RUSSIAN COMMITTEE OF THE UNESCO INTERNATIONALGEOSCIENCES (IGCP) AND GEOPARKS PROGRAMME

ANNUAL REPORT ON IGCP ACTIVITIES FOR 2018

This report informs on the Russia's activities in the IGCP projects in 2018

Co-Chairman of the Committee:
Acad. Mikhail A. Fedonkin
GIN RAS, Pyzhevsky, 7, 119017
Tel: + 7 495 951-75-00/ 8 495 953 37 91
Fax: +7 495 953 37 64
E- mail: igcpcrus@ginras.ru

Projects with Russian co-leaders:

Project 609 Cretaceous Sea-Level Changes (2013-2017, OET). S.O. Zorina, dr., Central Research Institute of Geology of Industrial Minerals, Kazan`

Project 610 From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary (2013-2017, OET). T.A.Yanina, dr., Moscow State University

Project 630 Permian-Triassic Climatic and Environmental Extremes and Biotic Response (2014-2018). Yuri D. Zakharov , dr., Far East Geological Institute, Far East Branch RAS, Vladivostok.

Project 653 The Onset of the Great Ordovician Biodiversification Event (2016-2020), O.T. Obut, dr. Institute of Petroleum Geology and Geophysics Siberian Branch RAS, Novosibirsk

Project 662 Orogenic architectures and crustal growth from accretion to collision (2018-2022), D.P. Gladcochub, Institute of Earth Crust , SB RAS, Irkutsk; I.Yu. Safonova, Institute of geology and mineralogy SB RAS, Novosibirsk.

Russian geoscientists are members of 8 IGCP projects, including 3 started in 2018: Nos.: 608, 609, 610, 630, 648, 652, 653, 655 and **662, 667, 668.**This report has been prepared on the basis of the information submitted by

Russian members IGCP projects in response to the Committee's request for information on 'significant' developments in 2018.

Reports were not received from IGCP Projects 662, 667 and 668as they started in 2018 and so far there were not significant achievements on them.

Project 608 Asia-Pacific Cretaceous Ecosystems (2013-2017, OET)

The report was presented by Shurygin B.N. (The Institute of petroleum geology and geophysics, Siberian Branch RAS, Novosibirsk

Main results of research activities in 2018:

- complex data on the J-K boundary deposits in the Maurynya section (northwestern margin of West Siberia) were analysed. This section can be considered a reference section for the transitional Volgian–Ryazanian beds formed in shallow water environments of the West Siberian sea basin. This study is a synthesis of the new data with previous results of lithologic, paleontological, biostratigraphic, and (O, C, Sr) isotope studies of the Upper Volgian–lowermost Ryazanian of the Maurynya section;

- Bazhenov Horizon (J-K transition) was traced throughout the entire West Siberian sedimentary basin. The criteria for the recognition of the top and base of this horizon within the stratigraphic equivalents of the Bazhenov Formation were suggested. The proposed facies-stratigraphic zonation of the Bazhenov Horizon reflects the spatial location of all formations identified within this horizon. A marginal filter has been identified along the East Siberian land;

- the Lower Cretaceous section of the Lena river basin (Eastern Siberia) was investigated for the solution of stratigraphic problem and paleogeographic reconstruction.
The Jurassic-Cretaceous terrigenous complex of the Laptev and East Siberian Seas is of considerable interest as a potential exploration target. However, the key Jurassic and Cretaceous sections of the New Siberian Islands have been poorly studied. The results of this study were used to obtain a detailed micropaleontological description of these sections and substantiation of the previous lithostratigraphic subdivision. We first identified a series of Boreal standard zones in the Jurassic and Cretaceous sections, based on the foraminifers, ostracods, dinocysts, and terrestrial palynomorphs;

- detailed analysis of organic matter in the Ryazanian-Lower Valanginian interval of the Nordvik section (Anabar Bay, Eastern Siberia) allows the definition of three geochemical horizons (terpane, diasterene, and hopane), which are characterized by specific geochemical compounds and their ratios. These horizons are correlated with several stages in the evolution of microfossils associated with ecological and geochemical changes in sea paleobasin. Moderately shallow-water facies was reconstructed using micropaleontological, palynological, and lithological data from the upper and lower parts of the section, where the terpane and hopane horizons were identified.

