

Craspedites (*Vitaliites*?) *sachsi*, a New Boreal Berriasian Ammonite Species of the North of Eastern Siberia (Nordvik Peninsula)

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Abstract—A new species *Craspedites* (*Vitaliites*?) *sachsi* sp. nov. is described from the Boreal Berriasian of the North of Eastern Siberia.

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INTRODUCTION

The genus *Craspedites* Pavlow is widespread in all Upper Volgian zones across the Panboreal Superrealm. The Late Volgian members of this genus have been studied by generations of paleontologists beginning with A. d'Orbigny. Earlier species of *Craspedites* are described from the Middle Volgian of the Russian Platform (*C. ivanovi* Gerasimov and *C. pseudofragilis* Gerasimov (Gerasimov, 1960). *Craspedites* is also recorded in the Middle Volgian of Siberia from the *Epivirgatites variabilis*—*C. cf. pseudofragilis* and *C. shulginae* Alifirov (*Opornyi razrez ...*, 1969; Alifirov, 2009). The maximum diversification of the genus was in the Late Volgian, when it included at least 25 species. Apparently, the last Volgian representative of the genus was *C. singularis* Schulgina from the upper zone of the Upper Volgian Substage *Chetaites chetae* in northeastern Siberia (*Opornyi razrez ...*, 1969). For a long time, it was widely believed that *Craspedites* species do not cross the Jurassic–Cretaceous boundary. Occasional records of these ammonites from the Berriasian were not taken into consideration. For instance, according to V.A. Zakharov (pers. comm.), as early as the 1960s he found several ammonites on the Kheta River from the Berriasian *Hectoroceras kochi* Zone, which N.I. Shulgina positively assigned to *Craspedites*. However this occurrence, apparently positioned stratigraphically too high, seemed doubtful and was attributed to a possible mistake in their stratigraphic assignment; this occurrence was not published. Later, in the 1980s in the same sections and at the same stratigraphic interval, S.N. Alekseev discovered well-preserved ammonites, which he and M.S. Mesezhnikov assigned with certainty to *Craspedites*. However, they did not systematically describe

these ammonite specimens. Alekseev (1984, p. 83, text-fig. 2) in a scheme illustrating the stratigraphic distribution of ammonites, showed *Craspedites* spp., for the *Borealites constans* Subzone of the *Hectoroceras kochi* Zone, without any explanation in the text. Alekseev's collection of Berriasian *Craspedites* is considered to have been lost. The Berriasian *Craspedites* were also indicated in the following sources: *Craspedites* (?) sp. in the *Chetaites sibiricus* Zone in the Nordvik Peninsula (Urduyuk-Kaya Cape, *Craspedites cf. mosquensis* Gerasimov, *C. aff. unshensis* (Nikitin), and *C. ex gr. kaschpuricus* (Trautschold) from the basal Ryazanian of the Russian Platform (Zakharov, Nalnyaeva, and Shulgina, 1983; Mesezhnikov, 1984). For the first time the Berriasian *Craspedites* was illustrated by M.A. Rogov—*Craspedites cf. canadensis* Jeletzky (Zakharov and Rogov, 2008, p. 89, text-fig. 3). This specimen was found in the *Chetaites sibiricus* Zone in the Nordvik Peninsula, about 1.5 m above the Jurassic–Cretaceous boundary.

In 2007 the expedition of A.A. Trofimuk Institute of Petroleum Geology and Geophysics, Siberian Branch, Russian Academy of Sciences led by V.A. Marinova conducted a comprehensive geological research of the Jurassic–Cretaceous boundary beds in the Nordvik Peninsula and collected a large collection of ammonites. Among the typical Berriasian genera *Praetollia*, *Borealites*, *Pseudocraspedites*, and others, a specimen was found which was difficult to identify at the generic level, as it did not resemble any of the known Berriasian ammonites (Igolnikov, 2010). After preparation, partial uncoiling and studying of the suture, it has become apparent that this ammonite is related to the Late Volgian *Craspedites*. It differs in the very late appearance of primary ribs in ontogeny, while the sec-

ondary ribs are distinct. In *C. taimyrensis* and *C. planus* the ornamentation is similar but only in the young whorls, up to 25–30 mm in diameter. The specimen under discussion has the flanks smooth in the lower part up to a diameter of 50–55 mm. The above characters allow the recognition of a new species, and perhaps a new genus (subgenus). The preservation of the specimen did not allow studying the ontogeny of its ornament; therefore, no new supraspecific taxa are recognized. Based on the morphological characters of the specimen it has been provisionally assigned to the subgenus *Craspedites* (*Vitaliites*) Schulgina. The diagnosis of this subgenus includes the following features: “Shells with flanks flat, less commonly inflated, semi-involute or semi-evolute. Ribs bifurcating and trifurcating, less commonly with multi-branch bunches. Ribs running without weakening along the external whorl, often the ribs are thickened compared to those on the flanks” (Schulgina, 1985, p. 116, emphasis added). The provisional assignment to *Craspedites* (*Vitaliites*) is explained by limited material and by the fact that in the two upper Upper Volgian zones *Vitaliites* has not previously been found.

