

Some new species of the subfamily 'Leptoceratoidinae' (Ancyloceratina, Ammonoidea) in uppermost Hauterivian and lower Barremian deposits from Rumania

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Avram, E. Some new species of the subfamily 'Leptoceratoidinae' (Ancyloceratina, Ammonoidea) in uppermost Hauterivian and lower Barremian deposits from Rumania. — Scripta Geol., Spec. Issue 3: 31-43, 2 figs., 2 pls, Leiden, December 1999.

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Key words: Ammonoidea, Leptoceratoidinae, new species, taxonomy, Hauterivian, Barremian.

The Berriasian — lower Valanginian genus *Leptoceras* reappears in the lower Barremian sequences of Rumania, where it is represented by at least two species: *L. brunneriforme* sp. nov. and *L. soinitense* sp. nov. This record has led to a revision of the so far accepted taxonomic interpretation of the criomorph Barremian Leptoceratoidinae and of their relationship with the Berriasian-Valanginian Protancyloceratinae. In addition, a new species of the genus *Hamulinites* (*H. nicklesi*, from the uppermost Hauterivian) provides evidence that the genus *Eoleptoceras* Manolov should be considered valid.

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Introduction

The inventory and the systematic position of the small uncoiled ammonites recorded in the Berriasian — lowermost Valanginian and in the Barremian sequences have long been discussed in a succession of papers, the most comprehensive of them by Thieuloy (1966) and Vasíček & Wiedmann (1994). As a result, all the Berriasian — lowermost Valanginian species were grouped within the subfamily Protancyloceratinae Breistroffer, 1947, thus in the family Bochianitidae Spath, 1922, while all the Barremian ones were placed within the family Ancyloceratidae Gill, 1871, subfamily Leptoceratoidinae Thieuloy, 1966 (this latter replacing Leptoceratinae Manolov, 1962, considered a subjective synonym of Protancyloceratinae by Thieuloy).

Wright's (1981) revision of Cretaceous ammonite classification led to a similar point of view, except that the Barremian Leptoceratoidinae were included (following Casey, 1960), though questionably, within the subfamily Helicancylinae Hyatt, 1894. However, he later (Wright et al., 1996) treated the Leptoceratoidinae as a separate subfamily in the Ancyloceratidae.

Most Berriasian - lowermost Valanginian species of the subfamily Protancyloceratinae were included in the genera *Protancyloceras* Spath, 1924 and *Leptoceras* Uhlig, 1883 (= *Protoleptoceras* Nikolov, 1967), while the Barremian species of the subfamily Leptoceratoidinae were grouped in several genera, differing from one another by the type of uncoiling (criocone, ancylocone, hamiticone) and by ornamentation. Among

the Barremian criocones, the genus *Karsteniceras* Royo y Gomez, 1945, clearly stands apart from *Leptoceras* by the siphonal weakening of the annular ribs and by the presence of marginal tubercles, while the genus *Leptoceratoides* is (in Wright's 1996 interpretation) a Barremian homeomorph of *Leptoceras*.

This picture is now challenged by the record in lower Barremian deposits from Rumania, of typical representatives of the genus *Leptoceras*, i. e. small criocones bearing annular, more or less distant ribs, continuous (even higher) on the venter and displaying suture lines comparable to those of the Berriasian representatives of this genus. They confirm, in a way, the controversial citation by Kilian (1910, p. 246) of *Crioceras* (*Leptoceras*) *brunneri* Ooster in the Barremian.

It is worth mentioning that the type species of *Leptoceratoides*, viz. *Leptoceras pumilum* (Uhlig, 1883), also displays exclusively non-tuberculate ribs that are continuous across the venter (confirmed by Dr Z. Vasíček, who studied the original material; personal communication), thus belonging to the group here discussed, but not to the genus *Karsteniceras* as defined by Vasíček & Wiedmann (1994).