Publications

1. Dzyuba, O.S., Pestchevitskaya, E.B., Urman, O.S., Shurygin, B.N., Alifirov, A.S., Igolnikov, A.E., Kosenko, I.N. 2018. The Maurynya section, West Siberia: a key section of the Jurassic-Cretaceous boundary deposits of shallow marine genesis. Russian Geology and Geophysics, 59(7), 864-890.

2. Kashirtsev, V.A., Nikitenko, B.L., Pestchevitskaya, E.B., Fursenko, E.A. 2018. Biogeochemistry and microfossils of the Upper Jurassic and Lower Cretaceous, Anabar Bay, Laptev Sea. Russian Geology and Geophysics, 59(4), 386-404.

3. Kosenko, I.N. 2018. The origin of the Pycnodonteinae, and relationship between gryphaeas and true pycnodontes. Acta Palaeontologica Polonica, 63, in press. DOI:https://doi.org/10.4202/app.00494.2018

4. Lebedeva, N.K., Kuzmina, O.B. 2018. Palynostratigraphy of the Upper Cretaceous and Paleogene Deposits in the South of Western Siberia by Example of Russkaya Polyana Boreholes, Omsk Trough. Stratigraphy and Geological Correlation, 26(1), 80-108.

5.Nikitenko, B.L., Devyatov, V.P., Lebedeva, N.K., Basov, V.A., Fursenko, E.A., Goryacheva, A.A., Pestchevitskaya, E.B., Glinskikh, L.A., Khafaeva, S.N. 2018. The Jurassic and Cretaceous biostratigraphy and the organic matter geochemistry of the New Siberian Islands (Russian Arctic). Russian Geology and Geophysics, 59(2), 168-185.

6. Nikitenko, B.L., Pestchevitskaya, E.B., Khafaeva, S.N. 2018. High-resolution stratigraphy and palaeoenvironments of the Volgian - Valanginian in the Olenek section (Anabar-Lena region, Arctic Eastern Siberia). Revue de Micropalaeontology, in press. DOI:https://doi.org/10.1016/j.revmic.2018.07.001

7.Ryzhkova S.V, Burshtein L.M., Ershov S.V., Kazanenkov V.A. .Kontorovich,A.E., Kontorovich, V.A., Nekhaev, A.Y., Nikitenko, B.L., Fomin, M.A., Shurygin, B.N., Beizel, A.L., Borisov, E.V., Zolotova, O.V.,

Kalinina, L.M., Ponomareva, E.V. 2018. The Bazhenov Horizon of West Siberia: structure, correlation, and thickness. Russian Geology and Geophysics, 59(7), 846-863.

Participation in conferences

The Sixth International Symposium on IGCP Project N 608 "Cretaceous Ecosystems and their Responses to Paleoenvironmental Changes in Asia and Western Pacific", Thailand, Khon Kaen-Kalasin, November 11-17, 2018.

The following reports were presented:

1. Dzyuba, O.S. Belemnite diversity across the Jurassic–Cretaceous boundary in Russian northern Eurasia.
2. Shurygin, B.N., Urman, O.S., Dzyuba, O.S. Buchia associations and interregional correlation of the Jurassic–Cretaceous boundary interval in Russian Boreal basins: new data from the Russian platform, Siberia, and the Far East.

Project 609 Cretaceous Sea-Level Changes (2013-2017,OET).

