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The ammonite *Forresteria* (*Harleites*) from the Santonian Gosau Group of the Randograben (Rußbach am Pass Gschütt, Salzburg), Austria

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1 Text-Figure, 1 Table, 2 Plates

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Late Cretaceous
Northern Calcareous Alps
Gosau Group
Austria

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Abstract

Lower Santonian representatives of the ammonite genus *Forresteria* have been collected for the first time from the Streiteck Formation (Gosau Group) of the Randobach section near Rußbach am Pass Gschütt in the Austrian Alps. *Forresteria* (*Harleites*) *seidli* nov. sp. is described herein; its co-occurrence with *Texanites quinquenodosus* (Redtenbacher, 1873), *Eulophoceras natalense* Hyatt, 1903, *Texasia cricki* (Spath, 1921), and *Cladoceramus undulatoplicatus* (Roemer, 1852) indicates an Early Santonian age.

Der Ammonit *Forresteria* (*Harleites*) aus dem Santonium der Gosau Gruppe des Randograbens (Rußbach am Pass Gschütt, Salzburg), Österreich

Zusammenfassung

Erstmals wurden Vertreter der Gattung *Forresteria* (*Harleites*) aus dem unteren Santonium der Streiteck-Formation der Gosau Gruppe des Randobach-Profils gesammelt: *Forresteria* (*Harleites*) *seidli* nov. sp. wird hier beschrieben. Die Begleitfauna von *Texanites quinquenodosus* (Redtenbacher, 1873), *Eulophoceras natalense* Hyatt, 1903, *Texasia cricki* (Spath, 1921) und *Cladoceramus undulatoplicatus* (Roemer, 1852) belegt frühsantones Alter.

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Introduction and Geological Setting

Representatives of the Late Cretaceous ammonite genus *Forresteria* are generally considered to be of late Turonian to Coniacian age (e.g. KENNEDY et al., 1983; KENNEDY, 1984; KENNEDY & COBBAN, 1991; IFRIM et al., 2019). *Forresteria* (*Harleites*) *petrocoriensis* (COQUAND, 1859) is widespread in the French Coniacian (KENNEDY, 1984: 49) and used as zonal marker for the Early Coniacian in ammonite zonations of Europe (KENNEDY & COBBAN, 1991: 9), including probably the uppermost Turonian (KENNEDY & WALASZCZYK, 2004; IFRIM et al., 2019). *Forresteria peruana* (BRÜGGEN, 1910) and *Forresteria* (*Forresteria*) *brancoi* (SOLGER, 1904) are common in the Coniacian of South and Central America. *F.* (*F.*) *alluaudi* (BOULE, LEMOINE & THÉVENIN, 1907) is known from the Coniacian of Europe, South Africa (Zululand; Coniacian II of KENNEDY & KLINGER, 1975), Madagascar, Japan, the United States Western Interior, Peru, and Mexico (IFRIM et al., 2019).

In the Austrian Alps, *Forresteria* has been poorly known. *Forresteria* (*Forresteria*) *alluaudi* (BOULE, LEMOINE & THÉVENIN, 1907) was described from the Bad Ischl road tunnel section (SUMMESBERGER et al., 2022), where it co-occurs with the Late Coniacian *Paratexanites serratomarginatus* (REDTENBACHER, 1873). In the present study, *Forresteria* (*Harleites*) *seidli* nov. sp. is described for the first time from the Randobach section (Rußbach am Pass Gschütt, Salzburg, Austria) of the Gosau Group of the Northern Calcareous Alps, where it was collected from the Streiteck Formation (WAGREICH, 1988). In contrast to the nearby assemblage of the Bad Ischl tunnel section, *Forresteria* (*Harleites*) *seidli* nov. sp. does not co-occur with *Paratexanites serratomarginatus*, but with an Early Santonian fauna of *Texanites quinquenodosus* (REDTENBACHER, 1873), *Eulophoceras natalense* HYATT, 1903, *Texasia cricki* (SPATH, 1921), and *Cladoceramus undulatoplicatus* (ROEMER, 1852).

