

TARAMELLICERATINAE ((*Taramelliceras compsum* (Oppel)) FROM KIMMERIDGIAN OF GHILCOȘ MOUNTAIN (THE EASTERN CARPATHIANS – ROMANIA)

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Abstract. The paper is a review of the species *Taramelliceras compsum* Oppel, which has been assigned various other forms / species (OLORIZ, 1978; SAPUNOV, 1979; SARTI 1993) as subspecies, morphotypes or varieties. Here we considered most of the forms under the morphotypes rank: *T (T) compsum compsum*, *T (T) compsum holbeini*, *T (T) compsum franciscanum*, *T (T) compsum hemipleurum*, *T (T) compsum kochi* and two more new ones are proposed subspecies *T (T) compsum bicostatum* and *T (T) compsum tuberculatum*, all forms/subspecies found in the same formation “Beds with Acanthicum”, from the Kimmeridgian from Ghilcoș (Hăghimaș Mountains, Romania).

Keywords: *Taramelliceras compsum*, paleontology, Hăghimaș, Carpathians, Romania.

Rezumat. Taramelliceratinae ((*Taramelliceras compsum* (Oppel)) din Kimmeridgianul din Muntele Ghilcoș (Carpații Orientali - România). Lucrarea constituie o revizuire a speciei *Taramelliceras compsum* Oppel, căreia i s-au atribuit diverse alte forme /specii (OLORIZ, 1978; SAPUNOV, 1979; SARTI, 1993) ca subspecii, morfotipuri sau varietăți. Aici am considerat majoritatea formelor cu rang de morfotipuri: *T (T) compsum compsum*, *T (T) compsum holbeini*, *T (T) compsum franciscanum*, *T (T) compsum hemipleurum*, *T (T) compsum kochi* și sunt propuse încă două noi forme *T (T) compsum bicostatum* și *T (T) compsum tuberculatum*, toate formele /morfotipi întâlnite în aceiași formațiune „Stratele cu Acanthicum”, din Kimmeridgianul de la Ghilcoș (Munții Hăghimaș, România).

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

INTRODUCTION

The described fauna comes from the Eastern Carpathians - Haghimaș Massif, (Kimmeridgian, “Acanthicum Beds”) of Lacu Roșu (Ghilcoș/Uciagașu and Ciofronca) area (Fig. 1). The litho- and bio- stratigraphy of these Upper Jurassic deposits and the outcrops have been previously described in detail (GRIGORE et al., 2009 and GRIGORE, 2011).

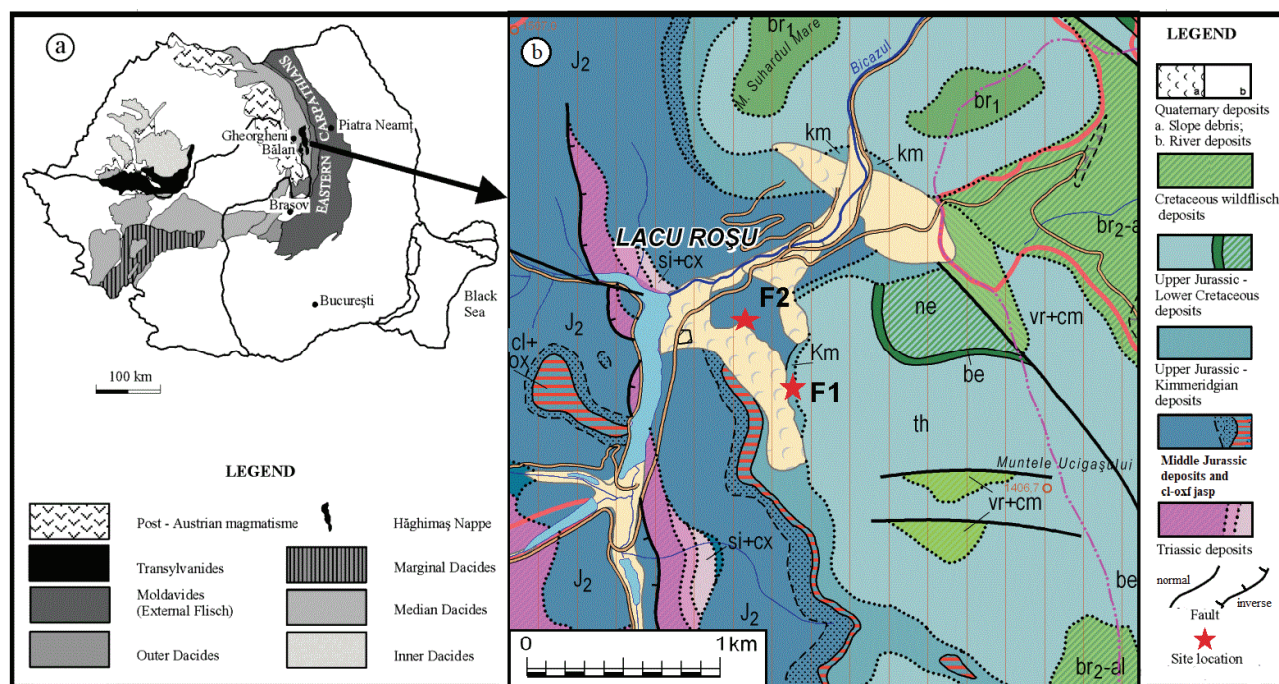


Figure 1. Localization of sites: a) in Romania - geotectonic sketch (after SĂNDULESCU, 1984); b) on the geological map scale 1: 50,000 (after SĂNDULESCU et al. 1975, revised by GHEUCA & GRIGORE, 2010).

The species presented here belongs to the Subfamily Taramelliceratinae Spath, well represented in the region by number of species and specimens, on the entire interval Kimmeridgian - Early Tithonian. Here a revision of some taxa of the genus *Taramelliceras* and, in particular, the species *T. compsum* (Oppel, 1863) is provided. All specimens described by previous authors are reviewed here in order to complete the picture of the association existing in this region (NEUMAYR, 1873; HERBICH, 1878 and PREDA, 1973). All these taxa came from the “middle” Kimmeridgian interval – Divisum to Eudoxus zones (Fig. 2).

Material: LRp115A8, LRp73K7, LRp7D3, LRp55A3, LRp29, LRp131A7, LRp19, LRp5A4, LRp13D2, LRp37T3, LRp47D2, LRp45D3, LRp107A, LRp86A9, LRp87A6, LRp40D2, LRp41, LRp39, LRp44K9; *Taramelliceras* (*T.*) cf. *compsum*: LRp249R1, LRp254T1, LRp335W5,5 Grigore Collection in GIR. Neumayr's specimens (1873): not figured, only mentioned from the Ghilcoș and Ciofronca outcrops. Herbich's specimen (1878): in the Collection of UBB and figured (Pl. 5, Fig. 1); originates from red nodular limestones – Ghilcoș outcrop (F1). Preda's specimens (1973): Collection of MPN inv. 13b MPN (Pl. 9, Fig. 5) originates from grey/green nodular limestones and inv. 11 MPN ("*Oppelia pugilis*" – Pl. 7, Fig. 2) from red nodular limestones – both from the Ghilcoș outcrop (F).

