

Diversity of conodonts in the Lochkovian and Early Pragian (Early Devonian) of the western slope of the Southern Ural

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The representative and complete Lower Devonian sections of Lochkovian and Pragian deposits are located in the southern part of the West Zilairian structural-facial zone and correspond to the shelf facies of the Southern Ural paleobasin (Fig. 1).

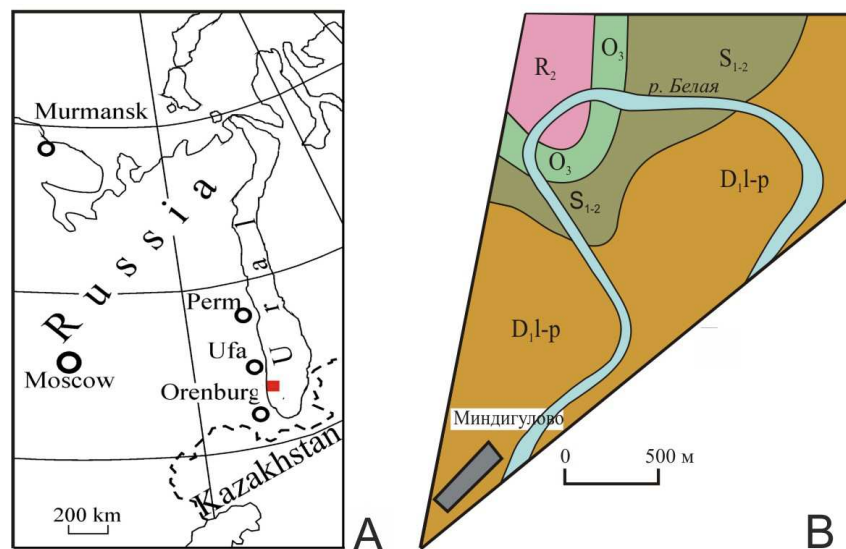


Fig. 1: A – The location of the area under study in Russia, B – Geological map of the area under study (according to SHEFER *et al.* 2001).

Detailed stratigraphic and biostratigraphic studies the Lower Devonian formations in the area were carried out in 1960 - 70 years (KRAUSE & MASLOV, 1961, TYAZHEVA *et al.* 1976).

In recent years several sections were studied for the purpose of investigation of conodont fauna. The most informative data were obtained from a section on the right bank of Belaya river at the village Mindigulovo. For the first time in the Lochkovian and the lower part of the Pragian of the Southern Ural a sequence of conodont associations was established, which can be correlated with the standard conodont zones (bottom-up):

- 1) The lowest part: the *postwoschmidti* – *woschmidti* Zone – *Ozarkodina remscheidensis remscheidensis* ZIEGL., *Caudicriodus woschmidti* (ZIEGL.) complex;
- 2) The next complex is characteristic one of the *delta* Zone, is represented by species *Ancyrodelloides cf. asymmetricus* (BISCH. & SANN.), *A. aff. delta* (KLAPP. & MUR.), *Ozarkodina remscheidensis repetitor* (CARLS & GANDL), *O. stygia* FLAJS, *Ozarkodina remscheidensis* ZIEGL. → *Ozarkodina pandora* MUR., MATTI & WALL., *Pandorinellina optima optima* (MOSK.);
- 3) The complex typical for the *pesavis* Zone, presented by *Ancyrodelloides trigonicus* (BISCH. & SANN.), *A. eleanorae* (LANE & ORM.), *A. transitans* (BISCH. & SANN.), *A. orcula* WILSON, *Ozarkodina pandora* MUR., MATTI & WALL., *O. stygia* FLAJS, *Pandorinellina exigua philipi* (KLAPP.), *Pandorinellina optima optima* (MOSK.);
- 4) The complex with *Caudicriodus angustoides alcoleae* (CARLS), *Pandorinellina exigua philipi* (KLAPP.) (with a predominance of *C. a. alcoleae*), common in *pesavis* Zone;

- 5) The complex typical for *sulcatus* Zone, contains: *Ozarkodina pandora* MUR., MATTI & WALL., *Ozarkodina pandora* MUR., MATTI & WALL. → *Eognatodus sulcatus eosulcatus* MUR., *Eognatodus sulcatus eosulcatus* MUR., *Pandorinellina miae* BULT.

The abundance and diversity of taxa in selected conodont associations are not equal (Fig. 2). The complex 4 (*pesavis* Zone) is the richest in species diversity and abundance of conodonts. 16 species and subspecies of 6 genera were identified in this complex. The number of specimens in it is up to 150 sp. per 1 kg of rock. 10 species and subspecies of 5 genera are found in the complex 3 (*delta* Zone). Number of conodonts in it is 90-100 sp. / 1 kg of rock. The remaining complexes are few in number and poor in species composition.

