First Finds of Lithancylus Casey, 1969 (Ammonoidea, Ancyloceratidae) in the Lower Aptian of Ul'yanovsk Povolzhye

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Baraboshkin Evgeny
Lomonosov Moscow State University

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First Finds of *Lithancylus* Casey, 1969 (Ammonoidea, Ancyloceratidae) in the Lower Aptian of Ul'yanovsk Povolzhie (Volga Region)

I. A. Mikhailova and E.Yu. Baraboshkin
Faculty of Geology, Moscow State University, Vorob'evy gory, Moscow, 119899 Russia
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Abstract—The genus *Lithancylus* Casey, 1960 was previously unknown from Ul'yanovsk Povolzhye. *L. grandis* (J. de C. Sowerby, 1828) is recorded and four new species, *L. glebi* sp. nov., *L. igori* sp. nov., *L. russiensis* sp. nov., and *L. tirolensiformis* sp. nov., are described from the Lower Aptian of this region.

INTRODUCTION

The Aptian of the middle reaches of the Volga River (Middle Povolzhye) has been studied for over a century. Although the Aptian stratigraphy of Povolzhye is well established (Sazonova, 1958; Glazunova, 1963, 1973; Sazonova and Sazonov, 1967), new data have allowed refinement of the existing stratigraphic schemes (Baraboshkin, 1998; Baraboshkin *et al.*, 1999).

Extensive collecting by I.A. Shumilkin, G.N. Uspenskii, M.V. Efimov, V.A. Krivosheev and ourselves, and reexamination of the collections of K.A. Kabanov and G.K. Kabanov show a considerable diversity of ancyloceratids in Povolzhye, including taxa new for Russia. One of these is the genus *Lithancylus* discussed below.

MATERIAL

The specimens studied come from two localities: the town of Sengilei and the village of Kriushi (Fig. 1). In both cases, the specimens were recovered from carbonate nodules in Clayey Member V of the *Deshayesites volgensis–Ancyloceras matheronianum* zone (the members are numbered according to Baraboshkin (1998) and Baraboshkin *et al.* (1999).

The major measurements of ammonoid shells and their explanations are shown in Fig. 2. In addition, we used the following measurements (see Baraboshkin and Mikhailova, 1994): α_1—the angle between the ribs and the axis of the shaft; α_3—the angle between the branches of the ribs.

The material described is housed in the Museum of the Earth at Moscow State University (MZ MGU, coll. no. 96).

SYSTEMATIC PALEONTOLOGY

Family Ancyloceratidae Gill, 1871

Genus *Lithancylus* Casey, 1960

Lithancylus: Casey, 1960–1980, p. 16, 70, 649; Day, 1967, p. 19; Klinger and Kennedy, 1977, p. 250; Aguirre Urreta and Ricardi, 1989, p. 199; Wright *et al.*, 1996, p. 216.
Toxoceratoides: Thieuloy, 1990, p. 102.

Type species. *Hamites grandis* J. de C. Sowerby, 1828; Lower Aptian; England.

Diagnosis. Very large hamulicones. Shaft straight, terminating in hook in later ontogenetic stages. Coiled portion, including first whorl and protoconch, unknown. Body chamber occupies slightly more than half of the hook. Cross section changes from almost circular to hexagonal (on hook across ribs). Ornamentation of shaft similar to that in *Ancyloceras*, represented by complex nodular primary ribs and simple secondary ribs in venter and flanks. On venter ribbing uniform. Primary ribs with one to two rows of nodes: ventral, lateral, and paradorsal. In ontogeny, ventral nodes appear first, followed by lateral, and then by paradorsal. Hook has primary three-noded ribs.

In the second half of the shaft and the beginning of the hook, the primary ribs are most complex with looped ribs between neighboring nodes. Occasionally, an additional third rib emerges that extends from the paradorsal node in a zigzag manner and approaches either the lateral or ventral node of the next rib. Lateral nodes may also give rise to an additional rib across the venter, similar to the intermediate ribs. Paradorsal node gives rise to 3–4 ribs, which, together with the intermediate ribs, form uniform ribbing on the dorsum. Intermediate ribs thin, laterally inclined orad, and sometimes weakening ventrally. In shaft 1–3, intermediate ribs occur between primary ribs, which have nodes.

The body chambers of two specimens possess muscle scars. Ventral scar narrow, distinct. Paired lateral muscles, twice as wide as ventral, shaped as wide bands with separated termination. Lateral muscles are terminated basally at the level of the paradorsal node. Part of body chamber (4–5 cm from last septum) shows a continuous line of mantle attachment, roughly following major sutural elements.

