ISSN 0031-0301, Paleontological Journal, 2021, Vol. 55, No. 5, pp. 511–519. © Pleiades Publishing, Ltd., 2021.
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Ammonites of the Ryazanian Stage of the Russian Platform: Genus *Pronjaites* Sasonova

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Received December 21, 2020; revised December 28, 2020; accepted December 30, 2020

Abstract—The ammonite species *Olcostephanus bidevexus* Bogoslowsky, 1896 and *O. suprasubditus* Bogoslowsky, 1896, established in the Ryazanian Horizon (=Stage) of the Oka River basin, are discussed based on study of their type series and new collections from the type locality. Both species characterize the middle part of the Ryazanian Stage (the lower and upper parts of the *Spasskensis* Zone respectively) and are attributed to the genus *Pronjaites* Sasonova, 1971, with the type species *Olcostephanus bidevexus* Bogoslowsky, 1896. The new species *Pronjaites yolkinensis* sp. nov. is described from the uppermost lower *Rjasanensis* Zone. A single specimen assigned to the genus *Pronjaites* in open nomenclature is reported from the upper part of the Ryazanian Stage, in the *Tzikwinianus* Zone. An emended diagnosis of the genus *Pronjaites* is given.

Keywords: Ammonoidea, Craspeditidae, Tolliinae, *Pronjaites*, Lower Cretaceous, Ryazanian Stage, Russian Platform

DOI: 10.1134/S0031030121050105

INTRODUCTION

At the end of the 19th century, the existence of a Boreal-Tethyan ecotone was established in the middle reaches of the Oka River, which formed at the beginning of the Early Cretaceous on the territory of the central regions of European Russia. Here, for a short time, the Boreal Basin and the basins of the northwestern Tethys Ocean were connected by straits. Ammonite taxa of both boreal and Tethyan origin, found together in the same intervals of the geological section, were first described from the Oka River basin in the territory of modern Ryazan region by Nikitin (1888) and Bogoslowsky (1896). With the development of ammonoid taxonomy, many species discovered by these pioneers served as type species of new genera, such as *Riasanites* Spath, 1923; *Pronjaites* Sasonova, 1971; *Peregrinoceras* Sasonova, 1971; *Externiceras* Sasonova, 1971; and *Gerassimovia* Schulgina, 1985. At present, the species composition of these genera needs to be revised at the modern level. This is especially required because these taxa are important for the stratigraphic subdivision of the Ryazanian Stage of the Russian Platform and the comparison of its subdivisions with the Jurassic-Cretaceous boundary beds of other regions.

I have described boreal ammonites of the Ryazanian Stage of the Russian Platform in a number of papers (Mitta, 2004, 2005, 2007, 2021; Mitta, Sha, 2011; Mitta, 2017, etc.). The taxonomic composition and stratigraphic distribution of the genera *Praesurites* Mesezhnikov et Alekseev, 1983 and *Hectoroceras* Spath, 1947 (Mitta, 2019a, 2019b), crossing the Volgian-Ryazanian (Jurassic-Cretaceous) boundary, has also been revised. This paper discusses representatives of the genus *Pronjaites*, according to new data, distributed in all three zones of the Ryazanian stage of the Moscow and Ryazan regions.

LOCALITIES AND MATERIAL

This study is based on my collection from quarry No. 10 of the Lopatinsky Phosphorite Mine in the Voskresensk District of Moscow Region and from an outcrop along the right bank of the Oka River below the village of Nikitino, in the Spassk district of the Ryazan Region (Fig. 1). In addition, museum collections were studied, primarily the material from the monographic works of Bogoslowsky (1896) and Sazonova (1971), housed in the F.N. Chernyshev Central Scientific Geological and Prospecting Museum in St. Petersburg (TsNIGR Museum). I also used specimen no. 856 from P.A. Gerasimov's collection, housed in the Borissiak Paleontological Institute, Russian Academy of Sciences (PIN). The author's collection for this work (coll. no. 3990) is also housed in PIN.

Fig. 1. Localities with *Pronjaites yolkinensis* sp. nov.: (1) quarry no. 10 of the Lopatinsky Phosphorite Mine, (2) village of Bolshoe Svistovo.

HISTORY OF STUDY

The genus *Pronjaites* with the type species *Olcostephanus bidevexus* Bogoslowsky, 1896 was established by Sasonova (1971) as monotypic. However, one more species, *Pronjaites nikitinoensis*, described based on an incomplete shell about 40 mm in diameter, was tentatively assigned to it (Sasonova, 1971, p. 56, pl. 9, fig. 5).

