

# Argonauts Programme, final report

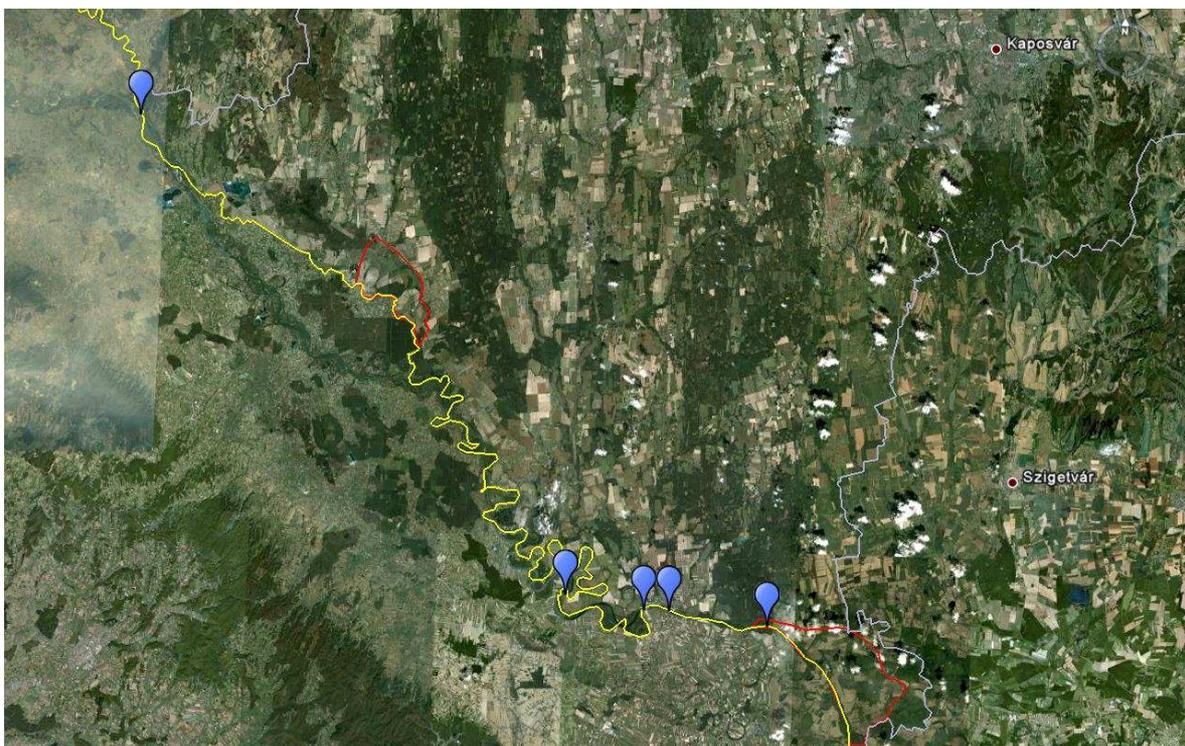
## *Summary of activities*

The Argonauts Programme is an interdisciplinary research project of the Drava River valley. Its aim is to collect information on the relationship between the river, the floodplain and its inhabitants during archaeological periods. We documented the changes of the river environment and settlement patterns which probably relates to different river strategies.

In the framework of the programme we organised archaeological field surveys on two sample-areas. We mapped the position of ca. 100 sites, dated from the Neolithic period to early modern times (Ottoman conquest). Most of the sites are new discoveries, due to the fact that the sample areas were white spots on the archaeological maps.

Parallel to field activity we reviewed manuscript maps and written sources related to the Drava plain. To identify the changes of the riverbed we collected aerial photos and built a 3D terrain model of the research area. On these documents the paleo-channels are clearly identifiable. We vectorised and geo-referred the two most complete manuscript map of the region: the so-called 1<sup>st</sup> and 2<sup>nd</sup> military cartography, dated to the late 18<sup>th</sup> and mid-19<sup>th</sup> c. This process allowed us to identify the observable geomorphologic features with the 18<sup>th</sup> and 19<sup>th</sup> c. situation.

These works helped to plan the geological field survey, carried out in 2010 winter. We collected (drilled) core samples from 5 different paleo-channels, which dates from different periods from the Ice Age to the 18<sup>th</sup> c. Our British partners from the Aberystwyth University (prof. J. Lewin and prof. M. Macklin) carried out sedimentological, geomorphologic, geochemical and geochronologic (C14) analyses to establish the Holocene river histories.