Table 1. Measurements of *Taramelliceras*(*T.*) *compsum* mph. *compsum* (Oppel, 1863) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
lectotype	146	80?	146	15	80	37	0.10	0.55	0.25	0.46	1
expl. Herbich	102	-	102	12	54	31	0.12	0.53	0.30	0.57	-
Preda 13b MPN	73	73	73	8	41	24	0.11	0.56	0.33	0.58	0.98
Preda 11 MPN	38	35	33	4.5	16	11	0.14	0.48	0.33	0.69	-
LRp115A8	67	67	51	8	27	16	0.16	0.53	0.31	0.59	0.96
LRp73K7	124	105	84	11	48	26	0.13	0.57	0.31	0.54	0.76
LRp7D3	190	115	145	20	79	45	0.14	0.54	0.31	0.57	0.71
LRp55A3	170	115	115	16	63	36	0.14	0.55	0.31	0.57	0.79
LRp131A7	46	36	40	7	21	13	0.17	0.52	0.32	0.62	1.04
LRp19	81	>81	81	12	43	25	0.15	0.53	0.31	0.58	0.91
LRp5A4	80	>80	80	11	46	25	0.14	0.57	0.31	0.54	-
LRp13D2	82	79	80	12	44	24	0.15	0.55	0.30	0.54	0.8
LRp47D2	123	90	90	11	50	22	0.12	0.55	0.24	0.44	0.7
LRp45D3	116	116	92	13	49	29	0.14	0.53	0.31	0.59	-
LRp107A	125	87	87	12	48	26	0.14	0.55	0.30	0.54	0.81
LRp86A9	130	101	93	13	50	26	0.14	0.54	0.28	0.52	0.84
LRp87A6	91	91	85	11	48	26	0.13	0.56	0.30	0.54	0.79
LRp40D2	107	90	90	11	49	28	0.12	0.54	0.31	0.57	1
LRp41	124	78	89	13	48	28	0.15	0.54	0.31	0.58	0.74
LRp39	141	105	120	16	65	32	0.13	0.54	0.26	0.49	-
LRp44K9	140	113	113	16	59	31	0.14	0.52	0.27	0.52	0.7
LRp37T3.0	100	84	100	13	55	31	0.13	0.55	0.31	0.56	0.96

Remarks: in most specimens, the living chamber is partially preserved, and the ornamentation is usually well-visible only on one side. There are a few juvenile and a few gerontic specimens (exceeding 150 mm in diameter), most of which have a diameter around 120 mm (see Table 1). Regarding the morphological parameters, there is a variability inscribed in the limits of the *compsum* subspecies, regarding: the inflection of the ribs, their strength and density, as well as the density of the tubercles. There are also variations of morphometric parameters (within species limits), regarding the width of the umbilicus and the thickness of the whorls. The LRp7D3 specimen has the morphological and morphometric parameters closest to those of the type specimen.

The specimen figured by Herbich is of moderate size and preserves ½ of whorl with the living chamber; compared to the type specimen it has a slightly wider cross-section and rarer ornamentation. The specimen figured by Preda represents a small fragmocon, whose morphological and morphometric parameters are within the limits of the variability of this subspecies, while the 11MPN specimen is a deformed juvenile, which presents the morphological characteristics of this species, differing morphometrically due to deformation and erosion.

Occurrence: Kimmeridgian – Divisum-Acanthicum zones in Ghilcoș outcrops; Kimmeridgian – Divisum-Acanthicum zones in Italy, Spain, Bulgaria, Swiss, France and Germany.

Taramelliceras (*Taramelliceras*) *compsum* morphotype *holbeini* (Oppel, 1863)
Pl. 4, Fig. 4.

1863 *Ammonites Holbeini* - OPPEL; p. 213.

1872 *Oppelia Holbeini* Oppel - GEMMELLARO; p. 35; Pl. 6, Fig. 1.

*1873 *Oppelia Holbeini* Oppel - NEUMAYR; p. 166; Pl. 3, Fig. 1.

1876 *Ammonites* (*Oppelia*) *Holbeini* Oppel - LORIOLO; p. 37; Pl. 3, Figs. 6-7.

1877 *Ammonites* (*Oppelia*) *holbeini* Oppel - FAVRE; p. 31; Pl. 2, Figs. 11-12.

1878 *Oppelia Holbeini* Oppel – HERBICH; p. 149.

1955 *Taramelliceras* (*Taramelliceras*) *compsum* (Oppel) - HOLDER; p. 110; Figs. tx. 96-98, 101.

1973 *Oppelia* (*Taramelliceras*) *holbeini* Oppel – PREDÁ; Pl. 6, Fig. 2.

1978 *Taramelliceras* (*Taramelliceras*) *compsum* var. *holbeini* (Oppel) - OLORIZ; p. 87; Pl. 6, Fig. 4.

1979 *Taramelliceras* (*Taramelliceras*) *compsum holbeini* (Oppel) - SAPUNOV; p. 49; Pl. 9, Figs. 3; 4.

1993 *Taramelliceras* (*Taramelliceras*) *compsum compsum* morfotipo *holbeini* (Oppel) - SARTI; p. 60.

Material: LRp10D3, LRp14A3, LRp17D3, LRp20A4, LRp6K6, LRp26A4, LRp24A3 Grigore Collection in GIR. Herbich's specimen (1878): in Collection of UBB, not figured; originates from red nodular limestones – Ghilcos and Ciofronca outcrops (F1). Preda's specimen (1973): Collection of MPN inv. 28 MPN ("*T. (T.) compsum* cf. *holbeini* (Oppel)") - Pl. 6, Fig. 2) originates from red/green nodular limestones – Ghilcoş outcrop (W1-W3 profile).

Table 2. Measurements of *Taramelliceras(T.) compsum* mph. *holbeini* (Oppel, 1863) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
lectotype	96	-	96	11.5	52.7	31.7	0.12	0.55	0.33	0.60	0.77
expl. Herbich A	70	-	70	10	38.5	20.3	0.14	0.55	0.29	0.53	-
Preda 28 MPN	97	>97	97	13	52	30	0.13	0.54	0.31	0.58	-
LRp10D3	90	>90	75	10	40	23	0.13	0.53	0.30	0.57	0.83
LRp14A3	97	>97	97	12	53	30	0.12	0.55	0.31	0.57	0.91
LRp17D3	85	>85	85	11	46	26	0.13	0.54	0.31	0.56	0.86
LRp20A4	68	>68	64	9	35	19	0.14	0.55	0.30	0.54	0.83
LRp6K6	61	>61	61	9	33	19	0.15	0.54	0.31	0.57	0.7
LRp24A3	55	>55	55	11	30	20	0.20	0.54	0.36	0.67	0.77
LRp26A4	-	-	72	11	40	23	0.15	0.55	0.32	0.57	1.15

Remarks: all my specimens represent fragmocons and fit the morphological and morphometric parameters of this subspecies. Specimens LRp14A3, LRp26A4 and LRp6K6 show some differences from the type specimen: a finer ribbing, the last one, also having a straight umbilical wall (with angular border); the LRp24A3 has a wider umbilicus.

