

The first records of *Aegopinella ressmanni* (Westerlund, 1883) in the Czech Republic extends its distribution range northwards

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A topsoil-dwelling Eastern Alpine terrestrial snail *Aegopinella ressmanni* (Westerlund, 1883) was found for the first time in the Czech Republic at nine sites in E Bohemia. Abundant populations of the species occurred in wet habitats of the Tichá Orlice River valley between the village of Hnátnice and the town of Brandýs nad Orlicí. These Czech populations were found 250 km far from the known northernmost sites in Germany and Austria.

Key words: *Aegopinella ressmanni*, Czech Republic, first record, northernmost occurrence

Introduction

Aegopinella ressmanni is an Eastern Alpine terrestrial snail with the known distribution in Slovenia, Croatia, SW Hungary, and SE Austria from which it extends to NE Italy and SE Germany (SEIDL 1978, KLEMM 1974, KERNEY et al. 1983, COSSIGNANI & COSSIGNANI 1995). It is a typical topsoil-dwelling species inhabiting different types of wet forest habitats in a rather broad altitudinal range (in Austria from 250 to 1700 m a.s.l., KLEMM 1974). Having the shell width up to 15 mm it belongs to the largest species of the genus with and it is the largest European *Aegopinella* species (KERNEY et al. 1983). During the research of land snails in the Tichá Orlice River Valley *A. ressmanni* was found for the first time in the Czech Republic.

Material and methods

The study area stretches between the Letohrad and Choceň Towns in NE Bohemia (Czech Republic); along the Tichá Orlice River line between coordinates 50°02'07" N, 16°29'56" E and 50°00'08" N, 16°13'44" E. Molluscs assemblage were sampled in Autumn 2007 using a standard sampling procedure (CAMERON & POKRYSZKO 2005), i.e. one person searched by eye in all appropriate microhabitats for 1 hour and litter samples were taken from four quadrats (each measuring 25×25 cm²) at each site (i.e. a plot of 100 m²). Snail assemblages were collected at 33 sampling sites situated on both river banks and regularly distributed along the studied river stretch; 11 sites in the river alluvium and 22 sites in slopes of the valley. In February 2008 additional collecting (just eye search) was done in order to (1) obtain live specimens for anatomical studies and (2) find out whether the species occurs in the river stretches below and above the stretch where it was already found. Thus, the whole investigated river stretch extends between the Verměřovice Village and the Boro-

hrádek Town (50°00'02" N, 16°32'09" E and 50°05'52" N, 16°05'49" E). Nomenclature is according to JUŘÍČKOVÁ et al. (2007) with several up-to-date changes.

Results and discussion

Aegopinella ressmanni was found at nine sites in the valley of the Tichá Orlice River (NE Bohemia) between the Hnátnice Village and the Brandýs nad Orlicí Town (Appendix 1, Fig. 1). The species was found in abundant populations and it mostly belonged to the dominant species of the assemblages (Tab. 1). The majority of populations occurred in the alluvium (7 sites) and only another two (out of 22 sites) were found on the valley slopes. The habitats were wet, covered mostly by sparse alder, ash and willow growths. The river alluvium sites were productive and nutrient-rich with a rich herb layer dominated by *Urtica dioica*, *Aegopodium podagraria*, *Galium aparine*, *Cirsium oleraceum* and including some common invasive species *Impatiens* spp. and *Reynoutria* spp. Those two slope sites were rock screes, also relatively wet.

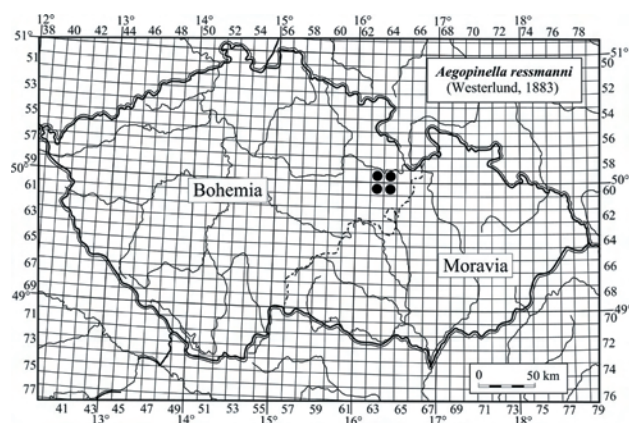


Fig. 1. Known distribution of *Aegopinella ressmanni* in the Czech Republic.

