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A. A. Kasum-Zade L. F. Romanov

FAMILY SPONDYLOPECTINIDAE KASUM-ZADE ET ROMANOV, FAM.  
NOV. IN THE JURASSIC OF THE SOUTHERN USSR

In the Upper Triassic and Jurassic of Europe, North Africa, northwestern parts of Asia, and India, groups of pectinoids that are substantially different than other groups of superfamily Pectinoidea Rafinesque, 1815 are widely distributed: shape of the shell is from rounded to spherical, with apical angle of  $> 90^\circ$ . On the hinge margin of the right valve two teeth or well-developed hinge and auricular crura are developed. Radial sculpture from solitary radial ribs or they are grouped in duplexes, triplexes or bundles on one of the valves. According to the indicated characters, this group of pectinoids clearly differs from the family Chlamydidae Korobkov, 1960, within which all of them are often included.

According to morphological characters (shape of shell, structural peculiarities of hinge and auricles, and being inequivalved),

It is proposed to combine them into the new family Spondylopectinidae fam. nov., consisting of two subfamilies: the nominative one and the subfamily Radulopectinidae Romanov, 1985.

#### Family SPONDYLOPECTINIDAE FAM. NOV.

Diagnosis. Shell equilateral, inequivalved, from moderately convex to spherical. Auricles unequal: anterior auricle of right valve is larger. Byssal notch is marked either well or indistinctly. Hinge apparatus is of two teeth on right valve or without them. Hinge and auricular crura are frequent. Sculpture is of radial ribs: solitary, duplexes, triplexes or bundles on one of the valves. Protuberances are frequent in places of intersection with concentric elements of sculpture.

Composition of family. Two subfamilies: Spondylopectininae Kasum-Zade et Romanov, subfam. nov. and Radulopectininae Romanov, 1985.

Range and Age. Upper Triassic (Norian) – Upper Jurassic (Tithonian).

#### Subfamily Spondylopectininae subfam. nov.

Diagnosis. Shell from small to large, from moderately convex to spherical. Hinge margin straight, marked indistinctly because of strongly developed beak of right valve. Auricles unequal: anterior of right valve is larger, with deep or gently sloping sinus. Hinge on right valve is of two unequal cochleariform teeth along margins of resilifer and correspondingly two small depressions {pits} on left valve. Ornamentation is of solitary radial ribs.

Composition of subfamily. Two genera: *Spondylopecten* Roeder, 1882 and *Plesiopecten* Munier-Chalmas, 1887.

Comparisons and comments. From the subfamily Radulopecteninae Romanov, 1985 it differs in having rounded, up to spherical, shell, in having two teeth on right valve and solitary radial ribs, equal in size on both valves.

Quenstedt (1852) first described pectinoids with the morphological characters mentioned above. In the following work (Quenstedt, 1858, p. 627), he expressed the expediency of combining them into a separate taxonomic group. This was done by Roeder (1882), distinguishing the genus *Spondylopecten* Roeder, 1882. From the composition of this genus, Munier-Chalmas (Munier-Chalmas in Fischer, 1887) distinguished the genus *Plesiopecten* Munier-Chalmas, 1887 and considered it to be a subgenus of *Chlamys*.

Subsequently some scientists combined these two genera into the genus *Spondylopecten* (V. F. Pchelintsev, 1928, 1931 and 1932; I. R. Kakhadze,

1943; G. T. Petrova, 1949; M. R. Abdulkasumzade and T. A. Gasanov, 1956; N. G. Khimshiashvili, 1957; T. A. Gasanov, 1961; L. F. Romanov, 1985; Philippi, 1898; Staesche, 1926; Déchaseaux, 1936; Hertlein in Moore, 1969; Yamani, 1975), but others considered them to be independent genera or subgenera of *Chlamys* (Arkell, 1936; Cox, 1952; Wellnchofer, 1964).

Such inconsistency in the validity of the genus *Plesiopecten* can be explained by the small number of species which are attributed to this genus. Currently new species have been distinguished in the Jurassic of Malyy Kavkaz [Caucasus], which allows tracing the differences between the genera *Plesiopecten* and *Spondylopecten*.