Although recorded in the East Carpathian flysch (Avram, 1976) and in the Diambovicioara region (unpublished), too, the best preserved examples are the pyritised individuals gathered in the Svinita village area, at the western end of the structural units defined as 'Marginal Dacides' by Sandulescu (1984) (Fig. 1). These pyritised fossils come from the Temeneacia valley, west of the water-reservoir of the village, from the beds which also yielded rare pulchelliids (*Kotetishvilia nicklesi* (Hyatt)), numerous holcodiscids (*Holcodiscus ziczac* Karakasch, *H. aff. cadoceroides* (Karakasch), *H. tzankovi* Avram, *H. decorus* Avram, *H. ouachensis* Avram, *H. alpha* Avram, *Astieridiscus* cf. *morleti* (Kilian), and the first *Holcodiscus caillaudianus* (d'Orbigny)), desmoceratids (*Melchiorites* spp.) and leptoceratoidines (*Leptoceras* cf. *pumilum* (Uhlig), *Manoloviceras saharievae* (Manolov), *Eoheteroceras silesiacum* (Vasíček & Wiedmann)). This fauna represents the *Kotetishvilia nicklesi* Zone and the bottom of the *Holcodiscus caillaudianus* Zone, as defined by Hoedemaeker & Company (1993).

Another new species described here is *Hamulinites nicklesi* sp. nov., recorded in the beds with *Pseudothurmannia* (uppermost Hauterivian) exposed in the Sasului Hill (= Dealul Sasului) from the Diambovicioara region, located at the eastern end of the South Carpathians (in the Median Dacides, sensu Sandulescu, 1984).

All the specimens described in this paper are housed in the Museum and Repository of the Geological Institute of Rumania (IG), in Bucharest.

Systematics

Suborder Ancyloceratina Meek, 1876

Family Ancyloceratidae Gill, 1871

Genus *Leptoceras* Uhlig, 1883

Type species — *Leptoceras brunneri* (Ooster, 1860); latest Berriasian – ?early Valanginian, Switzerland.

Discussion — The genus is here adopted in the meaning given by Thieuloy (1966), who also subsumed Uhlig's (1883), Sarasin & Schöndelmayer's (1902) and Manolov's (1962) opinions on the matter: cyrtocone to criocone microconchs, with regular or

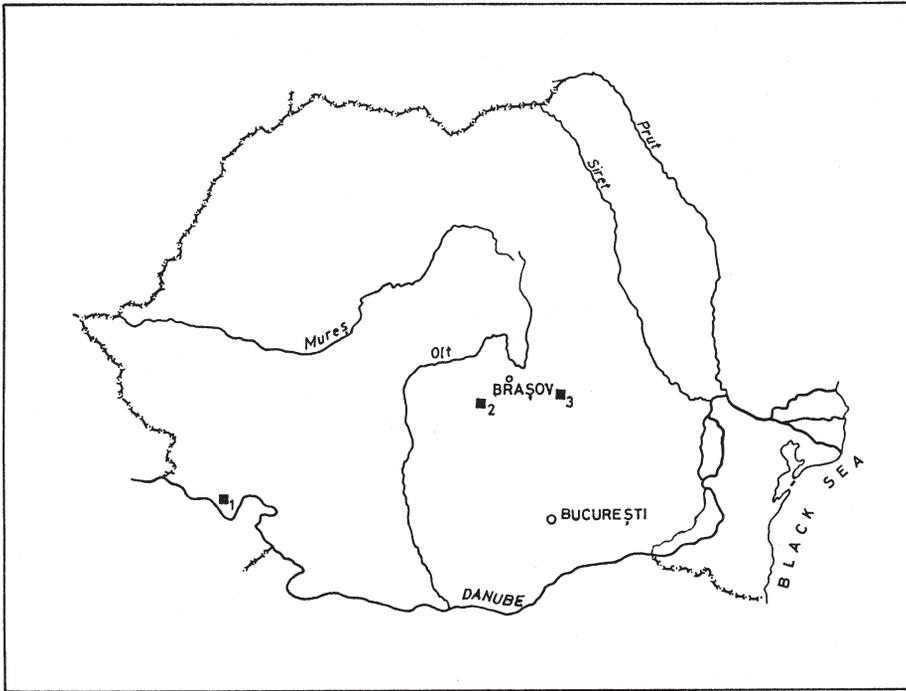


Fig. 1. Location of the Rumanian sites which yielded the new species of leptoceratids: 1: Svinita village area; 2: Diambovicioara region; 3: East Carpathian Flysch.

