



The Fourth International Symposium of International Geoscience Programme IGCP Project 608



Lebedeva N.K., Yan P.A., Feofanova O.A.,
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Cretaceous dinosaur-bearing deposits in Kemerovo Oblast

Field Excursion Guidebook
of the Fourth International Symposium
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IGCP Project 608

August 18–20, 2016, Novosibirsk, Russia



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State Cultural Institution "Kemerovo Regional Museum of Local Lore"

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The Field Excursion Guidebook contains information about program of field trip and some geological data on Shestakovo localities of Early Cretaceous vertebrates.

The book is of interest for a wide range of the geologists studying Mesozoic deposits.

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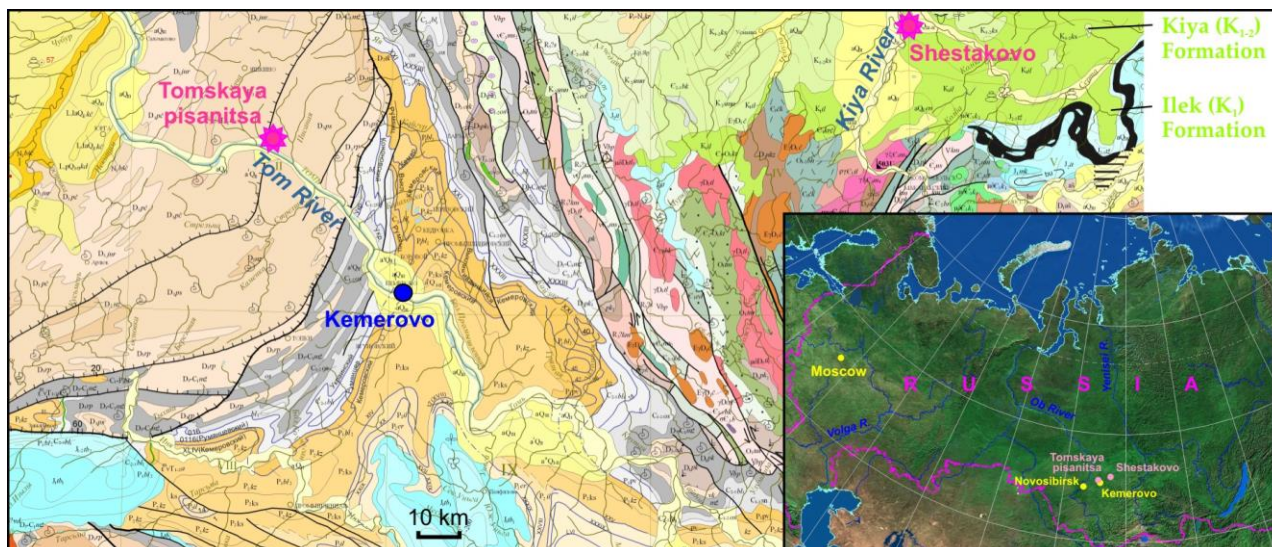
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Route map of excursion



Day 1 (Thursday, August 18):

8:00 am Leaving Hotel "Golden Valley" in Novosibirsk for Kemerovo.

14:00 Arrival at Hotel of Kemerovo.

16:00-18:00 Visiting the Kemerovo Regional Museum of Local Lore, arrival to hotel in Kemerovo.

Kemerovo Regional Museum consists of geological, zoological, botanical and paleontological collections (<http://www.kuzbasskray.ru/>). The museum and its collections have nearly 100 years of history. Today Kemerovo Regional Museum has developed and adopted a scientific concept for acquisition of exhibits. One of such directions is the collection of paleontological objects and the creation of a new permanent exhibition that reflects the evolution of life on the territory of Kuzbass.

In 2013 Kemerovo Regional Museum initiated the organization of scientific research of Early Cretaceous vertebrates deposit in Shestakovo, one of the largest and most promising dinosaurs burials in Russia (Alifanov et al., 1999; Mashchenko et al, 2014).

Shestakovo-3 locality in collaboration with PIN RAS team.

Presently the museum has reached outstanding results never seen before in the research in Shestakovo locality. During the expeditions of 2014-2015 more than 1,500 paleontological items were collected, also a new bone-bed streak was discovered bearing a mass burials of skeletons *Psittacosaurus sibiricus* Voronkevich & Averianov, 2000 (Lopatin et al., 2015).





Day 2 (Friday, August 19):

9:00-19: 00 Field excursion on Early Cretaceous dinosaur localities near the village of Shestakovo in Kemerovo Region.

The Russia's largest complex of localities of Early Cretaceous vertebrates is situated near village Shestakovo (Chebula district, Kemerovo region).

