

***Vitrea binderi* Pintér, 1972, a brief redescription of a species endemic to a doline in Slovenia (Gastropoda: Stylommatophora: Zonitidae)**

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Abstract. PINTÉR (1972) described *Vitrea binderi* from Laška kukava doline in Slovenia. The original description is based on shell features; with unknown anatomy. In a recent search, the Author discovered living specimens from the type-locality. Shell and genitalia of *V. binderi* are described and illustrated. So far, the species is restricted to Laška kukava doline, despite extensive collecting in the surrounding area. This requires an effective conservation of the habitat of the doline area.

Kurzfassung. *Vitrea binderi* Pintér, 1972 – eine kurze revidierte Beschreibung einer in einer slovenischen Doline endemischen Art (Gastropoda: Stylommatophora: Zonitidae). – PINTÉR (1972) beschrieb *Vitrea binderi* aus dem Laška-Kukava-Tal in Slovenien. Die Originalbeschreibung basierte lediglich auf Gehäusen, die Anatomie ist bisher nicht bekannt. Bei kürzlich durchgeführten Aufsammlungen wurden lebende Tiere entdeckt. Gehäuse und Genitalien von *V. binderi* werden beschrieben und abgebildet. Die Art ist, was eine Nachsuche in der weiteren Umgebung ergab, auf das Laška-Kukava-Tal beschränkt. Daher ist ein effektiver Habitatschutz der Doline erforderlich.

Key words. Zonitidae, taxonomy; *Vitrea binderi*, redescription, genital system, Slovenia.

Introduction

PINTÉR (1972: 224) described *Vitrea binderi* from specimens collected from the Laška kukava doline in the Logaška Planota area near the village of Laze, 6 km NNE of the town of Planina, Slovenia. He described the shell by means of a drawing (1972: 224) and photographs (1972: Plate 2, Figs. 16–18) of the holotype preserved in the Zoological Institute of the Polish Academy of Sciences, Warsaw (specimen 20749b/12).

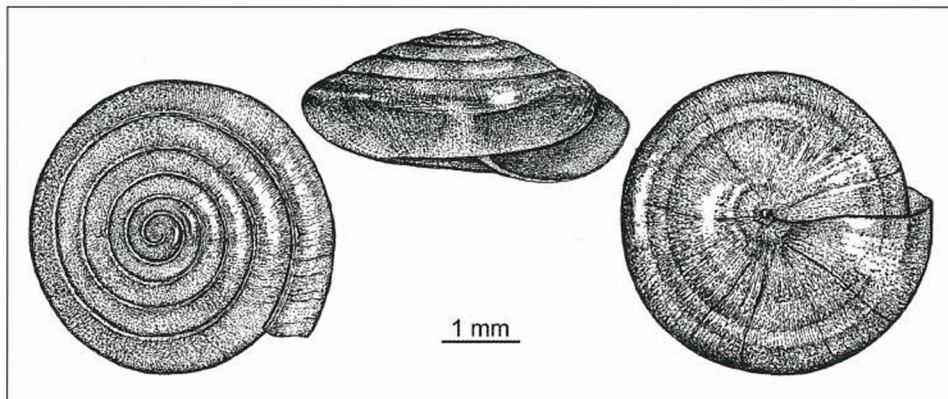
PINTÉR did not carry out any anatomical investigations. Hence, the description of this species is purely based on shell characteristics. BOLE (1976: 170) cited *V. binderi* for the same locality. RIEDEL (1980: 35) includes the species in the check-list, indicating its “Slovenian” origin and specifying “anatomy unknown”. In his later paper (RIEDEL, 1998: 15), he reports the same data. In the course of the Author’s faunistic researches in the Karst zone of southern Slovenia, the Laška kukava doline was sampled repeatedly. The discovery of living specimens of *V. binderi* has confirmed the accuracy of the shell characteristics described by PINTÉR (1972), and made a description of the structure of the genital system possible.

Material and methods

The material was hand-collected by the author in 2002 and 2004 from different parts within the Laška kukava doline (see Tab. 1). Collecting was also extended to the nearby dolines in Logaška Planota, central Slovenia. All living specimens were relaxed in water and then preserved in 70% ethanol. Finally, they were anatomically investigated. All empty shells were kept dry, and have been measured by means of height and diameter. The material is deposited in the Author’s private collection. Morphological and anatomical examinations, photos and drawings were carried out with an Olympus SZX-9 stereomicroscope and Olympus SZX-DA camera-lucida.

Tab. 1. Data regarding sampling area of *Vitrea binderi*.

