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The distribution, mixture, and diversity models of woody species in Spatial Pattern of Persian oak (*Quercus brantii* var. *persica*) forests

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ABSTRACT

Collection of quantitative and qualitative data from trees is necessary for appropriate management and planning of forest stand. The model of spatial distribution, mixture status, and their diversity are some of the important features of forest stand. The final objective for evaluation of spatial pattern is formation and presentation of the relevant hypotheses regarding ecologic communities, which are crucially important in forest sustainable management. The present study is aimed to examine spatial distribution pattern, mixture status, and diversity of forest woody species in forests of Mid Zagros Zone (Zarabin Ilam, Shoorab, and Ghalehbol in Lorestan province) by means of Nearest Neighborhood Index (Clark & Evans). The 100% inventory of stand was employed to extract accurate land data. The results of Clark and Evans' Index showed the Clumped Pattern for zones of Shoorab and Ghalehbol and the Uniform Pattern for Zarabin region. In order to examine way of arrangement of various species along each other, Mixture Index was applied. With respect to mixture and biological diversity indices, the uniform pattern may be produced due to modification in clumped pattern, which caused by increase in distance among basal sprout due to aging and further diversity of species.

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INTRODUCTION

The forests in Zagros vegetation are considered as the second recoverable cellulosic resource in Western Iran and one of the most valuable deposits of oak tree in the world. Arch-like Zagros Range is elongated like a colossal wall from the northwest to southwest of Iran and it represents one of the greatest natural phenomena in this country. Zagros Range is divided into three parts i.e. northern, central, and southern zones; Mid Zagros (central) is assumed as the peak point of Zagros stratifications. The current area of these forests is about 5 million hectares and the dominant constituent type of these forests is Persian oak trees, which make up the dominant tree species of these forests along with other oak species [30]. With their unique species diversity which including several plant species, these forests are deemed as the paramount natural ecosystems in Iran [19, 30].

With respect to distribution of these forests, study on spatial pattern diversity, dispersion, mixture, and quantification of structural patterns are some of important issues. Distribution pattern and its result in demographic dynamism and ecosystem are two essential subjects in ecology [24]. One of the foremost tools in forestry management is quantification of structure. The method of achieving an appropriate structure can be possible with study on their current status. One could conserve biologic diversity and forest reliability by employing appropriate silviculture operation and simulation of natural structures in the managed stand [8]. Spatial distribution patterns may vary at temporal and spatial scales [36, 40 & 47]. Spatial distribution structure is one of the foremost effective factors in biologic diversity in forest ecosystems [38]. This important issue is assumed as one of the noticeable and necessary subjects, especially in the course of silviculture close to nature objective [18]. Generally, there are three main types of spatial patterns in the nature:

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