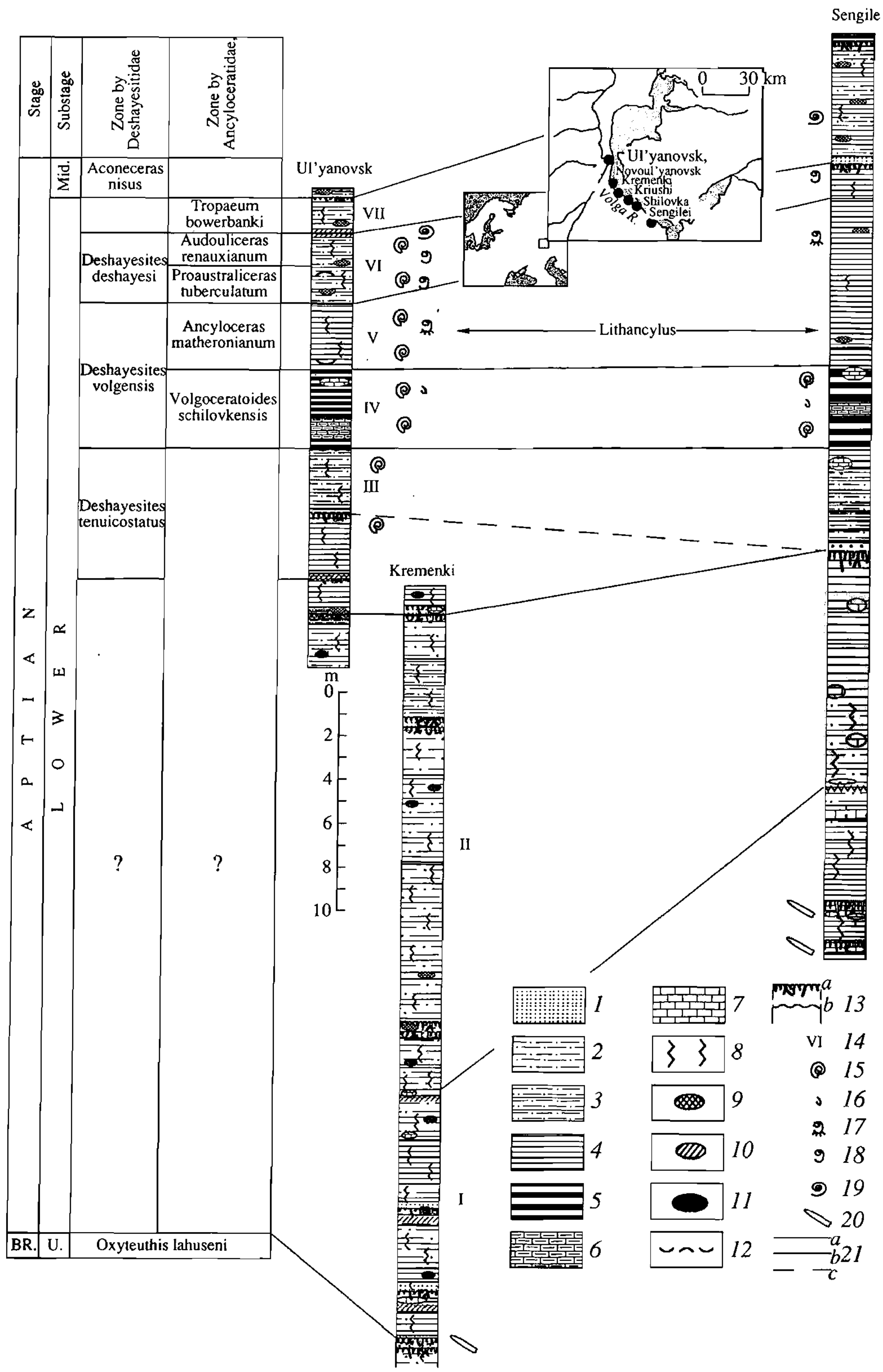

Fig. 1. Map of the Ul'yanovsk Region showing the localities, from which ammonites were obtained and sections in Ul'yanovsk (near the new bridge), village of Kremenki and town of Sengilei. Explanation of lithology: *1*—sand, *2*—siltstone, *3*—sand interbedded with clay, *4*—clay, *5*—combustible shale, *6*—clayey limestone, *7*—limestone, *8*—bioturbation, *9*—sideritic nodules, *10*—sulfide nodules, *11*—phosphorite, *12*—shell detritus, *13*—contacts (*a*—"loose ground" type, *b*—erosion), *14*—member number (after Baraboshkin, 1999); *15–20*—fossil occurrences: *15—Deshayesites*, *16—Volgaceratoides*, *17—Ancyloceras/Lithancylus*, *18—Audouliceras/Proaustraliceras*, *19—Tropaeum*, *20—Oxyteuthis*, *21*—stratigraphic boundaries (*a*—between stages/substages, *b*—members, *c*—beds).