elliptical spire, the last whorl touching or not the initial shell; whorl section rounded to oval; ornamentation composed generally of rectiradiate or rursiradiate single ribs, crossing the venter without any siphonal weakening or furrow and without ventrolateral swellings or nodes; poorly incised suture line of ELUI type, with large bifid saddles and indistinctly trifid lateral lobe. Species are discriminated on the ground of the spire uncoiling and section and also of the style of ribbing.

There is no reason to exclude from *Leptoceras* the Barremian species described below (or *Leptoceras pumilum* (Uhlig)), except for the break in the stratigraphical record of its representatives between the latest Valanginian and the lower Barremian. Consequently, the genus *Leptoceratoides* Thieuloy, 1966, as interpreted by Wright, 1996, is regarded as a junior subjective synonym of *Leptoceras*.

Leptoceras brunneriforme sp. nov.
Pl. 1, figs. 1-4, 5a-b; Fig. 2/1a-b, 2a-b.

1883 *Crioceras* (*Leptoceras*) cf. *Brunneri* — Uhlig, p. 271.

1976 *Leptoceras* sp. aff. *L. brunneri* — Avram, p. 32.

Holotype — IG P 14770 (Avram coll.): Pl. 1, fig. 1 and Fig. 2/1a-b.
Locus typicus — Svinita village area (for details see Introduction).

Stratum typicum — Lower Barremian (Svinita Formation, Temeneacia Member).

Derivatio nominis — Species resembling the Berriasian *Leptoceras brunneri* (Ooster).

Diagnosis — Small criocone with open, slowly growing spire and rectiradial, straight ribbing, continuous (and higher) on venter.

Material — Twenty-five specimens: 11 examples, partly deformed by lateral compression, from the same bed as the holotype at Svinita (Avram coll., IG P 14771, 14773); 5 fragmentary individuals from the Diambovicioara region, in the Muierii Valley (Patrulus & Avram coll., IG P 14799); 5 fragmentary individuals from the East Carpathian flysch, in the Tarlung Valley (Avram coll., IG P 14745-14746).

Description — The holotype preserves two thirds of its mature whorl, with the beginning of the body chamber. It displays an open crioconid spire, with compressed-oval section (Fig. 2/1a), growing slowly, as in *Leptoceras brunneri* (Ooster). Its ornamentation consists of single, almost straight sharp and distant rectiradial ribs, higher along the siphonal line. The sutures (Fig. 2/1b), still distant to one another, are simple, with the median, lateral and dorsal lobes almost equal in length.

Variability — Most of the pyritised individuals from Svinita (Pl. 1, figs. 2-4) illustrate the young stages, with a smooth, coiled first whorl and the beginning of the uncoiled shell, smooth on the first 7 mm, then bearing equal, slightly prorsiradial ribs. Two fragmentary specimens (IG P 14773), of which one is figured (Pl. 1, figs. 5a-b), are still septate at a whorl-height of 8.8 mm; their ribs at the older end (Fig. 2/2a) are much higher than in the holotype along the siphonal line.

All the specimens here described lack any constriction. However, three other individuals (IG P 14772 and 14776), like *L. pumilum*, develop shallow constrictions at the beginning of (Pl. 1, fig. 6), or on, the body chamber (Pl. 1, figs. 7-8); the constrictions are bordered by two ribs that are stronger than usual; the whorl section of these forms seems to be more compressed (Figs. 2/3a, 2/4a) and the gerontic stage bears diminished ornamentation. These three specimens could represent a separate group from the species here described, although constrictions have not been considered so far as an important feature of discrimination at the species-group level.

