

Modern Trends in Scientific Studies on Ancient Ceramics

Papers presented at the 5th European Meeting on
Ancient Ceramics, Athens 1999

Edited by

V. Kilikoglou

A. Hein

Y. Maniatis

BAR International Series 1011
2002

WORKSHOP REFERENCES AND CLAY SURVEYING IN SAMOTHRACE: AN APPLICATION TO THE STUDY OF THE ORIGIN OF SOME CERAMIC GROUPS

C. KARADIMA¹, D. MATSAS¹, F. BLONDÉ² and M. PICON²

¹ *IO' Ephorate of Prehistoric and Classical Antiquities, Archaeological Museum, GR-691 00 Komotini (Greece)*

² *CNRS CRA Laboratoire de Céramologie, (UPR 7524), Maison de l' Orient Méditerranéen-7, rue Raulin-69365 Lyon Cedex 07-France*

The X-ray fluorescence analysis of archaeological ceramics from Samothrace, dating mainly from the 4th c. BC, and clays from the areas of ancient pottery workshops on this island, led to the definition of 6 principal composition groups. Group A, is of unknown origin, as it is the case with the 7th c. BC fabric known as G 2-3 ware. Group B and a group from Maroneia, named Group 1 from Maroneia, are certainly not local. The ceramics of the Group 1 from Samothrace come largely from workshop areas not yet located (some of them perhaps not even on the island), in contrast to the Samothracian Groups 2 and 3, which are clearly connected to the areas of Keramidhariá and Paliápoli respectively and their workshops.

KEYWORDS: SAMOTHRACE, CERAMIC PRODUCTION, X-RAY FLUORESCENCE, CLUSTER ANALYSIS, COMPOSITION GROUPS, G 2-3 WARE

INTRODUCTION

Our knowledge of ceramic production on the island of Samothrace has benefited from three complementary approaches. The first was the survey and discovery on Samothrace of ceramic workshops of the Hellenistic and Roman periods producing amphoras, tiles, common wares and possibly fine pottery. The second was the study of ceramics coming from excavations at different settlement-sites in northern Greece, including Samothrace (cf. Blondé and Picon, this volume) and dated to the 4th c. BC. The third was the research carried out recently on the local clays. These three approaches were the subject of laboratory study, the results of which will be presented in this paper.

In order to obtain an overall view of the ceramic problems in Samothrace, we shall start with analysis of a large sample of 4th c. BC ceramics, which will be compared with data from the surveys of amphora workshops and the research carried out on the clays. The information thus acquired will be used to study the problem of origin of an important group of 4th c. BC black glazed pottery that might be supposed of local origin, which was also the case with the Subgeometric G 2-3 ware (Moore 1982) of the 7th c. BC from the *Hall of Choral Dancers* in the Sanctuary of the Great Gods (Lehmann 1998, 73-8). Both groups will be investigated for a possible local origin.

PRELIMINARY CLASSIFICATION

The main 4th c. BC ceramic groups analysed included black glazed pottery, *VN* on the dendrogram (=céramiques à vernis noir), common wares, *CC*

(=céramiques communes), and cooking pots, *CW* (=céramiques culinaires, cooking ware).

From the total number of 160 samples, 150 archaeological ceramics (Catalogue of Analysed Archaeological Ceramics: 1-10) coming from the excavations of the Institute of Fine Arts, New York University in the Sanctuary of the Great Gods (91) and from the excavations or surface collections of the IO' Ephorate of Prehistoric and Classical Antiquities at other sites of the island (59) were analysed by X-ray fluorescence and then classified using cluster analysis in an average unweighted relationship of centred reduced variables corresponding to the 17 following elements: K, Rb, Mg, Ca, Sr, Ba, Mn, Ni, Zn, Al, Cr Fe, Si, Ti, Zr, Cc, V.

The dendrogram representing graphically the result of the classification (Fig. 1) establishes the existence of 6 principal compositional groups and a considerable number of outliers, 25 out of 115. This number is notably larger (approximately double) than that from important production sites like *Thasos*, *Abdera* or *Maroneia*, and undoubtedly reflects numerous and varied imports from outside the island. Among the groups shown up by the classification, 3 were identified to come from other sites in the region, after comparison with already analysed pottery: these are two groups of unknown origin, designated **A** and **B**, and **Group 1 from Maroneia**. It is mainly **Group A** which interests us here, since the two others are certainly not local.