MATERIAL

The collection is housed in the Central Siberian Geological Museum (TsGSM), coll. no. 2035.

SYSTEMATIC PALEONTOLOGY

Family Craspeditidae Spath, 1924

Genus *Craspedites* Pavlow, 1892

Subgenus *Vitaliites* Schulgina, 1985

Craspedites (*Vitaliites*?) *sachsi* Igolnikov, sp. nov.

Plate 2, fig. 1

E t y m o l o g y. In honor of outstanding geologist and paleontologist V.N. Sachs.

H o l o t y p e. TsGSM, no. 2035/1, phragmocone with partly preserved body chamber; northeastern Siberia, Nordvik Peninsula; Berriasian; *Chetaites sibiricus* Zone.

D e s c r i p t i o n. The shell is large. The phragmocone is 103 mm in diameter. The shape of the cross-section of the early whorls is unknown. At $D \sim 35$ –50 mm the whorls are elongated, with flattened flanks. The venter is narrow, but rounded. At D_m about 60–65 mm and greater, the venter widens and broadly rounded, the flanks become more convex, but remained somewhat flattened. Later in ontogeny, the whorls expand, and the shape of the cross-section becomes regularly oval. The umbilicus is moderately wide and stepped. The umbilical shoulder is gentle. The umbilical wall is steep.

O r n a m e n t a t i o n. The ornamentation was observed only beginning from $D_m \sim 35$ mm. Until $D_m \sim 55$ mm only secondary ribs are present. At a

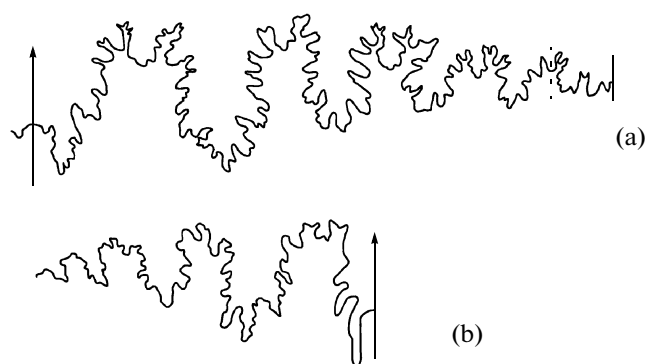


Fig. 1. Sutures: (a) *Craspedites* (*Vitaliites*?) *sachsi* sp. nov., holotype no. 2035/1 at $D_m = 65$ mm, $\times 2$; (b) *Craspedites* (*Vitaliites*?) ex gr. *sachsi* sp. nov., specimen no. 2035/2 at $D_m = 30$ mm, $\times 5$.

larger diameter, weakly inflated, wide, widely spaced primary ribs (up to 17 per whorl) indistinctly connected with the secondary ribs appear near the umbilical shoulder. The secondary ribs are relatively prominent, low, and are clearly reflected on the inner mold. On the body chamber they become wider, but they remain distinct. One primary rib corresponds to five or six secondary ribs. The ribs cross the venter without bending.

Dimensions in mm and ratios:

