Geol. vjesnik	29	213—218	1 plate	Zagreb, 1976

563.17:551.762(161.15.45)

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TINTINNOPSELLA KAPELENSIS N. SP., A NEW ABERRANT TINTINNID FROM THE TITHONIAN OF MT. VELIKA KAPELA, CENTRAL CROATIA

At several localities in the karst region of the Outer Dinarids a new species of the group of the aberrant tintinnids (after Radoičić, 1969) has been found; these finds can be associated with other forms of the same group and other microfossils indicating the Tithonian age. Judging by its morphological characteristics, the new species can be classed in the genus Tintinnopsella.

INTRODUCTION

During the elaboration of the Upper Jurassic samples, collected in the region of Mt. Velika Kapela (central Croatia, topographic sheet Ogulin) for the purpose of the geological mapping, a new form belonging to the group of the aberrant tintinnids (according to Radoičić, 1969) has been recognized. Although different opinions exist as to the true nature of that group of microfossils (Favre & Richard, 1927; Carozzi, 1954; Farinacci, 1963; Ramalho, 1968; Barthel, 1969; Radoičić, 1969 and earlier; Luperto-Sinni & Ricchetti, 1973; Bernier, 1974) we chose to follow Mrs. Radoičić's interpretation (1969). According to the criteria used by Radoičić (1969), it has been assigned to the genus *Tintinnopsella*. The new species has also been found subsequently in several other localities, notably in the region of Platak (Gorski Kotar, central Croatia) and the environs of Neum in southern Hercegovina. Associated with other species of the same group and other microfossils indicating the Tithonian age, *Tintinnopsella kapelensis* n. sp. is easily recog-

nized in spite of its rather infrequent occurrence. All the samples and slides containing the described material are stored at the Institute of Geology, Zagreb.

PALEONTOLOGIC DESCRIPTION

Family Codonellidae Kent, 1882

Genus *Tintinnopsella* Colom, 1948

Tintinnopsella kapelensis n. sp.

Plate I

Holotype: Section figured in Pl. I, fig. 1, slide No. OG-8249/2.
Type-locality: Javorov Vrh, on the southwestern slopes of Mt. Velika Kapela, about 6 km WNW of Brinje, Croatia.
Type stratum: Upper Jurassic, Tithonian.
Origin of the name: after Mt. Velika Kapela.

Diagnosis: A large *Tintinnopsella* with broad bell-shaped lorica, broad oral zone, and well-developed collar twisted laterally outwards and bending slightly downwards.

Description: The lorica is composed of recrystallized calcite. Its shape (in axial section) may best be defined as broadely bell-shaped, the length and the width being about the same. The oral opening is approximately as wide as is the broadest part of the lorica itself. The main distinguishing feature in that species is the collar. Compared with the other parts of the lorica it is considerably thinner, and thus is frequently destroyed. It bends laterally outwards from the oral zone at about an angle of 90°, and at its outermost part (if this is sufficiently preserved to be noticed) it bends slightly but visibly downwards (Pl. I, figs. 1, 3—5). The aboral part is broadly curved, almost semicircular in shape. In some specimens, longitudinal ridges and grooves (striae) (Pl. I, figs. 1, 3) can be noticed, while in the majority of the sections observed this feature is completely destroyed by recrystallization.

Dimensions in mm:

Length of lorica	1.00—1.33
Width of lorica	1.11—1.64
Diameter of oral opening	0.89—1.41
Width (diameter) of oral zone, including collar	1.52—2.17

Similarities and differences: The new species has been attributed to the genus *Tintinnopsella* by the shape of the lorica, which fits what has been described as characteristic of that

genus (Colom, 1948, p. 245; Radoičić, 1969, p. 18). The forms of this genus have a bell-shaped or cylindrical lorica with a rounded aboral zone (with or without caudal appendix), broad oral opening and laterally directed collar. In the new species, proportional relations of single morphological elements are different from any other species of the genus *Tintinnopsella* described so far. In the description we have already emphasized that the width of the lorica approximately equals (or even slightly exceeds) the length, the diameter of the oral zone being always greater than the length of the lorica, features which have not been noticed in any other species. Another characteristic feature of *T. kapelensis* is the form of the collar: it is situated laterally, directed outwards and slightly but visibly bending downwards. A similar form of the collar occurs in *T. ricta* Radoičić, but it does not show such pronounced bending downwards. In addition, wall thickness and shape of the lorica are different in *T. ricta* (thicker wall, elongated bell-shaped lorica). Sections similar to axial (longitudinal) sections of *T. kapelensis* may be theoretically produced by strongly oblique peripheral or subhorizontal (almost transversal) sections of *T. ricta* or *Campbelliella milesi milesi* Radoičić, but in such cases the wall thickness of the oral zone and of the collar would be considerably greater. As distinct from this, in *T. kapelensis* the wall becomes distinctly thinner towards the distal end of the collar.

