

THE AMMONITES OF THE FAMILY PULCHELLIIDAE HYATT, 1903 (AMMONITINA) IN ROMANIA

EMIL AVRAM¹

Abstract. The complete inventory of the family Pulchelliidae representatives in Romania (including the author's own collections, but also the fossils preserved in visitable collections), was carried out in the last years. 22 species, belonging to 9 genera, have been inventoried. They come from the famous Carpathian fossiliferous regions: the Svinița village area, at the western end of the South Carpathians, near the Danube, and the Dâmbovicioara Couloir, at the eastern end of the South Carpathians, but also from several areas of the East Carpathian flysch: the Baraolt Mts. (yielded by the Bistra Formation), and the Zizin, Târlung, Doftana and Prahova valleys (recorded in the upper member of the Sinaia Formation and in the Comarnic Formation). Generally, the occurrences of these species in Romania are similar to those established in the Tethyan regions (Colombia, Spain, France) richer in pulchelliid representatives: from the Upper Hauterivian up to the Upper Barremian. Some new species, among which one is here named *Kotetishvilia delanoyi* n. sp., illustrate the local variation in this family-group morphologies.

Keywords: Ammonites, Pulchelliidae, inventory, new species, Hauterivian, Barremian, Romania

INTRODUCTION

An inventory of the family Pulchelliidae representatives in Romania is necessary for several reasons: on the one hand, because since they were presented in literature, several papers, especially due to Vermeulen (1994, 1995a-b, 1996 a-c, 1997 a-b, 1998), but also to Delanoy (1992), Vašiček et al. (1994), Cecca et al. (1995, 1998), etc. have introduced new generic interpretations and/or revised the stratigraphic value of various of its species up to a zonation based exclusively on Pulchelliidae; on the other hand, the inventory can be completed to include newly recognized or even new species, recorded in the Carpathian area; and, finally, because, except for Simionescu (1898), partly Ștefănescu et al. (1965), Avram (1976) and Avram & Kusko (1984), none of the Romanian papers included a description of the species we have focused on.

22 species, belonging to 9 genera, have been inventoried. Their presentation here below emphasizes the definition adopted by the author for every species-group, with references to the Romanian material attributed to. The worldwide spread and the stratigraphic range as known up to now is also included.

Because of the limited space of the paper, no explanation was given for the subfamily-group and genus-group separations; they could be generally found in the quoted literature; besides, part of the quotations in this paper are to be found in the reference lists of the selected literature presented in the last chapter.

All the species in discussion are housed in visitable repositories of the Geological Institute of Romania (IG) and University of Iassy (IU).

FOSSILIFEROUS SITES

(the sites/layers listed here below are indicated by symbols, partly used in a published paper: Avram, 1994; the other, especially those from the Dâmbovicioara region, are here announced for the first time; H2, B1 and B2 mean the Upper Hauterivian, Lower or Upper Barremian age of the sites/layers).

A. The Baraolt Mts:

- in the Sâmbreaza valley, at its tributary on the right mouth, some 250 m upstream the last house of the Sf. Gheorghe town (B1): *Kotetishvilia compressissima*;
- in the right confluent of the Sâncrai valley, 150 m

upstream the junction with the left one (B1): *Kotetishvilia* aff. *compressissima*, *K. brevicostata* (= *Subpulchellia sauvageaui* in Avram & Kusko, 1984);

B. The Zizin valley basin:

- in the Zizin valley, 800 m downstream the Podului creek (B1): *Arnaudiella* (?) cf. *schlumbergeri*;

C. The Târlung valley basin:

- in the Târlung valley, 280 m upstream the Zimbrului valley mouth (B1): *Kotetishvilia* cf. *changarnieri*, *Arnaudiella* (?) cf. *schlumbergeri*;

D. The Doftana valley basin:

- in the Mușița valley, some 800 m downstream the Calda valley mouth (B1): *Arnaudiella malladae*;
- in both the Mușița and Doftana valleys, at their junction (B1): *Kotetishvilia sauvageaui*, *Pulchellia multicostata*;

E. The Prahova valley basin:

- in the Prahova valley, left bank, immediately upstream the Bătrăoara valley mouth (B1): *Kotetishvilia* (?) *prahovense*;

F. The Dâmbovicioara Couloir:

- in the cutting of the highway on Sasului Hill, 585 m W of the Piatra Craiului hostel (78A = H2): *Buergliceras favrei*;
- idem, 185 m W of the Piatra Craiului hostel (75A = B1): *Nicklesia* cf. *karsteni*;
- idem, 500 m W of the Piatra Craiului hostel, some 150 m above the highway (96P = B1): *Kotetishvilia* cf. *changarnieri*;
- idem, some 1200 m, on the highway, from the Piatra Craiului hostel towards the Podu Dâmboviței village (or directly 450 m WNW from the hostel) (121P = B1): *Kotetishvilia sauvageaui*, *K.* cf. *changarnieri*, *K.* aff. *nicklesi*, *Arnaudiella* (?) cf. *schlumbergeri*;
- idem, at the spring located immediately SW of the Piatra Craiului hostel (5P = B1): *Kotetishvilia compressissima*;
- 150 m on the Brusturet valley left slope, 725 m upstream the Muierii valley (of Brusturet) (1155P = B1 ?): *Arnaudiella* cf. *anglesense*;
- in the Orășii valley, some 725 m downstream the highway on Sasului Hill (38A = B1/B2): *Kotetishvilia sauvageaui*, *K. brevicostata*, *Nicklesia* (?) cf. *pseudokarsteni*, *P.* cf. *caicedi*;

¹ Geological Institute of Romania, 1 Caransebeș str., Ro-78344 Bucharest-32, Romania.

- *idem*, some 150 m downstream the highway (44A = B1): *Kotetishvilia cf. compressissima*, *K. aff. nicklesi*;
- *idem* (layer unspecified): *Kotetishvilia sp.*, *K. sauvageaui*, *Heinzia provincialis*;
- in the Muierii valley (of Dâmbovicioara), 400 m upstream its mouth (3A = B1): *Nicklesia sp.*, *Kotetishvilia sauvageaui*, *K. cf. changamieri*, *K. cf. compressissima*, *K. cf. brevicostata*, *K. cf. nicklesi*, *Pulchellia cf. communis*;
- *idem* (layer unspecified): *Kotetishvilia sauvageaui*, *K. delanoyi* n. sp., *Pulchellia cf. caicedi*, *Carstenia lindigii*;
- in the Zamvelei valley, 500 m upstream its mouth (24A = B1/B2): *Nicklesia sp.*, *Pulchellia cf. multicostata*, *Heinzia sp.*;
- two sites on the route on the right slope of the Izvorului valley 330-450 m north of the Dâmbovicioara village church (910P, 912P = B1/B2): *Kotetishvilia sauvageaui*;
- at the mouth of the Izvorului valley tributary on the right in the Dâmbovicioara village (915P = B2): *Heinzia provincialis*;
- on the route along the Cheii valley, 1860 m downstream the Crøvului valley mouth (62A = B1): *Pulchellia cf. communis*.

