

Research articleSubmitted: January 18th, 2019 - Accepted: March 29th, 2019 - Published: May 31st, 2019**Notes on the distribution and habitat of *Ochthebius lobicollis* Rey, 1885, a poorly known north-western Mediterranean coastal species (Coleoptera: Hydraenidae)**Ignacio RIBERA ^{1,*}, Carles HERNANDO ²¹ Institute of Evolutionary Biology (CSIC-Universitat Pompeu Fabra) - Passeig Marítim Barceloneta 37, 08003 Barcelona, Spain
ignacio.ribera@ibe.upf-csic.es² P.O. Box 118, E-08911 Badalona, Catalonia, Spain - leptotyphlus@gmail.com

* Corresponding author

Abstract

Ochthebius (Ochthebius) lobicollis Rey, 1885 is recorded for the first time from the Iberian Peninsula (Girona) and the island of Corsica; new records are also given for the islands of Menorca and Sardinia. The species is known only from coastal habitats through the Gulf of Lion and the Ligurian and Balearic seas, typically living in rockpools of different salinity or small trickles or freshwater runoffs. Genetic data of the cytochrome oxidase 1 gene from Iberian, Menorcan and Sardinian specimens shows less than 1% divergence, suggesting lack of isolation between populations.

Key words: coastal habitats, aquatic Coleoptera, biogeography.**Introduction**

Ochthebius (Ochthebius) lobicollis Rey, 1885 (Figs 1, 2) was described from a small series collected “près de Port Vendres”, in the French Pyrénées Orientales (Rey 1886: 56; although given simply as “Port Vendres” in the description, Rey 1885: 25). Specimens were found in a small trickle of freshwater flowing to the sea, all of them in a small area (Rey 1886). These specimens were studied by Jäch (1990) in his revision of the group, who found six specimens in the Rey collection in the “Musée Guimet d’Histoire Naturelle” (Lyon), labelled “Colliure” (just north of Port Vendres), one of them designated as lectotype. Additional paralectotypes are kept in the Muséum national d’Histoire naturelle, Paris (MNHN), Naturhistorisches Museum Wien (NMW) and the Musée Municipal de Brou (Bourg-en-Bresse), all apparently from the same syntype series (Jäch 1990).

There was no new information on the species until the records of Chiesa (1959) from Sardinia (Golfo Aranci and Cagliari) and Pirisinu (1970, 1976) from the island of Capraia, in the old prison area (“Colonia Penale”). The habitat was described as brooks not far from the sea by Chiesa (1959) and running water in hygropetric environment by Pirisinu (1981). Jäch (1990) reported some additional material from Colliure, Côte d’Azur, Fréjus (coll. Knirsch, Field Museum of Natural History, Chicago, USA) and Sardinia, Golfo Aranci (A. Doderò leg. 1910, specimens in the NMW and MNHN). Finally, Javier García-

Avilés found the species in Menorca, in the Favàritx cape, in 1988, reporting the data in his unpublished PhD thesis (García-Avilés 1990) and subsequently in Valladares & García-Avilés (1999). According to the text of the thesis, specimens were found in localities Nos 147 (UTM 31SFE071284, stream, 10 m a.s.l., 4.iii.1988, 31.v.1988) and 248 (UTM 31SFE073284, stream, 31.v.1988), although in Valladares & García-Avilés (1999) they were recorded as having been found in “two small ponds in the north of the island with a slate substratum [...], permanent or semi-permanent, slightly brackish water and without vegetation.”

The species is the eponym of the *O. lobicollis* group within the subgenus *Ochthebius*, introduced by Pirisinu & Ferro (1978) and well characterised by the shape of the aedeagus, with three lobes (Fig. 2; Jäch 1990). Currently it includes 11 species with a mostly Mediterranean distribution (Villastrigo et al. 2019). Within the group, *O. lobicollis* can be separated from other species by its densely punctate pronotum (Fig. 1; Jäch 1990).

We have recently collected the species in coastal habitats in Sardinia, Menorca and in Girona, representing the latter a new record for the Iberian Peninsula (although being less than 100 km in straight line from the type locality, Colliure). Here we report these captures, together with some unpublished records of material in the NMW and observations on the peculiar habitat of this seemingly rarely collected and poorly known species.