The report was submitted by Yu.D.Zakharov (Far East Geological Institute, DVO RAS,Vladivostok)

Main results of research activities in 2018:

- late Barremian to early Albian palaeotemperatures have been determined through oxygen isotope analysis of well–preserved brachiopod, bivalve, gastropod and ammonite shells and belemnite rostra from the Caucasus. Results from calcitic invertebrate skeletal elements from the upper Barremian Sartousiana, Securiformis and Waagenoides zones indicate palaeotemperatures of 19.2, 12.0-17.1, and 11.3-14.3 ºC, respectively. In contrast, early Aptian fossils of the Weissi and Deshayesi zones reveal significantly higher palaeotemperatures (20.5-22.3 º and 17.1 ºC, respectively), than those obtained from brachiopod shells of the Securiformis Zone. Isotopic palaeotemperature data are not available for the Furcata Zone in the Caucasus. The warmest conditions in our study interval developed during the late Aptian Melchioris-Abichi Chrone according to data on bivalves, gastropods and the ammonite *Parshoplites* (20.8-27.1 ºC),

and Subnodosocostatum Chrone (?25.3? ºC), on the basis of a shell of the oyster *Amphidonte*..

- the studied Sr-calibration curves for the Phanerozoic are based mostly on analyses of calcite and apatite fossil material and whole-rock samples. In our investigations we focus on Mesozoic Sr-isotope oscillations, based on the data on the aragonite-preserved ammonoid shells.

Our new results from aragonite-preserved fossil material with good diagenetic control are useful for both corroboration of published Sr data and also for the minor correction of data points in the Olenekian, lower Toarcian, upper Volgian, upper Santonian and lower Campanian intervals.

Publications

1. Zakharov Y.D., Kakabadze M.V., Sharikadze M.Z., Smyshlyaeva O.P., Sobolev E.S., Safronov P.P., 2018. Stable O- C-isotope record of fossils from the upper Barremian-lower Albian of the Caucasus-palaeoenvironmental implications. Special Issue: Jagt-Yazykova E.A.,Jagt J.W.M. and Mortimore R.N. (Eds.), Advance in Cretaceous palaeontology and stratigraphy – Christofer John Wood Memorial Volume. Cretaceous Research, 87, 55-73.
2. Zakharov Y.D., Dril S.I., Shigeta Y., Popov A.M., Baraboshkin E.Y., Michailova I.A., Safronov P.P., 2018. New aragonite $^{87}Sr/^{86}Sr$ records of Mesozoic ammonoids and approach to the problem of N, O, C and Sr isotope cycles in the evolution of the Earth. Sedimentary Geology, 364, 1-13.
3. Zakharov Y.D., 2018. Strontium isotope composition of Mesozoic ammonoid shells [Reply to] comments on “New aragonite $^{87}Sr/^{86}Sr$ records of Mesozoic ammonoids and approach to the problem of N, O, C and Sr isotope cycles in the evolution of the Earth.” [Sedimentary Geology, 364 (2018): 1-13]. Volumina Jurassica, 2018 , 16 (1).
4. Zakharov Y.D., Seltser V.B., Kakabadze M.V., et al.,(in press). Oxygen-carbon isotope composition of MiddleJurassic-Cretaceous molliscs from the Saratov-Samara Volga region and main climate trends in the Russian Platform-Caucasus .Geol. Soc. London Spec.

Project 610 From the Caspian to Mediterranean Environmental Change and Human Response during the Quaternary (2013-2017OET)

The report was submitted by T.A,Yanina (Moscow State University, Geographical Faculty).

Main results of research activities in 2018:

- In the Caspian Sea region in-depth understanding of the: (1) Caspian Sea development during Anthropocene. (2) The Baer Knolls of the Caspian Depression as the Late Quaternary submarine and aeolian landforms. (3) The loess-soil sequences in the Lower Volga area: stratigraphy, geochronology and paleogeography. (4) Processes of accumulation of the Late Pleistocene sediments in the North Caspian basin from the stable oxygen isotope data. (5) The existence of the Late Pleistocene Hyrcanian stage in the Caspian Sea history was proved, its paleogeographical characteristic was given.

- In the Manych valley the study was carried out by different methods of the middle-late Pleistocene and Holocene sediments in outcrops near the Chograysky dam, Zunda-Tolga settlement, and cliffs near the Manych-Gudilo Lake, as well as four boreholes up to 50 m in length and the Late Pleistocene Hyrcanian passage in the Manych Depression.

