FIRST STEP IN THE PREPARATION OF A SOIL MAP OF THE PROTECTED DESIGNATION OF ORIGIN VALDEPEÑAS (CENTRAL SPAIN).

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ABSTRACT

The Protected Designation of Origin (P.D.O.) Valdepeñas is located in the south of the province of Ciudad Real (Central Spain) with 22,000 ha of vineyard (Fig. 1). The characterization of group the soils of the P.D.O. Valdepeñas the profiles studied according to their physico-chemical characteristics and the concentration of the most relevant geochemical elements are reported in this work. This information constitute a first step in the elaboration of a viticulture soil map.
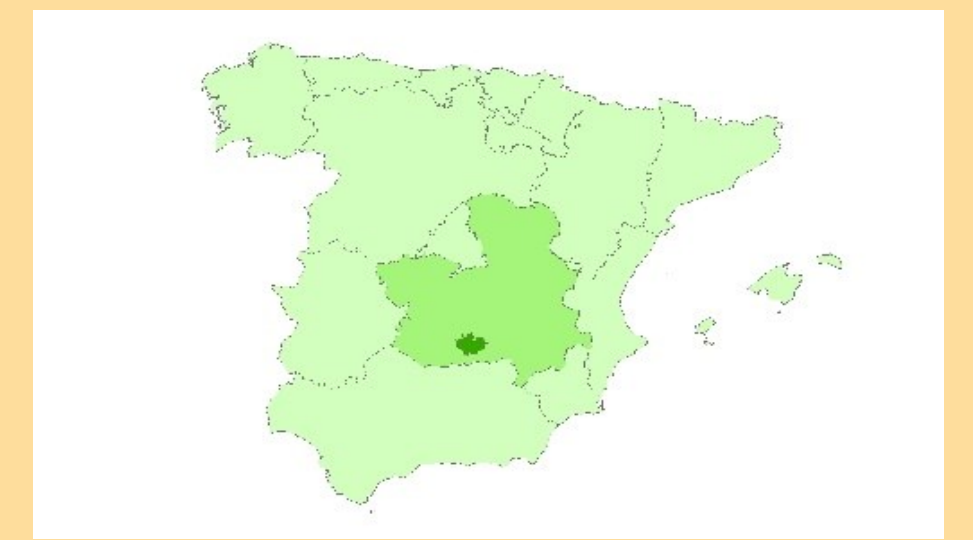
Fig 1. Located of P.D.O Valdepeñas (Ciudad Real, Spain)

