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RESEARCH PAPER

Lower Tithonian and lower Berriasian brachiopods from the Márévár Limestone Formation, Zengővárkony (Mecsek Mountains Hungary), and remarks on their palaeoenvironment

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Abstract
A new collection provided some brachiopods assigned to *Lacunosella hoheneggeri*, *Pygope diphya* and *P. janitor* from the lower Tithonian (Micracanthoceras ponti Zone) and lower Berriasian (Calpionella Zone), and from the limestone succession at Zengővárkony, Mecsek Mountains, Hungary. This is the first taxonomic description and photographic documentation of these fossils. We provide reliable documentation of pygopid brachiopods from the Mecsek Mountains, known since 1880, but previously not described. For the moment, three pygopid brachiopod species are reliably reported from the Mecsek Mountains: *Pygope diphya, P. janitor* and *Pygites diphyioides*. The *Lacunosella hoheneggeri* described herein is the first record of Berriasian rhynchonellide brachiopods from the Mecsek Mountains. The lower Berriasian brachiopods may belong to a normal palaeoenvironment, with the usual size distribution.

Keywords *Pygope diphya* · *Pygope janitor* · *Lacunosella hoheneggeri* · Micracanthoceras ponti Zone · Calpionella Zone · Palaeoenvironment · Tisza Mega-unit

Introduction

Berriasian brachiopods are scarce in the Western Tethys. Any new record increases our knowledge. However, Tithonian brachiopods are abundant, especially pygopid ones in the Tethyan faunal realm. After a long static period from the Triassic to the end of the Jurassic (Ager 1993: fig. 10.2), three distinctive genera evolved from the genus *Nucleata*. These morphologically characteristic fossils with known stratigraphic distribution have been frequently used for palaeoecological (Vogel 1966; Krobicki 1993; Ager 1994; Lukeneder 2002), and/or palaeobiogeographical analysis (Sandy 1988, 1991; Kázmér 1990, 1993; Somody 1992; Vörös 1993, 1997).

Pygopid brachiopods were first reported from the Mecsek Mountains by Böckh (1880: 17), who carried out geological mapping in that region 1874. He reported *Pygope diphya* from the Tithonian limestones of the abandoned quarry of Pusztafalu (today referred to as Zengővárkony), but with neither a description nor figure. Later, Vadász (1935: 63) listed occurrences of more pygopid species (*Pygope dilatata, P. diphya, P. janitor*) from the Tithonian of the Mecsek Mountains, however, again with neither descriptions nor illustrations.

Later authors (Sandy 1988; Kázmér 1990, 1993; Somody 1992; Vörös 1993, 1997) used these works as references for their palaeobiogeographical analyses. Vörös (1997) re-examined the old collection of the Mining and Geological Survey of Hungary (later abbreviated MGSH) and confirmed the presence of Tithonian brachiopods: *Fortunella spoliata, Placothyris? carpathica, Pygope diphya, P.* cf. *janitor*, and *Zittelina* sp., although only a line drawing of a Tithonian

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Pygope diphya from another locality in the Mecsek Mountains was included (Vörös 1997: 107, fig. 53). Bujtor (2006) was the first to publish systematic descriptions and figures of pygopid brachiopods from the Cretaceous of the Mecsek Mountains. Two fragmentary specimens of *Pygites diphyoides* were reported from the lower Valanginian (Thurmanniceras pertransiens Zone) of Kisújbánya, Mecsek Mountains (Bujtor 2006).

These brachiopods remained without taxonomic descriptions until now, when the present authors revisited their reported localities. Before submitting this paper, we tried to find these pygopid brachiopods in the collection of the MGSH, Budapest. However, the pygopid brachiopods collected by Böckh (1880) and Vadász (1935) from the Mecsek Mountains are currently under revision by Attila Vörös, and were not available; there were no rhynchonellide brachiopods in the collections from the Berriasian of the Mecsek Mountains. The aim of this paper is to report, describe and document the rare Berriasian brachiopods from the Mecsek Mountains that have been known for decades (Böckh 1880, Vadász 1935, Vörös 1997), but only from faunal lists.

