

# A new species of the genus *Navalis* Quiñonero-Salgado & Rolán, 2017 (Gastropoda: Hydrobiidae) from Spain

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*Navalis edetanus* a new species of the genus *Navalis* Quiñonero-Salgado & Rolán, 2017 is described for the province of València (Spain). The new species can be easily differentiated by its morphology from the other single known species of the genus.

**Keywords:** *Gastropoda*, *Hydrobiidae*, *Navalis*, València, Spain, new species.

## Nova espècie del gènere *Navalis* Quiñonero-Salgado & Rolán, 2017 per a Espanya

Es descriu *Navalis edetanus*, nova espècie del gènere *Navalis* Quiñonero-Salgado & Rolán, 2017 en la província de València (Espanya). La nova espècie es pot diferenciar fàcilment per la seua morfologia de l'altra espècie coneguda del gènere.

**Mots clau:** *Gastropoda*, *Hydrobiidae*, *Navalis*, València, Espanya, espècie nova.

The family Hydrobiidae Stimpson, 1865 includes a number of genera in the Spanish territory of the Iberian Peninsula, but only a few of them have the so called valvatiform shape. Among those, we can cite: *Deganta* Arconada & Ramos, 2019, in the north of the Peninsula; *Islamia* Radoman, 1973, in the north, center, south and east; *Corbellaria* Girardi & Boeters, 2012 in the center; *Arganiella* Giusti & Pezzoli, 1980 in the southwest; *Boetersiella* Arconada & Ramos, 2001, *Iberhoratia* Arconada & Ramos, 2007 and *Milesiana* Arconada & Ramos, 2006, in the south; *Chondrobasis* Arconada & Ramos, 2001, *Spathogyna* Arconada & Ramos, 2002, *Josefus* Arconada & Ramos, 2006, *Tarraconia* Ramos & Arconada, 2000 and *Navalis* Quiñonero-Salgado & Rolán, 2017 in the east (Arconada & Ramos, 2001, 2002, 2006, 2007; Girardi & Boeters, 2012; Quiñonero-Salgado & Rolán, 2017; Ruiz-Cobo *et al.* 2018, Delicado *et al.* 2019).

The genus *Navalis* Quiñonero-Salgado & Rolán, 2017 is characterized by small sized valvatiform shells, easily distinguishable from all the other known genera of the family Hydrobiidae due to its prominent keel. It has a stygobiotic habitat, and at present there is no knowledge on its body parts. The only described species, *Navalis perforatus* Quiñonero-Salgado & Rolán,

2017, is only known from two localities in the province of Castelló (Quiñonero-Salgado & Rolán, 2017).

In the present paper, a new species of the genus *Navalis* is described, being the first species of this genus in the province of València.

## Material and methods

The type locality was visited on 2020/09/16, with the pertinent permits for sampling. The study material was obtained from sediments collected in the upwelling area, where the water directly leaves the spring, down to 1 m deep, with the help of a home-made concave recipient, attached to an extensible long stick. After cleaning and drying out the sediment, it was filtered through successive sieves of 2.0, 1.0 and 0.5 mm mesh to obtain aquatic micromolluscs. The material obtained was examined with the help of a stereomicroscope for its identification, and cleaned with water by using a small brush. No live specimens were collected, so the study was carried out only with empty shells. Photographs of the specimens were done with a trinocular stereomicroscope Nexius Zoom NZ 1903-S coupled to a Euromex CMEX-10PRO camera. Subsequently, some shells were processed in aluminum stubs for electronic pictures with an electronic

Quanta-200 microscope in order to examine details of microsculpture.

