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Early-Middle Holocene archaeological periodization and environmental changes in the Eastern Gulf of Finland: Interpretative correlation

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ABSTRACT

An analysis of correlation between cultural and environmental changes in the eastern part of the Gulf of Finland region during the Early and Middle Holocene was performed basing on 42 reference archaeological contexts from 35 sites, including six multilayer sites. Three main cultural-chronological units were defined basing on material culture, communication systems, settlement patterns and subsistence strategies of the ancient population - Early and Late Mesolithic and Early Pottery period. Cultural changes can be related with global and regional environmental events - "9300 cal. BP event" and the final stage of the Litorina transgression.

1. Introduction

Understanding of driving forces of development of human (prehistoric) societies can be considered as one of the major purposes of cultural anthropology as well as of (palaeo)geography. Archaeological research provide information on social and cultural processes in the past, far not such detailed as what can be obtained through historical, ethnological and sociological studies, but in much larger chronological perspective. Specifics of archaeological data allow tracing changes in material culture, which could be provoked by different factors (e.g. Birks et al., 2015). Modelling of socio-cultural processes in the past requires taking in account environmental conditions and changes which affected prehistoric societies (e.g. Crombé et al., 2015; Uchiyama, 2016; Djindjian, 2016).

This article presents an analysis of correlation between cultural and environmental changes in the eastern part of the Gulf of Finland region (EGF) during the Early and Middle Holocene (Figs. 1 and 2). Discussing territory has about hundred and fifty years long history of archaeological (Indreko, 1948a; Gurina, 1961, 1967; Jaanits, 1965; Timofeev, 1993; Siiriainen, 1982; Timofeev et al., 2004) and palaeogeographical (Yakovlev, 1926; Ramsey, 1927; Markov, 1931; Hyyppä, 1937; Hyvärinen et al., 1988) studies. Generally non-contradictive model of post-glacial geological and environmental development of the region was created due to several generations of scientists. Also several precise models of Baltic oscillations were suggested in the last decades for different areas of EGF (Miettinen, 2002; Sandgren et al., 2004; Miettinen et al., 2007; Rosentau et al., 2013). Those models are generally coherent, even if show some differences (Fig. 2).

Quite a large amount of revealed Stone Age sites allows to define main cultural and chronological units which existed in the region during the Early and Middle Holocene. But only in the last decades representative materials for Early and Late Mesolithic periods were obtained in EGF due to systematic archaeological investigations. Excavations (including small-scale excavations) and interdisciplinary studies were conducted at c. 40 sites with archaeological contexts of different age (Table 1). Those objects can be considered as reference sites for developing of local chronology and make basis for correlation of local archaeological periodization at regional and inter-regional levels.

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2. Regional and chronological setting

Discussing territory (Fig. 1) includes south-eastern coast of the Gulf of Finland, Karelian Isthmus that locates between the Gulf of Finland and the Ladoga Lake, the largest fresh water body in Europe, and the Northern Ladoga shore. Salpausselkä end moraine at the Russian-Finnish border that divides two remarkably different geographical areas is considered as a northern limit. The designated area is in focus of this study because due to its geographical position during the Holocene time it was very sensitive to shoreline displacement of large water bodies. Topographical position and stratigraphy of Stone Age sites in EGF provide very good markers for chronological correlation of archaeological contexts independently from direct ^{14}C dating. This allows to improve regional palaeogeographical models as well. The neighbouring territories - Eastern Baltic, Southern Finland, Karelia (Fig. 1) - were culturally developing generally the same way, and with the same environmental circumstances.

After deglaciation EGF was affected by combination of two main geological factors: oscillations of the Ancient Baltic reservoir and isostatic land uplift with gradient growing from south-east to north-west (Miettinen, 2004). The last provoked several essential rearrangements of the regional hydrological system. Those factors determined environmental processes in the whole EGF, but have become apparent differently in different parts of the region depending on their geological and geographical peculiarities. Differences in subsurface geology, geographical locations and development of coastal formations caused appearance of different landscapes within the region. But nevertheless environmental changes in this territory were going synchronously.

Coastal system of lagoons, sand bars and spits prevails in the southern part of the Gulf of Finland (e.g. Saarse et al., 2009; Rosentau et al., 2013; Ryabchuk et al., 2016). Those formations start from the southern part of Karelian Isthmus and continue west far over the focused area along the Baltic coast. There are no lagoons in the northern part of the Gulf of Finland, but there are large archipelagos and deep sounds. Also prior to the river Neva breakthrough (c. 3200 cal. BP) the Ladoga reservoir was connected with the Baltic sea by the Heinijoki strait in the northern part of Karelian Isthmus (Saarnisto, 2008; Nordqvist et al., 2009). The last represented a huge area of channels and islands.