The productions supposed to be local are represented by three compositional groups, one of which, **Group 1**, is certainly heterogeneous. We shall first consider these 3 groups, before examining the problems posed by **Group A**.

THE SAMOTHRACIAN GROUPS 2 AND 3

It must be pointed out initially that Samothracian Groups 2 and 3 are distinguished notably by their average contents of chromium, Cr, and nickel, Ni, equal respectively to 489 ± 111 ppm and 221 ± 32 ppm for Group 2, 262 ± 55 ppm and 129 ± 27 ppm for Group 3. In Group 1 these concentrations are 148 ± 50 ppm and 106 ± 52 ppm.

Such levels must correspond, as far as the workshops are concerned, to more or less proximate concentrations of the mass of gabbro formations forming the centre of this island (cf. Davi 1963; I.G.S.R. 1972; Tsikouras and Hatzipanagiotou 1995; Higgins and Higgins 1996, 121-3) and have increased the concentrations of chromium and nickel of the sediments resulting from alteration. This notion of proximity is not to be thought of in terms of geometric distance, but of a more or less exclusive supply of detrital material deriving from the alteration of the gabbros.

It can be seen, in fact, that the chromium and nickel concentrations of Groups 2 and 3 are very close to those of the two areas of the ancient workshops at *Keramidhariá* and *Paliápoli* on the north coast of the island. If one now considers the location of these two workshop areas in relation to the gabbro mass (Fig. 2), one can understand that the workshops in the *Keramidhariá* (Karadima 1994) area exhibit the higher values of chromium and nickel, as they received detrital material deriving mainly from gabbros (Fig. 2: 4). It is also understandable why the *Paliápoli* workshop exhibit lower proportions of chromium and nickel, since they were on the edge of the gabbro mass and also immediately close to sedimentary formations included in the gabbros (not distinguished on the map, cf. Higgins and Higgins 1996, 123, Fig. 12.6). The similarities existing between these two areas of workshops and the ceramics of Groups 2 and 3 are not found solely in the concentrations of chromium and nickel, but extend to the whole of the determined elements. This is shown in the dendrogram (Fig. 3), in which the specimens of the two groups are grouped in the same cluster as the ceramics and clays coming from the two workshop areas of *Keramidhariá* and *Paliápoli* (the conditions are the same as in Fig. 1). The matching of the ceramics of Groups 2 and 3 with the corresponding references, as well as examination of their composition, confirms their close similarities; it is almost certain that the origins of the ceramic Groups 2 and 3 are to be found, in the areas of *Keramidhariá* and *Paliápoli* respectively.

GROUP 1 FROM SAMOTHRACE

We have already pointed out the heterogeneous character and the lower concentrations of chromium and nickel of the Samothracian Group 1, in comparison to Groups 2 and 3. Among the ancient workshops of Samothrace, three exhibit similar compositions. These are the workshops of *Sdhiári* and *Phoniás* on the northeast coast

and that of *Armírichos* on the south coast. An examination of the map (Fig. 2) indicates the reasons accounting for these concentrations. The *Sdhiári*, *Phoniás* and *Armírichos* workshops are more distant from the gabbros than the previous workshops, and have partly different contributions, coming, in the case of *Phoniás*, from the central granite mass (Fig. 2: 3), and in the case of *Sdhiári* and *Armírichos* from volcanic rhyodacitic formations (Fig. 2: 2), more recent than the gabbros.

If, however, the compositions of these three workshops are compared to those of the Samothracian Group 1, it can be seen (Fig. 4) that few of the specimens can apparently be attributed to any of the three workshops.

It is not surprising that no ceramic comes from the *Sdhiári* region, which is situated in a very distant location and its production dates from the late Hellenistic period onwards. It is more surprising that only one specimen, STH 54, has been found to possibly come from *Phoniás*. But it is true that the reference groups available for this workshop and the neighbouring region are very insufficient, and under these conditions, it is reasonable to assume that the group containing samples STH 88 to STH 91 (Fig. 4) originates from *Phoniás*. This is only a hypothesis, however. As for the *Armírichos* workshop, it was probably the source of the two specimens STH 73 and 74, though this remains of little importance. There is no doubt then that the ceramics of Group 1 come largely from workshop areas not yet located, some of them perhaps not even in Samothrace.

