In this study, the relationship between the essential oil amount in the cones of J. excelsa, which is an important tree species, and the environmental factors were analyzed. To this end, the ecological site conditions in 40 different sampling areas located in the Lakes Region in the southwest of Turkey (climate, physiographic and edaphic factors) were determined and then the essential oils were isolated from the mature cones collected from each sampling area using Clevenger apparatus. The analysis performed in each sampling area with 3 repetitions revealed that the average essential oil yield of the cones was 3.82±1.08 (% v/w). During the statistical assessment, first the statistical significance of the difference between the essential oil yields of the sampling areas was determined through one-way analysis of variance and Duncan’s multiple range tests. The relationships between the yield of essential oils and site factors were tested by Principal Component Analysis (PCA). The results revealed that the percentage of essential oils in the cones of J. excelsa was very high and thus it can be used as a typical essential-oil plant. Furthermore, the statistical analyses showed that the yield of essential oils in the cones varied across the sampling areas in different locations, which might be basically caused by climate and soil properties.