

Multi-isotope evidence for cattle droving at Roman Worcester

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ABSTRACT

Tooth enamel from six cattle mandibles excavated from Roman deposits at The Hive development site, Worcester (mid-2nd to early 4th century AD) was subjected to strontium, oxygen and carbon isotope analyses ($^{87}\text{Sr}/^{86}\text{Sr}$, $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$) to investigate the movement of cattle into Worcester, a purported regional cattle market, during the Roman period. Strontium isotope ratios show that none of the cattle were born and bred in close proximity to Worcester and arrived as mature beasts some time before death. Whilst two are consistent with origins in the region of Old Red Sandstone of Herefordshire to the west, the unusually high strontium isotope ratios of four of the cattle (i.e. > 0.714) show that they originated in a region of ancient or radiogenic rocks such as granites which are found only in the west and north of Britain (e.g. Wales, the Lake District and northern Scotland) based on the currently available biosphere data. Comparison of the oxygen and carbon isotope values also suggests that the cattle were not from the same herd, but interpretation is complicated by the lack of comparative cattle data for the Roman period as well as other time periods. The severe wear of the molars from the aged cattle in this study also limits the interpretation of the results. More isotopic analyses are needed from other British sites in order to fully understand the implications of cattle movement into urban centres during the Roman period.

1. Introduction

The primary aim of the study was to improve understanding of Roman cattle droving and the potential status of Roman Worcester as a cattle market by investigating the origins and movement of cattle to Worcester in the Roman period based on bone recovered from The Hive development site (specifically the mid-2nd to early 4th century AD). To achieve this, tooth enamel from six cattle mandibles was subjected to strontium, oxygen and carbon isotope analysis ($^{87}\text{Sr}/^{86}\text{Sr}$, $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$). Strontium and oxygen isotope analysis have the potential to determine whether the cattle were of local or non-local origin, whereas carbon isotope analysis can inform on diet and the environment in which the cattle were living during tooth formation.

1.1. Archaeological context

1.1.1. Overview

Worcester (Fig. 1), the county town of Worcestershire, UK, is mainly situated to the east of the River Severn. The core of the city sits on sand and gravel deposits of the Second (Worcester) Terrace and overlies the

Mercia Mudstone geology formation, a series of sandstone, siltstones and mudstones of Triassic age (Dalwood and Currie, 2004; Fig. 2). Roman settlement at Worcester has long been recognised, with Roman finds recorded in the 17th, 18th and 19th centuries, but it was not until widespread redevelopment in the post-war period that the archaeological evidence began to be revealed with regularity.

It is possible that the Roman ‘small town’ developed as an urbanisation of a pre-existing Iron Age centre of occupation, perhaps a defended enclosure; rescue excavations at Lich Street in the centre of the city identified a large ditch, which may have defined a settlement area, dated to the Iron Age (Barker, 1969). Cunliffe (1991) has previously proposed that this may have taken the form of a political centre for the Dobunni tribe, though this hypothesis has not been revisited. Support for the Iron Age origins of the Roman town has more recently been revealed beneath the site of the Norman castle, close to the Cathedral, with the important discovery of a palisaded rampart scientifically dated to the 7th to 5th centuries BC (Napthan, 2014).

Although the development process for the early Roman settlement remains unclear, an issue partly hindered by a lack of any structural evidence associated with the conquest, it has been argued that a fort