The presented findings significantly extend the known recent distribution of the species; the sites are situated 250 km far from the nearest known northernmost occurrences in Upper Bavaria and Upper Austria (KLEMM 1974, SEIDL 1978). Since they are largely isolated the origin of these E-Bohemian populations is unknown. The main problem is that the malacological survey of the area has never included the river valley; only the slopes on calcium-rich sandstone bedrock were investigated (see JUŘIČKOVÁ et al. 2006) and thus there are no data elucidating a question of the population origin. However, the fact that the species was found mostly at semi-natural sites with invasive vegetation indicates a recent spreading connected with human activities. On the other hand, its autochthonous occurrence

in this area cannot be ruled out since several other Alpine snails – *Itala ornata*, *Cochlodina costata commutata*, *Aegopis verticillus* (LOŽEK 1956, KERNEY et al. 1983) – have their isolated distributions here. Moreover, from fossil data we know that *A. ressmanni* was a member of our fauna during warm Pleistocene periods; it is considered as an index species of the last Interglacial (LOŽEK 1955, 1964, HORÁČEK & LOŽEK 1988). From Early Pleistocene it was documented even from south Poland near to the Krakow Town (STWORZEWICZ 1975). Unfortunately, it is practically impossible to make a reliable conclusion about the origin of Bohemian populations without having exact fossil evidence.

Identification notes

It might be difficult or even impossible to correctly identify “large” species of the genus *Aegopinella* without using anatomical characters of their genitalia (HUDEC 1964, KERNEY et al. 1983). Luckily it is not the case of *A. ressmanni*, which possesses several reliable identification characters



Fig. 2. Adult shell of *Aegopinella ressmanni* from site No. 5; height = 12.6 mm, width = 6.1 mm.

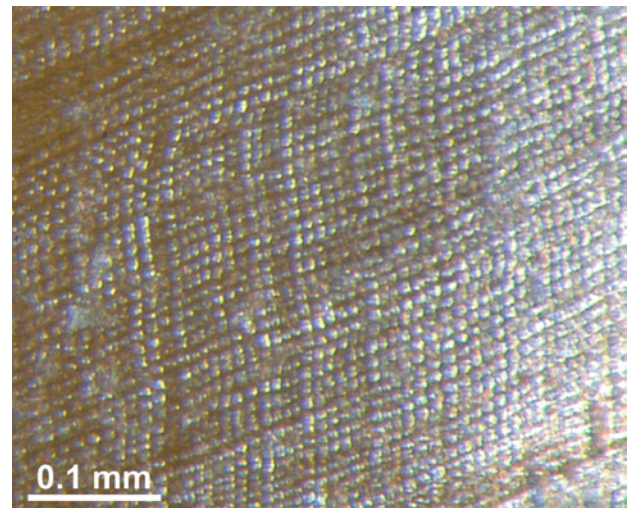


Fig. 3. Microstructure of shell of *Aegopinella ressmanni* from site No. 5.

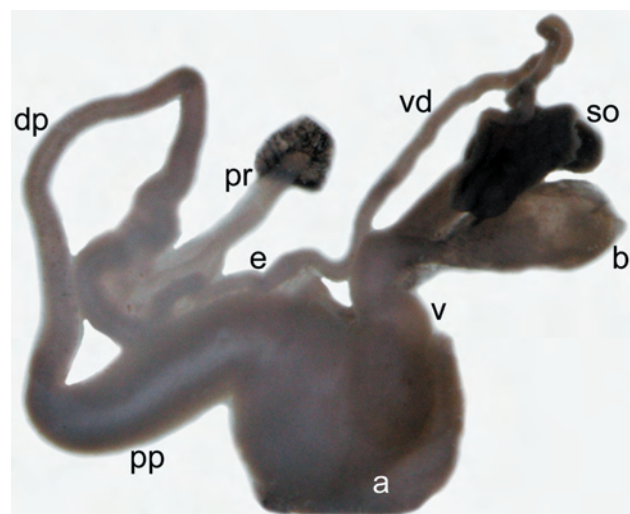


Fig. 4. Reproductive organs of *Aegopinella ressmanni* from site No. 5.; only the part with diagnostic characters is shown: a – atrium, b – bursa, dp – distal part of penis, e – epiphallus, pp – proximal part of penis, pr – penial retractor muscles, so – spermoductus, vd – vas deferens, v – vagina.

