Quaternary International 345 (2014) 1–8

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

Guest Editorial

Caspian–Black Sea–Mediterranean corridors during last 30 ky: Sea level change and human adaptive strategies: Proceedings of IGCP 521, 481 – INQUA 501 Sixth and Seventh Plenary Meetings and field trips

Keywords:
Caspian Sea
Black Sea
Mediterranean
Sea level change
Human adaptive strategies

The Fifth Special Volume of the *Quaternary International* journal is dedicated to the memory of Prof. Dr. Evgeny Larchenkov (1946–2012), a Co-Coordinator of the Working Group 6 "Structural Geology and Active Tectonics." Evgeny was Head of the Department of Physical and Marine Geology at Odessa I. I. Mechnikov National University and Academician of the Ukrainian Engineering Academy of Sciences. He was a high ranking specialist in structural geology, had a forceful personality, was a fine leader, and impressed all as an honest and energetic person with a great sense of humor. His scientific interests were related to the study of historic and genetic conditions of oil and gas development as well as the petroleum potential of the rift sedimentary basins of the Eastern European and Siberian platforms, and the passive continental margins of South America, western Africa, and the western and southern parts of Australia. Within the IGCP 521-INQUA 501 frameworks, he worked on evaluating the role of active tectonics on sea-level change and coastal processes in the Black Sea, the Marmara Gateways, the Aegean Sea, and northern Turkey.

The Fifth Special Volume of the *Quaternary International* journal includes ten contributions to the projects IGCP 521 "Black Sea-Mediterranean Corridor during last 30 ky: Sea level change and human adaptation" (2005–2010) and INQUA 501 "Caspian–Black Sea–Mediterranean Corridor during the last 30 ky: Sea level change and human adaptive strategies" (2005–2011). Most of the papers were discussed at the Sixth and Seventh Plenary Meeting in 2010 and 2011.

Both projects focus on the evolution of the coastal zone, where a rich sedimentary and archaeological archive provides a superb opportunity to study spatial and temporal interactions between human adaptation and environmental change. The main goal of both projects was to bring relevant research groups together to obtain cross-disciplinary and cross-regional correlation of geological, archaeological, and historical records within various settings of the Caspian–Black Sea–Mediterranean Corridor [the "Corridor"] and thereby evaluate the influence of sea-level change and coastline migration on human adaptive strategies during the last 30 ky.

To reach the main goal and objectives, the IGCP 521 – INQUA 501 projects incorporated five dimensions, each addressed by integrating existing data and testing of hypotheses: 1. The geological dimension examined the sedimentary record of vertical sea-level fluctuations and lateral coastline change caused by external (climate change, active tectonics) and internal (mainly coastal sedimentary budget) forces. 2. The paleoenvironmental dimension integrated paleontology, palynology, and sedimentology in order to add new features to the portrait of past landscapes. 3. The archaeological dimension investigated cultural remains. 4. The mathematical dimension dealt with GIS-based mathematical modeling of the human dynamics underlying past/future sea-level change in the "Corridor" that can be meaningfully compared with global sea-level fluctuations. 5. The Geo-information dimension grasps the "big picture" of geological and archaeological events in the "Corridor" over the past 30,000 years. The structure of the project encouraged shared responsibilities to foster effective and efficient management of project activities. The Headquarters and twelve Regional Working Groups (WG) were headed by Regional Coordinators who distributed the tasks among the participants, monitored progress, and submitted their data for integration to the Correlation Committee. As of today, most of abovementioned objectives have been fulfilled (Yanko-Hombach, 2011).

WG1 "Paleontology and Biostratigraphy" established several reference collections of Quaternary benthic foraminifera and mollusks from the Black Sea, Sea of Azov, and Eastern Mediterranean. These collections will allow us to improve the stratigraphic scale for the last 30 ky and to provide correlation of various geological settings within the "Corridor." The collections are stored at the Paleontological Museum of Odessa I. I. Mechnikov National University, Odessa, Ukraine, Institute of Geography of the Russian Academy of Science, Moscow, Russia, and Moscow State University named after M.V. Lomonosov.

