

TARAMELLICERATINAE (*Taramelliceras*) SPECIES FROM THE UPPER JURASSIC DEPOSITS OF HĂGHIMAȘ MTS. (EAST CARPATHIANS – ROMANIA)

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Abstract. The paper presents description of the eleven species of the subgenus *Taramelliceras* (*Taramelliceras*) Del Campana 1904 found in the Formation of "Acanthicum Beds" (Kimmeridgian) from Ghilcoș (Hăghimaș Mountains, Romania). The species *T. trachinotum* (Opp.), *T. erycinum* (Gemm.), *T. mikoï* (Herb.) and *T. pugile* (Neum.) have been previously described from this region by previous authors, the last two (*T. mikoï* and *T. pugile*) being recorded for a first time and one, (*T. pugile pseudopugile* Sarti), is determined on the base of specimens from Preda Collection. In addition to the species listed, now there are six other species that enrich the association: *T. greenackeri* (Moesch), *T. pseudoflexuosum* (Fav.), *T. cf. platyconcha* (Gemm.), *T. af. subcallicerum* (Gemm.) and *T. pugile pugiloides* (Canav.), unknown in the region until now.

Keywords: *Taramelliceras*, ammonites, Kimmeridgian, paleontology, Hăghimaș, Carpathians, Romania.

Rezumat. Taramelliceratinae (*Taramelliceras*) din depozitele Jurasicului superior din Munții Hăghimaș (Carpații Orientali - România). Lucrarea prezintă unsprezece specii ale subgenului *Taramelliceras* (*Taramelliceras*) Del Campana 1904 găsite în Formațiunea „Stratelor cu Acanthicum”, din Kimmeridgianul de la Ghilcoș (Munții Hăghimaș, România). Speciile *T. trachinotum* (Opp.), *T. erycinum* (Gemm.), *T. mikoï* (Herb.) și *T. pugile* (Neum.) au mai fost descrise anterior în regiune de autorii anteriori, ultimele două (*T. mikoï* și *T. pugile*) fiind descoperite aici iar una, (*T. pugile pseudopugile* Sarti), este pusă în evidență aici, prin revizuirea exemplarelor din Col. Preda. Pe lângă speciile enunțate acum se mai adaugă alte șase specii care îmbogățesc asociația: *T. greenackeri* (Moesch), *T. pseudoflexuosum* (Fav.), *T. cf. platyconcha* (Gemm.), *T. af. subcallicerum* (Gemm.) și *T. pugile pugiloides* (Canav.), necunoscute în regiune până acum.

Cuvinte cheie: *Taramelliceras*, paleontologie, Hăghimaș, Carpați, România.

INTRODUCTION

The ammonite fauna comes from the Lacu Roșu region (Ghilcoș and Ciofronca) in the Hăghimaș Massif (Eastern Carpathians) (Fig. 1). Details about lithology and biostratigraphy of this Kimmeridgian-Lower Tithonian deposits (the Acanthicum Beds), and outcrops were made previously (GRIGORE et al., 2009 and GRIGORE, 2011). From the entire fauna of ammonite assemblage in this region the opelids are the most representative and, of all this, the *Taramelliceras* group are the richest. In this paper eleven taxa from this group are described, six of them are new for this region and one, potentially a new species (*T. aff. subcallicerum*). The species described are Kimmeridgian in age (Fig. 2). Are reviewed and the specimens described previously by NEUMAYR (1873), HERBICH (1878) and PREDĂ (1973). In determination of species I tecked into account the classification of SARTI (1993) and OLORIZ (1978).

