

ISSN 0494-7304 0082-1756

# TARTU ÜLIKOOLI TOIMETISED

УЧЕНЫЕ ЗАПИСКИ ТАРТУСКОГО УНИВЕРСИТЕТА

ACTA ET COMMENTATIONES UNIVERSITATIS TARTUENSIS

934

EESTI ORDOVIITSIUMI  
PALEONTOLOOGIA  
JA STRATIGRAAFIA

Tõid geoloogia alalt XII



# HARJUAN (LATE ORDOVICIAN) NEW BIVALVES AND A NEW GASTROPOD FROM NORTH ESTONIA

Mare Isakar

So far little attention has been paid to Late Ordovician bivalves and gastropods. In the present publication 3 new species of bivalves and a new species of gastropod, which I think are new to science, have been distinguished. The material is not very large because it has not been collected specially. The described material consists of more or less occasional samples from different localities and it certainly gives a very incomplete picture of the bivalves and gastropods taxonomy and their distribution in Harjuan of Estonia. It has been impossible to obtain several papers, which perhaps contain descriptions of species unknown to me. Usually Ordovician bivalves and gastropods are very badly preserved, but there are examples among described specimens with original shell and examples which are silicified. The material for this study comes from the geological department of the Zoological Museum of Tartu University (TUG). In general the classification after Knight J.B.; Cox L.R.; Keen A.M.; Batten R.L.; Yochelson E.L.; Robertson R. [1960] and McAlester A.L.; Newell N.D. [1969] is adopted.

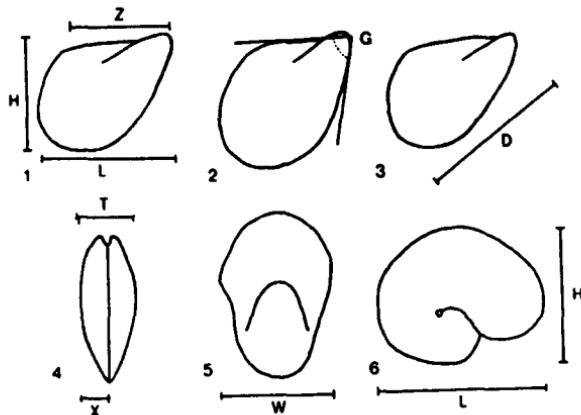
I would like to thank the following persons for valuable help: prof. Arvo Rõõmusoks improved the manuscript, Ebe Namsing gave linguistic help and Peep Männik gave some silicified examples of Similodonta.

All linear measurements are given in millimetres, abbreviations which are used, see on text-figure 1.

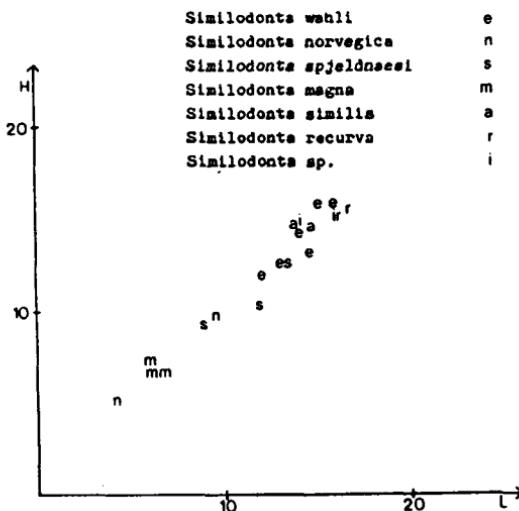
ORDER *NUCULOIDA* DALL, 1889  
FAMILY *PRAENUCULIDAE* McALSTER, 1969  
*Similodonta* Soot-Ryen, 1964  
*Similodonta wahli* sp.nov.  
Pl.I, fig. 1-8

*Similodonta sp.*: Киселев, Синицына, Исакар и др., 1990, с. 19,  
табл. V, фиг. 3, 4, 7.

NAME. This species is named in memory of A. v.Wahl.



Text-figure 1. This shows various linear dimensions of the shell (for Amboynchiidae after Pojeta, 1966, p. 137): H - height, L - length, D - greatest dimension (diagonal), Z - hinge margin length, X - convexity of a single valve, T - shell thickness, G - angle between anterior and hinge margin (angle gamma), W - width of aperture.



Text-figure 2. Showing height/length relation of shells.

**HOLOTYPE.** Right valve, TÜG 3/23, Porkuni Stage, Vohilaid Member, Harjuan, Porkuni, North Estonia. Coll. A. v.Wahl.

**MATERIAL.** Röa Member — the broken external and internal mold of left and right valve, an external mold of left valve from road ditch near Röa-Jaagupi, an internal mold of left valve from Muuga: Vohilaid Member — 4 right and 2 left valves from Porkuni, Singe Member — 1 right and 1 left valves from Porkuni.

**DIAGNOSIS.** *Similodonta* with rounded triangular shell, umbones prosogyre. Anterior and posterior hinge plates meet at about 80 degrees.

**DESCRIPTION.** Shell rounded-triangular, small, about as high as long. Anterior-dorsal margin slightly concave, postero-ventral margin rounded. Umbonal margin sharply curved (angle about 80 degrees). Hinge with teeth in two series separated in the umbonal angle, beneath the umbo teeth smaller and diminish. The posterior hinge branch longer than the anterior. Teeth are small, lamelliform. The sculpture consists of fine concentric lines (5–6 lines on 2 mm in the middle part of the valve) with coarser striae developing at later growth stage (PI. I, fig. 6). Umbones small, prosogyre. Shell convexity rather small ( $X/H = \text{max. } 0.31$ ). The adductor scars small, nearly equal but the anterior more distinct, situated just under the teeth; the posterior one elongated.

