On the pleurotomariid gastropod genus *Trachybembix* from the Middle Triassic Marmolada Limestone, South Alps, Italy

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Abstract

The Middle Triassic (Ladinian) gastropod genus *Trachybembix* from the Marmolada Limestone in South Tyrol, Italy is reviewed based on the study of type material. Contrary to previous suggestions, *Trachybembix* has a selenizone and thus represents a member of the order Pleurotomariida. The genus is placed in the family Eotomariidae, an essentially Palaeozoic group of gastropods. Lectotypes are designated for the type species of *Trachybembix*, *T. junonis* Kittl, 1894 and for *T. salomoni* Böhm, 1895. Besides the type species *Trachybembix junonis*, *T. jovis* and *T. salomoni*, all from the Marmolada Limestone, undoubtedly represent the genus *Trachybembix*. A synonymy of these three taxa seems to be possible but at least *T. salomoni* is probably a species distinct from the type species *T. junonis*. Other species assigned to *Trachybembix* (all from China) are based on poorly preserved or documented material so that their generic assignment needs corroboration i.e., *Trachybembix cyclosis* Pan, 1982 (Early Triassic), *Trachybembix raris* Pan, 1977 (Late Triassic) and *Trachybembix incerta* Wang, 1982 (Late Perm).

Key words: Gastropoda, Pleurotomariida, Triassic, Systematics

Zusammenfassung


Schlüsselwörter: Gastropoda, Pleurotomariida, Trias, Systematik

1. Introduction

The great Middle Triassic gastropod faunas of the carbonate platforms of the South Alps were comprehensively studied in the second half of the 19th century (Stoppani 1868–70; Kittl 1894, 1899; Böhm 1895). The gastropod fauna of the Marmolada and Esino Limestones comprises ca. 150 described species making these formations the most diverse Middle Triassic gastropod occurrences worldwide. However, little additional work on these faunas has been done subsequently. A characteristic genus present in the Marmolada Limestone is *Trachybembix*. This genus was initially placed in the family Pleurotomariidae but has been considered to be of doubtful systematic placement subsequently (Haas 1953; Knight et al. 1960). Based on Kittl’s (1894) and Böhm’s (1895) type material from the Marmolada present in the Natural History Museum, Vienna and the Bavarian State Collection, Munich, this genus is revised in the following.
Material: Two syntypes of Kittl (1894), one of which designated as lectotype herein, NHMW 1969/1085/0002, specimen figured by Kittl (1894, pl. 1, fig. 17) and here (PL 1, Figs 1, 2); another syntype is designated as paratype herein, NHMW 1969/1085/0001, specimen figured by Kittl (1894, pl. 1, fig. 15) and here (PL 1, Figs 3, 4); three specimens to Böhm (1895), SNSB-BSPG 1887 XI 83, 780, 781. All specimens are from the Marmolada Limestone.

Description: Shell low-spired, turbiniform; lectotype designated herein comprising 5 to 6 whorls (protoconch missing), 15.6 mm high, 16.3 mm wide; spire gradate with angulated whorl face; narrow, concave selenizone present on whorl angulation at about middle of whorl face respectively above mid-whorl; selenizone demarcated by sharp crests; whorl face with steep ramp and more steeply inclined between selenizone and abapical suture; whorl face distinctly concave above and below median angulation; whorls ornamented with a subsutural spiral bulge or spiral cord and a suprasutural spiral cord; suprasutural spiral cord forms angular transition from whorl face to base; whorls ornamented with irregularly strengthened growth lines; growth lines strongly prosocytic and prosocline between adapical suture and median angulation, strongly backward curving towards selenizone; growth lines straight prosocline below median crest, less oblique than growth lines above crest, abruptly curving backward just below selenizone towards selenizone; strengthened growth lines forming nodes or short riblets on subsutural bulge; whorls ornamented with numerous spiral threads; base strongly convex, evenly rounded, distinctly phaneromphalous with a circumumbilical edge; growth lines on base much weaker than on whorl face, more or less radial; base ornamented with numerous very fine spiral threads; aperture approximately as high as wide with rounded outer and columellar lip, acute adapically.

Remarks: The lectotype of Trachybembix junonis as well as well-preserved specimens from Böhm's (1895) material are clearly conspecific. The studied material shows that the growth lines curve backward at the angulation of the outer face both, in the adapical and abapical portion of the whorl face. There-
fore *Trachybembix* has a narrow selenizone on the angulation. The selenizone is concave and bordered by sharp crests. However, due to preservation it remains unclear how deep the slit was and the selenizone itself is also not obvious.

*Trachybembix salomoni* Böhm, 1895
Plate 2, Figures 5–9

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<th>Year</th>
<th>Description</th>
<th>Material Reference</th>
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<tr>
<td>1895</td>
<td><em>Trachybembix salomoni</em> n. sp. – Böhm, p. 221, pl. 9, fig. 10.</td>
<td>SNSB-BSPG 1887 XI 783, material to Böhm (1895, pl. 9, fig. 10d).</td>
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| 1899 | *Trachybembix salomoni* – Kittl, p. 9. | SNSB-BSPG 1887 XI 84, figured by Böhm (1895, pl. 9, fig. 10d) and here (Pl. 2, Fig. 9); a third syntype of Böhm (1895), SNSB-BSPG 1887 XI 784, is a small and poorly preserved specimen. All specimens are from the Marmolada Limestone.

