

A CANDIDATE GSSP FOR THE BASE OF THE JURASSIC IN THE NORTHERN CALCAREOUS ALPS (KUHOCH SECTION; KARWENDEL MOUNTAINS, TYROL, AUSTRIA).

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SUPPLEMENT

HILLEBRANDT, A. V.

Lecture given at "Jahrestagung der Paläontologischen Gesellschaft 2008".

Abstract: Hillebrandt, A. v. (2008): Aragonitische Foraminiferen (Robertinina) aus dem Trias/Jura-Grenzbereich der Nördlichen Kalkalpen und ihre stratigraphische Bedeutung. – Erlanger geol. Abh., Sonderband 6: p. 34.

Aragonitic Foraminifera (Robertinina) from the Triassic-Jurassic boundary area of the Northern Calcareous Alps and their biostratigraphic significance.

With different species and genera of the Robertinina is possible a detailed biostratigraphy of the Triassic-Jurassic boundary beds in the Northern Calcareous Alps. The genera *Oberhauserella*, *Praegubkinella* and *Reinholdella* enable a subdivision of the Late Rhaetian and lower part of the Early Hettangian which can be compared with ammonite horizons of this time (Fig. 1). The time period between the last Rhaetian ammonite *Choristoceras* and the first Jurassic *Psiloceras* (*P. spelae* n. ssp.) is characterized by species of the genus *Oberhauserella* which are different from those occurring together with the last *Choristoceras* and those found together with *Psiloceras spelae* n. ssp. These Robertinina are also found in the latest Triassic and earliest Jurassic beds in England and a detailed study of this fossil group could be useful.

The Oberhauserellidae are the only family of the aragonitic Robertinina which survived the Triassic-Jurassic boundary. Many sections of the Northern Calcareous Alps were studied and the same evolutionary trend was found. An increasing of size (from 0.1 to 0.3 mm) was taking place from the latest Rhaetian to the earliest Hettangian. Different species of *Oberhauserella* are found in the Late Rhaetian. *Oberhauserella rhaetica* and *Oberhauserella alta* are typical for the latest Rhaetian. The first sample with these species was taken at the Kuhjoch section (candidate GSSP) in greyish marls with red intercalations (1 cm thick) transitional to the red Schattwald Beds below (Fig. 2). The following beds contain the same species (Figs. 3). Fig. 3.2 was taken 90 cm above the Schattwald Beds. Higher up appears *Oberhauserella* cf. *subcircularis* (Fig. 4.3; 1.5 mm above Schattwald beds). The first *Praegubkinella* cf. *turgescens* were found 0.5 m below the first *Psiloceras spelae* n. ssp. (Fig. 4.4). The *Spelae* beds are characterized by *Praegubkinella turgescens* (Fig. 5). Typical assemblages with *P. turgescens* also appear in the *Spelae* beds of other sections of the Karwendel Syncline (Fig. 6) and this species is also found in a section of the Zlambach Basin (Fig. 7). A transitional species from *Praegubkinella* to *Reinholdella* occurs 2 and 2.3 m above the *Spelae* beds (Fig. 8). Different new species of *Praegubkinella* were found 2.9 and 3.9 m above *P. spelae* n. ssp. Well preserved and high variable *Reinholdella* n. sp. (Fig. 10, 12) occur together with new species of *Praegubkinella* (Fig. 11) in the beds with *Psiloceras* cf. *pacificum*. *Reinholdella* n. sp. and the Middle Jurassic *Reinholdella media* mainly can be distinguished by less advanced structures of the inner apertures (Fig. 13).

Lecture given at Meeting of the late IGCP 467 and STS, September 2008, Bad Goeisern (Austria).

Extended abstract: HILLEBRANDT, A.V. & URLICH, M. (2008): Foraminifera and Ostracoda from the Northern Calcareous Alps and the end-Triassic biotic crisis.-Berichte der Geologischen Bundesanstalt, 76: 30-38; (Vienna). <http://www.geologie.ac.at/>

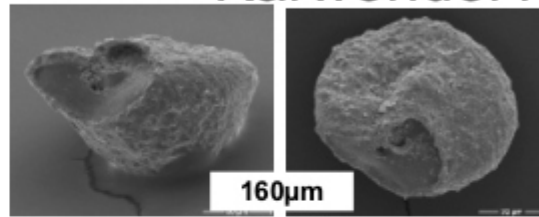
HILLEBRANDT, A. & KRISTYN, L. (submitted): *Psiloceras spelae tirolicum* n. ssp. the oldest Jurassic European ammonite from the Northern Calcareous Alps (Austria) and its global significance.-N. Jb. Geol. Paläont. Abh., Stuttgart.

Evolution of Robertinina at the Triassic - Jurassic boundary area in the Karwendel region (NCA)

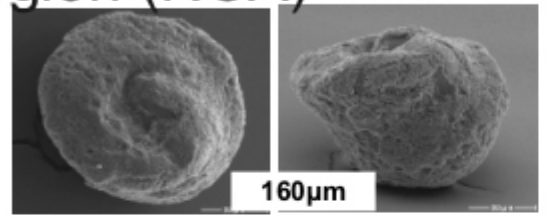
Early Hettangian

P. tilmanni Zone

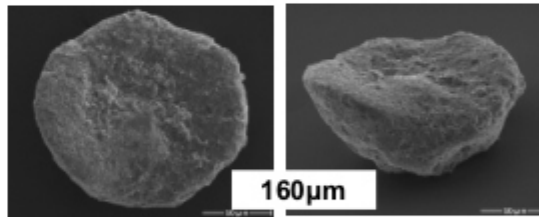
Spelae horizon Tilmanni horizon Pacificum hor.



