Honey is a very important food stuff due to its nutrient and therapeutic effects. It is the natural product obtained by honey bees (Apis mellifera L.) from the nectar of flowers or from secretions of living parts of the plants. The composition and properties of honey rely on the botanical origin of the nectars or secretions. Large number of studies in the literature has proved the possibility of characterizing honey samples by selected chemical parameters. The main goal of this study is to classify honey samples according to their botanical origin applying statistical pattern recognition methods. For this purpose, three replicates of 13 flower and 7 pine honey samples were digested with 5:1 (v/v) nitric acid and peroxide mixture. Then the concentrations of 18 elements (Li, B, Na, Mg, Al, K, Ca, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sr, Cd, Ba, Pb) in the honey samples were determined with inductively coupled plasma mass spectrometer (ICP-MS). Furthermore, statistical pattern recognition methods were applied for the results obtained. Figure 1 shows the application of principal component analysis (PCA) to the element concentrations of the honey samples.

As can be seen from the Figure 1, flower and pine honey samples can be classified into two groups by using the first and second principal components which explain approximately 50% of the total variance of the data. In addition, hierarchical cluster analysis and linear discriminant analysis were also applied in order to evaluate the similarities and dissimilarities of elemental compositions for the flower and pine honey samples.