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Biodiversity of Devonian conodonts from the West Siberia

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In West Siberia the Devonian deposits compose a part of the shelf belt along the western margin of the Siberian continent and extend from W to NE: from Altai to Salair and Kuznetsk Basin deepening farther north beneath the Mesozoic-Cenozoic cover of the West Siberian Lowland. Devonian marine sediments contain abundant benthic and pelagic fauna. Conodont associations were recovered from the NW and central parts of the West-Siberia Geo syncline (WSG), Rudny and Gorny Altai, Kuznetsk Basin.
Many conodont index-species of two (deep- and shallow-water) parallel zonal scales were recovered from the several Devonian sections.

***The north-west of the West-Siberia Geosyncline*.** The Upper Emsian – middle Famennian conodont association from the Shchuchiy Ledge (IZOKH 2011). The Emsian association includes: *Polygnathus serotinus* TELFORD, *P. bultyncki* WEDDIGE, *Neopanderodus perliniatus* ZIEGLER & LINDSTROM, *N.* cf. *transitans* ZIEGLER & LINDSTROM, *Belodella devonica* (STAUFFER), *B. triangularis* (STAUFFER), *B. resima* (PHILIP), *Panderodus* sp. and *Pseudooneotodus* sp.
The Eifelian association is characterized by species derived from Emsian and entering Givetian. It includes: *Polygnathus serotinus* TELFORD, *P. costatus patulus* KLAPPER, *P. costatus partitus* KLAPPER *et al*., *P.* cf. *linguiformis* HINDE, *P. costatus costatus* KLAPPER, *P.* aff. *P. trigonicus* BISCHOFF & ZIEGLER, *P. pseudofoliatus* WITTEKINDT, *P. eiflius* BISCHOFF & ZIEGLER, *Icriodus* cf. *regularicrescens* BULTYNCK, *Belodella devonica* (STAUFFER).
The Upper Frasnian association is represented by *Polygnathus decorosus* STAUFFER, *P.* cf. *P. aequalis* KLAPPER & LANE, *P.* cf. *P. samueli* KLAPPER & LANE, *P.* cf. *P. politus* OVNATANOVA, *Palmatolepis* cf. *Pa. rhenana* BISCHOFF, *Pa.* cf. *Pa. subrecta* MILLER & YOUNGQUIST, *Nothognatella* sp., *Belodella devonica* (STAUFFER).
Upper Famennian olistostrome-turbidite complex is composed of large limestone blocks characterized by three different in age conodont associations. The first is early Emsian which includes *Pedavis* aff. *sherryae* LANE & ORMISTON, *Pandorinellina* cf. *exigua philipi* (KLAPPER) and *Pseudooneotodus beckmanni* (BISCHOFF & SANNEMANN). The other two are Famennian: Second association characterizes triangularis Zone (*Palmatolepis praetriangularis* ZIEGLER & SANDBERG, *Pa. triangularis* Sannemann, *Icriodus alternatus* BRANSON & MEHL), third – belong to *marginifera*—Early *trachitera* zones (*Palmatolepis marginifera marginifera* HELMS, *Polygnathus* sp. A).

***In the central part of WSG*.** *Ozarkodina remscheidensis remscheidensis* (WALLISER), *Oz. r. repetitor* (CARLS & GANDL), *Pandorinellina exigua philipi* (KLAPPER), and *Pand. steinhornensis miae* (BULTYNCK) were defined from the Lower Devonian deposits. The Emsian sequences yielded *Polygnathus kitabicus* YOLKIN *et al*., *P. excavatus* CARLS & GANDL, *Pandorinellina e. exigua* (PHILIP), *Polygnathus nothoperbonus* MAWSON, *P. inversus* KLAPPER & JOHNSON, *P. serotinus* TELFORD and *P. foliformis* SNIGIREVA. The Eifelian association being very poor, only Upper Eifelian species were identified: *Tortodus kockelianus australis* and *P. x. ensensis*. *Icriodus obliquimarginatus* BISCHOFF & ZIEGLER, *Polygnathus x. xylus* STAUFFER, *P. varcus* STAUFFER, *Ozarkodina brevis* BISCHOFF & ZIEGLER, *Klapperina disparilis* ZIEGLER & KLAPPER were found in the Givetian. The Frasnian associations include *Palmatolepis hassi* MÜLLER & MÜLLER, *Ancyrognathus triangularis* KLAPPER, *Pa. gigas* MILLER & YOUNGQUIST, *Pa. subrecta* MÜLLER & YOUNGQUIST. The Famennian associations are dominated by *Palmatolepis* (*Pa. triangularis* SANNEMANN, *Pa. rhomboidea* SANNEMANN, *Pa. quadrantinodosa inflexoidea* ZIEGLER, *Pa. postera* ZIEGLER), with rare *Polygnathus* (*Polygnathus znepolensis* Spasov) (DUBATOLOV *et al*. 1990).