As Wellnchofer (1964, p. 39) has already noted, in the genus *Plesiopecten* the anterior auricle of the right valve is slightly larger than the posterior and is with a small byssal notch. The external sculpture of the valves has an insignificant number (up to 15-16) of radial roof-like ribs, often with spines, especially on the left valve. In the rib interspaces, concentric sculpture is well-developed.

Range and age. From the upper Bajocian to the Tithonian of Europe, North Africa, Central Asia, and India.

Below a description of species of this subfamily new and previously not known in the territory of the USSR is given.

Genus *Spondylopecten* Roeder, 1882

*Spondylopecten stoliczkai* (Cox, 1952)

Plate I, Fig. 2

*Chlamys (Spondylopecten) stoliczkai*: Cox, 1952, p. 15, pl. 3, fig. 17.

Description. Shell small, of rounded, triangular outline. Sculpture is of 20 rounded radial ribs. In size, ribs are consistent {firm}, except for the first and last three on the margins of the valve, which are narrower than the rest. On the slopes of the ribs a row of punctated {consisting of points} protuberances {bumps} is traced, formed as a result of the intersection of concentric sculpture and striae. Fine striation is observed on the surface as well of the ribs. Rib interspaces are narrower than ribs themselves. Concentric sculpture is in form of fine lines, which curve on the surface of the ribs to the side of the beak.

Comparisons and comments. It differs from *Spondylopecten erinaceus* (Buv.) (1852, p. 23, pl. 19, figs. 7-12) in having smaller number of ribs (20 as opposed to 22-24) and in the absence of protuberances on the ribs. From *Spondylopecten badiensis* (Cox) (1952, p. 16, pl. 1, fig. 14) it differs in having smaller number of ribs (20 as opposed to 23-24).

Range and age. USSR: M. Kavkaz {Caucasus} (Azerbaijan). Callovian. Outside of the USSR: lower Callovian of India.

*Spondylopecten badiensis* (Cox, 1952)

Pl. I, Fig. 3

*Chlamys* (*Spondylopecten?*) *badiensis*: Cox, 1952, p. 16, pl. 1, fig. 14; 1965, p. 58, pl. 7, figs. 3 and 4.

Description. Shell small, rounded, triangular, and equilateral. Radial sculpture consists of 24 rounded ribs. In middle part ribs are straight, but are slightly curved on the margins. Rib interspaces are equal in width to ribs.

Comparisons and comments. It differs from *S. erinaceus* (Buv.) in having larger number of ribs, in the absence of ornamentation on the ribs and in the rib interspaces.

Range and age. USSR: M. Kavkaz, Callovian? Outside of the USSR: Callovian of India and Tanzania.

*Spondylopecten ejnaltachtensis* Kasum-Zade, sp. nov.

Pl. I, Fig. 5

Holotype. IG AN Azerb. SSR {probably Institute of Geology, Academy of Sciences of the Azerbaidzhan SSR}. No. KAA 109/219, M. Kavkaz (Azerbaijan), village of Eynaltakht; upper Callovian – lower Oxfordian. Named after the village of Eynaltakht.

Description. Shell is equilateral, rounded, triangular, moderately convex. The greatest convexity {inflation} is on the posterior third of valve. Anterior auricle is larger than posterior, is covered by five coarse radial ribs and numerous concentric lines. Sculpture of 24 fan-shaped rounded, triangular ribs radiating {diverging} from beak. On the sides of the ribs spines are situated. Rib interspaces are equal or narrower than width of ribs.

Comparisons and comments. From *Spondylopecten erinaceus* (Buv.) it differs in having rounded ribs, but differs from *Spondylopecten aequatus* (Quenstedt) (1852, p. 507, pl. 40, Fig. 45), in having smaller number of ribs (24 as opposed to 35-36).

Range and age. USSR: M. Kavkaz, upper Callovian – lower Oxfordian.

*Spondylopecten abdulkasumzadae* Kasum-Zade, sp. nov.

Pl. I, Fig. 7

Holotype. IG AN Azerb. SSR. No. KAA 435/3, M. Kavkaz (Azerbaijan), village of Dagrov, upper Oxfordian. It is named in honor of M. R. Abdulkasumzade.