- In the Black Sea and Sea of Azov region Holocene geological sequences were investigated on the Kerch Strait coast; Eltigen (Late Pleisticene) outcrop in the Kerch Peninsula with use of OSL dating. The conclusion about water exchange, migrations of faunae and moving of the first peopling in the Mediterranean and Black Sea region during the Pleistocene is made.

Publications

1.Badyukova, E.N. 2018. Genesis of the Baery knolls developed in the Northern Caspian Plain. Quaternary International 465(A):11-21.

2.Bolikhovskaya, N. S., Porotov, A. V., Richards, K.; Kaitamba, M. D., Faustov, S. S., Korotaev, V. N. 2018. Detailed reconstructions of Holocene climate and environmental changes in the Taman Peninsula (Kuban River delta region) and their correlation with rapid sea-level fluctuations of the Black Sea. Quaternary International 465(A):22-36

3. Esin, N.V., Yanko-Hombach, V., Esin, N.I. Evolutionary mechanisms of the Paratethys Sea and its separation into the Black Sea and Caspian Sea. Quaternary International 465(A): 46-53.

4. Kislov, A. 2018. On the interpretation of century–millennium-scale variations of the Black Sea level during the first quarter of the Holocene. Quaternary International 465(A):99-104.

5. Kurbanov, R.N., Yanina T.A., Murrey A., and Borisova O.K. 2018. Girkanskiy etap v pleistotsenovoy istorii Manychskoy depressii [Hyrcanian epoch in the Pleistocene history of the Manych depression]. Vestnik Moskovskogo Unviersiteta. Seriya 5. Geografiya 3; 77–88 n Russian).

6. Sorokin, V., Yanina, T., Bezrodnykh, Yu., and Romanyuk, B. 2018. Identification and age of submarine Girkanian sediment beds (upper Pleistocene) in the Caspian Sea. Quaternary International 465(A): 152-157.

7. Yanina, T., Sorokin, V., Bezrodnykh, Yu., and Romanyuk, B. 2018. Late Pleistocene climatic events reflected in the Caspian Sea geological history (based on drilling data). Quaternary International 465(A): 130-141.

8.Yanko-Hombach,V. (also Yanko, V.)., Kislov, A. 2018. Late Pleistocene 8. e Holocene sea-level dynamics in the Caspian and Black Seas: Data synthesis and Paradoxical interpretations. Quaternary International. 465(A): 63-71

9.Yanko-Hombach, V., Yanina, T., Kurbanov, R. 2018. INQUA IFG 1709F Ponto-Caspian Stratigraphy and Geochronology (POCAS). Quaternary Perspectives 25(1): 11-12.

10. Kirillova I., Levchenko V., Ippolitov A. et al. The origin of objects of invertebrate descent from the Khvalynsk eneolithic cemeteries (northern Caspian region) // *Quaternary International*. — 2018. — no. 265. — P. 142–151

11. Konstantinov E. A., Velichko A. A., Kurbanov R. N., Zakharov A. L. Middle to late Pleistocene topography evolution of the north-eastern Azov region // *Quaternary International. — 2018. — no. 465. — P. 72–84.*

Participation in conferences

The Russian scientists took part in the 3 conferences:

1. Joint Plenary Conference and Field Trip of IGCP 610 and INQUA IFG POCAS, Antalya, Turkey, October 14-22, 2018

2. LXIV session of the Paleontological Society "Fundamental and Applied Paleontology",St. Petersburg, Russia, 2-6 April, 2018. Special Session on the IGCP Project N 610.

3. International Conference "LOESSFEST Diversity of Loess: Properties, Stratigraphy, Origin and Regional Features", (Volgograd, Russia, 24-29 of September, 2018.

At these conferences the Russian scientists presented on the whole 24 reports.

Field work activities

Field investigations to obtain new factual material about the development of natural environment in the Pont-Caspian region were carried out in the Low Volga area, in the Manych Depression, and on the Taman' and Kerch peninsulas.