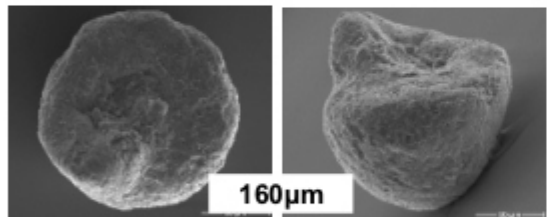
Reinholdella



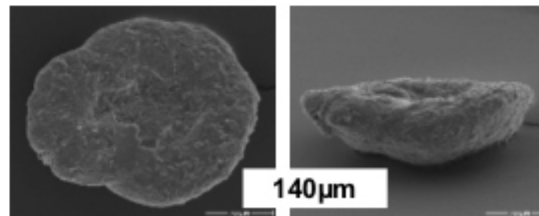
Reinholdella



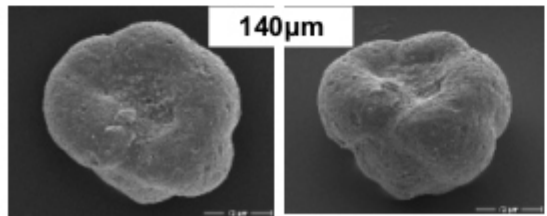
Transitional form to *Reinholdella*



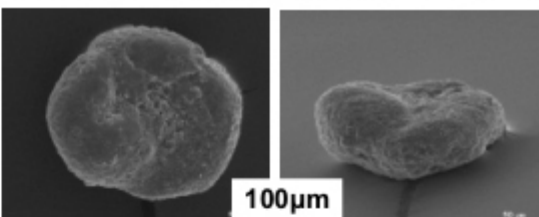
Transitional form to *Reinholdella*



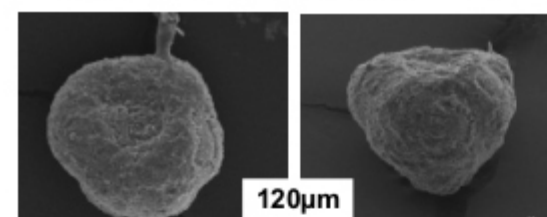
Oberhauserella cf. *subcircularis*



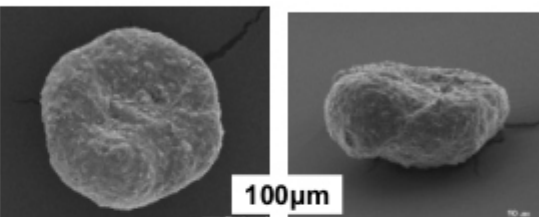
Praegubkinella *turgescens*



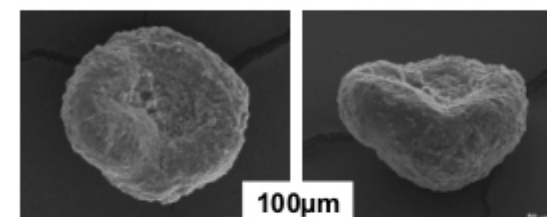
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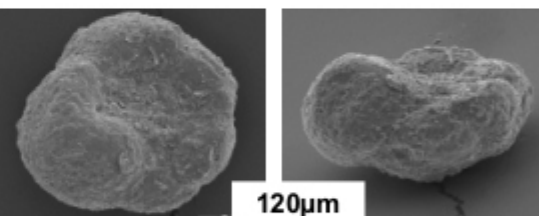
Praegubkinella cf. *turgescens*



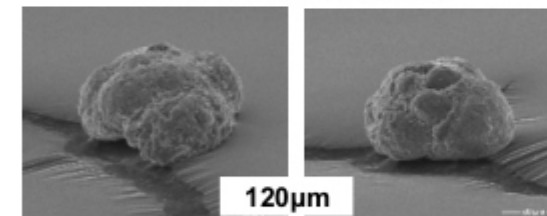
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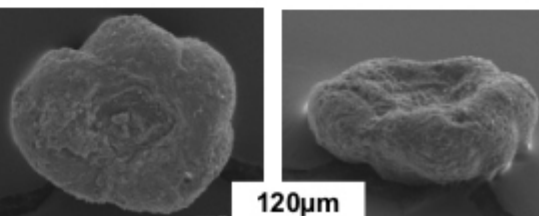
Oberhauserella *alta*



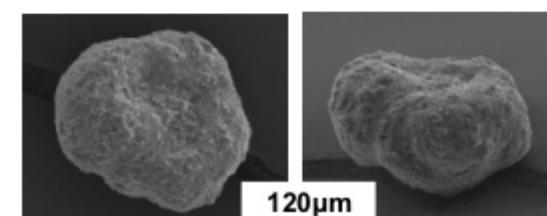
Oberhauserella cf. *quadrilobata*



Oberhauserella *alta*



Oberhauserella cf. *quadrilobata*



Oberhauserella *alta*

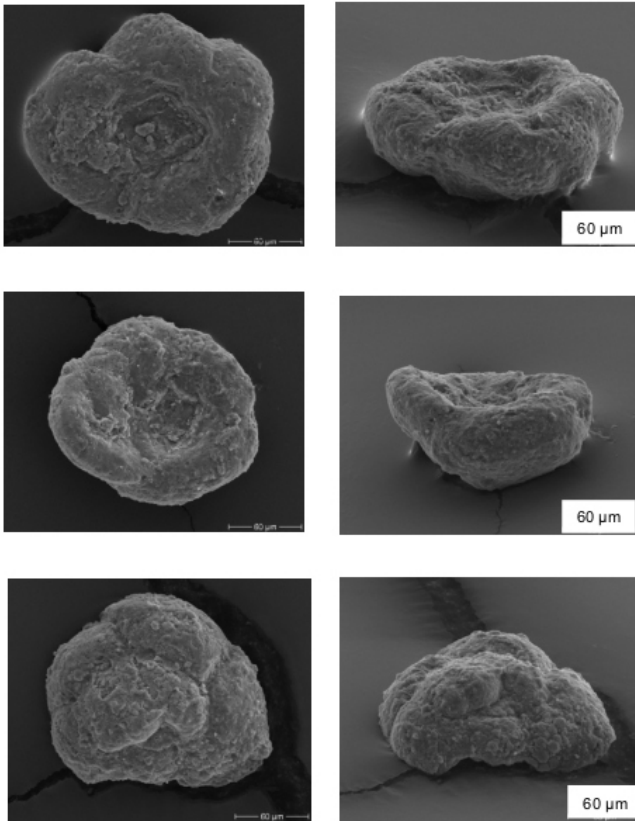
Latest Rhaetian

(without ammonites)

Fig. 1

Oberhauserellidae, basal Tiefengraben Mb. s. str.
latest Rhaetian (Kuhjoch)

Oberhauserella rhaetica



Oberhauserella alta

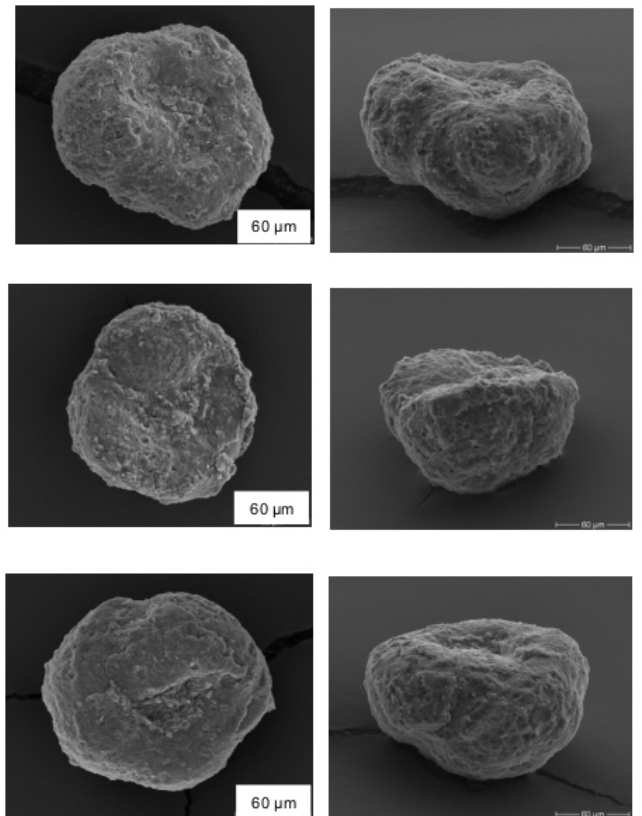
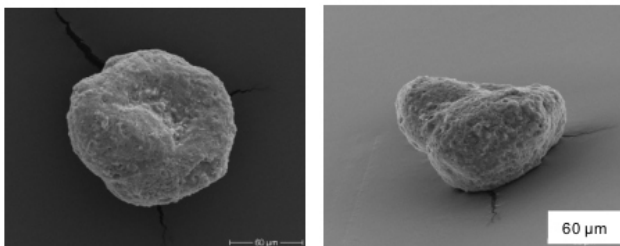