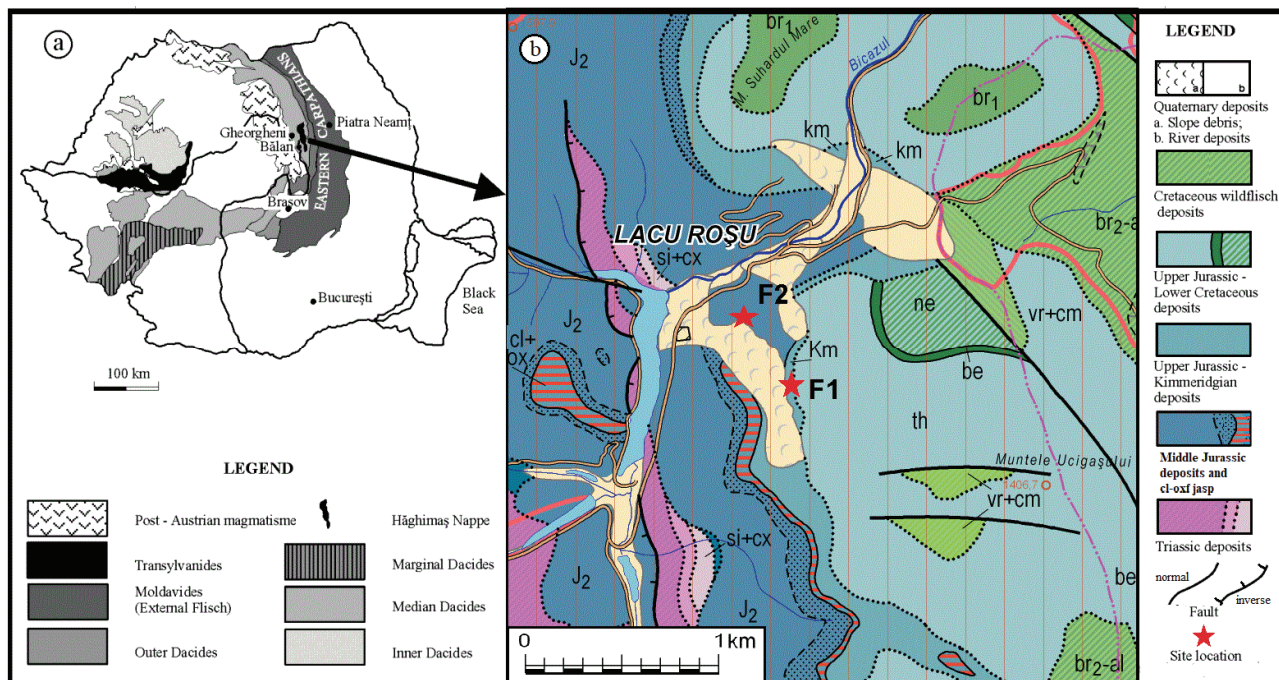


Figure 1. Localization of sites: a) in Romania - geotectonic sketch (after SĂNDULESCU, 1984); b) on the geological map scale 1: 50,000 (after SĂNDULESCU et al., 1975, revised by GHEUCA & GRIGORE, 2010).

MATERIAL AND METHOD

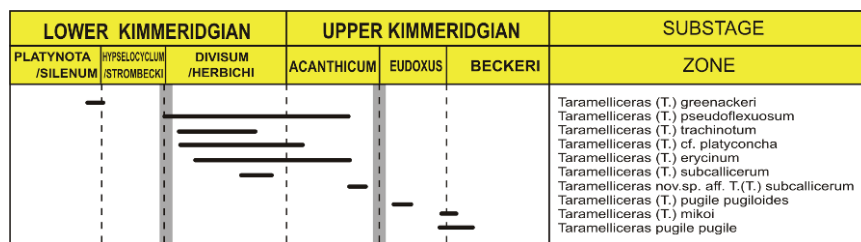


Figure 2. Stratigraphic distribution of studied taxa through these sections.

The material belongs to the author's collection, deposited in the National Geological Museum (MNG – GIR) - Bucharest. Additional specimens from the collections of Professor Preda hosted in University of Bucharest or Museum of Natural Sciences in Piatra Neamț and by

Herbich hosted in the museum of University “Babeș Bolyai” in Cluj were also studied.

In determinations of species was used the method of comparison with the specimens known in literature and mentioned in synonymy. Where possible, the type specimens were used as a key for comparison of morphometric parameters and morphology.

SYSTEMATICS

Abbreviations for the measurements, collections and outcrops:

Dmax = maximal diameter

Dph = phragmocone diameter

D = measured diameter

U = diameter of umbilicus

H = whorl height

W = whorl width

ic = ribs/costal index (H/L at 5 primary ribs)

UBB = “Babeș Bolyai” University from Cluj Napoca

LGB = Geology Laboratory of Bucharest University

MPN = Museum of Natural Sciences - Piatra Neamț

GIR = Geological Institute of Romania

GBA = Geological Institute of Austria (Bundesanstalt)

F1 = Outcrop from western Ghilcoș walls

F2 = Outcrop from north-western Ghilcoș slope

F17 = Outcrop from “Ciofronca”; all in GRIGORE et al., 2009

A, D... K = studied sections (GRIGORE, 2002, 2011)

Family Opeleidae Douville, 1890

Subfamily Taramelliceratinae Spath, 1928

Genera *Taramelliceras* Del Campana, 1904

Subgenera *Taramelliceras* Del Campana, 1904 in HOLDER, 1955

Taramelliceras (*Taramelliceras*) *trachinotum* (OPPEL, 1863)

Pl. 2, Figs. 1, 2, 4, 5.

1863 *Ammonites trachynotus* - OPPEL; p. 214; Pl. 56, Fig. 4.

1873 *Opeleia trachynota* OPPEL - NEUMAYR; p. 169.

1877 *Ammonites* (*Opeleia*) *trachynotus* OPPEL - FAVRE; p. 34; Pl. 3, Fig. 2.

1878 *Opeleia trachynota* OPPEL – HERBICH; p. 154; Pl. 3, Fig. 2.

1878 *Ammonites* (*Opeleia*) *trachynotus* OPPEL - LORIOL; p. 41; Pl. 4, Figs. 2, 3.

1887 *Ammonites flexuosus auritus* QUENSTEDT - QUENSTEDT; p. 906; Pl. 18, Fig. 21.

1955 *Taramelliceras* (*Taramelliceras*) *trachinotum* (OPPEL) - HOLDER; p. 80; Pl. 18, Fig. 21.

1973 *Taramelliceras* (*Taramelliceras*) *trachinotum* (OPPEL) – PREDA; Pl. 15, Fig. 3.

1973 *Opeleia* (*Taramelliceras*) *strombecki* OPPEL – PREDA; Pl. 6, Fig. 1.

1978 *Taramelliceras* (*Taramelliceras*) *trachinotum* (OPPEL) - OLORIZ; p. 80; Pl. 9, Figs. 2a-b.

1979 *Taramelliceras* (*Taramelliceras*) *trachinotum* (OPPEL) - SAPUNOV; p. 45; Pl. 8, Fig. 1.

1993 *Taramelliceras* (*Taramelliceras*) *trachinotum* (OPPEL) - SARTI; p. 59; Pl. 3, Fig. 1.

