



# Southern African glass beads: chemistry, glass sources and patterns of trade

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## ABSTRACT

Three-hundred-and-sixty glass beads from 19 archaeological sites in southern Africa dating between about the 8th and 16th centuries AD were analyzed using LA-ICP-MS, determining 47 chemical elements. The eight different bead series, previously defined on morphological characteristics, possess different glass chemistries. Some bead series were made from plant-ash glasses, others from soda-alumina glasses. Zhizo series beads of the late 1st millennium AD were probably made from Iranian glass. Later bead series were made of glass probably manufactured in South Asia, though there are changes through time in both South Asian glass recipes and bead morphologies.

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## 1. Introduction

Glass beads, often in large quantities, have been discovered at archaeological sites in southern Africa from the 8th century AD onwards. They are the most abundant artifacts attesting to international trade with southern Africa and, at least until the late 13th century AD, they occur most frequently in the area of the confluence of the Shashe and Limpopo rivers where the modern countries of South Africa, Zimbabwe and Botswana meet (Fig. 1). It was in this region that the first state-level society, the precursor to Great Zimbabwe, evolved in the early second millennium AD. Excavations at the roughly 10th century site of Schroda, the largest Zhizo period site south of the Limpopo River, produced over 1000 glass beads. Far fewer such beads were discovered at contemporary smaller sites. The presence of numerous ivory artifacts at Schroda indicates it was “articulated directly with the Indian Ocean commercial network” (Huffman, 2000:19). Around AD 1000 immigration into the region led to the development of the major political center known as K2, where tens of thousands of beads were recovered from a massive midden next to the central cattle enclosure and the court (the center of political decision-making), as well as in residential areas. Although ivory exports probably continued, alluvial gold became

the most important trade commodity. The K2 elite who controlled the distribution of exotic goods were able to amass wealth and power. Glass beads were traded or gifted on to communities in neighboring regions. “Garden Roller” beads (see below), which were made at K2 and possibly other related sites by reworking imported glass beads (and thus are evidence of interaction with K2), were widely distributed as well; the most distant example coming from the southern Zambian site of Isamu Pati (Wood, 2005:49).

In the 13th century, the capital moved from K2 to nearby Mapungubwe, where for the first time in southern Africa the head of what was now a state-level society lived on a hilltop separate from the rest of the inhabitants and the cattle enclosure was moved away from the center of the settlement. This spatial pattern was also evident at the later, more famous site of Great Zimbabwe. More than 100,000 glass beads have been found at Mapungubwe, of which at least 26,000 (Saitowitz, 1996:201), plus over 12,000 gold beads, were discovered in a royal burial, one of several at the site which is also the first to have grave goods indicative of high status (Huffman, 2007:58). Clearly, the rulers of the Mapungubwe state, which was supplanted by Great Zimbabwe at the end of the 13th century, controlled the distribution of imported glass beads, as well as the cotton cloth that historical sources indicate was probably the most sought-after import, despite its low visibility in the archaeological record. In the final pre-European period, after the decline of Great Zimbabwe in the mid 15th century, beads of the Khami Series are

