



INQUA



SEQS



**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

THE SPECIFIC FEATURES OF SEDIMENTATION ON THE SHELF OF THE SOUTHERN SEAS (THE SEA OF AZOV BEING EXEMPLIFIED)

Gennady MATISHOV. Southern Scientific Centre RAS, Rostov-on-Don, Russia; Murmansk marine biological Institut of Russian Academy of Science, Murmansk, Russia. *matishov_ssc-ras@ssc-ras.ru*

Vladimir POLSHIN, Galina KOVALEVA. Institute of Arid Zones RAS, Southern Scientific Centre of Russian Academy of Science, Rostov-on-Don, Russia. *polshin@ssc-ras.ru, kovaleva@ssc-ras.ru*

The study of relief formation and sedimentogenesis processes of the seas of the South of Russia is the most important theoretical and applied task of geomorphology and marine geology. Many issues of sedimentation on the shelf of inland seas, genesis, and development of relief forms, and paleogeography remain to be unsolved. To give answers to the nowadays questions the seas' studying faces is possible basing on the results of complex marine and terrestrial researches. But classical methods, applied to geomorphology and marine geology, should be supplemented and correlated with the results of biostratigraphic research. Since the mid 1990s, such researches have been carried out by SSC RAS. Vast actual material on the Sea of Azov, the Russian part of the Black Sea, and the water area of the Northern Caspian Sea has been accumulated and generalized for the period.

Pre-Holocene history of geological development of these seas, in many aspects, is similar and rather often intersects. Their common long-term development within the limits of one marine basin, alternation of transgress-regressive phases contributed to numerous biological invasions and frequent changes of hydrological and hydro-chemical conditions. During Holocene, separation of marine basins within the framework of current boundaries took place and limited connection with the World Ocean predetermined its own history of development for each water basin.

Underwater landscape studies, including such works as continuous echolocation and seismic profiling, and ground surveys, resulted in obtaining new data on the bottom relief composition, sedimentation conditions and velocity in the Late Holocene. The major part of research was concentrated in the Sea of Azov water area, where the cores of bottom sediments (up to 2 meters) and ground samples from the surface horizon were taken. The preserved shell material and carried out palynologic and diatoms analyses indicate that the sediments are of the Late Holocene age (the New Azov Layers). The results of seismic-acoustic survey and absolute age determinations of bottom sediments, sampled in different areas of the sea from ground cores, confirm biostratigraphic research data (Matishov, 2007; Matishov et al., 2007, 2009).

New ideas of bottom relief composition and genesis, paleogeographic situations of sedimentation and climate changes in the Late Holocene, as well as distribution of recent bottom sediments and related zoo-benthos biocenoses in the Sea of Azov, became the results of analysis and generalization of collected research material (Matishov, 2006, 2007; Matishov et al., 2008, 2009).

The current relief of the Sea of Azov formed during the Holocene as the result of complicated interrelation of endogenous and exogenous processes. In that time the linear accumulative forms of relief (spits), numerous underwater sand-shell ridges

caused by wind drifts, and erosive flat hollows of the bottom were formed. Among flat forms of relief, occupying the larger part of water area, abrasive and abrasive-accumulative terraces (located at the depth of 4-9 m.) and accumulative plains linked to the maximum bathymetric points of the sea bottom are specified (Matishov, 2006, 2007). The accumulative plains' morphology is complicated by the system of ancient valleys of paleorivers, with the biggest one being the valley of Paleo-Don (Shnyukov et al., 1974; Matishov, 2006). The outlines of paleorivers' valleys in the bottom relief are smoothed by the covering thickness of marine sediments formed in the Early-Azov and the New-Azov stages of the sea development.

Differentiated character of tectonic movements within the borders of marine basin determined the conditions and rates of sedimentation, as well as morphology and development of relief (Khrustalyev, Shcherbakov, 1974). Frequent changes of the sea level, which took place during the New-Azov stage of the sea development, predetermined the rhythmic character of sedimentary mass composition. The terrigenous sediments, which are, basically, clay and aleurite-clay silts, prevail in the central part of the sea in the studied transects. The larger types of sediments (fine-aleurite silts and fine-grained sands) are registered in the ground cores sampled along the periphery of marine basin, not far away from the coast and situated locally. Carbonaceous sediments are shells and products of its destruction (organic-detritus sand). The presence of heavily carbonaceous (shell) silts and silted shells over the total bottom area of horizons is typical of the sediment mass transect. The mass and quantity of interlayers enriched with shell material generally increase in the cores sampled closer to the coast with the sea depth decreasing. Obviously, it relates to the increase of biomass of bottom organisms from the areas with the distribution of clay silts to the areas covered by more coarse-grained sediments and general cross transport of bottom-bed loads, directed from the centre of the sea to its coastal area.