***Salair, Rudny and Gorny Altai*.** The Lochkovian conodont association was found in Salair. It includes the following taxa: *Caudicriodus woschmidti transiens* CARLS & GANDL, *Pedavis* cf. *Ped. breviramus* MURPHY & MATTI, *Pandorinellina exigua philipi* (KLAPPER), *Pand. optima* (MOSKALENKO), *Pelekysgnathus serratus* JENTZSCH, *Ozarkodina e. excavata* BRANSON & MEHL, *Panderodus* sp. and

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Belodella sp. Predominant are the *Panderodus* elements (up to 75%) in the conodont collection. Most diverse conodont associations were established in the Emsian of Rudny Altai, Gorny Altai, Salair and Tuva Depression. They include species belonging to *Pandorinellina*, *Caudicriodus*, *Latericriodus*, *Ozarkodina*, *Polygnathus*, *Panderodus*, *Pelekysgnathus*, *Vjaloviodus* and *Belodella*. Almost all Emsian zonal index-species have been identified. Among them are *Polygnathus kitabicus* YOLKIN *et al*., *P. excavatus* CARLS & GANDL, *P. nothoperbonus* MAWSON, *P. inversus* KLAPPER & JOHNSON, *P. serotinus* TELFORD. The Emsian-Eifelian boundary interval is expressed by non-marine deposits with flora remains.

The Eifelian sequences of Rudny Altai, Gorny Altai and Salair are characterized by *Polygnathus*, *Icriodus* and *Tortodus*, including *Polygnathus costatus partitus* KLAPPER *et al*., *Po. costatus costatus* KLAPPER, *Po. linguiformis klapperi* CLAUSEN *et al., Icriodus regularicrescens* BULTYNCK (BAKNAREV *et al*. 2004). The Givetian interval is represented by shallow-water associations of *Icriodus* with rare *Polygnathus* in Rudny Altai, NW Kuznetsk Basin and Minusa Depression (AKSENOVA *et al*. 1994, BAKNAREV *et al*. 2004). The *Icriodus obliquimarginatus* BISCHOFF & ZIEGLER species was identified in Rudny Altai and NW Kuznetsk basin.

Most diverse Frasnian associations which typify complete zonal succession (*falsiovalis* - *linguiformis* zones) were found in Rudny Altai. The Lower and Middle Frasnian carbonates contain abundant *Polygnathus*, *Ancyrodella*, *Mesotaxis*, and rarely, Icriodus and *Palmatolepis*. The Late Frasnian siliceous-terrigenous sequences contain rare *Palmatolepis* and *Polygnathus* (BAKNAREV *et al*. 2004, IZOKH *et al*. 2004, OBUT *et al*. 2007).

The Frasnian conodonts, comprising common *Polygnathus*, *Ancyrognathus*, *Icriodus*, few *Pelekysgnathus* and *Ancyrodella* from SE Altai differ from the above associations.

NW Kuznetsk Basin. The Frasnian sequences contain shallow-water biofacies association, mainly *Polygnathus* and *Icriodus*, single *Palmatolepis*, *Ancyrodella*, *Ancyrognathus*, *Polylophodonta*. Among them: *Polygnathus dengleri* BISCHOFF & ZIEGLER*, P. angustidiscus* YOUNGQUIST*, Po. brevilamiformis* OVNATANOVA, *P. webbi* STAUFFER, *P. aequalis* KLAPPER & LANE, *P. robustus* KLAPPER & LANE, *P. costulatus* ARISTOV, *P. samueli* KLAPPER & LANE, *Palmatolepis hassi* MÜLLER & MÜLLER, *Ancyrodella gigas* YOUNGQUIS, *An. nodosa* ULRICH & BASSLER). F/F interval is characterized by: *Polygnathus brevilaminus* Branson & Mehl, *Icriodus praealternatus* Sandberg, Ziegler & Dreesen, *I. alternatus alternatus* BRANSON & MEHL*, I. alternatus helmsi* SANDBERG & DREESEN.

Polygnathus izhmensis KUZMIN, *P.* gr. *P. semicostatus* BRANSON & MEHL and *I. iowaensis* YOUNGQUIST & PETERSON are found beginning from the base of the Famennian. Conodonts diversity sharply increased at the base of the Lower Famennian crepida Zone: abundant *Polygnathus* and *Palmatolepis*, rare *Icriodus* and single *Ancyrolepis* (*Palmatolepis triangularis* SANNEMANN, *Pa. quadrantinodosalobata* SANNEMANN, *Pa. crepida* SANNEMANN, *Ancyrolepis cruciformis* ZIEGLER and others).

The Uppermost Famennian complex of conodonts from the NW Kuznetsk Basin contain *Polygnathus*, *Pelekysgnathus*, *Neopolygnathus*, *Bispathodus*, *Icriodus*, and *Siphonodella*.

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