on its shell. At the first look the shell of an adult is obviously larger than those of other *Aegopinella* species (collected specimens had shells up to 14 mm wide). The impression of a large shell is further reinforced by a broadly opened mouth (Fig. 2). However, a fully reliable character is on the shell surface, which has a fine but noticeable “squared” microstructure that consists of irregular radial growth lines crossed by spiral striae (Fig. 3). The similar structure has only *Aegopinella pura*; the other species have only very fine striae. Fortunately, there is no risk of misidentification of these two species due to absolutely distinct dimensions of their shells (*A. pura* grows up to 4.5 mm and thus it has also baby whorls significantly smaller). We have also checked our identification using the anatomical characters of the species’ reproductive organs, which were published by SEIDL (1978) and we found a perfect accordance with our material (Fig. 4).

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Appendix 1. List of known sites of *Aegopinella ressmanni* in the Czech Republic. Data in the list are as follows: number of the site, geographical co-ordinates (N, E) (Geobáze digital map of the Czech Republic 1 : 100 000), code of the mapping grid for faunistic mapping according to PRUNER & MÍKA (1996), name of the nearest settlement, elevation (m a.s.l., approximately), description of the site, number of alive individuals/empty shells (ex.), date of investigation. All the sites were investigated by Jan Myšák.

1 – 50°00'23.2", 16°27'46.2", 5964, Hnátnice, an willow growth in the confluence of the Potočnice brook and the Tichá Orlice River, 357 m, 16 Oct 2007, 164/122 ex.; 2 – 49°59'05.9", 16°26'07.8", 6064, Černovír, a woody slope on the left bank of the Tichá Orlice River northwards the village, 346 m, 6 Oct 2007, 24/2 ex.; 3 – 49°59'10.6", 16°26'06.7", 6064, Václavov, an alder growth on the right bank of the Tichá Orlice River northwards the Černovír Village, 324 m, 7 Oct 2007, 59/11 ex.; 4 – 49°59'01.6", 16°24'47.5", 6064, Oldřichovice, wet woody rock slopes under the road no. 360, 322 m, 19 Sep 2007, 20/18 ex.; 5 – 49°59'02.0", 16°24'51.3", 6064, Oldřichovice, an willow growth on the left bank of the Tichá Orlice River under the village, 315 m, 24 Sep 2007, 49/12 ex.; 6 – 49°58'07.6", 16°22'44.9", 6064, Kerhartice, an alder and willow growth on the left bank of the Tichá Orlice River E of the village, 335 m, 18 Sep 2007, 57/18 ex.; 7 – 49°58'55.5", 16°20'08.0", 6064, Sudislav nad Orlicí, an alder growth on the left bank of the Tichá Orlice River 1.5 km SE of the village, 331 m, 22 Aug 2007, 43/9 ex.; 8 – 49°59'48.7", 16°19'35.0", 6063, Bezpráví, an ash growth on the right bank of the Tichá Orlice River SW of the village, 325 m, 25 Jul 2007, 45/5 ex.; 9 – 50°00'01.8", 16°18'09.2", 5963, Brandýs nad Orlicí, a shrubby former pasture on the left bank of the Tichá Orlice River 1 km E of the town, 276 m, 23 Jul 2007, 14/0 ex.

Table 1. Land snail species co-occurred with *Aegopinella ressmanni*; numbers of recorded specimens (both alive and empty shells) are given. The site numbers as in the Appendix.

