

***Ivaldiceras*, a new genus of heteromorphic ammonites from the Lower Aptian of southeast France**

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Abstract: New investigations in the Vocontian Lower Aptian deposits resulted in the discovery of very rare specimens of heteromorphic ammonites whose specific morphological and ornamental features have led to the erection of *Ivaldiceras* gen. nov. Represented by a very limited number of specimens this new genus consists of two species: *I. baratteroi* gen. & sp. nov. and *I. divajeuensis* gen. & sp. nov. The suprageneric position of the new genus is difficult to determine because of the poor preservation of its sutural elements and the incomplete state of the specimens. The genus is tentatively assigned to the Family Macroscaphitidae HYATT, 1900, pending the study of better preserved material.

Key Words: Ammonoidea; *Ivaldiceras* gen. nov.; Lower Aptian; Lower Cretaceous; southeast France.

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Résumé : *Ivaldiceras*, un nouveau genre d'ammonites hétéromorphes de l'Aptien inférieur du Sud-Est de la France.- La poursuite des investigations dans les dépôts de l'Aptien inférieur vocontien a conduit à la découverte de très rares spécimens d'ammonites hétéromorphes dont les caractéristiques morphologiques et ornementales particulières ont amené à la création du genre *Ivaldiceras* gen. nov. Représenté par un nombre très restreint de spécimens ce nouveau genre est constitué de deux espèces : *I. baratteroi* gen. nov. sp. nov. et *I. divajeuensis* gen. nov. sp. nov. La position supragénérique de ce nouveau genre reste actuellement très difficile à préciser à cause de la très mauvaise conservation des éléments suturaux et de l'état incomplet des spécimens. Il est inclus avec doute dans la famille des Macroscaphitidae HYATT, 1900 en attendant l'étude d'un matériel mieux conservé.

Mots-clefs : Ammonoidea ; *Ivaldiceras* gen. nov. ; Aptien inférieur ; Crétacé inférieur ; Sud-Est de la France.

1. Introduction

For several years, systematic investigations have been conducted in the Lower Aptian deposits of southeast France in order to clarify the nature of the ammonite faunal assemblage and the biostratigraphic framework. The ammonite fauna collected shows significant quantitative differences between the main part of the sedimentary basin and its peripheries (DELANOY, 1995, 1997; CECCA *et al.*, 1998, 1999; ROPOLLO & GONNET, 1998; ROPOLLO *et al.*, 1998a, 1998b, 1999, 2006, 2008; DELANOY *et al.*, 2008a, 2008b; PICTET *et al.*, 2009). In the pelagic facies, this fauna is scarce and often restricted to the taxa with a wide geographical and stratigraphical distribution (e.g., genera *Pseudohoplaceras* HYATT, 1900, *Macroscaphites* MEEK,

1876, *Lytoceras* SUESS, 1865) while the most biostratigraphically significant elements belonging to genera *Deshayesites* KAZANSKY, 1914, *Procheloniceras* SPATH, 1923, and *Cheloniceras* HYATT, 1903, are infrequent and/or poorly preserved making their biostratigraphical use difficult. At the same time these investigations revealed the presence of rare but very distinctive elements that allowed the creation of new taxa of generic rank, *Taxyites* (DELANOY *et al.*, 2008b) and *Ivaldiceras* gen. nov.

2. Palaeontological study

The terminology used to designate different parts of the shell is that used by VAŠÍČEK (1972) (Fig. 1). Measurements are in mm and were carried out as shown in Fig. 1.

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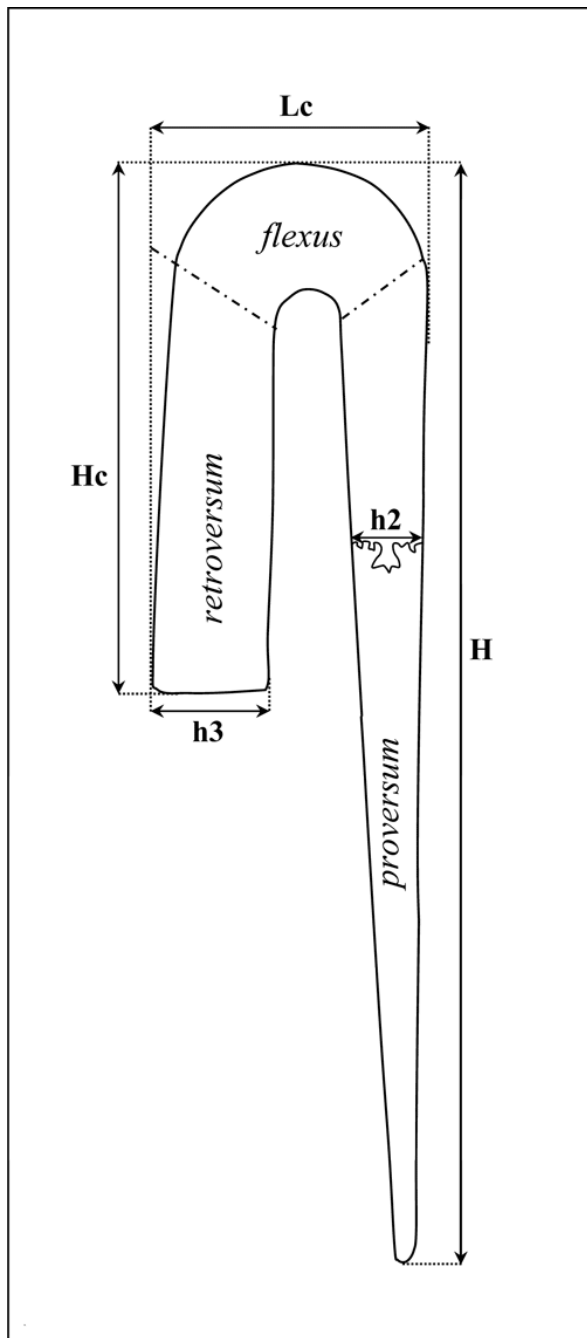


