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Biostratigraphy of the Early Pleistocene (Palaeopleistocene) deposits of the Southern Fore-Urals, Russia

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ABSTRACT

A summary of published and unpublished data on the stratigraphy of the Early Pleistocene (Palaeopleistocene) of the Southern Urals region is presented in this paper. The summary follows previous reviews about the characteristics of the Pleistocene deposits of the easternmost part of Europe. The improvement and unification of the Regional Quaternary stratigraphical scheme was the main aim of these investigations. Deposits of different origin, which constitute the regional stratigraphical units (Zilim-Vasilyevo, Akkulaevo and Voevodskoe), are characterized. Malacological data form the base for the biostratigraphical subdivision. At the beginning of the Early Pleistocene, an ingression of the Akchagyl Sea (modern Caspian Sea area) began in the Zilim-Vasilyevo time, which developed as much as possible during Akkulaevo time, and then shortly re-emerged after regression into the territory of the Southern Fore-Urals during Voevodskoe time. During the Early Pleistocene (Palaeopleistocene), the Southern Fore-Urals region was characterized by continental climate conditions, which were influences by the wideapreaded brackish-water gulf of the Akchagyl Sea. Fossil molluscs, ostracods, mammals and pollen are used for the reconstruction of the palaeoenvironmental conditions and the biostratigraphical position of the main localities. The units have been correlated with the Gelasian stage of the Western European stratigraphical timescale.

1. Introduction

The Southern Urals region includes the southeastern part of the Russian Platform, the Fore-Ural depression, the mountainous part of the Southern Urals and the Southern Trans-Urals area. The structural-geological subdivision of these zones, which have their own specific deposits and features, is shown in Fig. 1.

A summary of published and unpublished data as well as authors' data dealing with the stratigraphy of Early Pleistocene (or Palaeopleistocene, a unit of the Russian stratigraphic scheme, equivalent to the early Early Pleistocene subseries; time interval 2.6–1.8 Ma) of the Southern Urals region is presented in this paper. It follows and complete previous reviews about the characteristics of the Quaternary deposits of the easternmost part of Europe (Danukalova et al., 2007, 2014, 2016; Yakovlev et al., 2013).

At the beginning of the Early Pleistocene, the area was under the strong influence of the second (maximal) ingression of the Akchagyl Sea (modern Caspian Sea area) (the first ingression of the Akchagyl Sea was at the end of Pliocene during Piacenzian stage) which started in the Zilim-Vasilyevo time, then developed as much as possible during Akkulaevo time, and then shortly re-emerged after regression into the territory of the Southern Fore-Urals during Voevodskoe time. The huge northern gulf of the Akchagyl Sea reached the footsteps of the western ridges of the Ural Mountains and Obzhyi Syrt Highland in the South. All hydrographic network existed before the Akchagylian time was overflooded and brackishwater liman (lagoon) was formed as a northern part of the Akchagyl Sea.

During the Early Pleistocene (Palaeopleistocene), the Southern Fore-Urals region was characterized by semi-marine and continental climate conditions, which were influences by the wideapreaded brackish-water gulf of the Akchagyl Sea (Yakhemovich et al., 1970, 1988; Danukalova, 1996; Puchkov and Danukalova, 2006, 2009).

Fluvial and marine deposits containing palaeontological remains form the base of the palaeogeographical reconstructions and the correlation of the different sedimentary units.

The Early Pleistocene (Palaeopleistocene) marine sediments nowadays are distributed in limited areas largely occurring below the topographic surface (Zilim-Vasilyevo Horizon) as well as on the interfluves

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