Project 630 Permian-Triassic Climatic and Environmental Extremes and Biotic Response (2014-2018)

The report was submitted by Yu.D.Zakharov (Far East Geological Institute Far East Branch RAS, Vladivostok)

Main results of research activities in 2018:

- to investigate and to constrain the the secular changes in Permian seawater chemistry global environmental changes during the end-Guadalupian (Middle Permian) extinction, we analized $^{87}Sr/^{86}Sr$ ratios in Capitanian shallow-marine limestones in South Kitakami (Iwaizaki) and South Primorye (Senkina Shapka section). The present analysis clarified extremely low $^{87}Sr/^{86}Sr$ values from all measured samples (Kani et al., 2018), which are in general agreement with previous results ($^{87}Sr/^{86}Sr$ ratios of < 0.7070) reported from the Capitanian intervals elsewhere in the world

- according to Algeo et al. (2014), the Phanerozoic $\delta^{15}N_{sed}$ curve has a strong relationship with first-order climate cycles, with high values occurring during cool and cold intervals of the Neoproterozoic, Late Palaeozoic and Middle Cenozoic glacial epochs and lower values occurring during warm and hot intervals of greenhouse epochs of the Middle Palaeozoic and Middle Mesozoic. To verify this assumption, detailed N and C isotopic data have been recorded for the first time for the Lower-Middle

Triassic claystones of South Primorye (Abrek, Kamenushka-1 and Kamenushka-2 sections). These sections, exposed in the southern part of South Primorye, provide almost complete $^{15}N_{org}$- and $^{13}C_{org}$-records for the Lower Triassic of this region.

Publications

1.Kani, T., Isozaki Y., Hayashi, R., Zakharov, Y., Popov, A., 2018. Middle Permian (Capitanian) seawater $^{87}Sr/^{86}Sr$ minimum coincided with disappearance of tropical biota and reef collapse in NE Japan and Primorye (Far East Russia). Palaeogeography, Palaeoclimatology, Palaeoecology, 499, 13-21.

2.Smyshlyaeva, O.P., Zakharov, Y.D., Popov, A.M., Bondarenko, L.G., Borisov, I.V., 2018. Stratigraphic subdivisions of the Lower Triassic of South Primorye region. Article 3. First finings of *Euflemingites prynadai* and *Shimanskyites shimanskyi* (Ammonoidea) in the SMID section. Russian Journal of Pacific Geology, 12 (6), 469-486.

3.Zakharov, Y.D., Dril, S.I., Shigeta Y., Popov, A.M., Baraboshkin, E.Y., Michailova ,I.A., Safronov P.P., 2018. New aragonite $^{87}Sr/^{86}Sr$ records of Mesozoic ammonoids and approach to the problem of N, O, C and Sr isotope cycles in the evolution of the Earth. Sedimentary Geology, 364, 1-13.

4.Zakharov, Y.D., Horacek, M., Shigeta, Y., Popov, A.M., Maekava, T., 2018. N and C isotopic compositions of the Lower Triassic of Southern Primorye and reconstruction of habitat conditions of marine organisms after mass extinction at the end of the Permian. Doklady Earth Sciences, 478 (2), 161-165.

5.Zakharov, Y.D., Horacek, M., Shigeta, Y., Popov, A.M., Bondarenko, L.G.., 2018. N and C isotopic compositions of the Lower Triassic of Southern Primorye and reconstruction of the habitat conditions of marine organisms. Stratigraphy and Geological Correlation, 26 (5), 534-551.

6.Zakharov, Y.D., Horacek M., Popov A.M., Bondarenko, L.G.., 2018. Nitrogen and carbon isotope data of Olenekian to Anisian deposits from Kamenushka/South Primorye, Far-East Russia and their palaeoenvironmental significance. Journal of Earth Science, 29 (4), 837-853.

7.Zakharov, Y.D., 2018. Triassic System (Period). Bolshaya rossijskaya entsiklopediya (Great Russian Encyclopedia).

Participation in conferences

IGCP 630 Final Meeting (International Symposium on deep-time environmental & climatic extremes and biotic responses), Wuhan, China, 22-24 May, 2018

The following reports were presented:

. 1. Biakov, A.S. Discovery of a new late Changhsingian bivalve complex in northestern Asia and a diachronous end-Permian mass extinction. 2.Bondarenko, L.G., Conodont assemblage from the upper part of the lower Olenekian, South Primorye (Abrek Bay).