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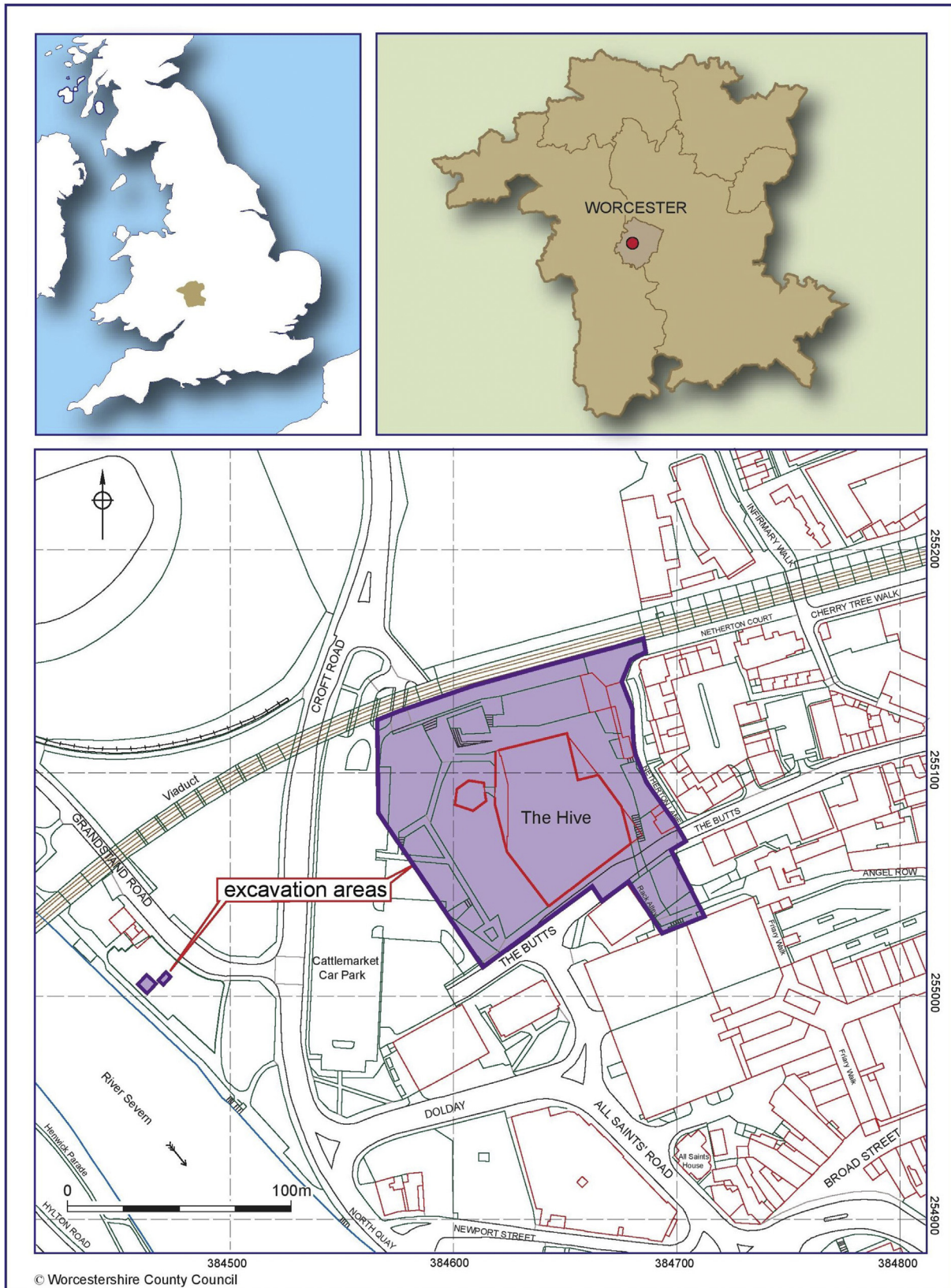


Fig. 1. Location of Worcestershire within the UK (top left) with Worcester highlighted (top right). Ordnance Survey map showing the location of The Hive excavation areas in Worcester (bottom). Publishing licence has been obtained from Ordnance Survey to reproduce the map.

was established at Worcester and occupied up to c. 75 CE, mainly due to the strategic location at a crossing point of the River Sever in proximity to Wales, but also the occasional recovery of artefacts with

military associations from sites on both the eastern and western side of the river (see Dalwood and Currie, 2004; Dalwood, 2004; Wainwright et al., 2014). Certainly, the town occupied a site with major regional

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