Specimen "A" described by Herbich, has a larger umbilicus and a narrower section than the type specimen; the specimen figured by Preda (28MPN), has a large waist and represents a damaged fragmocon, with a thicker secondary rib and a section, slightly narrower than the type specimen (Table 2).

Occurrence: Late Kimmeridgian –Acanthicum Zone in Ghilcoş outcrops; Kimmeridgian – Divisum-Acanthicum zones in Italy, Spain, Bulgaria and Germany.

Taramelliceras (Taramelliceras) compsum morphotype *franciscanum* (Fontannes, 1879)

Pl. 1, Fig. 2; Pl. 2, Fig. 1; Pl. 3, Fig. 1.

1879 *Oppelia franciscana* - FONTANNES; p. 41; Pl. 6, Figs. 1a-b, 2.

1978 *Taramelliceras (Taramelliceras) compsum* var. *franciscanum* (Fontannes) - OLORIZ; p. 86; Pl. 6, Fig.2.

1979 *Taramelliceras (Taramelliceras) franciscanum* (Fontannes) - SAPUNOV; p. 50; Pl. 10, Figs. 1a-b.

1993 *Taramelliceras (Taramelliceras) franciscanum* (Fontannes) - SARTI; p. 62.

Material: LRp11A3, LRp144A3, LRp138A8, LRp136A6, LRp12D3, LRp23D2, LRp117A7, LRp25, LRp70K7, LRp204W6,0, LRp116A Grigore Collection in GIR.

Table 3. Measurements of *Taramelliceras(T.) compsum* mph. *franciscanum* (Fontannes, 1879) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
holotype	79	-	75	12	40	18	0.16	0.53	0.24	0.45	0.60
LRp11A3	56	>56	42	8	23	12	0.19	0.55	0.28	0.52	0.81
LRp144A3	31	-	31	7	15	9	0.22	0.48	0.29	0.60	0.8
LRp138A8	32	-	32	7	16	10.5	0.22	0.50	0.33	0.66	1.06
LRp136A6	33	-	33	6.5	17	11	0.20	0.51	0.33	0.65	1
LRp12D2	111	83	53	9	28	18	0.13	0.53	0.33	0.64	0.83
LRp23D2	91	88	91	12	49	28	0.13	0.54	0.31	0.57	0.63
LRp117A7	87	>87	67	10	36	221	0.15	0.54	0.31	0.58	0.75
LRp25	79	75	70	11	39	23	0.16	0.56	0.33	0.59	0.83
LRp70K7	102	79	83	11	48	27	0.13	0.58	0.32	0.56	0.66

Remarks: the studied specimens are in different stages of development, mostly in the juvenile stage, only two in the adult stage (>100 mm diameter); all specimens partially preserve the living chamber. Compared to the type specimen (Table 3), they have the following features: the juveniles have a thicker section, and the adult ones have a wider umbilicus; morphologically all specimens correspond to the ornamental parameters of this subspecies, with some exceptions: LRp117A7 - has a thicker primary rib, LRp136A6 and LR138A8 - have a coarser secondary ribbing.

Occurrence: Kimmeridgian – Divisum-Acanthicum zones in the Ghilcoş outcrops; Kimmeridgian – Divisum-Beckeri zones in Italy, Spain, France (Crussol) and Bulgaria.

Taramelliceras (Taramelliceras) compsum mph. *hemipleurum* (Fontannes, 1879)

Pl. 3, Fig. 3.

1879 *Oppelia hemipleura* - Fontannes; p. 47; Pl. 6, Figs. 6a- b, 7a-b.

1955 *Taramelliceras compsum* cf. *hemipleurum* (Fontannes) - HOLDER; p. 114; Fig. tx. 110.

1978 *Taramelliceras* (*Taramelliceras*) sp.gr. *T. compsum hemipleurum* (Fontannes) - OLORIZ; p. 89.

1993 *Taramelliceras* (*Taramelliceras*) *compsum hemipleurum* (Fontannes) - SARTI; p. 61.

Material: LRp102A, LRp22A Grigore Collection in GIR.

Table 4. Measurements of *Taramelliceras*(*T.*) *compsum* mph. *hemipleurum* (Fontannes, 1879) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
holotype	95	-	95	15.2	47.5	23.8	0.16	0.50	0.25	0.50	0.66
LRp102A	115	107	96	12	53	30	0.13	0.55	0.31	0.57	0.59
LRp22A	88	>88	58	8	33	18	0.14	0.57	0.31	0.54	0.75

Remarks: the specimen LRp102A partially preserves the living chamber and has a diameter greater than 100 mm; LRp22A only is a fragmocon. The ornament of both specimens can be compared to that of the type specimen. The morphometric parameters (Table 4) of both specimens show small differences from the type specimen: the width of the section larger and the umbilicus narrower; these morphometric differences can be attributed to deformations, as in the species *T. (T.) compsum franciscanum*, which possesses a shell with a more delicate ornament, there are the same deformational problems in this region.

Occurrence: Early Kimmeridgian – Divisum Zone in Ghilcoș outcrops; Early Kimmeridgian – Herbichi (Divisum) Zone in Italy, Spain and France (Crussol).

Taramelliceras (*Taramelliceras*) *compsum* morphotype *kochi* (Herbich, 1878)

Pl. 1, Fig. 1; Pl. 2, Fig. 4, 5; Pl. 3, Fig. 4 (holotype); Pl. 4, Fig. 3 (paratype), Figs. 1-2, 5.

1878 *Ammonites* (*Oppelia*) *Kochi* - Herbich; p. 151; Pl. 6-7, Figs. 1a-b, 2.

1973 *Oppelia* (*Taramelliceras*) *kochi* Herbich – Preda; Pl. 7, Fig. 1.

1978 *Taramelliceras* (*Taramelliceras*) *compsum* var. *kochi* (Herbich) - Oloriz; p. 87; Pl. 6, Fig. 1.

1986 *Taramelliceras* (*Taramelliceras*) *compsum* (Oppel) - Sarti; p. 496.

1993 *Taramelliceras* (*Taramelliceras*) *compsum compsum* morfotipo *kochi* (Herbich) - Sarti; p. 60.