Table 1. Measurements of *Taramelliceras* (*T.*) *trachynotum* (OPPEL, 1863) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	90	50	90	17	48	33	0.19	0.53	0.37	0.68	0.87
Herbich A	55	-	55	11	27	21	0.20	0.49	0.38	0.78	-
Preda 10a MPN	41	~35	40	7.5	20	15	0.19	0.50	0.37	0.75	-
Preda 13a MPN/30	102	72	97	19	50	32	0.19	0.51	0.33	0.64	-
LRp114A2	62	-	62	11	29	20	0.18	0.47	0.32	0.69	0.96
LRp127dp	48	>48	48	9	23	17	0.19	0.48	0.35	0.74	1.17
LRp129dp	34	-	-	-	18	14	-	-	-	0.78	-
LRp78K8	30	-	30	5	14	10	0.17	0.47	0.33	0.71	-
LRp145A	-	-	-	7	16	10.5	-	-	-	0.66	-
LRp51dp	175	110	175	26	90	50	0.14	0.51	0.28	0.55	-

Material: LRp114A2, LRp504X4, LRp129dp, LRp78K8; *Taramelliceras* (*T.*) cf. *trachynotum*: LRp127dp, LRp51dp and LRp145A Grigore Collection in GIR. Herbich's specimens (1878): Collection of UBB – figured specimen (Pl. 3, Fig. 2), originates from red nodular limestones of Ghilcoș outcrop and second specimen, from Ciofronca outcrop. Preda's specimens (1973): Collection of MPN – inv. 10aMPN (Pl. 15, Fig. 3) and inv. 13aMPN, figured as “*Oppelia* (*Taramelliceras*) *strombecki*” (Pl. 6, Fig. 1), both originates from red nodular limestones of Ghilcoș outcrop.

Remarks: the LRp504X4 is the best preserved, it also preserves part of the living chamber; it presents all morphological characters comparable to those of the type specimen. Specimens LRp114A2, LRp129 also present morphological and morphometric parameters comparable to those of the type specimen. The specimens LRp129, LRp145A and LRp78K8 are juveniles, the last of which is half of a phragmocone that preserves the specific ornamentation. The rest of my specimens are incomplete or deformed fragments and have been conferred to this species; of these: LRp145A - has a more prominent, more flexuous primary ribs and a dense tuberculation; LRp127 - has a rarer primary costation and is generally coarser.

The specimen figured by Herbich is of moderate size and well preserves the characteristic ornament; presents morphometric parameters (Table 1) comparable to those of the type specimen. The Preda's specimen (**10a MPN**) is small and preserves ¼ of whorl with the living chamber, thus being able to observe the modification of the ornament. The figured specimen (**13a MPN**) as “*Oppelia* (*Taramelliceras*) *strombecki* Opperl”, is large and preserves ½ of whorl from the living chamber. The specimen presents the morphological characters of the species *T. (T.) trachinotum* (Opperl): dense, flexuous costation, mostly composed of bifurcated ribs ending in a ventro-lateral tubercles; the tubercles are round on the phragmocone and elliptical on the living chamber, and strong. The mid-ventral row of tubercles is less prominent, due to erosion, but it represented by elongated tubercles, alternating with the ventro-lateral ones. The most important differences from the type specimen are: the more rigid costation (similar to that of the *T. hauffianum* species) and a narrower cross-section, due to the deformation of the peri-umbilical region.

Occurrence: Lower Kimmeridgian–Strombecki/Divisum zones in F1, F2 and F17 outcrops; Lower Kimmeridgian – Strombecki (Hypselocyclum)/Divisum zones in Europe (Italy, Spain, France, Switzerland, Germany and Bulgaria).

Taramelliceras (*Taramelliceras*) *groenackeri* (Moesch, in Mayer, 1865)
Pl. 2, Fig. 8.

1878 *Ammonites* (*Oppelia*) *Greenackeri* Moesch - LORIOLE; p. 44; Pl. 5, Fig. 2 (Lectotype).

1955 *Taramelliceras* (*Taramelliceras*) *greenackeri* (Moesch) - HOLDER; p. 115; Fig. tx. 111.

Material: LRp161E1 Grigore Collection in GIR.

Table 2. Measurements of *Taramelliceras* (*T.*) *greenackeri* (Moesch, 1865) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	36	-	36	6	18	6	0.17	0.50	0.17	0.33	1.4
LRp161E1	21	-	21	5.5	9.5	7	0.26	0.45	0.33	0.74	1.1

Remarks: the specimen represents a well-preserved phragmocone, whose ornamentation is comparable to that of the type specimen; analyzing the morphometric data (Table 2), the following differences are observed: the umbilicus is wider and the thickness of the cross-section is larger than in the type specimen (which is deformed).

Occurrence: Lower Kimmeridgian–Platynota zone in F2 outcrop; Lower Kimmeridgian – Platynota zone in Europe (Switzerland and Germany).

Taramelliceras (*Taramelliceras*) *pseudoflexuosum* (Favre, 1877)
Pl. 2, Figs. 7, 9, 10, 11.

1849 *Ammonites flexuosus costatus* – Quenstedt; p. 126; Pl. 9, Fig. 1.

1877 *Ammonites* (*Oppelia*) *pseudoflexuosum* - FAVRE; p. 40; Pl. 3, Fig. 6 (Lectotype).

1955 *Taramelliceras* (*Taramelliceras*) *pseudoflexuosum* (Favre) - HOLDER; p. 117; Pl. 19, Fig. 23.

1986 *Taramelliceras* (*Taramelliceras*) *pseudoflexuosum* (Favre) - SARTI; p. 498; Pl. 2, Figs. 2a-b.

1993 *Taramelliceras* (*Taramelliceras*) *pseudoflexuosum* (Favre) - SARTI; p. 63; Pl. 4, Fig. 3.

Material: LRp141D2, LRp66A2, LRp59A1, LRp142R1, LRp89A, LRp325A Grigore Collection in GIR.

Observations: LRp141D2, LRp325A and LRp142R1 are three juvenile specimens and LRp89A, a large specimen, which keeps 1/3 of the whorl with the living chamber; the specimens LRp66A2 and LRp56A1 represent two fragments, which preserve very well the specific ornamentation. All specimens are within the morphological parameters of this species and have morphometric (Table 3) features comparable to those of the type specimen.