Description. Shell is of average dimensions, strongly convex, inequilateral. Auricles are unequal, with very weak byssal notch. Sculpture consists of 24 radial rounded ribs. Two lines of fine protuberances are on slopes of ribs. There are 5-6 radial ribs on auricles.

Comparisons and comments. It differs from all other known species because of the rounded shell shape, structure of auricles, and in having two lines of small protuberances on the slopes of the ribs.

Range and age. USSR: Malyy Kavkaz, upper Oxfordian.

*Spondylopecten proumbonatus* Yamani, 1975

Plate I, Figs. 8-9

*Spondylopecten proumbonatus* Yamani, 1975, p. 64, pl. 3, figs. 11-12.

Description. Shell is large, triangular in outline, elongated. Beak of right valve strongly protrudes over hinge margin, is elongated, inflated. Hinge margin is straight. Anterior auricle of right valve is twice as large as posterior and is with deep byssal notch. Valves are ornamented with 31 radial, acute-angled ribs with interspaces approximately twice as narrow as the ribs.

Comparisons and comments. From other species of genus it differs in having valve elongated in height, narrow and protruding beaks, a large anterior auricle with deep byssal notch.

Range and age. USSR: Southern slope of Bol'shoy Kavkaz {Caucasus Mountains} (Azerbaijan), Tithonian. Outside of the USSR: West Germany, lower Tithonian.

Genus *Plesiopecten* Munier-Chlasmus {i.e. Chalmas}, 1887

*Plesiopecten karabachensis* Kasum-Zade sp. nov.

Pl. II, Figs. 2-3

Holotype. IG. AN Azerb. SSR, No. KAA-1002, M. Kavkaz (Azerbaijan), village of Dagrov. From basal conglomerates of the upper Oxfordian. It is named after the locality, Karabakh.

Description. Shell is of average dimensions, rounded-triangular in outline. Sculpture consists of 12 powerful roof-like radial ribs, equal in size. On the slope of the ribs two radial striae each are situated, {striae} which are accentuated well by rows of protuberances, formed from the intersection with the concentric sculpture. Rib interspaces are equal to the ribs in width and depth. Concentric sculpture is in the form of fine lines, covering throughout the surface of the valves and clearly marked on the crests of the ribs, where they form protuberances, but on the slopes of ribs, it {concentric sculpture} appears in the form of irregular {uneven} and elongated ribs.

Comparisons and comments. It differs from known species of genus *Plesiopecten* in having shell elongated in height, more angular and higher ribs.

Range and age. USSR: M. Kavkaz, probably, lowest part of upper Oxfordian.

*Plesiopecten touragatchajensis* Kasum-Zade, sp. nov.

Pl.II, Fig. 4

Holotype. IG AN Azerb. SSR, No.KAA-417, M. Kavkaz (Azerbaijan), village of El'bektash, Callovian – lower Oxfordian. Named after the Touragachay River.

Description. Shell is of average dimensions, rounded-triangular in outline. Sculpture consists of 10 (11) powerful roof-like radial ribs, approximately identical in size. Rib interspaces are equal to ribs in width and depth. Entire surface of shell is covered by fine, densely situated concentric lines, which are most distinctly visible on slopes of ribs.

Comparisons and comments. It differs from closely related species *Plesiopecten karabachensis* sp. n. in having smaller number (10-11 as opposed to 12) coarser and rounded radial ribs.

Range and age. USSR: M. Kavkaz, upper Callovian – lower Oxfordian.

*Plesiopecten elbektaschensis* Kasum-Zade, sp. nov.

Pl. II, Fig. 5

Holotype. IG AN Azerb. SSR. No. KAA-434, M. Kavkaz (Azerbaijan), village of El'bektash, Upper Callovian – Lower Oxfordian.

Description. Shell of average size, moderately convex. Greatest convexity coincides with the upper third, but on margins, valve is smoothed {flattened} out. Surface of valve is covered with 15-16 radial ribs. In area of beak, they are slightly rounded, but toward lower section they become sharp {acute} and high. On tips of ribs protuberances are visible. On anterior margin 3-4 very feeble ribs in the form of a bundle diverge {radiate} from the beak. Rib interspaces are equal to ribs.