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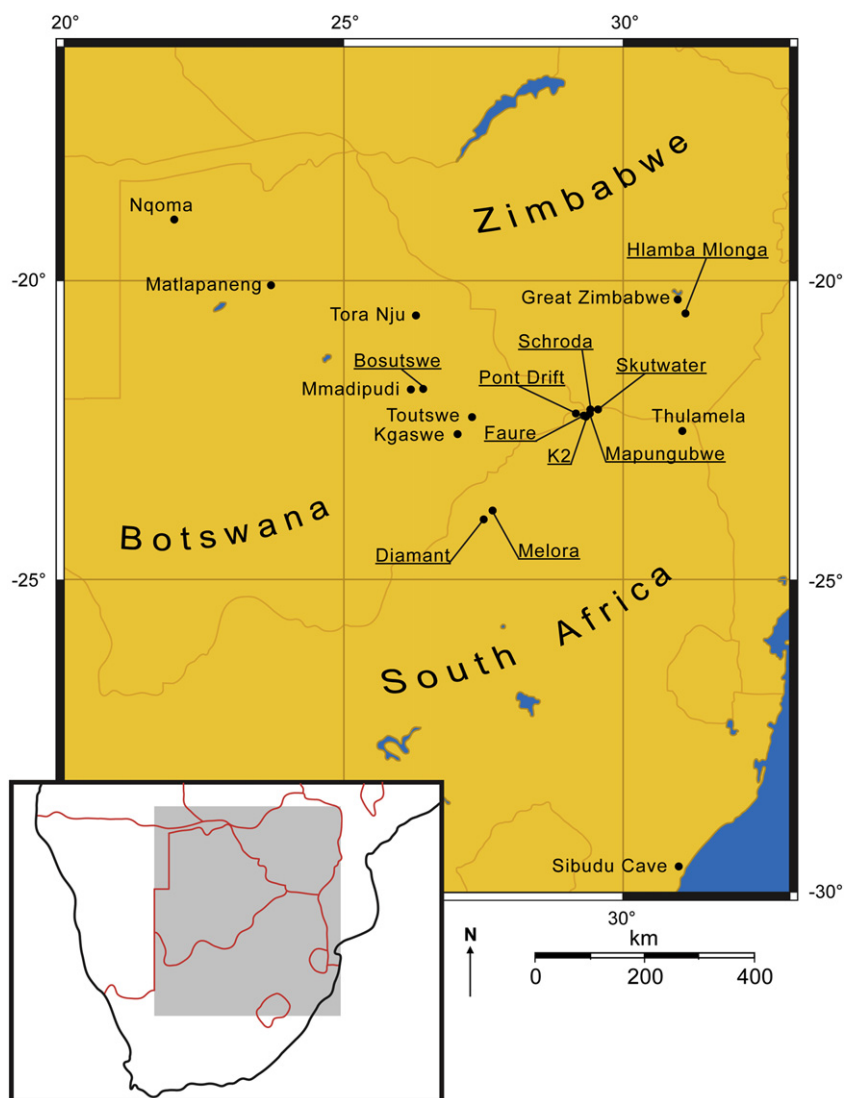


Fig. 1. Map of sites from which the analyzed beads were recovered.

widely distributed at settlements across the eastern part of southern Africa, though as in earlier times they are more common at the larger political centers. In summary, “control of the supply of imported glass beads and cotton cloth, and of their redistribution, appears to have been a central mechanism in the development of complex societies in this region [the Limpopo Valley] (Hall, 1990:88–90; Huffman, 2000)” (Killick, 2009:188). Easily stored and transported, beads provided an alternative expression of wealth and power that was not prone to the vicissitudes of cattle-keeping.

Two questions have dominated studies of the southern African glass beads: 1) How old are they? 2) Where did the glass come from? This first question has recently been definitively answered by Wood (2000, 2005), who succeeded both in defining bead series based on morphological and technological attributes and in dating these series by reference to established radiocarbon chronologies. Answering the second question involves comparative studies of beads from various parts of the world and chemical analyses. This report presents the results of the chemical analysis of 360 glass beads, belonging to 8 different bead series, recovered from 19 sites in southern Africa. We then compare our results with published glass compositions to identify the probable sources of the different bead series found in southern Africa.

This study is part of a larger project on the chemistry of glass beads from African sites dated between about AD 800 and 1500, i.e. preceding most European contact (see Robertshaw et al., 2003 for a longer introduction to the project). We have analyzed more than 1000 glass beads recovered from relatively well-dated contexts on African archaeological sites. The major goal of the project is to use the results of the chemical analysis to identify the regions where the glass was manufactured and thereby to reconstruct changing patterns of trade between various regions of Africa and the wider world. Our southern African research builds upon pioneering chemical studies of glass beads by Davison (1972, 1973; Davison and Clark, 1974, 1976), who analyzed about 130 beads from southern African sites using destructive neutron activation analysis (NAA) and a smaller number of beads using non-destructive x-ray fluorescence analysis (XRF). Both techniques provided quantitative data on a limited number of elements, but a dearth of comparative data from other parts of the world hampered Davison's ability to interpret her results in terms of provenance.

More recently, Saitowitz (1996; Saitowitz et al., 1996), employing mostly laser-ablation inductively coupled plasma mass spectrometry (LA-ICP-MS), concluded that the results from the rare earth elements (REE) “showed positively that some beads

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