Occurrence: Kimmeridgian –Divisum-Acanthicum zones in F1 and F2 outcrops; Kimmeridgian – Divisum-Acanthicum zones in Europe (Italy, Spain, Portugal, Germany).

Table 3. Measurements of *Taramelliceras (T.) pseudoflexuosum* (Favre, 1877) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	-	-	41	7	21	-	0.17	0.51	-	-	0.72
LRp141D2	33	-	33	6.5	18	10.5	0.20	0.54	0.32	0.58	0.83
LRp66A2	-	-	-	-	59	36	-	-	-	0.61	0.79
LRp59A1	-	-	-	-	94	55	-	-	-	0.58	0.79
LRp142R1	32	-	32	6	16	11	0.19	0.50	0.34	0.69	-
LRp89A	117	70	117	20	54	36	0.17	0.46	0.31	0.67	0.80
LRp325A	19.5	13	19.5	4	10	7.5	0.20	0.51	0.38	0.75	-

Taramelliceras (Taramelliceras) cf. platyconcha (Gemmellaro, 1872)
Pl. 3, Fig. 5.

1872 *Oppelia platyconcha* - GEMMELLARO; p. 40; l. 7, Figs. 1a-b.

1877 *Ammonites (Oppelia) platyconcha* Gemmellaro - FAVRE; p. 33.

1978 *Taramelliceras (Taramelliceras) cf. platyconcha* (Gemmellaro) - OLORIZ; p. 100; Pl. 8, Fig. 3.

1993 *Taramelliceras (Taramelliceras) platyconcha* (Gemmellaro) - SARTI; p. 64.

Material: LRp49dp, LRp60A2, LRp1K12, LRp95dp Grigore Collection in GIR.

Table 4. Measurements of *Taramelliceras (T.) cf. platyconcha* (Gemmellaro, 1872) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	141	-	141	22.6	70.5	52.2	0.16	0.50	0.37	0.74	1.15
LRp1K12	?117	?97	?117	19	65	38	0.16	0.55	0.32	0.58	0.91
LRp49dp	140	-	140	17	76	44	0.12	0.54	0.31	0.58	-
LRp60A8	-	-	-	-	57	35	-	-	-	0.61	-

Remarks - *T. (T.) cf. platyconcha*: my specimens are fragmentary, presenting part of the living chamber and part of the phragmocone; in specimen LRp1K12, the venter is slightly wider than (Table 4) the type specimen and has siphonal tubercles in the internal whorls; the LRp95 specimen has a finer and dense costation compared to the type specimen.

Occurrence: Upper Kimmeridgian–Acanthicum zone in F1 and F2 outcrops; Upper Kimmeridgian – Acanthicum–Cavouri zones in Italy, Divisum–Cavouri zones in Spain.

Taramelliceras (Taramelliceras) erycinum (Gemmellaro, 1870)
Pl. 2, Figs. 3, 6.

1870 *Oppelia erycina* - GEMMELLARO; p. 50; Pl. 10, Fig. 2.

1872 *Oppelia erycina* Gemmellaro - GEMMELLARO; p. 39; Pl. 6, Fig. 5.

1873 *Oppelia erycina* Gemmellaro - NEUMAYR; p. 166.

1878 *Oppelia erycina* Gemmellaro - HERBICH; p. 149; Pl. 4, Fig. 2.

1993 *Taramelliceras (Taramelliceras) cf. erycinum* (Gemmellaro) - SARTI; p. 63.

Material: LRp18A, LRp157T2,0; *Taramelliceras (T.) cf. erycinum*: LRp93A, LRp21D2 Grigore Collection in GIR.

Herbich's specimens (1878): Collection of UBB – “A” specimen originates from the green sandstones of Ghilco's outcrop (F1) and second specimen (“B”), from Ciofronca outcrop (F17 - red nodular limestones).

Table 5. Measurements of *Taramelliceras (Taramelliceras) erycinum* (Gemmellaro, 1870) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	103	-	103	11.5	55	31	0.11	0.53	0.31	0.56	0.80
Gemmellaro (1872) specimen	86	80	86	13	45	-	0.15	0.52	-	-	0.79
Herbich A specimen	111	-	111	12	60	33	0.11	0.54	0.30	0.55	-
LRp21D2	75	>75	70	11	40	25	0.16	0.57	0.36	0.62	-
LRp18A	?89	89	66	10	36	23	0.15	0.54	0.35	0.64	0.76
LRp93A	?80	?80	68	11	36	23	0.16	0.53	0.34	0.64	0.84
LRp157T2,0	28	-	28	5.8	14.5	9	0.20	0.52	0.32	0.62	-

Remarks: specimens LRp18A and LRp157T2,0 (juveniles) are well preserved, the former one having a more densely primary ribbing than the type specimen. The other two specimens (LRp93A, LRp21D2) are fragmentary, being only tentatively referred to this species; represent fragments of a whorl that have a coarser and straighter costation than the type specimen. The specimen figured by Herbich is large and represents a phragmocone that only partially preserves the ornamentation; it is comparable to the type specimen, both morphologically and morphometrically (Table 5).

Occurrence: Upper Kimmeridgian–Acanthicum zone in F1, F2 and F17 outcrops; Upper Kimmeridgian – Acanthicum zone in Europe (Italy, France and Germany).

Taramelliceras (Taramelliceras) subcallicerum (Gemmellaro, 1872)

Pl. 3, Fig. 6.