The stratigraphic position of the localities with Shestakovo complex in regional section

The locations of Early Cretaceous vertebrates in the area of Shestakovo are confined to the Ilek Formation, which stratotype is described by L.A. Ragosin in 1936 on the right bank of the Chulym River in a outcrop of the Big Ilek (Achinsk, Krasnoyarsk Region). Formation lies with a break on the Jurassic and Paleozoic sediments, overlapping with the erosion of the Upper Cretaceous rocks. The age of the Ilek Formation was defined as Valangin – Apt. The Ilek Formation is exposed only in the south of the Chulym-Yenisei region (river basins: Kiya, Chulum, Kemchug, Kem), where it is presented by a greenish-gray and yellowish-green sand with calcareous sandstone concretions, rhythmically alternating with benches of thin-greenish-gray and brown-red siltstone and marl clay.

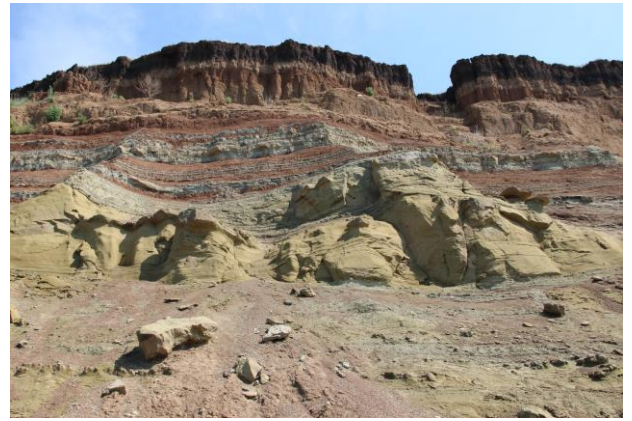
The location comprises two sections:

- the Shestakovo 1 locality – the Kiya River Bluff about 500 m downstream from Shestakovo village;
- the Shestakovo 3 locality – about 1.5 km south-east from Shestakovo village.

The Shestakovo 1 locality

The Shestakovo locality which has yielded Early Cretaceous vertebrates, is located on the right bank of the Kiya River 1.5 km downstream from the village of Shestakovo (Chebulinskii District, Kemerovo Region).

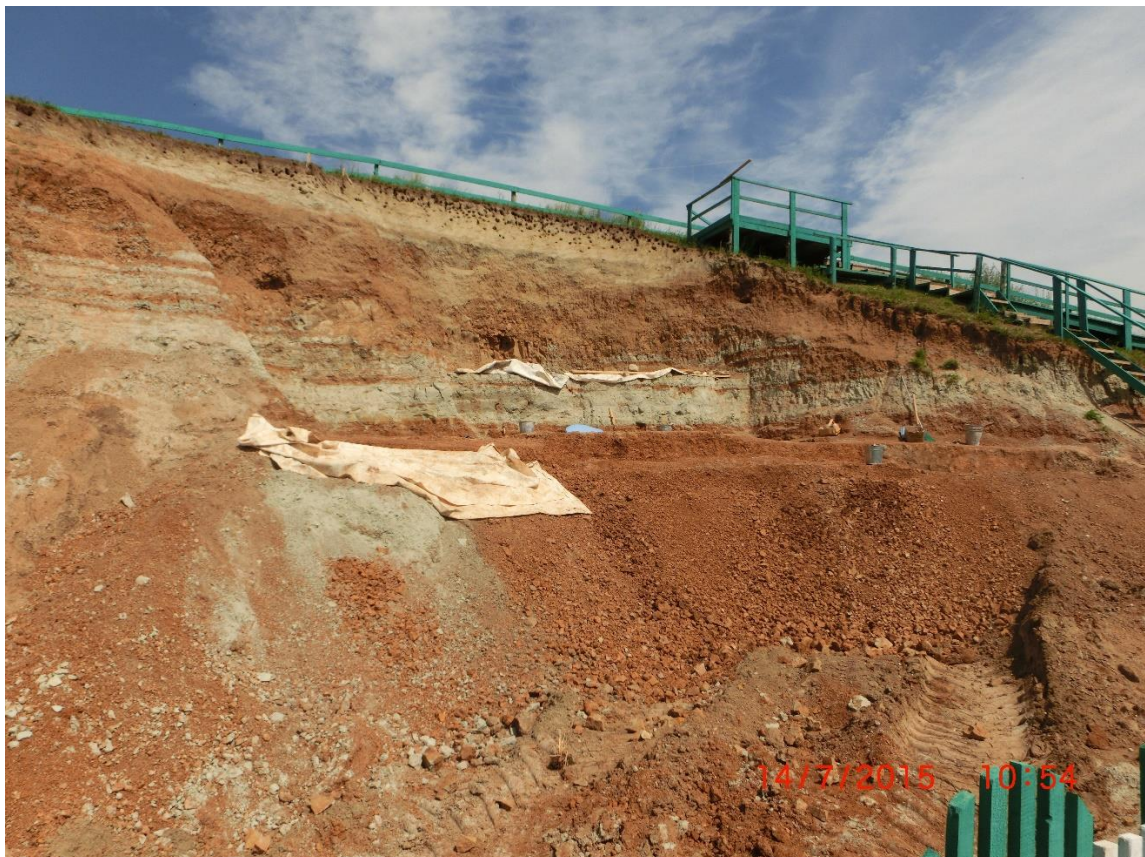
In the course of these studies a large number of late Pleistocene mammals were found including woolly mammoth, Pleistocene bison, woolly rhinoceros, wolf, reindeer, Pleistocene horses. In addition to these, the fossils of Early Cretaceous vertebrates, such as giant dinosaurs (Sauropods) and Tyrannosaurids dinosaurs were found.

