Middle Jurassic terrestrial vertebrate fauna of the Berezovsk coal mine in western Siberia (Russia)

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The Berezovsk coal mine in the Nazarovo Basin in southern Krasnoyarsk Territory of western Siberia has yielded a rich Middle Jurassic (Bathonian) vertebrate assemblage. The fossils occur in floodplain claystones and siltstones of the Itat Formation above a coal seam of more than 50 m thickness without vertebrates. About 15 tons of sediment have been screen washed in 2010-2013 for the recovery of microvertebrates. The isolated microvertebrate remains are concentrated in one slightly sandy siltstone layer of 20-30 cm thickness and are often somewhat water worn. Accidentally, partial turtle shells occur within the microvertebrate level.

The most common fossils are scales and bones of paleonisciform and sinamiid fishes. In 2012, an assemblage of about a dozen articulated paleonisciform skeletons has been found. Dipnoans are extremely rare and are represented only by few fragments of dental plates, in contrast to the contemporaneous near shore deposits of the Balabansai Formation in Kyrgyzstan where lungfish are abundant. Chondrichthyans are also very scarce, and only few teeth of presumably fresh water hybodontiform sharks been recorded from Berezovsk.

Xinjiangchelyid turtles are the dominant tetrapods, represented by thousands of isolated shell plates, postcranial and cranial bones, and few partial shells of a new taxon (Danilov et al. 2013). Crocodiles (cf. Goniopholididae) are surprisingly rare (Kuzmin et al. 2013). Amphibians are represented by the large stem caudate *Urupia*, a more derived smaller caudate, and a lalagobatrachian anuran (Skutschas and Krasnolutzkii 2011, Skutschas 2013, Skutschas et al. in review). Noteworthy is the absence of labyrinthodonts that persisted in other Asian Middle to Late Jurassic ecosystems in China, Mongolia, and Kyrgyzstan. So far also no albanerpetontids have been recorded. Squamates are represented by few jaw fragments and other bones of an unidentified scincomorph (Valeev 2008). Similarly uncommon are remains of a choristodere possibly related to *Cteniogenys*. Dinosaurs are represented in the screen washed fossiliferous layer by isolated teeth of sauropods, theropods, stegosaurs, and basal ornithischians similar to heterodontosaurids (Averianov and Krasnolutskii 2009, Averianov et al. 2010). Higher in the section a bone bed occurred with several partially articulated skeletons of an undetermined stegosaur and bones of the tyrannosauroid theropod *Kileskus aristotocus*. Isolated teeth of pterosaurs are common, but otherwise only a single pterosaur bone fragment has been found.

Nonmammalian synapsids are represented by isolated teeth of a tritylodontid. More than two hundred mammalian specimens have been recovered so far. Most common are edentulous jaw fragments and isolated mammal teeth or tooth fragments

as in other fluvial deposits. The Berezovsk mammal assemblage includes the eleutherodontid haramiyid *Sineleutherus issedonicus*, diverse docodonts (*Itatodon tatarinovi*, *Simpsonodon sibiricus*, and *Hutegotherium yaomingi*), an amphilestid-grade eutriconodontan, a new multituberculate, as well as the cladotherians *Amphibetulimus krasnolutzkii* and the dryolestid *Anthracolestes sergeii* (Averianov and Lopatin 2006, Averianov et al. 2005, 2008, 2010, 2011, 2014, 2015, Lopatin and Averianov 2007). The multituberculate and the dryolestid are among the oldest in the fossil record. The vertebrate assemblage from the Itat Formation is very similar to that from the British Bathonian Forest Marble Formation and suggests a lack of a provincialism in the Middle Jurassic Laurasian landmass.

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