1872 *Oppelia subcallicera* - GEMMELLARO; p. 38; Pl. 6, Figs. 4a-b.1978 *Taramelliceras (Taramelliceras) sp.gr. subcallicerum* (Gemmellaro) - OLORIZ; p. 102; Pl. 8, Fig. 1.1993 *Taramelliceras (Taramelliceras) subcallicerum* (Gemmellaro) - SARTI; p. 63; Pl. 4, Fig. 4.Material: LRp146A6; *Taramelliceras (T.) cf. subcallicerum*: LRp121A Grigore Collection in GIR.Table 6. Measurements of *Taramelliceras (Taramelliceras) subcallicerum* (Gemmellaro, 1872) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype	95	-	95	12.4	53.2	31.4	0.13	0.56	0.33	0.58	1.10
LRp146A6	31	30	31	6	16	10	0.19	0.52	0.32	0.62	-
LRp121A	-	-	-	-	24	14	-	-	-	0.58	0.96

Observations: the specimen LRp146A6 is a juvenile that has a wider umbilicus (Table 6) than the type specimen. The second specimen is conferred to this species; it represents a fragment of winding with morphological characteristics similar to the specimen described by Sarti (1993; pl. 4, Fig.4).

Occurrence: Upper Kimmeridgian–Acanthicum zone in F2 outcrop; Upper Kimmeridgian –Acanthicum zone in Italy, Kimmeridgian - Divisum-Acanthicum zones in Spain.

Taramelliceras (Taramelliceras) nov. sp. aff. Taramelliceras (T.) subcallicerum (Gemmellaro, 1872)

Pl. 3, Fig. 7.

Material: LRp4D3 Grigore Collection in GIR.

Table 7. Measurements of *Taramelliceras (Taramelliceras) nov. sp.* and *T. (T.) subcallicerum* (Gemmellaro, 1872) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Lectotype <i>T. subcallicerum</i>	95	-	95	12.4	53.2	31.4	0.13	0.56	0.33	0.58	1.10
LRp4D3	74	74	74	11	39	22	0.15	0.53	0.30	0.56	1.10

Description: the specimen represents a well-preserved phragmocone (undeformed and ornamented) with a medium-sized shell, involute ($O/D = 0.15$) and compressed. The cross-section is oval, high in the last part of the outer whorl and subrectangular in the internal whorls, where the flanks are flat (almost parallel). The ornamentation consists of bifurcated ribs, external intercalaries (rare), and ventro-lateral and mid-ventral tubercles. The ribbing is dense and the ribs are flexuous and of a moderate coarseness; as a particularity, the main ribs are widened, the intercalaries appearing one per three - four main ribs. True ventro-lateral tubercles are sparse and weak, instead each secondary rib ends with thickening (very fine tubercle); the row of siphonal tubercles consists of tubercles of the same power as the ventro-lateral ones (from the endings of the ribs), constituting practically three parallel rows on the ventral side (with elements in correspondence).

Remarks: the specimen can be considered a new subspecies within the *T. compsum* (Oppel) species, intermediate between some taxa from the *T. compsum* group and the *T. subcallicerum* species, having morphological and morphometric parameters (Table 7) comparable to those of the mentioned taxa. Having only one specimen, we cannot decide on the species.

Occurrence: Upper Kimmeridgian–Acanthicum zone in F2 outcrop.

Taramelliceras (Taramelliceras) mikoi (Herbich, 1878)

Pl. 3, Figs. 1 (Holotype), 4.

1878 *Oppelia Mikoi* - Herbich; p. 152; Pl. 6/7, Figs. 4a-b.non1973 *Oppelia (Taramelliceras) mikoi* Herbich – PREDA; Pl.8, Fig. 2 (*T. pugile pseudopugile*).1978 *Taramelliceras (Taramelliceras) sp.gr. mikoi* (Herbich) - OLORIZ; p. 101; Pl. 8, Figs. 2a-b.1993 *Taramelliceras (Taramelliceras) mikoi* (Herbich) - SARTI; p. 68.Table 8. Measurements of *Taramelliceras (Taramelliceras) mikoi* (Herbich, 1878) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Holotype	100	-	100	14	53	30	0.14	0.53	0.30	0.56	0.83
LRp192H12	72	-	72	11	37	23	0.15	0.51	0.32	0.62	-

Material: LRp192H12 Grigore Collection in GIR. **Holotype** (Herbich)(1878): Collection of UBB – No. inv. **2044UC**; originates from the green sandy limestones of Ghilcoș (F2).

Remarks: the specimen LRp192H12 is a half-whorl of a phragmocone, which partially preserves the specific ornamentation. Compared to the type specimen of Herbich, it has a slightly thicker section (Table 8).

Occurrence: Upper Kimmeridgian–Acanthicum-Eudoxus zones in F2 outcrop; Upper Kimmeridgian – Acanthicum zone in Italy, Acanthicum-Beckeri zones in Spain.

Taramelliceras (Taramelliceras) pugile pugile (Neumayr, 1871)

Pl. 1, Figs. 1, 3; Pl. 3, Fig. 3.

1871 *Oppelia pugilis* - NEUMAYR; p. 24.

1873 *Oppelia pugilis* Neumayr - NEUMAYR; p. 167; Pl. 32, Figs. 1-2.

1878 *Oppelia pugilis* Neumayr - HERBICH; p. 151.

1959 *Taramelliceras pugile* (Neumayr) - HOLDER&ZIEGLER; p. 199; Pl. 22, Figs. 1; 3.

non1973 *Oppelia (Taramelliceras) pugilis* Neumayr – PREDA; Pl. 7, Fig. 2 (^ *T. compsum compsum*).

1978 *Taramelliceras (Taramelliceras) pugile pugile* (Neumayr) - OLORIZ; p. 94; Pl. 7, Figs. 2a-b.

1979 *Taramelliceras (Taramelliceras) pugile* Neumayr - SAPUNOV; p. 51; Pl. 10, Fig. 6.

1993 *Taramelliceras (Taramelliceras) pugile pugile* (Neumayr) - SARTI; p. 66; Pl. 4, Fig. 1.

2020 *Taramelliceras pugile pugile* (Neumayr) - SARTI; p. 98; Fig. tx. 31.