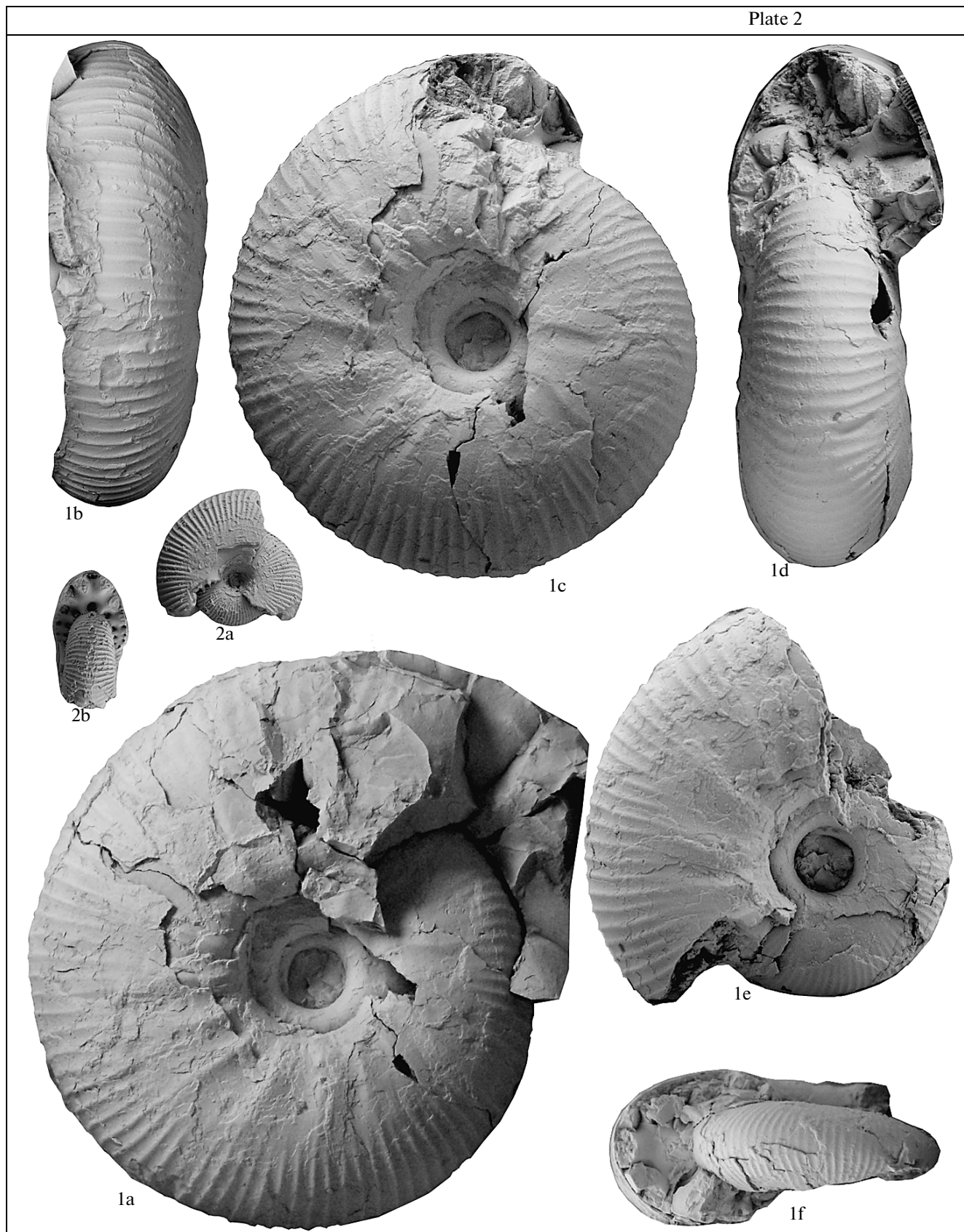
Specimen no.	D_m	WH	WW	UW	WH/ D_m	WW/ D_m	UW/ D_m	Pr	Sr	Ci
Holo-	105	44	—	24.5	0.42	—	23	17	86	5.1
type 2035/1	95	40	34	23.5	0.42	0.36	0.25	15	85	5.6

Note: (Pr) primary ribs, (Sr) secondary ribs, (Ci) coefficient of rib intercalation.

Suture. The suture is typical of *Craspedites* (Fig. 1a). It is composed of wide and elongated lobes and saddles. The ventral lobe and the first lateral lobes are equally deep.

Comparison. This species is distinguished from other species of the genus by the very late appearance of primary ribs.

Remarks. My collection contains a fragment of a phragmocone (specimen no. 2035/2; $D_m \sim 30$ mm, WH = 15 mm, WW = 14 mm, UW = 6 mm) that comes from the *Chetaites sibiricus* Zone of the North Urals (Mauryn'ya River) and was originally identified as *Subcraspedites* ? aff. *maurynjensis* Mesezhnikov et Alekseev (Alifirov, Igolnikov, and Dzyuba, 2008, pl. 2, fig. 6). This specimen lacks primary ribs but has distinct and densely spaced secondary ribs that cross the venter with a small projection forward and levels off later in ontogeny. The suture is typical of *Craspedites* s.l. (Fig. 1b). Based on morphology of this shell and



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Explanation of Plate 2

All sizes are natural. The arrow indicates the beginning of the body chamber. The collection is housed in the Central Siberian Geological Museum (TsGSM).

Fig. 1. *Craspedites (Vitaliites?) sachsi* sp. nov., holotype no. 2035/1: (1a) phragmocone with the beginning of the body chamber, lateral view; (1b) phragmocone with the incompletely preserved last whorl, lateral view; (1c) the same specimen, ventral view; (1d) the same specimen, apertural view; (1e) phragmocone, inner whorls, lateral view; (1f) the same specimen, apertural view; northern East Siberia, Nordvik Peninsula; Berriasian, *Chetaites sibiricus* Zone.

Fig. 2. *Craspedites (Vitaliites?) ex gr. sachsi* sp. nov., specimen no. 2035/2: (2a) phragmocone, lateral view; (2b) apertural view; North Urals, Mauryn'ya River; *Chetaites sibiricus* Zone.

the stratigraphic position of the Uralian specimen (Pl. 2, fig. 2), I re-identified it as *C. (Vitaliites?) ex gr. sachsi*.

M a t e r i a l. Holotype.

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