

NOTA BREU

Wolffia columbiana* (Araceae, Lemnoideae) new to the Iberian Peninsula**Wolffia columbiana* (Araceae, Lemnoideae), nova per a la península Ibèrica**

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***Wolffia columbiana* H. Karst.**

Osona: Tavèrnoles, north of Serrabou, 31TDG4245, 520 m, pond, 8-VIII-2023 (D. Vilasis & P. Aymerich); Tavèrnoles, between Serrabou and El Pendís, DG4345, 525 m, pond, 8-VIII-2023 (D. Vilasis & P. Aymerich); Tavèrnoles, Torrents, 31TDG4344, 545 m, two agricultural ponds, 11-VIII-2023 (D. Vilasis); Tavèrnoles, Teuleria de Savassona, 31TDG4544, 615 m, pond in a forested area, 9-VIII-2023 (D. Vilasis).

The genus *Wolffia* Schleid. includes the smallest flowering plants in the world. *Wolffia arrhiza* (L.) Wimm., the only species that is accepted as native in Europe and the Iberian Peninsula (Galán, 2008) has never been reported from Catalonia (Sáez & Aymerich, 2021). The closest data of this species are from the regions of Languedoc (Tison *et al.*, 2014) and Valencia (Mateo, 2008), a few hundred kms away. Other three *Wolffia* species are known in Europe as alien plants, all of them discovered from 2010 onwards: *W. globosa* (Roxb.) Hartog & Plas. of Asian origin (Kirjakov & Velichkova, 2013), *W. columbiana* H. Karst. of American origin (Schmitz *et al.*, 2014) and *W. australiana* (Benth.) Hartog & Plas. of Australian origin (Achterkamp & Soes, 2014). Of these introduced species, the most widespread is *W. columbiana*, while *W. australiana* has only been observed in the Nether-

lands and *W. globosa* in a few places of Bulgaria, France, Germany and Britain (Kirjakov & Velichkova, 2013; Niebler *et al.*, 2021; Lansdown *et al.*, 2022).

In August 2023, populations of *Wolffia* were found in five ponds near Tavèrnoles, in central Catalonia. The study of these plants showed that they did not belong to the native *W. arrhiza* and that agreed with *W. columbiana*. The identification has been based on the shape and size of the plants, in accordance with updated works (Bog *et al.*, 2020; Lecron *et al.*, 2021; Lansdown *et al.*, 2022). We did not do stomata counts, a particularly useful character for *Wolffia* species, because a SEM microscope was not available and the counts are inaccurate with a light microscope. The plants found have a pale green colour, with an obvious lighter and transparent margin in apical view (Fig. 1), and the upper part is distinctly convex. These traits exclude *W. arrhiza*, but are shared by *W. columbiana* and *W. globosa*. Our plants fit well with *W. columbiana* and not *W. globosa* because of these characteristics: frond length 0.8-1 mm (0.4-0.8 mm *W. globosa*), width 0.65- 0.75 mm (less than 0.6 mm *W. globosa*) and length-width ratio 1.2-1.3 (1.25-1.7 *W. globosa*).

W. columbiana is native to the American continent, where it spreads through temperate and subtropical regions, and it is particularly common in eastern North America (Bog *et al.*, 2020). It has been introduced to Europe, where it was

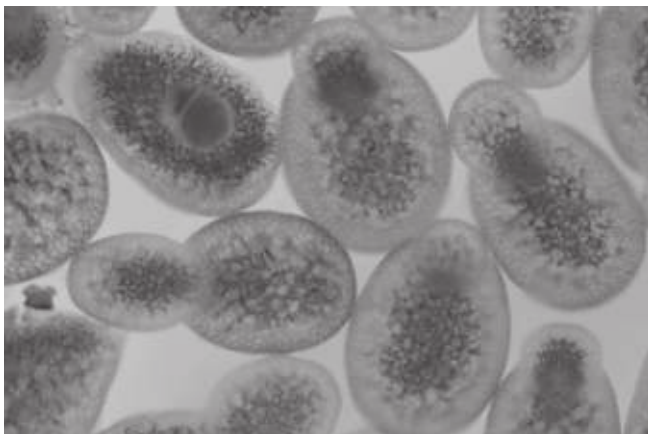


Figure 1. *Wolffia columbiana*: lighter margin in apical view (*Wolffia columbiana*: marge més clar en visió apical). Photo: David Vilasis.



