

Nummulitins from flysch in surroundings of Ilirska Bistrica, southwest Slovenia

Numulitine iz fliša v okolici Ilirske Bistrice

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Ključne besede: numulitine, eocen, fliš, Slovenija

Abstract

Described are nummulitins from four localities in surroundings of Ilirska Bistrica. They were found in flysch rocks of Lower Cuisian and Upper Cuisian age, and of Cuisian/Lutetian transition.

Kratka vsebina

Opisane so numulitine iz štirih nahajališč v okolici Ilirske Bistrice. Najdene so bile v flišu spodnjecuisijske in zgornjecuisijske starosti ter iz prehoda cuisij – lutecij.

Introduction

There were no detailed paleontologic investigations of nummulitins in the surroundings of Ilirska Bistrica till now with the exception of those near Podgrad (Khan et al., 1975), where new forms *Operculina marinellii similis* Khan & Pavlovec (at present *Assilina marinellii similis*), *Nummulites brkiniensis* Khan & Pavlovec and *N. postbearnensis* Khan & Pavlovec were determined. In addition occur in that locality *Nummulites aquitanicus* Benoist, *N. ustjensis* De Zanche & Pavlovec, *N. rotularius* Deshayes, *N. aff. partschi tauricus* De la Harpe and *N. subdistans* De la Harpe. In the northern part of the Brkini flysch basin are present at Leskovec near Gornje Ležeče the Middle Cuisian nummulitins *Assilina marinellii similis* (Khan & Pavlovec), *Ass.*

laxispira De la Harpe, *Nummulites brkiniensis* Khan & Pavlovec and *N. rotularius* Deshayes (Pavlovec et al., 1991). In Ilerdian limestones occur along with alveolinas (Drobne, 1977) *Assilina canalifera* D'Archiac, *Ass. exiliformis* (Pavlovec), *Nummulites globulus* Leymerie and *N. robustiformis* Schaub (Knez, 1989).

Geology of this area is best described in guidebook and geologic map of the sheet Ilirska Bistrica (Šikić et al., 1972, 1975). In guidebook the mentioned nummulitin species from various stratigraphic horizons are listed, and therefore also the determinations are not very reliable. A short description of geology of surroundings of Ilirska Bistrica was provided by Pavlovec and Pleničar (1980, 2000). East and northeastward from Ilirska Bistrica extend Cretaceous and Paleogene limestones, and on the other side, in

Brkini, the flysch beds. Microfossils from a profile between Podgrad and Šembije were examined by

Khan (1976, 1977, 1983). He determined the beginning of flysch deposition with basal marlstone at Ilirska Bistrica in Ilerdian, and in surroundings of Podgrad on southern side of Brkini in Cuisian only.

From the environs of Kuteževo and Trpčane (fig. 1) several specimens of nummulitins were sent by Franc Poklar from Podgrađe near Ilirska Bistrica. Along with him

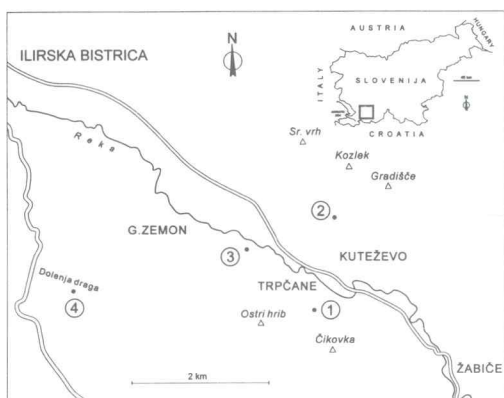


Fig. 1. Sketch of the nummulitin localities in the surroundings of Ilirska Bistrica.

Sl. 1. Skica nahajališč numulitin v okolici Ilirske Bistrice.

fossils were collected also by Peter Valenčič from Trpčane, Marko Šajn and by pupils of the Kuteževo elementary school. The localities were visited also by Dr. Vasja Mikuš who furnished several fossils. A sample from Dolenjska Draga north of Dolenje was brought by Silvano Belušič from Ilirska Bistrica. In this way several nummulitins from east of Ilirska Bistrica could have been first determined. Also in this place kindest thanks are extended to the mentioned persons for their valuable assistance in collecting the nummulitins. Unfortunately, the late S. Belušič did not live to see this publication.

The small villages of Trpčane and Kuteževo are situated in the Reka valley 7 to 8 km southeast of Ilirska Bistrica, or about 5 km northwest of Jelšane. In the valley itself occur in part swampy Holocene alluvial deposits of river Reka and its affluents. Immediately above the flood plain flysch beds are exposed. Above Kuteževo and Trpčane in



Fig. 2. The nummulitin locality near Trpčane.

Sl. 2. Nahajališče numulitin pri Trpčanah.

slopes of Goli vrh (859 m), Kozlek (997 m) and Gradišče (874 m) Cretaceous, and above Žabiče also Jurassic beds crop out. They are thrust over the flysch beds. In hills west of Trpčane (fig. 2, 3) occurs grey to dark grey marlstone, in places with thicker sandstone intercalations. In certain parts occur abundant pebbles. Marlstone is little resistant to erosion, therefore the weathering crust is thick and erosion intense with smaller slumps in the slopes. Stronger erosion phenomena marked in the detailed maps extend south of Trpčane in the Ivanšek ravine between Golobinjek (534 m), Svibni hrib (572 m) and Čikovka (504 m).

