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On the find of Triassic brachiopod fauna in the variegated micrites on the Dachstein Plateau

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Abstract: Triassic age of the variegated micritic marly limestones sporadically occurring in the Dachstein Formation on the Dachstein Plateau SSW of Hallstatt was documented with the finds of Upper Triassic terebratulid *Triadithyris gregariaeformis* (ZUGMAYER, 1880) and of remains of dasycladacean algae.

Key words: Northern Calcareous Alps, Triassic, Dachstein Formation, brachiopods

Introduction

Rich Liassic brachiopod fauna is well-known from white and red biosparitic fissure-fillings in the monotonously grey Dachstein Limestone on the Dachstein massif SSW of Hallstatt and it was described in detail already many years ago (e.g. from Hierlatz by Oppel, 1861 and Geyer, 1889). The present study was prompted by the discovery of biplicate terebratulid brachiopods occurring not far from Hierlatz in the yellow, reddish, ochrous or greenish micrites which form irregular spots – not fissure fillings – in the Dachstein Limestone on the Plateau, S of the Wiesberghaus. In 1991 I happened to find the first locality, following years 3 other localities were ascertained in the vicinity of the touristic path from the Wiesberghaus towards the Simonyhütte yielding always the same, only one determinable terebratulid species, the only one determinable macrofossil in these variegated micrites. The age of micrites was questionable, because biostratigraphic information on them was missing at that time. They reminded oneself externally of similarly variegated Lowermost Liassic carbonates of other areas of the Northern Calcareous Alps. The terebratulid species under consideration was studied and determined as *Triadithyris gregariaeformis* (ZUGMAYER). In the locality 3 only, 25 small (up to 9.0 mm long) mostly fragmentary juvenile specimens of undeterminable flat zeileriids (?) were found except for *Triadithyris gregariaeformis*, showing rectimarginate anterior commissure, clear dental lamellae and dorsal septum. *Triadithyris gregariaeformis* had been described by Zugmayer in 1880 from the Rhaetian of the Piesting Valley near Vienna, and its lectotype designated later by Pearson (1977) came from the Kaisersteffel near Waldegg. However, this species was mentioned in the older literature also from the Lower Liassic (e.g. by Vigh, 1961 -- not newly revised), and so the uncertainty about the age of the micrites under consideration remained.

Samples kindly taken by Dr. G. Mandl (Wien) for conodonts (with negative results) and by Dr. H. Lobitzer (Wien) for microfacies did not help much to tell anything more about the age of the carbonate matrix. Nevertheless, from the geological point of view both these colleagues were rather sceptical as to the Liassic age of the rock (personal communications). According to Lobitzer, the micritic marly limestones are equivalents of Member A sensu Fischer (1964). At studied outcrops typical Lofer cycles are not developed but surrounding Dachstein Limestone is clearly of lagoonal origin and nearby various types of complete or „amputated„ Lofer cycles can be observed. Maybe most of the micritic sediment is of pedogenic origin with temporary influence of marine sedimentation (Lobitzer, written communication). Recently, 4 thin sections of the micrite coming from the locality 4 were kindly examined by Dr. O. Ebli (München). According to him, they were nearly barren of microfossils and very rare foraminifers were represented mainly by stratigraphically not important *Lagenidae*. Of great interest was, however, his find of dasycladacean algae (? *Salpingoporella*?). This was an

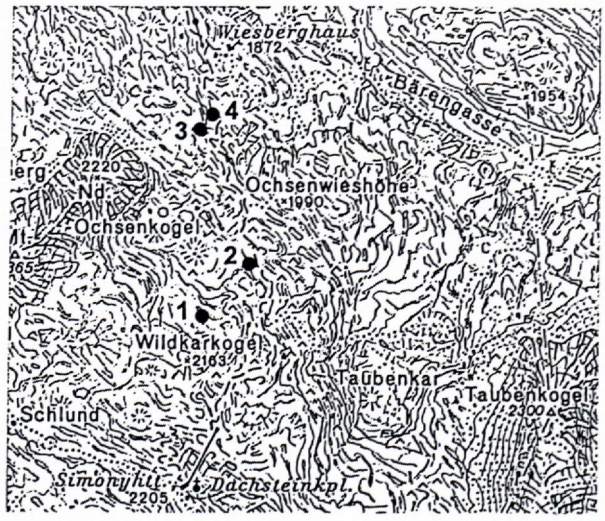

Fig. 1 Situation map of the area S of the Wiesberghaus showing 4 localities of variegated micrites with brachiopod fauna (ÖK 96 Bad Ischl).