Dimensions of the specimens (in mm) (see text-figure 1):

Nr.	H	L	X	H/L	X/H
TÜG 3/23	14	14	3.9	1.0	0.27
TÜG 3/24	11.8	12	3.4	0.98	0.28
TÜG 3/26	12.4	13	3.7	0.95	0.29
TÜG 41/2	13	14.5	3.8	0.90	0.30
TÜG 42/1	15.8	14	4.2	1.1	0.26
TÜG 34/1	15.8	15.8	5.0	1.0	0.31

**COMPARISON.** Height/length relation see in text-figure 2. The closest species to *S. wahli* is *Ctenodonta spjeldnaesi* Soot-Ryen, 1960 from Upper Chasmops Shale (4bγ), Norwegia, from which it differs in its more acute umbonal angle and different sculpture (the finer lines regularly interchanged with coarser growth lines). *Ctenodonta norwegica* Soot-Ryen, 1960 from Lower Chasmops limestone (4bβ). Norwegia have more convex anterior margin, its sculpture consists of much more lines and umbones angle is more than 90 degrees. *Nucula magna* Lamont, 1946 from Lower Drummuck Group, Scotland is smaller with very blunt umbo and more elongated teeth. *Similodonta* sp. Tunnicliff, 1982 from Bardahessiagh Formation, Ireland is large, umbones angle is about 100 degrees and sculpture consist of the fine and numerous lines only. *Ctenodonta similis* Ulrich and *Ctenodonta*

*recurva* Ulrich, 1892 from "Hudson River Group", North America, are rather alike in shape of shell, but they are smaller, posteroventral margin shorter and umbones more prosogyre than of the new species.

REMARK. Valves from lower part of Siuge Member are silicified.

OCCURRENCE. Harjuan, Porkuni Stage, Röa, Vohilaid and Siuge Members of Ärina Formation, North Estonia.

LIFE HABIT. J. Jr. Pojeta (1971, p. 30, 35) noted that Ordovician nuculoid represented infaunal burrowing bivalves. He has referred to Yonge (1939) who had studied recent *Nucula*-like shells. Yonge noted that in its life position in the substrate *Nucula*-like shells have an anterior inhalent current and are shallowly buried with the anterior end approximately parallel to the sediment-water interface and this end is covered with thin layer of sediment. Pojeta has assumed that Ordovician *Nucula*-like shells such as *Similodonata* lived in a similar fashion. The relative values of length, height and thickness, constituting the bivalve shell form, were compared by Stanley (1970, fig. 25) to show the relation of burrowing rate to gross shell shape. Most values of *S.wahl* sp.nov. were within the region of slow burrowing. From Porkuni Stage I have found only single valves of *S.wahl*. That means that they have not stayed at life position after death.

ORDER PTERIOIDA NEWELL, 1965

FAMILY AMBONYCHIIDAE S. A. MILLER, 1877

Genus *Ambonychia* Hall, 1847

*Ambonychia orvikui* sp.nov.

PI. II, fig. 1-6, PI. III, fig. 6

*Ambonychia radiata* Hall: Schmidt, 1858, p. 210;

*Byssonychia radiata* (Hall): Twenhofel, 1928, p. 81;

*Byssonychia* cf. *radiata* (Hall): Twenhofel, 1916, p. 297, 301, 309;

*Ambonychia radiata* (Hall): Киселев, Синицына, Исакар и др., 1990, с. 22, табл. V, фиг. 1, 2.

NAME. This species is named in memory of late prof. K. Orviku.

HOLOTYPE. Right valve, TÜG 3/36, (PI. II, fig. 1, 3-5) Porkuni Stage, Vohilaid Member, Harjuan, Porkuni, North Estonia, coll. A. v.Wahl.

MATERIAL. Adila Formation — an external mold from outcrop Pirgu, an external mold of broken left valve and a right valve from erratic boulder near village Vardi, an external mold from erratic boulders near Haapsalu; Röa Member — an external mold of left

valve, 2 broken external molds of right valve and a broken external mold of left valve from railway ditch near Röa, a broken external mold of right valve from road ditch near Röa-Jaagupi, an external shell from Porkuni; Vohilaid Member — a right valve (holotype) from Porkuni.

**DIAGNOSIS.** *Ambonychia* possessing about 45 radial costae, angle gamma 80-90 degrees.

**DESCRIPTION.** Shell ovate, possessing about 45 radial costae, obliquity prosocline, angle gamma 80-90 degrees; umbones keeled, project above the hinge line (3 mm); size medium for the genus; length about 3/4 of the greatest dimension; greatest convexity of a single valve 12 mm. Byssal gape elliptical (6 mm length), placed about its length below the umbonal beaks, and somewhat depressed. Byssal sinus shallow, but well noticeable. Ligamental area leaves a rather wide space (1.6 mm), which housed the ligament.

Sculpture (prosopon) consists of coarse simple radial costae and of single concentric growth varices. A right valve (holotype) possesses two cardinal teeth, which occur immediately below the beaks. Musculature unknown.