Locality	Date	Live specimens	Empty shells
Laška kukava doline in the Logaška Planota area (VL 8547), 525m asl, 2.3 km N of the railway station of Planina, nearby the village of Laze, 6 km NNE of the town of Planina, Slovenia. De Mattia leg.	27 july 2002	1 adult 1 juv.	6
	15 maj 2004	2 adults 1 juv.	28

**Fig. 1.** *Vitrea binderi* Pintér, 1972. Laška kukava doline in the Logaška Planota area (VL 8547), 2.3 km N of the railway station of Planina, nearby the village of Laze, 6 km NNE of the town of Planina, Slovenia. leg. DE MATTIA 15.05.2004. Shell.***Vitrea binderi* Pintér, 1972**

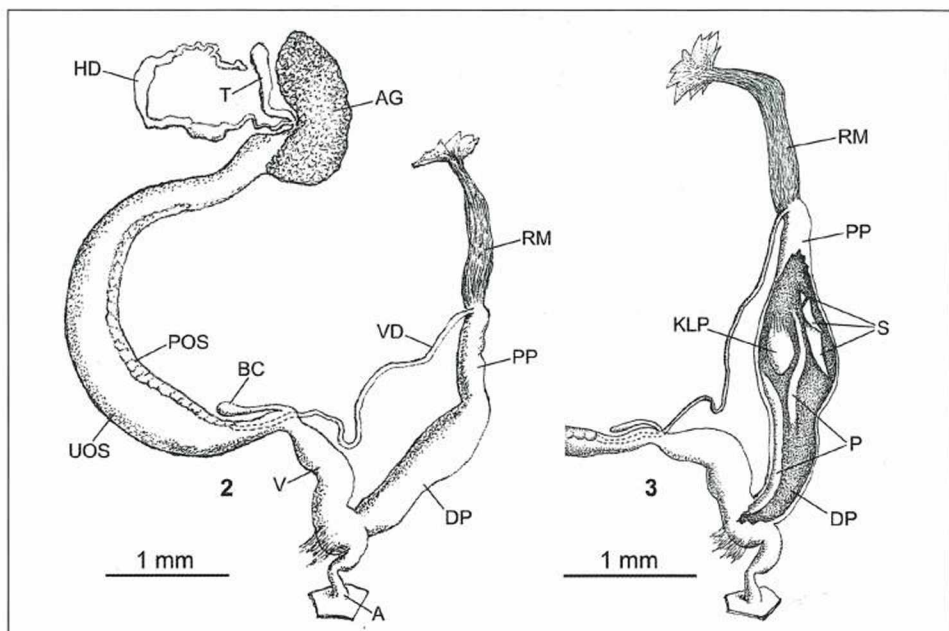
1972 *Vitrea binderi* – PINTÉR: 224, Figs. 28–30, Plate 2, Figs. 16–18; 1976 *Vitrea binderi* – BOLE: 170; 1979 *Vitrea binderi* – BOLE: 40, Fig. 2; 1980 *Vitrea binderi* – RIEDEL: 35; 1998 *Vitrea binderi* – RIEDEL: 15.

Description (Fig. 1; Pl. 1: Figs. 4–7). Shell dextral, very small, spire markedly tectiform, slightly rounded below, colourless and moderately transparent when fresh, whitish when old; surface with evident growth lines above, less marked below; no microsculpture present. Shell with $5\frac{1}{2}$ – 6 whorls, tightly coiled, regularly-growing whorls. Last whorl slightly dilated and markedly angled at periphery. Sutures shallow, marginated but evident. Umbilicus usually obliterated, slit-like in a few, rare specimens. Aperture small and oblique without internal thickening. Peristome interrupted, slightly reflected below.

Measurements of shell. Height=1.8 – 2.1 mm; Diameter=3.6–3.9 mm.

Body. Body colour whitish with whitish aulacopod-type foot. Ocular dots present.

Genital system (Figs. 2–3). Hermaphrodite gonad (ovotestis) situated in first whorls of visceral sac with winding hermaphrodite duct. Talon, long and slender, connects to the albumen gland which is moderately developed. Uterine part of ovispermiduct markedly developed, prostatic part shorter and slender. From its distal part the vas deferens originates. From the free oviduct a short and slender duct originates, leading into a small bursa copulatrix. Vaginal gland apparently absent. Moderately large vagina leads into the atrium. Vas deferens connects sideways as regards the proximal part of the penis, where the penial retractor muscle inserts. Inner walls of proximal portion of penis with a large sarcobellum branching into three simple, flagelliform, distally-directed appendixes with no lobes or knobs. Distal appendixes