Figure 1: Terminology and measured dimensions of shell used in this work.

Order Ammonoidea ZITTEL, 1884

Suborder Ammonitina HYATT, 1889

**? Superfamily Ptychoceratoidea
GILL, 1871**

**? Family Macroscaphitidae
HYATT, 1900**

Genus *Ivaldiceras* gen. nov.

Type-species : *Ivaldiceras baratteroi* gen. & sp. nov.

Derivatio nominis: The genus is dedicated to Jean Pierre IVALDI, geologist and hydrogeologist at the University of Nice-Sophia Antipolis.

Diagnosis: Heteromorphic ammonite showing a hamuliniform coiling. The existence of an initial spiral part could not be observed. The *proversum* is straight, ornamented with fine single or bifurcated ribs and shows small tubercles arranged more or less regularly on the ribs or between the ribs. The *flexus* is closed and the *retroversum* is subparallel to the *proversum*. On the *flexus* the ribs thicken and converge toward conical or nodular tubercles. On the *retroversum* the ornamentation consists of ribs which may bear small tubercles on the edge of the dorsal and ventral regions.

Stratigraphic and geographic distribution: *Ivaldiceras* gen. nov. is known only from the Lower Aptian (*Deshayesites oglanlensis* and *D. forbesi* zones) of southeast France.

Comparison and discussion: The systematic position of the genus *Ivaldiceras* gen. nov. is currently difficult to determine due to the poor preservation of the specimens studied which prevents study of the suture lines. Within Acrioceratidae VERMEULEN, 2004 (*sensu* VERMEULEN *et al.*, 2013) morphological similarities exist with the genera *Dissimilites* SARKAR, 1954, *Hamiticerias* ANDERSON, 1938, *Toxoceratooides* SPATH, 1924, *Artareites* BERT, 2009, and with some species assigned to the genus *Helicancylus* GABB, 1869. The generic position of the species of *Helicancylus* GABB, should be reviewed if the latter is considered *nomen dubium* (VERMEULEN, 2010; VERMEULEN *et al.*, 2013). *Dissimilites* SARKAR shows a morphology very similar to that of *Ivaldiceras* gen. nov., but the ornamentation of the *proversum* consists of alternate main trituberculate ribs and simple intermediary non-tuberculate ribs. Small tubercles are also present on the dorsal and/or the ventral regions of the *retroversum*. The stratigraphic position of the genus *Dissimilites* SARKAR is very different, confined to the Lower Barremian and lowermost Upper Barremian and ranging from the *Nicklesia pulchella* Zone to the *Toxancyloceras vandenheckii* Zone (VERMEULEN, 2009; A. LUKENEDER & S. LUKENEDER, 2014).

Toxoceratooides SPATH (Upper Barremian-Lower Aptian) shows acyloceratic to toxoceratic coiling. The ornamentation on the *proversum* consists of a more or less regular alternation of main trituberculate ribs and intercalatory ribs, usually without tubercles or tuberculated on the periventral area. On the *retroversum*, ribs lack tubercles and originate in twos or threes from a small tuberculiform peridorsal bulge.

In *Artareites* BERT, ranging from the Upper Barremian (*Toxancyloceras vandenheckii* Zone) to the Lower Aptian (*Deshayesites forbesi* Zone) (BERT, 2009; VERMEULEN, 2013), the ornamentation of the *proversum* is characterized by many fibulate ribs with a periventral tubercle. Trituberculate ribs, if present, can occur with the fibulate ribs. At least on the *retroversum*, ribs

are simple or bifurcate from a peridorsal tubercle.

The genus *Hamiticeras* ANDERSON, present at various levels of the Aptian, is characterized by ornamentation similar to that of *Toxoceratoides* SPATH on the *proversum* and simple ribs without tubercles on the *retroversum*.