According to species composition of zoobenthos sampled from different horizons of ground cores, we can say that the composition of bottom sediments in the Sea of Azov, as well as salinity, in the Late Holocene was one of the main limiting factors influencing the distribution of bottom biocenoses (Matishov et al., 2008). In the total sedimentation balance, the role of terrigenous material formed in the result of coast and bottom abrasion with the general lift of the eustatic sea level increased. Because of the lithological composition of rocks experiencing destruction, mainly fine aleurite-clay material entered the water area, which distributed over the bottom under the influence of rough waves and currents. The major part of that clastic material deposited in the central part of the sea within the borders of a broad accumulative plain. The average velocity of sedimentation in the New-Azov period was 2 mm/year, reaching the maximum of 10 mm/year during the Nymphaean transgression. Sedimentation rates in the part of accumulative plain close to the Temryuk Bay were 0.2-6 mm/year. The abrasion of the coasts and the outflow volume of the Kuban River loads, apparently, conditioned such a regime. In some cases, depending on geomorphologic situation and closeness to the coastal bluffs, the speed of accumulation reached 4-6 mm/year (Matishov et al., 2009).

Spore-pollen analysis of ground cores of the Sea of Azov bottom sediments showed the increase of pollen quantity of wooden plants in the lower horizons of the cores, indicating that during the accumulation period of the sediments (~1300–1800 years ago) the climate on the sea coast was less arid if compared to the current one. Arborescent pollen is mainly of pine and birch, the decrease of the role of the broad-

leaved trees' pollen has been registered. The presence of xerophyte and halophyte types of pollen of Chenopodiaceae is the evidence of climate aridification during the formation of the upper part of the New-Azov sediments (Matishov et al., 2007).

The results of diatomaceous analysis of the bottom sediments indicated that only upper (up to 20–35 cm) layers of sediments are characterized by great species diversity (more than 70 species) and contain shells of diatomaceous algae dominating in the recent plankton of the Sea of Azov (Matishov et al., 2007). Species composition of the mass species differs according to the area of the core sampling. Regardless of the area of the sea, the species composition of diatomaceous in the lower layers of sediments has become very poor. Taking into account the ecology of the registered species, one may assume that during accumulation of the indicated sediments' layers (~1500–1900 years ago) the water body was shallower when compared to the nowadays Sea of Azov (Matishov et al., 2009). Thus, by the methods of absolute geochronology and litho-biostratigraphy, it has been determined that 2-meter sediment cover and the recent bottom relief of the Sea of Azov were formed during the New-Azov period of the water body formation, i.e. during the last 2000 years, together with the recurrent stage of transgression under the conditions of intense denudation-accumulative regime. Tectonic regime of the adjacent areas and periodic alternations of climatic conditions, which, according to the results of biostratigraphic research, were of regular and frequent nature, influenced the relief formation processes that time significantly.