GROUP A OF UNKNOWN ORIGIN

Group A is found to contain ceramic material of the 4th c. BC from all studied sites, except *Amphipolis* (Blondé et Picon 2000, 170). On *Thasos*, however, only one specimen of Group A has been identified out of 46 non-Attic black-glazed wares (this way of counting relies on the fact that at least a part of the Attic wares can be identified by eye and that it was excluded from the sampling). At *Abdera* Group A comprises 11 out of 35 non-Attic black-glazed, at *Stryme* 5/18 BG (=black-glazed pottery), at *Maroneia* 1/35 BG, and at *Messembria-Zoni* 8/17 BG. This represents at *Thasos* 2% of the non Attic BG, at *Abdera* 31%, at *Stryme* 29%, at *Messembria-Zoni* 46%, and at *Maroneia* 3% (the group has also been recognized further to the east, at *Doriskos*, near Evros river).

Nevertheless it is in Samothrace (*Ai-Yióryis* in the Ancient Town [1] (Numbers enclosed in brackets denote the number of specimens analysed), *Southern Necropolis* [4], *Rotunda of Arsinoe II* in the Sanctuary of the Great Gods [29], and *Kerasoúdhá* [1]) that the group is best represented (Fig. 1). Twenty-four BG out of 43 non-Attic BG, or 56%, are attached to it. Above all it also includes 11 specimens of common ware, or 19% of the 4th c. common ware samples analysed for this island. By contrast, on the other sites, only one single specimen of common ware belonging to Group A occurs (at

Messembria-Zoni).

The high proportion of **Group A** specimens present among the non-Attic black-glazed wares from Samothrace, and the relatively important number of common ware accompanying them, seems to constitute a good argument for suggesting a local origin for this group. This appears even more probable on the basis of the average percentages of chromium and nickel, equal to 257 ± 12 ppm and 261 ± 15 ppm respectively, which are in good agreement with the existence of ophiolitic (Tsikouras and Hatzipanagiotou 1995) and gabbroic areas.

The agreement is not so satisfactory in its details, however. A first disagreement concerns the average Cr/Ni ratio, which is 0.98 for **Group A**, a value much higher than in the nearby gabbro areas, from which **Group A** would come, if it were local. The ratio is however 2.37 at *Keramidhariá* and 2.17 at *Paliápoli*. The geological conditions around *Keramidhariá* present insignificant variations in this ratio, but it must be underlined that surveys of the clays have not been very intensive in this region. On the other hand, surveys have been conducted around *Paliápoli*, partly for historical reasons, but more particularly because of the relative complexity of the geological environment. A dozen argillaceous formations have been studied there, but none of them has produced a Cr/Ni ratio approaching that of **Group A**.

For the *Phoniás*, *Sdhiári* and *Armírichos* areas these ratios are lower, being 1.32, 1.75, and 1.79 respectively, but they are still much higher than that of **Group A**. Furthermore, it has already been pointed out that these areas are characterized by detrital contributions, which are not all derived from the gabbros; these are responsible for the lower percentages of chromium and nickel to be seen there, and which are thus incompatible with those of **Group A**.

A final argument can also be added in favour of excluding a local origin for the ceramics of **Group A**. It concerns the dispersion of the percentages of chromium and nickel, which is considerable at Samothrace. This is why the relative standard deviations are very rarely lower than 15% or 16%. That characteristic can be linked to the narrowness of the coastal plains of the island, which does not permit a sufficient homogenisation of the clay deposits. **Group A**, on the contrary, exhibits a remarkable homogeneity in these same constituents, the corresponding relative standard deviations being equal to 5% and 6% respectively.

It seems then that in the present state of our knowledge the hypothesis of a local origin for **Group A** cannot be defended. If now one looks at other localities where the clays exhibit high percentages of chromium and nickel, clays that could have been utilized for making the ceramics of **Group A**, the two closest are in the Troad and on the island of Lesvos. As regards the possibility of finding a low dispersion of these constituents there, the former appears better placed than the latter, where the sedimentary deposits are limited. In both localities, however, surveys of the local clays are needed. It is of

course also possible that the origin sought for is even further distant.

G 2-3 WARE

The fabric with subgeometric decoration that is called **G 2-3 ware** (Moore 1982) forms the most interesting of the various wares of the fill of the (former) *Temenos*, now *Hall of Choral Dancers*, and its terrace, in the Sanctuary of the Great Gods (Lehmann 1998, 73-8). So far, only sites in the northeastern Aegean have yielded examples of **G 2-3 ware** (cf. McMullen Fisher 1996). Although it is generally attributed to the Troad, Lesvos or Samothrace, the place of origin and manufacture of **G 2-3 ware** is a perplexing problem, which will be considered here. The 12 specimens from the fill of the *Hall of Choral Dancers* and the Terrace (Moore 1982) analysed (Catalogue of Analysed Archaeological Ceramics: 11) were the object of a preliminary classification after analysis, under the same conditions as those already indicated (Matsas *et al.* forthcoming).