### Abbreviations

MCNB: Museu de Ciències Naturals de Barcelona

MNCN: Museo Nacional de Ciencias Naturales de Madrid

CSQS: Collection of Sergio Quiñonero-Salgado

CJT: Collection of Julio Talaván

## Results

### Systematics

Family HYDROBIIDAE Stimpson, 1865

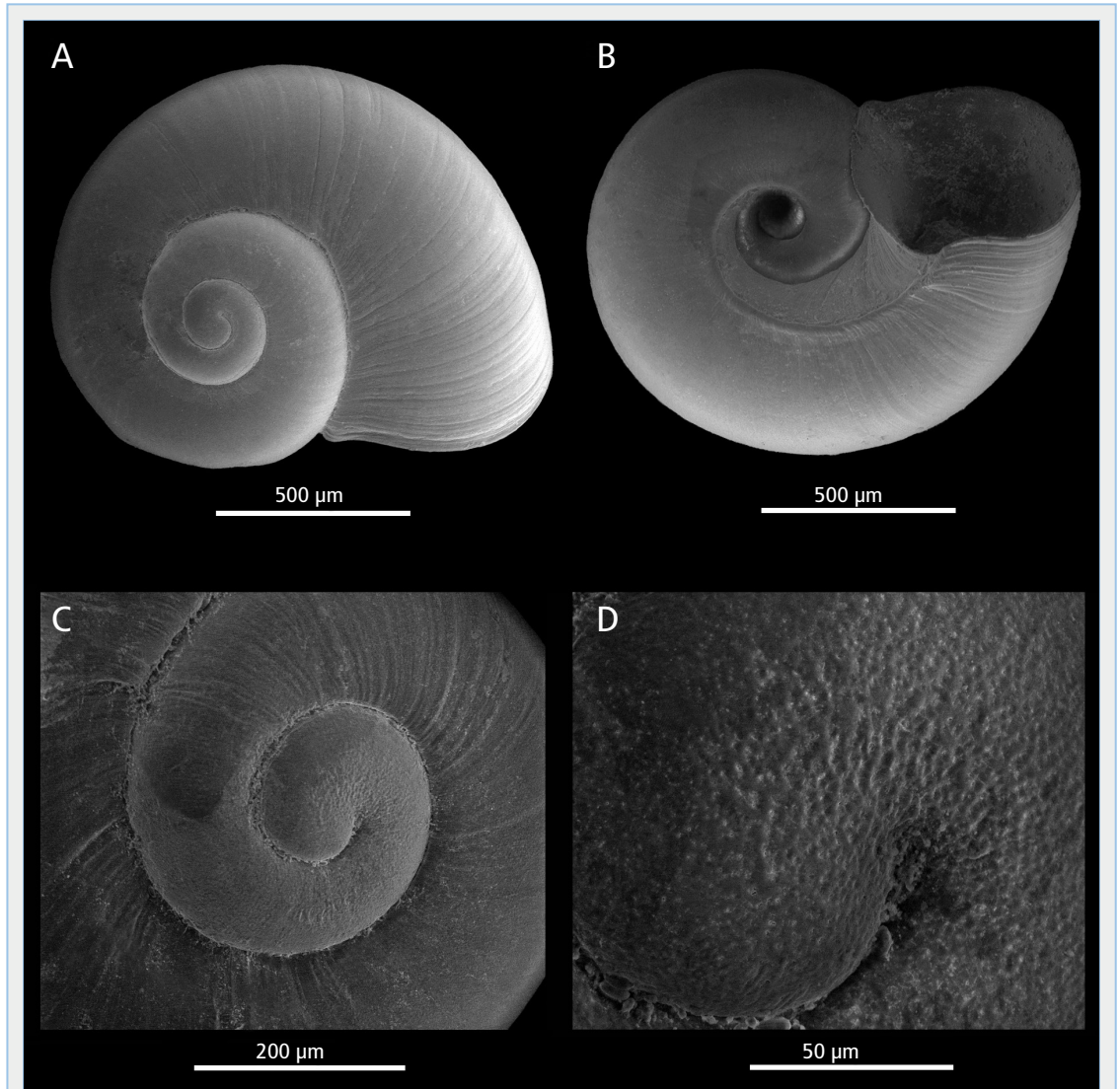
Genus *Navalis* Quiñonero-Salgado & Rolán, 2017

Type species: *Navalis perforatus*

Quiñonero-Salgado & Rolán, 2017

*Navalis edetanus* sp. n.

(Figs. 1-2)



**FIGURE 1:** SEM photographs of *Navalis edetanus* sp. n. from the type locality. **A, B:** shell **C, D:** detail of the protoconch microsculpture.

Microfotografies de microscopi electrònic de *Navalis edetanus* sp. n. de la localitat tipus. **A, B:** closca. **C, D:** detall de la microescultura de la protoconquilla.

**Type material:** Holotype (Fig.2) in MCNB, MZB 2021-0468, paratypes: 1 s in MNCN 15.05/200132, 3 shells CSQS, 3 shells CJT.

**Type locality:** font de Sant Vicent, Lliria. Province of València, Comunitat Valenciana. Spain. (30SYJ07969182). 175m. (Figs. 4-5).

This spring has a calcareous nature and is located in a municipal park in the north of Lliria municipality. It is composed of a number of upwellings of different sizes, spread over hundreds of meters. The water coming out directly from the spring forms a small pond.

**Etymology:** The name refers to the historical

Iberian-Roman town of “Edeta”, whose archaeological remains are at the “Tossal de Sant Miquel”, near the contemporary city of Lliria (Valencia). At that time, it was the capital of the “Edetania” region, comprising most of the present northern part of València and southern part of Castelló provinces.