Material: LRp118A, LRp16D3, LRp119J, LRp94A, LRp99A, LRp90AIII, LRp137R1, LRp139A8, LRp27D3, LRp9D2, LRp110T0,3, LRp506M2; *Taramelliceras* (*T.*) *compsum* cf. *kochi*: LRpW6 Grigore Collection in GIR. Holotype (Herbich): Collection of UBB **2046a** UBB (Fig. 6-7/1 a, b) - originates from greenish sandy limestones from Ghilcoș and a Paratype: **2046b** UBB (Fig. 6-7/2) - originates from red nodular limestones from Ciofranca. Preda's specimen (1973): Collection of MPN (figured in its publication) but removed in the UB Collection of Pelin (1976, Pl. 3, Fig. 3), which re-figured this specimen as "*Taramelliceras mikoi*"(1pLGB); originates from red nodular limestones from Ghilcoș outcrop.

Table 5. Measurements of *Taramelliceras*(*T.*) *compsum* mph. *kochi* (Herbich, 1878) specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Holotype 2046a UC	100	71	100	15	55	32	0.15	0.55	0.32	0.58	0.61
Paratype 2046b UC	72	51	72	14	32	20	0.19	0.44	0.28	0.62	-
Preda 1p LGB	>79	-	72	13	36	-	0.18	0.50	-	-	-
LRp118A	65	>65	65	9	37	23	0.14	0.57	0.35	0.62	0.82
LRp16D3	80	76	80	11	44	28?	0.14	0.55	0.35	0.64	-
LRp119J	73	>73	73	13	39	24	0.18	0.53	0.33	0.61	0.84
LRp94A	72	54	54	6.5	31	21	0.12	0.57	0.39	0.68	0.96
LRp99A	122	93	93	14	53	30	0.15	0.57	0.32	0.57	0.88
LRp90AIII	154	107	107	15.5	55	34	0.14	0.51	0.32	0.62	0.81
LRp137R1	-	-	-	-	23	13	-	-	-	0.56	1
LRp139A8	32	25	32	7.5	16	11	0.23	0.50	0.34	0.69	1.19
LRp27D3	104	104	73	10.5	40	25	0.14	0.55	0.34	0.62	0.74
LRp9D2	111	77	83	13	43	27	0.16	0.52	0.32	0.63	0.77
LRp506M2	110	78	95	14	51	30	0.15	0.54	0.31	0.59	-

Diagnosis: medium-sized taramelliceratin with involute (U/D=0.15) and compressed shell. The cross-section has a specific, subrectangular shape, with a (wide - smooth) curved ventrum and convex flanks, flared periumbilically. The umbilical wall is high, oblique and incised, and the umbilical edge is prominent, angular. The ornamentation is vigorous, both the ribs and the tubercles are strong on the whole shell (phragmocone and the living chamber). The ribbing is dense, flexible, consists from bifurcates and intercalaries (starting from the lower third of the flanks), in relatively small numbers (2-4). There are only rows of ventro-lateral tubercles; the tubercles are round and strong, corresponding to the main ribs. The suture line has bifid and asymmetrical lobes and saddles.

Remarks: the LRp504M2 specimen has a size close to that of the holotype and is the best preserved; it preserves the living chamber (almost entirely), which is morphological as well as morphometric (Table 5) being almost

identical to those of the holotype. Specimen LRp139A8 is a juvenile that has a wider umbilicus than the holotype; the other specimens are in various stages of development. The LRp90AIII specimen has the largest size (gerontic), its characters (morphological and morphometric) being comparable to those of the type specimen, except for the shape and size of the tubercles, which are nipples, tall. The morphological variations observed in these specimens concern the thickness and density of the primary ribs, the prominence of the umbilical border, the size of the ventro-lateral tubercles and the modification (attenuation) of the ribs on the living chamber; however, all these variations remain in the spectrum of the *kochi* morphotype. The LRpW6 specimen is a juvenile that differs from the type specimen by a strong main costulation; being assigned to this species with reservations (confer).

The specimen figured by Preda is of medium size and has specific morphological characteristics, differing from the Holotype by a wider umbilicus, similar to that of Herbach's paratype (at similar diameters).

Occurrence: Kimmeridgian – Divisum-Acanthicum zones in Ghilcoş outcrops; Kimmeridgian – Herbichi (Divisum)-Acanthicum zones in Italy and Spain.

Taramelliceras (Taramelliceras) compsum morphotype *bicostatum* nov. mph.

Pl. 5, Fig. 1 (Holotype), Figs. 2-3 (paratypes).

Holotypus: the specimen figured in Pl. 5, Fig. 1, nr. inv. LRp109T1,0.

Derivatio Nominis: “bis” double and “costatum” with ribs (in Latin); with paired ribs - from the specific morphological peculiarity.

Locus Typicus: Ghilcoş (Lacu Roşu region, Hăghimaş Massif, România), “T” profile.

Stratum Typicum: *Acanthicum Beds*, T1,0 level (100 cm from the base).

Biostratigraphic range: the morphotype originates from the Kimmeridgian, Divisum - Acanthicum zones.

Material: Holotype LRp109T00; Paratypes: LRp132D3, LRp124T5,0, LRp35D3, LRp152D2.

Table 6. Measurements of *Taramelliceras(T.) compsum* mph. *bicostatum* nov. mph. specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Holotype LRp109T1,0	112	86	86	13	46	27	0.15	0.53	0.31	0.59	0.9
LRp132D3	?45	-	29	7	15	10	0.24	0.52	0.34	0.66	1.2
LRp124T5,0	?75	69	69	11.5	38	20?	0.17	0.55	0.29	0.53	0.82
LRp35D3	97	88	88	11	48	27	0.12	0.54	0.31	0.56	-

Description: Medium-sized taramelliceratin, involute and compressed (Table 6), which partially preserves the living chamber. The section is subrectangular, with convex flanks, slightly depressed periumbilically, similar to the section of the morphotype *kochi*, but narrower than this one; the ventral side is curved, of medium width. The umbilical wall is incised and relatively high, the border being angular. The ornamentation is represented by paired bifurcated ribs, flexed in the middle of the flanks; there are up to four external intercalary (residual) ribs. The ventro-lateral tubercles are of medium strength, round and distributed in pairs, next to each primary rib. The flexion of the ribs, their strength and the radiated character decrease from the internal to the external whorls, towards the living chamber, where the tubercles become stronger and elongate (elliptical).

Remarks: the specimen LRp132D3 represents a juvenile stage, whose ribs are more prominent; the primary ribs are transformed into bullae, and form a “knee” at an almost right angle to the secondary ribs; the ribbing is rursiradiate at this stage. The tuberculation in the juvenile stage is less accentuated, a stage in which there is also a siphonal row of tubers. The specimen LRp124T5,0 differs by a more oval section, a generally finer ribbing and a practical absence of tubers; the paired ribs are much closer.