Ornamental features characteristic of *Ivaldiceras* gen. nov. are also found in some Anahamulinidae BREISTROFFER, 1952, from the Lower Barremian such as *Anahamulina lorioli* (UHLIG, 1883) or *A. davidsoni* (MATHERON, 1880), in which ornamental similarities exist on the *retroversum*. Similarly, *Anahamulina suttneri* (UHLIG, 1883) and *Amorina hoheneggeri* (UHLIG, 1883) show marked but brief strengthening of some ribs in the middle part of the *flexus*. The presence of strong ventral tubercles located in the same part of the shell is known in the genus *Auritina* EGOIAN, 1989, from the Lower Barremian (*Kotetishvilia nicklesi* Zone).

The genus *Ptychohamulina* VERMEULEN, 2005 (= *Pacaudina* VERMEULEN *et al.*, 2010; = *Badina* VERMEULEN & VAŠIČEK 2011 in BAUDOUIN *et al.*, 2012) present in the Upper Barremian and Lower Aptian ("Bedoulian") consists of small shells whose *proversum* and *retroversum* are nearly parallel to subparallel, sometimes divergent. The ornamentation of the *proversum* and the *retroversum* is generally feeble and sometimes absent. Where present, the ribs are never tuberculate. The *flexus* is smooth and shows non-tuberculate ribs of weak relief while a thick, more or less elevated rib is often present. In *P. couletti* VERMEULEN *et al.*, 2007, this localised strengthening of ribbing modifies the whorl section.

Duyeina glemmbachensis (IMMEL, 1987), ranging from the top of the *Martelites sarasini* Subzone to the base of the *Deshayesites oglanensis* Zone, has a shell whose *retroversum* and *proversum* are parallel and very close to each other. The ornamentation is quite uniform and strong, consisting of simple, non-tuberculate, thick and annular ribs that branch on the *flexus*.

The genus *Monodites* BERT 2009 (Family Monoditidae BERT, 2009), although morphologically close to *Ivaldiceras* gen. nov., differs in that its ribbing is mainly composed of relatively strong ribs which are trituberculate on the *proversum*. In addition, its tuberculation tends to be attenuated on the *flexus* and the *retroversum*. *Monodites* BERT also differs from *Ivaldiceras* gen. nov. in its distinct stratigraphical position in the uppermost Hauterivian and Lower Barremian (VERMEULEN *et al.*, 1999; BERT, 2009).

The micromorphic genus *Xerticeras* DELANOY *et al.*, 2013, is also characterized by a fairly uniform ribbing consisting of very fine, sharp

ribs which may strengthen on the *retroversum*. It differs from *Ivaldiceras* gen. nov. in the lack of tubercles and in its aspinoceratic morphology (hamuliform in *Ivaldiceras* gen. nov.). This taxon is present in the Lower Aptian *Deshayesites deshayesi* and *Dufrenoyia furcata* zones (DELANOY *et al.*, 2013).

"*Toxoceratoides*" *dietrichii* DELANOY *et al.* (2008a) shows toxoceratid coiling (AGUIRRE URRETA, 1986) and ornamentation consisting of simple non-tuberculate ribs on the spire and the base of the *proversum*, which develop in pairs from large bullae in the peridorsal area of upper part of the *proversum* and at the beginning of the *flexus*. The bullae tend to disappear early in the *retroversum* where ribs are either simple or bifurcated from the peridorsal area.

Some morphological and ornamental characteristics of *Ivaldiceras* gen. nov., *i.e.*, very fine more or less angular ribs and discrete tuberculation on the *proversum* and the *retroversum*, are present in some members of the Family Macroscaphitidae HYATT, 1900, particularly among the microconch forms of genera *Macroscaphites* MEEK, 1876, and *Lytocrioceras* SPATH, 1924. However, none of these taxa shows *Ivaldiceras*'s early strengthening of the ornamentation in the *flexus*. In the genus *Epacrioceras* EGOIAN, 1974, also assigned to the Macroscaphitidae (VERMEULEN & BULOT, 2007; KLEIN *et al.*, 2007), the tuberculated ribs are present only on the spire. The *proversum* is ornamented with fine, simple, non-tuberculated ribs; likewise on the *flexus* and the *retroversum* where the ribbing tends to thicken and peridorsal bifurcations seem to be present. Finally, *Ivaldiceras* gen. nov. shares most of its morphological and ornamental features with some representatives of the Macroscaphitidae HYATT. Hence we tentatively include *Ivaldiceras* gen. nov. within the Family Macroscaphitidae HYATT, 1900, pending the discovery of better preserved and more complete material.

***Ivaldiceras baratteroi* gen. & sp. nov.**

(Fig. 2; Pl. 1, fig. 1.a-c)

Studied material: One specimen MNHN.F. A57290 coll. BARATTERO, deposited in the collections of the Muséum National d'Histoire Naturelle de Paris, from Lower Aptian, *Deshayesites forbesi* Zone, bed 266 from Tremolies section (Alpes de Haute-Provence, France).

Holotype: Specimen MNHN.F A57290 coll. BARATTERO, Lower Aptian, *Deshayesites forbesi* Zone, bed 266 from the Tremolies section (Alpes de Haute-Provence, France).

