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Section on European Quaternary Stratigraphy (SEQS)
Southern Scientific Centre, Russian Academy of Sciences
Geological Institute, Russian Academy of Sciences**

QUATERNARY STRATIGRAPHY AND PALEONTOLOGY OF THE SOUTHERN RUSSIA: connections between Europe, Africa and Asia

**Abstract volume
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The conference is devoted to the memory of Andrey Dodonov – geologist, colleague, friend and teacher

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Quaternary stratigraphy and paleontology of the Southern Russia: connections between Europe, Africa and Asia: Abstracts of the International INQUA-SEQS Conference (Rostov-on-Don, June 21–26, 2010). Rostov-on-Don, 2010. 228 p.

The book presents the materials of the International Conference held in Rostov-on-Don (Rostov Region, Russia). Reports concern a wide spectrum of issues connected to the study of Quaternary marine and continental deposits of Eastern and Western Europe, Asia, and Africa. Paleobiological record of the Eastern Europe, faunal connections with Asia, Africa, and Western Europe are considered. The special attention is given to questions of paleogeography, climatic changes in the Quaternary, stratigraphy and sedimentology of Eastern Europe. Also presented are the newest data on the tectonics and climatic record. Questions of distribution and chronology of Paleolithic sites, adaptations of the ancient people to paleoenvironment are discussed.

Addressed to geologists, stratigraphers, paleontologists, paleogeographers, and archaeologists.

Materials are published with the maximal preservation of the authors' texts

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**Международный союз по изучению четвертичного периода
Секция европейской четвертичной стратиграфии
Южный научный центр РАН
Геологический институт РАН**

ЧЕТВЕРТИЧНАЯ СТРАТИГРАФИЯ И ПАЛЕОНТОЛОГИЯ ЮЖНОЙ РОССИИ: взаимосвязи между Европой, Африкой и Азией

**Материалы международной конференции
INQUA-SEQS 2010**

**Ростов-на-Дону, Россия
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При поддержке INQUA, грантов РФФИ № 10-05-06045-г, 09-05-00307а, Программы фундаментальных исследований Президиума РАН «Происхождение биосферы и эволюция геобиологических систем», Программы фундаментальных исследований ОНЗ РАН «Состояние окружающей среды и прогноз ее динамики под влиянием быстрых глобальных и региональных природных и социально-экономических изменений»

Конференция посвящена памяти Андрея Евгеньевича Додонова – геолога, коллеги, друга и учителя

Редакционная коллегия: В.В. Титов, А.С. Тесаков

Четвертичная стратиграфия и палеонтология южной России: взаимосвязи между Европой, Африкой и Азией: Материалы международной конференции INQUA-SEQS (Ростов-на-Дону, 21–26 июня 2010 г.). Ростов-на-Дону, 2010. 228 с.

Книга содержит материалы международной конференции INQUA-SEQS 2010, проведенной в г. Ростов-на-Дону (Ростовская область). Сообщения касаются широкого спектра проблем, связанных с изучением четвертичных морских и континентальных отложений Восточной Европы, Западной Европы, Азии и Африки. Рассматриваются палеобиологическая летопись Восточной Европы, фаунистические взаимодействия с Азией, Африкой и Западной Европой. Особое внимание уделяется вопросам палеогеографии, климатических изменений в четвертичном периоде, стратиграфии и седиментологии в Восточной Европе. Показаны новейшие данные изучения тектонической и климатической летописи. Обсуждаются вопросы распространения и хронологии палеолитических стоянок, адаптации древнего человека к палеосреде.

Издание предназначено для геологов-стратиграфов, палеонтологов, палеогеографов и археологов.

Материалы публикуются с максимальным сохранением авторской редакции

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HIGH-RESOLUTION STRATIGRAPHY AND CHRONOLOGY OF LATE PLEISTOCENE PERIGLACIAL ZONE OF THE EAST-EUROPEAN PLAIN

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The stratigraphy of late Pleistocene of the periglacial zone of the East-European plain is based till now upon the investigation of the outcrops and soil pits situated on the interfluves, interfluve's slopes, ancient terraces. The structure of such type of outcrops and soil pits is not detailed – many horizons known for the glacial regions or other territories are absent; soils are often superimposed. Such compressed stratigraphy is obviously not satisfactory for the investigation of middle and upper Paleolithic sites

The most thickness and complexity of late Pleistocene deposits in periglacial zone of the Russian Plain are characteristic to the filling of depressions, formed in the beginning of the new climate-erosional cycle – during the Moscow late-glacial before the Mikulino Interglacial. They are presented by buried gullies (balkas) and little paleovalleys. Such conditions lead to the formation of pedolithogenic cyclitis consisting of the deposits of alluvial, slope, and aeolian genesis separated by paleosols.

Relief-forming processes and accumulation of deposits prevailed during the periods of cooling unfavorable for the vegetation. During the warm periods the rate of pedogenic processes was higher than the rate of sedimentation, and soils of various genesis and various degree of the development were formed. We investigated such objects in Mikchailov, Aleksandrov, Monastirsky, Novoposelkovsky and Lebedinsky open pits across the Middle Russian Plain.