3.Popov, A.M., New data on the Lower Triassic brachiopod recovery: evidences from South Primorye

4. Smyshlyaeva, O.P., Zakharov, Y.D., Bondarenko, L.G, Popov, A.M., . First finings of *Euflemingites prynadai* and *Shimanskyites shimanskyi* (Ammonoidea) in the SMID section, South Primorye.

5.Zakharov ,Y.D., Biakov ,A.S., Horacek, M., Stable N-isotope analyses of upper Wuchiapingian-lower Anisian mudstone from the middle and higher palaeolatitudes of Russia and their palaeoclomatic interpretation.

XVII All Russian Micropaleontology Meeting "Modern Micropaleontology – Problems and Prospects" Kazan', Russia, September 24-29, 2018.

The following report was presented:

Guravskaya, G.I., Kasatkina , A.P., The similarity of the difference in the morphological features of proto-and euconodont animals.

Field work activities

In July and September-October 2018, field works in South Primorye were organized by Y.D. Zakharov, A.M. Popov and V.P. Nechaev (DVGI DVO RAN) to collect some samples for N- and C-isotope analyses in the Permian, Lower and Middle Triassic of the Senkina Shapka, Neizvestnaya, Vodopadnaya, Golyj and Neizvestnaya sections.

In August 2018, an additional field work was carried out in an area in the southern Primorye in connection with the selection of zircons from the Cambrian sandstones of the Chernigovka region, the Middle Permian sandstones of the village of Barabash and granitoids from the Zarubino area for the purpose of tectonic reconstructions, as well as the collection of material from the Middle Permian limestone in the Lozovy area for paleomagnetic and Sr- and C-isotopic studies.

Project 648 Supercontinent Cycles and Global Geodynamics (2015-2019)

The report was presented by D.P. Gladkochub and T.V.Donskaya, (Institute of Earth Crust, Siberian Branch RAS, Irkutsk)

The main results of the research activities in 2018:

- we have studied detrital zircons in Neoproterozoic sedimentary strata of the southern part of the Siberian Craton (Birusa Prisayanie) using the LA-ICP-MS method. We carried out the synthesis of new and published data on detrital zircon geochronology of the Neoproterozoic strata of the southern part of the Siberian craton (Sayan, Baikal and Patom segments of the Sayan-Baikal-Patom fold belt). Moreover we done the analysis of previously published stratigraphic and sedimentological data obtained for key sections in the the Sayan-Baikal-Patom fold belt that allows us to trace the process of birth and early stages of development of the Paleo-Asian Ocean. Before the break-up of Rodinia and opening of PAO, Tonian – Cryogenian intracontinental sedimentary basin existed between southern Siberia and northern Laurentia. The detachment of the southern flank of the Siberian craton from northern Laurentia and opening of the Paleo-Asian Ocean between these cratons took place in Cryogenian. The detrital zircon ages from lower parts of Neoproterozoic successions suggest the Siberian craton as the sole provenance area right after the opening of the Paleo-Asian Ocean. The age constraints on the lower parts of the studied Neoproterozoic successions, which are based on correlation of their tillite horizons with the Marinoan glaciation, suggest the late Cryogenian age for these sedimentary rocks. We marked a clear change in the age spectra of detrital zircons from “unimodal” (Early Precambrian only) in older sedimentary rocks to “bimodal” (Early Precambrian and Neoproterozoic) in younger sequences of the studied successions. The abundance of youngest (Neoproterozoic) detrital zircons in the upper parts of the studied sequences reflects a shrinkage of the oceanic basin as a result of the convergence of the craton with the microcontinents and island arcs within the Paleo-Asian Ocean. We suggest that a passive oceanic margin along the southern margin of the Siberian craton has been transformed into a series of foreland basins at ~610 Ma.

Publications

Gladkochub D.P., Donskaya T.V., Stanevich A.M., Pisarevsky S.A., Zhang S., Motova Z.L., Mazukabzov A.M., Li H. U-Pb detrital zircon geochronology and provenance of Neoproterozoic sedimentary rocks in

southern Siberia: New insights into breakup of Rodinia and opening of Paleo-Asian Ocean // Gondwana Research, 2018, v. 65, p. 1 – 16.