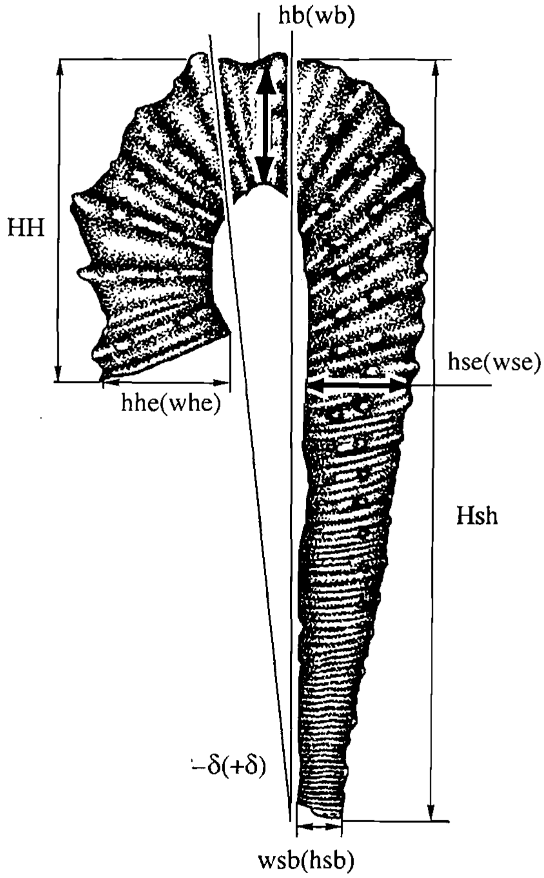

Fig. 2. Measurements of the shell: Hsh—shell height, HH—hook height, hse—height of the shaft bend, wse— width of the shaft bend, hsb—height of the spiral bend, wsb—width of the spiral bend, hb—height of the hook bend; wb—width of the hook bend; hhe—height at the end of the hook, whe—width at end of the hook, δ—angle of the hook (+ is used when the hook is curved from the shaft, – when the hook is curved toward the shaft).

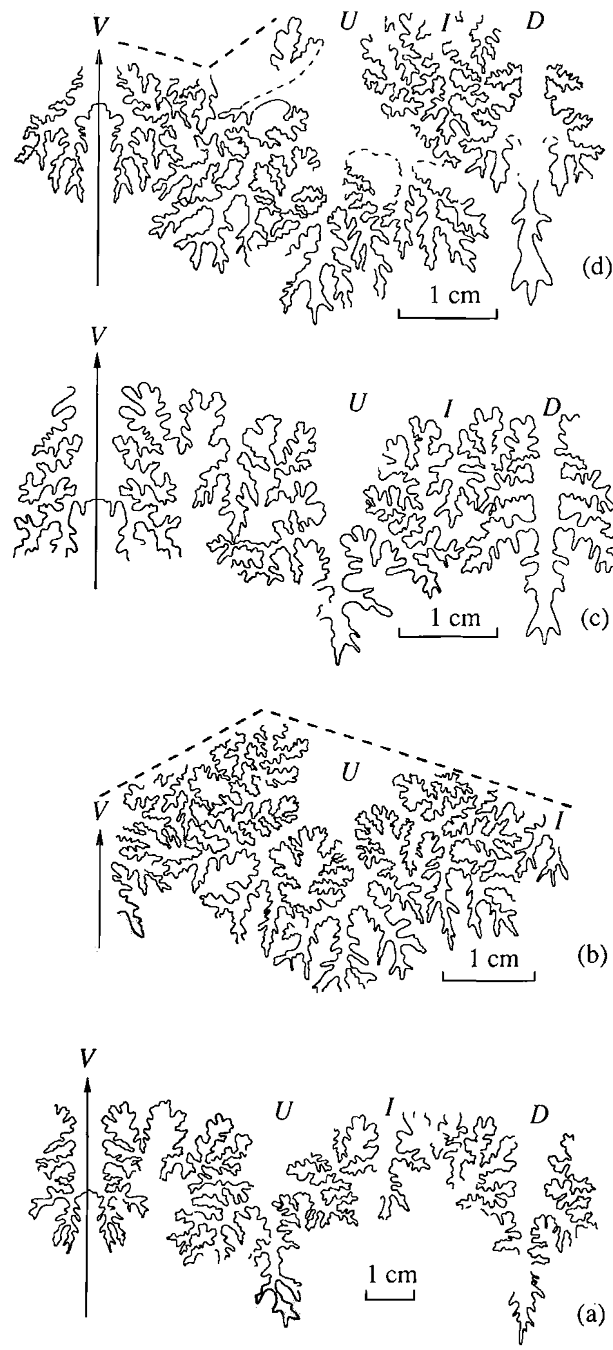

Fig. 3. The sutures of the representatives of the genus *Lithancylus*: (a) *L. grandis* (J. de C. Sow.); specimen MZ MGU, no. 14/96 at hse = 56.9 mm and wse = 51.2 mm; (b, c) *L. russiensis* sp. nov.: (b) holotype MZ MGU, no. 15/96 at hse = 48.7 mm and wse = 40 mm (dashed line outlines the visible part of the suture); (c) specimen MZ MGU, no. 18/96 at hse = 56.7 mm and wse = 56.5 mm; (d) *L. tirolensiformis* sp. nov.; holotype MZ MGU, no. 19/96 at hse = 54.5 mm and wse = 29.6 mm (the suture is shown incompletely because the specimen is fractured and partly distorted).