G. The Svinia village area:

- in the Vodiniciki valley, 300 m upstream the highway (V8/4 = B1): *Buergliceras favrei*;
- *idem*, 200 m upstream the highway (V9/2-3 = B2): *Gerhardtia ? cf. sartousiana*, *G. cf. galeatoides*;
- in the Orșova-Svinia highway cutting, 300 m E of the Vodiniciki valley (3+25/4 = H2; 3+25/9 = B1): *Buergliceras favrei*;
- *idem*, 275 m E of the same valley (2+100 = B2): *Curialites cf. subcaicedi*;
- on the pass on the left side of the Vodiniciki valley, 250 m above the highway (VS2 = B2): *Kotetishvilia delanoyi*, *Heinzia sayni*;
- in the left slope of the Temeneacia valley, 250 m above the highest street of the village (A = B1): *Kotetishvilia nicklesi*;
- on the watershed between the Temeneacia and Vodiniciki valleys, above the highest street of the village (C = B1/B2): *Kotetishvilia sauvageaui*, *K. nicklesi*;
- in the Tiganski valley (B2): *Kotetishvilia brevicostata* (T2/2, T8/10), *K. sauvageaui* (T8/9, T8/10);
- on the route along the Sirinia valley, 135 m north of the Belareka valley mouth (578 = B1): *Arnaudiella? cf. schlumbergeri*.

SYSTEMATICS

Subfamily Buergliceratinae VERMEULEN, 1995

Genus *Buergliceras* ETAYO SERNA, 1968

Type species: *Buergliceras buerglii* ETAYO SERNA, 1968; lowermost Barremian, Colombia.

Buergliceras favrei (OOSTER)

Plate 1, figs. 1, 2, 3a-b, 4, 5

Type reference: *Ammonites Favrei* OOSTER, 1860, p. 119, pl. 24, figs. 1-3 (lectotype), 4-6.

Other references: *Psilotissotia favrei* (OOSTER), Avram, 1994, pl. 19, figs. 9, 10. *Psilotissotia (Buergliceras) favrei* (OOSTER), Cecca et al., 1998, p. 86, pl. 4, figs. 18, 19, text-fig.13g and tab.15 (Cum. Syn.).

Specific characters. According to Sarasin & Schöndelmayer (1901), the species includes discoid ammonites, with narrow umbilicus, high lanceolate whorl section and variable ornamentation: smooth up to the diameter of 10 mm, the shell is later (up to 40-50 mm) gradually covered with flat, unequal, slightly sigmoid ribs, risen around the umbilicus and progressively stood out towards the outer margin, where they bear small tubercles and suddenly disappear; only one of three or four ribs reaches the umbilicus, all the other begin at mid-sides. From the diameter of 15-16 mm the longer ribs bifurcate at the mid-sides, where they also bear a lateral tubercle. On the complete whorl there are 6-8 main tuberculate ribs, with 3-4 short intercalatories in between. From the diameter of 40-50 mm the lateral tubercles smoothen and, then, the whole ornamentation diminishes beginning from the umbilical area, so that the body chamber is completely smoothen, with vague waves on the sides. The related *Pulchellia Mariolae* NICKLES preserves only the second stage ornamentation of *Buergliceras favrei*, and *Ammonites Masyleus* COQUAND is apart from the latter by lack of the shorter ribs between the main ones and of the lateral tubercles, and also by stronger ventrolateral tubercles and by crenellated keel.

Material. Four specimens, preserved as impressions, recorded at Svinia in the sites V8/4 (= IG P 19643), 3+25/4 (IG P 19642) and 3+25/9 (= IG P 19644); a single specimen from Dâmbovicioara, recorded in the site 78A (= IG P 19040). Among them, the specimen figured in pl. 1, fig.2 is similar to the lectotype, that presented in fig.4 is nearer to *P. mariolae* NICKLES, while those from figures 1 and 3 display the transition from the tubercled to the smooth stage (at larger diameter than 40 mm); one of these specimens (fig.3), as well as the example from Dâmbovicioara (fig.5) preserve the whorl section and also the lateral tubercles, like in "*Psilotissotia*" *masylea*, but also short intercalatory ribs and lateral tubercles, like in *Buergliceras favrei* type.

Occurrence. Upper Hauterivian (starting from the Sayni Zone, according to Vermeulen, 1980 and Autran, 1993) and lowermost Barremian in France, Switzerland, Italy, Slovakia (West Carpathians). In Romania the species was recorded both at the top of Hauterivian (78A, 3+25/4) and in lowermost Barremian (V8/4, 3+25/9) rock sequences.

Subfamily Psilotissotiinae VERMEULEN, 1995

Genus *Arnaudiella* VERMEULEN, 1996

Type species: *Psilotissotia anglesense* VERMEULEN, 1995a; Lower Barremian, France.

Arnaudiella malladae (NICKLES)

Plate 1, fig.9.

Type reference: *Pulchellia malladae* n.sp., Nickles, 1894, p. 46, pl. VII, figs. 1a-b (lectotype), 2-4.

Other references: *Psilotissotia malladae* (NICKLES), Avram, 1976, p. 51, pl. V, fig.10 (Cum. Syn.); Vermeulen, 1995a, p. 70. *Psilotissotia (Psilotissotia) malladae* (NICKLES), Vermeulen, 1980, pl. II, figs. 4-12.

Specific characters. Small, involute, compressed, with rounded (not keeled) venter in all stages. The ribbing appears at a diameter of 4.5-9.5 mm with

umbilical, arched forward, fine ribs, stronger at mid-sides and smoothed immediately outer, and of rectiradiate, wide, rounded and continuous on ventral area outer ribs. The keeled variety (Nickles, 1894, p. 46) is assimilated to *P. anglesense* VERMEULEN.

Material. 8 crushed specimens, recorded in the East Carpathian flysh, on the Mușița valley (IG P 11184). They display typical lateral ornamentation and the same measurements like the type individuals.

Occurrence: Lower Barremian (above to *A. anglesense*, by Vermeulen, 1996b), in France and Spain; top of Lower Barremian in Colombia; bottom of Barremian in Romania (level with *Hamulinites parvulus* (UHLIG)).

Arnaudiella cf. anglesense VERMEULEN

Plate 1, figs. 6, 7

Type reference: *Psilotissotia anglesense* nov.sp., Vermeulen, 1995a, p. 69, pl. 1, figs. 5-8 (holotype).

Other references: *Arnaudiella anglesense* (VERMEULEN), Vermeulen, 1996b, p. 102, pl. 1, figs. 7-10 (refigured holotype); *Arnaudiella anglesense* (VERMEULEN), Vermeulen, 1997a, p. 86.

Specific characters. Smooth and killed up to the whorl-height of 8.3 mm, then with progressively rounded venter, crossed by short, rursiradiate, rounded and wide outer ribs, slightly reduced on the siphuncle up to the whorl-height of 11.5 mm. Finally, the ribs are prolonged towards the periumbilical area, become equal and continuous on the venter and seem to alternate longer and shorter on the end of the last whorl. This species is apart from *A. malladae* (NICKLES) by the presence in youth of the keel, and by the later rise of ornamentation. Mature stage is of *Nicklesia* type.

