

Leather Shoes in Early Danish Cities: Choices of Animal Resources and Specialization of Crafts in Viking and Medieval Denmark

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This article presents the findings of the minimally destructive biomolecular species identification method known as ZooMS (zooarchaeology by mass spectrometry) to identify the use and choices of resources for manufacturing leather shoes in urban contexts in Viking and medieval Denmark. Whereas parchment and historical skin samples have been previously analysed by ZooMS, the potential of the method is demonstrated here for archaeological, vegetable-tanned, and waterlogged leather from the eleventh to thirteenth-century Danish cities of Ribe, Odense, and Viborg. Sheep, goat, and cattle were used to produce shoes, with explicit choices of species for specific purposes. The selection seems to be largely based on the skins' material properties, suggesting that functionality was more important than signalling. The urban environment is seen as promoting synergy among providers of resources, crafts, and customers.

Keywords: medieval, ZooMS, leather shoes, urbanization, animal resources, crafts

INTRODUCTION

For millennia, people have worn leather shoes to protect their feet from rough surfaces and the weather (Hald, 1972; Goubitz et al., 2001). Shoes varied considerably in construction, style, and decoration over time and space, from primitive one-piece shoes to elaborately decorated examples made of multiple elements with separate soles (Swann, 2001; Volken, 2014). The state of preservation of archaeological leather finds depends on a complex set of pre-depositional factors and burial environment, such as the pH level, oxygen, and water content and the microorganisms present (Cameron et al., 2006: 245). Therefore, leather shoes are not equally represented over time, cultural

contexts, or in urban settlements *vs* rural sites. In northern Europe, they survive in, amongst others, the waterlogged and anaerobic contexts of urban environments (e.g. Groenman-van Waateringe, 1984, 1988; Madsen & Mikkelsen, 1985; Mould et al., 2003; Pedersen, 2005; Harjula, 2008; Hansen, 2015; Haase & Larsen, 2017: 153). To date, the earliest large assemblages of leather in Denmark are the eighth-century AD finds from Ribe and the slightly later assemblage from Haithabu (Hedeby, now in Schleswig-Holstein, Germany), where large quantities of leather waste associated with a workshop were recovered (Groenman-van Waateringe, 1984). The recovery of such assemblages is probably related to the accumulation of archaeological stratigraphy