Comparisons and comments. It differs from known species in the number of radial ribs.

Range and age. USSR: M. Kavkaz, upper Callovian – lower Oxfordian.

*Plesiopecten pseudosubspinus* Kasum-Zade, sp. nov.

Pl. II, Fig. 9

Holotype. IG AN Azerb. SSR, No. KAA 609-10, M. Kavkaz (Azerbaijan), village of Mikhtarkent. Tithonian. It is named because of the resemblance to species *P. subspinus* (Schlotheim).

Description. Shell is small, elongated oval and moderately convex and equilateral. Sculpture consists of 11 (12) radial ribs. Rib interspaces are equal to or slightly wider than ribs. In the rib interspaces, coarse, concentric striae are situated, the number of which can reach 20.

Comparisons and comments. The most closely related species is *P. subspinus* (Schlotheim), from which it differs in having shell elongated in height and less convexity.

Range and age. USSR: M. Kavkaz, Tithonian.

*Plesiopecten heterocostatus* Kasum-Zade sp. nov.

Pl. II, Figs. 6-7

Holotype. IG AN Azerb. SSR, No. KAA 439, M. Kavkaz (Azerbaijan), Kyapaz River, upper Callovian – lower Oxfordian.

Description. Valve is small, rounded, equilateral. Sculpture consists of 11 radial roof-like ribs, alternating in power, as well as in depth and height. On the slopes and crests of the ribs spines are traced. Rib interspaces are slightly narrower than ribs. Entire surface of valve is covered with powerful concentric lines.

Comparisons and comments. It differs from other species in having alternation of ribs in power, width and height.

Range and age. USSR: M. Kavkaz, upper Callovian – lower Oxfordian.

## Subfamily Radulopectininae Romanov, 1985

Shell is rounded, equilateral, more often inequivalved. Valves are irregularly convex. Auricles are unequal: anterior auricle of right valve is elongated, with shallow byssal notch or is without it. Hinge structures consist of two odontoid {tooth-like} protuberances on the right valve or is without them. Hinge and auricular crura are variable. Sculpture on valves varies. Consists of pliciform ribs: solitary, duplexes, triplexes or grouped in bundles, often aculeate {prickly} because of intersection with concentric lines.

Composition of subfamily. Jurassic genera are combined within the subfamily: *Pseudopecten* Bayle, 1878 with nominative subgenus and subgenus *Echinopecten* Brasil, 1985; *Praespondylopecten* Romanov, gen. nov.; *Radulopecten* Rollier, 1911 with nominative subgenus and subgenus *Fibrosopecten* Romanov, 1985; *Pamiropecten* Romanov, 1985; *Minervapecten* Romanov, 1985. This subfamily, in our opinion (L. F. Romanov), should also include the genus *Indopecten* Douglas, 1929, in representatives of which Yu. S. Repin (in col.) observed hinge structures similar to the hinge structures of spondylopectinids, and the new genus *Iranopecten* Repin (in col.), which differs from the genus *Indopecten* in the absence of “teeth” and ribs situated in triplexes, like the Jurassic species *Radulopecten (Radulopecten) tipperi* (Cox).

Comparisons and comments. It differs from the subfamily Spondylopectininae subfam. nov. in having relatively flat shell, being inequivalved because of differing radial sculpture on the valves, variation in the presence of “teeth” and less well-developed spines and protuberances on the ribs.

Range and age. Upper Triassic (Norian stage) – Upper Jurassic (Tithonian stage).

The description of a new monotypic genus, *Praespondylopecten* Romanov gen. nov., from the subfamily Radulopectininae, as well as all information known by us about the species composition of this subfamily in the Jurassic of the southern USSR will be given in the work of L. F. Romanov (1985).

#### Genus *Praespondylopecten* Romanov, gen. nov.

Type species. *Praespondylopecten besnosorwi* sp. nov. M-8/230, IG AN SSR. Northern Caucasus, Lower Jurassic, Pliensbachian.

Diagnosis. Shell is small, rounded oval, inequivalved. Left valve is more convex. Hinge margin is straight. Apical angle is blunt. Auricles unequal: anterior is larger and with deep byssal notch. Hinge structures consist of two teeth, with one on each side of the resilifer on the right valve, and corresponding depressions {pits} on the left. Sculpture consists of radial ribs (up to 16), not identical on the valves. On the right, they are wider with interspaces narrower than the ribs; on the left, they are narrow and with interspaces wider than the ribs.