**Description:** Shells of small size, very fragile, valvate-form, oval shaped, depressed, less convex in the upper whorls than the lower part. Sizes range from 0.47 to 0.76 mm high, and 0.96 to 1.35 mm wide. It has 3 to 3 1/3 spire whorls, a bit globose, the last one representing one third or more of the total width of the shell. Freshly collected specimens are translucent. Sutures are shallow but well defined. Slightly prominent apex. Protoconch presents a microsculpture formed by microperforations, irregularly displayed. Teleoconch showing isolated, narrow growth lines, more abundant at the end of the shell.

Oval umbilicus, very wide, representing one third of shell diameter, very perspective, allowing to see the whole spiral rolling through it. The presence of a strong angularity or keel in the lower part of the shell is quite characteristic, delimitating the umbilical contour, and being quite conspicuous in the last whorl. Ovoid aperture, 0.40 to 0.48 mm high and 0.40-0.61 mm wide,

<i>Navalis edetanus</i>		SH	SW	BWH	PH	PW
(n=13)	HOLOTYPE	0.69	1.17	0.64	0.44	0.52
	min	0.47	0.96	0.52	0.40	0.40
	max	0.76	1.35	0.72	0.48	0.61
	mean	0.63	1.15	0.61	0.44	0.50
	st.dev.	0.091	0.018	0.066	0.030	0.058

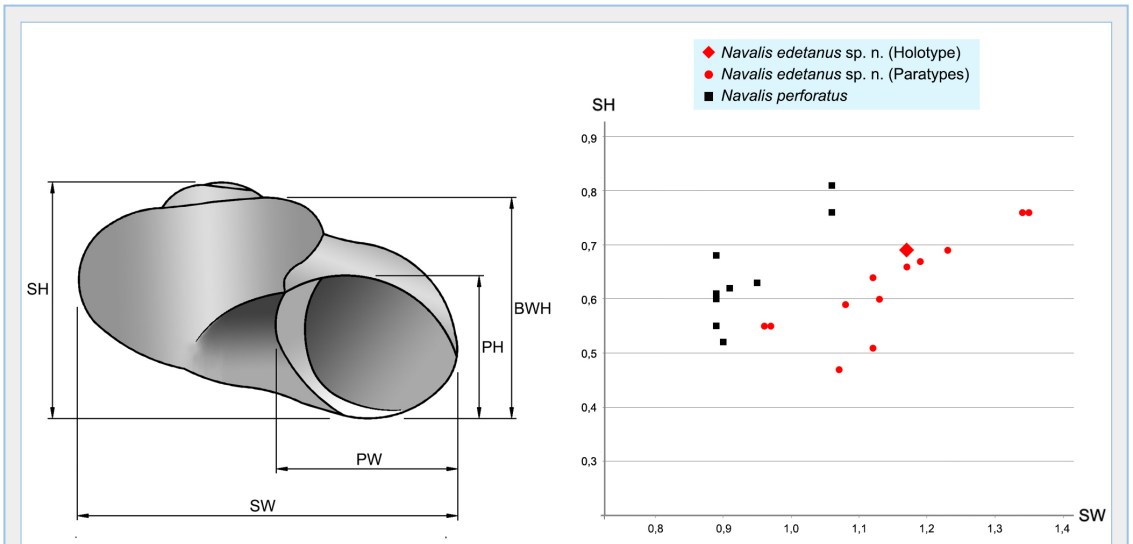
**TABLE 1.** Measurements of *Navalis edetanus* sp. n. shells. SH: shell height. SW: shell diameter. BWH: last whorl height. PH: aperture height. PW: aperture width. See also Fig. 3.

Mesures de la conquilla de *Navalis edetanus* sp. n. SH: alçada. SW: diàmetre. BWH: alçada de l'última volta. PH: alçada de l'obertura. PW: amplada de l'obertura. Cal veure també la Fig. 3.



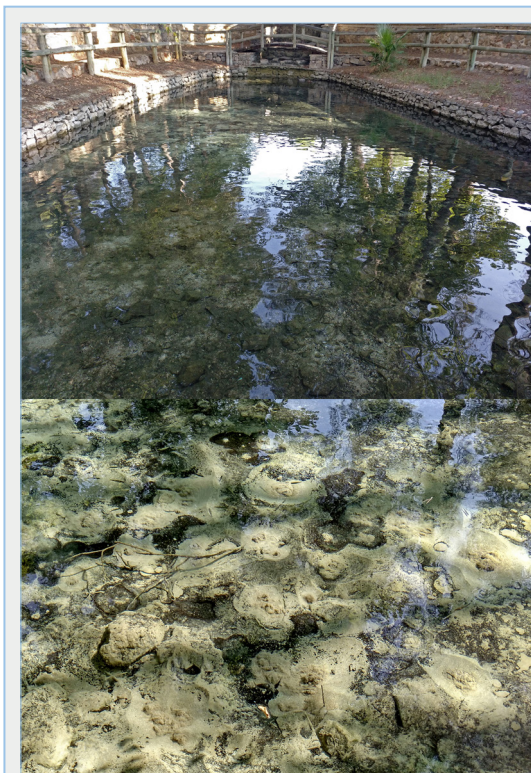
**FIGURE 2.** Holotype of *Navalis edetanus* sp. n. Scale bar: 1 mm.