Species / Site	1	2	3	4	5	6	7	8	9
<i>Aegopinella minor</i> (Stabile, 1864)								1	1
<i>Aegopinella pura</i> (Alder, 1830)				2		5		1	1
<i>Aegopinella ressmanni</i> (Westerlund, 1883)	286	26	70	38	59	75	52	50	14
<i>Aegopis verticillus</i> (Lamarck, 1822)		1	1				1		1
<i>Alinda biplicata</i> (Montagu, 1803)	8	11	3	182	1	95	13	17	7
<i>Arianta arbustorum</i> (Linnaeus, 1758)	4	2	4	16	6	28	4	5	6
<i>Arion silvaticus</i> (Lohmander, 1937)		1							
<i>Arion distinctus</i> Mabille, 1868		3	12	3					
<i>Arion lusitanicus</i> Mabille, 1868			6		1	7		13	56
<i>Arion fuscus</i> (O.F. Müller, 1774)	1	1	3				1		
<i>Boettgerilla pallens</i> Simroth, 1912	4	3	2	6	2	3			
<i>Carychium minimum</i> O.F. Müller, 1774		22	6		92		3		2
<i>Carychium tridentatum</i> (Risso, 1826)		34			26	2	10		1
<i>Cepaea hortensis</i> (O.F. Müller, 1774)	7		2	7	2	2	2		3
<i>Clausilia parvula</i> Férussac, 1807				75					
<i>Cochlicopa lubrica</i> (O.F. Müller, 1774)	1		3		29	17	10	6	6
<i>Cochlodina costata commutata</i> (Rossmässler, 1836)				94			2		
<i>Cochlodina laminata</i> (Montagu, 1803)		60					3	7	5
<i>Daudebardia rufa</i> (Draparnaud, 1805)		23		8	2		2	2	2
<i>Discus perspectivus</i> (Megerle von Mühlfeld, 1816)							12		
<i>Discus rotundatus</i> (O.F. Müller, 1774)		14		44		9	8	4	3
<i>Ena montana</i> (Draparnaud, 1801)	2	12	3	12		2	1		
<i>Eucobresia diaphana</i> (Draparnaud, 1805)	5		24		5	8	3		
<i>Euconulus fulvus</i> (O.F. Müller, 1774)							1		
<i>Faustina faustina</i> (Rossmässler, 1835)				27					
<i>Fruticicola fruticum</i> (O.F. Müller, 1774)	14		7		15	80	52	27	8
<i>Helicigona lapicida</i> (Linnaeus, 1758)		4		8					
<i>Helix pomatia</i> Linnaeus, 1758	1	1				6	10	2	5
<i>Isognomostoma isognomostomos</i> (Schröter, 1784)		9		7		1	3		
<i>Laciniaria plicata</i> (Draparnaud, 1801)		27		151					
<i>Lehmannia marginata</i> (O.F. Müller, 1774)		4		2					
<i>Limax cinereoniger</i> Wolf, 1803		1		4	2				
<i>Macrogastra ventricosa</i> (Draparnaud, 1801)		3		18			2	1	
<i>Monachoides incarnatus</i> (O.F. Müller, 1774)	11	15	9	24	15	68	23	13	14
<i>Monachoides vicinus</i> (Rossmässler, 1842)		8					7	1	
<i>Oxychilus cellarius</i> (O.F. Müller, 1774)		2	1	5		2			
<i>Oxychilus depressus</i> (Sterki, 1880)				4					
<i>Perpolita hammonis</i> (Ström, 1765)	4		3		3	15	19	2	1
<i>Petasina unidentata</i> (Draparnaud, 1805)		11		6					
<i>Punctum pygmaeum</i> (Draparnaud, 1801)		6		9	4		2		
<i>Semilimax semilimax</i> (J. Férussac, 1802)	53	3	50	3	18	47	3	17	1
<i>Succinea putris</i> (Linnaeus, 1758)	2		5		6	9	1	18	24
<i>Succinella oblonga</i> (Draparnaud, 1801)						2			
<i>Tandonia rustica</i> (Millet, 1843)		6		3					
<i>Trochulus sericeus</i> (Draparnaud, 1801)	2			1	5	35		6	3
<i>Urticicola umbrosus</i> (C. Pfeiffer, 1828)					1				
<i>Vallonia costata</i> (O.F. Müller, 1774)								1	
<i>Vertigo alpestris</i> Alder, 1838				3					
<i>Vertigo pygmaea</i> (Draparnaud, 1801)						1			
<i>Vertigo substriata</i> (Jeffreys, 1833)						4			
<i>Vitrea contracta</i> (Westerlund, 1871)					1				
<i>Vitrea crystallina</i> (O.F. Müller, 1774)	3	2			9	5			3
<i>Vitrea diaphana</i> (Studer, 1820)		3		4			7	1	
<i>Vitrina pellucida</i> (O.F. Müller, 1774)	1		8				74	23	20
<i>Zonitoides nitidus</i> (O.F. Müller, 1774)						2		1	26