Material. 4 specimens, recorded in Dâmbovicioara, in the site 1155P (IG P 19041). They are crushed, with comparable ornamentation to that of the holotype up to the end of the mature whorl, where the last 5-6 ribs are crowded and slightly sigmoid. In places (on two specimens only) the ribs are denser on the last whorl, where they preserve the body chamber (19 instead of 12-13).

Occurrence. The holotype comes from the French Lower Barremian. The range of Romanian specimens could not be established accurately, for lack of other index species in assemblage.

Arnaudiella (?) cf. schlumbergeri (NICKLES)

Plate 2, fig. 8.

Type reference: *Pulchellia Schlumbergeri* n. sp., Nickles, 1894, p. 38, pl. VII, fig. 11+pl. VIII, fig. 9 (= lectotype), pl. VIII, fig. 10.

Other references: *Pulchellia schlumbergeri* NICKLES, Avram, 1976, p. 50, pl. V, fig. 6. *Arnaudiella schlumbergeri* (NICKLES), Vermeulen, 1997a, p. 86, pl. 3, figs. 4-7.

Specific characters. Small, with relatively wide umbilicus ($u = 0.18$) and a peculiar whorl section with strongly convex lower half of the sides, with concave outer part of the sides and concave venter. The ornamentation consists of very large, short ribs (about 15 on a complete whorl) developed only in the outer half of the sides and separated from each other by large and deep interspaces on the ventral area; they are higher on the ventrolateral margins (bicarinate shell), a feature typical of *Kotetishvilia* VERMEULEN.

Material. One specimen recorded in Svinița (site 578, IG P 19646), two other gathered in the East Carpathian flysh, in the Zizin and Târlung valleys (IG P 11175 and 11176, respectively), and one - in the

Dâmbovicioara Couloir, in the Sasului Hill area (site 121 P, IG P 19064). The first of them, very crushed, reveals the left side, comparable to that of the lectotype but displaying 17 short, strongly clavate ribs; the examples from the Carpathian flysh, also crushed, belong cautiously to the species; and the specimen from Dâmbovicioara resembles the lateral ornamentation of the lectotype, but on its venter the intercostal ditches are very shallow. All these specimens have narrower umbilicus than the lectotype.

Occurrence. Barremian in Spain; lowermost Lower Barremian in Romania.

Genus *Kotetishvilia* VERMEULEN, 1996.

Type species: *Kotetishvilia changarnieri* (SAYN), 1890; Barremian, Algeria.

Kotetishvilia cf. changarnieri (SAYN)

Plate 2, fig. 4.

Type reference: *Pulchellia Changarnieri* nov.sp., Sayn, 1890, p. 25, pl. I, figs. 13a-d (holotype)

Other references: *Pulchellia aff. changarnieri* SAYN, Avram, 1976, p. 51, pl. V, fig. 7. *Subpulchellia changarnieri* SAYN, Kotetishvili, 1980, p. 84, pl. X, figs. 7a-b. *Kotetishvilia changarnieri* (SAYN), Vermeulen, 1996c, p. 118, pl. 1, figs. 7-8, 9-10, pl. 2, figs. 3-4.

Specific characters (according to Sayn, 1890). Discoid, compressed, with narrow umbilicus; whorls widest near the rounded umbilical margin, with narrow, concave ventral area; sides smooth in youth (up to a diameter of some 16 mm), then smooth only in their lower part and bearing sickle-shaped, flat and wide ribs limited by narrower, shallow interspaces; the intercostal ditches cross the venter, interrupting the keels, so that the outline is indented. The mature stage (up to the diameter of 65 mm), figured by Vermeulen (1996c), shows the same ribbing up to the aperture, but each 2-3 ribs are separated by sickle-shaped ditches, crossing the sides up to the umbilical margin, like in *Nicklesia pulchella* (d'ORBIGNY); there are 17-18 ribs on a complete whorl, at a diameter of 65 mm.

Measurements (after Sayn, 1890): Diameter = 23 mm; Umbilicus = 3 (0.13); Height = 14 (0.60); Width = 7 (0.30).

Material. Four small or fragmentary specimens, yielded from the Dâmbovicioara region, in the Sasului Hill (site 96P = IG P 19051, and 121P = IG P 19050) and in the Muierii valley (site 3A = IG P 19052), and also a specimen from the East Carpathian flysh in the Târlung valley (IG P 11180). The former specimens display the smooth stage shorter than in the holotype and the beginning of typical ornamentation; the latter one shows the rare, sigmoid ribbing of the mature stage.

Occurrence. Lower Barremian in Algeria; boundary Lower-Upper Barremian (in the Compressissima and Darsi zones, according to Vermeulen, 1996b), in France; Lower Barremian in Romania.

Kotetishvilia compressissima (d'ORBIGNY)

Plate 2, figs. 1, 2, 3a-b.

Type reference: *Ammonites compressissimus* d'ORBIGNY, 1841, p. 210, pl. 61, figs. 4-5 (holotype).

Other references: *Pulchellia compressissima* d'ORBIGNY, Hyatt, 1903, p. 142, pl. XVII, figs. 9-13. ? *Pulchellia compressissima* (d'ORBIGNY), Dimitrova, 1967, p. 164, ?pl. LXXX, figs. 3-4. ? *Pulchellia aff. compressissima* (d'ORBIGNY), Kotetishvili, 1980, p. 47, pl. II, figs. 1, 2. *Psilotissotia (Subpulchellia) compressissima* (d'ORBIGNY), Vermeulen,

1980, pl. 1, figs. 1-4, 5-6; Vermeulen, 1995b, p. 203, ? pl. 1, figs. 14-16. *Kotetishvilia compressissima* (d'ORBIGNY), Vermeulen, 1996c, p. 118, pl. 1, figs. 3-4, 5-6; Vermeulen, 1997b, p. 102, ? pl. 2, figs. 11-12.

non: *Pulchellia compressissima* d'ORBIGNY, Nickles, 1890, p. 8, pl. I, figs. 1-5, pl. III, fig. 1, pl. IV, figs. 1-6 (= *K. nicklesi* (HYATT)). *Pulchellia compressissima* (d'ORBIGNY), Breskovski, 1966, p. 107, pl. X, fig. 10 (= *K. sauvageaui* (HERM.))

Specific characters. The holotype is discoid, with convex sides and very small umbilicus, and is covered by some 26 wide and straight rectiradiate ribs, developed only near the outline; they are separated by very narrow ditches which, thus, interrupt the two edges of the venter. As asserted by Hyatt (1903) and Vermeulen (1996), *K. compressissima* displays wider ribs than *K. nicklesi*, developed only on the outer half of the sides, and the interspaces in between cross the ventral region; the ribs also cross the ventral area keeping their width from the sides and are slightly fluted; in mature stage (at a larger diameter than in the holotype) the ribs are gently projected forward.

Measurements of the holotype: D = 33 mm; H = 19.5 (0.59); W = 8 (0.24).