The original diagnosis of the genus is essentially a brief description of *P. bidevexus*, which was initially established based on several pieces of phragmocone and inner whorls of a relatively completely preserved entire specimen (Bogoslowsky, 1896, pl. 3, figs. 1–4; here, Fig. 2). According to Sasonova, the new genus differs from *Surites spasskensis* (Nikitin) and related species (i.e., from the genus *Surites* Sasonov, 1951), in the different shape of the whorl section and the absence of a linguiform curvature of the ribs on the venter. In the phylogenetic schemes of Sasonova (1971, text-fig. 4; 1977, text-fig. 11) *Pronjaites* is shown as ancestral to the Late Ryazanian genus *Peregrinoceras* Sasonova, 1971 and the Early Valanginian *Menjaites* Sasonova, 1971. As the lectotype of the type species, Sasonova (1971, p. 54) proposed a small specimen, illustrated by Bogoslowsky in pl. 3, fig. 1 (here, Figs. 2c, 2d). However, Donovan (1964, p. 27) had previously designated as the lectotype a specimen represented by a part of a larger phragmocone, illustrated by Bogoslowsky in pl. 3, fig. 3 (here, Figs. 2a, 2b).

The species *bidevexus* was placed in different years in the genera *Subcraspedites* Spath, 1923 (Spath, 1947; Gerasimov, 1971) and *Borealites* Klimova, 1969 (Wright et al., 1996; Klein, 2006); this was done rather conditionally, without re-examining the type material. According to the results of a recent revision of the Siberian genus *Borealites* and related groups of Craspeditidae (Igolnikov, 2014, 2019), the status and generic rank of *Pronjaites* are not disputed.

The species *Olcostephanus suprasubditus* Bogoslowsky, 1896 was described (Bogoslowsky, 1896, p. 47, pl. 1, figs. 1–4) based on material of much better state of preservation. An adult specimen with a body chamber (Bogoslowsky, 1896, pl. 1, fig. 1; here: pl. 7, fig. 2) was designated as the lectotype by Schulgina (1972b, p. 145). Sasonova (1971, p. 37) redescribed this species in the genus *Surites*.

Subsequently, the species *suprasubditus* was indicated from other Boreal regions. Numerous specimens of *Subcraspedites (Borealites) suprasubditus* were described from the outcrops on the Boyarka River (northern Central Siberia) (Schulgina, 1972b, p. 145, pl. 3, figs. 1, 2; pl. 6, figs. 3–6; fig. 10, fig. 5; fig. 12, fig. 8). Recently, these ammonites were redescribed by Igolnikov (2014) as the new species *Borealites (Borealites) schulginae*. Igolnikov also considered an ammonite from Siberia, identified by Ershova (1972, p. 85, pl. 1, fig. 1) as *Subcraspedites (Borealites)* cf. *suprasubditus,* to be a junior synonym of *B. (B.) schulginae*. The species *suprasubditus* was also assigned by Igolnikov to *Borealites (Borealites)*.

Casey (1973) described a new subspecies *Surites (Bojarkia) suprasubditus pavlovi* from the Ryazanian Stage (Spilsby sandstones) in eastern England (Casey, 1973). In addition, outside Russia, the species *suprasubditus* was listed in open nomenclature from Canada (Eletzky, 1973) and East Greenland (Surlyk, 1973).

DISCUSSION

The species under discussion are known for their exceptional rarity, even in the type area. After the work of Bogoslowsky (1896) from the Ryazan Region, only one find of *"Surites" suprasubditus* has been published (Sazonova, 1971, pl. 4, fig. 2). In my collections, which have been assembled over several decades, the species *suprasubditus* is represented by a small number of incompletely preserved specimens (Pl. 8, figs. 3, 4).

When studying the originals for Bogoslowsky's work, I noticed an incompletely preserved portion of the internal whorls of one of the paralectotypes of the species *suprasubditus*, shown in the figures (Bogoslowsky, 1896, pl. 1, fig. 2) only in lateral view. With a whorl height of about 12 mm, its cross-section is high, ellipsoidal, with a narrow venter; the ribs are tripartite with a curved posterior branch (Pl. 7, fig. 1). In shape and ornamentation, this appears to be very close to the paralectotype of *Olcostephanus bidevexus* of similar size (Figs. 2c, 2d). Comparison of speci-

