INTEGRATING ARCHEOLOGICAL AND GEOMORPHOLOGICAL DATA TO EVALUATE THE LATE HOLOCENE EVOLUTION OF THE KARTALINI BASIN (GEORGIA)

Stefano Furlani¹, Alberto Stinghen², Luca Bertoldi³, Elisabetta Boaretto³, Aldino Bondesan¹, David Kuparadze⁴, Matteo Massironi², Giovanni Monegato⁵ & Elena Rova⁸
¹Dipartimento di Geografia “G. Morandini”, Università degli Studi di Padova, Italy
²Dipartimento di Geoscienze, Università degli Studi di Padova, Italy
³Helen Kimmel Center for Archaeological Science, Israel
⁴Caucasian Institute of Mineral Resources, Tbilisi, Georgia
⁵Dipartimento di Scienze dell’Antichità e del Vicino Oriente, Università Ca’ Foscari, Venezia, Italy

Corresponding author: S. Furlani <sfurlani73@gmail.com>

ABSTRACT: Furlani S. et al., Integrating archaeological and geomorphological data to evaluate the late-Holocene behaviour of the Kartalini Basin (Georgia). (IT ISSN 0349-3356, 2011)

A multidisciplinary approach has been used to evaluate the Late-Holocene modifications of the Kartalini basin (Georgia). Data from satellite images (Corona, Landsat, Russian aerial images, etc) and field surveying allowed to reconstruct the neotectonics in the area of Aradetis Orgora archaeological site.

1. THE STUDY AREA

The study area is located in the Shida Kartli Region, a hundred kilometres West from Tbilisi. The Kura River crossed the area following a NNW-SSE direction, while the Lakhvi River represents an important tributary, which flows into the Kura near the modern city of Gori. The site of Aradetis Orgora-Dedopolis Gora is located at the junction of a system of rivers (Kura, Western Prone, Eastern Prone). In particular, Aradetis Orgora lies on an isolated portion of the fluvial terrace (660 m a.s.l.), about 20 meters above the recent Kura floodplain (640 m a.s.l.). The site hosted an important settlement Roman/Medieval in age, which was excavated by Georgian archaeologists under the direction of prof. Julon Gagoshidze (FÜRTWÄNGLER et al., 2008). The Classical Antiquity occupational levels are underlain by a long sequence of earlier levels, which date back at least to the late 4th millennium BC, and are still virtually unexplored.

2. THE ARCHAEOLOGICAL SITE OF ARADETIS ORGORA

The stratigraphic analysis was carried out on an exposed section on the southern sector of the terrace slope, where the archaeological levels are superimposed to an alluvial stratigraphy related to the Kura River and its tributaries. Starting from the base, three main archaeological levels have been identified (Fig. 2):

1) An Early Bronze Age level characterized by a sequence of layers with abundant pottery and ceramics fragments of the Kura-Araxes and Bedeni periods (late 4th-mid 3rd millennium BC) in a muddy matrix. Radiocarbon dating of a wood
fragment from the base of the sequence yielded the age of the layer (±1σ 3025-2920 BC.). The level had been buried by a coarse alluvial event characterized by 1.5 m thick gravel body;
2) a Late Bronze Age layer characterized by muddy matrix with abundant pottery fragments;
3) a Roman Age and later layer at the topmost part of the site, characterized by abundant pottery and brick fragments.

The presence of alluvial deposits between the two Bronze Age levels indicates a channel fluvial activity on the terrace after 4300 BP.

We suggest two possible hypothesis about the drainage evolution:
a) The gravel layer covering the Early Bronze Age could represent the last phase of aggradation of

---

Fig. 1 The study area / L’area di studio

---

Fig. 1 The Aradetis Orgora archaeological site / Il sito archeologico di Aradetis Orgora
the Liakhvi alluvial fan and its progradation toward south. Subsequently the deepening of the Kura riverbed and its northward migration triggered the small incisions of the trenches surrounding the site. The Roman Age site was probably chosen for the isolated position derived from the geomorphological evolution of the terrace. According to the present difference in elevation between the Liakhvi alluvial surface and the present Kura riverbed, the estimated total erosion is about 5 mm/year, that is the result of a joined effect between river incision and active uplift of the area.

b) The gravel layer may be ascribed to a palaeo-Kura (present Western Prone River) running waters. After about 4000 BP, the Kura was forced to migrate toward south because of an active uplift of the Transcaucasian region. In this case, most of the 20 metres in the elevation difference between palaeo and present Kura should be related to tectonic activity.

The importance of tectonic activity in the area is furthermore supported by the high seismicity of the Transcaucasian Basin (PHILIP et al., 1989; TRIEP et al., 1995) and the low fluvial erosion expected in a time span in which no great climatic changes occurred. Local uplift within the basin possibly related to a contractional step-over along the Borjomi-Kazbegi fault zone or the southern propagation of the Greater Caucasus belt.

ACKNOWLEDGEMENTS

We are kindly grateful to Mindia Jalabadze (Georgian National Museum), who accompanied us on the site during the 2009 season. The field survey in the Aradetis Orgora area took place in the framework of the “Georgian-Italian Shida Kartli Archaeological Project” (ROVA, 2008) of Ca’ Foscari University of Venice. This was funded by Ca’ Foscari University, Ministero degli Affari Esteri, and the Shelby White-Leon Levy Program for Archaeological Publications.

REFERENCES


Ms. received: January 15, 2011
Testo ricevuto il 15 gennaio 2011