

Red paleosols in the key sections of the Middle and Upper Permian of the Kazan Volga region and their paleoclimatic significance

Mouraviev F., Arefiev M., Silantiev V., Khasanova N., Nizamutdinov N., Trifonov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015, Pleiades Publishing, Ltd. This paper presents the preliminary results of investigations of carbonate nodules from red paleosols of the reference sections of the Middle and Upper Permian of the Kazan Volga region. The main genetic types of paleosols are calcic gleysols and gleyed vertisols, the pedogenic nodules are composed of dolomite and calcite. Scanning electron microscopy and spectroscopic and isotopic methods of analysis show that the nodules retained their original mineral composition and were formed with the participation of soil microorganisms under conditions of contrasting seasonality in an arid climate. In the vicinity of the Kiama-Illawarra paleomagnetic boundary, the Urzhumian paleosols show a transition in the composition of pedogenic nodules from dolomite to calcite. It is suggested that this transition was caused by the humidization of climate, which is supported by lithological and isotopic data.

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Keywords

calcite, dolomite, Kiama-Illawarra boundary, Middle and Upper Permian, paleosols, pedogenic nodules