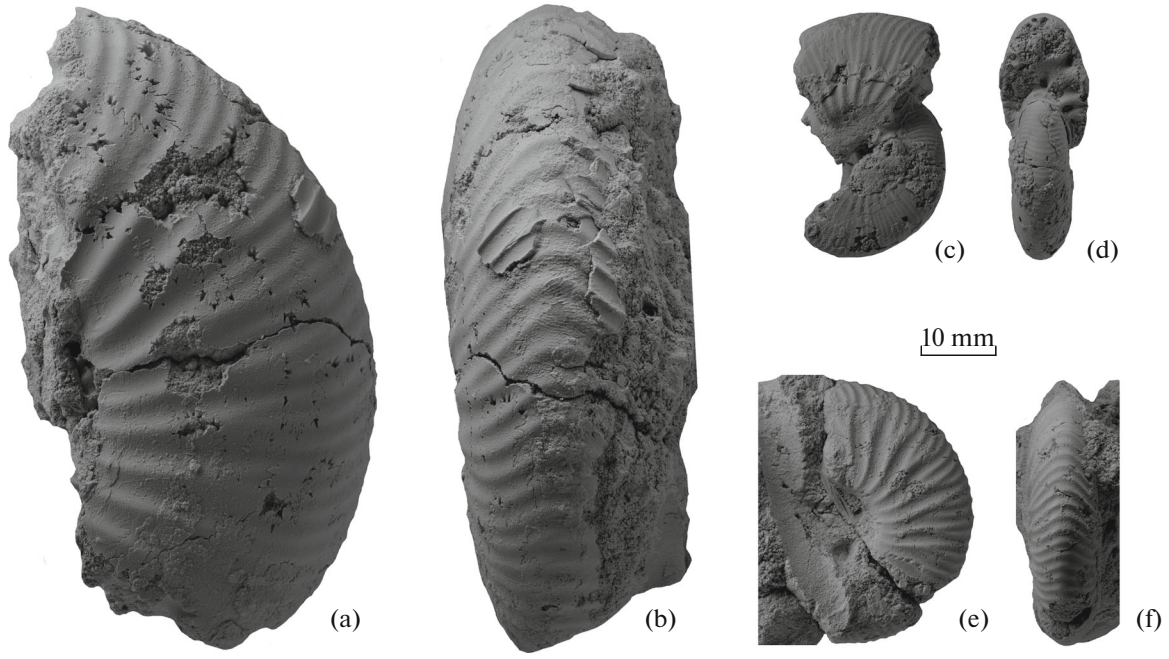


Fig. 2. *Pronjaites bidevexus* (Bogoslowsky, 1896), phragmocones: (a, b) lectotype TsNIGR Museum no. 13/623: (a) lateral view, (b) ventral view; (c, d) paralectotype TsNIGR Museum no. 10/623: (c) lateral view, (d) apertural view; (e, f) paralectotype TsNIGR Museum no. 14/623: (e) lateral view, (f) ventral view; Ryazan Region, (a–d) Voskresenskoe on the Pronya River, (e, f) Mikhei on the Pozhva River; Ryazanian Stage, *Spasskensis* Zone.

mens of the type series of *O. bidevexus* with ammonites from my collection, previously identified as *Pronjaites bidevexus* (Mitta, 2005), revealed their clear differences at the species level.

Further study of all the material at my disposal showed that *"Olcostephanus" bidevexus* and *"O." suprasubditus* differ very little and should be assigned to the same genus *Pronjaites*. Ammonites, previously identified in the lists by Gerasimov (1971) and Mitta (2005) as *P. bidevexus*, are described below as *P. yolkinensis* sp. nov.

The subspecies *Surites (Bojarkia) suprasubditus pavlovi*, identified by Casey from an adult shell (Casey, 1973, p. 252, pl. 9, fig. 1), significantly differs from *suprasubditus* from Central Russia in the much more frequent primary ribs and cannot be confidently assigned to the genus *Pronjaites*. A fragment of an ammonite body chamber illustrated by Surlyk from the *Hectoroceras kochi* Zone of Eastern Greenland as *"Subcraspedites" (=Borealites)* aff. *suprasubditus* (Bogoslowsky) (Surlyk, 1973, p. 91, pl. 1, fig. 3), based on its ornamentation, should be assigned to the genus *Pseudocraspedites* Casey et al., 1977. The ammonite with similar strongly inflated primary ribs, illustrated by Eletzky (1973, pl. 6, fig. 1) from the Lower Berriasian of Arctic Canada as *Craspedites (Subcraspedites)* aff. *suprasubditus* (Bogoslowsky) may also belong to the same genus, or to *Craspedites* Pavlow, 1892.

All specimens of *Pronjaites yolkinensis* sp. nov. in my collection were found in one location, in quarry no. 10 of the Lopatinsky Phosphorite Mine. A description of the geological section of this locality was published earlier (Mitta, 2005).

Finds of *P. yolkinensis* are restricted to Beds 8c and 9a (according to updated data, belonging to the *Surites spasskensis* Zone). Judging by the mode of preservation (black phosphorite molds with inclusions of oolites: Pl. 8, figs. 1, 2), these ammonites are most likely redeposited from the *Riasanites rjasanensis* Zone, for which sandy phosphorites and sandstones with oolites are characteristic in the Moscow Region.