Material: Four specimens from Dâmbovicioara (recorded in sites 3A-IG P 19053, 5P-IG P 19054 and 44A-IG P 19060), and two (IG P 17120, 17121) from the Sâmbreaza and Sâncraii valleys, Baraolt Mts. The first of them are almost identical to the holotype, except fewer ribs: 22 at a diameter of 27 mm; the one recorded in site 44A and also that of the Sâncraii valley display much larger and slightly sigmoid ribs, features here considered as individual variations within the species frame.

Occurrence. Upper part (the Compressissima Zone) of Lower Barremian in France, Bulgaria, Georgia and in Romania.

Kotetishvilia nicklesi (HYATT)

Plate 1, figs. 24a-c, 25a-c, 26, 27a-b; Plate 2, figs. 6a-b, 7.

Type reference: *Pulchellia compressissima* d'ORBIGNY, Nickles, 1890, p. 8, pl. I, figs. 1+1a (lectotype), 2-5, pl. III, fig. 1. **Other references:** *Pulchellia compressissima* d'ORBIGNY, Nickles, 1894, p. 36, pl. V, figs. 1, 2, 5, ?6. *Subpulchellia nicklesi* HYATT, Kotetishvili, 1980, p. 85, ? pl. VIII, fig. 8; Vermeulen, 1995b, p. 201, pl. 1, figs. 3-4, 5-6. *Kotetishvilia nicklesi* (HYATT), Vermeulen, 1996c, p. 118, pl. 1, figs. 1-2; Vermeulen, 1997b, p. 101, pl. 2, figs. 3-4, 5-6.

Specific characters. Discoid, compressed, with narrow umbilicus; whorls with continuous, gentle convex in youth, then flat in their outer third sides, and with narrow, edged ventral area; this latter is flat and smooth in youth, then (after the diameter of 12 mm) evolving towards bicarinate, slightly concave. The ribs appear prorsiradiate and feeble on the periumbilical area and become stronger and almost rectiradiate at a diameter of 17 mm; they cross the venter as wide as on the ventral margin. The lectotype displays 14 ribs on the last half-whorl. Larger specimens than the lectotype were figured by Vermeulen (1996c), they displaying longer on the sides and denser sigmoid ribs.

Material. Seven pyritised nuclei from Svinița (site A = IG P 19651a, and C = IG P 19651b). Part of them are larger in size and evolve from the smooth to the costate stage at a larger diameter than the lectotype.

Measurements: lectotype D = 18 mm; U = 2.5 (0.13); H = 11 (0.60); W = 6.5 (0.36).

Plate 1, fig. 24: D = 19.4; U = 1.6 (0.08); H = 11.8 (0.60); W = [5.4 (0.25)] and D = 33; U = 2.8 (0.08); H = 18.5 (0.56); W = 9.2 (0.28).

Remarks. Two individuals, recorded in Dâmbovicioara (site 121P, in the Sasului Hill, IG P 19062; site 44A, in the Orășii valley, IG P 19063) remind the ontogenetic evolution of *K. nicklesi*, but display some 21 sigmoid, gently prorsiradiate near the ventral margin ribs on half a whorl; they are here considered as an extreme variation of *K. nicklesi*, although their range is partly different (= *K. aff. nicklesi* (HYATT) in pl. 2, figs. 6a-b, 7). Besides, a questionable specimen (*K. cf. nicklesi*) was recorded in the Muierii valley, site 3A (IG P 19053).

Occurrence. Lower Barremian in Spain, France (the Nicklesi Zone), Georgia. The Romanian specimens come from the upper part of Lower Barremian (with *Holcodiscus* spp., *Leptoceras* spp., etc. in the layers A, C, 121 P), but one of the questionable individuals from Dâmbovicioara (44A) was recorded together *K. aff. compressissima* near the top of Lower Barremian.

Kotetishvilia sauvageaui (HERMITE)

Plate 1, figs. 10a-b, 11a-b, 12, 13a-b, 14a-b, 19, 20.

References: *Pulchellia Sauvageaui* HERMITE, Sayn, 1890, p. 23, pl. I, fig. 11a-b, 12a-b; Nickles, 1890, p. 9, pl. I, fig. 6, pl. III, fig. 2. *Subpulchellia sauvageaui* (HERMITE), Avram, 1976, p. 50, pl. V, fig. 8; Kotetishvili, 1980, p. 83, pl. VIII, fig. 10. *Subpulchellia plana* KOTETISHVILI, 1980, p. 77, pl. 9, figs. 1-13. *Kotetishvilia sauvageaui* (HERMITE), Vermeulen, 1996c, p. 118, pl. 2, figs. 5-7.

non: *Subpulchellia cf. sauvageaui* (HERMITE), Avram & Kusko, 1984, p. 20, pl. II, fig. 13 (= *K. brevicostata* KOTETISHVILI). *Subpulchellia sauvageaui* (HERMITE), Delaney, 1992, pl. 6, fig. 9 (= *K. delaneyi* n.sp.), 10 (= *K. brevicostata* KOTETISHVILI).

Specific characters (according to Sayn, 1890). In mature stage very compressed, whorl section with gentle convex sides and tabulate, slightly concave venter; bicarinate, with continuous keels up to the largest size; narrow umbilicus, with rounded umbilical margin; ornamentation built up of sigmoid ribblets starting from the umbilical margin. Initial whorls rounded, then compressed, but preserving a rounded (evolving to tabulate) venter, and a bolder ornamentation than in adult stage. As asserted by Vermeulen (1996c, p. 118), the final stage seems to be illustrated by *K. plana* (KOTETISHVILI), which displays rare and flat, slightly sigmoid ribs on the outer half of the sides, near the aperture (at larger diameter than 30 mm).

Measurements: *K. sauvageaui* (in Sayn, 1890): D = 21mm; U = 2 (0.09); H = 12 (0.57); W = 6 (0.28).

K. plana (holotype): D = 29.5; U = 1.3 (0.07); H = 17 (0.58); W = 6.7 (0.23).

Material. Two small pyritised specimens, and two larger, crushed ones, recorded in Svinița area (site C = IG P 19654, and T8/9 = IG P 19653, T8/10 = IG P 19652, respectively); besides, 13 individuals from the Dâmbovicioara Couloir (site 38 = IG P 19047, and unspecified = IG P 19048, in the Orășii valley; site 121P = IG P 19045, on the Sasului Hill; site 3A = IG P 19049, 19057, and unspecified = IG P 19046, on the Muierii valley; and sites 910-912P on the right slope of the Izvorului valley, IG P 19058). Some of the latter are large in size (diameter of 35-40 mm), with typical ornamentation of *K. plana* (KOTETISHVILI). Finally, two specimens (IG P 11178, 11179) recorded in the East Carpathian fish in the Doftana valley, display a much

earlier mature ribbing but also the typical continuous keels up to the end of the shell.

Occurrence. Barremian in Algeria, Balearic Islands, Spain; Lower Barremian in Georgia; top of the Lower and bottom of the Upper Barremian (38A, 910-912P) in Romania.