Also in slopes west and northwest of Kuteževo (fig. 4) outcrops abundantly the partly slaty grey to brown marlstone and in places also sandstone. In its lower parts occur many pebbles up to 10 cm of size. Among them prevail limestones with moderate sandstone and chert. Especially on slopes on the marlstone surface erosion and small slumps are

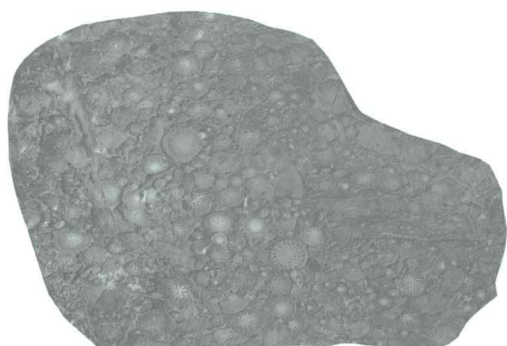


Fig. 3. Sandstone with *Assilina plana* Schaub, *Ass. karreri* (Penecke), *Nummulites burdigalensis pergranulatus* Schaub, *N. pavloveci* Schaub and *N. pustulosus* Douvillé near Trpčane, Lower Cuisian.

Sl. 3. Peščenjak z *Assilina plana* Schaub, *Ass. karreri* (Penecke), *Nummulites burdigalensis pergranulatus* Schaub, *N. pavloveci* Schaub in *N. pustulosus* Douvillé pri Trpčanah, spodnji cuisij.



Fig. 4. The nummulitin locality near Kuteževo.
Sl. 4. Nahajališče numulitin pri Kuteževem.



Fig. 5. Flysch beds near Kuteževo are quite intensely folded and faulted.

Sl. 5. Flišne plasti okrog Kuteževga so precej nagubane in prelomljene.

developed. Nummulitins were collected west of Kuteževo. Beds are in places folded and faulted (fig. 5).

At Dolnji Zemon occur partly marlstone with occurrences of smaller slumps, and partly mudstone and somewhat thicker beds of sandstone.

The nummulitin locality is situated in the ravine Dolenjska draga a kilometer and a half southeast of Mala Bukovica, west of Golobinjek, north of Stražnica (577 m) and 2,5 km northwest of Jelšane. Nummulitins occur in an intercalation of hard calcarenite.

In the entire area of mentioned nummulitin localities occur several presumed or established faults, mostly of the Dinaric direction (Šikić et al., 1972), and north and south of the Reka valley also a number of folds, synclines and anticlines. The complex structure is a consequence of pressure and thrusting of the Mt. Snežnik massif. Owing to this geologic structure in individual parts the flysch beds of various ages are exposed.

Descriptions of nummulitins

Assilina plana Schaub, 1981

1981. *Assilina plana* nov. sp. – Schaub, 198–199, pl. 72, fig. 64–66, pl. 73, fig. 1–55, pl. 74, fig. 51–52

Locality: Trpčane

The microspheric generation is about 14 mm across. At the surface appear in the cen-

ter star-like ridges, then dense round granules. Toward the external edge on the surface the whorl rim and septa are visible. Toward the center the test is bulged, just at center somewhat depressed, and it thins toward the external edge. The megalospheric generation measures around 5 mm. On the surface appear in the center several round granules, and toward the outer edge the internal structure with five whorls is distinctly visible.

This Lower Cuisian species was found in Slovenia first.

Assilina karreri (Penecke, 1885)

Pl. 1, fig. 1

1961. *Operculina parva* H. Douvillé et G. O' Gorman – Nemkov & Barhatova, 113–116, pl. 9, fig. 7–12

1977. *Operculina karreri* Penecke, 1885 – Hottinger, 79–81, fig. 31H-P, pl. 36–37

1998. *Assilina karreri* (Penecke 1885) – Tosquella & Serra-Kiel, 123–124, pl. 25, fig. 13–15

Locality: Trpčane

The test diameter is 2.2 mm, with 2.5 whorls that heighten rapidly. In the center are dense round thorns that are close to spirally disposed. On the external two whorls the thorns are strewn on vestiges of septa. In the lower part septa are almost level or only slightly concave. In the upper part they are strongly bent backward, and are sickle-shaped

In the Trpčane locality this species is very rare. It lived in Lower Eocene, according to Hottinger (1977) and Tosquella & Serra-Kiel (1998) in Lower Cuisian. It was found at Guttaring (Kotarče) in Carinthia, in Pyreneans, Betic Cordilleras and on Crimea. It was first found in Slovenia.

Assilina marinellii marinellii (Dainelli, 1915)

Pl. 1, fig. 2

1915. *Operculina Marinellii* n.sp. – Dainelli, 170–171, Pl. 18, fig. 27–28

1977. *Operculina marinellii* Dainelli, 1915 – Hottinger, 68–69, pl. 27–29

Locality: Kutežev, Dolenjska draga



Fig. 6. *Assilina maior maior* Heim, A form, equatorial section, Kutežev, Upper Cuisian.