Dimension of the specimens (in mm):

Nr.	H	L	H/L	D	Z	Z/L	L/D	X
TÜG 3/30	34	32	1.0	41	18	0.56	0.78	12
TÜG 3/29	35	34	1.0	43	18	0.53	0.79	12
TÜG 35/1	35	31	1.1	44	17	0.55	0.71	11
TÜG 46/1	36	31	1.1	44	14	0.46	0.70	12

**COMPARISON.** Gastropod limestone (5a), Norway, species determined by R. Toni (1975) as *Ambonychia radiata* (Hall) differs in its more massive beaks, more obtuse angle gamma (100 degrees), more shell costae (50) and few projecting umbones above the hinge line. Upper Bala and Drummuck Group, Wales and Scotland, species determined by W. Hind (1910) as *Byssonychia radiata* Hall included more than one species. Specimens, figured on plate I, figs 19, 22, 23, 24 all differ from one another in shape of shell. S.P. Tunnicliff (1982) described a new species *Ambonychia arundinea* from Killey Bridge Formation of Ireland and included there Hind's specimens (Pl. I, fig. 20, 21) too. P. Tunnicliff noted that Scottish specimens have more costae than Irish ones. *Ambonychia arundinea* differs from the present species in generally being flatter (convexity of a single valve is 4 mm), height about 1.25 from the length. North American Cincinnati species *Ambonychia radiata* Hall (Pojeta, 1962, p. 183) is smaller, but possesses longer ligamental area (about 3/4 of the length), and blunt umbones. North American Maysvillian species

*A.ulrichii* (Pojeta, 1962) has more acute angle gamma (70 degrees), less costae (35–40) and longer ligamental area.

REMARK. Specimens from Pirgu Stage possess more delicate costae and three of them are young individuals (length about 0.8 of the greatest dimension).

OCCURRENCE. Harjuan, Pirgu Stage, Adila Formation and Porkuni Stage, Röa and Vohilaid Members, North Estonia.

LIFE HABIT. *Ambonychia orvikui* have lost the anterior lobe and have a byssal opening. The hard-part morphology shows adaptation for epifaunal mode of life. Ambonychiids without anterior lobe lived in the same fashion like members of recent *Mytilus*. This genus projected above the bottom and was attached to hard substratum (Pojeta, 1971). Specimens from Porkuni Stage are only single valves but from Pirgu Stage there are complete shells.

Genus *Mytilarca* Hall and Whitfield, 1869

*Mytilarca porkuniensis* sp.nov.

PI. III, figs. 1–5

*Mytilarca* sp.: Киселев, Синицына, Исакар и др., 1990, с. 22.  
табл. V, фиг. 5.

NAME. This species is named according to its occurrence in Porkuni Stage.

HOLOTYPE. Right valve, TÜG 43/1, Porkuni Stage, Vohilaid Member, Harjuan, Porkuni, North Estonia, coll. Ralf Männil.

MATERIAL. Röa Member — internal mold of right valve and two broken external molds of right valve from railway ditch near Röa, external mold of right valve from Paasvere; Vohilaid Member — two right valves, left valve and 3 broken valves from Porkuni, an broken external mold of valve from Aruküla-Kivist.

DIAGNOSIS. *Mytilarca* with acute angle gamma and triangle upper third of shell.

DESCRIPTION. Shell mytiliform, inequilateral, an anterior lobe and posterior wing lacking. Beaks terminal and prosogyral, turned anterior. Angle gamma 70 degrees; greatest convexity of a single valve small (convexity is about 0.07 of height). The greatest convexity occur near the umbonal part (subparallel to hinge line). The greatest convexity runs approximately through the centre of the valve. Posterior of beaks straight ligamental area, anterior of beaks margin slightly concave. This slightly concave margin and ligamental area give for the upper third of the shell a shape of triangle. Anterior and posterior border subparallel and gently arched, the lower margin rounded. The sculpture (prosopon) consists of only concentric varices. Byssal sinus weakly developed. Hinge unknown.

Dimensions of the specimens (in mm):

Nr.	H	L	H/L	X	G	D	L/D	X/H
TÜG 43/1	23	17	1.6	2	70	30	0.56	0.07
TÜG 39/1	32	22	1.5	3	70	33	0.66	0.07

**COMPARISON.** *Mytilarca* species described by O. Isberg (1934) from Boda reef limestone, Sweden, all differ from greatest convexity. The new species resembles more Upper Boda species *M.triangularis* Isberg (that has triangular part of shell but angle gamma is about 80 degrees and shell is rather thick) and *M.iniqua* Isberg (that has straight ligamental area but angle gamma is about 90 degrees).

**OCCURRENCE.** Harjuan, Porkuni Stage, Röa and Vohilaid Members, North Estonia.

**LIFE HABIT.** Genus *Mytilarca* belongs to the extinct family Ambonychiidae, representatives of which mainly lived epifaunally. *Mytilarca porkuniensis* has not anterior lobe and distinct byssal gape. The slightly sinuate anterior margin accommodating to a byssal gape opening, suggests byssal attachment (Liljedahl, 1984, p. 52). From Porkuni Stage only single valves of *Mytilarca porkuniensis* sp.nov. have been found.

#### SUPERFAMILY *BELLEROPHONTACEA* McCOY, 1851

##### FAMILY *SINUITIDAE* Dall in Zittel-Eastmann, 1913

Genus *Sinuites* (*Sinuites*) Koken, 1896

*Sinuites* (*Sinuites*) *usitatus* sp.nov.

PL. IV, V

*Bellerophon bilobatus* Sowerby: Schmidt, 1858, S. 207,

*Sinuites bilobatus* Sowerby: Koken, 1896, p. 393; Koken, 1897, p. 118; Twenhofel, 1916, p. 298, 305,

*Sinuites* cf. *bilobatus* Sowerby: Twenhofel, 1916, p. 313; 1928, p. 81.