Derivatio nominis: Species dedicated to Xavier BARATTERO who discovered the holotype of this new taxon.

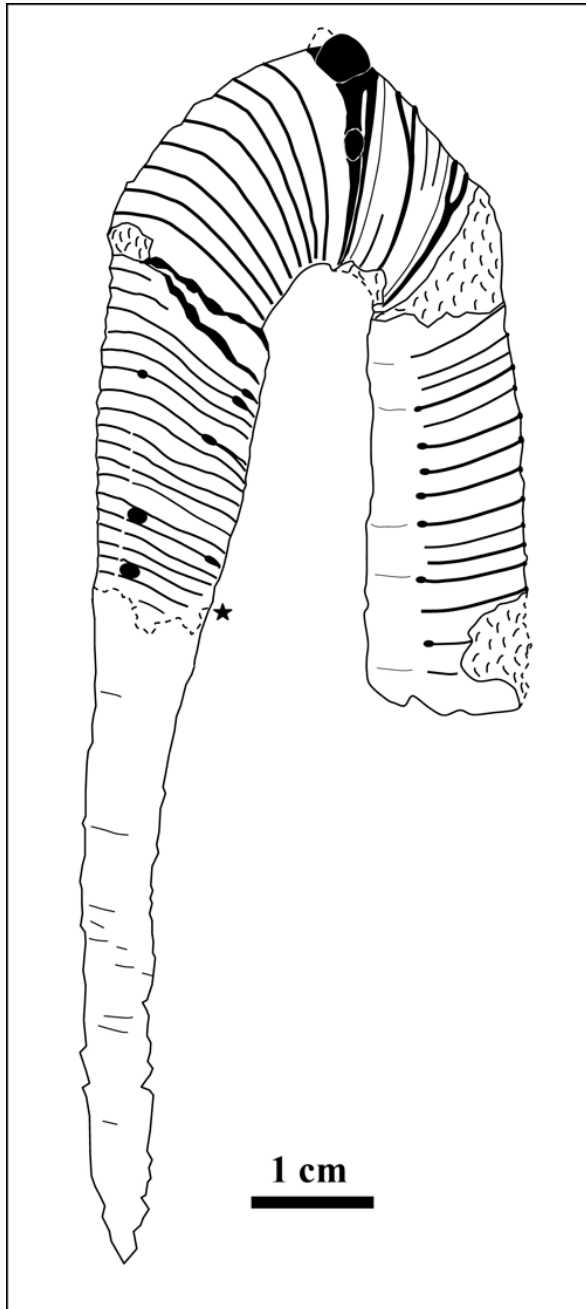


Figure 2: Schematic representation of *Ivaldiceras baratteroi* gen. & sp. nov. The end of the phragmocone is indicated by a star.

Locus typicus: Ravin de la Colle section, Tremolies, near the village of Moriez (Alpes de Haute-Provence, France).

Stratum typicum : Bed 266 of the Ravin de la Colle section.

Diagnosis: *Ivaldiceras* with more or less large conical tubercles in the middle of the *flexus*.

Measurements (mm):

Table 1: Measurements of *Ivaldiceras baratteroi* gen. & sp. nov.

Specimen	H	Hc	Lc	h2	h3
MNHN.F.57290	94	53	36	10	(ca 16)-19*

* For h3, the measurement ca 16 mm is an estimate of the whorl height without allowing for *post mortem* compression of the specimen. The total observed height including deformation is 19 mm.

Description

The incomplete *proversum* and *retroversum* are the only preserved elements. The shell, affected by strong post-mortem compression, shows hamuliniform coiling.

The lower half of the preserved *proversum* corresponds to the limonitized phragmocone; no ornamentation is distinguishable except for numerous poorly preserved fine ribs.

The upper part of the *proversum*, corresponding to the beginning of the body chamber, shows numerous thin, sharp ribs, regularly spaced and crossing the flanks and venter with uniform thickness.

At the very beginning of the body chamber, on the assumed periventral area, tiny tubercles with minimal relief are located between two ribs that they connect. Fine intercalatory ribs are arranged between these groups of ribs/tubercles. Distally, the tubercles disappear and the last part of the *proversum*, just before the *flexus*, shows a small number of very small tubercles irregularly arranged on the ribs and at different heights on the lower half of the sides, but rarely along the ventral area.

The *flexus* shows significant changes in ornamentation. In its first half, ornamentation is similar to that of the *proversum* but the ribbing is stronger. The regularly spaced simple ribs thicken gradually towards and on the ventral region. A pair of strong ribs, thicker than the previous ones, appears in the middle of the *flexus*. The strongest, located aborally, bears a lateral tubercle that extends radially towards mid-flank. The two ribs merge on the ventral area to form a large, more or less conical tubercle along the ventral axis. Thus, two such tubercles occur on either side of the ventral axis.