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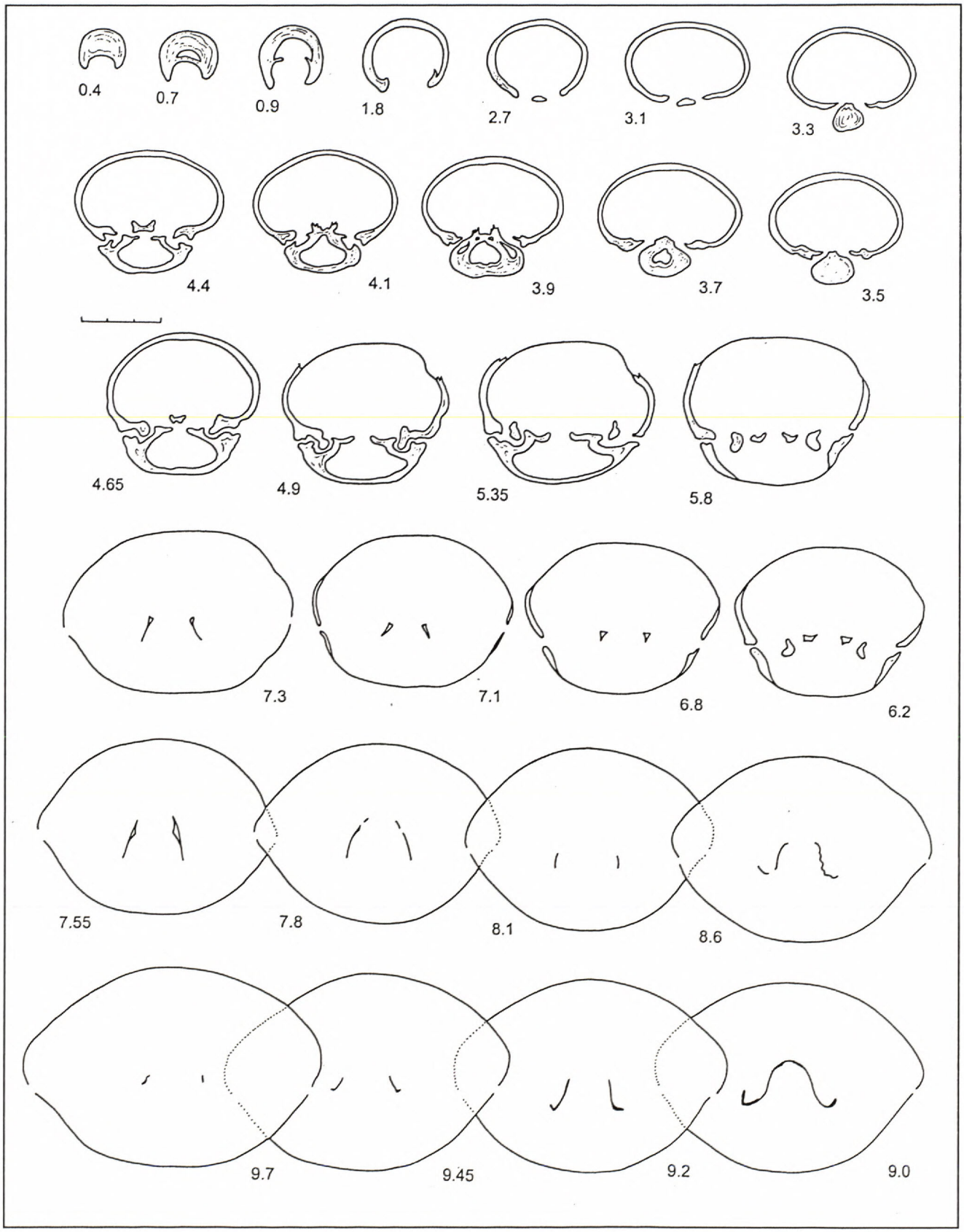

Fig. 2 Triadithyris gregariaeformis (ZUGMAYER). S of Wiesberghaus, locality 2. Serial transverse sections through the posterior part of shell. Total length of specimen 18.0 mm. Enlarged, scale bar equals 3 mm.

important hint for the Triassic age of the sample, because green algae are not known to occur in the Alpine Liassic. According to Ebli (written communication), the find of green algae in the thin section together with the geological situation dates the sampled lithology as Triassic.