Results

Ochthebius lobicollis Rey, 1885 (Figs 1, 2)

Studied material. Spain: Balearic Islands, Menorca (Fig. 3): 7 exx (Institute of Evolutionary Biology, Barcelona; IBE): “2 Menorca 26.2.2010 / Cap de Favàritx, stream / 39°59'48"N 4°15'26"E 3m / I. Ribera & A. Cieslak leg.”. Two specimens (males) used for DNA extraction and sequencing, with DNA-voucher numbers IBE-RA181 and IBE-RA242. Sequence data of the latter have been used in Abellán et al. (2013) and Villastrigo et al. (2019) (GenBank accession numbers LT991364, HF931308, HF931534, LT990937, LT991146); Iberian Peninsula, Catalonia (Fig. 6): 8 exx (IBE, coll. Hernando, Badalona): “CAT, Punta de Cala Pedrosa / S’Agaró, Sant Feliu de Guíxols / 41°47'27"N 3°03'31"E / C. Hernando leg. 10.12.2017”. One male used for DNA extraction and sequencing, with DNA-voucher number IBE-AV153 (Fig. 1).

Italy: Sardinia (Figs 4,5): 1 male, 2 females (IBE): “10 Sardinia, Isola Rossa 12.iv.2017 / rockpools in pink granit / 41°0'51"N 8°52'14"E 3m / I. Ribera, A. Cieslak & B. Ribera leg.”. Specimen male used for DNA extraction and sequencing, with DNA-voucher number IBE-AV86.

The examination of the collections of the NMW by M.A. Jäch (personal communication, 2019) revealed some additional unpublished records:



Fig. 1 – Habitus of *Ochthebius (Ochthebius) lobicollis* Rey, 1885, specimen voucher IBE-AV153 (Girona, Spain) after DNA extraction. Scale bar, 1 mm.

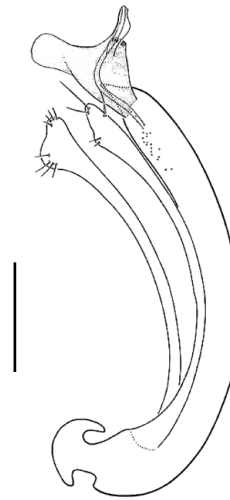


Fig. 2 – Aedeagus of *Ochthebius lobicollis* (from Jäch 1990). Scale bar, 0.1 mm.

France: Corsica: 1 male (NMW): “Hte Corse, AREGNO / Calcinaiu, Rock Pools / 07-IV-2002 / JF.Elder”; **Italy:** Sardinia, 1 female (NMW): “Sard., 10.5.85 / Capo Falcone / leg. Schillhammer”; 9 exx (NMW): “S a r d i n i e n / SA, Stintino / 24.IV.–5.5.92 Heiss”.

Habitat. Two of the localities in which *O. lobicollis* was recently found were marine rockpools (Sardinia and Girona; Figs 4–6), with clear marine influence and in company of species exclusively found in this habitat (*O. (Cobalius) subinteger* Mulsant & Rey, 1861 and *O. (s.str.) quadricollis* Wollaston, 1864). The pools were, however, not in the immediate vicinity of the sea, and had some riparian vegetation (S’Agaró; Fig. 6) or algal growth (Sardinia; Figs 4–5), and possibly some freshwater input through runoff. The site in Menorca was a small freshwater stream which is most likely temporary, running close to the sea but without direct marine influence, with a slate substratum and almost no vegetation (Fig. 3); this is most likely the same habitat reported in García-Avilés (1990) and Valladares & García-Avilés (1999). Accompanying water beetle species included *Hydroglyphus geminus* (Fabricius, 1792), *Hydroporus tessellatus* (Drapiez, 1819), *Nebrioporus ceresyi* (Aubé, 1838) (a single specimen), *Stictometes optatus* (Seidlitz, 1887), *Limnebius cf. minoricensis* Jäch, Valladares & García-Avilés, 1996 (a single female) and *Ochthebius punctatus* Stephens, 1829. Most of the species are typical or exclusive of freshwater, with the exception of *N. ceresyi* – but this could be a straying specimen from nearby saltmarshes.

According to our observations and literature data (Rey 1886; Chiesa 1959; Pirisinu 1970, 1976; Valladares & García-Avilés 1999) it seems that *O. lobicollis* is restricted to coastal habitats, with preference for hygropetric surfaces, small streams or marine rockpools with some input from surface runoff and some riparian vegetation or algal



Figs 3-6 – Some of the habitats where *Ochthebius lobicollis* has been recently found. **3**, Spain, Balearic Islands, Menorca, Cap de Favàritx; **4**, Italy, Sardinia, Isola Rossa; **5**, same, detail of the rockpool; **6**, Spain, Girona, Punta de Cala Pedrosa.

growth. Although they can live in freshwater, they obviously are able to tolerate a high degree of salinity, something not surprising giving that most (if not all) species of the *O. lobicollis* group are usually found in saline or hypersaline habitats (e.g. *O. caesaraugustae* Jäch, Ribera & Aguilera, 1998, *O. delgadoi* Jäch, 1994 or *O. eyrei* Jäch, 1990).