Comparison: compared to the morphotype *T. compsum*, it has a different, thicker section and a different ribbing; compared to the morphotype *T. kochi* it has rarer primary ribs and elongated tubercles on the living chamber; compared to the morphotypes *T. franciscanum* and *T. hemipleurum*, it differs in cross-section, ribbing style and tuberculation. Compared to *T. trachinotum*, it has a narrower cross-section and does not have elongated ventral tubercles on the living chamber; compared to *T. mikoi*, it has a thicker cross-section and more flexible ribbing.

Occurrence: Kimmeridgian – Divisum-Acanthicum zones in the Ghilcoş outcrops.

Taramelliceras (Taramelliceras) compsum morphotype *tuberculatum* nov. mph.

Pl. 5, Fig. 4 (Holotype), Fig. 5 (paratype).

1993 *Taramelliceras (Taramelliceras) compsum compsum* morphotip *kochi* (HERBICH) - Sarti; p. 60; Pl. 3, Fig. 2.

Holotypus: the specimen figured in Pl. 5, Fig. 4, nr. inv. LRp104A6.

Derivatio Nominis: “tuberculatum” tuberculate (with tubercles in Latin) - from the specific morphological peculiarity.

Locus Typicus: Ghilcoş (Lacu Roşu region, Hăghimaş Massif, România), “A” profile.

Stratum Typicum: *Acanthicum Beds*, A6 level (50 cm from the base).

Biostratigraphic range: the morphotype originates from the Late Kimmeridgian, Acanthicum Zone.

Material: Holotype LRp104A6; Paratypes: LRp103M2 and the Sarti specimen (figured in 1993).

Table 7. Measurements of *Taramelliceras(T.) compsum* mph. *tuberculatum* nov. mph. specimens.

Specimen	Dmax	Dph	D	U	H	W	U/D	H/D	W/D	W/H	ic
Holotip LRp104A6	93	75	70	10.5	38	23	0.15	0.54	0.33	0.60	0.73
expl. Sarti	97	51	77	11	41	26	0.14	0.53	0.34	0.63	0.79
LRp103M2	85	85	66	9.5	36	21	0.14	0.54	0.32	0.58	0.75

Description (Holotype): the holotype partially preserves the living chamber and is slightly deformed on a side face; the ornament is well preserved. It is a medium-sized taramelliceratin, involute ($O/D=0.15$) and compressed (Table 7). The section is oval, with maximum thickness in the middle of the flanks (similar to the morphotype *kochi*); the flanks are convex, with a slight accentuation of the umbilical border. The ventrum is convex. The umbilicus, not very deep, has a rounded wall, prominent and incised. The ornamentation consists of ribs and ventro-lateral tubercles. The ribs are flexible, the primary ribs being very prominent and rare, the secondary one is finer and thicker (there are up to 9 secondary ones in a primary one). On the living chamber, the primary ribs become stronger, as opposed to the secondary (erased). The tubercles are round, relatively sparse and well developed (joining two secondary ribs) up to a diameter of 67 mm; after this diameter they thicken and become nipples, leaving a narrow ventrum below their height (which are perpendicular to the ventrum).

Remarks: the LRp103M2 specimen represents a phragmocone, with a less thick cross-section and a thicker primary ribs, the secondary ribs being coarser than the holotype. The tubercle thickens from a diameter of 60 mm and is more moderate in strength. The specimen figured as *T. kochi* by Sarti (1993) has comparable morphometric characteristics and a similar ornamentation, intermediate between the two forms described above. Thus, its (main - secondary) ribs is less differentiated, the primary ones being more frequent, and the tuberculation similar to that of the holotype, with the difference that in this specimen the tubercle thickens and increases from the diameter of 78 mm.

Comparisons: the two taxa that could be comparable to the specimens described above are *T. compsum kochi* and *T. platyconcha*. Compared to the morphotype *T. kochi*, it has a much stronger tuberculation and a narrowed venter; compared to *T. platyconcha*, it has thicker and finer secondary ribs, and the maximum thickness is at the middle of the flanks, in addition, the tubercles are much more prominent towards the venter. It could be a form of transition between the two species mentioned.

Occurrence: Late Kimmeridgian –Acanthicum Zone in Ghilcoș outcrops; Late Kimmeridgian – Acanthicum Zone in Italy.

CONCLUSIONS

As a conclusion, the ammonites assemblage in Ghilcoș area was enriched with more taxa of the *Taramelliceras* genus and with two new morphotypes proposed here – *T. compsum bicostatum* and *T. compsum tuberculatum*. A new revision was proposed for the group of *Taramelliceras compsum* (Oppel), with this occasion. Some of the previous specimens mentioned by PREDA (1973) were reviewed on this occasion.