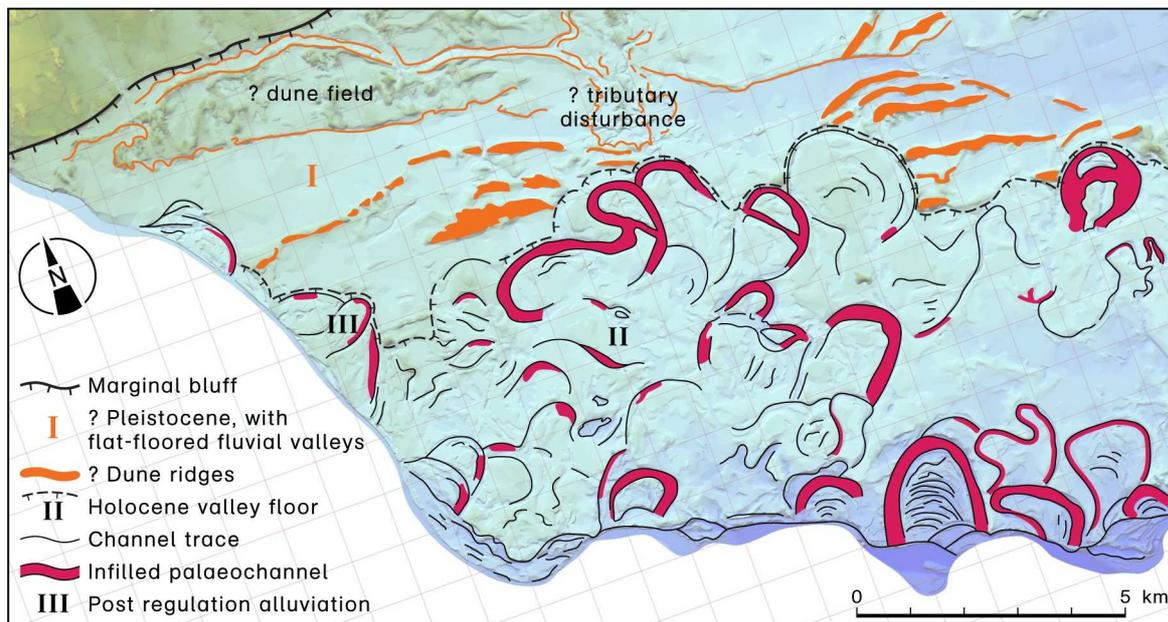
Research activity: blue – underwater survey, red line – 1<sup>st</sup> and 2<sup>nd</sup> field surveys

The archaeological information was transferred to the National Office of Cultural Heritage, where the sites are registered into the national archaeological information system. We started a new homepage for the programme: [www.argonauts.hu](http://www.argonauts.hu), where project information, documents (including articles) are available for the public. We also published a database of archaeological sites (including cartography) which is available for partner experts after registration (information related to archaeological sites is sensible due to treasure hunters).

## Scientific achievements

We documented 142 archaeological sites on the Drava floodplain and on the high-bank bordering it on the North. According to our preliminary work hypothesis these sites situate in “chains” on the bank of former river beds (today wet or dry depressions). The geomorphologic study and the evidences from 3D terrain model and aerial photos showed, that contrary to our hypothesis the observed river channels along the sites were mostly inactive wetlands when the settlements founded along them.

Geological survey detected traces of different horizons of river activity. At the end of the Ice Age a wide and abundant (linear) Drava valley is observable, later, in Early Holocene the energy of the river decreased and formation of large meanders begun. In historical period evolution of meanders continued, the diameter of the meanders become narrower. Sand ridges, which are the places of modern (and late medieval) settlements formed by the end of the Ice Age. Geological analysis showed that the main features of the landscape formed before the settling of agricultural communities. The evolution of meanders however was active, and intensity and level of floods changed in time.



3D terrain model of the 2<sup>nd</sup> sample area with the representation of main periods of floodplain formation

The presence of the different periods is unbalanced. Most of the sites are multi-period, which could be caused by the similar geographical preference of different cultures. The Arpadian period (11<sup>th</sup>-13<sup>th</sup> c.) is the most frequently identified in archaeological material (80% of the sites contains Arpadian material). We found correlation between surface finds and alluvial iron occurrences. On a large number of Arpadian sites we found iron slag, sometimes furnace

fragments on the edge of the settlement, close to wet depressions (former riverbeds), which are the natural sources of alluvial iron. These sites are often just 0.5-1 m higher than the surrounding floodplain, and the settlement size is smaller than a ripe-medieval village. We documented the same pattern in the case of our two sample areas (Somogyudvarhely-Berzence and Drávatamási-Szentborbás area).



Arpadian settlement is contoured by a dark surface near Tótújfalu

Medieval sources mention forests (oak) and lakes/*piscinae* on the floodplain, especially in relation of Csurgó and in the environment of Berzence and Somogyudvarhely. The large number of wet riverbed depressions could be used as *piscinae* (similar fishing system was documented by B. Andrásfalvi in the case of the Danube, in Tolna county during 18<sup>th</sup>-19<sup>th</sup> c., and he found evidences for earlier use of the so called “*fok*” system). The use of alluvial iron is a new feature in the use of the wetlands. The extensive forests in the environment (described in the 17<sup>th</sup> c. by a Turkish traveller Evliya Celebi, mentioned in a number of early 18<sup>th</sup> c. “*urbaria*”, and depicted on 18<sup>th</sup> c. maps) could furnish iron smelting with wood.