**NAME.** Is derived from the latin *usitatus* — ordinary, common.

**HOLOTYPE.** Whole internal mold, TÜG 2/3, Harju Series, Vormsi Stage, Kõrgessaare Formation, old stone-pit Oru, North Estonian, old collection.

**MATERIAL.** All specimens are internal molds. Kõrgessaare Formation — Oru, 1 specimen (holotype); Saaremõisa (Lyckholm), 2 specimens; Küti, 1 specimen; island Vormsi, sea-shore near Saxby (North), 3 specimens; Kärlätt, 1 specimen.

**DIAGNOSIS.** *Sinuites* (*Sinuites*) with long aperture, strong wrinkles on dorsal part of the shell.

**DESCRIPTION.** Globose, whorl strongly involuted — last whorl enveloping earlier ones so that height of aperture corresponds to that of shell. In the specimens with have preserved the origin shell material closed umbilicus (PI. V, fig. 6). Narrow umbilicus is visible on internal mold only. Dorsal part of the body whorl roundly arched, sinus shallow, U-shaped. The aperture wide, about twice as wide as high. Interior of shell with some strong wrinkles, well developed on dorsal part (PI. IV, fig. 4). Specimens preserving the shell are everywhere rare. These shows, that the perfect shell was ornamented with fine concentric growth lines (18–19 lines on 2 mm) (PI. V, fig. 4) and even revolving lines, which surrounded the umbilical region. Growth lines traced sinus. Musculature unknown.

Dimensions of the specimens (in mm):

Nr.	H	L	W	H/L
TÜG 2/3	23	29	20	0.79
TÜG 44/4	20	26	15	0.77
TÜG 40/2	22	26	17	0.84
TÜG 47/1	18	22	15	0.81
TÜG 47/2	17	25	18	0.68
TÜG 40/1	22	25	16	0.88

**COMPARISON.** *Bellerophon nitens* Eichwald, 1860. Harjuan (Vormsi Stage) is smaller than *S.(S)usitatus* and hasn't wrinkles on the dorsal part of the shell. The closest species is *Bellerophon navicula* Eichwald, 1843, Harjuan (Vormsi Stage, too), from which it differs in its more globose shape and smaller aperture.

**REMARK.** Bekker (1925, PI. II, fig. 9) have pictured *Sinuites bilobatus* (Sowerby) from Jõhvi Stage, Anija (Viruan). This species doesn't belong into the genus *Sinuites* because it has a remarkable slit on dorsal part.

**OCCURRENCE.** Harjuan, Vormsi Stage, Kõrgessaare Formation, North Estonia.

**LIFE HABIT.** It is widely accepted that bellerophontaceans possessed aspidobranch ctenidia in similar fashion to other archaeogastropods (Knight, 1952), which restricted their distribution to hard substrata in clear water. A subsphaerical shell has a high degree of compactness which appears to satisfy the stability requirements of life on hard substratum (Peel, 1974, p. 245).

## REFERENCES.

- Bekker H. Lühike ülevaade Eesti geoloogiast. (Eozoline ja paleozooline ladekond) // Koguteos "Eesti". Tartu, 1925. — 32 lk.
- Eichwald E. Neuer Beitrag zur Geognosie Esthlands und Finlands // Beitr. Kenntn. russ. Reichs. — 1843. — Bd. 8. St. Petersb. S. 1–138.
- Eichwald E. Lethaea Rossica ou Paleontologie de la Russie. Stuttgart, 1860. — 1, P. 2. — P. 930–1041.
- Hind W. The lamellibranchs of the Silurian rocks of Girvan // Trans. Roy. Soc. Edinb. — 1910. — Vol. 47, N 18. — P. 479–548.
- Isberg O. Studien über lamellibranchiaten des Leptaenakalkes in Dalarna. Lund, 1934. — 493 pp.
- Knight J.B. Primitive fossil gastropods and their bearing on gastropod classification // Smithson. misc. Colls. — 1952. — Vol. 117, N 13. — 56 p.
- Knight J.B., Cox L.R., Keen A.M., Batten R.L., Yochelson E.L., Robertson R. Systematic description // Treatise of Invertebrate Paleontology. Part 3: Mollusca 1. — 1960. — P. J169–J324.
- Koken E. Die Leitfossilien. Leipzig, Chr. Herm. Tauchnits, 1896. — 848 S.
- Koken E. Die Gastropoden des baltischen Untersilurs // Bull. Acad. Imp. Sci. St. — Petersb. — 1897. — Ser. 5. — T. 7, N 2. — S. 97–214.
- Koken E., Perner J. Die Gastropoden des baltischen Untersilurs // Mem. Acad. Sci. Russ. — 1925. — Ser. 8. — Vol. 37, N 2. — 326 S.
- Lamont A. Lamellibranchs from the Lower Drummuck Group (Ashgillian), Girvan, Scotland // Cement, Lime and Gravel. — 1946. — Vol. 20, N 10. — P. 364–366.
- Liljedahl L. Silurian silicified bivalves from Gotland // Sver. geol. unders. — 1984. — S.C, N 804. — 82 p.
- McAlester A.L. Superfamily *Nuculacea* Gray, 1924 // Treatise on Invertebrate Paleontology. — 1969. — Part N, 1: *Mollusca, Bivalvia* — P. N229–N231.
- Newell N.D. Superfamily *Ambonychiacea* S.A. Miller, 1877 // Treatise on Invertebrate Paleontology. — 1969. — Part N, vol. 1: *Mollusca, Bivalvia* — P. N285–N297.
- Peel J.S. Systematics, ontogeny and functional morphology of Silurian trilobed bellerophontacean gastropods // Bull. geol. Soc. Denmark. — 1974. — Vol. 23. — P. 231–265.
- Pojeta J.J.R. The pelecypod genus *Dyssoonychia* as it occurs in the Cincinnati at Cincinnati, Ohio // Palaeontographica Americana. — 1962. — Vol. IV, N 30. — P. 169–216.
- Pojeta J.J.R. Review of Ordovician Pelecypods // Prof. Pap. U.S. geol. Surv. — 1971. — N 695. — 46 p.
- Schmidt F. Untersuchungen über die Silurische Formation von Ehstland, Nord-Livland und Oesel // Arch. Naturk. Liv-, Ehst.- u. Kurl. — 1858. — Ser. 1, Bd. 2. — 248 S.
- Soot-Ryen H. and T. The Middle Ordovician of the Oslo Region, Norway. 11 *Pelecypoda* // Norsk Geol. Tidsskr. — 1960. — Vol. 40, part 2, P. 81–122.