EGF was mainly deglaciated between 13,300–12,300 cal. BP (Kalm, 2006). After that large territories were covered by the ice-dammed Baltic Ice Lake. After the Billingen breakthrough about 11,700 cal. BP a short-term stage of the brackish Yoldia Sea occurred (Andrén et al., 2011). About 11,000 cal. BP the Baltic reservoir was again separated from the ocean by the continuing isostatic uplift, then the fresh-water Ancylus Lake stage began. Continuation of the threshold uplift caused the Ancylus transgression (Saarnisto et al., 1999; Subetto et al., 2002, 2003; Wohlfarth et al., 2007; Andrén et al., 2011; Rosentau et al., 2013). After 10,200 cal. BP the Danish Straits appeared, then the water level gradually decreased till approximately 9200 cal. BP (Björck, 2008). Within the interval of 9200–8800 cal. BP the level of the Ancylus Lake became equal to the ocean, and the Litorina Sea stage began. The Litorina Sea transgression is mainly dated in the Gulf of Finland region (Fig. 2) within the period of 8400–5100 cal. BP; and the maximum was reached between 7500 and 6800 cal. BP. (Hyvärinen, 1999; Miettinen, 2002; Sandgren et al., 2004; Miettinen et al., 2007; Rosentau et al., 2013).

The earliest archaeological contexts in the eastern part of the Baltic region are dated back to 11,000 cal. BP, to the time of Yoldia/Ancylus transition (Pesonen et al., 2014). For EGF the earliest date (10,700 cal. BP) came from Saarenoja 2 site (Jussila et al., 2012). This is the lower chronological limit of this study, which follows cultural and environmental changes in EGF till spreading of the earliest pottery making traditions in the region, so the upper chronological limit is established about 6000 cal. BP.

Essential peculiarity of EGF is absence of local flint. The nearest sources of high quality flint are cretaceous outcrops in the territory of Belorussia, moraine deposits with flint nodules in Southern Lithuania and carboniferous limestone outcrops in the Upper Volga region in Russia (Kovnurko, 1963; Zhilin, 1997; Baltrūnas et al., 2006). Also Silurian limestone outcrops and moraine deposits

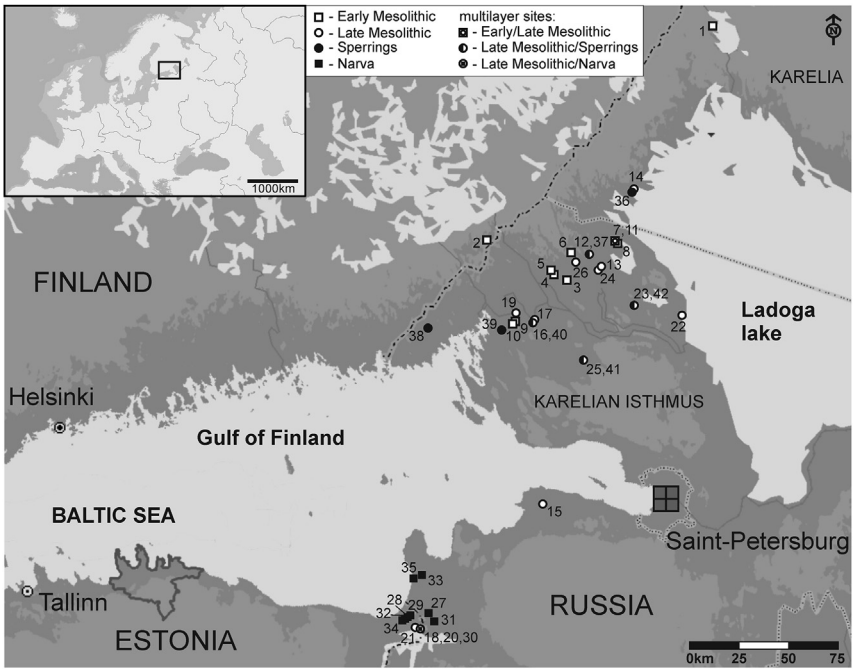

Fig. 1. Map of the Eastern Gulf of Finland and the reference Early and Middle Holocene archaeological sites. Numbers refer to Table 1.

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