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GEOLOGY OF THE DEVONIAN SYSTEM

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Представлены материалы Международного симпозиума «Геология девонской системы», посвященного рассмотрению накопленных за последнее десятилетие новых данных о геологии одной из интереснейших и важнейших в ресурсном отношении систем фанерозоя. Среди проблем, отраженных в материалах симпозиума — эволюция седиментационных бассейнов и биоты девона, стратиграфия и корреляция разрезов, фации и геохимия осадочных толщ, их тектоника и геодинамика.

Сборник представляет интерес для широкого круга специалистов, занимающихся изучением различных аспектов геологии девонской системы и палеозоя в целом.

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The materials of the International symposium «Geology of the Devonian system» are submitted. They represent the recent data on the geology of one of the most interesting and rich in natural resources systems of the Fanerozoic. The present volume focuses on the problems of the evolution of sedimentary basins, Devonian biota, stratigraphy and correlation, facies and geochemistry of sedimentary sequences, tectonics and geodynamics.

The publication is of interest to a wide range of geologists dealing with the Devonian.

В карьере № 1 Неверовского месторождения известняков вскрыта нижняя часть рифогенной фации верхней подсвиты каменевской свиты — известняки бело-розовые, с белыми кораллово-строматопоратовыми постройками; промежутки заполнены детритово-шламовыми обломками в красной тонкозернистой карбонатной основной массе. Здесь были обнаружены следующие конодонты: *Ancyrodella lobata* Branson et Mehl, *Polygnathus normalis* Mill. et Young., *Belodella triangularis* (Stauffer), *Hindeodella aculeata* Br. et Mehl, *H. subtilis* Ulrich et Bass., *Ozarkodina elegans* (Stauffer), *Apatognathus porcata* (Hinde). Наряду с кораллами, брахиоподами, трилобитами и другими ископаемыми беспозвоночными перечисленные конодонты могут указывать на раннефранский возраст отложений на уровне стандартных зон *falsiovalis-punctata.*

В глубоководном разрезе верхнекаменевской подсвиты по руч. Грязнухе близ с. Раздольного значительное место занимают карбонатные породы с аммоноидеями, двустворками, морскими лилиями, конодонтами. Из этих отложений автору удалось выделить представительный комплекс конодонтов: *Ancyrodella nodosa* Ulrich et Bassler, *A. gigas* Joung., *A. curvata* (Br. et Mehl), *A. lobata* Br. et Mehl, *Palmatolepis hassi* Мыller et Мыller, *Pa.* aff. *punctata* (Hinde), *Pa. jamieae* Ziegler et Sandberg, *Pa.* aff. *proversa* Ziegler, *Pa. gigas* Miller et Youngquist, *Pa. rhenana* Bischoff, *Synprioniodina gracilis* Stauf. и др. Таким образом, верхняя подсвита каменевской свиты отвечает значительному интервалу франского яруса — от зоны *hassi* до зоны *rhenana.*

Необходимо продолжить изучение этих важнейших для Сибири и России в целом разрезов девонской системы с целью получения дополнительной характеристики по конодонтам, аммоноидеям и другим группам ископаемых.

ЛИТЕРАТУРА

Аристов В. А., Белый В. Ф. Первые находки франских конодонтов на Рудном Алтае // Изв. вузов. Геология и разведка, 1976. № 7. С. 171—175.

Богословский Б. И. Девонские аммоноидеи Рудного Алтая: Тр./ ПИН АН СССР. Т LXIV. М., 1958. 155 с.

Караулов В. Б. Особенности строения отложений живетского и франского ярусов в связи с проблемой границы среднего и верхнего девона. Статья II. Восточная часть СССР и некоторые зарубежные страны // Изв. вузов. Геология и разведка, 1989. № 7. С. 15—28.

Караулов В. Б. К стратиграфии палеозойских отложений северо-западной части Рудного Алтая. // Вопросы стратиграфии и региональной геологии. СПб: Изд-во СПб ун-та, 1995. С. 48—63.

Опорные разрезы девона Рудного Алтая и граница среднего и верхнего девона / Сост. Я. М. Гутак, О. В. Мурзин и др. Змеиногорск, 2000. 75 с.

Sandberg C. A., Ziegler W., Bultynck P. New Standard Conodont Zones and Early Ancyrodella Phylogeny across Middle-Upper Devonian Boundary // Courier Forschungs-Institut Senckenberg, 1989. 110. P. 195—230.

LOWER AND UPPER DEVONIAN CONODONTS OF THE RUDNYI ALTAY

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The Devonian sections in the Rudnyi Altay mountains are distinguished for their completeness and perfect paleontological characteristics. Along with the diverse benthic fauna (brachiopods, corals, crinoids, bivalves and a lot of others), ammonoids and conodonts occur within the rocks. Devonian ammonoids of the Rudnyi Altay have been studied by B. I. Bogoslovsky (1958), conodonts — by V. A. Aristov and V. F. Belyi (1976), E. A. Yolkin and N. G. Izokh (1991). In the process of works on complying the Russia state geological chart (the Altay series) of the 1:200000 scale, a demand has arisen for the comprehensive conodont characteristics of the Devonian deposits of the Rudnyi Altay. In 1997 the author of this article together with Y. M. Gutak and the geologists of the Rudnyi-Altay expedition (O. V. Murzin, V. A. Zhdanov) tested certain sections in the Zmeinogorsk and Lokot' districts for the additional investigation on fossil fauna.

As a result, the conodont sequence has been established for the Givetian/Frasnian boundary deposits. In particular, it has been established, that ammonoid Zone *Pharciceras lunulicosta* is correlatable with the bottom of a section of the lower subsuite of the Kamenevskaya suite enclosing the conodont species *Polygnathus* ex gr. *varcus* Stauf., while the top of the subsuite contains of the *falsiovalis* Zone conodonts. The section of the lower subsuite of the Kamenevskaya suite can thus serve as the reference for the Givetian/ Frasnian boundary interval. Besides, the continuous reference conodont sequence has been established for practically the whole Frasnian stage.