Occurrence — Taking into consideration its presence in various structural units of Rumania, and also in the Czech Republic (Skalice) (Uhlig, 1883), this species is relatively frequent, although it has not been described before. It characterises the upper part of the lower Barremian (especially the *Kotetishvilia nicklesi* Zone interval).

Leptoceras svinitense sp. nov.

Pl. 1, figs. 9-10; Pl. 2, figs. 1, 3; Fig. 2/5a-b.

Holotype — IG P 14774 (Avram coll.): Pl. 1, fig. 9 and Fig. 2/5a-b.

Locus typicus — Svinita village area (see details in the Introduction).

Stratum typicum — Lower Barremian (Temeneacia Member of the Svinita Formation).

Derivatio nominis — The species is named after the type locality.

Diagnosis — Small criocone, with almost circular and relatively rapidly growing spire, bearing rectiradial (in places rursiradial) sparse ribbing, continuous on venter.

Material — Twenty-two pyritised individuals, all from the same bed as the holotype (Avram coll., IG P 14774-14775).

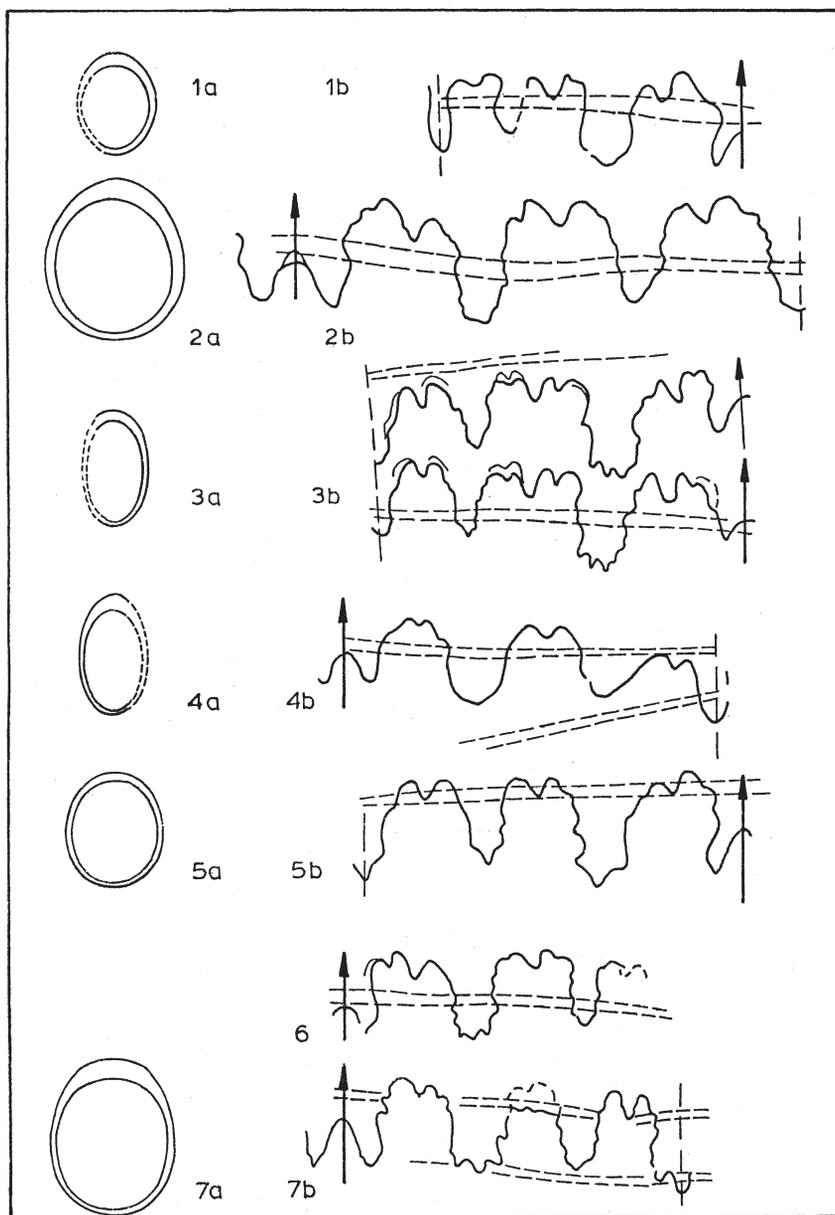


Fig.2. 1a-b: *Leptoceras brunneriforme* sp. nov., holotype, whorl section ($\times 3$) and suture line at a whorl-height of 4.8 mm; 2a-b: the same species, specimen on Pl. 1, fig. 5, whorl section ($\times 3$) and suture line at a whorl-height of 6.7 mm; 3a-b: *Leptoceras* aff. *brunneriforme*, specimen on Pl. 1, fig. 7, whorl section ($\times 3$) and the last-but-two sutures, at a whorl-height of 5.5 mm; 4a-b: the whorl section ($\times 3$) and suture at a whorl-height of 5.7 mm, of the specimen figured on Pl. 1, fig. 8; 5a-b: *Leptoceras soinitense* sp. nov., holotype, whorl section ($\times 3$) and suture at a whorl-height of 5.2 mm; 6: *Leptoceras?* sp., suture line at a whorl-height of 8 mm, of the specimen figured on Pl. 2, fig. 5; 7a-b: the same species, whorl section ($\times 3$) and suture line at a whorl-height of 7.6 mm, of the specimen figured on Pl. 2, fig. 4.