Sl. 6. *Assilina maior maior* Heim, oblika A, ekvatorialni prerez, Kutežev, zgornji cuisij.

This foraminifer is very rare in Dolenjska draga. Whorls heighten rapidly, septa are slightly concave and strewn with thorns. On the surface, granules are the most abundant in central part of the test that is somewhat thickened along the whorl edge. This form is very similar to subspecies *Assilina marinellii similis* (Khan & Pavlovec) (Khan et al., 1975), but the difference with subspecies *Ass. marinellii marinellii* (Dainelli) is minimal. It is questionable whether the establishment of a new subspecies was justified, and whether the "subspecies" *similis* could be included into the variation range of the type. Also the possibility of closeness of the individual of Dolenjska draga to Lower Lutetian species *Assilina praespira* Douvillé cannot be excluded. These problems could be solved on the basis of more numerous and better preserved specimens.

Assilina marinellii marinellii is known from Middle Cuisian (Hottinger, 1977). Of same age is also *Assilina marinellii similis* (Khan et al., 1975). With respect to subspecies *Assilina maior maior* Heim the locality Dolenjska draga can be attributed to the Upper Cuisian. With this, the life span of group *Assilina marinellii* is extended to the Middle and Upper Cuisian.

Assilina maior maior Heim, 1908

Fig. 6, pl. 2, fig. 1, 2

1974. *Assilina major* Heim – Cimerman et al., 56–57, pl. 10–12, 13, fig. 11981. *Assilina maior* Heim, 1908 – Schaub, 200–202, pl. 75, fig. 1–26, pl. 76, fig. 1–37, pl. 77, fig. 1–30

Locality: Kuteževo, Dolenjska draga

The microspheric generation is about 20 mm, and the megalospheric around 8 mm across. On surface the frequent spiral ridges follow the whorl edge. Especially in central part the granules are dense, and toward the outer edge the internal structure becomes visible. Toward the central part tiny granules increasingly occur on the septal prolongements.

An individual from Dolenjska draga is of megalospheric generation that resembles in its equatorial section the transitory form *Assilina laxispira-maior* mentioned by Schaub (1981, 200) from Middle Cuisian near Buttrio in Friuli. However, the individuals of microspheric generation with test diameter above 20 mm seem too large for this form. Therefore also the foraminifers from Dolenjska draga are attributed to subspecies *Assilina maior maior*.

This subspecies is rather frequent, and was already found several times in Slovenia. It is especially abundant in two localities at Vipolže in Goriška brda in Slovenia (Cimerman et al., 1974; Pavlovec & Simčič, 1999), which are now largely destroyed due to newly developed vineyards. *Assilina maior maior* is an Upper Cuisian species that was found in Friuli at Rosazzo (Rožac), on island of Krk in Croatia and elsewhere (Schaub, 1981).

Assilina cuvillieri Schaub, 1981

Pl. 1, fig. 3, 4

1974. *Assilina* sp. (n.sp. Peyrac, Schaub) – Cimerman et al., 59–60, pl. 141981. *Assilina cuvillieri* nov. sp. – Schaub, 210–211, pl. 88, fig. 22–26, pl. 89, fig. 1–49, pl. 90, fig. 1–171998. *Assilina cuvillieri* Schaub 1981 – Tosquella & Serra-Kiel, 112–113, pl. 22, fig. 1–3

Locality: Kuteževo

The test of microspheric generation is thin, in the center somewhat concave. On the surface occur numerous round granules that are densest in the central part. Toward the external edge granules are disposed on septal prolongements and above the whorl edge. The test of megalospheric generation is more thickened in the center and has strong thorns. Toward the external edge thorns are fewer.

The species is Upper Cuisian. It was found among others also on the Krk island in Croatia and in Goriška brda in Slovenia (Cimerman et al., 1974).

Assilina suteri Schaub, 1981

Pl. 1, fig. 5

1974. *Assilina medianica* n.sp. – Cimerman et al., pl. 15, fig. 3–61981. *Assilina suteri* nov. sp. – Schaub, 216–217, pl. 95, fig. 34–53, pl. 96, fig. 1–9

Locality: Dolnji Zemon

Flat tests are in center somewhat thickened, some are a little concave. On the surface occur in the center either strong star-like ridges, or radial ridges and thorns that follow the internal structure across the entire test. Size of test is less than 10 mm and its thickness 2 to 2.3 mm. This species is rare at Dolnji Zemon.

Assilina suteri was found in the youngest Cuisian in Goriška brda in Slovenia and on the Krk island in Croatia. In other localities it is known from the base of Lutetian or from somewhat higher horizons of Lower Lutetian. The beds at Dolnji Zemon can be attributed to the youngest Cuisian, resp. to Cuisian-Lutetian transition.

Assilina medianica Pavlovec, 1974

Pl. 1, fig. 6

1974. *Assilina medianica* n.sp. – Cimerman et al., 60–64, pl. 15, fig. 1–21981. *Assilina medianica* Pavlovec, 1974 – Schaub, 217–218, pl. 97, fig. 22–51

Locality: Kuteževo

This form is very rare at Kuteževo. The test diameter is 9.8 mm, and thickness

3.4 mm. At the center, the test is somewhat thickened and just in the center slightly concave. The surface is covered by dense granules. Toward the external edge the septa and whorl edge are visible, and granules are strewn also on these elements and between them. The external edge of test is sharp.