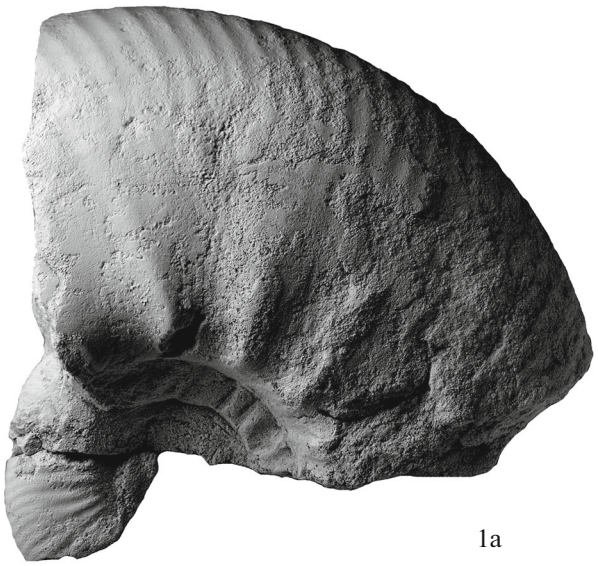
A specimen of *P. yolkinensis* from Gerasimov's collection (Fig. 3), with a partially preserved shell, is also composed of sandy phosphorite with oolites (for a description of the Svistovo[1] section, see Gerasimov, 1971, p. 432; Mitta, 2014, p. 85).

The type series of *P. bidevexus* is represented by molds (sometimes with remains of mother-of-pearl) in yellowish-brown phosphorite sandstone. This rock is typically found in the sections of the Ryazanian Stage of the southern Ryazan type (Mitta, 2017) in the

[1]The lectotype of Riasanites swistowianus, one of the earliest ammonite taxa to be described from the Ryazanian Stage, (Nikitin, 1888), comes from the Svistovo locality on the Pronya River.

Plate 7

1b



1a

10 mm

2a

2b

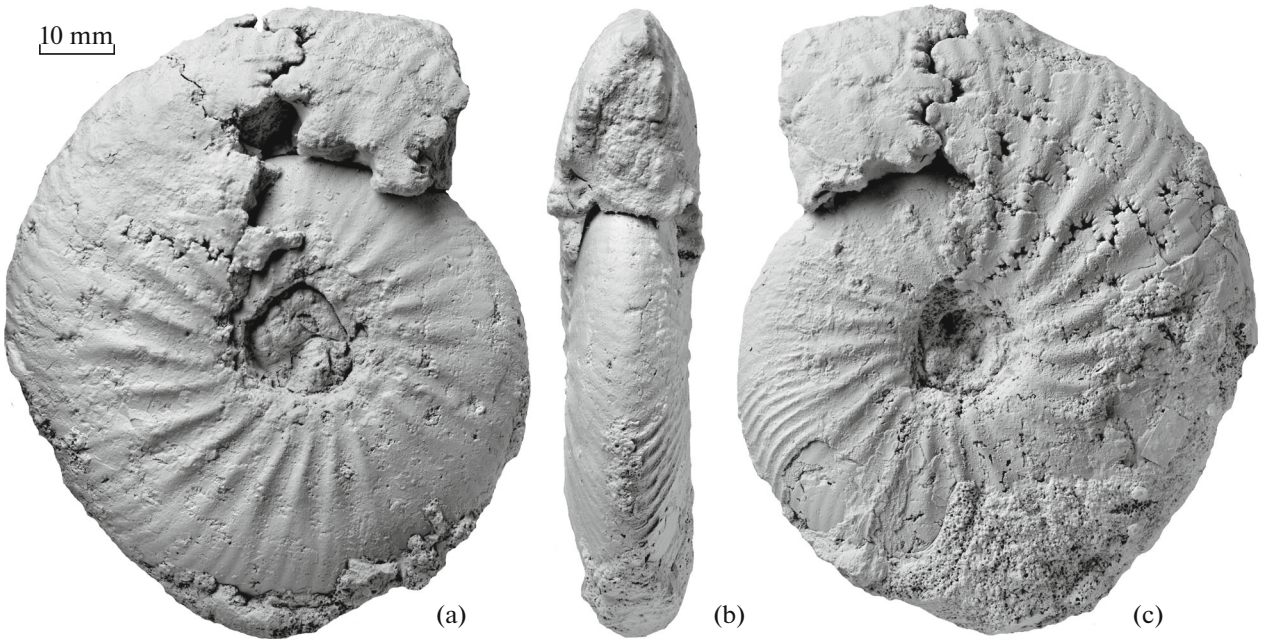


Fig. 3. *Pronjaites yolkinensis* sp. nov., specimen PIN, P.A. Gerasimov's collection, no. 856, phragmocone: (a, c) lateral view, (b) apertural view; Ryazan Region., village of Bolshoe Svistovo on the Pronya River; Ryazanian Stage, *Rjasanensis* Zone; collected by P.A. Gerasimov, in 1929.

upper part of the *Rjasanensis* Zone–the lower part of the *Spasskensis* Zone.

The only specimen of *P. suprasubditus* originating from Moscow Region (Pl. 8, fig. 4), found at the base of the *Surites tzikwinianus* Zone (Bed 9b after Mitta, 2005), and is represented by a rounded mold composed of clay-type phosphorite, apparently redeposited from the *Spasskensis* Zone. The type series of this species is represented by molds composed of gray glauconite sandstone (like my find in the type area: Pl. 8, fig. 3), characteristic of the sections of the southern Ryazan type for the upper part of the *Spasskensis* Zone.

