



Kazan Golovkinsky Stratigraphic Meeting

2019



Kazan Federal University
Institute of Geology and Petroleum Technologies

Kazan Golovkinsky Stratigraphic Meeting 2019

Late Palaeozoic Sedimentary Earth Systems:
Stratigraphy, Geochronology, Petroleum Resources

September 24-28, 2019, Kazan, Russia

ABSTRACT VOLUME



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Late Paleozoic Sedimentary Earth Systems:
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Fifth All-Russian Conference “Upper Paleozoic of Russia”

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Abstract Volume

**KAZAN
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Международная стратиграфическая конференция Головкинского 2019

Осадочные планетарные системы позднего палеозоя:
стратиграфия, геохронология, углеводородные ресурсы

Пятая Всероссийская конференция «Верхний палеозой России»

24-28 сентября 2019 г., Казань, Россия

Сборник тезисов

**КАЗАНЬ
2019**

УДК 551.71.8
ББК 26.33
О-72

Ответственный редактор
Данис К. Нургалиев

Научные редакторы:
Александр С. Алексеев;
Владимир В. Силантьев;
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Технические редакторы:
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О-72 **Осадочные планетарные системы позднего палеозоя: стратиграфия, геохронология, углеводородные ресурсы** [Электронный ресурс]: сборник тезисов Международной стратиграфической конференции Головкинского 2019 (24-28 сентября 2019 г., Казань, Россия). – Электрон. сетевые данные (1 файл: 19 440 КБ). – Казань: Издательство Казанского университета, 2019. – 329 с. – Систем. требования: Adobe Acrobat Reader. – Режим доступа: <http://dspace.kpfu.ru/xmlui/bitstream/handle/net/151929/golovkinsky2019.pdf>. – Загл. с титул. экрана.

Международная конференция посвящена проблемам девонской, каменноугольной и пермской планетарных систем, стратиграфическим событиям, эволюции биоты, седиментационным бассейнам и полезным ископаемым.

УДК 551.71.8
ББК 26.33

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UDC 551.7/.8
LBC 26.33
L36

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Late Paleozoic Sedimentary Earth Systems: Stratigraphy, L36 Geochronology, Petroleum Resources: Abstract Volume of Kazan Golovkinsky Stratigraphic Meeting 2019 (September 24-28, 2019, Kazan, Russia). – Kazan: Kazan University Press. – 329 p.

The International Stratigraphic Meeting is dedicated to the Devonian, Carboniferous and Permian Earth systems, stratigraphic events, biotic evolution, sedimentary basins and resources.

UDC 551.7/.8
LBC 26.33

Late Paleozoic climate bipolarity: glaciation signs in Siberia

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Climate is one of the most important factors in the Earth's biosphere evolution. It is involved in the Earth thermodynamic state and influential to the internal and partially external energy transfer. Global warmings and glaciations in the history of the Earth were extreme climatic events that are of great importance for the present and the future state of our planet. Five glacio-eras with the complex chronological structure have been established in the history of the Earth. One of the most significant, but still insufficiently studied, is the Late Paleozoic glacioera, which is often considered as an analogue of the Oligocene-Quaternary glacioera of the Late Cenozoic. Until recently, the Late Paleozoic glacial and glacial-marine deposits were known and studied only in Gondwana, i.e. in the Southern Hemisphere of the Earth. The presence of bipolarity of glaciation, which is known in Late Cenozoic, was also assumed for the Late Paleozoic, but so far these assumptions remain either doubtful and/or purely speculative and are not documented with the definite data. The Upper Paleozoic deposits of the Northern Hemisphere in the northern part of the Siberian continent (Angarida), conventionally described as glacial, are still poorly studied. The so-called "the Late Perm glaciation" in the North-East of Russia are widely known in the literature. However, a recent study of these sediments has shown their volcanic marine landslide nature. The other existing data are too scarce and/or not credible. Recent glacial-marine deposits are well studied in Russia. A particular type of sea-ice sedimentation is distinguished and widespread in the Arctic Ocean.

The configuration and location of continents and oceans in the Late Paleozoic, with respect to climatic zones, determines the fact that glacial or glacial-marine deposits potentially could be present in the Northern Hemisphere only on the northern periphery of the Siberian Craton. We need to reconstruct the paleogeography of the Siberian continent in the Late Paleozoic with respect to the equilibrium line altitude (ELA) on the Earth's surface. In the existing Pz3 paleogeographic reconstructions that are developed with paleomagnetic and detrital zircons provincial data, the Siberian craton is placed at 70–80 degrees northern latitude. Biotic data are rarely considered in such reconstructions. However, they can often justify a more accurate position of the continents relative to climatic zones. For example, our preliminary data suggest the position of the Verkhoyanie in Pennsylvania and Permian around mid-latitudes (approximately 40–45 degrees north latitude), that is, significantly south of ELA lines that proposed by paleomagnetic and zircon provenance data (Fig. 1). Thanks to the Russian Science Foundation grant (project 19-17-00178), this year we conducted a study of the Middle Upper Permian successions along the Kobyume River in South Verkhoyanie. Several glendonite horizons (lithological indicators of cold-water deposits) and diamictites were found