Kotetishvilia (?) *prahovense* (AVRAM & ȘTEFĂNESCU)
Plate 2, fig.25

Type reference: *Pulchellia prahovens* AVRAM & ȘTEFĂNESCU, Ștefănescu et al., 1965, p. 353, fig.2 (holotype, IG P 8873).

Specific characters. Small, compressed, with very narrow umbilicus; whorl sides more prominent at the mid-height; ornamentation made-up of some 17 very wide, short, indistinctly sigmoid ribs, with claviform endings at the ventral margin, and grouped by 3 or (rarely) 2 in bunches separated by ditches which are extended up to the rounded umbilical margin; every rib in the middle of a bunch of three bears a flat swelling immediately below the mid-sides; ventral area unknown.

Measurements of the holotype (IG P 8873): D = 36 mm; U = 1 (0.03); H = 21 (0.60).

Remarks. The generic affiliation is questionable lacking the ventral area of the holotype. Nevertheless, it is very similar to the large specimens of *K. changarnieri* (SAYN) figured by Vermeulen (1996c, pl. 2, figs 3-4), except for its more convex sides, its mid-height swellings and its almost rectiradiate ditches between the bunches of ribs. They belong probably to the same group, but the detailed relations have still to be clarified.

Occurrence: upper part of Lower Barremian (with *Dissimilites dissimilis* (d'ORBIGNY)).

Kotetishvilia sp.
Plate 2, fig.5.

= ? *Ammonites Dutrugei* COQUAND, 1879, p. 17 (Plate I, in Heinz, 1886).

A specimen of *Kotetishvilia*, gathered in the Dâmbovicioara region, on the Orășii valley (layer unspecified IG P 19061) displays a bicarinate, smooth shell up to a diameter of 40 mm, then the ventral margins become rounded, and very wide, flat ribs appear on the outer half of the sides. This specimen could be compared only with *Kotetishvilia dutrugei* (COQUAND) as this species is accepted by Vermeulen (1996c), by their very long smooth stage; its mature stage, ribbed and with rounded ventral area could illustrate the final part of this species, which lacks in the holotype.

Kotetishvilia brevicostata (KOTETISHVILI)
Plate 1, figs. 15a-b, 16, 17, 18

Type reference: *Subpulchellia brevicostata* KOTETISHVILI, 1980, p. 80, pl. X, figs. 1-2, 3a-b (holotype), 4-6.

Other references: *Pulchellia cf. changarnieri* SAYN, Eristavi, 1955, p. 155, pl. VII, fig.4. *Subpulchellia cf. sauvageaui* (HERMITE), Avram & Kusko, 1984, p. 20, pl. II, fig.13. *Subpulchellia sauvageaui* (HERMITE), Delanoy, 1992, pl. 6, fig.10. *Kotetishvilia brevicostata* (KOTETISHVILI), Vermeulen, 1996c, p. 118, pl. 2, figs. 1-2.

Specific characters. Unlike *K. sauvageaui* by its scaphitoid coiling in gerontic stage and by the ornamentation consisting of thin riblets on the inner part of the sides and of short, crescent ribs on the outer half of the sides, never developed up to the keeled ventral margin and separated by interspaces much larger than the ribs themselves.

Material. Three individuals recorded in the Svinița village area (sites T2/2 and T8/10 = IG P19652), two specimens from Dâmbovicioara (site 38 in the Orășii valley = IG P 19055; site 3A in the Muierii valley = IG P 19056) and also a specimen from the East Carpathian fish (on the Sâncraii valley, IG P 6480). All these are crushed, but comparable to the holotype by ornamentation.

Measurements: Holotype: D = 32.2mm; U = 1.7 (0.05); H = 18 (0.56); W = 7.6 (0.24).

Pl.1, fig.15: D = 36; U = 1.5 (0.04); H = 21.3 (0.59).

Pl.1, fig.16: D = 30.6; U = 2 (0.06); H = 17.4 (0.56).

Occurrence. Lowermost Upper Barremian (with *Heinzia matura*) in Georgia; the same interval (Darsi Zone - Sartousiana Zone) in France; in Romania, between the top of Lower Barremian (Sâncraii valley) to the lowermost Upper Barremian (38, T2/2, T8/10).

Kotetishvilia delanoyi n. sp.
Plate 1, figs. 21-23.

Holotypus: *Subpulchellia sauvageaui* (HERMITE), example JO-17, Delanoy's coll. (in Delanoy, 1992, p. 40, pl. 6, fig.9).

Derivatio nominis: devoted to Dr. Gerard Delanoy, who gathered and figured the holotype.

Locus typicus: Saint-Lorent-de-l'Esarene, Alpes Maritimes, France.

Stratum typicum: lowermost Upper Barremian, layer 4B4 from the Clarissia section.

Specific characters. The holotype is mature, with the body chamber preserved on half of the last whorl. It displays a compressed discoid shell, with narrow umbilicus and continuously bicarinate ventral region, at least on the last whorl up to the end. Its ornamentation on the end of the phragmocone (first half of the last whorl) consists of almost 10 slightly concave ribs, developed only on the outer half on the sides; the body chamber bears progressively stronger and larger ribs, which start from the umbilicus and cross S-shaped the sides where, in places, they bifurcate (in this stage the ventral area is deeply concave).

Variability. The Romanian specimens preserve the phragmocone (pl. 1, fig.21) and the body chamber ornamentation (pl. 1, figs. 22-23), very similar to that of the holotype, but with the ventral area always flat but not concave, up to the largest diameter. They were recorded in the lowermost Upper Barremian, in the Svinița village area (site VS2 = IG P 19694, with *Heinzia sayni*) and in Dâmbovicioara (site unspecified in the Muierii valley = IG P 19059).

Genus *Nicklesia* HYATT, 1903
(incl. *Semipulchellia* BÜRL, 1956 and *Nicklesiella* BÜRL, 1956)

Type species: *Ammonites Dumasianus* d'ORBIGNY, 1841; Lower Barremian, Colombia (Vermeulen, 1980, considered this species as a junior synonym of *Nicklesia pulchella* (d'ORBIGNY) which thus has to be considered the type species of the genus).

Nicklesia cf. karsteni (UHLIG)
Plate 1, fig.8.

Type reference: *Pulchellia Karsteni* n. sp., Uhlig, 1883, p. 249, pl. XX, fig.1 (holotype).

Other references: *Nicklesia karsteni* UHLIG, Bürgl, 1956, p. 54, pl. XI, figs. 6a-b (= Karsten's, 1856 type), 7-9. *Pulchellia* (*Nicklesia*) *didayi* (d'ORBIGNY), Vermeulen, 1980, pl. III, figs. 9-10.

Specific characters. Discoid, with very narrow umbilicus; whorl section high oval, with flat venter in youth, then oval; ornamentation composed of 45 thin, flat, sigmoidal ribs (counted at the outline). According to Bürgl (1956) the ribs rise in bunches of 2-3 or more near the umbilicus, could be branched below the mid-sides and also could alternate with intercalatory ribs of various length, irregularly disposed; in mature stage the ribs are typically different in height on the ventral region. Vermeulen (1980, p. 21) considered *N.karsteni* as synonym to *N.didayi* (d'ORBIGNY) on the ground of its flat-oval ventral area. Although the two species belong to the same group, the very irregular ornamentation of the former is typical enough to consider it as an independent taxon.