MATERIAL AND METHODS

In this study, 90 vineyard soils profile were analysed through the territory of the P.D.O. All profiles were sampled and described according to FAO and classified according to Soil Taxonomy and FAO. The samples were dried and sieved previously to the determination of physico-chemical parameters, following standards protocols. The contents of major and trace elements were analysed by X-Ray fluorescence. Statistical study was made using SPSS program and trend maps were made using Arc-GIS program (both programs licenced by University of Castilla-La Mancha.
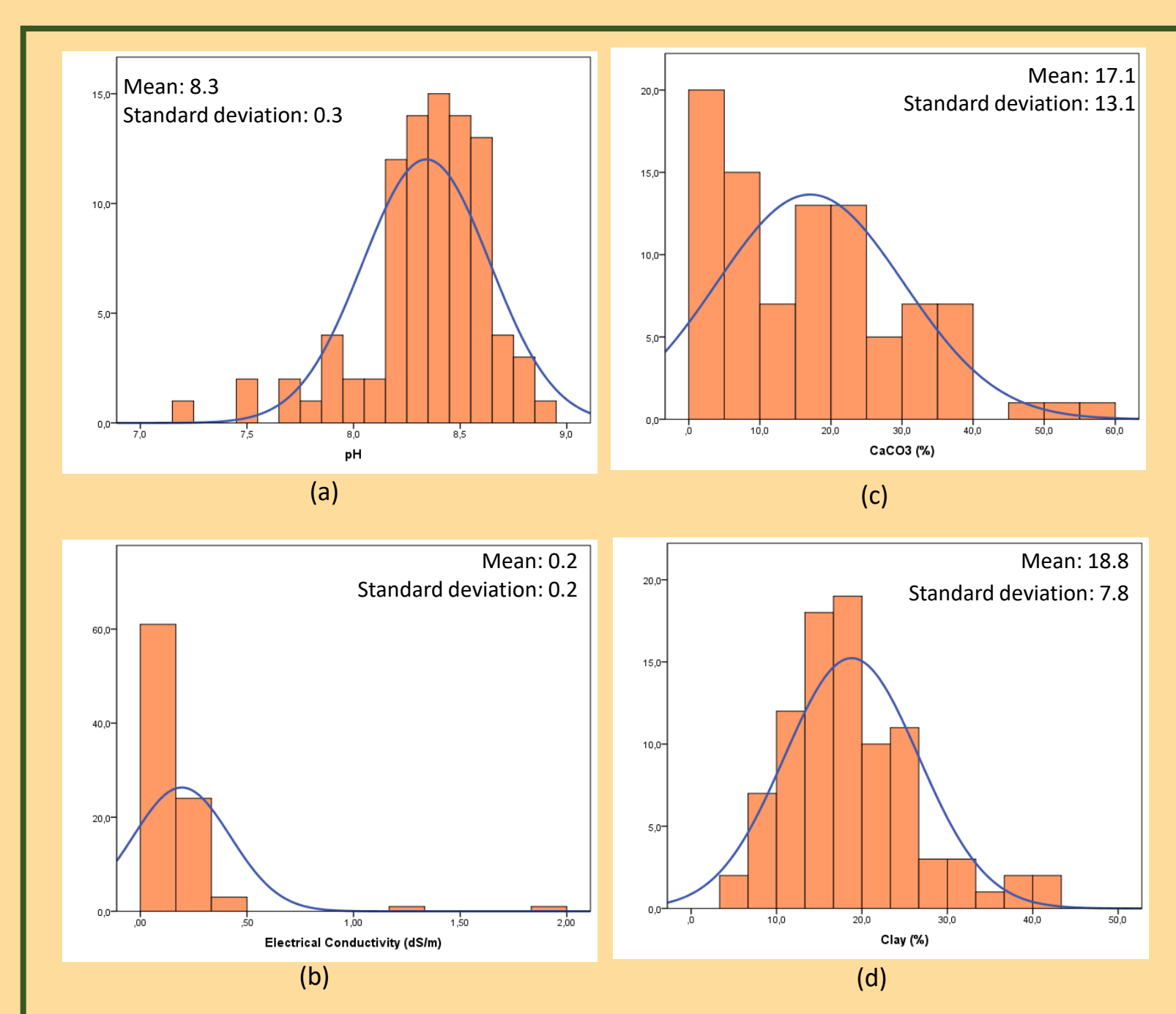
RESULTS

Fig 2. Histograms of the principal characteristic physico-chemical of soils: pH (a); electrical conductivity (b); CaCO3 (c) and clay (d).