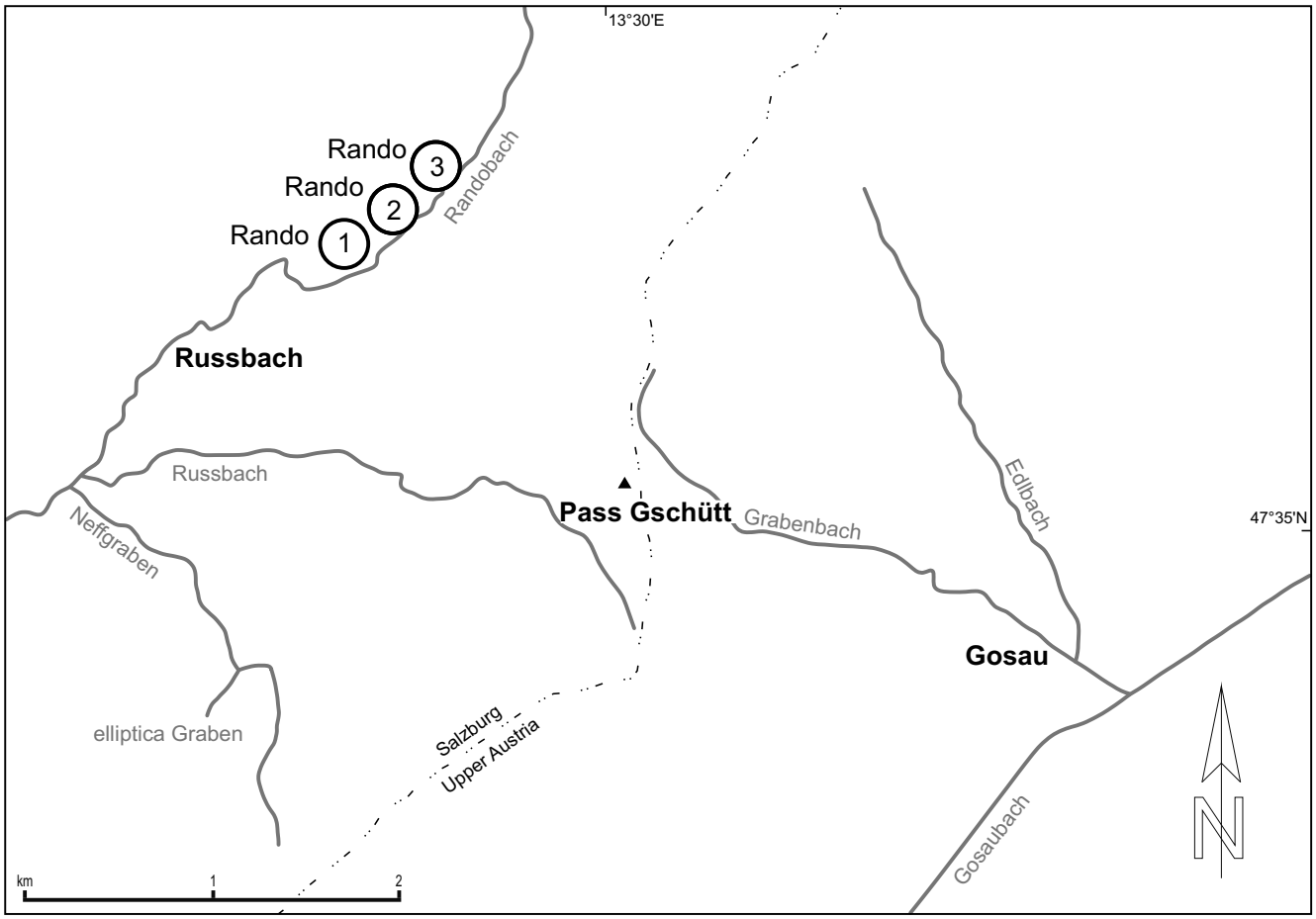
Repositories of Specimens

CE Seidl collection, Salzburg.

