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Steatite characterization using X-ray fluorescence and insights into Northern Iroquoian interregional interaction

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ABSTRACT

The research presented here evaluates the applicability of energy-dispersive X-ray fluorescence (EDXRF) for characterizing steatite. We present compositional data from an assemblage of 100 steatite beads and pipes deriving from 11 Northern Iroquoian sites in southern Ontario and New York State. Percentages of major elemental constituents and principal components analysis define two compositional groups and various non-steatite artifacts. Our results suggest that EDXRF is an expedient means of characterizing steatite based on major oxides and trace elements. The results support the assertion that individual Iroquoian communities were involved in distinct interaction networks that linked groups in southern Ontario and the St. Lawrence Valley region.

1. Introduction

Steatite beads and pipes commonly occur on Northern Iroquoian archaeological sites in southern Ontario and the St. Lawrence Valley. While the elemental heterogeneity of this material makes it difficult to link back to its geologic source, individual artifacts can be characterized and sorted into compositional groups to make inferences about how these materials were distributed and transmitted across the landscape. The assemblage considered here includes 100 beads and pipes from 11 Northern Iroquoian sites in southern Ontario and northern New York State dating to ca. 1250–1650 CE. Percentages of major elemental constituents and principal components analysis are employed to define compositional groups. Two compositional groups are chemically steatite and the third is non-steatite soapstone that falls outside common ranges of Mg-Si-Ca for steatite.

Our research has two primary objectives: 1) To evaluate the applicability of energy-dispersive X-ray fluorescence (EDXRF) for characterizing steatite among archaeological materials; and 2) to evaluate how these data contribute to understandings of interregional interaction and exchange, particularly regarding relationships between ancestral and historical Wendat-Tionontaté and St. Lawrence Iroquoian peoples. In the Lower Great Lakes-St. Lawrence region, geological sources for this material originate from the east, in the St. Lawrence Valley and surrounding areas. As such, steatite artifacts have implications for understanding the nature of east-west interaction networks among Northern Iroquoian peoples (Fig. 1).

The results of this study allow us to 1) provide suggestions for best practices in analysis of steatite by EDXRF and 2) investigate patterns of steatite distribution among Northern Iroquoian societies and communities. Our results suggest that EDXRF is an expedient means of characterizing steatite based on major oxides and trace elements. The results also suggest that individual communities were accessing steatite via distinct community-based networks and as such provide new insights on interactions between Iroquoian communities in southern Ontario, northern New York State and the St. Lawrence Valley.

2. Regional context

Sites recognizable as Iroquoian appear in the archaeological record at approximately 1000 CE. The earliest Iroquoian village sites are generally characterized as small, seasonally-occupied base camps (Hart and Brumbach, 2003; Williamson, 1990). Around approximately 1250–1300 CE, these base camps became more permanent, longhouse-based villages which were, for the first time, sustained primarily by maize-based agricultural systems (Dodd et al., 1990; Hart, 2001). Between 1250 CE and 1350 villages were typically not palisaded, with

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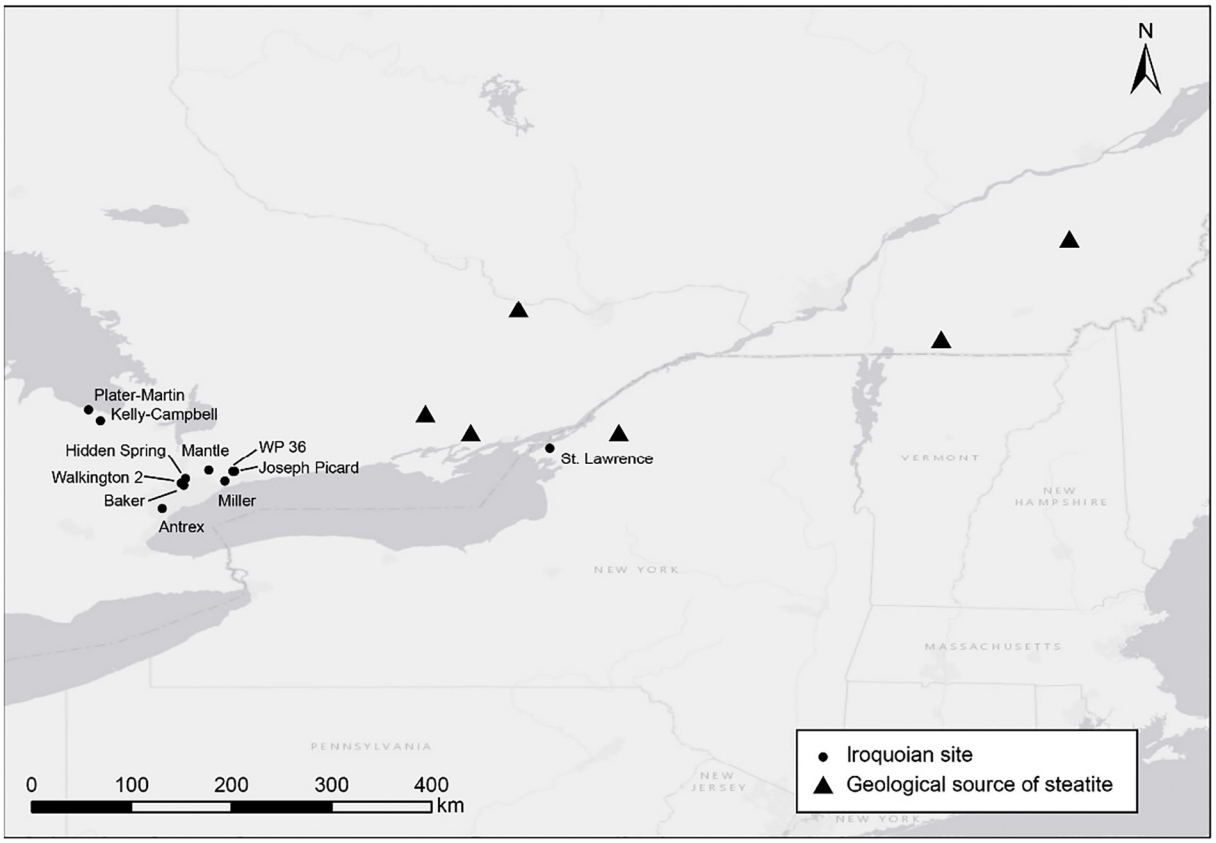