Material: LRp193H11, LRp474H11, LRp223D20; *Taramelliceras (T.)* cf. *pugile*: LRp106B, LRp201B5, LRp473K23, LRp74D20 Grigore Collection in GIR. Neumayr Lectotype (1873) (Pl. 32, Figs. 1a-b): Collection of UBB – lost Holotype; originates from green-grey facies (sandstones) of Ghilcoş. Herbich's specimen (1878): collection not specified – originates from Ghilcoş. Preda's specimen (1973): Collection of MPN – inv. 45MPN – originates from green-grey sandstones of Ghilcoş walls (F1).

Table 9. Measurements of *Taramelliceras (Taramelliceras) pugile pugile* (Neumayr, 1871) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H
Lectotype	109	-	109	25	48	29.4	0.23	0.44	0.27	0.62
Herbich specimen	69	-	69	16.5	32.4	21	0.24	0.47	0.30	0.64
Preda 45 MPN	80	>80	73	20	32	22	0.27	0.44	0.30	0.69
LRp223D20	80	-	80	14	42	-	0.18	0.52	-	-
LRp201B5	39	-	39	11	17	10	0.25	0.43	0.26	0.59
LRp474H11	30	30	30	8	16	8	0.27	0.53	0.27	0.50
LRp193H11	61	>61	61	11	32	20	0.18	0.52	0.33	0.62

Remarks: the specimen LRp223D20 is of medium size (Table 9), deformed (crushed) in silty deposits and preserves almost entirely the living chamber; differs from the type by a narrower umbilicus and finer tubercles. The specimen LRp193H11 represents a half of medium-sized phragmocone, which preserves the specific ornamentation, similar to that of the paratype (Pl. 32, Fig. 2), and LRp474H11 is a half of small-sized phragmocon that preserves well the specific ornament. The specimens conferred to this species are: LRp106B - represents a fragment from a whorl that preserves the specific ornamentation; LRp201B - is a small phragmocone, which has ventro-lateral tubercles on the ends of all ribs and LRp473K23 - is a ventral fragment from a whorl (living chamber) that preserves the specific ornament (tubercles).

Preda's specimen (45 MPN) was conferred to this species due to the following reasons: compared to the known specimens of this species, it has the widest umbilicus (0.27), and the mid-ventral row of tubercles is less obvious (due to erosion), the venter being strongly keeled; it has an obvious costation on half of the last whorl, specific (for the phragmocone), and the ventro-lateral tuberculation is relatively dense and increases in strength towards the end of the conch.

Occurrence: Upper Kimmeridgian–Eudoxus-Beckeri zones in F1 and F2 outcrops; Upper Kimmeridgian –Beckeri zone in Italy, Germany and Kenia, Cavouri-Beckeri zones in Spain and Sesquinosodum-Beckeri zones in Bulgaria.

Taramelliceras (Taramelliceras) pugile pugiloides (Canavari, 1896)

Pl. 1, Fig. 2.

1872 *Oppelia pugilis* - GEMMELLARO; p. 36; Pl. 6, Fig. 2.

1896 *Oppelia pugiloides* Canavari - CANAVARI; p. 45; Pl. 7, Fig. 3.

2020 *Taramelliceras pugile pugiloides* (Canavari, 1896) - SARTI; p. 100; Pl. 6, Fig. 2.

Material: LRp3H8 Grigore Collection in GIR.

Remarks: the specimen LRp3H8 is of medium size (Table 10) and preserves a half of a whorl from the living chamber; it differs from the subspecies *T. pugile pugiloides* by elliptical and rarer tubercles on the living chamber and a generally stronger ornamentation; at the same time, compared to the type specimen, it has a wider umbilicus and a more depressed section. Given that the morphological and morphometric parameters of the specimens described by other authors (Gemmellaro, Sarti) vary greatly ontogenetically, and the closest species / subspecies (*T. pugile*, *T. subpugile*, *T. mikoi*) show greater differences (in ornamentation), my specimen can be included in this subspecies, with the appreciation that it is a form at the boundary between it and *T. mikoi*.

Table 10. Measurements of *Taramelliceras (Taramelliceras) pugile pugiloides* (Canavari, 1896) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H
Lectotype	105	-	105	21	49.4	29.4	0.20	0.47	0.28	0.60
Gemmellaro specimen	100	71	100	22	44	30	0.22	0.44	0.30	0.68
LRp3H8	72	~50	67	16	28	20	0.24	0.42	0.30	0.71

Occurrence: Upper Kimmeridgian–Eudoxus-Beckeri zones in F2 outcrop; Upper Kimmeridgian –Acanthicum-Beckeri zones in Italy and Spain.

Taramelliceras (Taramelliceras) pugile pseudopugile Sarti, 1993

1973 *Oppelia (Taramelliceras)* sp. – PREDA; Pl. 8, Fig. 1.

1973 *Oppelia (Taramelliceras) mikoi* Herbich – PREDA; Pl. 8, Fig. 2.

1986 *Taramelliceras (Taramelliceras) pugile* Neumayr – SARTI; p.494; Pl. 2, Figs. 3a-b.

1993 *Taramelliceras (Taramelliceras) pugile pseudopugile* nov.subp. – SARTI; p. 65; Pl. 2, Figs. 3a-b; Fig. txt. 15

Material: Preda's two specimens (1973) stored in Collection of MPN were removed to LGB Collection and refigured in Pelin (1976). Inv. „2p LGB” (Pl. 8, Fig. 1, Preda) and inv. „3p LGB” (as *T. mikoi* - pl. 8, fig 2, Preda) (provisory numbers); first originates from red nodular facies and second from the green-grey facies, booth from Ghilcoş outcrops.