Species composition. Monotypic genus. Only one species is known from the Lower Jurassic of northern Caucasus. Pliensbachian stage.

Comparisons and comments. It is most closely related in shell morphology to the genera *Pseudopecten* Bayle, 1878 and *Spondylopecten* Roeder, 1882. With representatives of the genus *Pseudopecten*, the similarity appears in the outer elements of the shell. Differences consist in the presence on the hinge margin of the right valve of two large teeth, one on each side of the resilifer.

With representatives of the genus *Spondylopecten*, similarity appears in the presence of two teeth on the right valve and presence of marginal bolsters on the valves. Differences consist of the flat shell, more convex left and not the right valve and sculpture not being identical on the valves, with substantial inequality of the posterior and anterior auricles.

Range and age. USSR: northern Caucasus, Lower Jurassic, Pliensbachian stage.

*Praespondylopecten besnosowii* Romanov, sp. nov.

Holotype. *Praespondylopecten besnosowii* sp. nov. Collection M-8/230. Lower Jurassic of the northern Caucasus, Pleinsbachian stage.

Description. Shell small, rounded oval, inequivalved. Right valve is flat, left is relatively convex, with beak protruding over hinge margin. Hinge margin straight. Auricles unequal: anterior is relatively larger and with deep byssal notch. Apical angle is obtuse. Dimensions: height: 8.10, length: 7.70 mm; anterior auricle: 3.75, posterior: 2.75 mm;  $\angle = 96^\circ$ .

Right valve is relatively flat, with central beak, situated at level of hinge margin. Auricles not equal: anterior is larger and is with deep byssal notch. Hinge margin straight. On the inner surface along the margins of the resilifer are two large odontoid processes, the posterior of which is larger (is traced on two specimens). The inner surface of the valve is smooth. Muscle impression is large, and is situated in posterior part of valve. Pallial margin is crenate. Outer sculpture is represented by 14 radial ribs, straight, rounded-tetragonal with interspaces narrower than ribs. On the margins is situated a single radial fold each. Auricles as well are covered by radial ribs, relatively coarse. Entire surface of valve is covered by concentric growth lines, which are traced as well in the interspaces. In the lower part of the valve, growth lines are coarser, and in some specimens, the lower part of valve recurves inward.

Left valve differs from the right in having "stronger" convexity, slightly protruding beak. As in the right valve, the left consists of 14 radial ribs, thinner {finer}, with interspaces twice as wide as the ribs. One fold is present on each of the margins of the valve. Concentric lines cover the entire valve, but in difference from the right, they are more clearly manifested in the rib interspaces.

Comparisons and comments. The presence of two odontoid processes on the hinge margin of the right valve make this species incomparable with some species of the genus *Pseudopecten*, to which the structure of the outer surface of both valves is similar. In external morphological characters it is very closely related to, and even indistinguishable from, *Pseudopecten (Pseudopecten) priscus* (Schlot.). The appearance of the shell and the identical sculpture differing on the right and left valves brings them together. In *P. (P.) priscus* (Schlotheim) there are 20 radial ribs, but in *P. besnosowii*, there are 14, 16 when counting lateral folds. However, Staesche (1926) also attributed to *P. (P.) priscus* (Schlotheim) forms with 16 radial ribs. It is not to be excluded, that the mentioned forms belong to the species being described {here}.

Range and age. USSR: northern Caucasus. Lower Jurassic, Pliensbachian stage.

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The issue of phylogeny of the new family has not been discussed by the authors because of the absence of consensus of opinion. A. A. Kasum-Zade proposes that both branches of the subfamily Spondylopectininae diverged in the Bajocian from the genus *Weyla* Bohm, 1919 and subsequently gave rise to the genus *Neithia* Drouet, 1824.