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Plate 1

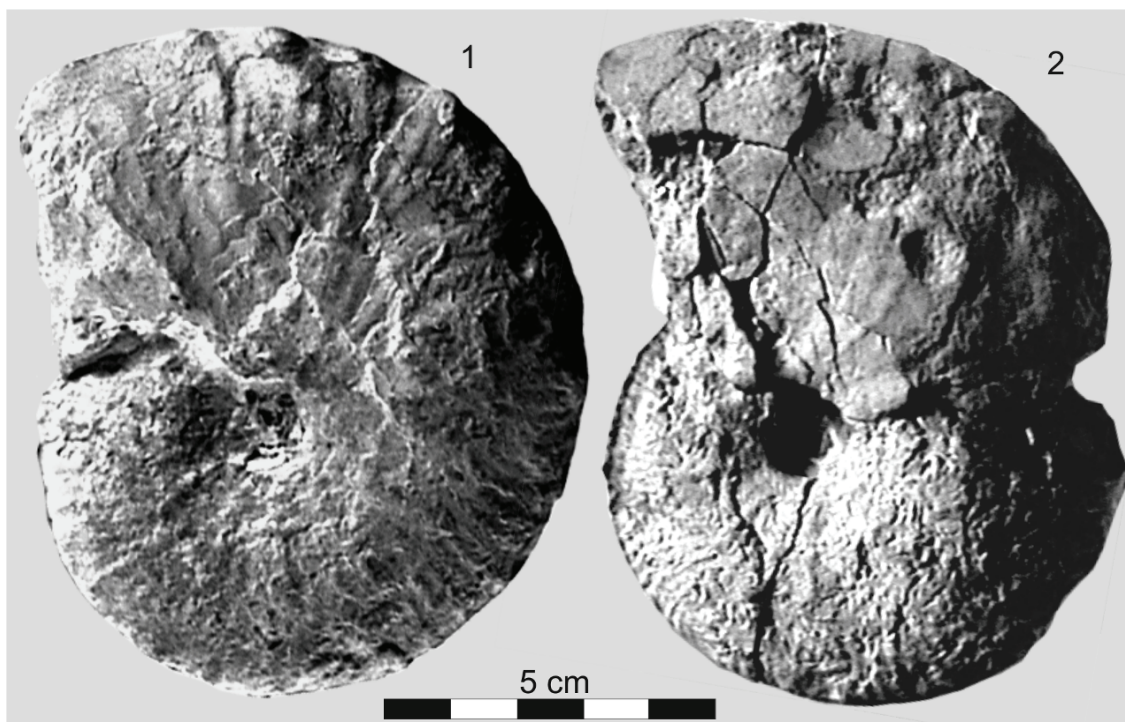


Figure: 1. *Taramelliceras (Taramelliceras) compsum mph. kochi* (Oppel) (LRp506M2); green nodular limestone, Early Kimmeridgian -Divisum Zone, North Ghilcoș blocks ("M" profile); 2. *Taramelliceras (Taramelliceras) compsum mph. franciscanum* (Fontannes) (LRp12D3); green nodular limestone, Late Kimmeridgian - Acanthicum Zone, North Ghilcoș blocks ("D" profile);

Plate 2

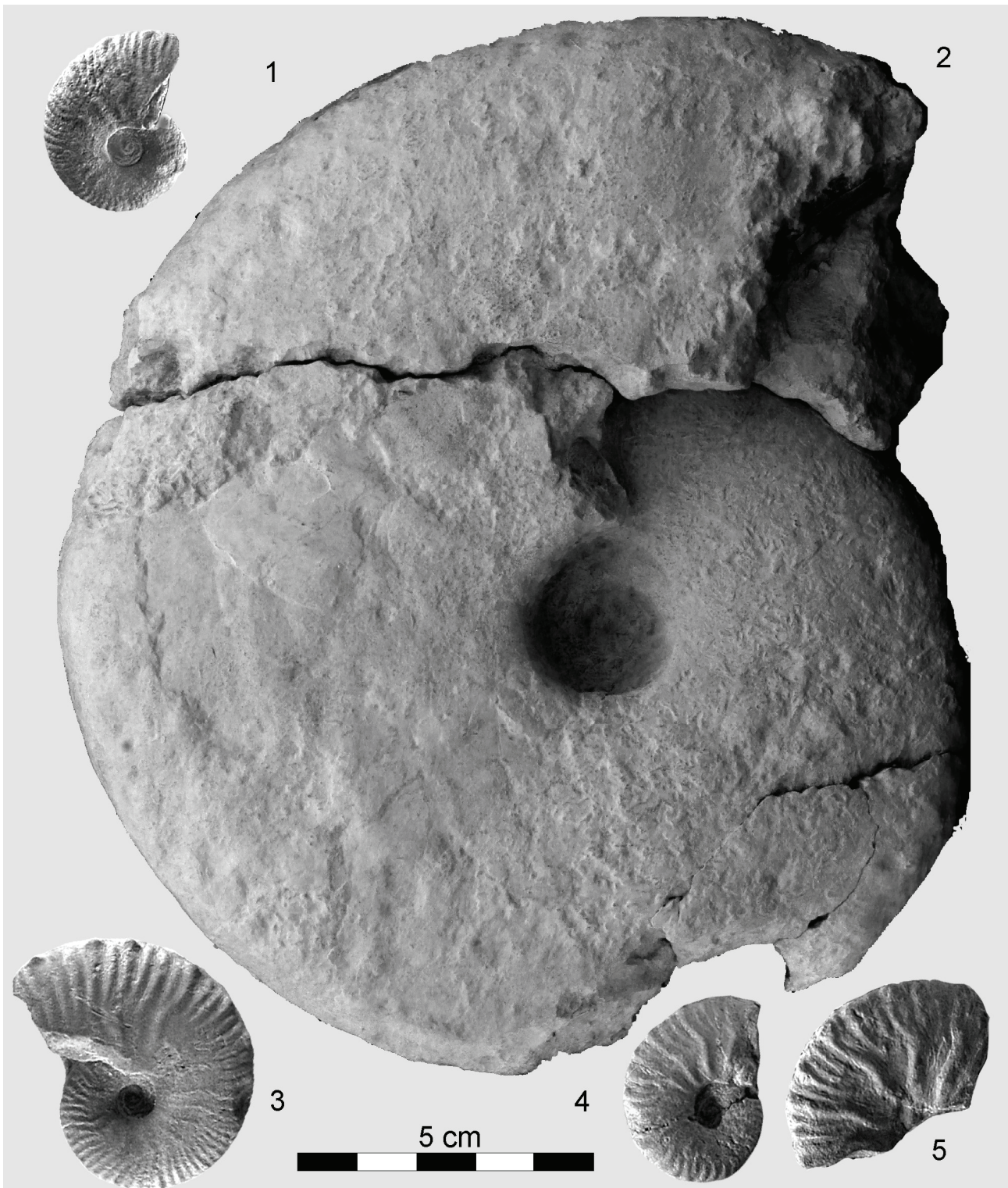


Figure 1. *Taramelliceras (Taramelliceras) compsum* mph. *franciscanum* (Fontannes) (LRp144A3), juvenile; green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoş blocks ("A" profile); 2. *Taramelliceras (Taramelliceras) compsum* mph. *compsum* (Oppel) (LRp7D3), gerontic; green nodular limestone, Late Kimmeridgian - Acanthicum Zone, North Ghilcoş blocks ("D" profile); 3. *Taramelliceras (Taramelliceras) compsum* mph. *compsum* (Oppel) (LRp131A7); green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoş blocks ("A" profile); 4. *Taramelliceras (Taramelliceras) compsum* mph. *kochi* (Herbich) (LRp139A8), juvenile; green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoş blocks ("A" profile); 5. *Taramelliceras (Taramelliceras) compsum* aff. *kochi* (Herbich) (LRp137R1), fragment; red nodular limestone, Early Kimmeridgian - Divisum Zone, Ghilcoş walls ("R" profile);