Suture complex, with enlarged trifid umbilical lobe (Fig. 3). This lobe is usually secondarily subdivided into three lobes with subhorizontal upper digits of the lateral lobes, closely approaching the lateral digits of ventral and dorsal lobes. Ventral lobe has three transverse digits (two lower digits largest). It is considerably shorter than the umbilical and dorsal lobes. Narrow dorsal lobe deep, narrower than umbilical, possesses two–three transverse digits in the upper part and weakly incised lateral sides in the lower. Inner lobe (I) is half the depth of umbilical and dorsal lobes. Therefore, narrow saddles U/I and I/D are seen as entire, relatively symmetrical saddle U/D. In contrast, external saddle wide, trifid, asymmetric because of deep secondary saddles. Terminations of many secondary lobes closely approach and sometimes contact each other making suture even more complex.

Composition. Eight species: *L. australis* Day, 1967; *L. fustis* Casey, 1960; *L. glebi* sp. nov., *L. grandis* (J. de C. Sowerby, 1828), *L. igori* sp. nov., *L. russiensis* sp. nov., *L. tirolensis* Casey, 1961, *L. tirolensiformis* sp. nov. from the Lower Aptian of Great Britain (*Deshayesites deshayesi* Zone, *Deshayesites grandis* Subzone), France, Russian Platform (*Deshayesites volgensis-Ancy-*

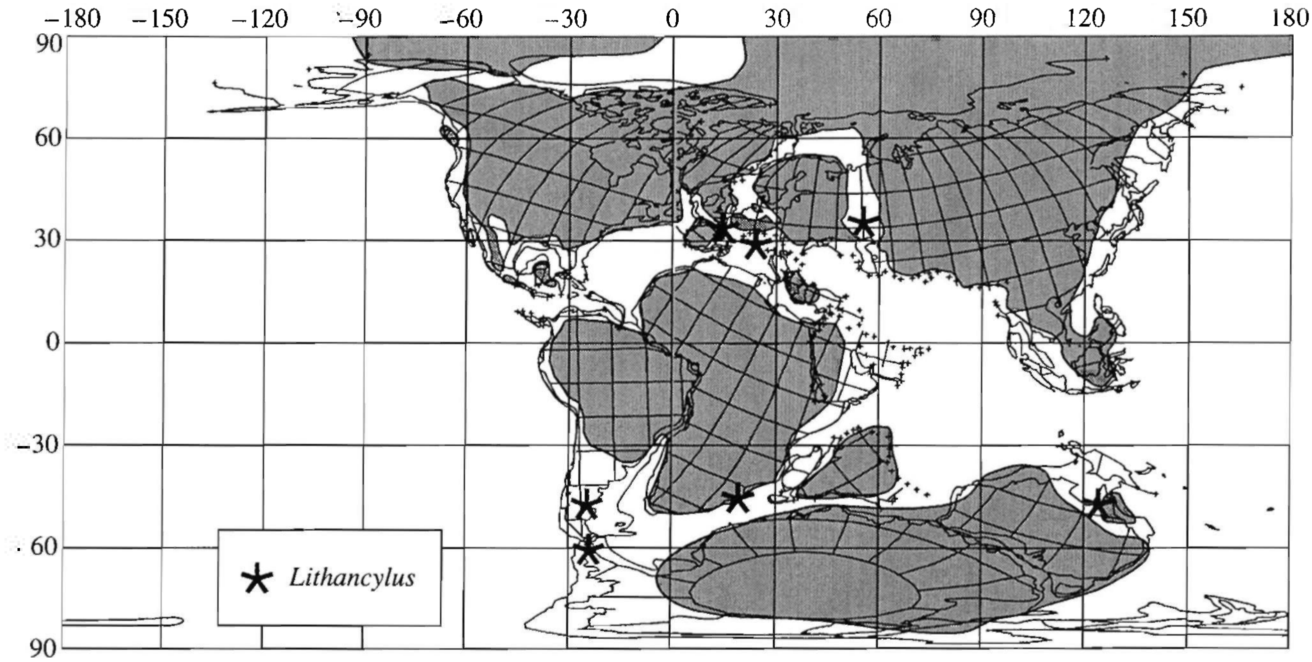

Fig. 4. Geographical distribution of the genus *Lithancylus*. The cylindrical projections and continent positions are after Smith *et al.* (1981); borders of the land are modified from Day, 1969; Wiedmann, 1982; and Smith *et al.* (1994).

loceras matheronianun Zone), Mozambique, Eastern Australia, and, possibly, Patagonia.

Comparison. This genus differs from *Ancyloceras* and *Audouliceras* by the very long, straight shaft. Although the initial part of the shell of *Lithancylus* is unknown, it is possible to suggest from the remaining shell that the helix was considerably reduced as compared to *Ancyloceras* and *Audouliceras*. In addition, in *Lithancylus*, lateral nodes appear gradually in ontogeny, and the terminal part of the shaft possesses complex looped ribs that are absent in *Ancyloceras* and *Audouliceras*.

Remarks. Because complete shells of *Lithancylus* have not been found, new species were often established based on the fragments of a shaft and more rarely of a hook. The type species is also established based on a few poorly preserved shell fragments. This has caused a problem with identification, because ornamentation in many ancyloceratids is quite similar. Some specimens previously assigned to *Lithancylus* should be excluded from this genus.