Material. A single, crushed specimen, recorded in Dâmbovicioara (site 75A = IG P 19042), in the Sasului Hill. It displays the lateral features almost identical to those of the type, but allows with difficulty the observation of the ribbed venter, with rounded ventrolateral margins in mature stage.

Occurrence. Barremian in Silezia, lowermost Lower Barremian in Colombia. The Romanian specimen comes from the middle part of Lower Barremian (near to the beds with *K. compressissima* (d'ORBIGNY)).

Nicklesia (?) cf. *pseudokarsteni* BÜRGL

Plate 2, figs. 11a-b.

Type reference: *Pulchellia* (*Nicklesia*) *pseudokarsteni* n. sp., Bürgl, 1956, p. 57, pl. III, figs. 12-13, pl. XII, figs. 1-3, 4a-d (holotype).

Specific characters. Discoid, compressed, with narrow umbilicus, gently convex sides and concave venter in youth. Ornamentation consists of 40-45 sigmoid, bifurcate ribs, better expressed only on outer half of the sides, where they are projected and thickened forming small, rounded tubercles. The ventral area evolves from concave to flat, then to gentle convex.

Measurements of the holotype: D = 40.8 mm; U = 2.5 (0.06); H = 23.2 (0.57); W = 11.9 (0.29).

Material. A single specimen, recorded in Dâmbovicioara, in site 38A = IG P 19068; it preserves the mature shell, similar to that of the holotype.

Occurrence. Top of Lower Barremian in Colombia; at the boundary Lower-Upper Barremian in Romania.

Genus *Pulchellia* UHLIG, 1883

Type species: *Ammonites galeatus* v. BUCH, 1839, in d'ORBIGNY, 1839; Barremian, Colombia.

Pulchellia multicostata RIEDEL

Plate 2, fig. 9.

Type reference: *Pulchellia multicostata* n.sp., Riedel, 1937, p. 68, pl. 11, figs. 21-22 (holotype), pl. 13, fig. 22.

Other references: *Pulchellia* (*P.*) *multicostata* RIEDEL, Bürgl, 1956, p. 63, pl. XIII, figs. 1a-b (type refigured), 12, 13. *Pulchellia multicostata* RIEDEL, Avram, 1976, p. 50, pl. V, fig. 9; Kotetishvili, 1980, p. 46, pl. I, figs. 3-10.

Specific characters. By its original description, the species has a very narrow umbilicus, the whorl section widest in its lower third, with convex sides and deep ventral furrow; the ribbing is dense (22 ribs on half a whorl), equal, sigmoid on the sides, with narrow intercostal ditches and with clavi at the ventrolateral margin.

Measurements: D = 40 mm; U = 2-3 (0.05-0.07); H = 13.5 (0.34).

Material. Two specimens, of which the most complete (IG P 11177) was recorded in the East

Carpathian flysh, on the Doftana valley; it preserves the left side bearing 41 sigmoid ribs with the same shape like in the holotype. The second one (IG P 19065) gathered from site 24A, in Dâmbovicioara, displays beside the typical long, dense, sigmoid ribs, several short intercalatories in between (= *P. cf. multicostata*).

Occurrence. "Middle" Barremian in Colombia; uppermost Lower Barremian (with *Dissimilites*, *Holcodiscus*, etc.) in Romania.

Pulchellia cf. communis BÜRGL

Plate 2, figs. 10a-b

Type reference: *Pulchellia* (*Semipulchellia*) *communis* n. sp., Bürgl, 1956, p. 59, pl. II, fig. 6, pl. III, fig. 15, pl. XII, fig. 6a-d (holotype), 7-12.

Other references: *Pulchellia cf. hispanica* HYATT, Riedel, 1938, p. 70, pl. XI, figs. 16-18. *Pulchellia communis* BÜRGL, Vermeulen, 1996b, ? p. 103, pl. 2, figs. 11-12, pl. 3, figs. 1-3 (= ? *P. caicedi* (KARSTEN)); Vermeulen, 1997b, ? p. 105, pl. 1, figs. 12-14 (= ? *P. caicedi* (KARSTEN)).

Specific characters. According to Bürgl (1956), the species is discoid, with narrow umbilicus, gentle convex sides, wider in youth near the umbilical margin and in mature stage at the mid-sides. The ornamentation and also the ventral furrow begin from a diameter of 12 mm. There are 28 ribs on a complete whorl, generally divided in two or (rarely) three branches on the sides and stopped, slightly prorsiradiate, at the ventral margin where they bear clavi. After the diameter of 45 mm short intercalatories appear between the primary ribs. After the diameter of 65 mm the ventral furrow is progressively smoothen, and the ventral area become rounded, like in *Nicklesia*. Although unclear in Bürgl's (1956) figuration, the true lateroventral tubercles are seen on the beginning of the last whorl of the holotype; by this feature this species is related to *Caicedia* BÜRGL, 1956.

Measurements of the holotype: D = 48 mm; U = 2.5 (0.05); H = 28.5 (0.58); W = 15 (0.31).

Material. Two specimens recorded in the Dâmbovicioara area, in the Muierii valley (site 3A = IG P 19066) and in the Cheii valley (site 62A = IG P 19067). Both of them reveal the transition from sulcate to convex venter, the former reminding the type by its ribbing density, and the latter being more related to the strongly ribbed paratype figured by Bürgl in pl. XII, fig. 12.

Occurrence. Top of Lower Barremian in Colombia, France (top of Compressissima Zone) and Romania.

Pulchellia cf. caicedi (KARSTEN)

Plate 2, figs. 12, 13.

References: *Pulchellia* (*Caicedia*) *caicedi* (KARSTEN), Bürgl, 1956, p. 67, pl. III, figs. 19, 20, pl. XIV, figs. 3a-b (reproduction of Karsten's holotype = 1856, pl. III, fig. 2), 4a-c, 5a-c.

Other references: *Pulchellia caicedi* (KARSTEN), Vermeulen, 1996a, p. 62, pl. 2, figs. 1-6 (Cum. Syn.); Vermeulen, 1996b, p. 103, pl. 3, figs. 4-5. Vermeulen, 1997b, pp. 103, 105, pl. 3, figs. 8-9, 10-11.

Specific characters. Discoid, wide shell with narrow umbilicus and narrow, concave ventral area; ornamentation made up of 16-20 straight rectiradiate ribs, of which the primaries are bifurcate and higher at the mid-sides, while the intercalatories are shorter, irregularly alternating with the former ones. All the ribs bear clavate tubercles located near to and at the ventral margin, between them becoming gently concave and slightly projected.

Measurements (after Bürgl, 1956): D = 40.7 mm; U = 2.2 (0.05); H = 23.8 (0.58); W = 17.1 (0.42).

Material. Three specimens recorded in Dâmbovicioara, on the Muierii valley (layer unspecified = IG P 19069, 19071) and Orății valley (site 38A = IG P 19070). All of them are crushed and display denser ribbing than the type (up to 25 ribs on a whorl) with rarely bifurcate primaries and fewer short intercalatories.