Description — The holotype is a mature, almost complete specimen, which preserves the body chamber on a quarter of the last whorl. Its spire, which begins very open and almost smooth (Pl. 1, fig. 10c; Pl. 2, fig. 1a), continues almost circular and grows much more quickly than in *Leptoceras brunneriforme*; it bears strong, generally rectiradiate ribs, dense only in youth and crossing the ventral area with highest relief along the siphonal line. The whorl section (Fig. 2/5a) is large-oval, almost circular ($W/H = 0.84$). On the crushed last quarter of whorl, coincident with the body chamber, the ornamentation diminishes and becomes irregular, as in *Leptoceras subtile* Uhlig. The last suture lines (Fig. 2/5b) are crowded, also proving the gerontism. No constriction is observed.

Variability — Ribbing can be slightly rursiradiate and the body chamber can begin later than in the holotype. The spire of the specimen figured in Pl. 1, fig. 8 is intermediate between that of *Leptoceras svinitense* and of *L. brunneriforme*.

Remarks — The species here described differs from *Leptoceras brunneriforme* in the almost circular uncoiled phragmocone, and by the much more rapid growth of the shell; it is also very near to *Karsteniceras beyrichoide* Vasíček and Wiedmann by its lateral view, but it is clearly different from this species by the ventral ornamentation (i.e. the generic features).

Occurrence — Svinita area (Rumania); upper part of the lower Barremian (*Kotetishvilia nicklesi* Zone).

Leptoceras? sp. (or *Karsteniceras?* sp.)

Pl. 2, figs. 2, 4, 5; Fig. 2/6, 7a-b.

? 1994 *Karsteniceras beyrichi* — Vasíček & Wiedmann, p.209, pl. 2, figs. 1-2; text-fig. 1B.

Material — Seven crushed specimens (Avram coll., IG P 14766, 14767) partly pyritised, all of them from the upper part of the lower Barremian at Svinita, in the same site and bed as the species described above (see also the Introduction).

Description — The specimens under discussion are all larger than the other criomorph members of the Leptoceratoidinae, and display an open spire with oval section and bearing rare, annular, sharp ribs. These ribs are rectiradiate, equal in size in youth, then differentiated in 2-3 consecutive stronger and 1-2 weaker ones; on the body chamber (Pl. 2, fig. 5) the raised ribs are in pairs. All the stronger ribs attain their highest relief at the ventro-lateral margin, so that their external outline looks tabulate (Fig. 2/7a). The sutures (Figs. 6, 7b) show wider saddles than in the species described above and more incised dorsal lobes.