CONTENTS

<i>Abramson N.</i> Evolution and distribution history of arvicoline fauna: contribution from molecular data	5
<i>Agadjanian A.</i> Development of small mammal communities in the Don River basin during the Pliocene and Pleistocene	7
<i>Agadjanian A., Iosifova Yu.</i> Dynamics of paleogeographical events in the Don River basin in the Pleistocene	9
<i>Agadjanian A., Shunkov M.</i> Locality of Upper Pliocene mammals and Early Paleolithic in Ciscaucasia.	12
<i>Akimova E., Stasyuk I., Harevich V., Motuzko A., Laukhin S., Orlova L.</i> The Late Paleolithic study of the Derbina Bay (Krasnoyarsk reservoir, Siberia).	14
<i>Alexeeva N., Erbjajeva M.</i> Development of the aridity in the Transbaikal area in context of global and regional events based on the study of small mammal faunas	19
<i>Andreescu I., Codrea V., Lubenescu V., Petculescu A., Stiuca E.</i> New developments in the Upper Pliocene-Pleistocene stratigraphic units of the Dacian Basin (Eastern Paratethys), Romania.	21
<i>Baigusheva V., Titov V.</i> Pleistocene large mammal associations of the Sea of Azov and adjacent regions	24
<i>Berto C., Rubinato G.</i> The Upper Pleistocene mammal record from Caverna Degli Orsi (San Dorligo della Valle – Dolina, Trieste, Italy): a faunal complex between Eastern and Western Europe.	28
<i>Bezusko L., Mosyakin S., Bezusko A., Boguckiy A.</i> Palynostratigraphy of the Upper Pleistocene deposits (Riss–Würm interglacial and Early Würm interstadials) in the unique section Kolodiiv–5 (Galych Dnister area, Western Ukraine).	29
<i>Borodin A., Markova E., Zinov'ev E., Strukova T., Fominykh M., Zykov S.V.</i> Quaternary rodent and insect faunas of the Urals and Western Siberia: connection between Europe and Asia	31
<i>Chlachula J., Serikov Yu.</i> Human adaptation to the last glacial environments in the Central Trans-Urals.	33
<i>Coltorti M., Pieruccini P.</i> Unconformity bounded stratigraphic units (UBSU) and their application to Central Italy and Sardinia.	35
<i>Danukalova G., Osipova E., Lefort J.-P., Monnier J.-L.</i> Recent advance in the stratigraphy of the Upper Pleistocene of Northern Brittany (France).	37
<i>Danukalova G., Osipova E., Yakovlev A., Kosintcev P.</i> Palaeoenvironment of the Bronze Age settlement Tanalyk located in the Trans-Urals Region (Russia).	39
<i>Demina O.</i> Paleocological patterns forming of the Lower Don vegetation	40

<i>Deng T.</i> Dispersals of Early Pleistocene large mammals between East Asia and Europe	44
<i>Dikarev V.</i> Problem of Phanagorian regression – comparing archaeological and paleogeographical data.	45
<i>Dobrovolskaya M., Kirillova I., Shidlovskiy F.</i> Stress markers of large mammals and humans. Enviromental influences reconstruction	48
<i>Farboodi M., Khaksar K., Haghighi S.</i> Study of erosion in the Quaternary units of Shiraz Area, Maharlou basin – Zagros mountains (SW Iran).	49
<i>Field M.H.</i> Preliminary results from an investigation of Pleistocene deposits at Happisburgh, Norfolk, UK – evidence of early hominin activity	50
<i>Frolov P.</i> Neopleistocene molluscs from Sinyi Yar locality (Severskii Donets River, Rostov Region, Russia)	52
<i>Gerasimenko N.</i> The Late Pleistocene environmental changes from the Northern Ukraine to the Southern Crimea as evidenced by pollen	53
<i>Golovina L.</i> Coccoliths and associated nannoliths from Maeotian (Taman peninsula).	56
<i>Haghighi S., Khaksar K., Rahmati M.</i> The Quaternary stratigraphy of Iran	58
<i>Inozemtsev S., Tesakov A., Targulian V., Sedov S., Shorkunov I.</i> Development of paleopedogenesis in Early Pleistocene in territory of the Ciscaucasia (Temizhbebsky section, Middle course of the Kuban River)	59
<i>Iosifova Yu., Agadjanian A.</i> Quaternary climatic changes, stratigraphy, and sedimentology of the Don River basin	61
<i>Kachevsky P., Litvinenko V.</i> Some results on Early Paleolithic sites and paleontological localities in the North-Eastern Sea of Azov Region	64
<i>Kalnina L., Strautnieks I., Cerina A., Juskevics V.</i> The Zidini (Cromerian) Complex lake sediment sequence, South-Eastern Latvia	65
<i>Kashibadze V.</i> Evidence from dental anthropology to the history of Eurasian populations.	66
<i>Khaksar K., Farboodi M.</i> Land subsidence problem in the Quaternary strata of Tehran Region-Iran	68
<i>Khaksar K., Haghighi S., Rahmati M.</i> The Quaternary stratigraphy and sedimentology of Tehran, Iran	69
<i>Kirillova I., Shidlovskiy F., Chernova O.</i> New data on woolly rhinoceros (<i>Coelodonta antiquitatis</i> Blumenbach) horns	70
<i>Kleschenkov A.</i> The use of digital elevation model for study of the paleogeography of the Azov Sea Region	72
<i>Kolfshoten T. van, Tesakov A.</i> Biostratigraphy of arvicoline assemblages from the Zuurland (the Netherlands) drilling project	75