L. F. Romanov supports the view expressed by Staesche (1926) on the origin of the genera *Spondylopecten* and *Plesiopecten* from the genus *Pseudopecten*, which could have been representatives of the subgenus *Echinopecten* Brazill, 1895. Representatives of the subgenus *Pseudopecten* gave rise to the subfamily Radulopectininae. As for the branches of *Weyla-Neitheia*, they form an independent group which had already arisen in the Triassic, from which representatives of the subfamily Radulopectininae diverged in the later Triassic, that is, the genera *Indopecten* Douglas, 1929 and *Iranopecten* Repin (in col.).

#### Bibliography of literature consulted

Abdulkasumzade, M. R. and T. A. Gasanov. 1956. Upper Jurassic Pelecypods of the Kyapaz Mountains (Malyy Kyapaz). Trudy Instituta Geologii, Baku. Vol.18, pp. 33-64.

Gasanov {Hassanov}, T. A. 1961. Fauna and Stratigraphy of Lower and Middle Jurassic Sediments of the Northeastern Section of Malyy Kavkaz (Azerbaidzhanskiy SSR). Baku, Izd-vo AN AzSSR, p. 157.

Kakhadze, I. R. Middle Jurassic Fauna of Georgia {Gruziya}. 1943. Trudy Geologicheskogo Instituta Gruzii. Ser. Geol, vol. I (VI), no. 3, pp. 208-333.

Petrova, G. T. Atlas of Guide Fossils of Fauna of the USSR. 1949. Moscow and Leningrad, Izd-vo Geologicheskoi Literatury, vol. IX, p. 332.

Pchelintsev, V. F. 1928. Some Data on the Fauna of the Lusitanian Stage of the Caucasus. *Izvestiia AN SSSR, Ser. fiz.-mat. Nauk*, pp. 481-504.

Pchelintsev, V. F. 1931. Material for Examining Upper Jurassic Sediments of the Caucasus. *Trudy ITRU. Moscow & Leningrad*, no. 91, pp. 166.

Pchelintsev, V. F. 1932. Fauna of Cliffs of Dibrar. *Iz-v. Geol.-Razv. Ob. LI*, no. 20, pp. 1-16.

Romanov, L. F. 1985. Jurassic Pectinoids of the Southern USSR. *Kishinev, Shtiintsa*, p. 232.

Khimshiashvili, N. G. 1957. Upper Jurassic Fauna of Gruzija {Georgia}: Cephalopoda, Lamellibranchiata. *Tbilisi, Izd-vo AN GSSR*.

{Remaining references are in the Latin alphabet.}

Plate I

- Fig. 1. *Spondylopecten erinaceous* (Buvignier)  
Right valve. M. Kavkaz (Azerbaijan), village of Sarushen. Upper Oxfordian.  
Collection of A. A. Kasum-Zade, No. KAA-446.
- Fig. 2. *Spondylopecten stoliczkai* (Cox)  
Left valve. M. Kavkaz (Azerbaijan), town of Kyapaz. Callovian. Collection of A.  
A. Kasum-Zade, No. KAA-462/12.
- Fig. 3. *Spondylopecten badiensis* (Cox)  
Left valve. M. Kavkaz (Azerbaijan), village of Shakhmansur. Callovian (?).  
Collection of A. A. Kasum-Zade, No. KAA-421/42.
- Fig. 4. *Spondylopecten kjapasensis* Hassanov  
Right valve. M. Kavkaz (Azerbaijan), village of Asrik-Dzhirdikhan. Callovian-  
lower Oxfordian. Collection of A. A. Kasum-Zade, No. KAA-496.
- Fig. 5. *Spondylopecten ejnaltachtensis* sp. nov.  
Right valve. M. Kavkaz (Azerbaijan), village of Eynaltakht. Callovian. Collection  
of A. A. Kasum-Zade, No. KAA-109/219, holotype.
- Fig. 6. *Spondylopecten globosus* (Quenstedt)  
Left valve. M. Kavkaz (Azerbaijan), village of Kazaraog. Upper Oxfordian –  
Kimmeridgian. Collection of A. A. Kasum-Zade, No. KAA-968/2.
- Fig. 7. *Spondylopecten abdukkasumzade* sp. nov.  
7 – right valve; 7a – left valve; 7b – hinge margin. The same shell. M. Kavkaz  
(Azerbaijan), village of Dagrav. Upper Oxfordian. Collection of A. A. Kasum-  
Zade, No. KAA-435/3, holotype.
- Figs. 8 & 9. *Spondylopecten proumbonatus* Jamani  
Right valves. Southern slope of B. {Bol'shoy} Kavkaz {Caucasus Mountains}  
(Azerbaijan), village of Laza. Collection of L. F. Romanov, M-8/260, 261.  
Tithonian.