WG2 "Palynology" has collaborated with the BIOME 6000 team (the Global Palaeovegetation Mapping subprogram) under the international program IGBP (International Geophysical-Biophysical Program) at Bristol University, and with members of IGCP 480 to compile existing pollen data sets for about 100 sites in the Caspian–Black Sea–Mediterranean Corridor, and to employ a student who will make biomization models for these data at selected time intervals over the past ca. 20,000 years. Through inter-laboratory exchange of technology and students, we have also established a system of standardized marine palynology preparation methods and taxonomy for study of the Black Sea corridor sediments and the palynomorphs to allow future interpretations to be based on

http://dx.doi.org/10.1016/j.quaint.2014.07.068

the same types of assemblages using updated nomenclature. Over the past 5 years, WG2 has produced more than 15 papers on regional palynology in scientific journals (e.g., Mudie et al., 2007, 2010, 2011, 2014; Cordova et al., 2009; Yanko-Hombach et al., 2014), and Carlos Cordova has published one book, *Millennial Landscape Change in Jordan: Geoarchaeology and Cultural Ecology* (Cordova, 2007). The group developed a research protocol for the Eastern Mediterranean-Black Sea-Caspian Biomes (EMBSeCBIO) and created a pollen and dinoflagellate WG3 "Geophysics and Sequence Stratigraphy" (Team of Prof. Aksu) contributed new high-resolution data from the southwestern Black Sea that show (1) the reconnection of the Mediterranean and Black Seas before 8.6 ka BP, (2) the absence of catastrophic flooding at any time during the Holocene, and (3) the presence of brackish to slightly saline water in the Black Sea during the Holocene (Flood et al., 2008; Hiscott et al., 2007a, b; 2009). The Team of Dr. Lericolais proposed that the level of the Black Sea was linked to regional climate modifications rather than to global eustatic changes. During the LGM, the Black Sea was an enclosed lake, its surface −120 m below present sea level. Deglaciation raised the lake level to −30 m, and then again to −100 m between 11 and 8.5 ka BP followed by rapid transgression starting just after 8.5 ka BP (Lericolais et al., 2007, 2011).

WG4 "Sedimentology and Mineralogy" developed a high-resolution geological model of sedimentation on the NW Black Sea shelf (Larchenkov and Kadurin, 2011) that reveals significant periodicities of sedimentation related to sea-level change and hydrodynamic activity (Konikov, 2007; Martin and Yanko-Hombach, 2011).

WG5 "Geochemistry" developed a new approach to investigating amino acid racemization and AMS radiocarbon dating of Holocene Black Sea core sediments that aimed to utilize the amino acid racemization (AAR) geochronological technique to date a number of shells in Holocene cores from the Black Sea, and explore the possible extent of time-averaging in Black Sea sediments (Nicholas et al., 2011).

WG6 "Structural Geology and Active Tectonics" evaluated the role of active tectonics on sea-level change and coastal processes in the Black Sea, the Marmara Gateway, the Aegean Sea, northern Turkey, and the northwestern part of the Black Sea (Koral, 2007; Yilmaz, 2007).

WG7 "Geomorphology" developed the Black Sea level curve in radiocarbon and calendar time scales for the last 12 kyr (Balabanov, 2007a, b, 2009). While some authors (Martin and Yanko-Hombach, 2011) agreed that despite its possible drawbacks, the synoptic curve of Balabanov appears to reflect relatively subtle eustatic sea-level change related to hemispheric—and perhaps even global—climatic phenomena, some others (Brückner et al., 2010) have insisted that tectonic signals often override the eustatic ones, and as such, establishing a local sea-level curve is the only reliable option.

WG8 "Paleoceanography and Paleoclimatology" described paleoceanographic evolution in terms of paleotemperature, paleosalinities, paleoproductivity, circulation patterns, and efficiency of the Manych (Chepalyga, 2007; Svitoch et al., 2010) and Marmara Gateways (Hiscott et al., 2007a) for given time intervals. They also traced the evolution of water masses in space and time, identified their possible sources, and reconstructed vegetation and climate dynamics in the "Corridor" since the LGM (Cordova et al., 2009).