Remarks — The features listed above relate these specimens to those figured as *Karsteniceras beyrichi* (Karsten) by Vasíček & Wiedmann (1994); all of them could be grouped in the genus *Karsteniceras* only with difficulty, since they have only marginal elevation of the main ribs, instead of a ventral furrow and marginal tubercles/swellings.

Occurrences — Lower Barremian (*Kotetishvilia nicklesi* Zone) in Rumania. The lower/upper Barremian boundary (?) in Colombia.

Genus *Hamulinites* Paquier, 1901

Type species — *Hamulina muniere* Nickles, 1894; Barremian, Spain.

Remarks — The genus *Hamulinites* was recently adopted (Vasíček & Wiedmann, 1994) with a broad scope to include both ptychoceratid and ancyloceratid uncoiled leptoceratoidines. A new species from the Diambovicioara region, typified by its ptychoceratid uncoiling, encourages the discrimination of these two groups as different genera, i. e. emphasizes the validity of the genus *Eoleptoceras* Manolov, 1962.

Consequently, the genus *Hamulinites* as interpreted here, embraces small ptychomorph ammonites composed of two, almost straight, joined branches and bearing simple straight ribs, without any tubercle or ventral furrow; the body chamber occupies the end of the shaft and the hook. The sutures are simple, of ELUI type.

In this restricted definition, the genus includes only the type species and the new species here described.

Range — Uppermost Hauterivian and lower Barremian.

Hamulinites nicklesi sp. nov.
Pl. 2, figs. 6-9.

Holotype — IG P 14794, specimen of Pl. 2, figs. 6a-b (Patrulius & Avram coll.).

Locus typicus — Diambovicioara region, South Carpathians (for details see the Introduction).

Stratum typicum — Uppermost Hauterivian (Diambovicioara Formation, Valea Muierii Member).

Derivatio nominis — In memory of R. Nickles, the author who figured the first species of the genus.

Diagnosis — Small ptychocone, with very rapid growth of the shell and rectiradate, almost straight and relatively dense ribbing.

Material — Beside the holotype, 12 more or less fragmentary specimens, preserved as internal moulds in fine-grained calcarenites, of which only 5 preserve parts of both branches (Patrulius & Avram coll., IG P 14795).

Description — The holotype preserves the older end of the shaft and the entire hook, almost 30 mm long; the main feature of the species is the rapid shell growth, so that the hook is at least twice as high as the shaft. The whorl section is oval (slightly deformed by lateral compression), the ornamentation consists of dense, rounded ribs, prorsiradate on the shaft and rectiradate on the hook, where they are gently bent forward on the dorsum. The body chamber begins at the end of the shaft (Pl. 2, fig. 6a). The suture line is not visible.

Variability — Some of the other individuals display (rare) bifurcate ribs from the inner margin of the hook near the bend, and stronger dorsal curvature of ribbing.

Occurrence — Type locality only.

Taxonomic implications

The main consequence of the occurrence in the lower Barremian of the genus *Leptoceras* is the need to reconsider the division into two different systematic units (the

subfamilies Protancyloceratinae and Leptoceratoidinae) of two groups of micromorph ammonites that are very similar in size, coiling, ornamentation and suture line but differ in age, being Berriasian - lowermost Valanginian and uppermost Hauterivian - lower Barremian, respectively.

