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**International Union for Quaternary Research (INQUA)
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
2010 annual meeting INQUA-SEQS**

**Rostov-on-Don, Russia
June 21–26, 2010**

Rostov-on-Don
2010

Supported by INQUA, by RFBR, grant nos. 10-05-06045-Г and 09-05-00307a, by the Programme for basic research of the Presidium of RAS “The origin of the biosphere and evolution of geo-biosystems” and by the Programme for basic research of the RAS Department of Earth Sciences “The condition of environment and forecast of its dynamics under the influence of quick global and regional natural and socio-economic modifications”

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

Editorial Board: V.V. Titov, A.S. Tesakov

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

ISBN 978-5-902 982-83-8



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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
21–26 июня 2010 г.**

Ростов-на-Дону
2010

УДК [903.211.+ 551.89](4/5)

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

ISBN 978-5-902 982-83-8

NEW DATA ON WOOLLY RHINOCEROS (*COELODONTA ANTIQUITATIS* Blum) HORNS

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1) Study of the woolly rhinoceros horn has a long history. The first scientific description was made by the outstanding scientist P. Pallas (1769). The work of his followers discovered the structure of keratin formation, interpreted in the form of nasal horns, its function and growth, the difference in the formation of the anterior and posterior horns, found the origin of cross-banding, unlike the modern rhinoceros horns, as well as similarities and differences with other derivatives of the skin (Eichwald, 1835; Brandt, 1849; Schrenck, 1880; Garutt V. et al, 1970; Fortelius, 1983; Garutt N., 1995, 1998, 2001; Chernova et al, 1998).

2) The number of woolly rhinoceros horns in public and private collections in the world amounts to several tens; the most representative of them is the collection of the Ice Age Museum, Moscow. The study of samples from this collection allowed us to obtain new information on the structure of the horn. The main objects of study were nasal horns nos. F-23 and F-2528.

3) The macrostructure of the *Coelodonta* horn. The horn has an uneven foot “surface” reflecting the curvature of nasal bones of the skull. Accordingly, the place breaking the horns of the natural boundaries of bands also have a curved surface, which has a convex relief on the distal part of the horns (formed early in ontogeny), and concave – on the proximal portion (formed later). Revealed the heterogeneity of the horns of density: the denser the middle part of the sagittal focus. Because of the destruction of the less dense layers of lateral filaments it is visible in the posterior *Coelodonta* horn no. F-2528, where its thickness is about 2 cm (fig. 1-A).

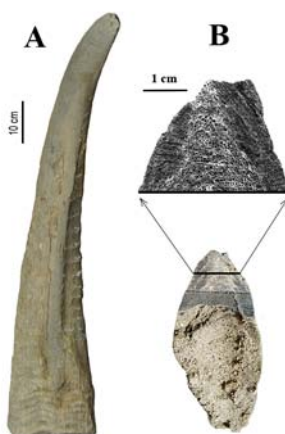


Fig. 1. Woolly rhinoceros nasal horns from the Ice Age Museum. A. Specimen no. F-2528, rear view. B. Specimen no. F-23, bottom view, the enlarged inset is visible to the heterogeneity of the structure of filaments in the center and the periphery of the cross section of the horn

4) The microstructure of the *Coelodonta* horn no. F-23 was studied using a scanning electron microscope JSM 840A (Japan). Diameters of filaments considerably vary in cross (horizontal) section. They are smaller (200–300 mk) in the peripheral part, and larger (500–600 mk), in the central zone (fig. 1-B). The shape of filaments varies from cylindrical to slightly flattened, rounded rectangular-pentagonal. The distance between filaments in the middle and on the periphery part of the horn is about of 100–200 mk but the smaller filaments are spaced closer.

Filaments are oriented along the long axis of the horns, with slightly convoluted and intertwined form, and their thickness is minimal on the periphery of the horns and a maximum in its central region. Matrix septa separating the filaments have a lamellar structure and thicker in the central part of the horn as compared with the periphery.

5) Revealed features in the structure of the Woolly Rhinoceros horns at the macro and micro levels, as previously known, provide strong connecting elements (bands of regular growth, filaments) between them, strength and elasticity of the organ to withstand high mechanical loads, in fact, resulting from adaptation of this animal to specific glacial conditions.