- Stanley S. Relation of shell form to life habits of the *Bivalvia* (*Mollusca*) // Geol. Soc. Amer. Mem. — 1970. — N 125. — 296 p.
- Toni R. Upper Ordovician bivalves from the Oslo Region, Norway // Norsk Geol. Tidsskr. — 1975. — Vol. 55. — P. 135–156.
- Tunnicliff S.P. A Revision of late Ordovician Bivalves from Pomeroy, Co. Tyrone, Ireland // Palaeontology. — 1985. — Vol. 25, P. 1. — P. 43–88.
- Twenhofel H.W. The Silurian and high Ordovician strata of Estonia, Russia and their faunas // Bull. Mus. comp. Zool. Harv. — 1916. — Vol. 36, N 4. — P. 2. — P. 179–286.
- Twenhofel H.W. Geology of Anticosti Island // Can. Dept. of Mines. — 1928. Geol. Surv. Mem. 154. — P. 28–98.
- Yonge C.M. The protobranchiate Mollusca; a functional interpretation of their structure and evolution // Royal Soc. London Philos. Trans. — 1939. — Ser. B. — Vol. 230, N 566. — P. 79–147.
- Киселев Г.Н., Синицына И.Н., Исакар М.А., Миронова М.Г., Саладиус В.Ю.** Атлас моллюсков верхнего ордовика и силура северо-запада Восточно-Европейской платформы. Ленинград, 1990. — 80 с.

## НОВЫЕ ДВУСТВОРКИ И ОДИН НОВЫЙ ВИД ГАСТРОПОД ИЗ ХАРЬЮСКОЙ СЕРИИ (ВЕРХНИЙ ОРДОВИК) СЕВЕРНОЙ ЭСТОНИИ

Маре Исакар

Резюме

Описываются три новых вида двустворчатых моллюсков и один новый вид гастропод из верхнего ордовика (харььюская серия) Эстонии. Изученные коллекции хранятся в геологическом отделе Зоологического музея Тартуского университета под № 2, 3, 34, 35, 39, 40, 41, 42, 43, 46, 47. При измерении использовались следующие размеры и отношения: Н — высота, L — длина, D — длина главной диагонали, Z — длина замочного края, G — угол между замочным и передним краями, X — вздутость одной створки, W — ширина устья (см. рис. 1).

*Similodonta wahlii* sp.nov.  
Pl. I, figs. 1–8

Раковина округло-треугольная, небольшая, неравносторонняя, высота и длина почти одинаковые. Передний край слегка вогнутый, с многочисленными зубами. Замок состоит из ряда зубов на двух ветвях, которые соединяются под углом 80°. Передняя ветвь короче задней. Зубы маленькие, пластинчатые, под

макушкой очень слабые. Раковина покрыта тонкими концентрическими струйками (в центре раковины 5–6 струек на 2 мм) и одинокими сильными линиями роста (Pl. I, fig. 6). Макушки маленькие, немного загнутые вперед. Раковина умеренно выпуклая. Отпечатки аддукторов маленькие, овальные, почти равные, но передний яснее, находится прямо под зубами, задний удлиненный.

Харьюская серия, поркуниский горизонт, зринаская свита, реакская и вохилайдская пачки, Северная Эстония.

*Ambonychia oreiksi* sp.nov.  
Pl. II, figs 1–6; Pl. III, fig. 6

Раковина довольно большая (самый большой размер образует 0.7 от длины и высота 1.0 от длины). Длина замочного края образует 0.5 от длины. Вздутость довольно большая, для одной створки 10–12 мм. Раковина просоклинина (средняя линия наклонена вперед), угол (G) между передним и замочным краем составляет от  $80^{\circ}$  до  $90^{\circ}$ . Макушки килеватые, клюв загнутый, выступающий за замочным краем (до 3 мм). Биссусная вырезка (Pl. II, figs. 4, 5) хорошо сложена (длиной до 6 мм) и находится примерно на свою длину ниже макушек. Биссусный синус неглубокий, но хорошо замеченный. Скульптура состоит из сильных, простых радиальных ребер, количества которых около 45. Встречаются также отдельные сильные концентрические линии нарастания. На правой створке голотипа под макушкой расположены две ямки и один кардинальный зуб (Pl. II, fig. 3).

Харьюская серия, пиргусский горизонт, адилаская свита; поркуниский горизонт, реакская и вохилайдская пачка зринаской свиты, Северная Эстония.