On the second half of the *flexus*, major ribs thickening and branching on the upper third of the flanks alternate with thinner intercalary ribs mainly on the upper third of the flanks.

The *retroversum* shows uniform ribbing consisting of simple, relatively thick ribs of uniform thickness, all originating from a tiny peridorsal tubercle. The ribs cross the venter with a small tuberculiform swelling on the periventral area. Thinner, irregularly arranged, intercalary ribs are also present. The dorsal region shows extremely fine costules.

The peristome is not preserved.

The sutures cannot be studied because their very poorly state of preservation

Comparison and discussion: *Ivaldiceras baratteroi* gen. & sp. nov. was collected in the *Deshayesites forbesi* Zone of Tremolies section, located near the village of Moriez (Alpes de Haute Provence, France). The section was described by DELANOY (1995, 1997) and includes the limestone beds of the *Deshayesites oglanlensis* Zone and of the *D. forbesi* Zone. The latter biostratigraphic unit is incomplete due to a significant gap between the top of the "Bedoulian" calcareous series and the beginning of the thick "Formation des Marnes Bleues". The base of the *Dufrenoyia furcata* Zone, characterized by the "Niveau Blanc", starts at about 3 meters above the top of the last limestone bed. The stratigraphic position of *Ivaldiceras baratteroi* gen. & sp. nov. is nevertheless confirmed by the presence in bed 263 of *Deshayesites* aff. *euglyphus* CASEY, 1964 (Pl. 1, fig. 3).

Ivaldiceras baratteroi gen. & sp. nov. shares, on the *flexus*, great ornamental similarities with *Auritina aurita* EGOIAN, 1989. The type species of the genus *Auritina* EGOIAN, 1989, described for the first time in the Western Caucasus (EGOIAN, 1989), is indeed characterized by the presence of two very strong tubercles in the same part of the shell. Nevertheless *A. aurita* EGOIAN differs from *Ivaldiceras baratteroi* gen. & sp. nov. in the presence of fine, dense ribbing without tubercles on the *proversum* and on the *retroversum* which are subparallel and almost contiguous.

The two taxa also differ in their very different stratigraphic positions. *A. aurita* EGOIAN is known only in the Lower Barremian *Kotetisvilia nicklesi* Zone. According to VERMEULEN (2009), the genus *Auritina* EGOIAN has been founded on teratological specimens but the discovery of several specimens in the *Kotetisvilia nicklesi* Zone of southeast France (Pl. 1, fig. 2) confirms the validity of the genus which probably originates from the Anahamulinidae with reinforced ribbing in the *flexus* such as *Amorina hoheneggeri* (UHLIG, 1883) or *Anahamulina suttneri* (UHLIG, 1883). This last species was tentatively assigned to the new genus *Auritina* by EGOIAN (1989).

Comparison with *I. divajeuensis* gen. & sp. nov. follows below.

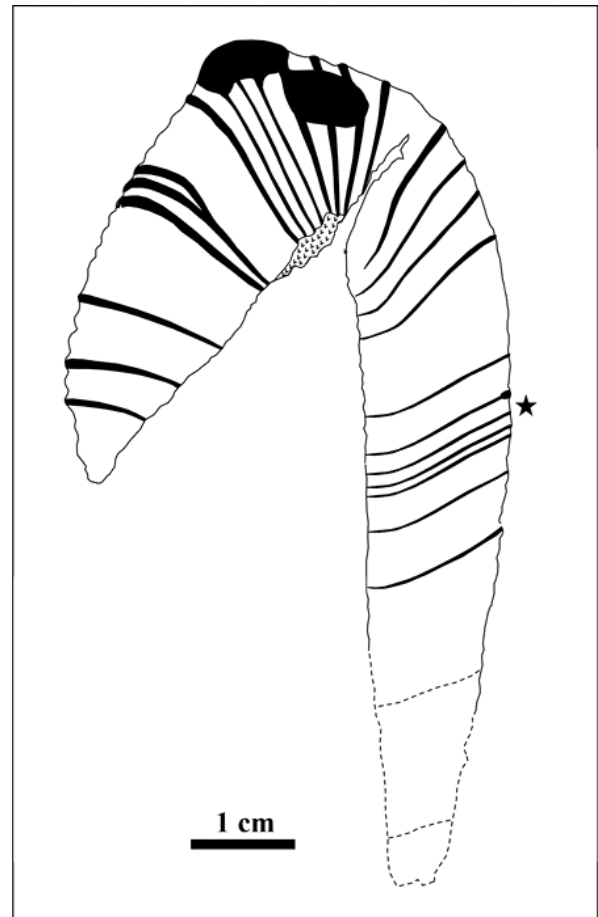


Figure 3: Schematic representation of *Ivaldiceras divajeuensis* gen. & sp. nov. The end of the phragmocone is indicated by a star.

Stratigraphic and geographic distribution: *Ivaldiceras baratteroi* gen. & sp. nov. is known only from the Lower Aptian of southeast France, in the *Deshayesites forbesi* Zone.