Fig. 2

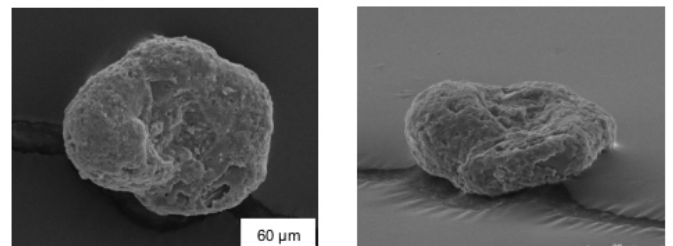
Duostominacea, lower Tiefengraben Mb. s. str.
latest Rhaetian (Kuhjoch)

1

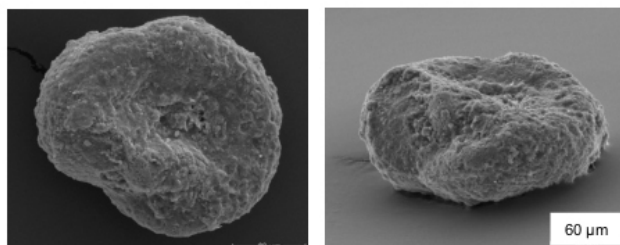


Oberhauserella alta

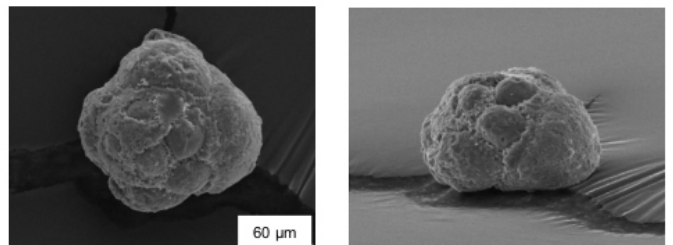
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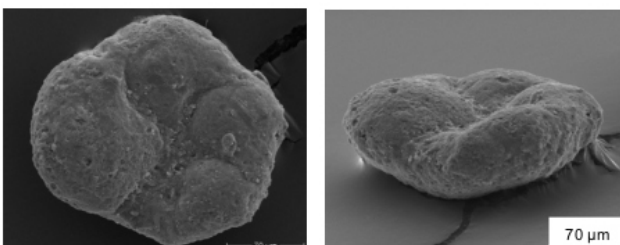
Oberhauserella rhaetica



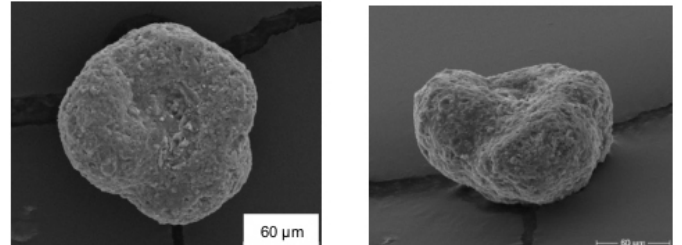
Oberhauserella rhaetica



Oberhauserella alta



Diplotremina subangulata



Oberhauserella alta

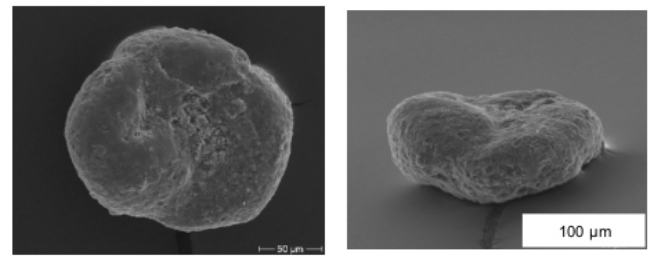
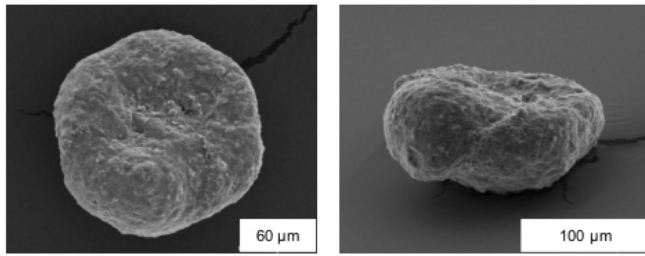
Fig. 3

Oberhauserellidae, lower Tiefengraben Mb. s.str.
latest Rhaetian (Kujoch)

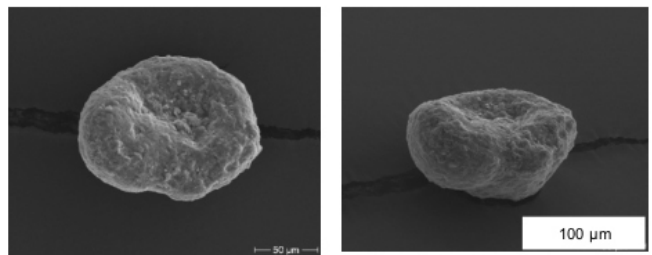
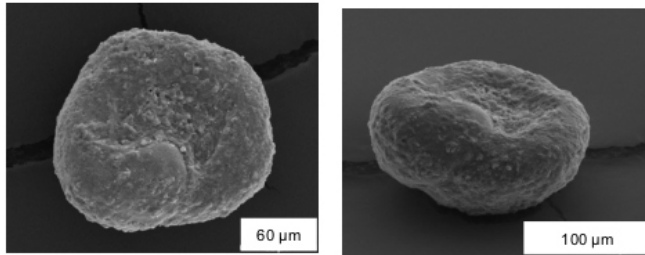
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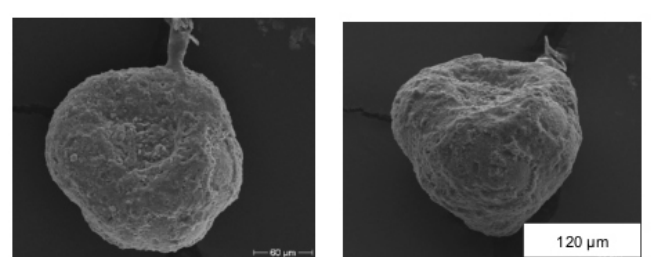
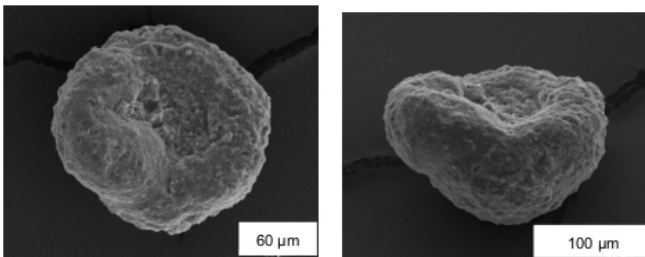
Oberhauserella cf. *subcircularis*



