

NEW INSIGHTS ON THE ROLE OF ENVIRONMENTAL DYNAMICS SHAPING SOUTHERN MESOPOTAMIA: FROM THE PRE-UBAID TO THE EARLY ISLAMIC PERIOD

By MARK ALTAWHEEL, ANKE MARSH, JAAFAR JOTHERI, CARRIE HRITZ, DOMINIK FLEITMANN, STEPHANIE ROST, STEPHEN F. LINTNER, MCGUIRE GIBSON, MATTHEW BOSOMWORTH, MATTHEW JACOBSON, EDUARDO GARZANTI, MARA LIMONTA AND GIUDITTA RADEFF

Recent fieldwork and archival sedimentary materials from southern Iraq have revealed new insights into the environment that shaped southern Mesopotamia from the pre-Ubaid (early Holocene) until the early Islamic period. These data have been combined with northern Iraqi speleothem, or stalagmite, data that have revealed relevant palaeoclimate information. The new results are investigated in light of textual sources and satellite remote sensing work. It is evident that areas south of Baghdad, and to the region of Uruk, were already potentially habitable between the eleventh and early eighth millennia B.C., suggesting there were settlements in southern Iraq prior to the Ubaid. Date palms, the earliest recorded for Iraq, are evident before 10,000 B.C., and oak trees are evident south of Baghdad in the early Holocene but disappeared after the mid-sixth millennium B.C. New climate results suggest increased aridity after the end of the fourth millennium B.C. For the third millennium B.C. to first millennium A.D., a negative relationship between grain and date palm cultivation in Nippur is evident, suggesting shifting cultivation emphasising one of these crops at any given time in parts of the city. The Shatt en-Nil was also likely used as a channel for most of Nippur's historical occupation from the third millennium B.C. to the first millennium A.D. In the early to mid-first millennium A.D., around the time of the Sasanian period, a major increase in irrigation is evident in plant remains, likely reflecting large-scale irrigation expansion in the Nippur region. The first millennium B.C. to first millennium A.D. reflects a relatively dry period with periodic increased rainfall. Sedimentary results suggest the Nahrawan, prior to it becoming a well-known canal, formed an ancient branch of the Tigris, while the region just south of Baghdad, around Dalmaj, was near or part of an ancient confluence of the Tigris and Euphrates.

Keywords: southern Mesopotamia, Nippur, Uruk, environment, palaeochannels, climate, speleothems, phytoliths, sediments, date palm, oak

Introduction

New fieldwork focusing on the paleoenvironment and past channel systems was carried out during 2016–2017 in southern Iraq. This work focused on gaining a better understanding of long-term palaeochannel and environmental development during prehistoric and historic periods. Boreholes were drilled in the Dalmaj and Nahrawan regions south of Baghdad (Fig. 1) in order to obtain sedimentary samples for analyses.¹ The new samples were combined with previously recovered sediments from Nippur's ancient channel (Shatt en-Nil) that ran through the city and with sediments recovered from a borehole near Uruk. Sediments were analysed for their structure, petrography, mineralogy, and microfossil remains, with phytoliths being a particular focus, and absolute dates were obtained using Accelerator Mass Spectrometry (AMS) methods where possible. New results also include palaeoclimate proxy data obtained from a speleothem (stalagmite) sample from Shalaih cave in the Kurdistan region of Iraq, dated using Uranium-Thorium dating. These combined data provide a long-term, environmental and hydrologic history in southern Mesopotamia that can now be juxtaposed to archaeological and historical data. Results provide insights into the plant ecology and human-environmental interactions that shaped southern Mesopotamia in different millennia.

In this article, we summarize the new results while also focusing on particular periods and instances where novel insights are gained. Up to this point, much of southern Mesopotamia's

¹ Borings in a third area, the Sawa Lake south of Najaf, were not productive due to extremely high salt content.