Figure 2. Habitat: pond north of Serrabou. (Hàbitat: bassa al nord de Serrabou). Photo: David Vilasis.

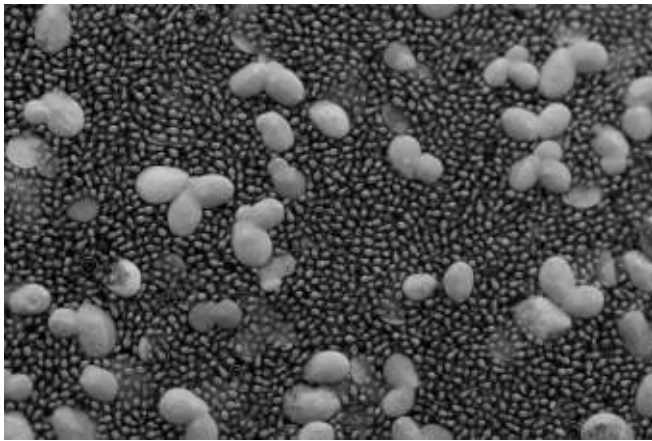


Figure 3. Mixed population of *Wolffia columbiana* and *Lemna* sp. (Polament mixt de *Wolffia columbiana* i *Lemna* sp.). Photo: David Vilasís.

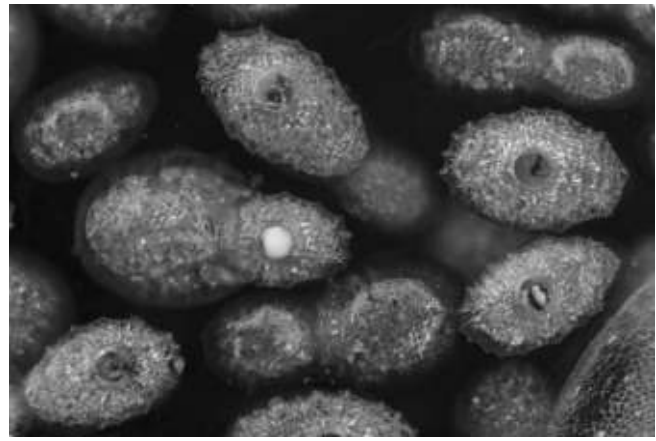


Figure 4. Blooming individuals of *Wolffia columbiana*. (Individus florits de *Wolffia columbiana*). Photo: David Vilasís.

observed for the first time in Germany and the Netherlands (Schmitz *et al.*, 2014), but it could have arrived there earlier and confused with *W. arrhiza*. It is currently a species that has already widespread in the Netherlands (<https://www.verbreidingsatlas.nl/6975>). Later it has been reported from Belgium (Hendrickx & Verloove, 2017), northern Italy (Ardenghi *et al.*, 2017), northern France (Lecron *et al.*, 2021) and the British Isles (Lansdown *et al.*, 2022). So far, and according to the information available, the only south-european data on *W. columbiana* were that from Italy (Ardenghi *et al.*, 2017). The closest record to Catalonia of an introduced *Wolffia* species was that of *W. globosa* in Languedoc, near Montpellier (Niebler *et al.*, 2021).

In Catalonia, *W. columbiana* has been found in small ponds (areas of a few tens of m²) located in agricultural areas and which are often used by livestock (Fig. 2). All these ponds are nearby, within a 2 km circle. Its water is eutrophic and *W. columbiana* coexists with other duckweeds (*Lemna minuta*, *L. gibba*, *L. minor*) (Fig. 3). The origin of these populations is unknown, which could either be a local introduction by emptying aquariums or a long-distance dispersal by waterfowl. In the near future, a regional expansion of this species is highly likely thanks to waterfowl movements.

The observation of many plants with flowers in several ponds is outstanding, because the flowering of *W. globosa* is always occasional (Fig. 4). In Europe it had already been reported from Germany (Schmitz *et al.*, 2014).

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