The external structure of the Kuteževo specimen resembles more the species *Assilina medanica* than the related *Assilina suteri*. It differs from typical *Assilina medanica* by greater test thickness for which Schaub (1981) reported 1.6 to 2.5 mm.

Assilina medanica is an Upper Cuisian species, but was found also in Lower Lutetian beds. Its first find was reported from Vipolže in Goriška brda, Slovenia.

Nummulites burdigalensis pergranulatus
Schaub, 1981

1951. *Nummulites burdigalensis pergranulatus* nov.sp. – Schaub, 122–124, fig. 82 a–c, pl. 3, sl. 2

1981. *Nummulites burdigalensis pergranulatus* Schaub, 1951 – Schaub, 101–102, pl. 4, fig. 1–7, pl. 6, fig. 1–6

Locality: Trpčane

The test of megalospheric generation is small, about 4 mm in diameter. In the center occur several strong thorns, and toward the periphery extend slightly curved septal lines. The whorls heighten only gradually. Septa are slightly curved, and chambers are

almost isometric. On the surface of the microspheric generation test occur in the center round, rather strong thorns. Near the external edge are relatively thin and almost straight septal lines.

This subspecies was mentioned by Schaub (1981) from Lower and Middle Cuisian. It was found near Buttrio in Friuli, Italy.

Nummulites sp.
Pl. 3, fig. 1, 2

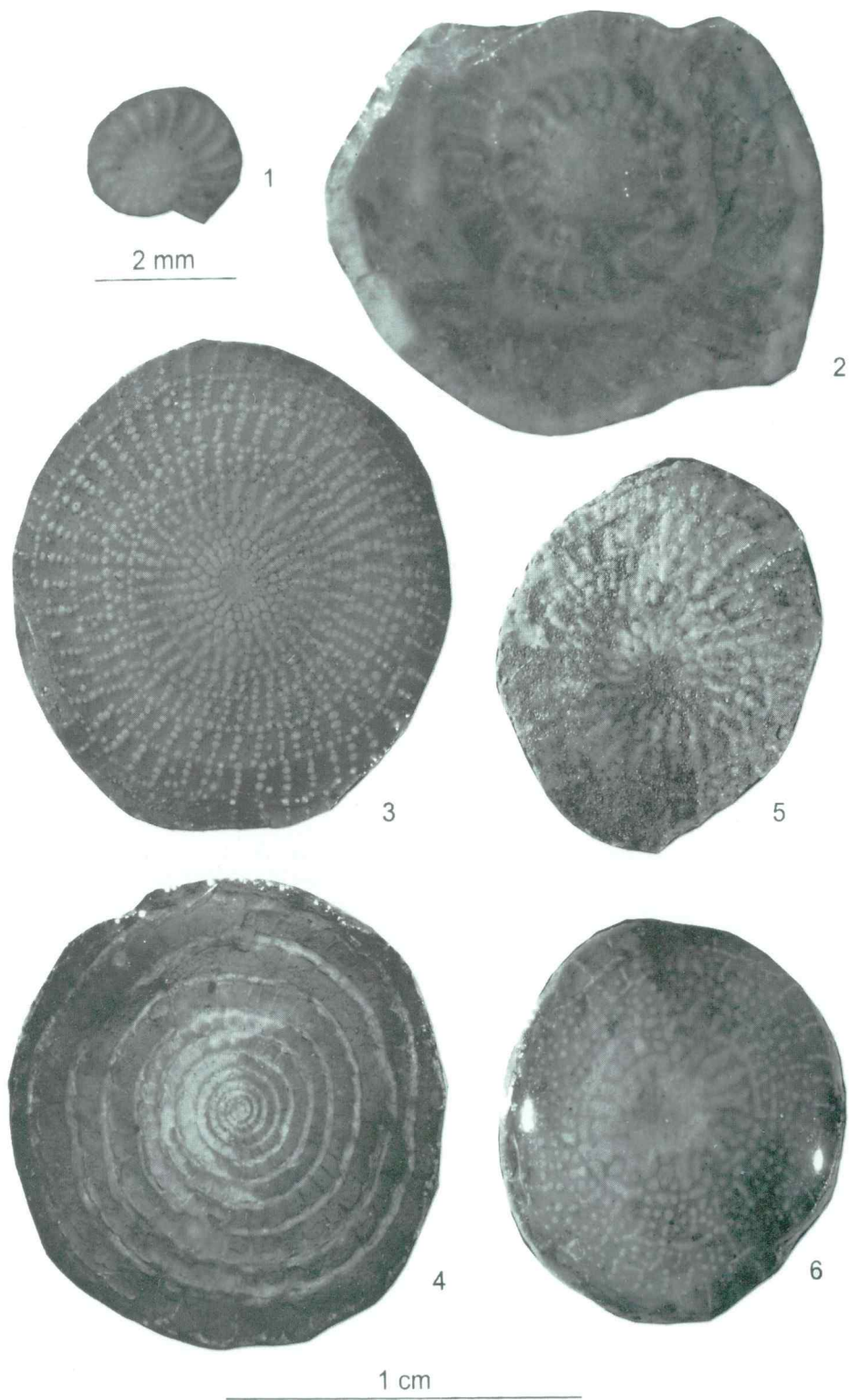
Locality: Trpčane

The microspheric generation measures up to 11 mm. The test is lenticular with a rather sharp and somewhat wavy external edge. On the surface appear dense round granules. The internal 5 to 6 whorls heighten slowly, and afterwards they increase more rapidly. The total number of whorls is about 15. Septa are inclined and slightly curved. Chambers are for the most part isometric, but in external whorls, however, the length of some chambers exceeds their height.