SCH W. and N. Schwaighofer collection, Rußbach am Pass Gschütt, Salzburg.

LEI Leiblfinger collection, Golling, Salzburg.

SK Skoumal collection, Vienna.



Text-Fig. 1.
Sketch map of the Randobach, with modifications after SUMMESBERGER et al. (2017: Text-Fig. 2).

Systematic Palaeontology

Subclass Ammonoidea Zittel, 1884
Order Ammonitida Hyatt, 1889
Superfamily Acanthoceratoidea de Grossouvre, 1894
Family Collignoniceratidae Wright & Wright, 1951
Subfamily Barroisiceratinae Basse, 1947
Genus *Forresteria* Reeside, 1932
Subgenus *Harleites* Reeside, 1932

The high variability and widespread, yet isolated, occurrences of the genus *Forresteria* Reeside, 1932 led to the introduction of a number of taxa now regarded as synonyms, which are discussed at length by Kennedy et al. (1983: 253). The type species is *Barroisiceras* (*Forresteria*) *forresteri* Reeside, 1932: 17, Pl. 5, Figs. 2–7, by the subsequent designation of Wright (1957: 432), which is a synonym of *Acanthoceras* (*Prionotropis*) *alluaudi* Boule, Lemoine & Thévenin, 1907: 12, Pl. 1, Figs. 6, 7 (Kennedy et al., 1983: 275). The type species of *Harleites* is *Barroisiceras haberfellneri* var. *harléi* de Grossouvre, 1894: 56, Pl. 2, Figs. 7, 8, by the subsequent designation of Kennedy et al. (1983: 259), which is a synonym of *Ammonites petrocoriensis* Coquand, 1859: 995. *Solgerites* Reeside, 1932 is a synonym of *Forresteria* Reeside, 1932 (Kennedy, 1985).

Forresteria (*Harleites*) *seidli* nov. sp.

(Pl. 1, Figs. 1–4; Pl. 2, Figs. 1–4)

Etymology: The species is named after Heinz Seidl (Salzburg), who collected the first specimen at the Randobach site (Text-Fig. 1) in 2016.

Material: Five specimens from the locality Rando 3 (Text-Fig. 1): CE.00027; LEI/GO/2019/0017; SCH/RA/2019/01, 02; SK/RA/2020/168 (Tab. 1).

Holotype: Designated herein is CE.00027 (Pl. 1, Figs. 3, 4) from the Seidl collection (Salzburg).

Description: All individuals are internal moulds with shell preserved in all specimens, often retaining the nacreous layer. They are laterally crushed to a certain degree, but measurements are still useful. Coiling is evolute. All specimens comprise both phragmocone and body chamber. Small sections of the suture are visible but impossible to describe. The whorl height increases rapidly. The umbilicus is wide, the umbilical wall vertical to slightly inclined outwards, towards the umbilical shoulder. The flanks are feebly inflated with the greatest thickness in median position. The sculpture is very coarse with 9 to 11 very strongly pinched tubercles at the umbilical shoulder that give rise to very strong ribs. Most ribs are ornamented by an additional tubercle at the internal (CE.00027) or external (SCH/RA/2019/01) third of the flank and they link to very strong clavi at the ventrolateral shoulder. Most ribs arise in pairs from the umbilical tubercles and there are some intercalatories. In adult specimens, a very feeble median ventral elevation is succeeded by a totally flat venter (Pls. 1, 2).

Inventory	D (mm)	Wh (mm)	Wb (mm)	U (mm)	U (%)
CE.00027	123.3	53.0	33.4	31.6	25.6 %
LEI/GO/2019/0017	98.6	35.7	15.0	30.0	30.4 %
SCH/RA/2019/01	104.4	40.8	22.4	31.9	28.7 %
SCH/RA/2019/02	111.4	45.3	- -	35.7	32.0 %
SK/RA/2020/168	67.6	25.9	13.8	18.0	26.6 %

Tab. 1.
Measurements of the Randograben specimens of *Forresteria* (*Harleites*) *seidli* nov. sp.
D = diameter; Wh = whorl height; Wb = whorl breadth; U = umbilical diameter; U % = ratio umbilical diameter to specimen diameter.