Geological setting

The Mecsek Mountains (Fig. 1) belong to the Tisza Mega-Unit (Haas and Péró 2004) as the northernmost unit of the domain, which is considered a microplate (Vörös 1993; Csontos and Vörös 2004). Late Jurassic development of the Mecsek Mountains is characterized by red, nodular, sometimes cherty and thin, ammonitico rosso-type Oxfordian and Kimmeridgian beds (Nagy 1964). In the Tithonian, the first indications of volcanic activity are discontinuous layers and beds of tuff. In the latest Jurassic and Berriasian continental rift type (Harangi 1994), volcanic activity halted carbonate sedimentation and produced an ankaramite–alkaline basaltic paleovolcano (Wein 1961; Császár 2002). The Upper Jurassic—Lower Cretaceous mixed volcano—sedimentary sequence seems to be continuous; however, Nagy (1964) indicated a discontinuity between the uppermost Tithonian and lowermost Berriasian. Contrary to this, a continuous Jurassic/Cretaceous boundary sequence has been suggested by Császár et al. (1990). Based on field observations, the present authors support the opinion of Császár et al. (1990). Related research is going on to define the J/K boundary beds in the Mecsek Mountains at Zengővárkony.

Studied sections

In the south-eastern part of the Mecsek Mountains in the abandoned quarry at Zengővárkony Böckh (1880) first reported Jurassic beds with pygopid brachiopods (Fig. 2). Böckh also collected ammonites from the abandoned quarry (called by him mészkemencék = lime kilns) that are housed in the collection of MGSH. The lime kilns of Zengővárkony are abandoned today. The small quarries traverse the succession (Fig. 3) from the Oxfordian (Nagy 1964) to the upper Berriasian (Grabowski et al. 2016). An artificial section was excavated during the current study between the lower Tithonian and upper Berriasian (Fig. 4). Some layers are recognized that have yielded pygopid specimens and a specimen of the ammonite *Volanoceras volanense* that indicates the lower Tithonian Micracanthoceras ponti Zone.

In a NW direction from the artificial section, there is a wall that would have been the quarry wall in the nineteenth century. Some sampling was done in the upper part that revealed a late Berriasian age on magnetostratigraphic sampling (Grabowski et al. 2016). 5–6 meters

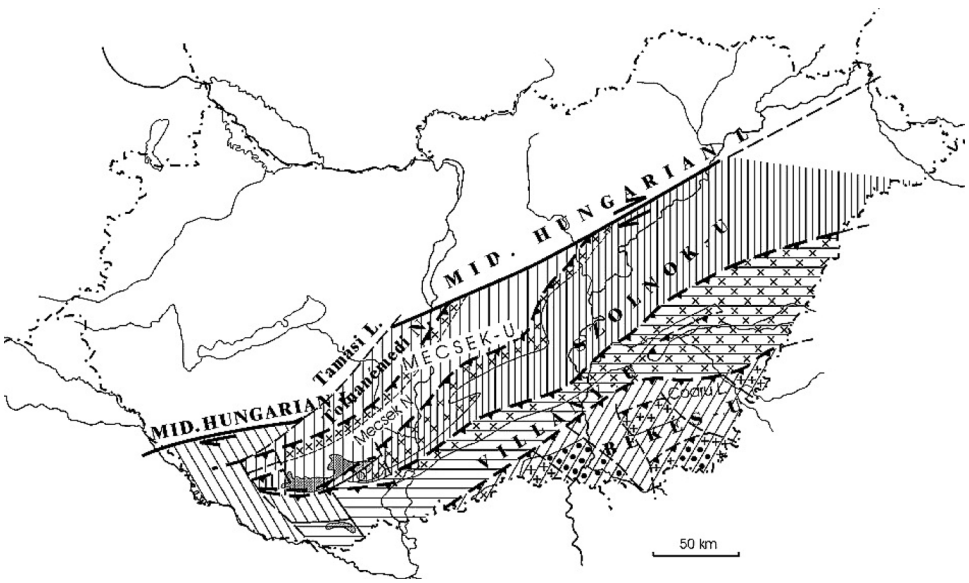

Fig. 1 Geographical position of the Mecsek Mountains in Hungary, major tectonic units of Hungary indicated. Map based on Haas and Péró (2004), simplified