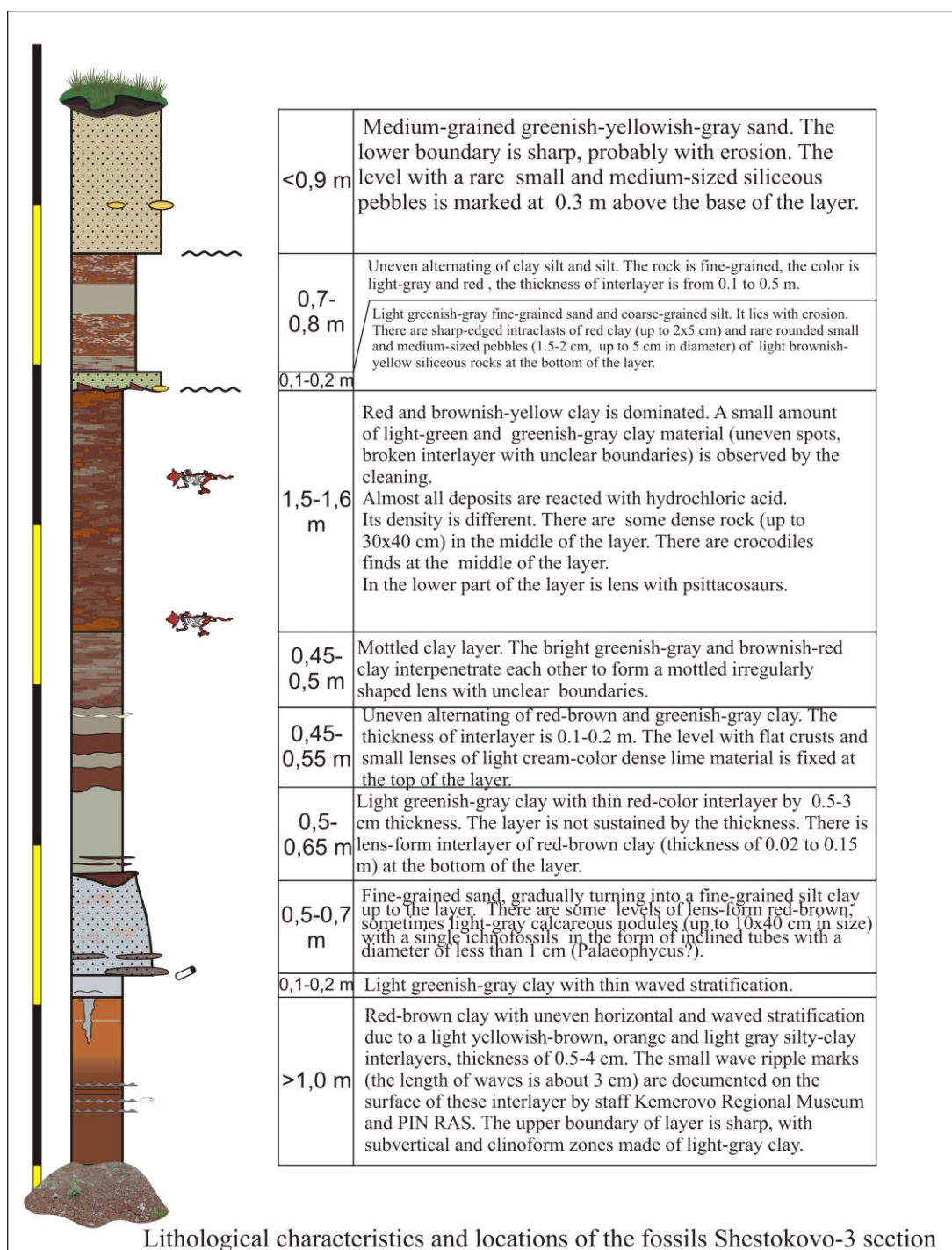
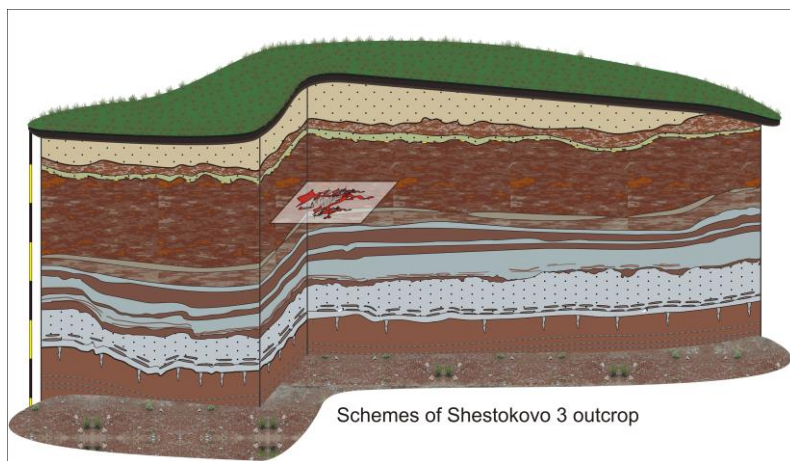