Discussion

Forresteria (*Harleites*) *seidli* nov. sp. is established as a new species on the basis of its wide umbilicus and it is so far the sole occurrence of the genus in the Santonian. Coniacian *Forresteria* (*Harleites*) *petrocoriensis* (Coquand, 1859) (Kennedy, 1984: 49, Pl. 4, Figs. 1, 2; Pl. 6, Figs. 1–9; Pl. 7, Figs. 1–20; Pl. 9, Figs. 1–4; Pl. 21, Figs. 2, 4; Text-Figs. 13d–f, h, 16, 18a, b, g) differs by its deep and narrow umbilicus. The Upper Coniacian *Forresteria* (*Forresteria*) *alluaudi* (Boule, Lemoine & Thévenin, 1907) (Kennedy et al., 1983: 276, Text-Figs. 5–9, 10a, b, e–f, 11–14, 15a, b, 16–31, 33, 34, 35c–e, 40d–e) differs also by its narrower umbilicus and by its great variability (Kennedy & Cobban, 1991: Pl. 5, Figs. 1–11; Summesberger et al., 2022) from very coarsely ribbed and tuberculated to flattened and feebly ornamented. *Forresteria* (*Forresteria*) *peruana* (Brüggen, 1910: 720, Pl. 27, Fig. 1) differs from *Forresteria* (*Harleites*) *seidli* nov. sp. by its tendency towards a smooth flank, by preservation of a row of mediolateral tubercles and weak ribs, and involute coiling (Kennedy & Cobban, 1991: 26, Pl. 2, Figs. 1, 15–17; Pl. 5, Figs. 1–11; Text-Figs. 4c, 6, 7). *Forresteria* (*Forresteria*) *brancoi* (Solger, 1904: 174, Pl. 5, Figs. 1, 2, 4, 5; Text-Figs. 63–66, 68) differs by its reduction of ribbing and loss of umbilical tuberculation leading to smooth flanks but retains a few but very coarse ventrolateral tubercles (Kennedy & Cobban, 1991: 30, Text-Figs. 8–11).

Stratigraphy

Forresteria (*Harleites*) *seidli* nov. sp. is present in the basal Santonian of the Streiteck Formation (Summesberger et al., 2017) of the Randograben (Rußbach, Salzburg), co-occurring with *Texanites quinquenodosus* (Redtenbacher, 1873), *Eulophoceras natalense* Hyatt, 1903, *Texasia cricki* (Spath, 1921), and *Cladoceramus undulatoplicatus* (Roemer, 1852), which confirm the Early Santonian age of the species. No biostratigraphically distinct calcareous nannofossils were found in samples from the site. *Muniericeras gosauicum* (Hauer, 1858) is absent in the Streiteck Formation (Rando 3; Summesberger et al., 2017: Text-Fig. 3) but it is very common in the sites Rando 1 and Rando 2 (Text-Fig. 1). *Forresteria* (*Harleites*) *seidli* nov. sp. appears to be so far the youngest reported representative of the genus.

Conclusion

A new species, *Forresteria* (*Harleites*) *seidli* nov. sp. is described from the Cretaceous of the Austrian Gosau Group. The most surprising observation is its appearance in the Santonian in contrast to the widespread occurrence of the genus in the upper Turonian to Coniacian.

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Plates

Plate 1

Figs. 1, 2: *Forresteria* (*Harleites*) *seidli* nov. sp.; SCH/RA/2019/02.

Figs. 3, 4: *Forresteria* (*Harleites*) *seidli* nov. sp.; CE.00027, the holotype.

All figures are natural size, coated with ammonium chloride, and from Randobach (Rando 3), Rußbach (Salzburg), Lower Santonian.