*Mytilacea porkuniensis* sp.nov.  
Pl. III, figs. 1–5

Раковина митилоидная, вытянуто-овальная, неравносторонняя, передняя лопасть и заднее крыло отсутствуют. Макушки острые, конечные, повернутые вперед. Макушечный угол около  $70^{\circ}$ . Раковина со слабо выпуклыми створками (коэффициент выпуклости  $X/H = 0.07$ ), линия наибольшей выпуклости проходит почти параллельно с замочным краем, потом плавно уравнивается. Позади макушек лежит прямой замочный край, впереди макушек на такую же длину край раковины немного вогнут. Эта вогнутая верхняя часть переднего края и замочный край придают верхней трети раковины очертание треугольника. Ниже этого передний и задний край слабо выпуклый и плавно

сопрягается с нижним краем. Характерна только концентрическая скульптура, которая состоит из тонких линий и из редких морщин роста. Нет ясно выраженной биссусной вырезки. Сохранность материала не позволяет наблюдать строения связочной площадки и судить о количестве зубов.

Харьюская серия, поркуниский горизонт, реакская и вохильдская пачки зринаской свиты, Северная Эстония.

*Sinuites (Sinuites) usitatus* sp.nov.

Pl. IV, V

Раковина шаровидная, инволютная — последний оборот объемлет предыдущие так, что ширина устья составляет ширину всей раковины. Вдоль оси навивания у ядер есть пупок, но у экземпляров с раковинным покроем тот почти прикрыт утолщениеми внутренней губы (Pl. V, fig. 6). Простирающийся к устью последний оборот имеет вышуклую округлую спинную сторону с довольно глубоким синусом. Устье широкое, высота немногого превышает половину ширины. На последнем обороте имеются поверхностных дуговидных морщины, которые прослеживают конфигурацию синуса. Скульптуру можно наблюдать у немногих экземпляров, у которых она состоит из тонких концентрических линий (на 2 мм 18–19 линий) (Pl. V, fig. 4), прослеживающих фигуру синуса. Со стороны пупка видны также спиральные линии, отсутствующие на спинной стороне.

Харьюская серия, вормсиский горизонт, кыргессаарская свита, Северная Эстония.

## PLATE I

Figs. 1-8 *Similodonta wahli* sp.nov.; 1-3 lateral view of right valve, internal view showing hinge and dorsal view of holotype (x2). Porkuni Stage, Porkuni, TÜG 3/23, coll. A.v. Wahl. 4 - lateral view of left valve (x2). Stage and locality the same as on figures 1-3, TÜG 3/26, coll. A.v. Wahl. 5 - internal mold of left valve (x2). Porkuni Stage, Röa Member, Muuga, TÜG 42/1, coll. F. Schmidt. 6 - broken external mold of left valve showing sculpture (x2). Stage and Member the same as on figure 5, railway ditch near Röa, TÜG 35/3, coll. A. Röömusoks. 7-8 - external and internal mold of left valve (x2). Stage and Member the same as on figure 5, road near Röa-Jaagupi, TÜG 34/1, coll. L. Pölma, L. Sarv, H. Nestor and J. Nölvak.

## PLATE II

Figs. 1-6 *Ambonychia orvikui* sp.nov.; 1, 3-5 - lateral view of right valve (x1), internal view of right valve showing hinge and ligamental area (x2), anterior view of right valve showing byssal notch (x2) and anterior view (x1) of holotype. Porkuni Stage, Vohilaid Member, Porkuni, TÜG 3/30, coll. A.v. Wahl. 2 - external mold of left valve (x1). Porkuni Stage, Röa Member, railway ditch near Röa, TÜG 45/4, coll. A. Röömusoks and T. Lodjak. 6 - anterior view of external mold (x1). Pirgu Stage, Adila Formation, erratic boulder near new port of Haapsalu, TÜG 46/1, coll. K. Orviku.