Consequently, *P. yolkinensis*, *P. bidevexus*, and *P. suprasubditus* characterize three successive stratigraphic intervals and are most likely linked by ancestor-descendant relationships.

An ammonite represented by a mold composed of clayey phosphorite (Fig. 4) comes from the *Tzikwinianus* Zone of Quarry no. 10 of the Lopatinsky Mine (Bed 9b according to Mitta, 2005). These are the inner whorls of a large shell with a surviving fragment of the next whorl. Despite the poor state of preservation, based on the shell shape and ornamentation, this ammonite can be attributed to the genus *Pronjaites*, probably one of the following species in the lineage *yolkinensis* → *bidevexus* → *suprasubditus*. Characteristics of the genus and a description of the new species are presented below.

SYSTEMATIC PALEONTOLOGY

Superfamily Perisphinctoidea Steinmann, 1890

Family Craspeditidae Spath, 1924

Subfamily Tolliinae Spath, 1952

Genus *Pronjaites* Sasonova, 1971

Pronjaites: Sasonova, 1971, p. 54; Schulgina, 1985, p. 120.
Subcraspedites (Pronjaites): Schulgina, 1972a, p. 123.

Type species. *Olcostephanus bidevexus* Bogoslowsky, 1896.

Diagnosis. Shell flattened or of medium width; whorl section highly oval; in early stages of ontogeny with narrow venter. Umbilicus moderately narrow to moderately wide. Umbilical wall steep; umbilical shoulder rounded; towards the end of body chamber; umbilical wall becoming flatter.

Ornamentation represented by raised subradial primary ribs, near mid-flank, dividing into three or four weaker and forward-curved branches. Secondary ribs on narrow venter curved weakly. With age, connection

Explanation of Plate 7

Figs. 1, 2. *Pronjaites suprasubditus* (Bogoslowsky, 1896): (1) paralectotype TsNIGR Museum no. 2/623: (1a) lateral view, (1b) apertural view; (2) lectotype TsNIGR Museum no. 5/623: (2a) lateral view, (2b) ventral view; Ryazan Region, bank of the Oka River near the village of Shatrishche; Ryazanian Stage, top of the *Surites spasskensis* Zone.

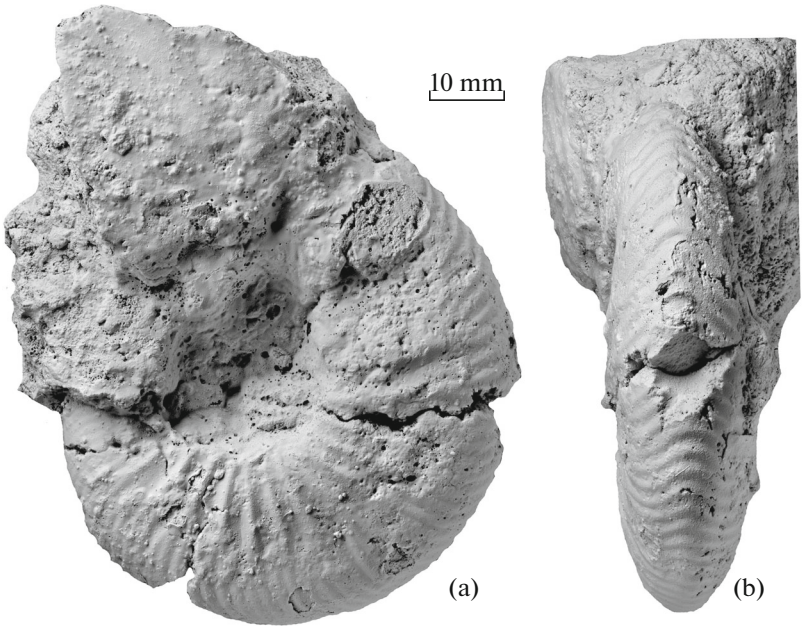


Fig. 4. *Pronjaites* sp., specimen PIN, no. 3990/489, phragmocone: (a) lateral view, (b) ventral view; Moscow Region, quarry no. 10 Lopatinsky Phosphorites Mine; Ryazanian Stage, *Tzikwinianus* Zone; collected by author, 2000.

of secondary ribs with the primary umbilical ribs weakens; ribbing coefficient increases to 5–6.

Comparison. The described genus is readily distinguished from the majority of representatives of Tolliinae by young (Dm = 40–60 mm) whorls, which have a high cross-section with a narrow venter and ornamentation with a higher ribbing coefficient.