The specimens studied (the locality in Middle Povolzhye probably contains the best preserved shells) show that the shell size, shape of the coil, and especially the shape of the cross section of different parts of the shell, are variable within species. This observation contradicts Casey (1960–1980, 1961) who, based on more limited material, assumed that the shape of the shaft cross section and the coil are distinct criteria for species identification.

The Middle Aptian *L. guanocoensis* (Leanza, 1970, p. 204, fig. III, 1–4; Aguirre Urreta and Riccardi, 1989, p. 200, pl. 1, figs. 1–8; text-fig. 2; pl. 2, fig. 3) should not be assigned to the genus *Lithancylus* because this species has a weakly curved shaft resembling that of *Hemibaculites* Hyatt, 1900 and shows regular, flattened simple ribs distinctly interrupted on the venter. A specimen represented by a thin-ribbed shaft fragment may be the only exception (Aguirre Urreta and Riccardi, 1989, p. 200, pl. 2, figs. 1 and 2).

L. elephas (Anderson, 1938) described by Dimitrova (1967, p. 61, pl. 28, fig. 1; and pl. 29, fig. 1) should be assigned to the genus *Audouliceras* as suggested by Klinger and Kennedy, 1977, p. 254 and Casey (1960–1980, p. 651).

Casey (1960–1980, p. 70) and later Klinger and Kennedy, 1977, p. 253) assigned some specimens described by Anderson (1983) as *Hemibaculites mirabilis* (p. 220, pl. 78, figs. 2–2a and 3), *H. nauplius* (p. 221, pl. 66, figs. 2–2a), *H. neleus* (p. 221, pl. 59, figs. 2–2a and 3) and *H. cyclopius* (p. 221, pl. 66, figs. 3–3a) to *Lithancylus*. The first three species are represented by fragments of a weakly curved shaft, the character typical of *Lithancylus*. Their diagnoses as new species seem doubtful. *Hemibaculites cyclopius* is represented by an almost complete shaft, although it should not be assigned to *Lithancylus*, because its weakly curved shaft and ribbing are not characteristic of this genus. Its simple ribs are bunched in groups of five or six and the groups are separated from each other by small constrictions, similar to those in the genus *Hamulina*.

We tentatively assign *L. tirolensis* composed by Casey (1960–1980, p. 74, fig. 29) based on the figure by

Haug (1889, p. 217, pl. 11, fig. 2) from the Barremian of Tyrol to the genus *Lithancylus*. This assignment was previously proposed by Thomel (1964), who noted the close resemblance of the Barremian *Audouliceras* to this species. Haug's specimen is represented by a helix and part of a shaft covered by closely spaced, simple, oblique ribs lacking nodes, the set of features not observed in *Lithancylus*. Therefore, it is unfortunate that the genus in the last edition of *Treatise*...(Wright *et al.*, 1996) is illustrated by the photograph of *L. tirolensis*. Unfortunately only a single specimen of this species is known and, therefore, the taxonomy of this species remains uncertain. The sample of *L. tirolensis* from the Upper Barremian of Austria (Immel, 1987, p. 119, pl. 12, fig. 4) represents a fragment of the coil that is perhaps impossible to identify even at the genus level.

It is very likely that the fragment of a large shaft figured by Thieuloy (1990, p. 102, pl. 1, figs. 2a and 2b) as *Toxoceratoides* ? sp. inc. *"gigantiomorphe godeti"* nov. may be assigned to the genus *Lithancylus* based on the ornamentation and a weakly curved shaft of similar size. The relatively rapidly expanding shaft does not appear to be a sufficient basis for assigning this specimen to the genus *Toxoceratoides*.

The geographic distribution of this genus is shown in Fig. 4. The species occurrences form two separate ranges (Klinger and Kennedy, 1977; Bengtson and Kakabadze, 1999) restricted to the subtropical or tropical surface water layers (according to classification by Stepanov (1983) and a warmer climate in the Cretaceous) between 30° and 60° in the northern and southern hemispheres. Similar ranges are characteristic of some recent nektonic and semiplanktonic pelagic cephalopods (Nesis, 1985; Westermann, 1990). Judging from paleogeographic reconstructions, the occurrences of *Lithancylus* are restricted to marine, relatively shallow-water (sublittoral) straits. In case of Ul'yanovsk Povolzhye, this was a submeridional strait connecting the reduced Boreal Basin with the Tethys. These data suggest that *Lithancylus* species were semiplanktonic animals inhabiting moderately deep basins and that the ancestors of this groups had inhabited tropical, more equatorial basins.

Lithancylus grandis (J. de C. Sowerby, 1829)

Plate 4, fig. 2

Hamites grandis: J. de C. Sowerby, 1829, pl. 593, fig. 1.

Hamites? (Gen. nov.?) grandis: Spath, 1930, p. 462, pl. 14, fig. 2.