Figs. 2–3. *Vitrea binderi* Pintér, 1972. Laška kukava doline in the Logaška Planota area (VL 8547 – 2) Whole genitalia (ovotestis excluded), 3) internal structure of penis. A atrium; AG albumen gland; BC bursa copulatrix; D diameter of shell; DP distal penis; H height of shell; HD hermaphrodite duct; KLP knob-like papilla; P pleats; POS prostatic ovispermiduct; PP proximal penis; RM penial retractor muscle; S sarcobellum (flagelliform appendages); T talon; UOS uterine ovispermiduct; V vagina; VD vas deferens.

are almost twice as long as the median, itself is twice as long as the proximal one. Close to the sarcobellum, a well-developed knob-like papilla is present. Two more pleats arise, one between sarcobellum and knob-like papilla, the other running along the distal penis.

Differential diagnosis. *Vitrea binderi* is, as shell, clearly distinguished from almost all the other species of the genus. The shell of *Vitrea binderi* only resembles that of *V. argolica* (Riedel, 1962) from the Peloponnese in the growing of whorls, dimensions, tectiform spire and angled last whorl. Nevertheless, the well-rounded profile of the last whorl of *Vitrea argolica* and its wide and deep umbilicus clearly distinguish the two species (PINTÉR, 1972: 270). Anatomical comparison is not yet possible since the anatomy of *Vitrea argolica* is still unknown. *Vitrea diaphana erjavci* (Brusina, 1870), syntopic with *Vitrea binderi* in the Laška kukava doline, is easily distinguishable by its greater dimensions (Diameter=3.9–4.2 mm), the larger number of whorls (6¼–6¾), the flattened spira, the closed umbilicus, and the buccal callosity.

Anatomical remarks. The scarcity of characters diagnostic for the various *Vitrea* species makes it difficult to suggest a hypothesis on the systematic relationships of *V. binderi*. RIEDEL (1998: 15) conducted studies on species that have considerable variation in anatomical characteristics. Specimens from different localities, assignable – as shells – to the same species, reveal extreme polymorphism in the internal structure of the penis. An example is *Vitrea subrimata* (Reinhardt, 1871) (GIUSTI, 1971: 471; ALTONAGA, 1989: 102; GIUSTI et al., 1995: 257; DE MATTIA, 2003: 139 et seq.) which probably is a heterogeneous group of species similar in their shell shape. At the same time, species that present a well-developed knob-like papilla such as *Vitrea etrusca* (Paulucci, 1878) (cfr. GIUSTI, 1971) or *Vitrea narbonensis* (Clessin, 1877) (cfr. ALTONAGA, 1989) display different sarcobellum structures.