Palaeontological part

Order:	Terebratulida WAAGEN, 1883
Superfamily:	Loboidothyridacea MAKRIDIN, 1964
Family:	Loboidothyrididae MAKRIDIN, 1964
Genus:	*Triadithyris* DAGYS, 1963

Triadithyris gregariaeformis (ZUGMAYER, 1880)

(Text-Figs. 2 - 3)

1880 *Terebratula gregariaeformis* n.f. - ZUGMAYER, p. 13, Pl. 1, Figs. 22, 26-29.
1977 *Triadithyris gregariaeformis* (ZUGMAYER) - PEARSON, p. 44, Text-Figs. 14-16, Pl. 7, Figs. 11-14 (cum syn.).
1988 *Triadithyris gregariaeformis* (ZUGMAYER) - SIBLÍK, p. 103.
1998 *Triadithyris gregariaeformis* (ZUGMAYER) - SIBLÍK, p. 84, Pl. 3, Fig. 5 (cum syn.).

Material: 246 mostly fragmentary specimens up to 20.0 mm long, 21.0 mm wide and 13.2 mm thick. The figured specimens measure: 15.2 x 13.4 x 8.4 mm (Text-Fig. 3, Figs. 1 A-C), 18.5 x c.18.8 x 10.2 mm (Text-Fig. 3, Figs. 2 A-C) and 16.4 x 16.5 x 8.1 mm (Text-Fig. 3, Figs. 3 A-C).

Occurrence: Dachstein Plateau, S of the Wiesberghaus: Locality 1 (14 specimens), locality 2 (186 specimens), locality 3 (3 specimens) and locality 4 (43 specimens). The species is not very frequent in the Northern Calcareous Alps (Pearson, 1977, p. 44). It is known from the Rhaetian of Austria (Siblík, 1988); from the Dachsteinkalk it was reported e.g. already by Bittner (1890, p. 278 -- locality in the Steinernes Meer near Saalfelden). Recently it was ascertained in the „Oberrhätkalk„ of Steinplatte (Siblík, 1998). The species is known from the Norian-Rhaetian in other countries, it is common e.g. in the Sevatian locality Drnava in Slovakia.

Remarks: Nothing substantial is to be added to the detailed descriptions given by Zugmayer (1880), Dagys (1963) and Pearson (1977).

Because of the problem of external homoeomorphy, it is not easy to determinate biplicate terebratulids described in the literature from near of the Triassic/Jurassic bound-