Plate 3

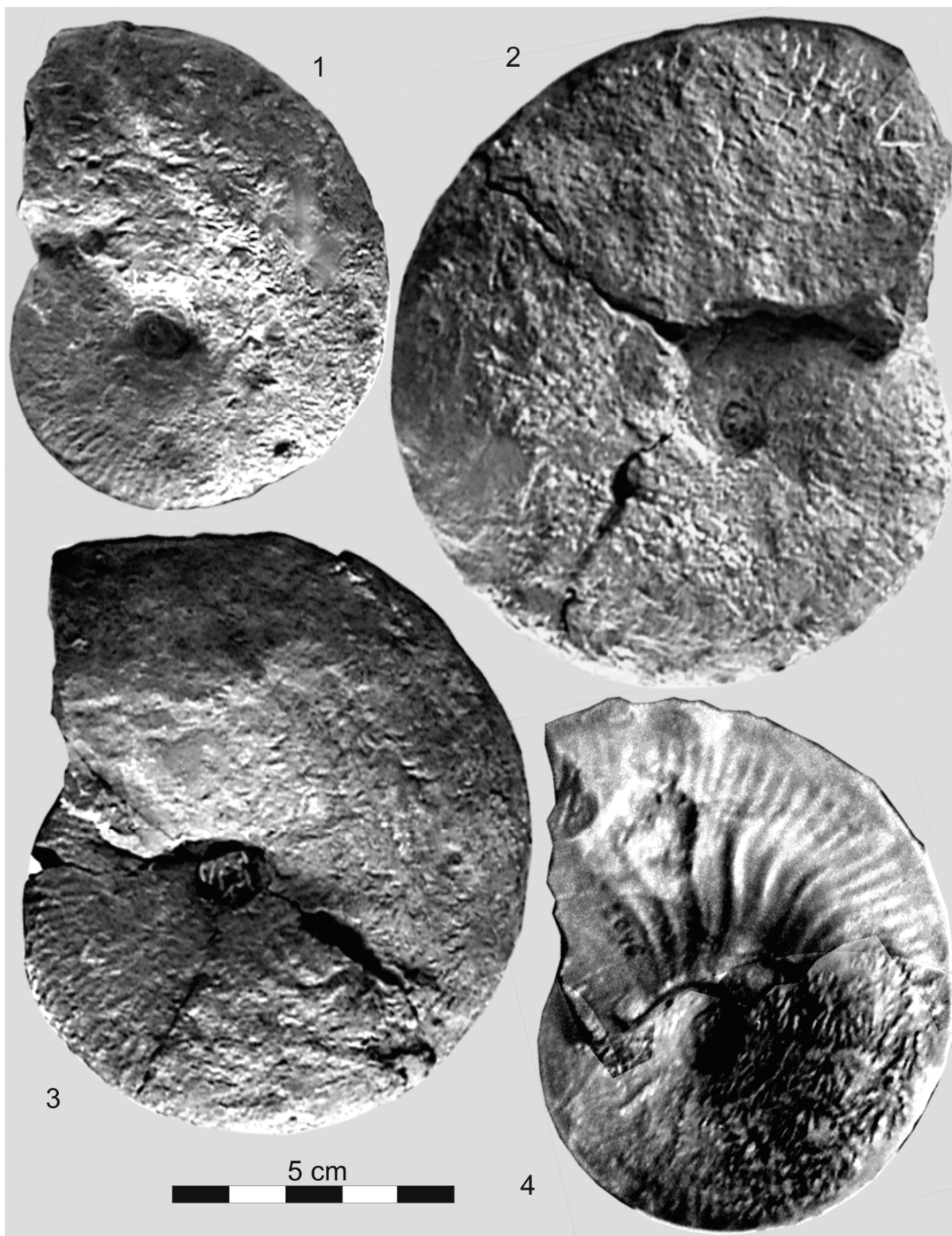


Figure 1. *Taramelliceras (Taramelliceras) compsum* mph. *franciscanum* (Fontannes) (LRp117A7), phragmocone; green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoș blocks ("A" profile); 2. *Taramelliceras (Taramelliceras) compsum* mph. *compsum* (Oppel) (LRp107A); green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoș blocks ("A" profile region); 3. *Taramelliceras (Taramelliceras) compsum* mph. *hemipleurum* (Fontannes) (LRp102A); green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoș blocks ("A" profile region); 4. *Taramelliceras (Taramelliceras) compsum* mph. *kochi* (Herbich) (holotype: 2046a UC); green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoș blocks ("A" profile region);

