustule) and resting stages (cysts): water transfer, ship drift, use of alluvial sands for the construction of hydraulic infrastructures, malpractice in aquarofilia, introduction of fish and aquatic invertebrates for sports and commercial purposes, natural movements of wetland birds, importation of aquatic plants, etc. (Turquin, 2010; Fraire-Pacheco *et al.*, 2017). Indeed, several invasive fish species (*Alburnus alburnus* Linnaeus, 1758; *Ameliurus melas* Rafinesque, 1820; *Lepomis gibbosus* Linnaeus, 1758) coexist at the study pools, which are frequented by fishers. Nevertheless, it is also necessary to consider the hypothesis of the spontaneous entry of *C. sowerbii* from the Guadalquivir River, since this is a natural route of introduction of exotic species in the area (Encina *et al.*, 2006). Moreover, in dry years in which the disruption between water-bodies from upper course and the Guadalquivir are more pronounced, medusa blooms were not usually observed (*e.g.*: 2016, 2017).

Craspedacusta sowerbii is classified by the European Commission as an alien species of high impact in the European freshwaters (EASIN, 2017). The predatory impact of *C. sowerbii* on zooplankton community has been described within natural environments and in the laboratory (Boothroyd *et al.*, 2002; Jankowski *et al.*, 2005; Smith & Alexander 2008). In fact, different authors point out that blooms of *C. sowerbii* can increase its negative effect on native zooplankton community, alter the aquatic food webs and reduce the dissolved oxygen in water (Jankowski, 2000; Smith & Alexander, 2008; Gasith *et al.,* 2011; Folino-Rorem *et al.*, 2016). Dodson & Cooper (1983) conclude that the size range of prey is about 0.2–2.0 mm, though it can kill, but not eat, preys up to 8.8 mm in length. Thus, the food web effect of *C. sowerbii* is by reducing the density of other invertebrate predators and increasing the abundance of herbivorous zooplankton.

The loss of biodiversity by the introduction of alien and invasive species could not simply be considered in terms of displacements of some native species in favour of their equivalent newcomers (González-Duarte *et al.*, 2016). All associated fauna and relationships can be finally altered (Byers *et al.*, 2002). The possible ecological, socio-economical and evolutionary implications of the introduction and dispersion of *C. sowerbii* around the world are far from correctly understood. The impact of this invasive species on Iberian ecosystems is still preliminary, but this study contributes to know its geographic distribution along with some important physicochemical parameters.

Only further molecular analysis will be able to provide additional information about the true origin of this species. In addition, long-term studies of the populations will provide more data about the relationship between the environmental factors and the fluctuations of the population, and the influence of *C. soberwii* in the trophic web.

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