

A NEW GENUS *Sulcohoplites* (AMMONOIDEA) FROM THE ALBIAN OF THE MANGYSHLAK PENINSULA

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Abstract: A new genus, *Sulcohoplites*, and its type species, *S. altifurcatus* sp. nov., from the Albian of the Mangyshlak region are described. The changes in the suture line during ontogenesis of the shell are studied, and an early division of the inner lateral lobe that is characteristic of the superfamily Hoplitaceae is established.

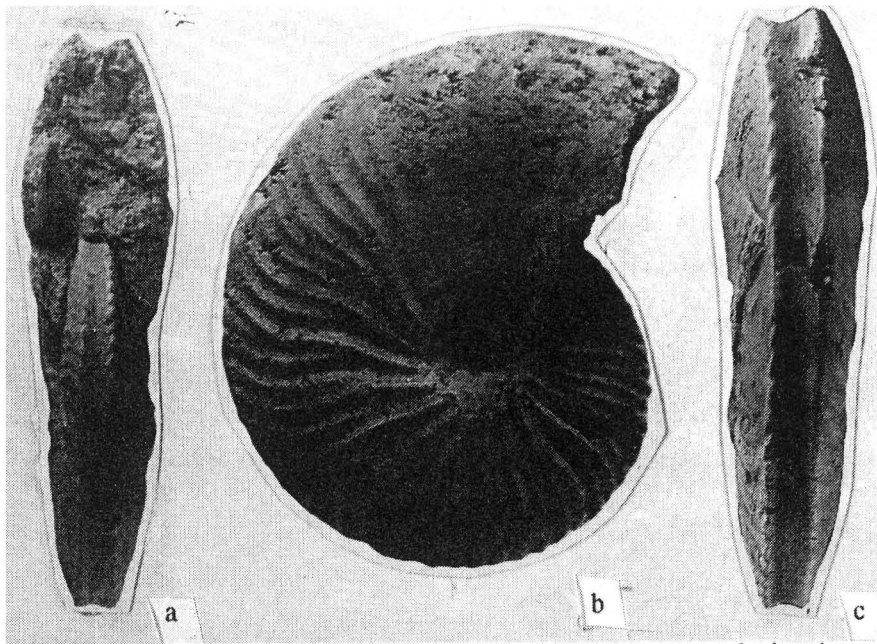
Из альбских отложений Мангышлака описан новый род *Sulcohoplites* с типовым видом *S. altifurcatus* sp. nov. Изучено изменение лопастной линии в онтогенезе раковины, установлено раннее разделение внутренней боковой лопасти, характерное для надсемейства Hoplitaceae.

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The new genus *Sulcohoplites*, whose members are numerous in the Middle and Upper Albian deposits of the Mangyshlak Peninsula on the eastern shore of the Caspian Sea, is described. *Sulcohoplites* are of substantial importance, since they are markers of particular individual zones in the detailed section of the Albian stage in this area [3, 4]. Three new species are distinguished in Saveliev's collection. We will describe the type species, from the Middle Albian *Anahoplites rossicus* zone of the Cretaceous.

The types are in the museum of the All-Russian Petroleum Scientific Research Geologic Prospecting Institute (VNIGRI) in St. Petersburg.

Translated from: Novyy rod *Sulcohoplites* (Ammonoidea) iz al'bskikh otlozheniy Mangyshlaka.



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Fig. 1. *Sulcohoplites altifurcatus* sp. nov.; Holotype No. 1563 ($\times 1$): a - front, b - side, c - ventral side; Mangyshlak, Tyubedzhik Nature Preserve, mouth of Mansu-Almaz ravine; Middle Albian *Anahoplites rossicus* zone.

ORDER AMMONITIDA

SUBORDER PERISPHINCTINA

SUPERFAMILY HOPLITACEAE H. DOUVILLE, 1890

FAMILY HOPLITIDAE H. DOUVILLE, 1890

SUBFAMILY DISCOHOPLITINAE SAVELIEV, 1969

Genus *Sulcohoplites* I. Michailova et Saveliev, gen nov.

Generic name. From Latin *sulcus* (groove) and Albian ammonite *Hoplites*.

Type species. *S. altifurcatus* sp. nov.; Middle Albian, *Anahoplites rossicus* zone; Mangyshlak.