Lithancylus grandis: Casey, 1960–1980, pp. 73, 649, pl. 19, fig. 1; [l. 20, fig. 1; pl. 102, figs. 2a–2c; text-figs. 27a, 28a, 28b, and 252a.

H o l o t y p e. University Museum of Oxford, no. 188; England, Kent, Lower Aptian, *D. deshayesi* Zone, *D. grandis* Subzone (Pl. 4, fig. 2; Figs. 5a, 5b, and 6b).

S h e l l s h a p e. A large fragment of a straight shaft. The cross section changes throughout growth from oval and vertically-elongated to hexagonal (across the nodes of primary ribs) and wide. Judging from the expanding cross section, this fragment is close to the end of the shaft.

O r n a m e n t a t i o n. Simple intermediate ribs are thin and strongly inclined orad. One intermediate rib extends between two complex primary ribs and almost joins them. The primary ribs are thick, raised, possess three rows of elongated nodes, and descend steeply onto the venter. On the dorsum, these ribs are subdivided into three, the subdivisions resembling the intermediate ribs, and together with the latter form uniform ornamentation. Indistinct looped ribs are observed between the lateral and ventral nodes.

D i m e n s i o n s i n m m a n d a n g l e s, d e g

Specimen no.	Hsh	HHh	sew	seh	bw	bh	he	whe	α_1	α_3	δ
14/96			57.4	51.6					60		

S u t u r e (Fig. 3a). The suture is very strongly incised. The umbilical and dorsal lobes are the deepest and have a narrow, deep central termination. The prongs of the umbilical lobe extends widely laterally. The inner digit is somewhat narrower and shorter than the outer. The ventral lobe has a high secondary saddle and two large obliquely transverse prongs. It is considerably shallower than the umbilical lobe. Two large lateral prongs are also characteristic of the dorsal lobe. The inner lobe is shortened and weakly developed. This is clearly visible on the projection of the septum (Pl. 1, Fig. 2). The external saddle is irregularly trifid, the saddle U/I is narrow, while I/D is wide and deeply incised with relatively asymmetric digits.

C o m p a r i s o n. This species differs from *L. russiensis* by the finer, more closely spaced ribbing and by the more strongly oblique ribs.

R e m a r k s. This specimen differs from the holotype by the somewhat more regular circular cross section of the shaft, more widely spaced ribs, and less prominent nodes.

O c c u r r e n c e. Lower Aptian of England, *D. deshayesi* Zone, *D. grandis* Subzone of Middle Povolzhye; Lower Aptian, *D. volgensis–A. matheronianum* Zone.

M a t e r i a l. One fragment of the upper part of the shaft from the vicinity of the town of Sengilei.

Lithancylus russiensis I. Michailova et Baraboshkin, sp. nov.

Plate 5, figs. 1 and 2

E t y m o l o g y. From Russia.

H o l o t y p e. MZ MGU, no. 15/96; Ul'yanovsk Region, town of Sengilei; Lower Aptian, *D. volgensis—A. matheronianun* Zone.

S h e l l s h a p e. The shell is very large. The coiled part is unknown. The long straight shaft terminates in a hook. The body chamber is slightly smaller than the hook. The transverse section changes from circular (more vertically elongated) to widely hexagonal (across the nodes in the hook). The ornamentation in the early ontogenetic part of the shaft is represented by major ribs with one–three rows of nodes (ventral, lateral and paradorsal) and simple intermediate ribs. The ribs are three-noded on the hook. At the end of the hook the major ribs have the most complex structure. During the shell growth, the ventral nodes are the first to appear. They are already present at a shaft height of 26.6 mm. Judging from the flattened apices of these nodes on the mold, they were spinelike, with an empty, isolated cavity. Furthermore, (hse = 35 mm) the lateral nodes emerge and later, (hse = 51 mm) the paradorsal emerges. The intermediate ribs are simple, thin, inclined orad on the lateral side, and become weaker on the venter. On the shaft 1–3 occur between major nodular ribs. In specimen no. 19/96 number of the intermediate ribs (in this region) varies from 4 to 8, where eight ribs are present and two ribs are bifurcated. Loop-shaped ribs occur between neighboring nodes. Sometimes there is a third additional rib extending from the paradorsal rib in a zigzag manner connected with either the lateral or the ventral node of the next rib. In addition, an additional rib may extend from the lateral nodes across the venter. The paradorsal nodes of these ribs give rise to 2–4 smaller ribs that extend across the dorsum maintaining their height and not differing from the simple intermediate ribs.

Suture (Figs. 3b and 3c). As it is seen from Fig. 3c, the ventral lobe has three transverse processes. The umbilical lobe is deep, trifid, with a narrow asymmetrical central digit and subdivided lateral digits. The dorsal lobe is deep with large transverse prongs (particularly two lower ones) and with the main vertical denticle elongated and pointed, resembling the central denticle of the umbilical lobe. The inner lateral lobe is narrow and relatively shallow. The saddles U/I and I/D are morphologically observed as a single bifid, relatively symmetrical saddle U/D. In contrast, the external saddle is wide, asymmetrically trifid, with uneven apices, in a stepped manner descending toward the umbilical lobe. The larger secondary lobe of this saddle is noticeably deeper than the inner lateral lobe.