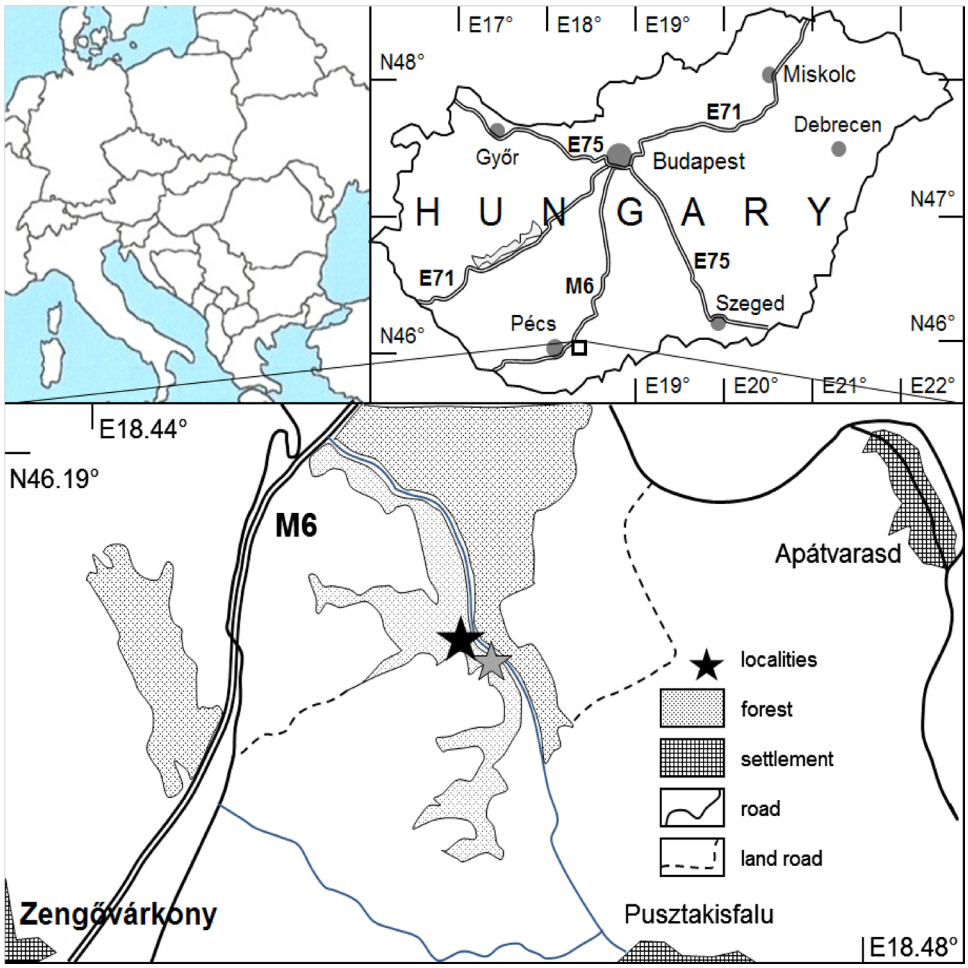

Fig. 2 Locality map. Map shows by asterisks the investigated sections in the Mecsek Mountains, in the vicinity of Zengővárkony. Asterisk in black: lower Berriasian section in the abandoned quarry. Asterisk in grey: lower Tithonian artificial section made during field work of this research in the forest

below paleomagnetic sampling points of Grabowski et al. (2016), an early Berriasian section was found that provided other brachiopod specimens (Fig. 5). This part of the section is characterized by massive, pink–red-coloured micritic poorly stratified limestone beds. Thin sections from this bed revealed a rich calpionellid microfauna with *Calpionella alpina* prevailing that may indicate the lowermost Berriasian.

Materials and methods

Abbreviations. FO: first occurrence; L: length of the valve; W: width of the valve; H: height of the valve; h: length of the perforation on the ventral valve; hl: length of the perforation on surface of the dorsal valve according to Lukeneder (2002). Dimensions are given in mm. Measurements were acquired by a manual caliper. Measurements in brackets refer to estimated data due to poor preservation. The specimens are housed in the Palaeontological Collection of the Hungarian Natural History Museum, Budapest.

Institutional abbreviations. HNHM—Hungarian Natural History Museum, Budapest. Systematics of brachiopods follows the system of Williams et al. (1996).

Systematic palaeontology

Phylum **Brachiopoda** Duméril, 1806
Subphylum **Rhynchonelliformea** Williams, Carlson, Brunton, Holmer, and Popov, 1996
Class **Rhynchonellata** Williams, Carlson, Brunton, Holmer, and Popov, 1996
Order **Rhynchonellida** Kuhn, 1949
Superfamily **Pugnacoidea** Rzhonsnitskaia, 1956
Family **Basiliolidae** Cooper, 1959
Subfamily **Lacunosellinae** Smirnova, 1963

Genus ***Lacunosella*** Wisniewska, 1932

Type species. Rhynchonella arolica Oppel, 1865.