Diagnosis. Shell is moderately to strongly involute, fairly flat, with subtrapezoidal transverse section. Lateral sides bulging moderately. Ventral side narrow, smooth, and depressed in form of sharply manifested regular groove of semicircular transverse section; its edges sharp. Umbilicus stepped. Supraumbilical ridges moderately sharp and elongated. Costae curved into S-shape, thin, equal in width and predominantly bifurcate. Marginal tubercles small and numerous;



Fig. 2. *Sulcatohoplites* [sic] *altifurcatus* sp. nov.; Holotype No. 1563 (VNI GRI 22/877)
 suture line at D = 68 mm ($\times 1.5$); Tyubedzhik Nature Preserve,
 mouth of Mansu-Almaz ravine; Middle Albian, *Anahoplites rossicus*
 zone.

ventral tubercles in alternating arrangement. Suture line strongly dissected: ventral lobe extremely narrow and long; umbilical lobe wide and deep, and slightly or distinctly asymmetrical; outer saddle deeply dissected and strongly slanted toward umbilical lobe.

Specific composition. Type species, and two more unpublished species in Saveliev's collection from Upper Albian (except Vraconian) of Mangyshlak.

Comparison. Differs from similar genera *Discohoplites* Spath, 1925 [6] and *Daghestanites* Glazunova, 1953 [1] in narrower umbilicus and sharp umbilical edge, presence of marginal tubercles, different form of ventral groove (in new genus it is semicircular in cross section, as opposed to triangular in compared genera, and distinctive form of ventral and great asymmetry of umbilical lobe. New genus additionally differs from *Discohoplites* in less bulging convex lateral sides of shell and from *Daghestanites* in more involute shell, deeper umbilicus, and especially in alternating rather than opposite arrangement of ventral tubercles.

Remarks. Among the numerous Albian hoplitids, the new genus is noteworthy for its distinctive form, which, because of the smoothly concave groove of the semicircular transverse section, resembles the bob of a pendulum wall clock. No less characteristic are the features of their suture line. The extremely narrow and deep ventral lobe with closely spaced bases of the secondary lobes is an exotic feature in the hoplitids. The strongly slanting, deeply dissected outer saddle and long, very deep umbilical (first lateral, according to Saveliev) lobe must also be regarded as typical features.

Sulcohoplites belongs to the subfamily Discohoplitinae, whose taxa according to Saveliev [3, 4], form a clear phylogenetic line in the following direction: *Daghestanites* (Middle Albian, *Anahoplites asiaticus* and *A. daviesi* zone) \rightarrow *Sulcohoplites* (from *Anahoplites rossicus* zone of Middle to *Pervinquieria inflata* zone of Upper Albian) \rightarrow *Discohoplites* (*Stoliczkaia dispar* zone, uppermost part of Upper Albian).

The details of similarity between the suture lines of *Sulcohoplites* and *Euhoplites* Spath. are interesting. Both genera have a deep and narrow ventral lobe and a slanting outer saddle [2,

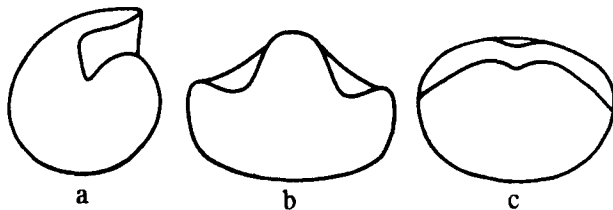


Fig. 3. *Sulcohoplites altifurcatus* sp. nov., Spec. No. 1560, initial chamber ($\times 43$): a - lateral side, b - ventral side, c - front; Tyubedzhik Nature Preserve, mouth of Mansu-Almaz ravine; Middle Albian, *Anahoplites rossicus* zone.

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fig. 94]. The narrowing of the ventral lobe is possibly determined by the appearance of the median groove, which limits the width of the lobe. A closer relationship of these genera cannot be excluded [3, fig. 3].

Sulcohoplites altifurcatus I. Michailova et Saveliev, sp. nov.

Sulcatihoplites altifurcatus: Saveliev, 1981, p. 45 (nom. nud.).

Specific name. Latin *altus* (high) and Latin *furcatus* (forked).

Holotype. VNIGRI No. 1563; ^{22/877} Mangyshlak Peninsula, Tyubedzhik Nature Preserve, mouth of Mansu-Almaz ravine; Middle Albian, *Anahoplites rossicus* zone.

Form (fig. 1). Shell is moderately involute, fairly flat, with narrow umbilicus, and transverse section in shape of medium-high trapezium. Very narrow ventral side is smooth, concave, semi-circular in cross section, and very sharply set off from wide, slightly bulging lateral sides. Umbilicus is stepped and moderately deep. Comparatively narrow and smooth umbilical wall is steep and sharply separated from lateral sides. Greatest convexity is at level of edge of umbilicus.

