In Turkey, many flora studies have been conducted on plant species richness. However, these studies reveal only plant species numbers. In some vegetation studies, some data are insufficient. The purpose of studying the diversity of plant species in Türkmen Mountain forest vegetation, which contains different plant communities; 1- To determine the species diversity of the study area by different indices (alpha, beta and gamma) and modelling the relationships between species diversity and some environmental factors. 2- To determinate the species diversity of plant groups and sample areas to compare the data obtained as a result of numerical analysis. The material of the work is the vascular plants in the forest of Türkmen Mountain which is between Eskişehir and Kütahya Provinces. The sampling plots belong to vegetation were obtained by using Braun-Blanquet method. Two sub-sampling plots (totally 190) were taken under the plots (100 x 100 m²). The size of per subsampling plot is 400 m² (20 x 20 m²). The data of the sampling plots were stored in TURBOVEG Database Program and analyzed with Jaccard distance measure and flexible beta (-0.25) from group linkage method in PC-ORD software. In Turkey, many flora studies have been conducted on plant species richness. However, these studies reveal only plant species numbers. In some vegetation studies, some data are insufficient. The purpose of studying the diversity of plant species in Türkmen Mountain forest vegetation, which contains different plant communities; 1- To determine the species diversity of the study area by different indices (alpha, beta and gamma) and modelling the relationships between species diversity and some environmental factors. 2- To determinate the species diversity of plant groups and sample areas to compare the data obtained as a result of numerical analysis. The material of the work is the vascular plants in the forest of Türkmen Mountain which is between Eskişehir and Kütahya Provinces. The indicator taxa of plant groups were determined in the JUICE Program. The relationships between plant groups and bedrock formations which are in the form of presence and absence data were analyzed by Pearson Chi Square Test Statistic. The relationships between other variables (coverage of the tree layer and the shrub layer, radiation index (RI), altitude, slope and location) and plant groups were analyzed by Wilcoxon Rank Sum Test. Shannon H and Simpson 1-D from the alpha (α) diversity indices and beta (βw) diversity index were calculated in Past Package Program. Gamma diversity (γ) was directly determined for plant groups as the sum of different species. The relations between ?, βw and γ plant diversity values of the sample plots and environment variables were analyzed with regression tree method in DTREG software. As a result of the regression tree analysis, the model variables with the highest explanation value for the diversity indices were elevation, tree and shrub coverage, bedrock formations, slope and radiation index. Similar results were obtained as a result of the analysis for the distribution of plant groups. As a result, Türkmen Mountain forest vegetation is divided into 9 plant groups. When the three diversity indices are evaluated together, plant groups with the highest species diversity were Group 1 (Pinus nigra subsp. pallasiana – Cistus laurifolius), Group 2 (Pinus nigra subsp. pallasiana – Dactylis glomerata subsp. hispanica), Group 4 (Pinus nigra subsp. pallasiana – Quercus petraea subsp. iberica) and Group 8 (Pinus sylvestris – Galium rotundifolium). For the sustainability, monitoring and protection of species diversity, it
will be appropriate the planning according to the factors affecting species diversity and species diversity of plant groups.