The Shestakovo 3 locality

In 2014 Kemerovo Regional Museum started excavation in the area of 2 x 8 m with the altitude of 7 m above the road level. 1 m below the soil level the alluvial deposits of Early Cretaceous including terrestrial vertebrate fossils were discovered. The bone-bearing layer included brownish-red and greenish-gray solid clay. Skulls, fractions of bones and fragments of skeletons of Early Cretaceous vertebrates (*Protosuchia*, *Tagarosuchus kulemzini*, *Lacertilia* (Agamidae) and dinosaur *Psittacosaurus sibiricus*) were found there. The bone-bearing lens was located at the level of 0,3 m under bon-bad layer. The characters of the bone-bearing lens taphonomy demonstrated that the examined piece of about 1 m wide and 4,5 m long extended from north-east to south-west. The thickness of the lens was approximately 60 – 70 sm.

The lens is unique with the quantity of complete *Psittacosaurus* skeletons, presented in anatomic position *in situ*. The taphonomy peculiarities suggest that the death of dinosaur group, consisting of specimen of different ages, was the result of a catastrophe. It is probable that moving along the temporary stream bed they were buried by a mud flow. Such type of a taphonomy has never been previously obtained at Shestakovo locality or at any other locality in Russia. (Maschenko, 2015, Averianov, 2006).





The discovered lens with a mass grave of psittacosaurus is probably formed as a result of a short-termed catastrophic event, which could be a flood. It can be assumed that the animals were washed away by the low power temporary stream. The presence of a significant number of young individuals in the burial, probably indicates complex forms of group behavior, possibly including taking care of offspring.

Day 3 (Saturday, August 20):

9:00 am Leaving Kemerovo

10:00-14: 00 Visiting the “Tomskaya pisanitsa” (historical cultural and natural museum-preserve) and returning to Novosibirsk.

18:00 Arrival at "Golden Valley" Hotel in Novosibirsk

Tomskaya pisanitsa is the first Siberian monument of Rock Art which became the museum (http://www.gukmztp.ru/eng_index.html). It is a unique monument of history and culture of Eurasia. Nearly 300 drawings are well-known from the Tomskaya pisanitsa.

Tomskaya pisanitsa appeared at the end of the Neolithic age, IV-III thousand years BC it served as a sanctuary before I millennium BC. Themes of Tomskaya pisanitsa are elks, holy birds, and a bear. In the bronze age (II-I thousand years BC) solar signs, boats, guises, and bird men appear.



References

Alifanov V.R., Efimov M.B., Novikov I.V., Morales M. 1999. A new psittacosaur complex of tetrapods from the Lower Cretaceous Shestakovo locality (Southern Siberia). *Reports of the Academy of Sciences* **369**: 491-493.

Averianov A.O., Voronkevich A.V., Leshchinskiy S.V., Fayngertz A.V., 2006. A Ceratopsian dinosaur *Psittacosaurus sibiricus* from the Early Cretaceous of West Siberia, Russia and its phylogenetic relationships. *Journal of Systematic Palaeontology* **4 (4)**: 359-395.

Lopatin A. V., Maschenko E. N., Tarasenko K.K., Podlesnov A.V., Demidenko N.V., Kuzmina E.A. 2015. Unique burial of Early Cretaceous vertebrates in Western Siberia (the Shestakovo 3 locality, Kemerovo Region, Russia). *Reports of Academy of Sciences* **462**: 620–623.

Maschenko E.N., Feofanova O.A., Demidenko N.V., Kuzmina E.A. 2014. Looking for a Siberian dinosaur. *Science and life* **11**: 74 – 80.