## PLATE III

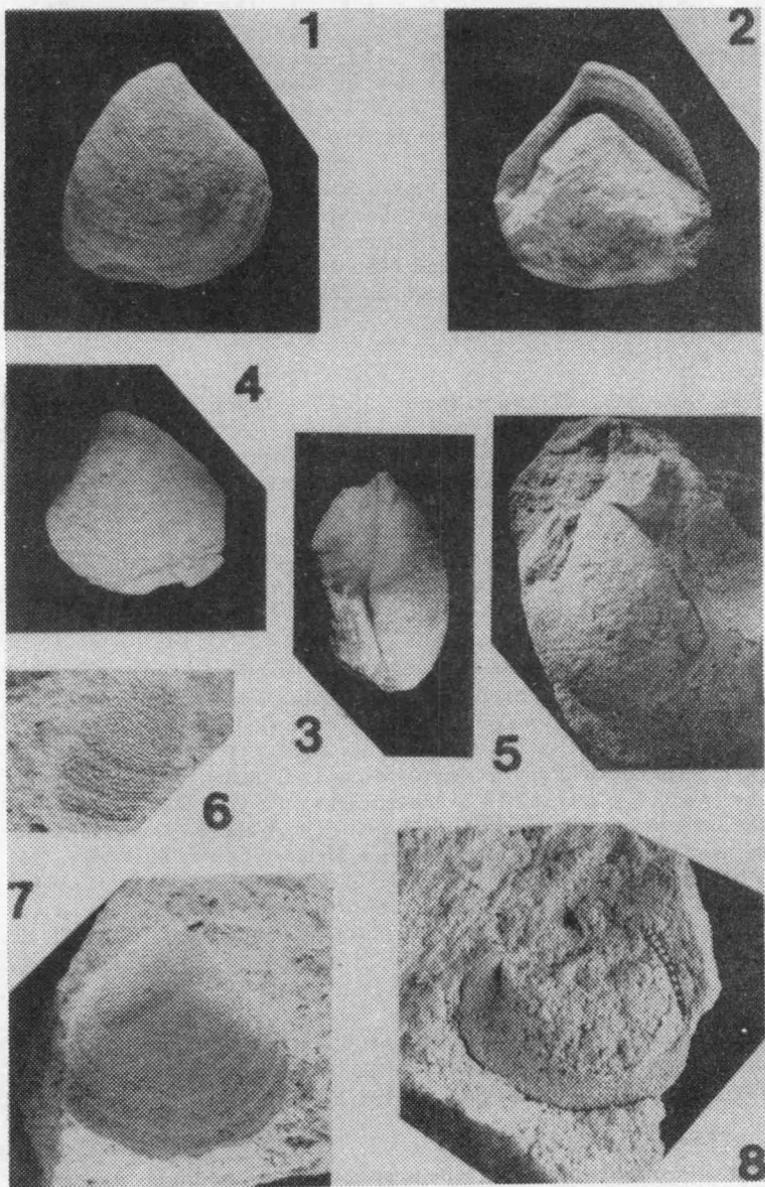
Figs 1-5 *Mytilarca porkuniensis* sp.nov.; 1 - lateral view of right valve of holotype (x2). Porkuni Stage, Vohilaiu Member, Porkuni, TÜG 43/1, coll. R. Männil. 2 - external mold of right valve (x1). Porkuni Stage, Röa Member, Röa, coll. A. Röömusoks. 3 - lateral view of broken left valve (x1). Stage, Member and locality the same as on figure 1, TÜG 3/31, coll. A.v. Wahl. 4 - lateral view of broken right valve (x1). Stage and locality the same as on figure 1, TÜG 3/32, coll. A.v. Wahl. 5 - external mold of right valve (x1.5). Porkuni Stage, Röa Member, railway ditch near Röa, TÜG 35/2, coll. A. Röömusoks and T. Lodjak. 6 - *Ambonychia orvikui* sp.nov.; lateral view of external mold of right valve (x1). Pirgu Stage, Adila Formation, erratic boulder near new port of Haapsalu, TÜG 46/1, coll. K. Orviku.

## PLATE IV

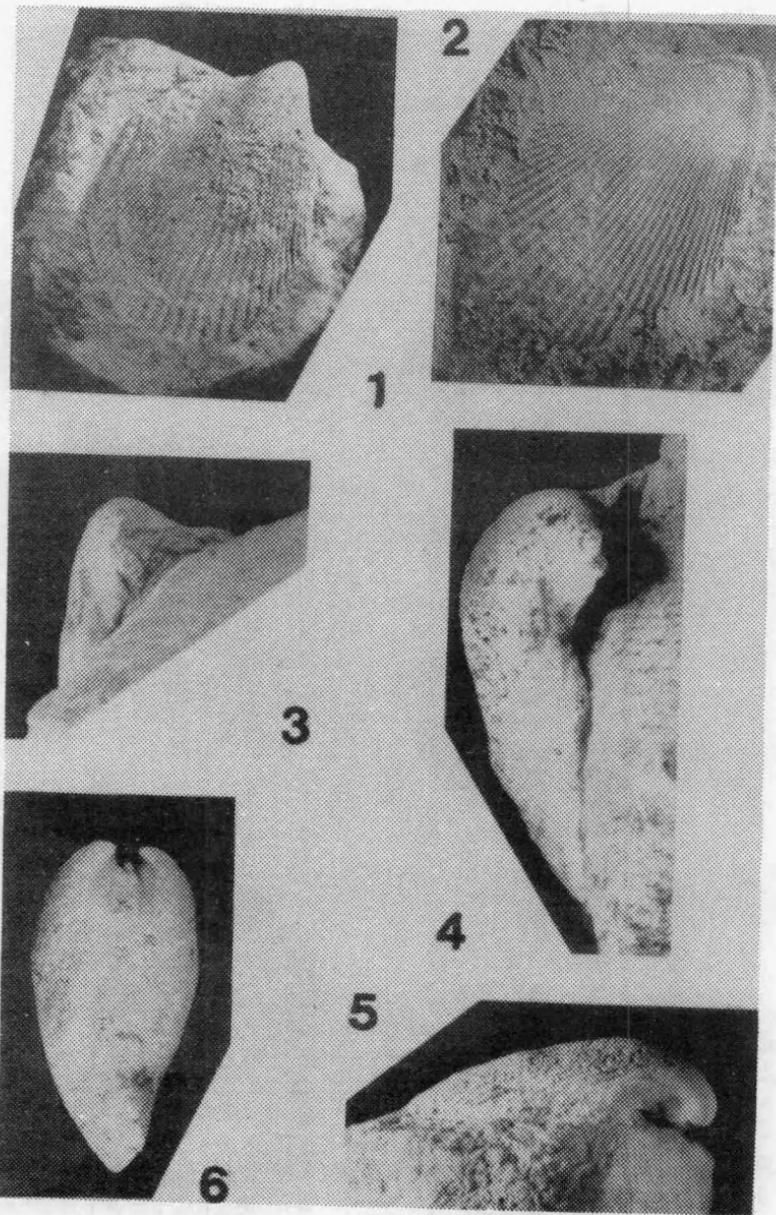
Figs. 1-4 *Sinuites (Sinuites) usitatus* sp.nov.; aperture view, lateral views and dorsal view of internal mold of holotype (x2). Vormsi Stage, Körgeasaare Formation, Oru, TÜG 2/3, old collection.

