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A new *Vitrea* species from the Holocene of south-eastern France (Gastropoda: Eupulmonata: Pristilomatidae)

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Abstract. *Vitrea luberonensis* n. sp. is described from south-eastern France. Shell attributes suggest that the new species is closely related to *V. pygmaea*, *V. etrusca*, and *V. inae*, in a “*V. etrusca* complex” which is characterised by very small size (the smallest of all *Vitrea* species) and a very wide umbilicus. Holocene subfossil shells were found in Manosque and Aix-en-Provence, in alluvial deposits between 7400 and 4200 BP. The species has not yet been found alive or in modern sediments. Associated malacofauna suggest a mosaic of riparian and open woodland habitats.

Key words. Provence, Mediterranean, Quaternary, Zonitidae, biogeography, new species.

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Introduction

Until now, 87 species have been assigned to the genus *Vitrea* (MOLLUSCABASE 2023), of which 68 are extant in the European fauna (WELTER-SCHULTES 2012, GEORGIEV & DEDOV 2014, PALL-GERGELY & ASAMI 2015). They are conchologically very diverse, although roughly similar to one another in their anatomy, except for the inner structure of the penis (RIEDEL 1992). Seven species are currently known from France, including 1 limited to Corsica (INPN 2023). I describe here a new species which is presently found only in Holocene deposits in Provence. Its shell resembles *V. pygmaea* (O. Boettger, 1880), *Vitrea etrusca* (Paulucci, 1878), and *Vitrea inae* de Winter & Ripken, 1991 in its very small size together with a large umbilicus. These characters differentiate them unambiguously not only from other living species but also from Pliocene fossil species, such as *V. geisserti* Schlickum, 1975 (Burgundy, Rhine region) and *V. faustinae* (Sacco, 1884) (Piedmont), which exhibit a covered or minute umbilicus. For example, the latter species is extremely similar to the modern *V. subrimata* (Reinhardt, 1871) (GIUSTI & MAZZINI 1971).

The shells of the new species were discovered during research on palaeoenvironments and Holocene land-snail communities in Provence (OLLIVIER et al. 2015, MAGNIN et al. 2022, in preparation). They come from 2 sedimentary sequences located in Manosque (Alpes-de-Haute-Provence) and Aix-en-Provence (Bouches-du-Rhône).

Materials and Methods

Samples of sediment, each 10 L, were collected in the different stratigraphic levels. The shells were extracted by the standard method (EVANS 1972, PUISSÉGUR 1976), that is by water-sieving on a 500 µm mesh sieve. To facilitate sieving, the sediment was sometimes dispersed by adding 35% hydrogen peroxide. The deposits were radiocarbon dated on charcoals contained in the samples. A few archaeological artefacts were present in some layers. These make it possible to place the succession of malacological assemblages in a cultural framework. A total of 79 shells of the new *Vitrea* species were collected in Manosque but only 2 in Aix-en-Provence. Many are immature or incomplete due to their fragility. The photographs were taken using a Euromex Stereoblue stereoscopic microscope and a ToupTek UCMOS USB2.0 5-MP camera. The measurements were made with the same microscope equipped with an ocular micrometre. I made 10 measurements (in mm) on each of the best-preserved specimens with at least 3 whorls. I measured 6 *V. pygmaea* specimens (including 3 from reliable published figures), 20 *V. etrusca*, and 26 *V. luberonensis* n. sp. from the type locality. The discriminant analysis (linear, bivariate model, fitted with ordinary least squares) was performed using the software PAST (PAleontological STatistics) v. 3.2 (HAMMER et al. 2001).

Materials used for comparison. *Vitrea pygmaea*: Ai Petri, Yalta, Crimea, in forest, 44.465° N, 034.064° E, May