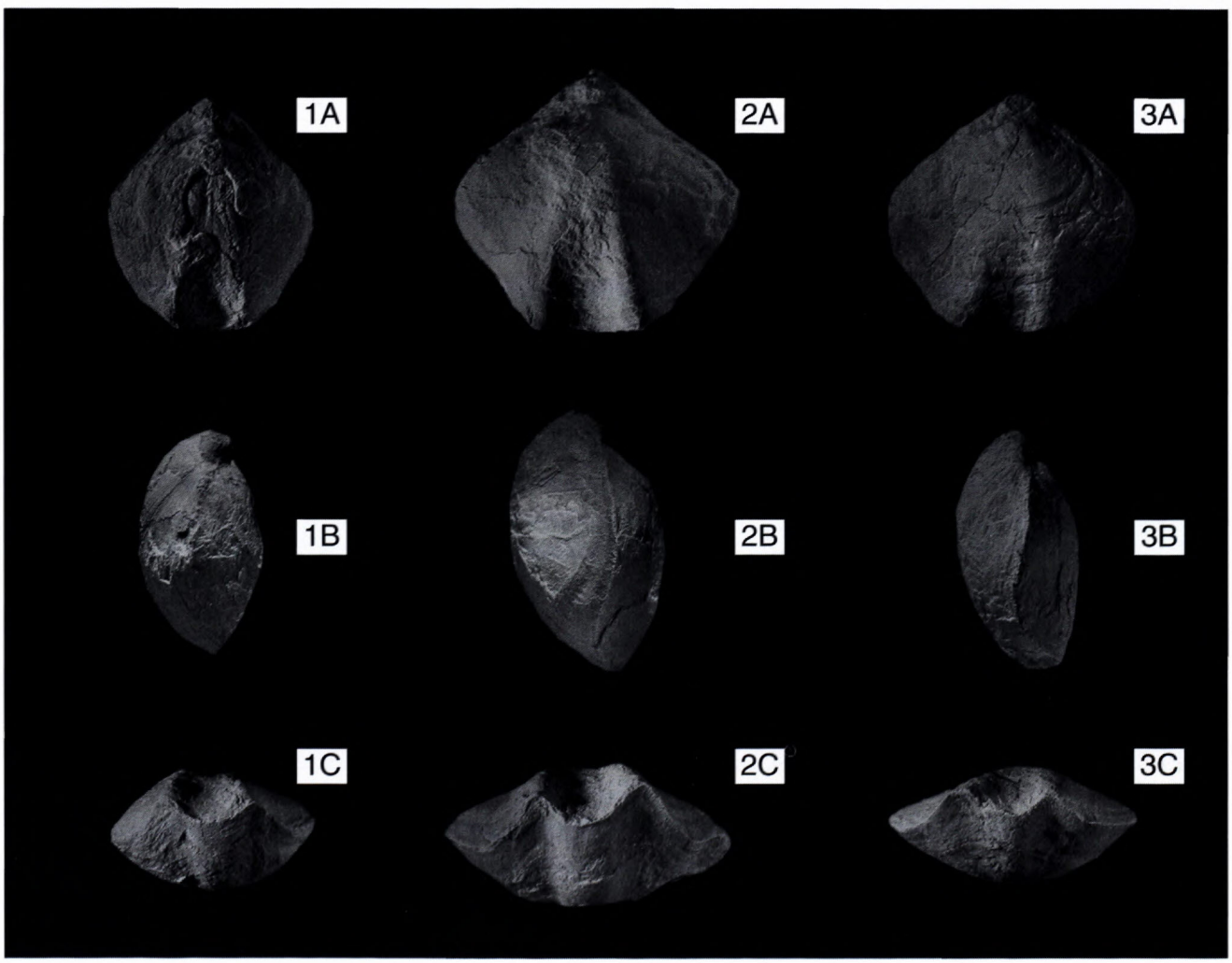

Fig. 3 Triadithyris gregariaeformis (ZUGMAYER). S of Wiesberghaus.
1 A-C: locality 1. GBA No. 2000/29/1; 2 A-C: locality 2. GBA No. 2000/29/2; 3 A-C: locality 4. GBA No. 2000/29/3.
All magnified, x 2. Collections of the Geologische Bundesanstalt Wien. Photo by Mr. J. Brožek (Prague).

ary, and it is difficult to speculate on their generic attri butions without knowledge of the internal characters. External similarity of *Triadithyris gregariaeformis* and *Rhaetina gregaria* (SUESS) is well known, their internal structures are quite different, however. *Rhaetina* WAAGEN, 1882 is externally homoeomorphic with *Pseudorhaetina* SANDY, 1994 (type species *P. antimoniensis* SANDY, 1994 from the Norian of Mexico) but they have different internal structures, esp. another shapes of brachidia and hinge plates. On the other hand, *Pseudorhaetina* can be distinguished internally from *Triadithyris* by its high crural processes and flattened top of transverse band; a cardinal process has not been ascertained in *Pseudorhaetina.* Another biplicate species which should be mentioned here, is *„Terebratula„ subgregaria* n.f. described by Dal Piaz (1909, p. 6, Pl.1, Fig. 3) from the Sinemurian of the Southern Alps. This species was ascertained some years ago in the Hettangian of the Bakony Mts. (Hungary) by Dulai (1993), and basing on the internal sections determined as *Lobothyris* ? *subgregaria* (DAL PIAZ). This species differs externally from average specimens of *gregariaeformis* and *gregaria* in its suboval outline, larger beak, and wider and shallower biplication.

In the older literature, there were some suggestions that *Rhaetina gregaria* (SUESS) is not restricted to the Rhaetian only, and ranges into the Earliest Liassic (e.g. Parona, 1884; Fucini, 1895; Geyer, 1889; Trauth, 1909; specimen figured in Raileanu & Iordan, 1964 = ? *Lobothyris subgregaria* ?). In most cases, these data have been neither revised nor proved recently. Geyer (1889) described and figured this species from the Lower Liassic of Hierlatz. Pearson (1977) refigured 3 Geyer's specimens from Hierlatz and made also serial sections of his another specimen which documented its *Rhaetina* character. The same was confirmed by my study of the internal structures made in 2 specimens from Geyer's collection from Hierlatz deposited in the Geologische Bundesanstalt in Vienna. It is of particular interest to notice that during our thorough samplings in the last years on Hierlatz, we have not still found any specimen of *Rhaetina gregaria.* The study of the interesting sedimentological situation on Hierlatz is in progress and it is clear that neptunian dykes are there infilled with material of at least 2 different ages (at least of Sinemurian and Pliensbachian ages). It cannot be thus excluded that Geyer's specimens of *Rhaetina gregaria* came from a separate Rhaetian fissure-filling on Hierlatz (maybe contemporaneus with the near-by variegated micrites with *Triadithyris gregariaeformis*) and were afterwards mixed with the other (Liassic) samples from Hierlatz. It seems to me that so far reported occurrence of *Rhaetina gregaria* within very rich Lower Liassic brachiopod fauna on Hierlatz cannot be still taken for granted, and taken as an important proof for *gregaria*'s occurrence in the Liassic.

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