The nummulite is similar especially by its surface granularity to species *Nummulites friulanus* Schaub. The nummulite from Trpčane is, however, older. The subspecies *Nummulites burdigalensis pergranulatus* is smaller and displays on its surface less thicker granules than the specimens from Trpčane. We consider the latter an intermediate form between *Nummulites burdigalensis pergranulatus* and *N. friulanus*.

Tabla 1 – Plate 1

- | | |
|---|--|
| 1 | <i>Assilina karreri</i> (Penecke), Trpčane, Lower Cuisian, surface of the test – spodnji cuisij, površina hišice |
| 2 | <i>Assilina marinellii marinellii</i> (Dainelli), Dolenjska draga, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice |
| 3 | <i>Assilina cuvillieri</i> Schaub, Kuteževo, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice |
| 4 | <i>Assilina cuvillieri</i> Schaub, Kuteževo, Upper Cuisian, equatorial section – zgornji cuisij, ekvatorialni prerez |
| 5 | <i>Assilina suteri</i> Schaub, Dolnji Zemon, Upper Cuisian or Cuisian/Lutetian, surface of the test – zgornji cuisij ali cuisij/lutecij, površina hišice |
| 6 | <i>Assilina medanica</i> Pavlovec, Kuteževo, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice |



Nummulites friulanus Schaub, 1962
Pl. 3, fig. 3, 4

1962. *Nummulites friulanus* nov. sp. – Schaub, 538–541, pl. 3, fig. 1–13
1963. *Nummulites friulanus* Schaub – Pavlovec, 465–467, fig. 26–28
1974. *Nummulites friulanus* Schaub – Cimerman et al., 64–65, pl. 16

Locality: Kuteževo.

Thick lenticular tests measure 9.5 to 10.5 mm across and are 4.5 to 5.2 mm thick. The surface is strewn with numerous round granules. Inbetween slightly curved ridges are situated, well expressed in some individuals, and less expressed in others. On the 5 mm radius come 16 whorls that tend to lower, especially in the peripheral part. Chambers are lengthened toward the external edge, septa are inclined and slightly curved.

Nummulites friulanus is an Upper Cuisian species. In Slovenia it was found already, and is the most abundant in Goriška brda. It was named after Friuli where it was first detected at Rosazzo (Rožac).

Nummulites aff. *lehneri* sensu Schaub
1981
Pl. 3, fig. 5, 6

1981. *Nummulites* aff. *lehneri*, praecursor du type – Schaub, 97, pl. 11, fig. 13–27

Locality: Kuteževo, Dolenjska draga and Dolnji Zemon.

The test is thick, lenticular, about 10 mm in diameter and to 5.5 mm thick. The external edge is sharp. On surface occur curved

septal lines. Granules in the central part are the most abundant, and they are less numerous toward the external edge of test. Whorls heighten slowly and regularly, the last ones tend to lower. Septa are inclined and slightly curved. Chambers in internal whorls are higher than long, or they are isometric, and lengthen somewhat in the external whorls.

Schaub (1981) described this form as *Nummulites* aff. *lehneri* from the Upper Cuisian beds at Haymana in Turkey. The original *Nummulites lehneri* Schaub is larger and lived in Lower Lutetian. For the form *Nummulites* aff. *lehneri* the surroundings of Ilirska Bistrica is the second known locality. Provided better and more abundant material a new species should be most probably described. The fossil is by all means a different form than the Lower Lutetian *Nummulites* cf. *lehneri*, mentioned from France by Schaub (1981) and Serra-Kiel (1984).

Nummulites pavloveci Schaub, 1981
Pl. 4, fig. 1, 2

1981. *Nummulites pavloveci* nov. sp. – Schaub, 120–121, pl. 27, fig. 26–52

Locality: Trpčane

The test, about 10 mm in diameter, is lenticular and rather thick with a rounded external edge. On the surface are strongly curved septal lines. The whorls heighten quite regularly, although many of them are irregular. Chambers are chiefly isometric, and even of greater length than height. Septa are curved and especially in their upper part strongly drawn backwards.

This species is known from Lower Cuisian.

Tabla 2 – Plate 2

- 1, 2 *Assilina maior maior* Heim, Kuteževo, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice



1



2

1 cm

Nummulites praelorioli Herb &
Schaub, 1963
Pl. 4, fig. 3, 4

1963. *Nummulites praelorioli* nov. sp. –
Herb & Schaub, 979–984, pl. 1, fig.
1–4

1969. *Nummulites praeloriloi* Schaub –
Pavlovec, 163–164, pl. 2–3

Locality: Kuteževo.