Occurrence. Basal Upper Barremian (with *Heinzia*) in Colombia and in France (layer with *P. caicedi* in the Darsi Zone). In Romania, immediately below the layer with *Heinzia provincialis* (d'ORBIGNY), at the Upper Barremian bottom.

Genus *Heinzia* SAYN, 1890 (emend HYATT, 1903)

Type species: *Heinzia (H.) sayni* HYATT, 1903; Barremian, Algeria.

Heinzia sayni HYATT

Plate 2, figs. 14, 15.

Type reference: *Pulchellia provincialis* d'ORBIGNY, Sayn, 1890, p. 35, pl. I, fig. 16, pl. II, fig. 7 (lectotype established by Vermeulen, 1998) (= *Heinzia sayni* Hyatt, 1903, p. 130).

Other references: *Pulchellia (Heinzia) cf. pallinii* Cecca et al., 1995, pl. 2, fig. 4. *Heinzia sayni* HYATT, Vermeulen, 1998, p. 79, pl. 1, figs. 1-3 (Cum. Syn.).

Specific characters. Discoid, with wide and deep umbilicus, flat sides and rectiradiate, narrow ribs, partly bifurcate near the umbilical margin; the ribs rise single or in pairs from the umbilical margin and bear lateroventral and marginal clavate tubercles, with a projected plateau in between. There are 10 periumbilical and 14-15 outer ribs on the lectotype, 14-15 and 23-25, respectively on the other example figured by Sayn. The ventral area is continuously concave, not crossed by the intercostal ditches.

Material. Two incomplete pyritised specimens from Svinița (site VS2, IG P 19647), which prove the lateral view of the paralectotype.

Occurrence. Barremian in Algeria; bottom of Upper Barremian in France (the Sayni Zone) and in Romania.

Heinzia provincialis (d'ORBIGNY)

Plate 2, figs. 16a-b, 17, 18, 19, 20.

Type references: *Ammonites provincialis* d'ORBIGNY, 1850, p. 99, no. 598 (= Cottreau, 1937, p. 55, pl. LXXVIII, figs. 18, 19) (holotype).

Other references: *Heinzia provincialis* (d'ORBIGNY), Delany, 1992, p. 37, pl. 6, figs. 1-4, 7 (Cum. Syn.). *Gerhardtia provincialis* (d'ORBIGNY), Vermeulen, 1996b, p. 103, pl. 4, figs. 4-6, 7-9; Vermeulen, 1997b, p. 103, pl. 4, figs. 1-3.

Specific characters. Convolute, with relatively narrow umbilicus and trapezoidal, very few compressed whorl section, widest in its lower third, with convergent sides and flat venter, narrowly sulcate along the siphuncle; ornamentation composed of slightly sigmoid prorsiradiate, single or bifurcate below the mid-sides ribs, raised in periumbilical bullate endings and in two rows of clavi, with flat, oblique forwards, gentle concave plateau between the latter, extended towards the perisiphonal margin. Single ribs are dominant in mature stage, where short intercalatories also appear; there are 25 ribs on the holotype's outline.

Measurements of the holotype (according to Vermeulen, 1980): D = 33.5 mm; U = 6.8 (0.20); H = 14.5 (0.43); W = 11.4 (0.34).

Material. Seven specimens, all recorded in Dâmbovicioara (site 915P = IG P 19073, 19074, from the Izvorului valley; layer unspecified = IG P 19072, 19076, from the Orății valley, and site unspecified in the

Muierii valley = IU Cr b D 116, published by Simionescu, 1898). Their individual variability is framed by the holotype and the type figured by Uhlig (1883, pl. XX, figs. 2a-b).

Occurrence. Lowermost Upper Barremian in France (Sartousiana Zone), in Colombia, Georgia and Romania.

Genus *Gerhardtia* HYATT, 1903

Type species: *Heinzia (Gerhardtia) galeatoides* (KARSTEN), 1856 (after Vermeulen, 1996b, junior synonym of *G. sartousiana* (d'ORBIGNY)); Barremian, Colombia.

Gerhardtia cf. galeatoides (KARSTEN)

Pl. 2, fig. 21.

References: *Pulchellia galeatoides* KARSTEN, Riedel, 1938, p. 66, pl. 11, figs. 8, 9, pl. 14, figs. 31, 32.

Other references: *Heinzia (Gerhardtia) galeatoides* (KARSTEN) Bürgl, 1956, p. 75, pl. II, fig. 13, pl. IV, figs. 7, 9-14, pl. V, figs. 9, 11, pl. XVII, figs. 1a-b (reproduction of Karsten's type = 1856, pl. III, fig. 1), 2-5, pl. XVIII, figs. 1-6, pl. XIX, fig. 1, pl. XX, figs. 1, 3; Avram, 1994, pl. 19, fig. 14.

Specific characters. Wide and deep umbilicus (u = 0.25-0.27), with steep wall; whorl section almost isometric (W/H = 0.80), widest near the umbilicus in youth, then at mid-sides; ventral concave depression, deeper in youth than the intercostal ditches, later crossed by them. The terminal clavi are oblique in youth, then parallel. There are 20 ribs on a complete whorl, rising from the umbilical margin and crossing the sides after a large-falcoid line; they are very thin near the umbilicus and very wide at the outline. Near to the clavate ventral end, the ribs get also a single or double thin, obtuse node. The intercostal ditches are narrow in youth, but become as wide as the ribs in mature stage.

Measurements (after Bürgl, 1956): D = 83.8 mm; U = 21.6 (0.26); H = 34.6 (0.41); W = 27.8 (0.32).

Material. A single specimen recorded in Svinița, in site V9/3 (IG P 19648). It displays the relatively wide umbilicus and the mature ornamentation of the sides, very near to that of the specimen figured by Bürgl in pl. XII, fig. 5a by the presence of shorter marginal intercalatories between the main ribs.

Occurrence. Lowermost Upper Barremian in Colombia; the same interval in Romania.

Gerhardtia (?) cf. sartousiana (d'ORBIGNY)

Plate 2, fig. 22.

Type reference: *Ammonites sartousianus* d'ORBIGNY, 1841, no. 144, p. 319, pl. 94, figs. 4-5.

Other references: *Heinzia matura* HYATT, 1903, p. 132, pl. XV, figs. 12-18 (holotype). *Heinzia (H.) matura* HYATT, Avram, 1994, pl. 19, fig. 3. *Heinzia (Gerhardtia) sartousiana* (d'ORBIGNY), Vermeulen, 1995a, p. 71, pl. 2, figs. 1-3 (neotype), 3-11.

Specific characters. Discoid, compressed, with relatively wide umbilicus and concave venter. Sides ornate with wide ribs, almost smooth at mid-sides but bearing umbilical projected nodes and a ventrolateral, projected plateau, limited outside by a clavate tubercle. The concave venter could be or not crossed by the shallow intercostal ditches.

Measurements (of the neotype): D = 37.8 mm; U = 5.1 (0.13); H = 20.3 (0.53); W = 11.2 (0.30).

