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Regional variation in the use of the earliest pottery in North-western Europe: Organic residue analysis of Swifterbant pottery (5000 - 4000 cal. BC)

PhD thesis

to obtain the degree of PhD at the
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to obtain the degree of PhD at the
University of York
on the authority of the
Vice-Chancellor and President Prof. Charlie Jeffery
and in the accordance with
the decision by the Dean of the York Graduate School

Double PhD degree

This thesis will be defended in public on

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**Regional Variation in the use of the earliest pottery
in North-western Europe: Organic Residue Analysis
of Swifterbant pottery (5000 - 4000 cal. BC)**

PhD thesis

by
Özge Demirci

University of Groningen and University of York
(Under a double doctoral degree programme)

Department of Archaeology
February 2021

Abstract

This thesis aims to investigate the function and functional variation of ceramic vessels of the Swifterbant culture (c. 5000-4000/3400 cal BC) in the Dutch wetlands through the application of lipid residue analysis. It is the first systematic application of this method to Swifterbant pottery. The Swifterbant culture is a hunter-gatherer-fisher society which demonstrates a continuation of hunter-gatherer subsistence strategies alongside a gradual shift towards food production on the basis of cereal cultivation and animal husbandry. Whilst the earliest Swifterbant pottery is dated to c. 5000 cal BC, the arrival of domesticated animals is dated to c. 4500 cal BC and cereals at c. 4300 cal BC. Here, lipid residue analysis was applied to 148 samples, representing 146 individual vessels recovered from eight archaeological sites: Swifterbant type sites S2, S3 and S4 (c. 4300-4000 cal BC) in Flevoland, the Netherlands; Polderweg, De Bruin, Brandwijk, and Hazendonk (c. 5000-3800 cal BC) in the Lower Rhine-Meuse area, the Netherlands; and finally, Hüde I (4700-3500 cal BC) in Lower Saxony, Germany. Overall, the new data generated for this thesis shows that Swifterbant pottery has been continuously and primarily used for processing of aquatic resources, almost exclusively freshwater fish, despite its highly diversified subsistence strategies, which game animals and other terrestrial and aquatic food resources. The results also present temporal changes in the exploitation of food resources in the Lower Rhine-Meuse area where we see pottery also being used to process different ranges of foodstuffs such as terrestrial resources and dairy products. The identification of dairy residue is the first direct evidence so far from Swifterbant pottery. Overall, this study shows that the motivation for the uptake of pottery into the Swifterbant culture was not necessarily related to changing subsistence strategies as we see a clear continuity in culinary traditions after the introduction of domesticates into the Swifterbant culture.

Samenvatting

Deze dissertatie heeft tot doel de functie en de functionele variatie van aardewerk van de Swifterbantcultuur (ca. 5000-4000/3400 v. Chr.) in de Nederlandse *wetlands* te onderzoeken door middel van residu-analyse. Het is de eerste systematische toepassing van deze methode op Swifterbant-aardewerk. De Swifterbant-cultuur zijn jager-verzamelaar-vissersgemeenschappen die een voortzetting laat zien van deze bestaanswijzen naast een geleidelijke verschuiving naar landbouw op basis van graanverbouw en veeteelt. Terwijl het vroegste aardewerk van Swifterbant gedateerd wordt op ca. 5000 v. Chr., wordt de komst van gedomesticeerde dieren gedateerd op ca. 4500 v. Chr. en van granen op ca. 4300 v. Chr. De residu-analyse is toegepast op 148 monsters, afkomstig van 146 individuele pottten die werden gevonden op acht archeologische vindplaatsen: Swifterbant typevindplaatsen S2, S3 en S4 (ca. 4300-4000 v. Chr.) in Flevoland, Nederland; Polderweg, De Bruin, Brandwijk, en Hazendonk (ca. 5000-3800 v. Chr.) in het Nederrijn-Maasgebied, Nederland; en tenslotte Hüde I (4700-3500 v. Chr.) in Nedersaksen, Duitsland. De gegevens die voor deze dissertatie zijn gegenereerd tonen ten eerste aan dat Swifterbant-aardewerk voortdurend en voornamelijk is gebruikt voor de verwerking van aquatisch voedsel, bijna uitsluitend zoetwatervis, ondanks de zeer diverse bestaanswijzen, met jachtwild en land- en waterdieren. De resultaten laten ook ontwikkelingen in de tijd zien in de exploitatie van voedselbronnen in het Nederrijn-Maasgebied, waar aardewerk ook wordt gebruikt voor de verwerking van verschillende soorten voedingsmiddelen, zoals vlees van landdieren en zuivelproducten. De aanwezigheid van zuivel is het eerste directe bewijs van het gebruik van melkproducten tot nu toe van Swifterbant-aardewerk. Over het geheel genomen toont deze studie aan dat de motivatie voor de introductie van aardewerk in de Swifterbantcultuur niet noodzakelijkerwijs verband hield met veranderende bestaanswijzen, aangezien we een duidelijke continuïteit zien in culinaire tradities na de introductie van veeteelt en akkerbouw in de Swifterbantcultuur.

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Author's declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References. The work carried out as part of this thesis has resulted in the following publications:

- 1- **Demirci, Ö.**, Lucquin, A., Craig, O. E., & Raemaekers, D. C. M. (2020). First lipid residue analysis of Early Neolithic pottery from Swifterbant (the Netherlands, ca. 4300–4000 BC). *Archaeological and Anthropological Sciences*, 12(5), 105.
- 2- **Demirci, Ö.**, Lucquin, A., Çakırlar, C., Craig, O. E., & Raemaekers, D. C. M. (2021). Lipid residue analysis on Swifterbant pottery (c. 5000-3800 cal BC) in the Lower Rhine-Meuse area (the Netherlands) and its implications for human-animal interactions in relation to the Neolithisation process. *Archaeological Science: Reports*, 36(3), 102812.
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