Within the *O. lobicollis* group there are no other species known to inhabit this type of habitat, but there are a number of species in the *O. metallescens* group with a similar ecology and also with a similar external morphology even if phylogenetically not closely related (Villastrigo et al. 2019). Thus, *O. poweri* Rye, 1869 is typically found in coastal sandstone cliffs from Britain and Ireland to south Iberia, “in the earthy incrustation deposited by the constant trickling of water from above, in places just moistened by the fine spray but it is not to be found amongst the strong algaoid growth affected by the Laccobii, Elmids, Hydrae-nae etc.” (Balfour-Browne 1958: 176). Although Balfour-Browne (1958) remarked that by the effect of the spray salinity is likely to be above the normal, d’Orchymont (1942: 8) notes that the water is fresh, and the physico-chemical conditions should be similar to those of the mountain

streams proper. The recently described *Ochthebius scopuli* Köhler, Jäch & Delgado, 2016 is known only from the type locality in Sardinia, a wet cliff face with algal coating at the beach of Cala Mariolu only about three meters above the sea level (Köhler et al. 2016). Similarly, *O. semiseri-*

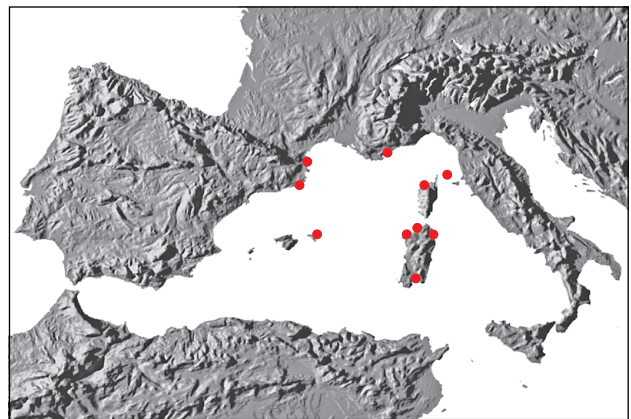


Fig. 7 – Known distribution of *Ochthebius lobicollis*.

ceus can be found in the vicinity of the sea, in small brooks or filtrations of freshwater (e.g. Girona, Port Bou, small spring in cliff, 42°25'42"N 3°09'39.5"E, 23.viii.2017, R. Vila leg.; Girona, Llança, runoff over rock, 42°21'56.5"N 3°09'52"E, 13.x.2017, R. Vila leg.), but it is also found far from marine influence (e.g. Girona, Port Bou, Cami de la Riera 42°25'34.5"N 3°09'E, 65m, 28.vi.2013 I. Ribera & A. Cieslak leg.) or in typical mountain streams (e.g. Tarragona, Horta de Sant Joan: Riu Canaletas, 17.iv.1998, I. Ribera, C. Hernando & P. Aguilera leg.; Teruel, Beceite, river Matarranya in El Parrisal 40°47'12.5"N 0°12'13.5"E, 680m, 7.viii.2006 I. Ribera, C. Hernando & A. Cieslak leg.) (see also d'Orchymont 1942; Jäch 2001).

Distribution. *Ochthebius lobicollis* is known only from a handful of coastal localities through the Gulf of Lion and the Ligurian and Balearic seas (Fig. 7). Only three are known from the mainland: the type locality (Colliure) in the French Pyrénées Orientales, S'Agaró in the province of Girona (Spain), and Fréjus in the Côte d'Azur (France). This scarcity of records cannot be due to lack of suitable habitat, as rocky shores are common in the north-western Mediterranean, and most likely also not due to the scarcity of the populations, but to lack of collecting. Coastal habitats are generally species poor and neglected by most entomologists, despite their high interest (e.g. Boudouresque et al. 2017; Hernando et al. 2017). Molecular data support the view of continuous, well communicated populations of the species through their distributional range, as differences between the specimens from Menorca, Sardinia and Girona differ in less than 1% in their cytochrome oxidase 1 gene.

Acknowledgements – We thank R. Vila (IBE) for the material of *O. semisericeus* (and other interesting water beetles), A. Cieslak (Barcelona) for help in the field and M.A. Jäch (NMW) for unpublished information and comments on the manuscript.

