



About 42% of 154 remains from the “Battle of Le Mans”, France (1793) belong to women and children: Morphological and genetic evidence



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ARTICLE INFO

Article history:

Received 10 May 2015

Received in revised form 15 February 2016

Accepted 16 February 2016

Available online 23 February 2016

Forensic archeology
Molecular genetic sex-typing
Morphological sex diagnosis
STR-UTY-UTX
mtDNA
Ancient DNA
Battle of Le Mans

ABSTRACT

Mass graves were discovered in Le Mans and 154 skeletons were exhumed, representing a remarkable historical series of human remains from western France. We aimed to characterise the age-class and sex of these subjects, and to determine whether their profile fits with that of the Catholic and Royal Army of Vendée, who fought against the Republican Army during the Battle of Le Mans (12th–13th December, 1793). This atypical army was composed of male soldiers, but also of civilian people who followed the troops, including the elderly, children and women. In total 154 skeletons from nine mass graves were exhumed from 2009 to 2010. Two morphological methods were used to determine the sex of the subjects: the Probabilist Sexual Diagnosis (DSP) and Secondary Sexual Diagnosis (DSS) methods. Samples were handled cautiously to avoid any pre-laboratory contamination. Molecular genetic sex-typing using a recently developed assay was used to maximise sex-diagnosis of the ancient DNA samples, and 97 successful profiles including immatures were generated. Using morphological and genetic data combined, we successfully determined the sex of 93% of the subjects; 62% were male and 31% female. About 87% of subjects could be considered adults (>18 years old), 6% adolescents (15–19 years old) and 7% infants (<15 years old). Our results of an unexpected population profile for an armed conflict (42% were women and children), in addition to traumatological and historical elements, tend to confirm that these subjects were involved in the Battle of Le Mans, either actively (Republican Army, the Catholic and Royal Army) or passively (collateral victims from the civilian population of Le Mans). They represent 5–6% of the estimated 2500–3000 victims.

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1. Introduction

Following the French Revolution of 1789, several conflicts were the result of opposition to the revolutionists of the Catholic and Royal Army of Vendée (i.e., counter-revolutionary army). A bloody battle known as “La Bataille du Mans” (The Battle of Le Mans) took place in Le Mans, France on the 12th–13th December in 1793 [1] between the Catholic and Royal Army and the Republican Army. The former was an atypical army, composed of 30–40,000 subjects including 10–15,000 adolescent and adult male soldiers, and 25–30,000 civilian people who followed the troops: the elderly, children, women and subjects from neighbouring departments

(Vendée, Loire-Atlantique, Maine and Loire, Deux-Sèvres) [2–4]. The number of deaths during the battle has been estimated at 2500–3000 [3].

Between 2009 and 2010, while urban work was in progress in Le Mans, mass graves were discovered dating back to the end of the 18th century and 154 skeletons were exhumed. The first observation was that subjects were deposited head-to-foot, characteristic of disaster graves linked to sudden and massive mortality. This type of burial suggests, theoretically, an epidemic event or a military episode [5,6]. Other initial observations included evidence of sword and bullet hole wounds on many of the skulls, an expected feature in the context of an armed conflict, and also the presence of female-like and immature-like skulls.

These elements, together with the geographical location, have suggested that these mass graves may be linked to the Battle of Le Mans. The only available documents describe how bodies were

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collected and transported after the battle [1]; information on precise burial locations or the age-sex of subjects is absent. Thus, there was a need to clarify this information using robust forensic methods.

We aimed to characterise the profile of the population discovered in Le Mans by studying the 154 skeletons exhumed from the site, and to confirm whether these subjects were directly linked to the Battle of Le Mans. For all subjects, both morphological and morphometric analyses of pelvic and infra-cranium bones were performed. Genetic sex typing was also conducted using DNA extracted from teeth, or bones when teeth were missing. By combining morphological and genetic data, we successfully determined the sex of 93% of subjects. Females and children made up 42% of the sample, and this, together with other

contextual indices, strongly suggests that these subjects were involved in the Battle of Le Mans, either actively (Republican Army, the Catholic and Royal Army) or passively (civilians from Le Mans), representing 5–6% of the estimated 2500–3000 victims [3].

