Małgorzata Daszkiewicz, Gerwulf Schneider

Tell Rad Shaqrah: Chemical Composition of North Mesopotamian Early Dynastic Period Ceramics from Tell Rad Shaqrah

Polish Archaeology in the Mediterranean 7, 171-175

1996

TELL RAD SHAQRAH

CHEMICAL COMPOSITION OF NORTH MESOPOTAMIAN EARLY DYNASTIC PERIOD CERAMICS FROM TELL RAD SHAQRAH

Małgorata Daszkiewicz and Gerwulf Schneider

The discussion of results of chemical analyses presented in this paper is intended as the first part of a combined chemical, mineralogical and technological study of North Mesopotamian Early Dynastic period pottery from excavations on Tell Rad Shaqrah in northeastern Syria. The site was excavated from 1991 to 1995 by a Polish mission headed by Prof. Piotr Bieliński.

The samples selected by archaeologists represented all the wares from the site. Chemical composition of ignited samples was determined by WD-XRF. Losses of ignition were estimated after refiring in air at 900°C with a heating rate of 200°C/h and a 1 h soaking time at peak temperature.

This brief report answers only one of several questions posed by archaeologists: Are all the analyzed samples made from the same raw material? A more detailed interpretation of the chemical data will be presented at a later date.

The analyzed samples can be divided into two major groups according to calcium content. The larger group is made of calcareous clays. This group can be divided into subgroups (Fig. 1). One of these subgroups is characterized by higher titanium content and consists of kitchen ware exclusively. The coarse inclusions in these samples, added as a tempering material, are of crushed basaltic rock which is the reason for the higher titanium content.

Another subgroup is characterized by higher strontium content, which could be due to a different raw material, but which could also constitute a secondary effect of deposit conditions. Generally, all subgroups are similar in composition and could well

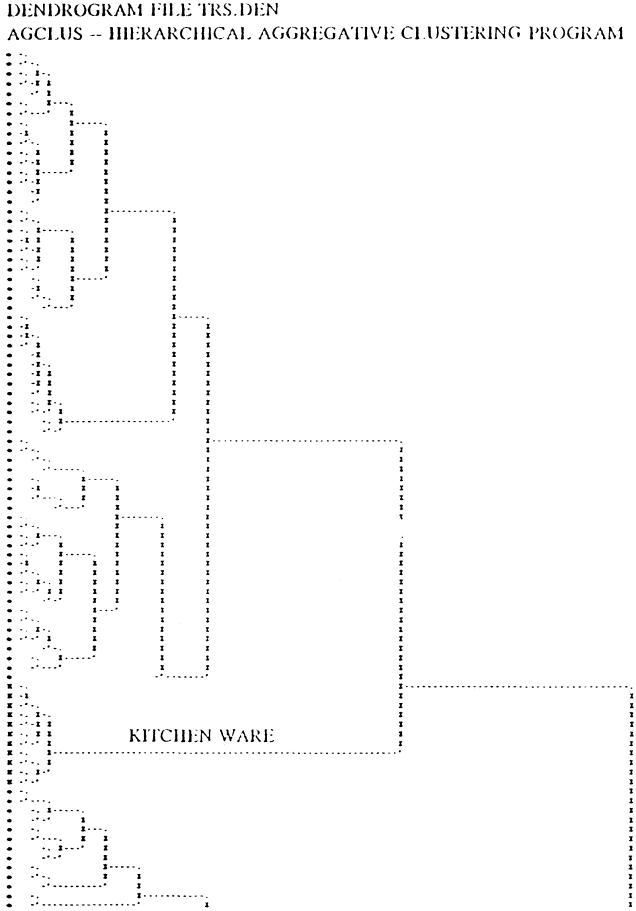

Fig. 1. Dendrogram of the cluster analysis of 91 sherds from the calcareous group of pottery using Natures Group clustering with Squared Euclidian Distance of logged data of Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, Cr, Ni, Rb, Sr, Zr, Ba (Brookhaven Data Handling Programs, kindly provided by E. Sayre).

have been made from the same clay, once different methods of preparation, including the addition of tempering material, are taken into account.