There is a facies dependence of conodont fauna in this section. Clay and lump limestone, apparently formed in calm, relatively deep-water conditions, is characterized by presence of a greatest number of diverse conodont fauna. Conodont complexes are represented mostly by genera *Pandorinellina*, *Ozarkodina*, u *Ancyrodelloides*. The organogenic, organogenic-detrital limestone, formed in well-aerated shallow-water shelf, contain fauna poor in taxonomy and abundance. They are dominated by Icriodontidae family. Fig. 2 shows that the levels where conodont complexes change are close to the levels of facial changes.

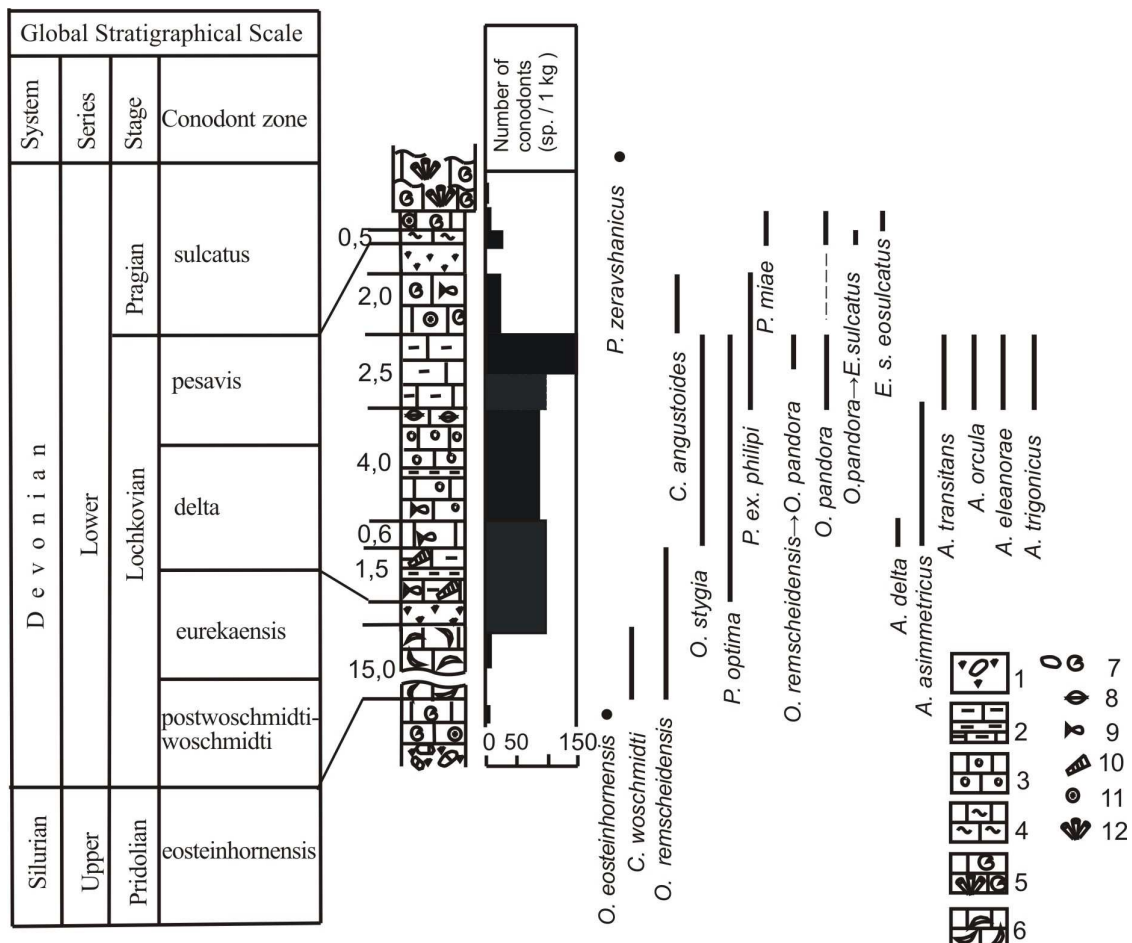


Fig. 2: Distribution of typical conodonts in the Lochkovian and Lochkovian/Pragian boundary beds of the Mindigulovo section. 1 – grass-covered interval with limestone boulders; 2 – clay limestone with interbeds of clay shale; 3 – lump limestone; 4 – bituminous limestones; 5 – organogenic limestones; 6 – organogenic-detrital limestones; 7 – shell fauna; 8 – ostracods; 9 – fish remains; 10 – tentaculites; 11 – crinoids; 12 – corals.

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A preliminary analysis of selected conodont fauna allowed to outline two phylogenetic lines: *Ozarkodina remscheidensis* – *Ozarkodina pandora* – *Eognatodus sulcatus* u *Ozarkodina remscheidensis* – *Pandorinellina optima* – *Pandorinellina exigua philipi* – *Pandorinellina miae*.

It is supposed that the evolutionary line *Ozarkodina remscheidensis* - *O. pandora* - *Eognatodus sulcatus* marked the start of a new genus *Polygnathus*, on the phylogeny of which, next conodont zonal scales from the top of Prague until the end of the Middle Devonian are based (MAWSON, 1998). Thus, the development of Lochkovian and Pragian conodont fauna in the Southern Urals paleobasin is a continuous series of phylogenetic and biofacies change.

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