Species composition. Three species: *P. yolkinensis* sp. nov. from the upper part of the *Rjasanensis* Zone, *P. bidevexus* (Bogoslowsky, 1896) from the lower part of the *Spasskensis* Zone, and *P. suprasubditus* (Bogoslowsky, 1896) from the upper part of the *Spasskensis* Zone of the basin of the Oka River. In addition, a single occurrence of *Pronjaites* sp. is recorded from the *Tzikwinianus* Zone.

Remarks. The species *"P." nikitinoensis* Sasonova, 1971, established based on an incomplete specimen ca. 40 mm in diameter, certainly does not belong to the genus under consideration.

The author of the genus indicated the wide geographical distribution of *Pronjaites,* including the Russian Platform in the basins of the Oka, Unzha, Sura rivers, up to the northeastern part of the Caspian Syneclise and the Pechora Basin. Analysis of literature data and examination of museum collections, as well as my own observations, suggest that there are no confirmed finds of *Pronjaites* on the Russian Platform outside the Moscow and Ryazan regions.

***Pronjaites yolkinensis* Mitta, sp. nov.**

Plate 8, figs. 1, 2

Etymology. After the village of Yolkino, which is near to the type locality.

Holotype. PIN, no. 3990/488; Moscow Region, Voskresensk District, Quarry no. 10 of the Lopatinsky Phosphorite Mine; Ryazanian Stage, from pebbles at the base of the *Spasskensis* Zone.

Description (Fig. 3). The material is represented exclusively by phragmocones; the largest specimen reaches 95 mm in diameter. The shell is flattened, with a high section, with a narrow but rounded venter, slightly widening with age. The flanks, almost flat in the early stages, become more convex with age (D > 40–50 mm). The umbilicus is moderately nar-