WG9 "Archaeology" developed an interdisciplinary model of ecological crisis dynamics for the NW Black Sea coast and adaptive reaction of ancient people to changeable environmental conditions at the Late Pleistocene–Holocene boundary, provided quantitative assessment of the impact of environmental changes on the spread of early farming in the northern Black Sea area, and investigated the Lower Volga in order to reconstruct Late Pleistocene and Holocene paleoenvironment and geochronology of Mesolithic-Early Neolithic settlements (Dolukhanov et al., 2009a, b). The group also provided in-depth study of transmigrations as a mechanism of living space exploration in the Northwestern Black Sea region at the Pleistocene-Holocene boundary (Smyntyna, 2007; Stanko, 2007; Yanko-Hombach et al., 2011a, b), investigated the interrelation between sea-level change and human adaptive strategies (Dolukhanov and Shilik, 2007; Yanko-Hombach et al., 2007a), and studied the cultural sequences, the emergence of food-producing village economies in SE Europe, and the collection of various rocks that have been used in the prehistory of the Southern Marmara (Özdoğan, 2007).

WG10 "Radiocarbon Chronology" established a data set on radiocarbon assays obtained in eastern (Balabanov, 2007b, 2009) and western laboratories (Yanko-Hombach, 2007).

WG11 "GIS-aided Mathematical Modeling" developed several mathematical models of: (1) the Late Pleistocene and Holocene transgressions of the Black Sea (Esin et al., 2010) that describe the process by which the Black Sea basin filled with freshwater flowed into it. The model takes into consideration the temporal changes of freshwater balance, rate of uplift of the strait's bottom, and geometry of the strait channel. This model is self-sufficient, explains all processes from the melting of the glaciers by physical laws and does not demand the application of any additional hypotheses (contact person Dr. N. Esin ovos_oos@mail.ru); (2) the extreme Black Sea and Caspian Sea levels of the past 21,000 years with general circulation models (Kislov and Toropov, 2011); and (3) the transition from the Mesolithic to the Neolithic, from about 7000 to 4000 BC in Europe (Davison et al., 2006).

WG12 "Geoinformation System" created the interactive website http://black.sealevel.ca. Its GIS-aided Web-database and science informatics permit the creation of a "big picture" of the influence of climate, sea-level change, and coastline migration on human adaptive strategies in the "Corridor" (Wallace, 2010).

The outcome of the projects is present in three books (Yanko-Hombach et al., 2007b; Dolukhanov et al., 2009b; Buynevich et al., 2011), seven peer-reviewed volumes of extended abstracts (Yanko-Hombach et al., 2005a, 2006a, 2007c; Gilbert and Yanko-Hombach, 2008, 2009, 2010, 2011), seven field trip guides (Yanko-Hombach et al., 2005b, 2006b, 2007d; Poenaru and Briecag, 2008; Helvaci et al., 2009; Sakellariou and Lukosis, 2010; Smyntyna et al., 2011), five (including present one) special volumes of Quaternary International (Yanko-Hombach and Yilmaz, 2007; Yanko-Hombach and Smyntyna, 2009; Yanko-Hombach et al., 2010, 2012; Yanko-Hombach, 2014) and few hundreds of articles in various journals and chapters in books (for example, Yanko-Hombach et al., 2011a).

The Field Trips carried out after the Plenary Meetings have allowed participants to visit under the guidance of local experts many relevant sites in the "Corridor" that would otherwise have been very difficult to see, and discuss important scientific issues about these sites with colleagues. The meetings and field trips were carried out in Istanbul, Turkey (2005), Odessa, Ukraine (2006, 2011), Gelendzik, Russia–Kerch, Ukraine (2007), Varna, Bulgaria–Bucharest, Romania (2008), Çanakkale–Izmir, Turkey (2009), and Rhodes, Greece (2010) (Fig. 1).

All together, they covered the coastal zone of the western and northern Black Sea from Varna to Gelendzhik (Yanko-Hombach and Smyntyna, 2009; Yanko-Hombach et al., 2010, 2012), the Marmara Sea (Yanko-Hombach and Yilmaz, 2007) and part of the Eastern Mediterranean (Helvaci et al., 2009; Sakellariou and Lukosis, 2010) as a single geographic unit bypassing language and political boundaries and encouraging East–West dialogue.