Oberhauserella cf. *subcircularis*



Oberhauserella *alta*



Praegubkinella cf. *turgescens*

Fig. 4

Oberhauserellidae, lower Tiefengraben Mb. s.str. (Kuhjoch)

latest Rhaetian

basal Hettangian (*spelae* horizon)

Oberhauserella cf. *subcircularis*

Praegubkinella *turgescens*

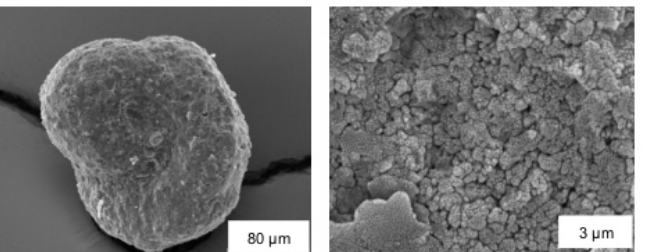
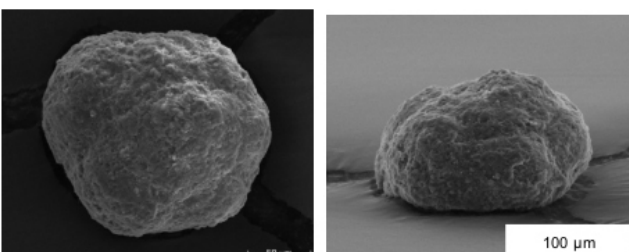
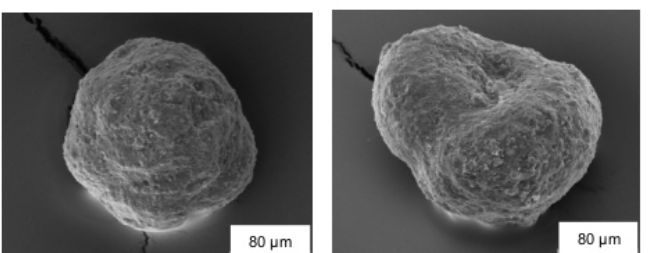
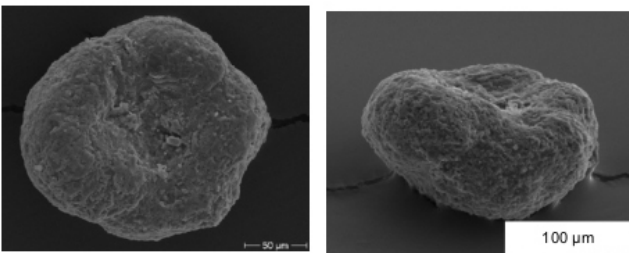
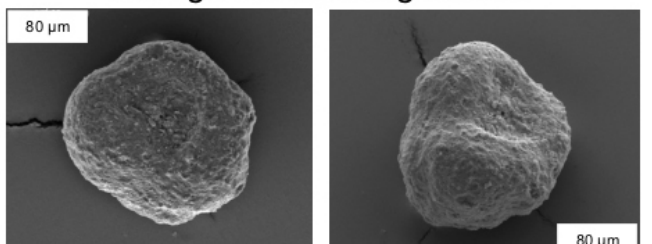
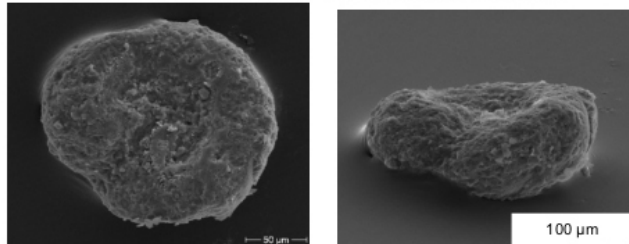
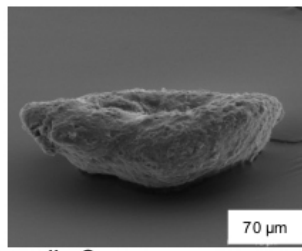
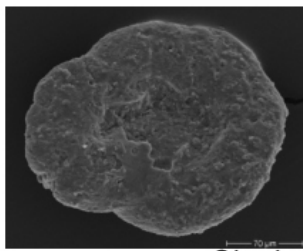


Fig. 5

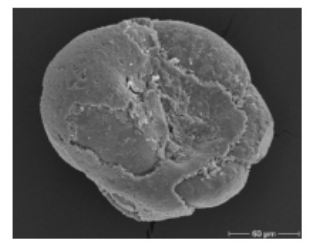
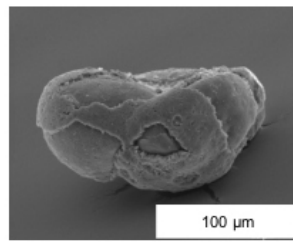
Oberhauserellidae, lower Tiefengraben Mb. s. str.
basal Hettangian, *Psiloceras spelae* horizon

Kuhjoch

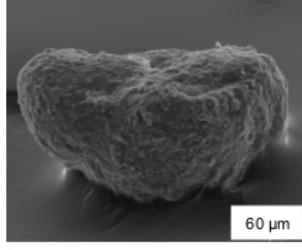
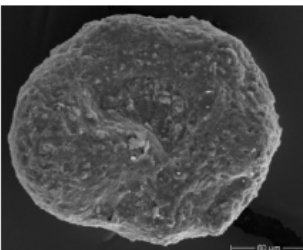
Hochalplgraben



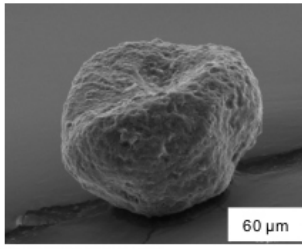
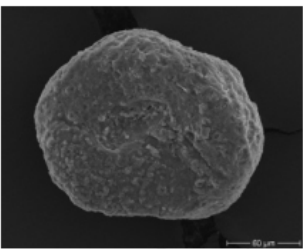
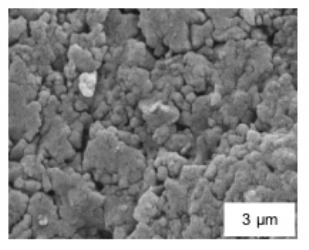
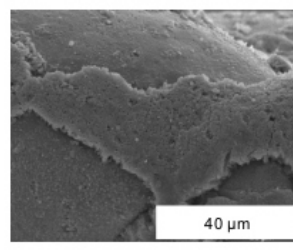
Oberhauserella ?