Holotip de *Navalis edetanus* sp. n. Barra d'escala: 1 mm.

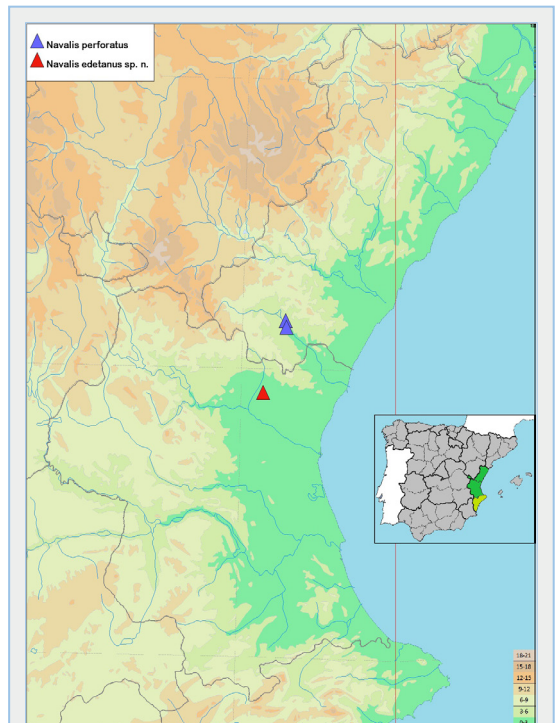


**FIGURE 3.** Shell measurements of *Navalis edetanus* sp. n. and *Navalis perforatus* SH: shell height. SW: shell diameter. BWH: last whorl height. PH: aperture height. PW: aperture width.

Dimensions de la conquilla de *Navalis edetanus* sp. n. i *Navalis perforatus* SH: alçada de la conquilla. SW: diàmetre de la conquilla. BWH: alçada de l'última volta PH: alçada de l'obertura. PW: amplada de l'obertura.



**FIGURE 4.** Font de Sant Vicent, type locality of *Navalis edetanus* sp. n.  
Font de Sant Vicent, localitat tipus de *Navalis edetanus* sp. n.



**FIGURE 5.** Map of Castelló and València provinces showing the known distribution range of the *Navalis* spp.

Mapa de les províncies de Castelló i València que mostra el rang de distribució de *Navalis* spp.

rounded in the lower margin, and more angular in the upper margin. Very slim peristome, finely thickened in the inner margin, and slightly expanded, especially on the columellar side.

**Dimensions:** see Table 1, Fig. 3

**Habitat:** Stygobiotic. Shells were washed out of the spring by water flow, likely after sudden increases in water flow.

**Distribution:** Only known from the type locality (Figs. 4-5).

**Remarks:** *Navalis edetanus* sp. n. shows the conchological main trait of the genus *Navalis*, that is, the presence of a marked angle or keel in the lower part of the shell that forms the umbilical margin. The anatomy of *Navalis perforatus*, type species of the genus, is still unknown.

*Navalis edetanus* sp.n is easily distinguished from *N. perforatus* by having a more expanded, and less globose and compact shell. The upper part is less flattened, while the lower part is less globose and prominent. Spiral whorls are more rounded, without an angled outline. Aperture is less ovate, and peristome is finer. Umbilicus is smaller, less rounded and less perspective. The angularity around the umbilicus in the lower part of the shell is much less developed than in *Navalis perforatus*, and barely protrudes on the lower contour of the shell, giving an overall less globose aspect to the lower half of the shell.

## Conclusions

With the description of *Navalis edetanus* sp.n. for the province of València, the number of known species of the genus is raised to two. There are enough conchological traits for differentiating both species. Since no live specimens were collected, the generic assignment is based only on conchological traits, while waiting for genetic or anatomic studies that should confirm its

taxonomic status. The anatomy of the genus is completely unknown at this point.

Due to the reduced geographic range of distribution, restricted to the type locality, and the fragility of this ecosystem, *Navalis edetanus* sp.n seems a highly vulnerable species, so we advocate for some protection status for both the species and its habitat.

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