Thin, in center gently thickened tests are at external edge somewhat wavy, and also the entire test is sometimes wavy. Size of tests is 13 to 15 mm, rarely even 17 to 19 mm, and thickness from 2.6 to 3.5 mm. On the surface occurs an abundance of irregularly arranged small thorns between which are radial, somewhat wavy ridges. On rare individuals pathologic marks can be seen that are probably a result of mechanical damages and later healing up of tests.

The species is known from Upper Cuisian, also in Friuli and on the Krk island, and from Lower Lutetian in Istria and elsewhere.

Nummulites pustulosus Douvillé, 1919

1981. *Nummulites pustulosus* Douvillé,
1919 – Schaub, 151, pl. 47, fig. 38–
43, pl. 48, fig. 12–16

Locality: Trpčane

A hardly 2 mm large nummulite has in the center a strong thorn. From it pass to-

ward the external edge almost straight and dense septal lines that are near the external edge slightly thickened. The most similarity with it is shown by the nummulite on plate 48, figure 12 b (Schaub, 1981).

Nummulites pustulosus is known from Lower and Middle Cuisian.

Age of beds

In the Trpčane locality *Assilina plana*, *Ass. karreri*, *Nummulites burdigalensis pergranulatus*, *N. sp.*, *N. pavloveci* and *N. pustulosus* were established. All these species indicate Lower Cuisian.

At Kuteževo were determined *Assilina marinellii marinellii*, *Ass. maior maior*, *Ass. cuvillieri*, *Ass. medianica*, *Nummulites friulanus*, *N. aff. lehneri* sensu Schaub 1981, *N. praelorioli*. These species suggest the Upper Cuisian age.

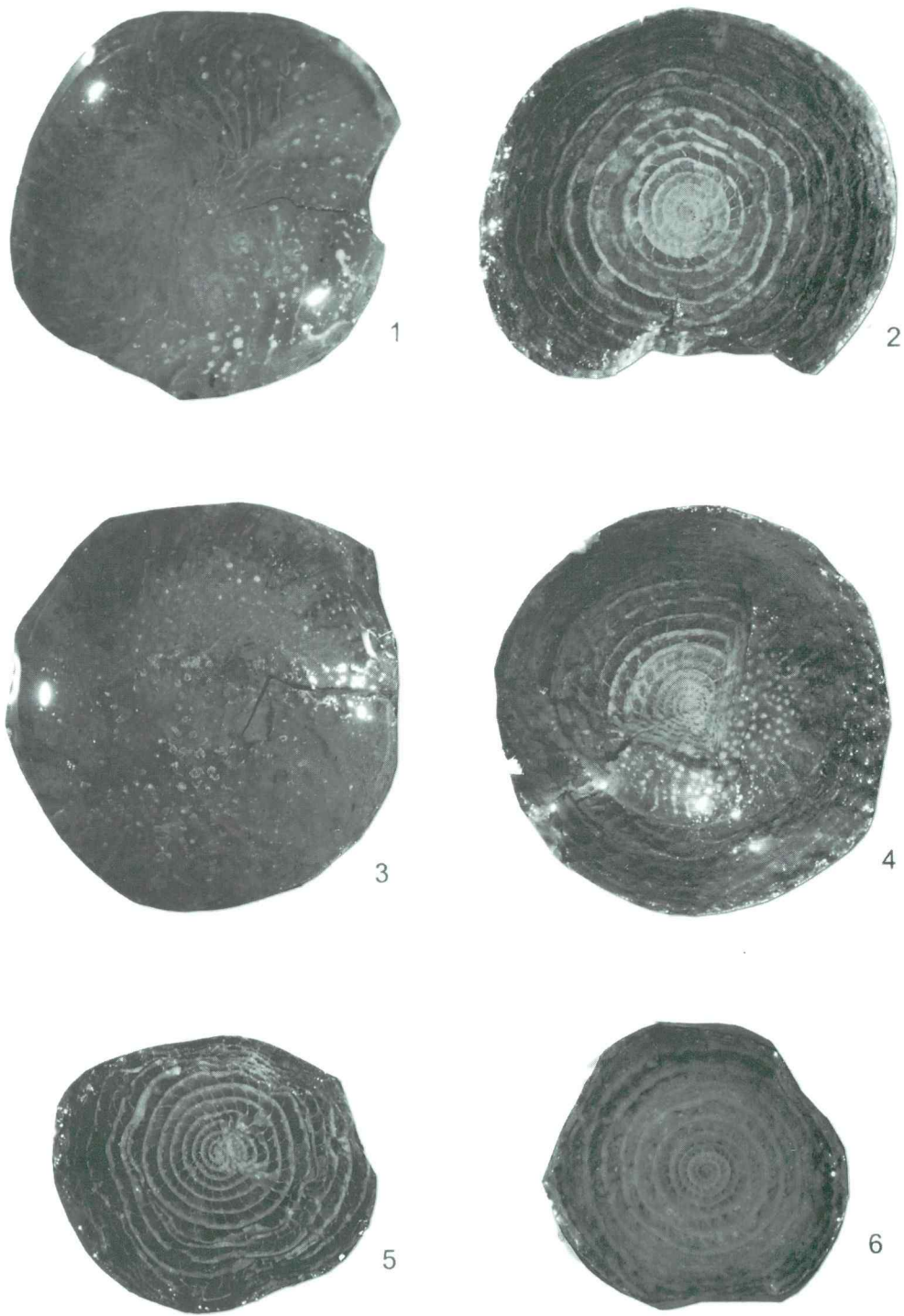
At Dolenjska draga occur *Assilina marinellii marinellii*, *Ass. maior maior* and *Nummulites aff. lehneri* sensu Schaub 1981. These species are Upper Cuisian.