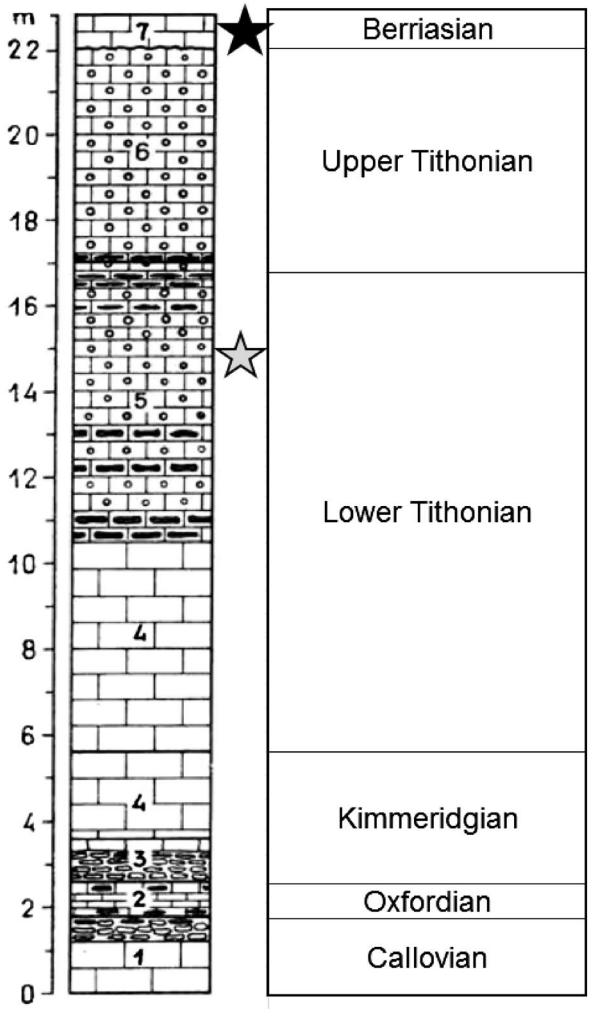

Fig. 3 The upper Jurassic–lower Cretaceous section at Zengővárkony, Mecsek Mountains, South Hungary. Lithological column after Nagy (1964), simplified. Asterisks indicate the position of the brachiopods collected from the section. Legend: 1: light coloured yellowish-grey thick bedded limestone; 2: thin bedded limestone; 3: marly–clayey, red coloured nodular limestone; 4: light coloured yellowish-grey thick bedded limestone; 5: light coloured yellowish-grey brecciated limestone with flint nodules; 6: yellowish-white brecciated limestone; 7: brownish-yellow clayey limestone

Fig. 4 *Pygope diphya* (specimen INV 2019.2816) in situ preserved in the lower Tithonian tuffitic limestone beds from an artificial section at Zengővárkony lime kilns. Coordinates: 46.1841° N; 18.4584° E

Lacunosella hoheneggeri (Suess, 1858)
Figure 6a–e

1858 *Rhynchonella Hoheneggeri* Suess—Suess: p. 56, pl. 6, figs. 13–19.
1870 *Rhynchonella Hoheneggeri* Suess—Zittel: p. 147, pl. 38, figs. 29–31.
? 1899 *Rhynchonella Hoheneggeri* Suess—Remeš: p. 229, pl. 8, figs. 1–2.
1977 *Lacunosella hoheneggeri* (Suess)—Nekvasilová: p. 60, pl. 4, figs. 1–9; pl. 5, figs. 1–5.
1979 *Lacunosella hoheneggeri* (Suess)—Barczyk: p. 55, pl. 2, figs. 4–5.
1996 *Lacunosella hoheneggeri* (Suess)—Krobicki: fig. 7.5.
1996 *Lacunosella hoheneggeri* (Suess)—Krobicki and Wierzbowski: fig. 4.3a–c.
2006 *Lacunosella hoheneggeri* (Suess)—Bujtor: p. 119, figs. 4–6, 7.1–4.

Studied material. One well preserved, partly decorticated specimen from limestone bed, Calpionella Zone, Lower Berriasian, Zengővárkony Mészkemencék section.

Dimensions.

Specimen no.	*L*	*W*	*H*
INV 2019.2814	15.2	16.0	11.9

Fig. 5 Lower Berriasian, massive, pink coloured micritic limestone beds in the NW quarry wall of the Zengővárkony lime kilns section. Hammer points to the bed from where the *Lacunosella hoheneggeri* and *Pygope janitor* were collected. Coordinates: 46.1848° N; 18.4564° E

Description. External characters: shell inflated wider than longer *Lacunosella*. Dorsal valve more inflated than ventral valve. Umbo small, erect, foramen not seen. Commissure uniplicate. Shell ornamented with strong primary ribs originated from the umbo. There are eight primary ribs on ventral and seven on dorsal valve. Fine growth lines and fine secondary ribs are only on the ventral valve. These intercalatory secondary ribs are not seen on the internal mould. Nekvasilová (1977: 60–68) gave a detailed diagnosis, which is accepted and followed here.