In fact, the presence in the lower Barremian of the genus *Leptoceras* argues (in spite of its quite long absence in stratigraphic records: in the whole interval between the early Valanginian and the earliest Barremian) for its range continuity across this interval, possibly hidden in an ecological niche/refuge. Consequently, the whole group of micromorph uncoiled ammonites would represent a single phyletic stock, derived from the Protancyloceratinae, in the Berriasian. It would, thus, include the Berriasian and Barremian species of the genus *Leptoceras*, beside all the Barremian genera and species of the subfamily 'Leptoceratoidinae' listed by Vasíček & Wiedmann (1993). As for the name of this subfamily, it should be stressed that 'Leptoceratoidinae' was introduced by Thieuloy (1966) as a replacement for 'Leptoceratinae' Manolov, 1962 (which also grouped all the Barremian uncoiled micromorph ammonites) on the grounds of the lack in the Barremian of its indicative genus: *Leptoceras*. Since this genus is proved to have existed in Barremian, the subfamily name given by Manolov ought be reinstated.

The specimens here described as *Leptoceras?* sp. (or *Karsteniceras?* sp.), displaying a ventro-lateral elevation of the ribs, pertain to the latter genus, as defined by Vasíček & Wiedmann (1994): 'ribs generally crossing venter; in some species rib-weakening on the siphonal line leads to the development of a ventral furrow'. Nevertheless, if we take into consideration the meaning of *Karsteniceras* as based on the description of its type species by Etayo Serna (1968) (i.e. small criomorph ammonites, with single, sharp, ring-shaped ribs, displaying a ventral furrow and marginal tubercles or swellings), these specimens, and also the one figured as *Karsteniceras beyrichi* by Vasíček & Wiedmann (1994), belongs to a different species and only doubtfully fit into *Karsteniceras*, while the species *Karsteniceras ibericum* Vasíček & Wiedmann falls into synonymy with *K. beyrichi*. Unfortunately, no satisfactory solution can be reached until a complete study of the Colombian *Karsteniceras*, including the intraspecific variability of its type-species, is carried out.

On the other hand, the presence of the new ptychocone species *Hamulinites nicklesi* in the uppermost Hauterivian is a reason for keeping the genus *Hamulinites* only for its ptychoceratid uncoiled representatives (*H. munieri* (Nickles), *H. nicklesi* sp. nov.) and for restoring the genus *Eoleptoceras* Manolov, 1962, for the ancyloceratid representatives of this stock (*E. parvulum* (Uhlig), *E. fragile* (Uhlig) and *E. assimile* (Uhlig)).

Acknowledgements

The author acknowledges with many thanks Professor Peter Rawson (University College London) and Professor Zdenek Vasíček (Mining University, Ostrava) for their suggestions and critical observations on the final draft of this paper.

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Plate 1

Figs. 1-5. *Leptoceras brunneriforme* sp. nov.

1: Holotype, IG P 14770; 2-4: topotypes, IG P 14771; 5a-b: lateral and ventral view of the largest, fragmentary specimen (IG P 14773).

Figs. 6-8. *Leptoceras* aff. *brunneriforme* sp. nov.

6a-b, 7: IG P 14772; 8: example transitional to *Leptoceras svinitense* sp. nov., IG P 14776.

Figs. 9, 10. *Leptoceras svinitense* sp. nov.

9a-b: Holotype (IG P 14774); 10a-c: topotype (IG P 14775) (10c, enlarged 2 to show the youngest part of the shell).

Except for fig. 10c, all specimens are figured at natural size. All come from the author's collection, collected from the lower Barremian succession at Svinita (site 1 in Fig. 1).