Evidences show us that Arpadian period inhabitants used the whole floodplain and exploited its resources. From the late medieval period archaeological sites disappeared, and concentrates on higher dunes, and on the edge of the high-bank of the floodplain. Taking into consideration that in many medieval charters from 1330’ and 1340’s floods (sometimes multiple flooding during the same year) are mentioned, and in May 1346 a non-suspected flood is documented east of our research area (Egyházasharaszti, Lúzsok, Vajszló, Hirics) we can suggest some change in the environment. In other parts of the continent this is the beginning of the Little Ice Age with more rain, more floods. The sensible balance of the Arpadian era between nature and the floodplain strategy of the inhabitants could be broken. The frequency and the intensity of floods could force the inhabitants to settle on higher levels.

We collected geological samples and scanned it to observe micro-layers of floods and other river events. Organic samples from different layers could be collected. The C14 data is not arrived yet, but this information (dating of large floods and the frequency of floods) will be a strong argument for the described hypothesis.

Underwater survey was carried out at the confluence of the Drava and the Mura, at Barcs and in a 10 km long section at Drávatamási. We found two logboat sites out of the known concentration at Drávatamási (near Barcs). A large, almost intact modern wooden wreck was found at Barcs. The cultural and the scientific value of the last site is important unless it’s recent age, because this ship is the only survived comparative material for modern wooden shipbuilding in the Drava valley!



The modern wreck at Barcs (built ca. 1840-60)

We mapped the Drávatamási logboat site, and the number of logboats raised to 34. The most important result is the dendrochronological dating of the boats. We collected a large number of wooden samples from logboats, timbers and natural trees brought by the river. We found, that the boats are dated from the same period. Fortunately it was possible to link the tree-ring sequence to the Slovenian chronology, and the date strengthened our previous hypothesis, that the site is the remain of a Turkish pontoon-bridge destroyed in 1603 by a Hungarian raid. Some human remains (including a skull) were collected. The site was in use later in history as documented by some 18<sup>th</sup> and 19<sup>th</sup> c. material (hemp washing place as modern name describes).



Late 17<sup>th</sup>-early 18<sup>th</sup> c. jug at Drávatamási

Wooden planks from a plank-built wreck were also found, with a special use of iron nails and sintels. A repaired logboat at the Drávatamási site shows some similarities with the early 17<sup>th</sup> c. wrecks of Solt (Danube). These evidences will be important in the study of early modern shipbuilding of the middle Danube Basin, principally when we will have more material from other rivers.

## ***Impacts***

Due to the Grant we could organise an interdisciplinary international research group which will work together after the finalisation of the project. We tried out methods, analyses we could not use earlier. The Argonauts Programme become a best practice pilot for river archaeological researches.

Preliminary results were published through conferences, scientific studies and articles, divulgare articles (see in bibliography). The collected data however will furnish studies in the next five years due to the richness and complexity of collected information. To maintain the achievements of the Programme we formed the Argonauts Research Group, an NGO organisation.

The planning of rehabilitation of Drava River branches started parallel to the second part of our research. We could use the collected data to advice the rehabilitation project (dredging) to avoid loss of archaeological heritage, and saving public money.

Two underwater sites are included in the preliminary nomination for UNESCO World Heritage title of the Roman Danube Limes in Hungary (not included in the reported project). During the preparation of the World Heritage project underwater heritage was not in the focus, but due to our achievements in the Argonauts Programme the potential of underwater sites were taken into consideration.

Hungary is working on the ratification process of the UNESCO 2001 “Convention on the protection of underwater cultural heritage”. The Argonauts Programme focused light on the importance of underwater heritage, and show, that even though Hungary has no seashore, we have important underwater heritage. During the preparation of the process governmental authorities referred to the Argonauts Programme as an important argument for the ratification.

## ***Publications in edition or in press***

(Other publications were uploaded on OTKA system)

Zatykó, Csilla: Fishponds as places for food storage in medieval Hungary In: *Ruralia VIII: Processing, Storage, Distribution of Food – Food in the Medieval Rural Environment* (ed.: Jan Klapšte) Brepols 2011, 57-75.

Tóth J. Attila – Macklin, Mark – Lewin, John: Complex interdisciplinary survey on the Drava River floodplain, Hungary Abstract sent to *Journal of Archaeological Science*

Tóth J. Attila – Dumont, Annie: River archaeological investigations in France and Hungary: comparing sites and methods. Abstract sent to *Archaeologisches Korrespondenzblatt*

Tóth J. Attila: Folyami régészet. *Természet Világa* 2011, in press (River Archaeology)

Tóth J. Attila: Folyami örökség – mi lesz a hazai víz alatti lelőhelyekkel? *MúzeumCafé* 2011 április-május (River heritage- what is the future of our underwater sites?)