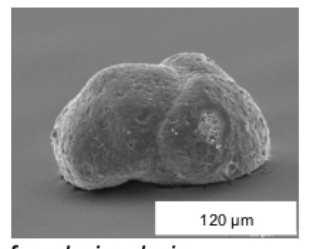
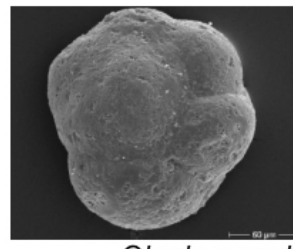
Oberhauserella cf. *subcircularis*



Oberhauserella cf. *subcircularis*



Praegubkinella turgescens



Oberhauserella cf. *subcircularis*

Fig. 6

Oberhauserellidae, correlation Eiberg and Zlambach Basin

Hochalplgraben *spelae* horizon

Gr. Zlambach *spelae* horizon

Praegubkinella turgescens

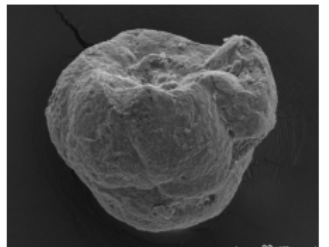
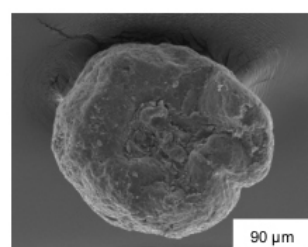
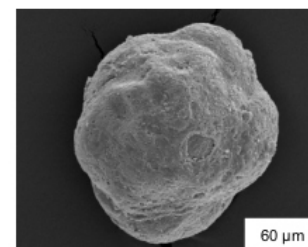
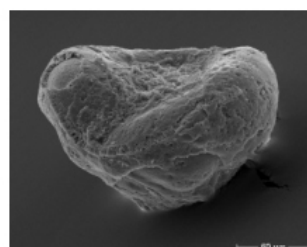
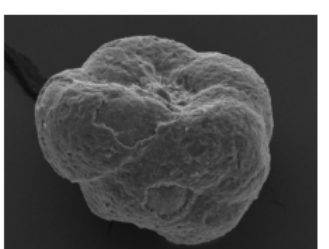
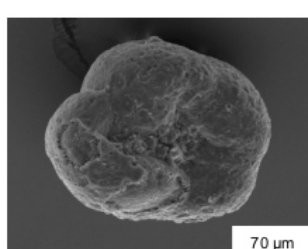
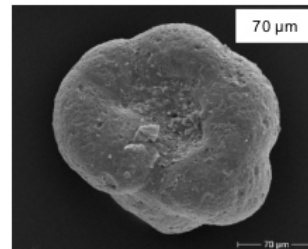
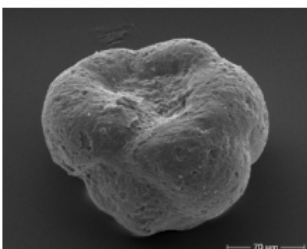
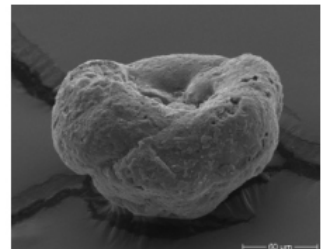
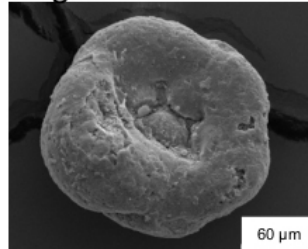
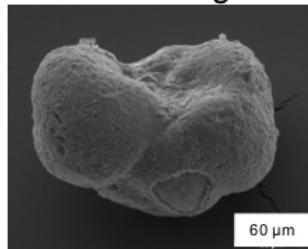
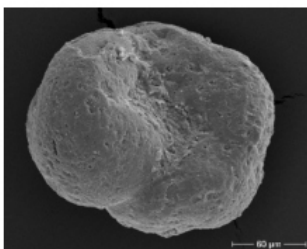


Fig. 7

Robertinina, lower Tiefengraben Mb. Hochalplgraben
Lower Hettangian, horizon with *P. ex gr. Psiloceras tilmanni*