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Fig. 4. Changes in transverse section through whorls during ontogenesis of shell *Sulcohoplites altifurcatus* sp. nov.; Spec. No. 1560: a-d - 2nd, 5th and 10th septa ($\times 28$); e - 17th septum, 1.2 whorls ($\times 28$); f - 22nd septum, 1.7 whorls ($\times 18$); g - 33rd septum, 2.7 whorls ($\times 14$); h - 37th septum, 3.2 whorls ($\times 7.5$); i - 43rd septum, 3.7 whorls ($\times 5.5$); j - 50th septum, 4.2 whorls ($\times 3$); Tyubedzhik Nature Preserve, mouth of Mansu-Almaz ravine; Middle Albian, *Anahoplites rossicus* zone.

Dimensions in mm and ratios in %:

Spec. No.	D	H	h	W	Du	H/D	h/D	W/D	Du/D
23/877 1560	14.3	8.5		5.3	2.0	59		37	14
- 11 - 1560	41.9	20.3	18.1	13.9	6.5	49	43	31	15
Holotype									
22/877 1563	75.0	36.7	30.0	25.5	12.0	49	40	34	16
21/877 2223	81.0	42.1	[36.0]	21.8	11.3	52	42	27	14

Sculpture. Umbilical margin bears 24-28 moderately sharp, markedly elongated, supraumbilical ridges, from which, considerably above edge of umbilicus, bifurcate, moderately S-curved costae branch out. In upper third of lateral side, between pairs of bifurcate costae, are short semilunar additional costae (from 8 to 14 per whorl). Total number of costae is 54-56. All costae end in marginal tubercles on sharp edge of ventral side. Tubercles are very small, slanting, and alternate along margins of ventral groove, and disappear at diameter of 70 mm.

Suture line (fig. 2). In adult stage ventral lobe is extremely long and narrow, with two large lateral denticles and high median saddle. Outer saddle is strongly slanted toward umbilical lobe and divided almost in middle by deep secondary lobe. Umbilical lobe is tripartite, slightly asymmetrical, large, occupies considerable part of lateral sides, and is deeper than ventral lobe. First umbilical lobe is asymmetrical, and half the length of the umbilical. Dorsal lobe is fairly small and shallow.

Ontogenesis. Initial chamber has ridgelike form, with high narrow medial saddle (fig. 3). Its width is 0.63 mm and its diameter 0.50 mm.

Transverse section through whorls changes from low, wide, and semilunar to high subtrapezoidal form (fig. 4). Throughout first whorl, width remains constant but height increases somewhat. From end of second whorl, height of transverse section increases more rapidly than width. At end of third whorl, section becomes rounded-quadrangle, and in fourth whorl height exceeds width. At end of fourth and beginning of fifth whorls, transverse section becomes trapezoidal and wide groove appears in middle of ventral side.

Suture line was traced through five whorls, from first to 56th lines (fig. 5). Prosuture is bilobate with high ventral, low dorsal and slightly elevated umbilical saddles; between them are umbilical and inner lateral lobes. Primasuture is five-lobed (VUU'ID), with corresponding lobes located on sites of three saddles of prosuture. Ventral lobe has minimal size but is already bipartite. In third line this lobe is already wide and larger than others. At end of first whorl (fig. 5f), inner lateral lobe divided into two parts ($I - I_v, I_d$); branch I_d occupies position of initial lobe I and retains this position from then on; first umbilical lobe moves completely to outer side of whorl.

Soon (fig. 5g) umbilical lobe takes on tripartite form, and lobe I_v divides into I_{vv} and I_{vd} . In middle of second whorl, ventral and dorsal lobes are simultaneously complicated by denticles, and outer and inner saddles become bipartite.