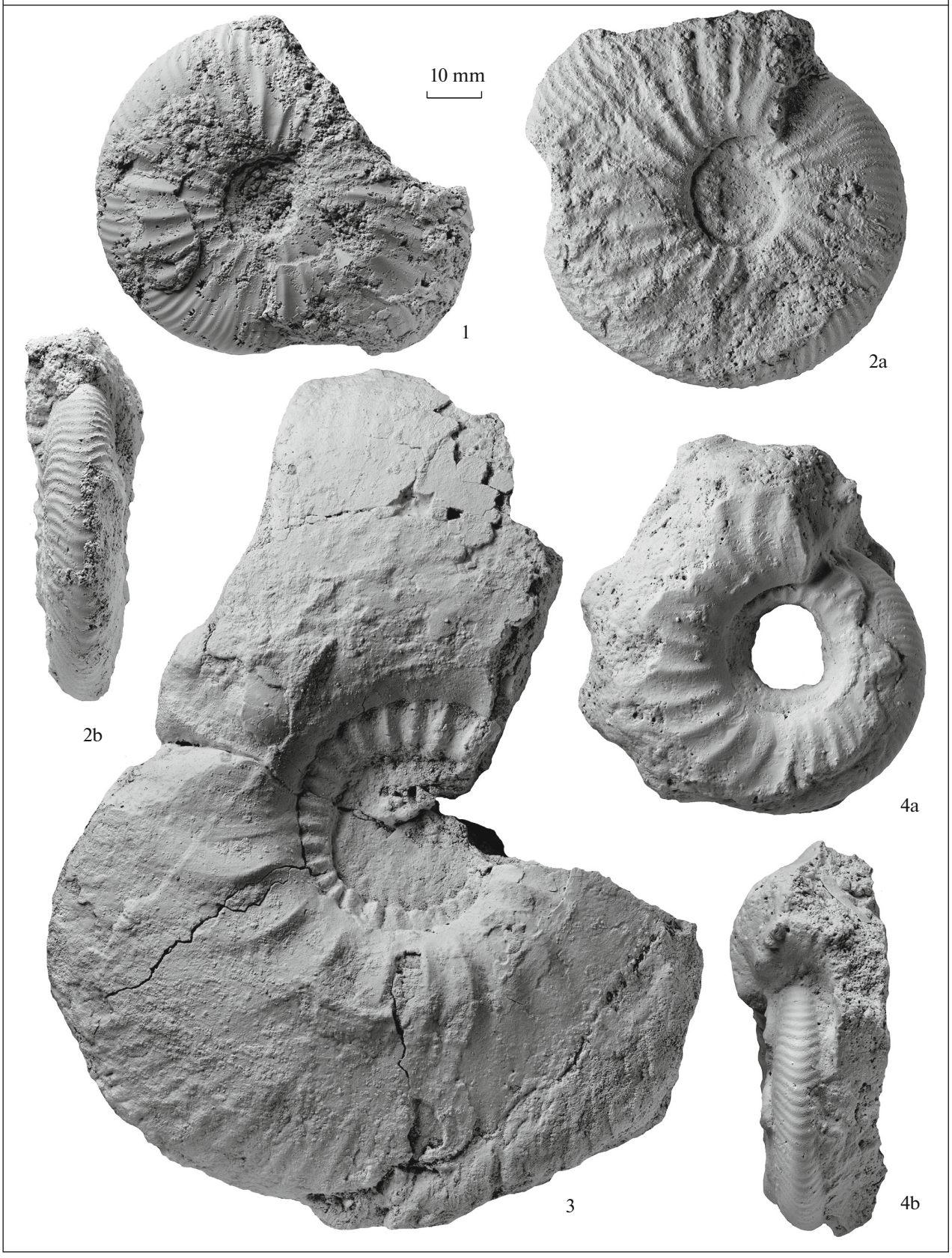
Explanation of Plate 8

Figs. 1–2. *Pronjaites yolkinensis* sp. nov.: (1) specimen PIN, no. 3990/490, phragmocone, lateral view; (2) holotype PIN, no. 3990/488, phragmocone: (2a) lateral view, (2b) apertural view; Moscow Region, Voskresensk District, quarry no. 10, Lopatinsky Phosphorites Mine; Ryazanian Stage, base of the Spasskensis Zone.

Figs. 3, 4. *Pronjaites suprasubditus* (Bogoslowsky, 1896): (3) specimen PIN, no. 3990/491, lateral view; Ryazan Region, bank of the Oka River, downstream of the village of Nikitino; (4) specimen PIN, no. 3990/495, phragmocone: (4a) lateral view, (4b) apertural view; Moscow Region, quarry no. 10, Lopatinsky Phosphorites Mine; both—Ryazanian Stage, top of the *Surites spasskensis* Zone.

All collected by the author, in 2000.

Plate 8



row, shallow; the umbilical wall is steep, the umbilical shoulder is rounded.

The ornamentation is represented by strong subradial primary ribs, separating near the mid-flank into three or four weaker and slightly curved branches. The curvature of the secondary ribs on the narrow ventral side is weak.

Dimensions in mm and ratios:

Specimen no.	Dm	WH	WW	UW	WH/Dm	WW/Dm	UW/Dm
856	74	34	19	15.3	0.46	0.26	0.21
3990/488, holotype	64	28	~18	15.6	0.44	0.28	0.24
3990/499	60	27	~16	14	0.45	0.27	0.23

Comparison. It readily differs from other species of the genus in the flattened whorls with a narrow venter, a narrower umbilicus, and a higher rib coefficient on young whorls.

Remarks. All specimens from my collection show signs of redeposition. In addition to a poor state of preservation, this is usually supported by the matrix, i.e., the ammonites are represented by black phosphorite molds, common for the *Spasskensis* Zone of Moscow Region, but on one of the flanks, remains of yellowish-gray oolitic sandstone of the *Rjasanensis* Zone are frequently preserved.

Material. Five specimens from the type locality; one specimen P.A. Gerasimov's collection, village of Bolshoe Svistovo, Mikhaylov District, Ryazan Region; all from the Ryazanian Stage, topmost beds of the *Rjasanensis* Zone–base of the *Spasskensis* Zone

ACKNOWLEDGMENTS

Many of my friends and colleagues have taken part for several decades in fieldwork in the sections in the Oka River basin in the Ryazan and Moscow regions. The photographs were taken by S.V. Bagirov (Paleontological Institute, Russian Academy of Sciences). The author is sincerely grateful to everyone who contributed to the preparation of this work.

REFERENCES

Bogoslowsky, N.A., Ryazanian Horizon. Fauna, stratigraphic relations and the probable age of this horizon, Mater. Geol. Ross., 1897, vol. 18, pp. 1–148 (separate reprint 1896).

Casey, R. The ammonite succession at the Jurassic–Cretaceous boundary in eastern England, in *The Boreal Lower Cretaceous*, Casey, R.F. and Rawson, P.F., Eds., London, 1973, pp. 193–266 (Geol. J. Spec. Iss., no. 5).

Donovan, D.T., Stratigraphy and ammonite fauna of the Volgian and Berriasian rocks of East Greenland, *Medd. Grønland*., 1964, vol. 154, no. 4, pp. 1–34.

Eletzky, J.A., Biochronology of the marine boreal latest Jurassic, Berriasian and Valanginian in Canada, in *The Boreal Lower Cretaceous*, Casey, R.F. and Rawson, P.F., Eds., London, 1973, pp. 41–80 (Geol. J. Spec. Iss., no. 5).

Ershova, E.S., *Some Berriasian ammonites of Svalbard Island, Mezozoyskiye otlozheniya Sval'barda*, Leningrad: NIIGA, 1972, pp. 82–89.

Gerasimov, P.A., Cretaceous system. Lower section, Geologiya SSSR, vol. 4 *(Center of the European part of the USSR. Geological description)*. Moscow: Nedra, 1971, pp. 425–445.

Igolnikov, A.E., A new species of the genus *Borealites* Klimova, 1969 (Ammonitida, Craspeditidae) from the Boreal Berriasian of Siberia, *Paleontol. J.*, 2014, vol. 48, no. 3, pp. 255–265.