Transitional specimens from *Praegubkinella* to *Reinholdella*

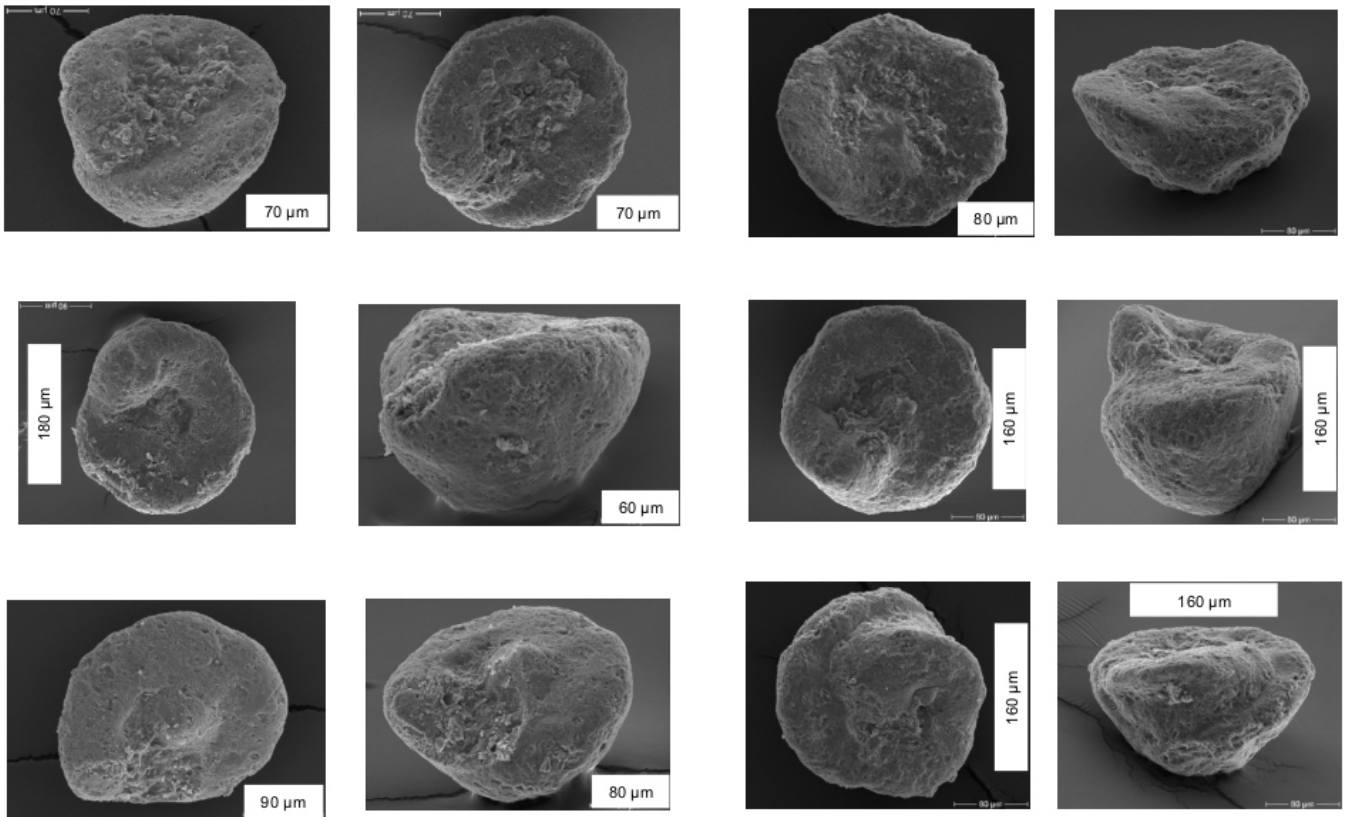


Fig. 8

Robertinina, middle part of Tiefengraben Mb., Hochalplgraben
Lower Hettangian, horizon with *P. ex gr. tilmanni*

Praegubkinella div. sp.

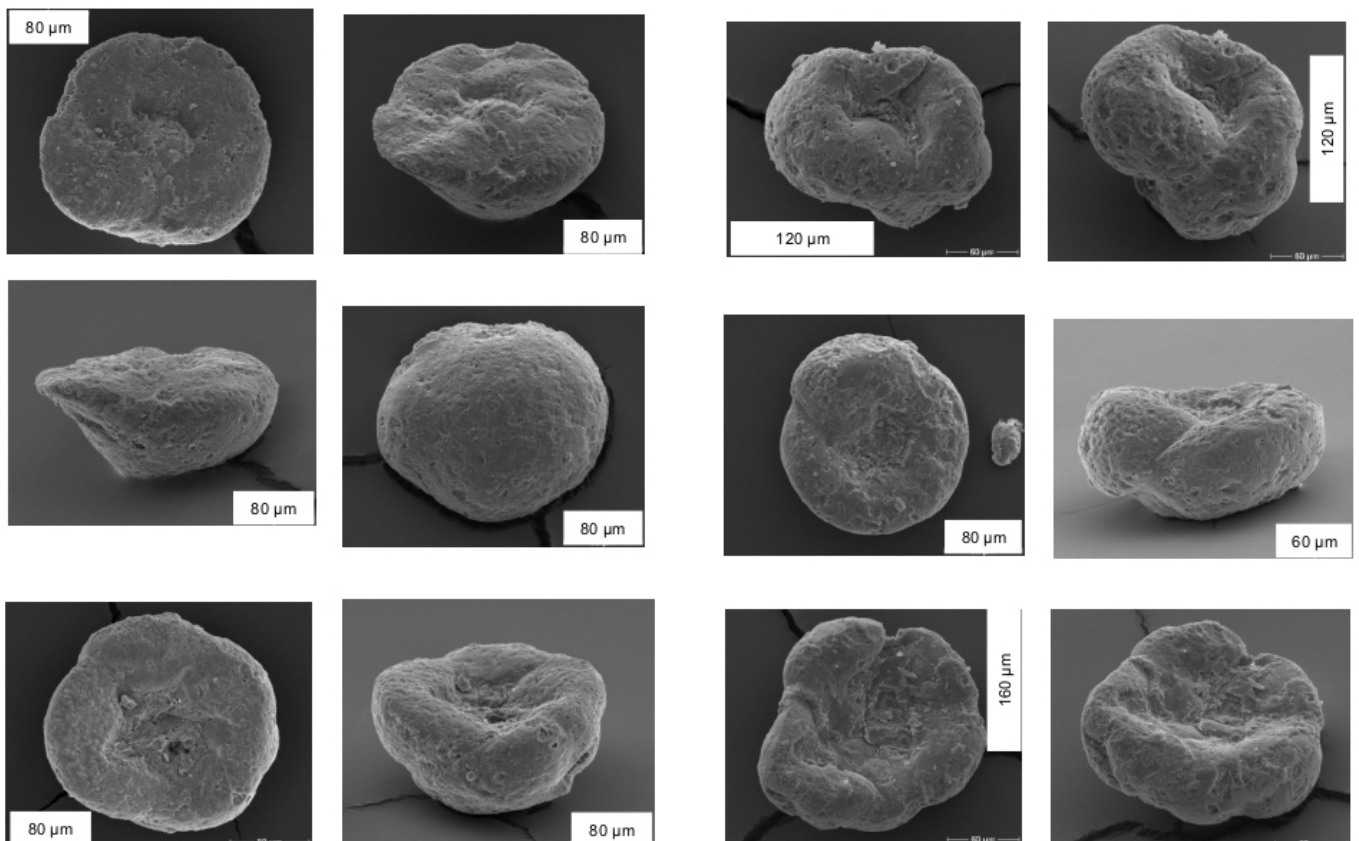


Fig. 9

Reinholdellinae, middle part of Tiefengraben Mb., Hochalplgraben
Lower Hettangian, horizon with *Psiloceras* cf. *pacificum*

Reinholdella n. sp.