<i>Komar M.</i> About location of possible last glaciation European trees refugium	76
<i>Komar M., Łanczont M.</i> Late Magdalenian and Świdry culture archeological objects from Poland in the light of palynological investigation	77
<i>Kosintsev P.</i> Relict mammal species of the Middle Pleistocene in Late Pleistocene fauna of the south of Western Siberia	78
<i>Kosintsev P., Bachura O.</i> Mammal faunas during the Late Pleistocene and Holocene in the Southern Urals	80
<i>Kovaleva G.</i> The reconstruction of hydrological regime and the level of the Azov Sea in the Quaternary by using of diatom analysis	82
<i>Krokhmal' A.</i> Morphogenesis of <i>Allophaiomys</i> teeth – the basis of European Early Pleistocene biostratigraphy	85
<i>Kuznetsov D., Subetto D., Neustrueva I., Sapelko T., Ludikova A., Gerasimenko N., Bakhmutov V., Stolba V., Derevyanko G.</i> Lakes sediments of the Crimean Peninsula and their use in reconstructions of the Black Sea level changes	88
<i>Lefort J.-P., Danukalova G.</i> Stratigraphic evidence for an Aktchagylian to Quaternary deformation developed at a right angle with the Main Southern Urals Chain	90
<i>Leonova N., Nesmeyanov S., Vinogradova E., Voeykova O.</i> The reconstruction of hilly paleolandscapes and Upper Paleolithic subsistence practices and settlement system on the South of the Russian Plane	93
<i>Markova A., Tchepalyga A.</i> The first locality of fossil rodents in the Manych basin (Rostov province)	96
<i>Matishov G., Polshin V., Kovaleva G.</i> The specific features of sedimentation on the shelf of the southern seas (the Sea of Azov being exemplified)	98
<i>Mayhew D.F.</i> West European arvicolid evidence of intercontinental connections during the Early Pleistocene	101
<i>Motuzko A.</i> Discovery of the herd of Late Pleistocene mammoths in Belarus	103
<i>Naidina O., Bauch H.</i> Holocene paleogeographical changes in the Laptev Sea as evidenced by sedimentary and pollen records	106
<i>Nevidomskaya D., Iljina L., Dvadnenko K.</i> Influence of the Bronze age burials on properties of soils of the Lower Don Region	107
<i>Novenko E., Krasnorutskaya K.</i> Vegetation dynamics of the Azov Sea Region in the Late Holocene	109
<i>Orlov N., Cooklin A.</i> Cave bears with pathological bone changes from the Nerubajskoe (Odessa Region, Ukraine)	111
<i>Ovechkina M., Green A., Garlick G.</i> Calcareous nannoplankton from the Holocene off the Eastern Coast of South Africa	113
<i>Palombo M.R.</i> Climate changes and large mammal dispersal during the Quaternary: a Mediterranean perspective	115