Internal characters—As only one specimen was recovered, serial sections were not prepared.

Remarks. Although this species has extreme variability (Nekvasilová 1977: 67), the specimens of Remeš (1899: pl. 8, figs. 1, 2) may fall outside the variability (lack of strong ribs, not inflated shell, etc.). The dimensions of the present specimen (length and width) conform to the average dimensions taken from 1100 specimens (Nekvasilová 1977). Bujtor (2006) reported it also from Zengővárkony but from younger (upper Valanginian–lower Hauterivian) sediments. The younger population of *L. hoheneggeri* from the same locality presented a significant average size increase (Bujtor 2007: 192, fig. 4) of mean dimensions compared to the material from the type locality in Štramberk, Czech Republic (Nekvasilová 1977). However, the dimensions of the present specimen fall into the range of the Štramberk population of Nekvasilová (1977). The present specimen is most similar to the specimen of Barczyk (1979: pl. 2, fig. 4).

Stratigraphic and geographic distribution. Tithonian to Valanginian of SE France, Štramberk (Czech Republic), Hungary, Pieniny Klippen Belt (Poland), and the Ukrainian Carpathians.

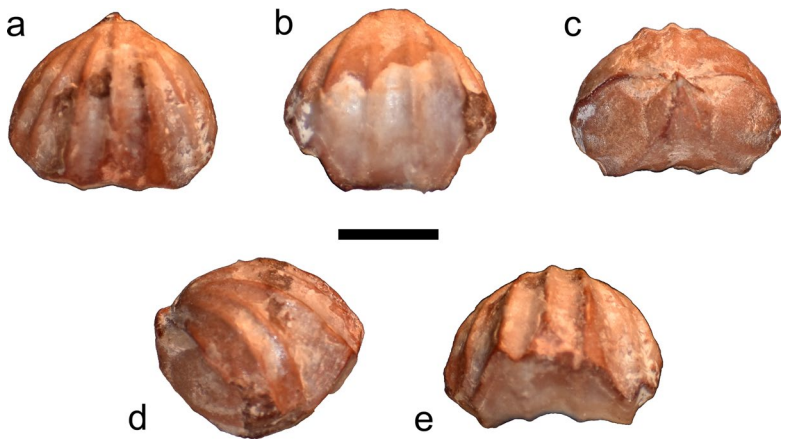

Fig. 6 **a**–**e** *Lacunosella hoheneggeri* (Suess 1858) lower Berriasian, Zengővárkony, Mecsek Mountains, Hungary; specimen INV 2019.2814. **a** Dorsal view; **b** ventral valve; **c** posterior view; **d** lateral view; **e** anterior view

Order **Terebratulida** Waagen, 1883
Suborder **Terebratulidina** Waagen, 1883
Superfamily **Discolioidea** Fischer and Oehlert, 1891
Family **Pygopidae** Muir-Wood, 1965
Subfamily **Pygopinae** Muir-Wood, 1965

Genus ***Pygope*** Link, 1830

Type species. Terebratula antinomia Catullo, 1827.

Pygope diphya (von Buch, 1835)
Figure 7a–c

1610 *Concha diphya*—Colonna: p. 388, pl. XXXVI.
1835 *Terebratula diphya* Fabio Colonna—von Buch: p. 108, pl. I, fig. 12.
1870 *Terebratula diphya* Fabio Colonna—Zittel: p. 126, pl. 13, figs. 1–10.
1880 *Terebratula diphya* F. C.—Böckh: p. 17. [in lit.]
1935 *Pygope diphya* Cat. sp.—Vadász: p. 63. [in lit.]
1948 *Terebratula (Pygope) diphya* Col.—Trauth: p. 211. [in lit.]
1959 *Pygope diphya* (Col.)—Kotanski and Radwanski: pl. LVI. fig. 2.
1962 *Pygope diphya* Fabius Columna—Jarre: p. 48, pl., fig. 5; pl. D, figs. 1–3; pl. E, fig. 1.
1963 *Pygope diphya* (Columna)—Thieuloy: p. 284, pl. II, fig. 1a–c.
1972 *Pygope diphya* (Colonna)—Barczyk: p. 509, pl. 1, figs. 2–3; pl. 4, figs. 1–3; text-fig. 1.
1981 *Pygope diphya* (von Buch)—Dieni and Middlemiss: p. 29, pl. I, figs. 1–4.
1992 *Pygope diphya* (von Buch)—Somody: p. 114. [in lit.]
1997 *Pygope diphya* (Buch)—Vörös: p. 107, fig. 53.
2007 *Pygope diphya* (Buch)—Vörös and Dulai: pl. III, fig. 29a–b.
2016 *Pygope diphya* (Buch)—Sulser: fig. 8t.