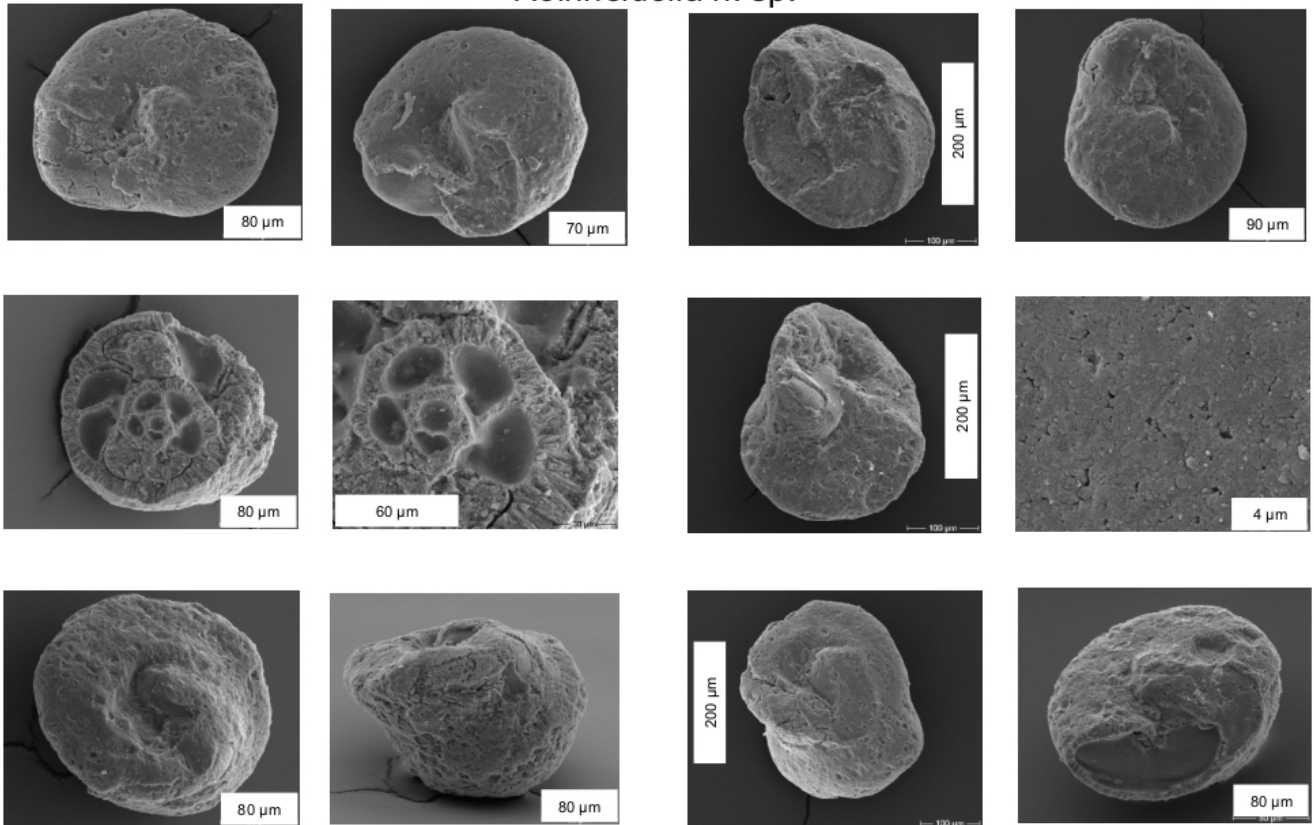


Fig. 10

Oberhauserellidae, middle part of Tiefengraben Mb., Kuhjoch
Lower Hettangian, horizon with *Psiloceras* cf. *pacificum*

Praegubkinella div. sp.

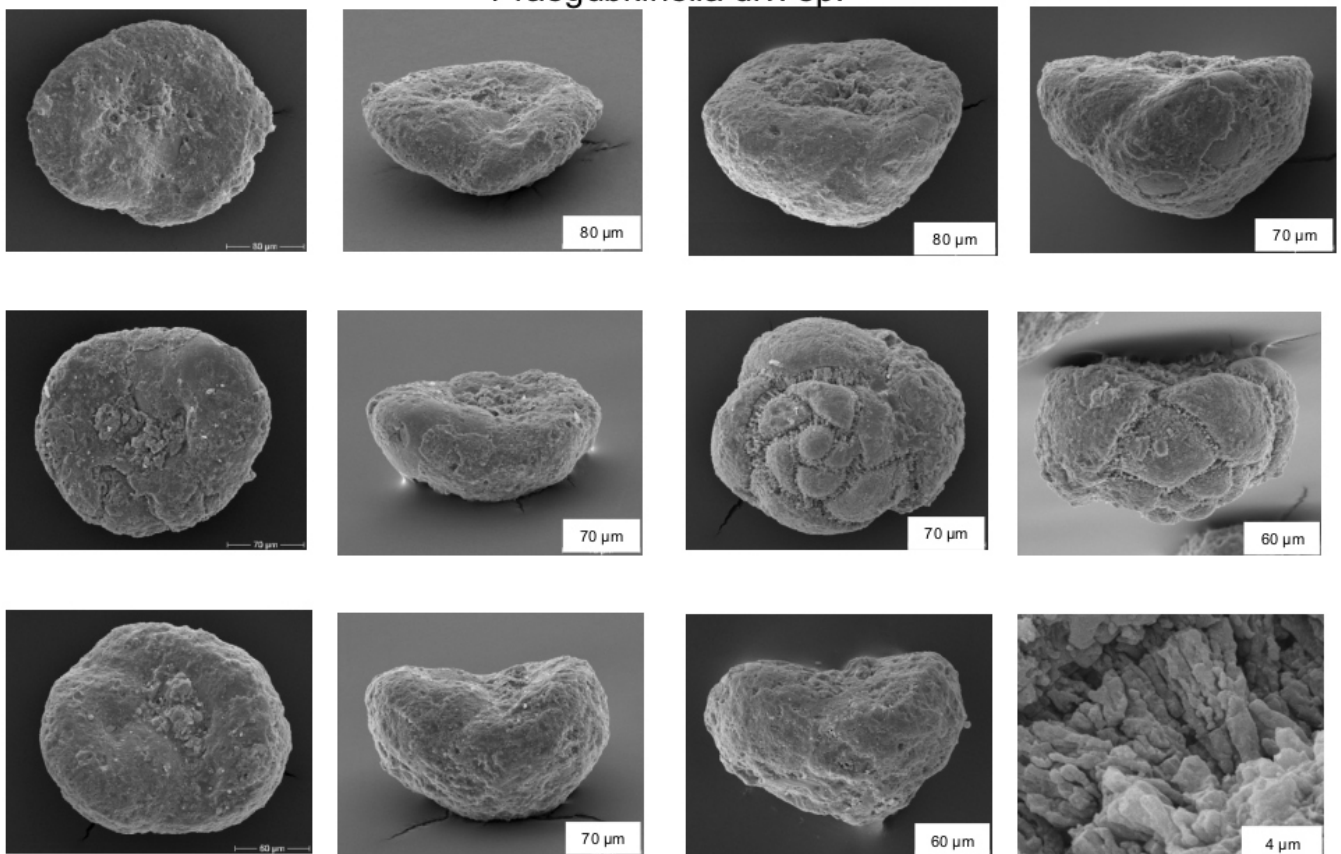


Fig. 11

Reinholdellinae, middle part of Tiefengraben Mb., Kuhjoch
Lower Hettangian, horizon with *Psiloceras* cf. *pacificum*

Reinholdella n. sp.