References

- Abellán P., Sánchez-Fernández D., Picazo F., Millán A., Lobo J.M., Ribera I. 2013. Preserving the evolutionary history of freshwater biota in Iberian National Parks. *Biological Conservation*, 162: 116–126.
- Balfour-Browne F. 1958. *British Water Beetles. Vol. 3*. Ray Society, London.
- Boudouresque C.F., Ponel P., Astruch P., Barcelo A., Blanfuné A., Geoffroy D., Thibaut, T. 2017. The high heritage value of the Mediterranean sandy beaches, with a particular focus on the *Posidonia oceanica* “banquettes”: a review. *Scientific Reports of the Port-Cros national Park*, 31: 23–70.
- Chiesa A. 1959. *Hydrophilidae europae. Coleoptera Palpicornia*. Arnaldo Forni, Bologna, 200 pp.
- García-Avilés J. 1990. *Insectos acuáticos de Baleares (Odonata, Ephemeroptera, Heteroptera, Plecoptera y Coleoptera)*. Unpublished PhD thesis, Universidad Complutense de Madrid, 501 pp.
- Hernando C., Villastrigo A., Ribera, I. 2017. A new species of *Micragasma* J. Sahlberg, 1900 (Coleoptera: Hydraenidae) from Crete. *Aquatic Insects*, 38: 185–196.
- Jäch M.A. 1990. Revision of the Palearctic species of the genus *Ochthebius* Leach IV. The *lobicollis* group. *Entomologische Blätter*, 86: 26–40.
- Jäch M.A. 2001. Revision of the Palearctic species of the genus *Ochthebius* XVIII. The European species of the *O. semisericeus* complex (Coleoptera: Hydraenidae). *Entomological Problems*, 32: 45–53.
- Köhler J., Jäch M.A., Delgado, J.A. 2016. Revision of the Palearctic species of the genus *Ochthebius* Leach, 1835 XXXI. *Ochthebius scopuli* sp.n. from Sardinia (Italy) (Coleoptera: Hydraenidae). *Koleopterologische Rundschau*, 86: 97–102.
- d'Orchymont A. 1942. Le groupe de l'*Ochthebius* (*Hymenodes*) *metallescens* Rosenhauer. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 18(51): 1–16.
- Pirisinu Q. 1970. Su alcuni Idrofili (Coleoptera Palpicornia) rinvenuti nel corso di ricerche idrobiologiche nell'isola di Capraia (Arcipelago Toscano). *Rivista di idrobiologia*, 9(3): 171–200.
- Pirisinu Q. 1976. Considerazioni zoogeografiche sugli Idroadeffagi e Palpicorni della Capraia (Arcipelago Toscano). *Lavori della Società italiana di Biogeografia*, n.s., 5(1974): 725–736.
- Pirisinu Q. 1981. *Guide per il riconoscimento delle specie animali delle acque interne italiane. 13. Palpicorni (Coleoptera: Hydraenidae, Helophoridae, Spercheidae, Hydrochidae, Hydrophilidae, Sphaeriidae)*. Consiglio Nazionale delle Ricerche, AQ/1/128, Verona, 97 pp.
- Pirisinu Q., Ferro G. 1978. Un nuovo *Ochthebius* (*Hymenodes*) del Gruppo *lobicollis*: *Ochthebius* (*Hymenodes*) *montalbensis* (Coleoptera Hydraenidae). *Rivista di Idrobiologia*, XVII (2): 259–263.
- Rey C. 1885. Descriptions de coléoptères nouveaux ou peu connus de la tribu des Palpicornes. *Annales de la Société Linnéenne de Lyon*, 31(1884): 13–32.
- Rey C. 1886. Histoire naturelle des coléoptères de France (suite). *Annales de la Société Linnéenne de Lyon*, 32(1885): 1–187.
- Valladares L.F., García-Avilés J. 1999. Distribution, habitats and biogeography of four families of aquatic Coleoptera of the Balearic Islands (Spain) (Coleoptera: Hydraenidae, Helophoridae, Hydrochidae, Hydrophilidae). *Koleopterologische Rundschau*, 69: 187–206.
- Villastrigo A., Jäch M.A., Cardoso A., Valladares L.F., Ribera, I. 2019. A molecular phylogeny of the tribe Ochthebiini (Coleoptera, Hydraenidae, Ochthebiinae). *Systematic Entomology*, 44: 273–288.