Stratigraphic position and geographical distribution: *T. kapelensis* was first found at the type-locality, in recrystallized biomicritic limestone, associated with dasyclads *Clypeina jurassica* Favre and *Salpingoporella annulata* Carozzi and various other species of the group of the aberrant tintinninds: *Campbelliella milesi milesi* Radoičić, *Tintinnopsella bacinensis* Radoičić, *T. simplex* Radoičić, etc. At the same stratigraphic level, near the type-locality, species of sphaeractinids and nerineids have also been found: *Ellipsactinia ellipsoidea* Steinmann, *E. caprense* Canavari, *E. ramosa* Canavari, and *Nerinea defrancei posthuma* Zittel. These associations are characteristic of the Upper Malmian (Tithonian) age.

T. kapelensis has also been found in the neighbouring regions of Mt. Velika Kapela, as well as in the other parts of the Dinaric karst region: at the village of Orlić on the SW slopes of Mt. Velika Kapela, about 5 km E of the village of Krivi Put, then on the SE slopes of Mt. Jasvina on the road to Platak, which branches off from the Zagreb—Rijeka highway, and at the village of Duži, about 3.5 km E of Neum, south Hercegovina.

Received 29 March 1976

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TINTINNOPSELLA KAPELENSIS N. SP., ABERANTNA TINTININA IZ TITONA VELIKE KAPELE

UVOD

Prigodom obrade uzoraka titonske starosti u području Velike Kapele, u okviru radova za Osnovnu geološku kartu na listu Ogulin, u mikrofosilnoj zajednici gdje dominiraju vrsta *Clypeina jurassica* Favre i različite vrste aberantnih tintinina, među ovim posljednjim zapažena je forma koja se osnovnim morfološkim karakteristikama izdvaja od do sada poznatih vrsta krupnih tintinina. Kasnijim istraživanjima u Gorskom Kotaru i Hercegovini ova vrsta nađena je na još dva lokaliteta: u području Platka i okolici Neuma. U vrstama bogatoj zajednici aberantnih tintinina titona *Tintinnopsella kapelensis* n. sp. zapaža se vrlo rijetko. Svi izbrusci koji sadrže opisani materijal čuvaju se u Institutu za geološka istraživanja u Zagrebu.

PALEONTOLOŠKI OPIS

Familija Codonellidae Kent, 1882

Rod *Tintinnopsella* Colom, 1948

Tintinnopsella kapelensis n. sp.

Tabla I

Holotip: Primjerak prikazan na tab. I, sl. 1, izbrusak br. OG-8249/2.

Locus typicus: Javorov Vrh, primorske padine Velike Kapele, oko 6 km zapadno-sjeverozapadno od Brinja (Hrvatska).

Stratum typicum: Gornji malm, titon.

Derivatio nominis: prema planinskom masivu Kapela.

Diagnosis: Krupna *Tintinnopsella* široko zvonaste lorike, široke oralne zone i lateralno usmjerene ogrlice izrazito svijene nadolje.

Opis: Lorika je izgrađena od rekristaliziranog kalcita. Njezin oblik može se definirati kao široko zvonast s približno podjednakom dužinom i širinom. Oralni otvor jednako je širok kao i najširi dio lorike. Posebno je kod ove vrste karakteristična ogrlica. U odnosu na ostale dijelove lorike ona je izrazito nježnije građe, pa često nije potpuno sačuvana. Usmjerena je lateralno od oralne zone na vanjsku stranu pod približno pravim kutom, a distalno (ako je sasvim ili većim dijelom sačuvana) blago ali izrazito povija nadolje (tab. I, sl. 1, 3—5). Aboralni dio lorike blago je zaobljen, pravilnog je polukružnog oblika. Kod pojedinih primjeraka na vanjskom dijelu stijenke lorike zapažaju se ostaci strijacije — uzdužna rebra i žlijebovi (tab. I, sl. 1 i 3), dok je kod većine posve uništena rekristalizacijom.

Dimenzije u mm:

	maksimalno	minimalno
Dužina lorike	1,33	1,0
Širina lorike	1,64	1,11
Promjer oralnog otvora	1,41	0,89
Širina oralne zone s ogrlicom	2,17	1,52

