

## NEW RECORDS OF *PUPILLA PRATENSIS* (CLESSIN, 1871) IN WESTERN POLAND

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**ABSTRACT:** Two localities of *Pupilla pratensis* were found in the environs of Gubin and Stęszew, W. Poland. Only one recent record of the species, earlier regarded as an ecotype of the widespread *P. muscorum*, was known from Poland. Consequently, the distribution and conservation status of the species are not well known. Our data indicate that *P. pratensis* is rare and has specific habitat requirements. In our study area it was found in only two out of 71 examined localities of a very similar habitat type and sampled on the same occasions. The two localities are wet meadows covered by sedges (mostly *Carex acutiforis*) growing on a calcareous peat substratum of lacustrine origin; the species is accompanied by two rare and legally protected vertiginids: *Vertigo angustior* and *V. moulinsiana*.

**KEY WORDS:** *Pupilla pratensis*, habitat, sedge meadows, W. Poland

### INTRODUCTION

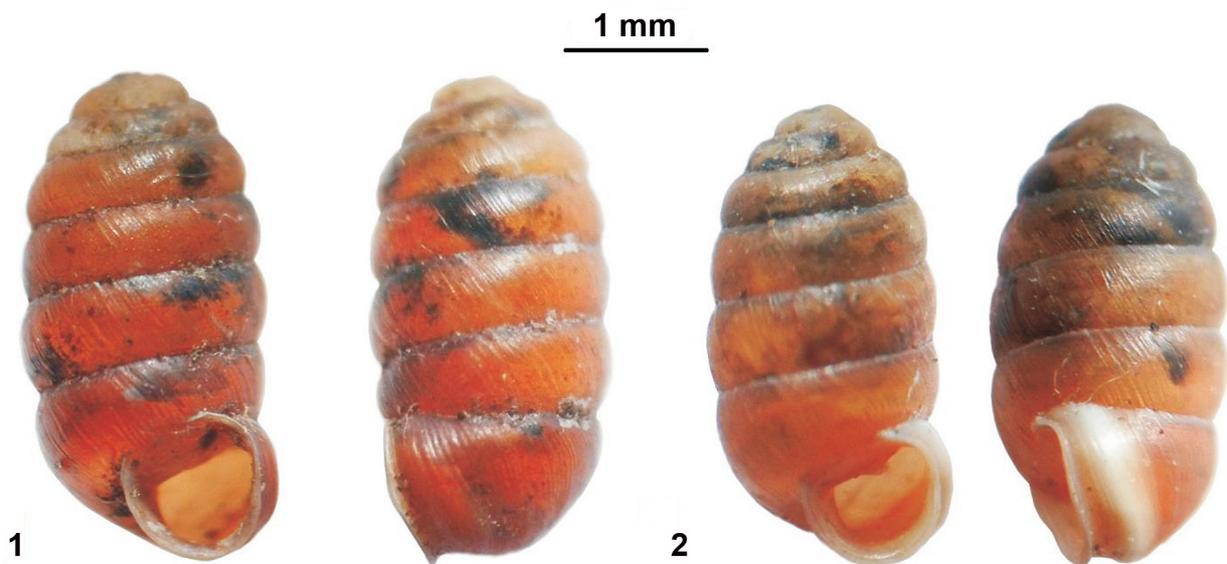
*Pupilla pratensis* (Clessin, 1871) is a small pulmonate land snail with a tall, cylindrical, brown shell (VON PROSCHWITZ et al. 2009, HORSÁK et al. 2010) (Fig. 1). For a long time the species was regarded as an ecotype of a very similar and widespread *P. muscorum* (Linnaeus, 1758). Its taxonomic identity was confirmed by VON PROSCHWITZ et al. (2009) as a result of comparative analyses of morphological, ecological and molecular traits. Most probably *P. pratensis* was reported from some localities as *P. muscorum*, and its current distribution and conservation status are unknown. Only recently the species was included in the red list of molluscs in Germany (JUNGBLUTH et al. 2009) with "Gefährungskategorie R" category (extremely rare).

According to the present knowledge, these two species differ distinctly in their habitat requirements. *P. muscorum* is considered to be xerophilous and inhabits dry, insolated and calcareous substrata (WIKTOR 2004) whereas *P. pratensis* is a hygrophile. In central Europe and Scandinavia the species inhabits

treeless, often calcareous wetland habitats (CLESSIN 1871, JUEG 1997, ZETTLER et al. 2006, VON PROSCHWITZ et al. 2009, VON PROSCHWITZ 2010, HORSÁK et al. 2010, 2012). Only in Northland County of Norway it was found on calcareous, rocky slopes close to the sea (VON PROSCHWITZ 2010).