<i>Palombo M.R., Giovinazzo C., Rozzi R.</i> The early to Middle Pleistocene Italian bovidae: biochronology and palaeoecology	118
<i>Petrova E.</i> New data about the skull of the <i>Elasmotherium sibiricum</i>	121
<i>Pogodina N., Strukova T.</i> New data on Pliocene vole fauna from Zverinogolovskoye locality (Southern Trans-Urals region)	123
<i>Popova L.</i> History of <i>Spermophilus</i> species, as it has been read through the teeth . . .	125
<i>Rekovets L., Dema L.</i> The faunistic association and evolution of biocoenosis of the periglacial zone of Eurasia in the Late Pleistocene	128
<i>Rudenko O.</i> Vegetation and climate dynamics through late glacial to Middle Holocene derived from Pechora Sea pollen records	130
<i>Sanko A., Kovaleva A., Tsygankova M., Dubman A.</i> Migration of Ponto-Caspian <i>Dreissena polymorpha</i> (Pallas) into Upper Dnieper basin in Pleistocene and Holocene	132
<i>Sato T., Khenzykhenova F.</i> Mammoth fauna of Baikal Siberia: results of contemporary archaeological studies.	134
<i>Schlöffel M., van Hoof L.</i> Geoarchaeological investigations on the landscape history of the Preazovian Plain (Southern Russia) during the Late Holocene	136
<i>Schokker J., Greaves H.J., Bunnik F.P.M.</i> Early Weichselian palaeogeography and palaeoecology of the North-Western Netherlands and correlation to global events	138
<i>Schvyreva A., Maschenko E.</i> Geological age and morphology of <i>Archidiskodon meridionalis</i> from Stavropol Region (Russia).	140
<i>Sedov S., Rusakov A.</i> MIS3 paleosols in Mexico and Northern Central Russia: paleoenvironmental implications from two geographical extremes of interstadial pedogenesis.	143
<i>Sharapov Sh.</i> The Late Cenozoic Hyaenidae (Mammalia, Carnivora) of South-East Middle Asia and their stratigraphical distribution	146
<i>Shchelinsky V., Tesakov A., Titov V.</i> Early Paleolithic sites in the Azov Sea Region: stratigraphic position, stone associations, and new discoveries.	148
<i>Socha P., Nadachowski A., Proskurnyak Yu., Ridush B., Stefaniak K., Vremir M.</i> New data on stratigraphy and fauna of Emine-Bair-Khosar cave, Crimea, Ukraine . . .	150
<i>Sotnikova M.</i> Major biotic events related to the dispersal and evolution of Canidae during the Pliocene and Pleistocene in Eurasia.	153
<i>Sotnikova M., Foronova I.</i> Late–Early–Middle Pleistocene records of <i>Homotherium</i> Fabrini (Felidae, Machairodontinae) from the Asian territory of Russia.	155
<i>Suata Alpaslan F., Dinçarslan .</i> The paleoenvironmental implications of the Eastern Mediterranean: a construction based on rodents	158
<i>Svitoch A.</i> Late Pleistocene history of the Russian shelf of the Caspian Sea.	161

<i>Sycheva S.</i> High-resolution stratigraphy and chronology of Late Pleistocene periglacial zone of the East-European plain.	164
<i>Syromyatnikova E., Danilov I.</i> The review of turtle record from the Quaternary sediments of European Russia and adjacent territories.	166
<i>Tesakov A.</i> New small mammal faunas of Late Pliocene – Early Pleistocene from Northern Caucasus and Lower Don area.	168
<i>Tesakov A., Simakova A., Inozemtsev S., Titov V.</i> Gorkaya Balka: a reference Quaternary section in the North Caucasus (Krasnodar Region, Russia)	169
<i>Tleuberdina P., Nazymbetova G.</i> Distribution of <i>Elasmotherium</i> in Kazakhstan	171
<i>Tong H.</i> Studies on the early steppe mammoth from North China, compared with those from Russia.	174
<i>Tymchenko Yu., Ogienko O.</i> Late Pleistocene – Holocene transformation of diatom assemblages in the Black Sea north-western shelf	175
<i>Tyutkova L.</i> Meizhartyk – Late Pliocene locality of small mammals (North Kazakhstan)	177
<i>Van der Made J.</i> Biogeography and human dispersal into Europe	179
<i>Van der Made J., Torres T., Ortiz J.E., Moreno-Pérez L., Fernández Jalvo Y.</i> The fauna from Azokh: new fossils and new interpretations.	180
<i>Veklych Yu.</i> Quaternary stratigraphical framework of the Zakarpattia Reion of Ukraine	182
<i>Velichko A., Catto N., Tesakov A., Titov V., Morozova T., Semenov V., Timireva S.</i> The structure of Pleistocene loess-paleosol formation in southern Russian Plain based on data from Eastern Azov Sea Region.	184
<i>Velichko A., Pisareva V., Morozova T., Borisova O., Faustova M., Gribchenko Yu., Timireva S., Semenov V., Nechaev V.</i> Correlation of the glacial and periglacial Pleistocene events in Eastern Europe: lines of attack.	188
<i>Voskresenskaya E.</i> Late Pleistocene stratigraphy and stratigraphic setting of the Khotylevo Paleolithic sites (Central East European plain, Desna drainage basin)	192
<i>Westerhoff W., Donders T.</i> The North Sea drilling project: Cenozoic climate and sea level changes on the NW European shelf – a major challenge for science (proposal outlines)	194
<i>Yanina T., Svitoch A.</i> Biostratigraphy of the Caspian Neopleistocene.	196
<i>Yelovicheva Ya.</i> Pleistocene nature events of the Central and Middle-East Europe for the comprehension of their development in the future (by palynological data)	198
List of participants	200
Table of contents	216
Содержание	221