FIRST JURASSIC FROG FROM SIBERIA, RUSSIA

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During the last 15 years our knowledge of Jurassic vertebrates from Siberia has greatly increased through the discovery by S.A. Krasnolutskii in 2000 of the Berezovsk Quarry vertebrate locality in the Middle Jurassic (Bathonian) Itat Formation, in the southern part of Krasnoyarsk Territory, western Siberia (Alifanov et al., 2001). The vertebrate assemblage of Berezovsk Quarry is one of the most taxonomically diverse Jurassic vertebrate assemblages in Asia and includes hybodont sharks, palaecosiniform and amiform actinopterygians, dipnoans, stem- and crown-group salamanders, xinjiangchelid turtles, basal lepidosauromorphs, scincomorph lizards, choristoderes, goniopholidid crocodyliforms, ornithischian and saurischian dinosaurs, pterosaurs, tritylodontids, and diverse Jurassic vertebrate assemblages in Asia and includes hybodont sharks, palaecosiniform and amiform actinopterygians, dipnoans, stem- and crown-group salamanders, xinjiangchelid turtles, basal lepidosauromorphs, scincomorph lizards, choristoderes, goniopholidid crocodyliforms, ornithischian and saurischian dinosaurs, pterosaurs, tritylodontids, and diverse mammaliaforms (e.g., Alifanov et al., 2001; Averianov et al., 2005, 2010, 2014; Kuzmin et al., 2013; Skutschas, 2013; Martin et al., 2014). The composition of this vertebrate assemblage is generally similar to that of the contemporary Forest Marble Formation (Great Britain), especially in the mammalian and salamander components (Evans and Milner, 1994; Kielan-Jaworowska et al., 2004; Benton et al., 2005; Averianov et al., 2010; Skutschas, 2013).

Here we describe an atlantal centrum of a frog (Anura) from Berezovsk Quarry of the Bathonian Itat Formation of Western Siberia. This find represents a new faunal component from that locality and is the first unambiguous record for Anura in the Jurassic of Asia.

Institutional Abbreviation—ZIN PH. Paleohertpetological Collection, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

SYSTEMATIC PALEONTOLOGY

AMPHIBIA Linnaeus, 1758
LISSAMPHIBIA Haeckel, 1866
ANURA Fischer von Waldheim, 1813
LALAGOBATRACHIA (sensu Frost et al., 2006)
EODISCOGLOSSUS Villalta, 1957

Comments—The extinct anuran genus Eodiscoglossus is known from the Middle Jurassic–Early Cretaceous of Europe (Sanchiz, 1998). Eodiscoglossus contains two species: E. oxoniensis Evans, Milner et Mussett, 1990 from the Middle Jurassic (Bathonian) of England (Evans et al., 1990) and E. santonjae Villalta 1957 from the Early Cretaceous (late Berriasian or early Valanginian) of Spain (Hecht, 1970; Estes and Sanchiz, 1982; Sanchiz, 1998). The type species E. santonjae is based on an articulated specimen (e.g., see Hecht, 1970), whereas E. oxoniensis is known by the holotype ilium and several isolated cranial and postcranial bones (including fragmentary atlantal centra; Evans et al., 1990). In addition to the holotype species of E. santonjae, isolated anuran bones from the Barremian–Aptian of Spain (Galve locality) were originally referred to this species (Estes and Sanchiz, 1982) but later were considered as E. cf. santonjae (Sanchiz, 1998).

Historically, Eodiscoglossus was assigned to Discoglossidae sensu lato (i.e., including Alytes, Barbourula, Bombina, and Discoglossus; Evans et al., 1990; Sanchiz, 1998; see also results of phylogenetic analysis by Gao and Chen, 2004). The recent phylogenetic analysis by Báez (2013) placed Eodiscoglossus between Asaphus and all other crown frogs. According to another recent phylogenetic analysis, by Dong et al. (2013), the genus Eodiscoglossus is a member of the anuran crown-group clade Lalagobatrachia (sensu Frost et al., 2006). Lalagobatrachia includes all crown-group frogs except leioelmatids (Asaphus and Leiopelma) and the Early Cretaceous Liaobatrachus (Dong et al., 2013). Within the Lalagobatrachia, the phylogenetic position of Eodiscoglossus is poorly resolved and this genus forms a polytomy with several archaeobatrachian taxa (e.g., Barbourula, Bombina, alytids [= discoglossids, Alytes and Discoglossus]) and a ‘mesobatrachian’ clade that includes some pelobatoids and pipoids (Dong et al., 2013).

?EODISCOGLOSSUS SP. (Fig. 1)

Specimen—ZIN PH 27/144, atlantal centrum (Fig. 1).

Locality and Horizon—The anuran atlantal centrum was recovered from gray clays in the upper part of the Itat Formation (= Svita), exposed in Berezovsk Quarry, southern Krasnoyarsk Territory, Western Siberia, Russia (for more detailed information on the geological setting see Averianov et al., 2005). The Itat Formation has been dated as Bathonian on the basis of spores and palynomorphs (Alifanov et al., 2001).

Description—The atlantal centrum is dorsoventrally flattened and shorter than wide. The maximum anterior width (i.e., between lateral rims of the anterior cotyles) is about 4.3 mm and the ventral midline length is about 2.5 mm (ratio of maximum anterior width : ventral midline length about 1.7). The anterior cotyles are dorsoventrally compressed, oval in outline, and their

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