Table 11. Measurements of *Taramelliceras (Taramelliceras) pugile pseudopugile* Sarti, 1993 specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H
Lectotype	124	86	124	21	67	41	0.17	0.54	0.33	0.61
Preda “2p LGB”	94	-	94	16	47	31	0.17	0.50	0.33	0.66
Preda “3p LGB”	108	75	108	17	55	34	0.16	0.51	0.31	0.62

Remarks: the “2p LGB” specimen is of medium size, is fragmentary and preserves a third of a whorl from the living chamber; the “3p LGB” specimen is of medium size and preserves ½ of the living chamber. Both specimens have the specific ornamentation and morphometric parameters (Table 11) comparable to those of the type specimen of Sarti.

Occurrence: Kimmeridgian–Divisum(?) or Acanthicum zone in F1 or F2 outcrop; Kimmeridgian –Divisum (Herbichi) -Acanthicum zones in Italy.

CONCLUSIONS

The ammonites assemblage from Ghilcoş Kimmeridgian it is enriched with six more taxa of the *Taramelliceras* genus: *T. groenackeri*, *T. pseudoflexuosum*, *T. platyconcha*, *T. subcallicerum*, *T. pugile pugiloides* and *T. pugile pseudopugile*, last one by reviewing Preda Collection published in 1973.

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Plate 1

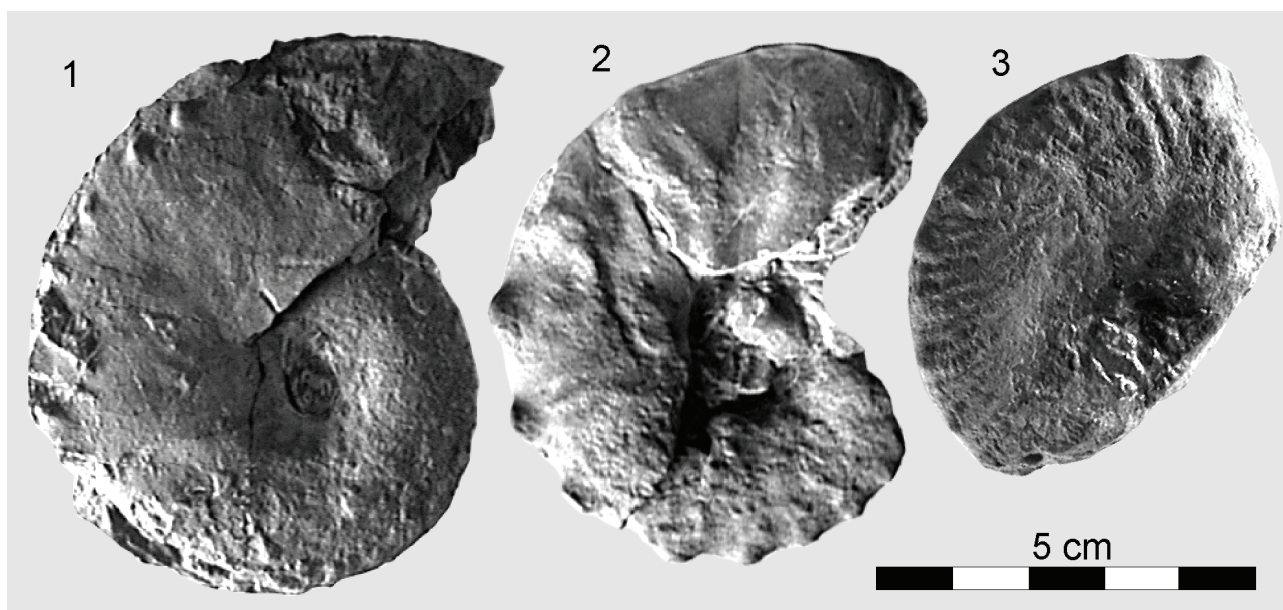


Figure: 1. *Taramelliceras (Taramelliceras) pugile pugile* (Neumayr) (LRp223D20), compressed conch in marl – green-grey facies in block D, level 20, F2, Beckeri Zone; 2. *Taramelliceras pugile pugiloides* (Canavari) (LRp3H8) – green-grey facies in block H, level 8, F2, Acanthicum Zone (Upper Kimmeridgian); 3 *Taramelliceras (Taramelliceras) pugile pugile* (Neumayr) (LRp193H11), part of phragmocone – green-grey facies in block H, level 11, F2, Eudoxus(?) Zone (Upper Kimmeridgian).