Material. Two badly preserved, fragmentary, partly decorticated internal moulds from limestone bed, Micracanthoceras ponti Zone (lower Tithonian), Zengővárkony Mészkemencék section.

Dimensions.

Specimen no.	*L*	*W*	*H*	*h*	hl
INV 2019.2815	50.6	55.3	23.9	6	16
INV 2019.2816	44	(56)	(23)	–	17

Description. External characters: Shell large, adult, triangular shape, biconvex, laterally not inflated with elongated, teardrop shape foramen on the brachial valve placed close to the umbo. Ventral valve has a narrow ridge from the umbo to the perforation. Maximum width of the ridge is 5.5 mm, maximum height 2 mm. The internal moulds are partly covered by shell with a thickness of 0.3–0.5 mm. Lateral commissure is not seen, anterior commissure is straight. Umbo is big, erect, oval shaped. Both valves show fine growth lines throughout from the umbo to the anterior commissure. Where it is not covered by shell remains, fine and thin imprints of vascular myarium channels are preserved on the right side of the dorsal valve internal mould (specimen INV 2019.2815).

Internal characters—As only one complete specimen was recovered, serial sections were not prepared.

Remarks. Böckh (1880) noted that preservation is bad but he collected many specimens. We have only collected two specimens but with poor preservation. The present specimens agree most closely with the specimen of Barczyk (1972: pl. 4, fig. 2a) and Sulser (2016: fig. 8t) with the same narrow and elongated foramen. It differs from the specimen of Vörös and Dulai (2007) with its narrower and elongated foramen, less inflated ventral valve and less developed umbo.

The authorship of *P. diphya* is variously interpreted. Authors refer to Catullo or von Buch as the original author of the species; however in his original work, von Buch (1835) clearly referred to Fabio Colonna (cf. Dollfuss and Dautzenberg 1932: 312). Notwithstanding, according to Art. 3.2. of the International Code of Zoological Nomenclature *"no name published before 1 January 1758 enters zoological nomenclature but information published before that day may be used"*. Therefore, von Buch must be credited as the author of the species; however, Fabio Colonna (or Fabius Columnae) could be indicated. We strongly suggest keeping

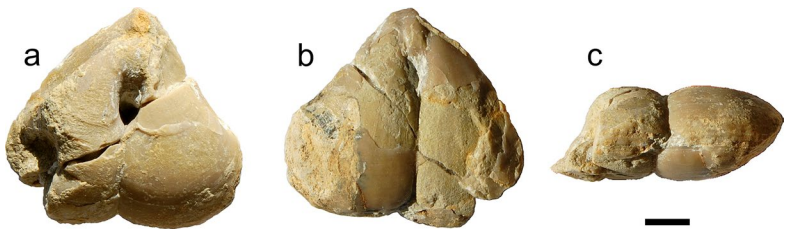

Fig. 7 **a**–**c** *Pygope diphya* (Buch 1835) lower Tithonian Micracanthoceras ponti Zone, Zengővárkony, Mecsek Mountains, Hungary; specimen INV 2019.2816. **a** Dorsal view; **b** ventral view; **c** anterior view

Fabio Colonna in taxonomic descriptions due to his pioneering work in natural sciences.

Stratigraphic and geographic distribution. Stratigraphic distribution: FO of *P. diphya* is at the base of the lower Tithonian and it disappears by the end of the Berriasian (Dieni and Middlemiss 1981). It occurs in the western part of the Tethys, most commonly along the northern margin; however, it also appears along the southern margin of the Tethys, in Morocco (Somody 1992).