***Ivaldiceras divajeuensis*
gen. & sp. nov.**

(Fig. 3; Pl. 2, fig. 1.a-d)

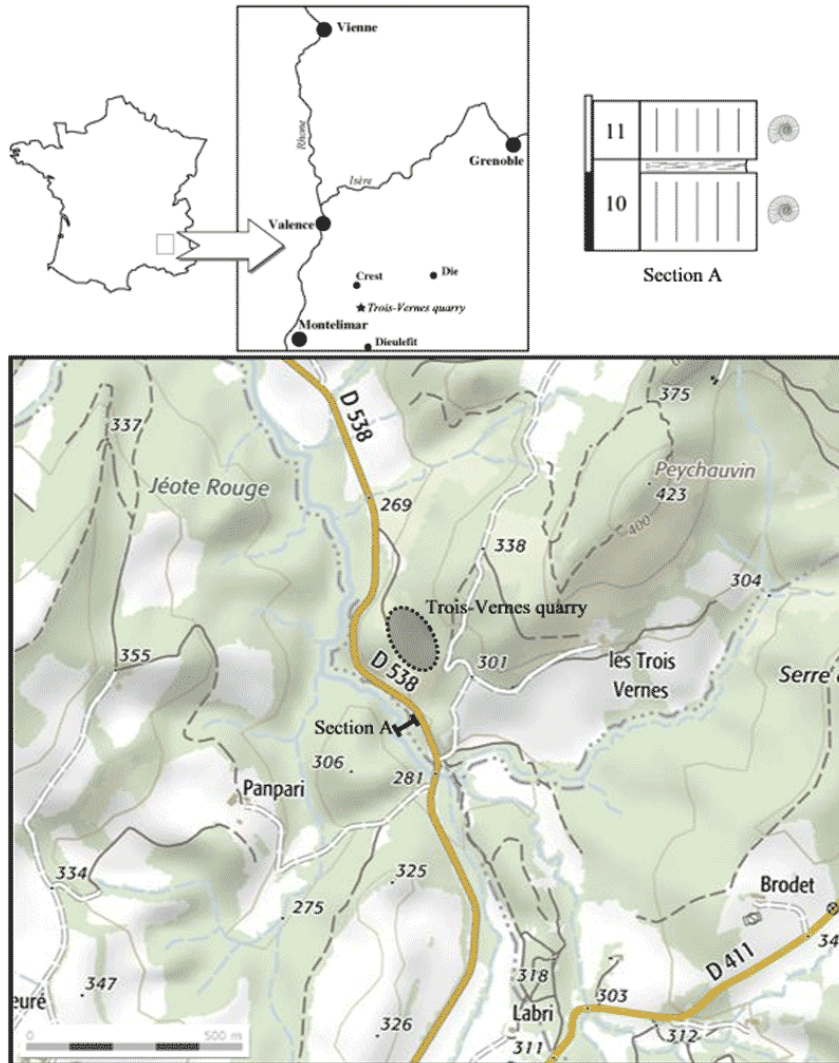
Material studied: One specimen no. div06, coll. BOSELLI, Lower Aptian, *Deshayesites oglanlensis* Zone, *Deshayesites luppovi* horizon, bed 10, Divajeu section A (Drôme, France). A cast is deposited in the collections of the Muséum National d'Histoire Naturelle de Paris under the no. MNHN.F. A57291.

Holotype: Specimen no. div06, coll. BOSELLI, Lower Aptian, *Deshayesites oglanlensis* Zone, *Deshayesites luppovi* horizon, bed 10, Divajeu section A (Drôme, France).

Derivatio nominis: From the name of the village of Divajeu (Drôme, France).

Locus typicus: Divajeu section A (Drôme, France).

Stratum typicum: Bed 10 of the Divajeu section A.



◀ **Figure 4:** Location of section A near the Trois-Vernes quarry.

Diagnosis: *Ivaldiceras* characterized by the presence of large nodular and flattened tubercles situated on the *flexus*, one on the venter and two others on the periventral area.

Measurements (mm):

Table 2: measurements of *Ivaldiceras divajeuensis* gen. & sp. nov.

Specimen	H	Hc	Lc	h2	h3
div06	83	47.5	42.5	13	--

Description: The specimen is incomplete, the early ontogenic stages and the lower part of the *proversum* missing. The partial phragmone, calcitized and poorly preserved, corresponds to the lower part of the *proversum*. However, numerous thin, prorsiradiate ribs can be distinguished, though no detail can be distinguished.

The body chamber begins in the upper part of the *proversum*. Until the beginning of the *flexus* it is oval in section, wider than high ($W/H = 19/13 = 1.46$). The flanks are convex and the ventral and dorsal regions are convex and broad. The ornamentation consists almost ex-

clusively of numerous, very fine, simple, slightly sinuous, prorsiradiate ribs. They are equally thick across the dorsal and ventral regions as on the sides. At the beginning of the body chamber, a rib thickens strongly in the upper third of the flanks and forms an inconspicuous flat tubercle extended radially on the ventrolateral border.