At Dolnji Zemon *Assilina suteri* and *Nummulites aff. lehneri* sensu Schaub 1981 were found. On this basis the flysch beds there are attributed to youngest Cuisian, or to the Cuisian-Lutetian transition.

Such diversity of flysch beds ages in the surroundings of Ilirska Bistrica is not surprising. It is the rather complex geology, especially near the overthrust of the Snežnik massif, that resulted into various ages of the near-by localities of Dolenjska draga, Trpčane and Kuteževo. Khan (1976) pro-

Tabla 3 – Plate 3

- 1 *Nummulites* sp., Trpčane, Lower Cuisian, surface of the test – spodnji cuisij, površina hišice
- 2 *Nummulites* sp., Trpčane, Lower Cuisian, equatorial section – spodnji cuisij, ekvatorialni prerez
- 3 *Nummulites friulanus* Schaub, Kuteževo, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice
- 4 *Nummulites friulanus* Schaub, Kuteževo, Upper Cuisian, equatorial section – zgornji cuisij, ekvatorialni prerez
- 5, 6 *Nummulites* aff. *lehneri* sensu Schaub 1981, Dolnji Zemon, Upper Cuisian or Cuisian/Lutetian, equatorial section – zgornji cuisij ali cuisij/lutecij, ekvatorialni prerez



1 cm

Nummulitins from the surroundings of Kuteževo near Ilirska Bistrica:

Locality	Age	Nummulitins
Dolnji Zemon	Upper Cuisian or Cuisian/Lutetian transition	<i>Assilina suteri</i> <i>Nummulites</i> aff. <i>lehneri</i> sensu Schaub 1981
Kuteževo and Dolenjska draga	Upper Cuisian	<i>Assilina marinellii marinellii</i> <i>Assilina maior maior</i> <i>Assilina cuvillieri</i> <i>Assilina medanica</i> <i>Nummulites friulanus</i> <i>Nummulites</i> aff. <i>lehneri</i> sensu Schaub 1981 <i>Nummulites praelorioli</i>
Trpčane	Lower Cuisian	<i>Assilina plana</i> <i>Assilina karreri</i> <i>Nummulites</i> sp. <i>Nummulites burdigalensis pergranulatus</i> <i>Nummulites pavloveci</i> <i>Nummulites pustulosus</i>

ved northwest of Ilirska Bistrica with microforaminifers even the Ilerdian age of flysch beds. In other parts, in the Brkini syncline, flysch is also of Middle Cuisian age (Khan et al., 1975; Pavlovec et al., 1991). At Trpčane now also the Lower Cuisian age of flysch beds of the Brkini basin was proved with nummulitins.

Povzetek

Numulitine iz fliša v okolici Ilirske Bistrice (SW Slovenija)

Opisane so numulitine iz flišnih plasti SE od Ilirske Bistrice (sl. 1). Najdene so bile v nahajališčih Kuteževo, Trpčane, Dolnji Zemon in Dolenjska draga (sl. 2–5). Pri Trpčanah je ugotovljen spodnji cuisij, pri Kuteževem in v Dolenjski dragi zgornji cuisij, v Dolnjem Zemonu najmlajši cuisij ali prehod cuisij – lutecij. Khan (1976) je v okolici Ilirske Bistrice dokazal tudi ilerdijski fliš. Takšna različna starost flišnih sedimentov