Plate 2

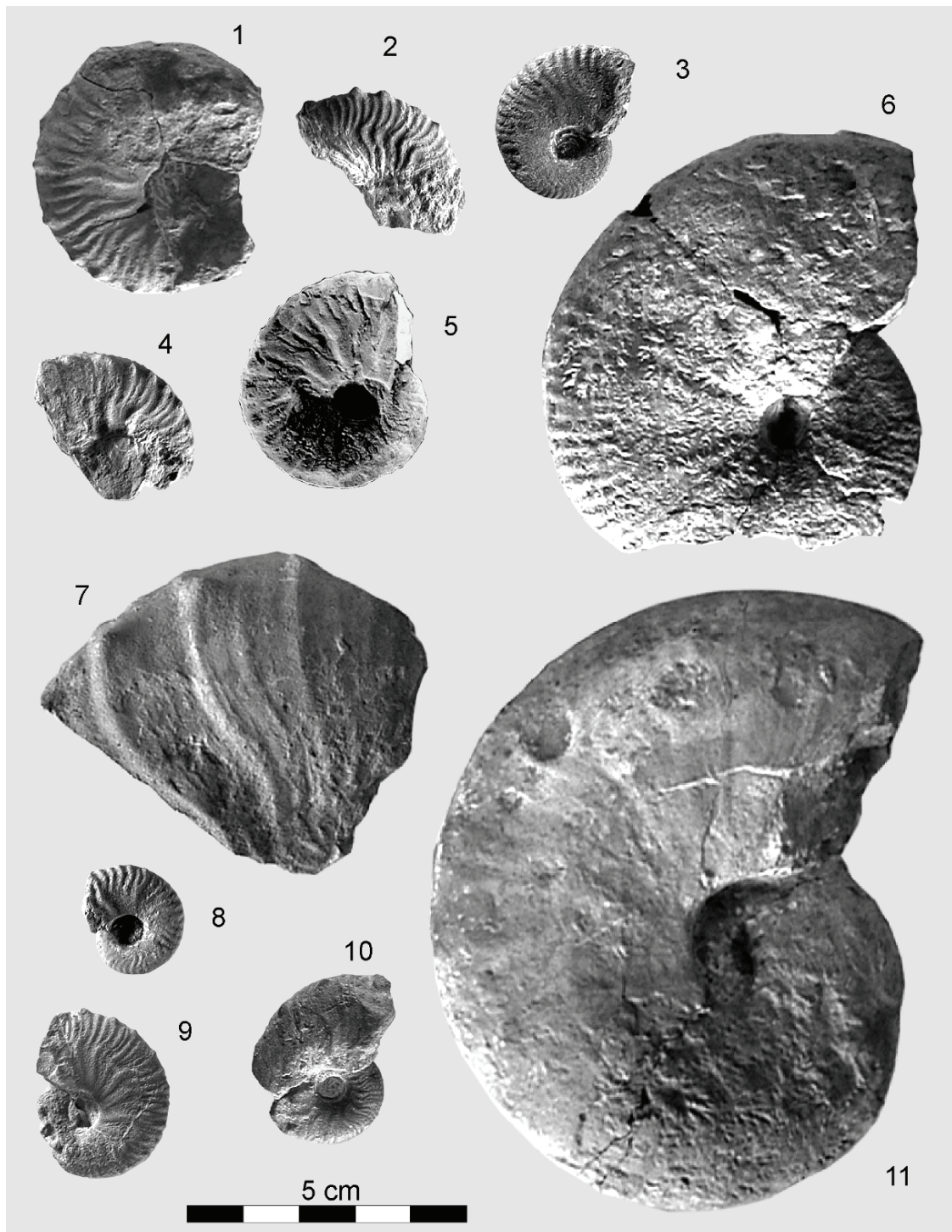


Figure: 1. *Taramelliceras (Taramelliceras) cf. trachinotum* (Oppel) (LRp127dp), phragmocone – green-grey facies, F2, Lower Kimmeridgian; 2. *Taramelliceras (T.) trachinotum* (Oppel) (LRp129dp) – green-grey facies, F2, Lower Kimmeridgian; 3. *Taramelliceras (T.) erycinum* (Gemmellaro) (LRp157T2.0), phragmocone – red nodular facies, T2 level (in the Ghilcoş walls) F1, Divisum Zone; 4. *Taramelliceras (T.) cf. trachinotum* (Oppel) (LRp145A), phragmocone - green-grey facies, block A, F2, Lower Kimmeridgian; 5. *Taramelliceras (T.) trachinotum* (Oppel), Preda specimen (**10 MPN**) – red nodular facies, from the Ghilcoş walls (F1), Lower Kimmeridgian; 6. *Taramelliceras (T.) erycinum* (Gemmellaro) (LRp18A), phragmocone – green-grey facies, block A, F2, Lower Kimmeridgian; 7. *Taramelliceras (T.) pseudoflexuosum* (Favre) (LRp59A10), part of phragmocone – green-grey facies in block A, level 10, F2, Divisum Zone; 8. *Taramelliceras (T.) groenackeri* (Moesch) (LRp161E1) – green-grey facies in block E, level 1, Platynota Zone; 9. *Taramelliceras (T.) pseudoflexuosum* (Favre) (LRp141D2) - green-grey facies in block D, level 2, Acanthicum Zone; 10. *Taramelliceras (T.) pseudoflexuosum* (Favre) (LRp142R1), juvenile – red nodular facies, from the Ghilcoş walls R1 level (F1), Divisum Zone; 11. *Taramelliceras (T.) pseudoflexuosum* (Favre) (LRp89A) - green-grey facies, block A, F2, Kimmeridgian.

Plate 3



Figure: 1. *Taramelliceras (Taramelliceras) mikoi* (Herbich), **Holotype (2044 UC)** in UBB repository – green-grey facies, F2, Lower Kimmeridgian; 2. *Taramelliceras (T.) cf. pugile* (Neumayr) (LRp201B5), juvenile - green-grey facies, block B, level 5, F2, Upper Kimmeridgian, Eudoxus(?) Zone; 3. *Taramelliceras (T.) pugile cf. pugile* (Neumayr) Preda specimen (**45 MPN**) in MPN repository; phragmocone – green-grey facies, F1, Upper Kimmeridgian; 4. *Taramelliceras (T.) mikoi* (Herbich) (LRp192H12), phragmocone – green-grey facies in block H, level 12, F2, Eudoxus(?) Zone (Upper Kimmeridgian); 5. *Taramelliceras (T.) cf. platyconcha* (Gemmellaro) (LRp1K12) - red nodular facies, from the Ghilcoș walls K12 level (F1), Divisum Zone; 6. *Taramelliceras (T.) cf. subcallicerum* (Gemmellaro) (LRp121A), fragmentary – green-grey facies, block A, F2, Kimmeridgian; 7. *Taramelliceras (T.) nov.sp. aff. Taramelliceras (T.) subcallicerum* (Gemmellaro) (LRp4D3), phragmocone – green-grey facies in block D, level 3, F2, Acanthicum Zone.