In Fig. 3b, the suture is shown incompletely because the fragment of the shaft is fractured at the top and distorted laterally, so that the suture has not been preserved. In concordance with the general large complexity of all secondary elements, the widely trifid umbilical lobe is very strongly developed. The central and two lateral parts of this lobe are also subdivided three times, and the upper marginal branches of the lateral parts are subhorizontal. The terminations of the majority of secondary denticles of neighboring saddles and lobes approach each other and often almost contact each other.

Dimensions, mm, and angles, deg

Specimen no.	Hsh	bw*	sew	seh	bw	bh	he	α_1	α_3	δ
Holotype 15/96	>440	26.6	59.3	53.6	63.8	150	66	70		−10
18/96			38.2	35.5				65–90	15	

Comparison. This species closely resembles the type species, differing by the coarser nodular ornamentation, the early appearance of the ventral nodes, the negative angle of the hook, and by the somewhat more compressed cross section in the middle part of the shaft. However, it is significant that the holotype of *L. grandis* is very poorly preserved and hence the comparison is tentative. *Lithancylus* sp. figured by Klinger and Kennedy, 1977, p. 254, figs. 25A, 25B, 82A, and 84A–84C) is somewhat similar to the new species, differing by the more weakly developed nodes and by the clearly more compressed shaft cross section. *Toxoceratoides*? sp. inc. *"gigantomorphe godeti"* nov. figured by Thieuloy, 1990, p. 102, pl. 1, figs. 2a–2b) are closely similar to the new species differing by the dorsoventral position of the nodes at the beginning of the shaft and by the more simple branching of the major ribs at the end of the shaft.

Occurrence. Lower Aptian, *D. volgensis–A. matheronianum* Zone; Middle Povolzhye.

Material. Apart from the holotype, specimen no. 19/96, represented by the part of the straight shaft almost at the transition from the phragmocone to the body chamber, from the vicinity of the town of Sengilei.

***Lithancylus glebi* I. Michailova et Baraboshkin, sp. nov.**

Plate 4, fig. 1

Etymology. In honor of Gleb Uspenskii.

Holotype. MZ MGU, no. 16/96; Ul'yanovsk Region, town of Sengilei; Lower Aptian, *D. volgensis—A. matheronianum* Zone (Pl. 4, fig. 1; Fig. 6a).

Shell shape. The shell is large. The body chamber occupies the hook and part of the shaft; the hook is inclined at a negative angle. The cross section changes from circular and slightly depressed at the end of the shaft to widely hexagonal across the nodes in the hook.

Ornamentation. The ornamentation is represented by intermediate ribs extending in pairs between the complex primary ribs that possess three rows of nodes. Looped ribs occur on the primary ribs between the lateral and ventral nodes and between the ventral nodes of different sides. A third additional rib sometimes extends obliquely from the lateral nodes onto the dorsum. This is an inverse type of ribbing: in other specimens, similar ribs extend onto the venter. The paradorsal node gives rise to two branches crossing the dorsum without descending.

Suture. The suture was not observed.

Dimensions, mm, and angles, deg

Specimen no.	sew	seh	bw	bh	he	whe	α_1	δ
Holotype 16/96	42	44	51	62.5	46.3	54.5	65	−10

Comparison. This species differs from *L. grandis* and *L. russiensis* by the more widely spaced primary ribs and by the inverse course of complex primary ribs.

Occurrence. Lower Aptian, *D. volgensis–A. matheronianum* Zone; Middle Povolzhye.

***Lithancylus igori* I. Michailova et Baraboshkin, sp. nov.**

Etymology. In honor of Igor A. Shumilkin.

Holotype. MZ MGU, no. 17/96; Ul'yanovsk Region, town of Sengilei; Lower Aptian, *D. volgensis—A. matheronianum* Zone (Figs. 5c and 5d).

Shell shape. The shell is large. The body chamber occupies the hook, which is the only hook in our collection inclined at a positive angle. The cross section changes from oval and strongly depressed to hexagonal (across the nodes at the end of the hook).

Ornamentation. The ornamentation is represented by intermediate simple ribs; one of each occurs between the complex, and the primary ribs have three nodes each. The primary ribs at the beginning of the hook are different from those in the species described above in that the paradorsal node is on the lateral side, while the lateral node is shifted toward the ventral border. Looped ribs are developed between the nodes. The additional rib may extend from the lateral node and may occur on the venter both anteriorly and posteriorly to the primary ribs. The second additional rib may extend anteriorly beginning from the ventrolateral node. The paradorsal node gives rise to two branches extending onto the dorsum, the posterior of which is secondarily subdivided. This type of ribbing is observed toward the end of the body chamber (hook), whereas in other species it is characteristically of the beginning of the hook.

Suture. The suture was not observed.