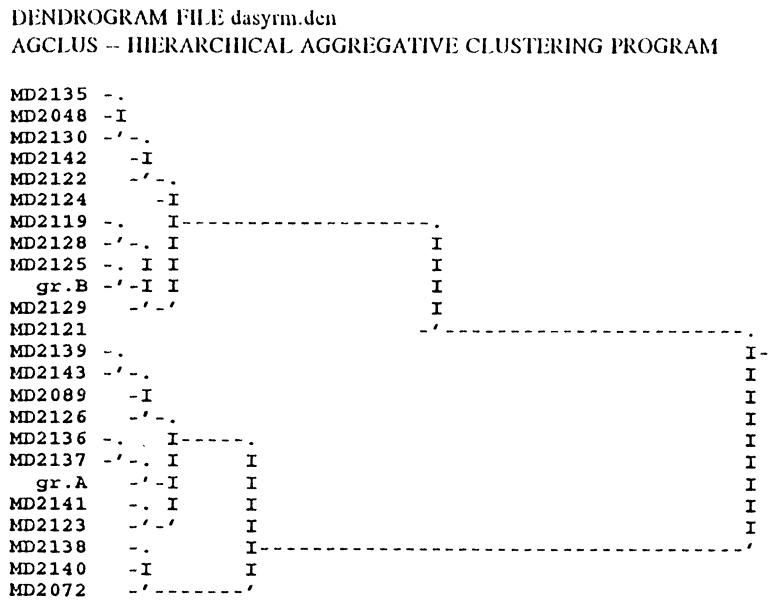

Fig. 2. Dendrogram of the cluster analysis of 22 sherds of the non-calcareous group of Metallic Wares using Natures Group clustering with Squared Euclidian Distance of logged data of Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, Cr, Ni, Rb, Sr, Zr, Ba (Brookhaven Data Handling Programs, kindly provided by E. Sayre). The dendrogram includes: group A – average of so called Tell Chuera Group of Metallic Ware, group B – average of so called Tell Brak Group of Metallic Ware (Schneider 1988).

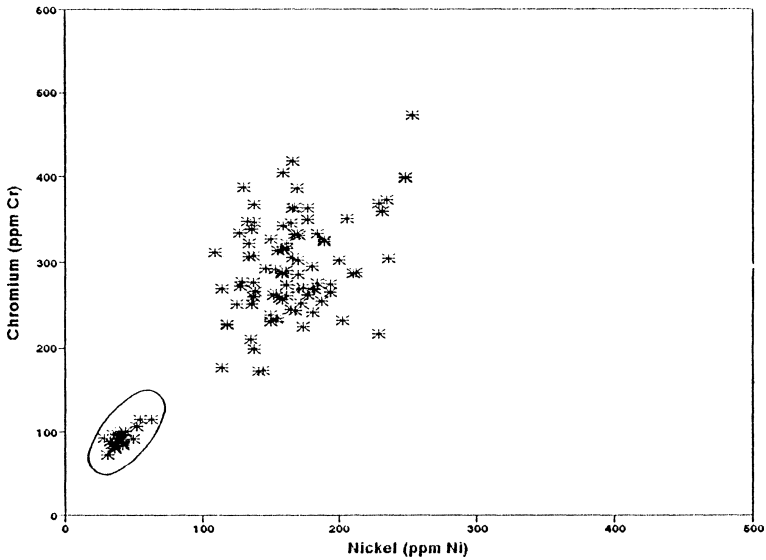

Fig. 3. Chromium and nickel contents of all analyzed samples showing the two major compositional groups. The Metallic Ware group is inside the circle.

The low-calcium group consists of Northern Mesopotamian Metallic Ware, typically made from non-calcareous clays. These, in contrast to the local marly clays in the Habur valley, are very low in chromium and nickel. The Metallic Ware samples from Tell Rad Shaqrah can be divided further into two subgroups (Fig. 2), corresponding to Schneider's group A and B (1988, 1989). One of the sherds classified by archaeologists as Fine Ware is indeed Metallic Ware. One sherd originally considered as Metallic Ware turned out to be made from calcareous clay and corresponds to the so called calcareous Metallic Ware or Northern Mesopotamian Stone Ware, which is also known from other sites (Schneider 1988, 1989).

To be sure that the non-calcareous and calcareous groups really correspond to different raw materials and not just to different pre-treatment of the same raw material, we must also consider the trace-element content. By very fine levigation or by treatment with acids, the amount of calcite and therefore the calcium content of the clays can certainly be reduced. Disregarding the technical aspect of this problem, it can be assumed that the calcium content is reduced to a level similar to that in the non-calcareous group. Strontium, geochemically connected with calcium, would also be reduced but, this is not the case for chromium and nickel which are not included in the calcite mineral. These two elements clearly indicate, therefore, that the raw material for the calcareous pottery and the non-calcareous Metallic Ware was not the same (Fig. 3). Regarding the geology of the area of Tell Rad Shaqrah, outcrops of quaternary basalts are found near the site, suggesting that the basalt-tempered wares were locally made. Calcareous clays, quaternary and tertiary marls and marly clays of the Lower and Upper Fars series, are abundant. On the other hand, it is hardly probable for non-calcareous clays low in chromium and nickel to be found in the area.

Bibliograhic references

G. Schneider (1988), Stoneware from the 3rd millennium BC: Investigation of metal-imitating pottery from Northern Mesopotamia [in:] R.M. Farquhar, R.G.V. Hancock, L. A. Palvish (eds), *Proceedings of the 26th International Archeometry Symposium*, 19-22, Toronto 1988

G. Schneider (1989) A technological study of North-Mesopotamian Stone Ware, *World Archaeology* 21(1), pp. 30-50