On the *flexus* the ornamentation shows significant changes. At its beginning, we observe simple, somewhat sinuous ribs which thicken from the dorsal region to the ventral area. Around the middle of the *flexus*, three thicker ribs appear that bear, in the upper third of the flanks, a very large nodular, flattened, more or less circular tubercle straddling these ribs. On the venter, the three thick ribs connect the two tubercles located on each side of the ventral area. In front of this group of ribs/tubercles, riblets converge towards a big nodular tubercle located in the middle of the ventral area, slightly forward of the previously described tubercles.

The *retroversum* is incomplete. However, it shows uniform ornamentation, generally consisting of simple ribs except on the end of the *flexus* where rare bifurcations can be observed in the upper part of the flanks. All these ribs are sharp and cross the broad ventral area.

The peristome is not preserved.

Sutures cannot be studied because their very poorly state of preservation.

Comparison and discussion: *Ivaldiceras divajeuensis* gen. & sp. nov. was discovered in a very small outcrop situated near the quarry of Trois-Vernes (Fig. 4), which delivered a rich ammonite fauna from the uppermost Barremian/lowermost Aptian (DELANOY *et al.*, 2008a).

Unfortunately, lithological continuity between the quarry and the outcrop is not observed but the fauna collected from the outcrop demonstrates that it exposes levels stratigraphically above those of the quarry. Indeed, the presence in bed 10 of *Procheloniceras* aff. *stobiesckii* (ORBIGNY, 1850) (Pl. 2, fig. 2), *Deshayesites* aff. *luppovi* BOGDANOVA, 1983 (Pl. 1, figs. 4-5), *Eulytoceras phestum* (MATHERON, 1880) and *Macroscaphites yvani* (PUZOS, 1832) [M] indicate clearly that this level belongs to the *Deshayesites oglanlensis* Zone. Bed 11 yielded only *Procheloniceras* aff. *stobiesckii* (ORBIGNY) and *Eulytoceras phestum* (MATHERON).

Ivaldiceras divajeuensis gen. & sp. nov. is close to *I. baratteroi* gen. & sp. nov. from which it differs in its three large nodular bulges situated on the *flexus*, whereas *I. baratteroi* gen. & sp. nov. shows two well developed conical tubercles on the same part of the shell. The ribbing shows great similarities between the two species but in *I. divajeuensis* gen. & sp. nov., the ribs are a little thicker and more sinuous, especially on the upper part of the *proversum* and on the *retroversum*. Furthermore, the little tubercles observed in *I. Baratteroi* gen. & sp. nov. are rare or absent on the beginning of the body chamber and absent from the preserved part of the *retroversum*. In addition, the two species have different stratigraphic positions: *Deshayesites oglanlensis* Zone for *Ivaldiceras divajeuensis* gen. & sp. nov. and *D. forbesi* Zone for *I. baratteroi* gen. & sp. nov.

Stratigraphic and geographic distribution: *Ivaldiceras divajeuensis* gen. & sp. nov. is known only in the Lower Aptian *Deshayesites oglanlensis* Zone of southeast France.

Conclusion

The description of the genus *Ivaldiceras* gen. nov. and the species *I. divajeuensis* gen. & sp. nov. and *I. baratteroi* gen. & sp. nov. completes the inventory of heteromorphic ammonite fauna of the Lower Aptian of the Vocontian Basin. This study advances our knowledge of these rare taxa whose systematic position of suprageneric rank remains very uncertain. The assignment of *Ivaldiceras* gen. nov. to the Family Macroscaphitidae HYATT, 1900, is based on morphological and ornamental criteria common in some representatives of this family. Only the collection of more complete specimens, particularly ones that allow the study of the suture patterns, will clarify the systematic position of the genus and its phylogenetic relationships.

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Plates

Plate 1:

Fig. 1: *Ivaldiceras baratteroi* gen. nov. sp. nov: holotype, ech. no. MNHN.F.A57290, coll. BARATTERO, Lower Aptian, *Deshayesites forbesi* Zone, bed 266 from Tremolies section (Alpes de Haute-Provence, France). **1a:** lateral view; **1b:** ventral view of the upper part of the *proversum*; **1c:** view of the other side of the *retroversum* showing the preserved little tubercles.

Fig. 2: *Auritina aurita* EGOIAN, 1989: ech. no. Arp01, coll. BAUDOUIN, Lower Barremian, *Kotetisvilia nicklesi* Zone, Arpavon (Drôme, France).

Fig. 3: *Deshayesites* aff. *euglyphus* CASEY, 1964: ech. no. XB.TRE03, coll. BARATTERO, Lower Aptian, *Deshayesites forbesi* Zone, bed 266 from Tremolies section (Alpes de Haute-Provence, France).

Fig. 4: *Deshayesites* aff. *luppovi* (BOGDANOVA, 1983): specimen no. dvj2-03, coll. BAUDOUIN, Lower Aptian, *Deshayesites oglanlensis* Zone, bed 10, Divajeu section A (Drôme, France).