In the histograms (Fig. 2) it can be observed that the soils of the P.D.O. Valdepeñas are: alkaline (average pH = 8.3), not saline (mean electrical conductivity 0.2 dS/m), with a high percentage in $CaCO_3$ (mean 17.1%) and texture slightly clayed (average clay = 18.8%). Figure 3 shows the spatial distribution of two of the most important characteristic physical-chemical properties of the studied area: pH and $CaCO_3$ content.
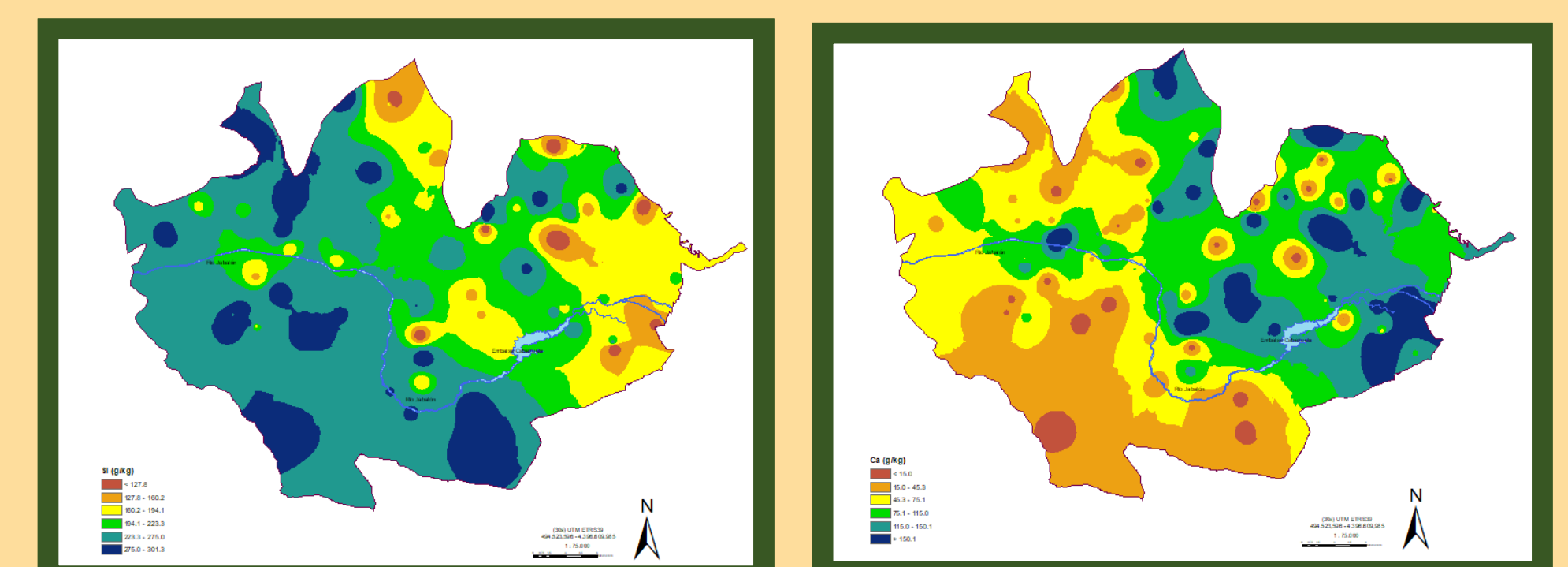

Fig 4. Maps of spatial distribution of Si (left) and Ca (right) in the P.D.O Valdepeñas
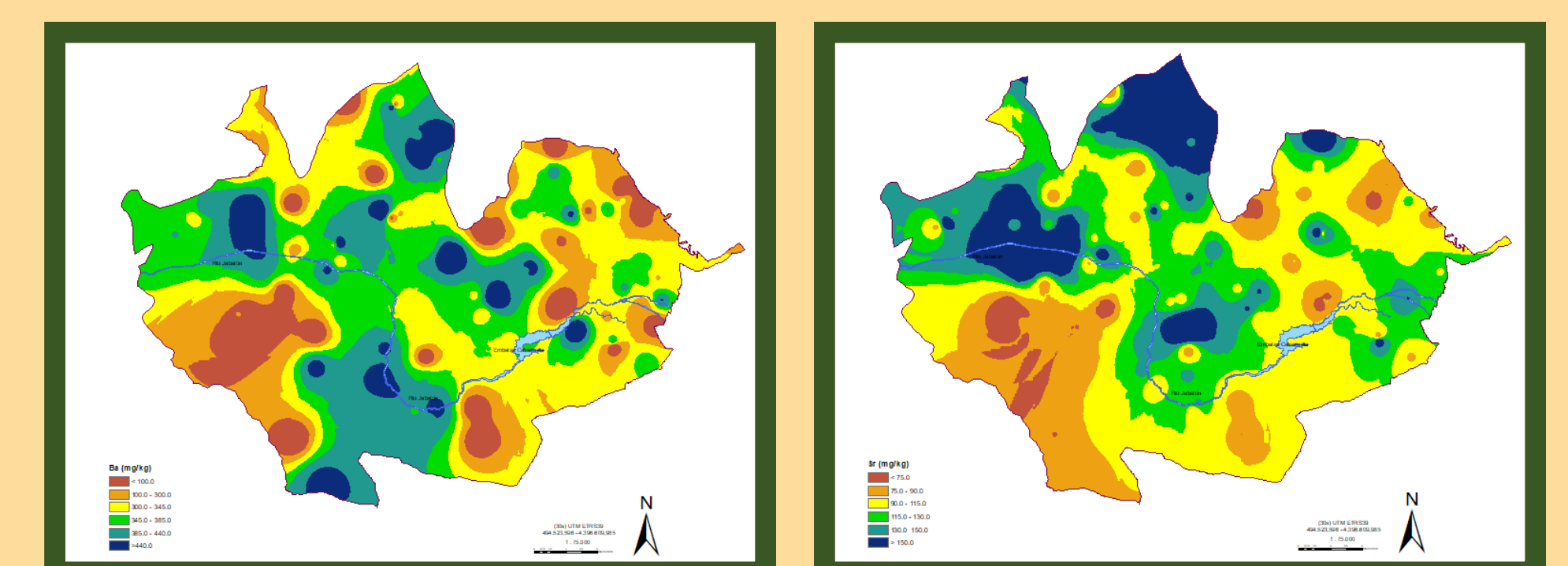