The conchological differences between *P. pratensis* and *P. muscorum* include the size of the shell, its colour and morphology of the body whorl (Figs 1, 2). The shell of *P. pratensis* is usually darker, larger and with more numerous whorls than that of *P. muscorum*. Also the lip as well as teeth are less developed in *P. pratensis* (VON PROSCHWITZ et al. 2009).

There are only two previous records of *P. pratensis* from Poland: one by GOLDFUSS (1883) from Upper Silesia, another made almost 180 years later by HORSÁK et al. (2012) from north-eastern Poland, near the border with Lithuania. In this paper we report on two more localities of *P. pratensis* in western Poland: Wielkopolska and Ziemia Lubuska regions.



Figs 1–2. Shell of *Pupilla pratensis* from the locality near Gubin (1) compared with the shell of *Pupilla muscorum* (Kaczanowo, W. Poland) (2)

## MATERIAL AND METHODS

In 2011 and 2012 we surveyed a total of 71 wetland localities in western Poland: 39 near Gubin (Ziemia Lubuska region) and 32 in the Wielkopolski National Park (Wielkopolska region) which is ca. 120 km away. Potential habitats selected based on maps, orthophotomaps as well as available botanical data included treeless or semi-open, wetland areas, covered by monocotyledon plants (sedges mainly). Each locality was searched for molluscs by the two authors for 30

minutes (total: 60 minutes). We examined leaves and stems of plants, we also searched and sieved the litter using 0.5 mm sieve and checking briefly the separated particles on a white tray for the smallest gastropods. Most snails were identified in situ using magnifying glass, only doubtful snails were checked in the laboratory under the stereomicroscope. The species were identified following descriptions by HORSÁK et al. (2010).

## RESULTS

*P. pratensis* was found only in two out of the surveyed 71 potentially suitable sites. One was located near the city of Gubin, Ziemia Lubuska province, about 4 km from the Polish-German border (Fig. 3),

the other was near Stęszew, Wielkopolska province, within the Wielkopolski National Park (Fig. 4). The aerial distance between the localities is 131 km.

## SITES DESCRIPTION

### 1. Coordinates: 52°3'06''N, 14°48'20''E

The locality of *P. pratensis* in Ziemia Lubuska, Krześciński Landscape Park (Figs 3, 5), had an area of ca. 2.5 ha and was a part of a complex of meadows extensively used in the past, covering ca. 8 ha, partially waterlogged and covered by reed (*Phragmites australis*). The site where the species was found was covered mainly by sedges (*Carex acutiformis*) and crossed by ditches which stretched between lakes Borek, Bagniste and Głębno, and connected with the Łomianka stream. The litter layer was well-developed

and saturated with water. The locality was bordered by a pine forest on its western and south-eastern side and by ditches on its north-eastern side. Numerous water-filled depressions were present within the area. *P. pratensis* inhabited the wet litter and was accompanied by other hygrophilous snails such as *Vertigo angustior* and *V. moulinsiana* (Table 1).

### 2. Coordinates: 52°18'15''N, 16°41'03''E

The species was widely distributed over an area of 7.5 hectares in the eastern part of a complex of mead-