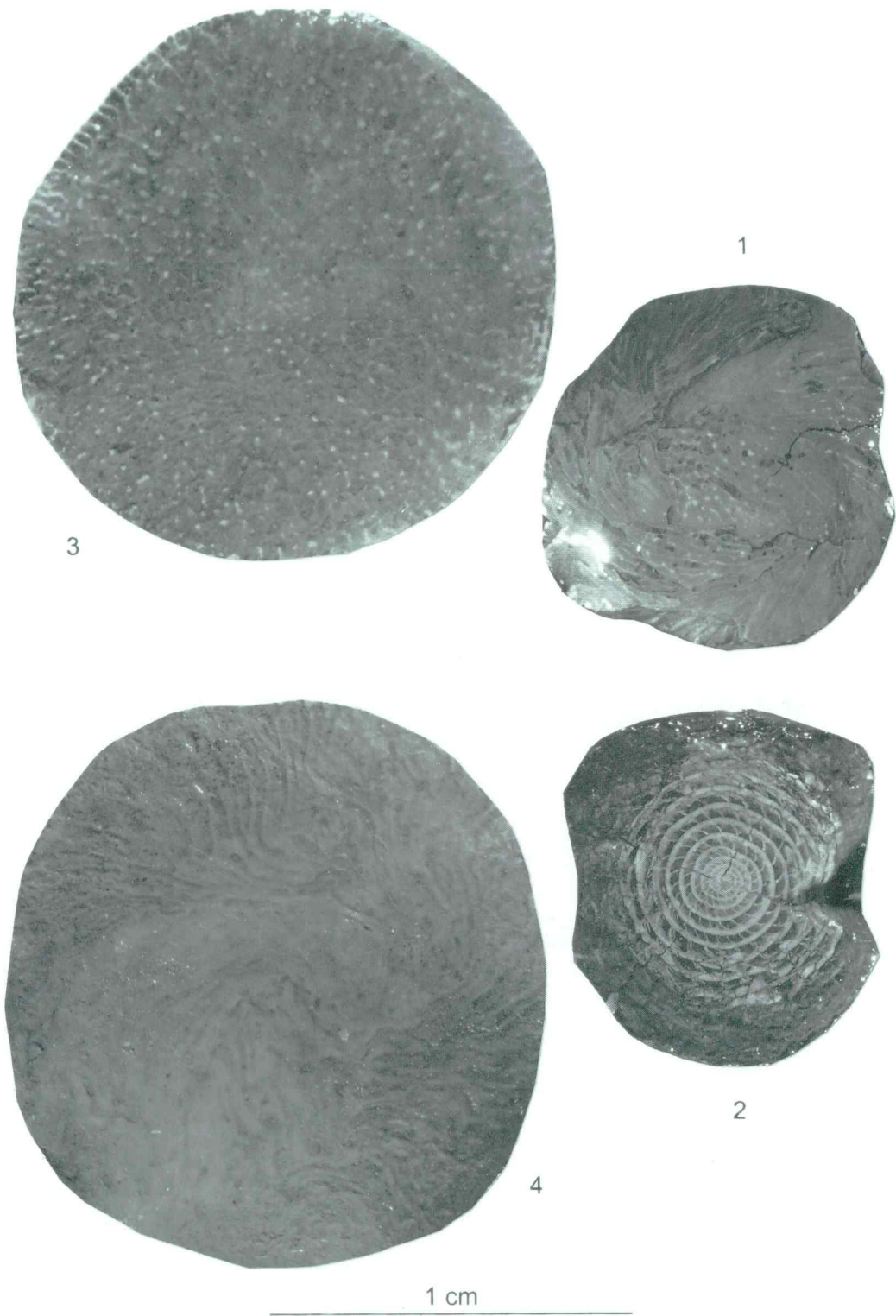
na majhne razdalje v okolici Ilirske Bistrice ne moti, ker so plasti marsikje nagubane in prelomljene, kar je predvsem posledica narivanja Snežniškega masiva na fliš (Šikić et al., 1972, 1975).

Assilina plana in *Ass. karreri* (tab. 1, sl. 1) sta bili najdeni pri Trpčanah in to prvič v Sloveniji. Tam smo ugotovili tudi podvrsto *Nummulites burdigalensis pergranulatus* ter vrsti *Nummulites pavloveci* (tab. 4, sl. 1, 2) in *N. pustulosus*. Oblika *Nummulites* sp. (tab. 3, sl. 1, 2) kaže prehodne znake med *N. burdigalensis pergranulatus* in *N. friulanus*, vendar imamo za določitev morebitne nove vrste premalo fosilnega materiala.

Pri Kuteževem in v Dolenjski dragi je bila najdena *Assilina marinellii marinellii* (tab. 1, sl. 2), ki je zelo podobna podvrsti *Ass. marinellii similis* (Khan et al., 1975). Zaradi velike podobnosti obeh podvrst je vprašljivo, če sta upravičeni samostojni podvrsti. Od asilin so bile v omenjenih nahajališčih ugotovljene še *Assilina maior maior* (sl. 6, tab. 2, sl. 1, 2), *Ass. cuvillieri* (tab. 1, sl. 3, 4) in *Ass.*

Tabla 4 – Plate 4

- 1 *Nummulites pavloveci* Schaub, Trpčane, Lower Cuisian, surface of the test – spodnji cuisij, površina hišice
- 2 *Nummulites pavloveci* Schaub, Trpčane, Lower Cuisian, equatorial section – spodnji cuisij, ekvatorialni prerez
- 3, 4 *Nummulites praelorioli* Herb & Schaub, Kuteževo, Upper Cuisian, surface of the test – zgornji cuisij, površina hišice



medanica (tab.1, sl. 6). V teh nahajališčih so še *Nummulites friulanus* (tab. 3, sl. 3, 4), *N. praelorioli* (tab. 4, sl. 3, 4) in *N. aff. lehneri* sensu Schaub 1981, ki jo bo ob boljšem in številnejšem fosilnem materialu verjetno treba opisati kot novo vrsto.

Pri Dolnjem Zemonu sta ugotovljeni *Assilina suteri* (tab. 1, sl. 5) in *Nummulites aff. lehneri* sensu Schaub 1981 (tab. 3, sl. 5, 6). Zlasti prva je bila doslej največkrat najdena na začetku lutecija (Schaub, 1981), redkeje v najmlajšem cuisiju, zato so plasti v nahajališču pri Dolnjem Zemonu najverjetneje iz prehoda cuisij – lutecij.

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