The grouping shows that 2 samples are clearly differentiated from the rest. The remaining 10 specimens exhibit the high average percentages of chromium and nickel, respectively equal to 221 ± 8 ppm and 194 ± 12 ppm, which correspond to a very weak dispersion of the compositions, the relative standard deviations being equal respectively to 4% and 6%. The Cr/Ni ratio shows a low value of 1.14. This is in exactly the same situation as with the 4th c. BC **Group A**, and for the same reasons these 10 samples should not be local. One can simply note that the argument concerning the dispersions must be treated with more prudence than in the case **Group A**. In the latter instance one could be sure that it is an important production, whose presence has been substantiated at numerous sites. This is not yet the case with the composition group of the 10 specimens studied here. For if it were a question of a quite small production, there would obviously be less reason for surprise at its homogeneity. Even so, the argument drawn for the weak Cr/Ni ratio would always remain valid.

CONCLUSION

While it is almost certain that the origins of the ceramic **Groups 2 and 3** are to be found in the areas of *Keramidhariá* and *Paliápoli* respectively on Samothrace, **Group A** of the 4th c. BC and **G 2-3 ware** do not originate from this island. Their origin should be sought at localities where the clays exhibit high percentages of chromium and nickel. Particularly for **Group A**, the two closest are in the Troad and on the island of Lesvos, with the former better placed than the latter.

ACKNOWLEDGMENTS

We are indebted to Prof. J.R. McCredie for his help.

REFERENCES

- Blondé, F. and Picon, M., 2000, Autour de la céramique du IV^e siècle dans le Nord-Est de l'Égée: quelques approches différentes, *BCH Études*, **124**, 1161-1188.
- Blondé, F. and Picon, M., Forthcoming, Some comments on the Production and Diffusion of IVth c. BC ceramics in Thasos and Several Sites in Northern Greece, in: *5th European Meeting on Ancient Ceramics. Modern Trends in Research and Applications. Athens, 18-20 Oct 1999*.
- Davi, E. N., 1963, Geologiki kataskevi nisou Samothrakis, *Geologika Chronika ton Ellinikon Choron*, **14**, 133-212 (in Greek).
- Dusenbery, E. B., 1998, *Samothrace 11. The Nekropoleis*, Princeton.
- I.G.S.R., 1972, Institute for Geology and Subsurface Research, *Geological Map of Greece*, Samothraki Sheet.
- Higgins, M. D. and Higgins, R., 1996, *A Geological Companion to Greece and the Aegean*. London.
- Karadima, Ch., 1994, Ergastirio paragogis amforeon sti Samothraki, in: *3rd Epistimoniki Sinandisi gia tin Ellinistiki Keramiki. Chronologimena sinola-Ergastiria. 24-27 Septemvriou 1991 Thessaloniki*, 355-362, Athens (in Greek).
- Karadima, Ch., 1998, Archeologikes Ergasies sti Maroneia ke ti Samothraki to 1995, *To archeologiko Ergo sti Makedonia ke Thraki 9 (1995)*, 487-496 (in Greek).
- Kopcke, G., 1992, Ceramics, in *Samothrace 7. The Rotunda of Arsinoe* (eds. J.R. McCredie, G. Roux, S.M. Shaw, and J.Kurtich), 277-326, Princeton.
- Lehmann, K., 1998, *Samothrace. A guide to the Excavations and the Museum*, Thessaloniki.
- Matsas D., Karadima, Ch., and Koutsoumanis, M., 1992, Archeologikes Ergasies Samothrakis, 1989, *To Archeologiko Ergo sti Makedonia kai ti Thraki 3 (1992)*, 607-614, (in Greek).
- Matsas, D., Karadima, Ch., Picon, M., and Blondé, F., Forthcoming, Keramiki G 2/3 apo ti Samothraki. To provlima tis proeleusis, in *Simposio sti Mnimi tou Vageli Pentazou. Ellines ke Thrakes sti Thraki tou Egeou. Komotini, 19-20 Martiou 1999* (in Greek).
- McMullen Fischer, S., 1996, Troian G 2/3 ware Revisited, *Studia Troica* **6**, 119-132.
- Moore, M. B., 1982, Ceramics, in *Samothrace 5. The Temenos* (eds. P. Williams Lehmann, and D. Spittle), 315-94, Princeton, New Jersey.
- Tsikouras, B., and Hatzipanagiotou, K., 1995. The geological evolution of Samothraki island (N. Aegean, Greece): An incomplete ophiolitic sequence in the Circum-Rhodopi Zone, in *Proceedings of the XV Congress of the Carpatho-Balkan Geological association, September 1995 Athens (Geol. Soc. Greece, Spec. Publ., 4 {1})*, 116-126.