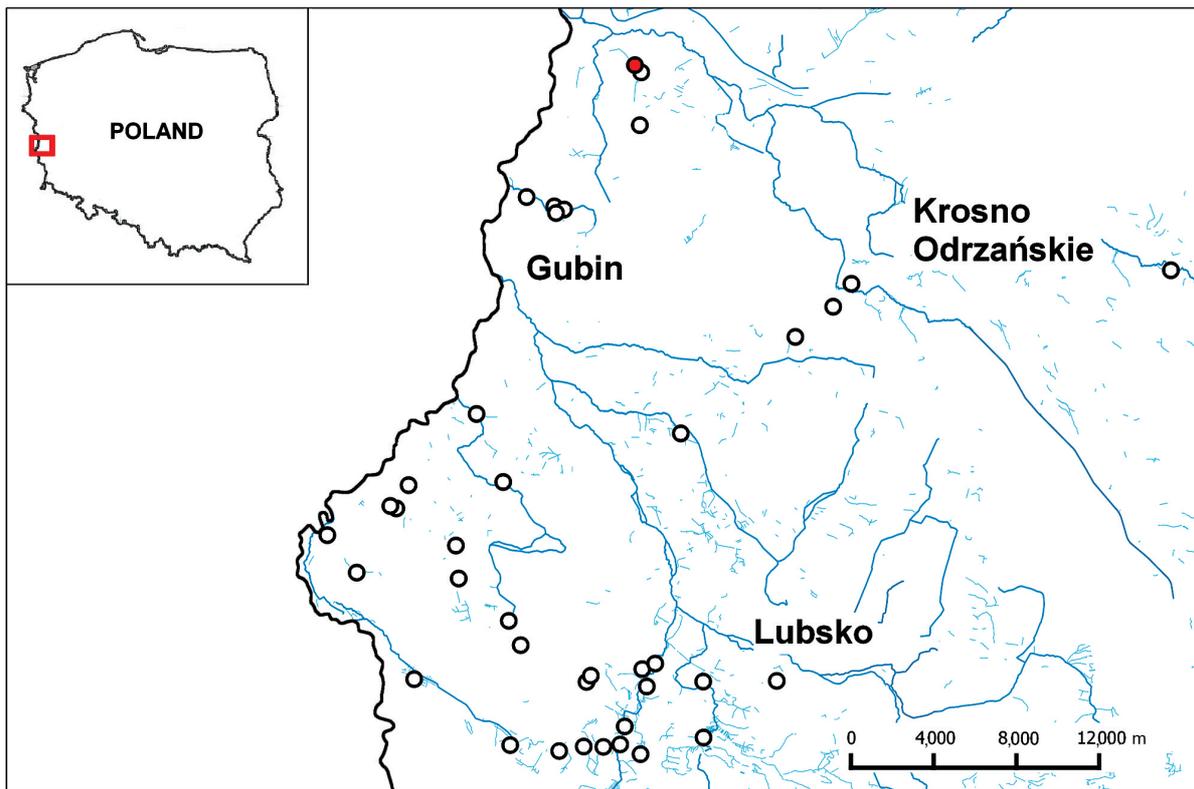


Fig. 3. Wetland localities sampled in Ziemia Lubuska region near Gubin: red circle – locality of *Pupilla pratensis*; hollow circles – localities where *Pupilla pratensis* was not found but the habitat was similar; black line – Polish-German border