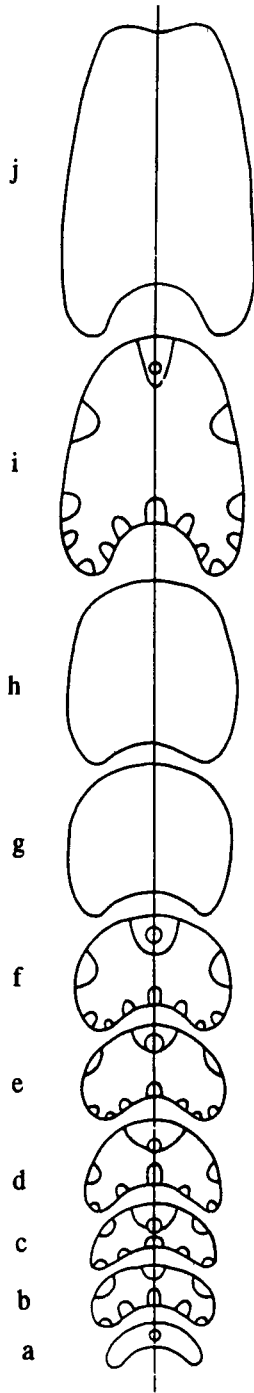


Fig. 4

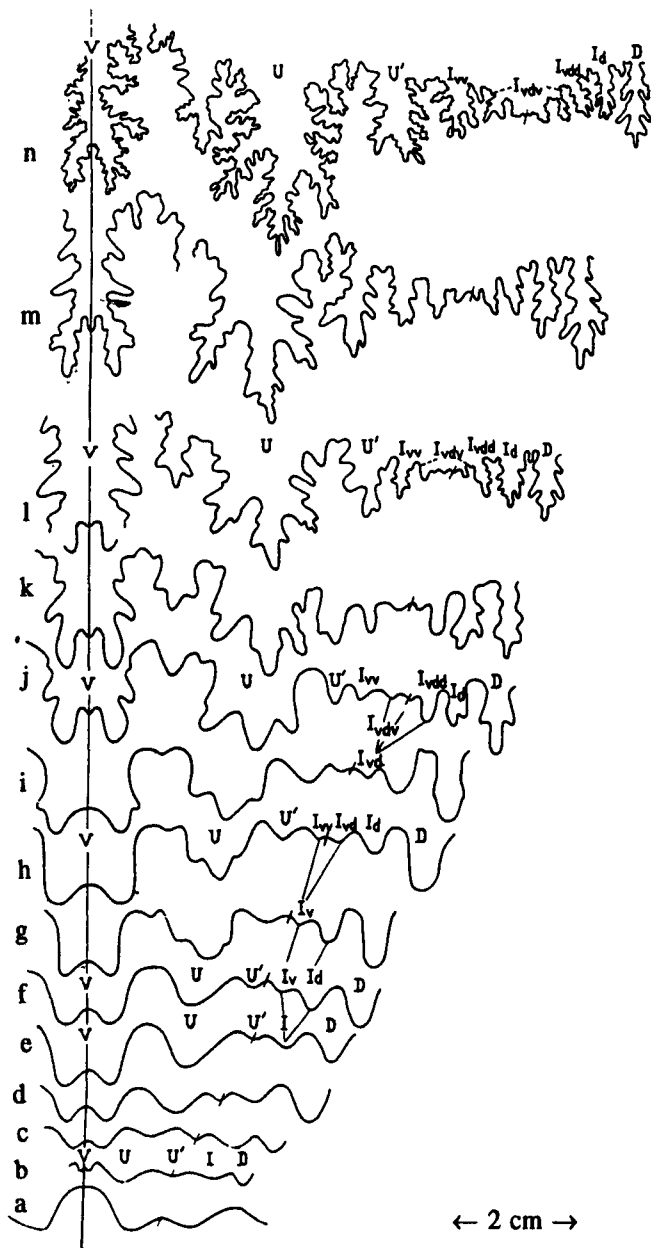


Fig. 5. Changes in suture line during ontogenesis of shell of *Sulchoplites altifurcatus* sp. nov., Spec. No. 1560: a-e - 1st, 2nd, 3rd, 6th and 9th lines ($\times 35$); f - 13th line, 1.0 whorls ($\times 35$); g - 16th line, 1.2 whorls ($\times 35$); h - 19th line, 1.5 whorls ($\times 35$); i - 22nd line, 1.7 whorls ($\times 28$); j - 28th line, 2.3 whorls ($\times 18$); k - 31st line, 2.7 whorls ($\times 15$); l - 36th line, 3.2 whorls ($\times 9$); m - 40th line, 3.5 whorls ($\times 8$); n - 56th line, 4.7 whorls ($\times 3$).

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Appearance of new elements in region of suture continues, taking form of successive division of derivatives of outer branch of inner lateral lobe (L_1). One of two new elements moves successively to outer and inner side, while second remains on seam and again divides. This feature (formation of sutural lobe) is extremely characteristic of the Hoplitidae family. On third and fourth whorls (fig. 5k-m), all existing elements become further complicated, and main lateral lobe and outer saddle take on distinctive structure typical of this genus. Ventral lobe narrows, and, therefore, becomes visibly drawn out, although it remains shorter than umbilical lobe. Symmetrically bipartite outer saddle, because of uneven increase in denticles, takes on asymmetrical slanting form (fig. 5l, m).

Distribution. Middle Albian, *Anahoplites rossicus* zone; Mangyshlak Peninsula.

Material. Three specimens from Tyubedzhik Nature Preserve, consisting of juvenile and adult septate casts.

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