In August, 2000, the field excursion of the VII outside session of the ISC Devonian commission of Russia was conducted over the Rudnyi Altay sections. Its participants examined the Rudnyi Altay reference sections of Emsian, Eifelian, Givetian and Frasnian stages of the Devonian.

In the uppermost part of the Verkhnemelnichnaya subsuite section (the bottom of the Zavodskiye Hills, there is a limestone interbed, within which the author has revealed conodonts *Icriodus obliquimarginatus* Bischoff et Ziegler. The *obliquimarginatus* Zone within the shallow-water sections marks the bottom of the Givetian stage and corresponds to the *hemiansatus* Zone of the reference conodont scale. This limestone horizon is assignable to the Givetian stage of Middle Devonian. Consequently, the boundary between the Eifelian and Givetian stages passes within the Verkhnemelnichnaya subsuite.

The attempt to isolate conodonts from the Zavodskaya suite of the Givetian stage has not met with success because of too high contents of the clayey material. Superjacent are yellow sandstones and siltstones of the Nizhnekamenevskaya subsuite (*Pharciceras lunulicosta* Zone according to B. I. Bogoslovsky), with congeries of tentaculits, ostracodes, radiolarians, rare brachiopods and goniatites *Pharciceras* cf. *lunulicosta* (Sand. et Sand.), *Tamarites subitus* Bog., *Trianoceras* cf. *gerassimovi* Bog. (definition by B. I. Bogoslovsky). In these rocks, the author has found a specimen of the conodont *Polygnathus* ex gr. *varcus* Stauffer, which is characteristic of the varcus Zone and of the bottom of Belgium's Fromelennes layers.

Nearby Goryunovo, the higher horizons of the Nizhnekamenevskaya subsuite have been encountered. Within the cloddy limestone, along with siliceous-terrigenous rocks, the following conodonts occur: *Klapperina disparilis* (Ziegler and Klapper), *Polygnathus ovatinodosus* Ziegler and Klapper, *Belodella devonica* (Stauffer) and others. The joint occurrence of the former two species is characteristic of the Givetian stage top and the Frasnian stage bottom.

On the right slope of the Zolotukha river valley, within a lense of grey polydetrital limestone of the Srednekamenevskaya subsuite bottom, the author has detected the following conodont assemblage: *Mesotaxis falsiovalis* Sandb., Ziegl. and Bult., *Ancyrodella binodosa* Uyeno, *A. pristina* Khalymbadzha and Chernysheva, *Polygnathus dengleri* Bischoff and Ziegler, *P. decorosus* Stauf., *P. pennatus* Hinde, *P. lodinensis* Pölsler, *P. normalis* Mill and Young., *Icriodus symmetricus* Branson and Mehl.

The assemblage is characteristic of the Lower *falsiovalis* Zone. The index species *Mesotaxis falsiovalis* occurs in the top of the Givetian stage. The joint occurrence of *Ancyrodella binodosa* and *A. pristina* is typical for the beginning of the Frasnian stage (the superface of the *norrisi* Zone). At this level, the global stratotype section and point (GSSP) of the Middle/Upper Devonian boundary lies. The following conodont species occur slightly upwards through the section: *Ancyrodella binodosa* Uyeno, *A. soluta* Sandb., Ziegl. and Bult., *A. rotundiloba* (Bryant) and others. The joint occurrence of the species *Ancyrodella soluta* and *A. rotundiloba* is characteristic of a top of the Lower *falsiovalis* Zone or for the Upper Subzone of this Zone. The species *Ancyrodella rotundiloba* appears later than *A. binodosa*, *A. pristina* and *A. soluta*, thus being their descendant on this phyletic branch (Sandberg et al., 1989).

In quarry no. 1 of the Neverovskoye limestone deposit, there is a lower part of the reef facies of the Verkhnekamenevskaya subsuite. The following conodonts have been isolated from this rock: *Ancyrodella lobata* Branson and Mehl, *Polygnathus normalis* Mill. and Young., *Belodella triangularis* (Stauffer), *Hindeodella aculeata* Br. et Mehl, *H. subtilis* Ulrich et Bass., *Ozarkodina elegans* (Stauffer), *Apatognathus porcata* (Hinde). Together with corals, brachiopods, trilobites and other fossils, the conodonts listed can indicate the Early Frasnian age of deposits in the level of reference *falsiovalis-punctata* Zones.

The carbonaceous rocks with ammonoids, bivalves, crinoids, conodonts occupy a prominent place within a deep-water section of the Verkhnekamenevskaya subsuite (the Gryaznukha river near the village Razdolnoye). The author succeeded in finding a representative conodont assemblage from these rocks: *Ancyrodella nodosa* Ulrich and Bassler, *A. gigas* Joung., *A. curvata* (Br. and Mehl), *A. lobata* Br. and Mehl, *Palmatolepis hassi* Müller and Müller, *Pa. aff. punctata* (Hinde), Pa. *jamieae* Ziegler and Sandberg, *Pa. aff. proversa* Ziegler, *Pa. gigas* Miller et Youngquist, *Pa. rhenana* Bischoff, *Synprioniodina gracilis* Stauf. and others. Thus, the Verkhnekamenevskaya subsuite corresponds to the considerable interval of the Frasnian stage: from the *hassi* Zone to the *rhenana* Zone.

It is necessary that the investigation on these Devonian system sections should be continued as the most important ones for Siberia and the whole Russia, in order to be additionally characterized by conodonts, ammonoids and other groups of fossils.