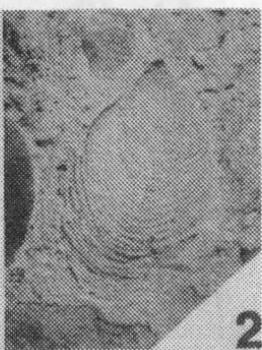
## PLATE V

Figs. 1-6 *Sinuites (Sinuites) usitatus* sp.nov.; 1-3 - aperture view, lateral view and dorsal view of internal mold (x2). Vormsi Stage, Körgeasaare Formation, island Vormsi, sea-shore near Saxby (North), TÜG 47/1, old collection. 4-6 - dorsal, aperture and lateral views of internal mold with remnants of shell (x2). Stage and Member the same as on figure 1-3, peninsula Noarootsi, Saaremõisa (Lyckholm), TÜG 40/2, coll. M. Isakar.



Figures 1-8. Various specimens from the same locality as figure 1. Length 10-100 mm. Fig. 1 - a large, rounded, smooth rock; fig. 2 - a small, elongated, ribbed rock; fig. 3 - a smooth, rounded rock; fig. 4 - a large, irregularly shaped rock; fig. 5 - a small, rounded rock; fig. 6 - a large, smooth, rounded rock; fig. 7 - a large, smooth, rounded rock; fig. 8 - a large, irregularly shaped rock.





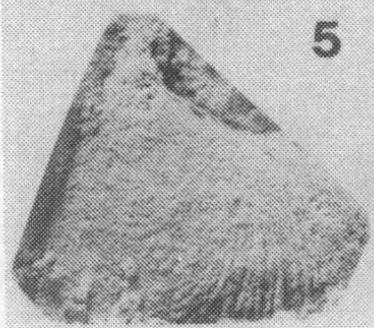
1



4



6

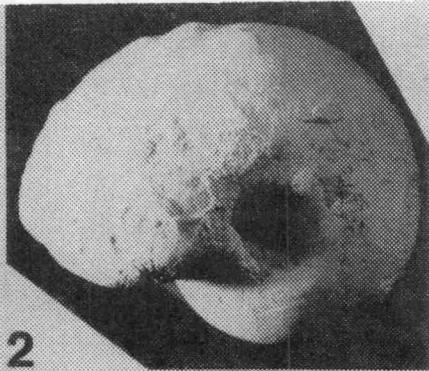


5

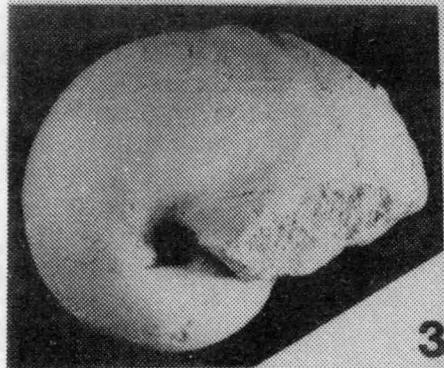




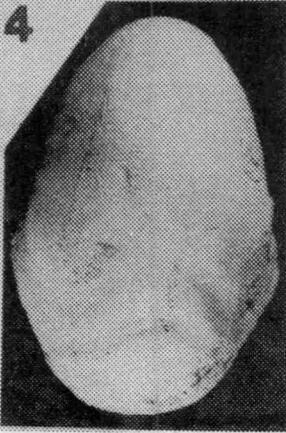
1



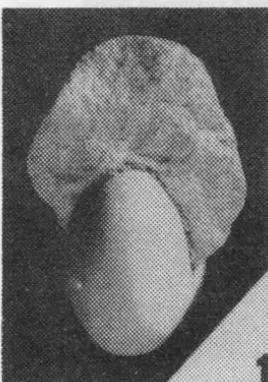
2



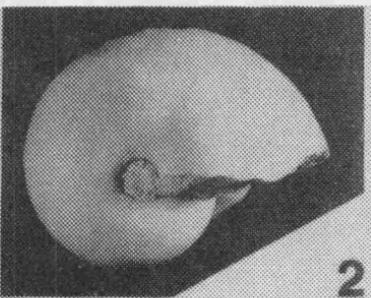
3



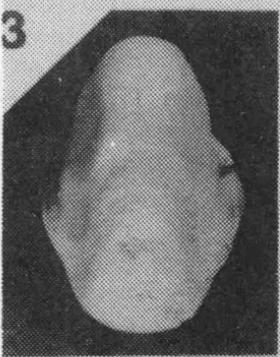
4



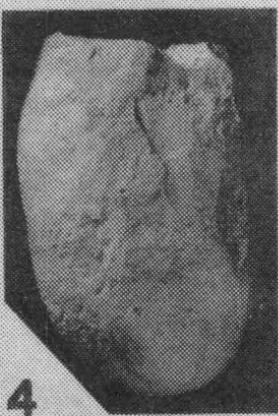
1



2



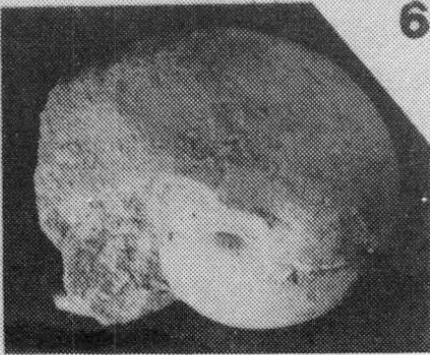
3



4



5



6