2. Material and methods

2.1. Archaeological excavation, initial observations and sampling

Urban work was being conducted in the city of Le Mans, in the Sarthe department of western France (Fig. 1), between 2009 and 2010, when mass graves were discovered (Fig. 2a). The excavation of the site was completed in three phases by the National Institute of Archaeological Research (INRAP): (1) in 1999, a first diagnostic

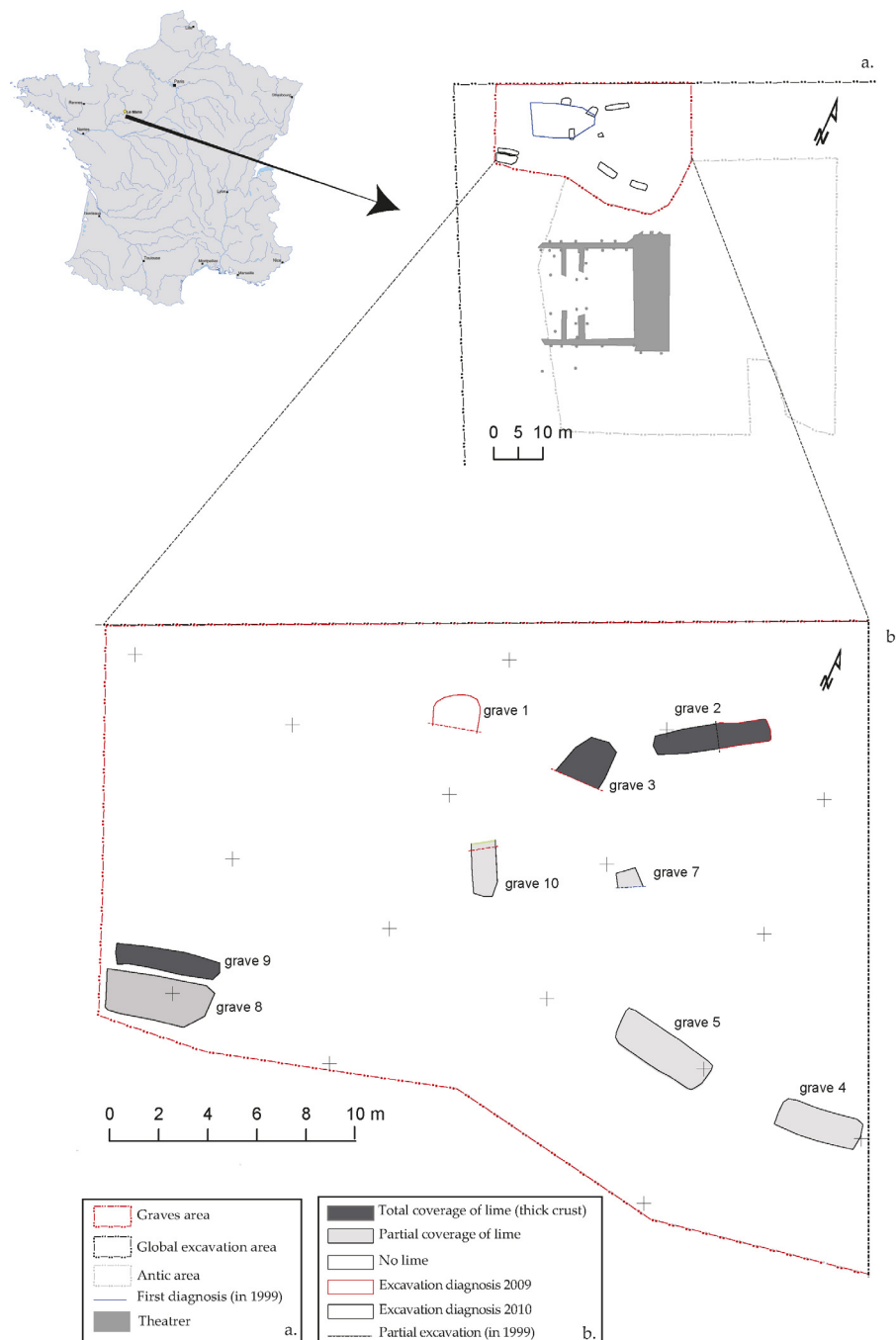


Fig. 1. Excavation site and location of investigated graves. (a) Grave no. 6 does not exist.

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