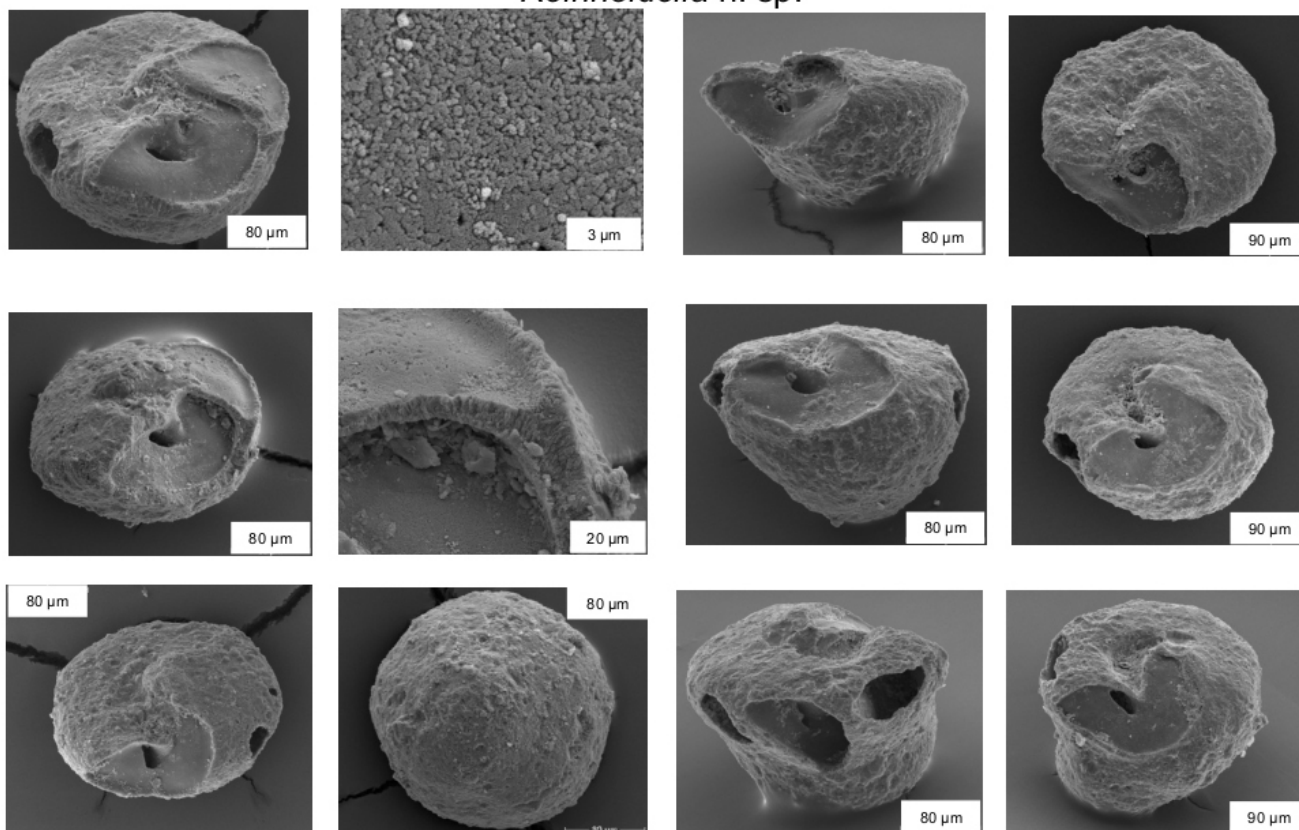
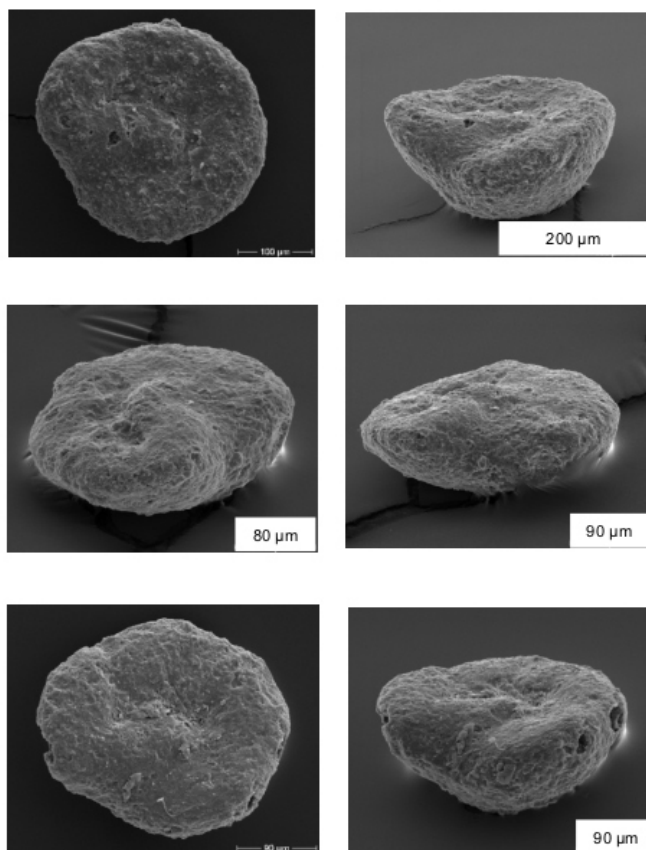


Fig. 12

Middle Tiefengraben Mb., Kuhjoch
L. Hettangian, *P.* cf. *pacificum* hor.

Clay pit, Gnaszyn, Poland
Middle Bathonian

Reinholdella n. sp.



Reinholdella media

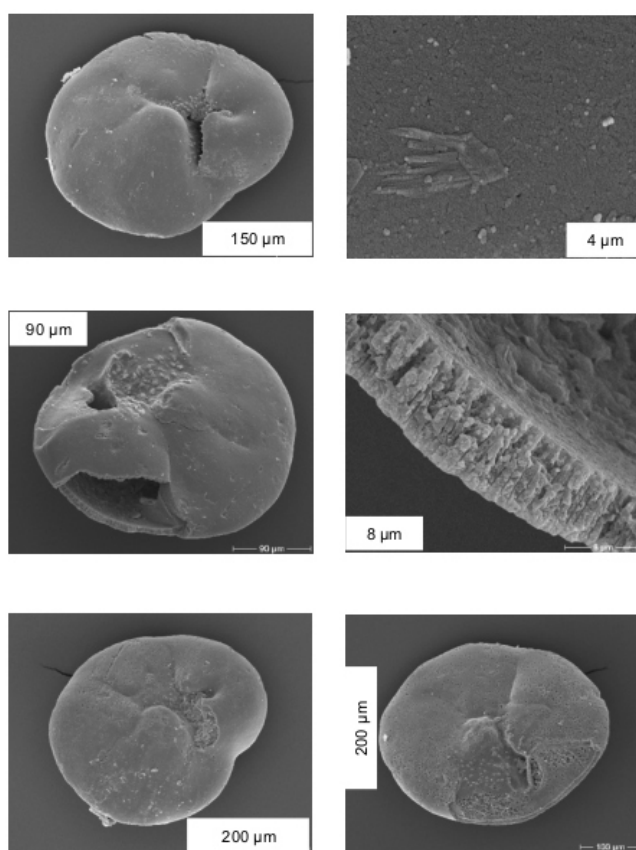


Fig. 13