Pygope janitor (Pictet, 1867)
Figure 8a–c

1867 *Terebratula janitor* Pictet—Pictet: p. 161, pl. 29, figs. 4–6, pl. 30.
1873 *Terebratula janitor* Pictet—Neumayr: pl. XLIII, fig. 8.
1890 *Pygope janitor* Pictet—Toucas: p. 585, pl. XIV, fig. 8a–b.
1899 *Terebratula janitor* Pictet—Remeš: p. 220, text-fig. 5A–D.
1935 *Pygope janitor* Pict.—Vadász: p. 63. [in lit.]
1962 *Pygope janitor* Pictet—Jarre: p. 38, pl. B, figs. 2–5; pl. C, figs. 1–8; text-fig. 4.
1972 *Pygope janitor* (Pictet)—Barczyk: p. 511, pl. 2, figs. 1–2; pl. 3, figs. 1–2.
1973 *Pygope janitor* Pictet—Preda: pl. 10, fig. 12.
1981 *Pygope janitor* (Pictet)—Dieni and Middlemiss: p. 36, pl. IV, fig. 2.
1993 *Pygope janitor* (Pictet)—Inesta-Alcoela: p. 14, pl. II, fig. 3a–d.
1994 *Pygope janitor* (Pictet)—Főzy et al.: pl. 2, figs. 17–18.
1994 *Pygope janitor* (Pictet)—Vašíček et al.: pl. 13, figs. 13–14.
1996 *Pygope janitor* (Pictet)—Krobicki and Wierzbowski: fig. 4.5a.
1996 *Pygope janitor*—Michalík: figs. 2, 3.5–6, 3.8, 3.10–12.
1997 *Pygope janitor* (Pictet)—Benzaggagh and Atrops: pl. 5, fig. 4.
2005 *Pygope janitor* (Pictet)—Enay et al.: fig. 4.8a–b.
2005 *Pygope janitor* (Pictet)—Harper et al.: p. 221, fig. 2Q.
2013 *Pygope janitor* (Pictet)—Dirksen et al.: pl.1, figs. 2–5.
2016 *Pygope janitor* (Pictet)—Sulser: fig. 8u.

Material. One, poorly preserved, broken and fragmentary, partly decorticated specimen from limestone bed, Calpionella Zone (Lower Berriasian), Zengővárkony, Mészkemencék section.

Dimensions.

Specimen no.	*L*	*W*	*H*	*h*	hl
INV 2019.2817	51	53	31	(15)	29

Description. External characters: Large sized, adult, biconvex and inflated, triangular shape shell with large, centrally placed perforation. The wall of the central perforation is vertical towards the flanks and rounded towards the umbo. Lateral commissure slightly sinusoidal; anterior commissure straight. Pedicle opening and umbo not preserved. Fine growth lines preserved throughout both flanks. Shell remnants around the lateral flanks of the central perforation, are 0.5–0.7 mm thick. Pronounced, branching vasculum myarium is preserved on the internal cast of the left dorsal valve. Maximum width of the canal 1.4 mm. Regarding intraspecific variability, the present specimen conforms with the second variation of Jarre (1962: 40, pl. B, fig. 3) with triangular shape and touching flanks.

Internal characters—As only one specimen was recovered serial sections were not prepared.

Remarks. The open perforation may refer to *Pygites diphyoides* (d'Orbigny 1847) but the lack of the pronounced ridge with sulcus of the dorsal valve (cf. Middlemiss 1978: pl. 15, fig. 1a–b) unequivocally refers to the species *janitor*. Other similarities (big central perforation, triangular shape) are towards *Pygites magomaevi*; however, that species lacks a biconvex shape, while the present specimen has a biconvex shape. It differs from the specimen of Toucas (1890: pl. XIV,

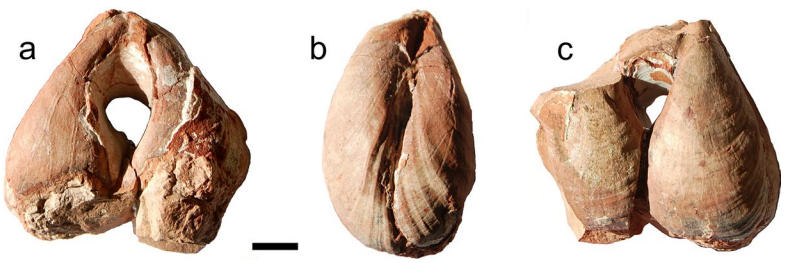

Fig. 8 **a**–**c** *Pygope janitor* (Pictet 1867) lower Berriasian, Zengővárkony, Mecsek Mountains, Hungary; specimen INV 2019.2817. **a** Dorsal view; **b** lateral view; **c** ventral view

fig. 8a–b) where the latter represents a juvenile stage where the flanks are not touching each other. Vašíček et al. (1994) described a specimen from the Hauterivian with an elongated perforation. The present specimens are most similar to the specimen of Pictet (1867: pl. 30, fig. 3A–B), Remeš (1899: text-fig. 5D), Michalík (1996: fig. 3.8), Benzaggagh and Atrops (1997: pl. 5, fig. 4), and Enay et al. (2005) with its big, central perforation, touching flanks, triangular shape and convex, inflated dorsal and ventral valves. The most remarkable feature of the present specimen is its large size and inflated biconvex lateral profile, which is not mentioned in the literature. Due to the fragmentary and broken preservation, the original dimensions of the specimen were bigger and the inflated flanks (T: 31 mm) may refer to a special local environment.