Igolnikov, A.E., Berriasian (Ryazan) ammonites (craspeditids and phylloceratids) of the north of Eastern Siberia: morphology, taxonomy, and biostratigraphic conclusions, *Dissertation, Cand. Geol.-Min. Sci.*, Novosibirsk: INGG SO RAN, 2019.

Klein, J., Lower Cretaceous ammonites II. Perisphinctaceae II: Polyptichitidae, in *Fossilium catalogus I: Animalia*. Leiden: Backhuys Publ., 2006, pp. 1–186.

Mitta, V.V., On the ammonite succession in the Jurassic–Cretaceous boundary beds of the Moscow Syneclise, *Paleontol. J.*, 2004, vol. 38, no. 5, pp. 483–491.

Mitta, V.V., New Data on the Age of the Ryazanian Stage Basal Layers, *Stratigr. Geol. Correl.*, 2005, vol. 13, no. 5, pp. 503–511.

Mitta, V.V., Ammonite Assemblages from Basal Layers of the Ryazanian Stage (Lower Cretaceous) of Central Russia, *Stratigr. Geol. Correl.*, 2007, vol. 15, no. 2, pp. 193–205.

Mitta, V.V., *On lithostratigraphic subdivisions of the Ryazanian Stage of the central regions of the Russian Platform, Problemy paleoekologii i istoricheskoy geoekologii*, Saratov: SGTU, 2014, pp. 82–91.

Mitta, V.V., The Ryazanian (basal Lower Cretaceous) standard zonation: state of knowledge and potential for correlation with the Berriasian primary standard, *N. Jb. Geol. Paläontol. Abh.,* 2017, vol. 286/2, pp. 141–157.

Mitta, V.V., Craspeditidae (Ammonoidea) of the Russian Platform at the Jurassic-Cretaceous boundary. I. Genus *Praesurites* Mesezhnikov et Alekseev, *Paleontol. J.*, 2019a, vol. 53, no. 5, pp. 471–481.

Mitta, V.V., Craspeditidae (Ammonoidea) of the Russian Platform at the Jurassic-Cretaceous boundary. II. Genus *Hectoroceras* Spath, *Paleontol. J.*, 2019b, vol. 53, no. 6, pp. 598–610.

Mitta, V.V., On the Zonal Index-Species of the Standard Scale of the Ryazanian Stage on the Russian Platform, *Paleontol. J.*, 2021, vol. 55, no. 3, pp. 277–287.

Mitta, V.V. and Jingeng Sha, Ammonite distribution across the Jurassic–Cretaceous boundary in central Russia, *Paleontol. J.*, 2011, vol. 45, no. 4, pp. 379–389.

Nikitin, S.N., Traces of the Cretaceous period in Central Russia, *Trudy Geol. Kom.*, 1888, vol. 5, no. 2, pp. 1–205.

Sasonova, I.G., Berriasian and Lower Valanginian ammonites of the Russian Platform, *Trudy Vsesoyuz. Nauch. Issled. Geol. Neft. Inst.,* 1971, vol. 110, pp. 3–110.

Sasonova, I.G., Ammonites of the Jurassic-Cretaceous boundary beds, *Trudy Vsesoyuz. Nauch. Issled. Geol. Neft. Inst.*, 1977, vol. 185, pp. 1–97.

Schulgina, N.I., Ammonites of the north of Central Siberia, in *Granitsa yury i mela i berriasskiy yarus v Boreal'nom poyase.* Novosibirsk: Nauka, 1972b, pp. 137–175.

Schulgina, N.I., Review of ammonites of the Boreal Belt, in *Granitsa yury i mela i berriasskiy yarus v Boreal'nom poyase.* Novosibirsk: Nauka, 1972a, pp. 117–137.

Schulgina, I.I., *Boreal'nyye basseyny na rubezhe yury i mela* (Boreal basins at the Jurassic-Cretaceous boundary), Leningrad: Nedra, 1985.

Spath, L.F., Additional observations on the invertebrates (chiefly ammonites) of the Jurassic and Cretaceous of East Greenland. 1. The *Hectoroceras* fauna of S.W. Jameson-Land, *Medd. Grønland.*, 1947, vol. 132, no. 3, pp. 1–69.

Surlyk, F., The Jurassic-Cretaceous boundary in Jameson Land, East Greenland, in *The Boreal Lower Cretaceous*, Casey, R.F. and Rawson, P.F., Eds., London, 1973, pp. 81–100 (Geol. J. Spec. Iss. no. 5).

Wright, C.W., Callomon, J.H., and Howarth, M.K., Cretaceous Ammonoidea, in *Treatise on invertebrate paleontology. Pt. L. Mollusca 4.* Boulder, Lawrence: Geol. Soc. Amer., Univ. Kansas Press, 1996.

Translated by S. Nikolaeva