Project 652 Reading Geologic Time in Paleozoic Sedimentary Rocks (2017-2021)

The report was presented by Dr. N.G. Izokh, Institute of Petroleum geology and geophysics SB RAS, Novosibirsk.

The main results in 2018:

- the age of the Paleozoic sedimentary successions of the Yuryung-Tumus Peninsula in the Khatanga Gulf (Laptev Sea) is determined as the late Eifelian and the beginning of the Early Givetian (kockelianus-varcus zones) based on the study of brachiopods, ammonoids, nautiloids, bactritoids, gastropods, and conodonts. The Middle Devonian sedimentary successions of the Yuryung-Tumus Peninsula show the level of the global sedimentary Kačak Event. The areas of distribution of the Devonian sedimentary deposits in the Yuryung-Tumus Peninsula in the Khatanga Gulf should be considered as one of the fragments of the regional geological structures of a remote (? isolated) region of the Taimyr Fold System, rather than a component of the structures of the northern Siberian Platform.

- the biostratigraphic intervals with conodonts were defined for the Devonian deposits of the Norilsk area (NW Siberia). The conodont complexes were found in the late Eifelian – Early Givetian, Frasnian and Upper Famennian intervals. Associations of conodonts represented by cosmopolitan taxa confirm the existence of open sea environments during global transgressive periods (Johnson et al., 1988). It was suggested that heterogeneous lithological structure of the Devonian deposits in studied area is due to periodic change of shallow-water environments with limited water circulation and increased salinity by normal marine regime reestablished during large transgressions.

Publications

1. Sennikov, N.V., Shcherbanenko, T.A., Varaksina, I.V., Izokh, N.G., Sobolev, E.S. & Yazikov, A.Yu. 2018. Biostratigraphy and Sedimentary Settings of the Middle Devonian Succession of the Yuryung-Tumus Peninsula, Khatanga Gulf of the Laptev Sea. – Stratigraphy. Geological Correlation, 26(3):267-282.

2. Varaksina, I.V., Izokh, N.G., Tumashov, I.V. 2017. Devonian lithology and stratigraphy of the north part of the Tunguska syncline (Norilsk Area) // Geology and mineral resources of Siberia. Novosibirsk, SNIIGGIMC, **4**:23-33.

Participation in conferences

The XVII All Russian Micropaleontological Conference "Modern micropaleontology-problems and prospects", Kazan', September 24-29, 2018

The following report was presented:

Izokh N.G., Erina M.V., Obut O.T., Abdiev N.Kh, Kim A.I., Rakhmonov U.D. Late Devonian microfauna (conodonts, radiolarians) from the Zeravshan-Gissar mountaneous area.

Project 653 The Onset of the Great Ordovician Biodiversification Event (2016-2020)

The report was presented by Drs. Obut O.T., Institute of Petroleum Geology and Geophysics, SB RAS, Novosibirsk and A.V. Dronov, Geological Institute RAS, Moscow.

The main results in 2018:

- the data on fossil faunal communities and sedimentary environments of Central Tuva Ordovician deposits are analyzed and summarized. It was suggested that during Ordovician two ecosystems marine and continental developed within this territory. They replaced each other, both in chronological order (with a constantly increasing marine ecosystem environments) and in the lateral rows. Thus, significant areas of the Ordovician deposits of Central Tuva should be asigned to the ecatonic zones of transition from continental sedimentary environments to marine ones associated with river deltas. In such environments, we find rare problematic forms of eurygallian inarticulate brachiopods and gastropods, and, as a rule, there are only traces of bioturbation and ichnofossils. The low waters salinity prevented the colonization of biotopes by typical stenobionts (especially stenoghaline) marine organisms.

