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SPATIAL PATTERN AND CONNECTION OF TREE DIAMETER CLASSES IN *PINUS HALEPENSIS* M. STANDS AFTER WILDFIRE

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EXTENDED ABSTRACT

Pinus halepensis M. is an exclusively Mediterranean species met in extensive stands in the evergreen-broadleaves zone where this species finds the optimum of its development. The regeneration and maintenance of these stands are influenced by the wildfires, which are a decisive factor for *P. halepensis* spread. The natural regeneration of the stands will be continuous and principally utilized for their renewal and improvement. The spatial pattern of the trees after the wildfire plays an important role to the structure and treatment of these stands. In this paper the methods for the estimation of spatial pattern and connection among diameter classes of *P.halepensis* trees are given.

The research was conducted in the forest area of the Kassandra Peninsula, Chalkidiki, and North Greece. The area is covered by the species *P. halepensis*. The trees had a diameter ranged from 4 to over 50 cm. The stands are mainly even-aged, whereas their management is based on a multiple uses frame. A representative sample of 49 plots of 0.05 ha was taken and the number and diameters of the trees in each plot were measured. The trees were then classified into five classes that could seem to be of interest for forest management.

The density and frequency of tree diameter classes, which provide the basic characteristics of spatial dispersion, were estimated. In studying spatial patterns, the plant ecologists have generally identified three distinct spatial patterns: random, aggregated and regular. For the characterisation of the spatial pattern of the trees in each diameter class, the Index of Dispersion (ID) was estimated and the null hypothesis of the spatial randomness was tested. Furthermore, the bootstrap distribution of the ID was estimated. The spatial dependence among the diameter classes was tested by the X^2 distribution. The test of the spatial randomness showed that the spatial pattern of the trees is aggregated. The findings show also that the *P. halepensis* like most trees after disturbance grows again in aggregated or clumped pattern. This initial, clumped pattern is caused by the seed dispersal, which results in a spatial pattern of advanced regeneration, suitable seedbeds for germination, competition from other plant species, mainly shrubs, and other factors. However, as the stands develop, a characteristic spatial pattern emerges as a result of intraspecies competition. Consequently, even though the stand begins in a strong clumped arrangement, later the component trees become more regularly spaced with age as the trees differentiate and as a consequence disturbances destroy some of them. By the time they reach the mature stage, the number of trees has become so reduced that they are relatively randomly or evenly distributed.

Key words: aggregated pattern, bootstrap estimate, index of dispersion, stand structure.