Fig. 1. Map of locations of sites in this study and steatite source locations (after Baron et al., 2016).

populations in the low hundreds (Warrick, 2008). The fourteenth-century was characterized by the development of a recognizably Iroquoian material culture and heightened local and interregional interaction (Birch, 2015). After 1450 CE, village sites in both Ontario and New York State become fewer in number, larger in size, and are surrounded by multi-row palisades, a phenomenon interpreted as signaling the initiation of widespread conflict (Birch, 2012; Williamson, 2007). While it is unclear who precisely was in conflict with whom, the outcomes of regional conflict varied between groups in different sub-regions at different periods. For the ancestral Huron-Wendat and Haudenosaunee, this conflict may have influenced nation- and confederacy-building. For Iroquoian populations occupying northern New York State and the St. Lawrence Valley, conflict may have contributed to the movements of some populations out of the region, resulting in the incorporation of at least some of these populations into what would become nations of the eastern Haudenosaunee and Huron-Wendat confederacies (Engelbrecht, 1995; Ramsden, 2016; Wonderley, 2005). Between the mid-1400s and early 1600s, alliances between nations developed into the historically-documented Haudenosaunee (Iroquois) confederacy in New York and the Huron-Wendat and Neutral confederacies in southern Ontario, each of which were encountered by early European explorers and missionaries in the seventeenth century (Biggar, 1929; Thwaites, 1896–1901).

There is no evidence that the Petun-Tionontaté, Erie, or St. Lawrence Iroquoian populations farther down the St. Lawrence River created formalized political confederations, though these groups also were characterized by alliances between related communities. Sites in the present study belong to ancestral Huron-Wendat (and in one case, possibly ancestral Neutral), Petun-Tionontaté, and Jefferson County St. Lawrence Iroquoian archaeological sub-groups (Table 1). The Petun-Tionontaté were closely allied with the Huron-Wendat in the contact period and these groups share many aspects of their material and cultural patterns. Populations inhabiting the St. Lawrence Valley produced distinctive ceramic vessels and possessed a complex bone tool industry that differs from the chert-based tools common on sites in southern Ontario and upper New York State (Engelbrecht and Jamieson, 2016a, 2016b; Jamieson, 2016). Although there are significant differences in the material culture of ancestral St. Lawrence Iroquoian and Huron-Wendat/Petun-Tionontaté populations, these are archaeological distinctions that have little relevance for contemporary members of the Huron-Wendat Nation who do not consider these criteria to describe the nature of their ethnicity (Gaudreau and Lesage, 2016; Lesage and Warrick, 2016). For them, more than 300 years of oral history identify the St. Lawrence Valley as ancestral Huron-Wendat territory (Richard, 2016) and archaeological data attest to the incorporation of some populations originating in the St. Lawrence Valley into Huron-Wendat communities and nations during the fifteenth and sixteenth centuries A.D. (Ramsden, 1990, Ramsden, 2009, 2016; Williamson et al., 2016). Recent social network analysis (SNA) of pottery decoration from throughout Iroquoia suggests that St. Lawrence Iroquoian populations in Jefferson County were signaling with groups in Ontario and New York State in previously unrecognized ways, acting as intermediaries between ancestral populations in these two regions (Hart et al., 2017).

Within the region, steatite is available from a limited number of sources, all located east of the ancestral Huron-Wendat and Petun-Tionontaté territories, and primarily within or adjacent to landscapes occupied and crisscrossed by the peoples archaeologists have labelled St. Lawrence Iroquoian (Fig. 1). One of the key research questions that this study helps to address is the nature of interaction between groups inhabiting the St. Lawrence Valley and those in south-central Ontario.