Dimensions in mm and angles, deg

Specimen no.	HHh	sew	seh	bw	bh	he	whe	α_1	δ
Holotype 17/96	110	40	53	53	62.8	54.4	57.7	70	65

Comparison. The shape of the cross section of this species is similar to that of *L. fustis* (Casey, 1960–1980; p. 75, pl. 21, figs. 4a–4d; p. 651, text-figs. 252b and 252c), but differs by the coarser, more widely spaced ribbing. The hook is unknown in *L. fustis*.

Remarks. This specimen was damaged at the end of the body chamber (at the beginning of the hook) during life, possibly a healed bite.

Occurrence. Lower Aptian, *D. volgensis–A. matheronianum* Zone; Middle Povolzhye.

Material. Holotype.

***Lithancylus tirolensiformis* I. Michailova et Baraboshkin, sp. nov.**

Etymology. From *L. tirolensis.*

Holotype. MZ MGU, no. 19/96; Ul'yanovsk Region, town of Sengilei; Lower Aptian, *D. volgensis–A. matheronianum* Zone (Fig. 6c).

Shell shape (Fig. 6c). The shell is large. The holotype is a young specimen without a hook, and the body chamber occupies only a part of the shaft. The cross section is rounded and slightly compressed at the beginning of the shaft.

Ornamentation. The ornamentation is represented by simple singular primary ribs. In one case the ribs bifurcate toward the venter. The ribs do not descend. Nodes are absent.

Suture. The suture is incompletely preserved (Fig. 3d). The ventral lobe, visible only in its lower part, is considerably shorter than the umbilical and dorsal, which are almost as deep. The umbilical lobe is wide, trifid, with multiply subdivided terminations, narrowing in its upper part and widening in the middle and lower parts. The deep dorsal lobe has a pair of large lateral digits and a narrow, elongate, weakly incised termination. The inner lateral lobe is narrow, shallow, and not deeper than the major subdivisions of the dorsal lobe. Because of this, the saddles U/I and I/D are observed as a single symmetric bifid saddle U/D.

Dimensions in mm and angles, deg

Specimen no.	sbw*	sbh*	sew	α_3
Holotype 19/96	32	30	47	60

Comparison. This species most resembles *L. tirolensis.* However, the absence of a hook in our specimen does not allow positive identification. In addition, the ribs in our specimen are somewhat more widely spaced than in *L. tirolensis.* The new species differs from *D. australis* (Day, 1967, p. 19, pl. 2, figs. 12 and 3–5; Fig. 2) in the somewhat more closely spaced ribbing, the more compressed cross section, and in the absence of ventrolateral nodes.

Remarks. The generic assignment of this species (and of *L. tirolensis*) is debatable; hence, it is only tentatively assigned to *Lithancylus.*

Occurrence. Lower Aptian, *D. volgensis–A. matheronianum* Zone; Middle Povolzhye.

Material. Holotype.

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Plate 4

Explanation of Plate 4

All natural size

Fig. 1. *Lithancylus glebi* sp. nov.; holotype MZ MGU, no. 16/96: (1a) ventral view of the terminal part of the hook (the shaft from the dorsum is partly seen); (1b) ventral view of the shaft and the beginning of the hook; town of Sengilei (Coll. by. G.N. Uspenskii and I.A. Shumilkin).

Fig. 2. *Lithancylus grandis* (J. de C. Sow.); specimen MZ MGU, no. 14/96, sutural view; town of Sengilei (Coll. by M.O. Agafonov).

Explanation of Plate 5

Figs. 1 and 2. *Lithancylus russiensis* sp. nov.: (1) specimen MZ MGU, no. 18/96, ×1: (1a) posterior view of the suture; (1b) lateral view, (1c) lateral view from ?*a different the other*? side; town of Sengilei (Coll. by M.V. Efimov); (2) holotype MZ MGU, no. 15/96, ×(7/10): (2a) lateral view, (2b) ventral view of the hook and dorsal view of the shaft; town of Sengilei (Coll. by. G.N. Uspenskii and I.A. Shumilkin).

Fig. 5. Shells of the representatives of the genus *Lithancylus*: (a, b) *L. grandis* (J. de C. Sow.); specimen MZ MGU, no. 14/96, ×1: (a) dorsal view; (b) lateral view; town of Sengilei (Coll. by M.O. Agafonov); (c, d) *L. igori* sp. nov.; holotype no. MZ MGU, no. 17/96, ×6/7: (c) lateral view, (d) ventral view at the curvature of the hook; town of Sengilei (Coll. by M.O. Agafonov).

Fig. 6. Shells of the representatives of the genus *Lithancylus*, ×1: (a) *L. glebi* sp. nov.; holotype MZ MGU, no. 16/96, lateral view; town of Sengilei (Coll. by G.N. Uspenskii and M.A. Shumilkin); (b) *L. grandis* (J. de Sow.); specimen MZ MGU, no. 14/96, ventral view; town of Sengilei (Coll. by M.O. Agafonov); (c) *L. tirolensiformis* sp. nov.; holotype MZ MGU, no. 19/96, lateral view (somewhat oblique toward the venter); town of Kriushi (Coll. by. G.N. Uspenskii and I.A. Shumilkin).