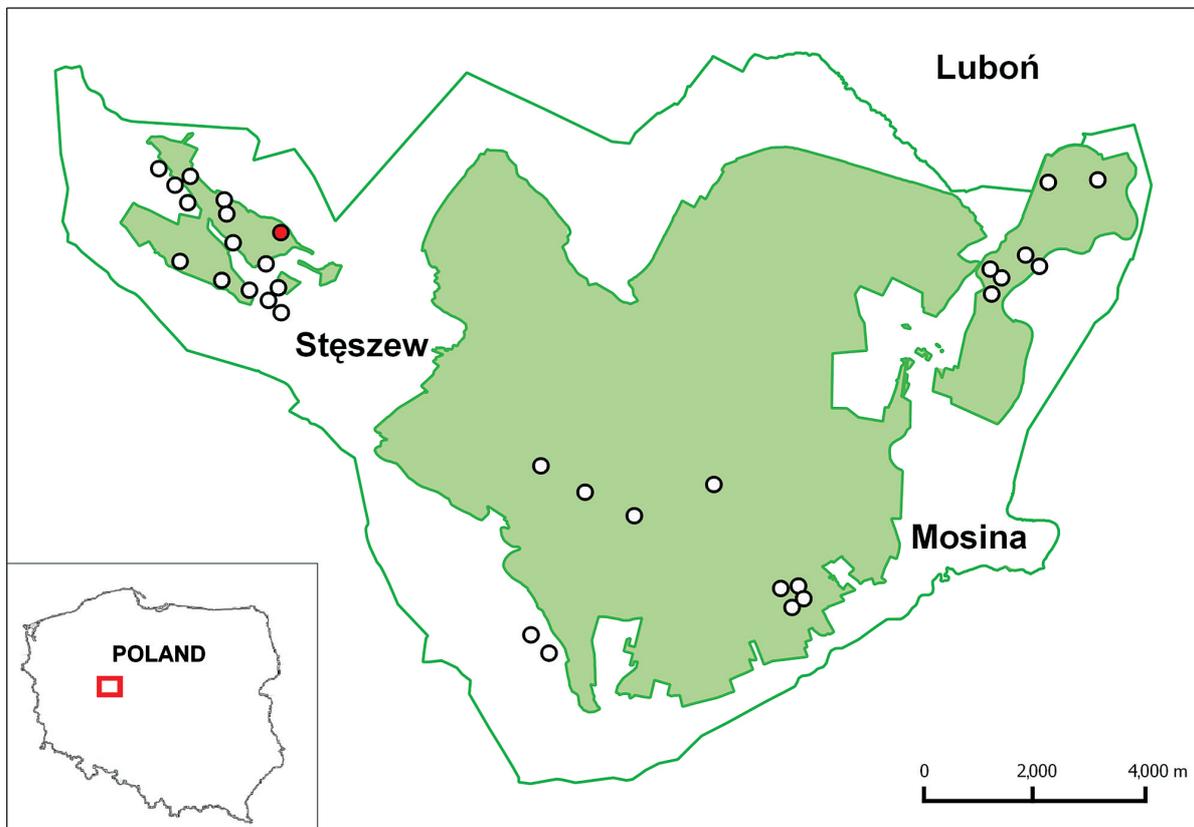


Fig. 4. Wetland localities sampled in the Wielkopolski National Park (green polygons) and its surroundings: hollow circles – localities where *Pupilla pratensis* was not found; red circle – locality of *P. pratensis* near Stęszew; green line – borders of Natura2000 protected area



Fig. 5. Locality of *Pupilla pratensis* near Gubin in Ziemia Lubuska

Table 1. List of land snail species co-occurring with *Pupilla pratensis* in localities: 1 – Gubin (Ziemia Lubuska), 2 – Stęszew (Wielkopolski National Park). Abundance categories: VR – very rare (1–2 individuals); R – rare (3–5 individuals); C – common (more than 5 individuals)

Species	1	2
<i>Carychium minimum</i> O. F. Müller, 1774	C	–
<i>Succinea putris</i> (Linnaeus, 1758)	VR	–
<i>Cochlicopa lubrica</i> (O. F. Müller, 1774)	VR	–
<i>Vertigo moulinsiana</i> (Dupuy, 1849)	R	VR
<i>Vertigo pygmaea</i> (Draparnaud, 1801)	VR	–
<i>Vertigo angustior</i> Jeffreys, 1830	R	C
<i>Pupilla pratensis</i> (Clessin, 1871)	C	R
<i>Vallonia pulchella</i> (O. F. Müller, 1774)	VR	–
<i>Punctum pygmaeum</i> (Draparnaud, 1801)	VR	–
<i>Arion intermedius</i> Normand, 1852	–	VR
<i>Nesovitrea hammonis</i> (Ström, 1765)	VR	–
<i>Zonitoides nitidus</i> (O. F. Müller, 1774)	VR	–
<i>Deroceras laeve</i> (O. F. Müller, 1774)	VR	–

ows and wetlands covering ca. 95 ha, bordering with the Trzcielińskie Bagna Reserve (Fig. 4). *Carex acutiformis* was the dominant plant, only some waterlogged parts were vegetated by *Phragmites australis*. The locality was crossed by numerous ditches connected with the Samica Stęszewska River and Lake Trzcielińskie. The site was extensively mown, only its fragments next to the ditches were intact and sedge-covered (Fig. 6). The site is protected as a part of the Wielkopolski National Park as well as the Natura2000 network area (Ostoja Wielkopolska, PLH300010). Live individuals of *P. pratensis* were found in the litter layer in both mown and intact vegetation patches. The number of snail species occurring at this locality was much smaller than that recorded near Gubin (Table 1). In the unmown patches the litter layer was well-developed and *P. pratensis* was accompanied by *V. angustior*, *V. moulinsiana* and *Arion intermedius*. The mown patches held little litter and the species co-occurred with *V. angustior* only.



Fig. 6. Locality of *Pupilla pratensis* near Stęszew in the Wielkopolski National Park

## CONCLUSIONS

1. In western Poland *P. pratensis* was found in open, wetland sedge-covered areas; the general characteristics of the habitat corresponded to that described by other authors (CLESSIN 1871, JUEG 1997, VON PROSCHWITZ et al. 2009, VON PROSCHWITZ 2010, HORSÁK et al. 2010, 2012). The site description however seems to be incomplete, since the species occurred only in less than 3% of the examined potentially suitable sites. Unique microhabitat characteristics, hydrology or site history may be the factors limiting its occurrence.
2. *P. pratensis* was found only in damp litter. The species probably feeds on dead plants remaining on the soil or on microorganisms developing in the detritus (STEUSLOFF 1937).
3. The species was found only in two localities out of the total of 71 explored, which makes *P. pratensis* rare in the studied areas. More detailed studies are necessary to assess its occurrence and conservation status.
4. In both sites the species co-occurred with two rare and threatened snails: *Vertigo angustior* and *V. moulinsiana*. However, *P. pratensis* was less frequent than the two vertiginids (KSIAŹKIEWICZ & GOŁDYN in prep.), and thus its conservation status could be even higher.
5. Due to the rather recent distinction between *P. pratensis* and *P. muscorum* and to the small number of records of the species in Poland, there is an urgent need for re-examining snail collections for *Pupilla pratensis* and for studying its distribution to determine the conservation status.

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