## Plate II

- Fig. 1. *Plesiopecten subspinosus* (Schlotheim)  
Left valve. M. Kavkaz (Azerbaijan), village of Beyuk-Taglar. Collection of A. A. Kasum-Zade, No. KAA-523.
- Fig. 2 & 3. *Plesiopecten karabachensis* sp. nov.  
2 – left valve, No. KAA-1002; 2a – same from the side of the beak. Holotype.  
3 – left valve, No. KAA-422. M. Kavkaz (Azerbaijan), village of Dagrav.  
Collection of A. A. Kasum-Zade. From the basal conglomerates at the base of the upper Oxfordian.
- Fig. 4. *Plesiopecten touragatcajensis* sp. nov.  
Left valve; 4a – the same from the side of the beak. Holotype. Collection of A. A. Kasum-Zade, No. KAA-417/34. Village of El'bekdash, M. Kavkaz (Azerbaijan).  
Upper Callovian – lower Oxfordian.
- Fig. 5. *Plesiopecten elbektaschensis* sp. nov.  
Right valve; 5a – the same from the side of the beak. Holotype. Collection of A. A. Kasum-Zade, No. KAA-434. M. Kavkaz (Azerbaijan), village of El'bekdash.  
Upper Callovian – lower Oxfordian.
- Figs. 6 & 7. *Plesiopecten heterocostatus* sp. nov.  
Right valve, holotype, No. KAA-439/228; 7 – right valve, No. KAA-512/5074.  
M. Kavkaz (Azerbaijan), town of Kyapaz. Collection of A. A. Kasum-Zade.  
Callovian.
- Fig. 8. *Plesiopecten kojkolensis* (Hassanov)  
Left valve. M. Kavkaz (Azerbaijan), town of Kyapaz. Collection of A. A. Kasum-Zade, No. KAA-524. Callovian.
- Fig. 9. *Plesiopecten pseudosubspinosus* sp. nov.  
Left valve, holotype, No. KAA-509/10. Magnified x 2. M. Kavkaz (Azerbaijan), village of Mikhtarkent. Collection of A. A. Kasum-Zade. Tithonian.
- Figs. 10 – 12. *Praespondylopecten besnosowi* sp. nov.  
10 & 10a – right valve from inner side, holotype. M-8/230; 11 – right valve; 11a – left valve, same specimen. M-8/231; 12 – right valve, M-8/232. Collections of N. V. Beznosov. Northern Caucasus. Pliensbachian stage.

{Extra} **Plate I**

(From an article by L. F. Romanov on p. 3)

Fig. 1. *Silberlingia sanctaenae* (Smith)

1 – Crimea, Meganom Peninsula, specimen M/8-231 (collection of the author);  
1a – the same, x 2. Lower Callovian. Collections of E. A. Uspenskaia.

Fig. 2 – 4. *Silberlingia pamirica* sp. nov.

2 – holotype No. 229/893, Museum of UGSM, TSSR {Tajikistan}, Dushanbe, collection of T. F. Andreeva (1977, p. 69, Pl. 2, Fig. 13); 3 – No. 227/893, the same (Fig. 12). South-eastern Pamir {Mountains}, Upper Bajocian (?) – Callovian; 4 – M/8-285 (collection of the author), South-eastern Pamir, Kurteke Pass. Callovian. Collections of E. A. Uspenskaia.

Figs. 5 – 6. *Bositra buchi* (Roemer)

Specimens with radial sculpture, which was formed under deformation of the valves: 5 – small {shallow}; 6 – large striation. Upper Bajocian, Preddobrudzhskiy Prohib, 5-skv {?} 168, int. 891-896, village of Moskovaya, specimen M/8 270, 6-skv. 299, int. 727-731 m, village of Roshu, specimen M/8-271. Collections of the author.