Fig. 5: *Deshayesites* aff. *luppovi* (BOGDANOVA, 1983), specimen no. div04, coll. BOSELLI, Lower Aptian, *Deshayesites oglanlensis* Zone, bed 10, Divajeu section A (Drôme, France).

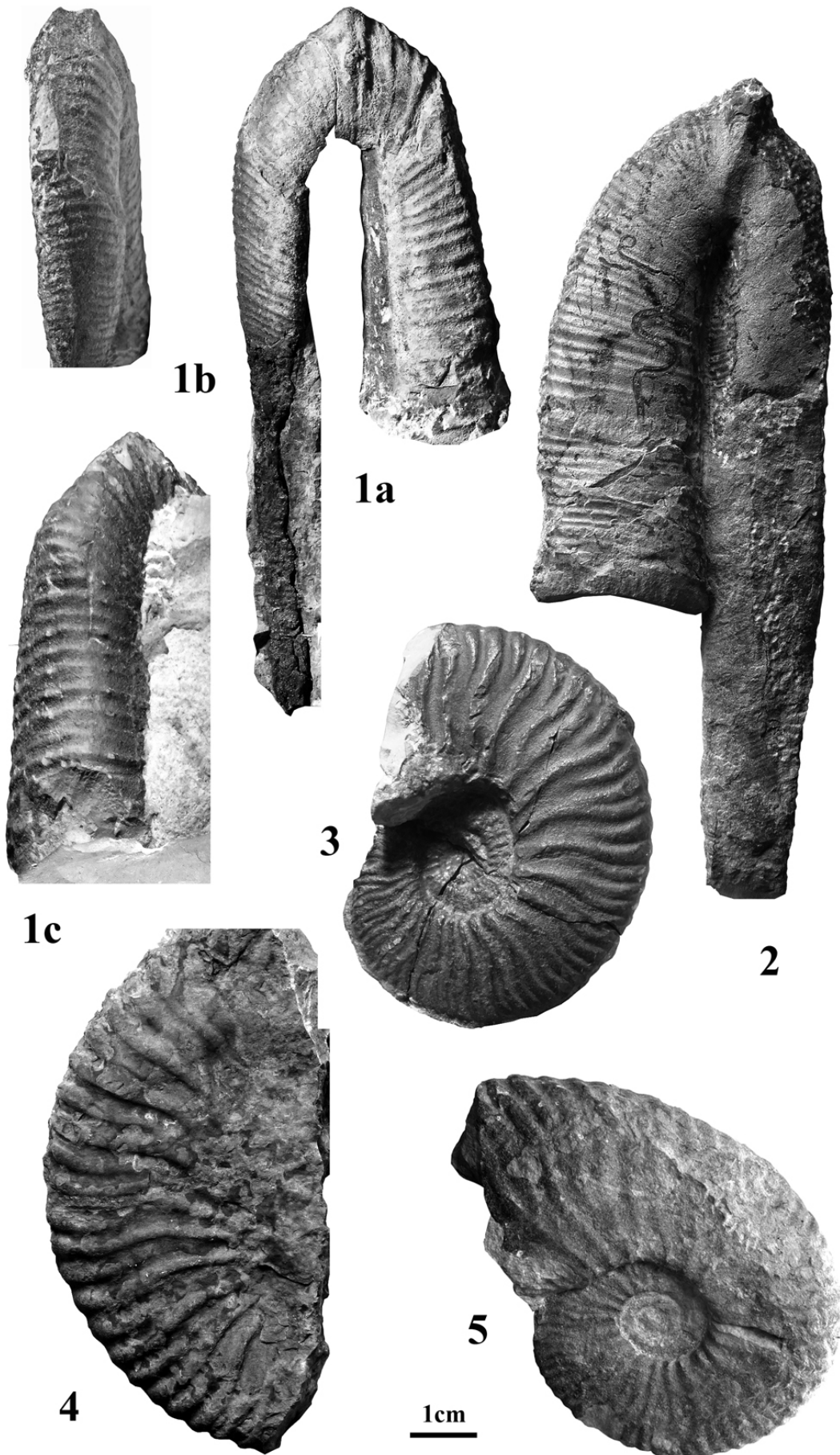


Plate 2:

Fig. 1: *Ivaldiceras divajeuensis* gen. nov. sp. nov. : specimen no. div06, coll. BOSELLI, Lower Aptian, *Deshayesites oglanlensis* Zone, *Deshayesites luppovi* horizon, bed 10, Divajeu section A (Drôme, France). **1a:** lateral view; **1b:** ventral view of the *proversum*; **1c:** ventral view of the *retroversum*; **1d:** ventral view in the *flexus*.

Fig. 2: *Procheloniceras* aff. *stobieckii* (ORBIGNY, 1850): specimen no. div01, coll. BOSELLI, Lower Aptian, *Deshayesites oglanlensis* Zone, bed 10, Divajeu section A (Drôme, France).