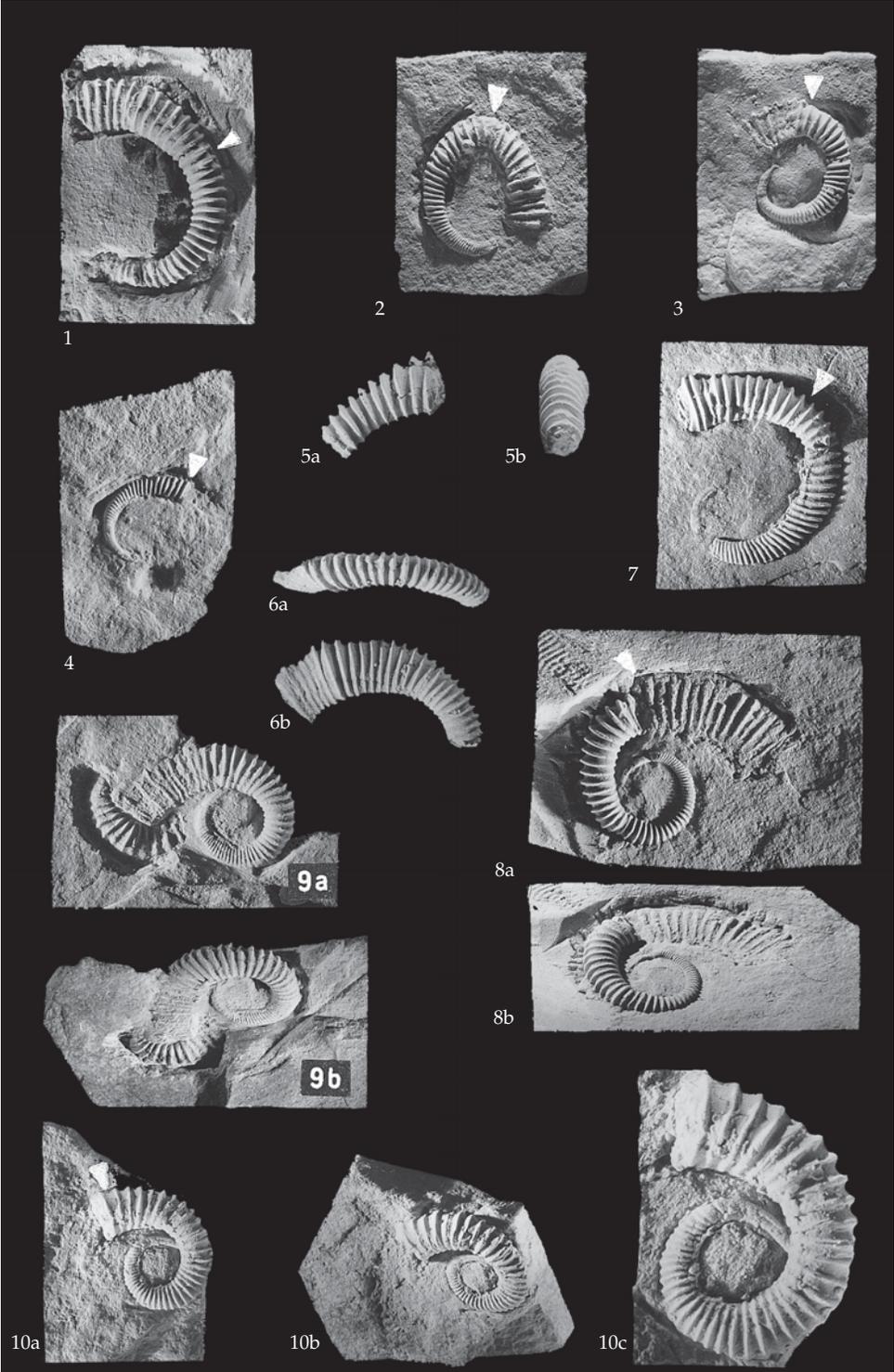


Plate 2

Figs. 1, 3. *Leptoceras svinitense* sp. nov., topotypes (IG P 14775).

Figs. 2, 4-5. *Leptoceras?* sp. (or *Karsteniceras?* sp.).
2, 4: IG P 14766; 5: IG P 14767.

Figs. 6-9. *Hamulinites nicklesi* sp. nov.
6a-b: Holotype (IG P 14794); 7-9: topotypes (IG P 14795).

All specimens are figured at natural size. Those of figs. 1-5 were collected by the author, from the lower Barremian deposits at Svinita; those of figs. 6-9 come from D. Patrulius & E. Avram's collection, from the beds with *Pseudothurmannia* (top of Hauterivian) in Diambovicioara (site 2 in Fig. 1).