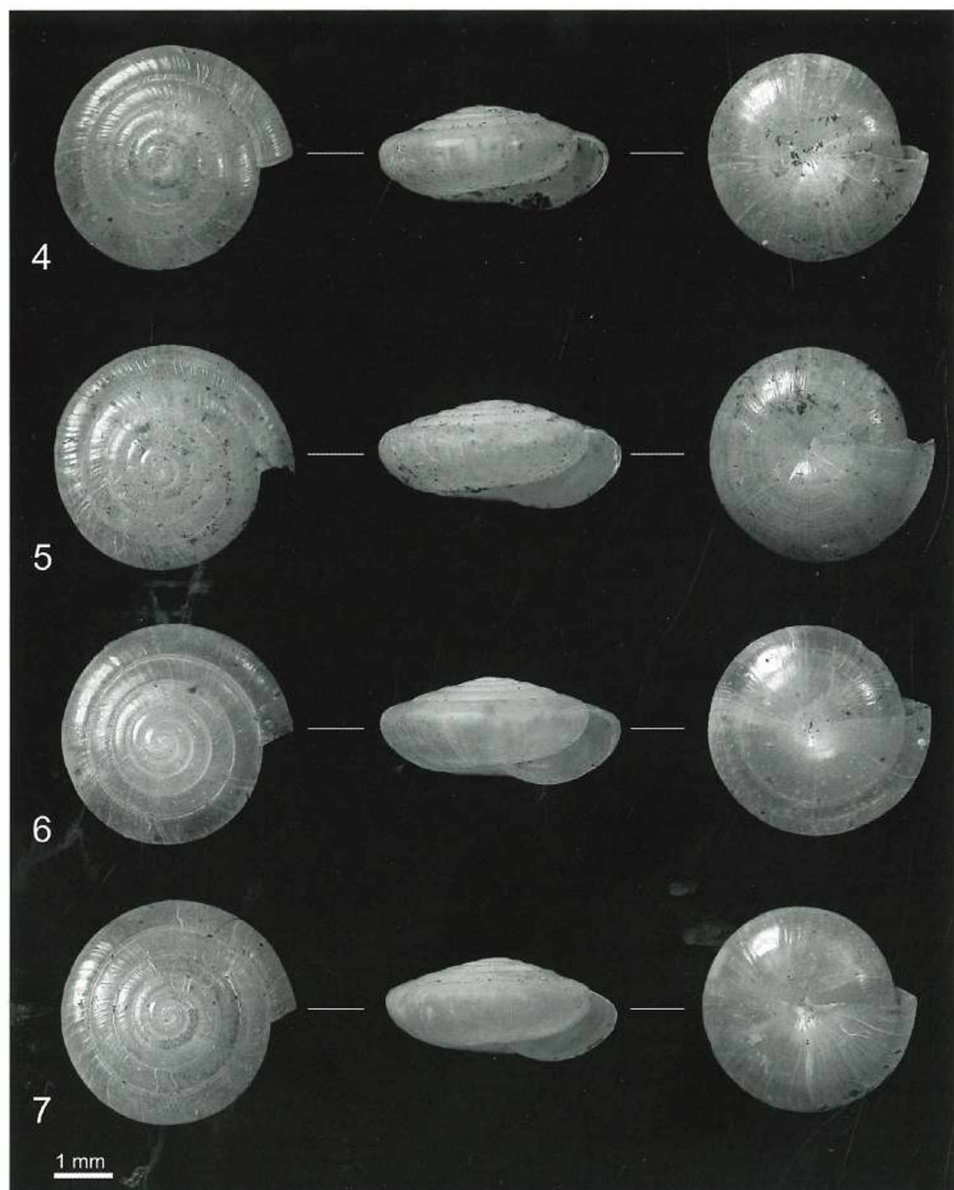


Plate 1, Fig. 4-7: Photographic documentations of shells of *Vitrea binderi* Pintér, 1972. Laška kukava doline in the Logaška Planota area (VL 8547).

The genital system of *Vitrea sorella* (Mousson, 1863) depicted in HAUSDORF & RIEDEL (1996: 115) shows the inner penis with the presence of a large sarcobellum, neither lobed nor spinous, branching into two simple, flagelliform, distally-directed appendixes, and the (apparent) lack of a vaginal gland. At first glance, it looks similar to the genital features of *V. binderi*, bringing the two species anatomically very close, but more accurate anatomical research, both anatomically and conchologically, remain to be done before any systematic and phylogenetic scenario can be made.

Distribution/Ecology. So far, *Vitrea binderi* is known only in Laška kukava doline, located 2300 m to the north of the railway station of Planina (VL 8547), Slovenia. The doline is 400 m long, 250 m wide and 70 m deep. The lip of the doline opens at 525 m asl (BOLE, 1976). The species can be found throughout the doline, but is concentrated where conditions are dampest and most affected by the phenomenon of thermal inversion, namely at the bottom among the rocks, rotting wood, and the moss.

Zoogeography. Slovenian endemic.

Conservation status. Although *V. binderi* is quite common in the Laška kukava doline, its limited distribution would be a clear risk factor in the face of man-made modifications to the peculiar biotope in which it lives. However, the population do not seem to be threatened by any human activity since the locality is relatively inaccessible and unfrequented. *V. binderi* has been enlisted in the Red List of terrestrial and freshwater Mollusca in Slovenia by BOLE (1992: 188) (IUCN code: R). Although it's surrounded by three National Parks: Planinsko polje, Rakov Škocjan and Cerkniško jezero, Laška kukava doline (and the Logaška Planota) is not included today in any slovenian park or protected areas. Thus *V. binderi* is still not protected by any particular regulation or law, although it should be strongly recommended.

Acknowledgements

I am grateful to Jessica Macor (Muggia, Italy) for help during field collecting, Ivano Niero (Spinea, Venezia, Italy), author of the anatomical plate and Massimo Prodan (Trieste, Italy) for informations and literature. I also wish to thank Folco Giusti (Siena, Italy) for reading the manuscript and usefull advices. Thanks to Nick Carter (Muggia, Trieste, Italy) for linguistic revision.

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Jahr/Year: 2006

Band/Volume: [24](#)

Autor(en)/Author(s): De Mattia Willy

Artikel/Article: [Vitreia binderi Pinter, 1972, a brief redescription of a species endemic to a doline in Slovenia \(Gastropoda: Stylommatophora: Zonitidae\) 129-133](#)