Fig 5. Maps of spatial distribution of Ba (left) and Sr (right) in the P.D.O Valdepeñas
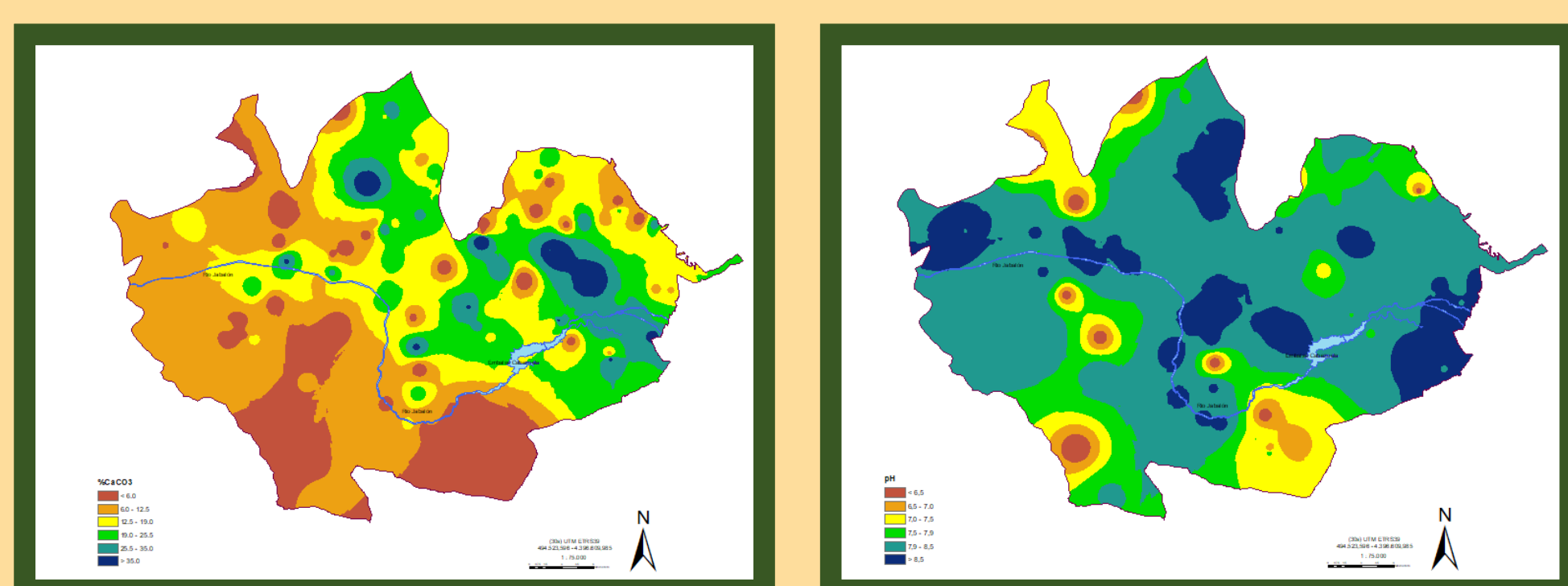

Fig 3. Maps of spatial distribution of pH (left) and CaCO3 (right) in the P.D.O Valdepeñas