Plate 4

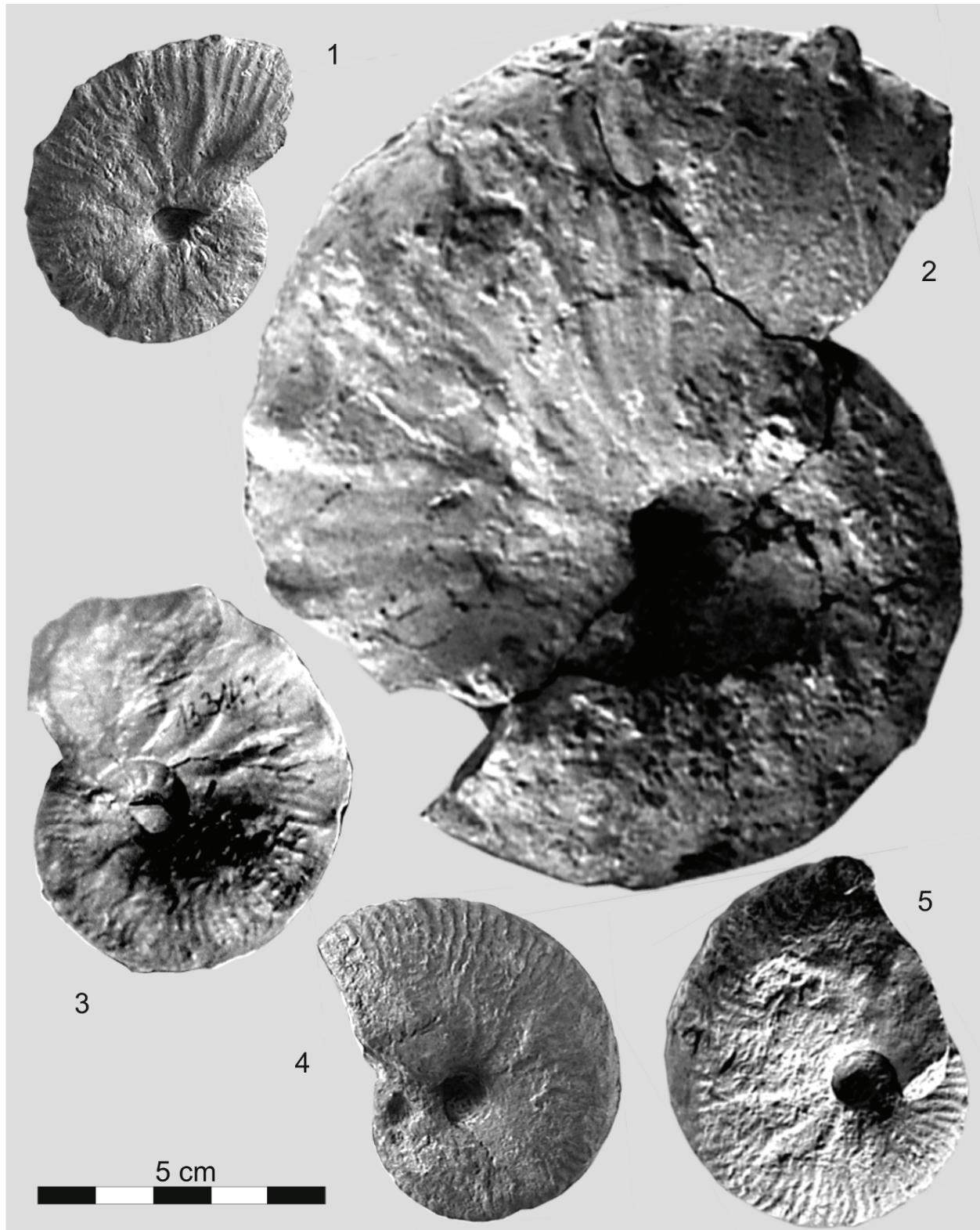


Figure 1. *Taramelliceras (Taramelliceras) compsum* aff. *mph. kochi* (Herbich)(LRp116A); green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoş blocks (“A” profile region); 2. *Taramelliceras (Taramelliceras) compsum* *mph. kochi* (Herbich) (LRp90AIII), gerontic; green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoş blocks (“A” profile region); 3. *Taramelliceras (Taramelliceras) compsum* *mph. kochi* (Herbich) (paratype) (2046b UC); red nodular limestone, Kimmeridgian, Ciofronca outcrop; 4. *Taramelliceras (Taramelliceras) compsum* *mph. holbeini* (Oppel)(LRp6K6), phragmocone; red nodular limestone, Early Kimmeridgian - Divisum Zone interval, Ghilcoş walls (“K” profile); 5. *Taramelliceras (Taramelliceras) compsum* *mph. kochi* (Herbich) (LRp118A), phragmocone; green nodular limestone, Kimmeridgian /Divisum – Acanthicum interval, North Ghilcoş blocks (“A” profile region)

Plate 5

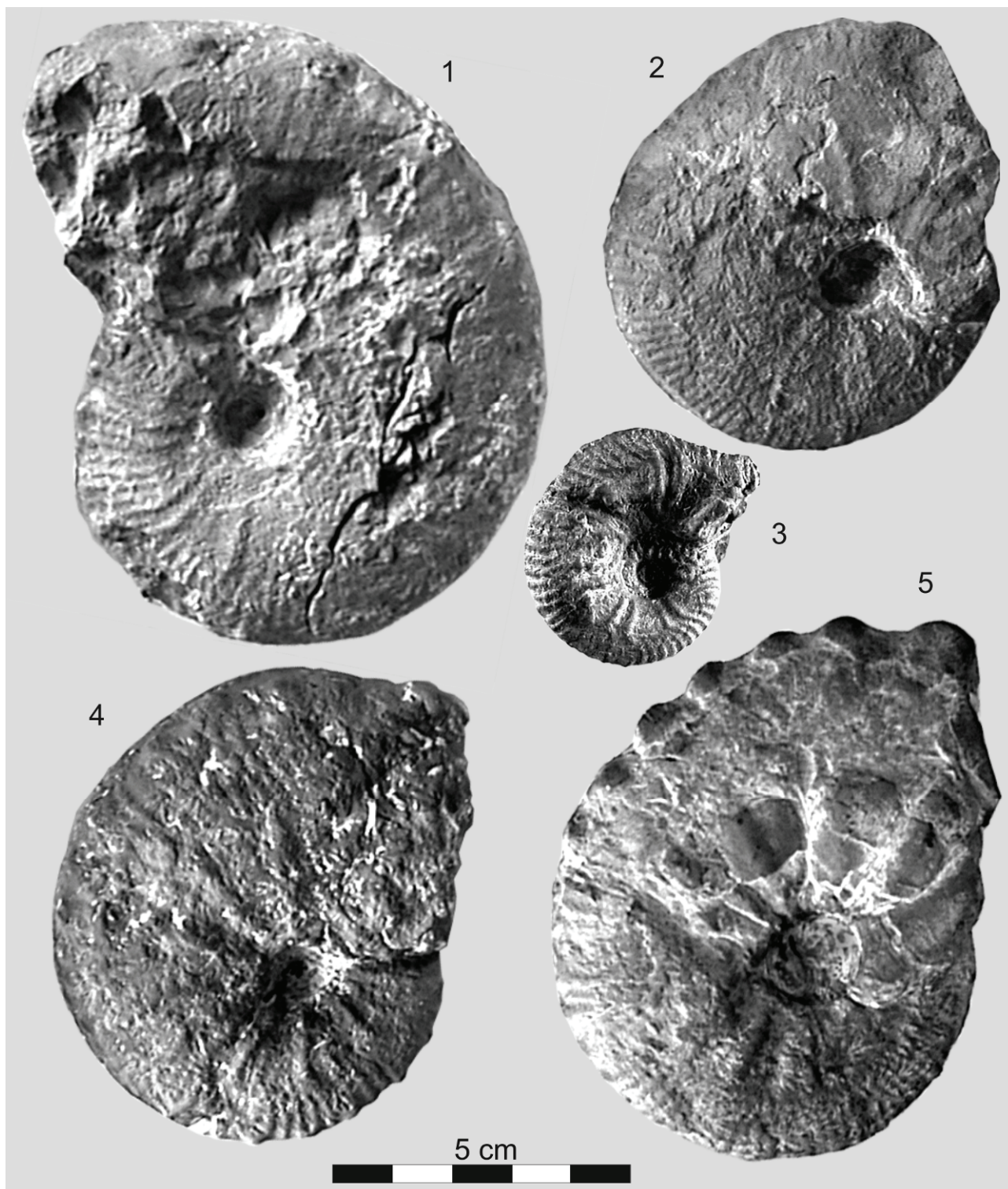


Figure 1. *Taramelliceras (Taramelliceras) compsum* mph. *bicostatum* n.mph. - Holotype (LRp109T1,0); red nodular limestone, Early Kimmeridgian - Divisum Zone, Ghilcoș walls ("T" profile); 2. *Taramelliceras (Taramelliceras) compsum* mph. *bicostatum* n.mph. - Paratype (LRp124T5,0); red nodular limestone, Late Kimmeridgian - Acanthicum Zone, Ghilcoș walls ("T" profile); 3. *Taramelliceras (Taramelliceras) compsum* mph. *bicostatum* n.mph. - Paratype (LRp132D3), juvenile; green nodular limestone, Late Kimmeridgian - Acanthicum Zone, North Ghilcoș blocks ("D" profile); 4. *Taramelliceras (Taramelliceras) compsum* mph. *tuberculatum* n.mph. - Paratype (LRp103M2) phragmocone; green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoș blocks ("M" profile); 5. *Taramelliceras (Taramelliceras) compsum* mph. *tuberculatum* n.mph. - Holotype (LRp104A6); green nodular limestone, Early Kimmeridgian - Divisum Zone, North Ghilcoș blocks ("A" profile).