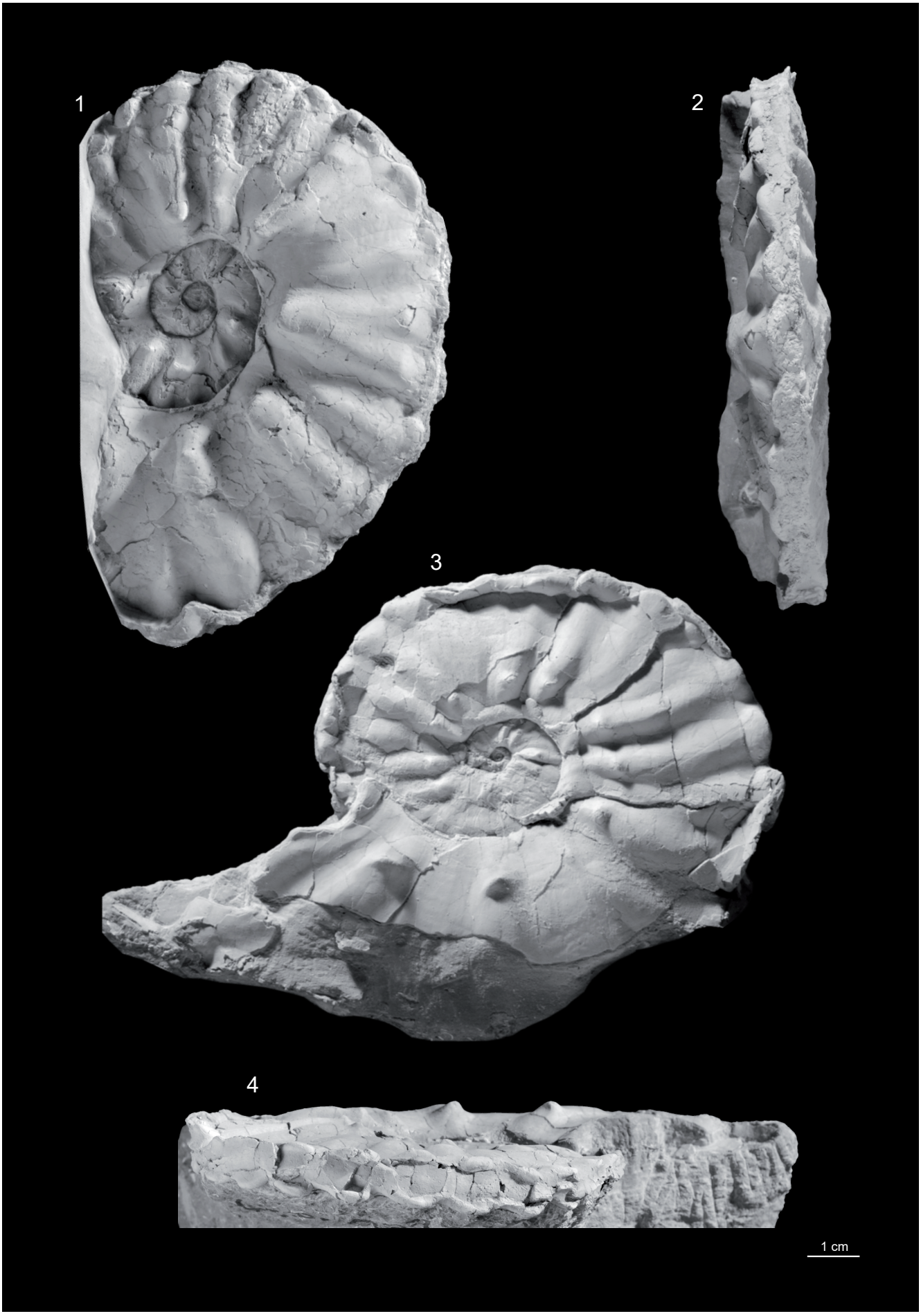
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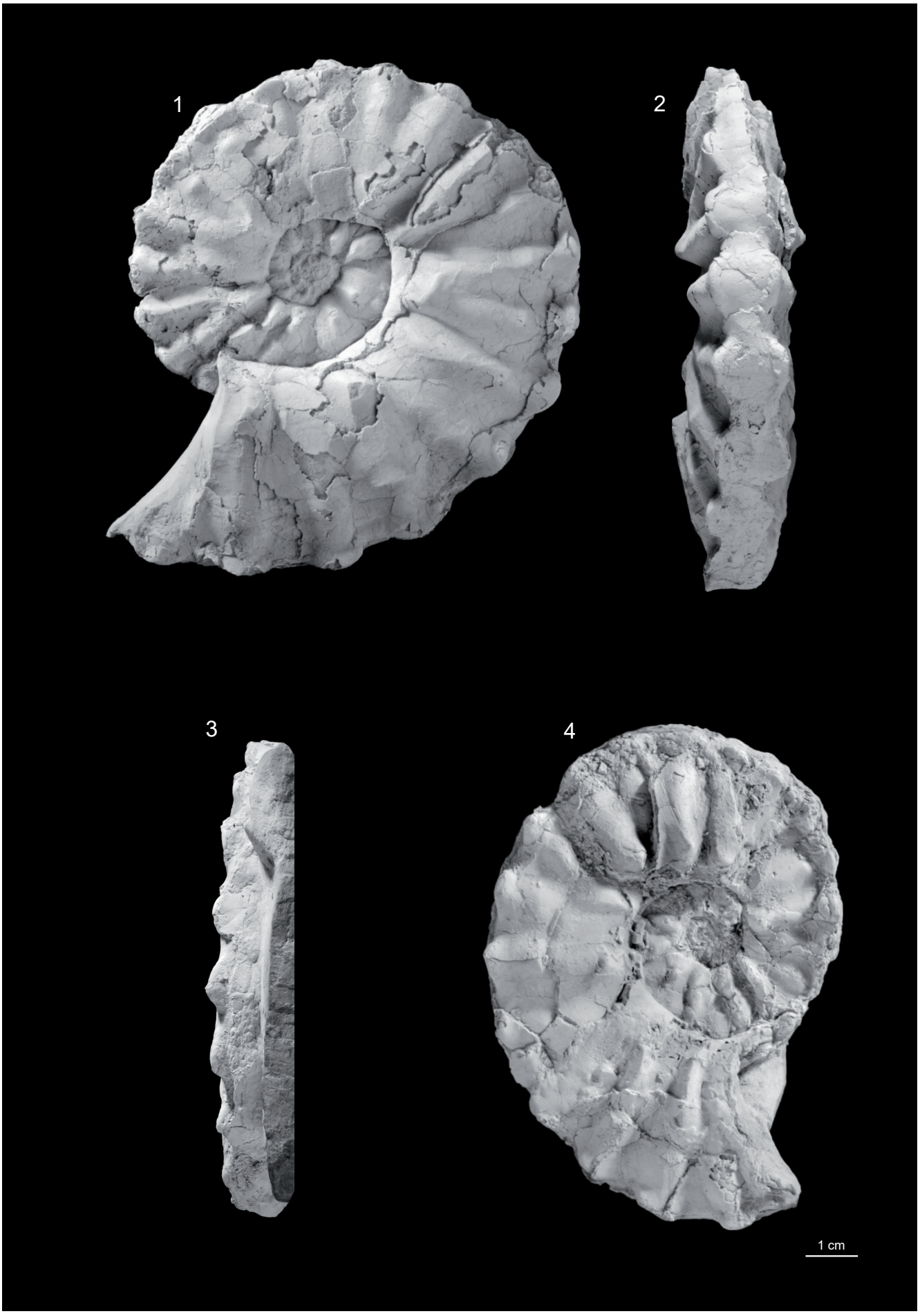
Plate 2

Figs. 1, 2: *Forresteria* (*Harleites*) *seidli* nov. sp.; SCH/RA/2019/01.

Figs. 3, 4: *Forresteria* (*Harleites*) *seidli* nov. sp.; LEI/GO/2019/0017.

All figures are natural size, coated with ammonium chloride, and from Randobach, Rußbach (Salzburg), Lower Santonian.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