- comprehensive lithofacies and biofacies analysis provided constraints on the origin of Upper Ordovician clastic and carbonate deposits in

northeastern Gorny Altai, which form large low-elevated flat carbonate banks located relatively close to the shore. The sediments were deposited during the Sandbian and early–middle Katian stages, according to new conodont data. Upper Ordovician sections in northeastern Gorny Altai store record of two global regressions: the early Sandbian (Vollen Lowstand) and early Katian (Frognerkilen Lowstand) event.

- during the field work on the Ordovician of the Siberian platform (low stream of Podkamennaya Tunguska and Stolbovaya Rivers) the reference sections of the Baksian and Dolborian regional stages were studied in detail, tephrostratigraphic correlation of the main outcrops was made and samples for absolute age dating were taken from the volcanic ash beds. During the field works in St.Petersburg region revision of the sequence stratigraphy of the Lower and the lower part of the Middle Ordovician was made.

Publications

1. Sennikov N.V., Obut O.T., Tolmacheva T.Yu., Lykova E.V., Khabibulina R.A. 2018. The Upper Ordovician of northeastern Gorny Altai: stratigraphy and deposition environments. Russian Geology and Geophysics, 59, p. 72-87.

2. Pokrovsky, B.G., Zaitsev, A.V., Dronov, A.V., Bujakaite, M.I., Timokhin, A.V., Petrov, O.L. 2018. C, O, S, and Sr Isotope Geochemistry and Chemostratigraphy of Ordovician Sediments in the Moyero River Section, North Siberian Platform. Lithology and Mineral Resources, Vol. 53, № 4, pp. 283-306

Participation in conferences

Annual meeting on IGCP 653 Project , Athens, Ohio, USA, June 3-7, 2018.

The following report was presented:

Dronov A. V. Siberian and Baltoscandian Ordovician depositional sequences and correlations.

Field work activities

Field work activities on the Ordovician of the Siberian platform were carried out in the low stream of the Podkamennaya Tunguska and Stolbovaya rivers and on the ordovician of the Russian Platform in the St. Petersburg region

Project 655 Toarcian Oceanic Anoxic Event Impact on Marine Carbon Cycle and Ecosystems (2017-2019)

The report was presented by Dr. Nikitenko B.L., Institute by Petroleam geology and geophysics, SB RAS, Novosirirsk

Main results of research activities in 2018:

Microfossils from different facies (from coastal to moderately deep-water distant from the coast) sections of the Pliensbachian/Toarcian boundary of the Arctic Siberia were studied. A number of almost simultaneous biotic and abiotic events are observed in the latest Pliensbachian to earlyest Toarcian in the Arctic basin and in the seas of the northwest of Western Europe. Studies of the mass extinction of foraminifera and ostracodes at the earliest Toarcian from the Arctic to the Tropical latitudes demonstrate the synchronicity of this event. The microbiotic crisis in the Arctic seas was more pronounced than in the West European ones.

IGCP Committee's Activities in 2018

During 2018 the Russian Committee maintained contacts with the Commission of the Russian Federation for UNESCO. There were also close interactions with Russian members of IGCP projects.

Co-chairman of the Russian National Committee for the International Geosciences and Geoparks Program

Academician

Mikhail A. Fedonkin

IGCP Projects, in which Russian scientists participated in 2018

Project 608 Asia-Pacific Cretaceous Ecosystems (2013-2017, OET)

Project 609 Cretaceous Sea-Level Changes (2013-2017, OET)

Project 610 From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary (2013-2017, OET)

Project 630 Permian-Triassic Climatic and Environmental Extremes and Biotic Response (2014-2018)

Project 648 Supercontinent Cycles and Global Geodynamics (2015-2019)

Project 653 The Onset of the Great Ordovician Biodiversification Event (2016-2020)

Project 652 Reading Geologic Time in Paleozoic Sedimentary Rocks (2017-2021)

Project 655 Toarcian Oceanic Anoxic Event Impact on Marine Carbon Cycle and Ecosystems (2017-2019)

Project 662 Orogenic Architecture and Crustal Gr0wth from Accretion to Collision (2018-2022)

Project 667 World Map of the Orogens (2018-2020)

Project 668 Equatorial Gondwana History and Early Palaeozoic Evolutionary Dynamics (2018-2022)