In the study of the major elements, Si and Ca are found in the highest average concentration (203.7 g/kg and 105.5 g/kg respectively). In the case of trace elements, the elements more abundant in average were Ba and Sr (361.8 mg/kg and 129.3 mg/kg respectively). Figures 4 and 5 shows the spatial distribution of these elements.
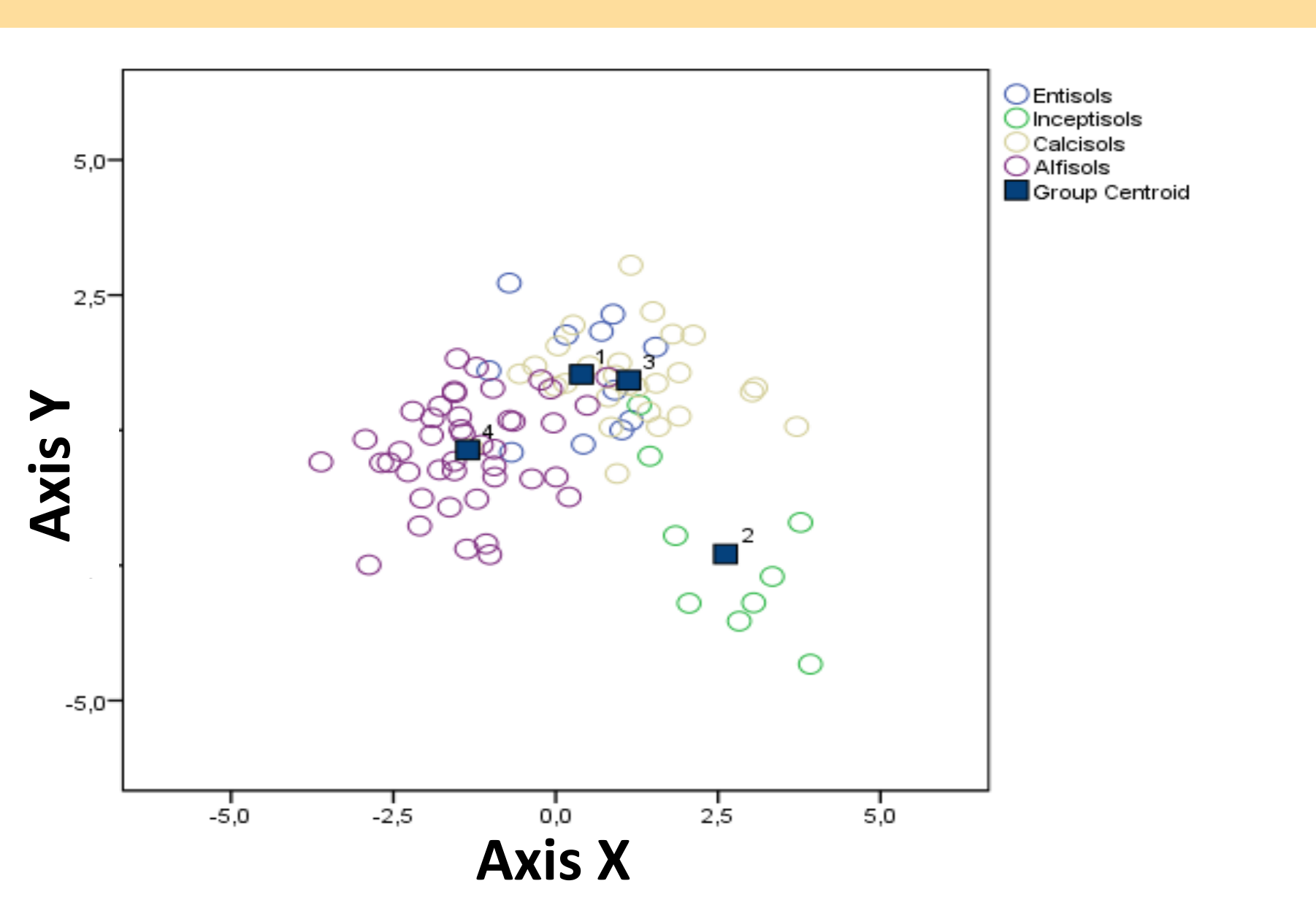

Fig 6. Grouping maps of the studied soils according to the established soil groups.

Regarding the statistical study, the result of principal component analysis allow us to establish four group to classify the studied soils (Entisols, Inceptisols, Calcisols and Alfisols). These groups have been used for the discriminant analysis, obtaining a 91% of correct grouping near the centroids. (Fig.6).

CONCLUSIONS

The physico-chemical properties and the contents of chemical elements allows classifying the soil of the studied area in 4 group according to the groups by Soil Taxonomy and FAO. This is the first step to make a soils map. Regarding the reported data it is possible to address the vineyard soils of the P.D.O. Valdepeñas that belong to four main order of soils.

ACKNOWLEDGMENTS