The late Pleistocene deposits are based on the Mikulino paleosol formed on the Moscow loess (MIS 5e). Mikulino paleosol can be found in the bottoms and on the slopes of the paleogullies, and represents the forest pedogenesis: sod-podzolic soils on the slopes and light gray soil in the bottoms. Mikulino interglacial soil includes 3-4 pedogenic stages with the initial formation of meadow soils, followed by the formation of forest soils, and 2–3 morpholithogenic stages with the increasing of erosional and accumulative processes in the bottom of the gullies under the endothermic cooling. One of such cooling is marked by the development of deep seasonal frost penetration.

Strong forest fires happened to be because of climatic instability following the transitions to the Valdai glaciation. Fires destroyed the vegetation and resulted in the accelerated erosion of Mikulino paleosol from the slopes. Fluvial processes together with the solifluctions due to the strong cooling increased the existed process of filling of the depressions. This stage correlates with MIS 5d.

Two interstadial forest-steppe soils of temperate belt were formed during the early Valdai warming – Kukuev meadow paleosol (MIS 5c) and Streletzk chernozem-meadow soil (MIS 5a). Frost and relief-forming processes revived during the stadial separating these stages (MIS 5b). The second interstadial was longer and warmed according paleosol and paleobotanical data. Early Valdai was ended by strong cooling (MIS 4) reflected in the formation of caldrion-shaped pseudomorphs in the pedosediment above Streletzk paleosol.

Two interstadial periglacial forest-steppe soils were formed during middle Valdai (MIS 3): Aleksandrov wet-meadow paleosol (14-C dates – 49600±700 yrs. B.P.) with plastic cryogenic deformations, and more complex Bryansk paleosol, transformed by wedge-shaped deformations. Gleyic loessial loam separating these paleosols indicates the mollification of the severe periglacial environment. The bone fragments of woolly rhinoceros and horse were

found in the loessial material (tab. 1). Hydrouzelsk paleosoil (^{14}C -age ~37 kyrs. B.P.) has close stratigraphic location. Bryansk paleosol is now represented by complicated pedolithoc-complex including at least 2 pedogenic phases: 33–27 kyrs and 25–24 kyrs. Deluvial slopes towards the second terrace have even more detailed record of the middle Valdai sediments (outcrops Molodova, Korman') or the fillings of burial gullies (Kostenki).

Table 1

Correlation of the author's high-resolution scheme with A.A.Velichko's scheme

A.A. Velichko	S.A. Sycheva			MIS
Soil, loess	Saint Germaine	Sites	^{14}C -dates, yrs.B.P.	
Holocene	Holocene	All objects		1
Altynovo	Loess	-«-		2
	Allered paleosoil	Monastyrsk, Aleksandrov open pits	11200±90, 11140±190	
	Loess	-«-		
Trubchevsk	2–3 embryonic soils	Fatyanovka, Kamennaya Balka etc.	14750±150 17900±200	
Desna	Loess			
Bryansk	Bryansk paleosoil	Monastyrsk open pit	23400+230	3
		Monastyrshina	24400±700	
	Loess	-«-		
	Monastyrsk paleosoil	-«-	29100± 340	
		Hydrouzel	30400±450	
Aleksandrov open pit	33140±230			
?	Loess	-«-		3
	Hydrouzel paleosoil	Hydrouzel	36950±1190	
			37200±500	
	Gleyish loess	Aleksandrov open pit	39710±580	
			40200±420	
Aleksandrov paleosoil	-«-	49600±700		
Khotylevo	Loess, Sediment	-«-		4
Krutitsa	Streletzk paleosoil	Aleksandrov, Monastyrsk, Novoposelkovsk open pits		5a
	Sediment			5b
	Kukuev paleosoil			5c
Sevsk	Sediment			5d
Salyn	Mikulino paleosoil		3 pedogenic stages	5e

Late Valdai sediments (MIS 2) in periglacial zone of Russian Plain have several levels of embryonic paleosoils often with gleyic features. They were formed during the warm periods of smaller scale than early or middle Valdai interstadials.

Thus the Late Pleistocene of the periglacial zone of the East-European plain appear to be much more complicated period than it is presented in the common scheme of ISC or A.A.Velichko.

High-resolution stratigraphic scheme of the late Pleistocene correlates well with the views of middle and west European scientists. We can correlate Mikulino paleosoil with Eemian interglacial, Kukuev paleosoil with = Brorup+Amersfoort = Saint Germaine 1 (~115–105 ca. B.P.), Streletzk paleosoil with = Odderade = Saint Germaine 2 (~70–80 ca. B.P.), Aleksandrov paleosoil with = Oerel (~50 ca. B.P.), Merskhort; gleyish loam, Hydrouzelsk paleosoil – Moershoofd = (44–45 kyrs. B.P.) and Hengelo (38–40 ca. B.P.), Monastyrsk and Bryansk paleosoils = Denenkamp = Grand Bois (33–24 ca. B.P.).