Stratigraphic and geographic distribution. Stratigraphic distribution: *P. janitor* FO is most probably in the Kimmeridgian and it disappears in the middle Barremian (Dieni and Middlemiss 1981). It has wide geographic distribution mainly in the western part of the Tethyan Realm with scarce occurrences in the Boreal Realm (East Greenland: Harper et al. 2005).

Discussion

Pygopid brachiopods are frequently used for palaeobiogeographical analysis. Kázmér (1990, 1993) proposed that the pairs of *Pygope catulloi* and *P. diphya* inhabited the nutrient-poor southern margin of Tethys, while *P. janitor* and *Pygites diphyoides* with a large central perforation inhabited the nutrient-rich northern margin of the Tethys. This assumption is rejected by Michalík (1996) on the basis that brachiopod distribution data did not support this pattern. However, later research may support this idea (Lukeneder 2002). Pygopids were also used as the marker ('Tethyan index' cf. Michalík 1992) of the Tethys; however, their presence in the Boreal Realm (Harper et al. 2005) did not fit into this assumption. Hence, it must be noted here that Ager and Walley (1977) considered a geographic range extension via the opening of the Atlantic Ocean. But other factors may interact, too. A Gulf Stream-type circulation may also have contributed to their extra-Tethyan distribution (Ager 1986; Sandy 1991).

Regarding the paleoecology of this group, it is also disputed. Although they are significant elements of the Tethyan basinal faunas (Ager 1976), their distribution was not only controlled by bathymetry and temperature (Michalík 1992), but by ocean currents, too (Ager 1994). Traditionally, pygopids are interpreted as deep-water organisms (Ager 1965, 1976). Today, pygopid brachiopods are rather considered as indicative of colder than warmer waters with eurybathic character. It is also suggested that pygopid brachiopods also occupy shallow water environments over seamounts (Ager 1993). On the other hand, in faunal assemblages, the increasing percentage of pygopids suggests deeper environments (Golonka and Krobicki 2001).

It is important to emphasize that in the Mecsek Mountains (but also in the Mecsek Tectonic unit) during the Berriasian volcanic activity intensified, Berriasian–Valanginian age pillow lavas are reported from the sequence, therefore the ocean floor was not quiescent, and undisturbed. It is remarkable, that beside the benthic brachiopods only nektonic animal remains (ammonites and calpionellids) and some microfossils (foraminifers) are recorded from the Tithonian–Berriasian beds in the Mecsek Mountains.

On the other hand, it is worth mentioning that the present specimen of *Lacunosella hoheneggeri* is remarkably smaller than those of the late Valanginian–early Hauterivian iron ore-related brachiopod fauna that is dominated by *L. hoheneggeri* (Bujtor 2006, 2007) from the same locality. But this is not surprising. The average mean dimensions of *L. hoheneggeri* are in line with the dimensions of the present specimen: Average L: 15.7 and average W: 16.3 mm (Bujtor 2007; Nekvasilová 1977). The dimensions of the present specimen fall into this range (see: Dimensions). This is further evidence that in normal conditions (e.g., at type locality of *L. hoheneggeri* in Štramberk, Czech Republic and the lower Berriasian at Zengővárkony), the length and width of this species is around 16 mm; while under special, nutrient-rich conditions, it remarkably shifts to larger dimensions due to special ecological conditions (Bujtor and Vörös in press).

Conclusion

The first description and publication of pygopid brachiopods based on a new collection from the Mecsek Mountains (South Hungary) provides a solid foundation for any further palaeobiogeographic analysis, which has been based only on faunal lists during the past 140 years. The new field collection supported the presence of two pygopid species (*Pygope diphya, P. janitor*) in the region from where earlier researchers (Böckh 1880; Vadász 1935) quoted the presence of three pygopid species, which represent the Tithonian and the Berriasian. Based on previous (Bujtor 2006) and current research presented herein, three pygopid species are confirmed from the Upper Jurassic and Lower Cretaceous succession of the Mecsek Mountains: *Pygope diphya, P. janitor* and *Pygites diphyoides*. The new occurrence of *Lacunosella hoheneggeri* and its dimensions refer to normal ecological conditions as in its type locality in Štramberk, Czech Republic.

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