APPENDIX: CATALOGUE OF ANALYSED ARCAEOLOGICAL CERAMICS

1. 67 samples (STH 45, 51-3, 59-68, 71, 73-124) from the *Rotunda of Arsinoe* (numbers enclosed in brackets denote the number of specimens analysed: 48.186, 48.344 [3], 48.194 [5], 48.190 [5], 48.343, 48.186 [7], 48.190 [5], 48.274 [10], 74.476 [3], 74.477 [4], 74.482 [8], 74.483 [5], 74.485 [5], 74.486 [4], 74.487) including ceramics from the 'Arsinoeion Fill' (Kopcke 1992, 277).
2. 21 samples (STH 36-44, 46-58, 70) from the nekropolises (Dusenbery 1998); 20 (STH 36-44, 47-58, 69-70) from the *Southern Nekropolis*: 60.222 [3], 57.124, 57.176, 57.175, 60.224 II, 57.173, 57.126, 60.224 I [4], 57.120 [5], 60.130, 57.375; 1 (STH 46) from the *H Nekropolis*: 54.442.
3. 3 samples (STH 125-7: 50.643-unstratified and 50.660) of common ware from the *Hall of Choral Dancers* (formerly known as the *Temenos*: Lehmann and Spittle 1982).
4. 17 samples (STH 1-16, 25) from the excavation at *Keramidhariá* (Matsas *et al.* 1992, 607-11; Karadima 1994).
5. 7 samples (surface collection, STH 18-24) from the workshop at *Armírichos*.
6. 13 samples (STH 26-35, 137-9) from the excavation in the Ancient Town, at the site *Ái-Yióryis* (Karadima 1998, 488-91).
7. 8 samples (surface collection, STH 128-35) from an outdoor sanctuary at the site *Kerasoùdha*, at an elevation of ca. 530 m on a south foothill of the peak *Ái-Lias*, probably dedicated to the 'Great Mother', a divinity of the mountainous world.
8. 5 samples (surface collection, STH 72, 136, MRN 54-6) from the workshop at *Kvára* (=Paliápoli workshop) in the Ancient Town.
9. 5 samples (surface collection, STH 140-4) from *Phoniás* workshop.
10. 4 samples (surface collection, STH 145-8) from *Sdhiári* workshop.
11. 12 samples from the fill of the *Hall of Choral Dancers* and the Terrace (STH 179-90): 50.203 C, 50.487 B, 53.128 B, x.51.309, 53.126, 53.127 A, 54.53, 50.166, 51.43, 50.201 E, 51.155 E, x.50.89).