Sličnosti i razlike: Opisana nova vrsta uvrštena je u rod *Tintinnopsella* na temelju oblika lorike, koji zadovoljava osnovne kriterije karakteristične za ovaj rod (Colom, 1948, str. 245; Radoičić, 1969, str. 18). To su forme koje imaju zvonastu ili cilindričnu loriku sa zaobljenom aboralnom zonom (s kaudalnim produžetkom ili bez njega), oralnom zonom sa širokim oralnim otvorom i lateralno usmjerenom ogrlicom. Međusobni odnosi pojedinih morfoloških elemenata kod naše vrste različiti su u usporedbi s bilo kojom drugom poznatom vrstom roda Tintinnopsella. Već kod opisa ove vrste naglašena je približno jednaka dužina lorike i širina lorike, a širina oralne zone veća je od dužine lorike, što kod drugih vrsta nismo zapazili. Druga značajka bitna za vrstu *T. kapelensis* n. sp. jest oblik ogrlice: lateralno je smještena, usmjerena prema van s postupnim ali izrazitim svijanjem nadolje. Sličnu formu ogrlice kod aberantnih tintinina pokazuje vrsta *Tintinnopsella ricta* Radoičić, kod koje, međutim, nije zapaženo tako izrazito svijanje ogrlice nadolje. Osim toga debljina stijenke i oblik lorike kod *T. ricta* bitno se razlikuju (deblja stijenka, zvonasto izdužena lorika). Slične presjeke lorike kao kod naše vrste mogli bi se teoretski dobiti kod izrazito kosih rubnih ili subhorizontalnih presjeka vrste *T. ricta* i podvrste *Campbelliella milesi milesi* Radoičić, ali bi u tim slučajevima širina stijenke oralne zone i ogrlice morala biti znatno veća. Nasuprot tome, kod *T. kapelensis* n. sp. u spomenutim dijelovima lorike zapaža se izrazito sužavanje i stanjivanje stijenke prema distalnom dijelu ogrlice.

Stratigrafski položaj i geografsko rasprostranjenje: *T. kapelensis* n. sp. nađena je u rekristaliziranom biomikritskom vapnencu u zajednici s vrstama *Clypeina jurassica* Favre i *Salpingoporella annulata* Carozzi, te različitim drugim vrstama iz skupine aberantnih tintinina: *Campbelliella milesi milesi* Radoičić, *Tintinnopsella bacinensis* Rad., *T. simplex* Rad. i dr. U istom stratigrafskom nivou u bližoj okolici tipskoga lokaliteta nađeni su i ostaci makrofosila — sferaktinide i nerineide:

Ellipsactinia ellipsoidea Steinmann, *E. caprense* Canavari, *E. ramosa* Can. i *Nerinea defrancei posthuma* Zittel. Navedene zajednice definiraju gornjomalmsku (titonsku) starost tipskoga lokaliteta.

Opisana vrsta nađena je i u drugom, susjednom području Velike Kapele i krškom dijelu Dinarida: kod sela Orlić na primorskim padinama V. Kapele, oko 5 km istočno od Krivoga Puta, zatim na jugoistočnim padinama brda Jasvina na odvjetku ceste prema Platku od autoceste Zagreb—Rijeka (Gorski Kotar) te kod sela Duži, oko 3,5 km istočno od Neuma (Hercegovina).

Primljeno 29. 3. 1976.

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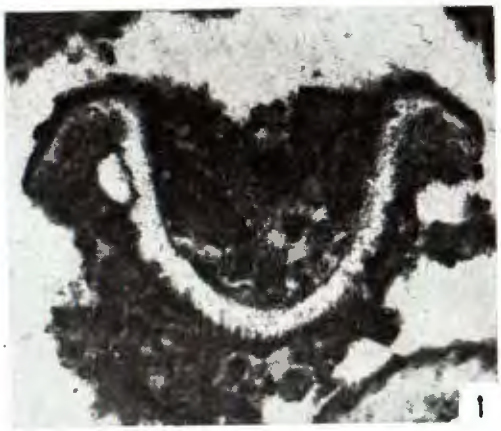
PLATE — TABLA I

Tintinnopsella kapelensis n. sp.
x 29

1—6 Longitudinal sections (uzdužni presjeci).
Slides (izbrusci): 1 = OG-8249/2 (holotype — holotip), 2 = OG-8249/1, 3 = OG-8249/2, 4 = Pl-6, 5 = OG-8366/2, 6 = Dž-5
Localities (lokaliteti): 1—3 = Javorov Vrh (Brinje), 4 = Jasvina (Platak), 5 = Orlići (Krivi Put), 6 = Duži (Neum)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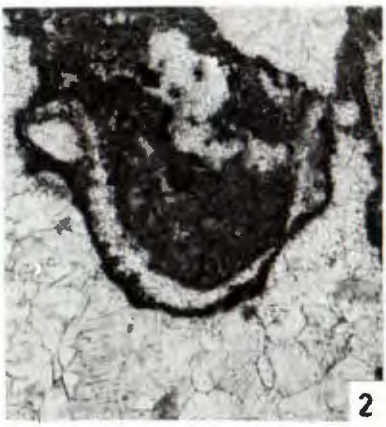
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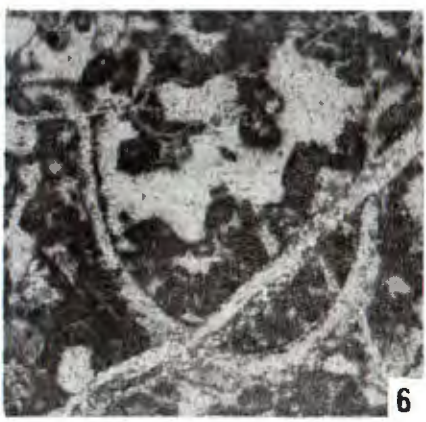
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