Remarks: *Trachybembix salomoni* resembles *T. junonis* but *T. salomoni* has a much lower spire and a wider umbilicus (lectotype designated herein comprising ca. 6 whorls, 11.5 mm high, 17.5 mm wide). Its circumumbilical edge moves to the middle of the base of the whorls in the last part of the last whorl whereas the edge remains close to the umbilicus in *T. junonis*. The preservation does not facilitate a detailed description of the shell ornament. Kittl (1899) noted that *T. salomoni* could represent a synonym of *T. junonis*, the latter being a very variable type. Based on the present material, this seems to be unlikely and both taxa are probably distinct but many more specimens must be examined to test Kittl’s (1899) claim.

*Trachybembix jovis* Kittl, 1894
Plate 2, Figures 10–12

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<tr>
<th>Year</th>
<th>Description</th>
<th>Material Reference</th>
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<tr>
<td>1894</td>
<td><em>Trachybembix jovis</em> n. sp. – Kittl, p. 220, pl. 1, fig. 14.</td>
<td>SNSB-BSPG 1887 XI 83; material to Böhm (1895, pl. 9, fig. 11a–d).</td>
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<td>1895</td>
<td><em>Trachybembix jovis</em> – Böhm, p. 221, pl. 9, fig. 38.</td>
<td>SNSB-BSPG 1887 XI 783, figured by Böhm (1895, pl. 9, fig. 10d) and here (Pl. 2, Figs 10–12); SNSB-BSPG 1887 XI 782. Both specimens are from the Marmolada Limestone.</td>
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| 1899 | *Trachybembix jovis* – Kittl, p. 9. | SNSB-BSPG 1887 XI 85, figured by Böhm (1895, pl. 9, figs 10, 10a–c) and here (Pl. 2, Figs 5–8); other syntype material, SNSB-BSPG 1887 XI 84, figured by Böhm (1895, pl. 9, fig. 10d) and here (Pl. 2, Fig. 9); a third syntype of Böhm (1895), SNSB-BSPG 1887 XI 784, is a small and poorly preserved specimen. All specimens are from the Marmolada Limestone.

Remarks: *Trachybembix jovis* closely resembles *T. junonis* in shape but *T. jovis* has a wider umbilicus and the ornament on the base is distinctly stronger. As previously discussed by Kittl (1894), *Trachybembix jovis* could be a morphological variety of *T. junonis*.

### 3. Discussion

It could be shown that the type species of the genus *Trachybembix* is a slitband gastropod (Pleuratomariidae) as was initially proposed by Kittl (1894) and Böhm (1895). Later discussions whether a selenizone was really present or not (Haas 1953; Knight et al. 1960) are obsolete now. *Trachybembix* could be closely related to a large group of Late Palaeozoic turbiniform pleurotomariid gastropods with gradate spire in which the selenizone is situated on a prominent whorl angulation for instance, *Ananias* Knight, 1945 or *Glabrocingulum* Thomas, 1940 both of which are currently placed in the family Eotomariidae. Although theOrdovician type species of the type genus *Eotomaria* differs widely from *Trachybembix* and the mentioned Late Palaeozoic gastropods, the family Eotomariidae seems preliminarily to be an appropriate place for *Trachybembix*.

At present, certain members of *Trachybembix* are only known from the Marmolada Limestone: *Trachybembix junonis*, *T. jovis* and *T. salomoni*. A synonymy of these three taxa seems to be possible but at least *T. salomoni* is probably a species distinct from *T. junonis* as is indicated by the very low spire and the extremely wide umbilicus. Kittl (1899, p. 226) mentioned that *Trachybembix* was short-lived and obviously only present in the Marmolada- and Esino Limestones. He also observed that it was present with numerous specimens in the Marmolada Limestone with three closely related species whereas only a single specimen representing *Trachybembix junonis* (most abundant species in the Marmolada Limestone) was found in the Esino Limestone. The genus *Trachybembix* is thus lacking in the other diverse Triassic gastropod faunas from the Alps such as those from the Carnian Cassian Formation and the Norian Hallstatt Limestone. Three other species - all from China - have been assigned to *Trachybembix*: *Trachybembix incerta* Wang, 1982 (Late Permian), *Trachybembix cyclosis* Pan, 1982 (Early Triassic) and *Trachybembix raris* Pan, 1977 (Late Triassic). These species are based on poorly preserved or documented material so that their generic assignment needs corroboration. *Trachybembix* is part of the strong pleurotomariid rebound after the end-Permian mass extinction which hit this group particularly hard (e.g., Hickman 1985; Nützel 2005).
Acknowledgments

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4. References


Kittl E. 1894. Die triadischen Gastropoden der Marmolata und verwandter Fundstellen in den weißen Riffkalken Südtirols. Jahrbuch der kaiserlich-königlichen geologischen Reichsan-