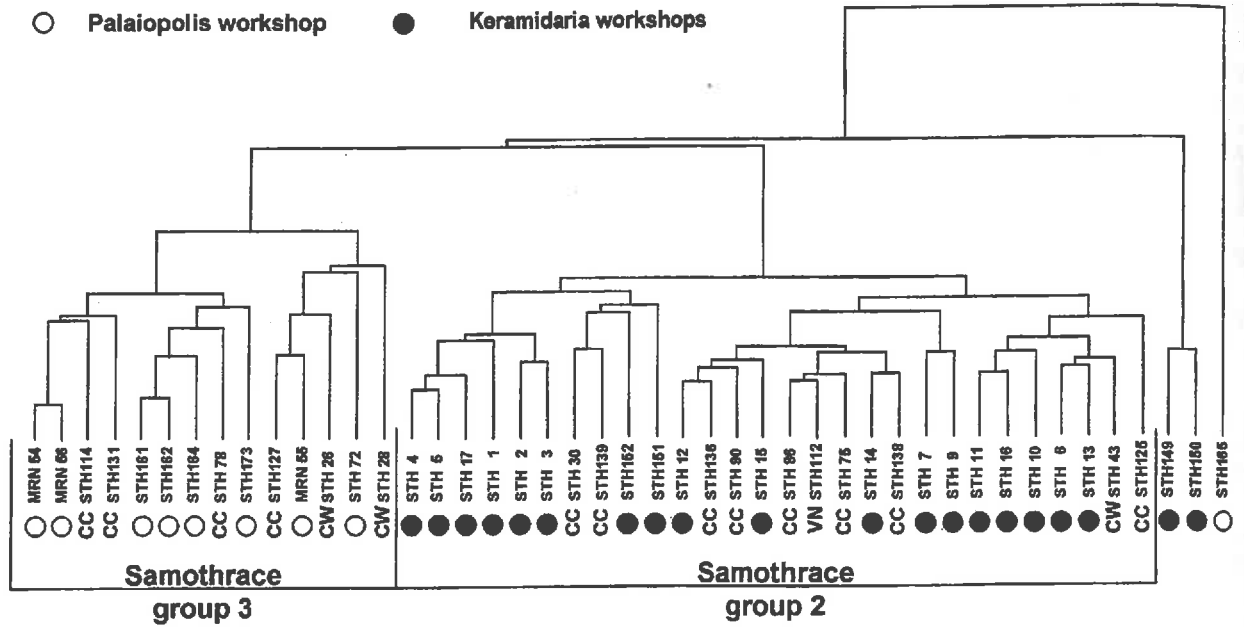


Figure 3 Classification of Groups 2 and 3 of Fig. 1 with reference to the Paliápoli and Keramidariá workshops.

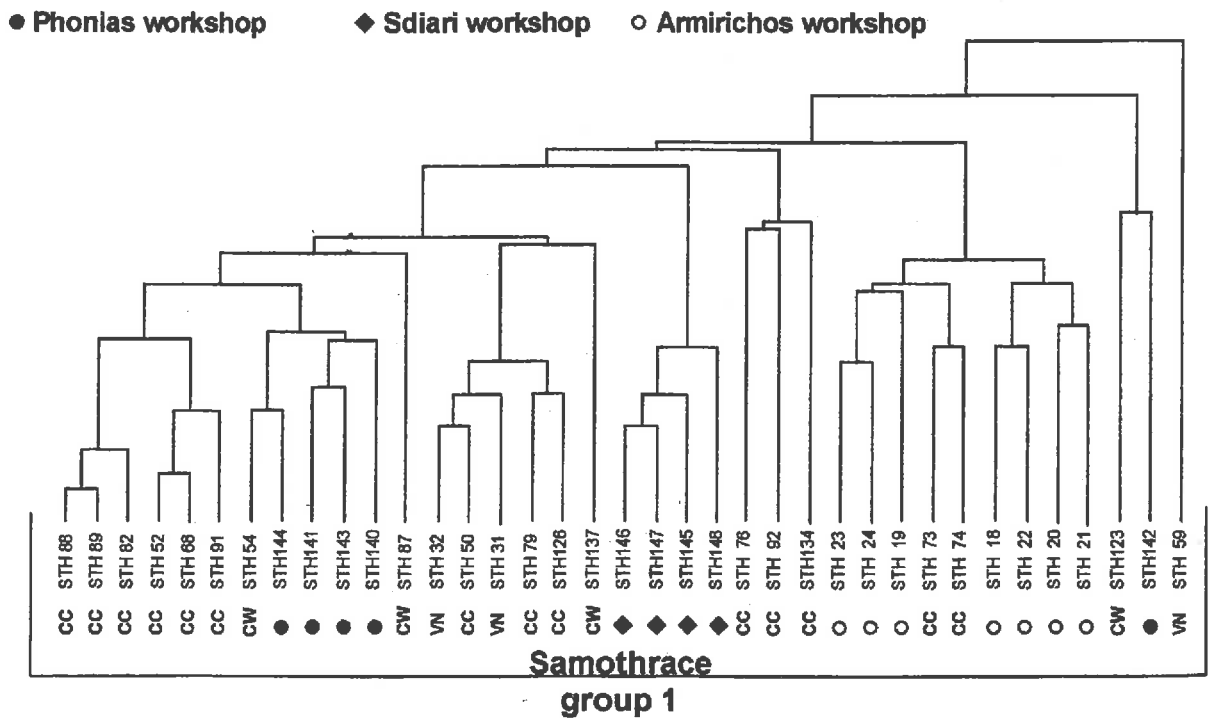


Figure 4 Classification of Group 1 of Fig. 1 with reference to the Phoniás, Sdiári and Armirichos workshops.