Material. A single specimen, recorded in the Svinița village area (site V9/2, IG P 19649). It preserves its left side, very similar to the neotype of *G. sartousiana* by ornamentation, but different by larger umbilicus (u = 0.17) and smaller whorl-height (H = 0.51).

Occurrence. Upper Barremian (Sartousiana Zone) in France; lowermost Upper Barremian (in assemblage with *Macrosphites*, *Costidiscus*, *Silesites seranonis*, etc.) in Romania;

Genus *Carstenia* HYATT, 1903

Type species: *Ammonites Lindigi* KARSTEN, 1856; Barremian, Colombia.

Carstenia lindigii (KARSTEN)

Plate 2, fig.23.

References: *Heinzia* (*Carstria*) *lindigii* (KARSTEN), Bürgl, 1956, p. 81, pl. XXIV, figs. 1a-b (Karsten's type, 1856, pl. III, fig.3), 2-7, pl. XXV, figs. 1-4. *Heinzia lindigii* (KARSTEN), Delanoy, 1992, p. 35, pl. 6, fig.11 (Cum. Syn.)

Specific characters. Whorls almost isometric, with subparallel sides and wide ventral area (bearing a shallow and narrow smooth siphonal line). Its ornamentation consists of strong, gentle prorsiradial ribs, bifurcate in lower third of the sides, where they bear a conical node; on the mid-sides the ribs diminish, then become once more stronger, with lateroventral and perisiphonal clavi and a parallelepipedic, concave, projected plateau, developed up to the siphonal smooth line. Single ribs appear at the diameter of 25 mm, and become dominant at a diameter of 30-35 mm, also bearing lateral tubercles, marginal + perisiphonal clavi and a ventrolateral plateau, up to the largest size, where no bifurcate ribs persist.

Measurements of the holotype: D = 40 mm; U = 8.5(0.21); H = 20(0.50); W = 18(0.45) -.

Material. A single crushed specimen, recorded in the Dâmbovicioara area on the Muierii valley (site unspecified, IG P 19077). It displays the transition from the stage with bifurcate ribs to that with single ones of the holotype; the rib density (16 ribs on half a whorl) is nearer to that of *Heinzia* (*Karstenia*) *densicostata*

KOTETISHVILI (1980), which could be at the most a subspecies of *C.lindigii*.

Occurrence. Bottom of Upper Barremian in Colombia, France Romania; top of Lower Barremian (!) in Georgia.

Genus *Curiolites* VERMEULEN, 1994

Type species: *Pulchellia Heinzi* SAYN (non COQUAND), 1890; Barremian, Algeria.

Curiolites cf. *subcaicedi* (SAYN)

Plate 2, figs. 24a-c.

Type reference: *Pulchellia subcaicedi* nov.sp., Sayn, 1890, p. 33, pl. II, figs. 6a-c (holotype).

Other references: *Curiolites subcaicedi* (SAYN), Vermeulen, 1996b, p. 103.

Specific characters. Globulous, with wide umbilicus, almost quadrate, slightly depressed whorl section and a flat venter, excavated only along the deep smooth siphonal furrow. Its ornamentation consists of strong, rare ribs, partly bifurcated at the mid-sides, where all of them bear a lateral tubercle; above these tubercles the ribs diminish, and then are also erected in a lateroventral plateau which crosses obliquely the ventral area up to the siphonal furrow. There are some 12 ribs round the umbilicus and almost 16 at the outline.

Measurements of the holotype: D = 13 mm; U = 3 (0.23); H = 6 (0.46); W = 7 (0.53).

Material. A single crushed, pyritised fragment, recorded in Svinîța (in the site 2+100, IG P 19650). It preserves only the lateral ornamentation, very similar to that of the holotype, and also the outer plateau of the ribs, developed up to the margin of the siphonal furrow.

Occurrence. Barremian in Algeria; lowermost Upper Barremian in Romania.

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PLATE 1

- Figs. 1, 2, 3a-b, 4, 5: *Buergliceras favrei* (OOSTER). 1 = IGP19644; 2, 4 = IGP 19643; 3 = IGP 19642; 5 = IGP19040.
 Figs. 6, 7: *Armaudiella cf. anglesense* VERMEULEN. IG P 19041.
 Fig. 8: *Nicklesia cf. karsteni* (UHLIG). IG P 19042.
 Fig. 9: *Armaudiella malladae* (NICKLES). IG P 11184.
 Figs. 10a-b, 11a-b, 12, 13a-b, 14a-b, 19, 20: *Kotetishvilia sauvageau* (HERMITE). 10, 11 = IG P19654; 12 = IG P19046; 13-14 = IG P 19048; 19, 20 = IG P 19653.
 Figs. 15a-b, 16, 17, 18: *Kotetishvilia brevicostata* KOTETISHVILI. 15-17 = IG P 19652; 18 = IG P 6480.
 Figs. 21-23: *Kotetishvilia deianoyi* n.sp. 21 = IG P 19694; 22-23 = IG P 19059.
 Figs. 24a-c, 25a-c, 26, 27a-b: *Kotetishvilia nicklesi* (HYATT). 24, 25, 27 = IG P 19651a; 26 = IG P19651b.

PLATE 2

- Figs. 1, 2, 3a-b: *Kotetishvilia compressissima* (d'ORBIGNY). 1 = IG P 19054; 2 = IG P 19060; 3 = IG P17120.
 Fig. 4: *Kotetishvilia cf. changamieri* (SAYN). IG P 19050.
 Fig. 5: *Kotetishvilia* sp. IG P 19061.
 Figs. 6a-b, 7: *Kotetishvilia* aff. *nicklesi* (HYATT) 6 = IG P 19062; 7 = IG P 19063.
 Fig. 8: *Armaudiella* (?) cf. *schlumbergeri* (NICKLES). IG P 19646.
 Fig. 9: *Pulchellia multicostata* RIEDEL. IG P 11177.
 Figs. 10a-b: *Pulchellia cf. communis* BÜRGL. IG P 19066.
 Figs. 11a-b: *Nicklesia* (?) cf. *pseudokarsteni* BÜRGL. IG P 19068.
 Fig. 12, 13: *Pulchellia cf. caicedi* (KARSTEN). 12 = IG P 19069; 13 = IG P 19071.
 Figs. 14, 15: *Heinzia sayni* HYATT. IG P 19647.
 Figs. 16a-b, 17, 18, 19, 20: *Heinzia provincialis* (d'ORBIGNY). 16, 17 = IG P 19072; 18, 19 = IG P 19076; 20 = IG P 19073.
 Fig. 21: *Gerhardtia cf. galeatoides* (KARSTEN). IG P 19648.
 Fig. 22: *Gerhardtia* (?) cf. *sartousiana* (d'ORBIGNY). IG P 19649.
 Fig. 23: *Carstenia lindigii* (KARSTEN). IG P 19077.
 Figs. 24a-c: *Curiolites cf. subcaicedi* (SAYN). IG P 19650.
 Fig. 25: *Kotetishvilia* (?) *prahovense* AVRAM & ȘTEFĂNESCU, holotype (IG P 8873).

All fossils are figured in natural size.



